



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



	Type	Model	Model Revision
Outdoor	Condensor	FPHMR18A3A	
Outdoor	Condensor	FPHMR24A3A	
Outdoor	Condensor	FPHMR36A3A	
Outdoor	Condensor	FPHMR42A3A	
Indoor	Wall Mount	FPMW07A3A	FPHMW07A3B WIFI
Indoor	Cassette	FPHFC09A3A	FPHFC09A3B WI-FI
Indoor	Cassette	FPHFC12A3A	FPHFC12A3B WI-FI
Indoor	Cassette	FPHFC18A3A	FPHFC18A3B WI-FI
Indoor	Cassette	FPHFC24A3A	FPHFC24A3B WI-FI
Indoor	Ducted	FPHFD09A3A	
Indoor	Ducted	FPHFD12A3A	
Indoor	Ducted	FPHFD18A3A	
Indoor	Ducted	FPHFD24A3A	
Indoor	Accessory	FPCG0912	
Indoor	Accessory	FPWC1	
Indoor	Accessory	FPCG182436	

FOR WALL MOUNTED UNITS FPHFW093A/B, FPHFW123A/B, FPHFW183A/B, AND FPHFW243A/B REFER TO THE FA PRO SINGLE ZONE SERVICE MANUAL 96261401

TABLE OF CONTENTS

Table of Contents	
INTRODUCTION-	4
Important Safety Information-	4
Personal Injury Or Death Hazards-	6
Personal Injury Or Death Hazards-	7
Model Identification Guide-	8
Product Appearance-	9
SPECIFICATIONS-	11
Product Specifications Multi-Zone Wall-Mounted-	11
Product Specifications Multi-Zone-Cassette -	12
Product Specifications Multi-Zone Concealed Ducted -	13
Product Specifications 18K, 24k and 36k Outdoor Condensor-	14
Product Dimensions: Wall Mounted Indoor Units-	16
Product Dimensions: 9k, 12k, and 18k Ducted Indoor Units-	17
Product Dimensions: 9k and 12k Cassette-	18
Product Dimensions: 18k and 24k Cassette-	19
Product Dimensions: 24k Outdoor Units-	20
Product Dimensions: 36k Outdoor Units-	21
Product Dimensions: 42k Outdoor Units-	22
Electrical Requirements 24k, 36K, AND 42K Outdoor Units-	33
CORRECTION FACTORS-	35
Piping Length Factor Chart-	36
OPERATION-	38
Display Panel-	38
Using Sleep during Off-Timer Function-	41
Control Mode (Indoor Unit Mode Control)-	45
Outdoor unit Control Mode-	46
INSTALLATION-	52
Leak Check, Evacuation, and Charging (Triple Evacuation)-	55
Checklist-	57
Field Settings (ESP Setting) Duct Type Only-	58
Field Settings (Indoor Unit Parameter Revision)-	59
Operation Test-	68
Cassette and Ducted Condensate Pump Drain Line-	68
Fresh Air Intake-	69
MAINTENANCE-	70
TROUBLESHOOTING-	73
Normal Malfunctions-	73
Test the jumper terminals-	74
Protection Circuit Fault Isolation-	75
Compressor Fault Isolation-	76
Indoor Fault Codes-	76
Indoor Fault Code-	78
Outdoor Fault Codes-	80
18K Outdoor Drive Fault Codes -	90
24k, 36k, and 42k Outdoor Drive Fault Codes -	91
Diagnosis and Solutions-	93
E36 Error-	104
Blank Display/Indoor Unit Door Micro Switch-	106
R-410A SEALED SYSTEM REPAIR-	109
Service Valves Appearance-	109
Pumping Down-	110
Gas Charging (After Repair)-	111
Replace 18/24k Outdoor unit Compressor and Motor-	112
Replace 36/ 42k Outdoor unit Compressor and Motor-	113
Replace 9k and 12k Duct Type unit Compressor and Motor-	114
Replace 18k Duct Type unit Compressor and Motor-	115
Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor-	116

TABLE OF CONTENTS

Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor-	117
Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor-	118
Replace 24k and 36k Cassette Compressor and Motor Type unit Compressor and Motor-	119
COMPONENTS TESTING -	120
Compressor-	120
Fan Motor-	121
EEV Stepper Coil-	122
Check Refrigerant System (Outdoor) -	123
Test System Flow (Outdoor) -	124
Check Fuse and Capacitor-	125
7k Indoor Wall Mount Printed Circuit Board -	126
Ducted 9, 12, and 18k Ducted Indoor Units Control Board-	127
Ducted 24k and 9-24k Cassette Indoor Units Control Board-	128
18k Outdoor Main Printed Circuit Boards-	129
24k Outdoor Main Printed Circuit Board-	131
24k Outdoor Drive Printed Circuit Board-	132
36k/ 42k Outdoor Main Printed Circuit Board-	133
36k/ 42k Outdoor Drive Printed Circuit Board-	134
WIRING DIAGRAMS-	135
7k Wall Units-	135
Ducted Indoor Units 9k, 12k, and 18k-	136
9k-36k Indoor Cassette Units-	137
18k Outdoor Units-	138
24k Outdoor Units-	139
36k Outdoor Units-	140
42k Outdoor Units-	141
APPENDIX-	142
Reference Sheet of Celsius and Fahrenheit-	142
Pipe Expanding Method-	143
Resistance Table Coil And Room Sensor-	144
Resistance Table Of Outdoor Compressor Temperature Sensor-	145
Available Accessories-	146
Interactive Parts Viewer-	147
Limited Warranty-	147
Friedrich Authorized Parts Depots-	148

INTRODUCTION

Important Safety Information

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

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


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

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


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.

