Service Manual

FRIEDRICH

Floating Air® Series
Ductless Split Air Conditioners
R-410A Refrigerant

FSHW091 - 9,000 BTU Single Zone - 110V
FSHW121 - 12,000 BTU Single Zone - 110V
FSHW183 - 18,000 BTU Single Zone - 230V
FSHW243 - 24,000 BTU Single Zone - 230V
FSHW363 - 36,000 BTU Single Zone - 230V

TABLE OF CONTENTS

TABLE OF CONTENTS

INTRODUCTION

Important Safety Information

This service manual is designed to be used in conjunction with the installation and operation manuals provided with each air conditioning system.

This service manual was written to assist the professional service technician to quickly and accurately diagnose and repair malfunctions.

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

Installation procedures are not given in this manual. They are given in the Installation/Operation manual which can be acquired on the Friedrich website.

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, drywalling, 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

Please read this manual thoroughly prior to equipment installation or operation. It is the installer's 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

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 R22 gauge sets. Failure to do so can result in property damage, personal injury, or death.

⚠ WARNING

Electrical 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

CAUTION

Indicates property damage can occur if instructions are not followed.

NOTICE

INTRODUCTION

Personal injury or death hazards

	⚠ WARNING	⚠ AVERTISSEMENT	⚠ ADVERTENCIA
SAFETY FIRST	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 the unit that the unit is properly grounded.
- Never operate the unit on an extension cord.
- 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 identification guide

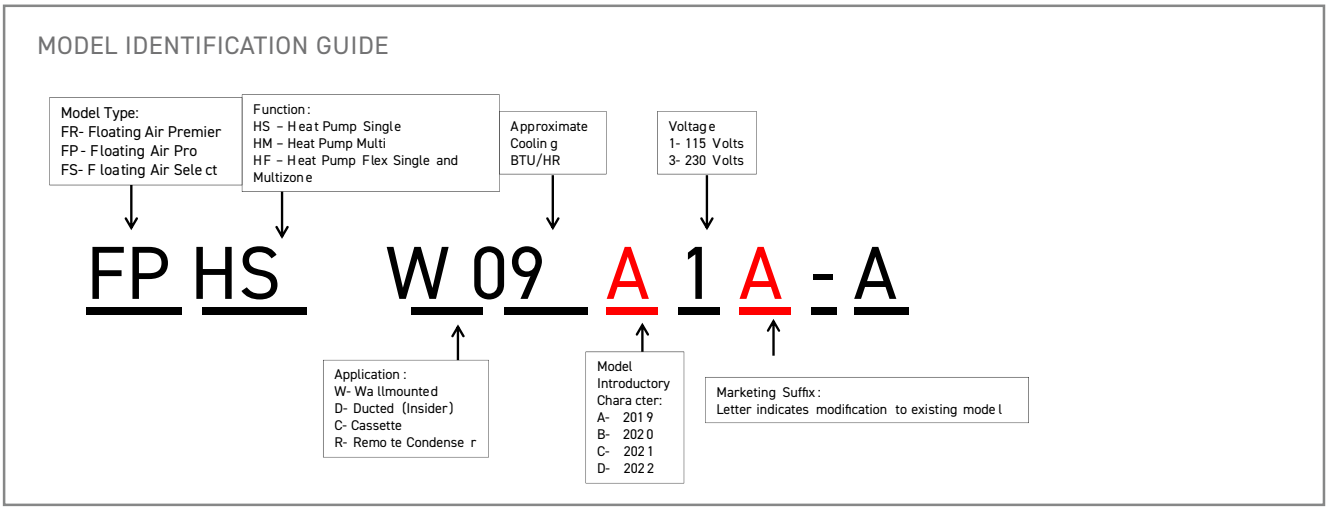
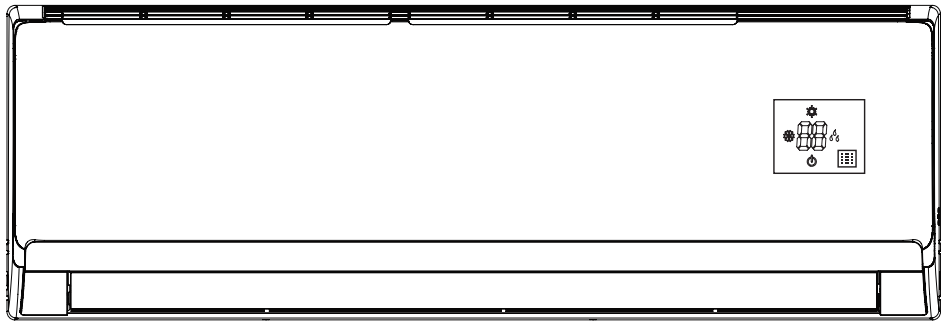


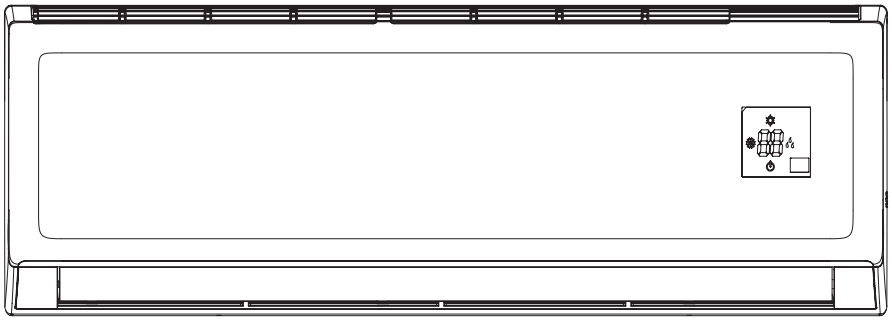
Figure 101
Model Identification Guide

INTRODUCTION

FSHSW09A1A
FSHSW12A1A



FSHSW18A3A
FSHSW24A3A



FSHSW36A3A

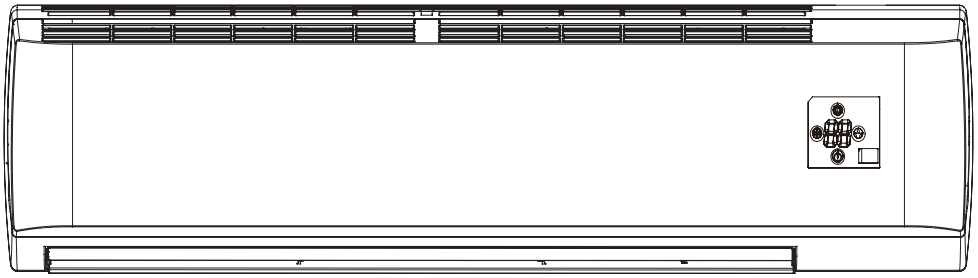


Figure 102

Indoor Units

INTRODUCTION

FSHSR09A1A
FSHSR12A1A
FSHSR18A3A
FSHSR24A3A
FSHSR36A3A

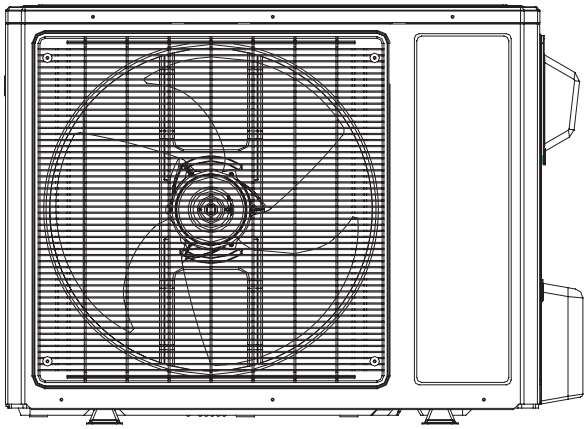


Figure 103
Outdoor Units

Figure 104
Remote Control

SPECIFICATIONS

Friedrich Indoor Model Number		Unit	FSHSW09A1A	FSHSW12A1A	FSHSW18A3A	FSHSW24A3A	FSHSW36A3A
Friedrich Outdoor Model Number			FSHSR09A1A	FSHSR12A1A	FSHSR18A3A	FSHSR24A3A	FSHSR36A3A
Friedrich Indoor UPC code			724587438710	724587438727	724587438734	724587438741	724587438758
Friedrich Outdoor UPC code			724587438765	724587438772	724587438789	724587438796	724587438802
Product Code			CB425008200	CB425007900	CB425007400	CB425007700	CB432008100
Power Supply	Rated Voltage	V	115	115	208/230	208/230	208/230
	Rated Frequency	Hz	60	60	60	60	60
	Phases	--	1	1	1	1	1
Power Supply Mode			Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
Cross-sectional Area of Power Cable Conductor		AWG	AWG12	AWG12	AWG14	AWG14	AWG12
Recommended Power Cable(Core)		N	3	3	3	3	3
Min/Max. Voltage		V	103/127	103/127	187/253	187/253	187/253
Cooling Capacity		W	2638	3517	5275	6450	9850
Cooling Capacity		Btu/h	9000	12000	18000	22000	33600
Min. Cooling Capacity		W	810	1100	1000	2500	2170
Min. Cooling Capacity		Btu/h	2764	3753	3412	8600	7404.04
Max. Cooling Capacity		W	2850	3664	6000	7034	10550
Max. Cooling Capacity		Btu/h	9724	12500	20472	24000	35996.6
Heating Capacity		W	2784	3810	5803	7034	10140
Heating Capacity		Btu/h	9500	13000	19800	24000	34600
Min. Heating Capacity		W	610	1000	1000	2500	4390
Min. Heating Capacity		Btu/h	2081	3412	3412	8600	14978.68
Max. Heating Capacity		W	3600	4400	6400	7600	10550
Max. Heating Capacity		Btu/h	12283	15013	21837	26000	35996.6
Cooling Power Input		W	900	1194	1820	2010	4100
Min. Cooling Power Input		W	350	380	80	600	450
Max. Cooling Power Input		W	1100	1300	2350	2700	4300
Heating Power Input		W	870	1250	2090	2130	3800
Min. Heating Power Input		W	280	350	220	650	560
Max. Heating Power Input		W	1250	1350	2350	2750	4300
Cooling Current		A	10.87	13	8.1	8.92	17
Heating Current		A	10.36	13.5	8.5	9.45	16.5
Rated Input		W	1270	1350	2350	2750	4300
Rated Current		A	12.66	13.5	12	11.98	20
Rated Heating Current		A	10.65	13.8	13	12.2	20
Max. Over Current Protection		A	25	30	25	25	40
Min. Current (MCA)		A	17	20	16	16	24
Starting Current		A	6	8	/	5	2
EER		W/W	2.93	2.95	2.9	3.21	2.4
EER		Btu/h)/w	10	10.05	9.89	10.95	8.2
COP		W/W	3.2	3.05	2.78	3.3	2.67
COP		Btu/h)/w	10.92	10.4	9.47	11.3	9.11
SEER			18	18	18	18	18
HSPF			9	9	9	10	9
Air Flow Volume		m3/h	540/490/ 410/290	680/540/ 410/330	850/750/ 650/500	1200/1050/ 900/750	1500/1300/ 1100 /950
Air Flow Volume		CFM	318/288/241/171	400/318/241/194	500/441/383/294	706.2/617.925 /529.65/441.375	882.75/765.05/647.35 /559.075

Figure 201

Product Specifications

SPECIFICATIONS

Friedrich Indoor Model Number		Unit	FSHSW09A1A	FSHSW12A1A	FSHSW18A3A	FSHSW24A3A	FSHSW36A3A
Friedrich Outdoor Model Number			FSHSR09A1A	FSHSR12A1A	FSHSR18A3A	FSHSR24A3A	FSHSR36A3A
Dehumidifying Volume		L/h	0.8	1.4	1.8	2	3.5
Dehumidifying Volume		PINT/D	1.69	2.96	3.8	4.23	7.4
Application Area		sq ft	130-194	172-258	248-366	248-366	495-764
Indoor unit	Fan Type	--	Cross-flow	Cross-flow	Cross-flow	Cross-flow	Cross-flow
	Fan Diameter Length(D×L)	inch	3.85 × 22.83	3.85 × 25	4.17 x 27.8	4.25 × 32.7	4.25 × 20.57
	Cooling Speed	r/min	1350/1200/1050/750	1350/1200/1000/800	1350/1200/1050/900	1300/1150/1000/850	1400/1250/1000/800
	Heating Speed	r/min	1350/1200/1050/850	1350/1200/1000/900	1300/1200/1100/900	1300/1150/1000/850	1400/1250/1050/850
	Fan Motor Power Output	W	20	20	35	30	70
	Fan Motor RLA	A	0.24	0.25	0.37	0.32	0.4
	Fan Motor Capaci-tor	μF	4	4	2.5	3	0
	Evaporator Form	--	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	inch	0.197	0.197	0.275	0.275	2/7
	Evaporator Row-fin Gap	inch	2-0.05	2-0.05	2-0.05	2-0.05	2-0.05
	Evaporator Coil Length (L×D×W)	inch	23×0.875×10.5	25×0.875×12.06	28.14x1x12	33.25×1×13.5	42.285×1×15
	Swing Motor Model	--	MP24AA	MP24BA	MP35CJ	MP35CJ	MP24BA
	Swing Motor Power Output	W	1.5	1.5	2.5	2.5	1.5
	Fuse Current	A	3.15	3.15	3.15	3.15	3.15
	Set Temperature Range	°F	61-86	61-86	61-86	61-86	61-86
	Sound Pressure Level	dB (A)	43/38/34/28	43/39/35/29	47/44/41/35	49/46/42/36	54/49/44/37
	Sound Power Level	dB (A)	53/48/44/28	53/49/45/39	57/54/51/45	63/59/56/52	64/59/54/47
	Dimension (W×H×D)	inch	31 1/8×10 7/8×7 7/8	33 1/4×11 3/8×8 1/4	38 1/4×11 3/4×8 3/4	42 1/2×12 3/4×9 5/8	53 1/8×12 7/8×10
	Net Weight	lb	20.9	23.2	30.9	37.485	41.895
	Gross Weight	lb	25.4	27.6	37.5	45.202	51.818

Figure 202
Product Specifications

SPECIFICATIONS

Friedrich Indoor Model Number		Unit	FSHSW09A1A	FSHSW12A1A	FSHSW18A3A	FSHSW24A3A	FSHSW36A3A
Friedrich Outdoor Model Number			FSHSR09A1A	FSHSR12A1A	FSHSR18A3A	FSHSR24A3A	FSHSR36A3A
Outdoor Unit	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO., LTD
	Compressor Model		QXA-A091zE190	QXA-A091zE190	QXA-B141zF030A	QXA-B141zF030A	QXAS-D32ZX090A
	Compressor Oil		FVC68D or RB 68EP	FVC68D or RB 68EP	RB68EP	RB68EP	RB68EP or equivalent
	Compressor Type		Rotary	Rotary	Rotary	Rotary	Rotary
	Compressor LRA.	A	40	40	25	25	67
	Compressor RLA	A	12.62	15.23	12.08	12.18	17.5
	Compressor Power Input	W	980	980	1440	1440	4150±3%
	Compressor Overload Protector		1NT11L-6233 or KSD115 or HPC115/95U1	1NT11L-6233 or KSD115 or HPC115/95U1	/	/	1NT11L-6233
	Fan Type		Axial-flow	Axial-flow	Axial-flow	Axial-flow	Axial-flow
	Fan Diameter	inch	15.748	15.748	/	20	21.654
	Fan Motor Speed	rpm	850	900	800	800	890
	Fan Motor Power Output	W	30	30	60	60	170
	Fan Motor RLA	A	0.24	0.23	0.52	0.4	0.73
	Outdoor Unit Air Flow Volume	m3/h	1800	1800	3200	3200	4400
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Condenser Pipe diameter	inch	0.276	0.276	0.375	0.375	φ3/8
	Condenser Rows-fin Gap	inch	1-.05	2-.05	1-.05	1-.05	2-.05
	Condenser Coil Length (L×D×W)	inch	29.76×3.75×20	28×1.5×20	33.6x.86x26	36.81x1.5x26	37×1 3/4×30
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3	4.3	4.3	4.3	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5	2.5	2.5	2.5	2.5
	Maximum Allowable Pressure	MPa	4.3	4.3	4.3	4.3	4.3
	Cooling Operation Ambient Temperature Range	°F	0~115	0~115	0~115	0~115	0~115

SPECIFICATIONS

Friedrich Indoor Model Number		Unit	FSHSW09A1A	FSHSW12A1A	FSHSW18A3A	FSHSW24A3A	FSHSW36A3A
Friedrich Outdoor Model Number			FSHSR09A1A	FSHSR12A1A	FSHSR18A3A	FSHSR24A3A	FSHSR36A3A
Outdoor Unit	Heating Operation Ambient Temperature Range	°F	-4~75	-4~75	-13~75	-13~75	-4~75
	Throttling Method		Electron expansion valve	Electron expansion valve	Electron expansion valve	Electron expansion valve	Electron expansion valve
	Defrosting Method		Automatic Defrosting	Automatic Defrosting	Automatic Defrosting	Automatic Defrosting	Automatic Defrosting
	Climate Type		T1	T1	T1	T1	T1
	Climate Zone		Temperate Zone	Temperate Zone	Temperate Zone	Frigd Zone	Temperate Zone
	Isolation		I	I	I	I	I
	Moisture Protection		IPX4	IPX4	IPX4	IPX4	IPX4
	Sound Pressure Level	dB (A)	52	53	57	58	65
	Sound Power Level	dB (A)	62	63	67	68	75
	Dimension (W×H×D)	inch	33 3/8×21 1/4×12 5/8	33 3/8×21 1/4×12 5/8	37 5/8×27 5/8×15 5/8	37 5/8×27 5/8×15 5/8	38 5/8×31 1/8×16 3/4
	Net Weight	lb	62.8	67.3	97	103.635	160.965
	Gross Weight	lb	68.4	72.8	106.9	113.558	171.99
	Refrigerant		R410A	R410A	R410A	R410A	R410A
	Refrigerant Charge	oz	24.7	31.8	45.86	56.4	91.71
	Length	ft	25	25	25	25	25
	Gas Additional Charge	oz/ft.	0.2	0.2	0.2	0.538	0.538
	Outer Diameter of Liquid Pipe(British System Allocation)	inch	1/4"	1/4"	1/4"	1/4"	1/4"
	Outer Diameter of Gas Pipe(British System Allocation)	inch	3/8"	3/8"	1/2"	5/8"	5/8"
	Max Distance Height	ft	32	50	65	65	32
	Max Distance Length	ft	65	100	100	100	100

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. (7.6m) / 0 ft. (0m)

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.

SPECIFICATIONS

Capacities and selection data

Cooling Template

Indoor units(Btu)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		64 / 54			70 / 60			75/ 63			80 / 67			85 / 71			90 / 73		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
		kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW
FSHSW09A1A	14	3.83	2.81	0.60	4.55	3.34	0.63	4.86	3.57	0.65	5.22	3.84	0.67	5.40	3.97	0.68	4.95	3.64	0.68
	23	4.19	3.10	0.63	4.91	3.63	0.66	5.22	3.86	0.67	5.58	4.13	0.69	5.76	4.26	0.70	5.31	3.93	0.71
	32	4.37	3.25	0.65	5.09	3.79	0.68	5.40	4.02	0.70	5.76	4.29	0.72	5.94	4.43	0.73	5.49	4.09	0.74
	41	4.91	3.68	0.67	5.63	4.22	0.71	5.94	4.46	0.72	6.30	4.73	0.75	6.48	4.86	0.76	6.03	4.52	0.77
	50	5.45	4.11	0.70	6.17	4.65	0.74	6.48	4.89	0.75	6.84	5.16	0.77	7.02	5.30	0.78	6.57	4.96	0.79
	59	5.90	4.48	0.72	6.62	5.03	0.76	6.93	5.27	0.78	7.29	5.54	0.80	7.47	5.68	0.81	7.02	5.34	0.82
	67	6.08	4.65	0.75	6.80	5.20	0.79	7.11	5.44	0.80	7.47	5.71	0.83	7.65	5.85	0.84	7.20	5.51	0.85
	77	7.97	6.13	0.77	8.69	6.69	0.81	9.00	6.93	0.83	9.36	7.21	0.86	9.54	7.35	0.86	9.09	7.00	0.87
	87	8.42	6.52	0.80	9.14	7.08	0.84	9.45	7.32	0.86	9.81	7.60	0.88	9.99	7.74	0.89	9.54	7.39	0.90
	95	7.61	5.93	0.81	8.33	6.49	0.86	8.64	6.74	0.87	**9.00**	**7.02**	**0.90**	9.18	7.16	0.91	8.73	6.81	0.92
	104	6.66	5.23	0.89	7.38	5.79	0.94	7.74	6.08	0.96	8.10	6.36	0.99	8.28	6.50	1.00	7.83	6.15	1.01
	115	6.300	4.977	0.975	7.020	5.546	1.026	7.380	5.830	1.048	7.740	6.115	1.080	7.920	6.257	1.089	7.470	5.901	1.098

Heating Template

Indoor units(Btu)	Outdoor Air		Indoor Air Temp. °F DB									
	°F DB	°F WB	60		65		70		75		78	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW
FSHSW09A1A	-15	-17	3.61	0.67	3.71	0.68	3.99	0.70	4.09	0.71	4.13	0.71
	-5	-7	4.18	0.68	4.28	0.69	4.56	0.71	4.66	0.73	4.70	0.73
	5	3	5.13	0.71	5.23	0.72	5.51	0.74	5.61	0.75	5.65	0.76
	10	8	5.32	0.73	5.42	0.73	5.70	0.76	5.80	0.77	5.84	0.77
	14	12	5.80	0.74	5.89	0.75	6.18	0.77	6.27	0.79	6.32	0.79
	23	19	7.32	0.77	7.41	0.78	7.70	0.80	7.79	0.82	7.84	0.82
	32	28	7.98	0.79	8.08	0.79	8.36	0.82	8.46	0.84	8.50	0.84
	41	37	8.65	0.80	8.74	0.81	9.03	0.84	9.12	0.85	9.17	0.86
	47	43	9.12	0.84	9.22	0.84	**9.50**	**0.87**	9.60	0.89	9.64	0.89
	50	47	9.22	0.86	9.31	0.87	9.60	0.90	9.69	0.91	9.74	0.92
	59	50	9.31	0.89	9.41	0.90	9.69	0.92	9.79	0.94	9.83	0.95
	68	59	9.93	0.94	10.02	0.95	10.31	0.98	10.40	1.00	10.45	1.00
	75	65	10.17	0.97	10.26	0.98	10.55	1.01	10.64	1.03	10.69	1.03

Cooling Template

Indoor units(Btu)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		64 / 54			70 / 60			75/ 63			80 / 67			85 / 71			90 / 73		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
		kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW
FSHSW12A1A	14	5.10	3.75	0.80	6.06	4.45	0.84	6.48	4.76	0.86	6.96	5.12	0.88	7.20	5.29	0.90	6.60	4.85	0.91
	23	5.58	4.13	0.83	6.54	4.84	0.87	6.96	5.15	0.89	7.44	5.51	0.92	7.68	5.68	0.93	7.08	5.24	0.94
	32	5.82	4.34	0.86	6.78	5.05	0.91	7.20	5.36	0.93	7.68	5.72	0.96	7.92	5.90	0.97	7.32	5.45	0.98
	41	6.54	4.91	0.89	7.50	5.63	0.94	7.92	5.94	0.96	8.40	6.30	0.99	8.64	6.48	1.00	8.04	6.03	1.01
	50	7.26	5.48	0.93	8.22	6.21	0.98	8.64	6.52	1.00	9.12	6.89	1.03	9.36	7.07	1.04	8.76	6.61	1.05
	59	7.86	5.97	0.96	8.82	6.70	1.01	9.24	7.02	1.03	9.72	7.39	1.06	9.96	7.57	1.07	9.36	7.11	1.09
	67	8.10	6.20	0.99	9.06	6.93	1.04	9.48	7.25	1.07	9.96	7.62	1.10	10.20	7.80	1.11	9.60	7.34	1.12
	77	10.62	8.18	1.02	11.58	8.92	1.08	12.00	9.24	1.10	12.48	9.61	1.13	12.72	9.79	1.15	12.12	9.33	1.16
	87	11.22	8.70	1.06	12.18	9.44	1.11	12.60	9.77	1.14	13.08	10.14	1.17	13.32	10.32	1.18	12.72	9.86	1.19
	95	10.14	7.91	1.08	11.10	8.66	1.13	11.52	8.99	1.16	**12.00**	**9.36**	**1.19**	12.24	9.55	1.21	11.64	9.08	1.22
	104	8.88	6.97	1.19	9.84	7.72	1.25	10.32	8.10	1.27	10.80	8.48	1.31	11.04	8.67	1.33	10.44	8.20	1.34
	115	8.40	6.64	1.29	9.36	7.39	1.36	9.84	7.77	1.39	10.32	8.15	1.43	10.56	8.34	1.44	9.96	7.87	1.46

Heating Template

Indoor units(Btu)	Outdoor Air		Indoor Air Temp. °F DB									
	°F DB	°F WB	60		65		70		75		78	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW
FSHSW12A1A	-15	-17	4.94	0.96	5.07	0.97	5.46	1.00	5.59	1.02	5.66	1.03
	-5	-7	5.72	0.98	5.85	0.99	6.24	1.02	6.37	1.04	6.44	1.05
	5	3	7.02	1.02	7.15	1.03	7.54	1.06	7.67	1.08	7.74	1.09
	10	8	7.28	1.04	7.41	1.05	7.80	1.09	7.93	1.11	8.00	1.11
	14	12	7.93	1.06	8.06	1.07	8.45	1.11	8.58	1.13	8.65	1.13
	23	19	10.01	1.11	10.14	1.12	10.53	1.15	10.66	1.18	10.73	1.18
	32	28	10.92	1.13	11.05	1.14	11.44	1.18	11.57	1.20	11.64	1.21
	41	37	11.83	1.15	11.96	1.16	12.35	1.20	12.48	1.22	12.55	1.23
	47	43	12.48	1.20	12.61	1.21	**13.00**	**1.25**	13.13	1.28	13.20	1.28
	50	47	12.61	1.24	12.74	1.25	13.13	1.29	13.26	1.31	13.33	1.32
	59	50	12.74	1.27	12.87	1.29	13.26	1.33	13.39	1.35	13.46	1.36
	68	59	13.59	1.35	13.72	1.36	14.11	1.41	14.24	1.44	14.30	1.44
	75	65	13.91	1.39	14.04	1.41	14.43	1.45	14.56	1.48	14.63	1.49

SPECIFICATIONS

Capacities and selection data

Cooling Template

Indoor units(Btu)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		64 / 54			70 / 60			75/ 63			80 / 67			85 / 71			90 / 73		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
		kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW
FSHSW18A3A	14	9.82	6.23	1.20	10.17	7.32	1.23	10.74	7.74	1.25	12.13	8.73	1.27	12.49	9.37	1.30	13.67	10.25	1.32
	23	10.85	6.88	1.22	11.50	8.28	1.26	12.31	8.86	1.27	14.10	10.15	1.30	14.52	10.89	1.32	15.51	11.63	1.34
	32	12.03	8.86	1.23	12.93	9.31	1.29	13.83	9.95	1.30	15.84	11.41	1.33	16.32	12.24	1.35	17.43	13.07	1.37
	41	12.52	9.03	1.32	13.46	9.69	1.43	14.40	10.37	1.44	16.50	11.88	1.47	17.00	12.75	1.50	18.15	13.61	1.52
	50	13.00	9.38	1.36	14.03	10.10	1.46	15.00	10.80	1.47	17.19	12.37	1.50	17.70	13.28	1.53	18.91	14.18	1.55
	59	14.53	10.53	1.37	15.28	11.00	1.48	16.35	11.77	1.50	17.91	12.89	1.53	18.44	13.83	1.56	20.61	15.46	1.58
	67	17.00	12.12	1.56	17.92	12.90	1.65	19.04	13.71	1.67	20.35	14.65	1.70	20.96	15.72	1.74	23.33	17.50	1.76
	77	16.23	11.65	1.60	17.18	12.37	1.69	18.28	13.16	1.70	19.56	14.09	1.74	20.15	15.11	1.77	22.46	16.85	1.79
	87	15.02	11.08	1.63	16.16	11.64	1.72	17.24	12.41	1.74	18.81	13.54	1.77	19.38	14.53	1.81	21.53	16.15	1.83
	95	14.31	10.56	1.65	15.44	11.12	1.75	15.77	11.35	1.77	**18.09**	**13.02**	**1.81**	18.63	13.97	1.84	20.82	15.62	1.86
	104	14.00	10.02	1.70	15.04	11.28	1.78	15.37	11.53	1.80	17.18	12.37	1.84	17.70	13.27	1.88	19.69	14.77	1.89
	115	13.52	10.23	1.77	14.45	10.84	1.89	15.00	11.25	1.91	16.15	12.11	1.95	16.63	12.48	1.99	19.16	14.37	2.01

Heating Template

Indoor units(Btu)	Outdoor Air		Indoor Air Temp. °F DB									
	°F DB	°F WB	60		65		70		75		78	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW
FSHSW18A3A	-15	-17	6.98	1.62	6.75	1.65	6.56	1.70	6.39	1.78	6.13	1.81
	-5	-7	8.75	1.70	8.60	1.76	8.51	1.82	8.42	1.86	8.23	1.90
	5	3	10.33	1.73	10.13	1.80	10.01	1.86	9.91	1.91	9.80	1.93
	10	8	11.85	1.80	11.60	1.86	11.43	1.91	11.28	1.95	11.23	1.98
	14	12	12.96	1.83	12.75	1.90	12.52	1.94	12.31	1.98	12.11	2.01
	23	19	14.94	1.86	14.74	1.92	14.46	1.96	14.02	2.00	13.88	2.04
	32	28	16.77	1.90	16.48	1.96	16.16	2.00	15.67	2.04	15.51	2.08
	41	37.00	18.63	1.94	18.46	2.00	18.10	2.04	17.56	2.08	17.38	2.12
	47	43.00	20.80	1.97	20.60	2.04	**20.20**	**2.08**	19.59	2.12	19.39	2.16
	50	47.00	21.22	1.99	21.02	2.06	20.60	2.10	19.98	2.14	19.78	2.18
	59	50	21.67	2.01	21.44	2.08	21.02	2.12	20.38	2.16	20.17	2.20
	68	59	18.45	1.71	18.22	1.77	17.86	1.80	17.33	1.84	17.15	1.87
	75	65	18.70	1.75	18.58	1.80	18.22	1.84	17.67	1.87	17.49	1.91

Cooling Template

Indoor units(Btu)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		64 / 54			70 / 60			75/ 63			80 / 67			85 / 71			90 / 73		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
		kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW
FSHSW24A3A	14	7.48	5.50	1.07	9.46	6.95	1.25	11.22	8.25	1.32	12.98	9.54	1.38	13.42	9.86	1.46	13.86	10.19	1.50
	23	8.36	6.19	1.13	9.90	7.33	1.32	11.66	8.63	1.39	13.42	9.93	1.46	14.08	10.42	1.48	14.74	10.91	1.56
	32	9.02	6.72	1.21	10.34	7.70	1.37	12.10	9.01	1.44	13.86	10.33	1.52	14.74	10.98	1.58	15.40	11.47	1.62
	41	9.68	7.26	1.27	11.66	8.75	1.41	13.42	10.07	1.48	15.18	11.39	1.56	15.84	11.88	1.64	16.50	12.38	1.68
	50	10.78	8.14	1.33	12.98	9.80	1.50	14.74	11.13	1.57	16.50	12.46	1.66	17.16	12.96	1.70	17.38	13.12	1.74
	59	11.44	8.69	1.42	13.86	10.53	1.55	15.62	11.87	1.63	17.38	13.21	1.72	17.60	13.38	1.76	18.04	13.71	1.77
	67	12.32	9.42	1.48	14.52	11.11	1.60	16.28	12.45	1.69	18.04	13.80	1.77	18.26	13.97	1.81	18.92	14.47	1.83
	77	14.96	11.52	1.54	18.48	14.23	1.62	20.24	15.58	1.70	22.00	16.94	1.79	22.22	17.11	1.85	22.66	17.45	1.87
	87	15.84	12.28	1.66	20.02	15.52	1.67	21.78	16.88	1.76	23.54	18.24	1.85	22.66	17.56	1.89	23.10	17.90	1.93
	95	13.42	10.47	1.76	18.48	14.41	1.76	20.24	15.79	1.85	**22.00**	**17.16**	**1.95**	23.32	18.19	2.01	23.98	18.70	2.05
	104	12.98	10.19	1.85	16.06	12.61	1.92	17.82	13.99	2.02	19.58	15.37	2.13	21.78	17.10	2.18	22.22	17.44	2.24
	115	10.56	8.34	1.99	14.74	11.64	2.04	16.50	13.04	2.15	18.26	14.43	2.26	20.02	15.82	2.34	20.24	15.99	2.36

Heating Template

Indoor units(Btu)	Outdoor Air		Indoor Air Temp. °F DB									
	°F DB	°F WB	60		65		70		75		78	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW
FSHSW24A3A	-15	-17	8.88	1.56	9.36	1.59	10.32	1.66	10.80	1.69	11.28	1.72
	-5	-7	10.08	1.59	10.56	1.62	11.52	1.69	12.00	1.73	12.48	1.76
	5	3	12.48	1.66	12.96	1.69	13.92	1.76	14.40	1.80	14.88	1.83
	10	8	12.96	1.69	13.44	1.73	14.40	1.80	14.88	1.83	15.36	1.87
	14	12	14.56	1.73	15.04	1.76	16.00	1.83	16.48	1.87	16.96	1.91
	23	19	17.76	1.80	18.24	1.83	19.20	1.91	19.68	1.95	20.16	1.99
	32	28	19.68	1.83	20.16	1.87	21.12	1.95	21.60	1.99	22.08	2.03
	41	37	21.36	1.87	21.84	1.91	22.80	1.99	23.28	2.03	23.76	2.07
	47	43	22.56	1.95	23.04	1.99	**24.00**	**2.07**	24.48	2.11	24.96	2.15
	50	47	22.80	2.01	23.28	2.05	24.24	2.13	24.72	2.17	25.20	2.22
	59	50	23.04	2.07	23.52	2.11	24.48	2.20	24.96	2.24	25.44	2.28
	68	59	24.48	2.19	24.96	2.24	25.92	2.33	26.40	2.38	26.88	2.42
	75	65	25.20	2.26	25.68	2.30	26.64	2.40	27.12	2.45	27.60	2.50

SPECIFICATIONS

Capacities and selection data

Cooling Template

Indoor units(Btu)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		64 / 54			70 / 60			75/ 63			80 / 67			85 / 71			90 / 73		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
		kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW
FSHSW36A3A	14	11.40	8.40	2.01	14.40	10.60	2.34	17.10	12.60	2.46	19.80	14.60	2.59	20.50	15.10	2.74	21.20	15.60	2.81
	23	12.80	9.50	2.12	15.10	11.20	2.47	17.80	13.20	2.60	20.50	15.20	2.74	21.50	15.90	2.77	22.50	16.70	2.92
	32	13.80	10.30	2.26	15.80	11.80	2.57	18.50	13.80	2.70	21.20	15.80	2.85	22.50	16.80	2.96	23.50	17.50	3.03
	41	14.80	11.10	2.37	17.80	13.40	2.64	20.50	15.40	2.77	23.20	17.40	2.92	24.20	18.20	3.07	25.20	18.90	3.14
	50	16.50	12.50	2.48	19.80	14.90	2.80	22.50	17.00	2.95	25.20	19.00	3.10	26.20	19.80	3.18	26.50	20.00	3.25
	59	17.50	13.30	2.66	21.20	16.10	2.90	23.90	18.20	3.05	26.50	20.10	3.21	26.90	20.40	3.29	27.60	21.00	3.32
	67	18.80	14.40	2.77	22.20	17.00	3.00	24.90	19.00	3.16	27.60	21.10	3.32	27.90	21.30	3.39	28.90	22.10	3.43
	77	22.80	17.60	2.88	28.20	21.70	3.03	30.90	23.80	3.19	33.60	25.90	3.36	33.90	26.10	3.47	34.60	26.60	3.50
	87	24.20	18.80	3.10	30.60	23.70	3.13	33.30	25.80	3.29	36.00	27.90	3.47	34.60	26.80	3.54	35.30	27.40	3.61
	95	20.50	16.00	3.29	28.20	22.00	3.29	30.90	24.10	3.47	**33.60**	**26.20**	**3.65**	35.60	27.80	3.76	36.60	28.50	3.83
	104	19.80	15.50	3.47	24.50	19.20	3.59	27.20	21.40	3.78	29.90	23.50	3.98	33.30	26.10	4.09	33.90	26.60	4.20
	115	16.10	12.70	3.72	22.50	17.80	3.82	25.20	19.90	4.02	27.90	22.00	4.23	30.60	24.20	4.38	30.90	24.40	4.42

Heating Template

Indoor units(Btu)	Outdoor Air		Indoor Air Temp. °F DB									
	°F DB	°F WB	60		65		70		75		78	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW
FSHSW36A3A	-15	-17	12.80	2.73	13.50	2.78	14.20	2.84	14.90	2.90	16.30	3.02
	-5	-7	14.50	2.78	15.20	2.84	15.90	2.90	16.60	2.96	18.00	3.08
	5	3	18.00	2.90	18.70	2.96	19.40	3.02	20.10	3.08	21.50	3.20
	10	8	18.70	2.96	19.40	3.02	20.10	3.08	20.80	3.14	22.10	3.27
	14	12	21.00	3.02	21.70	3.08	22.40	3.14	23.10	3.21	24.50	3.34
	23	19	25.60	3.14	26.30	3.21	27.00	3.27	27.70	3.34	29.10	3.47
	32	28	28.40	3.21	29.10	3.27	29.80	3.34	30.40	3.41	31.80	3.54
	41	37	30.80	3.27	31.50	3.34	32.20	3.41	32.90	3.48	34.30	3.62
	47	43	32.50	3.41	33.20	3.48	**33.90**	**3.55**	34.60	3.62	36.00	3.77
	50	47	32.90	3.51	33.60	3.58	34.30	3.65	34.90	3.73	36.30	3.88
	59	50	33.20	3.61	33.90	3.69	34.60	3.76	35.30	3.84	36.70	4.00
	68	59	35.30	3.83	36.00	3.91	36.70	3.99	37.40	4.07	38.80	4.24
	75	65	36.30	3.95	37.00	4.03	37.70	4.11	38.40	4.20	39.80	4.37

SPECIFICATIONS

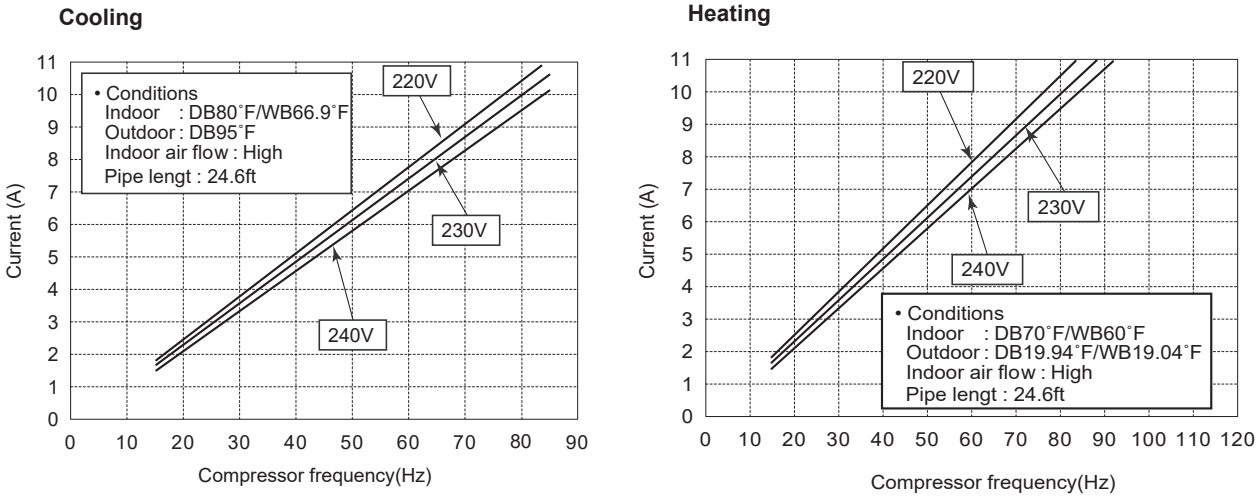


Figure 203

9-12K Operation Characteristics curve

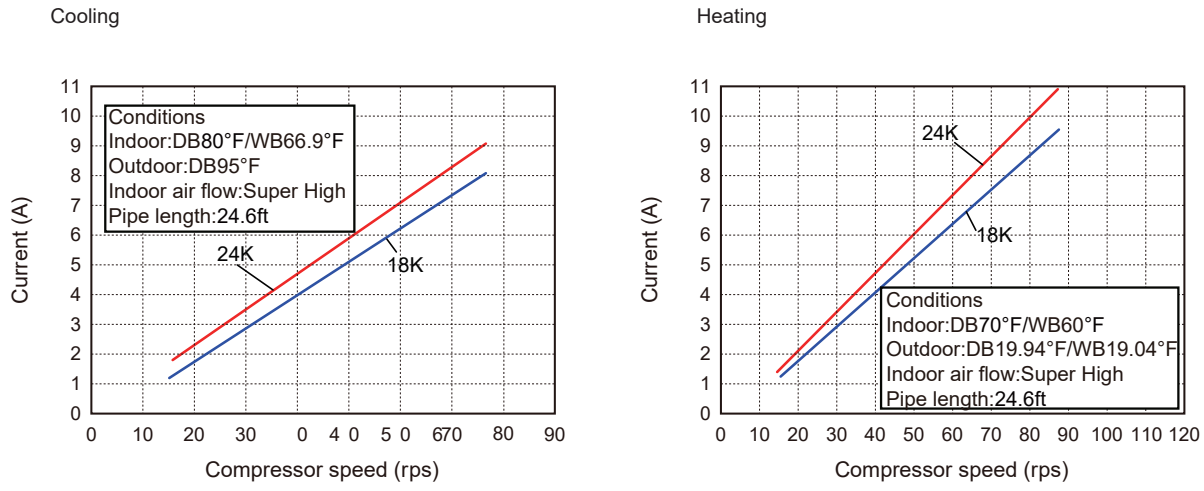


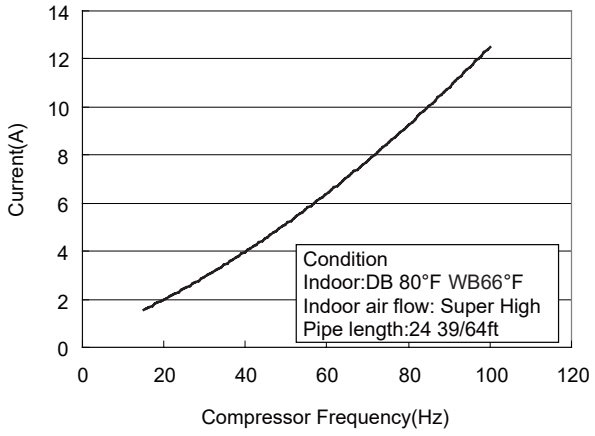
Figure 204

18-24k Operation Characteristics curve

SPECIFICATIONS

24K

Cooling



Heating

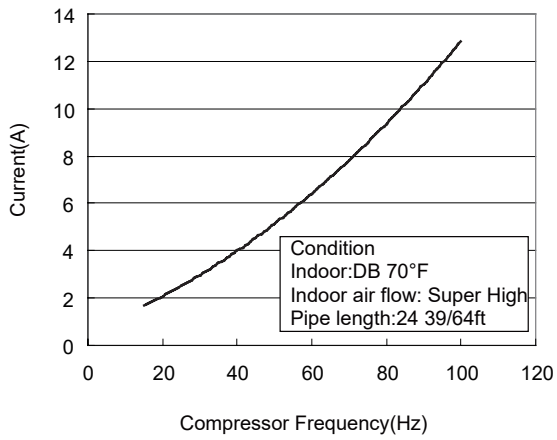
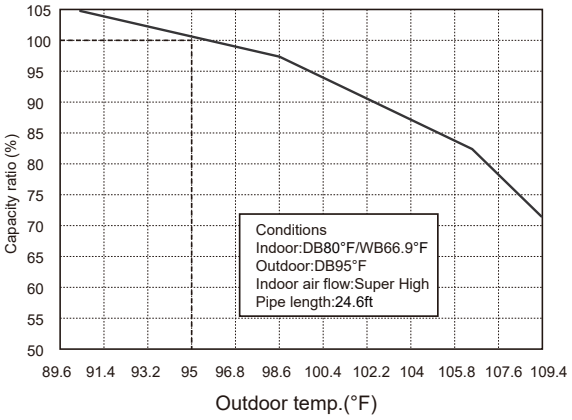


Figure 205

36K Operation Characteristics curve

SPECIFICATIONS

Cooling



Heating

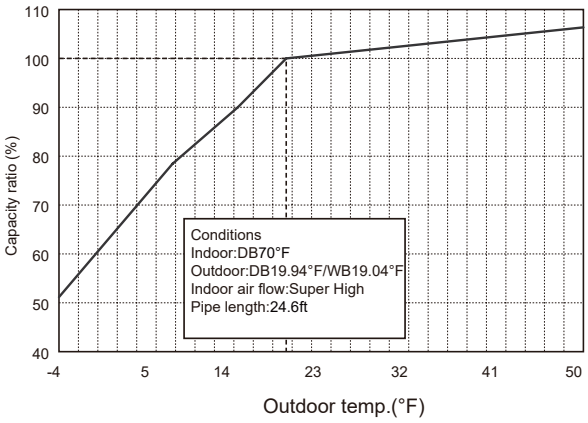
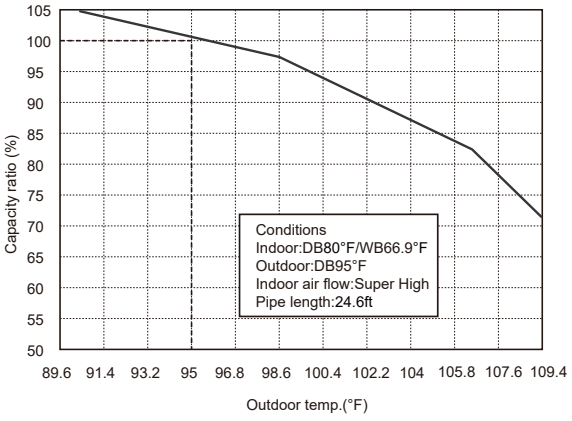


Figure 206

9-12K Capacity Variation Ratio According to Temperature

Cooling



Heating

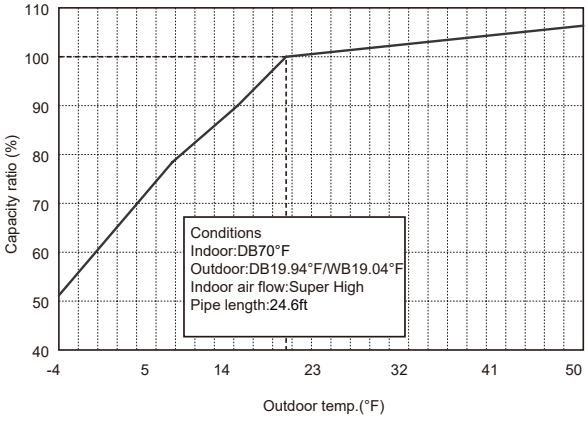


Figure 207

18-24 K Capacity Variation Ratio According to Temperature

SPECIFICATIONS

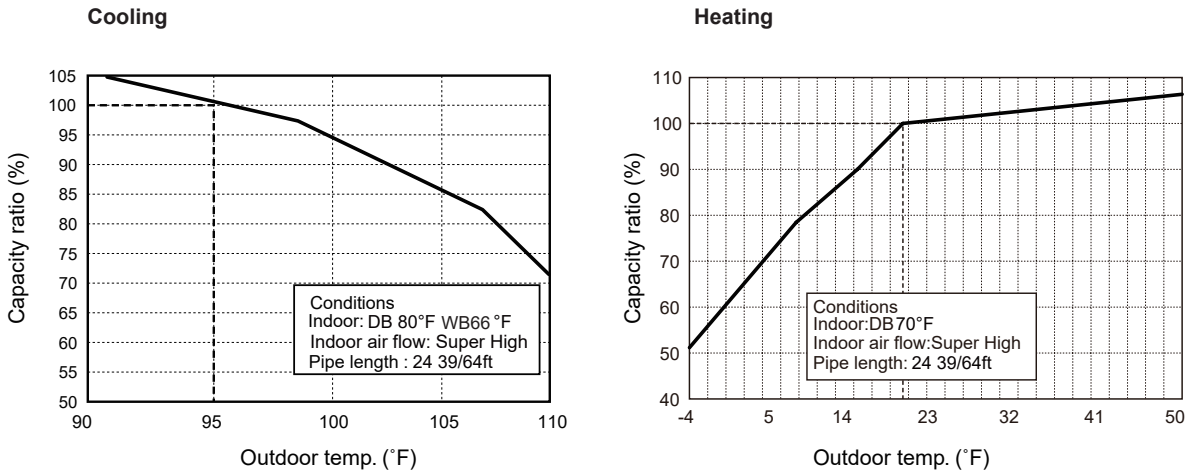


Figure 208

36K Capacity Variation Ratio According to Temperature

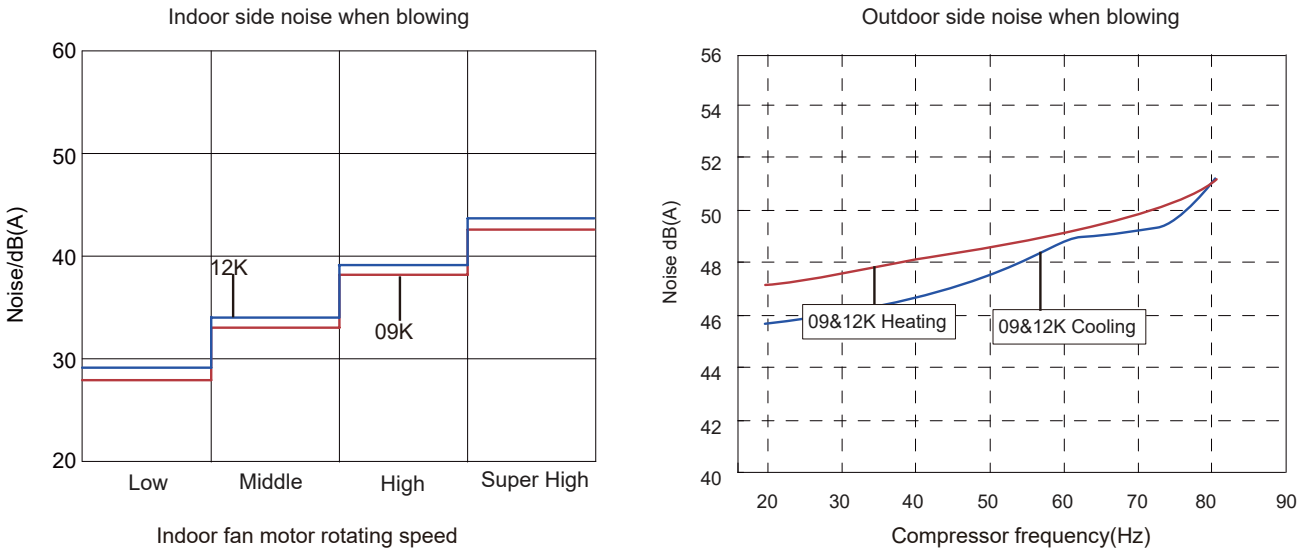


Figure 209

9-12K Noise Curve

SPECIFICATIONS

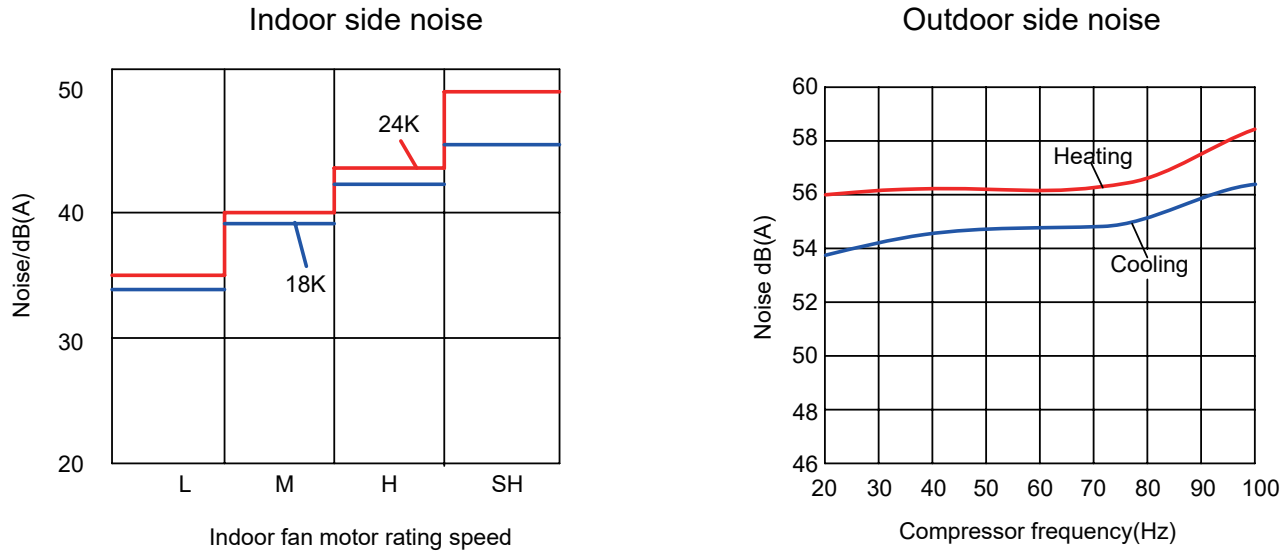


Figure 210

18-24K Noise Curve

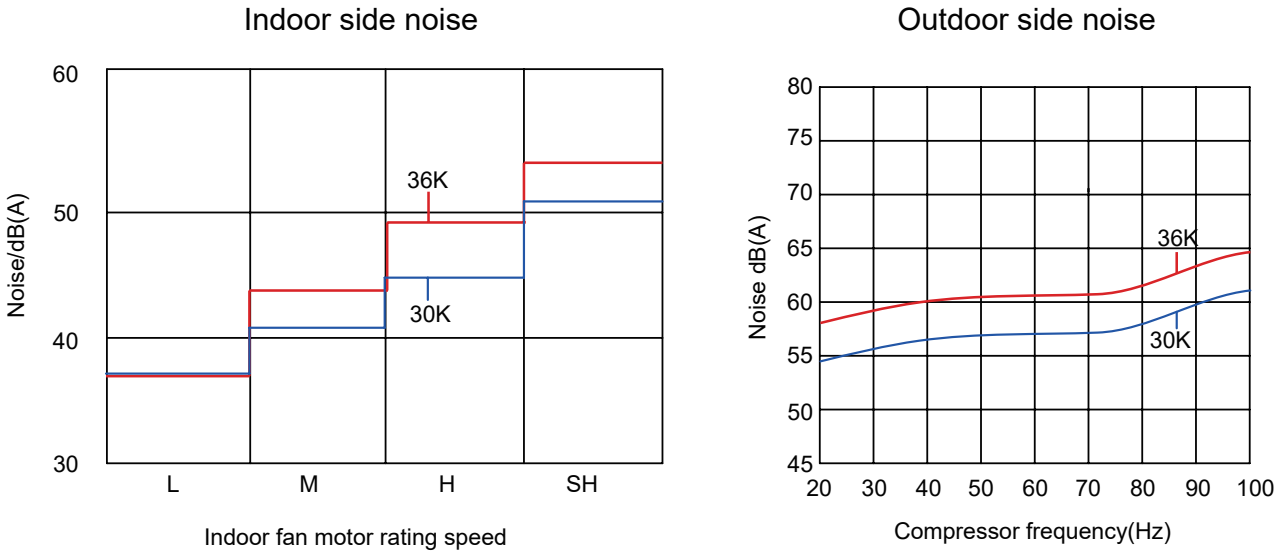


Figure 211

36K Noise Curve

SPECIFICATIONS

Rated cooling connecting indoor and (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor frequency (Hz)
Indoor	Outdoor		PSI	T1 (°F)	T2 (°F)			
80/67	95/75	9k	130.44~144.93	in:46.4~51.8	in:167~181.4	Super High	High	52
		12k		out:51.8~57.2	out:98.6~118.4			72
80/67	95/75	18k	130~142	in:46.4~51.8	in:167~181.4	Super High	High	75
80/67	95/75	24k		out:51.8~57.2	out:98.6~118.4	Super High	High	87
80/66	95/75	36k	130~145	46.8 to 52.8	127 to 96.8	Super High	High	60
T1: Inlet and outlet pipe temperature of evaporator T2: Inlet and outlet pipe temperature of condenser P: Pressure at the side of big valve Connection pipe length: 24.6ft.								

