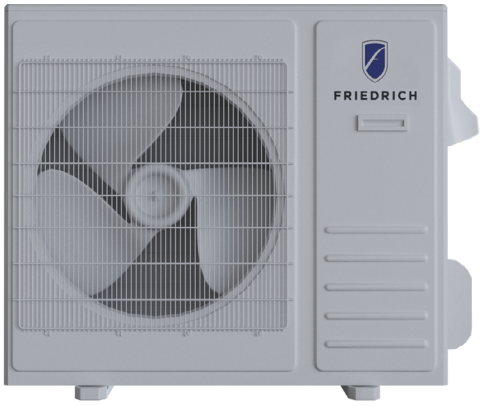
Service Manual

FRIEDRICH

Friedrich Breeze™ Universal Heat Pumps



Breeze™ 208/230 VOLT

Outdoor Unit	WFPU17Z243C (24K), WFPU18Z363C (36K), WFPU18Z483C (48K) , WFPU17Z603C (60K)
Indoor Unit	WFH24Z193C (24K), WFH36Z193C (36K), WFH48Z223C (48K), WFH60Z223C (60K)

96162000_04

THE EXPERTS IN ROOM AIR CONDITIONING

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INTRODUCTION

Important Safety Information

The information in this manual is intended for use by a qualified technician who is familiar with the safety procedures required for installation and repair, and who is equipped with the proper tools and test instruments required to service this product.

Maintenance is the responsibility of the owner. Failure to properly maintain or repair equipment may result in personal injury and/or various types of property damage (fire, flood, etc.).

Installation or repairs made by unqualified persons can result in subjecting the unqualified person making such repairs as well as the persons being served by the equipment to hazards resulting in injury or electrical shock which can be serious or even fatal.

Safety warnings have been placed throughout this manual to alert you to potential hazards that may be encountered. If you install or perform service on equipment, it is your responsibility to read and obey these warnings to guard against any bodily injury or property damage which may result to you or others.

Due to continuing research in new energy-saving technology, all information in this manual is subject to change without notice.

Your safety and the safety of others is very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is a safety Alert symbol.
This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION". These words mean:

⚠WARNING Indicates a hazard which, if not avoided, can result in severe personal injury or death and damage to product or other property.

CAUTION Indicates a hazard which, if not avoided, can result in personal injury and damage to product or other property.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what will happen if the instructions are not followed.

NOTICE Indicates property damage can occur if instructions are not followed.

⚠ WARNING

Refrigeration system under high pressure

Do not puncture, heat, expose to flame or incinerate.

Only certified refrigeration technicians should service this equipment.

R410A systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used.

Only use gauge sets designed for use with R410A.
Do not use standard R22 gauge sets.

INTRODUCTION

Important Safety Information

CAUTION

DO NOT OPERATE EQUIPMENT DURING ACTIVE STAGES OF CONSTRUCTION

To ensure proper operation, Friedrich requires that all equipment is not operated during active construction phases. This includes active stages of completing framing, dry walling, spackling, sanding, painting, flooring, and moulding in the equipment's designated conditioning space. The use of this equipment during construction could result in premature failure of the components and/or system and is in violation of our standard warranty guidelines. The operation of newly installed equipment during construction will accelerate the commencement and/or termination of the warranty period.

⚠ WARNING

EXPLOSION HAZARD

Please read this manual thoroughly prior to equipment installation or operation. It is the installers responsibility to properly apply and install the equipment. Installation must be in conformance with the NFPA 70-2008 National Electric Code or current edition, International Mechanic code 2009 or current edition and any other applicable local or national codes.

⚠ WARNING

EXPLOSION HAZARD

Refrigeration system under high pressure. Do not puncture, heat, expose to flame or incinerate. Only certified refrigeration technicians should service this equipment. Appropriate safe service and handling practices must be used. Only use gauge sets designed for use with R410A. Failure to do so can result in property damage, personal injury, or death.

⚠ WARNING

ELECTRIC SHOCK HAZARD

Turn OFF electric power before service or installation.

Unit must be properly grounded.

Unit must have correct fuse or circuit breaker protection. Unit' s supply circuit must have the correct wire conductor size. All electrical connections and wiring must be installed by a qualified electrician and conform to the National Electrical Code and all local codes which have jurisdiction. Failure to do so can result in property damage, personal injury and/or death.

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety Alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others.
All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION".
These words mean:

Indicates a hazard which, if not avoided, can result in severe personal injury or death and damage to product or other property.

⚠ WARNING

Indicates a hazard which, if not avoided, can result in personal injury and damage to product or other property. All safety messages will tell you how to reduce the chance of injury, and tell you what will happen if the instructions are not followed.

CAUTION

Indicates property damage can occur if instructions are not followed.

NOTICE

Indicates property damage can occur if instructions are not followed.

INTRODUCTION

Personal Injury Or Death Hazards

SAFETY FIRST	⚠ WARNING	⚠ AVERTISSEMENT	⚠ ADVERTENCIA
	Do not remove, disable or bypass this unit's safety devices. Doing so may cause fire, Doing so may cause fire, injuries, or death.	Ne pas supprime, désactiver ou contourner cette l´unité des dispositifs de sécurité, faire vous risqueriez de provoquer le feu, les blessures ou la mort.	No eliminar, desactivar o pasar por alto los dispositivos de seguridad de la unidad. Si lo hace podría producirse fuego, lesiones o muerte.

⚠ WARNING

ALWAYS USE INDUSTRY STANDARD PERSONAL PROTECTIVE EQUIPMENT (PPE)

ELECTRICAL HAZARDS:

- Shutdown and/or disconnect all electrical power to the unit before performing inspections, maintenance, or service.
- Make sure to follow proper lockout/tag out procedures.
- Always work in the company of a qualified assistant if possible.
- Capacitors, even when disconnected from the electrical power source, retain an electrical charge potential capable of causing electric shock or electrocution. Wait a few minutes after shutdown to allow the capacitors to discharge the stored energy.
- Handle, discharge, and test capacitors according to safe, established, standards, and approved procedures.
- Extreme care, proper judgment, and safety procedures must be exercised if it becomes necessary to test or troubleshoot equipment with the power turned on to the unit.
- Do not spray water on the air conditioning unit while the power is on.
- Electrical component malfunction caused by water could result in electric shock or other electrically unsafe conditions when the power is restored and the unit is turned on, even after the exterior is dry.
- Use air conditioner on a single dedicated circuit within the specified amperage rating.
- Ensure that the unit is properly grounded.
- Follow all safety precautions and use approved protective safety equipment such as: gloves, goggles, and clothing. Ensure that properly insulated tools, and testing equipment are are used as well to protect against equipment damage and reduce the risk of injury.
- Failure to follow proper safety procedures and these warnings can result in serious injury or possibly death.

INTRODUCTION

Personal Injury Or Death Hazards

- **REFRIGERATION SYSTEM REPAIR HAZARDS:**

- Use approved standard refrigerant recovering procedures and equipment to relieve high pressure before opening system for repair. Reference EPA regulations (40 CFR Part 82, Subpart F) Section 608.
- Do not allow liquid refrigerant to contact skin. Direct contact with liquid refrigerant can result in minor to moderate injury.
- Be extremely careful when using an oxy-acetylene torch. Direct contact with the torch's flame or hot surfaces can cause serious burns.
- Make certain to protect personal and surrounding property with fire proof materials and have a fire extinguisher at hand while using a torch.
- Provide adequate ventilation to vent off toxic fumes, and work with a qualified assistant whenever possible.
- Always use a pressure regulator when using dry nitrogen to test the sealed refrigeration system for leaks, flushing etc.

- **MECHANICAL HAZARDS:**

- Extreme care, proper judgment and all safety procedures must be followed when testing, troubleshooting, handling, or working around unit with moving and/or rotating parts.
- Be careful when, handling and working around exposed edges and corners of the sleeve, chassis, and other unit components especially the sharp fins of the indoor and outdoor coils.
- Use proper and adequate protective aids such as: gloves, clothing, safety glasses etc.
- Failure to follow proper safety procedures and/or these warnings can result in serious injury or death.

- **PROPERTY DAMAGE HAZARDS**

- **FIRE DAMAGE HAZARDS:**

- Read the Installation/Operation Manual for the air conditioning unit prior to operating.
- Use air conditioner on a single dedicated circuit within the specified amperage rating.
- Be extremely careful when using acetylene torch and protect surrounding property.
- Failure to follow these instructions can result in fire and minor to serious property damage.

- **WATER DAMAGE HAZARDS:**

- Improper installation, maintenance or servicing of the air conditioner unit can result in water damage to personal items or property.
- Insure that the unit has a sufficient pitch to the outside to allow water to drain from the unit.
- Do not drill holes in the bottom of the drain pan or the underside of the unit.
- Failure to follow these instructions can result in damage to the unit and/or minor to serious property damage.

INTRODUCTION

Model Number Identification Guide

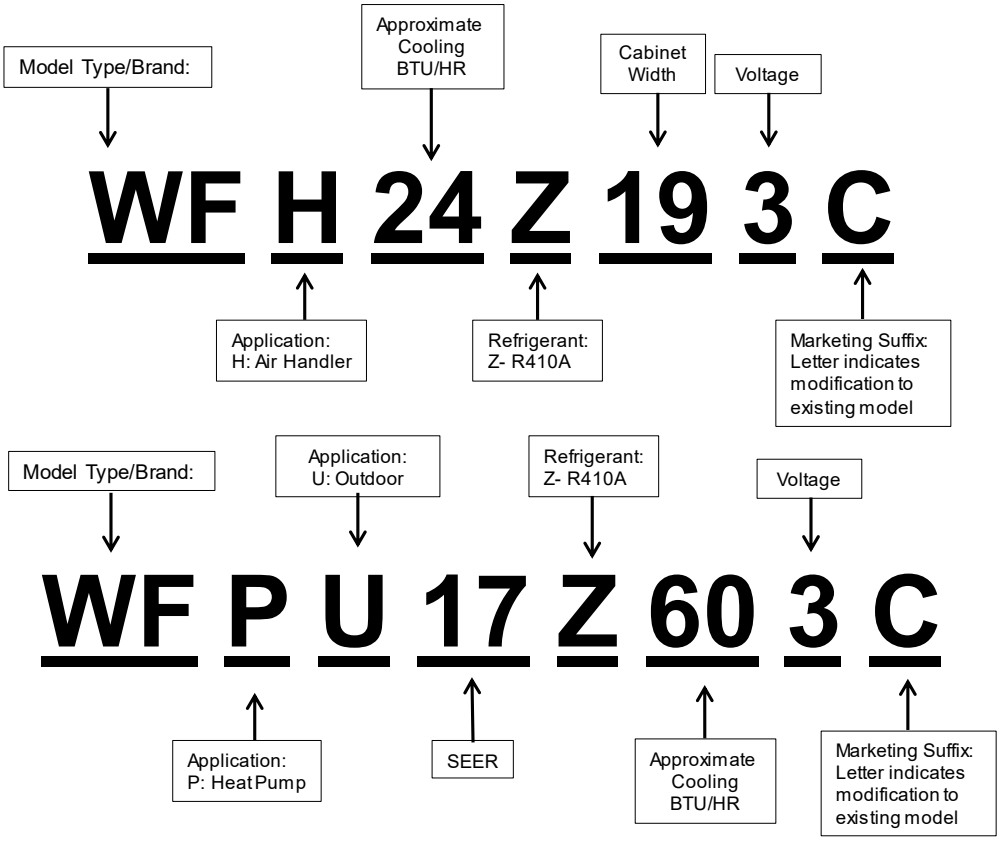


Figure 101

Serial Number Identification Guide

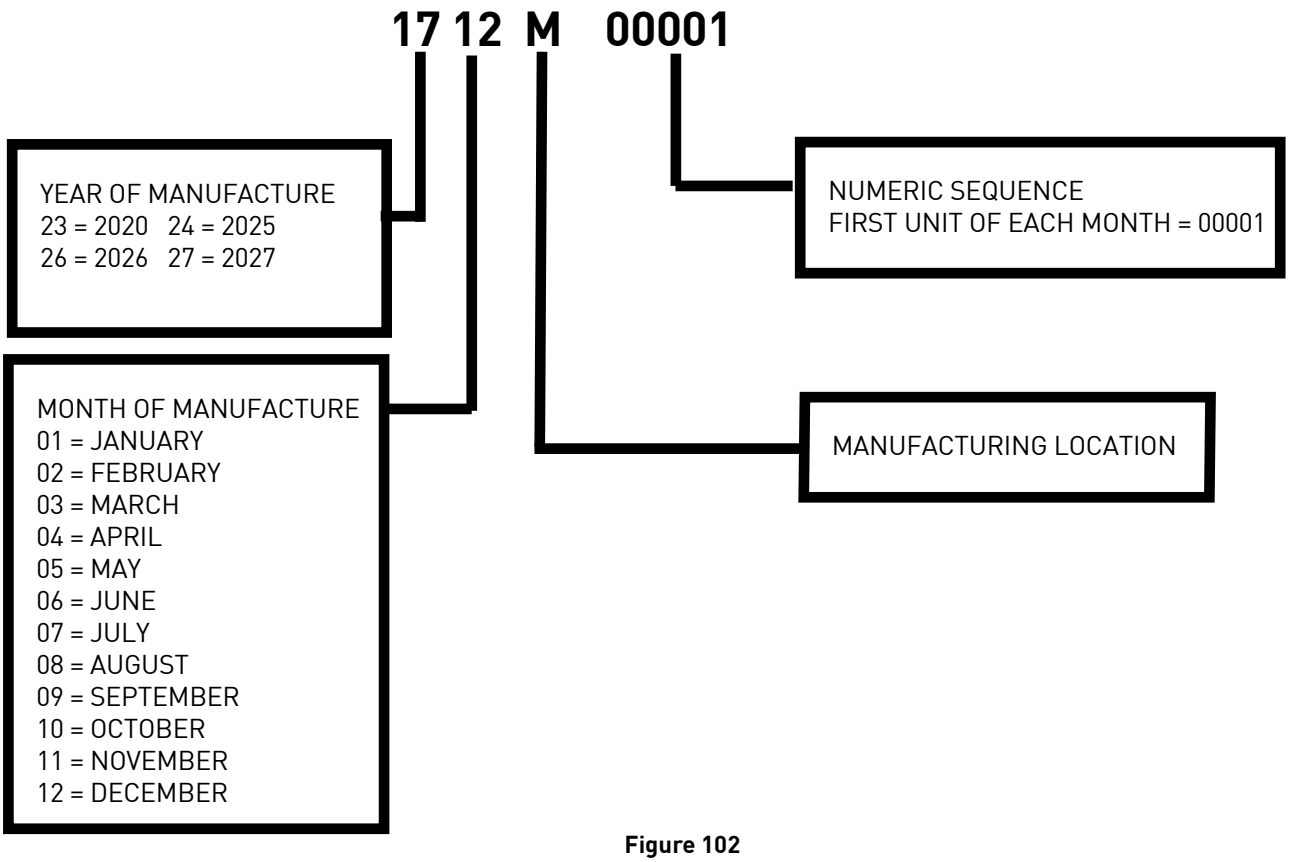


Figure 102

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model			24K	36K	48K	60K
Power supply		V/ph/Hz	208~230/1/60	208~230/1/60	208~230/1/60	208~230/1/60
Cooling	Capacity	Btu/h	22000	34000	48000	56000
	Capacity(min-max)	Btu/h	6700-26000	11800-36800	18300-52000	18300-59400
	Capacity(min-max)	W	2227-7327	2814-10697	5363-15240	5363-17409
	Input	W	2180	3370	4750	6780
	Current	A	10.0	15.4	21.8	31.0
	EER2	W/W	2.96	2.96	2.96	2.42
	SEER2	Btu/(W.h)	16.5	18.0	17.5	17.0
	EER2	Btu/(W.h)	10.10	10.10	10.10	8.25
Heating	Capacity	Btu/h	23000	35000	47000	56000
	Capacity(min-max)	Btu/h	6700-26000	8900-38200	17600-52000	17600-56600
	Capacity heating(Rated) @ 47°F	Btu/h	23000	35000	47000	56000
	Capacity heating(Rated) @ 17°F"	Btu/h	15000	24000	31000	40000
	Maximum Heating Capacity@ 5F	Btu/h	16100	24600	33000	34000
	COP @ 5F (Under Maximum Capacity)	W/W	2.10	2.10	1.90	1.86
	Input	W	1980	2950	4170	5290
	Current	A	9.5	14.1	19.5	21.0
	HSPF2	Btu/(W.h)	9.0	9.5	8.5	8.5
	COP2	W/W	3.4	3.5	3.3	3.1
	COP2	Btu/(W.h)	11.60	11.94	11.26	10.58
Min. Ampacity		A	15	23	35	35
Max. td fuse/ breaker		A	25	35	50	50
Communication cable (SI Cord)		No. × AWG	5×18	5×18	5×18	5×18
Working Voltage		198V ~ 253V				
Voltage Imbalance		Within a 3% deviation from each voltage at the main terminal of outdoor unit.				
Starting Voltage		Higher than 85% of the Rated Voltage				
Outdoor fan motor	Type		DC	DC	DC	DC
	Model		ZWK511A805001	SIC-71FW-F8121-1	SIC-71FW-D8121-1/ SIC-71FW-D8121-2	SIC-71FW-D8121-1/ SIC-71FW-D8121-2
	Qty		1	1	2	2
	Output	W	60	121	121	121
	Speed (Hi)	r/min	880	810	850	850

Figure 201

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model			24K	36K	48K	60K
Outdoor coil	Number of Rows		2	2	2	2
	Tube Pitch(a)	in	0.827	0.827	0.827	0.827
	Row Pitch(b)	in	0.852	0.852	0.852	0.852
	Fin Spacing	Fins Per in	18	19	17	18
	Coil Dimension (W×H×D)	in	"(35-5/8+34)×25-1/4 ×7/8	38-3/16×31-3/8×1-1 1/16"	38-3/16×53×1-7/16	38-3/16×53× 1-11/16
	Fin Type		Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium
	Tube Outside Diameter and Type	mm	Φ7.94, innergroove tube	Φ7.94, innergroove tube	Φ7.0, innergroove tube	Φ7.94, innergroove tube
	Number of Circuits		6	5	6	6
Outdoor air flow		CFM	1825	2350	3525	3525
Outdoor noise level (sound pressure) Hi		dB(A)	54	57	59	60
Outdoor Metering Device			EEV	EEV	EEV	EEV
Compressor	Model		EATF250D22UMT	EATF250D22UMT	EATF400D64UMTA	EATF400D64UMTA
	Brand		GMCC	GMCC	GMCC	GMCC
Compressor	Type		Twin ROTARY	Twin ROTARY	Twin ROTARY	Twin ROTARY
	Capacity	Btu/h	26085	26085	41865	41865
	Input	W	2080	2080	3385	3385
	Rated current (RLA)	A	9.45	9.45	15.39	15.39
	Oil	oz	VG74 /22.7	VG74 /22.7	VG74 /33.9	VG74 /33.9
Refrigerant type/Quantity	Type		R-410A	R-410A	R-410A	R-410A
	Refrigerant charge	oz(kg)	70.5(2.0)	98.7(2.8)	142.9(4.05)	142.9(4.05)
	Factory pre-charge	Ft(m)	25(7.6)	25(7.6)	25(7.6)	25(7.6)
	Additional charge for each ft	oz/ft	0.38	0.38	0.6	0.6
Outdoor unit	Dimension(W×H×D)	inch	33-7/8×26-3/8× 12-1/4	37-3/8×33×13-3/8	37-3/8×54-5/8× 13-3/8	37-3/8×54-5/8× 13-3/8"
	Packing(W×H×D)	inch	39×28-3/4×17-3/4	43-3/4×36-1/4× 18-1/8	43-3/4×60-1/4× 18-1/8	43-3/4×60-1/4× 18-1/8
	Net weight	lbs	112.4	147.7	227.1	251.3
	Shipping Weight	lbs	121.3	158.7	253.5	277.5
Design pressure	H/L	PSIG	550/240	550/240	550/240	550/240
Refrigerant piping	Liquid side/ Gas side	inch	(3/8'/5/8')	(3/8'/3/4')	(3/8'/7/8')	(3/8'/7/8')
	Max. pipe length	ft	164	246	246	246
	Max. difference in level	ft	98	98	98	98
Operating temperature range	Cooling	˚F	5-122	5-122	5-122	5-122
	Heating	˚F	-13-75	-13-75	-13-75	-13-75

Figure 201

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model		24K	36K	48K	60K
Qty' per 20' /40' /40'HQ (Outdoor unit)	Set	90/186/186	52/106/106	26/53/53	26/53/53

NOTE:

1. Test conditions:

1.1 Rated capacity test conditions:

Cooling: Indoor: DB 80.0˚F /WB 67.0˚F Outdoor: DB 95.0˚F /WB 75.0˚F

Heating: Indoor: DB 70.0˚F /WB 60.0˚F Outdoor: DB 47˚F /WB 43˚F

1.2 SEER & HSPF test standard: AHRI 210/240.

2. The Sound Pressure Level is based on the following conditions: Outdoor unit.

Measure the noise value of 3 points which are 1 meter in front of the three sides of the unit surface.

(front/left/right) and 1/2 (unit height +1) meter high from floor level, and calculate the weighted average of the noise.

3. The above data was measured in an anechoic chamber. Please take into consideration the reflected sound of your specific application environment.

4. All specifications are subject to change by the manufacturer without prior notice.

5. Max. Running Current (A): REFER TO NAMEPLATE

6. Follow all National and local codes and regulations when selecting field wires, and all the above are the minimum wire size.

7. When transmitting cable (SI) is longer than 100 feet, a larger wire size should be selected.

8. Install main switch and circuit breaker for each system separately. Select a high response type circuit breaker that acts within 0.1 second.

Figure 201

SPECIFICATIONS

Product Specifications (Indoor Unit)

Indoor model			24K	36K	48K	60K
Type			US Duct	US Duct	US Duct	US Duct
Power supply		V/ph/Hz	208~230/1/60	208~230/1/60	208~230/1/60	208~230/1/60
Moisture Removal	L/h		2.2	4.5	5.5	7.50
	Pts/h		4.64	9.5	11.6	15.80
Min. Ampacity	A		3.3	4.8	6.8	6.8
Max. td Fuse/ Breaker	A		10	10	15	15
	Nominal Sensitive Current (mA)		30	30	30	30
Communication Cable	No. × AWG		5×18	5×18/	5×18	5×18
Thermostat Cable	5x18 or 6x18 (when using Matched Air Handler)					
Indoor Fan Motor (Multi Speed ECM)	Qty		1	1	1	1
	Model		ZWK702B006073	ZWK702B500026	ZKSD-560-8-50-14	ZKSD-560-8-58
	Output	HP	1/3	1/2	3/4	3/4
	RLA	A	2.4~2.6	3.6~3.8	5.0~5.4	5.0~5.4
	Speed	r/min	350~1400	350~1400	350~1400	350~1400
Indoor Air Flow Rated		CFM	800	1120	1588	1706
Indoor Coil	Number of Rows		4	4	5	5
	Tube Pitch(a)	in	0.827	0.827	0.827	0.827
	Row Pitch(b)	in	0.535	0.535	0.535	0.535
	Fin Spacing	Fins Per in	18	18	17	17
	Fin Type		Hydrophilic Aluminium	Hydrophilic Aluminium	Hydrophilic Aluminium	Hydrophilic Aluminium
	Tube outside Diameter and Type	mm	Φ7, I nnergroove Tube	Φ7, Innergroove Tube	Φ7,Innergroove Tube	Φ7,Innergroove Tube
	Coil	mm	2(444× 420×54.4)	2(444×420 ×54.4)	2 (509×546×68)	2 (509×546×68)
	Dimension (W×H×D)	in	2(17-1/2×16-1/2× 2-1/8)	2(17-1/2×16-1/2×2-1 /8)	2 (20×21-1/2×2-11/16)	2 (20×21-1/2×2-11/16)
	Number of Circuits		8	8	12	12
ESP	Rated	In. W.C.	0.18	0.228	0.276	0.276
	Range	In. W.C.	0-0.8	0-0.8	0-0.8	0-0.8
Indoor Noise Level (Hi)		dB(A)	55	57	64	65
Throttle Type			TXV	TXV	TXV	TXV
	Dimension (W×H×D)	inch	19-5/8 × 46-1/8 × 21-5/8	19-5/8 × 46-1/8 × 21-5/8	22×53-7/8×24	22×53-7/8×24
	Packing (W×H×D)	inch	22-1/2×49-5/8× 25-3/8	22-1/2×49-5/8× 25-3/8	25-1/4×55-1/2×28	25-1/4×55-1/2×28
	Net Weight	lbs	135.5	140	187.2	187.2
	Shipping Weight	lbs	158.6	163.1	214	214
Drainage Water Pipe Diameter		inch	3/4"	3/4"	3/4"	3/4"
"Design Pressure"	H/L	PSIG	550/240	550/240	550/240	550/240

Figure 202

SPECIFICATIONS

Product Specifications (Indoor Unit)

Indoor model	24K	36K	48K	60K
NOTE: 1. Test Conditions: 1.1 Rated Capacity Test Conditions: Cooling: Indoor: DB 80.0˚F /WB 67.0˚F Outdoor: DB 95.0˚F /WB 75.0˚F Heating: Indoor: DB 70.0˚F /WB 60.0˚F Outdoor: DB 47˚F/WB 43˚F 1.2 SEER & HSPF Test Standard: AHRI 210/240. 2. The Sound Pressure Level is based on the following conditions: Indoor Unit Air Handler Unit Measure the noise value of the point 3.28 feet in front of the outlet of the wind tunnel and 3.28 feet high from the bottom of the unit. 3. The above data was measured in an anechoic chamber. Please take into consideration the reflected sound of your specific application environment. 4. All specifications are subject to change by the manufacturer without prior notice. 5. Max. Running Current (A): REFER TO NAMEPLATE 6. Follow local and National electrical codes and regulations when selecting field wires, and all the above are the minimum wire size. 2. When transmitting (SI) cable is longer than 100 feet, a larger wire size should be selected. 3. Install main switch and circuit breaker for each system separately. Select a high response type circuit breaker that acts within 0.1 second. 4. If an auxiliary heater is required and already installed on indoor unit, power source cable should be installed separately and the size should be selected in accordance with Local and National Electrical Codes. Refer to Figure 203(Electric Heater Kit Selection Table) for Specifications.				

Figure 202

SPECIFICATIONS

Electric Heater Kit Selection Table

Electric Heat Kit Model	Air Handler Model	Electric Heat (kW)	MIN. Circuit Ampacity		MAX. Fuse or Breaker (HACR) Ampacity		Fan Speed Tap			
			230VAC	208VAC	230VAC	208VAC	2	3	4	5
AUX5KW	24k	5	28.3	25.9	30	30	O	O	O	O
AUX7KW		7.5	40.7	37.2	45	40	X	O	O	O
AUX10KW		10	53.2	48.5	60	50	X	X	O	O
AUX5KW	36k	5	29.8	27.4	30	30	O	O	O	O
AUX7KW		7.5	42.2	38.7	45	50	X	O	O	O
AUX10KW		10	54.7	49.9	60	50	X	X	O	O
AUX15KW		15	42.2+36.9	38.6+33.8	45+40	40+35	X	X	X	O
AUX5KW	48K/60K	5	31.8	29.4	35	30	O	O	O	O
AUX7KW		7.5	44.8	40.7	45	45	X	O	O	O
AUX10KW		10	56.7	51.9	60	55	X	X	O	O
AUX15KW		15	44.8+36.9	40.7+33.8	50+40	50+35	X	X	O	O
AUX20KW		20	56.7+49.9	51.9+45.2	60+50	60+50	X	X	X	O
							O = Fan Speed tap may be used X= Fan speed tap may not be used See Blower Data(Indoor Units)			

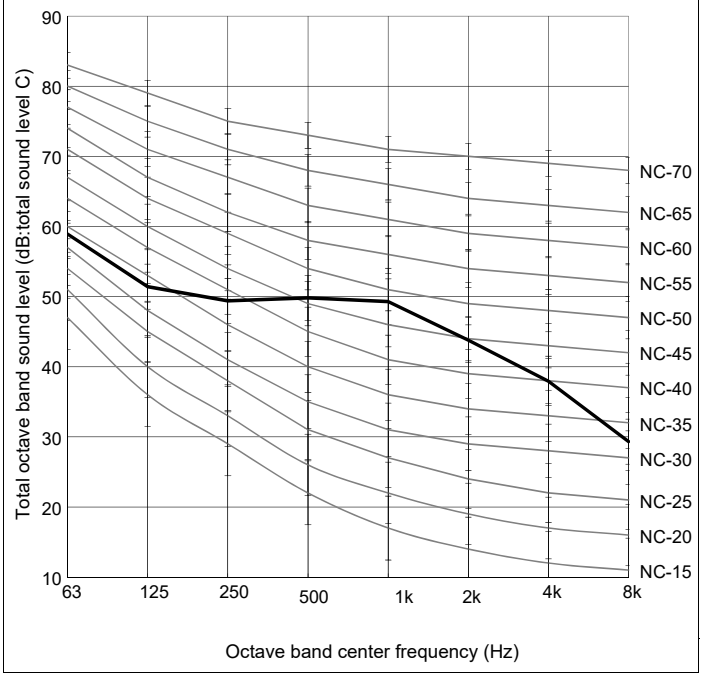
NOTES:
- When optional electric heater kit is installed, obtain power for AHU from load side of L1 and L2 of electric heater kit.
- It is recommended that the electric heater kit should be installed in cold climate regions or when long piping is used.
- Properly size the auxiliary heater per the table above.
- Ampacities for MCA and Fuse/breaker include the blower motor.
- Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM).

Figure 203

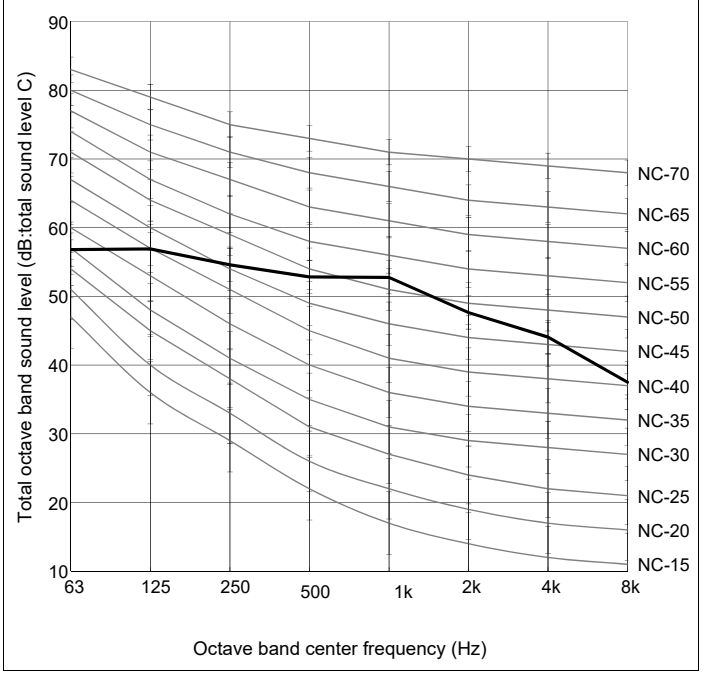
SPECIFICATIONS

Sound Pressure Data (Outdoor Units)

Model	24K
Test condition	3.28 ft in front of the unit; 2.7 ft high from the bottom of the unit; 3.28 ft above the ground.



Model	36K
Test condition	3.28 ft. in front of the unit; 3.28 ft. above the bottom of the unit.



Model	48K/60K
Test condition	3.28 ft. in front of the unit; 3.28 ft. above the bottom of the unit.

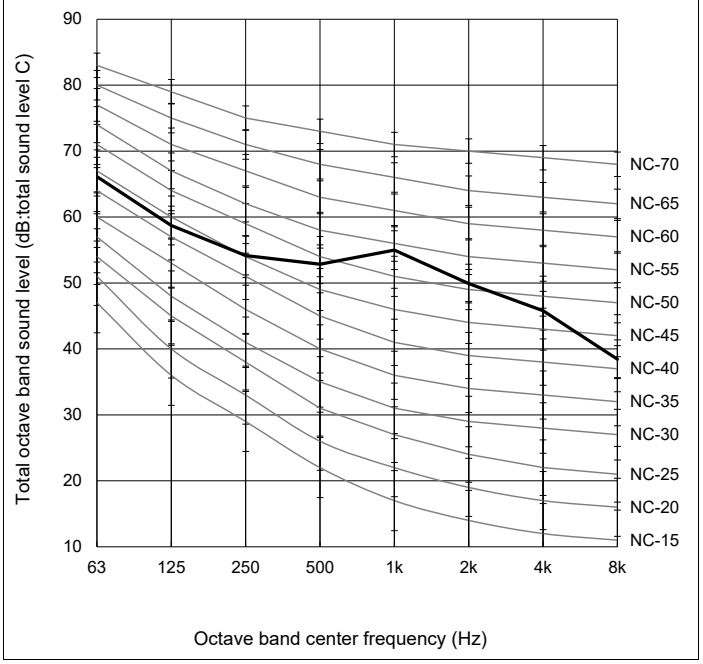
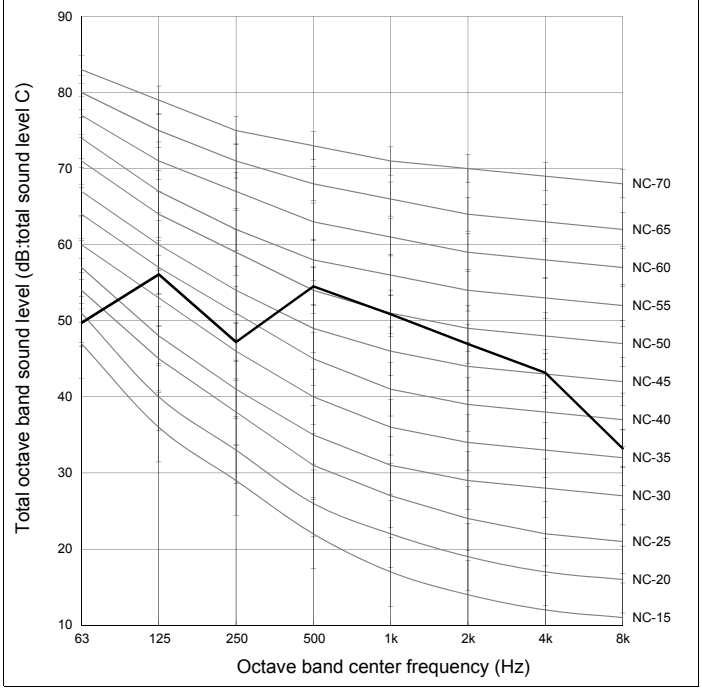


Figure 210

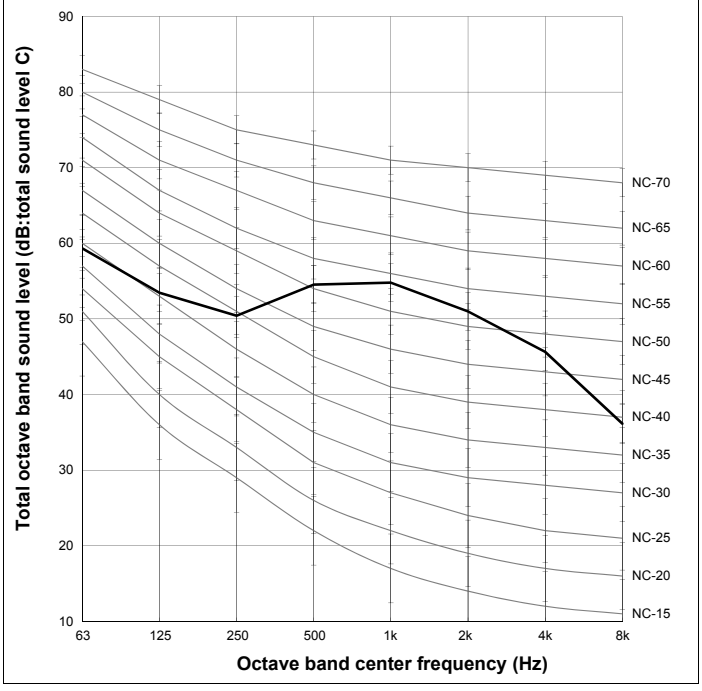
SPECIFICATIONS

Sound Pressure Data (Indoor Units)

Model	24K
Test Condition	3.28 ft. in front of the outlet of the wind tunnel; 3.28 ft. above the bottom of the unit.



Model	36K
Test Condition	3.28 ft. in front of the outlet of the wind tunnel; 3.28ft. above the bottom of the unit.



Model	48K/60K
Test Condition	3.28 ft. in front of the outlet of the wind tunnel; 3.28 ft. above the bottom of the unit.

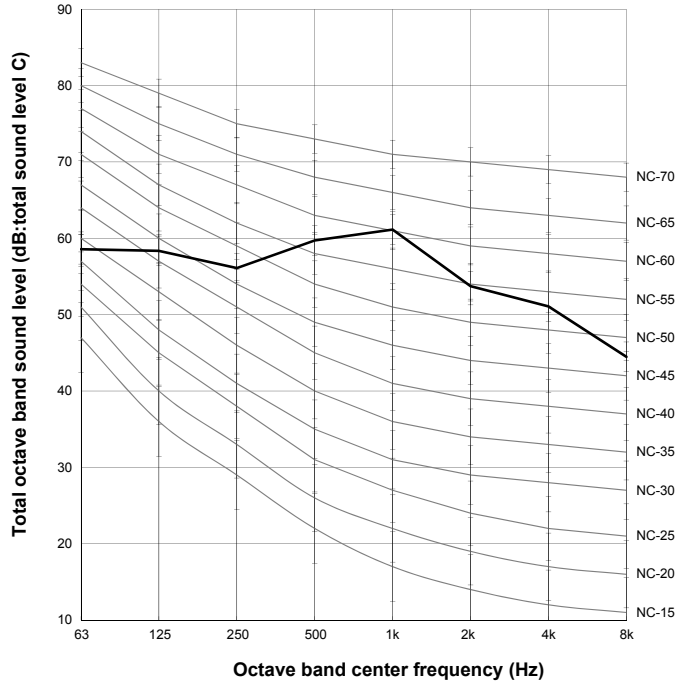


Figure 211

SPECIFICATIONS

Blower Data (Indoor Units)

Airflow performance data is based on cooling performance with a coil and no filter in place. Check the performance table for appropriate unit size selection. External static pressure should stay within the minimum and maximum limits shown in the table below to ensure proper cooling, heating, and electric heating operation.

NOTES:

- Required 350-450 CFM/Ton range.
- When there is an electric heater, set the fan speed based on the air volume that the electric heater needs (not less than 350 CFM/Ton).
- Airflow based upon air handler unit operates at 230 V with no electric heater kit and no filter. Airflow at 208 V is approximately the same as 230 V.

Incorporate your filter's pressure drop into static pressure calculations. Common pressure drops are:		
Merv	Material	Drop
4	Spunglass	0.1
8	Pleated	0.12
13	Pleated	0.25

- **Model: WFH24Z193C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	**0.1 (0.02)**	**0.18 (0.045)**	**0.3 (0.07)**	**0.4 (0.1)**	**0.5 (0.12)**	**0.6 (0.15)**	**0.7 (0.17)**	**0.8 (0.20)**
Tap (2) Default setting	CFM	815	792	752	709	—	—	—	—	—
	w	94	102	110	123	—	—	—	—	—
Tap (3)	CFM	862	828	792	735	705	—	—	—	—
	w	106	114	125	137	145	—	—	—	—
Tap (4)	CFM	—	—	—	859	853	803	769	735	—
	w	—	—	—	178	185	193	203	213	—
Tap (5)	CFM	—	—	—	—	—	895	864	825	779
	w	—	—	—	—	—	241	251	258	267

Figure 211

SPECIFICATIONS

Blower Data (Indoor Units)

- **Model: WFH36Z193C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,264	1,216	1,172	1,135	1,096	—	—	—	—
	w	215	222	233	238	244	—	—	—	—
Tap (3)	CFM	1,350	1,314	1,269	1,206	1,116	1,082	1,050	—	—
	w	257	264	274	282	292	297	302	—	—
Tap (4)	CFM	—	—	—	1,323	1,266	1,192	1,122	1,060	—
	w	—	—	—	304	313	323	333	340	—
Tap (5)	CFM	—	—	—	—	1,350	1,292	1,221	1,148	1,088
	w	—	—	—	—	371	381	394	401	406

- **Model: WFH48Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,756	1,701	1,626	1,579	1,520	1,468	1,425	—	—
	w	348	357	369	378	387	395	407	—	—
Tap (3)	CFM	1,799	1,746	1,678	1,634	1,571	1,522	1,449	1,402	—
	w	366	377	388	398	410	419	428	444	—
Tap (4)	CFM	—	1,794	1,749	1,719	1,670	1,633	1,589	1,553	1,510
	w	—	387	401	413	428	437	452	465	482
Tap (5)	CFM	—	—	—	1,782	1,735	1,701	1,665	1,626	1,585
	w	—	—	—	456	469	481	495	510	525

- **Model: WFH60Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,838	1,810	1,770	1,760	—	—	—	—	—
	w	376	387	401	413	—	—	—	—	—
Tap (3)	CFM	1,888	1,855	1,813	1,782	1,751	—	—	—	—
	w	415	428	445	456	469	—	—	—	—
Tap (4)	CFM	1,971	1,941	1,893	1,864	1,820	1,786	1,755	—	—
	w	472	485	501	513	530	540	558	—	—
Tap (5)	CFM	2,056	2,022	1,978	1,950	1,907	1,878	1,826	1,801	1,750
	w	533	545	562	575	592	603	495	631	638

Figure 212

SPECIFICATIONS

Product Dimensions (24k Outdoor Unit)

UNIT: INCHES.

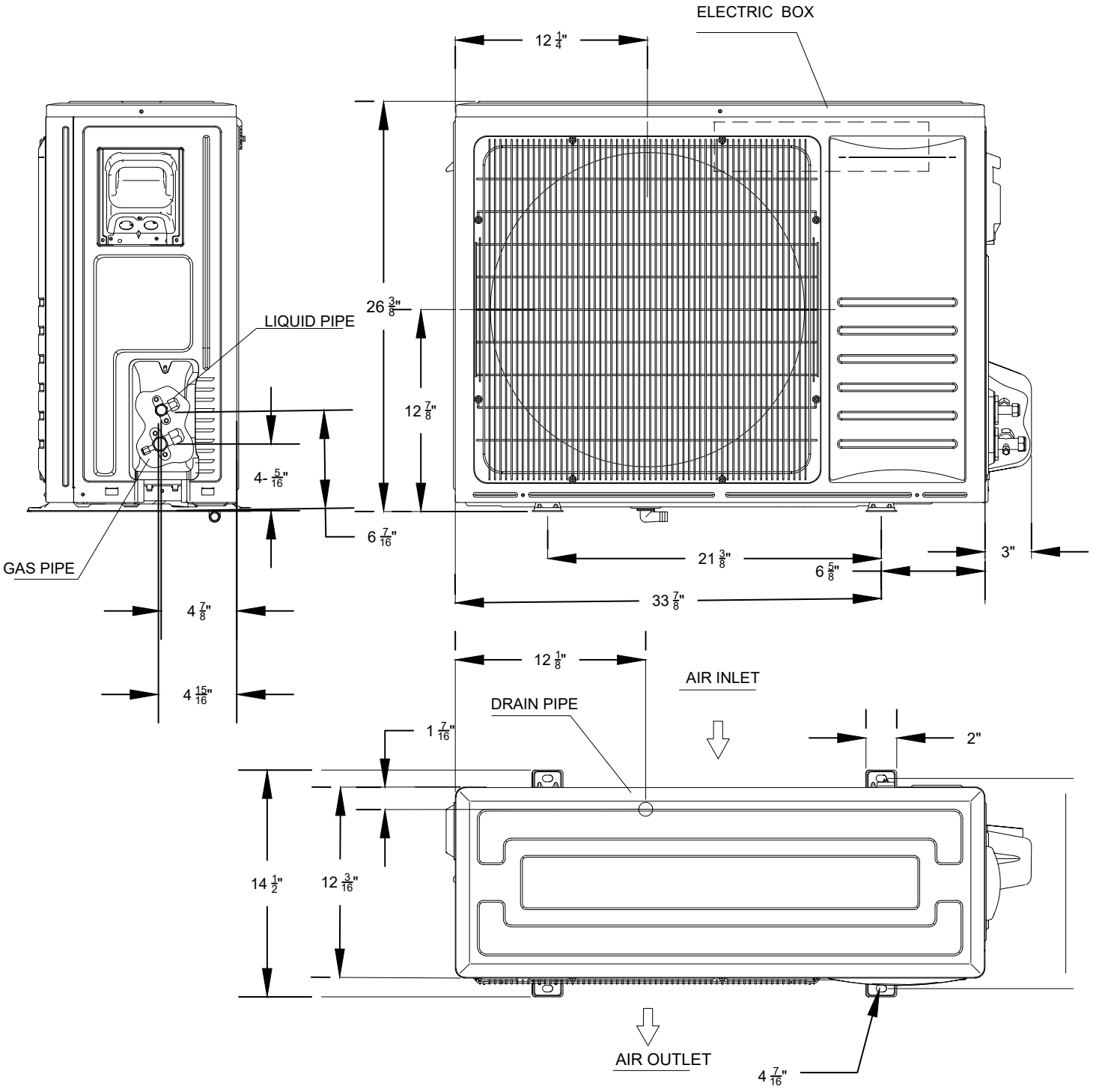


Figure 204

SPECIFICATIONS

Product Dimensions (36k Outdoor Unit)

Unit : inches

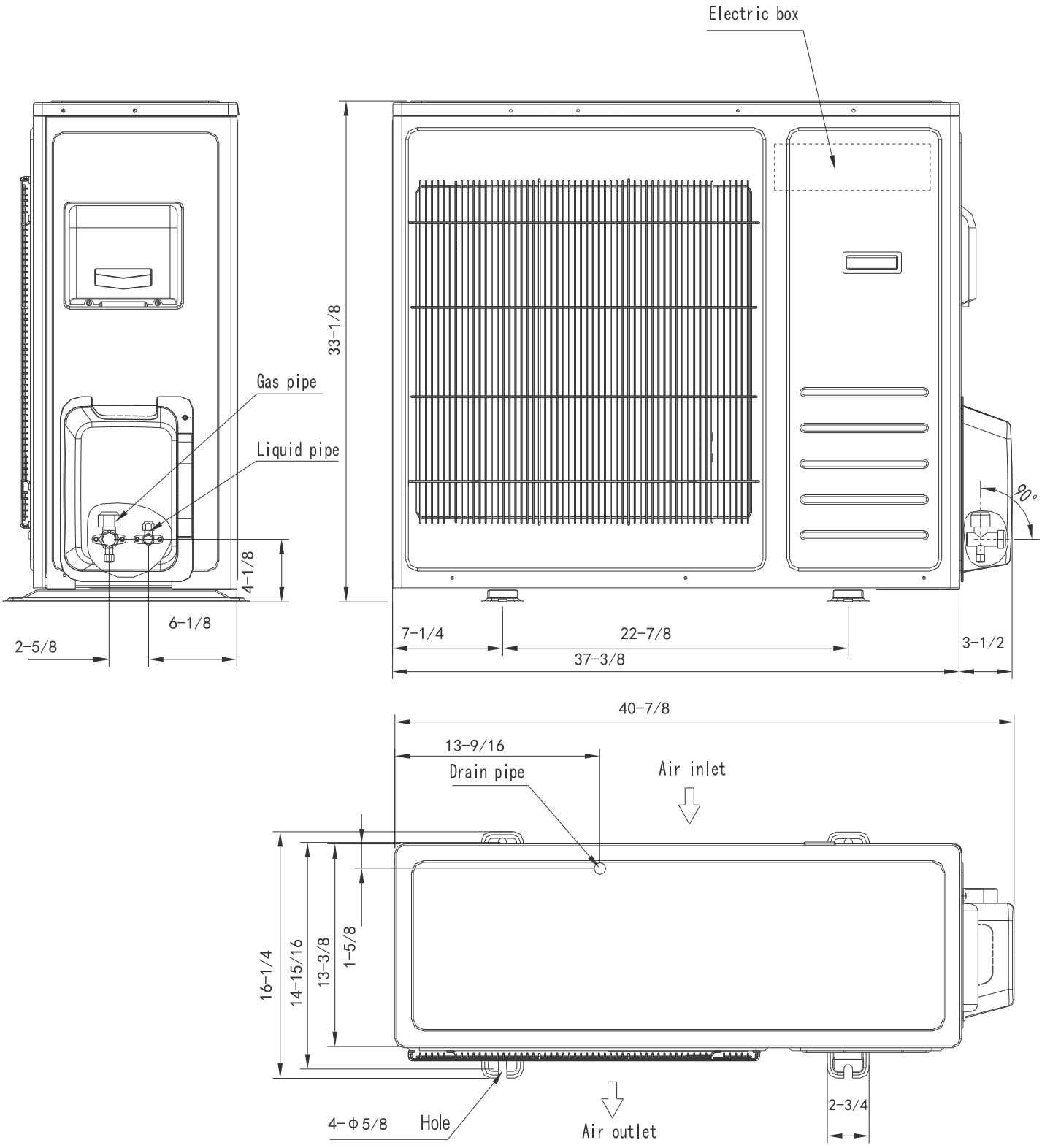


Figure 205

SPECIFICATIONS

Product Dimensions (48-60k Outdoor Unit)