Indicates property damage can occur if instructions are not followed.

NOTICE


 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**

	<p>Electrical shock hazard.</p> <p>Turn OFF electric power before service or installation.</p> <p>Unit must be properly grounded.</p> <p>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.</p>
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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.
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 **WARNING**

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

CAUTION

Indicates property damage can occur if instructions are not followed.

NOTICE

Indicates property damage can occur if instructions are not followed.

INTRODUCTION

Personal Injury Or Death Hazards

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




⚠ WARNING
ALWAYS USE INDUSTRY STANDARD PERSONAL PROTECTIVE EQUIPMENT (PPE)

ELECTRICAL HAZARDS:

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

SAFETY FIRST	 WARNING	 AVERTISSEMENT	 ADVERTENCIA
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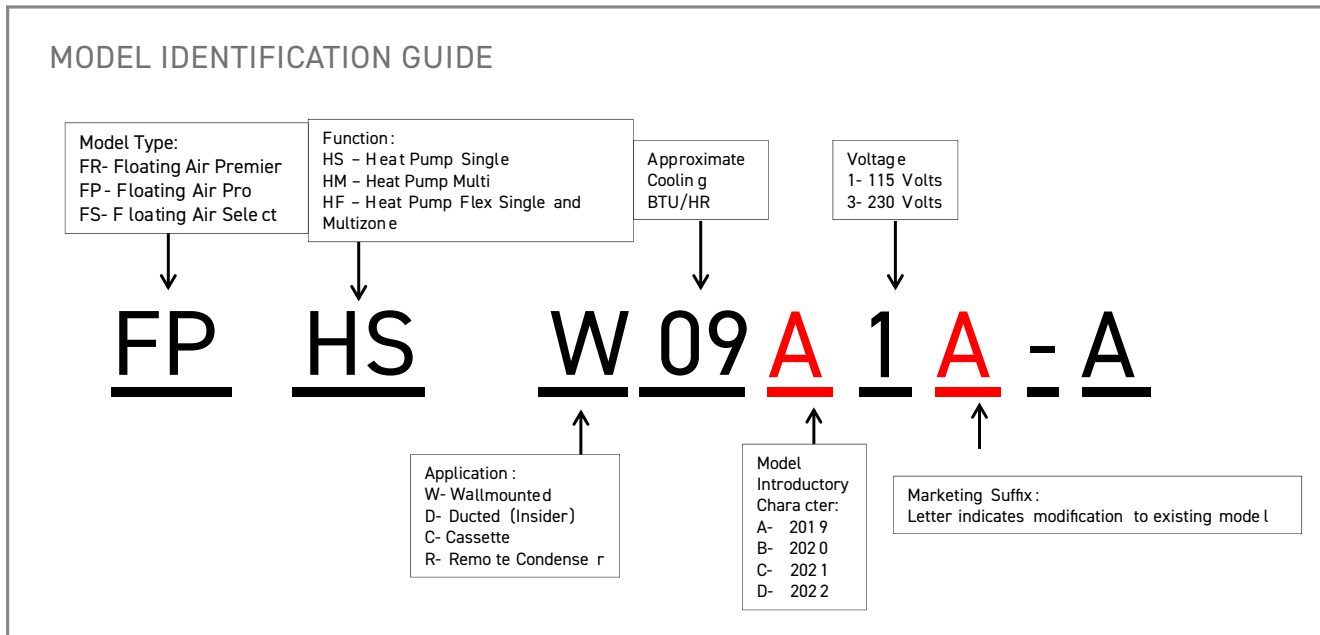


ELECTRICAL HAZARDS:

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- Make sure to follow proper lockout/tag out procedures.
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- Failure to follow proper safety procedures and these warnings can result in serious injury or possibly death.

INTRODUCTION

Model Identification Guide



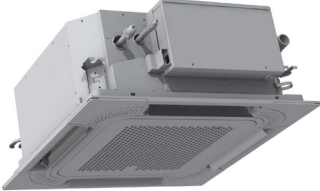

INTRODUCTION

Product Appearance

Duct type


Model (Btu/h)	Indoor Unit
9K/12K	
18K	

Cassette type

Model (Btu/h)	Indoor Unit
9K/12K	
18K/ 24k	

INTRODUCTION

Product Appearance - Outdoor Units

Type	Minimum and Maximum connectabel Capacity (Btu/h)	View
3-Zone Tri	12,000-36,000 BTU	
4-Zone Quad	18,000-48,000 BTU	
5-Zone	24,000-63,000 BTU	