Figure 212

Cooling Data Sheet in Rated Frequency

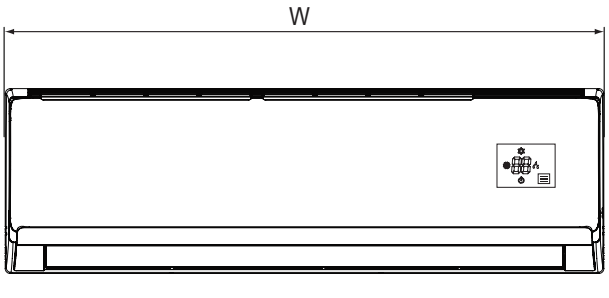
Rated Heating connecting indoor and (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor frequency (Hz)
Indoor	Outdoor		PSI	T1 (oF)	T2 (oF)			
70/60	19.94/19.04	9k	362.32~405.80	in:167~181.4	in:33.8~37.4	Super High	High	65
		12k		out:98.6~113	out:35.6~42.8			77
70/60	47/43	18k	507~550	in:167~181.4	in:33.8~37.4			90
70/60	47/43	24k		out:98.6~113	out:35.6~42.8			87
70/-	20/19	36k	507~550	134.4 to 102	36 to 39			58
T1: Inlet and outlet pipe temperature of evaporator T2: Inlet and outlet pipe temperature of condenser P: Pressure at the side of big valve Connection pipe length: 24.6ft.								

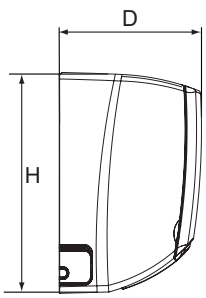
Figure 213

Heating Data Sheet in Rated Frequency

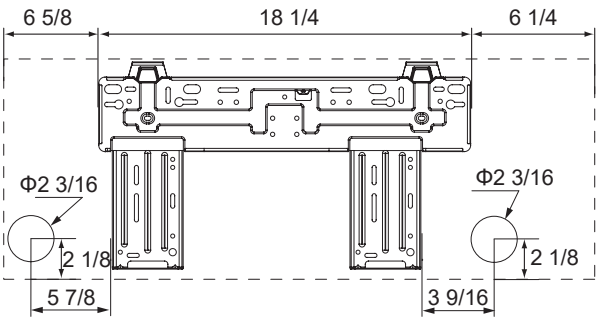
SPECIFICATIONS

Unit: “ (inches)

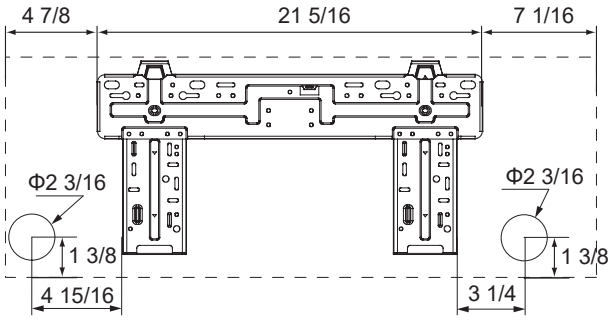




09K



12K



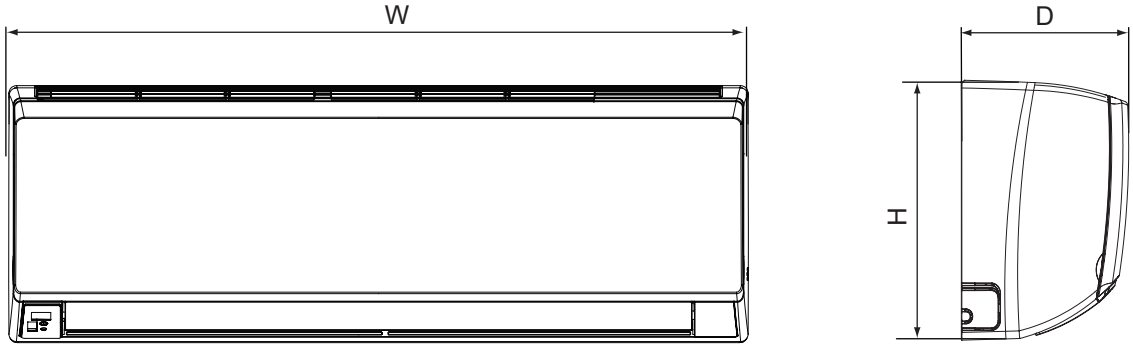
Models	W	H	D
09K	31 1/8	10 13/16	7 7/8
12K	33 1/4	11 3/8	8 1/4

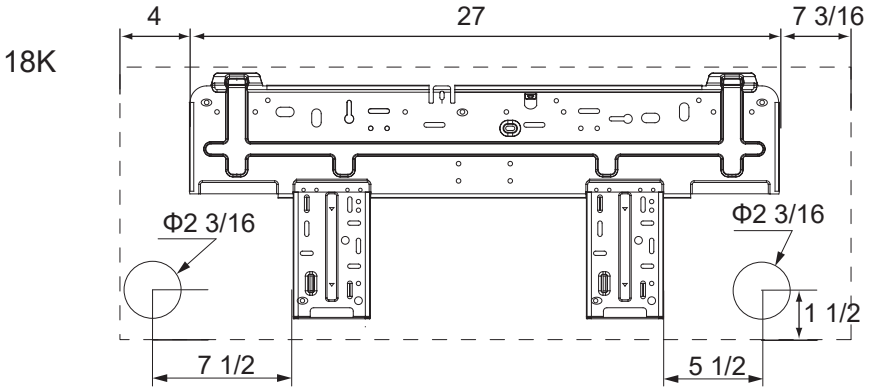
Figure 224

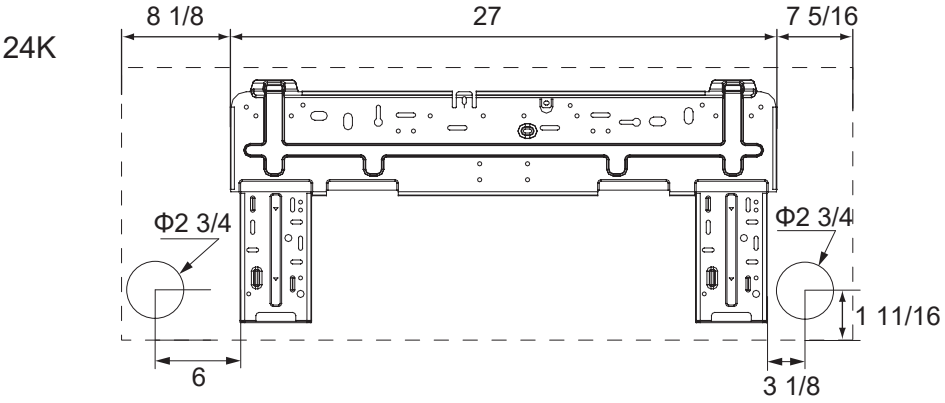
9-12K Indoor Unit Dimensions

SPECIFICATIONS

Unit: “ (inches)







Models	W	H	D
18K	38 3/16	11 13/16	8 13/16
24K	42 7/16	12 13/16	9 11/16

Figure 225

18-24K Indoor Unit Dimensions

SPECIFICATIONS

Unit: “ (inches)

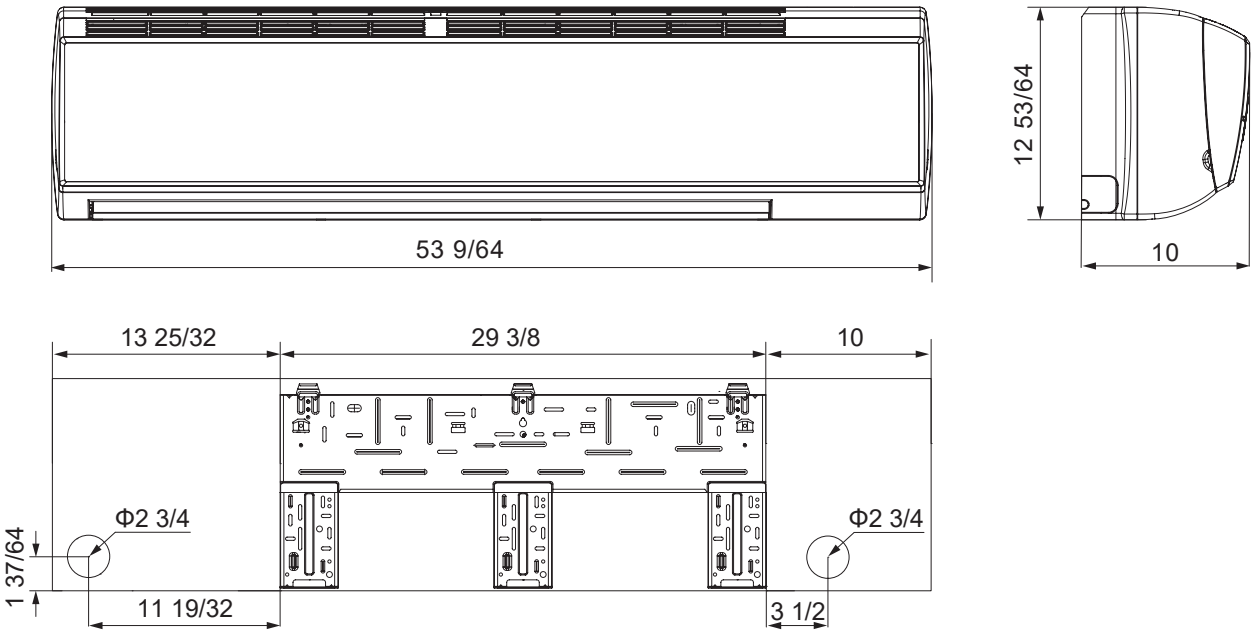


Figure 226

36K indoor Unit DimensionsK Indoor Unit Dimensions

Unit: “ (inches)

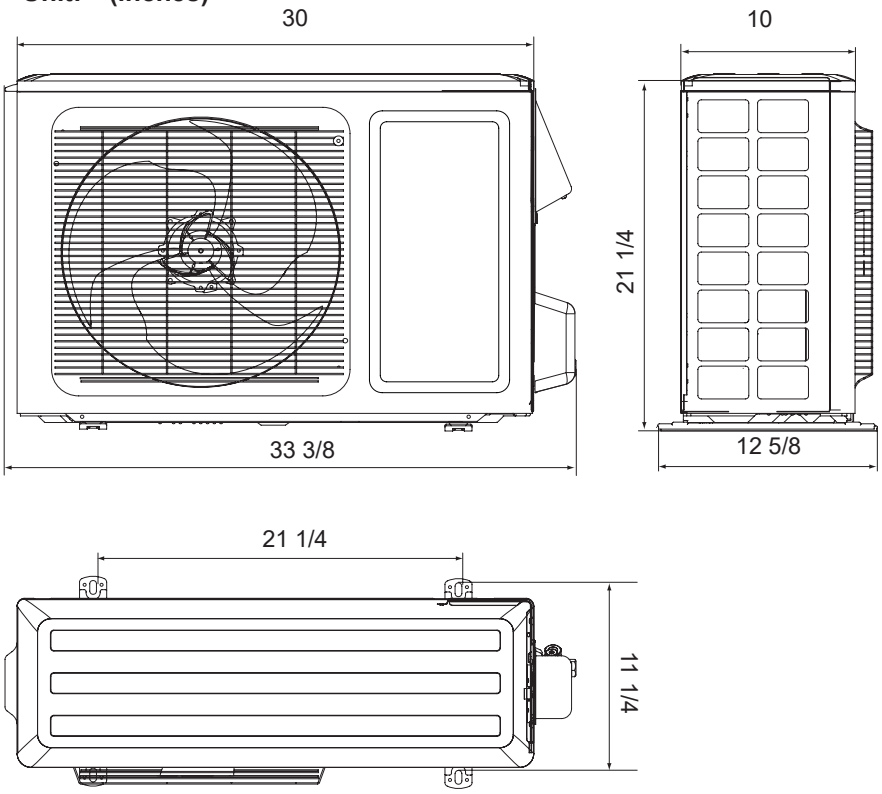


Figure 227

9-12K Outdoor Unit Dimensions

SPECIFICATIONS

Unit: “ (inches)

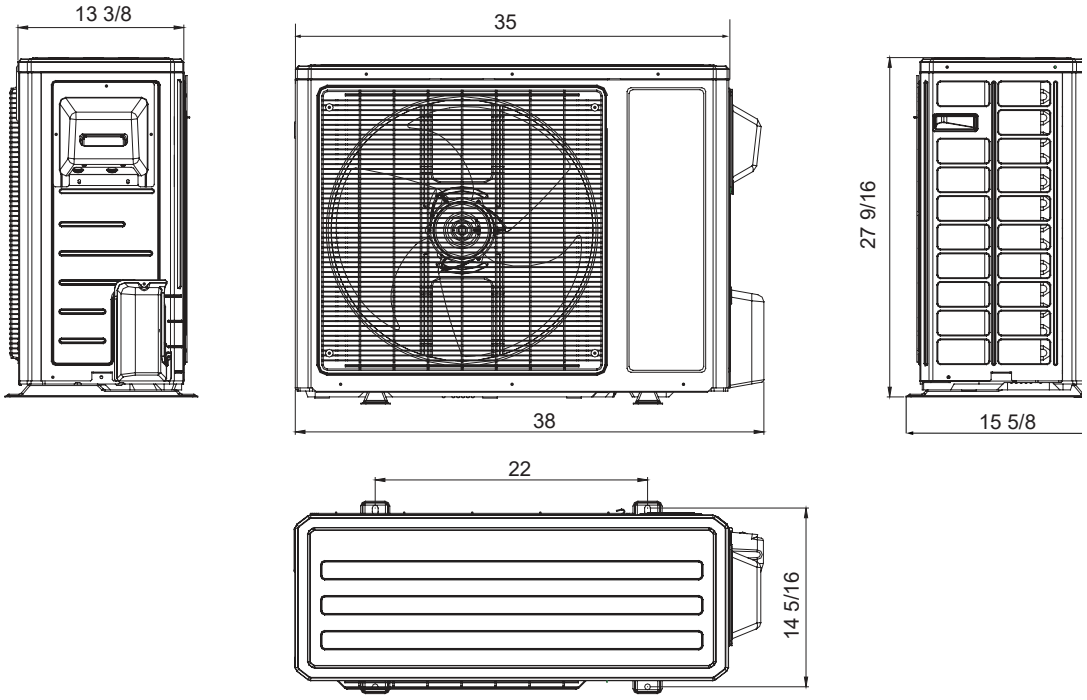


Figure 228

18-24K Outdoor Unit Dimensions

Unit: “ (inches)

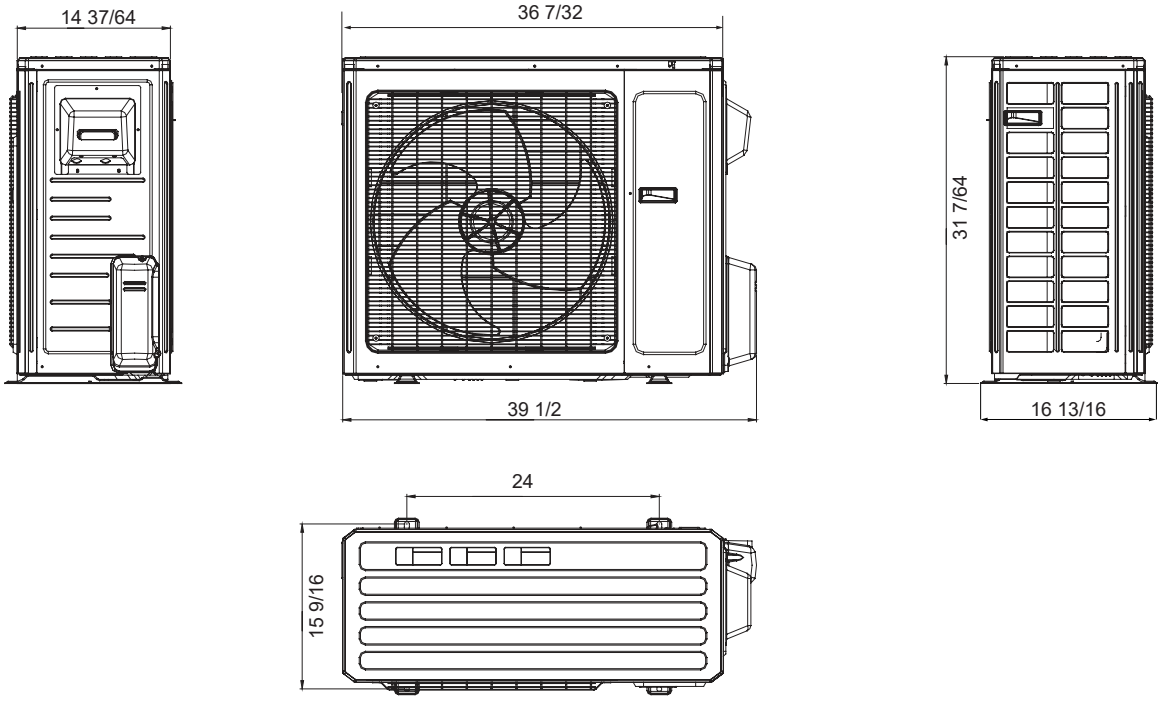


Figure 229

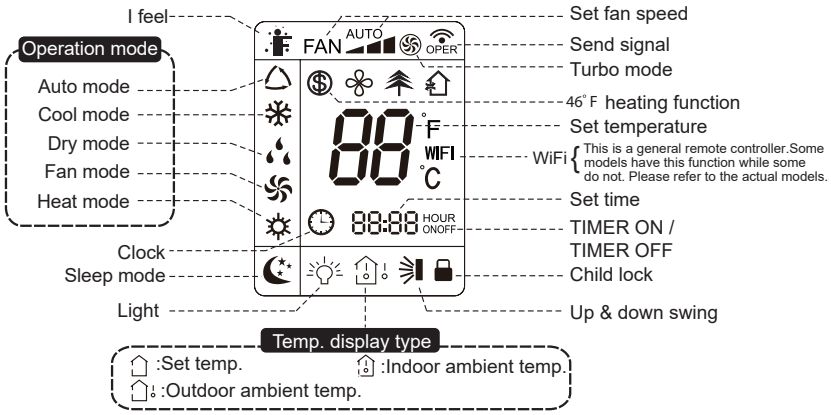
36K Outdoor Unit Dimensions

OPERATION

Remote Control (PN 69700657)

1. ON/OFF button
2. MODE button
3. FAN button
4. SWING button
5. TURBO button
6. ▲/ ▼button
7. SLEEP button
8. TEMP button
9. WiFi button
10. LIGHT button
11. CLOCK button
12. TIMER ON / TIMER OFF button

Introduction for icons on display screen



Introduction for buttons on remote controller

Note:

- This is a general use remote controller, it could be used for the air conditioners with multifunction; For some function, which the model doesn't have, if press the corresponding button on the remote controller that the unit will keep the original running status.
- After putting through the power, the air conditioner will give out a sound. Operation indicator " ⏻ " is ON (red indicator, the colour is different for different models). After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon " ((•)) "on the display of remote controller will blink once and the air conditioner will give out a “de” sound, which means the signal has been sent to the air conditioner.
- Under off status, set temperature and clock icon will be displayed on the display of remote controller (If timer on, timer off and light functions are set, the corre- sponding icons will be displayed on the display of remote controller at the same time); Under on status, the display will show the corresponding set function icons.

Figure 301

Remote Control Button Identification

OPERATION

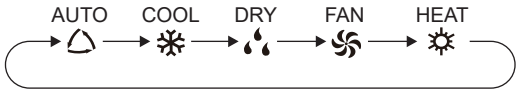
Remote Control (PN 69700657)

1. ON/OFF button

Press this button to turn on the unit. Press this button again to turn off the unit.

2. MODE button

Press this button to select your required operation mode.



● When selecting auto mode, air conditioner will operate automatically according to ex-factory setting. Set temperature can't be adjusted and will not be displayed as well. Press "FAN" button can adjust fan speed. Press "SWING" button can adjust fan blowing angle.

● After selecting cool mode, air conditioner will operate under cool mode. Cool indicator on indoor unit is ON.
.Press "▲" or " ▼ " button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle.

● When selecting dry mode, the air conditioner operates at low speed under dry mode. Dry indicator " " on indoor unit is ON. Under dry mode, fan speed can't be adjusted. Press "SWING" button to adjust fan blowing angle.

● When selecting fan mode, the air conditioner will only blow fan, no cooling and no heating. All indicators are OFF. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle.

● When selecting heating mode, the air conditioner operates under heat mode. Heat indicator on indoor unit is ON.
Press "▲" or " ▼ " button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle. (Cooling only unit won't receive heating mode signal. If setting heat mode with remote controller, press ON/OFF button can't start up the unit).

Note:

● For preventing cold air, after starting up heating mode, indoor unit will delay 1~5 minutes to blow air (actual delay time is depend on indoor ambient temperature).

● Set temperature range from remote controller: 61 ~ 86 ° F; Fan speed: auto, low speed, medium speed, high speed.

3. FAN button

Pressing this button can set fan speed circularly as: auto (AUTO), low( ) ,medium( ), high( ).

Note:

● Under AUTO speed, air conditioner will select proper fan speed automatically according to ex-factory setting.

● Fan speed under dry mode is low speed.

● X-FAN function:Hold fan speed button in COOL or DRY mode, the icon " " is displayed and the indoor fan will continue operation for a few minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO, FAN or HEAT mode.
This function indicates that moisture on evaporator of indoor unit will be blowed after the unit is stopped to avoid mould.

●Having set X-FAN function on:After turning off the unit by pressing ON/OFF button indoor fan will continue running for a few minutes.at low speed.In this period,Hold fan speed button to stop indoor fan directly.

●Having set X-FAN function off: After turning off the unit by pressing ON/OFF button, the complete unit will be off directly.

4. SWING button

Press this button can select up&down swing angle. Fan blow angle can be selected circularly as below:

(horizontal louvers stops at current position)

● When selecting " ", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle.

● When selecting " ", air conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position.

● When selecting " ", air conditioner is blowing fan at fixed angle. Horizontal louver will send air at the fixed angle.

● Hold " "button above 2s to set your required swing angle. When reaching your required angle, release the button.

Note:

● " " may not be available. When air conditioner receives this signal, the air conditioner will blow fan automatically.

5. TURBO button

Under COOL or HEAT mode, press this button to turn to quick COOL or quick HEAT mode. " " icon is displayed on remote controller. Press this button again to exit turbo function and " " icon will disappear.

OPERATION

Remote Control (PN 69700657)

6. ▲/▼ button

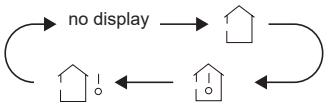
- Press "▲" or "▼" button once increase or decrease set temperature 1° F Holding "▲" or "▼" button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly. (Temperature can't be adjusted under auto mode)
- When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▼" button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons)

7. SLEEP button

Under COOL, HEAT mode, press this button to start up sleep function. " " icon is displayed on remote controller. Press this button again to cancel sleep function and " " icon will disappear.

8. TEMP button

By pressing this button, you can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor units display. The setting on remote controlleris selected circularly as below:



- When selecting " " or no display with remote controller, temperature indicator on indoor unit displays set temperature.
- When selecting " " with remote controller, temperature indicator on indoor unit displays indoor ambient temperature.
- When selecting " " with remote controller, temperature indicator on indoor unit displays outdoor ambient temperature.

Note:

- Outdoor temperature display is not available for some models. At that time, indoor unit receives " "signal, while it displays indoor set temperature.
- It's defaulted to display set temperature when turning on the unit.There is no display in the remote controller.
- Only for the models whose indoor unit has dual-8 display.
- When selecting displaying of indoor or outdoor ambient temperature, indoor temperature indicator displays corresponding temperature and automatically turn to display set temperature after three or five seconds.

10. LIGHT button

Press this button to turn off display light on indoor unit. " " icon on remote controller disappears. Press this button again to turn on display light. " " icon is displayed.

11. CLOCK button

Press this button to set clock time. " " icon on remote controller will blink. Press "▲" or "▼" button within 5s to set clock time. Each pressing of "▲" or "▼" button, clock time will increase or decrease 1 minute. If hold "▲" or "▼" button, 2s later, time will change quickly. Release this button when reaching your required time. Press "CLOCK" button to confirm the time. " " icon stops blinking.

Note:

- Clock time adopts 24-hour mode.
- The interval between two operation can't exceeds 5s. Otherwise, remote controller will quit setting status. Operation for TIMER ON/TIMER OFF is the same.

12. TIMER ON / TIMER OFF button

- TIMER ON button

  "TIMER ON" button can set the time for timer on. After pressing this button, " " icon disappears and the word "ON" on remote controller blinks. Press "▲" or "▼"button to adjust TIMER ON setting. After each pressing "▲" or "▼" button, TIMER ON setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time. Press "TIMER ON" to confirm it. The word "ON" will stop blinking. " " icon resumes displaying. Cancel TIMER ON: Under the condition that TIMER ON is started up, press "TIMER ON" button to cancel it.
- TIMER OFF button

  "TIMER OFF" button can set the time for timer off. After pressing this button," " icon disappears and the word "OFF" on remote controller blinks. Press "▲" or "▼" button to adjust TIMER OFF setting. After each pressing "▲" or "▼" button,
  TIMER OFF setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time. Press "TIMER OFF" word "OFF" will stop blinking. " " icon resumes displaying. Cancel TIMER OFF. Under the condition that TIMER OFF is started up, press "TIMER OFF" button to cancel it.

OPERATION

Remote Control (PN 69700657)

Note:
- Under on and off status, you can set TIMER OFF or TIMER ON simultaneously.
- Before setting TIMER ON or TIMER OFF, please adjust the clock time.
- After starting up TIMER ON or TIMER OFF, set the constant circulating valid. After that, air conditioner will be turned on or turned off according to setting time. ON/OFF button has no effect on setting. If you Don't need this function, please use remote controller to cancel it.

Function introduction for combination buttons

1. Energy-saving function

Under cooling mode, press "TEMP" and " CLOCK" buttons simultaneously to start up or turn off energy-saving function. When energy-saving function is started up, "SE" will be shown on remote controller, and air conditioner will adjust the set temperature automatically according to ex-factory setting to reach to the best energy-saving effect. Press "TEMP" and "CLOCK"buttons simultaneously again to exit energy-saving function.

Note:
- Under energy-saving function, fan speed is defaulted at auto speed and it can't be adjusted.
- Under energy-saving function, set temperature can't be adjusted. Press "TURBO" button and the remote controller won't send signal.
- Sleep function and energy-saving function can't operate at the same time. If energy-saving function has been set under cooling mode, press sleep button will cancel energy-saving function. If sleep function has been set under cooling mode, start up the energy-saving function will cancel sleep function.

2. 46ºF heating function

Under heating mode, press "TEMP" and "CLOCK" buttons simultaneously to start up or turn off 46ºF heating function. When this function is started up, " $ " and "46ºF" will be shown on remote controller, and the air conditioner keep the heating status at 46ºF. Press "TEMP" and "CLOCK" buttons simultaneously again to exit 46ºF heating function.

Note:
- Under 46ºF heating function, fan speed is defaulted at auto speed and it can't be adjusted.
- Under 46ºF heating function, set temperature can't be adjusted. Press" TURBO" button and the remote controller won't send signal.
- Sleep function and 46ºF heating function can't operate at the same time. If 46ºF heating function has been set under cooling mode, press sleep button will cancel 46ºF heating function. If sleep function has been set under cooling mode, start up the 46ºF heating function will cancel sleep function.
- Under ℉ temperature display, the remote controller will display 46 ℉ heating.

3. Lock function

Press "▲" and "▼" simultaneously to turn on or turn off child lock function. When child lock function is on, " 🔒 " icon is displayed on remote controller. If you operate the remote controller, the " 🔒 " icon will blink three times without sending signal to the unit.

4. Temperature display switchover function

Under OFF status, press "▼" and "MODE" buttons simultaneously to switch temperature display between ℃ and ℉ .

5. I FEEL Function

Press "▲" and "MODE" buttons simultaneously to start I FEEL function and " " will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unitwill automatically adjust the indoor temperature according to the detected tempera-ture. Press this two buttons simultaneously again to close I FEEL function and " " will disappear.

- Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.When I FEEL function is turned on, the remote controller should be put within the area where indoor unit can receive the signal sent by the remote controller.

If “H1” is displayed on the remote controller while it’s not operated by the professional person/after-sales person, it belongs to the misoperation.

Please operate it as below to cancel it.Under the OFF status of remote controller, hold the Mode button for 5s to cancel “H1” display.

Note:
- If remote controller displays “H1”, it belongs to the normal function reminder. If the unit is defrosting under heating mode, it operates according to H1 defrosting mode. “H1” won’t be displayed on the panel of indoor unit;
- Once you set H1 mode, if you turn off unit by remote controller, H1 will display 3 times on the remote controller and then disappear;
- Also, when you set H1 mode, when you change to heating mode, H1 will display 3 times on the remote controller and then disappear.

OPERATION

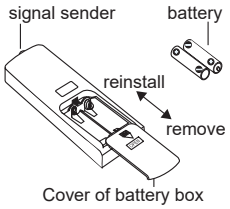
Remote Control (PN 69700657)

Operation guide

1. After putting through the power, press "ON/OFF" button on remote controller to turn on the air conditioner.
2. Press "MODE" button to select your required mode: AUTO, COOL, DRY, FAN, HEAT.
3. Press "▲" or "▼" button to set your required temperature. (Temperature can't be adjusted under auto mode).
4. Press "FAN" button to set your required fan speed: auto, low, medium and high speed.
5. Press "SWING" button to select fan blowing angle.

Replacement of batteries in remote controller

1. Press the back side of remote controller marked with " OPEN ", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two AAA 1.5V dry batteries, and make sure the "+" and "-" are postioned correctly.
3. Reinstall the cover of battery box.



Note:

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.
- Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- If you won't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there's no display, please replace batteries.

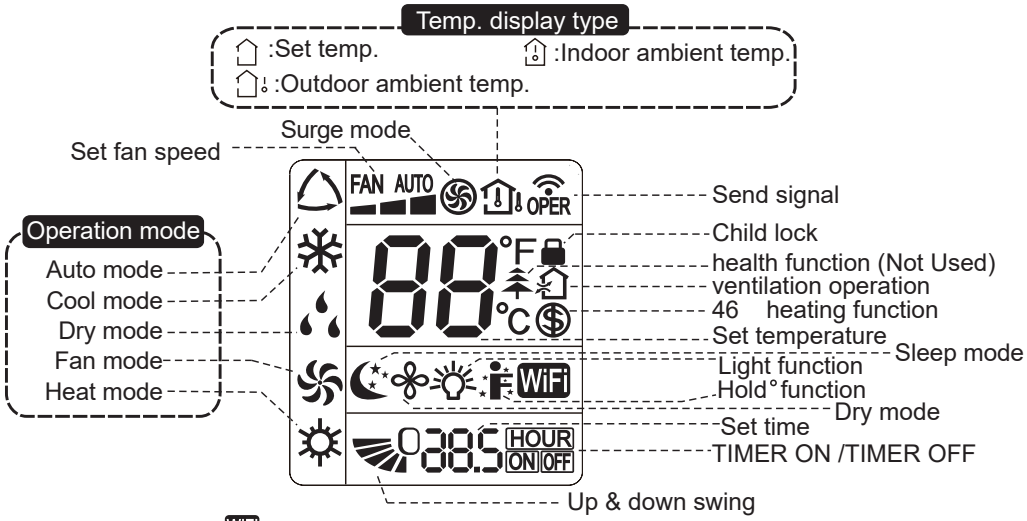
OPERATION

Remote Control (PN 69700623)

Buttons on remote controller

1. On/Off button
2. Mode button
3. Fan button
4. ▲/ ▼ button
5. Swing button
6. Sleep button
7. Temp button
8. Surge button
9. Hold° button
10. Timer button
11. Dry button
12. Light button

Introduction for buttons on remote controller



NOTICE: " WiFi " This is a general remote controller. Some models have this function while some do not. Please refer to the actual models.

OPERATION

Remote Control (PN 69700623)

Introduction for buttons on remote controller

Note:

- Once power is supplied to unit, unit will chime.
  Operation indicator "⏻" is ON (red indicator, the colour is different for different models). After that, you can operate the air conditioner by using remote controller.
- In operation mode, button presses on the remote will cause the "((•))" to blink. This means that the remote is sending signals to the unit. The air conditioner responds to button presses with a chiming sound.
- In stand-by mode, set temperature and clock icon will be displayed on the display of remote controller (If timer on, timer off and light functions are set, the corresponding icons will be displayed on the display of remote controller at the same time); Under on status, the display will show the corresponding set function icons.

1 On/Off button

Press this button to turn on the unit. Press this button again to turn off the unit.

2 Mode button

Each time you press this button, a mode is selected in a sequence that goes from AUTO, COOL, DRY, FAN, and HEAT , as the following:

AUTO ▶ COOL ▶ DRY ▶ FAN ▶HEAT*

3 Fan button

This button is used for setting Fan Speed in the sequence that goes from AUTO, ◢ ◢▮ , to ◢▮▮ , then back to Auto.

Note:

- In DRY mode fan speed is set only to low speed, for maximum dehumidification.

4 ▲ / ▼ button

Press ▲/ ▼button to increase/decrease set temperature. In AUTO mode, set temperature is not adjustable. When setting Timer On or Timer Off, press "▲" or "▼" button to adjust the time.

OPERATION

Remote Control (PN 69700623)

Introduction for buttons on remote controller

5 Swing button

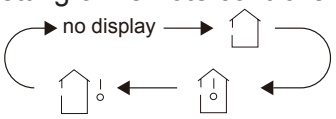
Press this button to set up & down swing angle.

6 Sleep button

Under Cool or Heat mode, press this button to turn on Sleep function. Press this button again to cancel Sleep function. Under Fan、Dry and Auto modes, this function is unavailable.

7 Temp button

Press this button, you can see indoor set temperature, indoor ambient temperature on indoor unit's display. The setting on remote controller is selected circularly as below:



Note:

- Outdoor temperature display is not available for some models. At that time, indoor unit receives " " signal, while it displays indoor set temperature.

8 Surge button

Under COOL or HEAT mode, press this button to activate / deactivate the Surge function.
Note: Not applicable for this unit.

9 Hold ° button

Press this button to start Hold ° function and " " will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press this button again to close Hold ° function and " " will disappear. When Hold ° function is turned on, the remote controller should be put within the area where indoor unit can receive the signal sent by the remote controller.

10 Timer button

- Under ON status, press this button to set timer OFF; Under OFF status, press this button to set timer ON.
- Press this button once and the characters of HOUR ON (OFF) will flash to be displayed. Meanwhile, press "▲" button or "▼" button to adjust timer setting (time will change quickly if holding "▲" or "▼" button). Time setting range is 0.5~24hours. Press this button again to confirm timer setting and the characters of HOUR ON (OFF)will stop flashing.
  If the characters are flashing but you haven't press timer button,timer setting status will be quit after 5s.If timer is confirmer, press this button again to cancel timer.

11 Dry button

Press this button in COOL or DRY mode to turn on Dry function.
When this function is started up, indoor fan will still operate at low fan speed for a while after turning off the unit by remote controller.

OPERATION

Remote Control (PN 69700623)

Introduction for buttons on remote controller

12 Light button

Press this button to turn on the display's light and press this button again to turn off the display's light.

Function introduction for combination buttons

Combination of "▲" and "▼" buttons: Remote Control lock

Press "▲" and "▼" buttons simultaneously 3s to lock or unlock the keypad. If the remote controller is locked, 🔒 is displayed. In this case, pressing any button, 🔒 blinks three times.

Combination of "MODE" and "▼" buttons: About switch between F° and C°

At unit OFF, press "MODE" and "▼" buttons simultaneously to switch between ℃ and ℉.

Combination of "TEMP" and "TIMER" buttons: Energy-saving Function

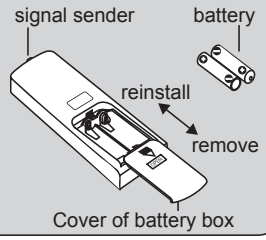
Press "TEMP" and "TIMER" simultaneously in COOL mode to start energy-saving function. Indoor unit displays "SE". Repeat the operation to quit the function.

Combination of "TEMP" and "TIMER" buttons: About 46° F Heating Function

Press "TEMP" and "TIMER" simultaneously in HEAT mode to start 46° F Heating Function indoor unit displays" ⓢ" and a selected temperature of "46° F". (8° C if Celsius is adopted). Repeat the operation to quit the function.

Replacement of batteries in remote controller

1. Press the back side of remote controller marked with "OPEN", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the "+" and "-" are positioned correctly.
3. Reinstall the cover of battery box.



OPERATION

9-24k Sequence of Operation

1.Basic function of system

(1)Cooling mode

(1) Under this mode, fan and swing operates at setting status. Temperature setting range is 61~86.0 °F.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(2)Drying mode

(1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 61~86.0 °F.

(2) If the outdoor unit malfunctions, or the unit is stopped because of protection, indoor unit keeps original operation status.

(3) Protection status is same as that under cooling mode.

(4) Sleep function is not available for drying mode.

(3)Heating mode

(1) Under this mode, Temperature setting range is 61~86.0 °F.

(2) Working condition and process for heating mode:

When unit heating mode is turned on, the indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been initially started, the unit enters into residual heat-blowing status.

(4)Working method for AUTO mode:

1.Working condition and process for AUTO mode:

a.Under AUTO mode, standard heating Temp preset=68.0°F and standard cooling Temp preset=77.0°F. The unit will switch mode automatically according to ambient temperature.

2.Protection function

a. During cooling operation, protection function is same as that under cooling mode.

b. During heating operation, protection function is same as that under heating mode.

3. Display: Set temperature is the set value under each condition. Ambient temperature is (Tamb.-Tcompensation) for heat pump unit and Tamb. for cooling only unit.

4. If there's I feel function, Tcompensation is 0. Others are same as above.

(5)Fan mode

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 61~86.0 °F.

2. Other control

(1) Buzzer

Upon energization or command from the unit or remote controller , the buzzer will give out a beep.

(2) Auto button

If press this auto button when turning off the unit, the complete unit will operate at auto mode. Indoor fan operates at auto fan speed and swing function is turned on. Press this auto button at ON status to turn off the unit.

(3) Auto fan

Heating mode: During auto heating mode or normal heating ode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

(4) Sleep

After setting sleep function for a period of time, system will adjust set temperature automatically.

(5) Timer function:

General timer and clock timer functions are compatible by equipping remote controller with different functions.

(6) Memory function

Memorized compensation temperature, off-peak energization value.

Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer can't be memorized).

After power recovery, the unit will be turned on automatically according to memory content.

(7) Health function

Option not activated on this Model.

OPERATION

9-24k Sequence of Operation

(8)I feel control mode

After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

(9)Compulsory defrosting function

(1) Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 60.8^{O}F. Press “+, -, +, -, +,-” button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit malfunctions or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.

(2) Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

(10)Refrigerant recovery function:

(1) Enter refrigerant recycling function

Within 5min after energizing (unit ON or OFF status), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; Fo is displayed and refrigerant recycling function is started. At this time, close the liquid valve.

After 5min confirm at the shrader valve pin that there is no remaining refrigerant, close the gas valve immediately and then turn off the unit to remove the connection pipe.

(2) Exit refrigerant recycling function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

(11)Ambient temperature display control mode

1. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.

2. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01,11),controller will display indoor ambient temperature for 3s and then turn back to display set temperature.

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 60.8~86.0^{O}F.

(12)Off-peak energization function:

Adjust compressors minimum stop time. The original minimum stop time is 180s and then we change to:

The time interval between two start-ups of compressor can't be less than 180+T s(0≤T≤15). T is the variable of controller. Thats to say the minimum stop time of compressor is 180s~195s.

(13) X-fan mode

When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

(14) 46º heating function

Under heating mode, you can set 46º heating function by remote controllerThe system will operate at 46ºset temperature.

(15) Turbo fan control function

Set turbo function under cooling or heating mode to enter into turbo fan speed. Press fan speed button to cancel turbo wind.

No turbo function under auto, dry or fan mode.

OPERATION

9-24k Sequence of Operation

Outdoor Units

1. Input Parameter Compensation and Calibration

(1) Check the ambient temperature compensation function Indoor ambient temperature compensation function.

a. In cooling mode, the indoor ambient temperature participating in computing control = ($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{cooling\ indoor\ ambient\ temperature\ compensation}$)

b. In heating mode, the indoor ambient temperature participating in computing control= ($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{heating\ indoor\ ambient\ temperature\ compensation}$)

(2) Check effective judgment controls of parameters

Effective judgment function of the outdoor exhaust temperature thermister When conditions a and b are satisfied, the outdoor exhaust temperature thermister is judged not to be connected into place, the mainboard of outer units will display failure of the outdoor exhaust temperature thermister (not connected into place), stop the machine for repairing, and resume the machine by remote controls of ON/ OFF.

a. Judgment of exhaust detection temperature change:

After the compressor starts up and runs for 10 minutes, if the compressor frequency f ≥ 40Hz, and the rising value Texhaust ($T_{exhaust\ (after\ start\text{-}up\ for\ 10\ minutes)}$ - $T_{exhaust\ (before\ start\text{-}up)}$) <35.6ºF , the outdoor exhaust temperature thermister can be judged not to be connected into place (judging once when the power is on the first time).

b. Comparative judgment of exhaust detection temperature and condenser detection temperature ($T_{pipe\ temperature}$ = $T_{outdoor\ pipe\ temperature\ in\ cooling\ mode}$, $T_{pipe\ temperature}$ = $T_{indoor\ pipe\ temperature\ in\ heating\ mode}$): After the compressor starts up and runs for 10 minutes, if the compressor frequency f ≥ 40Hz, and $T_{pipe\ temperature}$ ≥($T_{exhaust+37.4}$), the outdoor exhaust temperature thermister can be judged not to be connected into place (judging once when power is on the first time).

2. Basic Functions

(1) Cooling Mode

1. Conditions and processes of cooling operation:

(1) If the compressor is shut down, and [T_{setup} – ($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{cooling\ indoor\ ambient\ temperature\ compensation}$)] ≤ 0.9ºF , start up the machine for cooling, the cooling operation will start;

(2) During operations of cooling, if 0ºF ≤ [T_{setup} – ($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{cooling\ indoor\ ambient\ temperature\ compensation}$)] < 3.6ºF , the cooling operation will be still running;

(3) During operations of cooling, if 3.6ºF ≤ [Tsetup – ($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{cooling\ indoor\ ambient\ temperature\ compensation}$)], the cooling operation will stop after reaching the temperature point.

2. Temperature setting range

(1) If $T_{outdoor\ ambient\ temperature}$ ≥ [$T_{low\text{-}temperature\ cooling\ temperature}$], the temperature can be set at: 61~86ºF (Cooling at room temperature);

(2) If $T_{outdoor\ ambient\ temperature}$ < [$T_{low\text{-}temperature\ cooling\ temperature}$], the temperature can be set at: 77~86ºF (Cooling at low temperature), that is, the minimum setting temperature for outer units judgment is 77ºF .

(2) Dehumidifying Mode

1. Conditions and processes of dehumidifying operations: Same as the cooling mode;
2. The temperature setting range is: 61~86ºF;

(3) Fan Only Mode

1. The compressor, outdoor fans and four-way valves are switched off;

(4) Heating Mode

1. Conditions and processes of heating operations: (T indoor ambient temperature is the actual detection temperature of indoor environment thermister, Theating indoor ambient temperature compensation is the indoor ambient temperature compensation during heating operations)

(1) If the compressor is shut down, and [($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{heating\ indoor\ ambient\ temperature\ compensation}$) –$T_{setup}$] ≤ 0.9ºF , start the machine to enter into heating operations for heating;

(2) During operations of heating, if 0ºF ≤ [($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{heating\ indoor\ ambient\ temperature\ compensation}$) –$T_{setup}$] < 3.6ºF , the heating operation will be still running;

(3) During operations of heating, if 3.6ºF ≤ [($T_{indoor\ ambient\ temperature}$ – ⊿ $T_{heating\ indoor\ ambient\ temperature\ compensation}$) –$T_{setup}$], the heating operation will stop after reaching the temperature point.

2. The temperature setting range in this mode is: 61~86ºF .

OPERATION

9-24k Sequence of Operation

3. Special Functions

Defrosting Control

① Conditions for starting defrosting

After the time for defrosting is judged to be satisfied, if the temperature for defrosting is satisfied after detections for continuous 3minutes, the defrosting operation will start.

② Conditions of finishing defrosting

The defrosting operation can exit when any of the conditions below is satisfied:

③ $T_{outdoor\ pipe\ temperature} \geq (T_{outdoor\ ambient\ temperature} - [T_{temperature\ 1\ of\ finishing\ defrosting}]$;

④ The continuous running time of defrosting reaches [tmax. defrosting time].

4. Control Logic

(1) Compressor Control

Start the compressor after starting cooling, heating, dehumidifying operations, and the outer fans start for 5s; When the machine is shutdown, in safety stops and when switching to air-supplying mode, the compressor will stop immediately. In all modes: once the compressor starts up, it will not be allowed to stop until having run for the [minimum compressor running time] (Note: including cases of shutdown when the temperature point is reached; except the cases requiring stopping the compressor such as fault protection, remote shutdown, mode switching etc.); In all modes: once the compressor stops, it will be allowed be restart after 3-minute delay (Note: The indoor units have a function of power memory, the machine can be restarted after remote shutdown and powering up again without delay).

1. Cooling mode

Start the machine to enter into cooling operation for cooling, the compressor is switched on.

2. Dehumidifying mode

Same as the cooling mode.

3. Fan-Only mode

The compressor is switched off.

4. Heating mode

(1) Start the machine to enter into heating operation for heating, the compressor is switched on.

(2) Defrosting:

a. Defrosting starts: the compressor is shut down, and restarts it after 55-second delay.

b. Defrosting ends: the compressor stops, then starts it after 55-second delay.

(2) Outer Fans Control

Notes:

Only the outer fans run for at least 80s in each air flow speed can the air flow be switched;

After the outer fans run compulsively in high speed for 80s when the machine starts up, control the air flow according to the logic.

After remote shutdown, safety stops, and when the machine stops after reaching the temperature point, as well as after the compressor stops, extend 1 minute, the outer fans will stop (During the period in the 1 minute, the air flow of outer fans can be changed according to the outdoor ambient temperature changes); When running with force, the outdoor fans shall run in the highest air flow.

(3) 4-way valve control

1. The 4-way valve control under the modes of Cooling, dehumidification and supplying air: closing;

2. The status of 4-way valve control under the heating mode: be energized;

(1) 4-way valve power control under heating mode

a. Starts the machine under heating mode, the 4-way valve will get be energized immediately.

(2) 4-way valve power turn-off control under heating mode

a. When you should turn off the power or switch to other mode under heating mode, the 4-way valve will be de-energized 2 minutes after the compressor has stopped.

b. When all kinds of protection stops, the 4-way valve will be de-energized after a 4 minute delay.

(3) Defrosting control under heating mode:

a. Defrosting begins: The 4-way valve will be de-energized after a 50 second delay.

b. Defrosting stops: The 4-way valve will be energized after a 50 second delay..

(4) Evaporator frozen-preventing protection function

At the mode of Cooling, dehumidifying:

Evaporator frozen-preventing protection function is allowed to begin after 6 min of starting the compressor.

OPERATION

9-24k Sequence of Operation

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{inner\ pipe}$> [$T_{frozen\text{-}preventing\ frequency\text{-}limited\ temperature}$],
the machine is only allowed to start for operating, otherwise it should not be started, and should be stopped to treat according to the frozen-preventing protection: Clear the trouble under the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited

[$T_{frozen\text{-}preventing\ normal\ speed\ frequency\text{-}reducing\ temperature}$] ≤[$T_{inner\ pipe\ T\ frozen\text{-}preventing\ frequency\text{-}limited\ temperature}$] , you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed:

If [$T_{frozen\text{-}preventing\ high\ speed\ frequency\text{-}reducing\ temperature}$] ≤[$T_{inner\ pipe\ T\ frozen\text{-}preventing\ normal\ speed\ frequency\text{-}reducing\ temperature}$], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit;

4. Reducing frequency at high speed:

If [$T_{frozen\text{-}preventing\ power\ turn\text{-}off\ temperature}$] ≤$T_{inner\ pipe}$ [$T_{frozen\text{-}preventing\ high\ speed\ frequency\text{-}reducing\ temperature}$] you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit;

5. Power turn-off:

If the $T_{inner\ pipe}$ <[$T_{frozen\text{-}preventing\ power\ turn\text{-}off\ temperature}$], then frozen-preventing protect to stop the machine; If T[$_{frozen\text{-}preventing\ frequency\text{-}limited\ temperature}$] <$T_{inner\ pipe}$, and the compressor has stopped working for 3 minutes, the whole machine should be allowed to operate.

6. If the frozen-preventing protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the t evaporator frozen-preventing protection times zero clearing time , the times of frozen-preventing power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, mode transferring will not clear it).