Unit : inches

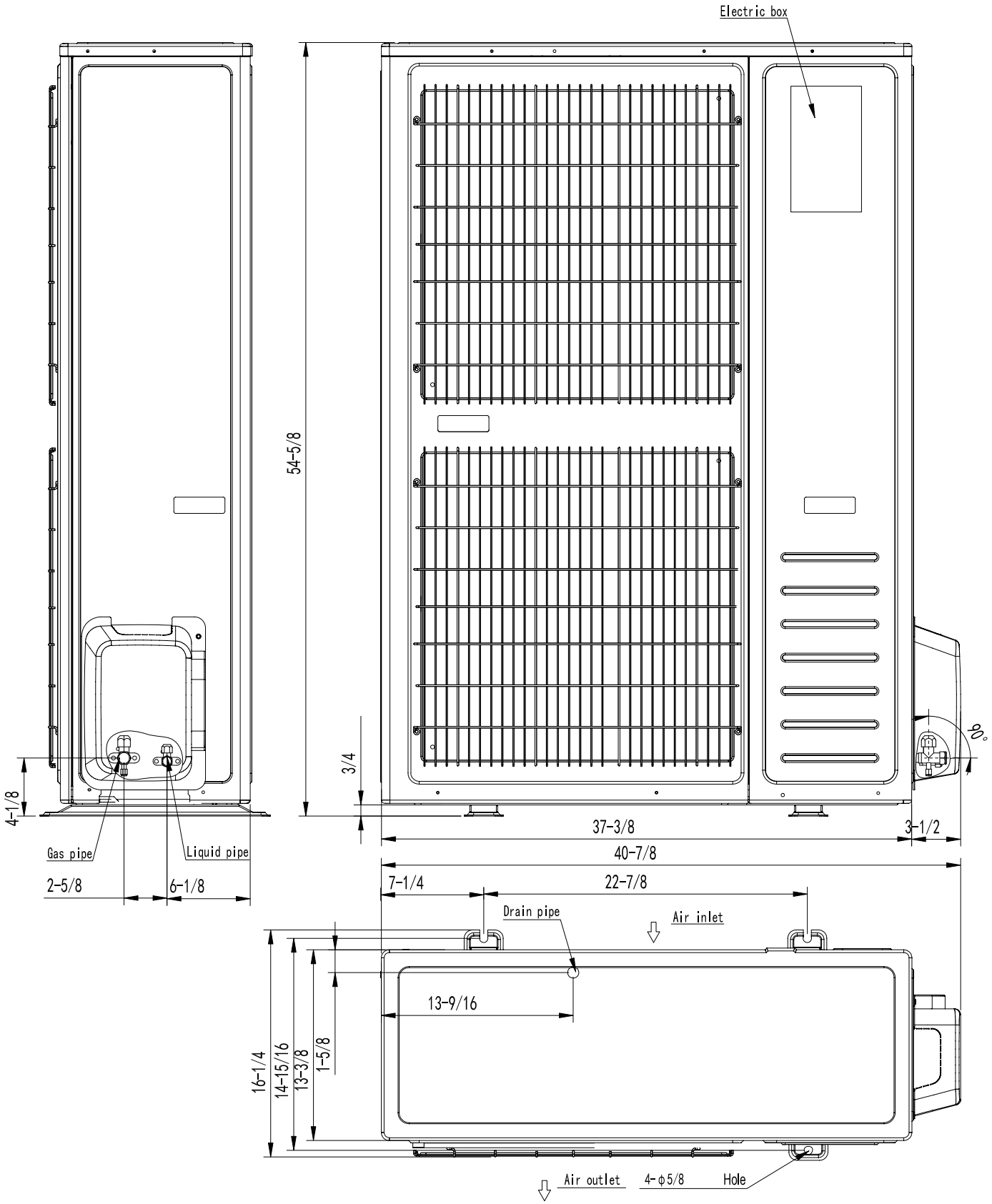


Figure 206

SPECIFICATIONS

Product Dimensions (24-36k Indoor Unit)

Unit: Inches

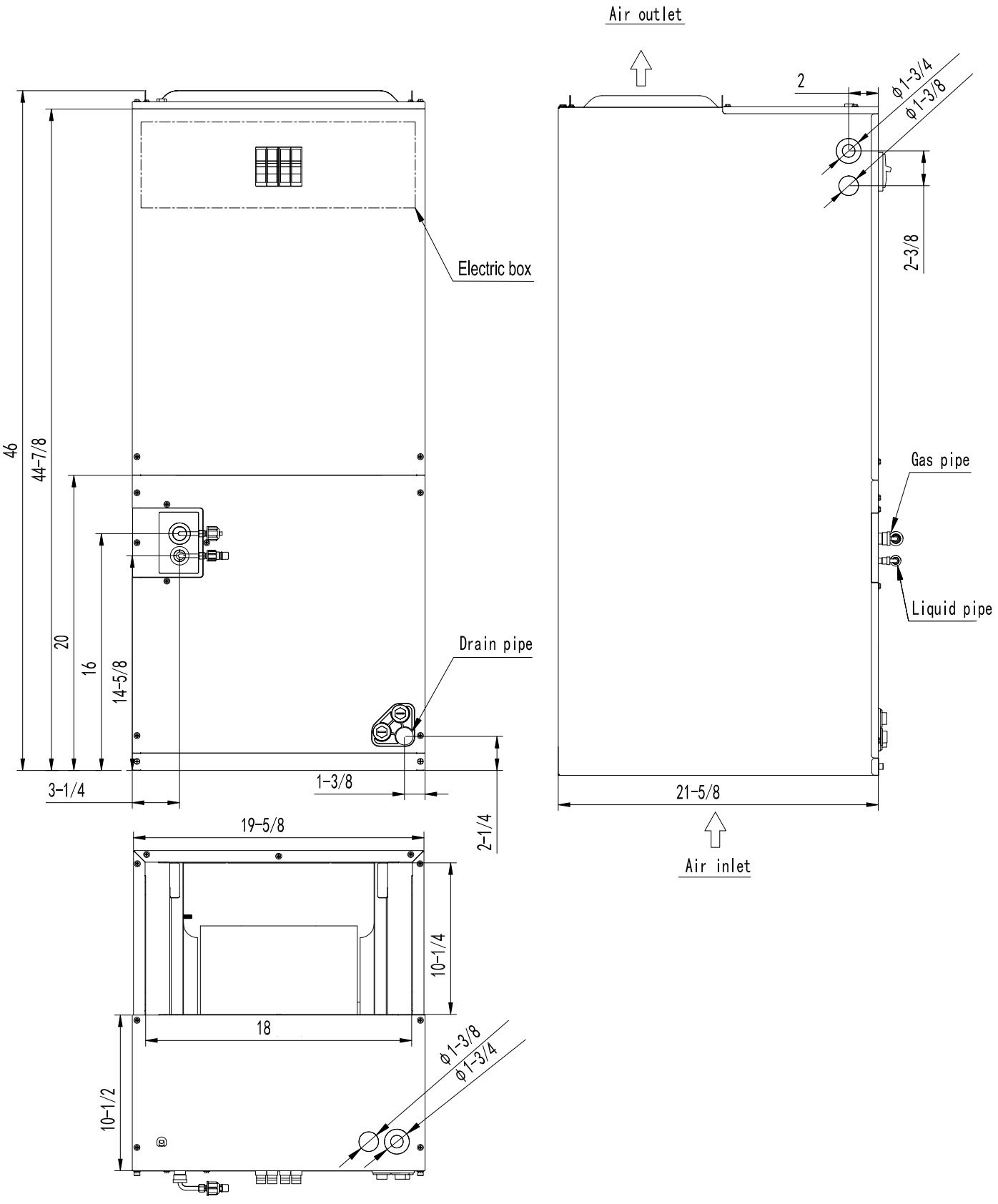


Figure 207

SPECIFICATIONS

Product Dimensions (48-60k Indoor Unit)

Unit: Inches

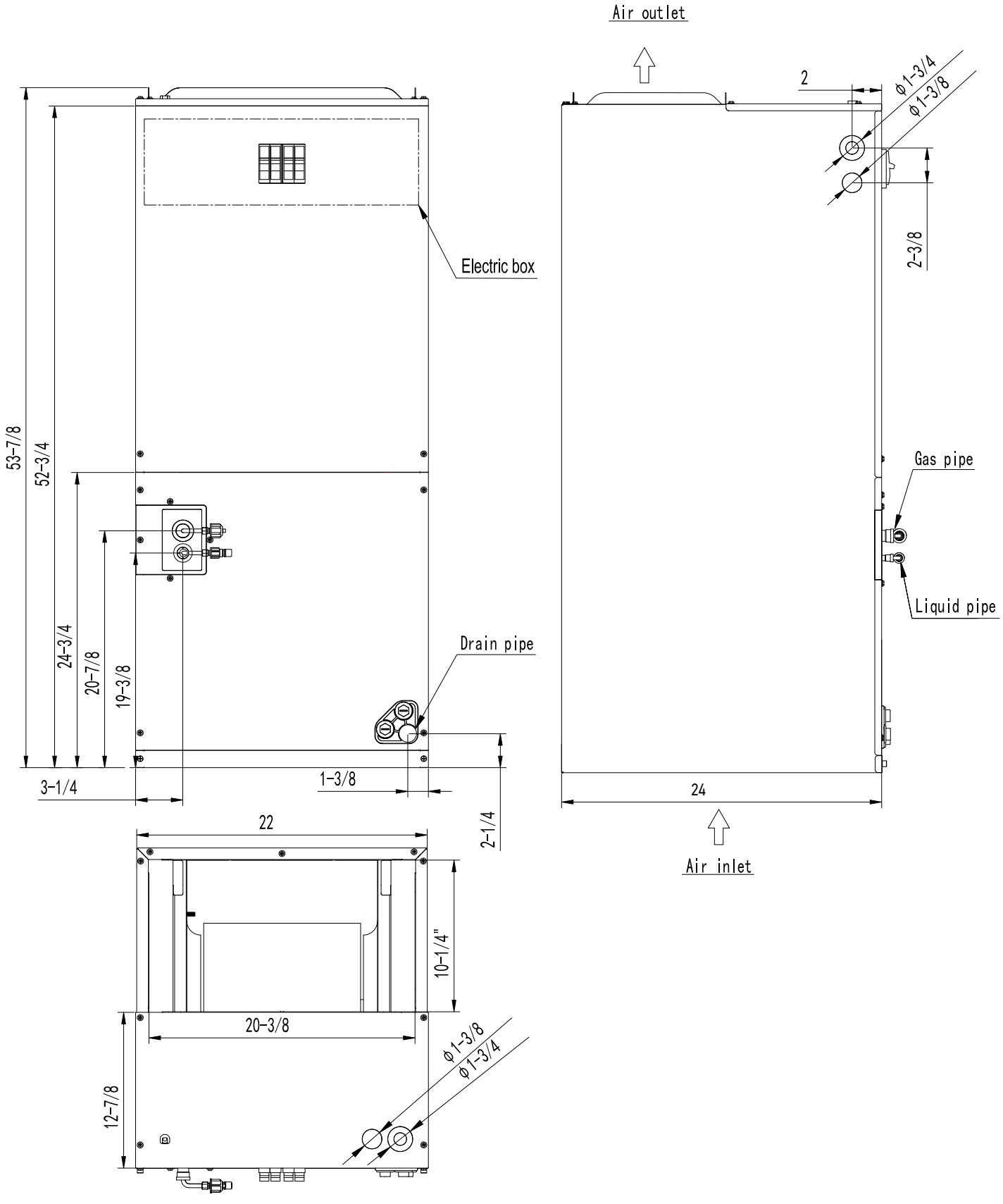


Figure 208

SPECIFICATIONS

Capacities and Selection Data

Capacity characteristic charts

The following charts show the characteristics of outdoor unit capacity, which corresponds with the operating ambient temperature of outdoor unit. This data is obtained with Free-Spin of the Condenser and not in a testing mode Conditions:

1. Pipe length / height difference : 25 ft. / 0 ft.
2. Compressor at rated inverter frequency
3. Indoor fan speed at high fan speed
4. Capacity loss due to frost accumulation and defrost operation is not included.

Remarks:
TC: Total Capacity (Gross) (kBtu/h)
SHR: Sensible Heat Ratio
kW(PI): Power Input (including the compressor & cond. fan motor) (kW) DB: Dry Bulb Temperature
WB: Wet Bulb Temperature
IDB: Indoor Dry Bulb Temperature
IWB: Indoor Wet Bulb Temperature

SPECIFICATIONS

Capacities and Selection Data

Performance data (Cooling operation at rated frequency)

24K outdoor unit matches 18K indoor unit

Airflow (CMF)	Outdoor DB(°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
450	5	TC	14.0	14.1	14.4	14.6	14.4	14.6	14.7	14.9	15.4	15.5	15.7	15.8	\	18.8	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.72	0.73	0.73	0.73	0.73	0.74	0.75	0.76	0.76	0.76	0.77	0.78	\	0.95	0.96	0.97
	30	TC	14.6	14.7	15.0	15.2	15.0	15.2	15.4	15.5	16.1	16.2	16.4	16.5	\	19.6	19.7	19.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.80	0.81	0.81	0.81	0.81	0.82	0.83	0.84	0.84	0.84	0.85	0.87	\	1.06	1.07	1.08
	65	TC	15.3	15.5	15.8	16.0	15.8	16.0	16.2	16.3	16.9	17.1	17.2	17.3	\	20.6	20.8	20.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.89	0.90	0.90	0.90	0.90	0.92	0.92	0.93	0.93	0.94	0.95	0.96	\	1.17	1.19	1.20
	75	TC	15.3	15.5	15.9	16.0	15.9	16.0	16.2	16.4	17.0	17.1	17.3	17.4	\	20.4	20.6	20.7
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	1.00	1.01	1.01	1.01	1.02	1.03	1.04	1.03	1.05	1.06	1.07	\	1.29	1.31	1.32
	85	TC	15.1	15.3	15.6	15.8	15.6	15.8	16.0	16.1	16.7	16.9	17.0	17.1	\	20.0	20.2	20.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	1.11	1.12	1.13	1.13	1.13	1.15	1.16	1.17	1.17	1.18	1.19	1.20	\	1.47	1.48	1.50
	95	TC	14.9	15.0	15.3	15.5	15.3	15.5	15.7	15.9	16.4	16.6	16.7	16.9	\	19.6	19.7	19.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	1.34	1.35	1.36	1.36	1.36	1.38	1.39	1.40	1.41	1.42	1.43	1.45	\	1.75	1.76	1.78
	105	TC	14.6	14.8	15.1	15.2	15.1	15.2	15.4	15.5	16.1	16.3	16.4	16.5	\	18.9	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	1.59	1.61	1.62	1.62	1.62	1.64	1.66	1.67	1.67	1.69	1.70	1.72	\	2.03	2.03	2.04
	115	TC	13.0	13.2	13.5	13.6	13.5	13.6	13.8	13.9	14.5	14.6	14.7	14.8	\	15.7	15.8	15.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.62	1.63	1.65	1.65	1.65	1.67	1.69	1.71	1.72	1.73	1.74	1.75	\	1.80	1.81	1.82
	122	TC	11.1	11.2	11.5	11.6	11.5	11.6	11.7	11.8	12.3	12.4	12.5	12.6	\	13.3	13.4	13.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.67	1.68	1.70	1.70	1.70	1.73	1.74	1.76	1.77	1.78	1.80	1.80	\	1.86	1.87	1.87
600	5	TC	15.0	15.1	15.5	15.7	15.5	15.7	15.9	16.0	16.6	16.7	16.9	17.0	\	20.0	20.2	20.3
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.84	0.85	0.86	0.86	0.86	0.87	0.88	0.89	0.88	0.90	0.90	0.91	\	1.09	1.10	1.11
	30	TC	15.7	15.8	16.2	16.4	16.2	16.4	16.6	16.7	17.3	17.4	17.6	17.7	\	20.9	21.1	21.2
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.93	0.94	0.95	0.95	0.95	0.96	0.97	0.98	0.98	0.99	1.00	1.02	\	1.21	1.23	1.24
	65	TC	16.5	16.6	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	22.0	22.2	22.3
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.04	1.05	1.06	1.06	1.06	1.07	1.08	1.09	1.09	1.11	1.12	1.13	\	1.35	1.36	1.38
	75	TC	16.5	16.7	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	21.9	22.0	22.2
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.13	1.15	1.16	1.16	1.16	1.17	1.18	1.19	1.19	1.20	1.22	1.23	\	1.42	1.43	1.44
	85	TC	16.2	16.4	16.7	17.0	16.7	17.0	17.1	17.3	17.9	18.1	18.2	18.4	\	21.3	21.4	21.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	1.25	1.26	1.28	1.28	1.28	1.29	1.30	1.32	1.32	1.33	1.34	1.36	\	1.63	1.65	1.66
	95	TC	16.0	16.2	16.6	16.7	16.6	16.7	16.9	17.1	17.6	17.8	18.0	18.1	\	20.8	20.9	21.0
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	1.48	1.50	1.52	1.52	1.52	1.53	1.55	1.57	1.57	1.58	1.60	1.61	\	1.92	1.94	1.95
	105	TC	15.6	15.8	16.2	16.3	16.2	16.3	16.5	16.7	17.2	17.4	17.5	17.7	\	19.3	19.3	19.4
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	1.76	1.77	1.79	1.79	1.79	1.81	1.83	1.85	1.85	1.87	1.89	1.90	\	2.08	2.07	2.08
	115	TC	12.9	13.1	13.4	13.5	13.4	13.5	13.7	13.8	14.7	14.8	14.6	14.6	\	15.2	15.2	15.3
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	1.65	1.66	1.68	1.68	1.68	1.70	1.72	1.73	1.76	1.77	1.77	1.78	\	1.80	1.80	1.81
	122	TC	11.0	11.1	11.4	11.5	11.4	11.5	11.6	11.8	12.5	12.6	12.4	12.4	\	12.9	12.9	13.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.70	1.71	1.73	1.73	1.73	1.75	1.77	1.78	1.81	1.83	1.82	1.83	\	1.85	1.86	1.86

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB(°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
750	5	TC	16.0	16.1	16.5	16.7	16.5	16.7	16.9	17.0	17.7	17.8	17.9	18.0	\	21.1	21.3	21.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	0.99	1.00	1.00	1.00	1.02	1.03	1.03	1.03	1.04	1.06	1.07	\	1.25	1.26	1.19
	30	TC	16.7	16.9	17.2	17.4	17.2	17.4	17.6	17.8	18.4	18.6	18.7	18.8	\	22.1	22.2	22.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.09	1.10	1.11	1.11	1.11	1.13	1.14	1.15	1.15	1.16	1.18	1.19	\	1.39	1.40	1.33
	65	TC	17.5	17.7	18.1	18.3	18.1	18.3	18.5	18.7	19.4	19.6	19.7	19.8	\	23.2	23.4	23.7
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	1.21	1.23	1.24	1.24	1.24	1.25	1.27	1.28	1.28	1.29	1.31	1.32	\	1.54	1.55	1.47
	75	TC	17.6	17.8	18.2	18.4	18.2	18.4	18.6	18.8	19.5	19.6	19.8	19.9	\	23.8	23.9	23.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	1.25	1.26	1.28	1.28	1.28	1.29	1.30	1.32	1.32	1.33	1.34	1.36	\	1.70	1.70	1.70
	85	TC	17.2	17.4	17.8	18.0	17.8	18.0	18.2	18.4	19.1	19.2	19.4	19.5	\	22.4	22.5	22.7
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	1.41	1.42	1.44	1.44	1.44	1.46	1.47	1.48	1.49	1.50	1.51	1.53	\	1.81	1.83	1.84
	95	TC	16.8	17.0	17.3	17.5	17.3	17.5	17.7	17.9	18.6	18.7	18.8	19.0	\	21.3	21.4	21.4
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	1.66	1.67	1.69	1.69	1.69	1.71	1.73	1.74	1.76	1.77	1.78	1.79	\	2.05	2.05	2.05
	105	TC	16.3	16.5	16.9	17.1	16.9	17.1	17.2	17.4	18.1	18.2	18.3	18.5	\	19.5	19.6	19.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	1.93	1.95	1.97	1.97	1.97	2.00	2.01	2.04	2.05	2.07	2.08	2.09	\	2.15	2.16	2.13
	115	TC	13.0	13.1	13.5	13.6	13.5	13.6	13.8	13.9	14.5	14.6	14.6	14.7	\	15.5	15.6	15.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	1.71	1.73	1.75	1.75	1.75	1.77	1.78	1.80	1.82	1.83	1.84	1.85	\	1.91	1.91	1.92
	122	TC	11.1	11.2	11.4	11.6	11.4	11.6	11.7	11.8	12.3	12.4	12.4	12.5	\	13.2	13.3	13.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.76	1.78	1.80	1.80	1.80	1.82	1.84	1.86	1.88	1.89	1.90	1.90	\	1.96	1.97	1.97

Performance data (Heating operation at rated frequency)
24K outdoor unit matches 18K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
450	60	TC	21.2	21.2	21.2	20.3	17.3	16.1	13.5	12.5	10.9	8.2
		kW	1.22	1.31	1.53	1.67	1.55	1.66	1.50	1.48	1.41	1.13
	70	TC	16.4	16.3	16.3	16.1	16.1	15.8	13.2	12.3	10.7	8.0
		kW	0.91	0.96	1.13	1.32	1.59	1.80	1.64	1.60	1.51	1.21
	75	TC	13.8	13.8	13.8	13.8	13.6	13.6	12.5	11.5	9.8	7.4
		kW	0.76	0.82	0.95	1.13	1.31	1.53	1.71	1.66	1.57	1.26
	80	TC	11.3	11.3	11.3	11.3	11.2	11.1	11.1	11.1	9.6	7.2
		kW	0.63	0.67	0.79	0.92	1.09	1.23	1.55	1.69	1.64	1.31
600	60	TC	23.7	23.7	23.0	20.6	17.5	16.3	13.8	12.8	11.1	8.3
		kW	1.45	1.53	1.70	1.64	1.53	1.65	1.52	1.48	1.42	1.14
	70	TC	18.4	18.3	18.1	18.0	17.1	16.0	13.4	12.5	10.9	8.2
		kW	1.05	1.13	1.29	1.49	1.67	1.78	1.64	1.60	1.52	1.22
	75	TC	15.5	15.4	15.4	15.2	15.2	15.2	12.7	11.7	9.9	7.4
		kW	0.89	0.94	1.10	1.25	1.50	1.76	1.71	1.66	1.57	1.26
	80	TC	12.7	12.7	12.7	12.6	12.5	12.4	12.5	11.5	9.8	7.4
		kW	0.73	0.77	0.90	1.04	1.22	1.41	1.77	1.73	1.64	1.31
750	60	TC	26.4	26.0	23.4	20.9	17.8	16.6	14.0	13.0	11.3	8.5
		kW	1.70	1.74	1.69	1.64	1.55	1.66	1.55	1.51	1.45	1.16
	70	TC	20.3	20.2	20.2	20.2	17.4	16.2	13.7	12.7	11.1	8.3
		kW	1.21	1.29	1.51	1.76	1.68	1.79	1.66	1.62	1.55	1.24
	75	TC	17.3	17.2	17.0	17.0	17.0	16.0	12.9	11.9	10.2	7.7
		kW	1.03	1.09	1.24	1.46	1.73	1.87	1.73	1.69	1.61	1.29
	80	TC	14.2	14.2	14.2	14.1	13.9	13.9	12.8	11.7	10.0	7.5
		kW	0.86	0.91	1.04	1.22	1.41	1.63	1.80	1.75	1.66	1.33

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

24K outdoor unit matches 24K indoor unit

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
600	5	TC	17.1	17.2	17.6	17.8	17.6	17.8	18.0	18.2	18.8	19.0	19.1	19.3	\	22.9	23.1	23.3
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	0.99	1.00	1.00	1.00	1.01	1.02	1.03	1.03	1.04	1.05	1.06	\	1.30	1.31	1.33
	30	TC	17.8	18.0	18.4	18.6	18.4	18.6	18.8	19.0	19.6	19.8	20.0	20.1	\	23.9	24.1	24.3
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.09	1.10	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.16	1.18	\	1.44	1.45	1.48
	65	TC	18.7	18.9	19.3	19.6	19.3	19.6	19.8	20.0	20.7	20.9	21.0	21.2	\	25.2	25.4	25.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.21	1.22	1.23	1.23	1.23	1.25	1.25	1.27	1.27	1.28	1.29	1.31	\	1.60	1.62	1.64
	75	TC	18.7	19.0	19.4	19.6	19.4	19.6	19.8	20.0	20.7	20.9	21.1	21.2	\	24.9	25.1	25.3
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	1.34	1.36	1.37	1.37	1.37	1.39	1.40	1.41	1.40	1.43	1.44	1.46	\	1.76	1.78	1.80
	85	TC	18.5	18.7	19.1	19.3	19.1	19.3	19.5	19.7	20.4	20.6	20.8	20.9	\	24.5	24.7	24.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	1.51	1.53	1.54	1.54	1.54	1.56	1.58	1.59	1.59	1.61	1.62	1.64	\	2.00	2.02	2.04
	95	TC	18.2	18.4	18.7	19.0	18.7	19.0	19.2	19.4	20.1	20.3	20.4	20.6	\	23.9	24.1	24.2
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	1.82	1.83	1.86	1.86	1.86	1.87	1.90	1.91	1.92	1.94	1.95	1.98	\	2.38	2.40	2.42
	105	TC	17.8	18.0	18.4	18.6	18.4	18.6	18.8	19.0	19.7	19.9	20.0	20.2	\	23.1	23.1	23.3
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	2.16	2.19	2.21	2.21	2.21	2.23	2.26	2.28	2.28	2.31	2.32	2.34	\	2.76	2.77	2.78
	115	TC	15.9	16.1	16.5	16.6	16.5	16.6	16.8	17.0	17.7	17.9	17.9	18.0	\	19.2	19.3	19.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.20	2.23	2.25	2.25	2.25	2.28	2.31	2.33	2.34	2.36	2.38	2.38	\	2.45	2.47	2.48
	122	TC	13.6	13.7	14.0	14.1	14.0	14.1	14.3	14.5	15.1	15.2	15.2	15.3	\	16.3	16.4	16.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.27	2.29	2.32	2.32	2.32	2.35	2.37	2.40	2.42	2.43	2.45	2.46	\	2.53	2.54	2.55
800	5	TC	18.3	18.5	19.0	19.1	19.0	19.1	19.4	19.6	20.3	20.4	20.6	20.8	\	24.5	24.7	24.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.14	1.16	1.17	1.17	1.17	1.18	1.19	1.21	1.20	1.22	1.23	1.24	\	1.49	1.51	1.52
	30	TC	19.1	19.3	19.8	20.0	19.8	20.0	20.2	20.4	21.2	21.3	21.5	21.7	\	25.6	25.7	25.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.27	1.28	1.30	1.30	1.30	1.31	1.33	1.34	1.33	1.36	1.37	1.38	\	1.65	1.67	1.69
	65	TC	20.2	20.3	20.9	21.0	20.9	21.0	21.3	21.5	22.3	22.4	22.6	22.8	\	26.9	27.1	27.3
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.41	1.43	1.44	1.44	1.44	1.46	1.47	1.49	1.48	1.51	1.52	1.54	\	1.83	1.86	1.87
	75	TC	20.2	20.4	20.9	21.0	20.9	21.0	21.3	21.6	22.3	22.5	22.6	22.8	\	26.7	26.9	27.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.54	1.56	1.58	1.58	1.58	1.59	1.61	1.62	1.62	1.64	1.66	1.68	\	1.93	1.95	1.97
	85	TC	19.8	20.0	20.5	20.7	20.5	20.7	20.9	21.2	21.9	22.1	22.3	22.4	\	26.0	26.2	26.4
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	1.70	1.72	1.74	1.74	1.74	1.76	1.77	1.80	1.80	1.81	1.83	1.85	\	2.23	2.24	2.27
	95	TC	19.6	19.8	20.3	20.5	20.3	20.5	20.7	20.9	21.5	21.8	22.0	22.1	\	25.4	25.5	25.6
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	2.02	2.05	2.07	2.07	2.07	2.09	2.11	2.13	2.14	2.16	2.18	2.20	\	2.62	2.64	2.66
	105	TC	19.1	19.3	19.8	20.0	19.8	20.0	20.2	20.4	21.0	21.3	21.4	21.6	\	23.5	23.5	23.7
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	2.39	2.42	2.44	2.44	2.44	2.47	2.49	2.52	2.53	2.55	2.57	2.59	\	2.83	2.82	2.83
	115	TC	15.8	16.0	16.3	16.5	16.3	16.5	16.7	16.9	18.0	18.0	17.8	17.9	\	18.6	18.6	18.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	2.24	2.27	2.29	2.29	2.29	2.31	2.34	2.36	2.40	2.42	2.41	2.42	\	2.45	2.45	2.46
	122	TC	13.4	13.6	13.9	14.0	13.9	14.0	14.2	14.4	15.3	15.3	15.1	15.2	\	15.8	15.8	15.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.31	2.33	2.36	2.36	2.36	2.38	2.41	2.43	2.47	2.49	2.48	2.50	\	2.52	2.53	2.54

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1000	5	TC	19.5	19.7	20.1	20.4	20.1	20.4	20.6	20.8	21.6	21.8	21.9	22.1	\	25.8	26.0	26.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.34	1.35	1.37	1.37	1.37	1.38	1.40	1.41	1.41	1.42	1.44	1.45	\	1.70	1.71	1.63
	30	TC	20.4	20.6	21.0	21.3	21.0	21.3	21.5	21.7	22.5	22.7	22.8	23.0	\	27.0	27.1	27.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.49	1.50	1.52	1.52	1.52	1.54	1.55	1.57	1.57	1.58	1.60	1.62	\	1.89	1.91	1.81
	65	TC	21.4	21.7	22.1	22.4	22.1	22.4	22.6	22.9	23.7	23.9	24.0	24.2	\	28.4	28.6	29.0
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	1.65	1.67	1.69	1.69	1.69	1.71	1.73	1.74	1.74	1.76	1.78	1.80	\	2.10	2.12	2.01
	75	TC	21.5	21.7	22.3	22.4	22.3	22.4	22.7	23.0	23.8	24.0	24.2	24.4	\	29.1	29.2	29.3
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	1.70	1.72	1.74	1.74	1.74	1.76	1.77	1.80	1.80	1.81	1.83	1.85	\	2.31	2.32	2.32
	85	TC	21.0	21.3	21.7	22.0	21.7	22.0	22.2	22.4	23.3	23.5	23.7	23.8	\	27.4	27.5	27.7
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	1.92	1.94	1.96	1.96	1.96	1.98	2.00	2.02	2.03	2.05	2.06	2.08	\	2.47	2.49	2.51
	95	TC	20.5	20.7	21.2	21.4	21.2	21.4	21.7	21.9	22.8	22.9	23.0	23.2	\	26.1	26.2	26.2
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	2.26	2.28	2.31	2.31	2.31	2.33	2.35	2.38	2.39	2.41	2.42	2.44	\	2.79	2.80	2.80
	105	TC	20.0	20.2	20.6	20.9	20.6	20.9	21.0	21.3	22.1	22.3	22.4	22.6	\	23.8	24.0	23.8
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	2.63	2.66	2.69	2.69	2.69	2.72	2.74	2.78	2.79	2.82	2.83	2.85	\	2.93	2.95	2.90
	115	TC	15.9	16.1	16.5	16.6	16.5	16.6	16.8	17.0	17.7	17.8	17.9	18.0	\	19.0	19.1	19.1
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	2.33	2.35	2.38	2.38	2.38	2.41	2.43	2.45	2.49	2.49	2.51	2.52	\	2.60	2.60	2.61
	122	TC	13.6	13.7	14.0	14.1	14.0	14.1	14.3	14.4	15.1	15.1	15.2	15.3	\	16.2	16.2	16.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.40	2.42	2.46	2.46	2.46	2.48	2.50	2.53	2.56	2.57	2.58	2.59	\	2.67	2.68	2.69

Performance data (Heating operation at rated frequency)
24K outdoor unit matches 24K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
600	60	TC	27.1	27.1	27.0	26.0	22.1	20.6	17.3	16.0	13.9	10.4
		kW	1.62	1.73	2.04	2.22	2.06	2.20	2.00	1.97	1.88	1.50
	70	TC	21.0	20.8	20.9	20.6	20.6	20.2	16.9	15.7	13.7	10.3
		kW	1.21	1.28	1.50	1.76	2.11	2.40	2.18	2.12	2.00	1.60
	75	TC	17.6	17.6	17.6	17.6	17.3	17.3	16.0	14.7	12.5	9.4
		kW	1.01	1.09	1.27	1.50	1.74	2.04	2.28	2.21	2.08	1.66
	80	TC	14.5	14.5	14.5	14.4	14.3	14.2	14.2	14.2	12.3	9.2
		kW	0.84	0.89	1.05	1.22	1.45	1.64	2.05	2.24	2.17	1.74
800	60	TC	30.3	30.3	29.4	26.3	22.4	20.9	17.6	16.3	14.2	10.7
		kW	1.92	2.03	2.26	2.17	2.04	2.19	2.02	1.97	1.88	1.50
	70	TC	23.5	23.3	23.1	23.0	21.9	20.4	17.2	15.9	13.9	10.4
		kW	1.40	1.50	1.72	1.98	2.23	2.37	2.18	2.12	2.02	1.62
	75	TC	19.8	19.7	19.7	19.4	19.4	19.4	16.3	14.9	12.7	9.5
		kW	1.18	1.25	1.47	1.67	1.99	2.34	2.27	2.20	2.09	1.67
	80	TC	16.2	16.2	16.2	16.1	15.9	15.9	15.9	14.7	12.5	9.4
		kW	0.97	1.03	1.20	1.38	1.62	1.88	2.35	2.30	2.17	1.74
1000	60	TC	33.7	33.2	29.9	26.8	22.7	21.2	17.8	16.6	14.5	10.9
		kW	2.26	2.31	2.24	2.17	2.05	2.20	2.06	2.01	1.93	1.54
	70	TC	25.9	25.8	25.8	25.8	22.2	20.8	17.5	16.3	14.1	10.6
		kW	1.61	1.71	2.01	2.34	2.23	2.38	2.21	2.16	2.06	1.65
	75	TC	22.1	22.0	21.7	21.7	21.7	20.5	16.5	15.2	13.0	9.8
		kW	1.37	1.45	1.65	1.94	2.30	2.49	2.30	2.24	2.14	1.71
	80	TC	18.2	18.1	18.1	18.0	17.8	17.8	16.3	15.0	12.8	9.6
		kW	1.14	1.21	1.38	1.62	1.87	2.17	2.39	2.33	2.21	1.77

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

36K outdoor unit matches 30K indoor unit

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
800	5	TC	23.3	23.5	24.0	24.3	24.0	24.3	24.5	24.8	25.6	25.9	26.1	26.3	\	31.3	31.5	31.7
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.30	1.32	1.33	1.33	1.33	1.34	1.35	1.37	1.37	1.38	1.39	1.41	\	1.72	1.74	1.77
	30	TC	24.3	24.5	25.0	25.4	25.0	25.4	25.6	25.9	26.8	27.0	27.3	27.4	\	32.6	32.9	33.1
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.45	1.46	1.47	1.47	1.47	1.49	1.50	1.52	1.52	1.53	1.55	1.57	\	1.92	1.93	1.96
	65	TC	25.6	25.8	26.3	26.7	26.3	26.7	27.0	27.2	28.2	28.4	28.7	28.9	\	34.3	34.6	34.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.61	1.63	1.64	1.64	1.64	1.66	1.67	1.69	1.69	1.70	1.72	1.74	\	2.13	2.15	2.18
	75	TC	25.6	25.9	26.4	26.7	26.4	26.7	27.0	27.3	28.3	28.5	28.8	29.0	\	34.0	34.3	34.5
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	1.78	1.80	1.83	1.83	1.83	1.85	1.87	1.88	1.87	1.90	1.92	1.94	\	2.35	2.37	2.39
	85	TC	25.2	25.5	26.0	26.3	26.0	26.3	26.6	26.9	27.8	28.1	28.3	28.5	\	33.4	33.7	33.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	2.01	2.03	2.06	2.06	2.06	2.08	2.10	2.12	2.12	2.14	2.16	2.18	\	2.66	2.69	2.71
	95	TC	24.8	25.0	25.6	25.9	25.6	25.9	26.2	26.4	27.4	27.7	27.8	28.1	\	32.6	32.9	33.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	2.42	2.44	2.47	2.47	2.47	2.49	2.52	2.55	2.56	2.58	2.60	2.63	\	3.17	3.19	3.22
	105	TC	24.3	24.6	25.1	25.4	25.1	25.4	25.7	25.9	26.9	27.1	27.3	27.5	\	31.5	31.6	31.7
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	2.88	2.91	2.94	2.94	2.94	2.97	3.00	3.04	3.04	3.07	3.09	3.12	\	3.67	3.68	3.69
	115	TC	21.7	22.0	22.5	22.7	22.5	22.7	23.0	23.2	24.2	24.3	24.4	24.6	\	26.2	26.3	26.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.93	2.96	2.99	2.99	2.99	3.04	3.07	3.10	3.12	3.14	3.16	3.17	\	3.27	3.29	3.30
	122	TC	18.5	18.7	19.1	19.3	19.1	19.3	19.5	19.7	20.5	20.7	20.8	20.9	\	22.2	22.4	22.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.02	3.05	3.08	3.08	3.08	3.13	3.16	3.19	3.21	3.23	3.26	3.27	\	3.36	3.38	3.40
1000	5	TC	25.0	25.2	25.9	26.1	25.9	26.1	26.4	26.7	27.7	27.9	28.1	28.3	\	33.4	33.6	33.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.52	1.54	1.55	1.55	1.55	1.57	1.59	1.61	1.60	1.62	1.64	1.66	\	1.98	2.00	2.02
	30	TC	26.1	26.4	27.0	27.3	27.0	27.3	27.6	27.8	28.9	29.1	29.3	29.6	\	34.9	35.1	35.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.69	1.71	1.73	1.73	1.73	1.75	1.77	1.78	1.77	1.80	1.82	1.84	\	2.20	2.23	2.24
	65	TC	27.5	27.7	28.4	28.7	28.4	28.7	29.0	29.3	30.4	30.6	30.9	31.1	\	36.7	37.0	37.2
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.88	1.90	1.92	1.92	1.92	1.94	1.96	1.98	1.97	2.00	2.02	2.04	\	2.44	2.47	2.49
	75	TC	27.5	27.8	28.4	28.7	28.4	28.7	29.0	29.4	30.4	30.7	30.9	31.1	\	36.4	36.7	37.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.06	2.08	2.10	2.10	2.10	2.12	2.14	2.16	2.16	2.18	2.21	2.23	\	2.57	2.60	2.62
	85	TC	27.0	27.3	27.9	28.3	27.9	28.3	28.5	28.9	29.9	30.2	30.3	30.6	\	35.5	35.7	36.0
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	2.26	2.28	2.32	2.32	2.32	2.34	2.36	2.39	2.39	2.41	2.43	2.46	\	2.96	2.98	3.01
	95	TC	26.7	27.0	27.7	27.9	27.7	27.9	28.2	28.5	29.3	29.7	30.0	30.2	\	34.6	34.8	35.0
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	2.69	2.72	2.75	2.75	2.75	2.77	2.81	2.84	2.85	2.87	2.90	2.92	\	3.48	3.52	3.54
	105	TC	26.0	26.3	27.0	27.2	27.0	27.2	27.5	27.8	28.7	29.0	29.2	29.5	\	32.1	32.1	32.3
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	3.18	3.21	3.24	3.24	3.24	3.29	3.32	3.35	3.36	3.39	3.42	3.44	\	3.77	3.74	3.77
	115	TC	21.6	21.8	22.3	22.5	22.3	22.5	22.8	23.0	24.5	24.6	24.3	24.3	\	25.3	25.4	25.5
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	2.98	3.01	3.05	3.05	3.05	3.08	3.11	3.14	3.19	3.21	3.20	3.22	\	3.25	3.27	3.28
	122	TC	18.3	18.6	18.9	19.1	18.9	19.1	19.4	19.6	20.8	20.9	20.6	20.7	\	21.5	21.6	21.7
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.07	3.11	3.14	3.14	3.14	3.17	3.20	3.23	3.29	3.31	3.30	3.32	\	3.35	3.36	3.37

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1200	5	TC	26.6	26.9	27.5	27.8	27.5	27.8	28.1	28.4	29.4	29.7	29.8	30.1	\	35.2	35.5	36.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.78	1.80	1.82	1.82	1.82	1.84	1.86	1.88	1.88	1.89	1.92	1.93	\	2.26	2.28	2.16
	30	TC	27.8	28.1	28.7	29.0	28.7	29.0	29.3	29.7	30.7	31.0	31.1	31.4	\	36.8	37.0	37.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.98	2.00	2.02	2.02	2.02	2.05	2.07	2.08	2.08	2.10	2.13	2.15	\	2.52	2.53	2.40
	65	TC	29.2	29.6	30.2	30.5	30.2	30.5	30.9	31.2	32.3	32.6	32.8	33.0	\	38.7	39.0	39.6
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	2.20	2.22	2.24	2.24	2.24	2.27	2.29	2.32	2.32	2.34	2.37	2.39	\	2.80	2.82	2.67
	75	TC	29.3	29.7	30.3	30.6	30.3	30.6	31.0	31.3	32.5	32.7	33.0	33.2	\	39.7	39.8	39.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	2.26	2.28	2.32	2.32	2.32	2.34	2.36	2.39	2.39	2.41	2.43	2.46	\	3.08	3.09	3.09
	85	TC	28.7	29.0	29.7	30.0	29.7	30.0	30.3	30.6	31.8	32.0	32.3	32.4	\	37.4	37.6	37.8
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	2.56	2.58	2.61	2.61	2.61	2.64	2.66	2.69	2.70	2.72	2.74	2.76	\	3.29	3.32	3.34
	95	TC	28.0	28.3	28.9	29.2	28.9	29.2	29.6	29.8	31.0	31.2	31.4	31.7	\	35.6	35.7	35.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	3.00	3.04	3.07	3.07	3.07	3.10	3.13	3.16	3.18	3.20	3.22	3.24	\	3.71	3.72	3.72
	105	TC	27.2	27.5	28.1	28.4	28.1	28.4	28.7	29.0	30.2	30.3	30.5	30.8	\	32.5	32.7	32.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	3.51	3.54	3.58	3.58	3.58	3.62	3.65	3.69	3.71	3.74	3.77	3.80	\	3.90	3.92	3.86
	115	TC	21.7	21.9	22.4	22.7	22.4	22.7	23.0	23.1	24.2	24.3	24.3	24.5	\	25.9	26.0	26.1
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	3.10	3.13	3.17	3.17	3.17	3.20	3.23	3.27	3.31	3.32	3.34	3.35	\	3.45	3.46	3.47
	122	TC	18.5	18.6	19.1	19.3	19.1	19.3	19.5	19.7	20.5	20.6	20.7	20.8	\	22.0	22.1	22.2
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.19	3.22	3.27	3.27	3.27	3.30	3.33	3.36	3.41	3.42	3.44	3.45	\	3.56	3.57	3.58

Performance data (Heating operation at rated frequency)

36K outdoor unit matches 30K indoor unit

Airflow (CFM)	ID ℉	OD ℉	75	65	55	47	35	25	15	5	-4	-13
800	60	TC	35.3	35.3	35.3	33.9	28.8	26.8	24.1	20.9	18.2	13.7
		kW	2.09	2.23	2.63	2.86	2.66	2.84	2.68	2.54	2.42	1.94
	70	TC	27.3	27.2	27.2	26.9	26.9	26.3	23.7	20.5	17.8	13.4
		kW	1.56	1.65	1.94	2.26	2.71	3.09	2.90	2.73	2.58	2.06
	75	TC	23.0	22.9	22.9	22.9	22.6	22.6	22.5	19.2	16.3	12.2
		kW	1.30	1.40	1.63	1.93	2.24	2.63	3.03	2.85	2.68	2.14
	80	TC	18.9	18.9	18.9	18.8	18.7	18.5	18.5	18.5	16.0	12.0
		kW	1.08	1.15	1.35	1.57	1.87	2.11	2.45	2.89	2.80	2.24
1000	60	TC	39.5	39.5	38.4	34.3	29.2	27.2	24.6	21.3	18.5	13.9
		kW	2.47	2.62	2.90	2.80	2.63	2.82	2.67	2.54	2.43	1.94
	70	TC	30.6	30.4	30.2	30.0	28.5	26.6	24.3	20.8	18.1	13.6
		kW	1.80	1.93	2.21	2.55	2.87	3.05	2.89	2.73	2.60	2.08
	75	TC	25.8	25.7	25.7	25.3	25.3	25.3	22.8	19.5	16.6	12.5
		kW	1.51	1.61	1.89	2.15	2.57	3.02	3.01	2.84	2.69	2.15
	80	TC	21.1	21.1	21.1	21.0	20.8	20.7	20.8	19.2	16.3	12.2
		kW	1.25	1.32	1.54	1.78	2.08	2.42	2.80	2.96	2.80	2.24
1200	60	TC	44.0	43.3	39.1	34.9	29.7	27.7	24.9	21.6	18.9	14.2
		kW	2.90	2.97	2.89	2.80	2.65	2.84	2.71	2.59	2.48	1.98
	70	TC	33.8	33.7	33.7	33.6	29.0	27.1	24.5	21.2	18.4	13.8
		kW	2.07	2.20	2.59	3.01	2.88	3.07	2.91	2.78	2.66	2.13
	75	TC	28.8	28.7	28.4	28.3	28.3	26.7	23.3	19.8	17.0	12.8
		kW	1.76	1.87	2.13	2.49	2.96	3.20	3.04	2.89	2.75	2.20
	80	TC	23.7	23.6	23.6	23.5	23.2	23.2	22.9	19.6	16.6	12.5
		kW	1.47	1.55	1.78	2.08	2.41	2.79	3.16	3.00	2.85	2.28

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

36K outdoor unit matches 36K indoor unit

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1000	5	TC	26.4	26.6	27.2	27.5	27.2	27.5	27.8	28.1	29.1	29.3	29.6	29.8	\	35.4	35.7	36.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.51	1.53	1.54	1.54	1.54	1.56	1.57	1.59	1.59	1.60	1.62	1.64	\	2.00	2.02	2.05
	30	TC	27.5	27.8	28.4	28.7	28.4	28.7	29.0	29.3	30.3	30.6	30.9	31.1	\	37.0	37.3	37.5
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.68	1.70	1.71	1.71	1.71	1.73	1.75	1.77	1.77	1.78	1.80	1.82	\	2.23	2.25	2.28
	65	TC	29.0	29.3	29.9	30.3	29.9	30.3	30.6	30.8	31.9	32.2	32.5	32.7	\	38.9	39.2	39.5
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.87	1.89	1.90	1.90	1.90	1.93	1.94	1.96	1.96	1.98	2.00	2.02	\	2.47	2.50	2.53
	75	TC	29.0	29.4	30.0	30.3	30.0	30.3	30.6	30.9	32.0	32.3	32.6	32.8	\	38.5	38.8	39.1
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.07	2.10	2.12	2.12	2.12	2.15	2.17	2.18	2.17	2.21	2.23	2.25	\	2.73	2.75	2.78
	85	TC	28.6	28.9	29.5	29.9	29.5	29.9	30.2	30.5	31.5	31.8	32.1	32.3	\	37.8	38.1	38.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	2.34	2.36	2.39	2.39	2.39	2.41	2.44	2.46	2.46	2.49	2.51	2.53	\	3.09	3.13	3.15
	95	TC	28.1	28.4	29.0	29.4	29.0	29.4	29.7	30.0	31.0	31.3	31.5	31.8	\	37.0	37.3	37.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	2.81	2.84	2.87	2.87	2.87	2.90	2.93	2.96	2.97	2.99	3.02	3.05	\	3.69	3.71	3.75
	105	TC	27.5	27.9	28.5	28.8	28.5	28.8	29.1	29.4	30.5	30.7	30.9	31.1	\	35.7	35.8	36.0
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	3.35	3.38	3.42	3.42	3.42	3.45	3.49	3.53	3.53	3.56	3.59	3.62	\	4.27	4.28	4.29
	115	TC	24.6	24.9	25.5	25.7	25.5	25.7	26.0	26.3	27.4	27.6	27.7	27.9	\	29.7	29.9	30.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.41	3.44	3.48	3.48	3.48	3.53	3.56	3.60	3.62	3.65	3.67	3.69	\	3.79	3.82	3.83
	122	TC	20.9	21.2	21.7	21.9	21.7	21.9	22.1	22.4	23.3	23.5	23.5	23.7	\	25.2	25.4	25.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.51	3.55	3.58	3.58	3.58	3.63	3.67	3.71	3.73	3.76	3.78	3.80	\	3.91	3.93	3.95
1200	5	TC	28.3	28.6	29.3	29.6	29.3	29.6	30.0	30.2	31.4	31.6	31.8	32.1	\	37.8	38.1	38.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.77	1.79	1.81	1.81	1.81	1.83	1.85	1.87	1.86	1.89	1.90	1.92	\	2.30	2.33	2.35
	30	TC	29.6	29.9	30.6	30.9	30.6	30.9	31.3	31.6	32.8	33.0	33.2	33.5	\	39.5	39.8	40.1
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.96	1.99	2.01	2.01	2.01	2.03	2.05	2.07	2.06	2.09	2.12	2.14	\	2.55	2.59	2.61
	65	TC	31.1	31.4	32.2	32.5	32.2	32.5	32.9	33.2	34.5	34.7	35.0	35.3	\	41.6	41.9	42.2
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.18	2.21	2.23	2.23	2.23	2.25	2.28	2.30	2.29	2.33	2.35	2.38	\	2.84	2.87	2.90
	75	TC	31.1	31.5	32.2	32.5	32.2	32.5	32.9	33.3	34.5	34.8	35.0	35.3	\	41.3	41.6	41.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.39	2.41	2.44	2.44	2.44	2.46	2.49	2.51	2.51	2.53	2.57	2.59	\	2.98	3.02	3.04
	85	TC	30.6	30.9	31.6	32.0	31.6	32.0	32.3	32.7	33.9	34.2	34.4	34.7	\	40.2	40.5	40.8
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	2.63	2.65	2.69	2.69	2.69	2.72	2.74	2.78	2.78	2.80	2.82	2.86	\	3.44	3.47	3.50
	95	TC	30.3	30.6	31.3	31.6	31.3	31.6	31.9	32.3	33.2	33.7	34.0	34.2	\	39.2	39.4	39.6
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	3.13	3.16	3.20	3.20	3.20	3.22	3.26	3.30	3.31	3.33	3.37	3.39	\	4.05	4.09	4.11
	105	TC	29.5	29.9	30.6	30.8	30.6	30.8	31.1	31.5	32.5	32.9	33.1	33.4	\	36.4	36.4	36.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	3.70	3.73	3.77	3.77	3.77	3.82	3.85	3.89	3.90	3.94	3.98	4.00	\	4.38	4.35	4.38
	115	TC	24.4	24.7	25.2	25.5	25.2	25.5	25.8	26.1	27.8	27.9	27.5	27.6	\	28.7	28.8	28.9
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	3.47	3.50	3.54	3.54	3.54	3.58	3.61	3.65	3.71	3.73	3.72	3.75	\	3.78	3.79	3.81
	122	TC	20.8	21.0	21.4	21.7	21.4	21.7	21.9	22.2	23.6	23.7	23.4	23.5	\	24.4	24.5	24.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.57	3.61	3.65	3.65	3.65	3.68	3.72	3.76	3.82	3.85	3.83	3.86	\	3.90	3.91	3.92