SPECIFICATIONS

Product Specifications Multi-Zone Wall-Mounted

PERFORMANCE RATINGS		Multizone Wall-Mounted - Heat Pumps				
		7k	9k	12k	18k	24k
INDOOR MODEL		FPHMW07A3A, FPHMW07A3B	FPHFW09A3A, FPHFW09A3B	FPHFW12A3A, FPHFW12A3B	FPHFW18A3A, FPHFW18A3B	FPHFW24A3A, FPHFW24A3B
SPECIFICATIONS						
CAPACITY COOLING (RATED)	BTU	7,000	9,000	12,000	18,000	24,000
CAPACITY HEATING (RATED)	BTU	8,500	9,500	13,000	19,000	24,200
MOISTURE REMOVAL	Pts/h	2.5	2.5	3.2	4.2	5.3
AIRFLOW (TURBO/HIGH/MED/LOW)	CFM	424/382/323/247	424/382/323/247	424/382/323/247	618/565/482/382	735/665/559/441
SOUND RATING (HIGH/MED/LOW)	dB-A	38/32/29	38/32/29	39/32/29	45/41/37	48/45/40
ELECTRICAL DATA						
POWER SOURCE	V, Ø, Hz	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
POWER AND COMMUNICATION CABLES	TYPE	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN
REFRIGERATION SYSTEM						
CONNECTIONS		Flare	Flare	Flare	Flare	Flare
LIQUID LINE O.D.	in	1/4	1/4	1/4	1/4	3/8
SUCTION LINE O.D.	in	3/8	3/8	3/8	1/2	5/8
DIMENSIONS & WEIGHT						
W x H x D	in	37 3/8"x 10 3/4"x 8 1/8"	33 7/8 x 11 3/16 x 8 1/2	33 7/8 x 11 3/16 x 8 1/2	48"x 12 5/8"x 9 1/4"	48"x 12 5/8"x 9 1/4"
NET WEIGHT	lbs	18.7	18.7	18.7	32	32
SHIPPING WEIGHT	lbs	24.3	24.3	24.3	37.5	37.5

SPECIFICATIONS

Product Specifications Multi-Zone-Cassette

PERFORMANCE RATINGS		Multizone Cassette - Heat Pumps			
		9k	12k	18k	24k
INDOOR MODEL		FPHFC09A3A	FPHFC12A3A	FPHFC18A3A	FPHFC24A3A
SPECIFICATIONS					
CAPACITY COOLING (RATED)	Btu	9,000	12,000	18,000	24,000
CAPACITY HEATING (RATED)	Btu	10,200	13,500	20,400	27,000
MOISTURE REMOVAL	Pts/h	1.9	2.5	3.2	5.0
AIRFLOW (HIGH)	CFM	306	471	559	1100
SOUND RATING (MAX.-MIN.)	dB-A	40/28	40/28	40/28	40/28
ELECTRICAL DATA					
POWER SOURCE	V, Ø, Hz	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
POWER AND COMMUNICATION CABLE	TYPE	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN
REFRIGERATION SYSTEM					
CONNECTIONS		Flare	Flare	Flare	Flare
LIQUID LINE O.D.	in	1/4	1/4	1/4	3/8
SUCTION LINE O.D.	in	3/8	3/8	1/2	5/8
DIMENSIONS & WEIGHT					
W X H X D	in	22 7/16 x 8 7/16 x 22		33 x 9 3/4 x 33	
NET WEIGHT	lbs	31.9	34	61.8	59.5
SHIPPING WEIGHT	lbs	38.5	40.7	81.6	79.5
PACKAGE DIMENSIONS W X H X D	in	28 3/4 x 11 1/2 x 26		39 1/4 x 37 1/16 x 14	39 1/4 x 37 1/16 x 14 9/16

SPECIFICATIONS

Product Specifications Multi-Zone Concealed Ducted

PERFORMANCE RATINGS		Multizone - The Insider™ Concealed Ducted Heat Pumps		
		9k	12k	18k
INDOOR MODEL		FPHFD09A3A	FPHFD12A3A	FPHFD18A3A
SPECIFICATIONS				
CAPACITY COOLING (RATED)	Btu	9,000	12,000	18,000
CAPACITY HEATING (RATED)	Btu	10,000	12,500	19,000
MOISTURE REMOVAL	Pts/h	1.9	3.2	3.2
Max Airflow (@0.1 E.S.P.)	CFM	294	353	529
SOUND RATING (MAX.-MIN.)	dB-A	33/26	34/27	35/31
ELECTRICAL DATA				
POWER SOURCE	V, Ø, Hz	208-230, 1, 60	208-230, 1, 60	208-230, 1, 60
POWER AND COMMUNICATION CABLE	TYPE	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN
REFRIGERATION SYSTEM				
CONNECTIONS		Flare	Flare	Flare
LIQUID LINE O.D.	in	1/4	1/4	1/4
SUCTION LINE O.D.	in	3/8	3/8	1/2
DIMENSIONS & WEIGHT				
W X H X D	in	35 7/8 x 7 7/16 x 17	35 7/8 x 7 7/16 x 17	46 7/16 x 7 1/2 x 17 1/2
NET WEIGHT	lbs	45.2	45.2	66.2
SHIPPING WEIGHT	lbs	51.8	51.8	77.2
<p>NOTE:</p> <p>1. Test conditions Cooling: Indoor: DB80°F(26.7)/ WB67°F(19.4) Outdoor: DB95°F(35)/ WB75°F(23.9) Heating: Indoor: DB70°F(21.1)/ WB60°F(15.6) Outdoor: DB47°F(8.3)/ WB43°F(6.1)</p> <p>2. The Sound Pressure Level is based on the following conditions: Indoor unit Duct: Measure the noise value of the point 4.6ft(1.4m) below the unit and 3.3ft(1.0m) high from the ground.</p> <p>3. The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific application environment.</p> <p>4. All specifications are subjected to change by the manufacturer without prior notice.</p>				