(5) Overload protection function

Overload protection function at the mode of Cooling and dehumidifying

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{outer\ pipe}$ <[$T_{Cooling\ overload\ frequency\text{-}limited\ temperature}$] , the
machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the overload protection: Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited

If [$T_{Cooling\ overload\ frequency\text{-}limited\ temperature}$] ≤[$T_{outer\ pipe\ T\ Cooling\ overload\ frequency\ reducing\ temperature\ at\ normal\ speed}$], you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and power turn-off:

If [$T_{Cooling\ overload\ frequency\ reducing\ temperature\ at\ high\ speed}$] ≤$T_{outer\ pipe}$< [$T_{Cooling\ overload\ power\ turn\text{-}off\ temperature}$] , you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{Cooling\ overload\ frequency\ reducing\ temperature\ at\ normal\ speed}$]≤$T_{outer\ pipe}$, then Cooling overload protects machine stopping;

4. Reducing frequency at high speed and stop machine:

If [$T_{Cooling\ overload\ frequency\ reducing\ temperature\ at\ high\ speed}$]≤$T_{outer\ pipe}$ [$T_{Cooling\ overload\ power\ turn\text{-}off\ temperature}$], you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{Cooling\ overload\ frequency\ reducing\ temperature\ at\ normal\ speed}$] ≤[$T_{outer\ pipe}$], then Cooling overload protects machine stopping;

5. Power turn-off:

If the [$T_{Cooling\ overload\ power\ turn\text{-}off\ temperature}$] ≤$T_{outer\ pipe}$, then Cooling overload protects machine stopping; If [$T_{outer\ pipe}$]<[$T_{Cooling\ overload\ frequency\text{-}limited\ temperature}$]and the compressor has been stopped working for 3 minutes, the machine should be allowed to operate.

6. If the Cooling overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the t overload protection times zero clearing time , the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it).

Overload protection function at the mode of heating

Starting estimation :

After the compressor stopped working for 180s, if heating pipe inner temp is less than overload frequency-limited temperature , the compessor is allowed to start, otherwise it will need to cool down until parameters are met.

Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.

OPERATION

9-24k Sequence of Operation

1. Frequency limited

If [$T_{heating\ overload\ frequency\text{-}limited\ temperature}$]≤$T_{inner\ pipe}$ <[$T_{heating\ overload\ frequency\ reducing\ temperature\ at\ normal\ speed}$] , you should limit the frequency raising of compressor.

2. Reducing frequency at normal speed and stopping machine:

If T[$_{heating\ overload\ frequency\ reducing\ temperature\ at\ normal\ speed}$]≤$T_{inner\ pipe}$<[$T_{heating\ overload\ frequency\ reducing\ temperature\ at\ high\ speed}$], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if T heating overload frequency reducing temperature at normal speed ≤T inner pipe, then overload protects machine stopping;

3. Reducing frequency at high speed and power turn-off:

If [$T_{heating\ overload\ frequency\ reducing\ temperature\ at\ high\ speed}$]≤$T_{inner\ pipe}$<[$T_{heating\ overload\ power\ turn\text{-}off\ temperature}$], you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if T heating overload frequency reducing temperature at normal speed ≤T outer pipe, then Cooling overload protects machine stopping;

4. Power turn-off:

If the [$T_{heating\ overload\ power\ turn\text{-}off\ temperature}$] ≤$T_{inner\ pipe}$, then overload protects machine stopping; If T inner pipe T heating overload frequency-limited temperature and the compressor has been stopped working for 3 minutes, the machine should be allowed to operate.

5. If the overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the t overload protection times zero clearing time , the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it). Protective function for discharge temperature of compressor

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{Discharge}$ <$T_{Discharge\ limited\ temperature}$ (the temperature of hysteresis is 35.6ºF), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the discharge temperature:

The machine should be stopped or transferred to supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited

If [$T_{Limited\ frequency\ temperature\ during\ discharging}$] ≤$T_{Discharge}$<[$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ during\ discharging}$] , you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and stopping machine:

If [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ during\ discharging}$] ≤$T_{Discharge}$<[$T_{frequency\ reducing\ temperature\ at\ high\ speed\ during\ discharging}$], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ during\ discharging}$] ≤$T_{Discharge}$, you should discharge to protect machine stopping;

4. Reducing frequency at high speed and power turn-off:

If [$T_{frequency\ reducing\ temperature\ at\ high\ speed\ during\ discharging}$] ≤$T_{Discharge}$ <[$T_{Stop\ temperature\ during\ discharging}$], you should adjust

the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ during\ discharging}$] ≤$T_{Discharge}$, you should discharge to protect machine stopping;

5. Power turn-off:

If the [$T_{Power\ turn\text{-}off\ temperature\ during\ discharging}$] ≤$T_{Discharge}$, you should discharge to protect machine stopping; If [$T_{Discharge}$]<[$T_{Limited\ frequency\ temperature\ during\ discharging}$] and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If the discharging temperature protection of compressor continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the t Protection times clearing of discharge , the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

7. Frequency limited

If [$I_{Limited\ frequency\ when\ overcurrent}$] ≤$I_{AC\ Electric\ current}$ <[$I_{frequency\ reducing\ when\ overcurrent}$], you should limit the frequency raising of compressor.

8. Reducing frequency:

If [$I_{Frequency\ reducing\ when\ overcurrent}$] ≤[$I_{AC\ Electric\ current}$ I Power turn-off when overcurrent] , you should reduce the compressor frequency till the lower limit or exit the frequency reducing condition;

9. Power turn-off:

If [$I_{Power\ turn\text{-}off\ machine\ when\ overcurrent}$] ≤[$I_{AC\ Electric\ current}$] , you should carry out the overcurrent stopping protection; If I $_{AC\ Electric\ current}$<[$T_{Limited\ frequency\ when\ overcurrent}$] and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

10. If the overcurrent protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the [$t_{Protection\ times\ clearing\ of\ over\ current}$] , the discharge protection is cleared to recount.

OPERATION

9-24k Sequence of Operation

(6)Voltage sag protection

After start the compressor, if the time of DC link Voltage sag [$U_{Sagging\ protection\ voltage}$] is measured to be less than t Voltage sag protection time , the machine should be stop at once, hand on the voltage sag trouble, reboot automatically after 30 minutes.

(7)Communication fault

When you have not received any correct signal from the inner machine in three minutes, the machine will stop for communication fault. When you have not received any correct signal from driver IC (aim to the controller for the separating of main control IC and driver IC), and the machine will stop for communication fault. If the communication is resumed, the machine will be allowed to operate.

(8)Module protection

Testing the module protective signal immediately after started, once the module protective signal is measured, stop the machine with module protection immediately. If the module protection is resumed, the machine will be allowed to operate. If the module protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. If the running time of compressor exceeds the [$t_{Protection\ times\ clearing\ of\ module}$] , the module protection is cleared to recount.

(9)Module overheating protection

1. Starting estimation:

After the compressor stopped working for 180s, if T_{Module}<[$T_{Module\ frequency\ limited\ temperature}$](the temperature of hysteresis is 35.6ºF), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the module overheating protection: The machine should be stopped or transferred to supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited

If [$T_{Limited\ frequency\ temperature\ of\ module}$] ≤$T_{Module}$ <[$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ of\ module}$] , you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and power turn-off:

If [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ of\ module}$] ≤$T_{Module}$<[$T_{frequency\ reducing\ temperature\ at\ high\ speed\ of\ module}$], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ of\ module}$] ≤$T_{Module}$, you should stop the machine for module overheating protection;

4. Reducing frequency at high speed and power turn-off:

If [$T_{frequency\ reducing\ temperature\ at\ high\ speed\ of\ module}$]≤$T_{Module}$ <[$T_{Power\ turn\text{-}off\ temperature\ of\ module}$] you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if [$T_{frequency\ reducing\ temperature\ at\ normal\ speed\ of\ module}$] ≤$T_{Module}$, you should stop the machine for module overheating protection;

5. Power turn-off:

If the [$T_{Power\ turn\text{-}off\ temperature\ of\ module}$] ≤$T_{Module}$, you should stop the machine for module overheating protection; If T_{Module} <[$T_{Limited\ frequency\ temperature\ of\ module}$] and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the [$t_{Protection\ times\ clearing\ of\ module}$] , the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

(10)Compressor overloads protection

If you measure the compressor overload switch action in 3s, the compressor should be stopped for overloading. The machine should be allowed to operate after overload protection was measured to resume. If the overloading protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. The protection times of compressor is allowed to clear after the compressor run [$t_{Protection\ times\ clearing\ of\ compressor\ overloading}$] 30 minutes.

(11)Phase current overcurrent protection of compressor

During the running process of compressor, you could measure the phase current of the compressor, and control it according to the following steps:

1. Frequency limited

If [$I_{Limited\ frequency\ phase\ current}$] ≤[$I_{Phase\ current\ T\ frequency\ reducing\ phase\ current}$] , you should limit the frequency raising of compressor.

2. Reducing Frequency

If [$I_{Frequency\ Reducing\ Phase\ Current}$]≤$I_{Phase\ Current}$<[$I_{Power\ Turn\text{-}Off\ Phase\ Current}$], the compressor shall continue to reduce frequency till the lowest frequency limit or out of the condition of reducing frequency;

3. Power turn-off

If [$I_{Phase\ Current}$]≥[$I_{Power\ Turn\text{-}Off\ Phase\ Current}$], the compressor phase current shall stop working for overcurrent protection; if [$I_{Phase\ Current}$]≤[$I_{Frequency\ Reducing\ Phase\ Current}$], and the compressor have stopped working for 3 min, the machine shall be allowed to operate;

4. If the overcurrent protection of compressor phase current continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the [$t_{Clearing\ Time\ of\ Compressor\ Phase\ Current\ Times}$] , the overcurrent protection is cleared to recount.

OPERATION

9-24k Sequence of Operation

(12) Starting-up Failure Protection for Compressor

Stop the compressor after staring fails, then restart it after 20s if the fault doesn't show.If starting fails 3 consecutive times, it shall be reported as Starting-up Failure, and then restart up it after 3 min. When it still not be able to operate through carry out the above process for 5 times, it is available if you press ON/OFF. The compressor should be cleared after it runs 2 min.

(13) Out-of-Step Protection for Compressor

The out-of-step protection signal should be detected immediately after starting-up compressor, and once find the out-of-step protection signal, the out-of-step protection shall be stopped; if it can run for lasting power turn-off 3 min, the machine shall be allowed to operate. If it still can't run automatically when the out-of-step protection for compressor happens to stop working for 6 times in succession, it needs to press ON/OFF to operate. And if the running time is more than 10 min, the power turn-off times for out-of-step protection shall be cleared and recounted.

(14) Voltage Abnormity Protection for DC Bus

To detect voltage abnormity protection for dc bus after completing the pre-charge:

1.Over-High Voltage Protection for DC Bus:

If it found the DCbus voltage U_{DC} >[$U_{DC\ Over\text{-}Voltage\ Protection}$], turn off PFC and stop the compressor at once, and it shall show the DC over-high voltage failure; it should clear out the failure when the voltage dropped to U_{DC} <[$U_{DC\ Over\text{-}Voltage\ Recovery}$] and the compressor stopped for 3 min.

2.Over-Low Voltage Protection for DC Bus:

If it found the DC bus voltage U_{DC} <[$U_{DC\ Low\text{-}Voltage\ Protection}$], turn off PFC and stop the compressor at once, and it shall show the DC over-low voltage; and it should clear out the failure when the voltage raised to U_{DC} >[$U_{DC\ Low\text{-}Voltage\ Recovery}$] and the compressor stopped for 3 min.

3.To detect voltage abnormity protect for DC bus when getting electricity:

If it found the DC bus voltage U_{DC} >[$U_{DC\text{-}Over\text{-}High\ Voltage}$], turn off the relay at once, and shows voltage abnormity failure for DC Bus. And the failure can't recover except to break off and get the electricity.

(15)Abnormity Protection for Four-way Valve

If the Unit is heating and a condition is detected where [$T_{Inner\ Tube}$ <($T_{Inner\ Ring}$ -$T_{\ Abnormity\ Temperature\ Difference\ For\ Four\text{-}Way\ Valve\ Reversion}$)], it should be regarded as four-way valve reversion abnormity, and the unit will stop running. If the abnormity is removed for 3 minutes the unit should run again normally. If it the unit won't run when the abnormity is removed for 3 minutes, turn off power on the unit and attempt to restart.

Attention: the protection shall be shielded during the testing mode and defrosting process, and it shall be cleared out the failure and its times immediately when turning off or delivering wind / cooling / dehumidifying mode conversed (the inverted mode Don't clear out the failure when it can't recover to operate).

(16) PFC Protection

1. After start up the PFC, it should detect the protection signal of PFC immediately; under the condition of PFC protection, it should turn off the PFC and compressor at the same time;
2. It shows the failure is cleared out if PFC Protection stopped working 3 min and recovers to run automatically;
3. If the PFC protection failure occurs 3 times consecutively, it will be available if you press ON/OFF; and clear the PFC Protection times when start up PFC for 10min.

(17) Failure Detection for Sensor

1. Outdoor Ambient Sensor: detect the failure of sensor at all times.
2. Outdoor Tube Sensor: You should not detect the failure of outdoor tube sensor within 10 minutes heating operation compressor except the defrosting, and you could detect it at other time.
3. Outdoor Exhaust Sensor:

(a) The compressor only detect the sensor failure after it start up 3 min in normal mode;

(b) It should detect the exhaust sensor failure immediately in the testing mode.

4. Module Temperature Sensor:

(a) Short-Circuit Detection: the compressor should be detected immediately when the module temperature sensor occurs short-circuits;

(b) Open-Circuit Detection: the compressor should be detected on open-circuit when it runs 3min (it neednt 30s avoiding the module over-heated).

(c) Detect the sensor failure at all times in the testing mode.

5. Disposal for Sensor Protection

(1) When the short-circuit of sensor is detected within 30s, It is regarded as the temperature of sensor over-high (or infinitely high), and now according to the over-high sensor, the machine should carry out the corresponding protection to stop working, and show the corresponding temperature shutdown protection and sensor failure at the same time (for example: the compressor stops immediately when the outdoor tube sensor short-circuit, and the machine shall show the overload protection and outdoor tube sensor failure).

(2) When the open-circuit of sensor is detected within 30s, The protection shall be stopped and it shall show the corresponding sensor failure.

OPERATION

9-24k Sequence of Operation

6. Electric Heating Function of Chassis

(1) When $T_{outdoor\ amb.} \leq 32^{o}F$, the electric heating of chassis will operate;

(2) When $T_{outdoor\ amb.} > 35.6^{o}F$, the electric heating of chassis will stop operation;

(3)When $32^{o}F < T_{outdoor\ amb.} \leq 35.6^{o}F$, the electric heating of chassis will keep original status.

7. Electric Heating Function of Compressor

(1) When $T_{outdoor\ amb.} \leq 23^{o}F$, compressor stops operation, while the electric heating of compressor starts operation;

(2) When $T_{outdoor\ amb.} > 28.4^{o}F$, the electric heating of compressor stops operation;

(3) When $23^{o}F < T_{outdoor\ amb.} \leq 28.4^{o}F$, the electric heating of compressor will keep original status.

OPERATION

36k Sequence of Operation

1. Temperature Parameters

Indoor preset temperature (Tpreset)

Indoor ambient temperature (Tamb.)

2. Basic Functions

Once energized, in no case should the compressor be restarted within less than 3 minutes. In the situation that memory functionis available, for the first energization, if the compressor is at stop before de-energization, the compressor will be started without a 3 minute lag; if the compressor is in operation before de-energization, the compressor will be started with a 3-minute lag; and once started, the compressor will have a minimum run time of 6 minutes regardless of changes in room temperature;

(1) Cooling Mode

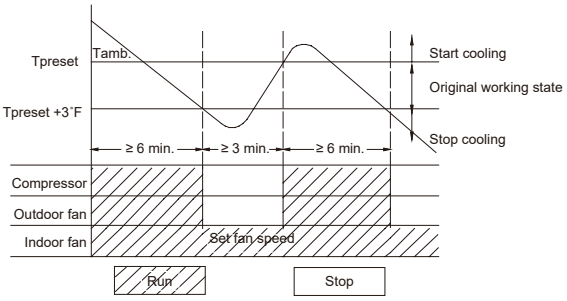
① Working conditions and process of cooling

When Tamb. ≥ Tpreset, the unit will enter cooling operation, in which case the indoor fan, the outdoor fan and the compressor will work and the indoor fan will run at preset speed.

When Tamb. ≤ Tpreset -3.6°F, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will run at preset speed.

When Tpreset-3.6°F < Tamb.< Tpreset+1.8°F, the unit will remain at its previous state.

Under this mode, the four-way valve will be de-energized and temperature can be set within a range from 61°F~86°F. If the compressor is shut down for some reason, the indoor fan and the swing device will operate at original state.



② Protection

Antifreeze protection

Under cooling and dehumidifying mode, 6 minutes after the compressor is started:

If EvapTemp ≤ 35.6°F , the compressor will operate at reduced frequency.

If EvapTemp ≤ 30.2°F is detected for durative 3 minutes, the compressor will stop, and after 60 seconds, the outdoor fan will stop;and under cooling mode, the indoor fan and the swing motor will remain at the original state.

If Tevap. ≥ 42.8°F and the compressor has remained at OFF for at least 3 minutes, the compressor will resume its original operation state.

Total current up and frequency down protection

If $current_{total}$ ≤ 16A, frequency rise will be allowed; if $Current_{total}$ ≥ 17A, frequency rise will not be allowed; if $Current_{total}$ ≥ 18A, the compressor will run at reduced frequency; and if $Current_{total}$ ≥ 20A, the compressor will stop and the outdoor fan will stop with a time lag of 60s.

(2) Dehumidifying Mode

① Working conditions and process of dehumidifying.

If Tamb. > Tpreset+1.8°F, the unit will enter cooling and dehumidifying mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If Tpreset -3.6°F ≤ Tamb. ≤ Tpreset+1.8°F, the compressor remains at its original operation state.

If Tamb.< Tpreset-3.6°F , the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will operate at low speed.

② Protection

Protection is the same as that under the cooling mode.

(3) Heating Mode

① Working conditions and process of heating

If Tamb. ≤ Tpreset+3.6°F, the unit enters heating mode, in which case the four-way valve, the compressor and the outdoor fan will operate simultaneously, and the indoor fan will run at preset speed in the condition of preset cold air prevention.

If Tamb. ≥ Tpreset+9°F, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will stop after 60-second blow at low speed.

If Tpreset+3.6°F < Tamb. < Tpreset+9°F, the unit will maintain its original operating status.

Under this mode, the four-way valve is energized and temperature can be set within a range of 61°F~86°F. The operating symbol, the heating symbol and preset temperature are revealed on the display.

② Condition and process of defrost

OPERATION

36k Sequence of Operation

When duration of successive heating operation is more than 45 minutes, or accumulated heating time more than 90 minutes, and one of the following conditions is reached, the unit will enter the defrost mode after 3 minutes.

a. Toutdoor amb. ≥41°F, Toutdoor pipe ≤28.4°F; b. 28.4°F ≤ Toutdoor amb.

c. 23.4°F < Toutdoor amb. ≤28.4°F, Toutdoor pipe ≤17.6°F;

d. 14°F < T outdoor amb. < 23°F, Toutdoor pipe- Tcompensation ≤ Toutdoor amb.-5.4°F;

e. Toutdoor amb. < 14°F, Toutdoor pipe- Tcompensation ≤ Toutdoor amb.-5.4°F;

After energization, when defrosting for the first time Tcompensation=0ºF. If it is not the firstl time for defrosting, the Tcompensation is determined by the Toutdoor pipe of last time quitting defrosting.

a. Toutdoor pipe > 35.6°F, Tcompensation=0°F; b. Toutdoor pipe ≤ 35.6°F, Tcompensation=5.4°F.

At that time, the indoor fan stops and the compressor stops, and after 60 seconds the outer fan will stop, and then after 30 seconds, the four-way valve will stop. After 30 seconds, the compressor is initiated for raising the frequency to defrost frequency.

When the compressor has operated under defrost mode for 10 minutes, or Touter tube ≥ 50°F, the compressor will be converted to 46Hz operation.After 30 seconds, the compressor will stop. And after another 30 seconds, the four-way valve will be opened, and after 60 seconds, the compressor and the outer fan will be started, the indoor fan will run under preset cold air prevention conditions,and H1 will be displayed at temperature display area on the display panel. Defrost frequency is 70 Hz.

3.Protection

Cold air prevention

The unit is started under heating mode (the compressor is ON):

① In the case of Tindoor amb. < 75°F: if T tube ≤ 104°F and the indoor fan is at stop state, the indoor fan will begin to run at low speed with a time lag of 2 minutes. Within 2 minutes, if T tube > 104°F, the indoor fan also will run at low speed; and after 1 minute operation atlow speed, the indoor fan will be converted to operation at preset speed. Within 1 minute low speed operation or 2 minute non-operation, if T tube > 108°F, the fan will run at present speed.

② In the case of Tindoor amb. < 75°F: if Ttube ≤ 108°F, the indoor fan will run at low speed, and after one minute, the indoor fan will be converted to preset speed. Within 1 minute low speed operation, if Ttube > 104° F, the indoor fan will be converted to preset speed. Note: Tindoor amb. indicated in ① and ② refers to, under initially heating mode, the indoor ambient temperature before the command to start the compressor is performed according to the program, or after the unit is withdrawn from defrost, the indoor ambient temperature before the defrost symbol is cleared.

Total current up and frequency down protection

If the total current I_{total} ≤ 16A, frequency rise will be allowed; if I_{total} ≥ 17A,frequency rise will not be allowed; if $I_{tota\ i}$ ≥ 18A, the compressor will run at reduced frequency; and if I_{total} ≥ 20A, the compressor will stop and the outdoor fan will stop with a time lag of 60s.

(4) Fan Mode

Under the mode, the indoor fan will run at preset speed and the compressor, the outdoor fan, the four-way valve and the electric heater will stop.

Under the mode, temperature can be set within a range of 61°F~86°F.

(5) AUTO Mode

① Working conditions and process of AUTO mode

Under AUTO mode, standard cooling temperature Tpreset is 77°F and standard heating temperature Tpreset is 68°F.

a. Once energized, if Tamb. ≤ 71.6°F, the unit will be started under heating mode; if 71.6°F < Tamb.< 78.8°F, the unit will run under fanmode and the run indicator will be bright; and if Tamb. ≥ 78.8°F, the unit will be started under cooling mode.

b.Under AUTO mode,if Tamb. ≥ Tpreset +1.8ºF is detected,the unit will select to run under cooling mode,in which case implicit preset temperature is 77 °F; if Tamb. ≤ Tpreset-1.8°F, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run at preset speed; and if Tpreset-1.8 °F < Tamb. < Tpreset+1.8ºF, the unit will remain at its original state.

c.Under AUTO mode, if Tamb. ≤ Tpreset+3.6°F is detected, the unit will select to run under heating mode, in which case implicit preset temperature is 64°F; if Tamb. ≥ Tpreset+9°F, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute,and the indoor fan will run under the mode of residue heat blowing; and if Tpreset+3.6°F < Tamb.< Tpreset+41°F, the unit will remainatits original state. The cooling-only unit will run under fan mode.

d.Under AUTO mode, if 71.6°F < Tamb.< 78.8°F, the unit will remain at its original state.

② Protection

a. In cooling operation, protection is the same as that under the cooling mode;

b. In heating operation, protection is the same as that under the heating mode;

c. When ambient temperature changes, operation mode will be converted preferentially. Once started, the compressor will remain unchanged for at least 6 minutes.

(6) Common Protection Functions and Fault Display under COOL, HEAT, DRY and AUTO Modes

① Overload protection

Ttube:measured temperature of outdoor heat exchanger under cooling mode; and measured temperature of indoor heat ex-changer under heating mode.

1) Cooling overload.

a. If Ttube ≤ 126°F, the unit will return to its original operation state.

b. If Ttube ≥ 131°F, frequency rise is not allowed.

OPERATION

36k Sequence of Operation

c. If Ttube ≥ 136°F, the compressor will run at reduced frequency.

d. If Ttube ≥ 144°F, the compressor will stop and the indoor fan will run at preset speed.

2) Heating overload

a. If Ttube ≤ 126°F, the unit will return to its original operation state.

b. If Ttube ≥ 131°F, frequency rise is not allowed.

c. If Ttube ≥ 136°F, the compressor will run at reduced frequency.

d. If Ttube ≥ 144°F,the compressor will stop and the indoor fan will blow residue heat and then stop.

② Exhaust temperature protection of compressor

If exhaust temperature ≥ 208°F, frequency is not allowed to rise.

If exhaust temperature ≥ 217°F, the compressor will run at reduced frequency.

If exhaust temperature ≥ 230°F, the compressor will stop.

If exhaust temperature ≤ 194°F, the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.

③ Communication fault

If the unit fails to receive correct signals for durative 3 minutes, communication fault can be justified and the whole system will stop.

④ Module protection

Under module protection mode, the compressor will stop. When the compressor remains at stop for at least 3 minutes, the compressor will resume its operation. If module protection occurs six times in succession, the compressor will not be started again.

⑤ Overload protection

If temperature sensed by the overload sensor is over 239°F, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. If temperature is below 203°F, the overload protection will be relieved.

If voltage on the DC bus is below 150V or over 420V, the compressor will stop and the outdoor fan will stop with a timelag of 30 seconds. When voltage on the DC bus returns to its normal value and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.

⑥ Faults of temperature sensors

Designation of sensors	Faults
Indoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 5 seconds
Indoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 5 seconds
Outdoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds, and no detection is performed within 10 minutes after defrost begins.
Exhaust	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.
Overload	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.

OPERATION

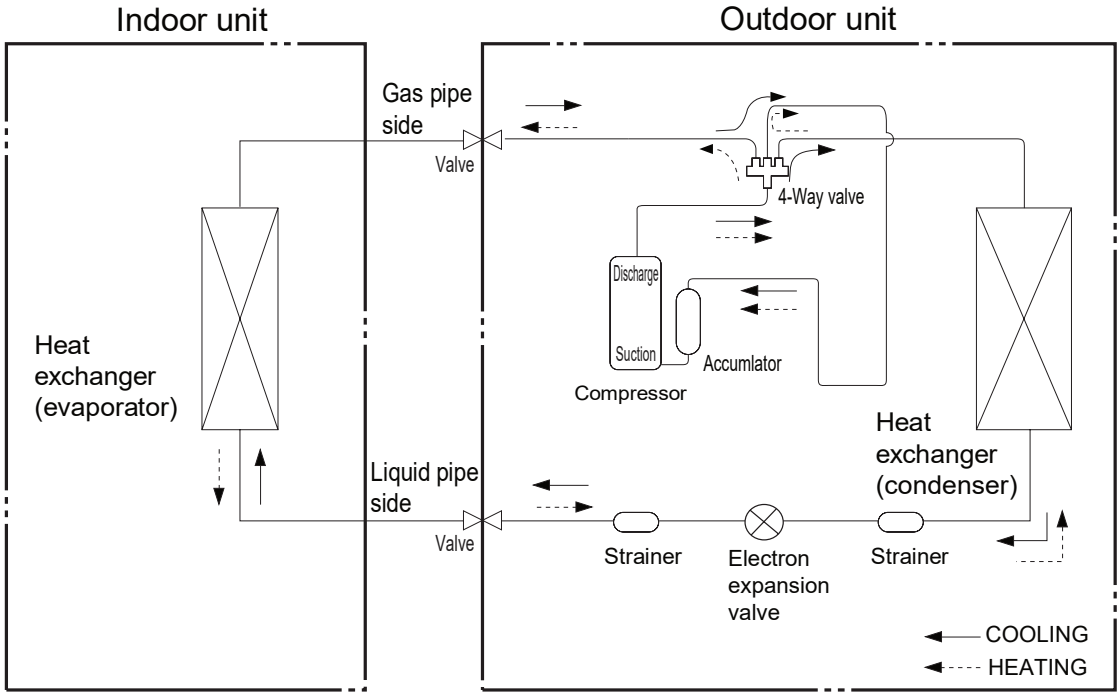


Figure 302

9-12K Refrigerant System Diagram

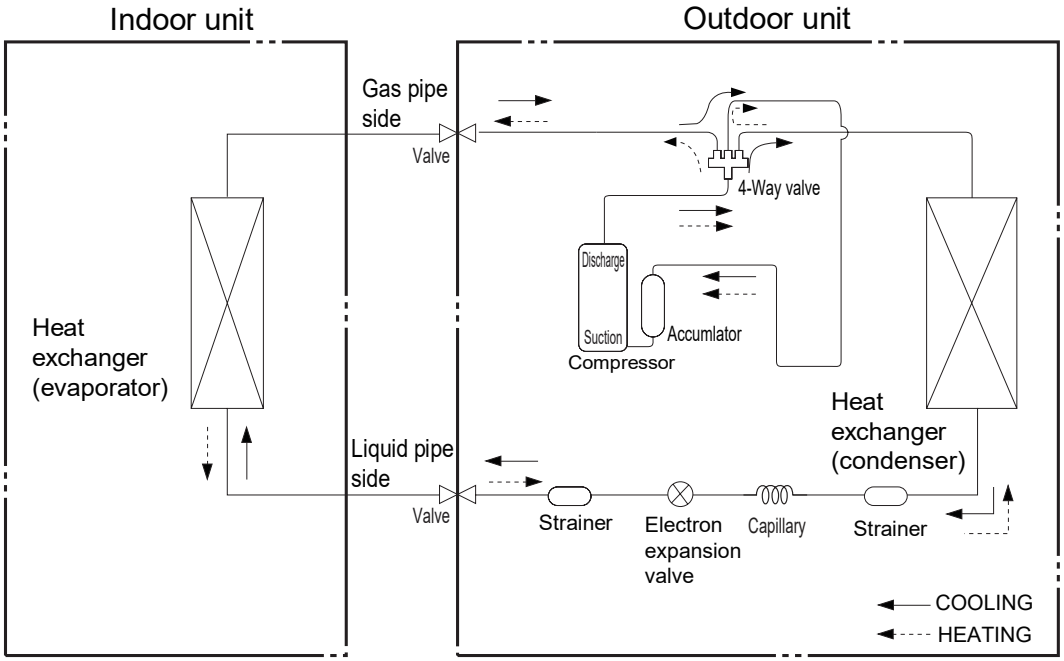
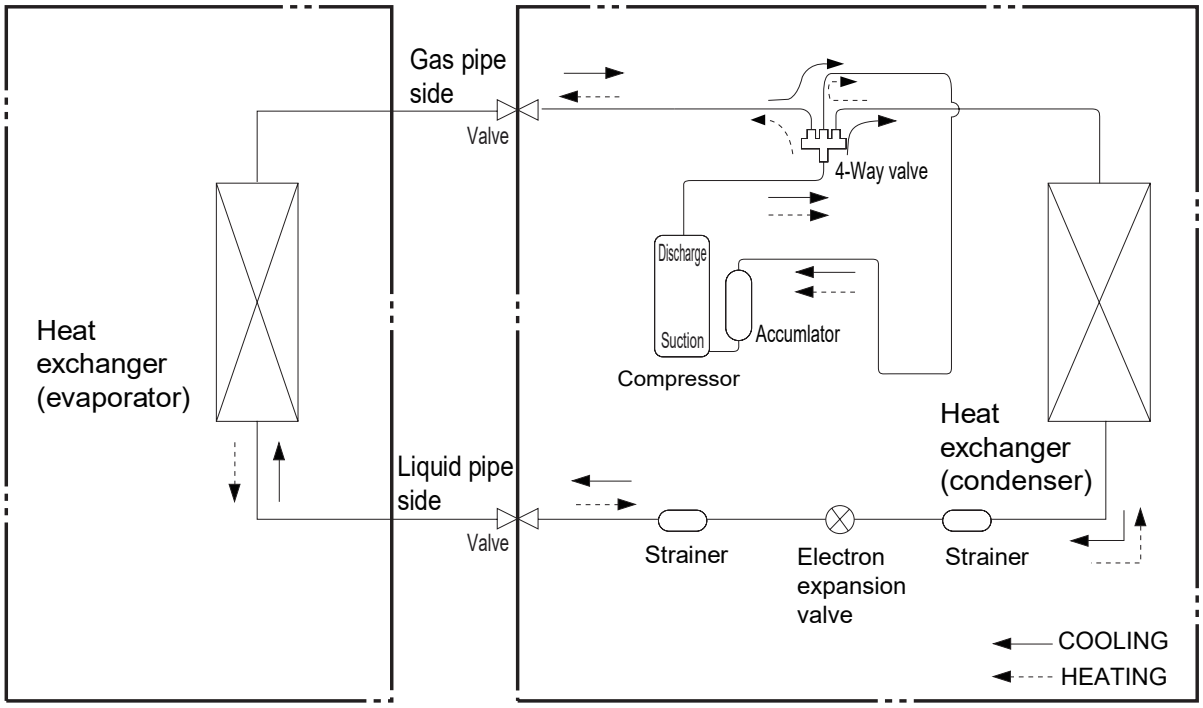


Figure 303

18-24K Refrigerant System Diagram

OPERATION



Connection pipe specification:

Liquid pipe:1/4 inch

Gas pipe:5/8 inch

Figure 304

36K Refrigerant System Diagram

INSTALLATION

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.
The following contents are very important for installation and maintenance.

Please follow the instructions below.

●The installation or maintenance must accord with the instructions.
●Comply with all national electrical codes and local electrical codes.
●Pay attention to the warnings and cautions in this manual.
●All installation and maintenance shall be performed by distributor or qualified person.
●All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
●Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

Warnings

Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.
2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4. Make sure each wiring terminal is connected firmly during installation and maintenance.
5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8. The power cord and power connection wires can't be pressed by hard objects.
9. If power cord or connection wire is broken, it must be replaced by a qualified person.
10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.
11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 1/8 inch.
12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.
13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
14. Replace the fuse with a new one of the same specification if it is burnt down; don't replace it with a cooper wire or conducting wire.
15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 44.09lb.
3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
4. Ware safety belt if the height of working is above 78 3/4 inch.
5. Use equipped components or appointed components during installation.
6. Make sure no foreign objects are left in the unit after finishing installation.

Refrigerant Safety Precautions:

1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
3. Make sure no refrigerant gas is leaking out when installation is completed.
4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

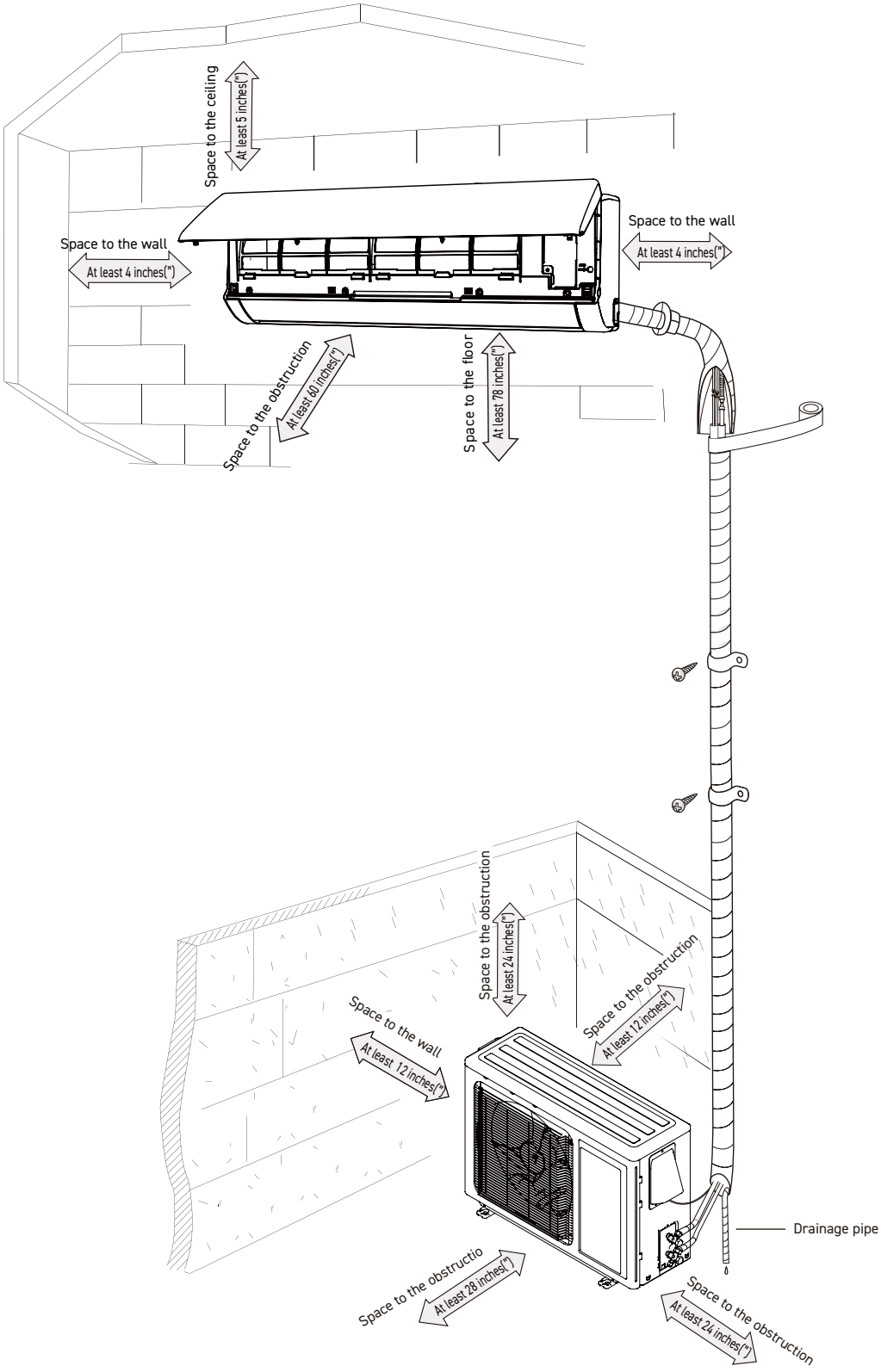
INSTALLATION

Installation Tools

1. Level meter, measuring tape 	2. Screw driver 	3. Impact drill, drill head, electric drill 
4. Electroprobe 	5. Universal meter 	6. Torque wrench, open-end wrench, inner hexagon spanner 
7. Electronic leakage detector 	8. Vacuum pump 	9. Pressure meter 
10. Pipe pliers, pipe cutter   	11. Pipe expander, pipe bender  	12. Soldering appliance, refrigerant container  

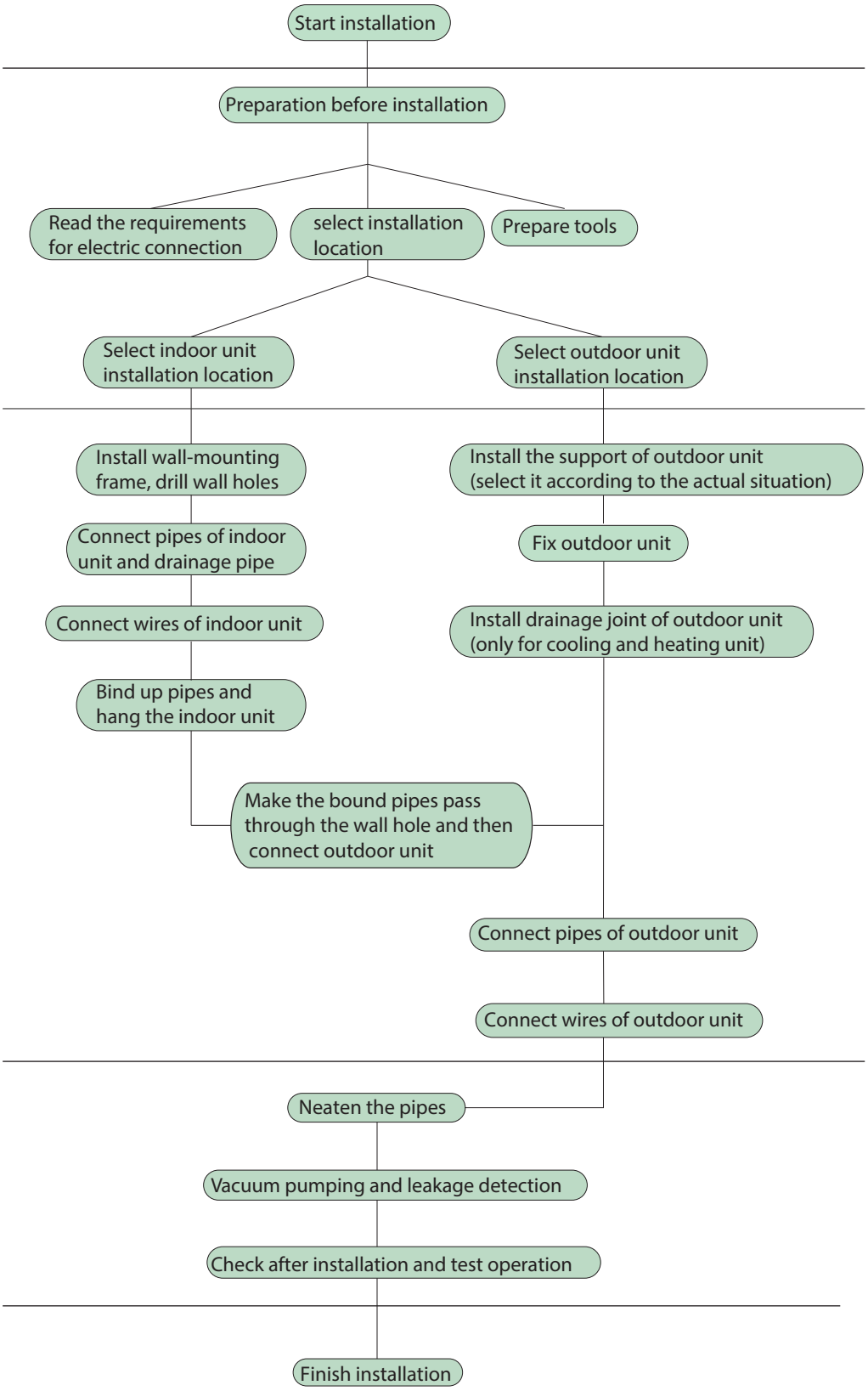
INSTALLATION

Installation Dimension Diagram



INSTALLATION

Installation Work Flow



INSTALLATION

Installation Parts Checklist

1. Indoor Unit
2. Outdoor Unit
3. Connection Pipe
4. Drainage pipe
5. Wall Mounting Frame
6. Connecting Cable (power cord)
7. Wall Pipe
8. Sealing gum
9. Wrapping Tape
10. Outdoor unit support
11. Fixing screw
12. Drainage plug (cooling and heating unit)
13. Owner's Manual
14. Remote Control

Selection of Installation Location

Basic Requirement

Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:

1. Places with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
2. Places with high-frequency devices (such as welding machine, medical equipment).
3. Places with oil or fumes in the air.
4. Places with sulfureted gas.

Indoor Unit

1. There should be no obstruction near air inlet and air outlet.
2. Select a location where the condensation water can be dispersed easily and won't affect other people.
3. Select a location which is convenient to connect the outdoor unit and near the power socket.
4. Select a location which is out of reach for children.
5. The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
6. The appliance must be installed 78 inches above the floor.
7. Don't install the indoor unit right above electric appliances.
8. The appliance shall not be installed in the laundry.

INSTALLATION

Outdoor Unit

1. Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood.
2. The location should be well ventilated and dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
3. The location should be able to withstand the weight of outdoor unit.
4. Make sure that the installation follows the requirement of installation dimension diagram.
5. Select a location which is out of reach for children and far away from animals or plants.If it is unavoidable, please add fence for safety purpose.

Electrical connection Requirements

Safety Precaution

1. Must follow the electric safety regulations when installing the unit.
2. According to the local safety regulations, use qualified power supply circuit and disconnect.
3. Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock,fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
4. Properly connect the live wire, neutral wire and grounding wire of power socket.
5. Be sure to cut off the power supply before proceeding any work related to electricity and safety.
6. Do not put through the power before finishing installation.
7. For appliances with type Y attachment,the instructions shall contain the substance of thefollowing.If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
8. The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
9. Ensure Electrical Field disconnect is accessible for emergency shutdown and is installed in accordance with National, State, and local codes and regulations."

Grounding Requirements

1. The air conditioner is first class electric appliance. It must be properly grounded with a specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
2. The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
3. The grounding resistance should comply with national electric safety regulations.

CAUTION

Do not rely on the fuse alone for protection of the circuit

INSTALLATION

Installation of Indoor Unit

Install Wall Mounting Frame

1. Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
2. Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles in the holes.
3. Fix the wall-mounting frame on the wall with tapping screws (ST4.2X25TA) and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.
4. Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame.(As show in Fig.1)
5. Open a piping hole with the diameter of 2 3/4inch on the selected outlet pipe position. In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°.(As show in Fig.2)

Note:

1. Pay attention to dust prevention and take relevant safety measures when opening the hole.
2. The plastic expansion particles are not provided and should be bought locally.

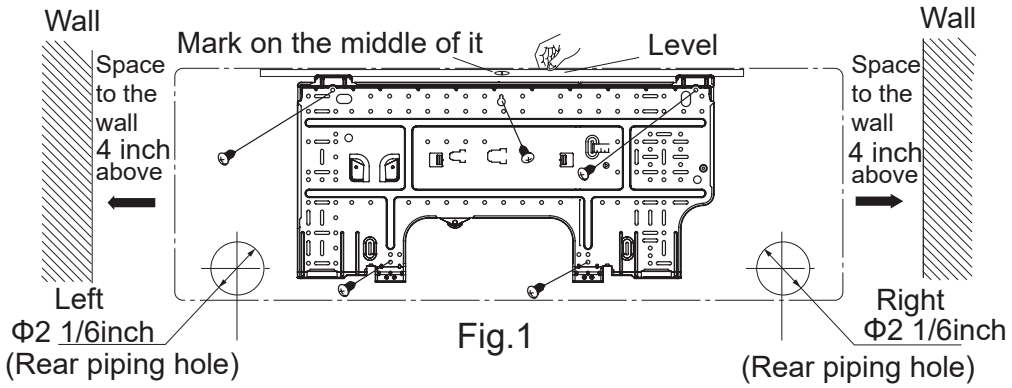


Fig.1

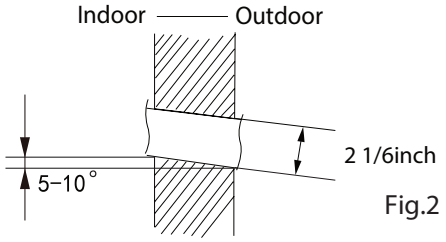
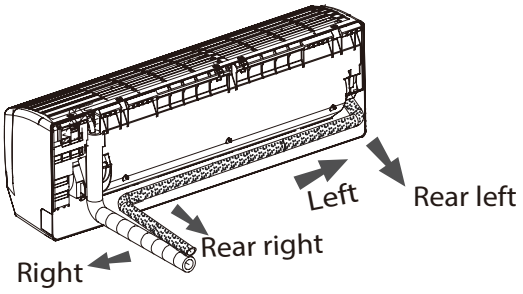
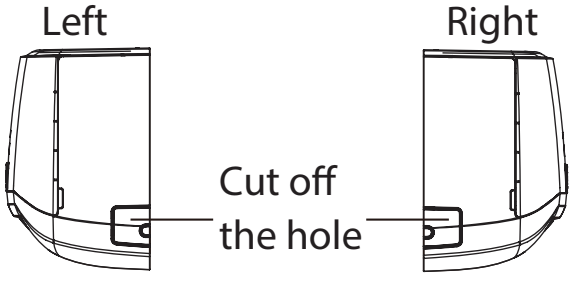


Fig.2

Outlet Pipe

1. The pipe can be led out in the direction of right, rear right, left or rear left.(As show in Fig.3)
2. When selecting leading out the pipe from left or right, please cut off the corresponding hole on the bottom case.(As show in Fig.4)





INSTALLATION

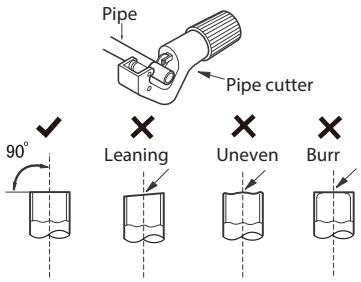
Pipe Flaring Method

⚠ **Note:**

Improper pipe expanding is the main cause of refrigerant leakage.Please expand the pipe according to the following steps:

A:Cut the pipe

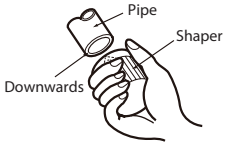
Confirm the pipe length according to the distance of indoor unit and outdoor unit.
Cut the required pipe with pipe cutter.



B:Remove the burrs

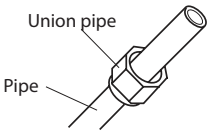
Remove the burrs with shaper and prevent the burrs from getting into the pipe.

C:Put on suitable insulating pipe



D:Put on the union nut

Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



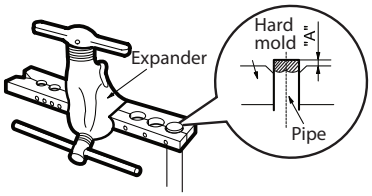
E:Expand the port

Expand the port with expander.

⚠ **Note:**

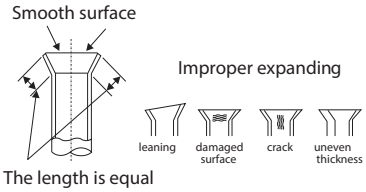
"A" is different according to the diameter, please refer to the sheet below:

Outer diameter(inch)	A(inch)	
	Max	Min
Φ1/4	2/39	1/36
Φ3/8	1/16	1/51
Φ1/2	1/14	1/51
Φ5/8	5/53	2/23



F:Inspection

Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



INSTALLATION

Installation of Indoor Unit

Connect the Pipe of the Indoor Unit

1. Aim the pipe joint at the corresponding bellmouth.(As show in Fig.5)
2. Pretightening the union nut with hand.
3. Adjust the torque force by referring to Figure 22a. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque wrench.(As show in Fig.6)
4. Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape.(As show in Fig.7)

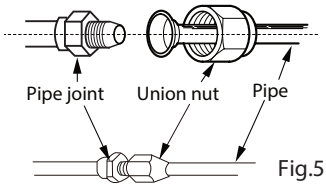


Fig.5

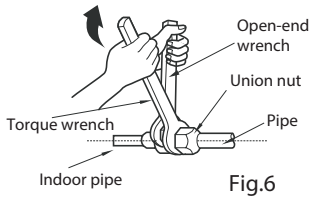


Fig.6

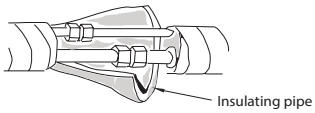


Fig.7

Install Drain Hose

1. Connect the drain hose to the outlet pipe of indoor unit.(As show in Fig.8)
2. Bind the joint with tape.(As show in Fig.9)

Note:

1. Add insulating pipe in the indoor drain hose in order to prevent condensation. (As show in Fig.10)
2. The plastic expansion particles are not provided.

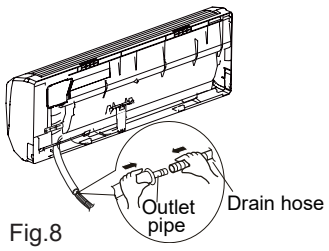


Fig.8

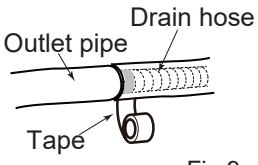


Fig.9

INSTALLATION

Installation of Indoor Unit

Connect Wire of Indoor Unit

1. Open the panel, remove the screw on the wiring cover and then take down the cover.(As show in Fig.11).
2. Fix the wire crossing board on connection wire sleeve at the bottom case; let the connection wire sleeve go through the wire crossing hole at the back of indoor unit, and then pull it out from the front.(As show in Fig.12).

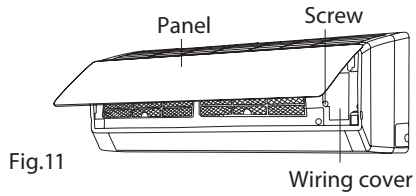


Fig.11

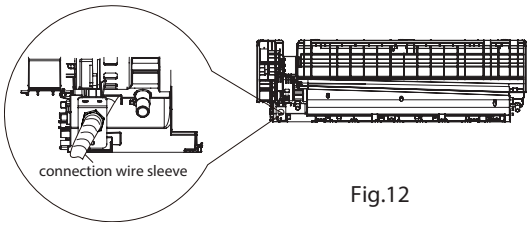


Fig.12

3. Remove the wire clip; connect the power connection wire to the wiring terminal; tighten the screw and then fix the power connection wire with wire clip.(As show in Fig.13)
4. Put wiring cover back and then tighten the screw.
5. Close the panel.

NOTE:

All wires of indoor unit and outdoor unit should be connected by a professional.

If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.

If required, a 3-pole disconnect switch maybe installed inline of the interconnecting wiring to provide a means for indoor unit disconnect. This switch should be located within a close proximity to the indoor unit.

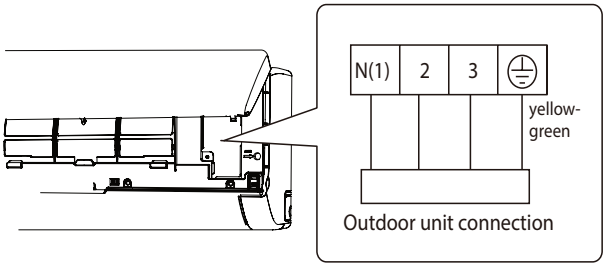


Fig.13

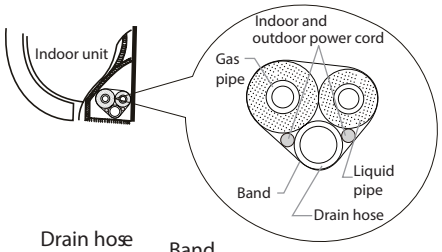


Fig.14

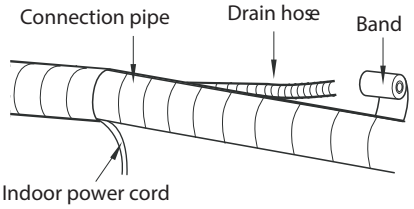


Fig.15

Bind Up Pipe

1. Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.14)
2. Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.15)
3. Bind them evenly.
4. The liquid pipe and gas pipe should be bound separately at the end.
5. The power cord and control wire can't be crossed or winding.
6. The drain hose should be bound at the bottom.