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1400	5	TC	30.1	30.5	31.1	31.5	31.1	31.5	31.8	32.2	33.4	33.6	33.8	34.1	\	39.9	40.2	40.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.07	2.09	2.11	2.11	2.11	2.14	2.16	2.18	2.18	2.20	2.23	2.25	\	2.63	2.65	2.51
	30	TC	31.5	31.8	32.5	32.9	32.5	32.9	33.2	33.6	34.8	35.1	35.3	35.6	\	41.7	41.9	42.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.30	2.32	2.35	2.35	2.35	2.38	2.40	2.42	2.42	2.44	2.48	2.50	\	2.92	2.95	2.79
	65	TC	33.1	33.5	34.2	34.6	34.2	34.6	35.0	35.4	36.7	37.0	37.2	37.4	\	43.9	44.2	44.8
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	2.56	2.58	2.61	2.61	2.61	2.64	2.67	2.69	2.69	2.72	2.75	2.78	\	3.25	3.27	3.10
	75	TC	33.2	33.6	34.4	34.7	34.4	34.7	35.1	35.5	36.9	37.1	37.4	37.6	\	44.9	45.1	45.2
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	2.63	2.65	2.69	2.69	2.69	2.72	2.74	2.78	2.78	2.80	2.82	2.86	\	3.58	3.59	3.59
	85	TC	32.5	32.9	33.6	34.0	33.6	34.0	34.3	34.7	36.1	36.3	36.6	36.8	\	42.4	42.6	42.9
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	2.97	2.99	3.03	3.03	3.03	3.07	3.09	3.13	3.14	3.16	3.19	3.21	\	3.82	3.85	3.88
	95	TC	31.7	32.0	32.7	33.1	32.7	33.1	33.5	33.8	35.2	35.4	35.6	35.9	\	40.3	40.5	40.5
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	3.49	3.53	3.56	3.56	3.56	3.60	3.64	3.67	3.70	3.72	3.75	3.77	\	4.32	4.33	4.33
	105	TC	30.8	31.1	31.8	32.2	31.8	32.2	32.5	32.9	34.2	34.4	34.6	34.9	\	36.9	37.1	36.9
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	4.07	4.11	4.16	4.16	4.16	4.21	4.24	4.29	4.32	4.35	4.38	4.41	\	4.53	4.56	4.49
	115	TC	24.6	24.8	25.4	25.7	25.4	25.7	26.0	26.2	27.4	27.5	27.6	27.8	\	29.4	29.5	29.6
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	3.60	3.64	3.69	3.69	3.69	3.72	3.76	3.79	3.84	3.85	3.88	3.89	\	4.01	4.02	4.04
	122	TC	20.9	21.1	21.6	21.9	21.6	21.9	22.1	22.3	23.3	23.4	23.5	23.6	\	25.0	25.0	25.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.71	3.75	3.80	3.80	3.80	3.83	3.87	3.91	3.96	3.97	4.00	4.01	\	4.13	4.15	4.16

Performance data (Heating operation at rated frequency)

36K outdoor unit matches 36K indoor unit

Airflow (CFM)	ID °F	OD °F	75	65	55	47	35	25	15	5	-4	-13
1000	60	TC	41.2	41.2	41.1	39.5	33.6	31.3	28.1	24.3	21.2	15.9
		kW	2.42	2.58	3.04	3.30	3.07	3.28	3.11	2.94	2.79	2.23
	70	TC	31.9	31.7	31.8	31.4	31.4	30.7	27.7	23.9	20.8	15.6
		kW	1.81	1.91	2.24	2.62	3.14	3.57	3.36	3.16	2.98	2.38
	75	TC	26.9	26.8	26.8	26.8	26.4	26.4	26.3	22.4	19.0	14.3
		kW	1.51	1.62	1.89	2.23	2.60	3.04	3.50	3.29	3.11	2.49
	80	TC	22.0	22.0	22.0	21.9	21.8	21.6	21.6	21.6	18.7	14.0
		kW	1.25	1.33	1.56	1.82	2.16	2.44	2.84	3.34	3.24	2.59
1200	60	TC	46.1	46.1	44.8	40.0	34.1	31.8	28.7	24.8	21.6	16.2
		kW	2.86	3.03	3.36	3.24	3.04	3.26	3.09	2.94	2.81	2.25
	70	TC	35.7	35.5	35.2	35.0	33.3	31.1	28.4	24.2	21.1	15.8
		kW	2.08	2.23	2.56	2.95	3.32	3.53	3.34	3.16	3.01	2.41
	75	TC	30.1	30.0	30.0	29.5	29.6	29.6	26.7	22.7	19.3	14.5
		kW	1.75	1.86	2.18	2.48	2.97	3.49	3.48	3.28	3.12	2.50
	80	TC	24.6	24.6	24.6	24.5	24.2	24.1	24.2	22.4	19.0	14.3
		kW	1.44	1.53	1.79	2.06	2.41	2.79	3.24	3.43	3.24	2.59
1400	60	TC	51.3	50.5	45.6	40.7	34.6	32.3	29.1	25.2	22.0	16.5
		kW	3.36	3.44	3.34	3.24	3.06	3.28	3.14	2.99	2.87	2.30
	70	TC	39.4	39.3	39.3	39.2	33.8	31.6	28.6	24.7	21.5	16.1
		kW	2.40	2.55	2.99	3.48	3.33	3.55	3.37	3.22	3.07	2.46
	75	TC	33.6	33.5	33.1	33.0	33.0	31.2	27.2	23.1	19.8	14.9
		kW	2.04	2.16	2.46	2.88	3.43	3.70	3.52	3.34	3.18	2.54
	80	TC	27.7	27.6	27.6	27.5	27.1	27.1	26.8	22.8	19.4	14.6
		kW	1.70	1.80	2.06	2.41	2.78	3.23	3.66	3.47	3.29	2.63

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

48K outdoor unit matches 42K indoor unit

Airflow (CMF)	Outdoor DB (°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1150	5	TC	32.6	32.9	33.6	34.0	33.6	34.0	34.3	34.7	35.9	36.2	36.6	36.8	\	43.8	44.1	44.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.84	1.86	1.88	1.88	1.88	1.90	1.91	1.94	1.94	1.95	1.97	1.99	\	2.44	2.46	2.50
	30	TC	34.0	34.3	35.0	35.5	35.0	35.5	35.9	36.2	37.5	37.8	38.2	38.4	\	45.7	46.0	46.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.04	2.07	2.08	2.08	2.08	2.11	2.12	2.15	2.15	2.16	2.19	2.22	\	2.71	2.73	2.77
	65	TC	35.8	36.2	36.9	37.4	36.9	37.4	37.7	38.1	39.4	39.8	40.2	40.4	\	48.1	48.5	48.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.27	2.30	2.32	2.32	2.32	2.34	2.36	2.39	2.39	2.40	2.43	2.46	\	3.01	3.04	3.08
	75	TC	35.8	36.3	37.0	37.4	37.0	37.4	37.9	38.2	39.6	39.9	40.3	40.5	\	47.6	48.0	48.3
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.52	2.55	2.58	2.58	2.58	2.61	2.64	2.65	2.64	2.68	2.71	2.74	\	3.32	3.35	3.38
	85	TC	35.3	35.7	36.4	36.9	36.4	36.9	37.3	37.6	39.0	39.3	39.7	39.9	\	46.7	47.1	47.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	2.85	2.88	2.91	2.91	2.91	2.93	2.96	2.99	2.99	3.02	3.05	3.08	\	3.76	3.81	3.83
	95	TC	34.7	35.1	35.8	36.3	35.8	36.3	36.6	37.0	38.3	38.7	39.0	39.3	\	45.7	46.0	46.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.42	3.45	3.50	3.50	3.50	3.52	3.57	3.60	3.61	3.64	3.67	3.72	\	4.48	4.51	4.56
	105	TC	34.0	34.5	35.2	35.5	35.2	35.5	35.9	36.3	37.6	38.0	38.2	38.5	\	44.1	44.2	44.4
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	4.07	4.11	4.16	4.16	4.16	4.20	4.25	4.29	4.29	4.34	4.37	4.41	\	5.19	5.21	5.22
	115	TC	30.4	30.8	31.5	31.8	31.5	31.8	32.1	32.5	33.8	34.1	34.2	34.5	\	36.6	36.9	37.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.14	4.19	4.23	4.23	4.23	4.29	4.34	4.38	4.41	4.44	4.47	4.48	\	4.62	4.65	4.66
	122	TC	25.9	26.2	26.8	27.0	26.8	27.0	27.3	27.6	28.8	29.0	29.1	29.3	\	31.1	31.4	31.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.27	4.31	4.36	4.36	4.36	4.42	4.47	4.51	4.54	4.57	4.60	4.62	\	4.75	4.79	4.80
1350	5	TC	35.0	35.3	36.2	36.6	36.2	36.6	37.0	37.3	38.8	39.0	39.3	39.7	\	46.8	47.1	47.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.15	2.17	2.20	2.20	2.20	2.22	2.25	2.27	2.26	2.29	2.32	2.34	\	2.80	2.83	2.86
	30	TC	36.5	36.9	37.8	38.2	37.8	38.2	38.6	39.0	40.5	40.7	41.1	41.4	\	48.8	49.2	49.5
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.39	2.42	2.44	2.44	2.44	2.47	2.50	2.52	2.51	2.55	2.58	2.60	\	3.11	3.15	3.17
	65	TC	38.5	38.8	39.8	40.2	39.8	40.2	40.7	41.0	42.6	42.9	43.2	43.6	\	51.4	51.7	52.1
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.65	2.68	2.71	2.71	2.71	2.74	2.77	2.80	2.79	2.83	2.86	2.89	\	3.45	3.50	3.52
	75	TC	38.5	39.0	39.8	40.2	39.8	40.2	40.7	41.1	42.6	43.0	43.2	43.6	\	51.0	51.4	51.7
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.91	2.93	2.96	2.96	2.96	2.99	3.02	3.05	3.05	3.08	3.13	3.16	\	3.63	3.67	3.70
	85	TC	37.9	38.2	39.1	39.6	39.1	39.6	39.9	40.4	41.9	42.2	42.5	42.9	\	49.7	50.0	50.4
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	3.20	3.23	3.27	3.27	3.27	3.30	3.33	3.38	3.38	3.41	3.44	3.48	\	4.19	4.22	4.26
	95	TC	37.4	37.9	38.7	39.1	38.7	39.1	39.4	39.9	41.0	41.6	42.0	42.2	\	48.5	48.7	48.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	3.81	3.85	3.89	3.89	3.89	3.92	3.97	4.01	4.03	4.06	4.10	4.13	\	4.93	4.97	5.00
	105	TC	36.4	36.9	37.7	38.1	37.7	38.1	38.5	39.0	40.2	40.7	40.9	41.3	\	44.9	44.9	45.2
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	4.50	4.54	4.59	4.59	4.59	4.65	4.69	4.73	4.75	4.79	4.84	4.87	\	5.32	5.29	5.32
	115	TC	30.2	30.6	31.2	31.5	31.2	31.5	31.9	32.3	34.3	34.5	34.0	34.1	\	35.4	35.5	35.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	4.22	4.26	4.31	4.31	4.31	4.35	4.39	4.44	4.51	4.54	4.53	4.56	\	4.60	4.62	4.63
	122	TC	25.7	26.0	26.5	26.8	26.5	26.8	27.1	27.4	29.2	29.3	28.9	29.0	\	30.1	30.2	30.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.34	4.39	4.44	4.44	4.44	4.48	4.53	4.57	4.65	4.68	4.66	4.69	\	4.74	4.75	4.77

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB (°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1550	5	TC	37.2	37.7	38.4	38.9	38.4	38.9	39.3	39.8	41.2	41.5	41.8	42.1	\	49.3	49.6	50.4
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.52	2.54	2.57	2.57	2.57	2.60	2.63	2.65	2.65	2.68	2.71	2.74	\	3.20	3.23	3.06
	30	TC	38.9	39.3	40.1	40.6	40.1	40.6	41.1	41.5	43.0	43.4	43.6	43.9	\	51.5	51.8	52.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.80	2.83	2.85	2.85	2.85	2.89	2.92	2.95	2.95	2.97	3.01	3.04	\	3.56	3.58	3.40
	65	TC	40.9	41.4	42.2	42.7	42.2	42.7	43.2	43.7	45.3	45.7	45.9	46.3	\	54.2	54.5	55.4
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	3.11	3.14	3.17	3.17	3.17	3.22	3.24	3.27	3.27	3.30	3.35	3.38	\	3.95	3.98	3.78
	75	TC	41.0	41.5	42.5	42.9	42.5	42.9	43.3	43.8	45.5	45.8	46.1	46.5	\	55.5	55.8	55.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	3.20	3.23	3.27	3.27	3.27	3.30	3.33	3.38	3.38	3.41	3.44	3.48	\	4.35	4.37	4.37
	85	TC	40.2	40.7	41.5	42.0	41.5	42.0	42.4	42.9	44.6	44.8	45.2	45.4	\	52.3	52.6	53.0
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	3.61	3.64	3.69	3.69	3.69	3.73	3.76	3.81	3.82	3.85	3.88	3.91	\	4.65	4.69	4.72
	95	TC	39.2	39.6	40.4	40.9	40.4	40.9	41.4	41.8	43.5	43.7	43.9	44.3	\	49.8	50.0	50.0
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	4.25	4.29	4.34	4.34	4.34	4.38	4.42	4.47	4.50	4.53	4.56	4.59	\	5.25	5.27	5.27
	105	TC	38.1	38.5	39.3	39.8	39.3	39.8	40.2	40.7	42.2	42.5	42.7	43.1	\	45.5	45.8	45.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	4.96	5.00	5.06	5.06	5.06	5.12	5.16	5.22	5.25	5.29	5.32	5.37	\	5.52	5.55	5.46
	115	TC	30.4	30.7	31.4	31.8	31.4	31.8	32.1	32.4	33.8	34.0	34.1	34.3	\	36.3	36.4	36.5
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	4.38	4.42	4.48	4.48	4.48	4.53	4.57	4.62	4.68	4.69	4.72	4.73	\	4.88	4.90	4.91
	122	TC	25.9	26.1	26.7	27.0	26.7	27.0	27.3	27.5	28.8	28.9	29.0	29.2	\	30.8	30.9	31.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.51	4.56	4.62	4.62	4.62	4.66	4.71	4.75	4.82	4.83	4.86	4.88	\	5.03	5.04	5.06

Performance data (Heating operation at rated frequency)

48K outdoor unit matches 42K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
1150	60	TC	49.5	49.5	49.4	47.4	40.3	37.5	33.7	29.2	25.5	19.1
		kW	3.06	3.27	3.84	4.18	3.88	4.15	3.93	3.72	3.53	2.82
	70	TC	38.3	38.0	38.1	37.7	37.7	36.8	33.2	28.7	25.0	18.8
		kW	2.29	2.41	2.83	3.31	3.97	4.52	4.25	4.00	3.77	3.02
	75	TC	32.2	32.1	32.1	32.1	31.6	31.6	31.5	26.9	22.8	17.1
		kW	1.91	2.05	2.38	2.82	3.28	3.84	4.43	4.16	3.93	3.14
	80	TC	26.4	26.4	26.4	26.3	26.2	25.9	25.9	25.9	22.4	16.8
		kW	1.58	1.68	1.98	2.30	2.73	3.08	3.59	4.22	4.09	3.27
1350	60	TC	55.3	55.3	53.7	48.0	40.9	38.1	34.4	29.8	25.9	19.4
		kW	3.62	3.83	4.25	4.09	3.84	4.12	3.91	3.72	3.55	2.84
	70	TC	42.8	42.6	42.2	42.0	39.9	37.3	34.0	29.1	25.3	19.0
		kW	2.64	2.82	3.24	3.73	4.19	4.46	4.22	4.00	3.80	3.04
	75	TC	36.1	36.0	36.0	35.4	35.5	35.5	32.0	27.3	23.2	17.4
		kW	2.22	2.36	2.76	3.14	3.76	4.42	4.40	4.15	3.94	3.15
	80	TC	29.6	29.6	29.6	29.4	29.1	29.0	29.1	26.9	22.8	17.1
		kW	1.82	1.94	2.26	2.61	3.04	3.53	4.09	4.33	4.09	3.27
1550	60	TC	61.6	60.6	54.7	48.9	41.5	38.7	34.9	30.3	26.4	19.8
		kW	4.25	4.35	4.22	4.09	3.87	4.15	3.97	3.79	3.63	2.90
	70	TC	47.3	47.2	47.2	47.1	40.6	37.9	34.3	29.7	25.8	19.4
		kW	3.03	3.23	3.79	4.40	4.21	4.49	4.26	4.07	3.88	3.10
	75	TC	40.3	40.2	39.7	39.6	39.6	37.4	32.6	27.8	23.8	17.9
		kW	2.58	2.73	3.11	3.65	4.33	4.68	4.45	4.22	4.02	3.22
	80	TC	33.2	33.1	33.1	32.9	32.5	32.5	32.1	27.4	23.3	17.5
		kW	2.15	2.27	2.61	3.04	3.52	4.08	4.63	4.39	4.16	3.33

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

48K outdoor unit matches 48K indoor unit

Airflow (CMF)	Outdoor DB (°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1360	5	TC	37.2	37.6	38.4	38.9	38.4	38.9	39.2	39.6	41.0	41.4	41.8	42.0	\	50.0	50.4	50.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.13	2.16	2.17	2.17	2.17	2.20	2.21	2.24	2.24	2.26	2.28	2.31	\	2.82	2.85	2.89
	30	TC	38.9	39.3	40.0	40.6	40.0	40.6	41.0	41.4	42.8	43.2	43.6	43.9	\	52.2	52.6	53.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.37	2.40	2.41	2.41	2.41	2.45	2.46	2.49	2.49	2.51	2.54	2.57	\	3.14	3.17	3.21
	65	TC	40.9	41.3	42.2	42.7	42.2	42.7	43.1	43.5	45.1	45.5	45.9	46.2	\	55.0	55.4	55.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.63	2.67	2.68	2.68	2.68	2.72	2.73	2.77	2.77	2.79	2.82	2.85	\	3.49	3.52	3.57
	75	TC	40.9	41.5	42.3	42.7	42.3	42.7	43.3	43.7	45.2	45.6	46.1	46.3	\	54.4	54.8	55.2
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.92	2.96	2.99	2.99	2.99	3.02	3.06	3.08	3.06	3.11	3.14	3.18	\	3.84	3.88	3.91
	85	TC	40.3	40.8	41.6	42.2	41.6	42.2	42.6	43.0	44.5	44.9	45.4	45.6	\	53.4	53.8	54.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	3.30	3.33	3.37	3.37	3.37	3.40	3.43	3.47	3.47	3.50	3.54	3.57	\	4.36	4.41	4.44
	95	TC	39.7	40.1	40.9	41.5	40.9	41.5	41.9	42.3	43.8	44.2	44.5	44.9	\	52.2	52.6	52.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.96	4.00	4.05	4.05	4.05	4.08	4.13	4.17	4.19	4.22	4.25	4.31	\	5.19	5.23	5.28
	105	TC	38.8	39.4	40.2	40.6	40.2	40.6	41.0	41.5	43.0	43.4	43.7	44.0	\	50.4	50.5	50.8
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	4.72	4.77	4.82	4.82	4.82	4.87	4.92	4.97	4.97	5.02	5.06	5.11	\	6.01	6.03	6.05
	115	TC	34.8	35.2	36.0	36.3	36.0	36.3	36.7	37.1	38.7	39.0	39.1	39.4	\	41.9	42.2	42.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.80	4.85	4.90	4.90	4.90	4.97	5.02	5.07	5.11	5.14	5.18	5.19	\	5.35	5.38	5.40
	122	TC	29.6	29.9	30.6	30.9	30.6	30.9	31.2	31.6	32.9	33.1	33.2	33.5	\	35.6	35.8	36.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.95	5.00	5.05	5.05	5.05	5.12	5.17	5.23	5.26	5.30	5.33	5.35	\	5.51	5.54	5.56
1560	5	TC	40.0	40.4	41.4	41.8	41.4	41.8	42.3	42.7	44.3	44.6	44.9	45.3	\	53.4	53.8	54.2
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.49	2.52	2.55	2.55	2.55	2.57	2.60	2.63	2.62	2.66	2.68	2.71	\	3.24	3.28	3.31
	30	TC	41.8	42.2	43.2	43.6	43.2	43.6	44.1	44.5	46.3	46.5	46.9	47.3	\	55.8	56.2	56.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.77	2.80	2.83	2.83	2.83	2.86	2.89	2.92	2.91	2.95	2.98	3.01	\	3.60	3.64	3.68
	65	TC	44.0	44.4	45.5	45.9	45.5	45.9	46.5	46.9	48.7	49.0	49.4	49.8	\	58.7	59.1	59.5
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.08	3.11	3.14	3.14	3.14	3.18	3.21	3.25	3.23	3.28	3.31	3.35	\	4.00	4.05	4.08
	75	TC	44.0	44.5	45.5	45.9	45.5	45.9	46.5	47.0	48.7	49.1	49.4	49.8	\	58.3	58.7	59.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.37	3.40	3.43	3.43	3.43	3.47	3.50	3.54	3.54	3.57	3.62	3.66	\	4.20	4.25	4.29
	85	TC	43.3	43.7	44.7	45.2	44.7	45.2	45.6	46.2	47.9	48.3	48.6	49.0	\	56.8	57.2	57.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	3.71	3.74	3.79	3.79	3.79	3.83	3.86	3.91	3.91	3.95	3.98	4.03	\	4.85	4.89	4.94
	95	TC	42.7	43.3	44.2	44.7	44.2	44.7	45.1	45.6	46.9	47.6	48.0	48.3	\	55.4	55.7	55.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	4.41	4.46	4.51	4.51	4.51	4.54	4.60	4.65	4.66	4.70	4.75	4.78	\	5.71	5.76	5.79
	105	TC	41.6	42.2	43.1	43.5	43.1	43.5	44.0	44.5	45.9	46.5	46.7	47.2	\	51.3	51.3	51.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	5.21	5.26	5.31	5.31	5.31	5.38	5.43	5.48	5.50	5.55	5.60	5.64	\	6.17	6.13	6.17
	115	TC	34.5	34.9	35.6	36.0	35.6	36.0	36.5	36.9	39.2	39.4	38.8	39.0	\	40.5	40.6	40.8
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	4.89	4.94	4.99	4.99	4.99	5.04	5.09	5.14	5.23	5.26	5.25	5.28	\	5.33	5.35	5.37
	122	TC	29.3	29.7	30.3	30.6	30.3	30.6	31.0	31.3	33.3	33.5	33.0	33.1	\	34.4	34.5	34.7
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	5.03	5.09	5.14	5.14	5.14	5.19	5.24	5.30	5.39	5.42	5.40	5.44	\	5.49	5.51	5.53

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB (°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1760	5	TC	42.5	43.0	43.9	44.4	43.9	44.4	44.9	45.5	47.1	47.5	47.7	48.1	\	56.3	56.7	57.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.92	2.95	2.98	2.98	2.98	3.02	3.04	3.07	3.07	3.10	3.14	3.17	\	3.71	3.74	3.54
	30	TC	44.4	44.9	45.9	46.4	45.9	46.4	46.9	47.5	49.2	49.6	49.8	50.2	\	58.8	59.2	60.1
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	3.24	3.28	3.31	3.31	3.31	3.35	3.38	3.41	3.41	3.44	3.49	3.52	\	4.12	4.15	3.94
	65	TC	46.7	47.3	48.3	48.8	48.3	48.8	49.4	49.9	51.8	52.2	52.5	52.9	\	61.9	62.3	63.3
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	3.61	3.64	3.67	3.67	3.67	3.72	3.76	3.79	3.79	3.83	3.88	3.91	\	4.58	4.61	4.37
	75	TC	46.9	47.4	48.6	49.0	48.6	49.0	49.5	50.1	52.0	52.3	52.7	53.1	\	63.4	63.7	63.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	3.71	3.74	3.79	3.79	3.79	3.83	3.86	3.91	3.91	3.95	3.98	4.03	\	5.04	5.06	5.06
	85	TC	45.9	46.5	47.4	48.0	47.4	48.0	48.4	49.0	50.9	51.2	51.6	51.9	\	59.8	60.1	60.5
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	4.19	4.22	4.27	4.27	4.27	4.32	4.36	4.41	4.43	4.46	4.49	4.53	\	5.38	5.43	5.47
	95	TC	44.8	45.2	46.2	46.7	46.2	46.7	47.3	47.7	49.7	49.9	50.2	50.6	\	56.9	57.2	57.2
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	4.92	4.97	5.02	5.02	5.02	5.07	5.13	5.18	5.21	5.25	5.28	5.31	\	6.08	6.10	6.10
	105	TC	43.5	44.0	44.9	45.5	44.9	45.5	45.9	46.5	48.3	48.6	48.8	49.3	\	52.0	52.3	52.0
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	5.74	5.79	5.86	5.86	5.86	5.93	5.98	6.05	6.08	6.13	6.17	6.22	\	6.39	6.42	6.32
	115	TC	34.8	35.1	35.9	36.3	35.9	36.3	36.7	37.0	38.7	38.8	39.0	39.2	\	41.5	41.6	41.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	5.07	5.13	5.19	5.19	5.19	5.25	5.30	5.35	5.42	5.43	5.47	5.48	\	5.66	5.67	5.69
	122	TC	29.6	29.8	30.5	30.9	30.5	30.9	31.2	31.5	32.9	33.0	33.1	33.3	\	35.2	35.4	35.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	5.23	5.28	5.35	5.35	5.35	5.40	5.46	5.51	5.58	5.60	5.63	5.65	\	5.83	5.84	5.86

Performance data (Heating operation at rated frequency)

48K outdoor unit matches 48K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
1360	60	TC	55.4	55.4	55.2	53.1	45.1	42.0	37.7	32.7	28.5	21.4
		kW	3.42	3.65	4.30	4.67	4.34	4.64	4.39	4.15	3.95	3.16
	70	TC	42.8	42.5	42.7	42.1	42.1	41.2	37.1	32.1	28.0	21.0
		kW	2.56	2.70	3.17	3.70	4.44	5.05	4.75	4.47	4.22	3.38
	75	TC	36.1	35.9	35.9	35.9	35.4	35.4	35.3	30.1	25.5	19.1
		kW	2.13	2.29	2.67	3.15	3.67	4.30	4.95	4.66	4.39	3.51
	80	TC	29.6	29.6	29.6	29.4	29.3	29.0	29.0	29.0	25.1	18.8
		kW	1.77	1.88	2.21	2.57	3.06	3.45	4.01	4.72	4.58	3.66
1560	60	TC	61.9	61.9	60.1	53.8	45.8	42.7	38.5	33.4	29.0	21.8
		kW	4.04	4.28	4.75	4.58	4.30	4.61	4.37	4.15	3.97	3.18
	70	TC	47.9	47.7	47.3	47.0	44.7	41.7	38.1	32.5	28.4	21.3
		kW	2.95	3.15	3.62	4.17	4.69	4.99	4.72	4.47	4.25	3.40
	75	TC	40.4	40.2	40.2	39.6	39.7	39.7	35.8	30.5	25.9	19.4
		kW	2.48	2.63	3.09	3.51	4.20	4.94	4.92	4.64	4.41	3.53
	80	TC	33.1	33.1	33.1	33.0	32.5	32.4	32.5	30.1	25.5	19.1
		kW	2.04	2.16	2.52	2.92	3.40	3.95	4.58	4.84	4.58	3.66
1760	60	TC	68.9	67.8	61.2	54.7	46.5	43.4	39.0	33.9	29.6	22.2
		kW	4.75	4.86	4.72	4.58	4.33	4.64	4.44	4.23	4.06	3.25
	70	TC	52.9	52.8	52.8	52.7	45.4	42.4	38.4	33.2	28.9	21.7
		kW	3.39	3.61	4.23	4.92	4.70	5.02	4.77	4.55	4.34	3.47
	75	TC	45.1	45.0	44.4	44.3	44.3	41.9	36.5	31.1	26.6	20.0
		kW	2.88	3.06	3.48	4.08	4.84	5.24	4.97	4.72	4.50	3.60
	80	TC	37.1	37.0	37.0	36.9	36.3	36.3	35.9	30.7	26.1	19.6
		kW	2.40	2.54	2.92	3.40	3.93	4.56	5.17	4.91	4.66	3.73

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1360	5	TC	37.2	37.6	38.4	38.9	38.4	38.9	39.2	39.6	41.0	41.4	41.8	42.0	\	50.0	50.4	50.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.04	2.07	2.08	2.08	2.08	2.11	2.12	2.15	2.15	2.16	2.19	2.21	\	2.70	2.73	2.77
	30	TC	38.9	39.3	40.0	40.6	40.0	40.6	41.0	41.4	42.8	43.2	43.6	43.9	\	52.2	52.6	53.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.27	2.30	2.31	2.31	2.31	2.34	2.36	2.39	2.39	2.40	2.43	2.46	\	3.00	3.03	3.08
	65	TC	40.9	41.3	42.2	42.7	42.2	42.7	43.1	43.5	45.1	45.5	45.9	46.2	\	55.0	55.4	55.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.52	2.55	2.57	2.57	2.57	2.60	2.62	2.65	2.65	2.67	2.70	2.73	\	3.34	3.37	3.42
	75	TC	40.9	41.5	42.3	42.7	42.3	42.7	43.3	43.7	45.2	45.6	46.1	46.3	\	54.4	54.8	55.2
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.80	2.83	2.86	2.86	2.86	2.90	2.93	2.95	2.93	2.98	3.01	3.04	\	3.68	3.72	3.75
	85	TC	40.3	40.8	41.6	42.2	41.6	42.2	42.6	43.0	44.5	44.9	45.4	45.6	\	53.4	53.8	54.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	3.16	3.19	3.22	3.22	3.22	3.26	3.29	3.32	3.32	3.36	3.39	3.42	\	4.17	4.22	4.26
	95	TC	39.7	40.1	40.9	41.5	40.9	41.5	41.9	42.3	43.8	44.2	44.5	44.9	\	52.2	52.6	52.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.80	3.83	3.88	3.88	3.88	3.91	3.96	3.99	4.01	4.04	4.08	4.12	\	4.98	5.01	5.06
	105	TC	38.8	39.4	40.2	40.6	40.2	40.6	41.0	41.5	43.0	43.4	43.7	44.0	\	50.4	50.5	50.8
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	4.52	4.57	4.62	4.62	4.62	4.66	4.71	4.76	4.76	4.81	4.84	4.89	\	5.76	5.78	5.79
	115	TC	34.8	35.2	36.0	36.3	36.0	36.3	36.7	37.1	38.7	39.0	39.1	39.4	\	41.9	42.2	42.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.60	4.65	4.70	4.70	4.70	4.76	4.81	4.86	4.89	4.93	4.96	4.98	\	5.12	5.16	5.17
	122	TC	29.6	29.9	30.6	30.9	30.6	30.9	31.2	31.6	32.9	33.1	33.2	33.5	\	35.6	35.8	36.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.74	4.79	4.84	4.84	4.84	4.91	4.96	5.01	5.04	5.07	5.11	5.12	\	5.28	5.31	5.33
1560	5	TC	40.0	40.4	41.4	41.8	41.4	41.8	42.3	42.7	44.3	44.6	44.9	45.3	\	53.4	53.8	54.2
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.39	2.41	2.44	2.44	2.44	2.47	2.49	2.52	2.51	2.55	2.57	2.60	\	3.10	3.14	3.17
	30	TC	41.8	42.2	43.2	43.6	43.2	43.6	44.1	44.5	46.3	46.5	46.9	47.3	\	55.8	56.2	56.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.65	2.68	2.71	2.71	2.71	2.74	2.77	2.80	2.78	2.83	2.86	2.89	\	3.45	3.49	3.52
	65	TC	44.0	44.4	45.5	45.9	45.5	45.9	46.5	46.9	48.7	49.0	49.4	49.8	\	58.7	59.1	59.5
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.95	2.98	3.01	3.01	3.01	3.04	3.08	3.11	3.09	3.14	3.18	3.21	\	3.83	3.88	3.91
	75	TC	44.0	44.5	45.5	45.9	45.5	45.9	46.5	47.0	48.7	49.1	49.4	49.8	\	58.3	58.7	59.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.22	3.26	3.29	3.29	3.29	3.32	3.36	3.39	3.39	3.42	3.47	3.50	\	4.03	4.08	4.11
	85	TC	43.3	43.7	44.7	45.2	44.7	45.2	45.6	46.2	47.9	48.3	48.6	49.0	\	56.8	57.2	57.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	3.55	3.58	3.63	3.63	3.63	3.67	3.70	3.75	3.75	3.78	3.81	3.86	\	4.65	4.68	4.73
	95	TC	42.7	43.3	44.2	44.7	44.2	44.7	45.1	45.6	46.9	47.6	48.0	48.3	\	55.4	55.7	55.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	4.22	4.27	4.32	4.32	4.32	4.35	4.40	4.45	4.47	4.50	4.55	4.58	\	5.47	5.52	5.55
	105	TC	41.6	42.2	43.1	43.5	43.1	43.5	44.0	44.5	45.9	46.5	46.7	47.2	\	51.3	51.3	51.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	4.99	5.04	5.09	5.09	5.09	5.16	5.20	5.25	5.27	5.32	5.37	5.40	\	5.91	5.88	5.91
	115	TC	34.5	34.9	35.6	36.0	35.6	36.0	36.5	36.9	39.2	39.4	38.8	39.0	\	40.5	40.6	40.8
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	4.68	4.73	4.78	4.78	4.78	4.83	4.88	4.93	5.01	5.04	5.02	5.06	\	5.11	5.12	5.14
	122	TC	29.3	29.7	30.3	30.6	30.3	30.6	31.0	31.3	33.3	33.5	33.0	33.1	\	34.4	34.5	34.7
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.82	4.87	4.92	4.92	4.92	4.97	5.02	5.07	5.16	5.19	5.18	5.21	\	5.26	5.28	5.29

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
1760	5	TC	42.5	43.0	43.9	44.4	43.9	44.4	44.9	45.5	47.1	47.5	47.7	48.1	\	56.3	56.7	57.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.80	2.82	2.85	2.85	2.85	2.89	2.92	2.94	2.94	2.97	3.01	3.04	\	3.55	3.58	3.39
	30	TC	44.4	44.9	45.9	46.4	45.9	46.4	46.9	47.5	49.2	49.6	49.8	50.2	\	58.8	59.2	60.1
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	3.11	3.14	3.17	3.17	3.17	3.21	3.24	3.27	3.27	3.30	3.34	3.37	\	3.95	3.98	3.77
	65	TC	46.7	47.3	48.3	48.8	48.3	48.8	49.4	49.9	51.8	52.2	52.5	52.9	\	61.9	62.3	63.3
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	3.45	3.49	3.52	3.52	3.52	3.57	3.60	3.63	3.63	3.67	3.72	3.75	\	4.39	4.42	4.19
	75	TC	46.9	47.4	48.6	49.0	48.6	49.0	49.5	50.1	52.0	52.3	52.7	53.1	\	63.4	63.7	63.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	3.55	3.58	3.63	3.63	3.63	3.67	3.70	3.75	3.75	3.78	3.81	3.86	\	4.83	4.84	4.84
	85	TC	45.9	46.5	47.4	48.0	47.4	48.0	48.4	49.0	50.9	51.2	51.6	51.9	\	59.8	60.1	60.5
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	4.01	4.04	4.09	4.09	4.09	4.14	4.17	4.22	4.24	4.27	4.30	4.34	\	5.16	5.20	5.24
	95	TC	44.8	45.2	46.2	46.7	46.2	46.7	47.3	47.7	49.7	49.9	50.2	50.6	\	56.9	57.2	57.2
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	4.71	4.76	4.81	4.81	4.81	4.86	4.91	4.96	4.99	5.02	5.06	5.09	\	5.83	5.84	5.84
	105	TC	43.5	44.0	44.9	45.5	44.9	45.5	45.9	46.5	48.3	48.6	48.8	49.3	\	52.0	52.3	52.0
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	5.50	5.55	5.61	5.61	5.61	5.68	5.73	5.79	5.83	5.88	5.91	5.96	\	6.12	6.15	6.06
	115	TC	34.8	35.1	35.9	36.3	35.9	36.3	36.7	37.0	38.7	38.8	39.0	39.2	\	41.5	41.6	41.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	4.86	4.91	4.98	4.98	4.98	5.02	5.07	5.12	5.19	5.20	5.24	5.25	\	5.42	5.43	5.45
	122	TC	29.6	29.8	30.5	30.9	30.5	30.9	31.2	31.5	32.9	33.0	33.1	33.3	\	35.2	35.4	35.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	5.01	5.06	5.12	5.12	5.12	5.18	5.23	5.28	5.34	5.36	5.39	5.41	\	5.58	5.60	5.61

Performance data (Heating operation at rated frequency)

60K outdoor unit matches 48K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
1360	60	TC	56.6	56.6	56.4	54.2	46.1	42.9	38.5	33.4	29.1	21.8
		kW	3.40	3.64	4.27	4.65	4.32	4.62	4.37	4.13	3.93	3.14
	70	TC	43.7	43.4	43.6	43.0	43.0	42.1	37.9	32.8	28.6	21.5
		kW	2.54	2.68	3.15	3.68	4.42	5.02	4.73	4.45	4.20	3.36
	75	TC	36.8	36.7	36.7	36.7	36.1	36.1	36.0	30.8	26.1	19.6
		kW	2.12	2.28	2.65	3.14	3.65	4.27	4.93	4.63	4.37	3.50
	80	TC	30.2	30.2	30.2	30.1	29.9	29.7	29.7	29.7	25.7	19.3
		kW	1.76	1.87	2.20	2.56	3.04	3.43	3.99	4.70	4.56	3.65
1560	60	TC	63.2	63.2	61.4	54.9	46.8	43.6	39.3	34.1	29.7	22.3
		kW	4.03	4.26	4.73	4.56	4.27	4.59	4.35	4.13	3.95	3.16
	70	TC	49.0	48.7	48.3	48.0	45.7	42.6	38.9	33.2	29.0	21.8
		kW	2.93	3.14	3.60	4.15	4.66	4.96	4.70	4.45	4.23	3.38
	75	TC	41.2	41.1	41.1	40.4	40.6	40.6	36.6	31.2	26.5	19.9
		kW	2.47	2.62	3.07	3.49	4.18	4.91	4.90	4.62	4.38	3.50
	80	TC	33.8	33.8	33.8	33.7	33.2	33.1	33.2	30.8	26.1	19.6
		kW	2.03	2.15	2.51	2.90	3.39	3.93	4.56	4.82	4.56	3.65
1760	60	TC	70.3	69.2	62.5	55.9	47.4	44.3	39.9	34.6	30.2	22.7
		kW	4.73	4.84	4.70	4.56	4.31	4.62	4.42	4.21	4.04	3.23
	70	TC	54.1	53.9	53.9	53.8	46.3	43.3	39.2	33.9	29.5	22.1
		kW	3.37	3.59	4.21	4.90	4.68	4.99	4.74	4.52	4.32	3.46
	75	TC	46.1	45.9	45.4	45.2	45.2	42.8	37.2	31.7	27.2	20.4
		kW	2.87	3.04	3.46	4.06	4.82	5.21	4.95	4.70	4.48	3.58
	80	TC	37.9	37.8	37.8	37.7	37.1	37.1	36.7	31.3	26.6	20.0
		kW	2.39	2.53	2.90	3.39	3.92	4.54	5.15	4.88	4.63	3.70

SPECIFICATIONS

Capacities and Selection Data frequency

Performance data (Cooling operation at rated frequency)

60K outdoor unit matches 60K indoor unit

Airflow (CMF)	Outdoor DB(°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
450	5	TC	14.0	14.1	14.4	14.6	14.4	14.6	14.7	14.9	15.4	15.5	15.7	15.8	\	18.8	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.72	0.73	0.73	0.73	0.73	0.74	0.75	0.76	0.76	0.76	0.77	0.78	\	0.95	0.96	0.97
	30	TC	14.6	14.7	15.0	15.2	15.0	15.2	15.4	15.5	16.1	16.2	16.4	16.5	\	19.6	19.7	19.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.80	0.81	0.81	0.81	0.81	0.82	0.83	0.84	0.84	0.84	0.85	0.87	\	1.06	1.07	1.08
	65	TC	15.3	15.5	15.8	16.0	15.8	16.0	16.2	16.3	16.9	17.1	17.2	17.3	\	20.6	20.8	20.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.89	0.90	0.90	0.90	0.90	0.92	0.92	0.93	0.93	0.94	0.95	0.96	\	1.17	1.19	1.20
	75	TC	15.3	15.5	15.9	16.0	15.9	16.0	16.2	16.4	17.0	17.1	17.3	17.4	\	20.4	20.6	20.7
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	1.00	1.01	1.01	1.01	1.02	1.03	1.04	1.03	1.05	1.06	1.07	\	1.29	1.31	1.32
	85	TC	15.1	15.3	15.6	15.8	15.6	15.8	16.0	16.1	16.7	16.9	17.0	17.1	\	20.0	20.2	20.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	1.11	1.12	1.13	1.13	1.13	1.15	1.16	1.17	1.17	1.18	1.19	1.20	\	1.47	1.48	1.50
	95	TC	14.9	15.0	15.3	15.5	15.3	15.5	15.7	15.9	16.4	16.6	16.7	16.9	\	19.6	19.7	19.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	1.34	1.35	1.36	1.36	1.36	1.38	1.39	1.40	1.41	1.42	1.43	1.45	\	1.75	1.76	1.78
	105	TC	14.6	14.8	15.1	15.2	15.1	15.2	15.4	15.5	16.1	16.3	16.4	16.5	\	18.9	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	1.59	1.61	1.62	1.62	1.62	1.64	1.66	1.67	1.67	1.69	1.70	1.72	\	2.03	2.03	2.04
	115	TC	13.0	13.2	13.5	13.6	13.5	13.6	13.8	13.9	14.5	14.6	14.7	14.8	\	15.7	15.8	15.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.62	1.63	1.65	1.65	1.65	1.67	1.69	1.71	1.72	1.73	1.74	1.75	\	1.80	1.81	1.82
	122	TC	11.1	11.2	11.5	11.6	11.5	11.6	11.7	11.8	12.3	12.4	12.5	12.6	\	13.3	13.4	13.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.67	1.68	1.70	1.70	1.70	1.73	1.74	1.76	1.77	1.78	1.80	1.80	\	1.86	1.87	1.87
600	5	TC	15.0	15.1	15.5	15.7	15.5	15.7	15.9	16.0	16.6	16.7	16.9	17.0	\	20.0	20.2	20.3
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.84	0.85	0.86	0.86	0.86	0.87	0.88	0.89	0.88	0.90	0.90	0.91	\	1.09	1.10	1.11
	30	TC	15.7	15.8	16.2	16.4	16.2	16.4	16.6	16.7	17.3	17.4	17.6	17.7	\	20.9	21.1	21.2
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.93	0.94	0.95	0.95	0.95	0.96	0.97	0.98	0.98	0.99	1.00	1.02	\	1.21	1.23	1.24
	65	TC	16.5	16.6	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	22.0	22.2	22.3
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.04	1.05	1.06	1.06	1.06	1.07	1.08	1.09	1.09	1.11	1.12	1.13	\	1.35	1.36	1.38
	75	TC	16.5	16.7	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	21.9	22.0	22.2
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.13	1.15	1.16	1.16	1.16	1.17	1.18	1.19	1.19	1.20	1.22	1.23	\	1.42	1.43	1.44
	85	TC	16.2	16.4	16.7	17.0	16.7	17.0	17.1	17.3	17.9	18.1	18.2	18.4	\	21.3	21.4	21.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	1.25	1.26	1.28	1.28	1.28	1.29	1.30	1.32	1.32	1.33	1.34	1.36	\	1.63	1.65	1.66
	95	TC	16.0	16.2	16.6	16.7	16.6	16.7	16.9	17.1	17.6	17.8	18.0	18.1	\	20.8	20.9	21.0
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	1.48	1.50	1.52	1.52	1.52	1.53	1.55	1.57	1.57	1.58	1.60	1.61	\	1.92	1.94	1.95
	105	TC	15.6	15.8	16.2	16.3	16.2	16.3	16.5	16.7	17.2	17.4	17.5	17.7	\	19.3	19.3	19.4
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	1.76	1.77	1.79	1.79	1.79	1.81	1.83	1.85	1.85	1.87	1.89	1.90	\	2.08	2.07	2.08
	115	TC	12.9	13.1	13.4	13.5	13.4	13.5	13.7	13.8	14.7	14.8	14.6	14.6	\	15.2	15.2	15.3
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	1.65	1.66	1.68	1.68	1.68	1.70	1.72	1.73	1.76	1.77	1.77	1.78	\	1.80	1.80	1.81
	122	TC	11.0	11.1	11.4	11.5	11.4	11.5	11.6	11.8	12.5	12.6	12.4	12.4	\	12.9	12.9	13.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.70	1.71	1.73	1.73	1.73	1.75	1.77	1.78	1.81	1.83	1.82	1.83	\	1.85	1.86	1.86

SPECIFICATIONS

Capacities and Selection Data frequency

Airflow (CMF)	Outdoor DB(°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
750	5	TC	16.0	16.1	16.5	16.7	16.5	16.7	16.9	17.0	17.7	17.8	17.9	18.0	\	21.1	21.3	21.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	0.99	1.00	1.00	1.00	1.02	1.03	1.03	1.03	1.04	1.06	1.07	\	1.25	1.26	1.19
	30	TC	16.7	16.9	17.2	17.4	17.2	17.4	17.6	17.8	18.4	18.6	18.7	18.8	\	22.1	22.2	22.6
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.09	1.10	1.11	1.11	1.11	1.13	1.14	1.15	1.15	1.16	1.18	1.19	\	1.39	1.40	1.33
	65	TC	17.5	17.7	18.1	18.3	18.1	18.3	18.5	18.7	19.4	19.6	19.7	19.8	\	23.2	23.4	23.7
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	1.21	1.23	1.24	1.24	1.24	1.25	1.27	1.28	1.28	1.29	1.31	1.32	\	1.54	1.55	1.47
	75	TC	17.6	17.8	18.2	18.4	18.2	18.4	18.6	18.8	19.5	19.6	19.8	19.9	\	23.8	23.9	23.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	1.25	1.26	1.28	1.28	1.28	1.29	1.30	1.32	1.32	1.33	1.34	1.36	\	1.70	1.70	1.70
	85	TC	17.2	17.4	17.8	18.0	17.8	18.0	18.2	18.4	19.1	19.2	19.4	19.5	\	22.4	22.5	22.7
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	1.41	1.42	1.44	1.44	1.44	1.46	1.47	1.48	1.49	1.50	1.51	1.53	\	1.81	1.83	1.84
	95	TC	16.8	17.0	17.3	17.5	17.3	17.5	17.7	17.9	18.6	18.7	18.8	19.0	\	21.3	21.4	21.4
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	1.66	1.67	1.69	1.69	1.69	1.71	1.73	1.74	1.76	1.77	1.78	1.79	\	2.05	2.05	2.05
	105	TC	16.3	16.5	16.9	17.1	16.9	17.1	17.2	17.4	18.1	18.2	18.3	18.5	\	19.5	19.6	19.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	1.93	1.95	1.97	1.97	1.97	2.00	2.01	2.04	2.05	2.07	2.08	2.09	\	2.15	2.16	2.13
	115	TC	13.0	13.1	13.5	13.6	13.5	13.6	13.8	13.9	14.5	14.6	14.6	14.7	\	15.5	15.6	15.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	1.71	1.73	1.75	1.75	1.75	1.77	1.78	1.80	1.82	1.83	1.84	1.85	\	1.91	1.91	1.92
	122	TC	11.1	11.2	11.4	11.6	11.4	11.6	11.7	11.8	12.3	12.4	12.4	12.5	\	13.2	13.3	13.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.76	1.78	1.80	1.80	1.80	1.82	1.84	1.86	1.88	1.89	1.90	1.90	\	1.96	1.97	1.97

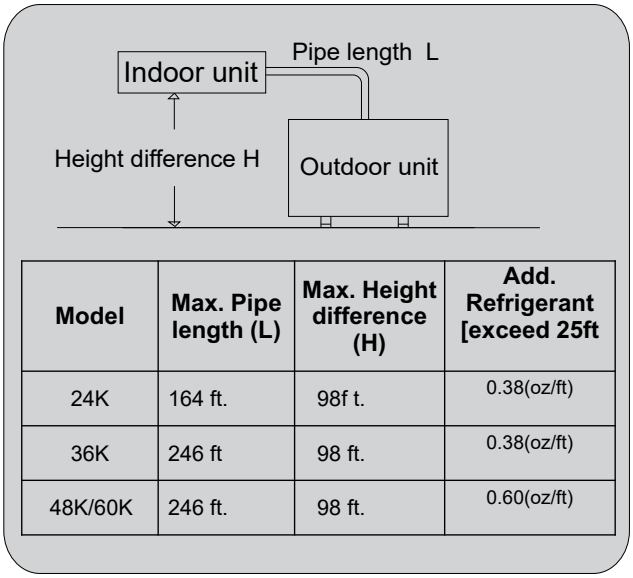
Performance data (Heating operation at rated frequency)

60K outdoor unit matches 60K indoor unit

Airflow (CFM)	ID (°F)	OD (°F)	75	65	55	47	35	25	15	5	-4	-13
1500	60	TC	66.0	66.0	65.8	63.2	53.7	50.0	44.9	38.9	34.0	25.5
		kW	4.34	4.63	5.45	5.93	5.51	5.89	5.57	5.27	5.01	4.01
	70	TC	51.0	50.7	50.9	50.2	50.2	49.1	44.3	38.3	33.3	25.0
		kW	3.24	3.42	4.02	4.69	5.63	6.40	6.03	5.67	5.35	4.28
	75	TC	43.0	42.8	42.8	42.8	42.2	42.2	42.0	35.9	30.4	22.8
		kW	2.70	2.90	3.38	4.00	4.65	5.45	6.28	5.91	5.57	4.46
	80	TC	35.2	35.2	35.2	35.1	34.9	34.6	34.6	34.6	29.9	22.4
		kW	2.25	2.39	2.80	3.26	3.88	4.38	5.09	5.99	5.81	4.65
1700	60	TC	73.7	73.7	71.6	64.0	54.6	50.9	45.9	39.7	34.6	26.0
		kW	5.13	5.43	6.03	5.81	5.45	5.85	5.55	5.27	5.03	4.02
	70	TC	57.1	56.8	56.3	56.0	53.3	49.7	45.4	38.8	33.8	25.4
		kW	3.74	4.00	4.59	5.29	5.95	6.32	5.99	5.67	5.39	4.31
	75	TC	48.1	48.0	48.0	47.1	47.3	47.3	42.6	36.4	30.9	23.2
		kW	3.14	3.34	3.92	4.45	5.33	6.26	6.24	5.89	5.59	4.47
	80	TC	39.4	39.4	39.4	39.3	38.8	38.6	38.8	35.9	30.4	22.8
		kW	2.59	2.74	3.20	3.70	4.32	5.01	5.81	6.15	5.81	4.65
1900	60	TC	82.1	80.8	72.9	65.2	55.4	51.7	46.5	40.4	35.2	26.4
		kW	6.03	6.17	5.99	5.81	5.49	5.89	5.63	5.37	5.15	4.12
	70	TC	63.1	62.9	62.9	62.8	54.1	50.5	45.7	39.6	34.4	25.8
		kW	4.30	4.57	5.37	6.24	5.97	6.36	6.05	5.77	5.51	4.41
	75	TC	53.7	53.6	52.9	52.8	52.8	49.9	43.4	37.0	31.7	23.8
		kW	3.66	3.88	4.41	5.17	6.15	6.64	6.30	5.99	5.71	4.57
	80	TC	44.3	44.1	44.1	43.9	43.3	43.3	42.8	36.5	31.1	23.3
		kW	3.04	3.22	3.70	4.32	4.99	5.79	6.56	6.22	5.91	4.73

SPECIFICATIONS

Piping Length Correction Factor



Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft
24K	164 ft.	98f t.	0.38(oz/ft)
36K	246 ft	98 ft.	0.38(oz/ft)
48K/60K	246 ft.	98 ft.	0.60(oz/ft)

The correction factor is based on the equivalent piping length in feet (EL) and the height difference between outdoor and indoor units in feet (H).