SPECIFICATIONS

Product Specifications 18K, 24k and 36k Outdoor Condensor

Multi-Zone Flex				2 Indoor units	2 or 3 indoor units	2 to 4 indoor units	2 to 5 indoor units
Model Name				FPHMR18A3A	FPHMR24A3A	FPHMR36A3A	FPHMR42A3A
Gas				R410A	R410A	R410A	R410A
Capacity	Cooling Capacity	95 °F	Btu/h	18000	24000	32000	42000
		47 °F	Btu/h	18000	24000	36000	42000
	Heating Rated Capacity	17 °F	Btu/h	12200	15400	22800	24000
		17 °F	Btu/h	20000	26000	40000	40000
	Heating Maximum Capacity	5 °F	Btu/h	18000	24000	36000	36000
			Btu/h	18000(7500~24000)	24000(8000~30200)	32000(12000~42000)	"42000 (9000~50000)"
		Btu/h	18000(5800~28700)	24000(5200~37000)	36000(8000~52000)	42000 (9000~52000)	
Air flow			CFM	3150	4000	5000	5800
			m3/h	1850	2353	2941	3411
EER			Btu/W•h	12.5	12.5	12.5	10.5
COP			Btu/W•w	3.45	3.66	3.37	3.17
COP			Btu/ W•h	11.77	12.49	11.50	10.82
SEER			Btu/W•h	22	22	21	20
HSPF			Btu/W•h	11.0	11	11	10.0
Noise Level			dB(A) (Max)	55	59	59	63
Operating Range	Cooling	°F	14~114.8	14~114.8	14~114.8	14~114.8	
		°C	-10~46	-10~46	-10~46	-10~46	
	Heating	°F	-13~75.2	-13~75.2	-13~75.2	-4~75.2	
		°C	-25~24	-25~24	-25~24	-20~24	
Compressor model	Model	EATF200D22UMT		EATF250D22UMT	EATF400D42UMT	EATF400D42UMT	
	Brand	GMCC		GMCC	GMCC	GMCC	
Electrical Data							
Power			V/Hz/ph	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
Power input	Cooling	95 °F	W (Rated Range)	1440(510~2610)	1920 (420~2640)	2520(700~5000)	4060(660~5550)
	Heating	47 °F	W Rated Range)	1530(450~3510)	1920 (420~4020)	3060(600~6000)	3690(530~6450)
Rated current	Cooling	95 °F	A Rated Range)	6.5	8.7	11	17.5
	Heating	47 °F	A Rated Range)	7.3	8.7	13	16
Minimum Ampacity			A	21	25	32	35
Max. TD Fuse / Breaker			A	30	30	50	50
<p>1. Test conditions Cooling : Indoor: DB80 °C/ WB 67°F Outdoor: DB95 °C/ WB75°F Heating: Indoor: DB70 °C/ WB 60°F Outdoor: DB47 °C/ WB 43 °F</p> <p>2. The Sound Pressure Level is based on the following conditions: Outdoor unit: Measure the noise value of 3 points, the points are 3'(ft) in front of the three sides of the unit surface. (front/left/right)and height =1/2(unit height +3) ft from floor level, and calculate the weighted average of the noise.</p> <p>3. The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific application environment.</p> <p>4. All specifications are subjected to change by the manufacturer without prior notice.</p>							

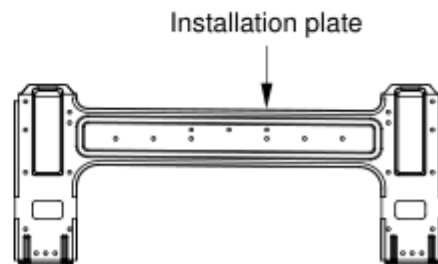
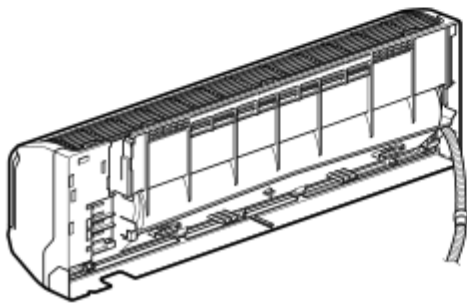
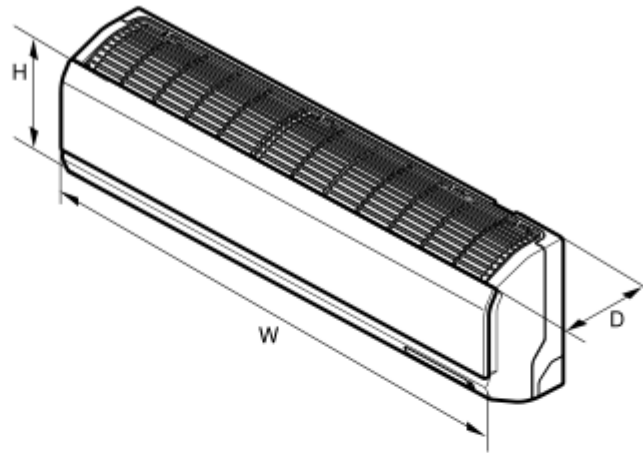
SPECIFICATIONS