INSTALLATION

Installation of Indoor Unit

Hang the Indoor Unit

1. Put the bound pipes in the wall pipe and then make them pass through the wall hole.
2. Hang the indoor unit on the wall-mounting frame.
3. Stuff the gap between pipes and wall hole with sealing gum.
4. Fix the wall pipe. (As show in Fig.16)
5. Check if the indoor unit is installed firmly and close to the wall.(As show in Fig.17)

NOTE

Do not bend the drain hose too excessively in order to prevent blocking.

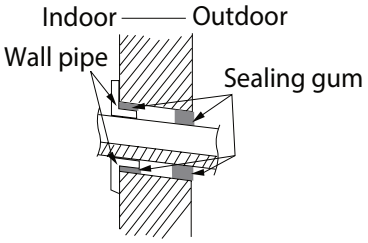
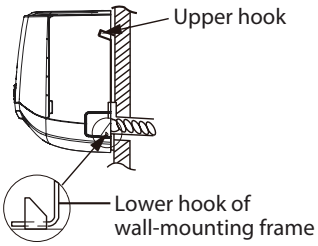


Fig.16

Fig.17



INSTALLATION

Installation of the Outdoor Unit

Install the Outdoor Support

1. Select installation location according to the house structure.
2. Fix the support of outdoor unit on the selected location with expansion screws.

Notes:

1. Take sufficient protective measures when installing the outdoor unit.
2. Make sure the support can withstand at least four times the unit weight.
3. The outdoor unit should be installed at least 1 1/6 inch above the floor in order to install drain joint.(As show in Fig.18)

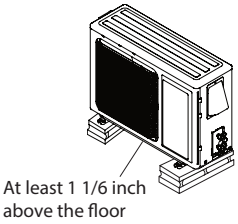


Fig.18

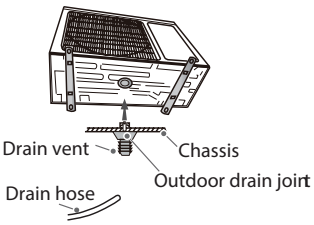


Fig.19

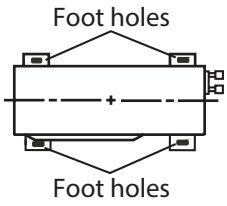


Fig.20

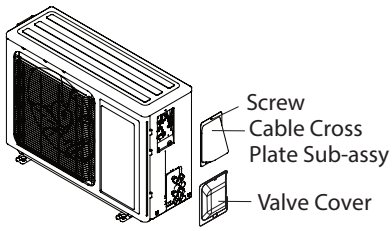


Fig.21

Install Drain Joint (For Cooling and Heating Unit Only)

1. Connect the outdoor drain joint into the hole on the chassis.
2. Connect the drain hose into the drain vent. (As show in Fig.19)

Fix the Outdoor Unit

1. Place the outdoor unit on the support.
2. Fix the foot holes of outdoor unit with bolts.(As show in Fig.20)

Connect Indoor and Outdoor Pipes

1. Remove the screw on the right cable cross plate sub-assy and valve cover of outdoor unit and then remove the cable cross plate sub-assy and valve cover.(As show in Fig.21)
2. Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.22)
3. Pretightening the union nut with hand.
4. Tighten the union nut with torque wrench .

Refer to the figure 22a for torque values.

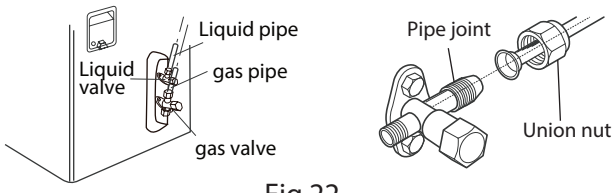


Fig.22

Hex nut diameter(inch)	Tightening torque(ft·lbf)
Φ1/4	11~14.7
Φ3/8	22.8~29.5
Φ1/2	33.2~40.6
Φ5/8	44.3~47.9
Φ3/4	51.6~55.3

Fig. 22a

INSTALLATION

Installation of the Outdoor Unit

Connect Outdoor Electric Wire

1. Put power connection wire and power wire through the wire–passing hole.
2. Remove the wire clip; connect the power connection wire and power wire to the wiring terminal;attach them with screws.(As shown in Fig.23)
3. Attach the power connection wire and power wire with wire clip.
4. Install the cable cross plate sub-assy.

Notes

1. After tightening the screw, pull the power cord slightly to check if it is firm.
2. Never cut the power connection wire to prolong or shorten the distance.
3. The connecting wire and connection pipe can not touch each other.
4. Top cover of outdoor unit and electric box assembly should be attached by the screw. Otherwise, it can cause a fire, or short circuit caused by water or dust.

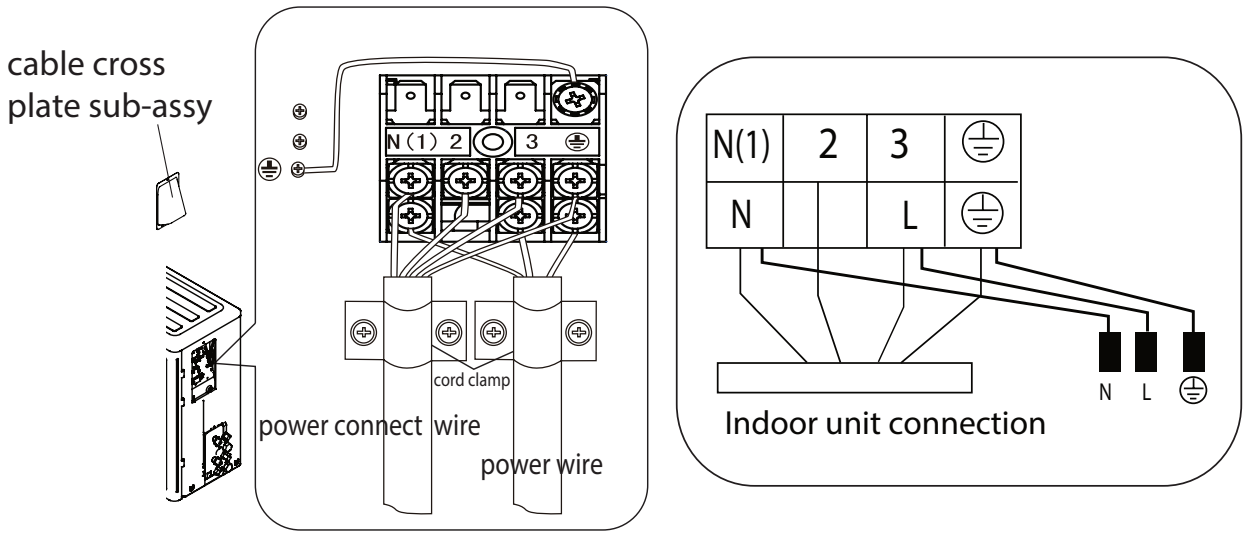
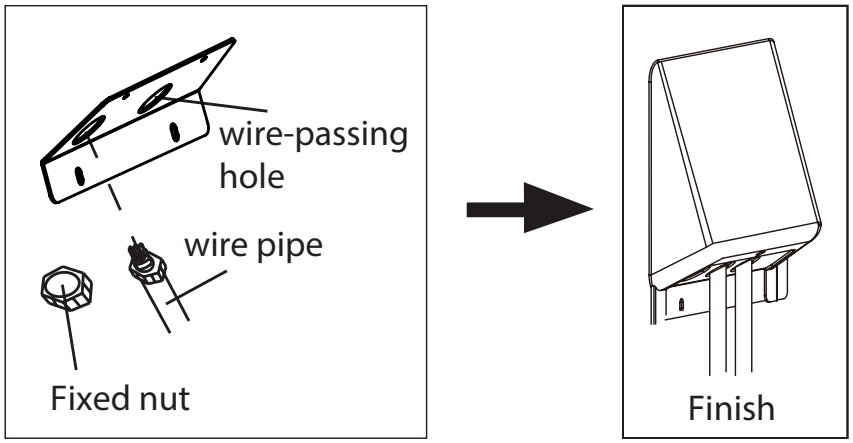


Fig.23



INSTALLATION

Installation of the Outdoor Unit

Neaten the Pipes

1. The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 4 inch.

2. If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room. (As show in Fig.24)

Notes:

1. The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit. (As show in Fig.25)

2.Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc. (As show in Fig.26)

3. The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.27)

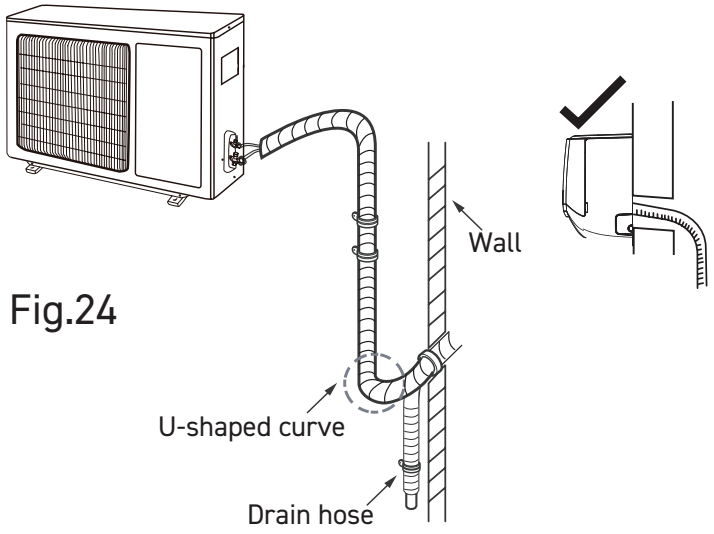


Fig.24

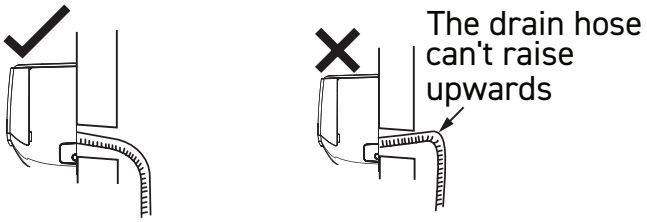
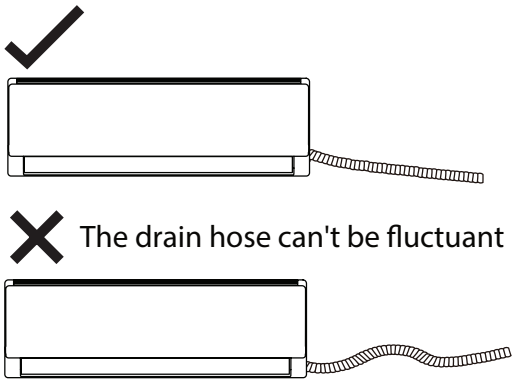


Fig.25



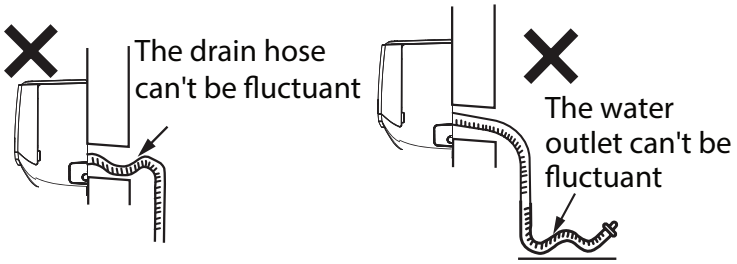


Fig.26

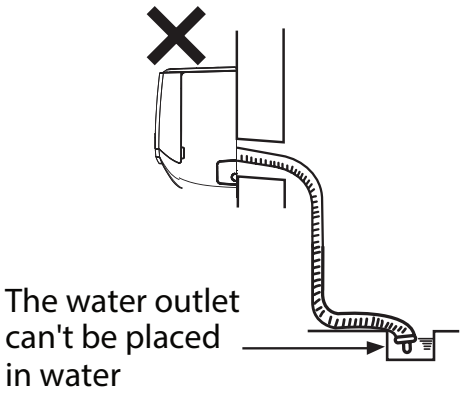


Fig.27

INSTALLATION

Leak Check, Evacuation, and Charging (Triple Evacuation)

Friedrich requires all installations 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 800psi 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.

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 550psi. 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 10 psi. If pressure can not be adequately held, check integrity of flares and torque specifications. Once pressure is held adequately, purge the nitrogen charge to system pressure of 5-10psi. DO NOT RETURN TO ATMOSPHERIC PRESSURE.

2. 1st Vacuum Micron Test:
Connect hoses and vacuum pump to the outdoor unit as shown in Fig.28. 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; follow 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 30-50psi of nitrogen. Wait 5 minutes, then purge to 5-10psi. 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 step 3 until achieved.

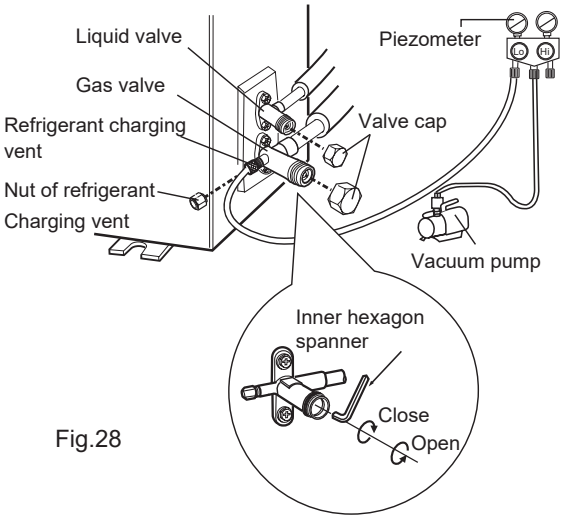


Fig.28

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

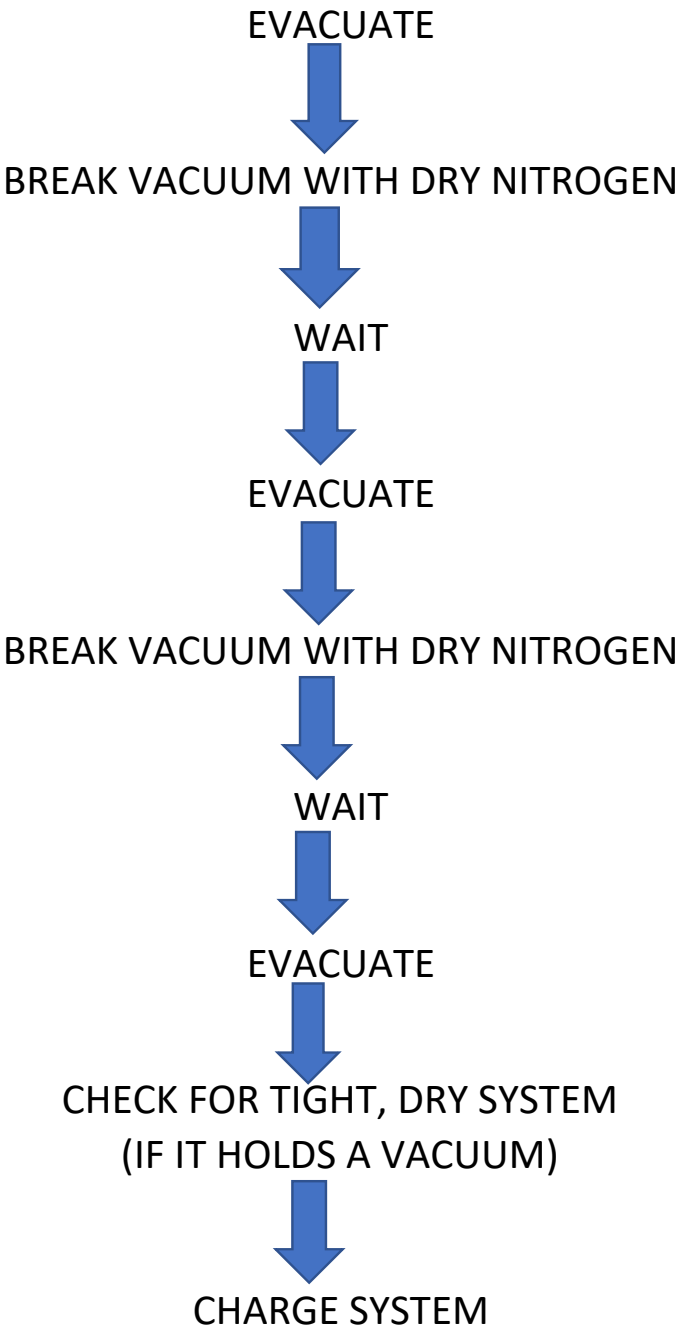
6. 3rd Final Vacuum Micron Test:
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 300 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 500 microns. Repeat step 5 until achieved. Once held under 500 microns, the system is considered dry and tight.

7. 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 feet, weight in the additional charge with an approved refrigerant scale as needed.

Unit Size	9k	12k	18k	24k	36k
additional charge oz/ft	0.2	0.2	0.2	0.538	0.538

INSTALLATION

Leak Check, Evacuation, and Charging (Triple Evacuation)



INSTALLATION

Checklist and Operation Test

Check Unit following Installation

No.	Items to be checked	Possible malfunction
1	Has the unit been installed firmly?	The unit may drop, shake or emit noise.
2	Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
3	Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
4	Is water drained well?	It may cause condensation and water dripping.
5	Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damage the parts.
6	Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage the parts.
7	Is the unit grounded securely?	It may cause electric leakage.
8	Does the power cord follow the specification?	It may cause malfunction or damage the parts.
9	Is there any obstruction in air inlet and air outlet?	It may cause insufficient cooling (heating).
10	The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
11	The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.

Test Operation

1. Preparation of Test Operation

The client approves the air conditioner installation.

Specify the important notes for air conditioner to the client.

2, Method of test operation

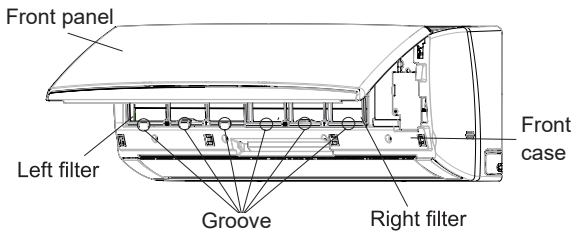
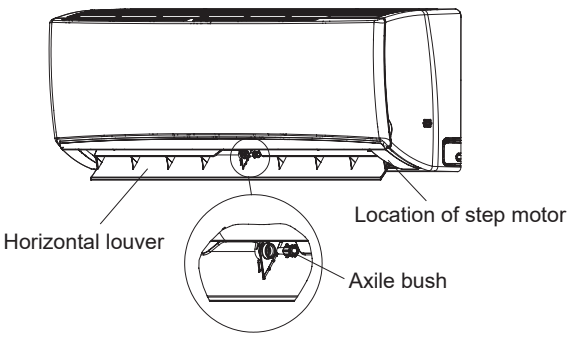
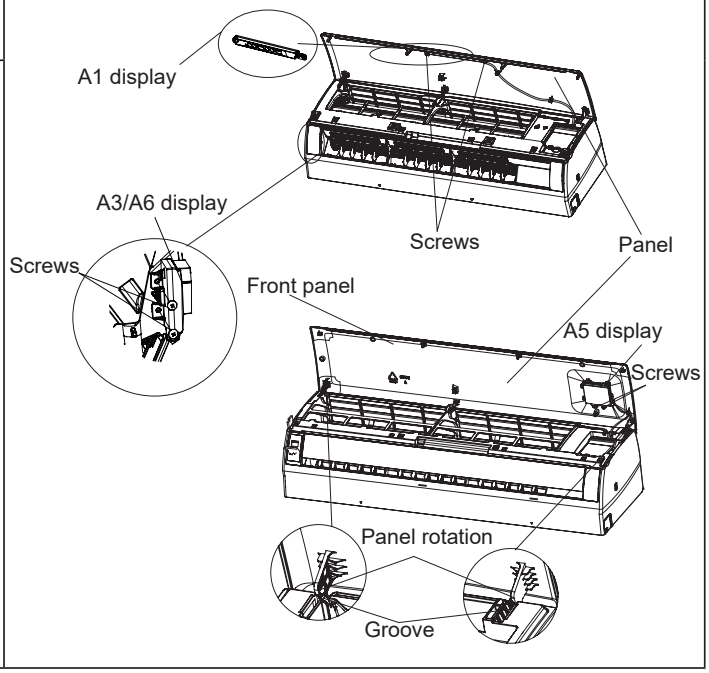
Turn on the power, press ON/OFF button on the remote controller to start operation.

Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.

If the ambient temperature is lower than 60.8°F, the air conditioner can’t start cooling.

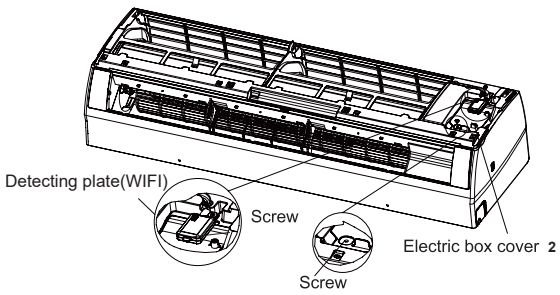
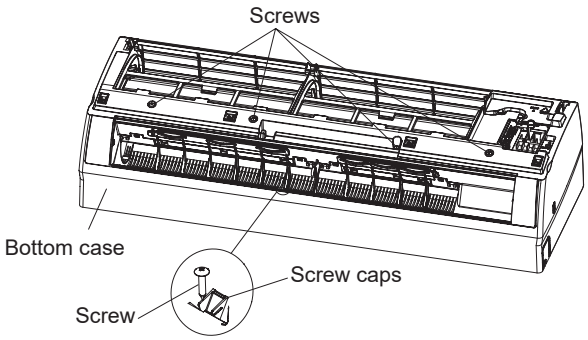
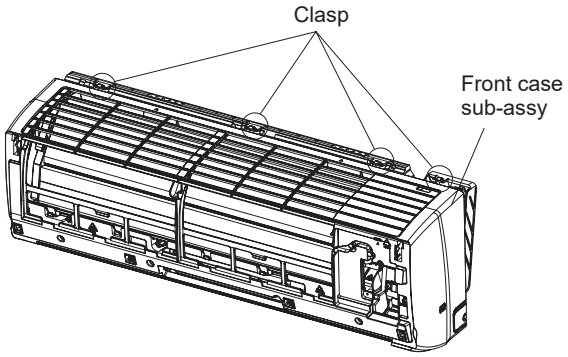
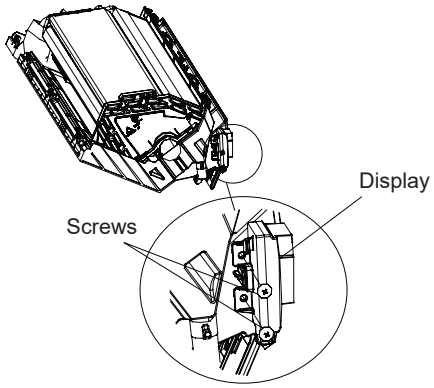
REMOVAL

Indoor Unit

Step	Procedure	
1. Remove filter assembly		
	Open the front panel. Push the left filter and right filter until they are separate from the groove on the front panel. Remove the left filter and right filter respectively.	
2. Remove horizontal louver		
	Push out the axile bush on horizontal louver. Bend the horizontal louver with hand and then separate the horizontal louver from the crankshaft of step motor to remove it.	
3. Remove panel		
a	(1)A1 display: Screw off the 2 screws that are locking the display board. Separate the display board from the front panel. (2)A3/A5 display: Screw off the 2 screws that are locking the display board.	
b	Separate the panel rotation shaft from the groove fixing the front panel and then removes the front panel.	

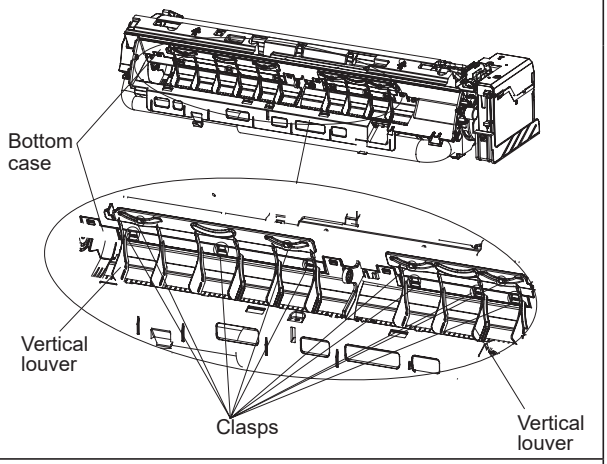
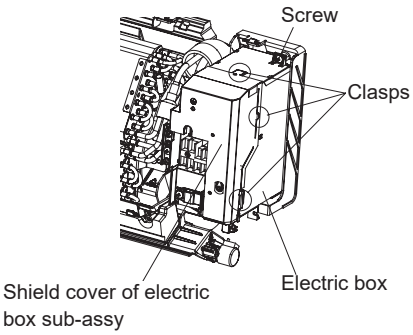
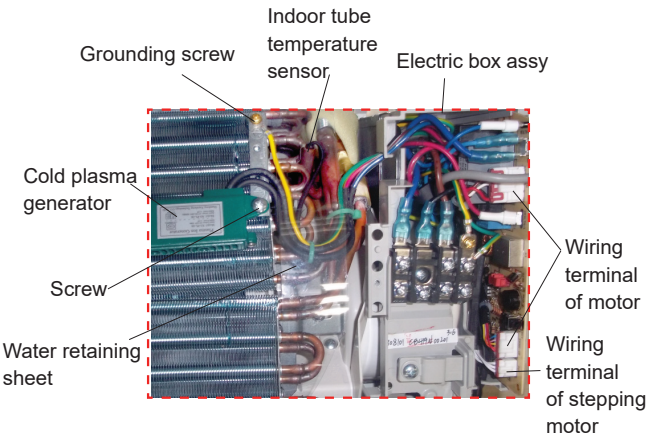
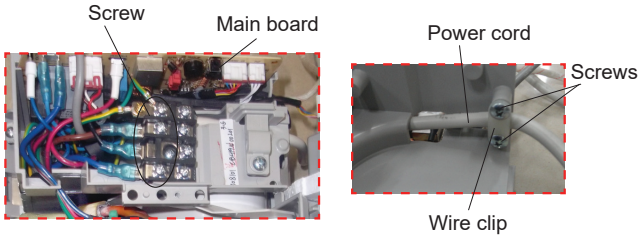
REMOVAL

Indoor Unit

Step	Procedure	
4. Remove electric box cover 2 and detecting plate(WIFI)		
	Remove the screws on the electric box cover 2 and detecting plate(WIFI), then remove the electric box cover 2 and detecting plate(WIFI). Note:the position of detection board(WIFI) may be different for different models.	
5. Remove front case sub-assy		
a	Remove the screws fixing front case. Note: 1.Open the screw caps before removing the screws around the air outlet. 2.The quantity of screws fixing the front case sub-assy is different for different models.	
b	Loosen the connection clasps between front case sub-assy and bottom case. Lift up the front case sub-assy and take it out.	
6. Remove display		
	Screw off the 2 screws that are locking the display board.	

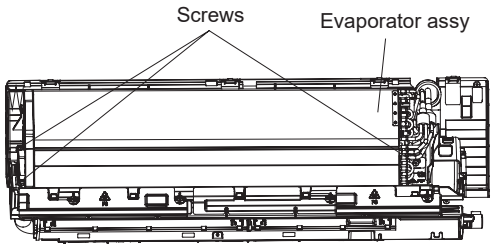
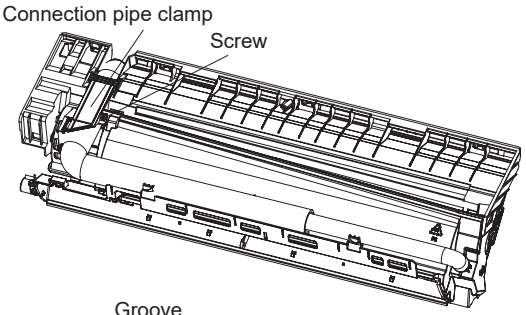
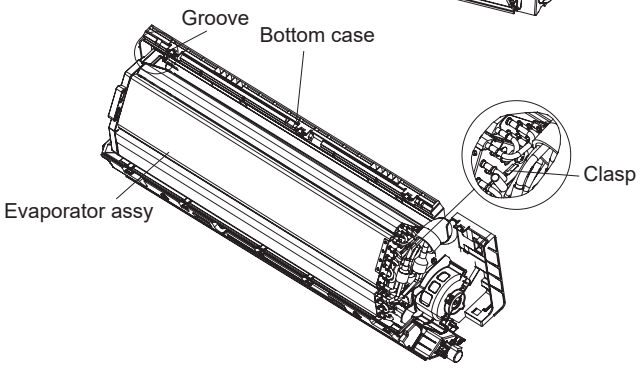
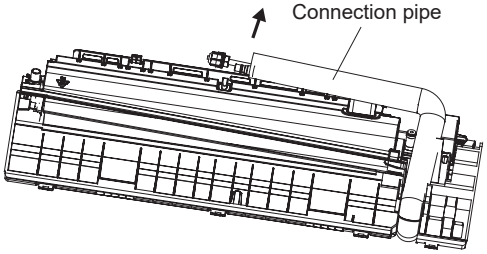
REMOVAL

Indoor Unit

Steps	Procedure	
7. Remove vertical louver		
	Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.	
8. Remove electric box assy		
a	Loosen the connection clasps between shield cover of electric box sub-assy and electric box, and then remove the shield cover of electric box sub-assy. Remove the screw fixing electric box assy .	
b	① Take off the water retaining sheet. Remove the cold plasma generator by screwing off the locking screw on the generator. ② Take off the indoor tube temperature sensor. ③ Screw off 1 grounding screw. ④ Remove the wiring terminals of motor and stepping motor. ⑤ Remove the electric box assy.	
c	Twist off the screws that are locking each lead wire and rotate the electric box assy. Twist off the screws that are locking the wire clip. Loosen the power cord and remove it's wiring terminal. Lift up the main board and take it off.	

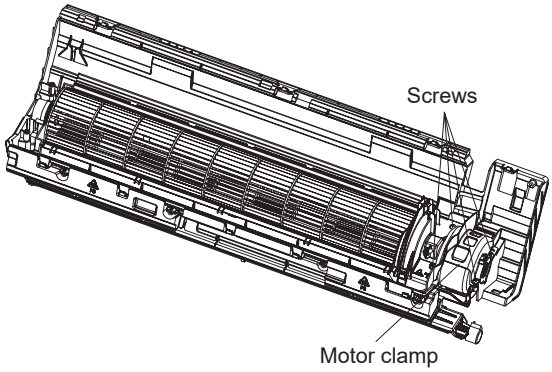
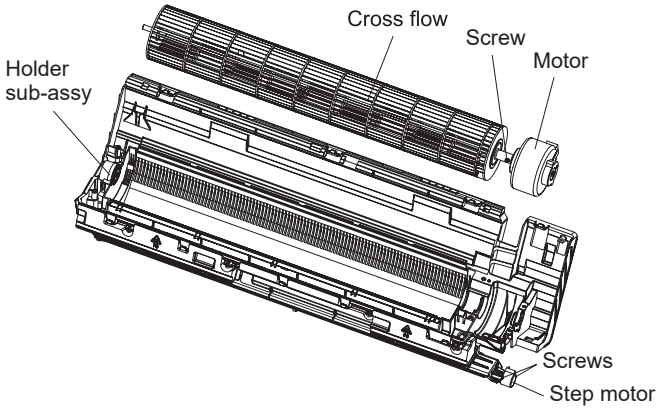
REMOVAL

Indoor Unit

Steps	Procedure	
	Instruction: Some wiring terminal of this product is with lock catch and other devices. The pulling method is as below: ① Remove the soft sheath for some terminals at first, hold the circlip and then pull out the terminals. ② Pull out the holder for some terminals at first (holder is not available for some wiring terminal), hold the connector and then pull the terminal.	
9. Remove evaporator assy		
a	Remove 3 screws fixing evaporator assy.	
b	At the back of the unit, remove the screw fixing connection pipe clamp and then remove the connection pipe clamp.	
c	First remove the left side of the evaporator from the groove of bottom case and then remove the right side from the clasp on the bottom case.	
d	Adjust the position of connection pipe on evaporator slightly and then lift the evaporator upwards to remove it.	

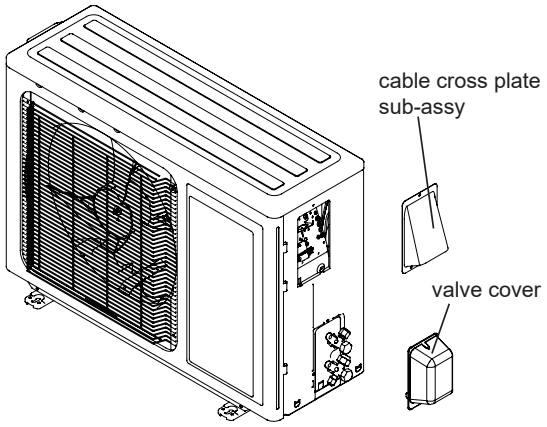
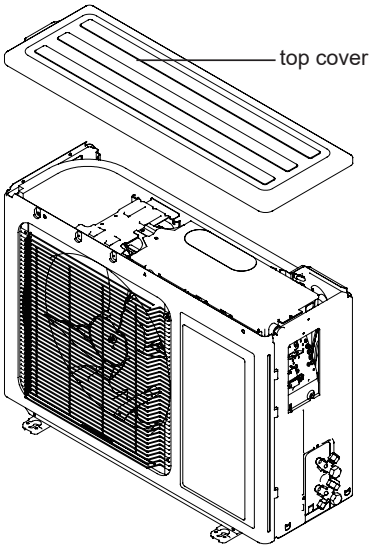
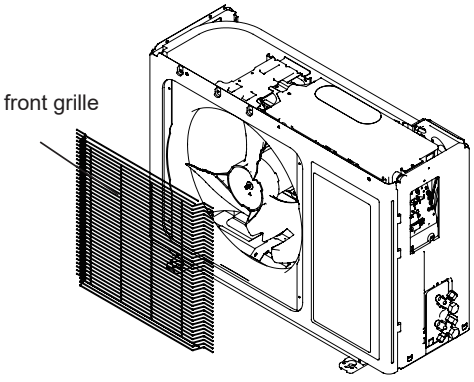
REMOVAL

Indoor Unit

Steps	Procedure	
10. Remove motor and cross flow blade		
a	Remove the screws fixing motor clamp and then remove the motor clamp.	
b	Remove the screws at the connection place of cross flow blade and motor; lift the motor and cross flow blade upwards to remove them. Remove the bearing holder sub-assy. Remove the screw fixing step motor and then remove the step motor.	

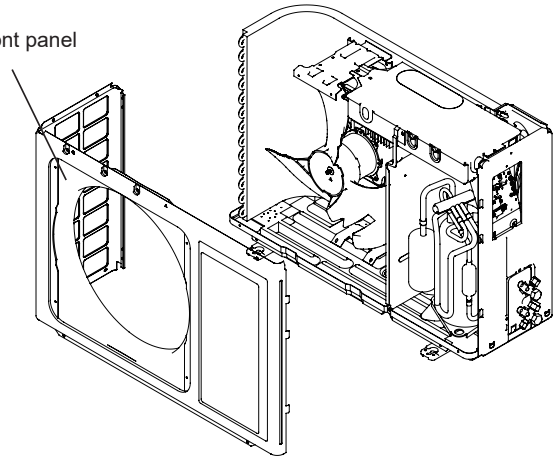
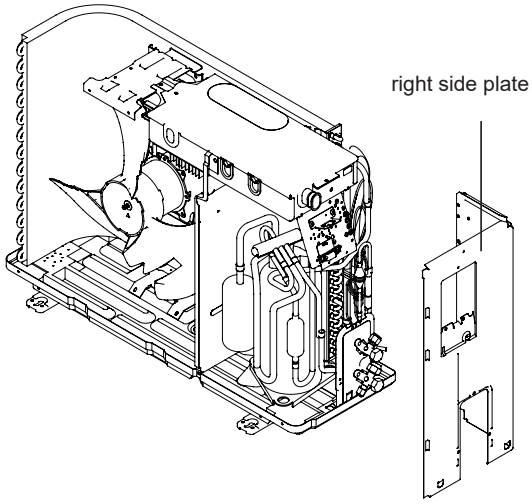
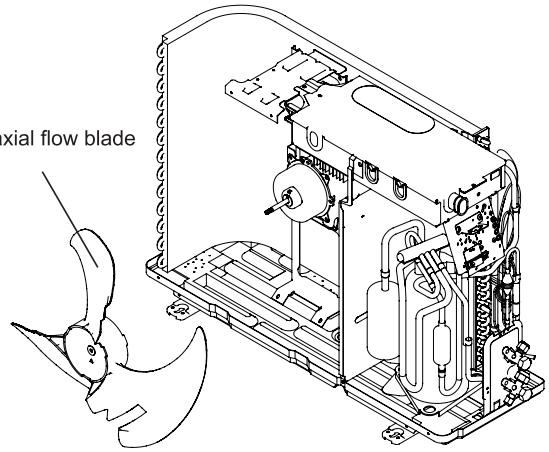
REMOVAL

Outdoor Unit

Steps	Procedure	
	1.Remove cable cross plate sub-assy and valve cover	
	Remove the screws fixing cable cross plate sub-assy and then remove the cable cross plate sub-assy. Remove the screws fixing valve cover and then remove the valve cover.	
	2.Remove top cover	
	Remove connection screws connecting the top cover plate with the front panel and the right side plate,and then remove the top cover.	
	3.Remove front grille	
	Remove connection screws between the front grille and the front panel. Then remove the front grille.	

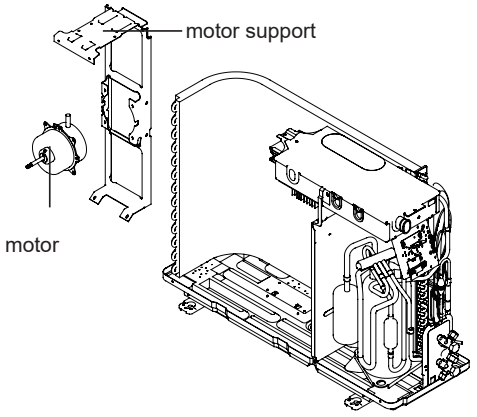
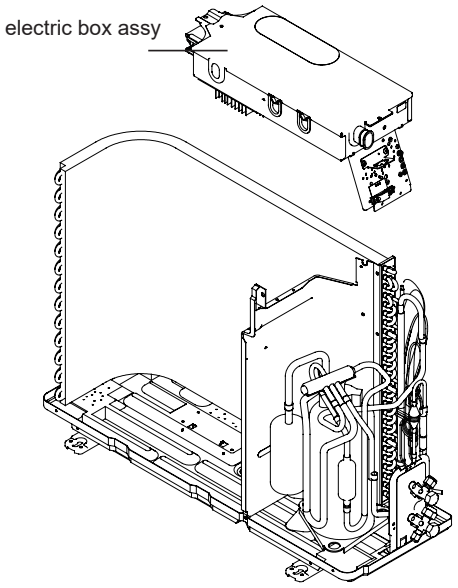
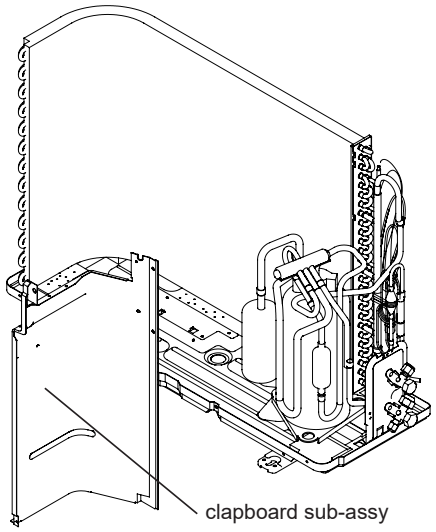
REMOVAL

Outdoor Unit

Steps	Procedure
4.Remove front panel	front panel 
Remove connection screws connecting the front panel with the chassis and the motor support, and then remove the front panel.	
5.Remove right side plate	right side plate 
Remove connection screws connecting the right side plate with the valve support and the electric box. Then remove the right side plate.	
6.Remove axial flow blade	axial flow blade 
Remove the nut fixing the blade and then remove the axial flow blade.	

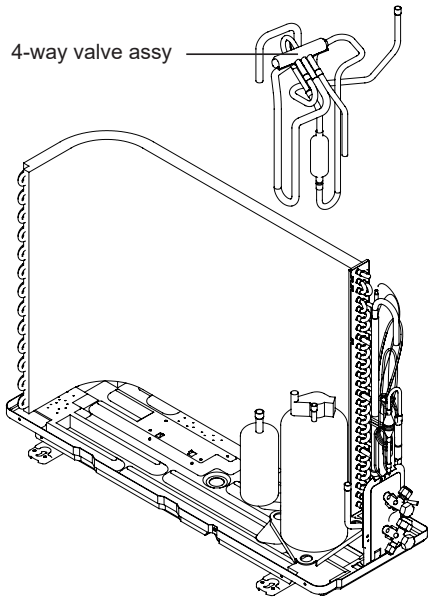
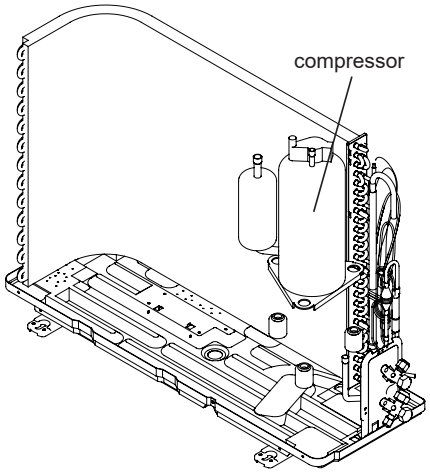
REMOVAL

Outdoor Unit

Steps	Procedure	
	7.Remove motor and motor support	
	Remove the 4 tapping screws fixing the motor Pull out the lead-out wire and remove themotor. Remove the 2 tapping screws fixingthe motor support. Lift motor support to re-move it.	
	8.Remove electric box assy	
	Remove the 2 screws fixing the cover of elec-tric box. Lift to remove the cover. Loosen thewire and disconnect the terminal. Lift to re-move the electric box assy.	
	9.Remove clapboard sub-assy	
	Loosen the screws of the clapboard sub-assy .The clapboard sub-assy has a hook on thelower side. Lift and pull the clapboard sub-assy to remove.	

REMOVAL

Outdoor Unit

Steps	Procedure
10.Remove 4-way valve assy	
Unscrew the fastening nut of the 4-way Valve Assy coil and remove the coil. Wrap the 4-way Valve Assy with wet cotton and unsolder the 4 weld spots connecting the 4-way Valve Assy to take it out (Note: Refrigerant shouldbe discharged firstly.) Welding process should be as quickly as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of compressor.	
11.Remove compressor	
Remove the 3 footing screws of the compressorand remove the compressor.	

WIRED CONTROLLER

Display

WIRED CONTROLLER

Display

1.2 Instructions for Related Displayed Symbols

No.	Symbols	Instructions
1		Up and down swing function
2		Left and right swing function
3		Fresh air function
4		Sleep function
5		Auto mode
6		Cooling mode
7		Dry mode
8		Fan mode
9		Heating mode
10		Health function
11		I-Demand function
12		Absence function
13		Shielding status (Buttons, temperature, ON/OFF, mode or energy saving is shielded by remote monitor)
14		Current set fan speed
15		Memory function (Memory in power failure)
16		DRED function
17		Save function
18		X-fan function
19		Timer on status
20		Gate card pulled-off status or nobody presented status
21		Quiet function
22		Function lock

WIRED CONTROLLER

Buttons

2.1 Button Graphics

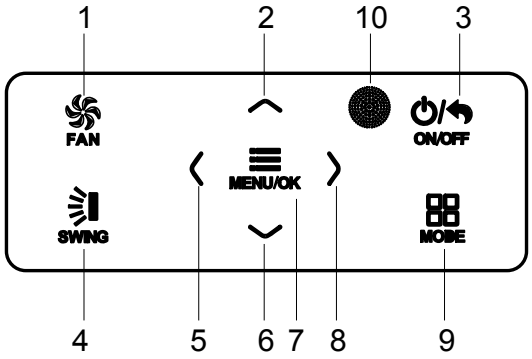


Fig. 2 Button graphics

2.2 Function Instructions of Buttons

No.	Button name	Button Function
1	FAN	Set low speed, medium speed,high speed, turbo and auto speed.
2	∧	(1) Set temperature (2) Set parameter (3) Move option cursor
6	∨	
3	ON/OFF/BACK	(1) Turn on or turn off unit (2) Return to last page
4	SWING	Set up&down swing and set left&right swing
5	＜	(1) Set related function on or off (2) Move option cursor (3) Set parameter
8	＞	
7	MENU/OK	(1) Enter menu page (2) Confirm setting
9	MODE	Set auto, cooling, dry, fan and heating modes for indoor unit.
10	Remote control receiver window	

3 Operation Instructions

3.1 Menu Structure

Normal setting of wired controller can be set directly on the main page, including fan speed, swing, set temperature, mode, ON/OFF. The setting and status view of other functions can be set in corresponding submenu. Detailed menu structure is as shown in Fig. 3.

WIRED CONTROLLER

Operation Instructions

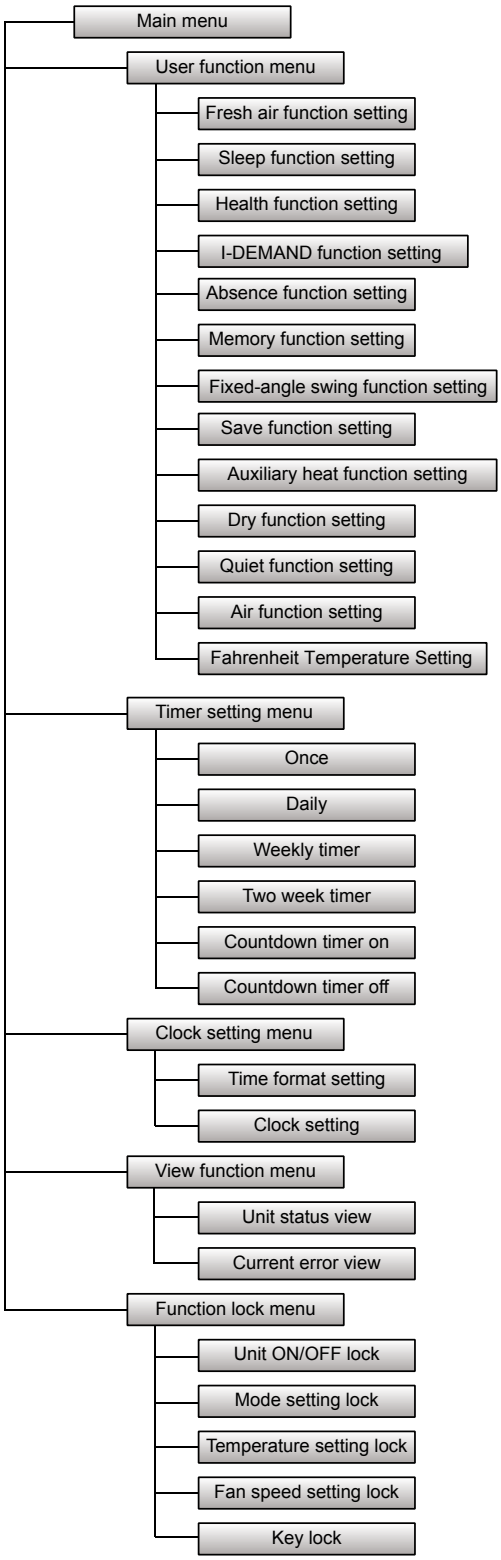


Fig. 3 Menu structure

WIRED CONTROLLER

Operation Instructions

3.2 On/Off

When the wired control is on main page, press ON/OFF button to turn on the unit. Press ON/OFF button again to turn off the unit. The interfaces of On/Off status are shown in Fig. 4 and Fig. 5.

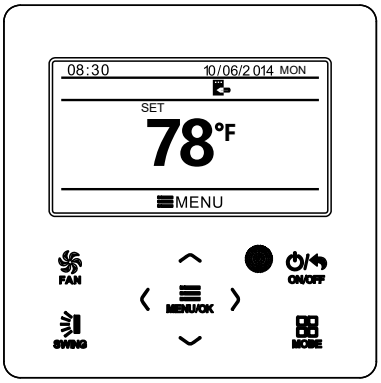


Fig. 4 Off interface

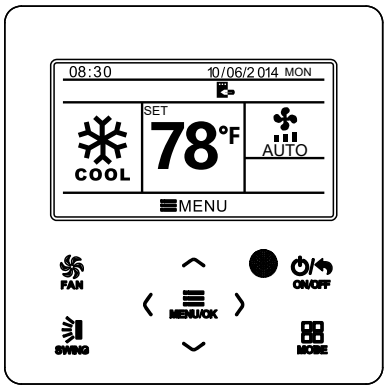
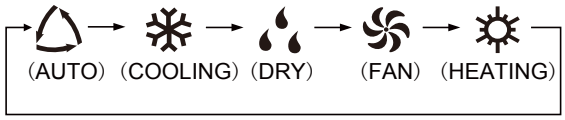


Fig. 5 On interface

3.3 Mode Setting

Under On status, pressing MODE button can set mode circularly as:



Note: If save function is on, auto mode is not available.

3.4 Temperature Setting

Under unit on status, pressing "∧" or "∨" button on the main page increases or decreases set temperature by 1℉) ; holding "∧" or "∨" button increases or decreases set temperature by 1℉ every 0.3s.

In cooling,dry,fan and heating mode,temperature setting range is 61℉～8 6℉. Under auto mode, set temperature cannot be adjusted.

3.5 Fan Setting

Under On status, pressing FAN button can set fan speed circularly as:

Low→Medium→High→Turbo→Auto→Low

Symbols displayed are as shown in Fig. 6.

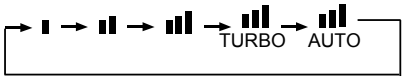


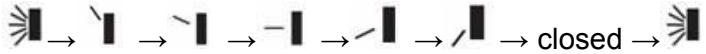
Fig. 6 Fan setting

3.6 Swing Setting

In unit on status, press SWING button for swing setting. Two swing modes are available: fixed-angle swing and simple swing.

When fixed-angle swing mode is set, swing operation is as follows:

In unit on status, press SWING button to select up&down swing  . Up&down swing angle will be adjusted circularly as below:



Select up&down swing and left&right swing through "＜" or "＞" button. When left&right swing  is selected. Left&right swing angle will be adjusted circularly as below:

Note:

①. Turn on fixed-angle swing mode in function setting page;

②. If fixed-angle swing is not available for the model, fixed-angle swing will be invalid when the wired controller turns on fixed-angle swing mode.

Simple swing mode: when fixed-angle swing mode is turned off, swing operation is as below:

Pressing SWING button under unit on status, up&down swing frame occurs. Then press SWING button to turn on or turn off up&down swing.  is displayed when up&down swing is on and is not displayed when up&down swing is off. When up&down swing frame have not disappeared, press "＜" or "＞" button to switch to left&right swing setting. Then left&right swing frame occurs. In this case, press SWING button to turn on or turn off left&right swing.  is displayed when left&right swing is on and is not displayed when left&right swing is off. For detailed operation, please refer to Fig. 7.