H:

Height difference between indoor unit and outdoor unit (feet).

• H>0: Position of outdoor unit is higher than that of the indoor unit (feet).

• H<0: Position of outdoor unit is lower than that of the indoor unit (feet).

L:

Actual one-way piping length between indoor unit and outdoor unit (feet).

EL: Equivalent one-way piping length between indoor unit and outdoor unit (feet).

Gas Diameter (mm/inch)	3/8'	1/2'	5/8'	3/4'	7/8'
90° Elbow	0.15	0.2	0.25	0.35	0.40

Cooling：

EL[ft] Model	25	38	50	75	100	125	150	164	200	246
24K	1.00	0.95	0.93	0.89	0.85	0.81	0.78	0.75	--	--
36K	1.00	0.98	0.97	0.93	0.89	0.86	0.82	0.81	0.75	0.69
48K	1.00	0.98	0.97	0.94	0.90	0.87	0.82	0.81	0.74	0.65
60K	1.00	0.98	0.97	0.94	0.90	0.87	0.82	0.81	0.74	0.65

Heating：

EL[ft] Model	25	38	50	75	100	125	150	164	200	246
24K	1.00	0.94	0.93	0.89	0.85	0.81	0.78	0.75	--	--
36K	1.00	0.98	0.97	0.93	0.89	0.86	0.83	0.81	0.76	0.70
48K	1.00	0.98	0.97	0.94	0.90	0.86	0.83	0.80	0.75	0.66
60K	1.00	0.98	0.97	0.94	0.90	0.86	0.83	0.80	0.75	0.66

SPECIFICATIONS

Capacities and Selection Data

The correction factor of height between indoor unit and outdoor unit

Height difference	16 ft	33 ft	108 ft
Factor	0.01	0.02	0.025

To ensure correct unit selection, consider the farthest indoor unit.

NOTE:

1. Above data is assuming that the height difference between indoor unit and outdoor unit is 0m.
2. Be sure to minimize length of connection pipes to optimize performance. If the outdoor unit is installed higher or lower than the indoor unit, it is necessary to apply height correction factor additionally to length correction factor to calculate cooling/heating.
   If outdoor unit is higher, correction should be applied to cooling capacity, if outdoor unit is lower, correction should be applied to heating capacity.

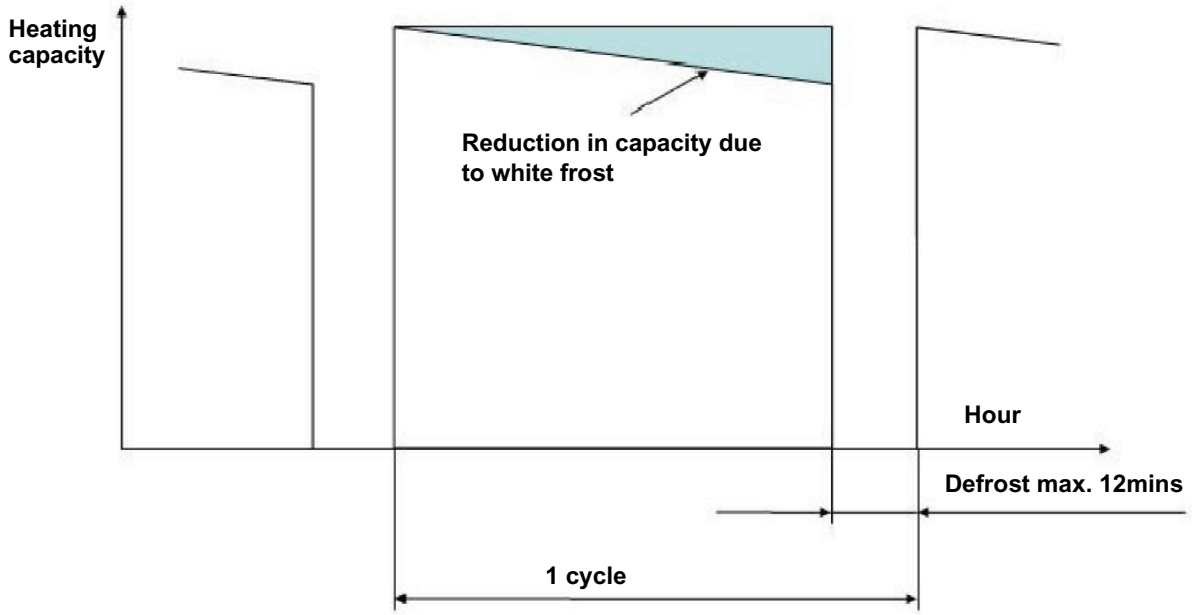
Correction factors according to defrosting operation

The heating capacity in the previous part, excludes the condition of defrosting operation period. In consideration of defrosting operation, the heating capacity is corrected by the equation below.

Corrected heating capacity = Defrost correction factor × unit capacity

Outdoor temperature [℉ DB]	5	14	23	32	44.6	50	59
Correction factor (humidity rate 85% RH)	0.95	0.95	0.93	0.85	1.0	1.0	1.0

Correction Factor



NOTE:

The correction factor is not valid for special conditions such as snowfall or operation in a transitional period.

INSTALLATION

Safety Precautions

1. This Heat Pump Air Conditioner uses refrigerant HFC (R410A).

2. Since the max working pressure is 550 psig, some of the piping, installation and service tools are specialized.

3. This air conditioner uses power supply: 208/230V ~, 60Hz.

4. The outdoor unit must be installed with an indoor coil equipped with TXV and ensure that the TXV can be opened to the maximum angle while running heating mode and can be set to 4-6° F superheat.

5. The outdoor unit must be matched with indoor unit refrigerant R410A.

6. For the 2-ton outdoor unit, it must be connected with a 1.5 to 2-ton indoor unit.

For the 3-ton outdoor unit, it can be connected with a 2.5 to 3-ton indoor unit.

For the 4-ton outdoor unit, it can be connected with a 3.5 to 4-ton indoor unit.

For the 5-ton outdoor unit, it can be connected with a 4.5 to 5-ton indoor unit.

NOTE:

Indoor units may be 1/2 ton less than Outdoor Unit. See Outdoor Unit Field Settings (Dip Switches)

7. A Bi-Flow filter drier is required on the liquid pipe when connecting the units, installation close to the indoor coil is recommend for best performance.

8. Be sure that servicing equipment and replacement components are applicable for R410A refrigerant.

9. Do not discharge R410A refrigerant into the atmosphere. When recovering, the cylinder service pressure rating must be over 550 psig. R410A refrigerant systems should be charged with liquid refrigerant and the service pressure rating of the hoses used must be over 750 psig.

10. Leak detectors should be designed to detect HFC refrigerant.

11. R410A refrigerant is only compatible with POE oils, which absorbs moisture rapidly, do not expose to the air.

12. Replace all the filter driers after maintenance to ensure the system is moisture free Please read these SAFETY PRECAUTIONS carefully to ensure correct installation

·Be sure to use a dedicates power circuit. Do not put other loads on the power supply.

·Be sure to read these SAFETY PRECAUTIONS carefully before installation.

·Be sure to comply with SAFETY PRECAUTIONS of installation manual.

Definitions for identifying hazard levels are provided below with their respective safety symbol. WARNING: Hazards or unsafe practices which may result in severe personal injury or death. CAUTION: Hazards or unsafe practices which may result in minor personal injury, product or property damage.

·Please carefully file indoor and outdoor unit manual away for future reference.

WARNING

·Installation should be performed by a qualified licensed service provider.

·Improper Installation may cause water leakage, electrical shock, or fire.

·Install the equipment on a solid base that can support the unit weight.

An inadequate base or incomplete installation may cause injury if the unit falls off the base.

·Use the specified type of wire to safely make electrical connections between the indoor and outdoor units. Firmly clamp the interconnecting wires so their terminals receive no external stresses.

For wiring, use a cable long enough to cover the entire distance with no splicing. Do not connect multiple devices to the same AC power supply.

Exceeding the allowable current due to improper torque of contacts or poor insulation, may cause fire or electric shock.

After all installation steps are completed, check to make sure that there are no refrigerant leaks. Refrigerant gas leakage in interior spaces will create harmful substances when exposed to heat or flame.

Perform the installation securely by referring to the installation manual.

Incomplete installation may cause personal injury due to fire, electric shock, equipment falling, water leakage.

In accordance with the installation instructions for electrical work, please be sure to use a dedicated line.

If the power supply circuit capacity or electrical work is not in place, it may cause a fire or electric shock. Secure electrical cover to indoor unit and service panel to outdoor unit.

INSTALLATION

Safety Precautions

• Failing to properly secure electrical cover or service panel may result in fire or electric shock.

• Shut off the main power supply before the installation of indoor electronic PCB or wiring.

• Not doing so may cause electric shock.

• Installation wiring shall be in accordance with the state/municipal code requirements.

• Carefully select the outdoor unit installation location in order to avoid contact from people and pets with the electrical components.

• When installing or relocating equipment, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit. (Install bi-flow filter drier on the liquid line at AHU)

• The presence of foreign substances such as air can cause abnormal pressure rise, malfunction, or an explosion.

• Perform proper grounding to NEC requirements.

• Do not connect the earth wire to a gas pipe, water pipe, lightning rod, or telephone earth wire.

• Defective grounding may cause electric shock.

• Do not install the equipment in a location where there is potential for a flammable gas leak.

• Flammable gas leaks in the area surrounding the equipment may cause an explosion.

• Install an earth leakage breaker depending on the installation location.

• Failing to use earth leakage breakers in a humid environment may cause electric shock.

• Perform drainage/piping work securely according to the installation manual.

Safety instructions CAUTION

• Do not let air enter the refrigeration system or discharge refrigerant when moving the air conditioner.

• Children should be supervised to ensure that they do not play with the appliance.

• The appliance shall be installed in accordance with national wiring regulations.

• Service shall only be performed as recommended by the equipment manufacturer.

• The maintenance and repair must be done by qualified personnel.

• Means for disconnection, such as circuit breaker, which can provide full disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring rules.

• It is required to allow the disconnection of the appliance from the supply after installation.

• Ensure the disconnection means can be locked-out to protect personnel servicing.

• The power supply connection to the appliance and interconnection between units/components shall be performed according to wiring diagrams and instructions in the product documentation.

• Details of type and rating of circuit breakers / ELB is detailed in this manual.

• Dimensions and space requirements are detailed in this manual.

• Instructions on additional charging of refrigerants are detailed below.

INSTALLATION

Tools

Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Copper Pipe Bender	11	Spanner	16	Leveler
2	PhillipsScrewdriver	7	Manual Water Pump	12	Charging Cylinder	17	Clamper for Solder-less Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Gauge Manifold	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

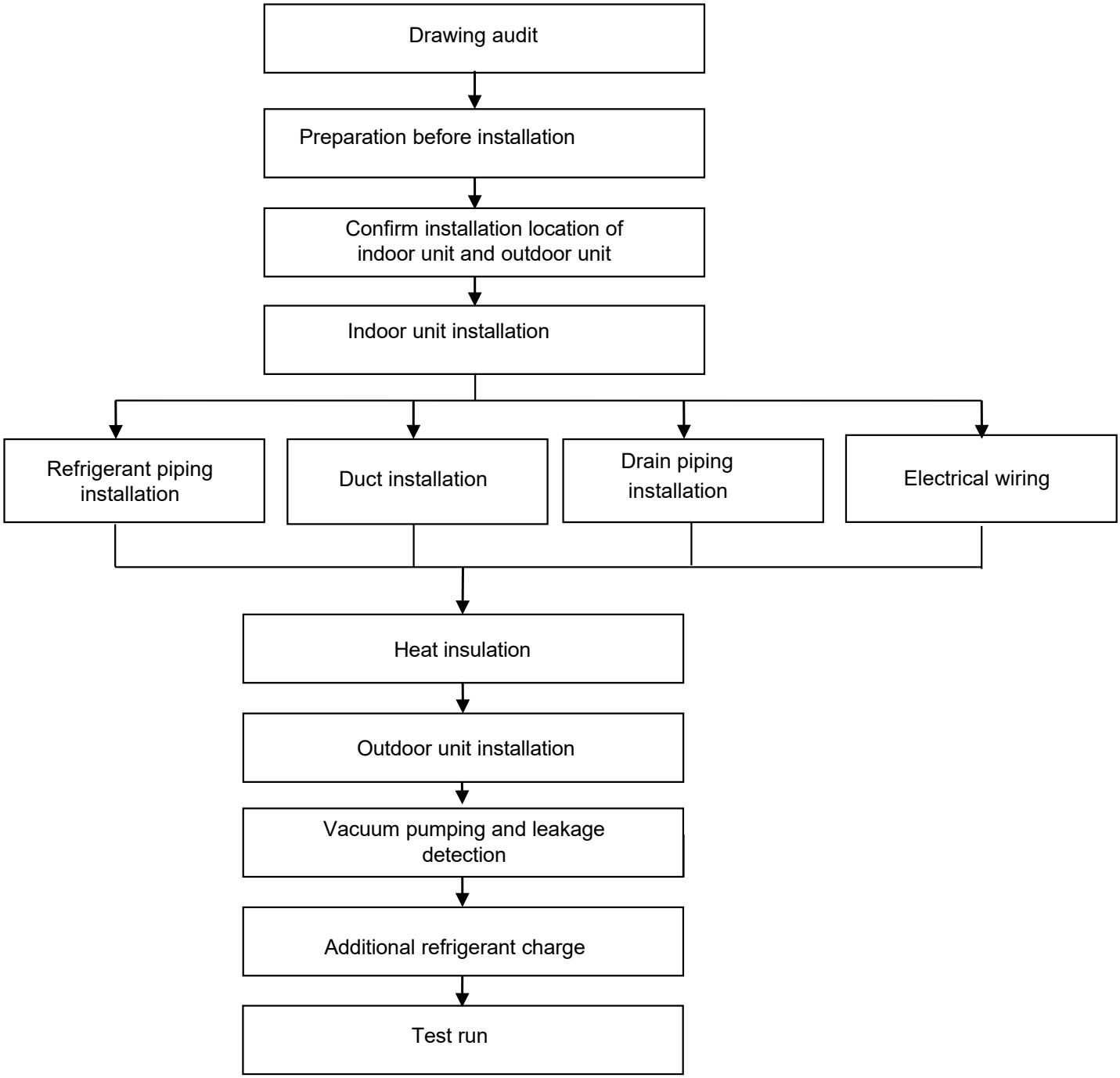
Use tools and measuring instruments only for the new refrigerant which is direct contact with to refrigerant.

Measuring Instrument and Tool for R410A		NOTES	**Use**
Refrigerant Pipe	Pipe Cutter Chamfering Reamer	-	Cutting Pipe Removing Burrs
	Pipe Bender	* In case of material 1/2H, bending is not available. Use elbow for bend and braze.	Bending
	Expanding Tool	* In case of material 1/2H, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
	Brazing Tool	* Perform correct brazing work.	Brazing for Tubes
	Nitrogen Gas	* Strict Control against Contaminant (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing
Vacuum Drying& Refrigerant Charge	Refrigerant Cylinder	* Check refrigerant cylinder color. * Liquid refrigerant charging is required regarding zerotropic refrigerant. * Use the weight scale.	Refrigerant Charging
	Vacuum Pump	* The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
	Adapter for Vacuum Pump		
	Manifold Valve		Vacuum Pumping, Vacuum Holding, Refrigerant Charging and Check of Pressures
	Charging Hose		
	Weight Scale		Measuring Instrument for Refrigerant Charging
	Refrigerant Gas Leakage Detector		Gas Leakage Check

Figure 301

INSTALLATION

Flow Chart



NOTE: This flow is only for reference; for details please see installation manual section.

Figure 302

INSTALLATION

Refrigerant Flow Diagram

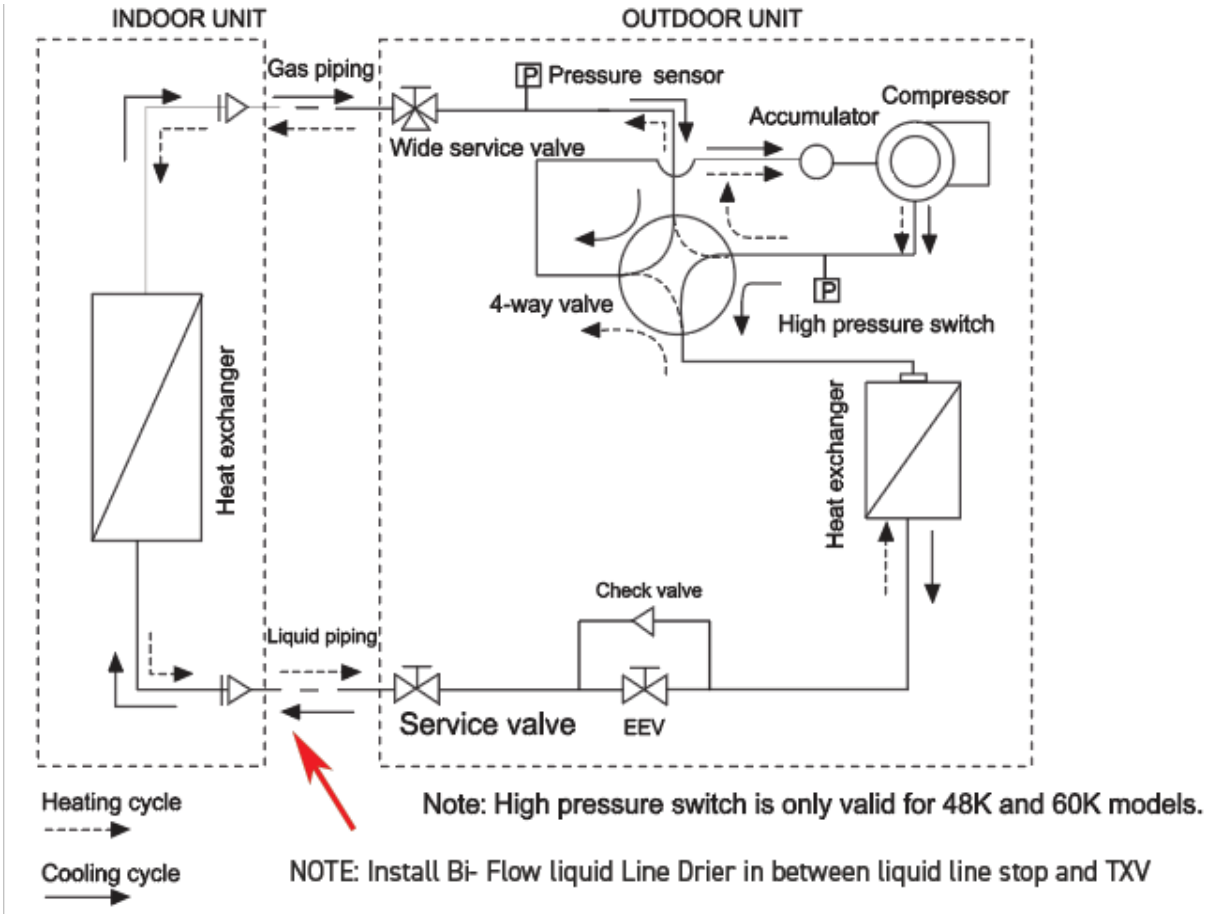
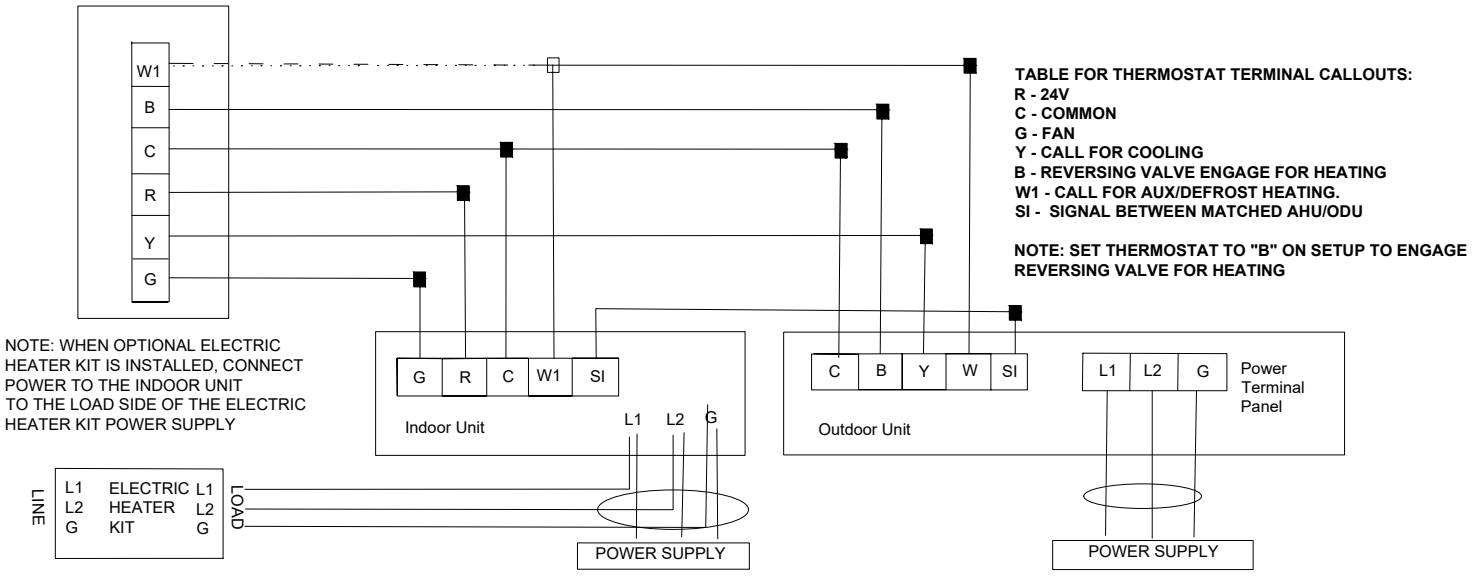


Figure 303

Electrical wiring diagram - Example: Matched AHU+ODU



The SI (signal wire) between indoor and outdoor units is not necessary when the outdoor unit is connected to the indoor unit of a different brand. In a matched system the SI (signal) connection enables energy savings by matching low load demands.

Do not hook up W1 to indoor unit when electric heat Kit is not used.

Figure 304

INSTALLATION

Indoor Unit - Caution Statements

Alert Symbols:

⚠ DANGER : The symbol refers to a hazard which can result in severe personal injury or death.

⚠ WARNING : The symbol refers to a hazard or an unsafe practice which may result in severe personal injury or death.

⚠ CAUTION : The symbol refers to a hazard or an unsafe practice which may result in minor personal injury, product, or property damage.

NOTE: Refers to the remarks and instructions related to the operation, maintenance, and service. Installation, maintenance, and repair of this unit must be performed by qualified, licensed service personnel.
Read these instructions thoroughly before installation or operation. Failure to follow these instructions may result in improper installation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

Before installation, check if the voltage of the power supply at the installation site is the same as the voltage shown on the nameplate.

⚠ DANGER

- Do not perform any alteration to this product, otherwise, it may cause water leakage, equipment failure, short circuit, electric shock, fire, etc.
- Piping, welding, and other such work should be carried out far away from any flammable and explosive materials, including the air conditioner refrigerant, in order to guarantee the security of the site.
- To protect the equipment from heavy corrosion, avoid installing the outdoor unit in the place, where sea water can splash directly onto it or in sulphurous air near a spa.
- Do not install the air conditioner where excessively high heat-generating objects are placed

⚠ WARNING

- If the power cable is damaged, it must be replaced by a service professional.
- The place where this product is installed must have the reliable electrical grounding facilities and protections. Do not connect the grounding of this product to air ducts, drain pipes, lightning protection facilities, as well as other piping lines to avoid electric shock and damage caused by other factors.
- Wiring must be done by a qualified electrician. All the wiring operations must be conducted according to local electrical codes.
- Consider the capacity of the electric current of your electrical meter and socket before installation.
- The power wire where this product is installed should have the independent leakage protection device and the electric current over-load protection device provided for this product.
- Never use gasoline or other inflammable gas near the equipment to avoid danger.
- When any abnormality like burnt smell, deformation, fire, smoke, etc. is found, you should stop using the equipment, immediately disconnect the main power supply and contact the dealer.
- The first 6 inches of supply air plenum and duct work must be constructed of sheet metal as required by NFPA 90B.
- The supply air plenum or duct must have a solid sheet metal bottom piece directly after the air handler unit with no opening, registers or flexible air ducts located in it. If flexible supply air ducts are used, they may be located only in the side walls of the rectangular plenum, a minimum of 6 inches from the solid bottom.

- **Read this manual carefully before using the equipment. If you still have any difficulties or problems, consult your dealer.**
- **The equipment is designed to provide you with comfortable room conditions. Use this unit only for its intended purpose as described in this installation and operation manual.**

INSTALLATION

Indoor Unit - Caution Statements

⚠ WARNING

PROPOSITION 65:

- This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to State of California to cause cancer.
- All manufacturer products meet current federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.
- California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.
- All 'new equipment" shipped for sale in California will have labels stating that the product contains and /or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.
- You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air conditioning equipment, or found'in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.
  - -Glass Wool (Fiberglass) Insulation
  - -Carbon Monoxide (CO)
  - -Formaldehyde
  - -Benzene
- More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important since the chemicals and substances on the list are found in our daily lives Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.

⚠ CAUTION

- Do not turn the air conditioner on and off from the main power switch. Use the ON/OFF operation button.
- Do not stick anything into the air inlet and air outlet of both the indoor and outdoor units. This is dangerous because the fan is rotating at a high speed.
- Do not cool or heat the room too much if babies or person are present.
- Type and rating of circuit breakers / ELB are detailed below.
- The method of connection of the appliance to the electrical supply and interconnection of separate components are detailed below.
- The information of dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed below.
- The range of external static pressures for ducted appliances is detailed below.
- Make sure the blower motor support is tight (3-motor mounting bolts). Then check to see if wheel is tightly secured to motor shaft before operation unit.

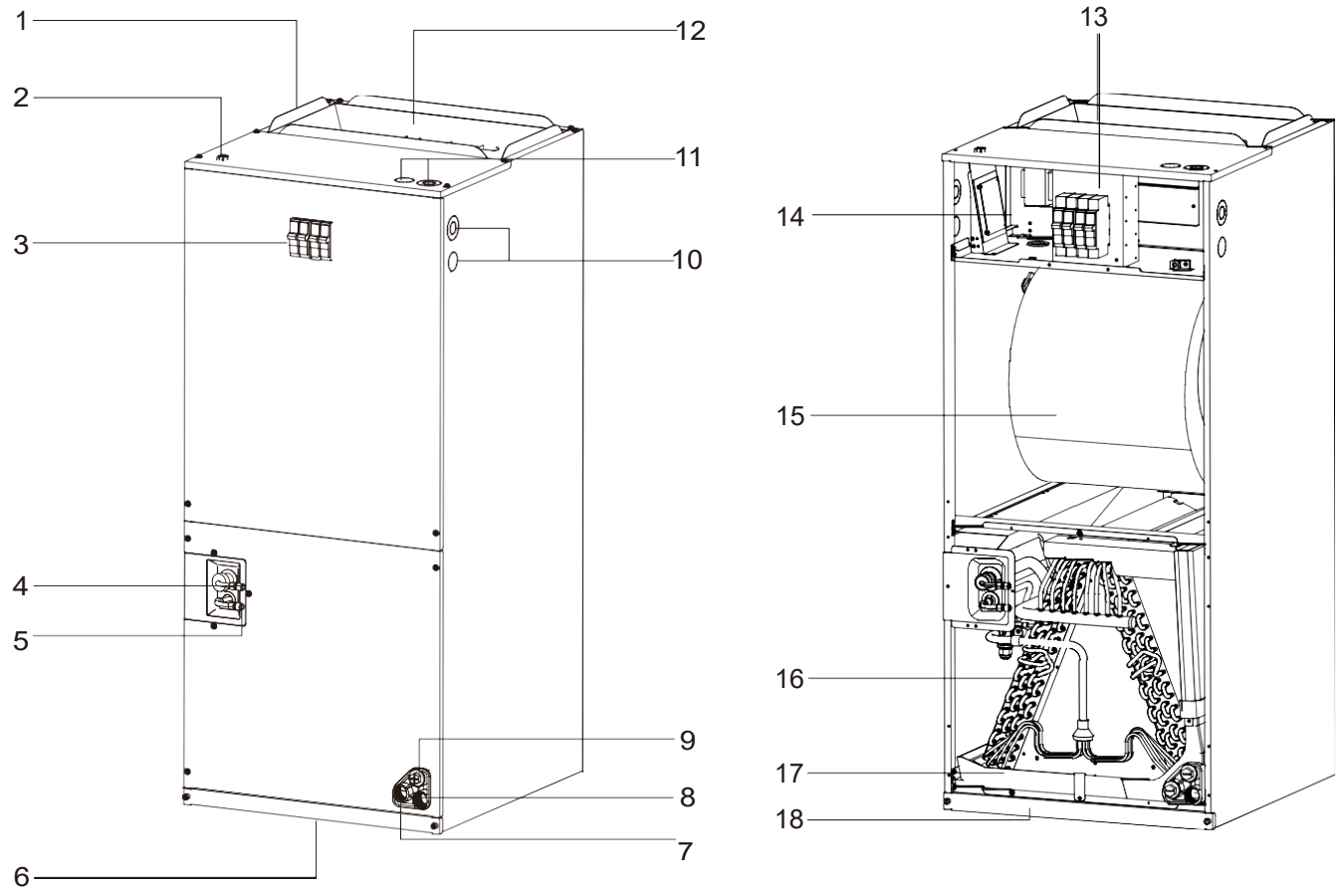
NOTE:

- **Storage condition: Temperature -13~140°F (-25~60°C)**
  Humidity 30%~80%

INSTALLATION

Indoor Unit - Component Identification

Indoor unit



1. Supply air outlet flange
2. Low voltage connection (for 24V)
3. Circuit breaker switch (Optional)
4. Refrigerant pipe (Gas)
5. Refrigerant pipe (Liquid)
6. Return air inlet
7. Auxiliary drain connection
8. Primary drain connection
9. Auxiliary drain connection
10. Knockout for power cable
11. Knockouts
12. Supply air outlet
13. Auxiliary heater (Optional)
14. Electrical enclosure
15. Blower fan
16. Coil
17. Condensate drain pan
18. Filter cover

Figure 305

Indoor Unit - Troubleshooting

⚠ CAUTION

When drain water overflows from the indoor unit, stop operation and contact your service provider. When you smell or see white smoke coming out of the unit, turn OFF the main power supply and contact your service provider.

1. If issues still Exists

If the issues still exists even after checking the following, contact your dealer and inform them of the following items.

(1) Unit Model Name
(2) Description of issue

2. No Operation

Check whether the SET TEMP is set at the correct temperature.

3. Not Cooling or Heating Properly

- Check for obstruction of air flow of outdoor or indoor units.
- Check if there are too many heating sources in the room.
- Check if the air filter is clogged with dust.
- Check if the doors or windows are open.
- Check if the temperature condition is within the operation range.

4. Examples of Abnormal/Normal Operation

Odor from Indoor Unit-
If filter goes unchanged for too long, or regular service of Evaporator coil lapse, unpleasant odors can occur. Please change your filter on a regular basis depending on your application. For coil service please contact your service provider. It is also highly recommended that your home or business has proper ventilation.

Unusual sounds-
It's common to hear the fan come on as well as some refrigerant or heater noise in regular operation. However, metal to metal, grinding or popping sounds are not. Please contact your service provide if any of the latter are heard.

Steam from outdoor unit-
This is a natural occurrence in the mode of defrost. Steam can be seen in certain outdoor conditions.

INSTALLATION

Indoor Unit - Air-Filter

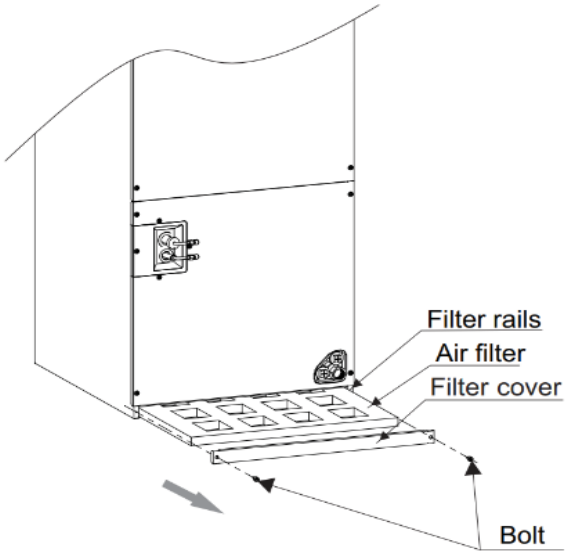
Air Filter (Field provided and installed)

Please replace or clean the filter regularly, to remove accumulated dust from the filter surface.

Follow these steps to properly replace the filter:

(1) Removing the two bolts, then remove the filter cover and pull out the filter from the cabinet.
(2) Insert the new filter into the cabinet along the filter rail.
(3) Fix the filter cover with bolts.

Model	Filter Size (LxWxH) in.
24K/36K	20x18x1
48K/60K	22x20x1



INSTALLATION

Indoor Unit - Caution Statements

1. Safety notice

⚠ WARNING

- Install the air conditioner on a solid base that can support the unit weight. (An inadequate base or incomplete installation may cause injury due to falling of the base.)
- Electrical work should be carried out in accordance with the installation manual and the local and national electrical wiring rules or code.

  (Insufficient capacity or incomplete electrical work may cause electrical shock or fire.)
- Be sure to use a dedicated power circuit. (Never use the power supply shared by another appliance.)
- For wiring, use a cable long enough for the entire distance, and do not use an extension cord.
- Do not put other loads on the power supply, and please use a dedicated power circuit.
- Use the specified types of wires for electrical connections between the indoor and outdoor units. (Firmly clamp the interconnecting wires so that the terminals receive no external stress.)
- Incomplete connections or clamping may cause terminal overheating or fire.
- After establishing connection between all the wires, fix the cables to prevent undue force on the electrical covers or panels. (Install covers over the wires, incomplete cover installation may cause terminal overheating. electrical shock or fire.)
- When installing or relocating the system, be sure to keep the refrigerant circuit free from air (Air in the refrigerant circuit may cause an abnormal pressure rise or rupture, resulting in injury.)
- If any refrigerant leakage occurs during the installation work, ventilate the room.
- After all installations are completed, make sure that no refrigerant leaks. (The refrigerant produces, toxic gas if exposed to flames.)
- When carrying out piping connection, do not let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause decreased performance, abnormal high pressure in the refrigeration cycle, explosion and injury.)
- Make sure that the installation has a proper earth connection. Do not ground the unit to a utility pipe, arrester, or telephone grounding. Incomplete grounding may cause electrical shock. (A high surge current from lightning or other sources may cause damage to the air conditioner.)
- An earth leakage circuit breaker may be required depending on the site condition to prevent electrical shock.
- Disconnect the power supply before wiring, piping, or checking the unit.

INSTALLATION

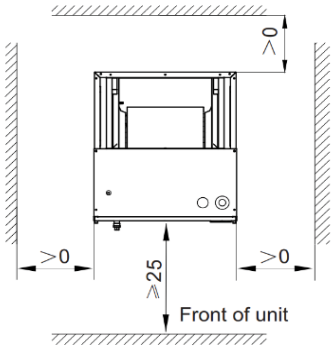
Indoor Unit - Installation Location and Clearances

2. Installation of the Indoor Unit

2.1 Initial Check

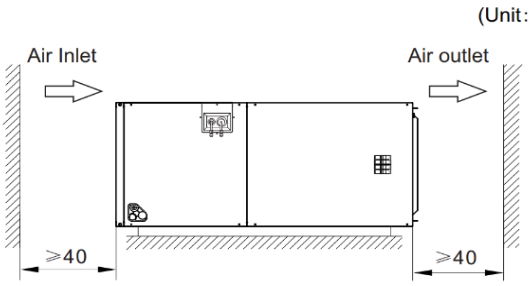
- When moving the unit after unpacking, do not to exert any pressure on other parts, especially the refrigerant piping, drain piping, and flange parts.
- Wear protective gear when installing the unit.

⚠ CAUTION



Clearance in the Vertical Position

(Unit: in.)

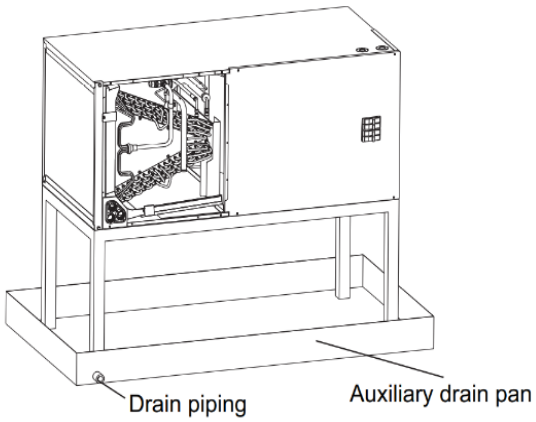


Clearance in the Horizontal Position

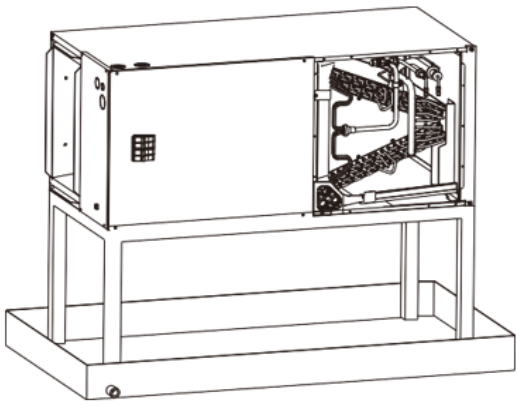
2.2 Installation location

Obtain owners approval before selecting the installation location.

- Select ideal installation location for proper air distribution.
- Ensure the air path is not blocked.
- Ensure condensation can drain properly.
- Maintain sufficient clearance for maintenance and servicing.
- Piping between the indoor and outdoor units should be within the allowable limits. (Refer to the installation of the outdoor unit)
- The indoor unit, outdoor unit, cable and transmission should be kept at least 3-1/4ft (1 m) away from televisions and radio, to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a 3-1/4ft (1 m) distance is maintained.)
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil can flow to the indoor unit. Oil deposit on the heat exchanger, will reduce system performance and may damage the equipment.
- When the unit is installed in a hot and humid location, it is recommended to insulate the cabinet exterior and to use auxiliary drain pans.
- If installed above a finished living space, an auxiliary drain pan(as required by local building codes), must be installed under the entire unit and the condensate drain line must be routed to a location such that the user will see the condensate discharge.



Horizontal right installation



Horizontal left installation

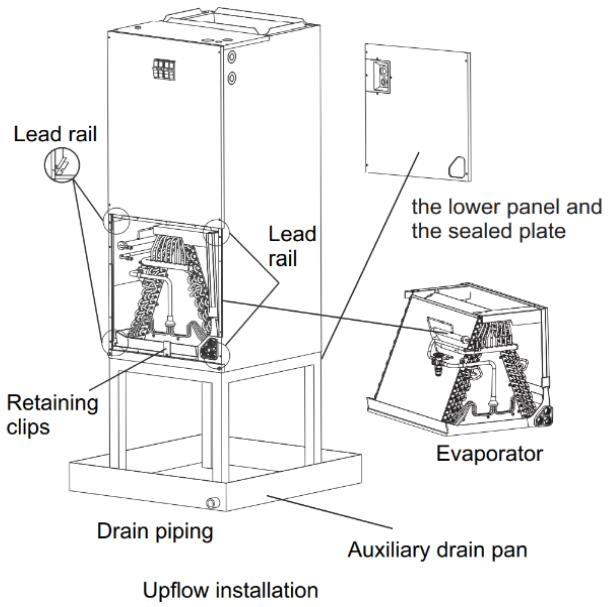
INSTALLATION

Indoor Unit - Install Unit

NOTE:

This equipment is designed for indoor installation only.

The indoor units can be installed in one of the following orientations: upflow, horizontal left, or horizontal right. Figure below for reference.



Upflow installation

Minor field modifications are necessary to convert to horizontal left. Up-flow installation method is selected by default. When the unit is mounted in the horizontal right configuration, rotate it to the right for 90 degrees, as shown in image horizontal right installation. When the unit is horizontal left mounted, the following steps are required.

1). Disassemble the lower panel and the sealed plate
2). Disassemble the retaining clips for the evaporator so that the evaporator can be pulled out along the lead rail easily
3). Rotate the evaporator for 180 degrees and insert it into the upper side of the lead rail
4). Rotate the unit to the left for 90 degrees, as shown in image horizontal left installation
5). Reinstall the sealed plate and the lower panel.

Do not, under any circumstances, connect return duct work to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal duct work run in unconditioned spaces must be adequately insulated and covered with a vapor barrier. Fibrous duct work may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Duct work must comply with National Fire Protection Association as tested by U/L Standard181 for Class I Air Ducts. Check local codes for requirements on duct work and insulation.

Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return duct work, grills, special filters, accessories, etc, are accounted for in total resistance.

INSTALLATION

Indoor Unit - Refrigerant Piping

⚠ DANGER

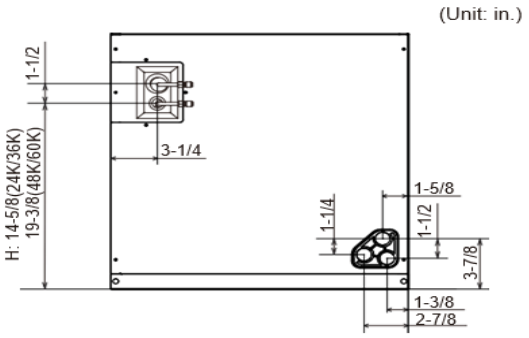
Use refrigerant according to outdoor nameplate. When carrying out the leakage check and test, do not mix in the oxygen with the acetylene and the flammable reactive gas, because these gases may result in explosion. It is suggested to use nitrogen to perform these tasks.

3.1 Pipe Material

(1) Select clean, and dry copper pipes.
(2) Choose dustless, dry and non-humid, clean copper pipe.
Before installing the pipe, use nitrogen or dry air to blow away dust and impurity on the pipe.
(3) Choose the copper pipe according to outdoor manual.

3.2 Piping Connection

(1) The connection positions of the pipe are shown below.



Connection positions of the pipe

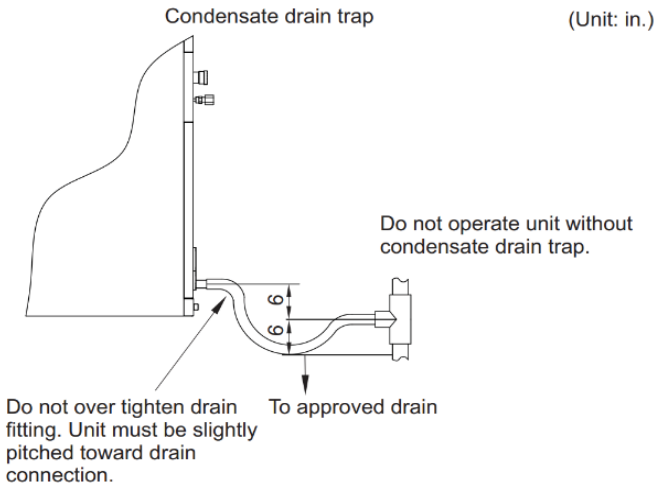
Refer to the outdoor unit Installation Instructions for details on pipe sizing, selection, pipe installation, and charging information.
Evaporator coil is pressurized with Nitrogen at the factory and shipped. Evacuate the system before charging with refrigerant.
Install refrigerant lines so that they do not block service access to the front of the unit.