Product Specifications 18K, 24k and 36k Outdoor Condensor

Multi-Zone Flex		2 Indoor units	2 or 3 indoor units	2 to 4 indoor units	2 to 5 indoor units
Model Name		FPHMR18A3A	FPHMR24A3A	FPHMR36A3A	FPHMR42A3A
Dimension & Weight					
Net Dimension (WxHxD)	inch	39x17 3/4x28 3/4	43 3/8x18 1/8x36 1/4	43 3/8x18 1/8x47 1/4	43 3/8x18 1/8x47 1/4
Net Weight	lbs	108.0	158.73	188.5	85.5
Package Dimension (WxHxD)	inch	39x17 3/4x28 3/4	43-3/8x18-1/8x36-1/4	43-3/8x18-1/8x47-1/4	43 3/8x18 1/8x47 1/4
Gross Weight	lbs	119	169.76	220.5	220.5
Piping	Diameter(Liquid)	inch	1/4	1/4	1/4
	Diameter(Gas)	inch	3/8	3/8	3/8
	Min/Max Length (Each)	ft	25/82	25/66	25/66
	Max Length (Total)	ft	164	197	246
	Max Height	ft	49	49	49
Factory Refrigerant Charge	oz	63.49	81.13	105.82	120
Additional Refrigerant Charge Note: refer to table 433.1 in the Installation section for details. Installations using 24k indoor units require additional calculations.	oz/ft	(L-50 ft * 0.16 oz./ft)	(L-75 ft * 0.16 oz./ft)	(L-100 ft * 0.16 oz./ft)	(L-125 ft * 0.16 oz./ft)
<p>1. Test conditions Cooling : Indoor: DB80 °C/ WB 67°F Outdoor: DB95 °C/ WB75°F Heating: Indoor: DB70 °C/ WB 60°F Outdoor: DB47 °C/ WB 43 °F</p> <p>2. The Sound Pressure Level is based on the following conditions: Outdoor unit: Measure the noise value of 3 points, the points are 3'(ft) in front of the three sides of the unit surface. (front/left/right)and height =1/2(unit height +3) ft from floor level, and calculate the weighted average of the noise.</p> <p>3. The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific application environment.</p> <p>4. All specifications are subjected to change by the manufacturer without prior notice.</p>					

SPECIFICATIONS

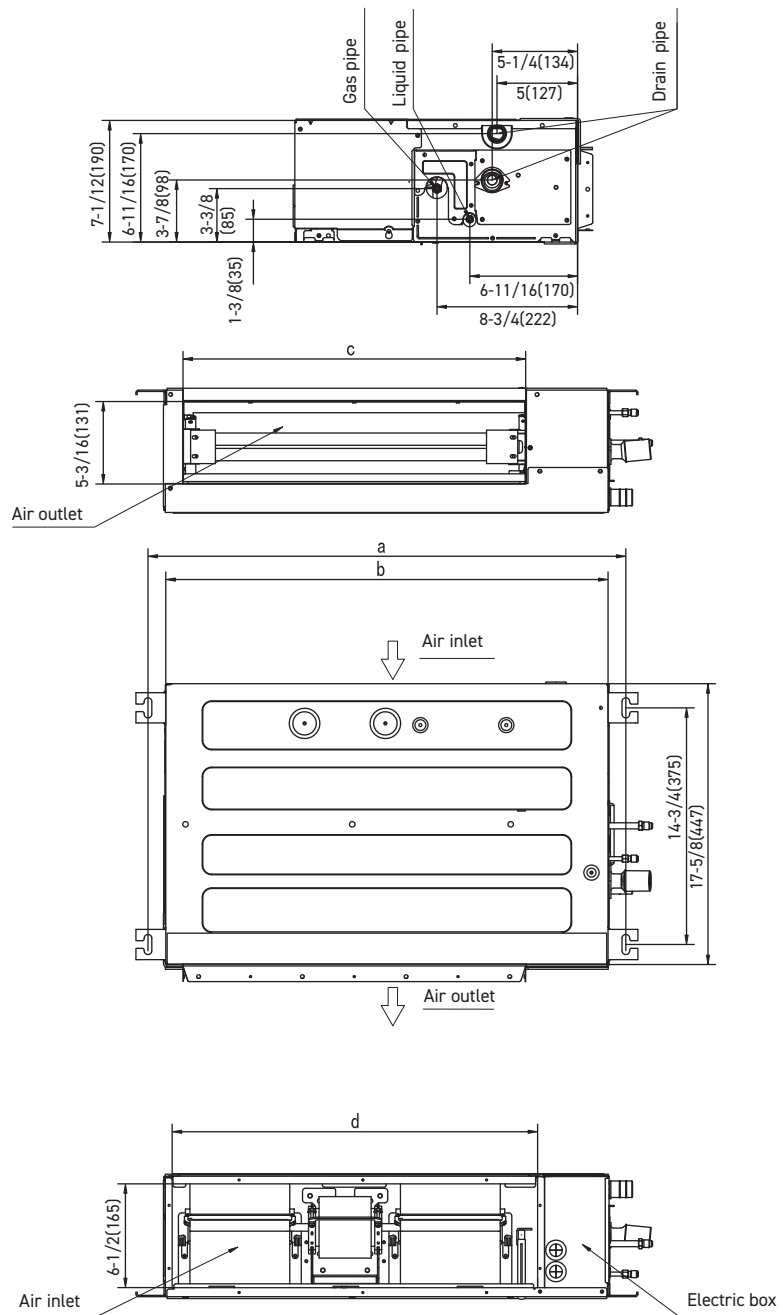
Product Dimensions: Wall Mounted Indoor Units