WIRED CONTROLLER

Operation Instructions

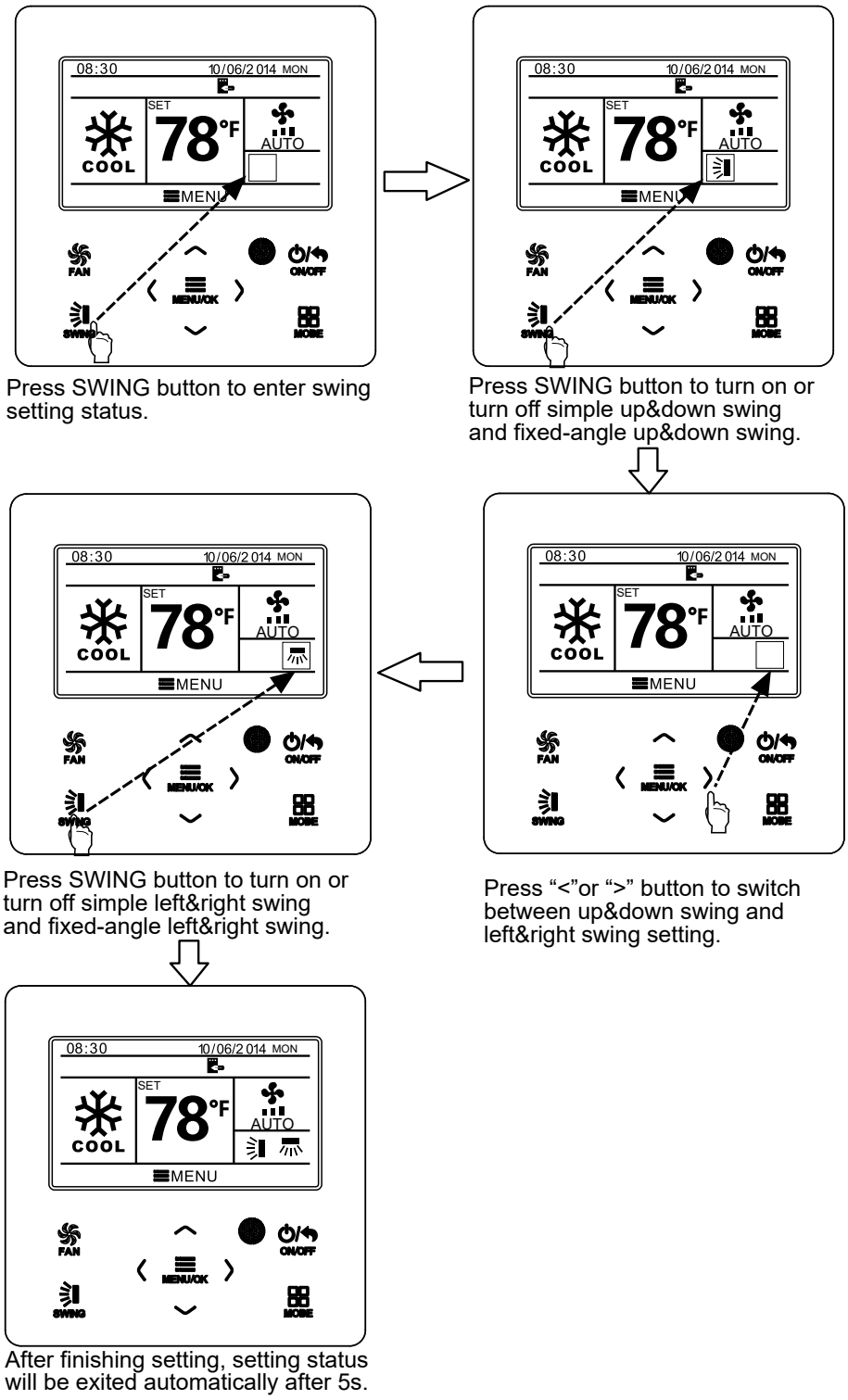


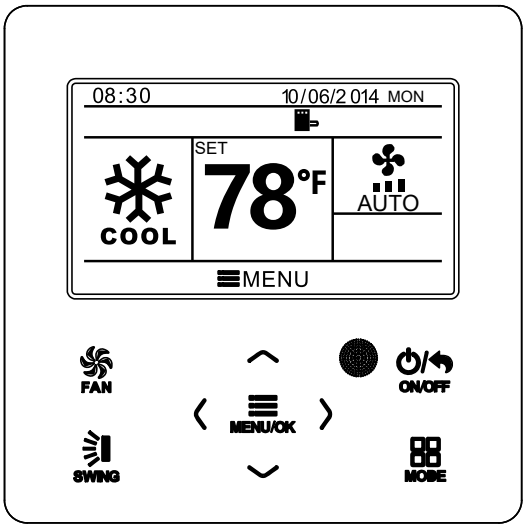
Fig. 7 Swing setting

WIRED CONTROLLER

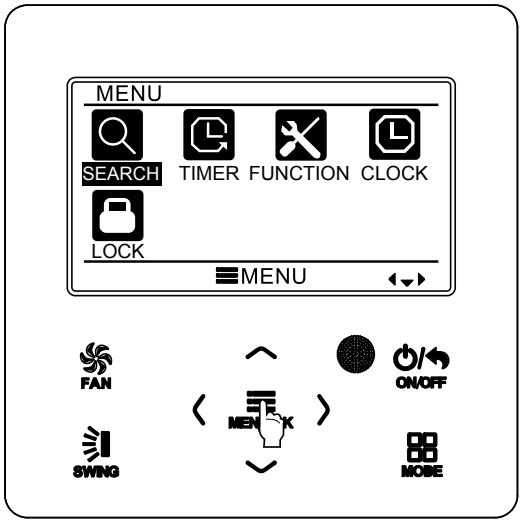
Operation Instructions

3.7 Functions Setting

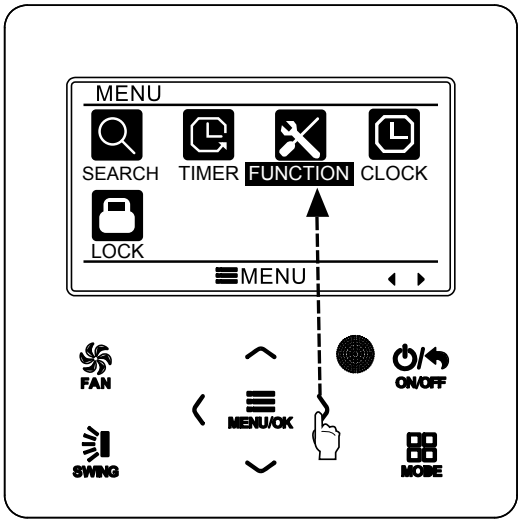
Press MENU/OK button on main page to enter main menu page. Press "∧" or "∨" or "<" or ">" button to select the function setting symbol. Then press MENU/OK button to enter user function setting page. Press "∧" or "∨" button to select specific function item. Press "<" or ">" button to turn on or turn off this function. If the function item cann't be set, it will displays with gray color. Please refer to Fig.8.



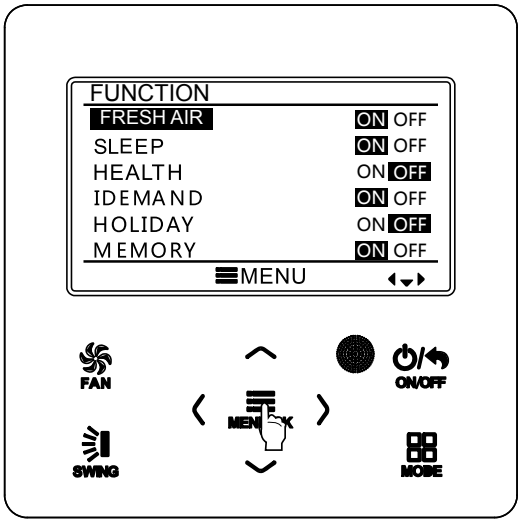
IN main page.



Press MENU/OK button to enter main menu page.



Press ">" button to select function setting item.



Press MENU/OK button to enter function setting page; press "∧" or "∨" to select function item, and press "< " or ">" button to set the function.

WIRED CONTROLLER

Operation Instructions

3.7.1 Fresh Air Function Setting

After entering user function page, press "∧" or "∨" button to select fresh air function and press "＜" or "＞" button to turn on or turn off air function. Press MENU button to adjust the mode of fresh air.

After entering fresh air mode setting, press "∧" or "∨" button to adjust the mode in the range of 1~10. After setting, press MENU button to save the setting.

3.7.2 Sleep Function Setting

After entering user function page, press "∧" or "∨" button to select sleep function and press "＜" or "＞" button to turn on or turn off sleep function with auto saving.

If this function is turned on, the unit will operate according to the preset sleep curve to provide comfortable sleep environment.

Note:

- ●In fan or auto mode, sleep function is not available.
- ●Sleep function will be cancelled when turning off the unit or switching modes.

3.7.3 Health Function Setting

After entering user function page, press "∧" or "∨" button to select health function and press "＜" or "＞" button to turn on or turn off health function with auto saving.

3.7.4 I-DEMAND Function Setting

After entering user function page, press "∧" or "∨" button to select IDEMAND function option and press "＜" or "＞" button to turn on or turn off this function with auto saving.

Note:

- This function is only available in cooling mode.
- When this function has been set, set temperature is displayed in SE. In this case, temperature setting and fan speed setting are shielded.
- This function will be cancelled when switching modes.
- This function and sleep function cannot be on simultaneously. If I-demand function is set firstly and then sleep function is set, I-demand function will be cancelled while sleep function will be valid, and vice versa.

3.7.5 Absence Function Setting

After entering user function page, press "∧" or "∨" button to select holiday function option and press "＜" or "＞" button to turn on or turn off this function with auto saving.

This function is used to maintain indoor temperature so that unit can realize fast heating.

Note:

- This function is only available in heating mode.
- When this function has been set, set temperature is displayed in 8℃(46℉). In this case, temperature setting and fan speed setting are shielded.
- This function will be cancelled when switching modes.
- This function and sleep function cannot be on simultaneously. If absence function is set firstly and then sleep function is set, absence function will be cancelled while sleep function will be valid, and vice versa.

3.7.6 Memory Function Setting

After entering user function page, press "∧" or "∨" button to select memory function and press "＜" or "＞" button to turn on or turn off memory function with auto saving.

3.7.7 Fixed-angle Swing Mode Setting

After entering user function page, press "∧" or "∨" button to select lock swing function option and press "＜" or "＞" button to turn on or turn off this function with auto saving.

Note: If fixed-angle swing function is not available for the connected unit, this function will be cancelled automatically after setting.

WIRED CONTROLLER

Operation Instructions

3.7.8 Save Function Setting

After entering user function page, press "∧" or "∨" button to select save function and press "＜" or "＞" button to turn on or turn off save function. Press MENU button to enter save function setting page.

After entering save function setting page, press "＜" or "＞" button to select cooling or heating limitation temperature. After selecting cooling or heating limitation temperature, press "∧" or "∨" button to adjust limitation temperature value. After setting, press MENU button to save the setting.

Note: When save function has been set, auto mode cannot be set.

3.7.9 Auxiliary Heating Function Setting

After entering user function page, press "∧" or "∨" button to select auxiliary heating function and press "＜" or "＞" button to turn on or turn off this function with auto saving.

3.7.10 X-fan Function Setting

After entering user function page, press "∧" or "∨" button to select dry function option and press "＜" or "＞" button to turn on or turn off this function with auto saving.

Note:

- This function is only available in cooling mode and dry mode.

3.7.11 Quiet Function Setting

After entering user function page, press "∧" or "∨" button to select quiet function and press "＜" or "＞" button to turn on or turn off this function with auto saving.

Note: This function is only available in cooling mode, heating mode and auto mode.

3.7.12 Fahrenheit Temperature Setting

After entering user function page, press "∧" or "∨" button to select Fahrenheit temperature function and press "＜" or "＞" button to turn on or turn off this function with auto saving. After closing this function, Celsius temperature will be displayed.

WIRED CONTROLLER

Operation Instructions

3.7.13 Air Function Setting

After entering user function page, press "∧" or "∨" button to select Air Function and press "＜" or "＞" button to turn on or turn off air function. Press MENU button to adjust the mode of Air Function .

After entering Air Function mode setting, press "∧" or "∨" button to adjust the mode in the range of 1~2. After setting, press MENU button to save the setting.

The each mode means as follows:1- suction 2-discharge

3.8 Unit Status View

Press MENU button to enter the menu and select the function symbol to be viewed. Then press MENU button to enter view function page. Press "∧" or "∨" button to select status view function. Press MENU button to enter unit status view page. Press BACK button to return to the last page. Please refer to Fig. 9.

The following statuses can be viewed: if auxiliary heating is operating;indoor ambient temperature; outdoor ambient temperature.

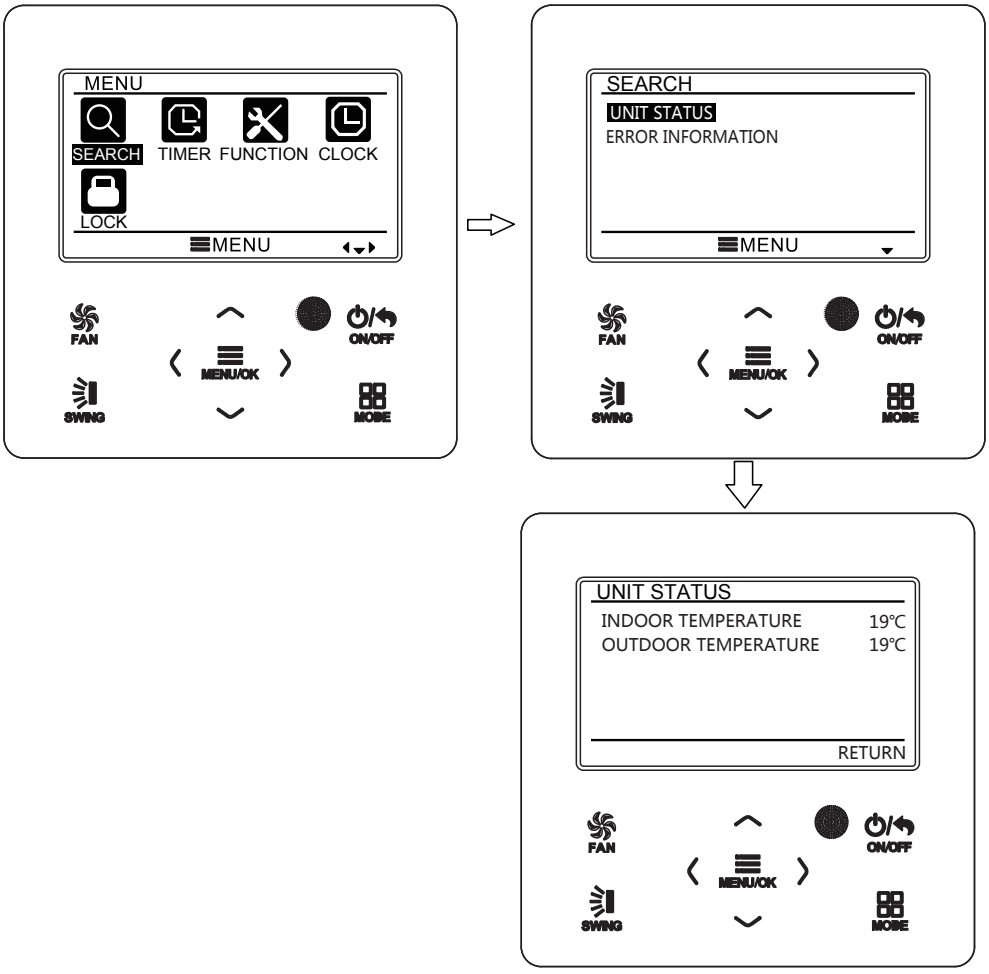


Fig. 9 Status View

WIRED CONTROLLER

Operation Instructions

3.9 Current Error View

When error occurs in the unit, error symbol will be displayed on the main page of wired controller to indicate that the unit is with error. In this case, you can enter error view page to view the current error.

Press MENU button to enter the menu and select the function symbol to be viewed. Then press MENU button to enter view function page. Press "∧" or "∨" button to select error information. Press MENU button to enter error view page. If there are too many errors, press "∧" or "∨" to turn pages. Press BACK button to return to the last page. Please refer to Fig. 10.

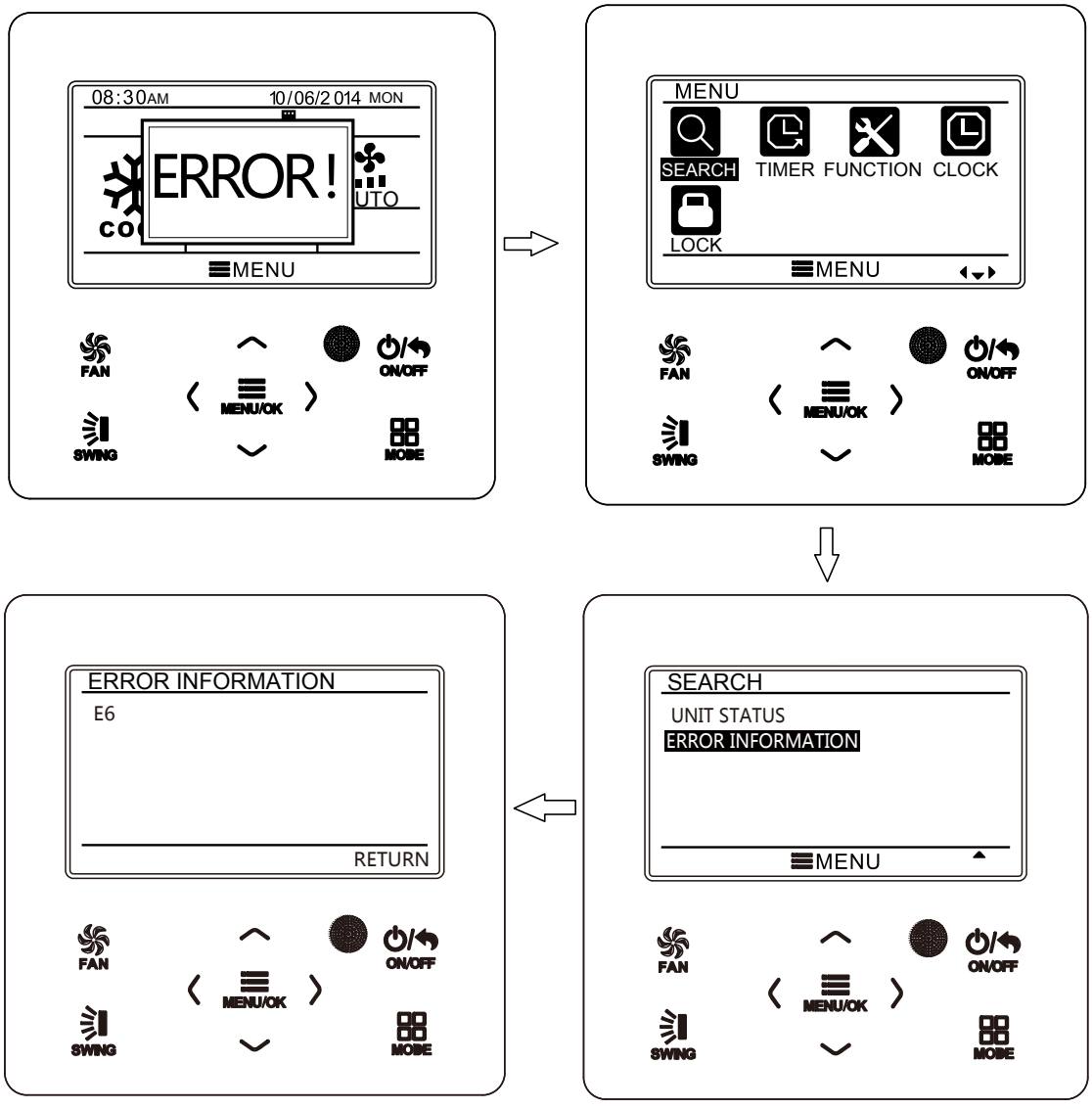


Fig. 10 Current Error View

WIRED CONTROLLER

Operation Instructions

Error	Error Code	Error	Error Code
Return air temperature sensor open/ short circuited	F1	Drive board communication error	P6
evaporator temperature sensor open/ short circuited	F2	Compressor overheating protection	H3
Indoor unit liquid valve temperature sensor open/short circuited	b5	Indoor and outdoor units unmatched	LP
Indoor gas valve temperature sensor open/ short circuited	b7	Communication line misconnected or expansion valve error	dn
IPM temperature sensor open/short circuited	P7	Running mode conflict	E7
Outdoor ambient temperature sensor open/ short circuited	F3	Pump-down	Fo
Outdoor unit condenser mid-tube temperature sensor open/short circuited	F4	Jumper error	C5
Discharge temperature sensor open/ short circuited	F5	Forced defrosting	H1
Indoor and outdoor communication error	E6	Compressor startup failure	Lc
DC bus under-voltage protection	PL	High discharge temperature protection	E4
DC bus over-voltage protection	PH	Overload protection	E8
Compressor phase current sensing circuit error	U1	Whole unit over-current protection	E5
Compressor demagnetization protection	HE	Over phase current protection	P5
PFC protection	Hc	Compressor desynchronizing	H7
IPM Temperature Protection	P8	IPM Current protection	H5
Over-power protection	L9	Compressor phase loss/reversal protection	Ld
System charge shortage or blockage protection	F0	Frequency restricted/reduced with whole unit current protection	F8
Capacitor charging error	PU	Frequency restricted/reduced with IPM current protection	En
High pressure protection	E1	Frequency restricted/reduced with high discharge temperature	F9
Low pressure protection	E3	Frequency restricted/reduced with anti-freezing protection	FH
Compressor stalling	LE	Frequency restricted/reduced with overload protection	F6
Over-speeding	LF	Frequency restricted/reduced with IPM temperature protection	EU
Drive board temperature sensor error	PF	Indoor unit full water error	E9
AC contactor protection	P9	Anti-freezing protection	E2
Temperature drift protection	PE	AC input voltage abnormal	PP
Sensor connection protection	Pd	Whole unit current sensing circuit error	U5
DC bus voltage drop error	U3	4-way valve reversing error	U7
Outdoor fan 1 error protection	L3	Motor stalling	H6
Outdoor fan 2 error protection	LA	PG motor zero-crossing protection	U8
compressor inhalation temperature sensor error	dc	Indoor fan tripping error	U0

Operation Instructions

Error	Error Code	Error	Error Code
Communication error between IDU and grid connection	Ln	IDU network address error	y3
Communication error between ODU and grid connection	LM	Ip address allocation overflow	yb
Main error at grid connection side	y2		

3.10 Timer Setting

The wired controller can set 6 kinds of timer: one time clock timer, everyday timer, one week timer, two week timer, countdown timer on and countdown timer off. Select timer symbol after entering menu page. Press "∧" or "∨" button to select one kind of timer. Press "＜" or "＞" button to turn on or turn off this timer. Please refer to Fig. 11.

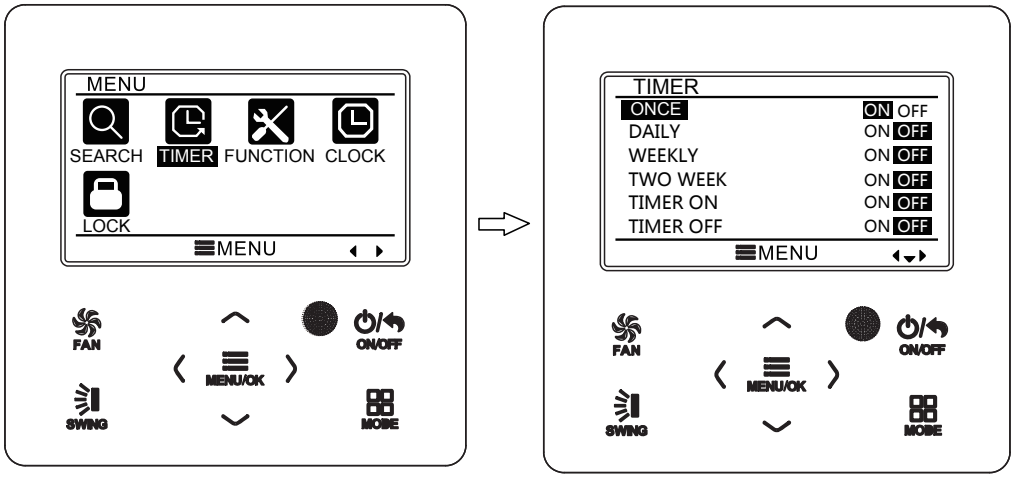


Fig. 11 Turn on or turn off timer

3.10.1 One Time Clock Timer

The wired controller can set one time clock timer. If the unit is off, timer on can be set. If the unit is on, timer off can be set. This timer will be carried out for only once when timer time is reached and then the timer will be off automatically.

In timer function setting page, when one time timer is selected, press "＜" or "＞" button to turn on or turn off this timer function. Press MENU button to enter timer time setting page, as shown in Fig. 12.

Press "＜" or "＞" button to select timer hour or minute and press "∧" or "∨" button to adjust time. Holding "∧" or "∨" button increases or decreases time rapidly. After finishing setting, press MENU button to save timer time.

WIRED CONTROLLER

Operation Instructions

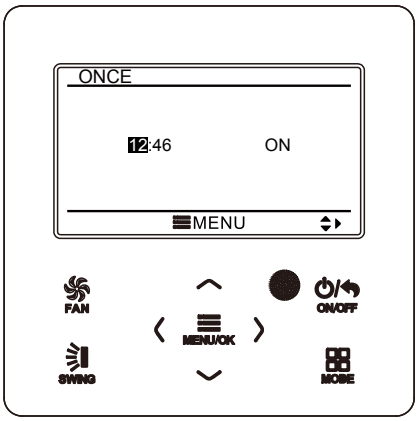


Fig. 12 Setting page of one time clock timer

Note: If this timer function is turned on, when the unit is turned on or turned off, this timer function will be cancelled automatically.

3.10.2 Daily Timer

In daily timer, user can set eight segments of timer individually. The individual segment will be valid only when it is turned on. In each segment, you can set time, unit ON/OFF, set temperature in cooling (it is valid only when the current mode is cooling), set temperature in heating (it is valid only when the current mode is heating). Please refer to Fig. 13. to select setting

After entering daily timer setting page, press "＜" or "＞" button item. Press "∧" or "∨" button to adjust the value. Press MENU button to save setting.

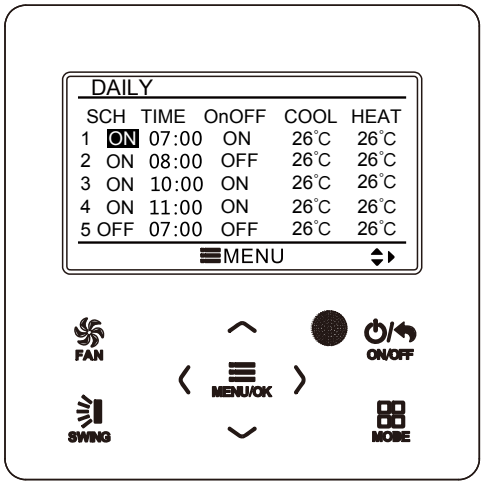


Fig. 13 Daily timer setting

3.10.3 Weekly Timer

The user can set the everyday timer content for a week. In each day, the user can set eight segments of timer content. The unit will execute corresponding timer setting in a week.

WIRED CONTROLLER

Operation Instructions

After entering weekly timer setting page, press "＜" or "＞" button to select the day to be set. Then press MENU button to enter timer programming of that day. Press "＜" or "＞" button to select the item to be set. Press "∧" or "∨" button to adjust the content. Press MENU button to save setting. Please refer to Fig. 14.

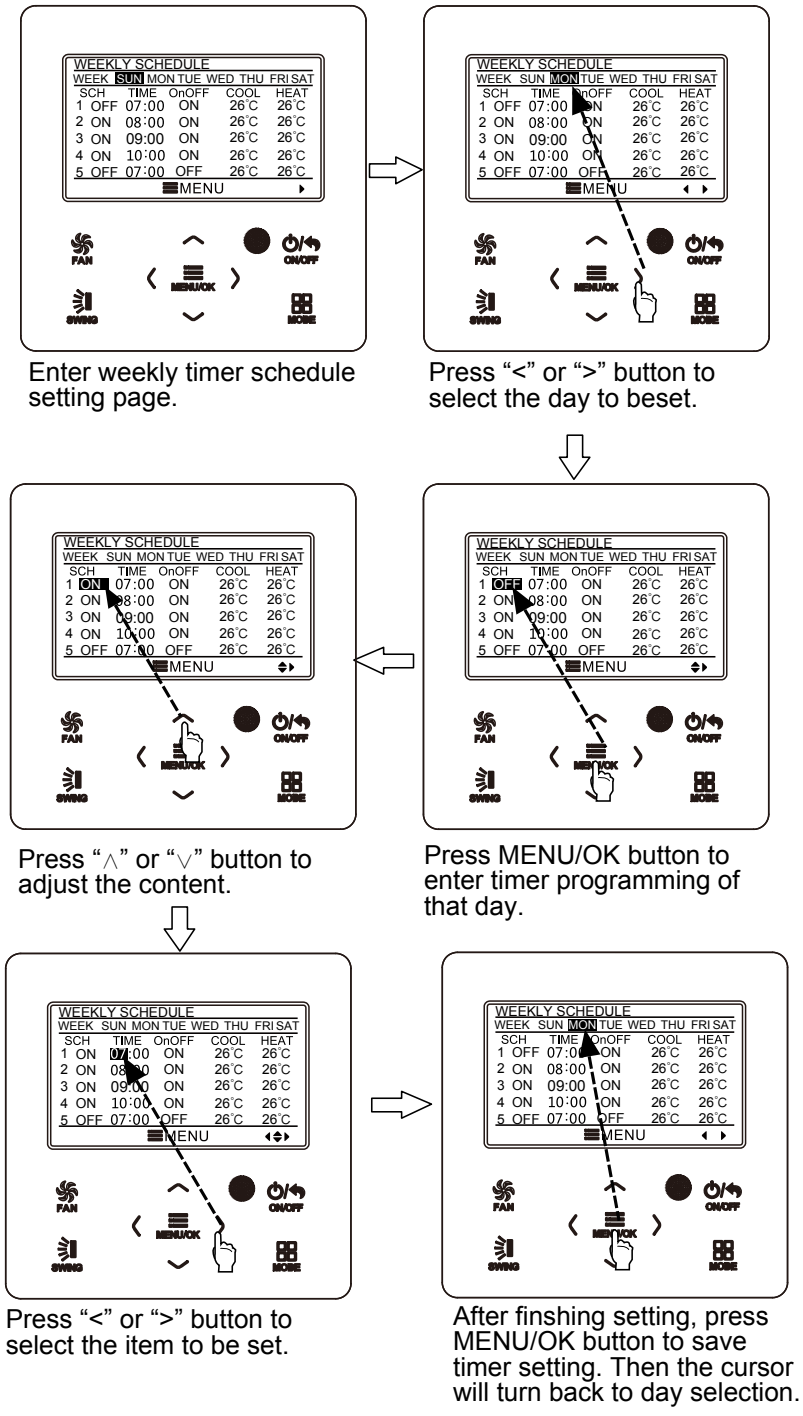


Fig. 14 Weekly timer setting

Operation Instructions

3.10.4 Two Week Timer

The user can set the everyday timer content for two weeks. In each day, the user can set eight segments of timer content. The unit will execute corresponding timer setting in two weeks.

In timer function setting page, press "∧" or "∨" button to select two week timer setting and then press MENU button to enter two week timer menu page. Press "∧" or "∨" button to select current week option and then press "＜" or "＞" button to set current week as first week or second week. Press MENU button to save current week setting. Please refer to Fig. 15.

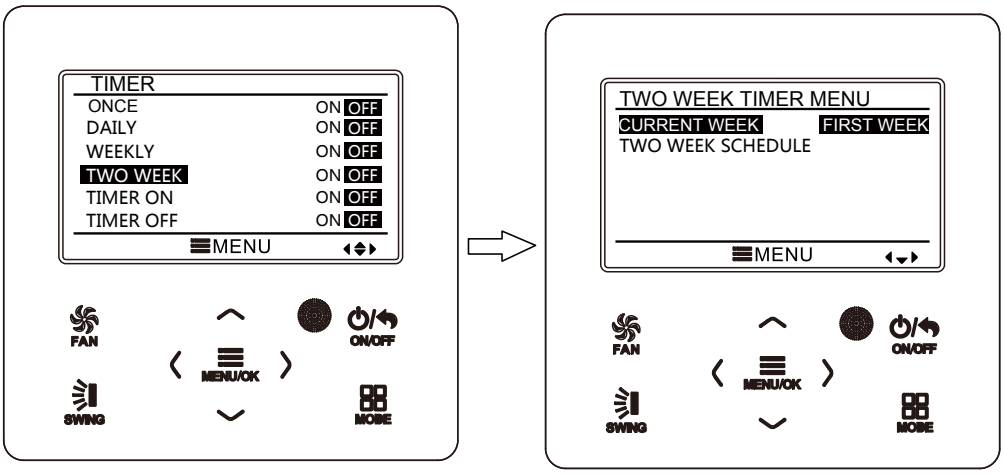


Fig. 15 Setting of current week

After entering two week timer menu page, press "∧" or "∨" button to select the two week schedule option and then press MENU button to enter two week timer programming. After entering two week timer setting page, press "＜" or "＞" button to select the day to be set. Then press MENU button to enter timer programming of that day. Press "＜" or "＞" button to select the item to be set. Press "∧" or "∨" button to adjust the content. Press MENU button to save setting. Press BACK button to exit this page. The setting symbols please refer to weekly timer setting.

3.10.5 Countdown Timer

Countdown timer includes timer on and timer off. Unit On/Off after a desired hour can be set. In unit on status, timer off can be set, or timer off and timer on can be set simultaneously. In unit off status, timer on can be set, or timer off and timer on can be set simultaneously. If timer off in x hours and timer on in y hours are set simultaneously in unit on status, the unit will be off in x hours and then the unit will be on in y hours after timer off.

WIRED CONTROLLER

Operation Instructions

After entering timer on setting page, press " ∧" or " ∨" button to increases or decreases timer time by 0.5h. Press MENU button to save setting. Press BACK button to return to the last page. Please refer to Fig. 16.

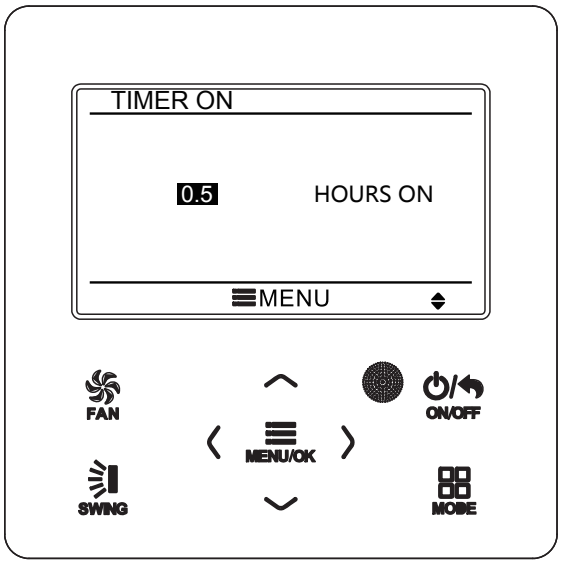


Fig. 16 Countdown timer on

After entering timer off setting page, press " ∧" or " ∨" button to increases or decreases timer time by 0.5h. Press MENU button to save setting. Press BACK button to return to the last page. Please refer to Fig. 17.

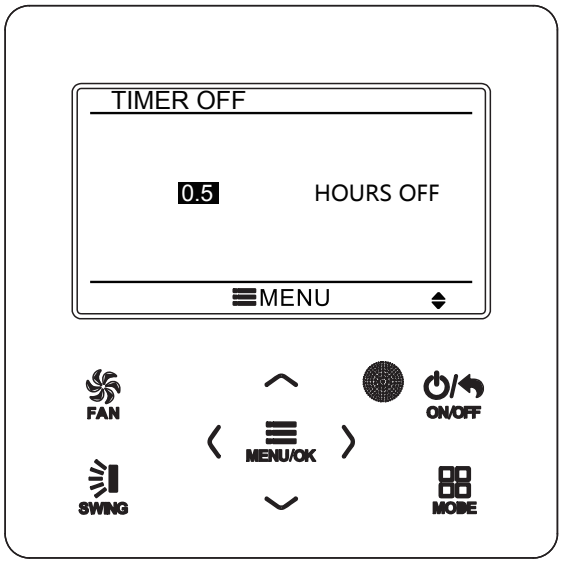


Fig. 17 Countdown timer off

If timer function is on, the set hours will decrease as the unit operation time increases. In this case, residual hours can be viewed after entering timer setting page.

Operation Instructions

This timer function will be carried out for only once and then it will be cancelled automatically.

Note: If this timer function is turned on, when the unit is turned on or turned off, this timer function will be cancelled automatically.

3.11 Clock Setting

3.11.1 Time Format Setting

The user can set the time format in 12-hour system or 24-hour system. Select clock symbol in menu page and then press MENU button to enter clock setting page. Press "∧" or "∨" button to select time format and then press "＜" or "＞" button to select 12-hour system or 24-hour system. Please refer to Fig. 18.

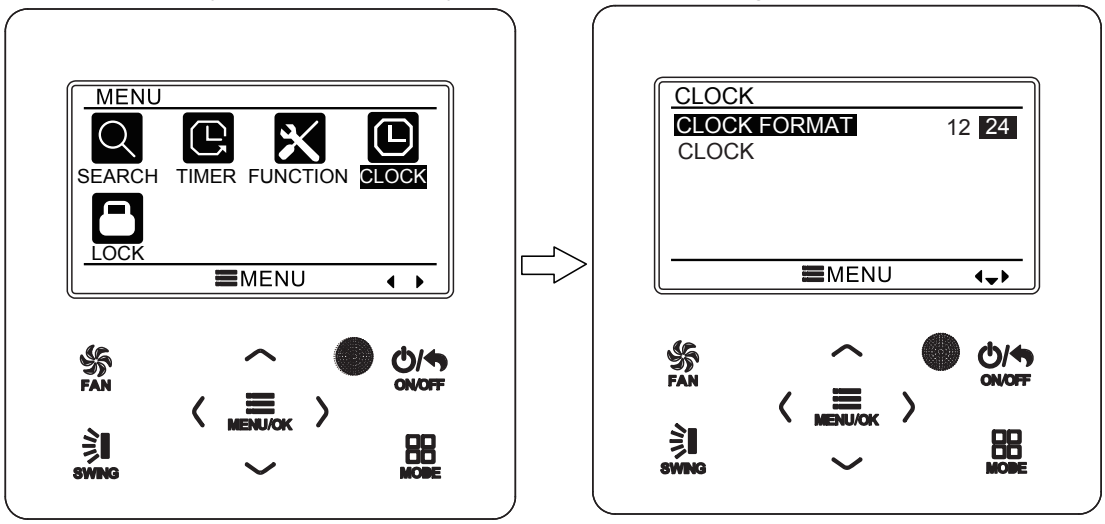


Fig. 18 Time format selection

3.11.2 Clock Setting

Select clock symbol in menu page and then press MENU button to enter clock setting page. Press "∧" or "∨" button to select time set and then press MENU button to enter time setting.

Press "＜" or "＞" button to select setting items: hour, minute, year, month, day; press "∧" or "∨" button to set the value and then press MENU button to save setting. Please refer to Fig. 19.

Note: If you need to use both the wired controller and remote controller,

WIRED CONTROLLER

Operation Instructions

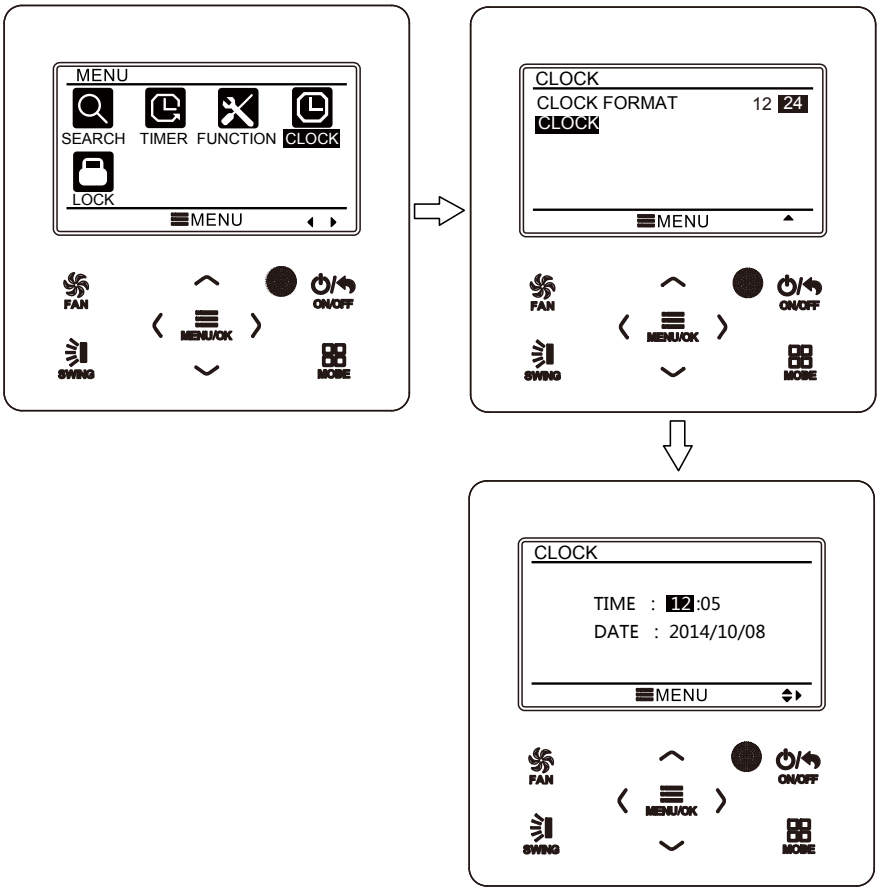


Fig. 19 Clock setting

3.12 Lock Setting

Select lock symbol in menu page and then press MENU button to enter lock setting page. Press "∧" or "∨" button to select the item to be locked and then press "＜" or "＞" button to lock or unlock. Please refer to Fig. 20.

Items can be locked: ON/OFF, mode setting, temperature setting, fan speed setting, key lock. After locking, the corresponding item cannot be set through buttons.

If the keys are locked, all keys cannot be operated after returning to the main page. Please unlock according to the instructions on main page. During unlocking, press MENU button, press "＜" button and then press "＞" button to unlock keys.

WIRED CONTROLLER

Installation Instructions

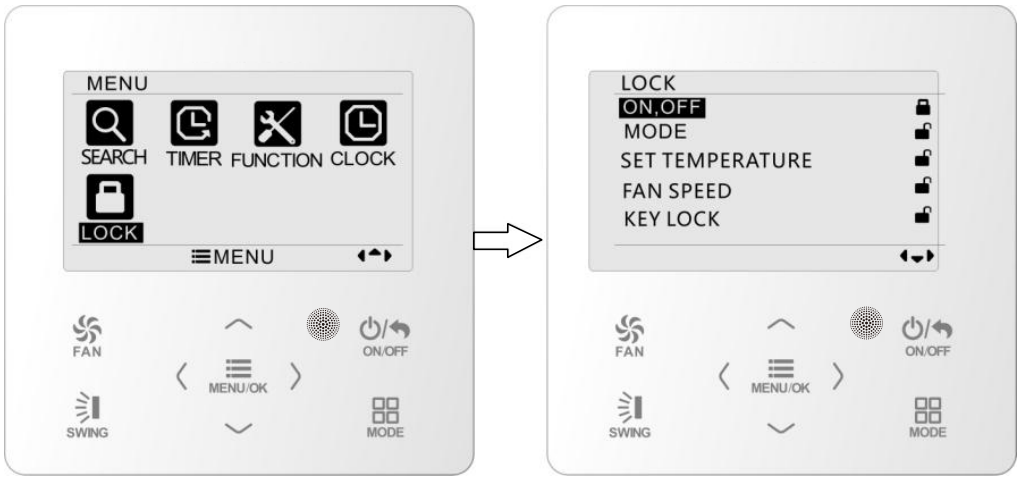


Fig. 20 Lock setting

4 Installation Instructions

4.1 Parts and Dimension of Wired Controller

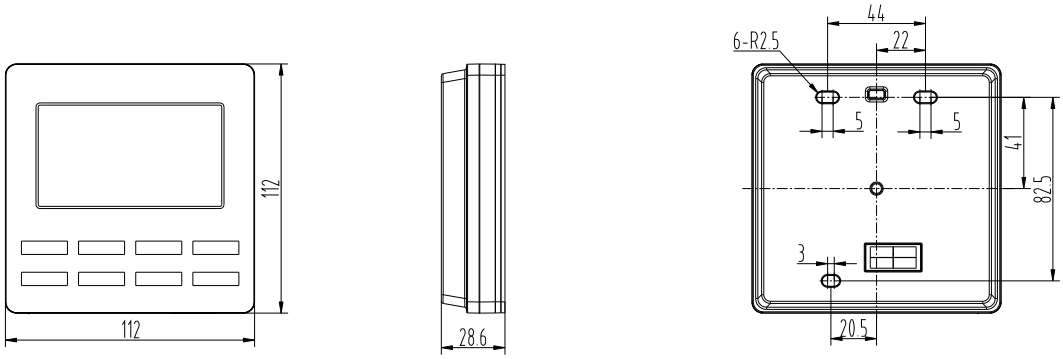


Fig. 21 Dimension of wired controller unit：mm

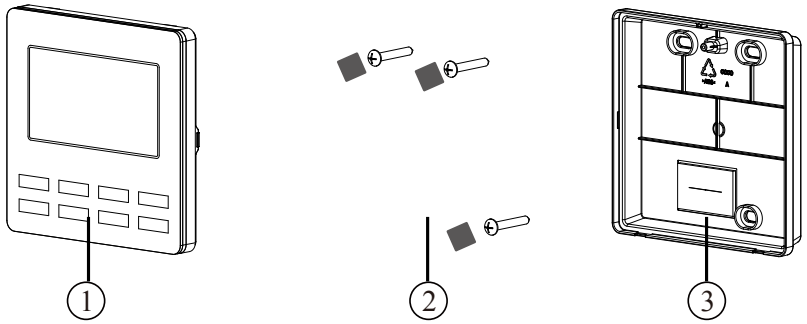


Fig. 22 Parts of wired controller

No.	1	2	3
Name	Panel of wired controller	Sponge 20×20×3 Screw M4×25	Soleplate of wired controller
Quantity	1	3	1

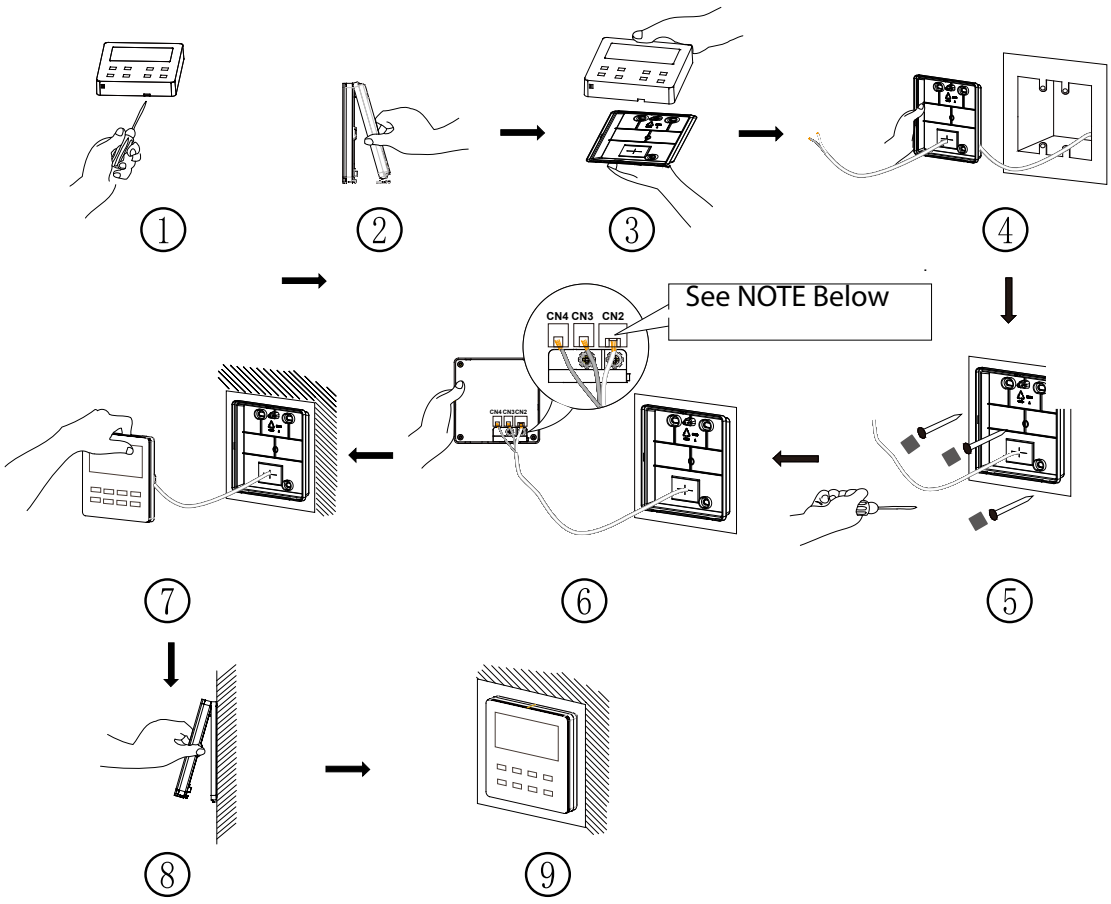
WIRED CONTROLLER

Installation Instructions

4.2 Installation Requirements

(1) Prohibit installing the wired controller at wet places.
(2) Prohibit installing the wired controller at the places with direct sunshine.
(3) Prohibit installing the wired controller at the place near high temperature objects or water-splashing places.

4.3 Installation Methods



NOTE:
CN2 terminal is used for connecting indoor unit and it must be connected. CN3 terminal and CN4 terminal are used for connecting the centralized controller, and these two terminals have the same function. Customers can select one or two terminals for connection according to their requirements.

Fig. 23 Installation diagram for wired controller

WIRED CONTROLLER

Installation Instructions

Fig. 23 is the simple installation process of wired controller; please pay attention to the following items:

(1) Before installation, please cut off the power for indoor unit;

(2) Pull out the four-core twisted pair line from the installation holes and then let it go through the rectangular hole behind the soleplate of the wired controller.

(3) Stick the soleplate of wired controller on the wall and then use screw M4×25 to fix soleplate and installation hole on wall together, attach the sponge 20×20×3 at the screw hole and then press it with fingers to make sure it's attached firmly.

(4) Insert the four-core twisted pair line into the slot of the wired controller and then buckle the front panel and the soleplate of the wired controller together.

(5) Block the four-core wire into the groove at the left side of wiring column; bundle the front panel of wired controller to its soleplate.

Note:

- Separate the signal and communication lines of the wired controller from the power cord and connection lines between the indoor and outdoor unit, with a minimum interval of 20cm, otherwise the communication of the unit will probably work abnormally.
- If the air conditioning unit is installed where is vulnerable to electromagnetic interference,then the signal and communication lines of the wired controller must be the shielding twisted pair lines.
- The 4-core terminal connects the air conditioner, while the 2-core terminal connects the centralized controller. The connecting method for the 2-core connection wire is same as that of 4-core connection wire.
- No need to set the wire of wired controller into the clasp.

For matching with different models, the patch cord and the connection wire are provided in the packaging box of wired controller. As shown in fig. A.

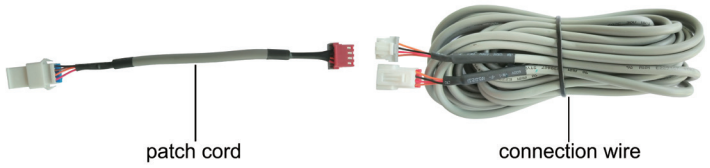


Fig. A: Schematic diagram of patch cord and connection wire

- If the air conditioner has been installed with the patch cord (fig. C) used for connecting the wired controller.

WIRED CONTROLLER

Installation Instructions

Only use the connection wire (fig. B) in the packing box of wired controller. Connect the terminal ② to the terminal ④ of patch cord which has been installed on the air conditioner; insert terminal ① to needle stand CN2 of wired controller. If there's protection terminal ③, pull out the protection terminal at first and then install it.

Fig. B: Schematic diagram of connection wire: Connect terminal ① with wired controller CN2; connect terminal ② with the terminal ④ of patch cord

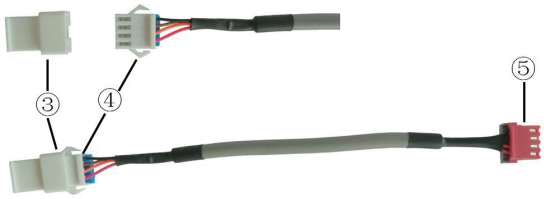


Fig. C: Schematic diagram of patch cord: Terminal ③ is the protection terminal; connect terminal ④ to the terminal ② of connection wire ; connect terminal ⑤ to the terminal of wired controller of air conditioner

- If the air conditioner hasn't been installed with the patch cord used for connecting the wired controller.

Use the connection wire and patch cord in the packing box of wired controller. Pull out the protection terminal of patch cord at first, connect the connection wire with the patch cord according to fig. D, and then insert the terminal ① of connection wire into the needle stand CN2 of wired controller and insert the terminal ⑤ of patch cord into the terminal of wired controller of air conditioner as well.