Nitrogen should flow through the refrigerant lines while brazing.
Use a wet rag or an approved heat paste to protect the TXV sensing bulb during the brazing process.

INSTALLATION

Indoor Unit - Drain Piping

The indoor units have field supplied primary and secondary 3/4-in. NPT drain connections.
When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, Silicone or Teflon tape and install by hand tightening.
When making drain fitting connections to drain pan, do not over-tighten.
All horizontal drain pipes must be pitched downward away from the unit a minimum of 1/8¨per foot to provide free drainage.



Do not connect the drain pipes directly to sewage pipes to avoid any odor. Ammonia in the sewage may enter the indoor unit through the drain pipe and corrode the heat exchanger. Do not twist or bend the drain hose. Excessive force applied during twisting or bending may cause leakage.
The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the pipe. Test condensate drain pan and drain pipe after installation is complete. Keep the cabinet horizontal (horizontal left or horizontal right) to ensure smooth drainage, or incline the case 0.5° to the drainage hole, making it the lowest point for draining. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain pipe fittings, and water is draining from the termination of the primary drain pipe.
NOTES:
If unit is located in or above a living space where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan, the unit requires servicing or water damage will occur. Install traps in the condensate lines as close to the coil as possible.

INSTALLATION

Indoor Unit - Electrical Wiring

⚠ CAUTION

- Before proceeding with electrical connections, make certain the power supply matches the information on the unit rating label. See unit wiring label for proper high and low-voltage wiring. Make all electrical connections in accordance with the NEC and any local codes or ordinances that may apply. Refer to the NEC(USA) or CSA (Canada) for wire sizing. Use copper wire only.
- Every installation must include an NEC(USA) or CSA (Canada) approved over-current protection device.

⚠ WARNING

Disconnect all power before servicing or installing this unit.
To avoid electrical shock, please ensure the air conditioner is properly grounded.
All routing of electrical wiring must be made through provided electrical knockouts. Do not cut, puncture or alter the cabinet provided for electrical wiring.
Knockouts are provide on the indoor unit top panel and sides of the cabinet to allow for the entry of the power supply cable conductors. If the knockouts on the cabinet sides are used for electrical conduit, an adapter ring must be used in order to meet UL 1995 safety requirements. An MEC or CEC approved strain relief is to be used at this entry point. Some codes/municipalities require the supply wire to be enclosed in conduit. Consult your local codes.

Wiring diagram - Matched AHU+ODU

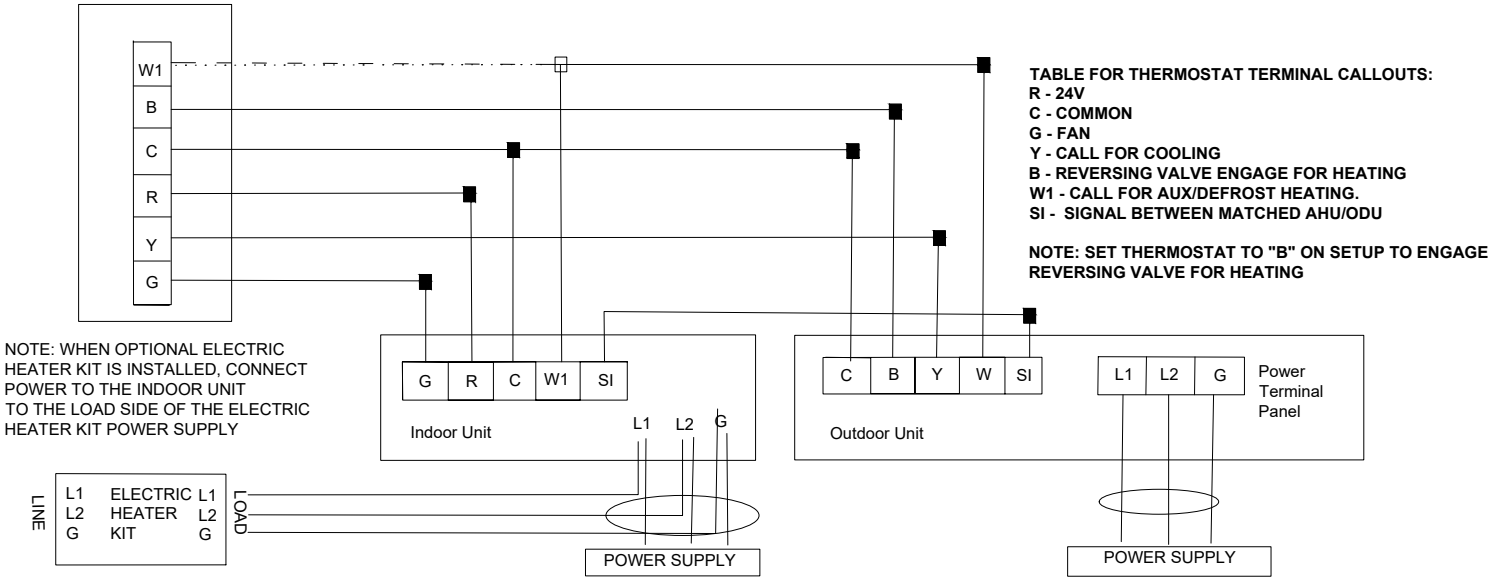


Figure 306

(1) Do not connect dashed line when electric heater is not used.
(2) Wiring must be performed according to wiring diagram that pasted on indoor unit.
(3) The SI wire that connects between the matched indoor and outdoor units improves the efficiency of the unit, allowing it run a slower speeds in low demand. In non matched applications the unit will run without error, even though the SI cable is not connected.
(4) Since the thermostat is locally provided, the terminal block in the diagram may differ from the actual one. The letter Y is the same as Y1.

INSTALLATION

Indoor Units - Electrical Wiring

Electrical data

Model (Capacity)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Thermostat Signal Size
		Rated Current (A)	Nominal Sensitive Current (B)			
24K/36K	208/230V ~/60Hz	15	30	See NEC	5×18AWG	5×18AWG/ 6×18AWG
48K/60K	208/230V ~/60Hz	15	30	See NEC	5×18AWG	5×18AWG/ 6×18AWG

Max. Running Current (A): REFER TO NAMEPLATE

NOTE:

(1) Follow National and local codes and regulations when sizing conductors. Minimum wire sizes are stated above.

(2) When transmitting cable length is longer than 262ft. (80m), a larger wire size should be selected.

(3) Install main switch and ELB for indoor and outdoor unit separately. Select the high response type ELB that is acted within 0.1second.

(4) If auxiliary heater is required and already installed on indoor unit, power source cable should be installed separately and the size should be selected in accordance National and Local Electrical Codes.

Refer to Figure 203 Electric Heater Kit Selection Table for Specifications.

(5) When the Electric Heater Kit is used jumpers will need to be installed from L1 and L2 of the Indoor PCB to the breaker of L1 and L2 of the electric heater kit.

INSTALLATION

Indoor Unit - Changing Static Pressure

The static pressure can be selected by changing the dip switches on the Indoor Unit Main PCB.

Static Pressure Setting:

DIP Switch S2 Setting	Blower Speed Tap	Fan Speed Select	Static Pressure In. W.C. 24k	Static Pressure In. W.C. 36k	Static Pressure In. W.C. 48k-60k
	2	Medium Low (Default setting)	0.18	0.24	0.28
	3	Medium	0.25	0.4	0.4
	4	Medium High	0.58	0.58	0.58
	5	High	0.8	0.8	0.8

NOTE: Symbol " ■ " indicates the position of the DIP switch.

INSTALLATION

Outdoor Unit Handling and Installation location Selection

Transportation and handling before installation

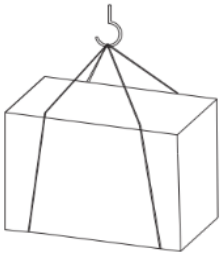
Transport the product as close to the installation location as practical before unpacking.

• Handling Method

When handling the unit, ensure the unit is balance, check that connection is secure, then lift up smoothly.

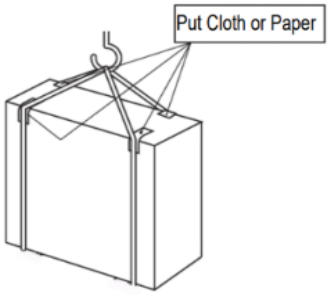
(1) Do not remove any packing materials.

(2) Hang the packaged unit with two ropes, as shown in Fig. below.



• Handling

Make sure the product is protected by package, cloth, or similar when it is being moved.



Installation locations selection

Before choosing the installation site, obtain user's approval.

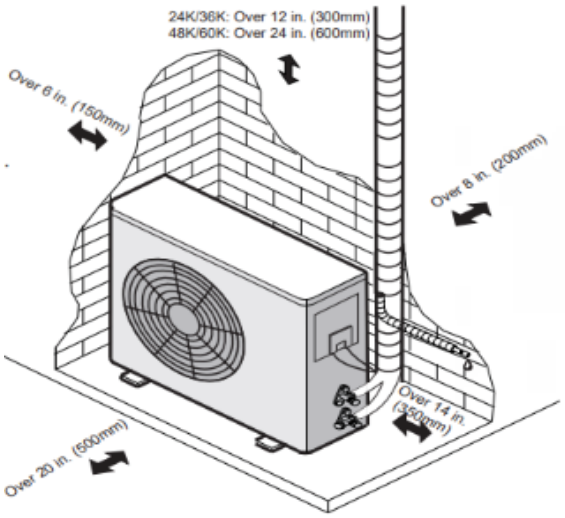
• Where it is not exposed to direct wind gusts.
• Where adequate air flow is possible.
• Where it is not exposed to rain and direct sunshine.
• Where neighbors are not disturbed by operation sound or hot air.
• Where rigid wall or support is available to prevent the increase of operation sound or vibration.
• Where there is no risk of combustible gas leakage.
• Where it is at least 10ft (3m) away from the antenna of TV set or radio To limit EMF exposure.

• Please install it in an area that are prone to snow above anticipated snow depth.

⚠ CAUTION

Avoid the following places for installation as lifecycle of product can be deteriorated.

• Where there is machine/fryer oil.
• Salt corrosive locations- Increased maintenance must be done.
• Where corrosive gases may be present
• Where there is high-frequency or wireless equipment.



NOTE:

When operating the air conditioner in low outside temperature, be sure to follow the instruction described below.

• Never install the outdoor unit in a location where air inlet/outlet side may be exposed directly to wind.
• To prevent exposure to wind, install the outdoor unit with the air inlet side facing the wall.
• To prevent exposure to wind, it is recommended to install a (Field supplied) wind baffle on the air outlet side of the outdoor unit.

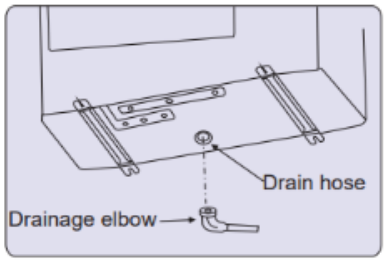
INSTALLATION

Outdoor Unit Drainage Elbow and Condensate Hose Installation

Install drainage elbow and condensate drain hose

• Condensate may drain from the outdoor unit when the unit operates in heating mode. It is recommended to install the supplied elbow to allow installer to direct drainage away from the unit.

• Connect the condensate drain hose [field-supplied, inside diameter: 3/5" (15mm)] as shown in the figure for drainage.



NOTE:

Do not use the drainage elbow in cold climate applications. If elbow must be used, field supplied insulation should be considered as drain may freeze and stop the fan operation if basepan heater cannot overcome ice build up due to stoppage.

(1) Use washers when mounting the unit with bolts to the foundation.

(2) When fastening the outdoor unit with bolts. Reference Fig 1. for fastener hole locations.

(3) Fasten the outdoor unit as shown in Fig 2.

(4) Make sure to fasten the outdoor unit tight and horizontal to ensure the unit operates correctly.

Outdoor Unit Installation

(1) Use washers when mounting the unit with bolts to the foundation.

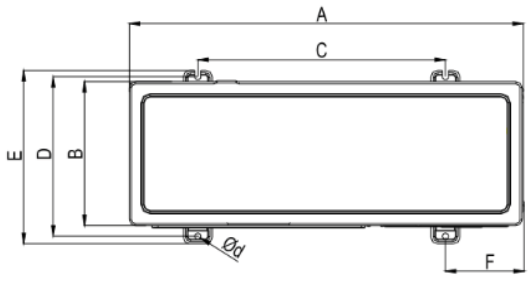
(2) When fastening the outdoor unit with bolts. Reference Fig 1. for fastener hole locations.

(3) Fasten the outdoor unit as shown in Fig 2.

(4) Make sure to fasten the outdoor unit tight and horizontal to ensure the unit operates correctly.

(5) Make sure the condensate drain is routed away to ensure safe and reliable operation.

(6) Use a robust base for the equipment (made of concrete, etc.) The equipment should be installed no less than 4" (10 cm) above grade level, to ensure proper drainage and operation. Failing to meet the installation requirements may reduce equipment life cycle. (Fig.3)



[Unit: in. (mm)]

Model	A	B	C	D	E	F	d
24K	33-7/8 (860)	12-3/16 (310)	21-11/32 (542)	13-7/16 (341)	14-1/2 (368)	6-5/8 (168)	7/16*21/32 (11*17)
36K/48K /60K	37-3/8 (950)	13-3/8 (340)	22-7/8 (580)	14-15/16 (380)	16-1/4 (414)	7-1/4 (185)	5/8 (15)

Fig.1

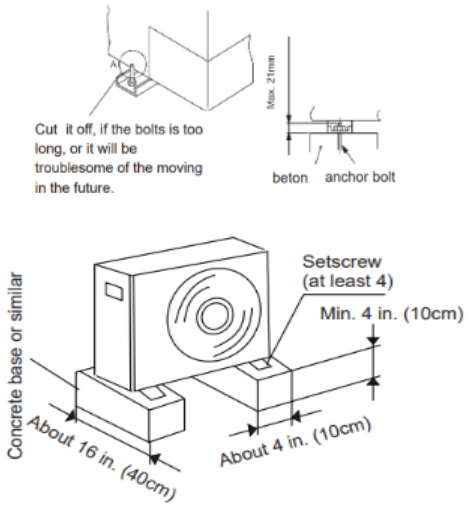


Fig.3

INSTALLATION

Outdoor Unit - Wiring

⚠ WARNING

• Follow safe procedures to shut off the breaker of the outdoor/indoor unit prior to performing any and all electrical work. For the outdoor unit please allow 3 minutes before working on the electrical, as the inverter boards capacitor must discharge. (Risk of personal injury can occur if not followed)
• Make sure that the indoor and outdoor fans have stopped completely before performing electrical work or reaching into the equipment.
• Protect the wires, electrical parts, etc. from small animals as well as lizards and ants. If not protected, damage to the electrical system or fire could occur.
• Prevent the wiring from touching refrigerant pipes, plate edges, and electrical parts inside the unit.
• Install an ELB (Electric Leakage Breaker) at the power source. If ELB is not used, it can cause electric shock or fire.
• This unit utilizes an inverter, which means that protections must be made to ensure harmonics in the electrical system are maintained, as well it is recommended that a surge protector be installed inline to protect the electrical components.
• The use of temporary connection wires, stranded wires, extension cables or control line connections, is prohibited. The use of such connections may cause electric shock or fire.
The tightening torque of each screw shall be as followed.
M4: 0.7 to 1.0 ft.lb (1.0 to 1.3 N·m)
M5: 1.5 to 1.8 ft.lb (2.0 to 2.5 N·m)
M6: 3.0 to 3.7 ft.lb (4.0 to 5.0 N·m)
M8: 6.6 to 8.1 ft.lb (9.0 to 11.0 N·m)
M10: 13.3 to 217 ft.lb (18.0 to 23.0 N·m)
Proper torquing of fasteners ensures not only safe and reliable operation but lower risk of ARC or fire.

⚠ CAUTION

General check

• Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data and that they all comply with National Electrical Code (NEC).
• Ensure that the voltage of power supply is within +10% of nominal voltage and earth/ground wire is connected at that power supply. Failing to do so will damage electrical components.
• Ensure that the power supply is adequately sized. Failure to properly size the power supply may cause compressor malfunction or failure.
• Ensure that the earth/ground wire is connected.
• Install a mains switch. Multi-pole mains switch with a space of 0.14 in. (3.5mm) or more, single phase main switch with a space of 0.12 in. (3.0mm) or more between each phase.

Check to make sure that live electrical parts (i.e. terminals, exposed wires, etc.) are not contacting ground. THere should be an electrical resistance of 2 MegOhms between live parts and ground. If it is determined that there is a short to ground, do not operate the system until the source of the problem is identified and corrected.

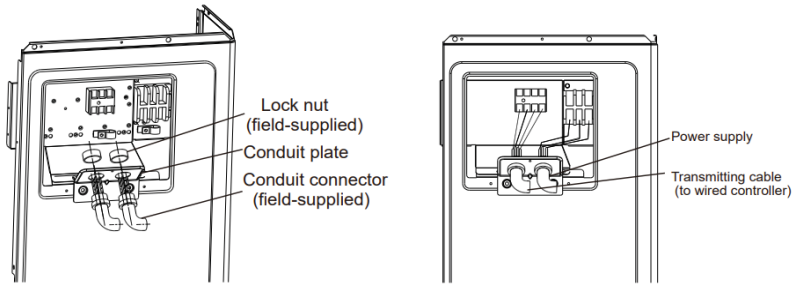
INSTALLATION

Outdoor Unit - Wiring

Wire connection steps:

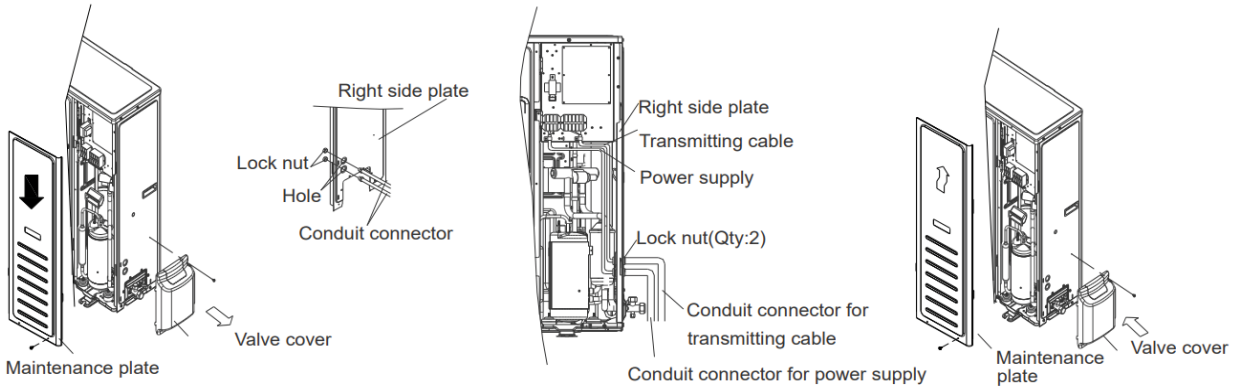
24K/36K

• Electric box cover removal- Unscrew the mounting screws to remove the electric box cover.
• Fasten the power supply cable and the transmission cable to the conduit holder using a lock nut.
• Connect the power supply cable and the transmission cable to terminal.
• Fasten the power supply cable and the transmission cable with the cable clamp.
• Seal holes and gaps using putty.
• Place cables side by side. (Do not overlap the cables.)
• Re-install the electric box cover back after completion of the work.



48K/60K

• Electric box cover removal- Unscrew the mounting screws, valve box and maintenance panel to remove the electric box cover.
• Fasten the power supply cable and the transmission cable to the conduit holder using a lock nut.
• Connect the power supply cable and the transmission cable to terminal.
• Fasten the power supply cable and the transmission cable with the cable clamp.
• Seal holes and gaps using putty.
• Place cables side by side. (Do not overlap the cables.)
• Re-install the electric box cover back after completion of the work.



INSTALLATION

Outdoor Unit - Wiring

Electrical Data

Model (Capacity)	Power Supply	ELB (Electrical Leakage Breaker)		Power Source Cable Size	Transmitting Cable Size
		Rated Current (A)	Nominal Sensitive Current (mA)		
24k	208/230V-/60Hz	25	30	See NEC	5x18AWG
36k	208/230V-/60Hz	35	30	See NEC	5x18AWG
48k/60k	208/230V-/60Hz	50	30	See NEC	5x18AWG

Max. Running Current (A): REFER TO NAMEPLATE

Note：

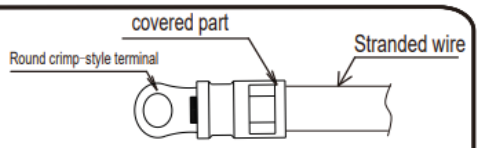
• Follow local codes/regulations when selecting wire. All of the above are minimum wire sizes.

• If Transmission(SI) cable length is longer than 100ft. (80m), a larger wire size should be selected.

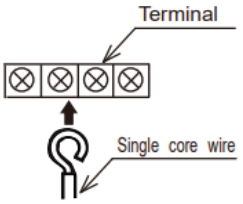
• Install mains switch and ELB for each system separately. Select the high response type ELB that is activated within 0.1second. Recommended capacity to see outdoor equipment switch capacity.

<Attentions when Connect the power supply wiring>

1. When connecting the terminal block using stranded wire, make sure to use the round crimp-style terminal for connection to the power supply terminal block. Place the round crimp-style terminals on the wires up to the covered part and secure in place.



2. When connecting the terminal block using a single core wire, be sure to perform curing.



INSTALLATION

Refrigerant Piping

1. Piping requirement

Model	Outer Diameter of Pipe [in.]	
	Gas	Liquid
24k	5/8	3/8
36k	3/4	3/8
48k/60k	7/8	3/8

The shorter the refrigerant piping is, the better the performance will be.

2. Piping material

(1) Use local supplied copper piping

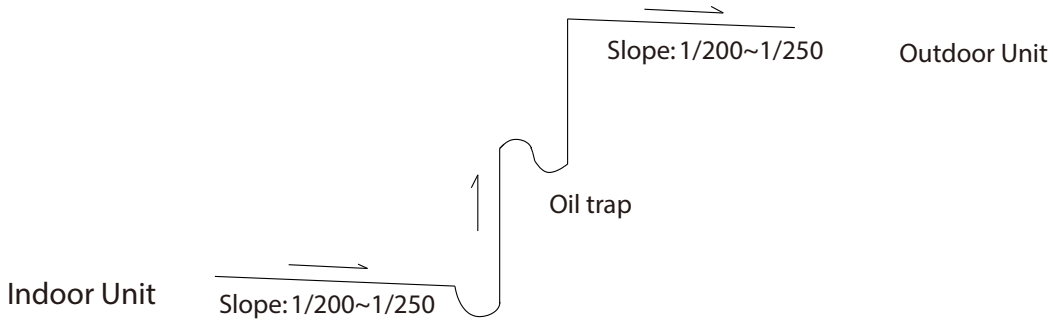
(2) Use clean copper pipes. Make sure that there is no dust and moisture inside the pipes. Blow the inside of the pipes with nitrogen or dry air to remove any dust or foreign material before connecting pipes.

(3) Piping thickness and material of the pipe are shown as below.

Diameter inches	Thickness inches
Ø 1/4	1/32
Ø 3/8	1/32
Ø 1/2	1/32
Ø 5/8	1/32
Ø 3/4	1/32
Ø 7/8	1/32

10.2 Oil trap

When the indoor unit is lower than outdoor unit and height difference is larger than 16.4ft.(Set an oil trap every 16.4ft. (height difference) on suction piping.

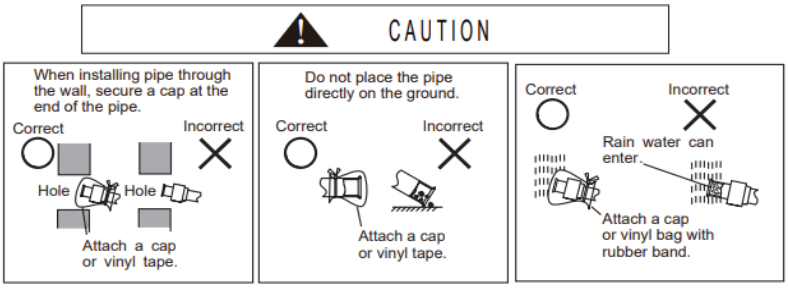


NOTE:

1) To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
2) The horizontal piping should slope down along the refrigerant flow direction, to bring the oil back to compressor , the slope is about 1/200 to1/250.
3) In order to ensure better cooling/heating performance, the refrigerant piping should be as short and straight as possible.

INSTALLATION

Refrigerant Piping



NOTICE

A Bi -Flowliquid line drier is required to be installed on the refrigerant system during installation or any refrigerant system repairs. Install in between liquid line stop and TXV.

3.Refrigerant piping work

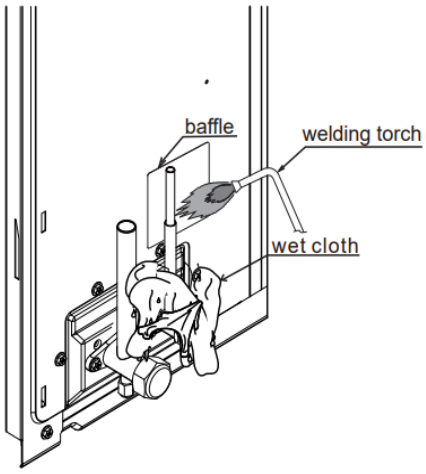
(1) Pipe cutting-
Cut the copper pipe correctly with pipe cutter.

(2) Burrs removal-
Completely remove all burrs from the cut cross section of the pipe.
*Position the end of the copper pipe downward to prevent burrs from dropping in the pipe.

4. Piping connection

(1) Confirm that the valves are closed.

(2) Connect the indoor unit and the outdoor unit with field-supplied refrigerant pipes. The refrigerant piping should be brazed with a phosphorous-copper alloy material such as Silfos-15 or equivalent.



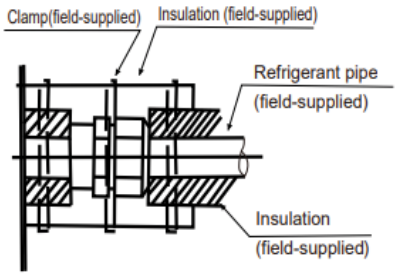
Precautions and steps during brazing service valve:

a. Remove the caps from both the liquid and gas service valve service ports at the outdoor unit.

b. Braze the liquid piping and gas piping to the respective valve at the outdoor unit.
Prior to brazing, wrap a wet cloth around each service valve to prevent heat damage while brazing.
A fire plate or divider can be used to protect painted surfaces and insulation while brazing.

c. Cool joints and other heat sensitive components with a wet rag during brazing.

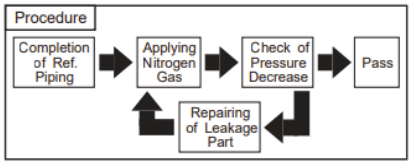
(3) After connecting the refrigerant pipes, insulate the pipes according to local codes and temperature/humidity conditions. See also detailed figure.
·For outdoor unit side, insulate all piping including valves.
·Cover piping joints with pipe cover.
·Using piping tape, apply taping starting from the entry of outdoor unit.
- Secure the end of the piping tape with adhesive tape.
- When piping has to be routed above ceiling, closet or area where temperature and humidity are high, apply additional insulation for prevention of condensation.



Piping insulation procedure

5. Air tight test

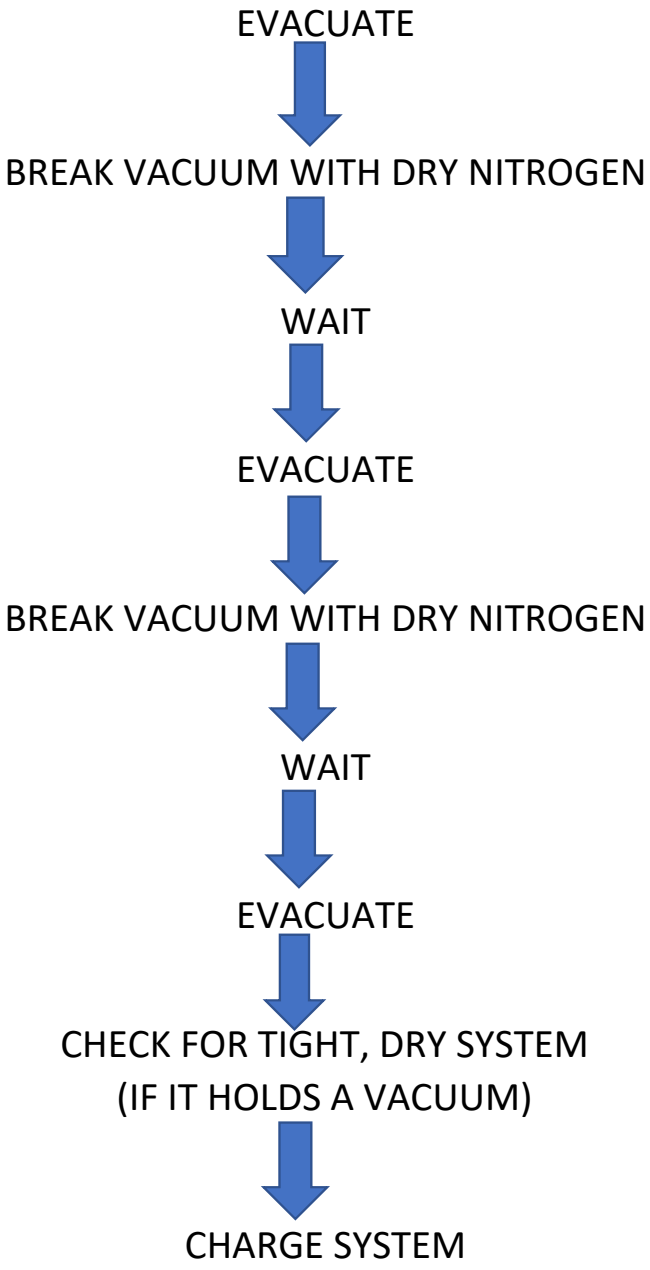
Use Nitrogen only.
Using charging hose, connect the gauge manifold at the nitrogen cylinder to the check joints of the liquid line and the gas line stop-valves.
Perform the air-tight test.
Don't open the gas line stop valves.
Apply nitrogen gas pressure of 550 psig (3.8 MPa).
Check for any gas leaks at the flare nut connections, or brazed parts utilizing gas leak detector or foaming agent.
In addition, observe the gas pressure during the leak test to make sure that it does not decrease.
After the air tight test, release nitrogen gas.



Air tight procedure

INSTALLATION

Leak Check, Evacuation, and Charging (Triple Evacuation)
Refer to the Refrigerant Evacuation and Charging Section in this manual.



INSTALLATION

Test Run

NOTICE:

The TXV must be able to open to the maximum angle while running in heating mode and be adjusted to 4-6˚ F superheat.

In a non matched unit ensure that the TXV is of the proper type.

Refer to TXV Replacement

⚠ CAUTION

COMPRESSOR DAMAGE MAY OCCUR DURING COLD - START UP

If the outdoor unit has been exposed to temperatures below 32°F for more than 6 hours, the unit will need to be energized for at least 6 hours to allow the crankcase heater to warm the oil before startup.

• Ensure that the stop valves of the outdoor unit are fully opened.
• Ensure that all wires have been fully connected and torqued.
• Ensure that the electrical resistance is more than 2MΩ by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

Test run function identification
Operate the thermostat to turn ON the equipment, then proceed test run.
Pay attention to the following items while the system is running.
Do not touch any of the parts by hand at the discharge gas side. Compressor body and pipes at the discharge side will reach temperatures in excess of 194°F (90°C).
Turn off the power after the test run is finished.
Installation of the equipment is complete after concluding the test run. For additional information, contact the local technical service center for further information.

OPERATION

Control Functions

1. Cooling Anti-Freeze Protection

The outdoor pressure sensor functions as real time temperature detector of evaporator. It prevents the indoor unit evaporator temperature becoming too low. If the indoor coil temperature is too low, the compressor will automatically start protection mode.

2. Overload Protection

To prevent system overload caused by excessive pressure, the machine will implement real-time detection when outdoor coil temperature is too high during cooling mode or indoor coil temperature is too high during heating mode.

3. Exhaust temperature protection

To prevent deterioration due to high exhaust temperature of compressor, the machine will recognize the real-time detection of the exhaust gas temperature. If the temperature is too high compressor provides automatic protection.

4. Oil-return Control

When the compressor runs at low frequencies for a long time, control system will start the oil-return mechanism. The oil in the system returns to the compressor.

5. Operation Mode

Air conditioning mode is the operation mode set by users through the thermostat, two modes are available: cooling, heating.

6. Four-way Valve Control

Four-way valve of the outdoor unit is de-energized during cooling and defrost and energized during heating. After the call for heat is satisfied and the compressor has stopped the four-way valve will de-energized after a period of time.

7. Start-up Protection

To prevent compressor from restarting frequently when the system pressure has not been completely balanced, it cannot be restarted within 3 minutes.

8. Pressure Protection

When the pressure increases to a preset value, the pressure switch will automatically come to protection mode. The compressor will stop and report the fault code protection. 24-36k BTU units d not have a high or low pressure switch. Pressure data is transmitted through a pressure sensor.

OPERATION

Control logic description

Communication between indoor and outdoor units:

The communication between the outdoor unit, thermostat and the indoor unit is achieved through 24 VAC. The thermostat controls the signal output of Y and B, and the outdoor unit identifies its operation mode according to these two signals. If Y is 24v, the outdoor unit starts in cooling mode; if both Y and B are 24v, the outdoor unit starts in heating mode. When the outdoor unit meets its defrosting conditions or anti-cold air conditions in heating mode, W is 24v, and when it exits from defrosting function and anti-cold air function, W is 0v. SI signal is sent when outdoor unit runs in low-frequency mode.

Cooling Mode

Start conditions:

When 24v compressor signal (Y) and 0v 4-way valve signal (B) are received from the thermostat the unit will start cooling.

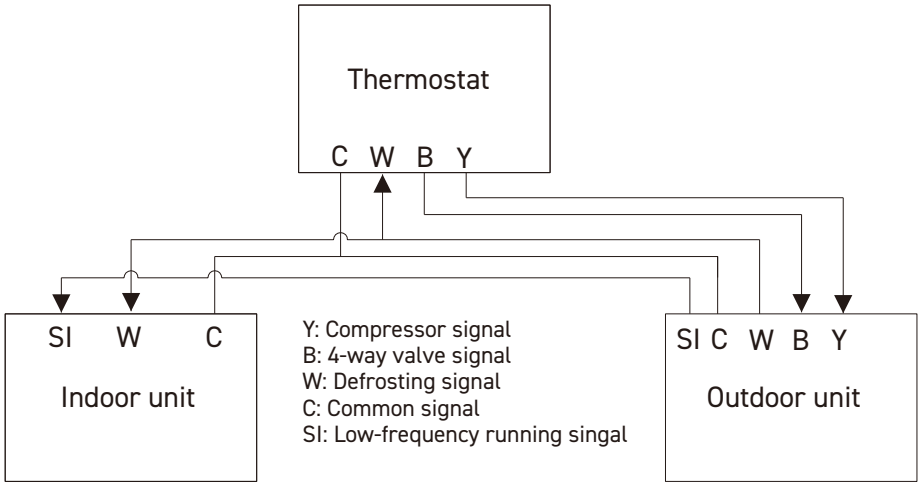


Figure 401

Stop conditions:

When 0v compressor signal is received from the thermostat the unit will stop.

Actions:

The compressor keeps operating with its current frequency, and detects its system pressure at the same time.

(a) If the pressure changes more than 5.8 PSI (e2)in 10 seconds, the compressor stops operating.

(b) If the pressure changes less than 5.8 PSI (e2) in 10 seconds, the compressor keeps operating and the target pressure is set to increase by 2.9 PSI (e2) based on the current system pressure. The motor and electronic expansion valve are controlled as usual, the protection function and oil-return control are valid.

Stopping conditions:

When the compressor signal (Y) received from the thermostat is 24v and 4-way valve signal (B) is low level, the unit restores the normal target pressure to operate or when the compressor has operated for 30 minutes e2 with the increased target pressure, the unit will stop operation.

Compressor running rules:

When the unit starts up in cooling mode, the compressor starts to work, and adjust its operating frequency according to the system target pressure and the actual pressure. If the actual pressure is higher than the target pressure, the compressor frequency will rise; if the actual pressure is lower than the target pressure, the compressor frequency decreases; when the target pressure is reached, the compressor frequency will stabilize.

Outdoor fan running rules:

Once the outdoor fan starts up, it will follow the rules below:

Single outdoor fan: First, it will run in an invariable speed for a short time; Then it will regulate the speed by the outdoor-coil temperature.

Double outdoor fan: If it has two outdoor fans, the upper fan regulates the speed by the rules, and the lower fan speed is slower than the upper fan speed by 30rpm~60rpm.

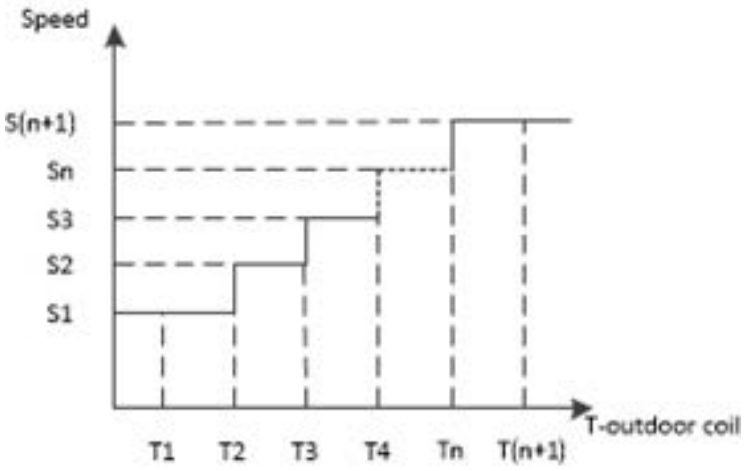


Figure 402

Indoor Fan Running Rules

Unmatched system: Fan will operate according to fan setting on PCB.

Matched system: Fan will operate according to fan setting on PCB. RPM may compensate for low-load applications.

OPERATION

Control logic description

Heating Mode

1. Start conditions:
When 24v compressor signal (Y) and 24v 4-way valve signal (B) are received from the thermostat the unit will start heating.

2. Stopping operating in heating mode.
Stopping conditions:
When 0v compressor signal (Y) and 0v 4-way valve signal (B) are received from the thermostat the unit will stop heating.
Stopping actions:
The compressor keeps operating with its current frequency, and detects its system pressure at the same time.
a. If the pressure keeps 522 PSI or more for 10 seconds, or it changes more than 14.5 PSI in 10 seconds, the compressor stops operating.
b. If the pressure changes less than 14.5 PSI in 10 seconds, the compressor keeps operating and the target pressure is set to decrease by 43.5 PSI based on the current system pressure. The motor and electronic expansion valve are controlled as usual, the protection function and oil-return control are valid.

When the 24v compressor signal (Y) and 24v 4-way valve signal (B) are received from the thermostat, the unit restores the normal target pressure to operate or when the compressor has operated for 30 minutes with the decreased target pressure the unit stops operating.

Compressor running rules:
When the unit starts up in heating mode, the compressor starts to work, and adjust its operating frequency according to the system target pressure and the actual pressure. If the actual pressure is higher than the target pressure, the compressor frequency will decrease; if the actual pressure is lower than the target pressure, the compressor frequency increases; when the target pressure is reached, the compressor frequency will keep stable.

Outdoor fan running rules:
Once the outdoor fan starts up, it will follow the rules below:
Single outdoor fan: First, it will run in an invariable speed for a short time; Then it will regulate the speed by the saturation temperature (which is got from high pressure cycling)
Double outdoor fan: If it has two outdoor fans, the upper fan regulates the speed by the rules, and the low fan speed is slower than the upper fan speed by 30 rpm~60 rpm.

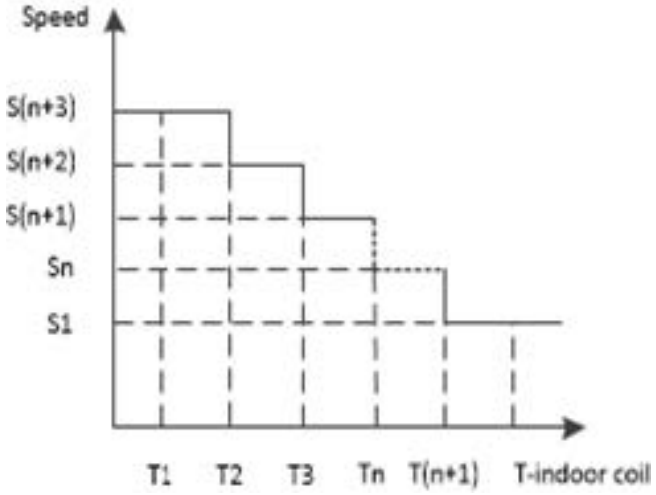


Figure 403

Indoor Fan Running Rules
Unmatched system: Fan will operate according to fan setting on PCB.
Matched system: Fan will operate according to fan setting on PCB. RPM may compensate for low-load applications.

OPERATION

Control logic description

Evaporator Low-temperature Protection

DC-Inverter

AC will enter T2 protection if any of the following condition is satisfied.

Condition:

Cooling mode: When the saturation temperature which is got from low pressure cycling) T2 stays lower than TE5 for 120 seconds, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

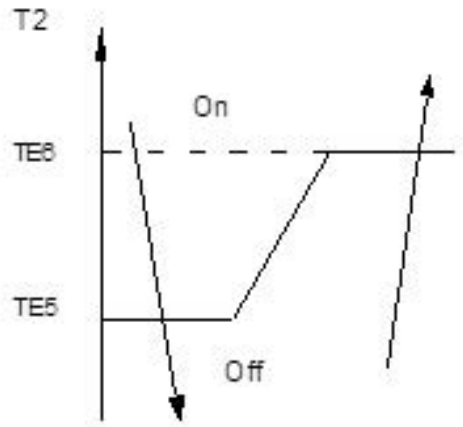


Figure 404

Condenser High-temperature Protection

DC-Inverter outdoor unit
AC will enter T3 protection if any of the following conditions is satisfied.

Condition 1:
Cooling mode: When the outdoor coil temp. T3 keeps higher than T2 for 10 seconds, the compressor and outdoor fan will shut off. When T3 is lower than T1, the compressor and outdoor fan will restart up.

Condition 2:
Heating mode: When the saturation temperature which is got from high pressure cycling) T3 stays higher than T2 for 10 seconds, the compressor and outdoor fan will shut off. When T3 is lower than T1, the compressor and outdoor fan will restart up.

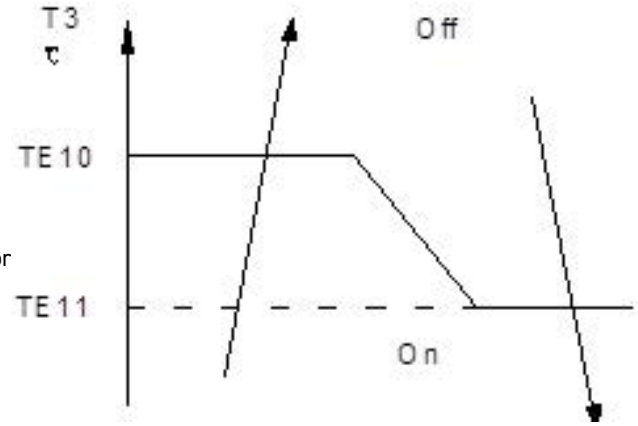


Figure 405

OPERATION

Matched ODU to IDU Refrigerant Cycle Schematic

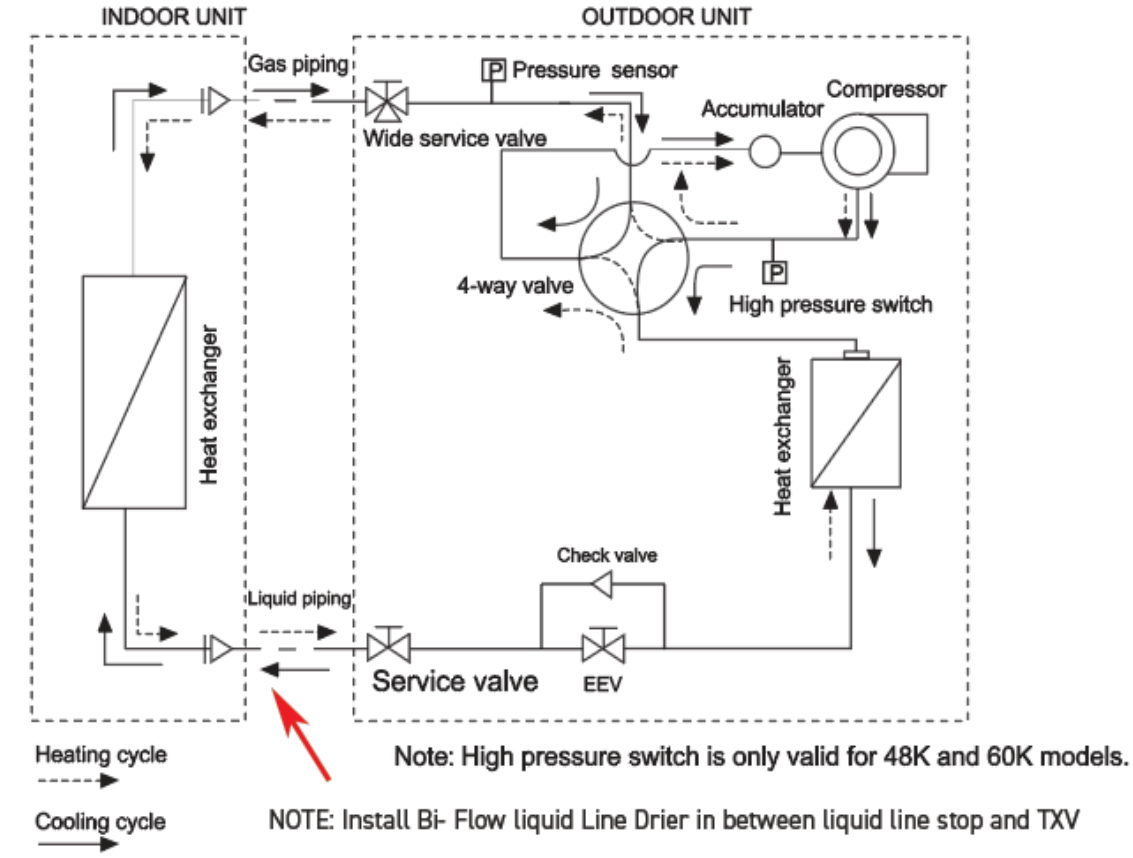


Figure 406

Matched ODU to IDU Wiring Schematic

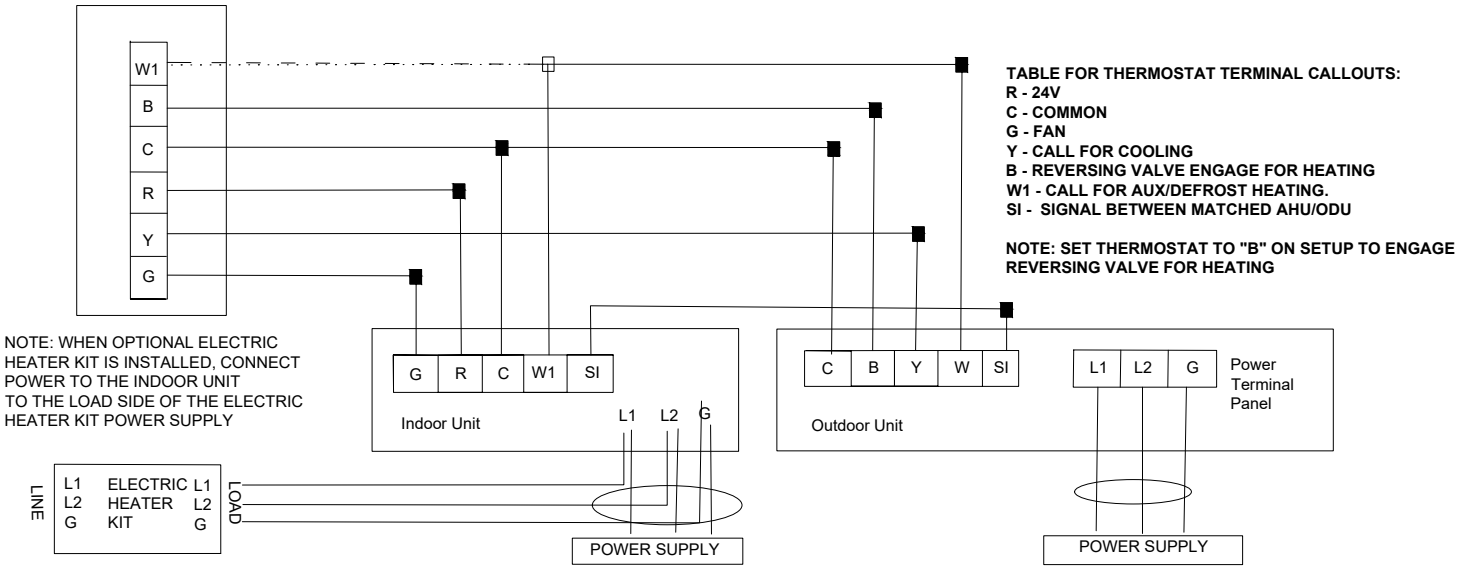
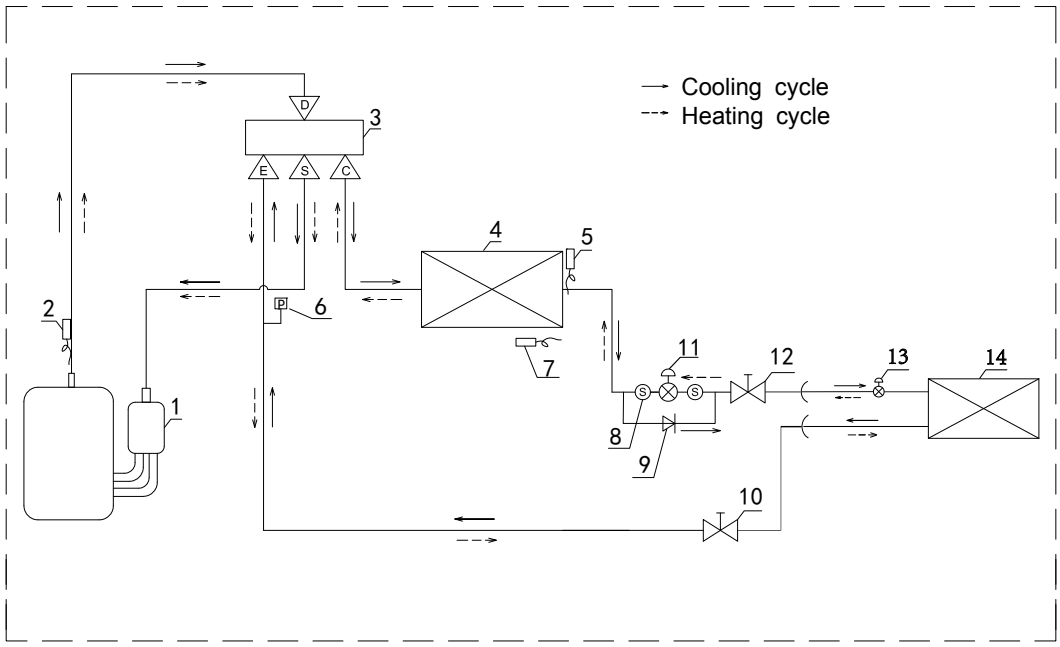


Figure 407

NOTE: The SI (Signal) wire between the indoor and outdoor units is not installed when the outdoor unit is connected to a non-matched indoor unit. In a matched system, SI enables greater energy efficient operation.