Model	Width	Height	Depth
FPHFW07A3A/B	33 7/8 "(Inches)	11 3/16 "(Inches)	8 1/2 "(Inches)
FPHFW09A3A/B	33 7/8 "(Inches)	11 3/16 "(Inches)	8 1/2 "(Inches)
FPHFW12A3A/B	33 7/8 "(Inches)	11 3/16 "(Inches)	8 1/2 "(Inches)
FPHFW18A3A/B	45 3/16 "(Inches)	13 1/8 "(Inches)	9 15/16 "(Inches)
FPHFW24A3A/B	45 3/16 "(Inches)	13 1/8 "(Inches)	9 15/16 "(Inches)

SPECIFICATIONS

Product Dimensions: 9k, 12k, and 18k Ducted Indoor Units



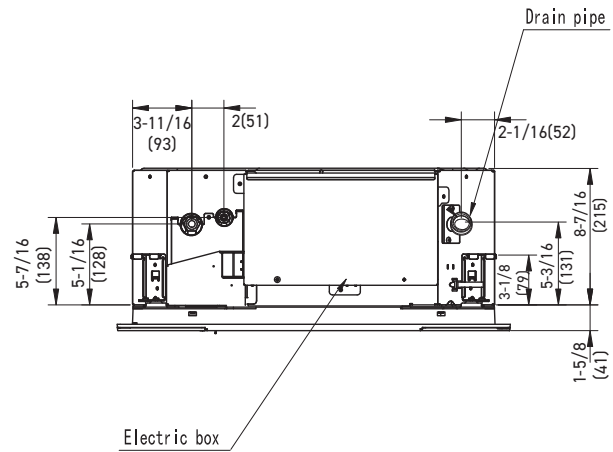
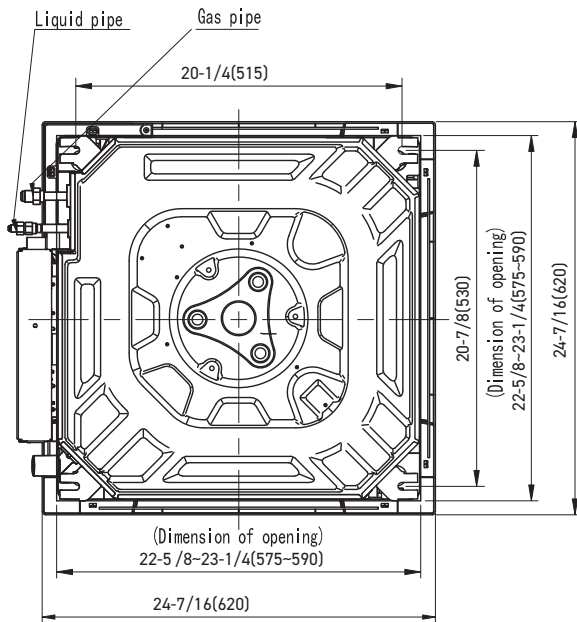
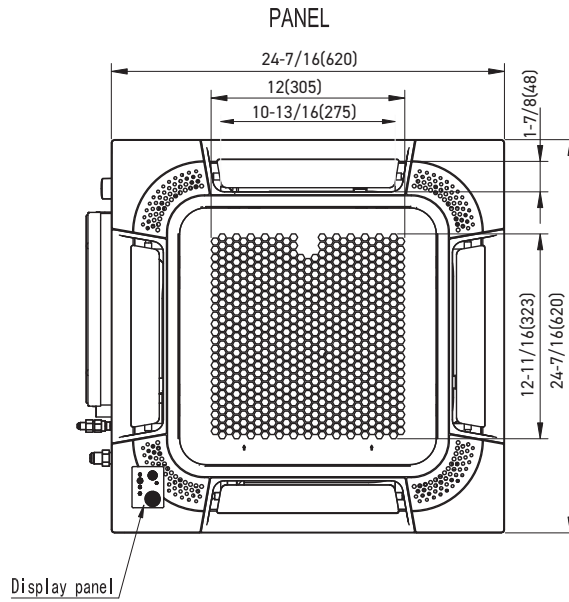
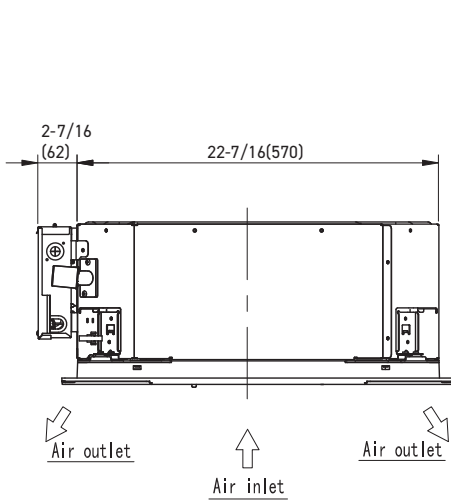
Unit: Inches “ (mm)

Model (Btu/h)	a	b	c	d
9K/12K	$37-13/16$ (961)	$35-13/16$ (910)	$29-1/2$ (749)	30 (786)
18K	$48-7/16$ (1231)	$46-7/16$ (1180)	$40-1/8$ (1019)	$41-5/8$ (1056)