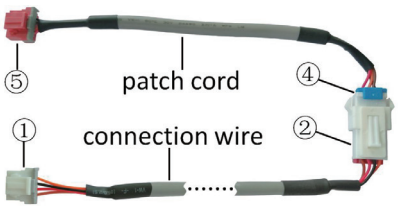


Fig. D: Schematic diagram after the connection wire and the patch cord have been connected: connect the terminal ② of connection wire and the terminal ④ of patch cord

WIRED CONTROLLER

Installation Instructions

4.4 Disassembly

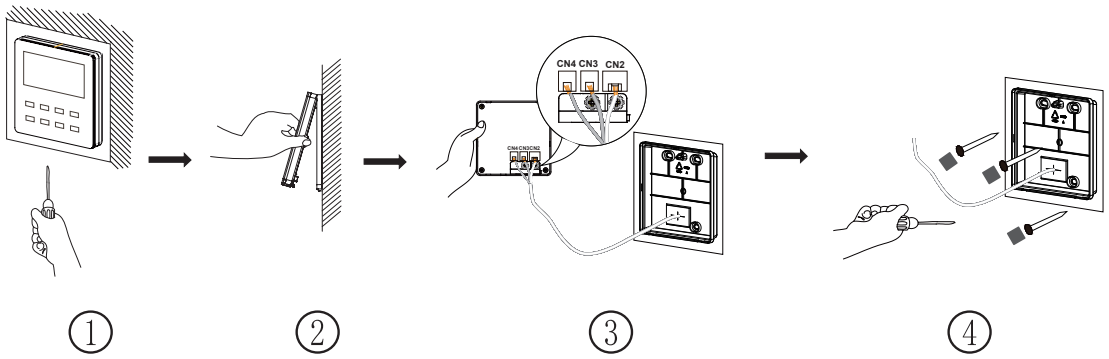


Fig. 24 Disassembly diagram for wired controller

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
1	High Pressure Protectioon Of System	E1	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1.Refrigerant was super-abundant; 2.Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3s and blink twice			OFF 1 s and blink 3 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1.Poor air-return in indoor unit; 2.Fan speed is abnormal; 3.Evaporator is dirty.
3	In Defect of refrigerant	F0					OFF 1 s and blink 9 times		The Dual-8 Code Display will show F0 and the complete unit stops.	1.In defect of refrigerant; 2.Indoor evaporator temperature sensor works abnormally; 3. The unit has been plugged up somewhere.
4	Gathering Refrigerant	F0	OFF 3s and blink once	OFF 3s and blink once		OFF 1s and blink 17 times			When the outdoor unit receive signal of Gathering refrigerant ,the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode
5	High Dis-charge tem-peraature protection of compressor	E4	OFF 3s and blink 4 times			OFF 1s and blink 7 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunc-tion analysis (discharge protection, overload).
6	Overcurrent protection	E5	OFF 3s and blink 6 times			OFF 1s and blink 5 times			During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	1. Supply voltage is unstable; 2. Supply voltage is too low andload is too high; 3. Evaporator is dirty.
7	Communica-tion malfunc-tion	E6	OFF 3s and blink 6 times			Always on			During cooling opera-tion, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the correspond-ing malfunction analysis.
8	High temperature resistant prtoection	E8	OFF 3s and blink 8 times			OFF 1s and blink 6 times			During cooling operation: compressor will stop while indoor fan will operate. Dur-ing heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
9	EEPROM malfunction	EE			OFF 3s and blink 15 times	OFF 1s and blink 11 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
10	Limit/ decrease frequency due to high temperature	EU		OFF 3s and blink 6 times	OFF 3s and blink 6 times				All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control the radiator is inserted tightly. If its no use, please replace control panel AP1.
11	Malfunction protection of jumper cap	C5	OFF 3s and blink 15 times						Wireless remote receiver and button are effective, but can not dispose the related command	1.No jumper cap insert on mainboard. 2.Incorrect insert of jumper cap. 3.Jumper cap damaged. 4.Abnormal detecting circuit of mainboard.
12	Indoor ambient temperature sensor is open/ short circuited	F2		OFF 3s and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1.Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2.Components in mainboard fell down leads short circuit. 3.Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) 4.Mainboard damaged.

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
13	indoor evaporator temperature sensor is open/ short circuted	F2		OFF 3s and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1.Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2.Components on the mainboard fall down leads short circuit 3.Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4.Mainboard damaged.
14	outdoor ambient temperature sensor is open/ short circuted	F3		OFF 3s and blink 3 times			OFF 1s and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt' been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	outdoor condenser temperature sensor is open/ short circuted	F4		OFF 3s and blink 4 times			OFF 1s and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor
16	outdoor discharge temperature sensor is open/ short circuted	F5		OFF 3s and blink for 5 times			OFF 1S and blink 7 times		During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1. Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor 2. The head of temperature sensor hasnt been inserted into the copper tube
17	limit/ decrease frequency due to overload	F6		OFF 3s and blink for 6 times			OFF 1s and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	decrease frequency due to over-current	F8		OFF 3s and blink 8 times			OFF 1s and blink once		All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
19	decrease frequency due to high air discharge	F9		OFF 3s and blink 9 times			OFF 1s and blink twice		All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; refrigerant is insuf-ficent Malfunction of electric expansion valve (EKV)
20	limit/ decrease frequency due to anti-freezing	FH		OFF 3s and blink 2 times	OFF 3s and blink 2 times		OFF 1s and blink 4 times		All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low
21	voltage for DC bus bar is too high high	PH		OFF 3s and blink 11 times		OFF 1s and blink 13 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1.Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
22	voltage of DC bus- bar is too low	PL			OFF 3s and blink 21 times	OFF 1s and blink 12 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1.Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, there is a malfunc-tion for the circuit, replace the control panel (AP1)
23	compres-sor min frequence in test state	P0		during blink-ing ON 0.25s and OFF 0.25s	during blinking ON 0.25s and OFF 0.25s					Showing during nominal cooling or nominal heating test

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
24	compressor rated frequence in test state	P1		during blinking ON 0.25s and OFF 0.25s	during blinking ON 0.25s and OFF 0.25s					Showing during middle cooling or middle heating test
25	compressor maximum frequence in test state	P2		during blinking ON and 0.25s and OFF and 0.25s	during blinking ON and 0.25s and OFF and 0.25s					Showing during max. cooling or max. heating test
26	compressor intermediate frequence in test state	P3		during blinking ON and 0.25s and OFF and 0.25s	during blinking ON and 0.25s and OFF and 0.25s					Showing during middle cooling or middle heating test
27	overcurrent protection of phase current for compressor	P5		OFF 3s and blink 15 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).
28	charging malfunction of capacitor	PU			OFF 3s and blink 17 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor
29	malfunction of module temperature sensor circuit	P7			OFF 3s and blink 18 times	s			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
30	module high temperature protection	P8			OFF 3s and blink 19 times				During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP is sufficient and whether the radiator is inserted tightly. If no faults found, replace control panel AP1
31	decrease frequency due to high temperature resistant during heating operation	H0			OFF 3s and blink 10 times				All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
32	static dedusting protection	H2			OFF 3s and blink twice					
33	overload protection for compressor	H3			OFF 3s and blink 3 times	OFF 1s and blink 8 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1.Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)
34	system is abnormal	H4		OFF 3s and blink 4 times	OFF 1s and blink 6 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (overload, high temperature resistant)
35	IPM protection	H5		OFF 3S and blink 5 times	OFF 1s and blink 4 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
36	module temperate is too high	H5		OFF 3s and blink 5 times	OFF 1s and blink 10 times					

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
37	internal motor (fan motor) does not operate	H6	OFF 3s and blink 11 times						Internal fan motor, external fan motor, compressor and electric heater stop operation,guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3.Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
38	desynchro-nizing of compressor	H7			OFF 3s and blink 7 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protec-tion, loss of synchronism protection and overcurrent protection of phase current for compressor.
39	PFC protec-tion	HC			OFF 3s and blink 6 times	OFF 1s and blink 14 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Replace Outdoor unit PCB
40	outdoor DC fan motor malfunction	L3	OFF 3s and blink 23 times				OFF 1s and blink 14 times		Outdoor DC fan motor mal-function lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
41	power protection	L9	OFF 3s and blink 20 times			OFF 1s and blink 9 times			compressor operation stops and Outdoor fan motor will stop 30s later , 3 minutes later fan motor and com-pressor will restart	To protect the electronical components when detect high power
42	indoor unit and outdoor unit don't match	LP	OFF 3s and blink 19 times			OFF 1s and blink 16 times			compressor and Outdoor fan motor don't work	Indoor unit and outdoor unit don't match
43	failure start up	LC			OFF 3s and blink 11 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
44	malfunction of phase cur-rent detec-tion circuit for compressor	U1			OFF 3s and blink 13 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
45	malfunction of voltage dropping for DC bus bar	U3			OFF 3s and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
46	malfunction of complete units current detention	U5		OFF 3s and blink 13 times					During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	There's a circuit malfunction on outdoor units control panel AP1, replace the outdoor units control panel AP1.
47	the four-way valve is abnormal	U7		OFF 3s and blink 20 times					If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
48	zero crossing malfunction of outdoor unit	U9	OFF 3s and blink 18 times						During cooling operation, compressor will stop while indoor fan will operate; during heating,the complete unit will stop operation.	Replace outdoor control panel AP1
49	frequency limiting (power)						OFF 1 and blink 13 times			
50	compressor running					OFF 1s and blink 13 times				
51	the temperature for turning on the unit is reached						OFF 1s and blink 8 times			
52	frequency limiting (module temperature)						OFF 1s and blink 11 times			
53	normal communication							OFF 0.5s and blink once		

TROUBLESHOOTING

Diagnostic Codes

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (During blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Power Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
54	defrosting	H1		OFF 3s and blink once (during blinking, ON 10S AND OFF 0.5S	OFF 1s and blink twice				Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state
55	malfunc-tion of zero-cross detection circuit	U8							The Complete Unit Stops	1. Power supply is abnormal 2. Detection circuit of in-door control mainboard is abnormal.
56	Malfunc-tion of detect-ing plate (WIFI)	JF								

TROUBLESHOOTING

Malfunction of Temperature Sensor F1, F2

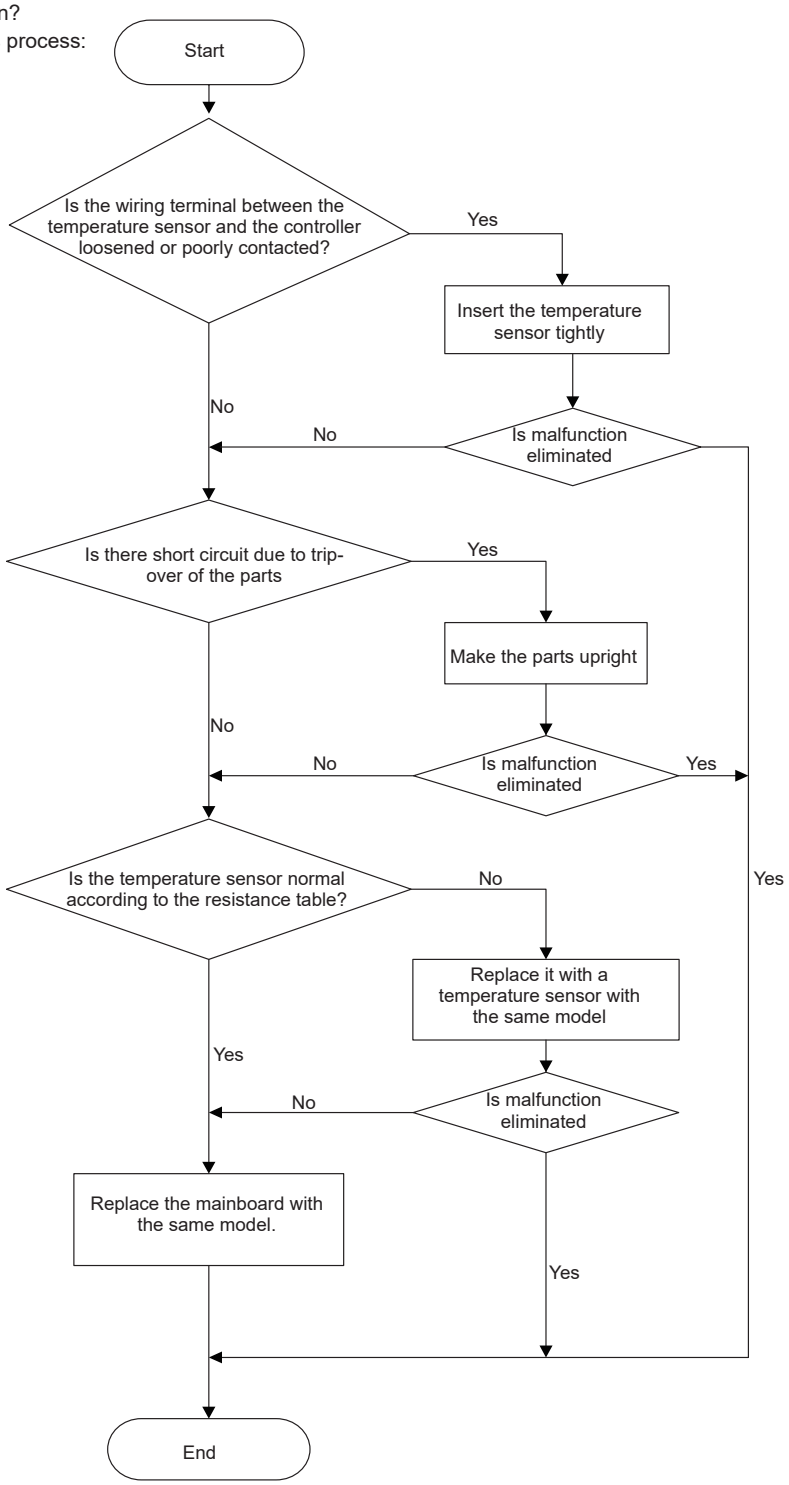
Indoor unit

(1) Malfunction of Temperature Sensor F1, F2

Main detection points:

- Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?
- Is there short circuit due to trip-over of the parts?
- Is the temperature sensor broken?
- Is mainboard broken?

Malfunction diagnosis process:



TROUBLESHOOTING

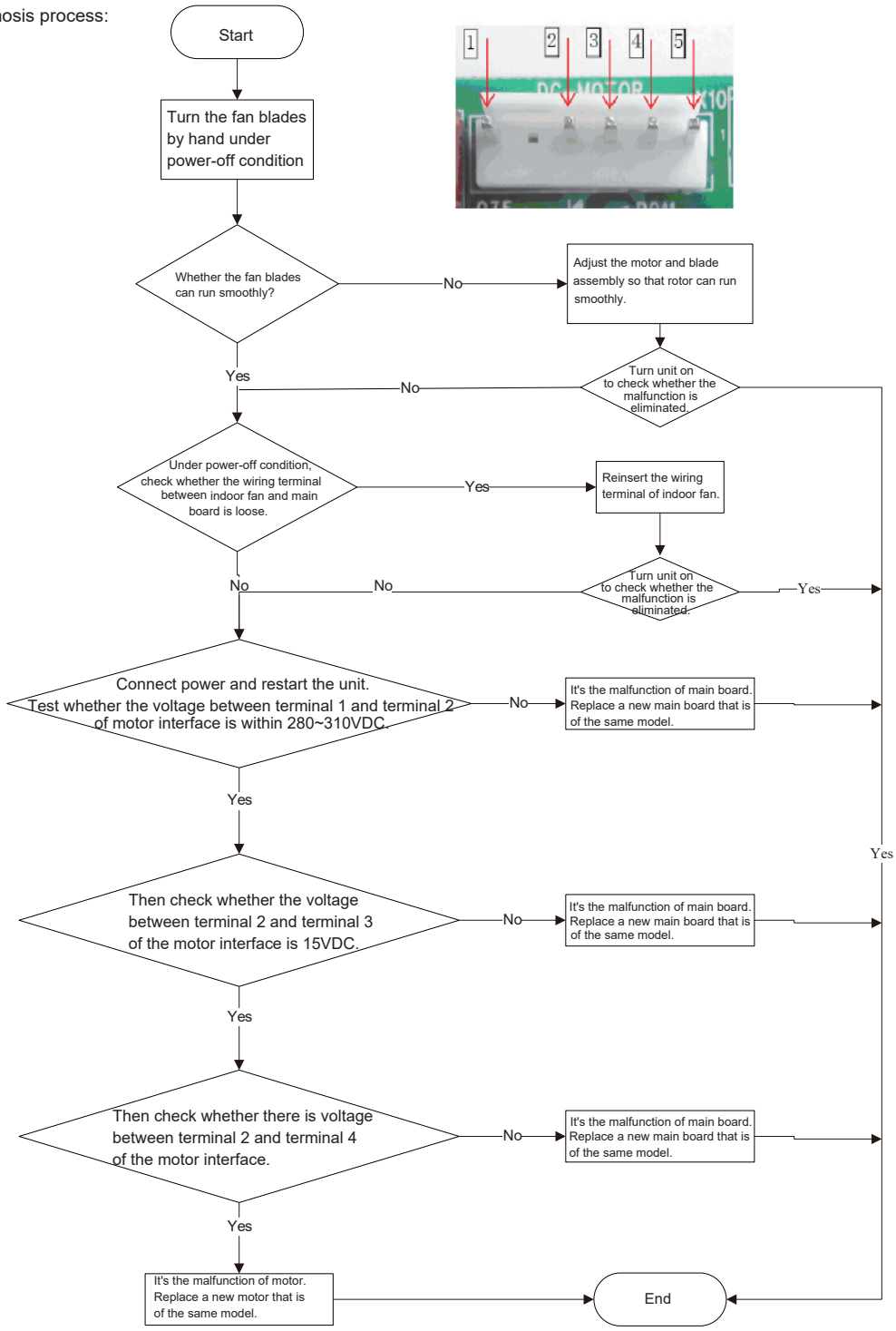
9-12k Malfunction of blocked Protection of IDU Fan Motor H6

2. Malfunction of Blocked Protection of IDU Fan Motor H6

Main detection points:

- SmoothlyIs the control terminal of PG motor connected tightly?
- SmoothlyIs the feedback interface of PG motor connected tightly?
- The fan motor cant operate?
- The motor is broken?
- Detectioncircuit of the mainboard is defined abnormal?

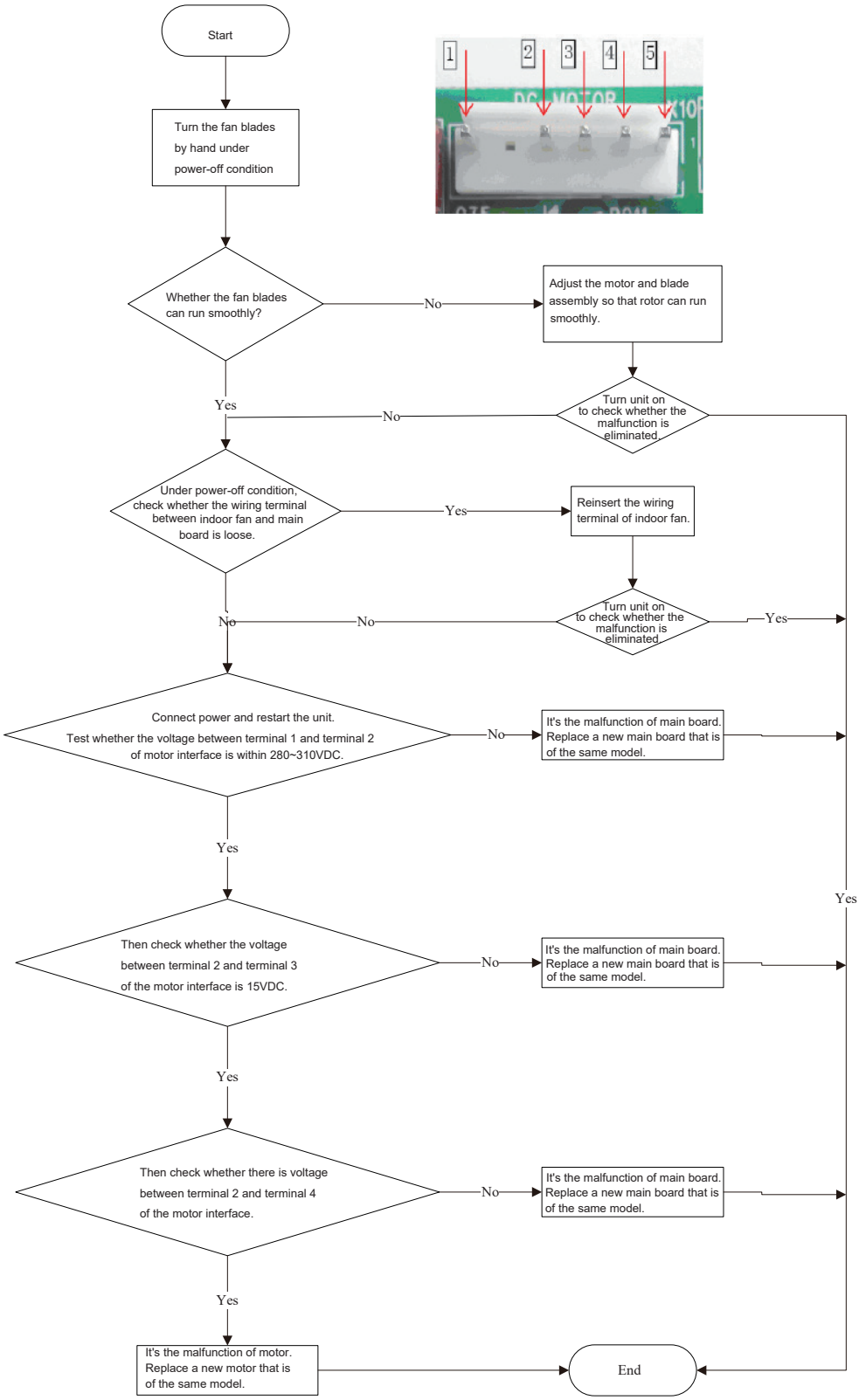
Malfunction diagnosis process:



TROUBLESHOOTING

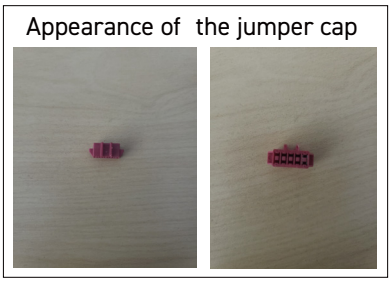
18-36k Malfunction of blocked Protection of IDU Fan Motor H6

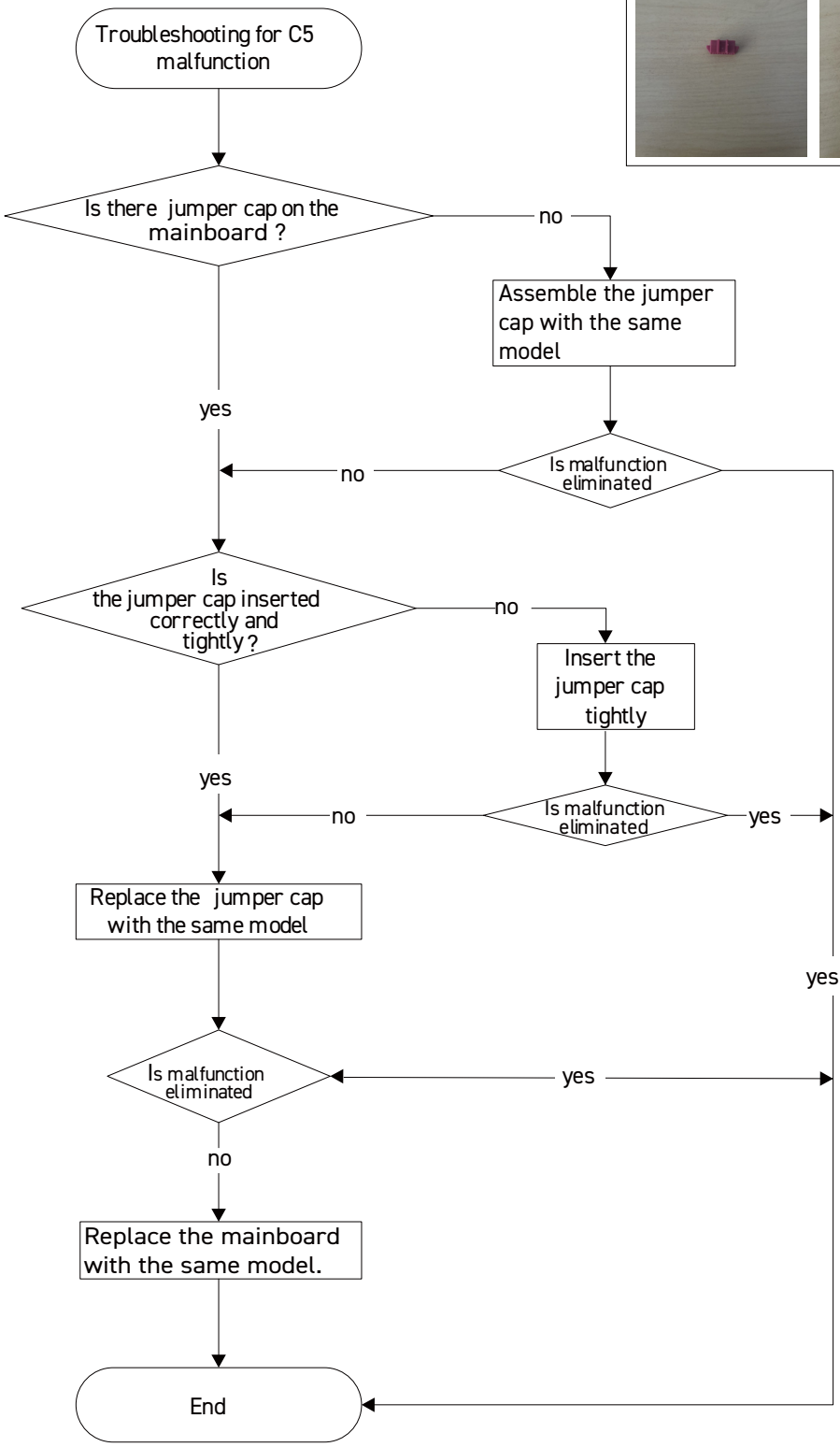
2.Malfunction of Blocked Protection of IDU Fan Motor H6



TROUBLESHOOTING

Malfunction of Protection of Jumper Cap C5





TROUBLESHOOTING

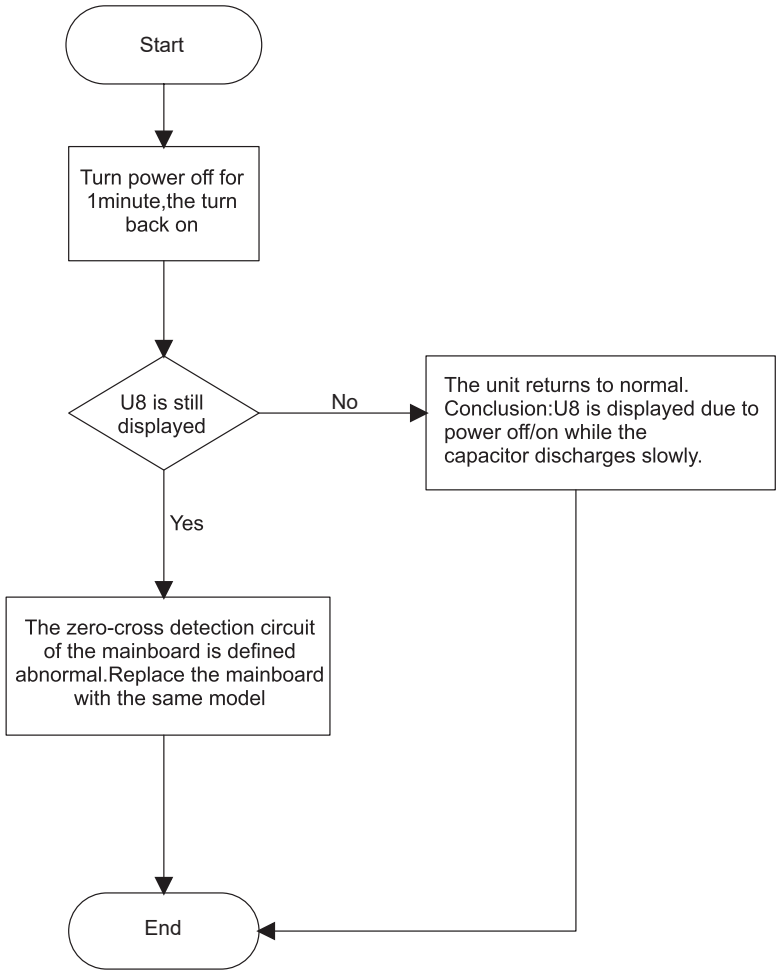
Malfunction of IDU Fan Motor U8

Main detection points:

● Instant energization afte de-energization while the capacitordischarges slowly?

● The zero-cross detectioncircuit of the mainboard is defined abnormal?

Malfunction diagnosis process:



TROUBLESHOOTING

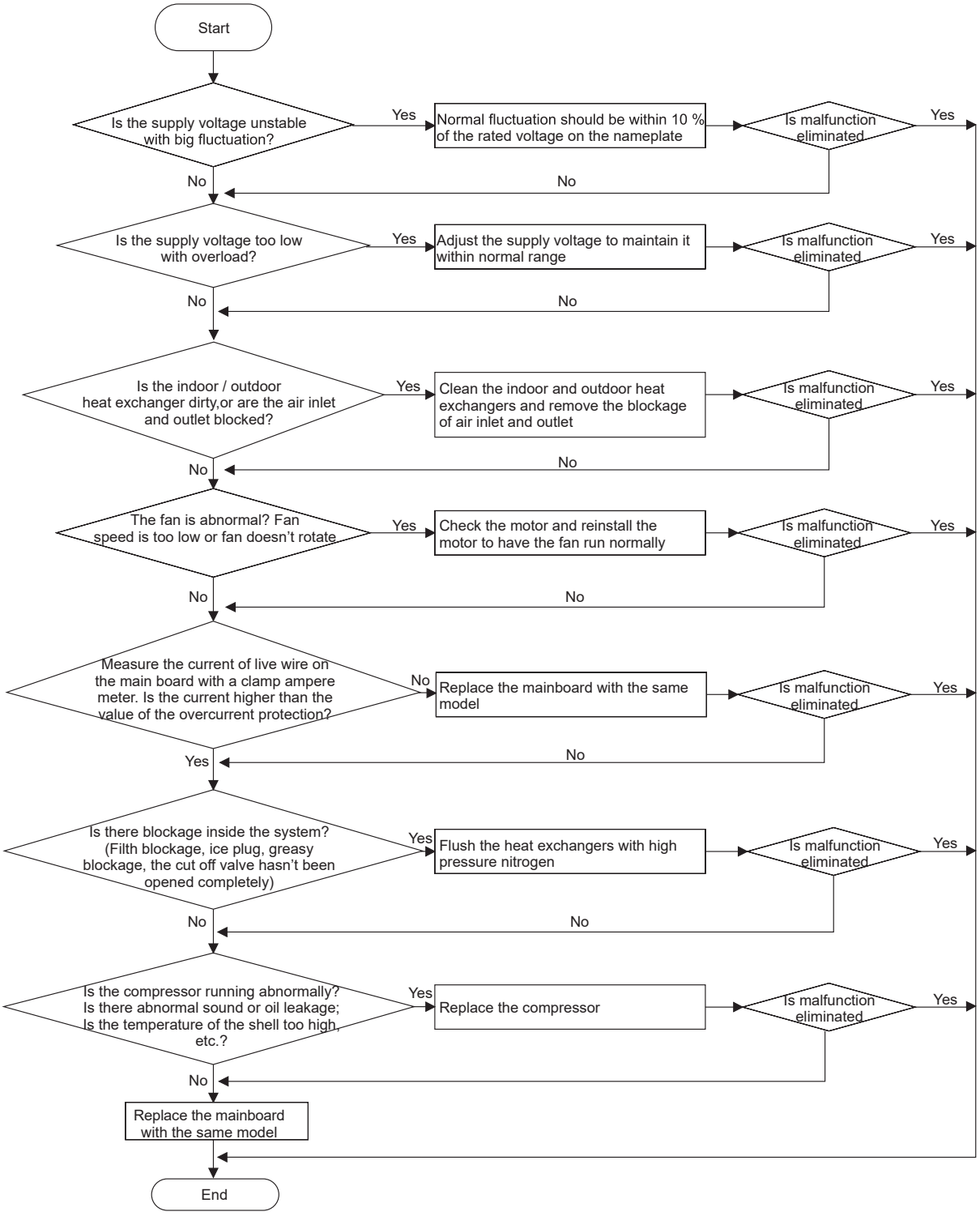
Overcurrent Protection E5

Malfunction of Overcurrent Protection E5

Main detection points:

- Is the supply voltage unstable with big fluctuation?
- Is the supply voltage too low with overload?
- Hardware trouble?

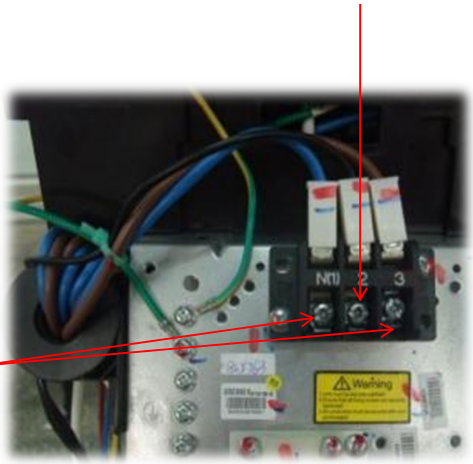
Malfunction diagnosis process:



TROUBLESHOOTING

Malfunction of Communication E6

Communication check can be done the same way as on the J Series. Please note that the communication wire is number 2, NOT number 3. Wires 1 and 3 are your power wires.

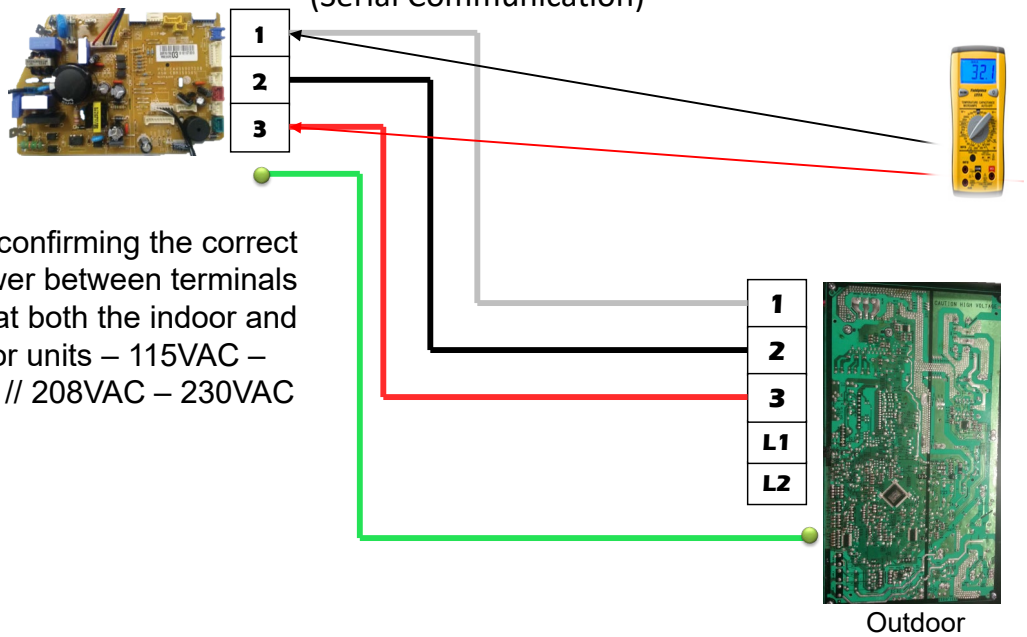


AC power

2 to ground should be 56 VDC

Wire to ground should be same as indoor board to ground.

The indoor and the outdoor unit communicate back and forth via the number 2 wire. (Serial Communication)

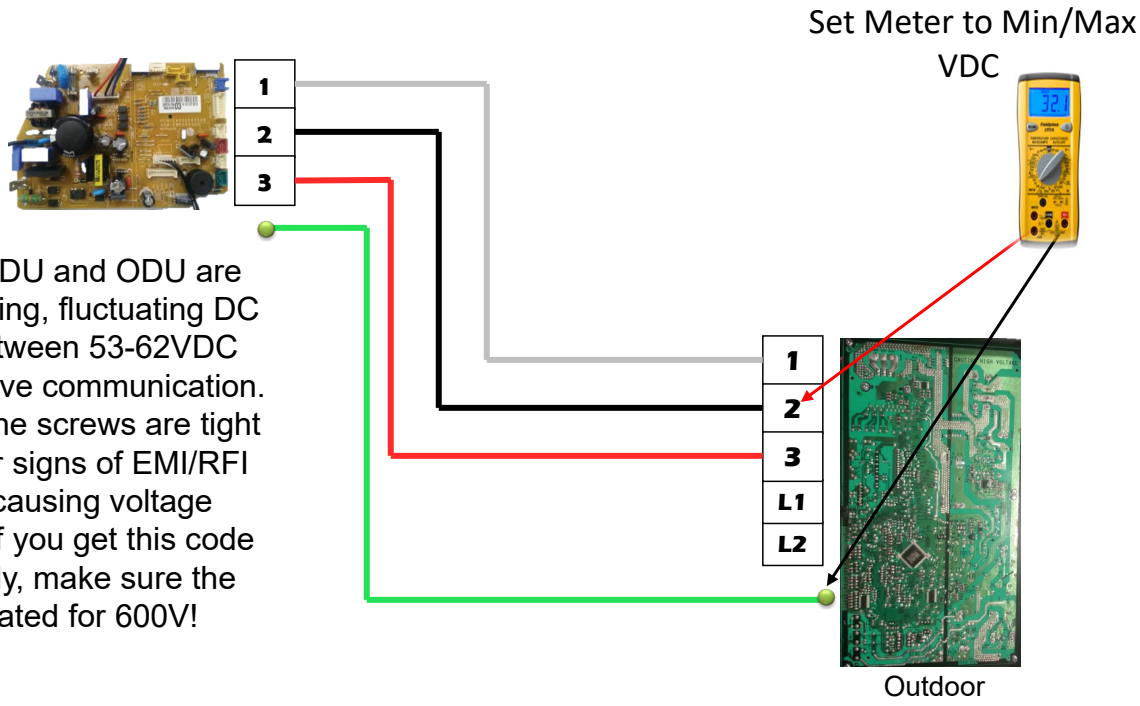


Start by confirming the correct VAC power between terminals 1 and 3 at both the indoor and outdoor units – 115VAC – 120VAC // 208VAC – 230VAC

TROUBLESHOOTING

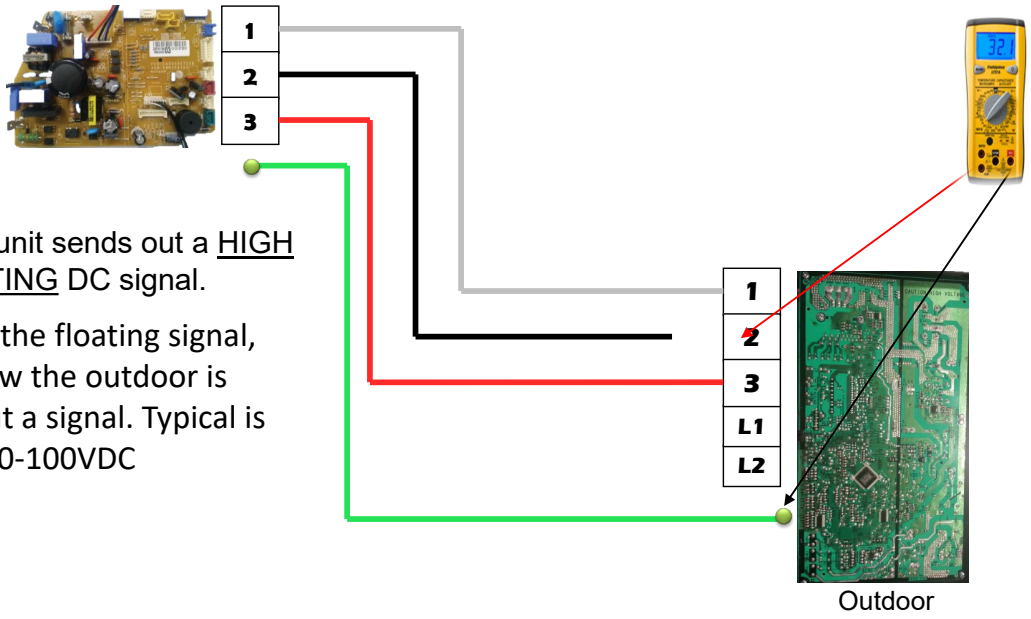
Malfunction of Communication E6

Check from 2 to G on the outdoor unit or indoor unit



When the IDU and ODU are communicating, fluctuating DC voltage between 53-62VDC confirms active communication. Make sure the screws are tight and look for signs of EMI/RFI that are causing voltage variations. If you get this code sporadically, make sure the wire is rated for 600V!

Disconnect the number 2 field wire at the outdoor unit. This can be done with the power on or off. Set meter do DC volts and measure from the terminal block number 2 to ground.



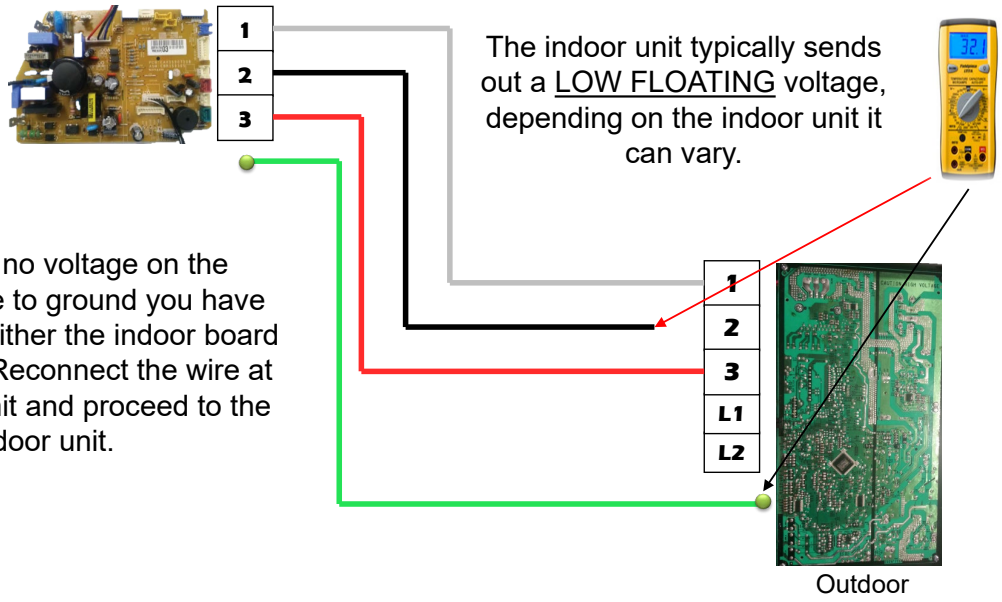
The outdoor unit sends out a HIGH FLOATING DC signal.

If you see the floating signal, you know the outdoor is sending out a signal. Typical is 50-100VDC

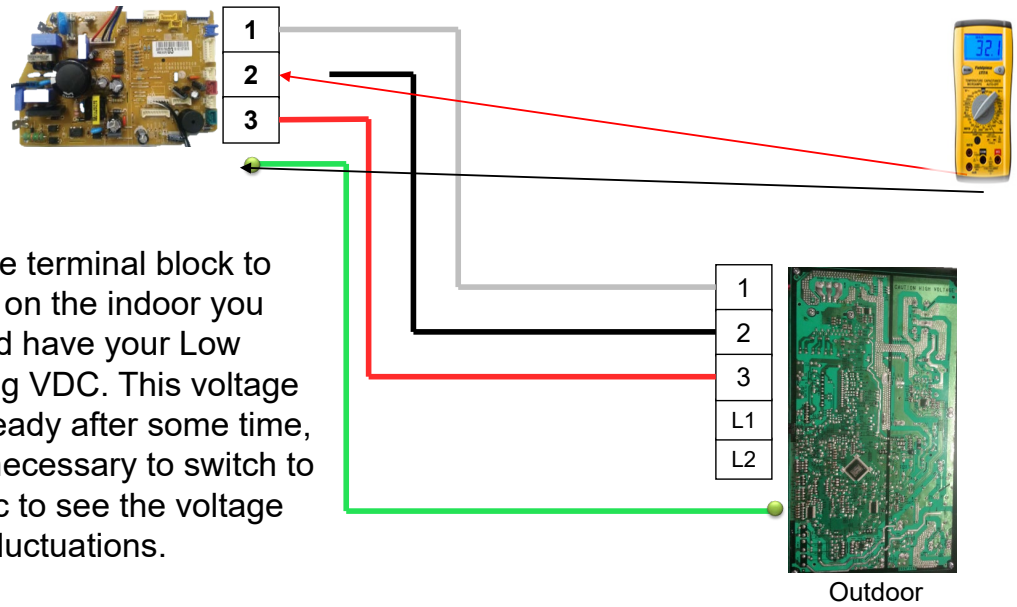
TROUBLESHOOTING

Malfunction of Communication E6

Check from the number 2 wire that you disconnected to ground next. This will allow you to check the signal coming from the indoor unit and the field wiring that you pulled to make sure you are getting communication from the indoor unit and across the wire.



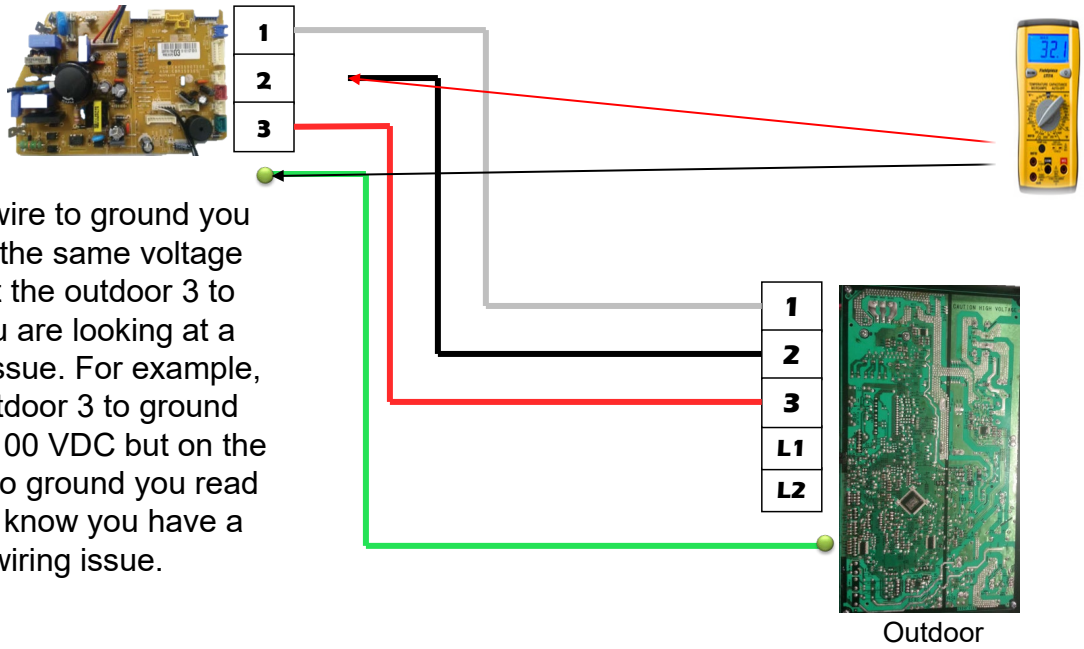
At the indoor unit, disconnect the number 2 field wire and check from the terminal block to ground



TROUBLESHOOTING

Malfunction of Communication E6

Next check from the wire to ground, the wire that connects to the outdoor unit.

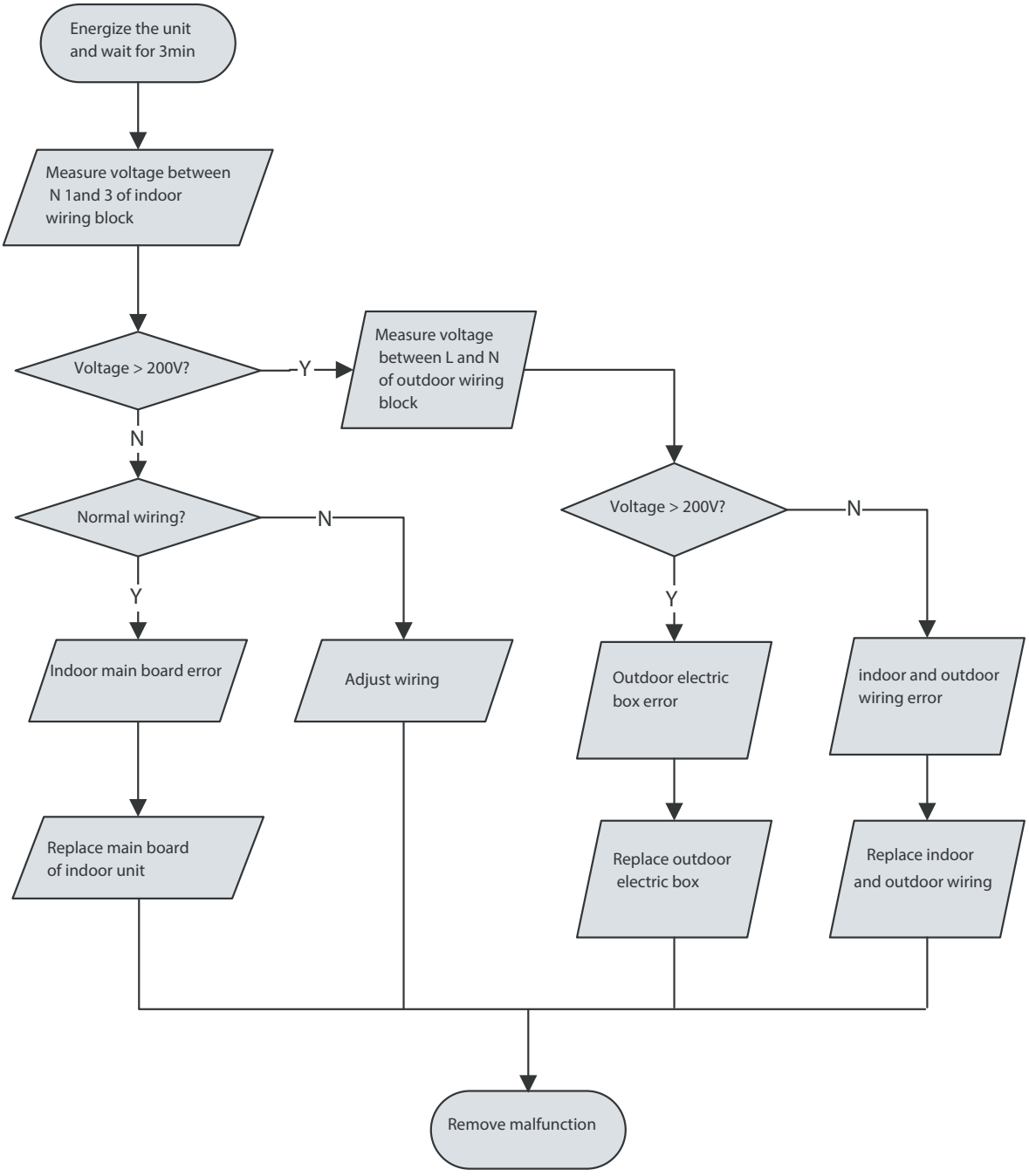


If from the wire to ground you do not see the same voltage you saw at the outdoor 3 to ground you are looking at a field wiring issue. For example, if at the outdoor 3 to ground you had 50-100 VDC but on the indoor wire to ground you read 2 VDC you know you have a field wiring issue.