OPERATION

24k BTU Refrigerant Cycle

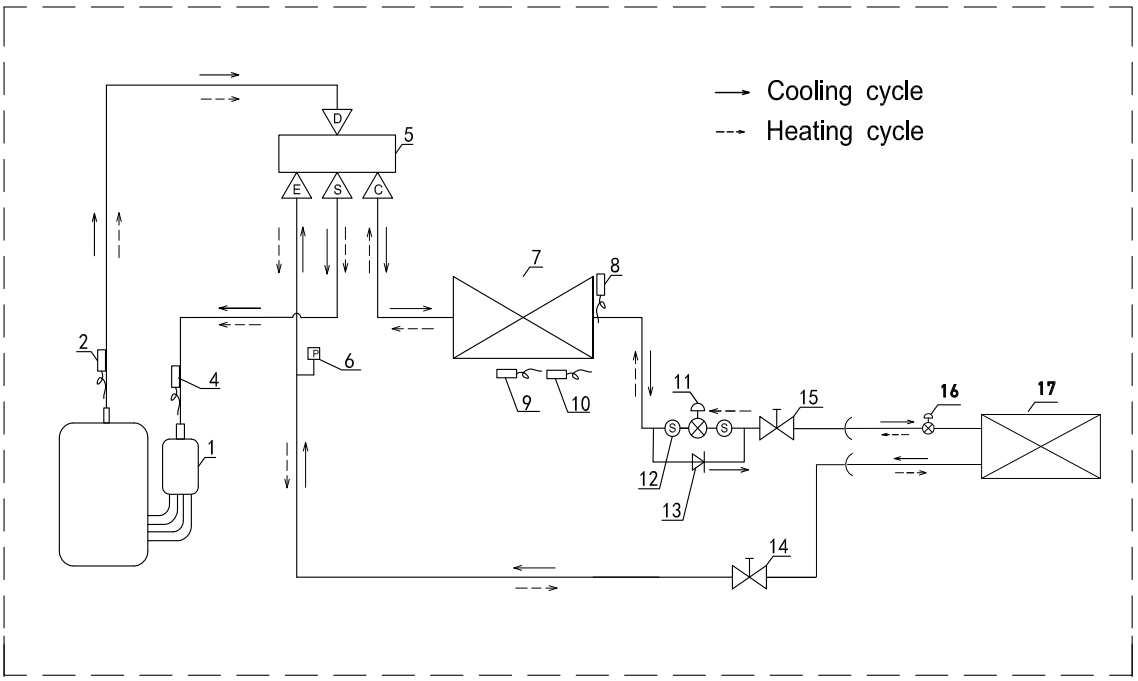


List of components			
1	Compressor	8	Strainer
2	Discharge temperature sensor	9	One-way valve
3	4-Way valve	10	Stop valve (Gas)
4	Outdoor heat exchanger	11	Electronic expansion valve
5	Coil temperature sensor	12	Stop valve (Liquid)
6	Pressure sensor	13	TXV
7	Ambient temperature sensor	14	Indoor heat exchanger

Figure 408

OPERATION

36k BTU Refrigerant Cycle

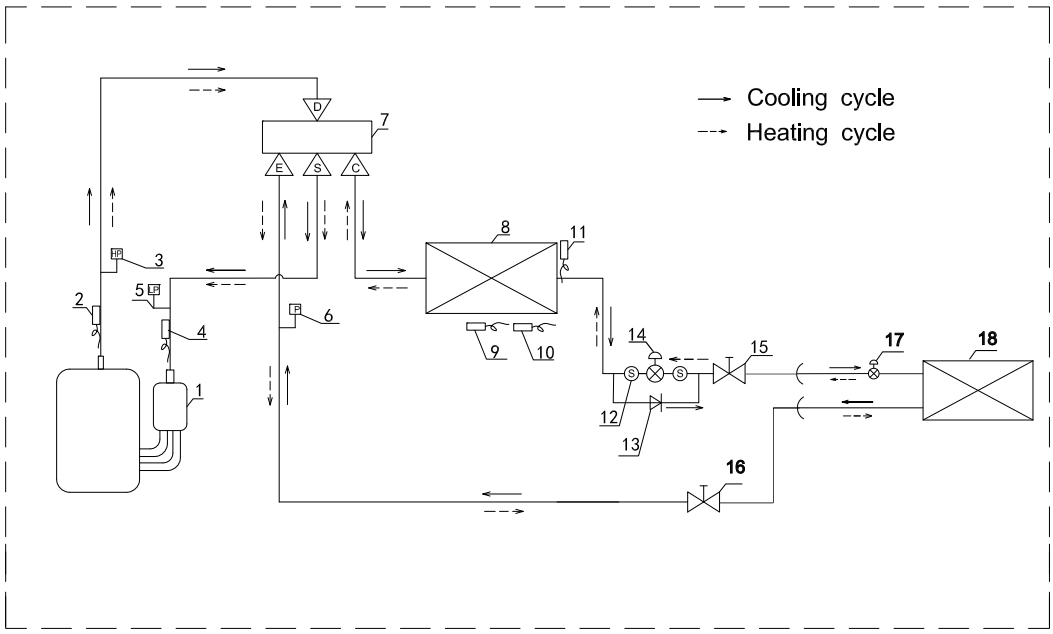


List of components			
1	Compressor	10	Defrost temperature sensor
2	Discharge temperature sensor	11	Electronic expansion valve
		12	Strainer
4	Suction temper ature sensor	13	One-way valve
5	4-Way valve	14	Stop valve (Gas)
6	Pressure sensor	15	Stop valve (Liquid)
7	Outdoor heat exchanger	16	TXV
8	Ambient temperature sensor	17	Indoor heat exchanger
9	Coil temperature sensor		

Figure 409

OPERATION

48k to 60k BTU Refrigerant Cycle



List of components			
1	Compressor	10	Defrost temperature sensor
2	Discharge temperature sensor	11	Ambient temperature sensor
3	High pressure switch	12	Strainer
4	Suction temperature sensor	13	One-way valve
5	Low pressure switch	14	Electronic expansion valve
6	Pressure sensor	15	Stop valve (Liquid)
7	4-Way valve	16	Stop valve (Gas)
8	Outdoor heat exchanger	17	TXV
9	Coil temperature sensor	18	Indoor heat exchanger

Figure 410

OPERATION

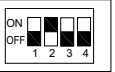
Outdoor Unit Field Settings

DIP Switch Setting of Outdoor Unit (Optional setting)

1. Turn on the power before setting the S4-2/S4-3 DIP switches, and dial the switches from OFF to ON. Without turning on, the switches settings are not refreshed and might be invalid.

2. Turn off all power sources before setting the S4-1/S5-1,2,3 DIP switches. Without turning off, the switches settings are not refreshed and might be invalid.

3. Mark of "■" indicates the position of DIP switches.

S4 DIP Switch Setting		S5 DIP Switch Setting	
Factory Setting		Factory Setting	
Pump Down Switch		Capacity High→Low	
Force Defrost		Cooling Only	

Force defrost mode set
Operation:
Change the switch from OFF to ON before turning on the appliance, and set it in heating mode, then it will run with manual defrosting mode at once.
Cooling only set
Operation:
Heating mode will be invalid after the DIP has been dialed.
Capacity set
Change it when the indoor units matched are in the following conditions.

Outdoor unit model	Indoor unit connect
24K	18K
36K	30K
48K	42K
60K	48K

Pump down mode
Actions:
The compressor runs with the target frequency, and without any protection when frequency rises; The EEV runs with setting opening; Outdoor unit fan will run with the set fan speed.

Operation procedures (24K/36K)
The thermostat is turned off during the whole process.
Remove power to unit va electrical disconnet
Step 1:
Open the wiring cover on the right side of the machine.
Step 2:
Close the stop valve of the liquid piping with an Allen wrench in a clockwise direction.

OPERATION

Outdoor Unit Field Settings

Step 3:

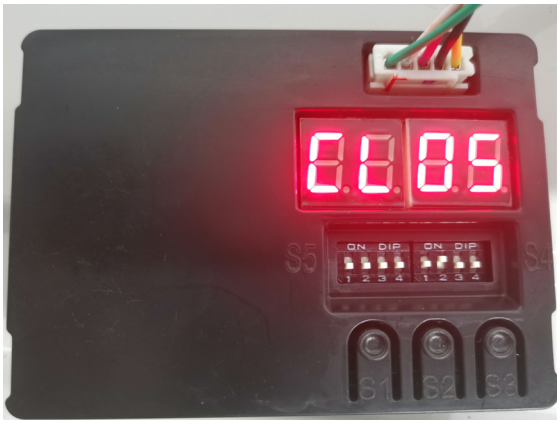
Turn on the power via the electrical disconnect.

Step 4:

Switch S4-2 to ON position on the checker board, the outdoor unit starts, and the current frequency value is displayed on the 7 segment display.

Step 5:

The frequency value will keep changing until "CLOS" is displayed on the 7 segment display, then please check whether the liquid stop valve is closed.



Step 6:

When "GOOD" is displayed on the 7 segment display, please close the stop valve of the gas piping with an Allen wrench in a clockwise direction within 10s.

Step 7:

Turn off the power and the procedure for recovering refrigerant is finished.

OPERATION

Outdoor Unit Field Settings

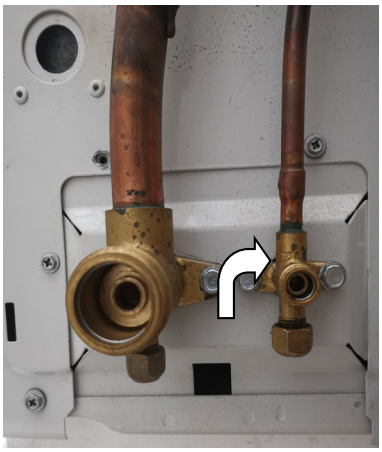
Operation procedures (48K/60K):

Step 1:

Remove power from unit via electrical disconnect

Step 2:

Close the stop valve of the liquid piping with an Allen wrench in a clockwise direction.



Step 3:

Open the maintenance panel.

Step 4:

Change the DIP switch position (referring to outdoor wiring diagram) ON position on the main control board.

Step 5:

Apply power to the unit via the electrical disconnect

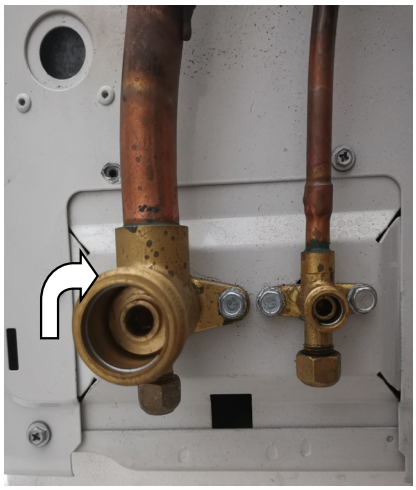
Step 6:

Check if “40” is displayed on the 7 segment display of the main control board.

Outdoor Unit Field Settings

Step 7:

When the numerals on the LED digital tube of outdoor unit count down to 0 (40 → 39 → 38 ... 0), and “0” begins to blink, close the shut-off valve of the gas piping with an Allen wrench in a clockwise direction.



Step 8:

Turn off the power and the procedure for recovering refrigerant is finished.

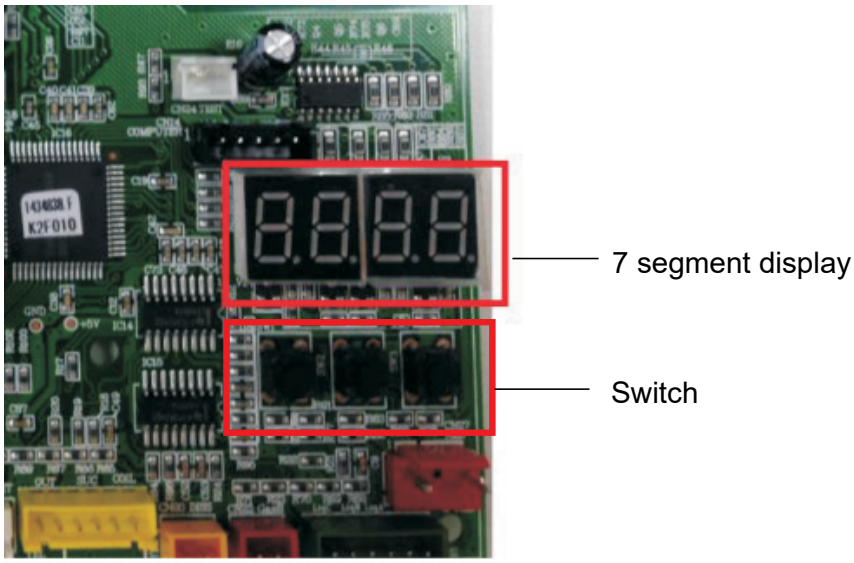
NOTE:

Be sure to switch back the DIP switch after refrigerant recovery operation. If not, it will enter refrigerant recovery mode again after power ON. But if the power is not off, it will not enter refrigerant recovery mode and will run normally.

This function is an auxiliary function, and the refrigerant recovery effect will be affected by factors such as indoor and outdoor ambient temperature and operator proficiency.

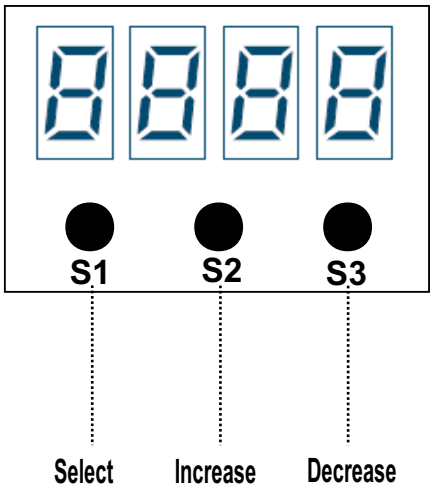
9.2 Running parameter query

Query by 7 segment display



7 segment display Introduction

24K/36K



There are 3 buttons on the 7 segment board.

1) Select button: Select to display outdoor/indoor unit parameter.

"P." -- Parameter of outdoor unit

2) Increase button: Each time it is pressed, the number rises by 1.

3) Decrease button: Each time it is pressed, the number lowers by 1.

The parameter content will be automatically displayed after the parameter code is selected for 3s.

OPERATION

Outdoor Unit Field Settings

Parameters can be checked in the following table below.

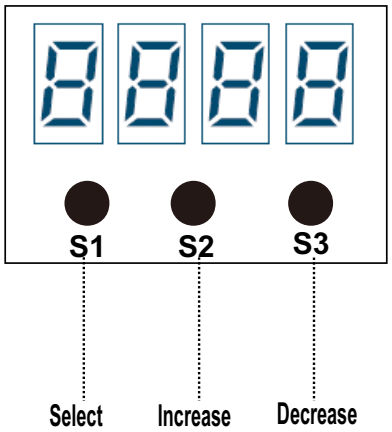
Parameter code	Descriptions
P.0	Fault codes
P.1	Compressor actual frequency
P.2	Compressor driving frequency
P.4	Compressor target frequency
P.5	Compressor exhaust temperature (℃)
P.6	Outdoor suction temperature(℃)
P.7	Outdoor ambient temperature(℃)
P.8	Outdoor coil temperature(℃)
P.9	Outdoor defrosting temperature(℃)
P.10	IPM module temperature(℃)
P.11	Outdoor capacity requirement
P.13	Outdoor DC Motor target speed
P.14	AC input current
P.15	AC input voltage
P.16	DC bus voltage
P.17	Compressor phase current
P.18	Frequency limit code
P.20	Target suction overheating
P.21	Target exhaust overheating
P.22	Actual suction overheating (heating)
P.23	Actual exhaust overheating (heating)

NOTE: The right is therefore reserved to EE changing without notice.

OPERATION

Outdoor Unit Field Settings

48K/60K



There are 3 buttons on the7 segment display board.

1) Select button:
Indoor parameters or outdoor parameters can be selected in turn by pressing it.
“P.”/“H.”-outdoor unit parameter

2) Increase button:
Each time it is pressed, the number rises by 1, hold down it, the number will be rapidly increased;

3) Decrease button：
Each time it is pressed, the number lowers by 1, hold down it, the number will be rapidly decreased.

Parameters can be checked in the following table below.

Parameter code	Descriptions
0	Protection code or fault code
P.1	Target frequency
P.2	Driving frequency
P.4	Outdoor EEV opening
P.5	Outdoor EEV target opening
P.6	Upper DC motor revolving speed
P.8	AC Input voltage
P.9	Current
P.10	Modular temperature(℃)
P.11	Capacity needed
P.12	Modular fault
P.20	Outdoor ambient temperature(℃)
P.21	Outdoor coil temperature(℃)
P.22	Outdoor defrost temperature(℃)
P.23	Suction temperature (℃)
P.24	Discharge temperature(℃)
H.1	DSH actual value
H.2	DSH target value
H.3	Target pressure in cooling mode (Actual pressure= the displayed value/100) (MPa)
H.4	Target pressure in heating mode (Actual pressure= the displayed value/100)(MPa)
H.5	Actual pressure (Actual pressure=the displayed value/100)(MPa)

OPERATION

Indoor Unit Field Settings

Static Pressure Setting:

DIP Switch S2 Setting	Blower Speed Tap	Fan Speed Select	Static Pressure In. W.C. 24k	Static Pressure In. W.C. 36k	Static Pressure In. W.C. 48k-60k
	2	Medium Low (Default setting)	0.18	0.24	0.28
	3	Medium	0.25	0.4	0.4
	4	Medium High	0.58	0.58	0.58
	5	High	0.8	0.8	0.8

NOTE: Symbol " ■ " indicates the position of the DIP switch.

TROUBLESHOOTING

Normal Malfunction

Troubleshooting	Possible Reasons of Abnormality	How to Deal With
Air conditioner will not start up	1. Power supply failure; 2. Circuit breaker tripped or fuse blown. 3. Power voltage is too low; 4. Improper setting of thermostat ; 5. Thermostat has lost power."	1. Check power supply circuit; 2. Measure insulation resistance to ground to see if there is any leakage; 3. Check if there is a defective contact or leak current in the power supply circuit; 4. Check and set thermostat again; 5. Change batteries."
The compressor starts or stops frequently	The air inlet and outlet have been blocked.	Remove obstacles.
Poor cooling/heating	1. The outdoor heat exchanger is dirty, such as condenser; 2. There are heating devices indoors; 3. The airtightness is not enough, and people come in and out too frequently; 4. Block of outdoor heat exchanger; 5. Improper setting of temperature."	1. Clean the heat exchanger of the outdoor unit, such as condenser; 2. Remove heating devices; 3. Keep certain air tightness indoors; 4. Remove block obstacles; 5. Check and try to set temperature again."
Sound from settling of parts	During system starting or stopping, a sound might be heard. However, this is due to the normal settling of plastic parts.	It is not abnormal, and the sound will disappear soon.
Water leakage	1. Drainage pipe is blocked or broken; 2. Wrap of refrigerant pipe joint is not closed completely.	1. Change drainage pipe; 2. Re-wrap and make it tight.

Fig. 501

TROUBLESHOOTING

Diagnostic Codes - Outdoor Unit

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
14	The high pressure switch operation or the unit is turned off for high pressure protection	1. The wiring of the high pressure switch is connected loosely; 2. The high pressure switch fails; 3. The outdoor control board is abnormal; 4. Overload in cooling; 5. Overload in heating.	1. Reconnect the wiring of the high pressure protector; 2. Replace the high pressure switch; 3. Replace the outdoor control board; 4. Please refer to NOTE 3; 5. Please refer to NOTE 4."	Applied to models with high pressure switch or pressure sensor
15	The low pressure switch protection or the unit is turned off for low pressure protection	1. The wiring of the low pressure switch is connected loosely; 2. The low pressure switch fails; 3. The refrigerant is low; 4. The expansion valve fails in heating mode; 5. The outdoor control board has failed.	1. Reconnect the wiring of the low pressure switch; 2. Replace the low pressure switch; 3. Check the welding point to confirm whether the unit leaks, and add some refrigerant; 4. Replace the expansion valve; 5. Replace the outdoor control board.	Applied to models with low pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to NOTE 3.	
17	Discharge temperature sensor fault	1. The wiring of the discharge temperature sensor is connected loosely; 2. The discharge temperature sensor fails; 3. The sampling circuit on outdoor control board has failed..	1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor; 3. Replace the outdoor control board.	
18	AC voltage is abnormal	1. The AC voltage>275V or <160V; 2. The AC voltage of sampling circuit on the driver board is abnormal.	1. Normal protection, please check the supply power; 2. Replace the driver board.	
19	Suction temperature sensor fault	1. The wiring of the suction temperature sensor is connected loosely; 2. The suction temperature sensor fails; 3. The sampling circuit on outdoor control board has failed..	1. Reconnect the wiring of the suction temperature sensor; 2. Replace the suction temperature sensor; 3. Replace the outdoor control board.	
22	The defrosting sensor fault	1. The wiring of the defrosting sensor is connected loosely; 2. The defrosting sensor fails; 3. The sampling circuit is abnormal.	1. Reconnect the wiring of the defrosting sensor; 2. Replace the defrosting sensor; 3. Replace the outdoor control board.	
43	High Pressure sensor fault	1. The wiring of the high-pressure pressure sensor connect is loose; 2. The high-pressure pressure sensor fails. 3. The sampling circuit of the high-pressure sensor fails.	1. Reconnect the wiring of the high-pressure pressure sensor; 2. Replace the high-pressure sensor; 3. Replace the outdoor control board."	
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 2, table 3.	See Driver PCB Diagnostic codes Diagnostic Codes -Drive Faults 24-36k Diagnostic Codes -Drive Faults 48-60k	

TROUBLESHOOTING

Diagnostic Codes - Outdoor Unit

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
46	IPM and control board communication fault	1. The cable between the control board and the driver board is connected loosely; 2. The cable between the control board and the driver board fails; 3. The driver board fails 4. The control board fails.	1. Reconnect the cable between the control board and the driver board; 2. Replace the communication cable between the control board and the driver board; 3. Replace the driver board; 4. Replace the control board.	
47	Discharge temperature exceeds upper limit fault	1. Refrigerant is low. 2. The refrigerant is low due to the length of the installation pipe and failure to make proper calculation 3. Throttling service fails; 4. The outdoor ambient temperature is too high.	1. Check the welding point to confirm whether the unit has leakage point, and then add some refrigerant; 2. Add some refrigerant Refer to Refrigerant Charging. 3. Replace the throttling service (such as capillary, expansion valve); 4. Normal protection.	
48	The outdoor DC fan motor fault (upper fan motor)	1. The connecting wiring of the up DC fan motor is loose; 2. The cord of the upper DC fan motor fails; 3. The upper DC fan motor fails; 4. The drive circuit of the upper DC fan motor fails; 5. The outdoor fan has been blocked.	1. Reconnect the wiring of the up DC fan motor; 2. Replace the upper DC fan motor; 3. Replace the upper DC fan motor; 4. Replace the driver board of the fan motor; 5. Check the outdoor fan and ensure the outdoor fan can run normally.	
49	The outdoor DC fan motor fault (lower fan motor)	1. The connecting wiring of the down DC fan motor is loose; 2. The cord of the lower DC fan motor fails; 3. The lower DC fan motor fails; 4. The drive circuit of the down DC fan motor fails; 5. The outdoor fan has been blocked.	1. Reconnect the wiring of the lower DC fan motor; 2. Replace the lower DC fan motor; 3. Replace the lower DC fan motor; 4. Replace the driver board of the fan motor; 5. Check the outdoor fan and ensure the outdoor fan can run normally.	(Only applicable to 48-60k BTU units.
91	The unit turns off due to the IPM board over heating fault	1. The outdoor ambient temp. is too high; 2. The speed of the out fan motor is too low if the fan motor is AC fan motor; 3. The outdoor unit is not installed in accordance with the standard; 4. The supply power is too low.	1. Normal protection; 2. Check the fan capacitor, and replace the fan capacitor if it is a failure; 3. Reinstalled the outdoor unit referring to the installation user manual; 4. Normal protection.	
96	Low Refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	
97	4-way valve commutation failure fault. (Valve position does nor correspond to call for heat or cool).	1. The connecting wiring of the 4- way valve coil is loose; 2. The 4-way valve coil fails; 3. The 4-way valve fails; 4. The driver board of the 4-way valve fails.	1. Reconnect the wiring of the 4-way valve; 2. Replace the 4-way valve coil; 3. Replace the 4-way valve; 4. Replace the driver board of the way valve.	
NOTE 1: If the indoor unit can not start or the indoor unit stops itself after 30s, at the same time the unit does not display the fault code, please check the wiring and the socket of the control board. NOTE 2: If the indoor unit displays the 75,76,77,78 fault code after you turn on the unit, please check the TEST seat of the indoor control board or the TEST detection circuit to see whether short circuit occurs.				

TROUBLESHOOTING

Diagnostic Codes - Outdoor Unit

Overload in cooling mode		
	The root cause	Corrective measure
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The outdoor ambient temperature is too high.	Please use it within allowable temperature range
3	Short-circuit occurs in the air outlet and air inlet of the outdoor unit.	Adjust the installation of the outdoor unit referring to the user manual.
4	The outdoor heat exchanger is dirty, such as condenser.	Clean the heat exchanger of the outdoor unit, such as condenser.
5	The speed of the outdoor fan motor is too low.	Check the outdoor fan motor and fan capacitor.
6	The outdoor fan is broken or the outdoor fan is blocked.	Check the outdoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve fails.	Replace the expansion valve.

Overload in heating mode		
	The root cause	Corrective measure
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The indoor ambient temperature is too high.	Please use it within allowable temperature range.
3	Short-circuit occurs in the air outlet and air inlet of the indoor unit.	Adjust the installation of the indoor unit referring to the user manual.
4	The indoor filter is dirty.	Clean the indoor filter.
5	The speed of the indoor fan motor is too low.	Check the indoor fan motor and fan capacitor.
6	The indoor fan is broken or the outdoor fan is blocked.	Check the indoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve fails.	Replace the expansion valve.

TROUBLESHOOTING

Diagnostic Codes -Drive Faults 24-36k

DC-Inverter unitary (Main control board upside-down)

1) Fault code displayed by LED lamps on outdoor main control board.

There are 3 LED lamps on control board, LED1, LED2 and LED3.

LED1 indicates the ten's place of the fault code, LED2 indicates the unit's place of the fault code and LED3 indicates outdoor drive control fault.

When LED3 is off, LED1 and LED 2 indicate main control fault code.

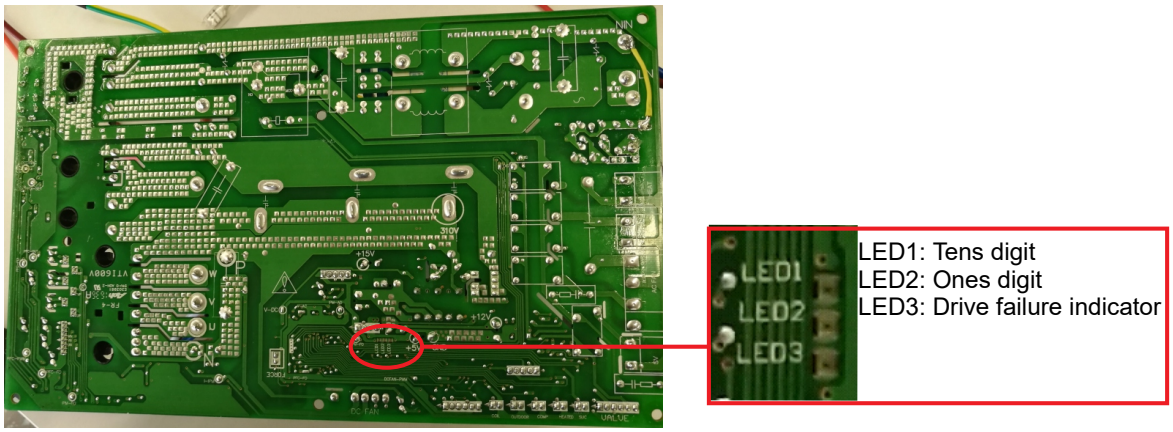
When LED3 is on, LED1 and LED 2 indicate drive control fault code.

When LED3 is flickering and LED1, LED 2 are all off, it indicates the compressor is preheating.

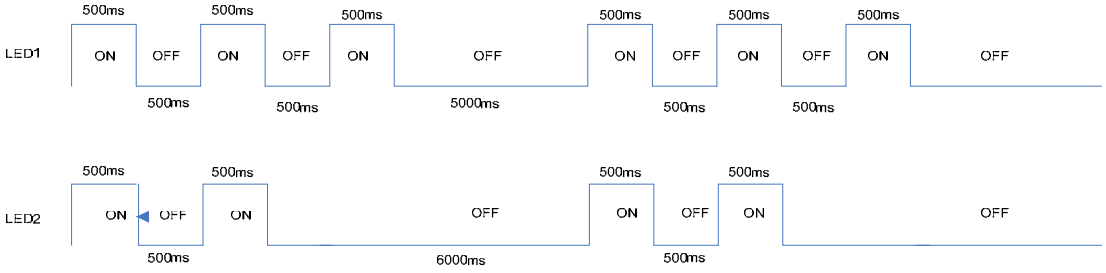
Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

System protection codes display method is the same with main control fault code.

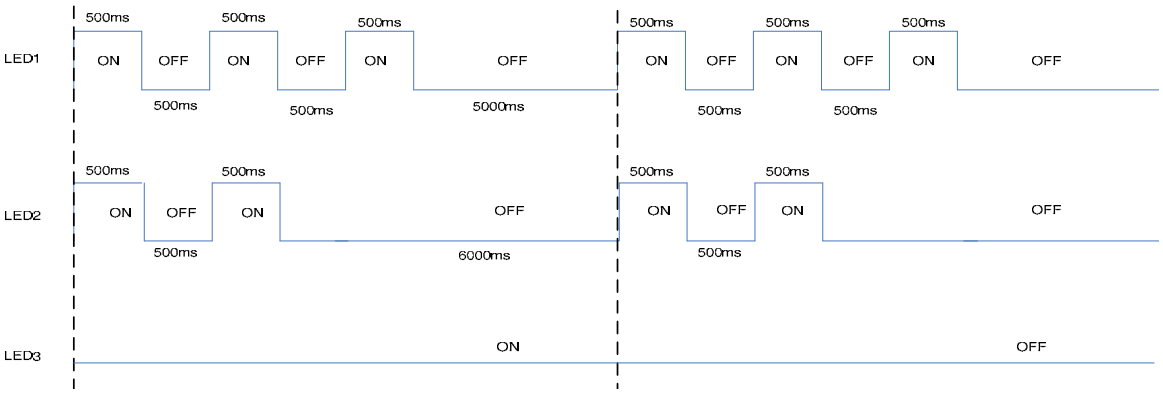
LED lamps will be off when there is no failure, protection or preheating.



For example, outdoor main control fault 32:



For example, outdoor drive fault 32:



2) Display by 7 segment display board.

Fault code will be displayed directly on 7 segment display board.

TROUBLESHOOTING

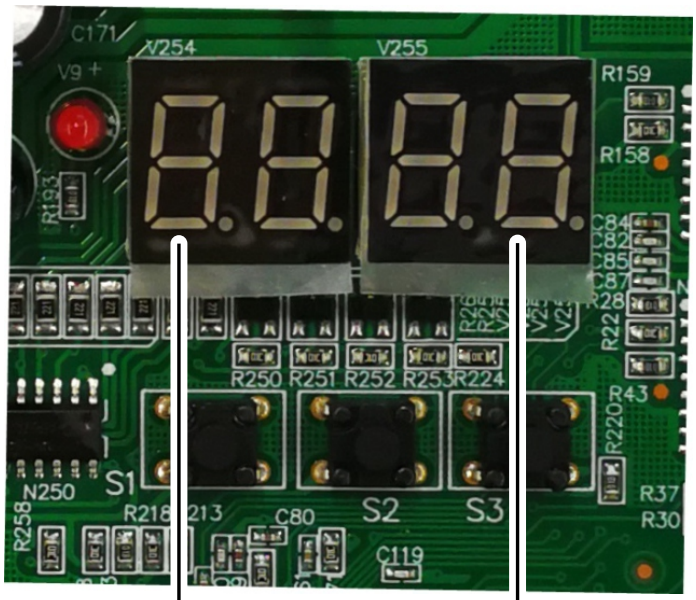
Diagnostic Codes -Drive Faults 24-36k

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Inverter DC voltage overload fault	1. Power supply input is too high or too low; 2. Driver board fault.	1. Check power supply 2. Change driver board.
2	Inverter DC low voltage fault		
3	Inverter AC current overload fault		
4	Out-of-step detection	1. Compressor phase lost 2. Bad driver board components 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change compressor."
5	Loss phase detection fault (speed pulsation)		
6	Loss phase detection fault (current imbalance)		
7	Inverter IPM fault (edge)	1. System overload or current overload; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system. 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
8	Inverter IPM fault (level)		
9	PFC_IPM IPM fault (edge)		
10	PFC_IPM IPM fault (level)		
11	PFC power detection of failure	1. The power supply is not stable; 2. Instantaneous power off; 3. Driver board failure.	1. Check the power supply. 2. No need to deal with. 3. Change the driver board.
12	PFC overload current detection of failure.	1. System overload, current is too high; 2. Driver board fails; 3. PFC fails.	1. Check the system; 2. Change the driver board; 3. Change the PFC.
13	DC voltage detected abnormal .	1. Input voltage is too high or too low; 2. Driver board fails.	1. Check the power supply; 2. Change the driver board.
14	PFC LOW voltage detected failure.		
15	AD offset abnormal detected failure.	Driver board fails.	Change the driver board.
16	Inverter PWM logic set fault.		
17	Inverter PWM initialization failure		
18	PFC_PWM logic set fault.		
19	PFC_PWM initialization fault.		
20	Temperature abnormal.		
21	Shunt resistance unbalance adjustment fault		
22	Communication failure.	1. Communication wire connection is incorrect, 2. Driver board fails; 3. Control board fails.	1. Check the wiring; 2. Change the driver board; 3. Change the control board.
23	Motor parameters setting of failure	Initialization is abnormal.	Reset the power supply.
26	DC voltage mutation error	1. Power input changes suddenly 2. Driver board fails."	1. Check power supply, to provide stable power supply; 2. Change driver board.
27	D axis current control error	1. System overload, phase current is too high; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
28	Q axis current control error	1. System overloads, phase current is too high 2. Driver board fails."	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
29	Saturation error of d axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
30	Saturation error of q axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
35	EE data abnormal	Driver board EEPROM is abnormal	1. Change EEPROM 2. Change the driver board.

TROUBLESHOOTING

Main control fault display

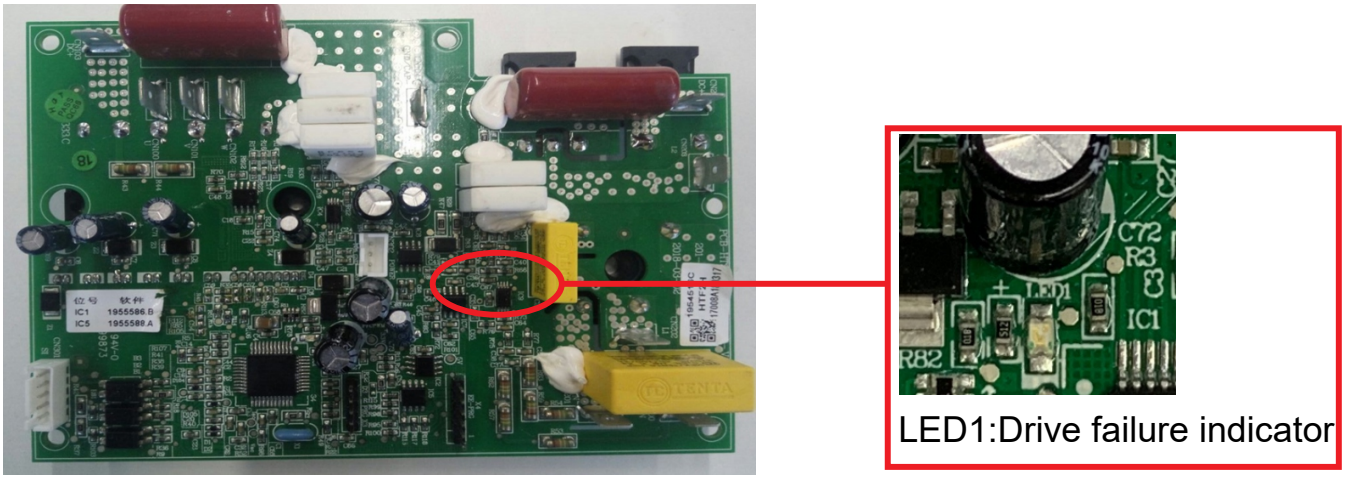
Fault code will be displayed by 7 segment display on main control board.



Drive fault code display

The lamp of drive board flashing shows failure occurs.

How many times the drive failure lamp flicker will show the failure code.



TROUBLESHOOTING

Diagnostic Codes -Drive Faults 48-60k

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Q axis current detection, failure in drive control	1. Compressor wire is not connected properly; 2. Bad driver board components; 3. Compressor start load is too large; 4. Compressor de-magnetization; 5. Compressor oil shortage serious wear of crankshaft; 6. The compressor insulation fails.	1. Check the wire of the compressor; 2. Change the driver board ; 3. Turn on the machine after the pressure is balanced again; 4. Change the compressor; 5. Change the compressor; 6. Change the compressor.
2	Phase current detection failure in drive control	1. Compressor voltage default phase; 2. Bad driver board components; 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change the compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change the driver board .
4	Speed estimation, failure in drive control	1. Bad driver board components; 2. Compressor shaft clamping; 3. The compressor insulation fails.	1. Change the driver board ; 2. Change the compressor ; 3. Change the compressor .
5	IPM FO output fault	1. System overload or current overload. 2. Driver board fails; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the air conditioner system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
6	Communication between driver board and control board fault	1. Communication wire is not connected well; 2. Driver board fault; 3. Control board fault;	1. Check compressor wire connection. 2. Change the driver board; 3. Change the control board ;
7	AC voltage,overload voltage	1. Supply voltage input is too high or too low; 2. Driver board fails;	1. Check power supply; 2. Change the driver board;
8	DC voltage,overload voltage	1. Supply voltage input is too high ; 2. Driver board fault;	1. Check power supply; 2. Change the driver board;
9	AC voltage imbalance	Driver board fails;	Change the driver board;
10	The PFC current detection circuit fault before compressor is ON	Bad driver board components;	Change the driver board
11	AC voltage supply in out range	1. Power supply abnormal, power frequency out of range; 2. Driver board fails;"	1. Check the system; 2. Change the driver board;
12	Products of single-phase PFC over-current, FO output low level	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Inverter over current (3-phase power supply air conditioners)	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
13	Inverter over current	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
14	PFC over current (single-phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1. 3-Phase voltage imbalance; 2. The 3-phase power supply phase lost; 3. Power supply wiring is wrong; 4. Driver board fault.	1, Check the power supply; 2. Check the power supply; 3. Check the power supply wiring connection; 4. Change the driver board.

TROUBLESHOOTING

Diagnostic Codes -Drive Faults 48-60k

Fault code	Fault description	Possible reasons for abnormality	How to deal with
15	The instantaneous power off detection	1. The power supply is not stable ; 2. The instantaneous power failure ; 3. Driver board fault;	1. Check the power supply; 2. Not fault; 3. Change the driver board.
16	Low DC voltage 200V	1. Voltage input is too low; 2. Drive board fault.	1. Check the power supply. 2. Change the driver board.
18	Driver board read EE data error	1. EEPROM has no data or data error; 2. EEPROM circuit fault.	1. Change EEPROM component; 2. Change the driver board.
19	PFC chip receives data fault	Abnormal communication loop.	Change the drive board.
20	PFC soft start abnormal	Abnormal PFC drive loop.	Change the drive board.
21	The compressor drive chip does not receive data from PFC chip.	Communication loop fault.	Change the drive board.

TROUBLESHOOTING

Diagnostic Codes - Outdoor Unit

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	1. The outdoor ambient temperature sensor is connected loosely; 2. The outdoor ambient temperature sensor fails to work; 3. The sampling circuit fails.	1. Reconnect the outdoor ambient temperature sensor; 2. Replace the outdoor ambient temperature sensor components; 3. Replace the outdoor control board components.	
2	Outdoor coil temperature sensor fault	1. The outdoor coil temperature sensor is connected loosely; 2. The outdoor coil temperature sensor fails to work; 3. The sampling circuit fails.	1. Reconnect the outdoor coil temperature sensor; 2. Replace the outdoor coil temperature sensor components; 3. Replace the outdoor control board components.	
3	The unit over-current turn off fault	1. Control board current sampling circuit fails; 2. The current is over high because the supply voltage is too low; 3. The compressor is blocked; 4. Overload in cooling mode; 5. Overload in heating mode."	1. Replace the electrical control board components; 2. Normal protection; 3. Replace the compressor; 4. Please see NOTE 3; 5. Please see NOTE 4.	
4	EEprom Data error	1. EE components fails; 2. EE components control circuit fails; 3. EE components are inserted incorrectly."	1. Replace the EE components; 2 .Replace the outdoor control board components; 3. Reassemble the EE components.	
5	Cooling freezing protection (the indoor coil temperature is too low) or heating overload (indoor coil temperature is too high)	1. The indoor unit can not blow air normally; 2. The room temperature is too low in cooling mode or the room temperature is too high in heating; 3. The filter is dirty; 4. The duct resistance is too high to resulting in low air flow; 5. The setting fan speed is too low; 6. The indoor unit is not installed in accordance with the installation standards, and the air inlet is too close to the air outlet .	1. Check whether the indoor fan, indoor fan motor and evaporator work normally; 2. Normal protection; 3. Clean the filter; 4. Check the volume control valve, duct length etc.; 5. Set the speed with high speed; 6. Reinstall the indoor unit referring to the user manual to change the distance between the indoor unit and the wall or ceiling.	
13	Compressor overheat protector device	1. The wiring of the overload protector is connected loosely. 2. The overload protector fails . 3. The refrigerant is not enough; 4. The installation pipe is much longer than the normal one, but extra refrigerant is not added ; 5. The expansion valve fails; 6. The outdoor control board fails.	1. Reconnect the wiring of the overload protector; 2. Replace the overload protector; 3. Check the welding point of the unit to confirm whether it is leakage, and then recharge the refrigerant; 4. Add the refrigerant; 5. Replace expansion valve; 6. Replace the outdoor control board."	

TROUBLESHOOTING

Test Refrigeration System-Cooling Mode

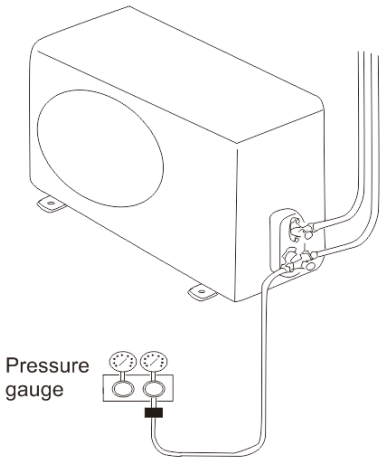
TEST SYSTEM FLOW:

Conditions: Compressor is running.

The air condition should be installed in good ventilation.

Tool: Pressure Gauge Technique: ① see ② feel ③ test

See ----- Tube defrost.
Feel ----- The difference between tube's temperature.
Test ----- Test pressure.



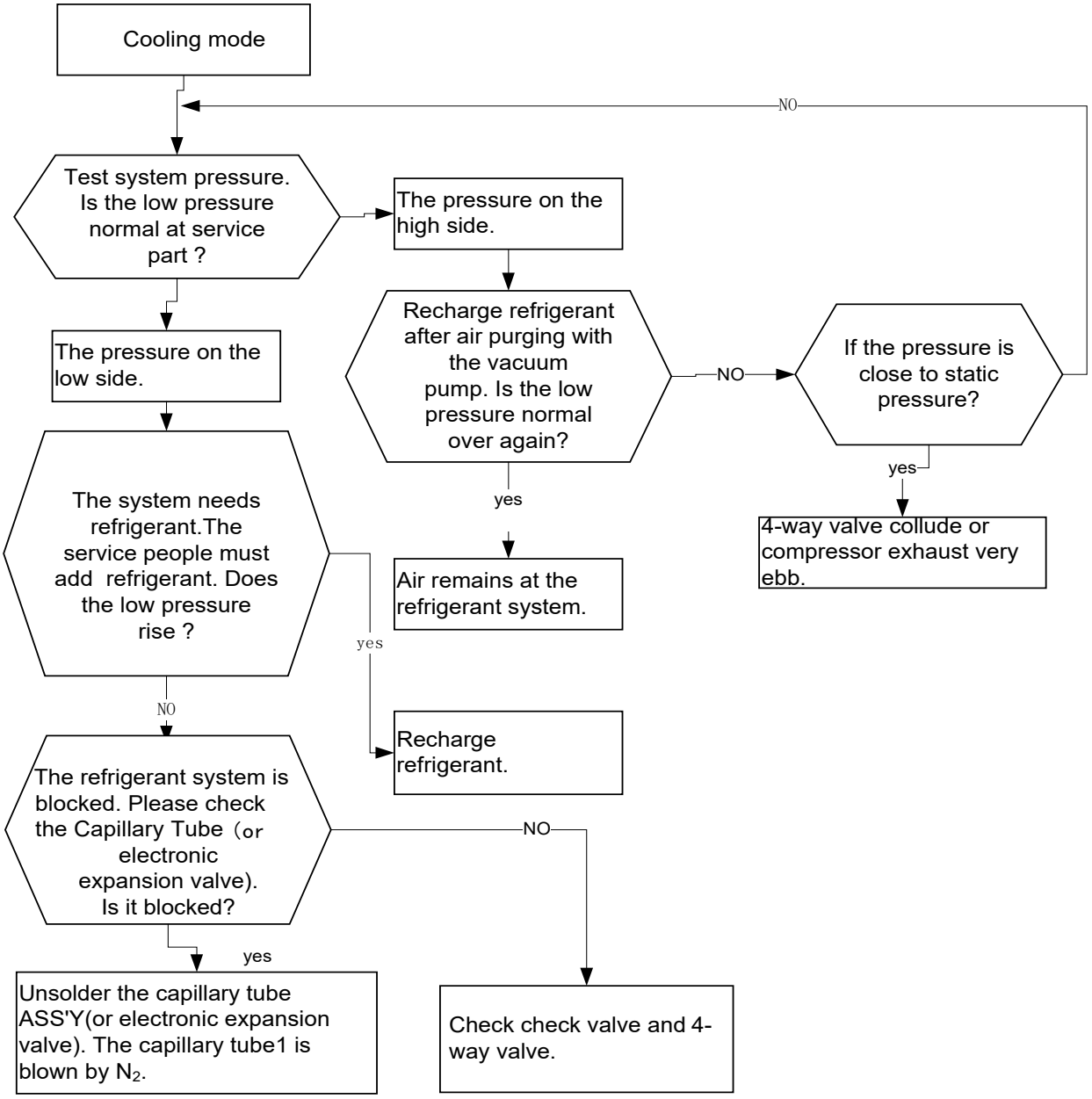


Figure 501

TROUBLESHOOTING

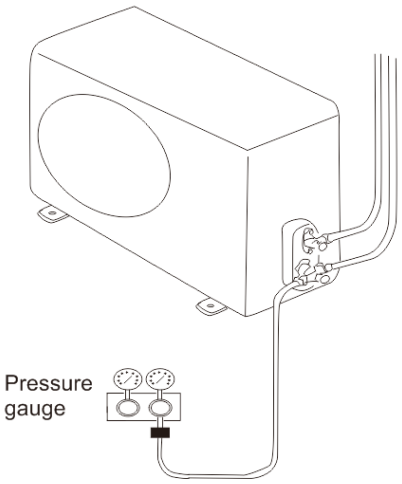
Test Refrigeration System-Heating Mode

TEST SYSTEM FLOW:

Conditions: Compressor is running.