SPECIFICATIONS

Product Dimensions: 9k and 12k Cassette

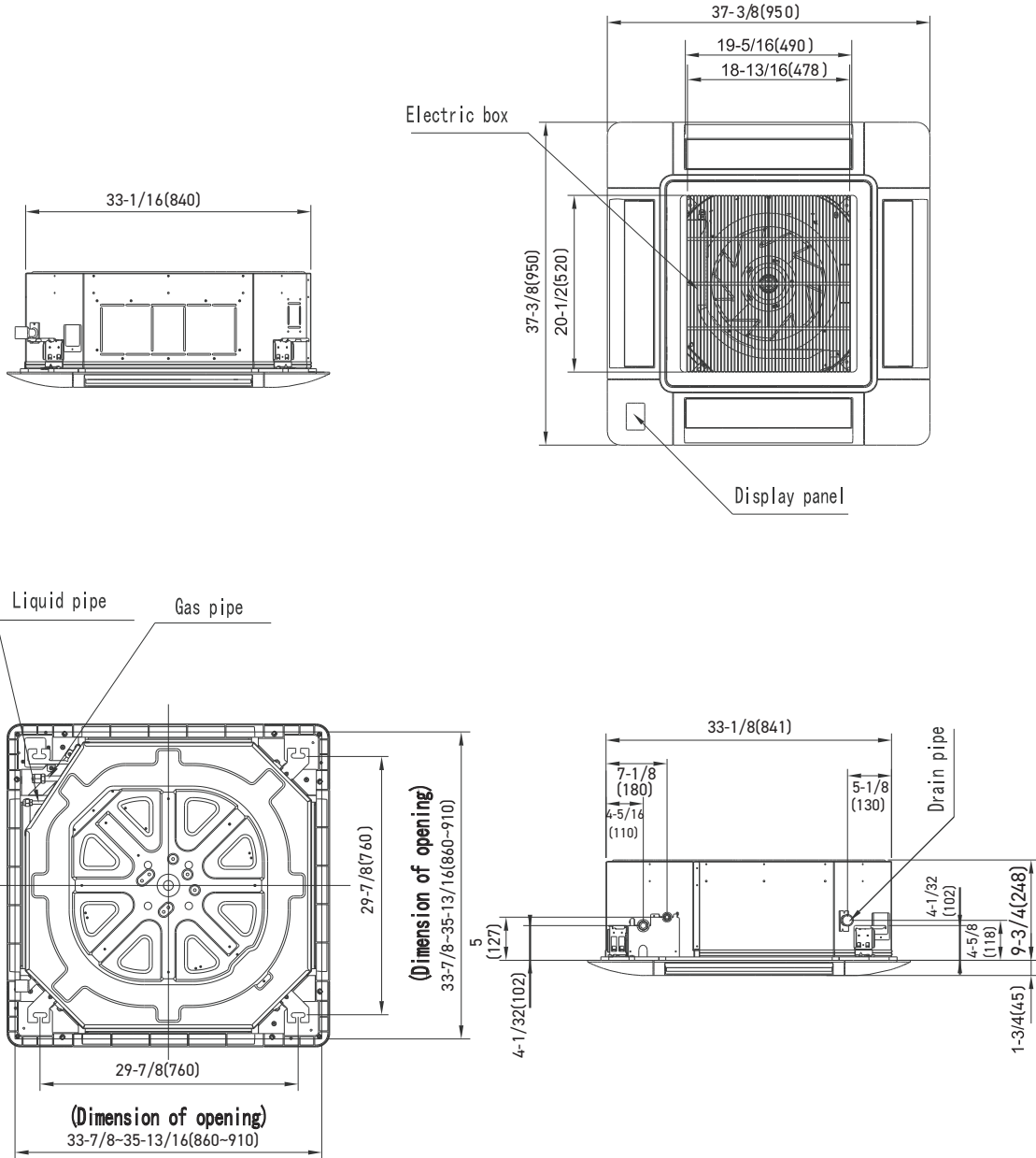
Unit: Inches “ (mm)