TROUBLESHOOTING

Malfunction of Power Supply from Indoor to Outdoor Unit

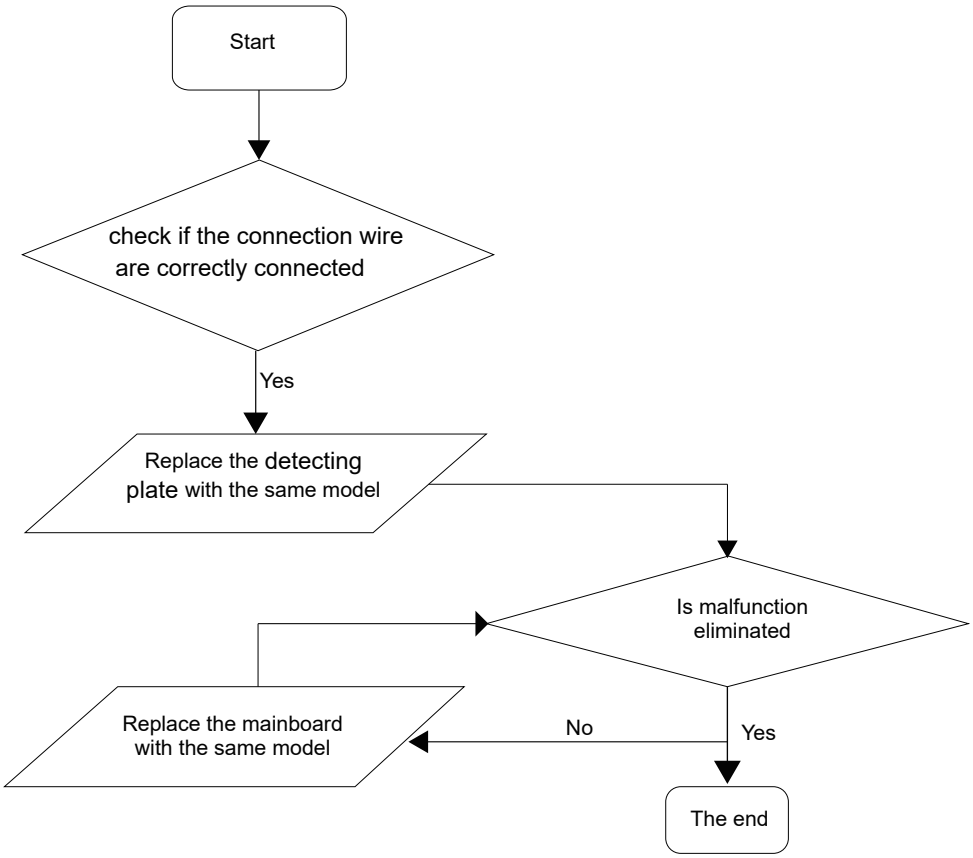
Inspect the power supply plug seat wit hAC voltage guage to check if voltage between L and N is within 200VAC-240 VAC.
Check with AC voltage gauge if the voltage between N1 and 3 of indoor wiring block is within 200 VAC-240AC



TROUBLESHOOTING

Malfunction of Detecting Plate (WIFI) JF

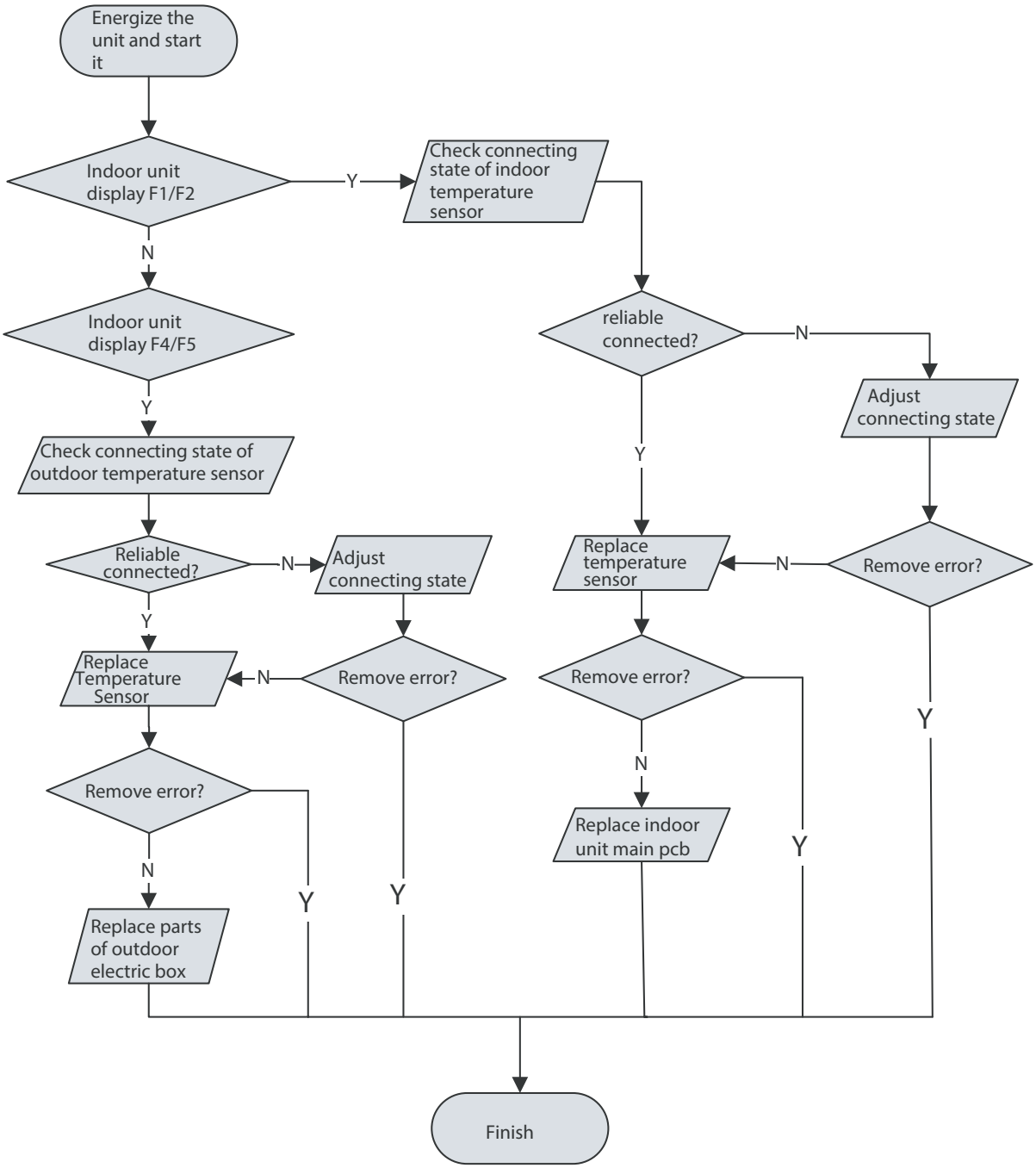
Malfunction of detecting plate(WIFI) JF



TROUBLESHOOTING

Temperature sensor malfunction

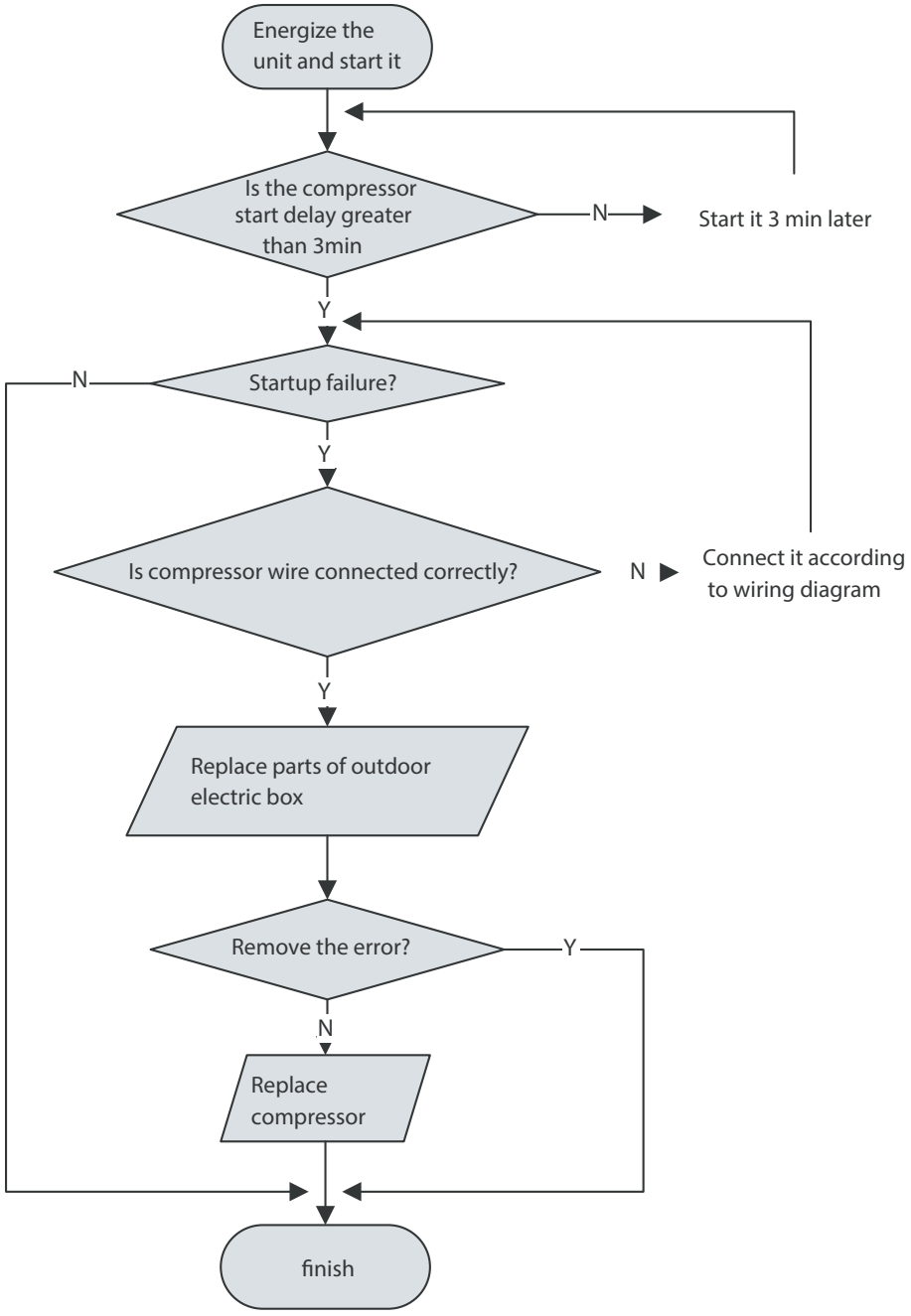
Is outdoor ambient temperature within the normal range?
Is indoor and outdoor fan running normally?
Is the radiating environment inside and outside the unit good enough?



TROUBLESHOOTING

Malfunction diagnosis of startup failure

Is wiring of compressor correct.
Is the stop time of compressor enough?
Is compressor damaged?



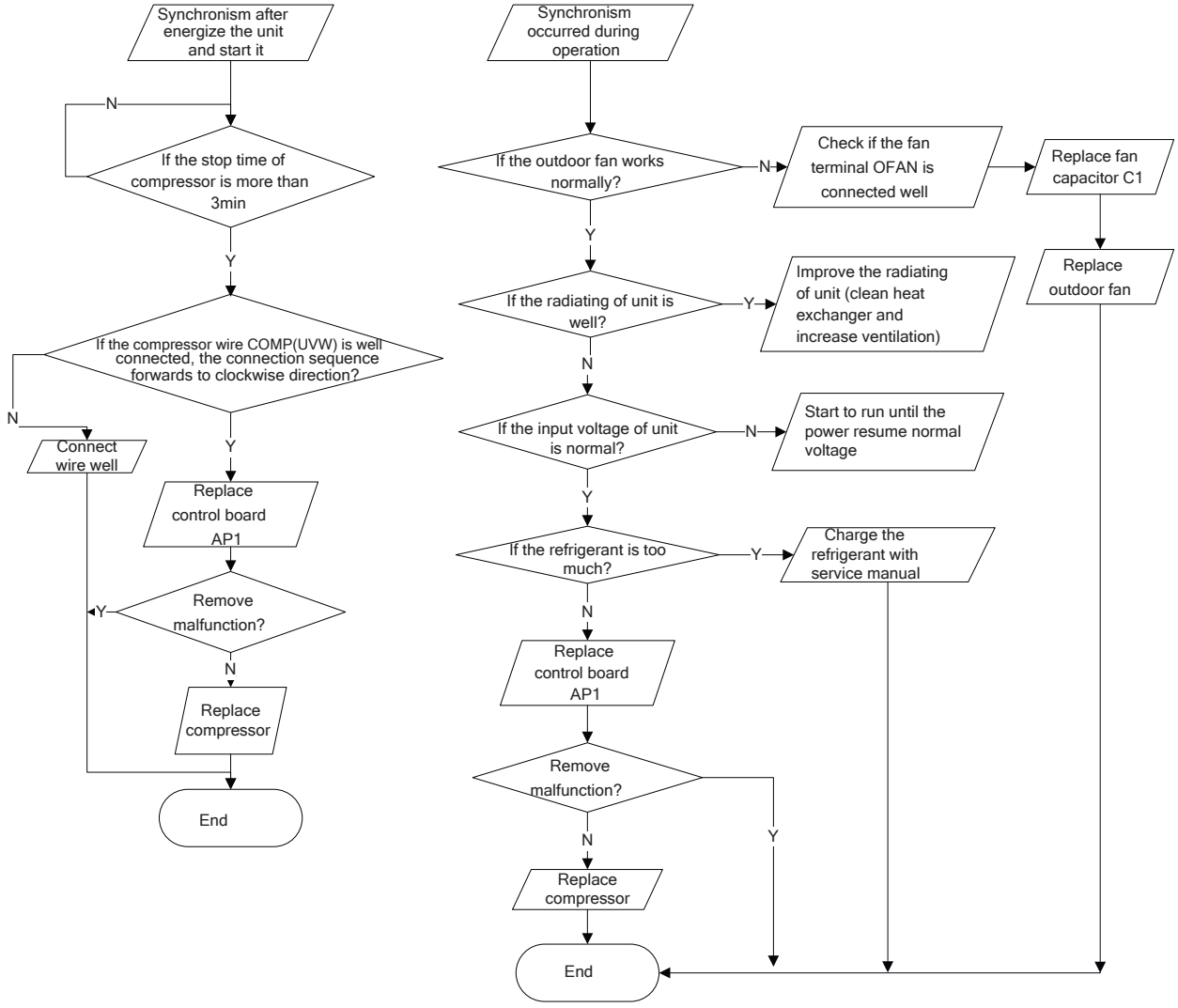
TROUBLESHOOTING

Diagnosis of losing synchronism for compressor

(AP1 below is control board of outdoor unit)

- If the system pressure is over-high?
- If the work voltage is over-low?

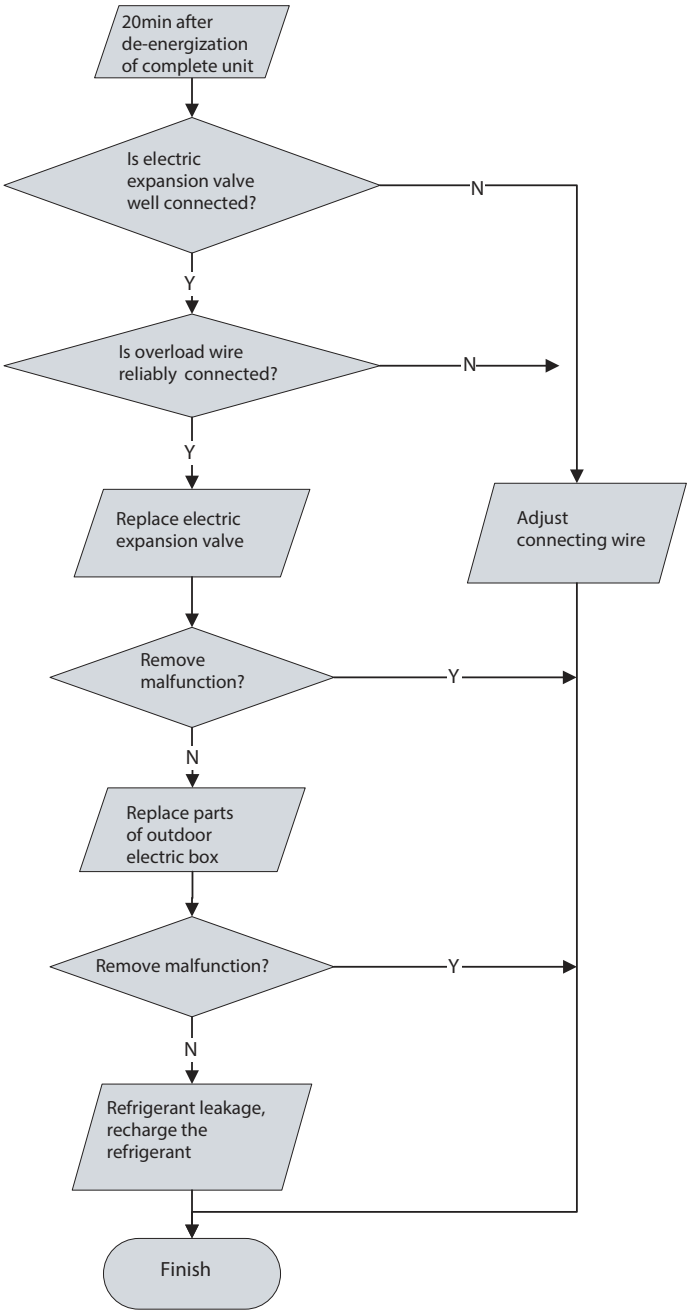
Malfunction diagnosis process:



TROUBLESHOOTING

9-12k, 36k Diagnosis of overload and discharge malfunction

Is electric expansion valve well connected? Is it damaged?
Is refrigerant leaked?
Is overload wire connection normal?
Are resistances between the first four pins close to the terminal hole and the 5th pin almost the same.? They should be less than 100 ohm.



TROUBLESHOOTING

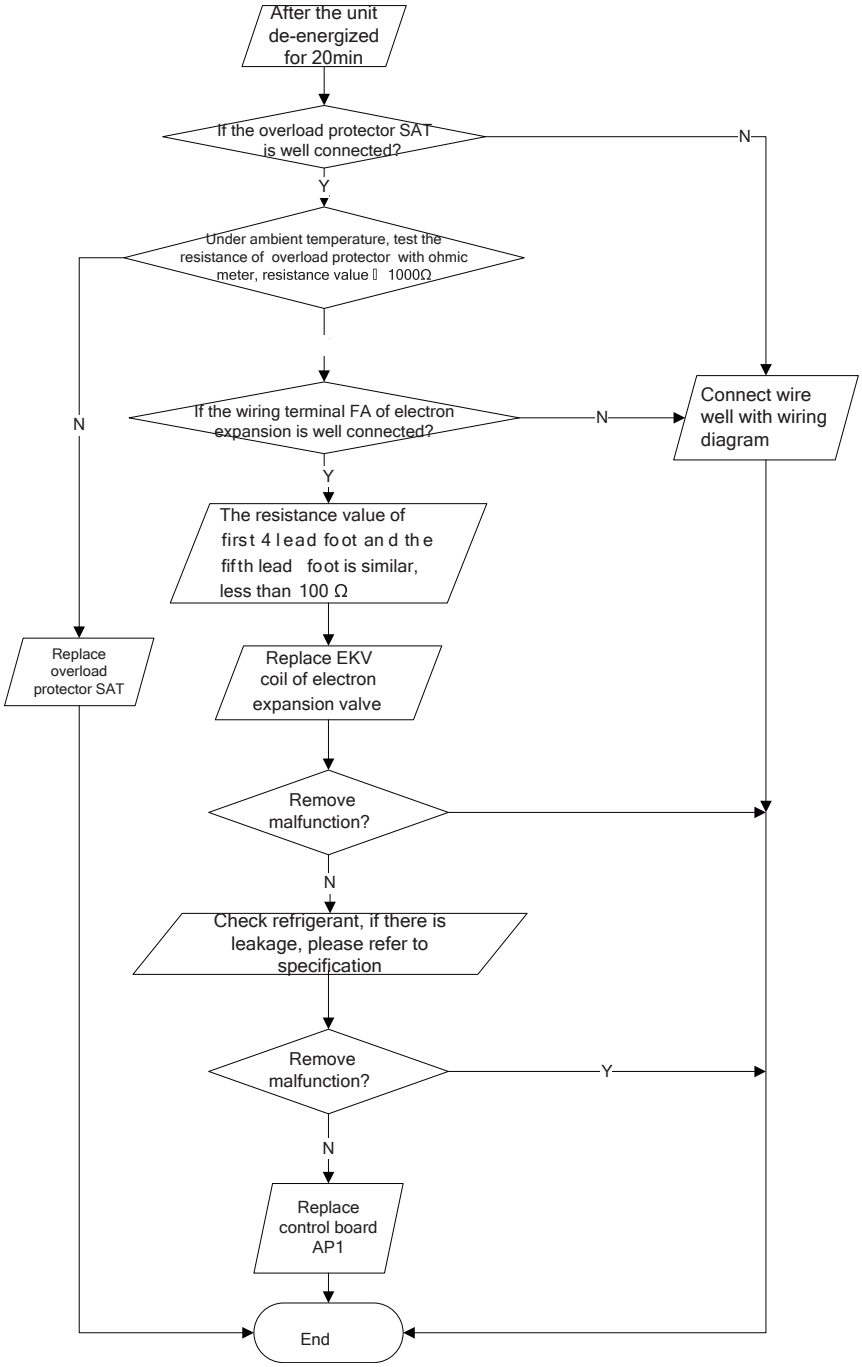
18-24k Diagnosis of overload and discharge malfunction

Diagnosis for overload and discharge malfunction (AP1 below is control board of outdoor unit)

Main detection point:

- If the electron expansion valve is connected well? Is the expansion valve damaged?
- If the refrigerant is leakage?
- If the overload protector is damaged?

Malfunction diagnosis process:



TROUBLESHOOTING

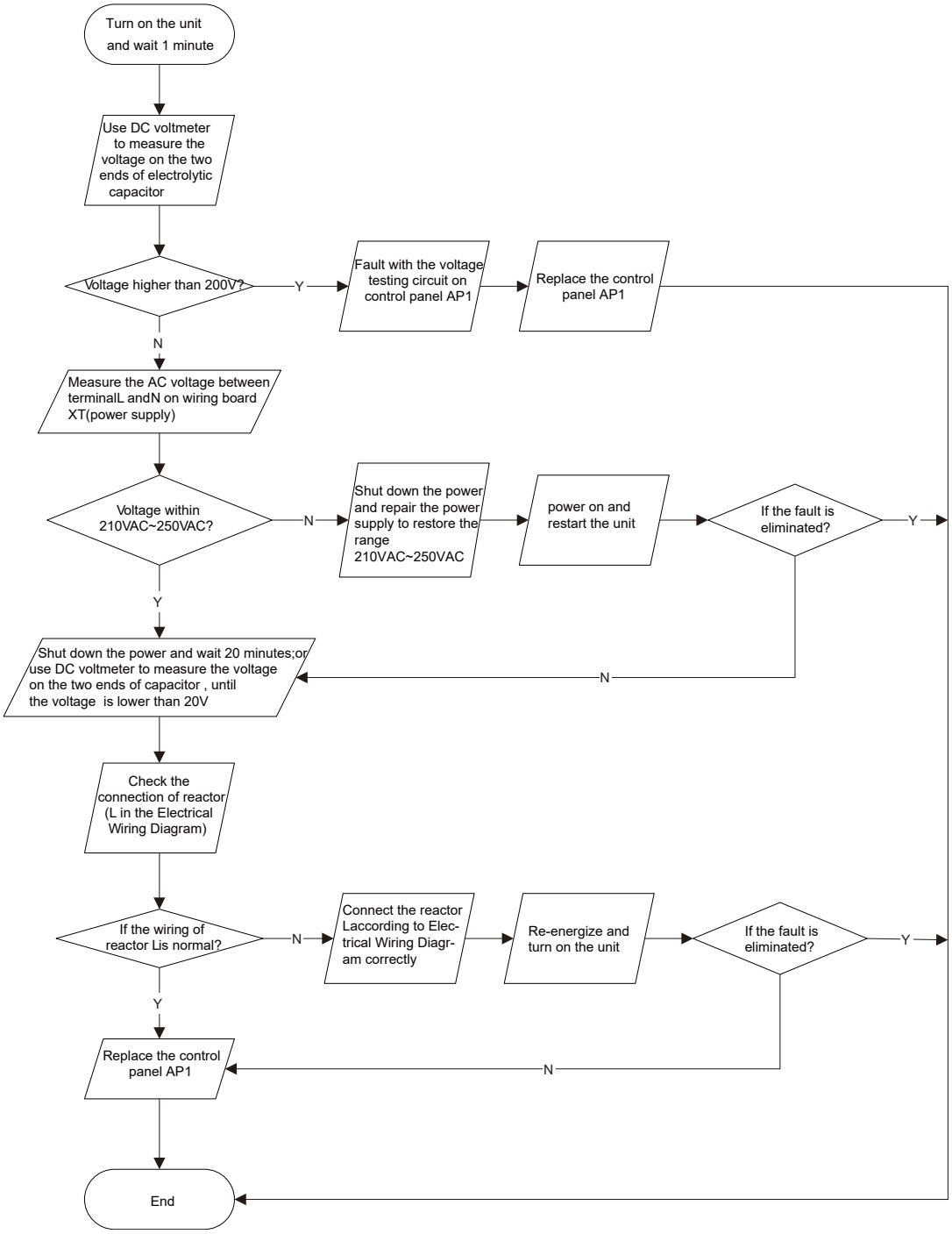
Capacity Charging malfunction - Outdoor unit

1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:

Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC~240VAC.

If the reactor (L) is correctly connected? If the connection is loose or fallen? If the reactor (L) is damaged?



TROUBLESHOOTING

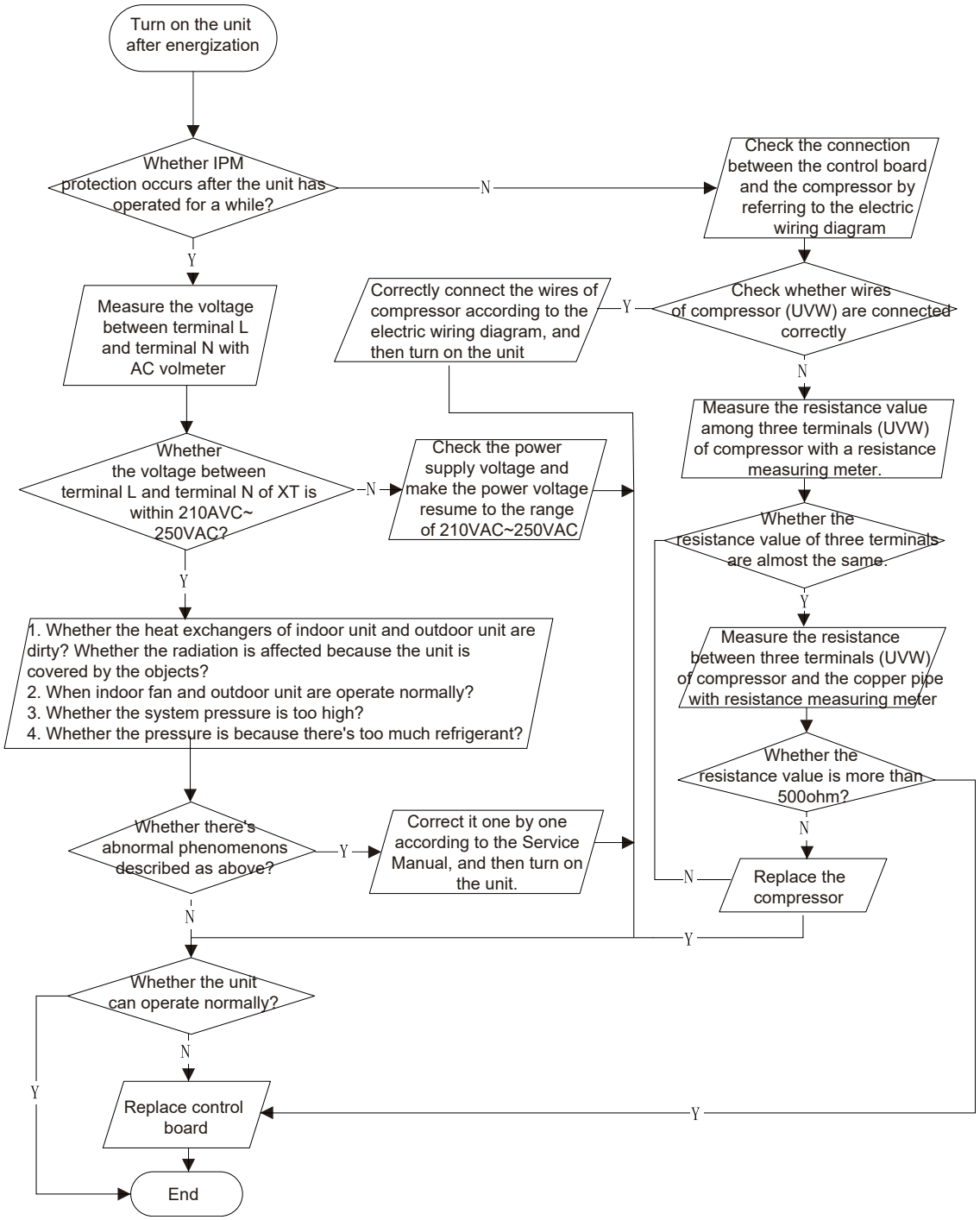
9-24k PM protection, phase current overcurrent

(the control board as below indicates the control board of outdoor unit) H5/P5

Mainly detect:

(1) Compressor COMP terminal (2) voltage of power supply (3) compressor
(4) Refrigerant-charging volume (5) air outlet and air inlet of outdoor/indoor unit

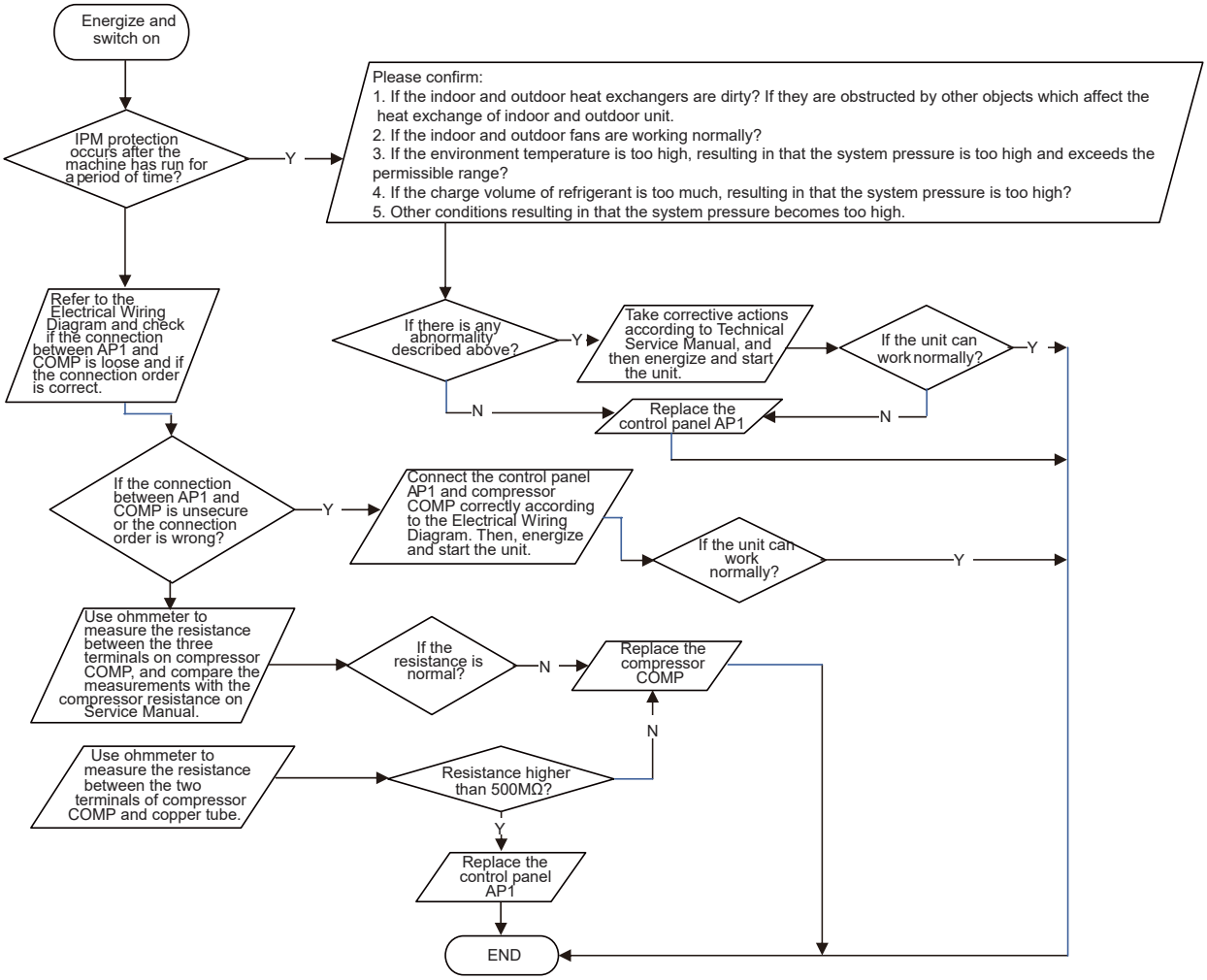
Troubleshooting:



TROUBLESHOOTING

36k IPM Protection, Out-of-Step Fault, Compressor Phase Overcurrent

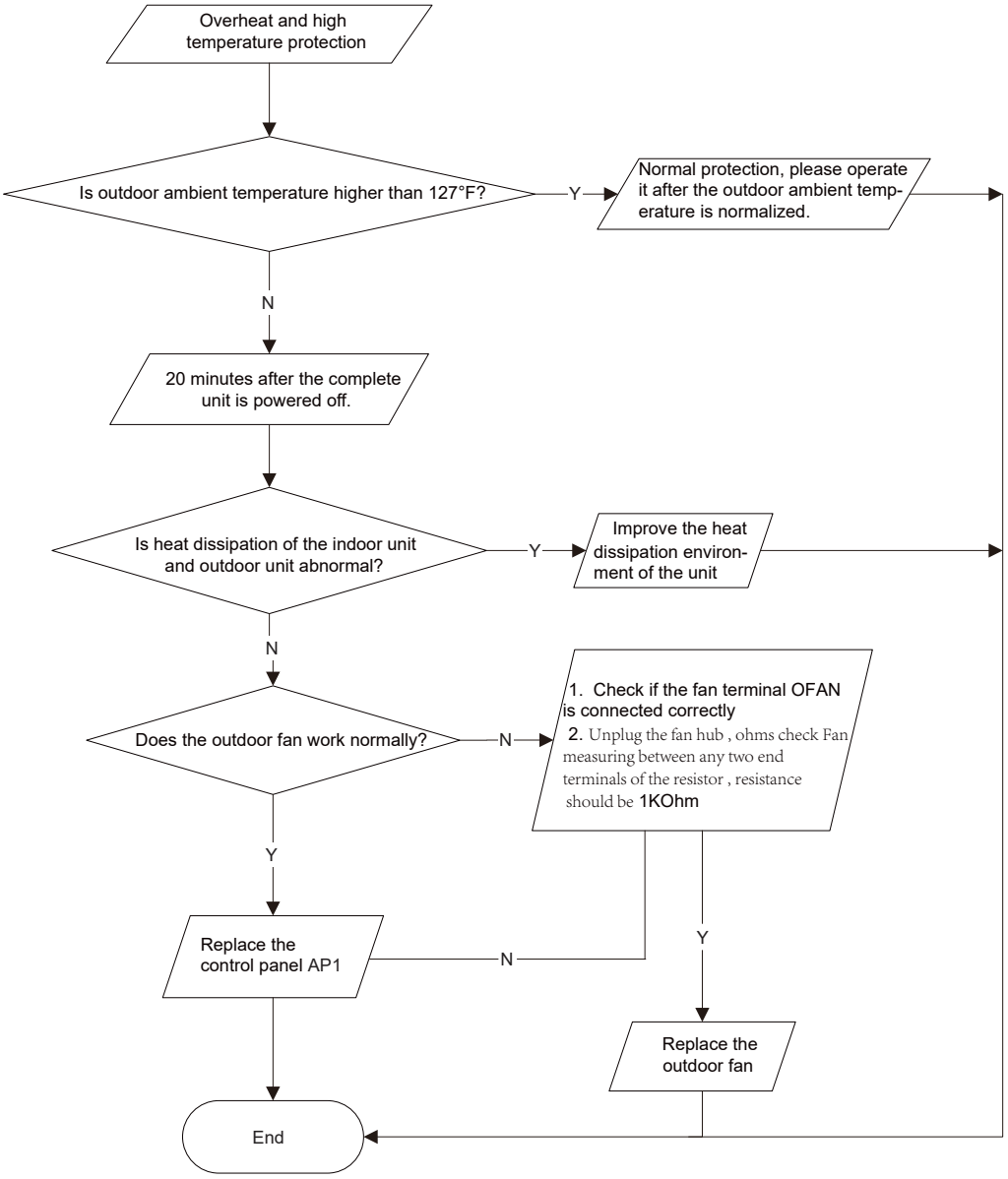
Is the connection between control panel AP1 and compressor secure? Is it loose? Is the connection is in correct order?
Is the voltage input of the machine is within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
Is the compressor coil resistance is normal?
Is the insulation of compressor windings against the copper tube is in good condition?
Is the working load of the machine are too high? If the radiation is good?
Is the charge volume of refrigerant is correct?
(AP1 below refers to the outdoor control panel)



TROUBLESHOOTING

High temperature and Overload Protection Diagnosis

Is outdoor ambient temperature in normal range?
Are the outdoor and indoor fans operating normally?
Is the heat dissipation environment inside and outside the unit is good?
(AP1 below refers to the outdoor control panel)



TROUBLESHOOTING

Communication malfunction: (following AP1 for outdoor unit control board)

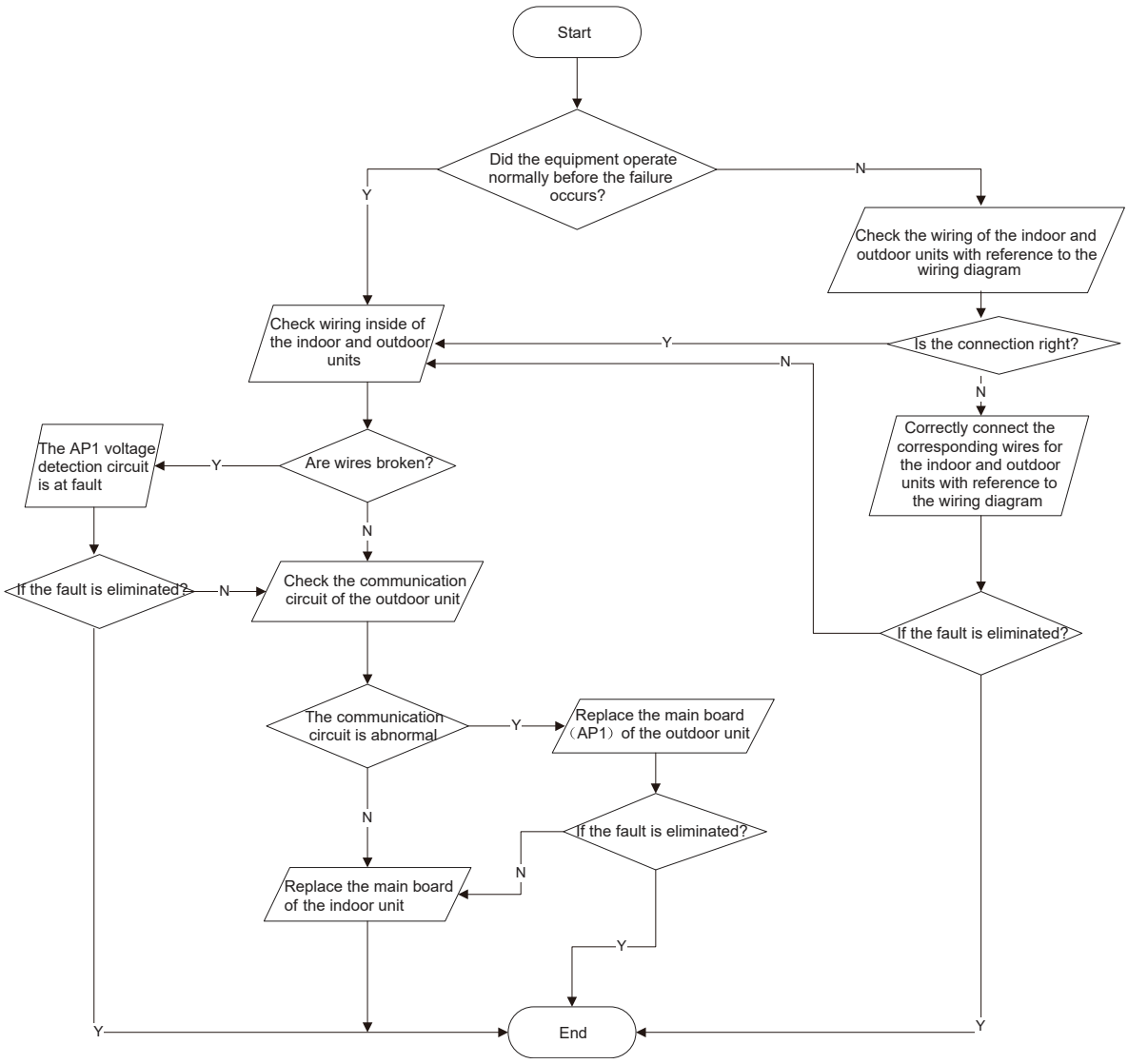
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

● Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

● Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

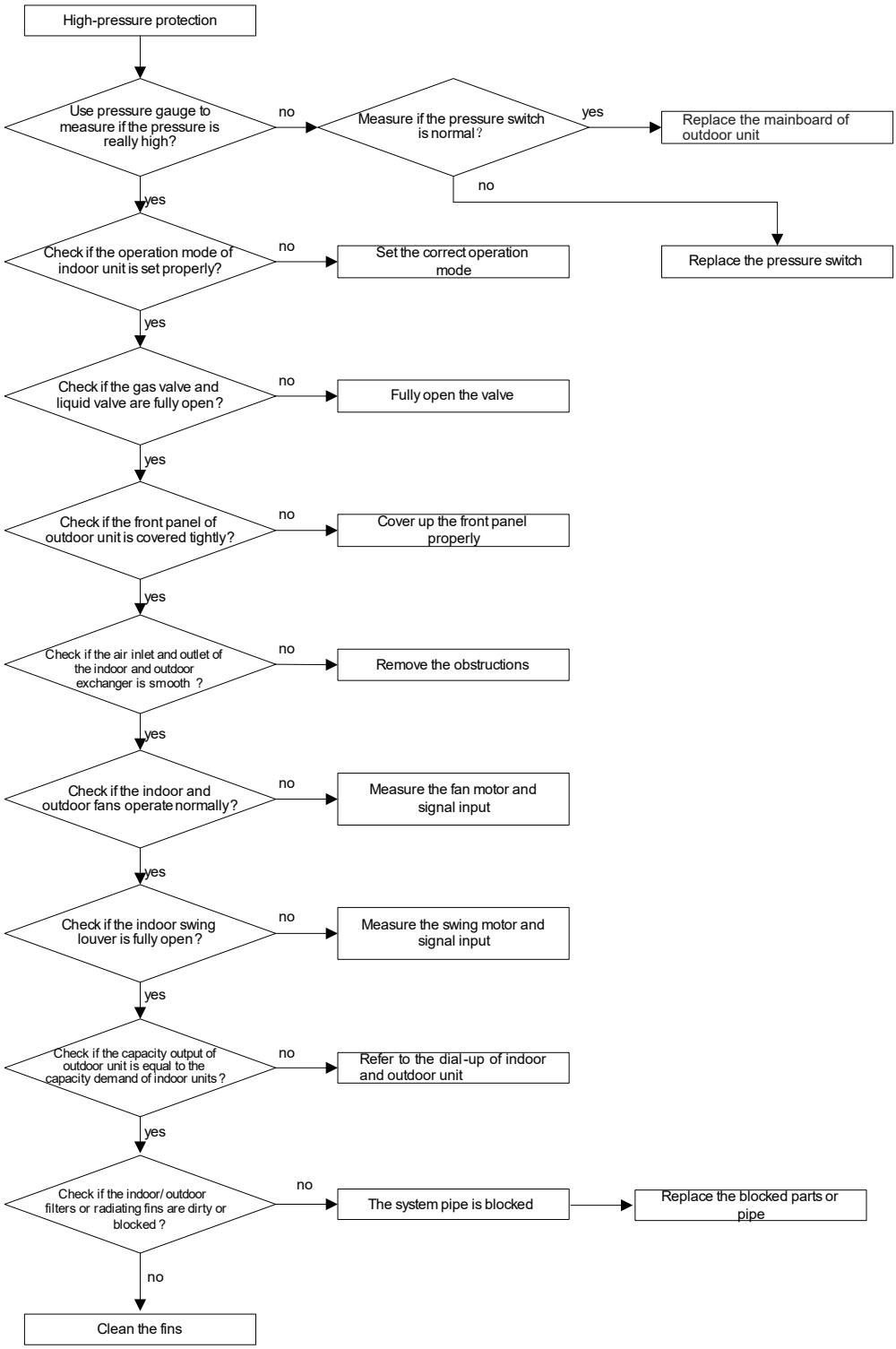
Fault diagnosis process:



TROUBLESHOOTING

High-pressure Protection

High-pressure Protection



TROUBLESHOOTING

Troubleshooting for Malfunction without Active Error Code

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Air Conditioner will not start up		
No power supply, or loose wiring connections	After energization, operation indicator isn't bright and the buzzer can't give out sound	Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the wiring is connected well.
"Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals"	Under normal power supply circumstances, operation indicator isn't bright after energization	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly
Electric leakage for air conditioner	After energization, room circuit breaker trips off at once	"Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord."
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch
Malfunction of remote controller	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller
Poor Cooling (Heating) for Air Conditioner		
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature
Rotation speed of the IDU fan motor is set too low	Minimal air flow	Set the fan speed at high or medium
Filter of indoor unit is blocked	Check the filter to see it's blocked	Clean the filter
Installation position for indoor unit and outdoor unit is improper	Check whether the installation postion is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproof and sunproof for outdoor unit
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range	Find the source of the leak and repair. Pull a vacuum on the system and weigh in appropriate charge.
Malfunction of 4-way valve	Blow cold air during heating	Check operation of the the 4-way valve
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged air temperature; Discharged air temperature during heating is lower than normal discharged air temperature; Unit's pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely

TROUBLESHOOTING

Troubleshooting for Malfunction without Active Error Code

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance method for details
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance method for details
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance method for details
Horizontal Louver Will Not Swing		
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model
ODU Fan Motor Does not Operate		
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	"Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly"
Capacity of the ODU fan motor is damaged	"Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor."	Replace the capacity of fan
"Power voltage is a little low or high"	"Use universal meter to measure the power supply voltage. The voltage is a little high or low"	Suggest to equip with voltage regulator
Motor of outdoor unit is damaged	"When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat."	Change compressor oil and refrigerant. If no better, replace the compressor with a new one
Compressor Can't operate		
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	"Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly"
Capacity of compressor is damaged	"Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor."	Replace the compressor capacitor

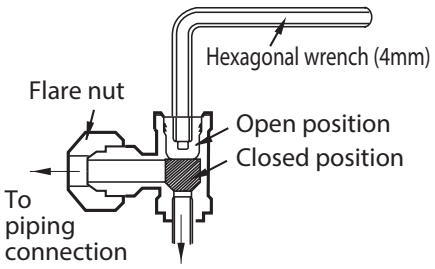
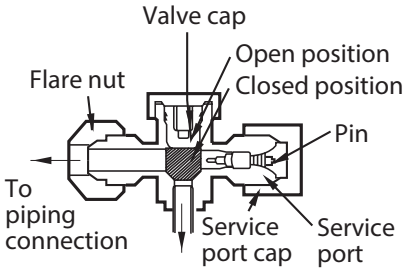
TROUBLESHOOTING

Troubleshooting for Malfunction without Active Error Code

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
"Power voltage is a little low or high"	"Use universal meter to measure the power supply voltage. The voltage is a little high or low"	Suggest to equip with voltage regulator
Coil of compressor is burnt out	"Use universal meter to measure the resistance between compressor terminals and it's 0"	Repair or replace compressor
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor
Air Conditioner is Leaking		
Drain pipe is blocked	Water leaking from indoor unit	"Eliminate the foreign objects inside the drain pipe"
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	"Water leaking from the pipe connection place of indoor unit"	Wrap it again and bundle it tightly
Abnormal Sound and vibration		
"When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound"	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
"When turn on or turn off the unit, there's abnormal sound due to flow of refrigerant inside air conditioner"	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.
"Foreign objects inside the indoor unit or there're parts touching together inside the indoor unit"	There's abnormal sound fro indoor unit	"Remove foreign objects. Adjust all parts' position of indoor unit, tighten screws and stick damping plaster between connected parts"
"Foreign objects inside the outdoor unit or there're parts touching together inside the outdoor unit"	There's abnormal sound fro outdoor unit	"Remove foreign objects. Adjust all parts' position of outdoor unit, tighten screws and stick damping plaster between connected parts"
"Short circuit inside the magnetic coil"	"During heating, the way valve has abnormal electromagnetic sound"	Replace magnetic coil
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	"Adjust the support foot mat of compressor, tighten the bolts"
Abnormal sound inside the compressor	Abnormal sound inside the compressor	"If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace ircumstances."

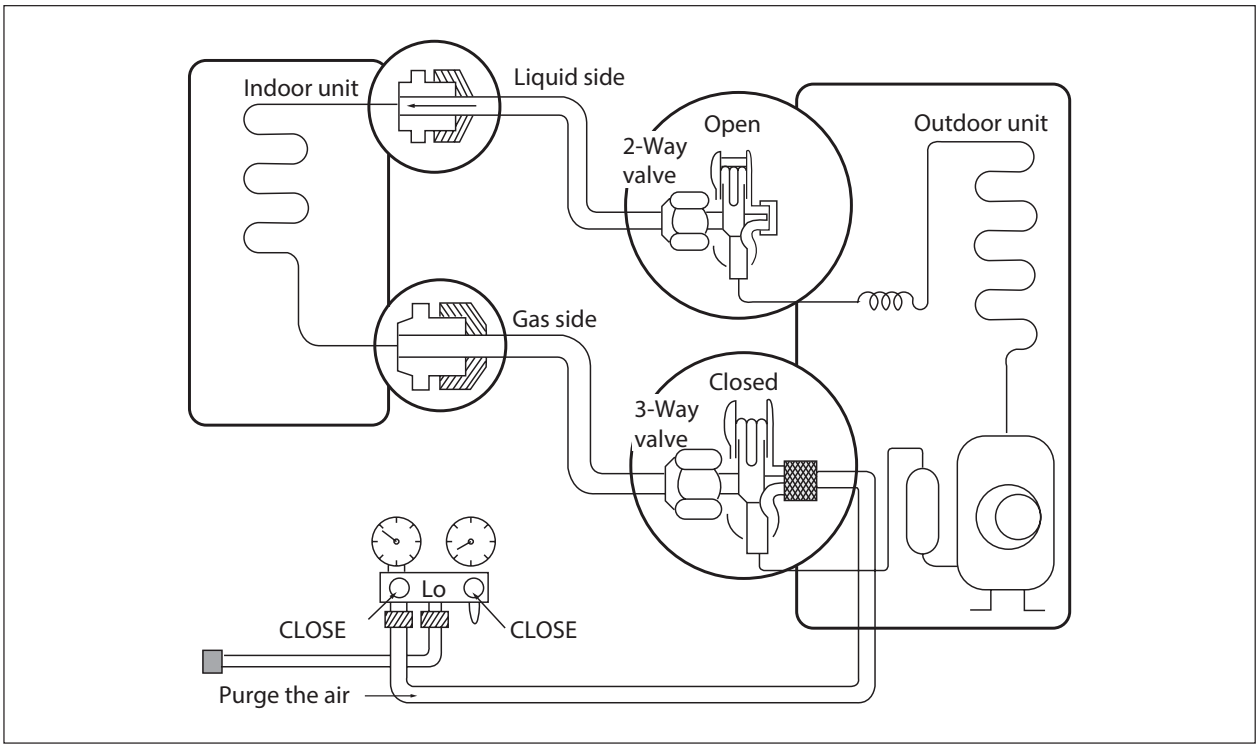
R-410A SEALED SYSTEM REPAIR

Service Valves Appearance

		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
		 To outdoor unit	 To outdoor unit	
Works		Shaft position	Shaft position	Service port
Shipping		Closed (with valve cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Closed (clockwise)	Closed (clockwise)	Open (with vacumm pump)
Operation		Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transfering)	Closed (clockwise)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Open	Open (with charging cylinder)
4.	Gas charging (Servicing)	Open	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open	Open (with charging cylinder)
6.	Gas releasing (Servicing)	Open	Open	Open (with charging cylinder)

R-410A SEALED SYSTEM REPAIR

Pumping Down



• Procedure

(1) Confirm that both the 2-way and 3-way valves are set to the open position.

– Remove the valve stem caps and confirm that the valve stems are in the raised position.

– Be sure to use a hexagonal wrench to operate the valve stems.

(2) Operate the unit for 10 to 15 minutes.

(3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.

– Connect the charge hose with the push pin to the service port.

(4) Air purging of the charge hose.

– Open the low-pressure valve on the charge set slightly to air purge from the charge hose.

(5) Set the 2-way valve to the closed position.

(6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 14 PSIG

(7) Immediately set the 3-way valve to the closed position.

– Do this quickly so that the gauge ends up indicating 0-15 PSI.

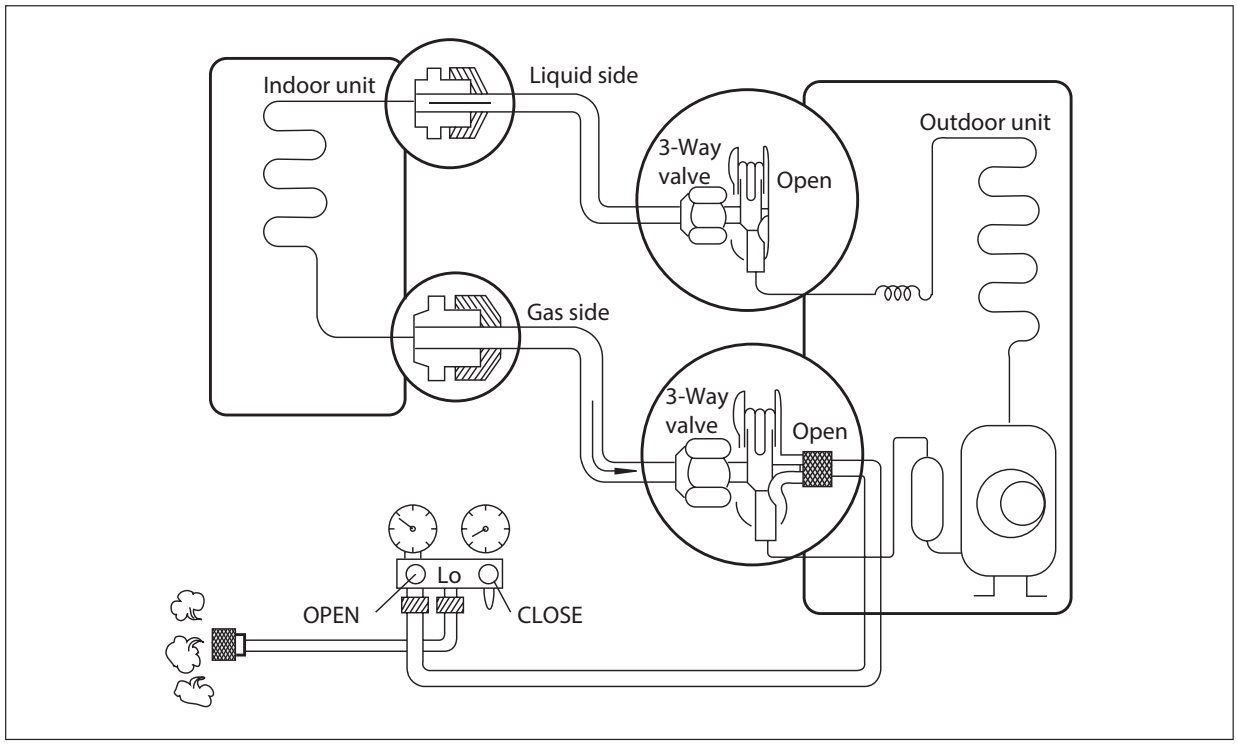
(8) Disconnect the charge set, and mount the 2-way and 3-way valves stem nuts and the service port nut.