The air condition should be installed in good ventilation.

Tool: Pressure Gauge Technique: ① see ② feel ③ test



See ----- Tube defrost.
Feel ----- The difference between tube's temperature.
Test ----- Test pressure.

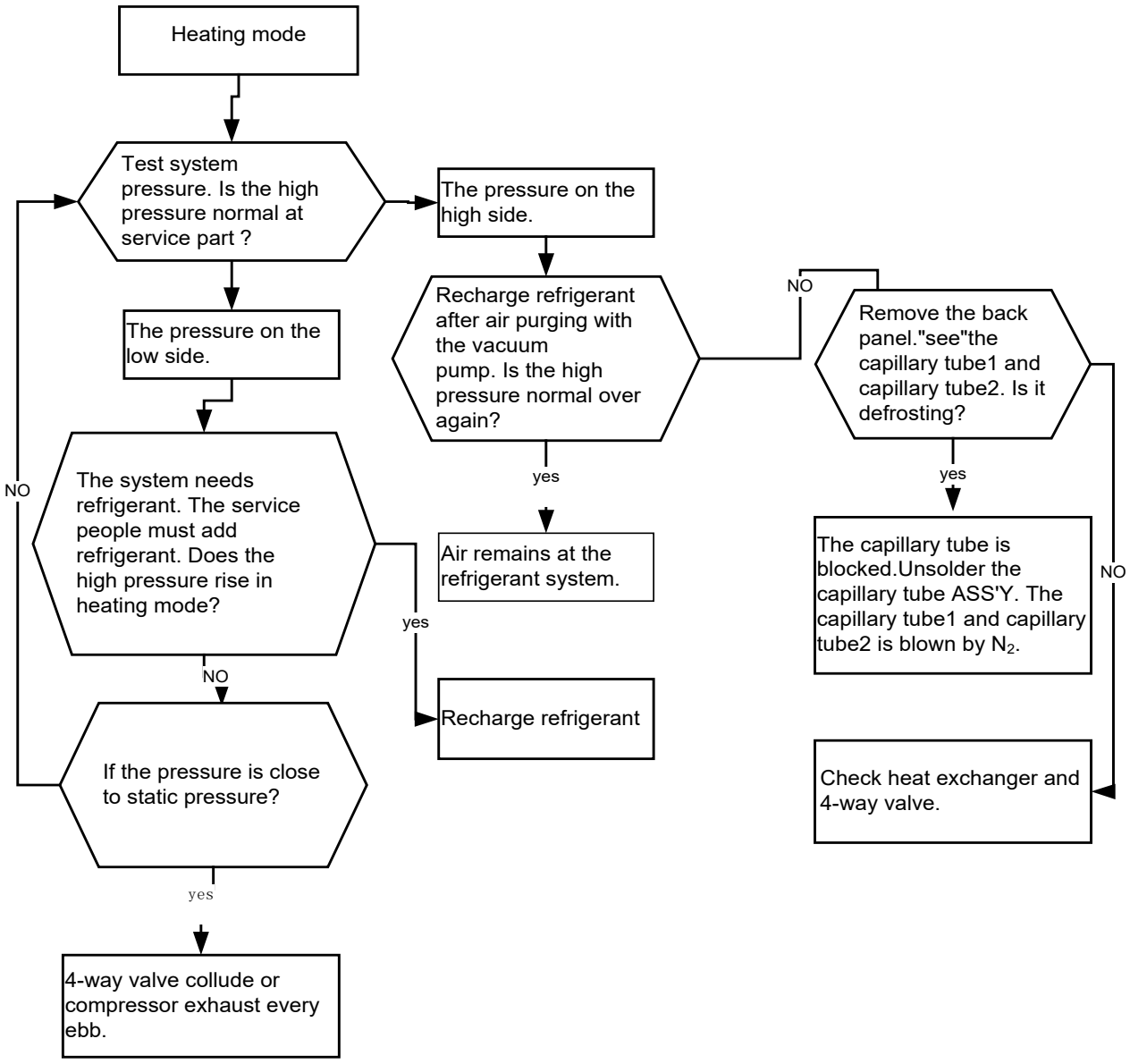


Figure 502

COMPONENTS TESTING

Compressor

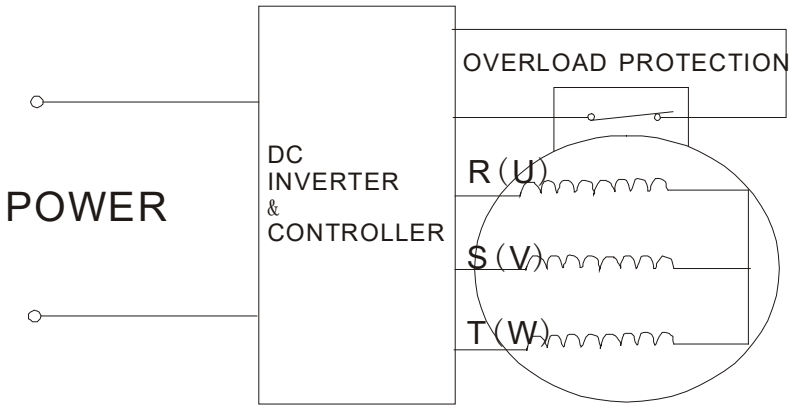


Figure 601

24K/36K : EATF250D22UMT

48K/60K: EATF400D64UMTA

Resistance Test.

The compressor is at fault if the resistance of winding is 0(short circuit)or∞ open circuit.
All 3 winding should show equal resistance.
Common signs compressor is faulty:

- Compressor motor lock.
- Discharge pressure value approaches static pressure value .
- Compressor motor winding abnormality.

Note:

- Don't put a compressor on its side or turn over.
- Assemble the compressor quickly after removing the plugs. Prolonged exposure will damage the internal components of the compressor
- Ensure wiring is correct before operating. Reverse operation will permanently damage the compressor.

- **Electric Reactor**

Common Problems:

- Sound abnormality
- Runs in a sporadic rhythm.

COMPONENTS TESTING

EEV Stepper Coil

Discharge pipe temperature is too high. This means the compressor is over heating and will shut down and lock itself out. The cause for this issue is lack of refrigerant coming back to the compressor to cool the compressor. The main causes of this would be low charge, restriction or issue with the electronic expansion valve (EEV).

Check Resistance of EEV stepper coil.
Using an ohmmeter check all wires against each other.
5 wire EEV
Grey to all colors is 45 +/- 10%
All other colors to each other are 95 +/- 10%

Remove the head off the EEV (pulls right off) & check for any rust build up. If there is any rust inside the EEV head, replace the EEV head. If there is rust on the EEV body you can clean it up with some emery cloth.

Figure 602

Figure 602

COMPONENTS TESTING

Outdoor Fan Motor

1. Outdoor unit fan motor

DC motor

24K: ZWK511A805001

36K/48K/60K: SIC-71FW-F8121-

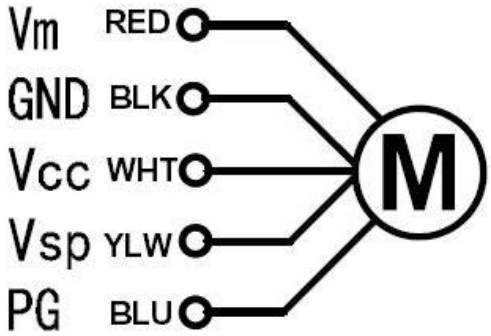


Figure 603

4. Check outdoor fan connector on driver Board Plug J8 as shown in figure below.
   There are 4 wires:
   Voltage for Power (Red) to Ground (Black) = 280 VDC
   Motor Return Voltage (White) to Ground (Black) = 15VDC
   PWM (Yellow) to Ground (Black) = 0-6.5VDC (Oscillating)
   Feedback (Blue) to Ground (Black) = VDC (Oscillating)

COMPONENTS TESTING

Indoor Fan Motor

Indoor Unit Fan Motor
Duct motor model
24K: ZWK702B006073
36K: ZWK702B500026
48K: ZKSD-560-8-50-14
60K: ZKSD-560-8-58

Check Power for Motor
Check L1 and L2 for 230 VAC

DC Voltage test

TOOL: Multimeter.
Black probe on white(com)
With Red probe Check for 24 + VAC on
Blue wire for low speed setting,
Blue and Grey wire for medium fan speed setting,
Blue, Grey, and Red wire for High fan speed setting.
Each wire should read 24 VAC with demand for indoor fan.
Insert screwdriver to rotate indoor fan motor slowly for 1 revolution or over, and measure voltage "YELLOW" and "GND" on motor. The voltage repeats 0V DC and 5V DC.

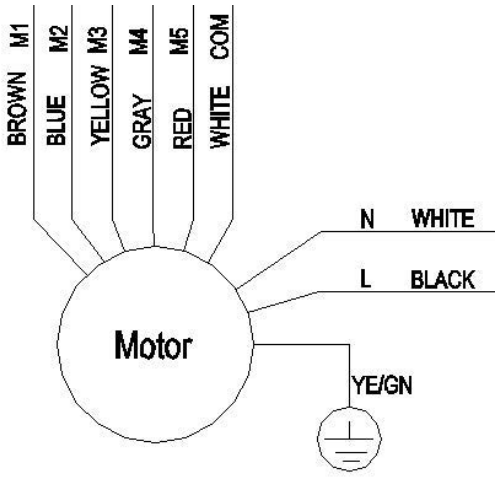
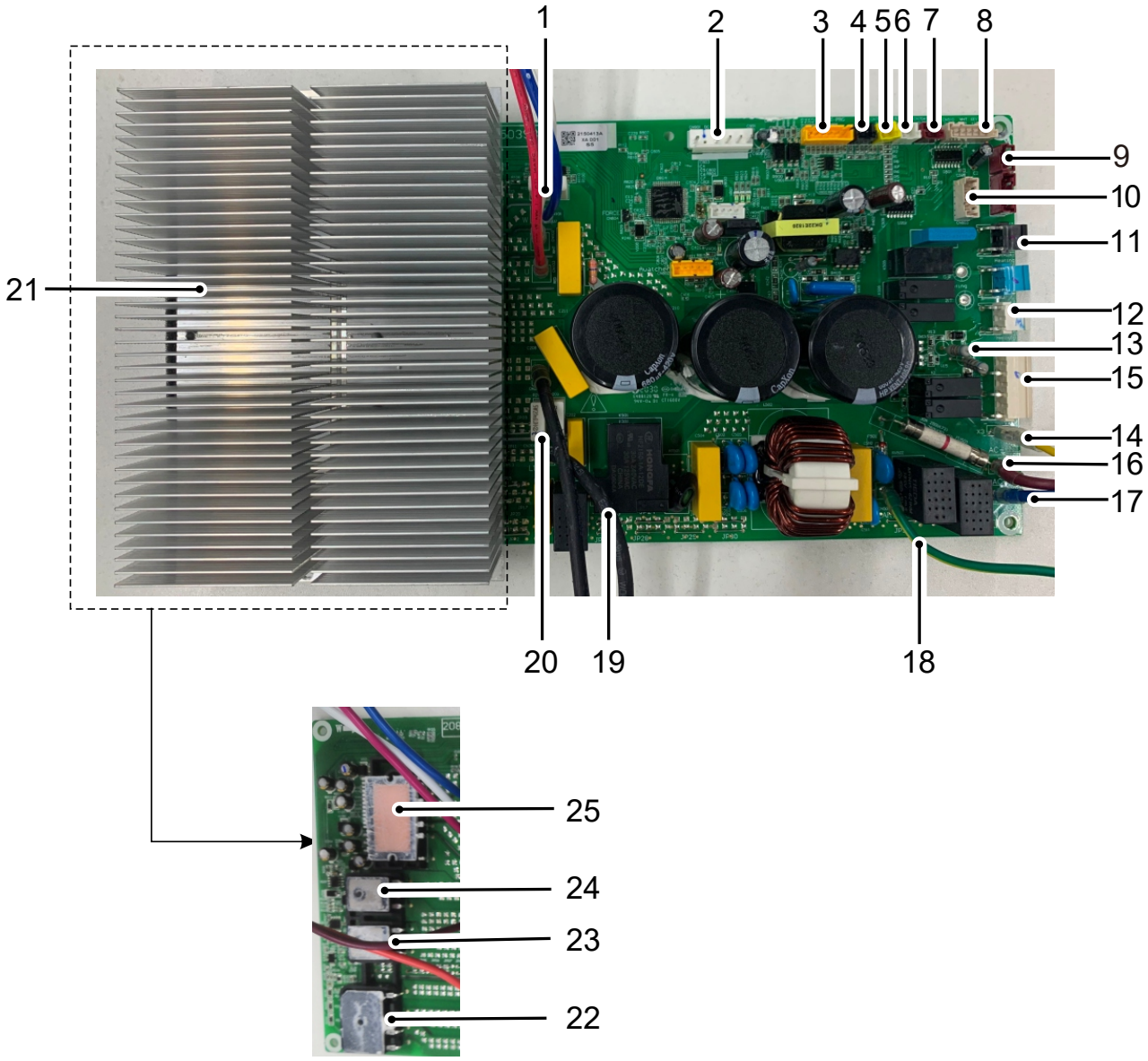


Figure 604

NOTES:
Do not hold motor by lead wires.
Do not plug IN/OUT the motor connector while power is ON.
Do not drop hurl or dump motor against hard material. Malfunction may not be observed at early stage after such shock. But it may be found later, this type of mishandling voids our warranty.

COMPONENTS TESTING

24k-36k BTU Outdoor Unit Logic PCB



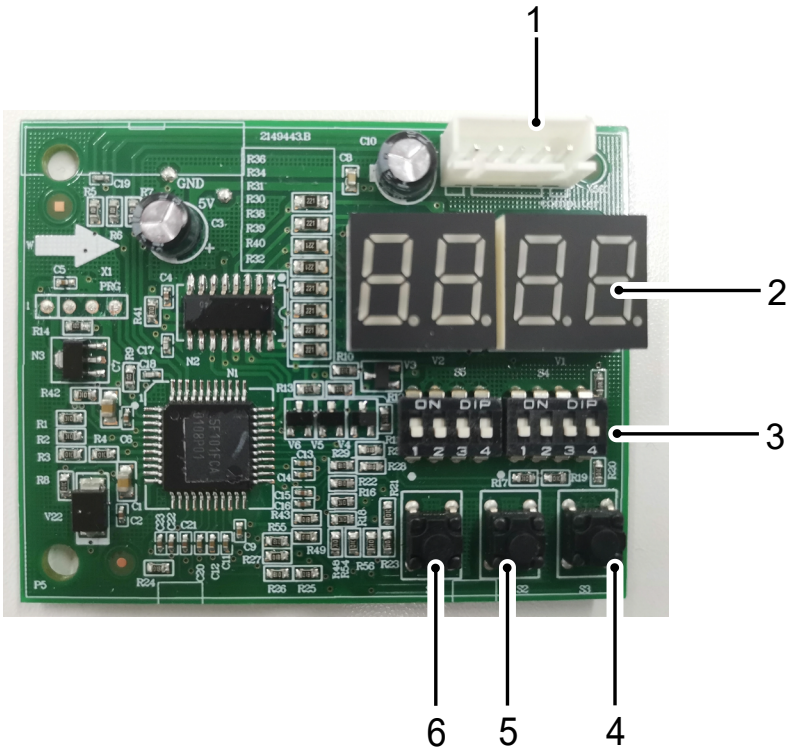
NO.	Description	NO.	Description
1	Compressor	14	SI Signal
2	DC Fan Motor	15	Low Voltage Terminal Connections
3	EEPROM	16	AC Power Lin
4	Coil Temperature Sensor	17	AC Power Nin
5	Ambient Temperature Sensor	18	Ground Wire
6	Discharge Temperature Sensor	19	Reactor L2 Wiring Terminal
7	Overheat Protector	20	Reactor L1 Wiring Terminal
8	Electronic Expansion Valve	21	Radiator
9	Pressure Sensor	22	Rectifier Bridge
10	Computer/Checker	23	IGBT
11	4-way Valve	24	Diode
12	Crankcase Heater	25	IPM
13	Crankcase Heater		

Figure 605 (24k-36k units)

COMPONENTS TESTING

24k-36k BTU Outdoor Unit Display PCB

7 Segment display board (Checker board)

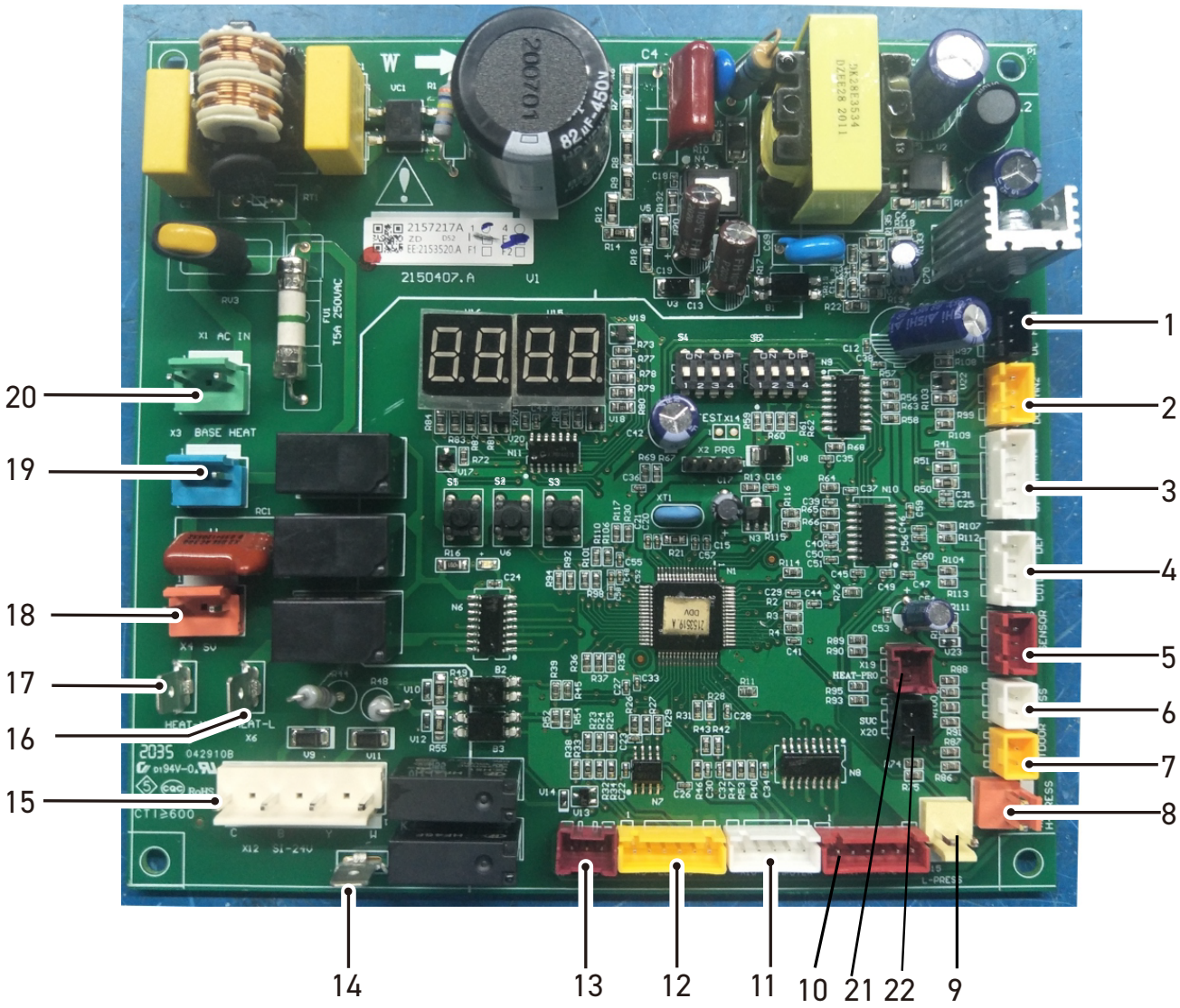


NO.	Description	NO.	Description
1	Computer/Checker to Outdoor Control Board	4	S3-Decrease Button
2	7-Segment Display	5	S1-Increase Button
3	DIP Switch	6	S2-Select Button

Figure 606 (Display PCB 48k-60 units)

COMPONENTS TESTING

48k-60k BTU Outdoor Unit Logic PCB

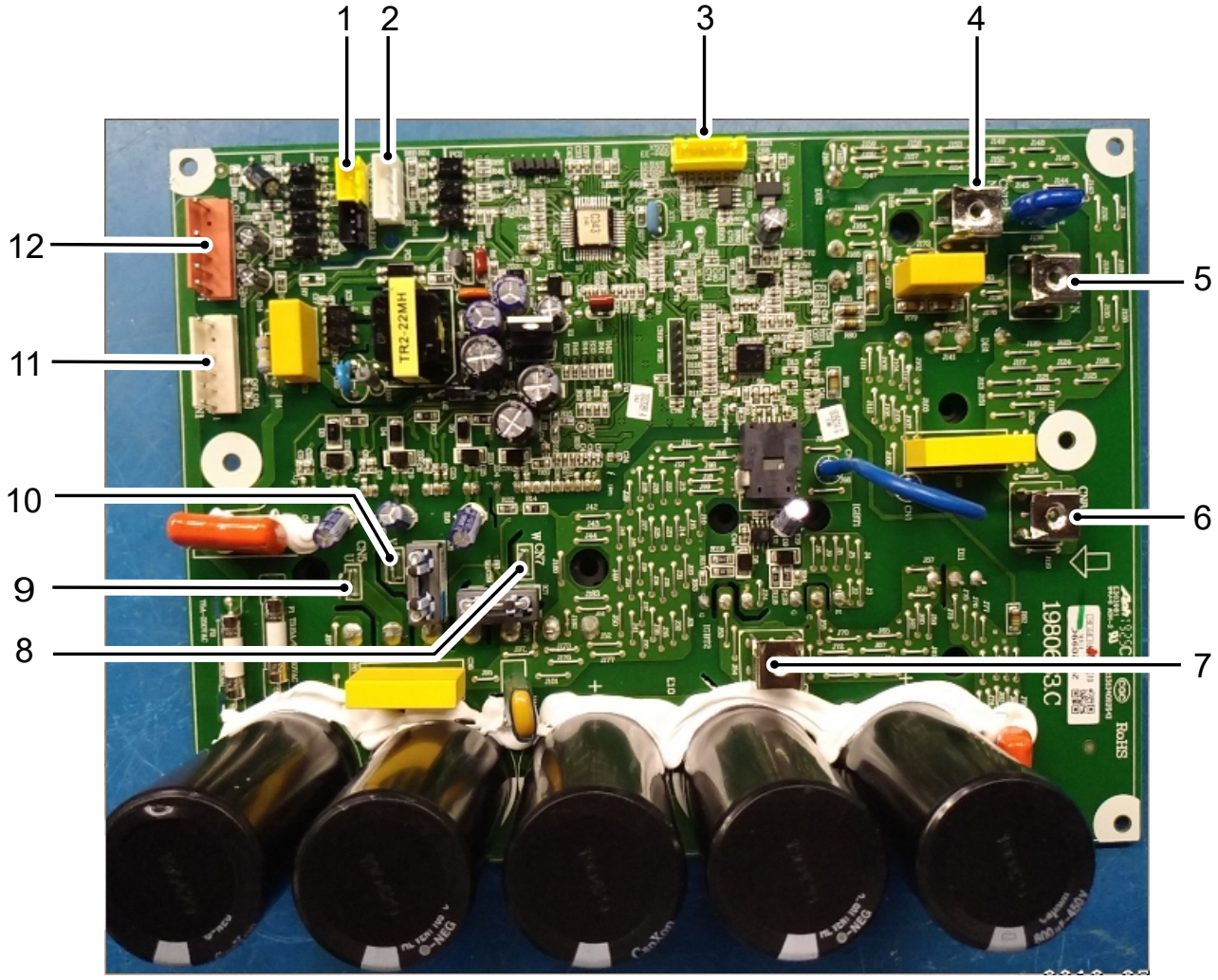


NO.	Description	NO.	Description
1	DC Fan Driver 1	11	Computer/Checker
2	DC Fan Driver 2	12	EEPROM
3	Communication Between Main Control Board & IPM	13	Communication Between Main Control Board& Filter Board
4	Defrost /Coil Temperature Sensor	14	SI Communication
5	Pressure Sensor	15	Low Voltage Terminal Connections
6	Discharge Temperature Sensor	16	Crankcase Heater
7	Ambient Temperature Sensor	17	Crankcase Heater
8	High Pressure Switch	18	4-way Valve
9	Low Pressure Switch	19	Drainage Pan Heater
10	Electronic Expansion Valve	20	AC Power Input
21	Overheat Protection Switch	22	Suction Temp Sensor

Figure 607 (Logic PCB 48k-60k BTU units)

COMPONENTS TESTING

48 - 60k BTU Driver PCB



NO.	Description	NO.	Description
1	DC Fan Driver	7	Reactor L2
2	Communication Between Main Control Board & IPM	8	Compressor W
3	EEPROM	9	Compressor U
4	Nin	10	Compressor V
5	Lin	11	DC Fan 1
6	Reactor L1	12	DC Fan 2

Figure 608 (48-60k BTU Driver PCB)

COMPONENTS TESTING

48-60k Outdoor Unit Filter Board

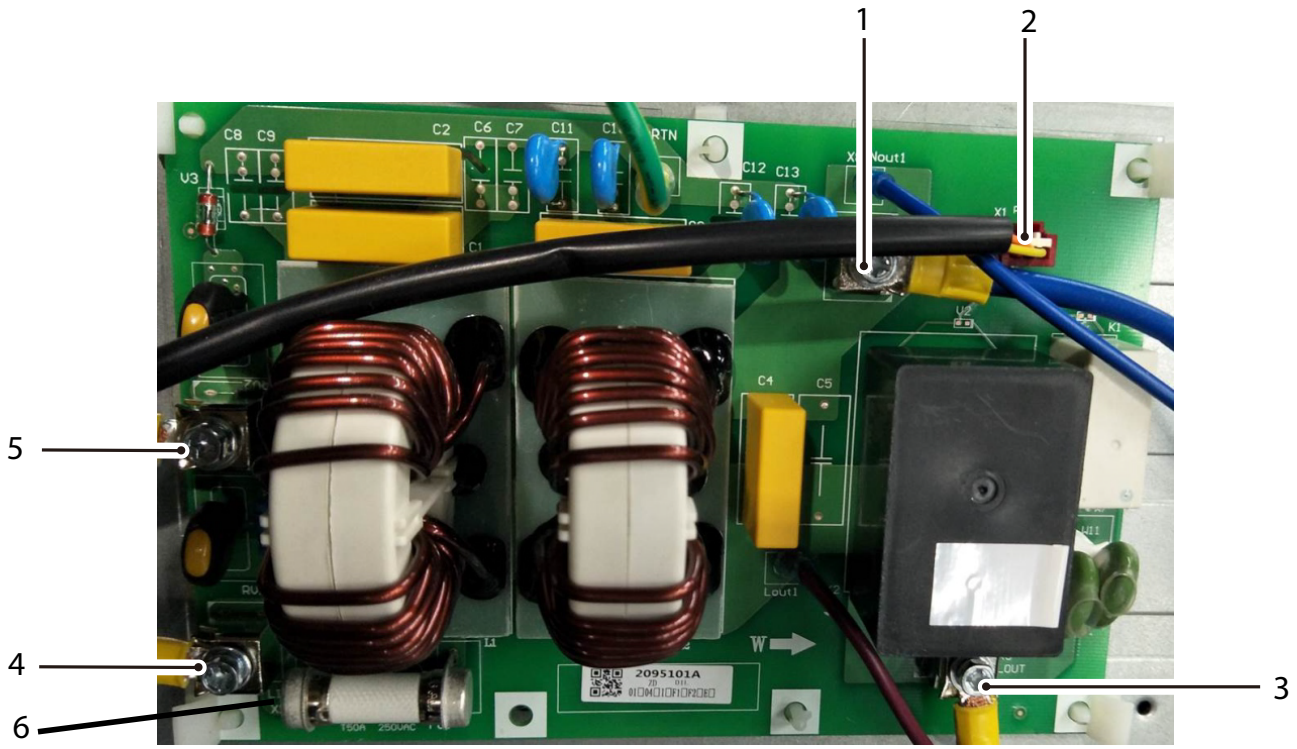
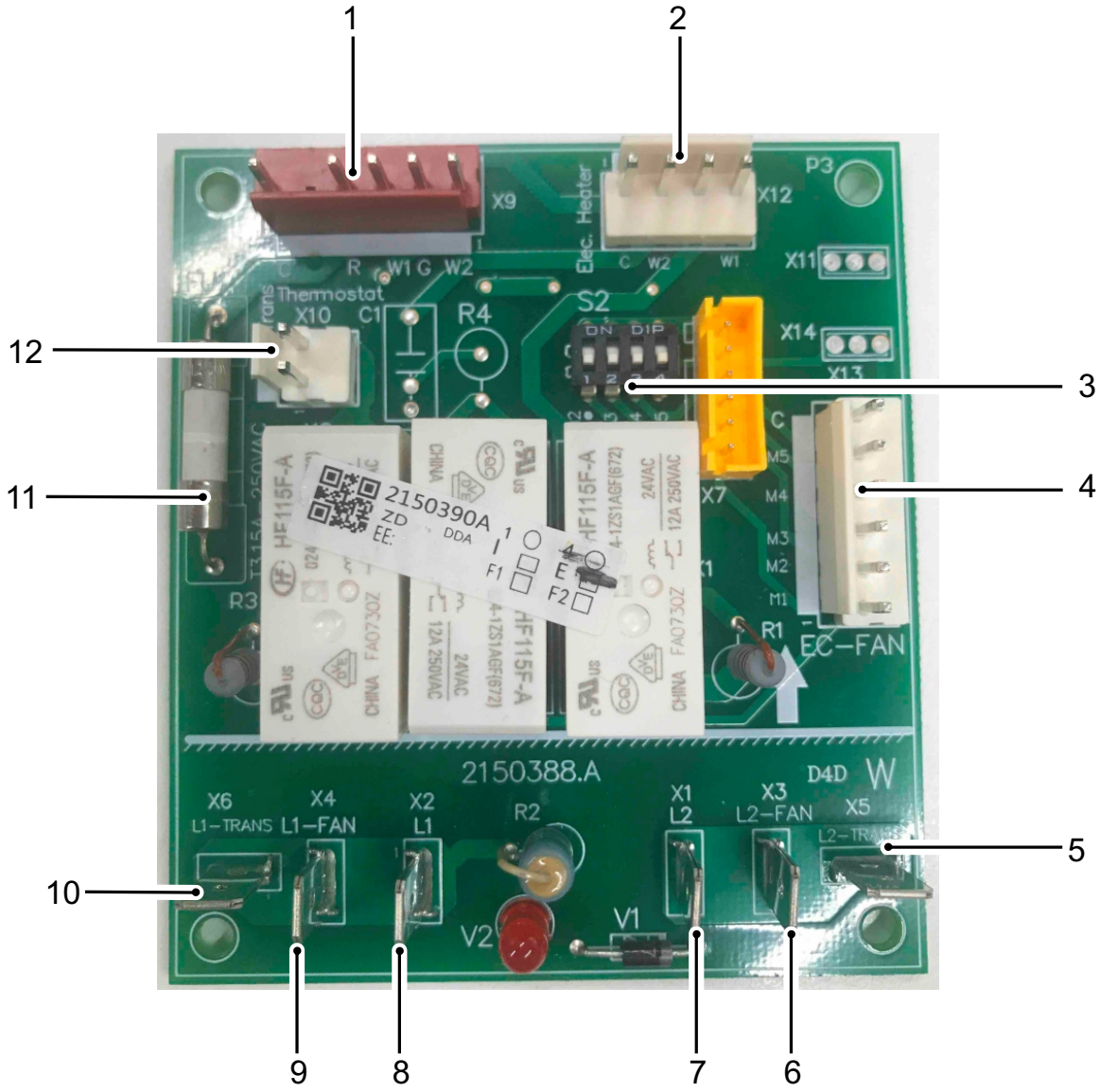


Figure 609 (48-60k BTU Filter PCB)

PIN	DESCRIPTION	CHECK	ACTION
1	n out		
2	Communication Between Main Control Board&Filter Board		
3	L OUT		
4	L IN		
5	N IN		
6	FUSE	With Power Off Unit Check For Continuity	Replace Filter PCB

COMPONENTS TESTING

Indoor Unit Logic PCB

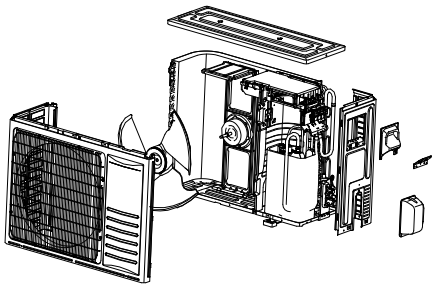
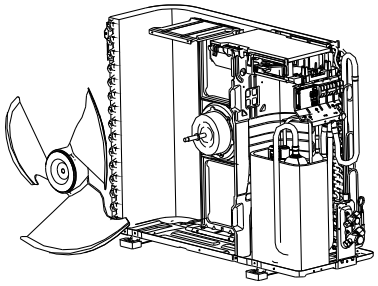
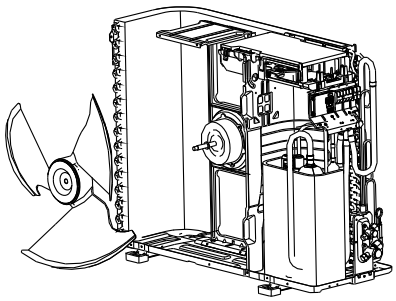
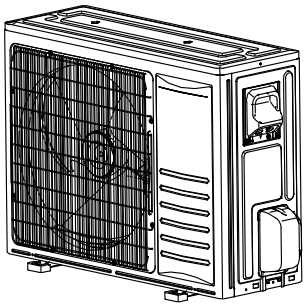


NO.	Description	NO.	Description
1	Thermostat	7	AC Power L2
2	Electrical Heat Kit	8	AC Power L1
3	DIP Switch for Blower Speed	9	L1 for Fan Motor
4	Fan Motor Control	10	L1 for Transformer
5	L2 for Transformer	11	Fuse
6	L2 for Fan Motor	12	AC 24V from Transformer

Figure 610 (IDU Logic PCB)

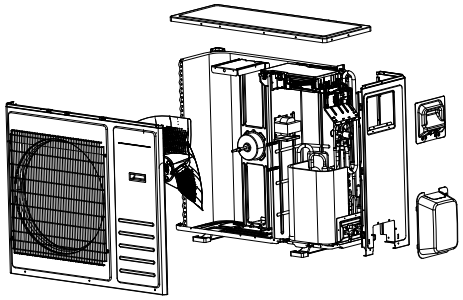
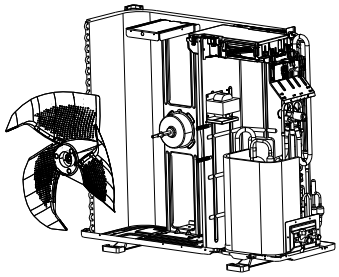
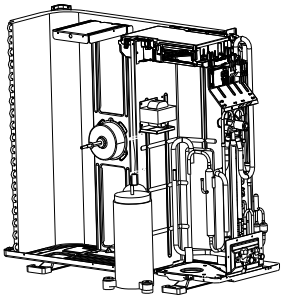
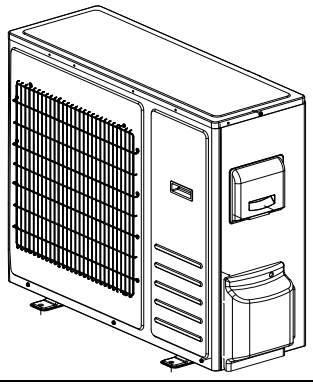
UNIT DISASSEMBLY

24k Outdoor Unit -Compressor And Motor

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.		
Step	**Illustration**	**Handling Instruction**
1. Remove external casing		1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2. Remove motor		1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter.
3. Remove compressor		1. Reclaim the refrigerant from the entire system; 2. Unsolder the 4-way valve piping assy from compressor; 3. Remove the compressor mounting bolts; 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

UNIT DISASSEMBLY

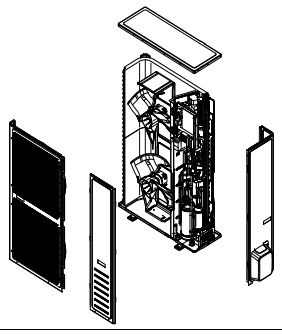
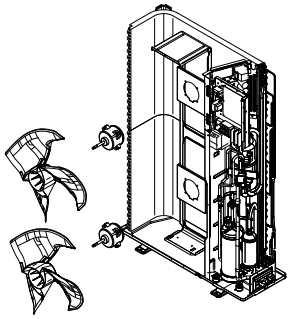
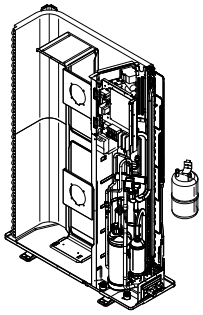
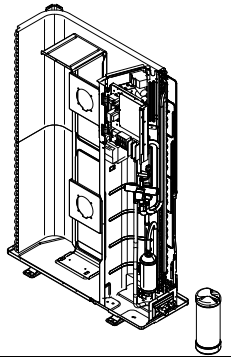
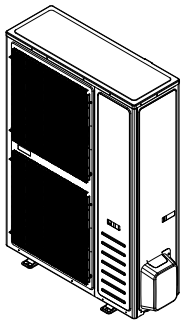
36k Outdoor Unit -compressor and motor

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.		
Step	**Illustration**	**Handling Instruction**
1. Remove external casing		1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2. Remove motor		1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter.
3. Remove compressor		1. Reclaim the refrigerant from the entire system; 2. Unsolder the 4-way valve piping assy from compressor; 3. Remove the compressor mounting bolts; 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

UNIT DISASSEMBLY

48k/60k Outdoor Unit -Compressor And Motor

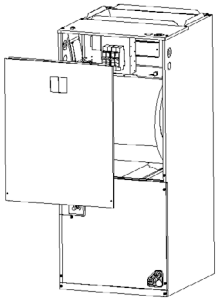
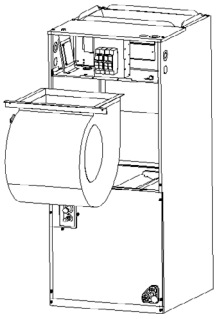
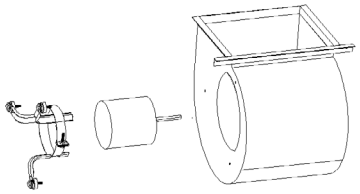
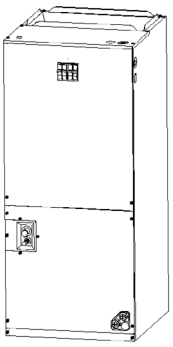
Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

Step	Illustration	Handling Instruction
1. Remove external casing		1. Remove the top cover, handle and valve cover. 2. Remove the outer case and right side plate.
2. Remove motor		1. Remove the blade nut and then remove the blade. 2. Remove the motor from motor supporter.
3. Remove gas liquid separator		1. Reclaim the refrigerant from the entire system. 2. Unsolder the 4-way valve piping assy from gas liquid separator. 3. Remove the gas liquid separator.
4. Remove compressor		1. Reclaim the refrigerant from the entire system. 2. Unsolder the 4-way valve piping assy from compressor. 3. Remove the compressor mounting bolts. 4. Carefully remove the compressor from chassis.
5. Assemble unit		Assemble the unit in the reverse order of disassembly.

UNIT DISASSEMBLY

24-60k Indoor Unit - Fan and Motor

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

Step	Illustration	Handling Instruction
1. Remove the top panel and unplug the motor cables.		Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Take out the fan snail shell unit.		Use screwdriver to unscrew two bolts from the top of the unit.
3. Remove the motor and the motor mount.		Use wrench to unscrew three bolts from the side of shell.
4. Reassembly of the unit. Assemble the unit		Reassemble the unit in the reverse order of disassembly and test operation.

R-410A REFRIGERANT SYSTEM REPAIR

General Information

⚠ WARNING

RISK OF ELECTRIC SHOCK

Unplug and/or disconnect all electrical power to the unit before performing inspections, maintenances or service.

Failure to do so could result in electric shock, serious injury or death.

⚠ WARNING

Refrigeration system under high pressure

Do not puncture, heat, expose to flame or incinerate.

Only certified refrigeration technicians should service this equipment.

R410A systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used.

Only use gauge sets designed for use with R410A. Do not use standard R22 gauge sets.

Proper refrigerant charge is essential to unit operation. Operating a unit with an improper refrigerant charge will result in reduced performance (capacity) and/or efficiency. Accordingly, the use of proper charging methods during servicing will insure that the unit is functioning as designed and that its compressor will not be damaged.

Too much refrigerant (overcharge) in the system is just as bad (if not worse) than not enough refrigerant (undercharge). They both can be the source of certain compressor failures if they remain uncorrected for any period of time. Quite often, other problems (such as low air flow across evaporator, etc.) are misdiagnosed as refrigerant charge problems.

An overcharged unit will at times return liquid refrigerant (slugging) back to the suction side of the compressor eventually causing a mechanical failure within the compressor. This mechanical failure can manifest itself as valve failure, bearing failure, and/or other mechanical failure. The specific type of failure will be influenced by the amount of liquid being returned, and the length of time the slugging continues.

Not enough refrigerant (undercharge) on the other hand, will cause the temperature of the suction gas to increase to the point where it does not provide sufficient cooling for the compressor motor. When this occurs, the motor winding temperature will increase causing the motor to overheat and possibly cycle open the compressor overload protector. Continued overheating of the motor windings and/or cycling of the overload will eventually lead to compressor motor or overload failure.

R-410A REFRIGERANT SYSTEM REPAIR

General Information

Under charged System

- An undercharged system will result in poor performance (low pressures, etc.) in both the heating and cooling cycle.
- Whenever you service a unit with an undercharge of refrigerant, always suspect a leak. The leak must be repaired before charging the unit.
- To check for an undercharged system, turn the unit on, allow the compressor to run long enough to establish working pressures in the system (15 to 20 minutes).
- During the cooling cycle you can listen carefully at the exit of the metering device into the evaporator; an intermittent hissing and gurgling sound indicates a low refrigerant charge. Intermittent frosting and thawing of the evaporator is another indication of a low charge, however, frosting and thawing can also be caused by insufficient air over the evaporator.
- Checks for an undercharged system can be made at the compressor. If the compressor seems quieter than normal, it is an indication of a low refrigerant charge.
- A check of the amperage drawn by the compressor motor should show a lower reading. (Check the Unit Specification.) After the unit has run 10 to 15 minutes, check the gauge pressures. Gauges connected to system with an undercharge will have low head pressures and substantially low suction pressures.

Overcharged System

- Compressor amps will be near normal or higher. Non-condensables can also cause these symptoms. To confirm, remove some of the charge, if conditions improve, system may be overcharged. If conditions don't improve, Non-condensables are indicated.
- Whenever an overcharged system is indicated, always make sure that the problem is not caused by air flow problems. Improper air flow over the condenser coil may indicate some of the same symptoms as an over charged system.
- An overcharge can cause the compressor to fail, since it would be "slugged" with liquid refrigerant.
- The charge for any system is critical. When the compressor is noisy, suspect an overcharge, when you are sure that the air quantity over the condenser coil is correct. Icing of the evaporator will not be encountered because the refrigerant will boil later if at all. Gauges connected to system will usually have higher head pressure (depending upon amount of over charge). Suction pressure should be slightly higher.

Restricted System

- Troubleshooting a restricted refrigerant system can be difficult. The following procedures are the more common problems and solutions to these problems. There are two types of refrigerant restrictions: Partial restrictions and complete restrictions.
- A partial restriction allows some of the refrigerant to circulate through the system.
- With a complete restriction there is no circulation of refrigerant in the system.
- Restricted refrigerant systems display the same symptoms as a "low-charge condition."
- When the unit is shut off, the gauges may equalize very slowly.
- A quick check for either condition begins at the evaporator. With a partial restriction, there may be gurgling sounds at the metering device entrance to the evaporator. The evaporator in a partial restriction could be partially frosted or have an ice ball close to the entrance of the metering device. Frost may continue on the suction line back to the compressor.
- Often a partial restriction of any type can be found by feel, as there is a temperature difference from one side of the restriction to the other.
- With a complete restriction, there will be no sound at the metering device entrance. An amperage check of the compressor with a partial restriction may show normal current when compared to the unit specification. With a complete restriction the current drawn may be considerably less than normal, as the compressor is running in a deep vacuum (no load.) Much of the area of the condenser will be relatively cool since most or all of the liquid refrigerant will be stored there.

R-410A REFRIGERANT SYSTEM REPAIR

Compressor Replacement

⚠ WARNING

ELECTRIC SHOCK HAZARD

Disconnect power to the unit before servicing. Failure to follow this warning could result in serious injury or death.

⚠ CAUTION

FREEZE HAZARD

Proper safety procedures must be followed, and proper protective clothing must be worn when working with liquid refrigerant.

Failure to follow these procedures could result in minor to moderate injury.

⚠ WARNING

BURN HAZARD

Proper safety procedures must be followed, and proper protective clothing must be worn when working with a torch.

Failure to follow these procedures could result in moderate or serious injury.

⚠ WARNING

EXPLOSION HAZARD

The use of nitrogen requires a pressure regulator. Follow all safety procedures and wear protective safety clothing etc.

Failure to follow proper safety procedures could result in serious injury or death.

1. Be certain to perform all necessary electrical and refrigeration tests to be sure the compressor is actually defective before replacing.

2. Recover all refrigerant from the system though the process tubes. PROPER HANDLING OF RECOVERED REFRIGERANT ACCORDING TO EPA REGULATIONS IS REQUIRED. Do not use gauge manifold for this purpose if there has been a burnout. You will contaminate your manifold and hoses. Use a Schrader valve adapter and copper tubing for burnout failures.

3. After all refrigerant has been recovered, disconnect suction and discharge lines from the compressor and remove compressor. Be certain to have both suction and discharge process tubes open to atmosphere.

4. Carefully pour a small amount of oil from the suction stub of the defective compressor into a clean container.

5. Using an acid test kit (one shot or conventional kit), test the oil for acid content according to the instructions with the kit.

6. If any evidence of a burnout is found, no matter how slight, the system will need to be cleaned up following proper procedures.

7. Install the replacement compressor.

8. Pressurize with a combination of R-410A and nitrogen and leak test all connections. If a leak cannot be found, pressurize with a combination of Nitrogen and a trace charge of R-410A and sweep with with an electronic or Halide leak detector. Recover refrigerant and repair any leaks found.

8a. If leak detector is unavailable remove all refrigerant from system and pressurize with nitrogen to 550 psi. Check that system holds pressure. Repeat Step 8 to insure no more leaks are present

9. Evacuate and charge the system. Refer to the evacuation and charging section of this manual. While the unit is being evacuated, seal all openings on the defective compressor. Compressor manufacturers will void warranties on units received not properly sealed. Do not distort the manufacturers tube connections.

R-410A REFRIGERANT SYSTEM REPAIR

Compressor Replacement -Special Procedure in Case of Compressor Burnout

⚠ WARNING

HIGH PRESSURE HAZARD

Sealed Refrigeration System contains refrigerant and oil under high pressure.

Proper safety procedures must be followed, and proper protective clothing must be worn when working with refrigerants.

Failure to follow these procedures could result in serious injury or death.

⚠ WARNING

ELECTRIC SHOCK HAZARD

Turn off electric power before service or installation. Extreme care must be used, if it becomes necessary to work on equipment with power applied.

Failure to do so could result in serious injury or death.

⚠ WARNING

EXPLOSION HAZARD

The use of nitrogen requires a pressure regulator. Follow all safety procedures and wear protective safety clothing etc.

Failure to follow proper safety procedures could result in serious injury or death.

⚠ WARNING

NEVER, under any circumstances, liquid charge a rotary-compressor through the LOW side. Doing so would cause permanent damage to the new compressor. Use a charging adapter.