– Tighten the service port nut.

– Be sure to check for gas leakage.

R-410A SEALED SYSTEM REPAIR

Gas Charging (After Repair)



• Procedure

(1) Connect the charge hose to the charging cylinder.

– Connect the charge hose which you dis-connected from the vacuum pump to the valve at the bottom of the cylinder.
– If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

– Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant).

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.

- Weigh in the refrigerant amount listed on the rating plate, adding additional refrigerant as needed for long line set length.
- If the temperature does not allow full liquid charge, run the system in air conditioning and throttle refrigerant in at 0.2 oz/min. Allow the system pressure to stabilize each time.

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valves service port.

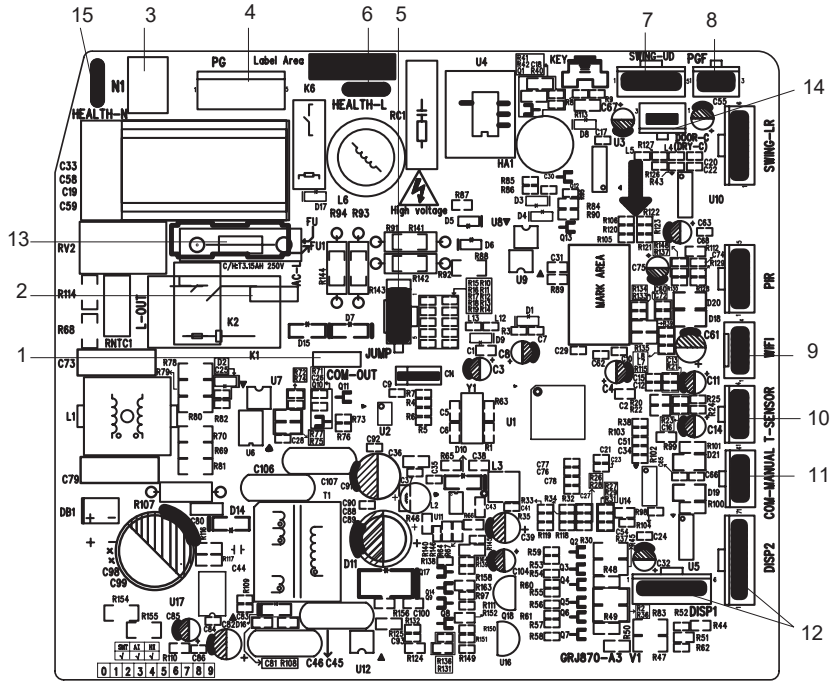
– Stopping partway will allow the gas to be discharged.
– If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

– Tighten the service port nut.
– Be sure to check for gas leakage.

COMPONENTS TESTING

● **Top view**



No	Name
1	Interface of communication wire for indoor unit and outdoor unit
2	Interface of live wire
3	Interface of neutral wire
4	Interface of fan
5	Jumper cap
6	Interface of health function live wire (only for the mode with this function)
7	Up&down swing interface
8	Feedback interface of indoor unit
9	Interface of wifi
10	Interface of tube temperature sensor
11	Wired controller (only for the mode with this function)
12	Display interface
13	Fuse
14	Interface of gate control (only for the mode with this function)
15	Interface of health function neutral wire (only for the mode with this function)

● **Bottom view**

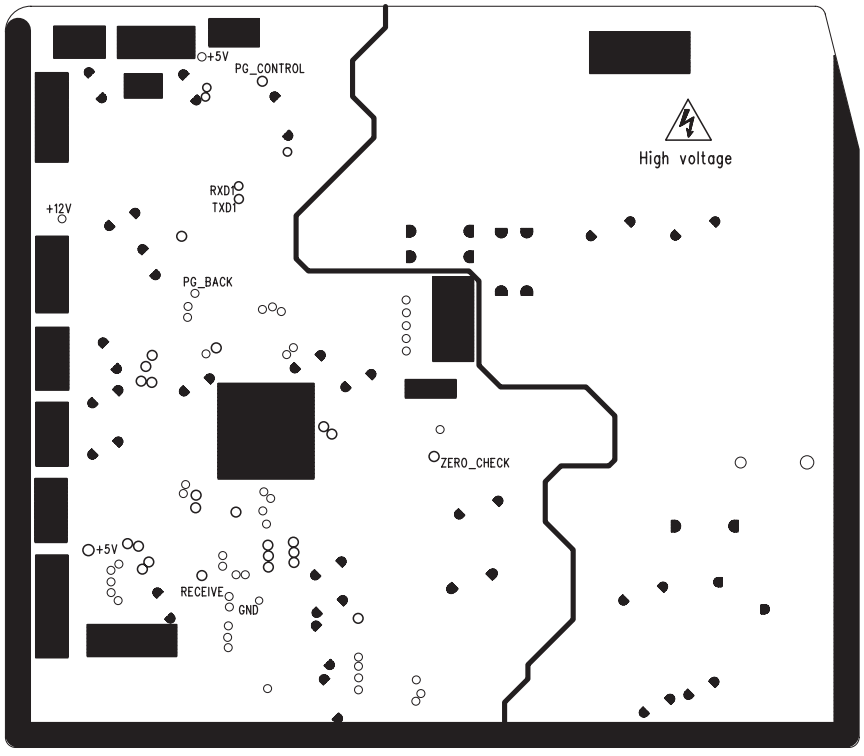
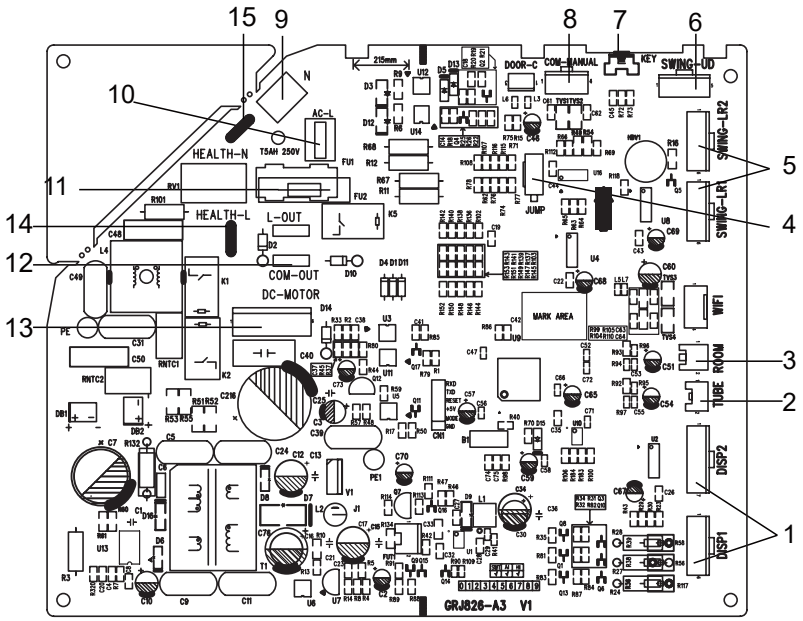


Figure 701

9-12k Indoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

Top view



No.	Name
1	Display interface
2	Inner tube temperature sensor
3	Ambient temperature sensor
4	Jumper cap
5	Left&right swing interface
6	Up&down swing interface
7	Auto button
8	Interface of wired controller
9	Neutral wire
10	Live wire
11	Fuse
12	Communication interface
13	Wiring terminal for DC motor
14	Interface of health function live wire (only for the mode with this function)
15	Interface of health function neutral wire (only for the mode with this function)

Bottom view

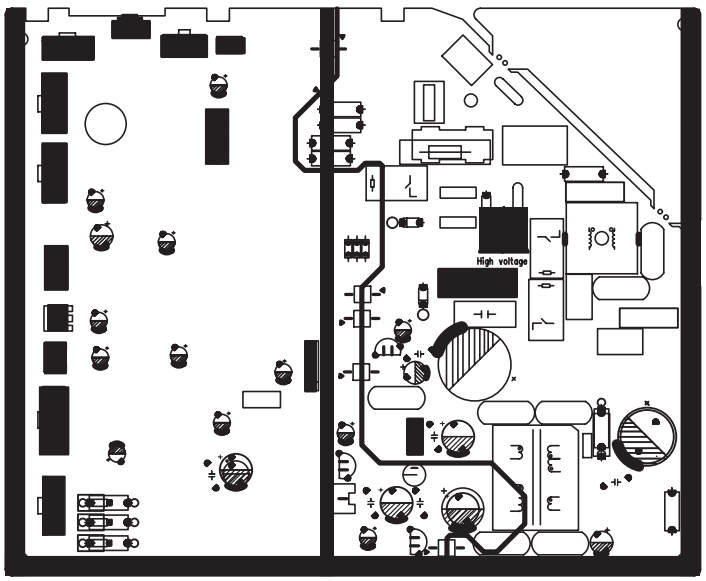
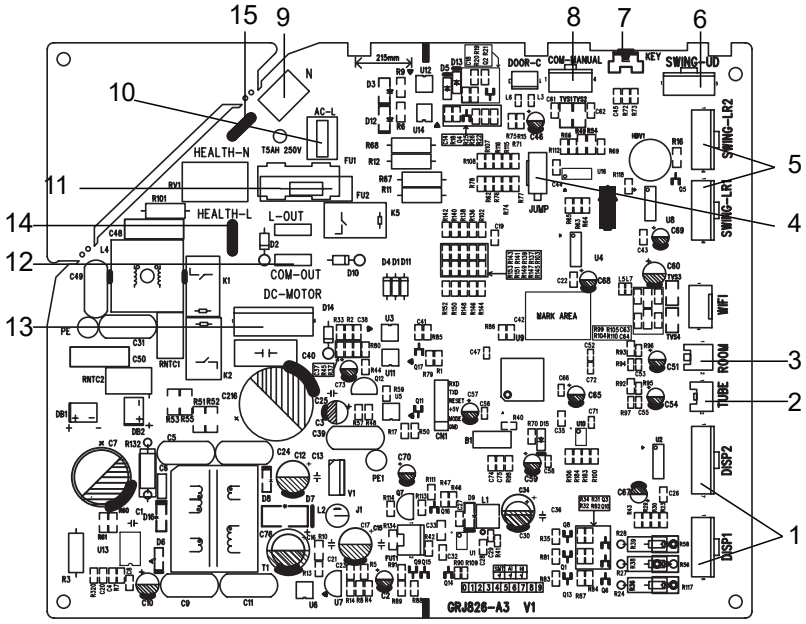


Figure 702

18-24k Indoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

Top view



No.	Name
1	Display interface
2	Inner tube temperature sensor
3	Ambient temperature sensor
4	Jumper cap
5	Left&right swing interface
6	Up&down swing interface
7	Auto button
8	Interface of wired controller
9	Neutral wire
10	Live wire
11	Fuse
12	Communication interface
13	Wiring terminal for DC motor
14	Interface of health function live wire (only for the mode with this function)
15	Interface of health function neutral wire (only for the mode with this function)

Bottom view

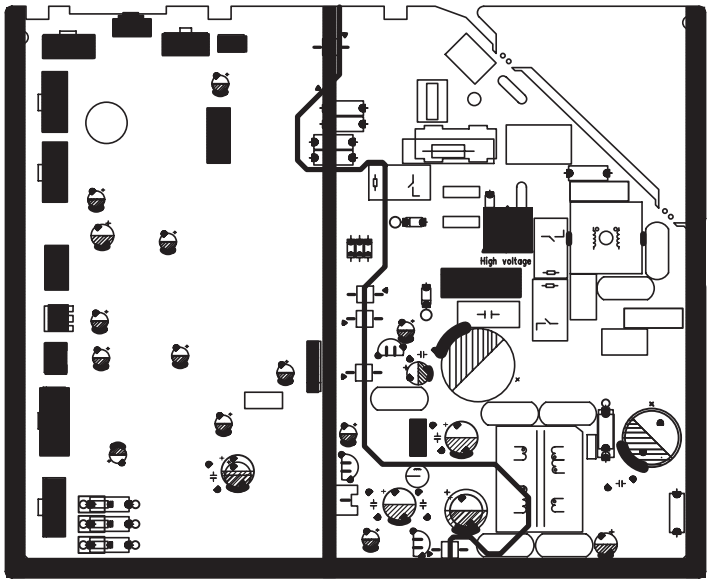
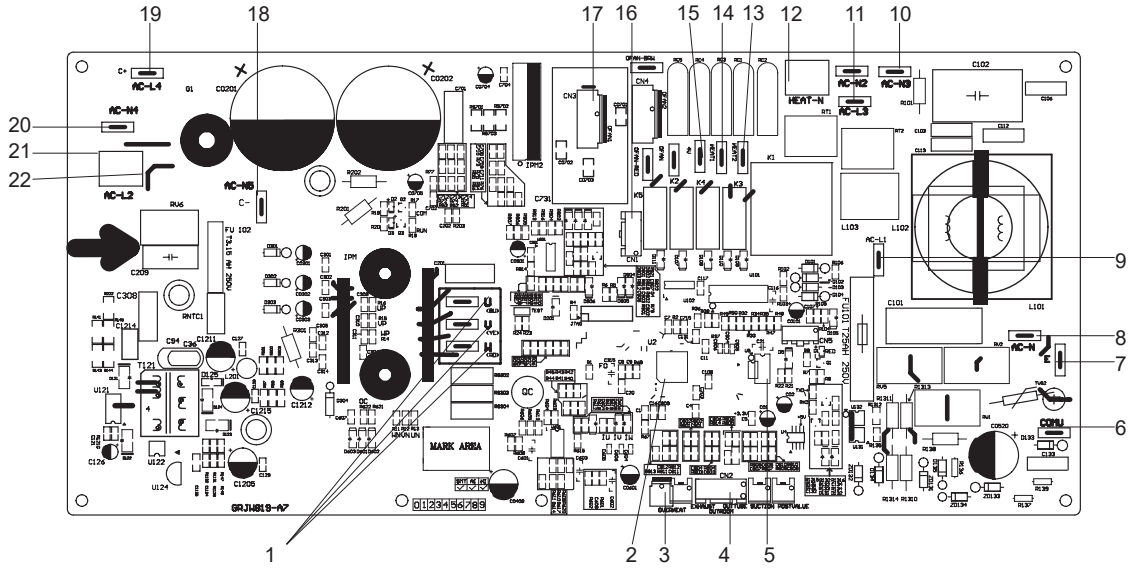


Figure 703

36k Indoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

• Top view



NO.	Name	NO.	Name	NO.	Name
1	Compressor output port	9	Live wire	17	Terminal of outdoor fan
2	Master control chip	10	Connection wire between boards of neutral wire connects AC-N4	18	Connect the negative pole of external big electrolytic capacitor
3	Overload temperature of compressor	11	Connection wire between boards of live wire connects AC-L2	19	Connect the positive pole of external big electrolytic capacitor
4	Temperature of temperature sensor	12	Neutral wire terminal for electric heating	20	Wire connection terminal between boards of neutral wire connects AC-N3
5	EEPROM	13	Live wire terminal for chassis electric heater	21	Connection wire between boards of live wire connects AC-L3
6	Communication wire port	14	Live wire terminal for compressor electric heater	22	Connect the middle position of external big electrolytic capacitor
7	Earthing wire port	15	4-way valve wiring terminal	/	
8	Port of power neutral wire	16	Terminal of electronic expansion valve	/	

• Bottom view

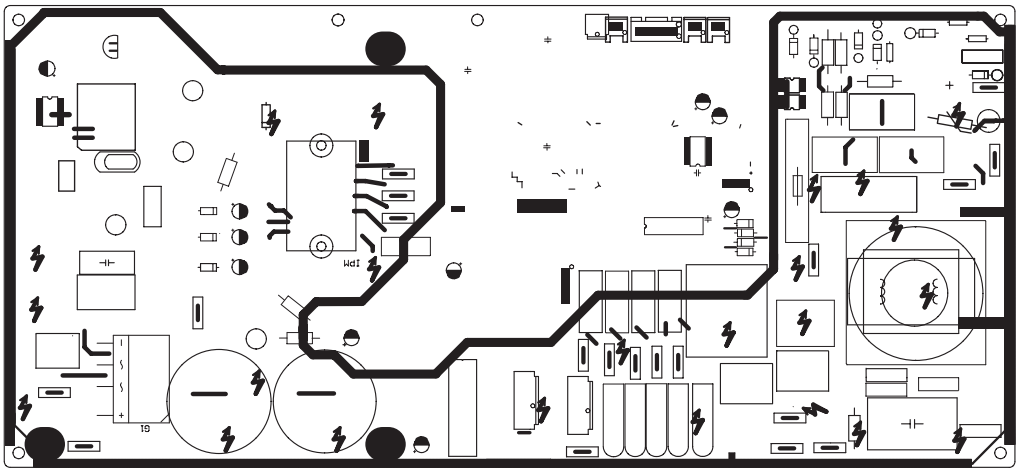


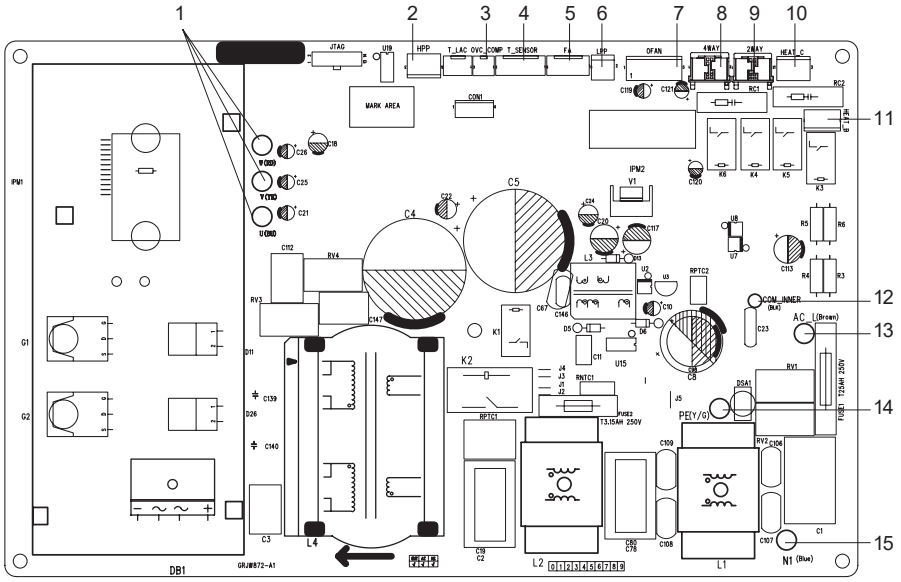
Figure 704

9-12k Outdoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

Outdoor Unit

- **Top view**



No.	Name
1	Compressor three phase input interface
2	Interface of system high pressure protection
3	Compressor overload protection interface
4	Interface of temperature sensor
5	Interface of electronic expansion valve
6	Interface of system low pressure protection
7	Interface of fan
8	4-way valve interface
9	2-way valve interface
10	Interface of electric heating for compressor
11	Interface of electric heating for chassis
12	Communication interface
13	Interface of live wire
14	Interface of earthing wire
15	Interface of netural wire

- **Bottom view**

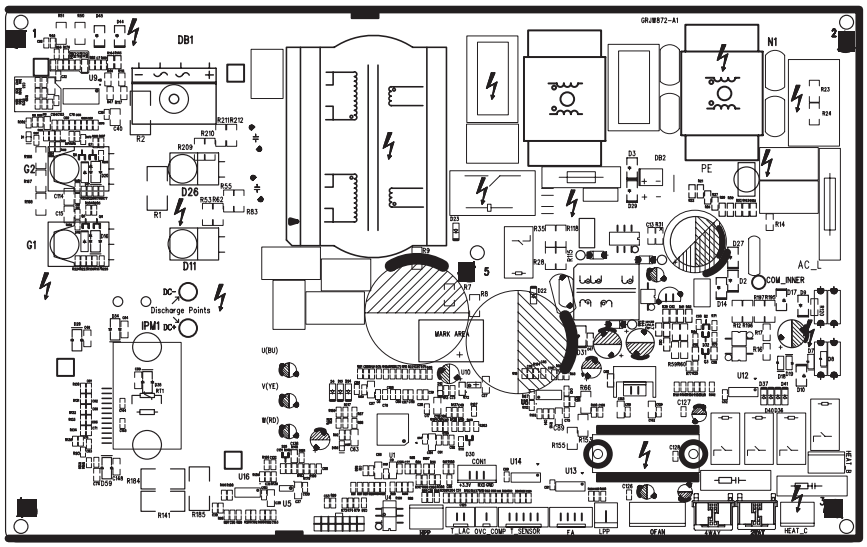
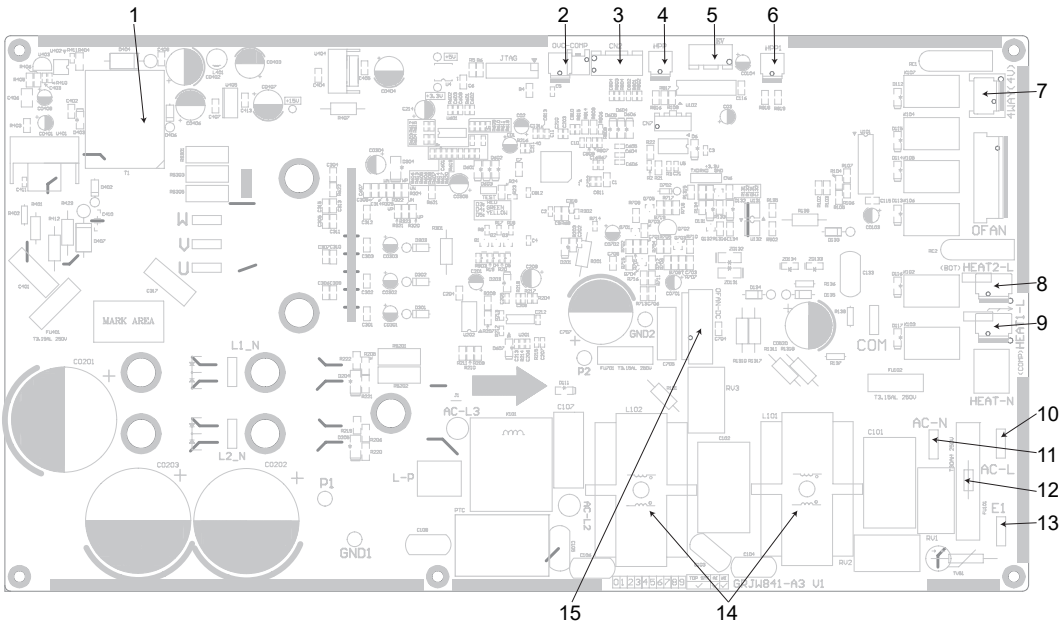


Figure 705

18-24k Outdoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

● **Top view**



No.	Name	No.	Name	No.	Name
1	High-frequency transformer T1	6	High pressure protection terminal HPP1	11	Terminal of neutral wire
2	Overload protection terminal of compressor OVC-COMP	7	Terminal of 4-way valve	12	Protective tube FU101
3	Terminal of temp sensor CN2	8	Electric heater band of chassis HEAT2-L	13	Terminal of ground wire
4	High pressure protection terminal HPP	9	Electric heater band of compressor HEAT1-L	14	Choke L 101 and L102
5	Electronic expansion valve terminal EV	10	Terminal of live wire	15	Terminal of outdoor fan OFAN-DC

● **Bottom view**

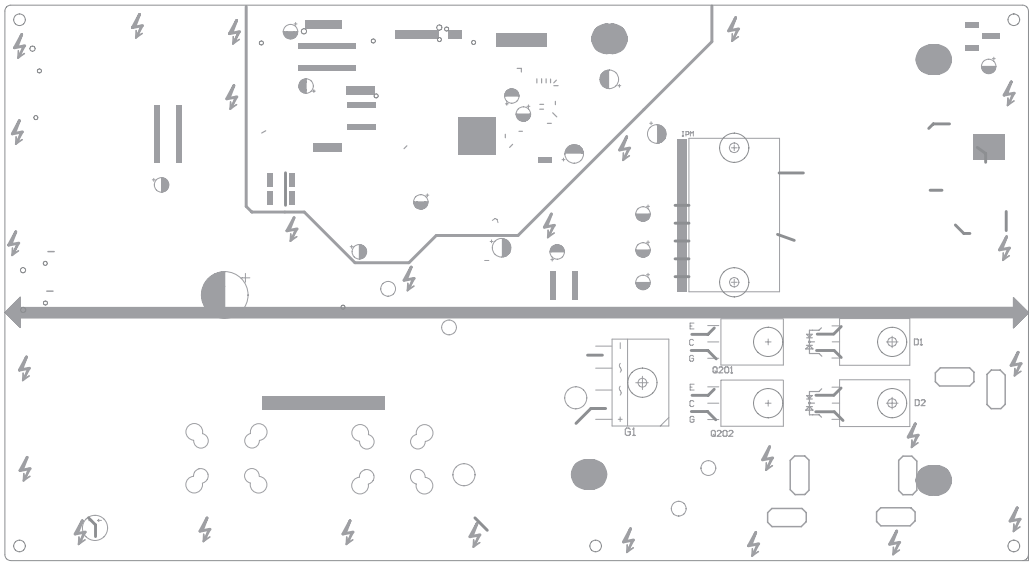


Figure 706

36k Outdoor Unit Printed Circuit Board Identification

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 Resistence 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.

WIRING DIAGRAMS

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

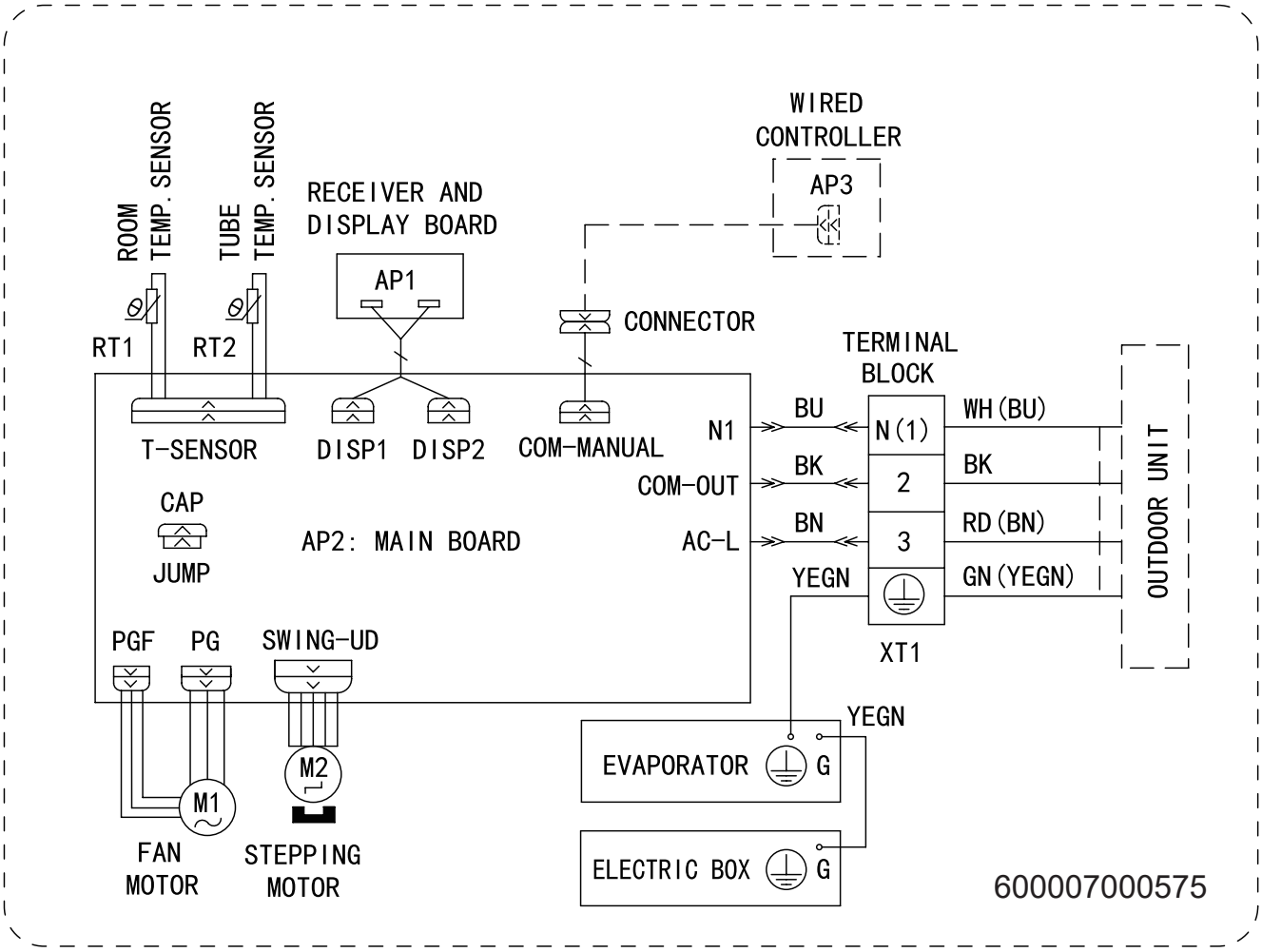


Figure 801

9-12K Indoor Unit Wiring Diagram

WIRING DIAGRAMS

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

● Indoor Unit

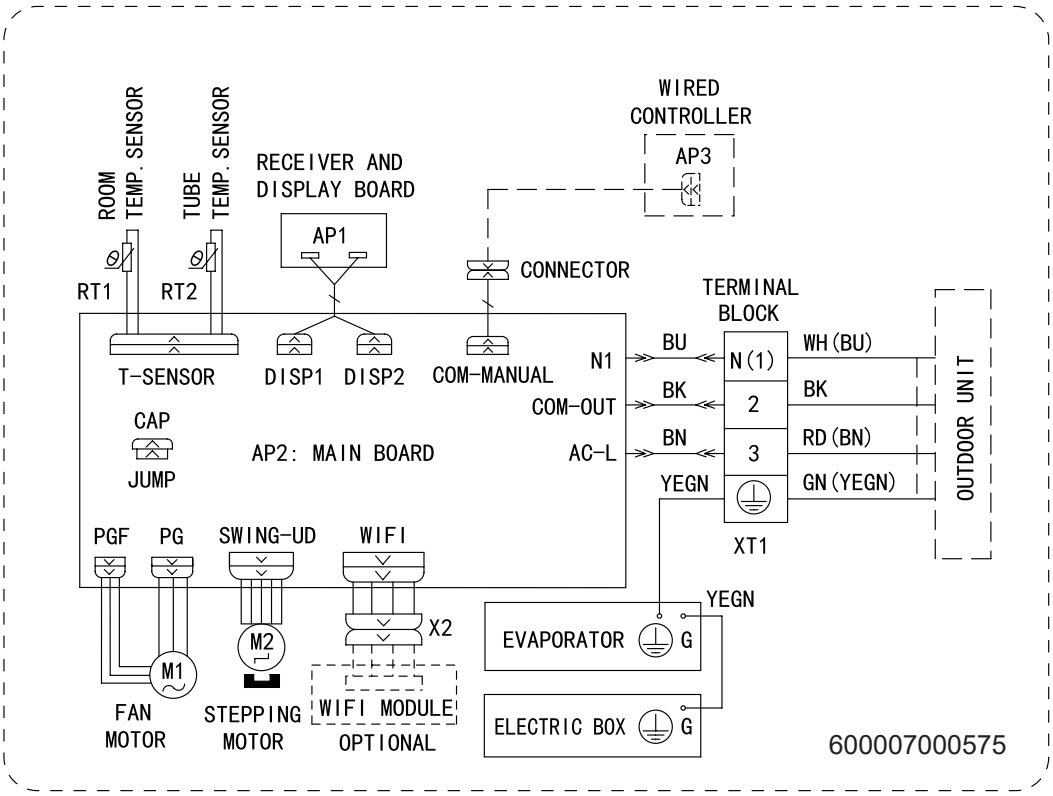


Figure 802

18-24k Indoor Unit Wiring Diagram

WIRING DIAGRAMS

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

● Indoor Unit

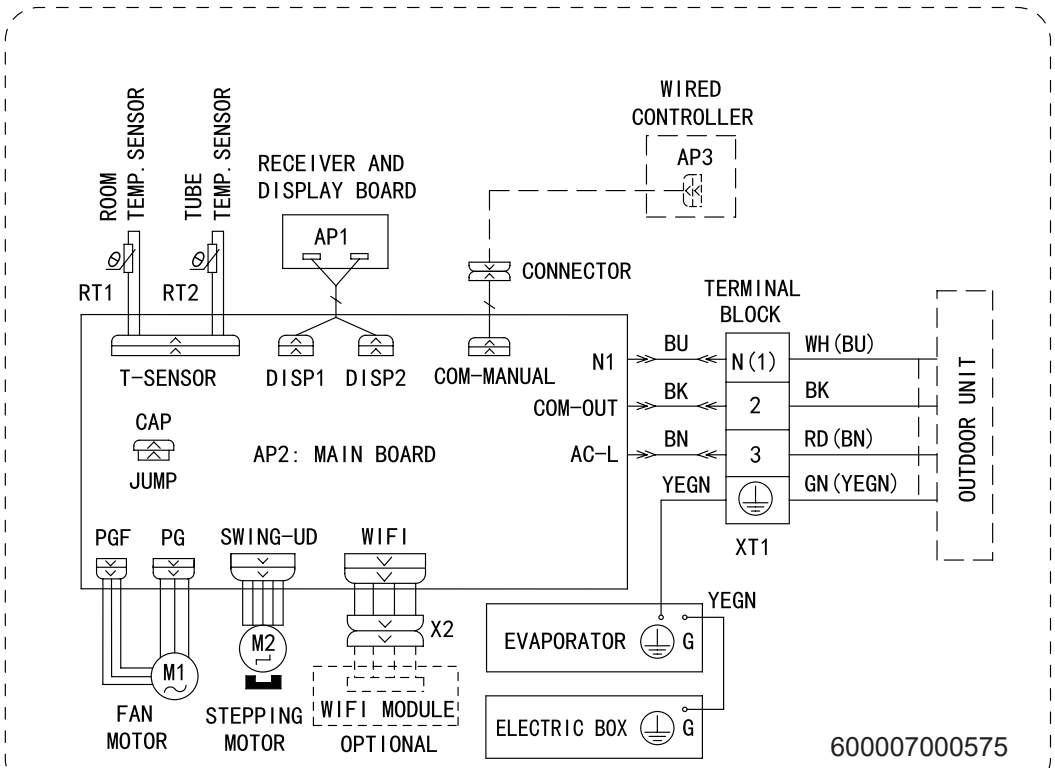


Figure 803

36K Indoor Unit Wiring Diagrams

WIRING DIAGRAMS

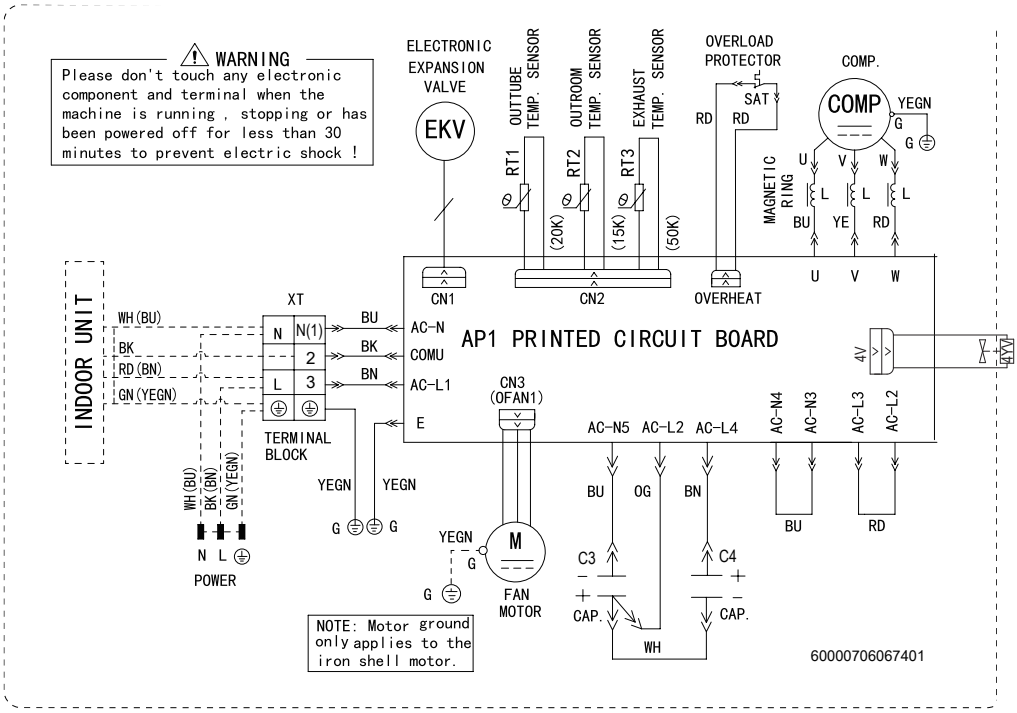


Figure 8054 9-12K Outdoor Unit Wiring Diagrams

WIRING DIAGRAMS

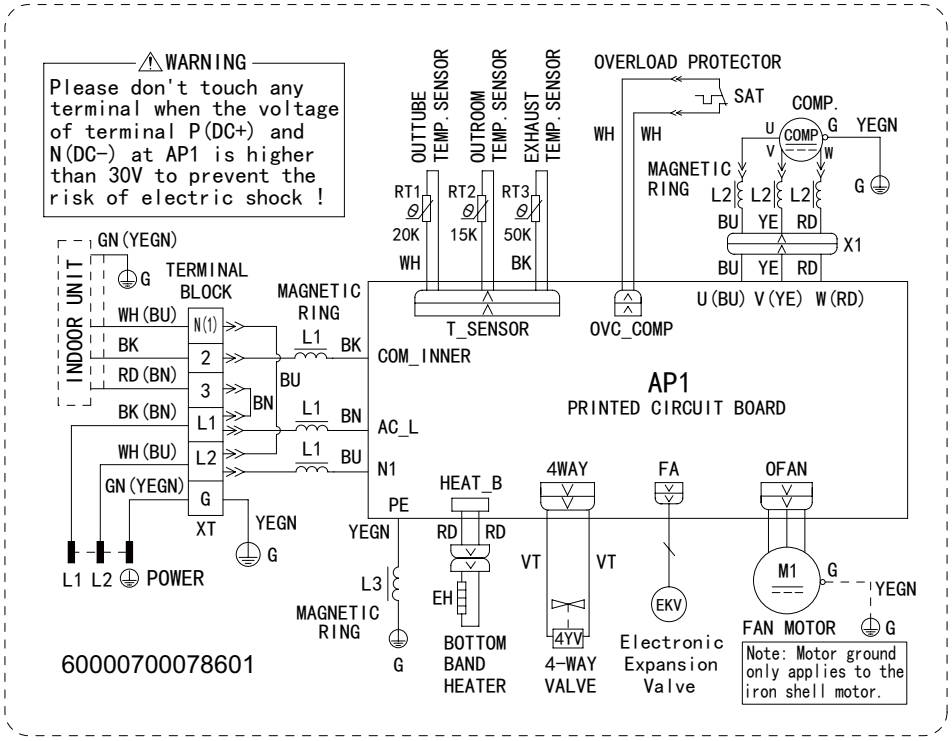


Figure 805

18-24k Outdoor Unit Wiring Diagrams

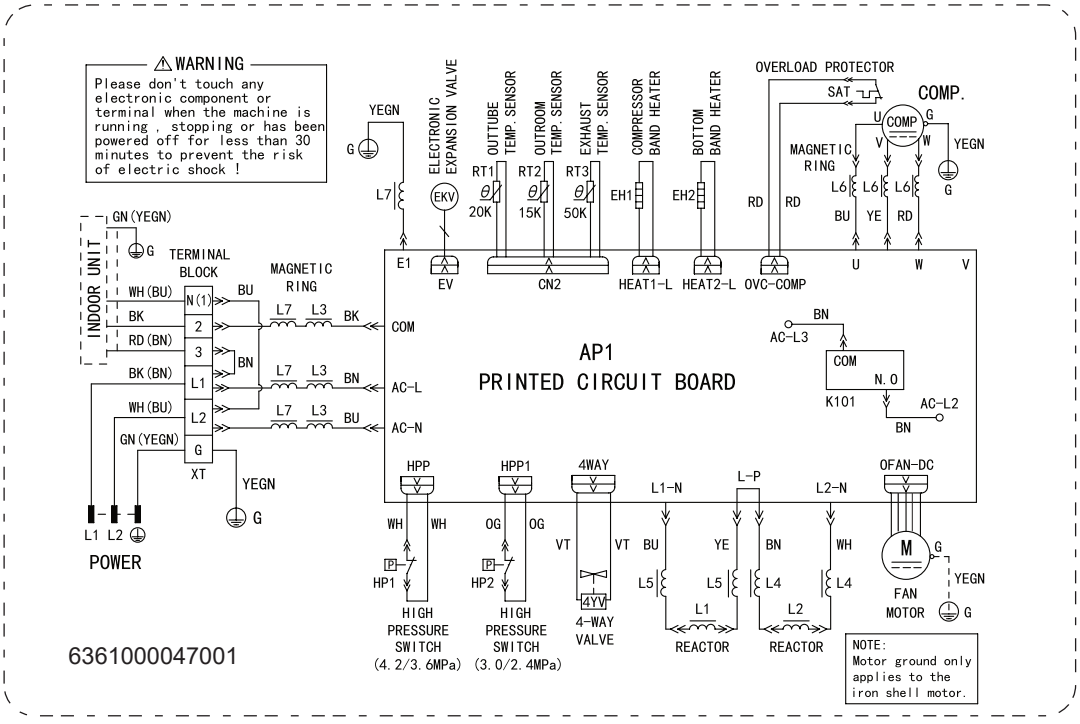


Figure 806

36k Outdoor Unit Wiring Diagrams

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 Assistence contact Friedrich customer service at **(1-800-541-6645)**.

APPENDIX

Appendix 1: Reference Sheet of Celsius and Farenheit

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 2 - Resistance Table of Air Temperature Sensor for Indoor and Outdoor Units (15kΩ)

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance(kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-2.2	138.1	68	18.75	138.2	3.848	208.4	1.071
-0.4	128.6	69.8	17.93	140	3.711	210.2	1.039
1.4	121.6	71.6	17.14	141.8	3.579	212	1.009
3.2	115	73.4	16.39	143.6	3.454	213.8	0.98
5	108.7	75.2	15.68	145.4	3.333	215.6	0.952
6.8	102.9	77	15	147.2	3.217	217.4	0.925
8.6	97.4	78.8	14.36	149	3.105	219.2	0.898
10.4	92.22	80.6	13.74	150.8	2.998	221	0.873
12.2	87.35	82.4	13.16	152.6	2.896	222.8	0.848
14	82.75	84.2	12.6	154.4	2.797	224 3/5	0.825
15.8	78.43	86	12.07	156.2	2.702	226.4	0.802
17.6	74.35	87.8	11.57	158	2.611	228.2	0.779
19.4	70.5	89.6	11.09	159.8	2.523	230	0.758
21.2	66.88	91.4	10.63	161.6	2.439	231.8	0.737
23	63.46	93.2	10.2	163.4	2.358	233.6	0.717
24.8	60.23	95	9.779	165.2	2.28	235.4	0.697
26.6	57.18	96.8	9.382	167	2.206	237.2	0.678
28.4	54.31	98.6	9.003	168.8	2.133	239	0.66
30.2	51.59	100.4	8.642	170.6	2.064	240.8	0.642
32	49.02	102.2	8.297	172.4	1.997	242.6	0.625
33.8	46.6	104	7.967	174.2	1.933	244.4	0.608
35.6	44.31	105.8	7.653	176	1.871	246.2	0.592
37.4	42.14	107.6	7.352	177.8	1.811	248	0.577
39.2	40.09	109.4	7.065	179.6	1.754	249.8	0.561
41	38.15	111.2	6.791	181.4	1.699	251.6	0.547
42.8	36.32	113	6.529	183.2	1.645	253.4	0.532
44.6	34.58	114.8	6.278	185	1.594	255.2	0.519
46.4	32.94	116.6	6.038	186.8	1.544	257	0.505
48.2	31.38	118.4	5.809	188.6	1.497	258.8	0.492
50	29.9	120.2	5.589	190.4	1.451	260.6	0.48
51.8	28.51	122	5.379	192.2	1.408	262.4	0.467
53.6	27.18	123.8	5.197	194	1.363	264.2	0.456
55.4	25.92	125.6	4.986	195.8	1.322	266	0.444
57.2	24.73	127.4	4.802	197.6	1.282	267.8	0.433
59	23.6	129.2	4.625	199.4	1.244	269.6	0.422
60.8	22.53	131	4.456	201.2	1.207	271.4	0.412
62.6	21.51	132 4/5	4.294	203	1.171	273.2	0.401
64.4	20.54	134.6	4.139	204.8	1.136	275	0.391
66.2	19.63	136.4	3.99	206.6	1.103	276.8	0.382

APPENDIX

Appendix 3 - Resistance Table of Temperature Sensor for Indoor and Outdoor Coils(20kΩ)

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance(kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-2.2	181.4	68	25.01	138.2	5.13	208.4	1.427
-0.4	171.4	69.8	23.9	140	4.948	210.2	1.386
1.4	162.1	71.6	22.85	141.8	4.773	212	1.346
3.2	153.3	73.4	21.85	143.6	4.605	213.8	1.307
5	145	75.2	20.9	145.4	4.443	215.6	1.269
6.8	137.2	77	20	147.2	4.289	217.4	1.233
8.6	129.9	78.8	19.14	149	4.14	219.2	1.198
10.4	123	80.6	18.13	150.8	3.998	221	1.164
12.2	116.5	82.4	17.55	152.6	3.861	222.8	1.131
14	110.3	84.2	16.8	154.4	3.729	224 3/5	1.099
15.8	104.6	86	16.1	156.2	3.603	226.4	1.069
17.6	99.13	87.8	15.43	158	3.481	228.2	1.039
19.4	94	89.6	14.79	159.8	3.364	230	1.01
21.2	89.17	91.4	14.18	161.6	3.252	231.8	0.983
23	84.61	93.2	13.59	163.4	3.144	233.6	0.956
24.8	80.31	95	13.04	165.2	3.04	235.4	0.93
26.6	76.24	96.8	12.51	167	2.94	237.2	0.904
28.4	72.41	98.6	12	168.8	2.844	239	0.88
30.2	68.79	100.4	11.52	170.6	2.752	240.8	0.856
32	65.37	102.2	11.06	172.4	2.663	242.6	0.833
33.8	62.13	104	10.62	174.2	2.577	244.4	0.811
35.6	59.08	105.8	10.2	176	2.495	246.2	0.77
37.4	56.19	107.6	9.803	177.8	2.415	248	0.769
39.2	53.46	109.4	9.42	179.6	2.339	249.8	0.746
41	50.87	111.2	9.054	181.4	2.265	251.6	0.729
42.8	48.42	113	8.705	183.2	2.194	253.4	0.71
44.6	46.11	114.8	8.37	185	2.125	255.2	0.692
46.4	43.92	116.6	8.051	186.8	2.059	257	0.674
48.2	41.84	118.4	7.745	188.6	1.996	258.8	0.658
50	39.87	120.2	7.453	190.4	1.934	260.6	0.64
51.8	38.01	122	7.173	192.2	1.875	262.4	0.623
53.6	36.24	123.8	6.905	194	1.818	264.2	0.607
55.4	34.57	125.6	6.648	195.8	1.736	266	0.592
57.2	32.98	127.4	6.403	197.6	1.71	267.8	0.577
59	31.47	129.2	6.167	199.4	1.658	269.6	0.563
60.8	30.04	131	5.942	201.2	1.609	271.4	0.549
62.6	28.68	132 4/5	5.726	203	1.561	273.2	0.535
64.4	27.39	134.6	5.519	204.8	1.515	275	0.521
66.2	26.17	136.4	5.32	206.6	1.47	276.8	0.509

APPENDIX

Appendix 4 - Resistance Table of Compressor Temperature Sensor for Outdoor Units (50kΩ)

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance(kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-20.2	853.5	50	98	120.2	18.34	190.4	4.754
-18.4	799.8	51.8	93.42	122	17.65	192.2	4.609
-16.6	750	53.6	89.07	123.8	16.99	194	4.469
-14.8	703.8	55.4	84.95	125.6	16.36	195.8	4.334
-13	660.8	57.2	81.05	127.4	15.75	197.6	4.204
-11.2	620.8	59	77.35	129.2	15.17	199.4	4.079
-9.4	580.6	60.8	73.83	131	14.62	201.2	3.958
-7.6	548.9	62.6	70.5	132 4/5	14.09	203	3.841
-5.8	516.6	64.4	67.34	134.6	13.58	204.8	3.728
-4	486.5	66.2	64.33	136.4	13.09	206.6	3.619
-2.2	458.3	68	61.48	138.2	12.62	208.4	3.514
-0.4	432	69.8	58.77	140	12.17	210.2	3.413
1.4	407.4	71.6	56.19	141.8	11.74	212	3.315
3.2	384.5	73.4	53.74	143.6	11.32	213.8	3.22
5	362.9	75.2	51.41	145.4	10.93	215.6	3.129
6.8	342.8	77	49.19	147.2	10.54	217.4	3.04
8.6	323.9	78.8	47.08	149	10.18	219.2	2.955
10.4	306.2	80.6	45.07	150.8	9.827	221	2.872
12.2	289.6	82.4	43.16	152.6	9.489	222.8	2.792
14	274	84.2	41.34	154.4	9.165	224 3/5	2.715
15.8	259.3	86	39.61	156.2	8.854	226.4	2.64
17.6	245.6	87.8	37.96	158	8.555	228.2	2.568
19.4	232.6	89.6	36.38	159.8	8.268	230	2.498
21.2	220.5	91.4	34.88	161.6	7.991	231.8	2.431
23	209	93.2	33.45	163.4	7.726	233.6	2.365
24.8	198.3	95	32.09	165.2	7.47	235.4	2.302
26.6	199.1	96.8	30.79	167	7.224	237.2	2.241
28.4	178.5	98.6	29.54	168.8	6.998	239	2.182
30.2	169.5	100.4	28.36	170.6	6.761	240.8	2.124
32	161	102.2	27.23	172.4	6.542	242.6	2.069
33.8	153	104	26.15	174.2	6.331	244.4	2.015
35.6	145.4	105.8	25.11	176	6.129	246.2	1.963
37.4	138.3	107.6	24.13	177.8	5.933	248	1.912
39.2	131.5	109.4	23.19	179.6	5.746	249.8	1.863
41	125.1	111.2	22.29	181.4	5.565	251.6	1.816
42.8	119.1	113	21.43	183.2	5.39	253.4	1.77
44.6	113.4	114.8	20.6	185	5.222	255.2	1.725
46.4	108	116.6	19.81	186.8	5.06	257	1.682
48.2	102.8	118.4	19.06	188.6	4.904	258.8	1.64

CUSTOMER SATISFACTION and QUALITY ASSURANCE

Friedrich is a conscientious manufacturer, concerned about customer satisfaction, product quality, and controlling warranty costs. As an Authorized Service Provider you play a vital role in these areas. By adhering to the policies and procedures you provide us with vital information on each warranty repair you complete. This information is used to identify product failure trends, initiate corrective action, and improve product quality, thereby further reducing warranty expenses while increasing customer satisfaction levels.

FRIEDRICH AUTHORIZED PARTS DEPOTS

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

United Products Distributors Inc.
4030A Benson Ave
Halethorpe, MD 21227
888-907-9675
c.businsky@updinc.com

Shivani Refigeration & Air Conditioning Inc.
2259 Westchester Ave.
Bronx, NY 10462
sales@shivanionline.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
support@totalhomesupply.com
https://www.totalhomesupply.com/brands/Friedrich.html

FRIEDRICH

TECHNICAL SUPPORT CONTACT INFORMATION

Friedrich Air Conditioning Co.
10001 Reunion Place, Suite 500 • San Antonio, Texas 78216
1-800-541-6645
www.friedrich.com