1. Recover all refrigerant and oil from the system.

2. Remove compressor and EEV.

3. Flush evaporator, condenser and all connecting tubing with dry nitrogen or equivalent. Use standard flushing agent to remove all contamination from system. Inspect suction and discharge line for carbon deposits. Remove and clean if necessary. Ensure all acid is neutralized.

4. Reassemble the system.

5. Pressurize with a combination of R-410A and nitrogen and leak test all connections. If a leak cannot be found, pressurize with a combination of Nitrogen and a trace charge of R-410A and sweep with with an electronic or Halide leak detector. Recover refrigerant and repair any leaks found.

5a. If leak detector is unavailable remove all refrigerant from system and pressurize with nitrogen to 550 psi. Check that system holds pressure. Repeat Step 5 to insure no more leaks are present

6. Evacuate and charge the system. Refer to the evacuation and charging section of this manual. While the unit is being evacuated, seal all openings on the defective compressor. Compressor manufacturers will void warranties on units received not properly sealed. Do not distort the manufacturers tube connections.

R-410A REFRIGERANT SYSTEM REPAIR

Replace The Reversing Valve

⚠ WARNING

HIGH PRESSURE HAZARD

Sealed Refrigeration System contains refrigerant and oil under high pressure.

Proper safety procedures must be followed, and proper protective clothing must be worn when working with refrigerants.

Failure to follow these procedures could result in serious injury or death.

NOTICE

FIRE HAZARD

Not following the above WARNING could result in fire or electically unsafe conditions which could cause moderate or serious property damage.
Read, understand and follow the above warning.

⚠ WARNING

EXPLOSION HAZARD

The use of nitrogen requires a pressure regulator. Follow all safety procedures and wear protective safety clothing etc.

Failure to follow proper safety procedures could result in serious injury or death.

1. Recover refrigerant from sealed system. PROPER HANDLING OF RECOVERED REFRIGERANT ACCORDING TO EPA REGULATIONS IS REQUIRED.

2. Remove solenoid coil from reversing valve. If coil is to be reused, protect from heat while changing valve.

3. Unbraze all lines from reversing valve.

4. Clean all excess braze from all tubing so that they will slip into fittings on new valve.

5. Remove solenoid coil from new valve.

6. Protect new valve body from heat while brazing with plastic heat sink (Thermo Trap) or wrap valve body with wet rag.

7. Fit all lines into new valve and braze lines into new valve.

8. Pressurize sealed system with a combination of R-410A and nitrogen and check for leaks, using a suitable leak detector. Recover refrigerant per EPA guidelines.

9. Once the sealed system is leak free, install solenoid coil on new valve.

NOTE: When brazing a reversing valve into the system, it is of extreme importance that the temperature of the valve does not exceed 250°F at any time.

Wrap the reversing valve with a large rag saturated with water. "Re-wet" the rag and thoroughly cool the valve after each brazing operation of the four joints involved.

The wet rag around the reversing valve will eliminate conduction of heat to the valve body when brazing the line connection.

9. Evacuate and charge the system. Refer to the evacuation and charging section of this manual. While the unit is being evacuated, seal all openings on the defective compressor. Compressor manufacturers will void warranties on units received not properly sealed. Do not distort the manufacturers tube connections.

R-410A REFRIGERANT SYSTEM REPAIR

TXV Replacement

⚠ WARNING

HIGH PRESSURE HAZARD

Sealed Refrigeration System contains refrigerant and oil under high pressure.

Proper safety procedures must be followed, and proper protective clothing must be worn when working with refrigerants.

Failure to follow these procedures could result in serious injury or death.

NOTICE

FIRE HAZARD

Not following the above WARNING could result in fire or electically unsafe conditions which could cause moderate or serious property damage.
Read, understand and follow the above warning.

⚠ WARNING

EXPLOSION HAZARD

The use of nitrogen requires a pressure regulator. Follow all safety procedures and wear protective safety clothing etc.

Failure to follow proper safety procedures could result in serious injury or death.

Please follow the steps below when replacing TXV:

NOTICE:
The TXV must be able to open to the maximum angle while running in heating mode and be adjusted to 4-6˚ F superheat.

1. Disassemble the front panel.

2. Remove the thermal bulb down by undoing the insulation around it.

3. Seal the pressure pipe from the gas pipe with a welding torch. Be careful not to burn the gas pipe.

4. Remove the TXV off from the liquid pipe with a welding torch. Be careful not to burn the liquid pipe.

5. Wrap the new TXV with a piece of wet cloth to prevent damage caused by heat from being too hot and connect the nitrogen flow to the liquid pipe to prevent it from being oxidized. Weld the TXV to the liquid pipe, (solder must be 5% or more silver content) and pay attention to the direction of the TXV, then weld the pressure pipe to the gas pipe.

6. When the pipe cools down, connect it with 550 PSI nitrogen equipment and examine the work for any leaks.

7. Secure the thermal bulb to the gas pipe with insulation strips and perform insulation works.

8. Evacuate the system and charge using the triple evacuation procedure.

9. Allow the unit to operate for 20 minutes, then adjust the TXV superheat to 4-6˚F.

10. After the unit has operated for another 20 minutes, examine whether the superheat is appropriate and record the reading.

R-410A REFRIGERANT SYSTEM REPAIR

Method of Triple Evacuation

Friedrich requires that all installations and repairs are Leak Checked and Evacuated in accordance to the "triple evacuation" process. This process promotes a dry tight refrigeration system before opening the service valves. It recommended that a single port refrigeration manifold and hoses rated over 31.5 psi be used. Refrigeration hose valves, along with a vacuum pump and micron gauge, must be used to ensure the system can be vacuumed and held under 500 microns. Check all equipment and hoses for proper usage and leaks before beginning.

⚠ WARNING

BURN HAZARD

Proper safety procedures must be followed, and proper protective clothing must be worn when working with a torch.

Failure to follow these procedures could result in moderate or serious injury.

This installation requires the installation of a liquid line drier after Installation and after any repair that requires opening the refrigerant system to outside air.

1. 1st Nitrogen Pressure Test:
Ensure all refrigeration connections are properly flared, secured, and torqued to their respective settings. Pressurize the system with nitrogen to 550 psi. Soap all connections with an approved refrigerant leak detection solution. The pressure in the system must hold for one hour respective to the environmental conditions and should not vary less than 540 psi. If pressure can not be adequate held, check integrity of flares and torque specifications. Once pressure is held adequately, purge the nitrogen charge to system pressure of 5-10 psi. DO NOT RETURN TO ATMOSPHERIC PRESSURE.

⚠ CAUTION

FREEZE HAZARD

Proper safety procedures must be followed, and proper protective clothing must be worn when working with liquid refrigerant.

Failure to follow these procedures could result in minor to moderate injury.

2. 1st Vacuum Micron Test:
Connect hoses and vacuum pump to the outdoor unit as shown in Fig. 436. Start the vacuum pump and vacuum to 1000 microns. Close the valve to the vacuum pump and check for micron rise for 15 minutes. If microns rise to near atmospheric pressure, there is a potential leak; repeat step 1 If microns rise over 5000, the system is very wet and will require further nitrogen purges.

3. 2nd Nitrogen Break:
Once the system holds below 5000 microns, reconnect the nitrogen tank break the system vacuum with 30-50 psi of nitrogen. Wait 5 minutes, then purge to 5-10 psi. DO NOT RETURN TO ATMOSPHERIC PRESSURE.

4. 2nd Vacuum Micron Test:
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 500 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 1000 microns. Repeat steps 3 and 4 until achieved.

5. 3rd Nitrogen Break:
Once the system holds below 1000 microns, reconnect the nitrogen tank break the system vacuum with 30-50 psi of nitrogen. Wait 5 minutes, then purge to 5-10 psi. DO NOT RETURN TO ATMOSPHERIC PRESSURE.

6. 3rd Final Vacuum Micron Test:
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 300 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 500 microns. Repeat steps 3 and 4 until achieved. Once held under 500 microns, the system is considered dry and tight.
Charge system with refrigerant. See Refrigerant Charging Section
The only acceptable method for charging the sealed system is the Weighed in Charge Method. The weighed in charge method is applicable to all units. It is the preferred method to use, as it is the most accurate.

R-410A REFRIGERANT SYSTEM REPAIR

Refrigerant Charging

The weighed in method should always be used whenever a charge is removed from a unit such as for a leak repair, compressor replacement, or when there is no refrigerant charge left in the unit. To charge by this method, requires the following steps:

1. Connect your EPA approved gauges to the proper valves with 750 psig rated pressure hoses.
2. Recover Refrigerant in accordance with EPA regulations.
4. Make necessary repairs to system.

NOTE: When brazing, ensure to flow nitrogen to reduce contamination of capillaries and valves.

5. Evacuate system. Refer to Method of Triple Evacuation.
6. Weigh in refrigerant with the proper quantity of R-410A refrigerant.
7. Start unit, and verify performance.
8. Remove hoses and ensure valves are tight and sealed to the O-ring in the valve cap.

Charging the system:

Unscrew Service Valve Caps to expose the inner hexagon head. Use an allen-head spanner or service wrench with appropriate adapter to release the refrigerant into the system. If the calculated line set length is over 25 ft, weight in the additional charge with an approved refrigerant scale as needed.

Additional Refrigerant Charge

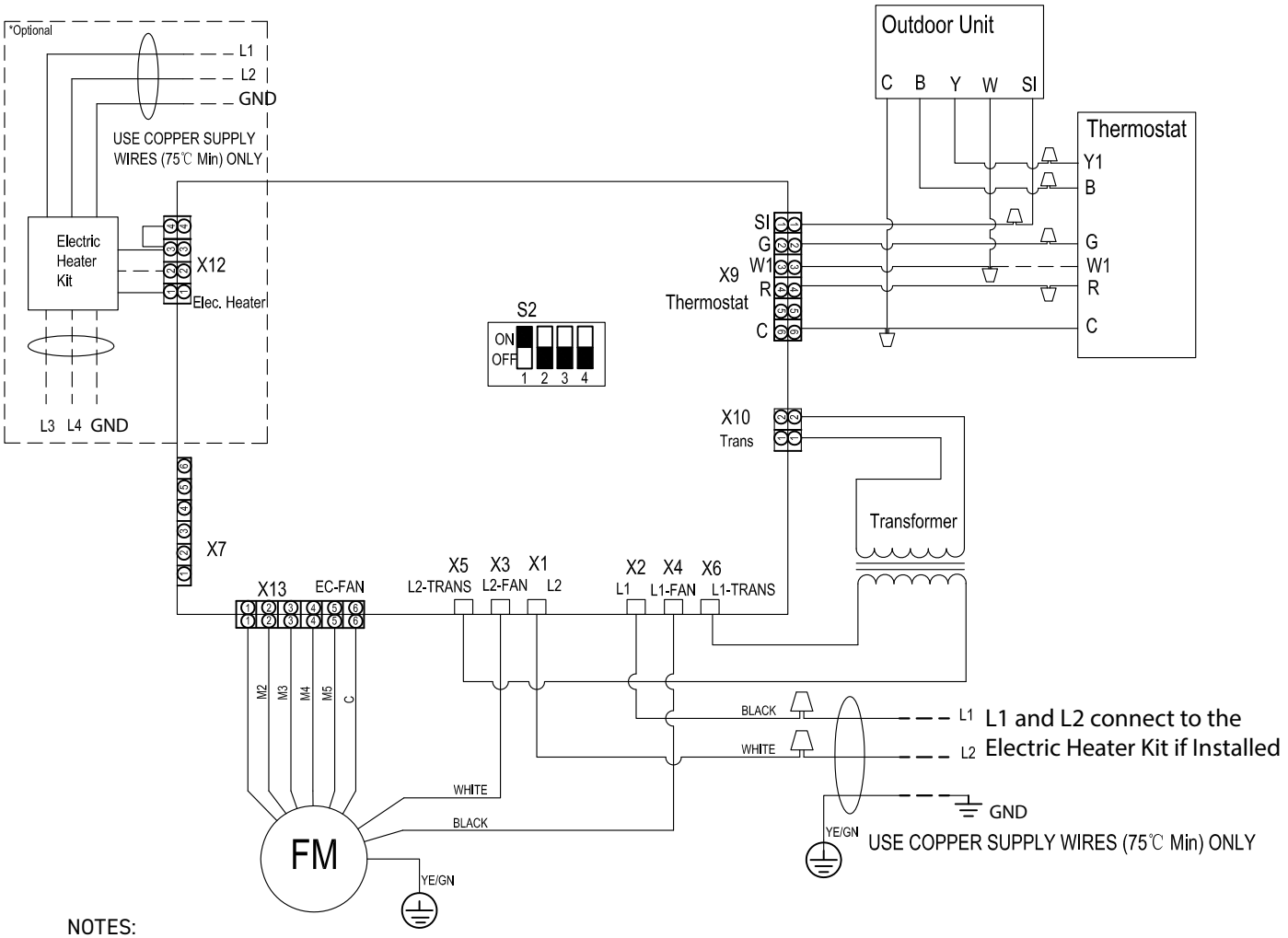
- The additional refrigerant precharge quantity should be determined and charged into the system according to the following procedure.
- Record the additional refrigerant quantity in order to facilitate maintenance and servicing activities. Refrigerant charge before shipment (W0 (oz.))
  W0 is the outdoor unit refrigerant charge before shipment
  Xg is additional refrigerant outdoor unit needed to charge according to piping length during installation.

Model	Max Pipe Length (L)	Max Height Difference (H)	Refrigerant Pre- charged before shipment	Total Refrigerant Pipe Length	
				0 ft -25 ft	Longer than 25 ft
24k	164 feet	98 feet	70.5	0	Xg = 0.38oz/ft ×(Total pipe length(ft.) -25)
36k	246 feet	98 feet	98.7	0	Xg = 0.38oz/ft ×(Total pipe length(ft.) -25)
48k - 60k	246 feet	98 feet	142.9	0	Xg = 0.60oz/ft ×(Total pipe length(ft.) -25)

The Outdoor unit is pre-charge with refrigerant to accommodate a total piping length of 25 feet. Additional refrigerant (R410A) is required for extending the piping beyond 25 feet.

WIRING DIAGRAMS

Indoor Units



NOTES:

1. Use copper wire (167˚F Min) only between disconnect switch and unit.
2. Ensure all wiring complies National and local electrical codes.
3. If any of the original wire supplied must be replaces, use the same or equivalent type.,
4. Connect R to R, G to G, etc. See installation instruction for details
5. Check airflow table to ensure appropriate operations.
6. The Electric Heater Kit is optional. If the electric heater kit needs to be installed please see Installation manual for unit and accessory kit for details.
7. The dashed line means that the component or wire is optional.
8. The DIP switch S2 in the diagram is the factory default configuration. In actual use, please set S2 to choose blower speed according to the value of static pressure.
9. **DO NOT** connect wire (W1) from controller to indoor PCB, if there the electric heater kit is not installed.

Table for thermostat terminal callouts:
R - 24V
C - Common
G - Fan
Y - Call for cooling
B - Reversing Valve engage for Heating
W1 - Call for Aux/defrost heating.
SI - Signal between matched AHU/ODU

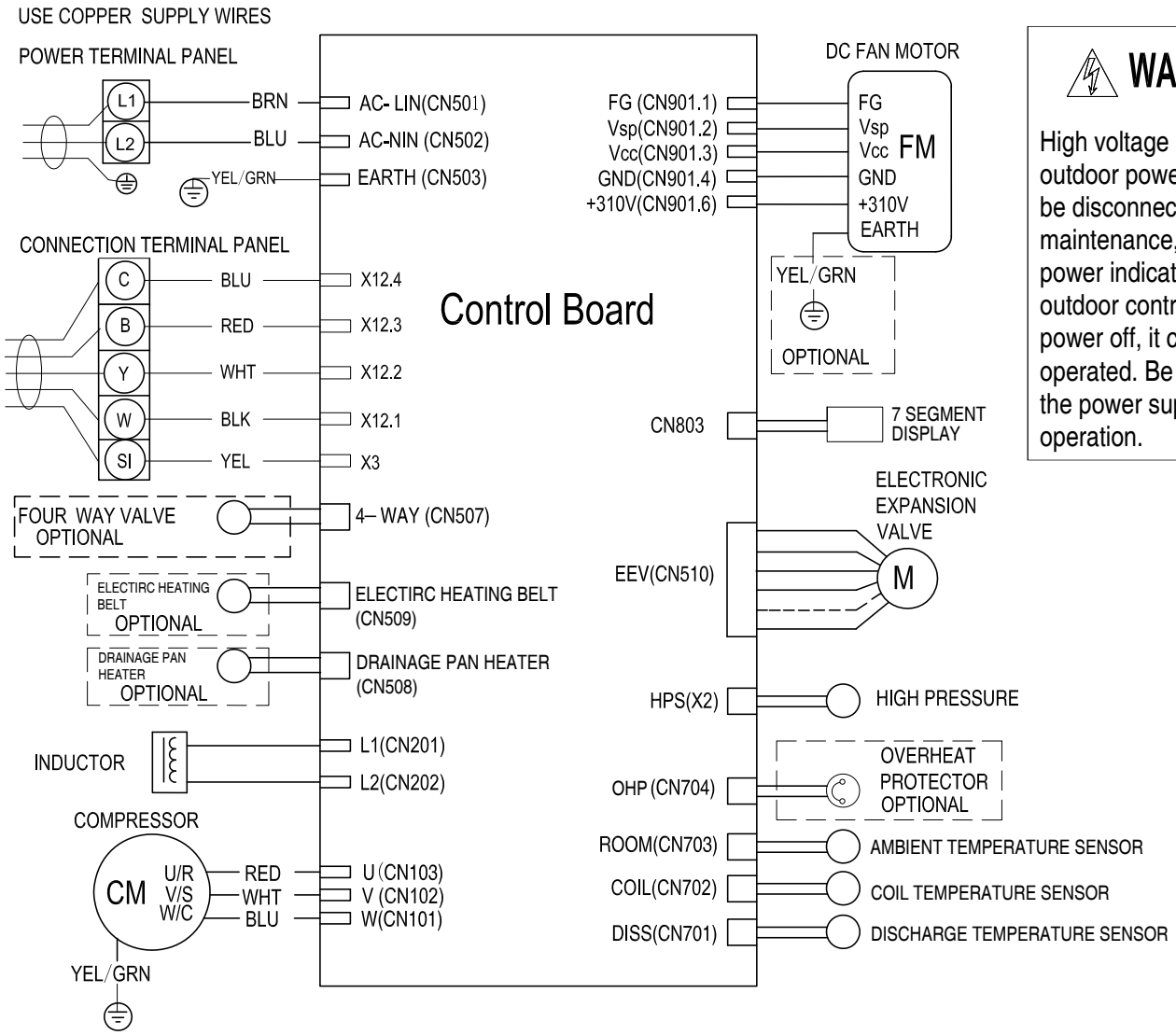
Note: Set thermostat to "B" on setup to engage Reversing valve for heating

Figure 801 (Indoor Units)

WIRING DIAGRAMS

24k-36k BTU Outdoor Units

Figure 702



WARNING

High voltage danger, outdoor power supply must be disconnected before maintenance, until the LED power indicator on the outdoor control board is power off, it can be operated. Be sure to cut off the power supply before operation.

DIP Switch Setting of Outdoor Unit

Turn on the power before setting the S4-2/S4-3 DIP switches, and dial the switches from OFF to ON. Turn off the power before setting the S4-1/ S5-1,2,3 DIP switches. Otherwise, the swithes do not work and the content of the setting are invalid. Mark of "▪" indicates the position of DIP switches.

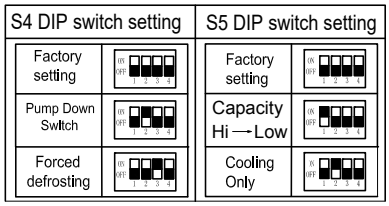
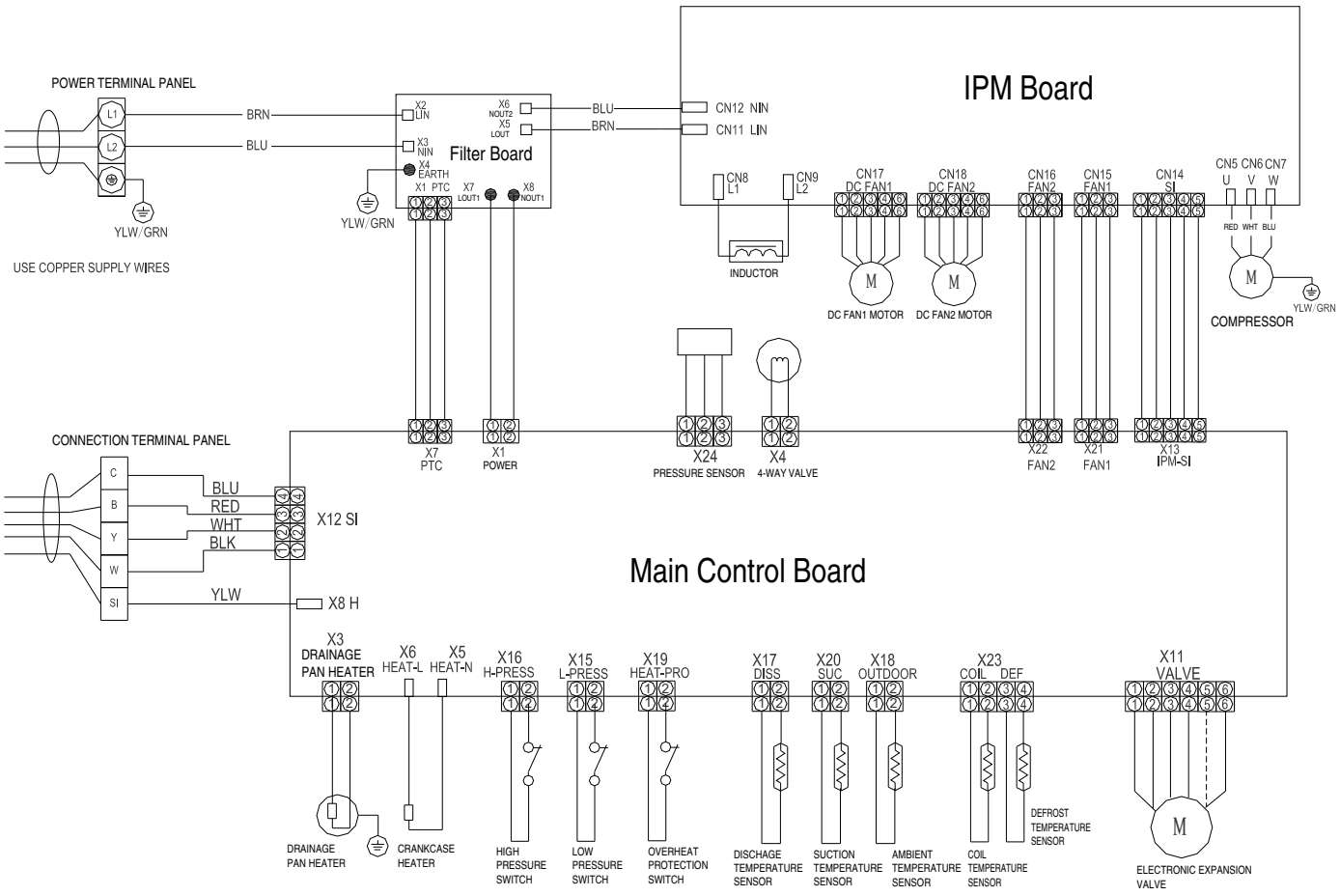


Figure 802 (24k-36k BTU Outdoor Units)

WIRING DIAGRAMS

48k-60k BTU Outdoor Units



DIP Switch Setting of Outdoor Unit

Turn on the power before setting the S4-2/S4-3 DIP switches, and dial the switches from OFF to ON. Turn off the power before setting the S4-1/ S5-1,2,3 DIP switches. Otherwise, the swithes do not work and the content of the setting are invalid. Mark of "▪" indicates the position of DIP switches.

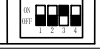
S4 DIP switch setting		S5 DIP switch setting	
Factory setting		Factory setting	
Pump Down Switch		Capacity Hi → Low	
Forced defrosting		Cooling Only	

Figure 803 (48-60k BTU Units)

APPENDIX

Interactive Parts Viewer

All Friedrich Service Parts can be found on our online interactive parts viewer.

Please click on the link below:

Interactive Parts Viewer

For Further Assistance contact Friedrich customer service at **(1-800-541-6645)**.

Limited Warranty

Current warranty information can be obtained by referring to https://www.friedrich.com/professional/support/product-resources

APPENDIX

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
61	60.8	16		69/70	69.8	21		78/79	78.8	26
62/63	62.6	17		71/72	71.6	22		80/81	80.6	27
64/65	64.4	18		73/74	73.4	23		82/83	82.4	28
66/67	66.2	19		75/76	75.2	24		84/85	84.2	29
68	68	20		77	77	25		86	86	30

Ambient temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
32/33	32	0		55/56	55.4	13		79/80	78.8	26
34/35	33.8	1		57/58	57.2	14		81	80.6	27
36	35.6	2		59/60	59	15		82/83	82.4	28
37/38	37.4	3		61/62	60.8	16		84/85	84.2	29
39/40	39.2	4		63	62.6	17		86/87	86	30
41/42	41	5		64/65	64.4	18		88/89	87.8	31
43/44	42.8	6		66/67	66.2	19		90	89.6	32
45	44.6	7		68/69	68	20		91/92	91.4	33
46/47	46.4	8		70/71	69.8	21		93/94	93.2	34
48/49	48.2	9		72	71.6	22		95/96	95	35
50/51	50	10		73/74	73.4	23		97/98	96.8	36
52/53	51.8	11		75/76	75.2	24		99	98.6	37
54	53.6	12		77/78	77	25				

APPENDIX

Appendix 3 Resistance Table for Compressor Discharge Sensor

1. The parameter of outdoor compressor discharge temperature sensor:

(R0=187.25K±6.3%；R_{100}=3.77K±2.5K；B0/100=3979K±1%)

DR: Deviation Rate

DR(MIN)%=（Rmin-Rnom）/Rnom*100%

DR(MAX)%=（Rmax-Rnom）/Rnom*100%

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-22	-30	908.2603	985.5274	1065.1210	-7.84	7.47
-20.2	-29	855.3955	927.6043	1001.9150	-7.78	7.42
-18.4	-28	805.9244	873.4324	924.8368	-7.73	5.56
-16.6	-27	759.6097	822.7471	887.5944	-7.67	7.31
-14.8	-26	716.2320	775.3041	835.9165	-7.62	7.25
-13	-25	675.5881	730.8775	787.5529	-7.56	7.20
-11.2	-24	637.4902	689.2583	742.2720	-7.51	7.14
-9.4	-23	601.7645	650.2533	699.8601	-7.46	7.09
-7.6	-22	568.2499	613.6835	660.1191	-7.40	7.03
-5.8	-21	536.7970	579.3832	622.8658	-7.35	6.98
-4	-20	507.2676	547.1989	587.9307	-7.30	6.93
-2.2	-19	497.5332	516.9882	555.1565	-3.76	6.88
-0.4	-18	453.4748	488.6192	524.3977	-7.19	6.82
1.4	-17	428.9819	461.9693	495.5191	-7.14	6.77
3.2	-16	405.9517	436.9251	486.3954	-7.09	10.17
5	-15	384.2888	413.3808	442.9105	-7.04	6.67
6.8	-14	363.9047	391.2386	418.9563	-6.99	6.62
8.6	-13	344.7169	370.4072	396.4325	-6.94	6.56
10.4	-12	326.6497	350.8019	375.2461	-6.88	6.51
12.2	-11	309.6286	332.3441	355.3104	-6.83	6.46
14	-10	293.5903	314.9620	336.5448	-6.79	6.41
15.8	-9	278.4719	298.5822	318.3744	-6.74	6.22
17.6	-8	264.2156	283.1464	302.2294	-6.69	6.31
19.4	-7	250.7678	268.5936	286.5448	-6.64	6.26
21.2	-6	238.0783	254.8686	271.7603	-6.59	6.22
23	-5	226.1003	241.9200	257.8193	-6.54	6.17
24.8	-4	214.7903	229.6997	244.6593	-6.49	6.11
26.6	-3	204.1073	218.1630	232.2612	-6.44	6.07
28.4	-2	194.0135	207.2681	220.5495	-6.39	6.02
30.2	-1	184.4732	196.9759	209.4913	-6.35	5.97
32	0	175.4533	187.2500	199.0468	-6.30	5.93
33.8	1	166.8952	178.0255	189.1529	-6.25	5.88
35.6	2	158.8023	169.3067	179.8058	-6.20	5.84
37.4	3	151.1467	161.0633	170.9724	-6.16	5.80
39.2	4	143.9026	153.2667	162.6216	-6.11	5.75
41	5	137.0455	145.8905	154.7246	-6.06	5.71
42.8	6	130.5528	138.9097	147.2544	-6.02	5.67
44.6	7	124.4033	132.3011	140.1856	-5.97	5.62
46.4	8	118.5769	126.0429	133.4946	-5.92	5.58
48.2	9	113.0550	120.1146	127.1591	-5.88	5.54
50	10	107.8202	114.4973	121.1586	-5.83	5.50
51.8	11	102.8560	109.1728	115.4734	-5.79	5.46
53.6	12	98.1470	104.1246	110.0855	-5.74	5.41
55.4	13	93.6787	99.3367	104.9778	-5.70	5.37
57.2	14	89.4378	94.7946	100.1342	-5.65	5.33
59	15	85.4114	90.4842	95.5398	-5.61	5.29
60.8	16	81.5875	86.3926	91.1805	-5.56	5.25
62.6	17	77.9551	82.5076	87.0430	-5.52	5.21
64.4	18	74.5034	78.8177	83.1150	-5.47	5.17

APPENDIX

Appendix 3 Resistance Table for Compressor Discharge Sensor

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
66.2	19	71.2227	75.3122	79.3848	-5.43	5.13
68	20	68.1036	71.9808	75.8414	-5.39	5.09
69.8	21	65.1373	68.8141	72.4746	-5.34	5.05
71.6	22	62.3155	65.8032	69.2746	-5.30	5.01
73.4	23	59.6306	62.9395	66.2324	-5.26	4.97
75.2	24	57.0752	60.2152	63.3395	-5.21	4.93
77	25	54.6424	57.6227	60.5877	-5.17	4.89
78.8	26	52.3258	55.1551	57.9695	-5.13	4.85
80.6	27	50.1192	52.8058	55.4778	-5.09	4.82
82.4	28	48.0168	50.5684	53.1058	-5.05	4.78
84.2	29	46.0133	48.4371	50.8472	-5.00	4.74
86	30	44.1034	46.4046	48.6960	-4.96	4.71
87.8	31	42.2825	44.4711	46.6466	-4.92	4.66
89.6	32	40.5458	42.6261	44.6937	-4.88	4.63
91.4	33	38.8891	40.8668	42.8323	-4.84	4.59
93.2	34	37.3084	39.1890	41.0576	-4.80	4.55
95	35	35.7998	37.5883	39.3653	-4.76	4.51
96.8	36	34.3596	36.0609	37.7511	-4.72	4.48
98.6	37	32.9844	34.6030	36.2109	-4.68	4.44
100.4	38	31.6710	33.2113	34.7412	-4.64	4.40
102.2	39	30.4164	31.8823	33.3383	-4.60	4.37
104	40	29.2176	30.6130	31.9988	-4.56	4.33
105.8	41	28.0718	29.4004	30.7197	-4.52	4.29
107.6	42	26.9765	28.2417	29.4979	-4.48	4.26
109.4	43	25.9293	27.1342	28.3306	-4.44	4.22
111.2	44	24.9277	26.0755	27.2150	-4.40	4.19
113	45	23.9697	25.0632	26.1488	-4.36	4.15
114.8	46	23.0530	24.0950	25.1293	-4.32	4.12
116.6	47	22.1757	23.1688	24.1545	-4.29	4.08
118.4	48	21.3360	22.2826	23.2221	-4.25	4.05
120.2	49	20.5321	21.4345	22.3301	-4.21	4.01
122	50	19.7623	20.6226	21.4766	-4.17	3.98
123.8	51	19.0261	19.8468	20.6612	-4.14	3.94
125.6	52	18.3211	19.1040	19.8808	-4.10	3.91
127.4	53	17.6458	18.3926	19.1338	-4.06	3.87
129.2	54	16.9986	17.7113	18.4185	-4.02	3.84
131	55	16.3784	17.0537	17.7335	-3.96	3.83
132.8	56	15.7839	16.4332	17.0774	-3.95	3.77
134.6	57	15.2139	15.8338	16.4488	-3.92	3.74
136.4	58	14.6673	15.2592	15.8464	-3.88	3.71
138.2	59	14.1430	14.7083	15.2690	-3.84	3.67
140	60	13.6400	14.1799	14.7154	-3.81	3.64
141.8	61	13.1573	13.6730	14.1846	-3.77	3.61
143.6	62	12.6941	13.1868	13.6756	-3.74	3.57
145.4	63	12.2494	12.7202	13.1872	-3.70	3.54
147.2	64	11.8224	12.2723	12.7186	-3.67	3.51
149	65	11.4124	11.8424	12.2690	-3.63	3.48
150.8	66	11.0185	11.4295	11.8373	-3.60	3.45
152.6	67	10.6401	11.0331	11.4230	-3.56	3.41
154.4	68	10.2765	10.6522	11.0251	-3.53	3.38
156.2	69	9.9271	10.2863	10.6429	-3.49	3.35
158	70	9.5912	9.9348	10.2756	-3.46	3.32
159.8	71	9.2682	9.5968	9.9231	-3.42	3.29
161.6	72	8.9576	9.2720	9.5841	-3.39	3.26
163.4	73	8.6589	8.9597	9.2583	-3.36	3.23
165.2	74	8.3716	8.6594	8.9451	-3.32	3.19

APPENDIX

Appendix 3 Resistance Table for Compressor Discharge Sensor

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
167	75	8.0951	8.3705	8.6440	-3.29	3.16
168.8	76	7.8290	8.0926	8.3544	-3.26	3.13
170.6	77	7.5730	7.8252	8.0758	-3.22	3.10
172.4	78	7.3264	7.5679	7.8078	-3.19	3.07
174.2	79	7.0891	7.3202	7.5499	-3.16	3.04
176	80	6.8605	7.0818	7.3018	-3.12	3.01
177.8	81	6.6403	6.8522	7.0629	-3.09	2.98
179.6	82	6.4282	6.6311	6.8329	-3.06	2.95
181.4	83	6.2239	6.4182	6.6115	-3.03	2.92
183.2	84	6.0269	6.2131	6.3982	-3.00	2.89
185	85	5.8371	6.0154	6.1928	-2.96	2.86
186.8	86	5.6542	5.8249	5.9949	-2.93	2.84
188.6	87	5.4777	5.6413	5.8042	-2.90	2.81
190.4	88	5.3076	5.4644	5.6205	-2.87	2.78
192.2	89	5.1435	5.2937	5.4433	-2.84	2.75
194	90	4.9853	5.1292	5.2726	-2.81	2.72
195.8	91	4.8326	4.9705	5.1079	-2.77	2.69
197.6	92	4.6852	4.8174	4.9492	-2.74	2.66
199.4	93	4.5430	4.6697	4.7960	-2.71	2.63
201.2	94	4.4058	4.5272	4.6483	-2.68	2.61
203	95	4.2733	4.3896	4.5058	-2.65	2.58
204.8	96	4.1453	4.2568	4.3683	-2.62	2.55
206.6	97	4.0218	4.1287	4.2355	-2.59	2.52
208.4	98	3.9024	4.0049	4.1074	-2.56	2.50
210.2	99	3.7872	3.8854	3.9837	-2.53	2.47
212	100	3.6758	3.7700	3.8643	-2.50	2.44
213.8	101	3.5661	3.6585	3.7512	-2.53	2.47
215.6	102	3.4601	3.5509	3.6419	-2.56	2.50
217.4	103	3.3577	3.4468	3.5362	-2.59	2.53
219.2	104	3.2588	3.3463	3.4341	-2.61	2.56
221	105	3.1632	3.2491	3.3353	-2.64	2.58
222.8	106	3.0708	3.1551	3.2398	-2.67	2.61
224.6	107	2.9816	3.0643	3.1475	-2.70	2.64
226.4	108	2.8953	2.9765	3.0582	-2.73	2.67
228.2	109	2.8118	2.8915	2.9717	-2.76	2.70
230	110	2.7311	2.8093	2.8881	-2.78	2.73
231.8	111	2.6531	2.7299	2.8072	-2.81	2.75
233.6	112	2.5776	2.6530	2.7289	-2.84	2.78
235.4	113	2.5046	2.5785	2.6531	-2.87	2.81
237.2	114	2.4340	2.5065	2.5798	-2.89	2.84
239	115	2.3656	2.4368	2.5087	-2.92	2.87
240.8	116	2.2995	2.3693	2.4400	-2.95	2.90
242.6	117	2.2354	2.3040	2.3733	-2.98	2.92
244.4	118	2.1734	2.2407	2.3088	-3.00	2.95
246.2	119	2.1134	2.1795	2.2463	-3.03	2.97
248	120	2.0553	2.1201	2.1858	-3.06	3.01
249.8	121	1.9991	2.0626	2.1271	-3.08	3.03
251.6	122	1.9446	2.0070	2.0702	-3.11	3.05
253.4	123	1.8918	1.9530	2.0151	-3.13	3.08
255.2	124	1.8406	1.9007	1.9617	-3.16	3.11
257	125	1.7911	1.8500	1.9099	-3.18	3.14
258.8	126	1.7430	1.8009	1.8597	-3.22	3.16
260.6	127	1.6965	1.7533	1.8110	-3.24	3.19
262.4	128	1.6514	1.7071	1.7638	-3.26	3.21
264.2	129	1.6076	1.6623	1.7180	-3.29	3.24
266	130	1.5652	1.6189	1.6736	-3.32	3.27

APPENDIX

Appendix 4 Resistance Table for Other Sensor

2. THE PARAMETER OF THE OTHER SENSOR:（R_0=15K±2%；B0/100=3450K±2%）

DR: Deviation Rate

DR(MIN)%=（Rmin-Rnom）/Rnom*100%　　DR(MAX)%=（Rmax-Rnom）/Rnom*100%

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-2	-30	60.78	64.77	68.99	-6.16	6.12
-20.	-29	57.75	61.36	65.16	-5.88	5.83
-18.	-28	54.89	58.15	61.58	-5.61	5.57
-16.	-27	52.19	55.14	58.23	-5.35	5.31
-14.	-26	49.63	52.30	55.08	-5.11	5.05
-1	-25	47.21	49.62	52.13	-4.86	4.81
-11.	-24	44.92	47.10	49.37	-4.63	4.60
-9.	-23	42.76	44.73	46.78	-4.40	4.38
-7.	-22	40.71	42.49	44.34	-4.19	4.17
-5.	-21	38.77	40.38	42.05	-3.99	3.97
-	-20	36.93	38.39	39.90	-3.80	3.78
-2.	-19	35.18	36.51	37.87	-3.64	3.59
-0.	-18	33.53	34.74	35.97	-3.48	3.42
1.4	-17	31.96	33.06	34.17	-3.33	3.25
3.2	-16	30.48	31.47	32.49	-3.15	3.14
5	-15	29.07	29.97	30.89	-3.00	2.98
6.8	-14	27.73	28.56	29.39	-2.91	2.82
8.6	-13	26.46	27.22	27.98	-2.79	2.72
10.4	-12	25.26	25.95	26.64	-2.66	2.59
12.2	-11	24.11	24.75	25.38	-2.59	2.48
14	-10	23.03	23.61	24.19	-2.46	2.40
15.8	-9	21.99	22.53	23.06	-2.40	2.30
17.6	-8	21.01	21.51	22.00	-2.32	2.23
19.4	-7	20.08	20.54	20.99	-2.24	2.14
21.2	-6	19.19	19.62	20.04	-2.19	2.10
23	-5	18.35	18.74	19.14	-2.08	2.09
24.8	-4	17.55	17.92	18.29	-2.06	2.02
26.6	-3	16.78	17.13	17.48	-2.04	2.00
28.4	-2	16.06	16.38	16.71	-1.95	1.97
30.2	-1	15.36	15.67	15.98	-1.98	1.94
32	0	14.70	15.00	15.29	-2.00	1.90
33.8	1	14.08	14.36	14.64	-1.95	1.91
35.6	2	13.48	13.75	14.02	-1.96	1.93
37.4	3	12.91	13.17	13.43	-1.97	1.94
39.2	4	12.36	12.62	12.87	-2.06	1.94
41	5	11.85	12.09	12.34	-1.99	2.03
42.8	6	11.35	11.59	11.83	-2.07	2.03
44.6	7	10.88	11.11	11.35	-2.07	2.11
46.4	8	10.43	10.66	10.89	-2.16	2.11
48.2	9	9.999	10.230	10.450	-2.26	2.11
50	10	9.590	9.816	10.040	-2.30	2.23
51.8	11	9.199	9.422	9.647	-2.37	2.33
53.6	12	8.826	9.047	9.269	-2.44	2.40
55.4	13	8.470	8.689	8.910	-2.52	2.48
57.2	14	8.129	8.347	8.567	-2.61	2.57
59	15	7.804	8.021	8.240	-2.71	2.66
60.8	16	7.493	7.709	7.928	-2.80	2.76
62.6	17	7.196	7.412	7.630	-2.91	2.86
64.4	18	6.912	7.127	7.346	-3.02	2.98
66.2	19	6.640	6.855	7.074	-3.14	3.10
68	20	6.381	6.595	6.815	-3.24	3.23
69.8	21	6.132	6.347	6.567	-3.39	3.35
71.6	22	5.894	6.109	6.330	-3.52	3.49

APPENDIX

Appendix 4 Resistance Table for Other Sensor

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
73.4	23	5.667	5.882	6.103	-3.66	3.62
75.2	24	5.449	5.664	5.886	-3.80	3.77
77	25	5.240	5.456	5.678	-3.96	3.91
78.8	26	5.048	5.260	5.478	-4.03	3.98
80.6	27	4.864	5.072	5.286	-4.10	4.05
82.4	28	4.687	4.891	5.101	-4.17	4.12
84.2	29	4.517	4.717	4.924	-4.24	4.20
86	30	4.355	4.550	4.753	-4.29	4.27
87.8	31	4.198	4.390	4.589	-4.37	4.34
89.6	32	4.048	4.236	4.431	-4.44	4.40
91.4	33	3.904	4.089	4.280	-4.52	4.46
93.2	34	3.766	3.946	4.134	-4.56	4.55
95	35	3.663	3.810	3.994	-3.86	4.61
96.8	36	3.506	3.679	3.859	-4.70	4.66
98.6	37	3.383	3.552	3.729	-4.76	4.75
100.4	38	3.265	3.431	3.604	-4.84	4.80
102.2	39	3.152	3.314	3.484	-4.89	4.88
104	40	3.043	3.202	3.368	-4.97	4.93
105.8	41	2.938	3.094	3.257	-5.04	5.00
107.6	42	2.838	2.990	3.149	-5.08	5.05
109.4	43	2.741	2.890	3.046	-5.16	5.12
111.2	44	2.648	2.793	2.946	-5.19	5.19
113	45	2.558	2.701	2.850	-5.29	5.23
114.8	46	2.472	2.611	2.758	-5.32	5.33
116.6	47	2.389	2.525	2.669	-5.39	5.40
118.4	48	2.309	2.443	2.583	-5.49	5.42
120.2	49	2.232	2.363	2.500	-5.54	5.48
122	50	2.158	2.286	2.421	-5.60	5.58
123.8	51	2.087	2.212	2.344	-5.65	5.63
125.6	52	2.018	2.140	2.269	-5.70	5.69
127.4	53	1.952	2.072	2.198	-5.79	5.73
129.2	54	1.888	2.005	2.129	-5.84	5.82
131	55	1.827	1.941	2.062	-5.87	5.87
132.8	56	1.767	1.880	1.998	-6.01	5.91
134.6	57	1.710	1.820	1.936	-6.04	5.99
136.4	58	1.655	1.763	1.876	-6.13	6.02
138.2	59	1.602	1.707	1.818	-6.15	6.11
140	60	1.551	1.654	1.762	-6.23	6.13
141.8	61	1.502	1.602	1.709	-6.24	6.26
143.6	62	1.452	1.553	1.657	-6.50	6.28
145.4	63	1.409	1.505	1.606	-6.38	6.29
147.2	64	1.364	1.458	1.558	-6.45	6.42
149	65	1.322	1.413	1.511	-6.44	6.49
150.8	66	1.280	1.370	1.466	-6.57	6.55
152.6	67	1.241	1.328	1.422	-6.55	6.61
154.4	68	1.202	1.288	1.379	-6.68	6.60
156.2	69	1.165	1.249	1.339	-6.73	6.72
158	70	1.129	1.211	1.299	-6.77	6.77
159.8	71	1.095	1.175	1.261	-6.81	6.82
161.6	72	1.061	1.140	1.224	-6.93	6.86
163.4	73	1.029	1.106	1.188	-6.96	6.90
165.2	74	0.9977	1.073	1.153	-7.02	6.94
167	75	0.9676	1.041	1.120	-7.05	7.05
168.8	76	0.9385	1.011	1.088	-7.17	7.08
170.6	77	0.9104	0.9810	1.056	-7.20	7.10
172.4	78	0.8833	0.9523	1.026	-7.25	7.18

APPENDIX

Appendix 4 Resistance Table for Other Sensor

T [℉]	T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
174.2	79	0.8570	0.9246	0.9971	-7.31	7.27
176	80	0.8316	0.8977	0.9687	-7.36	7.33
177.8	81	0.8071	0.8717	0.9412	-7.41	7.38
179.6	82	0.7834	0.8466	0.9146	-7.47	7.43
181.4	83	0.7604	0.8223	0.8888	-7.53	7.48
183.2	84	0.7382	0.7987	0.8639	-7.57	7.55
185	85	0.7167	0.7759	0.8397	-7.63	7.60
186.8	86	0.6958	0.7537	0.8161	-7.68	7.65
188.6	87	0.6755	0.7322	0.7933	-7.74	7.70
190.4	88	0.6560	0.7114	0.7712	-7.79	7.75
192.2	89	0.6371	0.6913	0.7498	-7.84	7.80
194	90	0.6188	0.6718	0.7291	-7.89	7.86
195.8	91	0.6011	0.6530	0.7051	-7.95	7.39
197.6	92	0.5840	0.6348	0.6897	-8.00	7.96
199.4	93	0.5674	0.6171	0.6709	-8.05	8.02
201.2	94	0.5514	0.6000	0.6527	-8.10	8.07
203	95	0.5359	0.5835	0.6350	-8.16	8.11
204.8	96	0.5209	0.5675	0.6179	-8.21	8.16
206.6	97	0.5064	0.5519	0.6014	-8.24	8.23
208.4	98	0.4923	0.5369	0.5853	-8.31	8.27
210.2	99	0.4787	0.5224	0.5698	-8.37	8.32
212	100	0.4655	0.5083	0.5547	-8.42	8.36
213.8	101	0.4528	0.4946	0.5401	-8.45	8.42
215.6	102	0.4404	0.4814	0.5259	-8.52	8.46
217.4	103	0.4284	0.4685	0.5121	-8.56	8.51
219.2	104	0.4168	0.4561	0.4988	-8.62	8.56
221	105	0.4056	0.4440	0.4859	-8.65	8.62
222.8	106	0.3947	0.4323	0.4733	-8.70	8.66
224.6	107	0.3841	0.4210	0.4611	-8.76	8.70
226.4	108	0.3739	0.4100	0.4493	-8.80	8.75
228.2	109	0.3640	0.3993	0.4379	-8.84	8.81
230	110	0.3544	0.3890	0.4267	-8.89	8.84
231.8	111	0.3450	0.3789	0.4159	-8.95	8.90
233.6	112	0.3360	0.3692	0.4055	-8.99	8.95
235.4	113	0.3272	0.3597	0.3953	-9.04	9.01
237.2	114	0.3187	0.3505	0.3854	-9.07	9.06
239	115	0.3104	0.3416	0.3758	-9.13	9.10
240.8	116	0.3024	0.3330	0.3665	-9.19	9.14
242.6	117	0.2947	0.3246	0.3574	-9.21	9.18
244.4	118	0.2871	0.3164	0.3468	-9.26	8.77
246.2	119	0.2798	0.3085	0.3401	-9.30	9.29
248	120	0.2727	0.3008	0.33	-9.34	9.34

APPENDIX

Friedrich Authorized Parts Depots

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888-907-9675
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2259 Westchester Ave.
Bronx, NY 10462
sales@shivanionline.com

NEUCO Inc.
515 W Crossroads Parkway
Bolingbrook, IL 60440
312.809.1418
borr@neuco.com

The Gabbert Company
6868 Ardmore
Houston, Texas 77054

713-747-4110
800-458-4110

Johnstone Supply of Woodside
27-01 Brooklyn Queens Expway
Woodside, New York 11377

718-545-5464
800-431-1143

Reeve Air Conditioning, Inc.
2501 South Park Road
Hallandale, Florida 33009

954-962-0252
800-962-3383

Total Home Supply
26 Chapin Rd Ste 1109
Pine Brook, NJ 07058
877-847-0050
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https://www.totalhomesupply.com/brands/Friedrich.html

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