SPECIFICATIONS

Product Dimensions: 18k and 24k Cassette

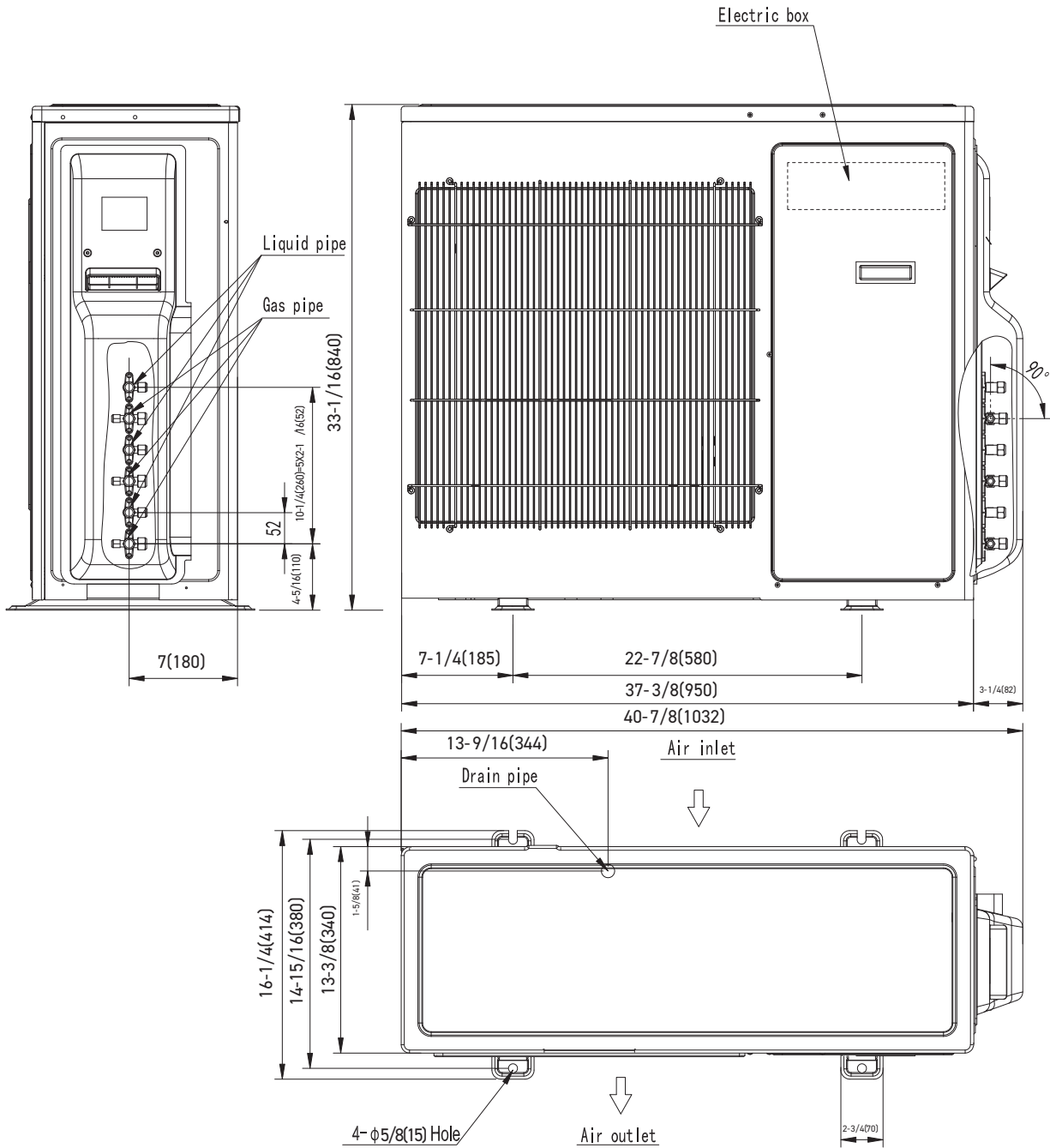
Unit: Inches “ (mm)



SPECIFICATIONS

Product Dimensions: 24k Outdoor Units

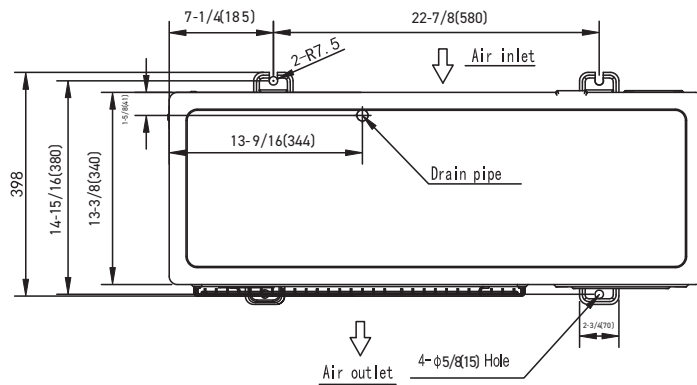
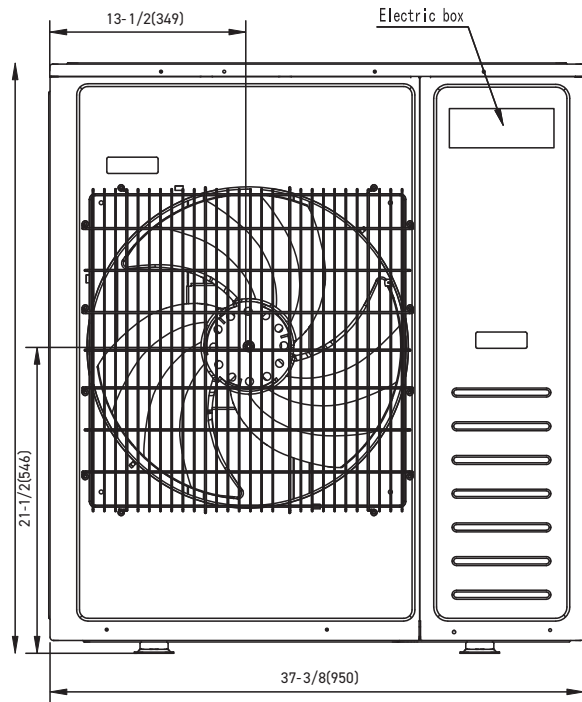
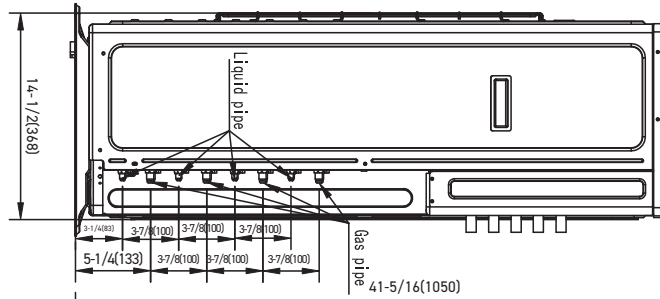
Unit: Inches “ (mm)



SPECIFICATIONS

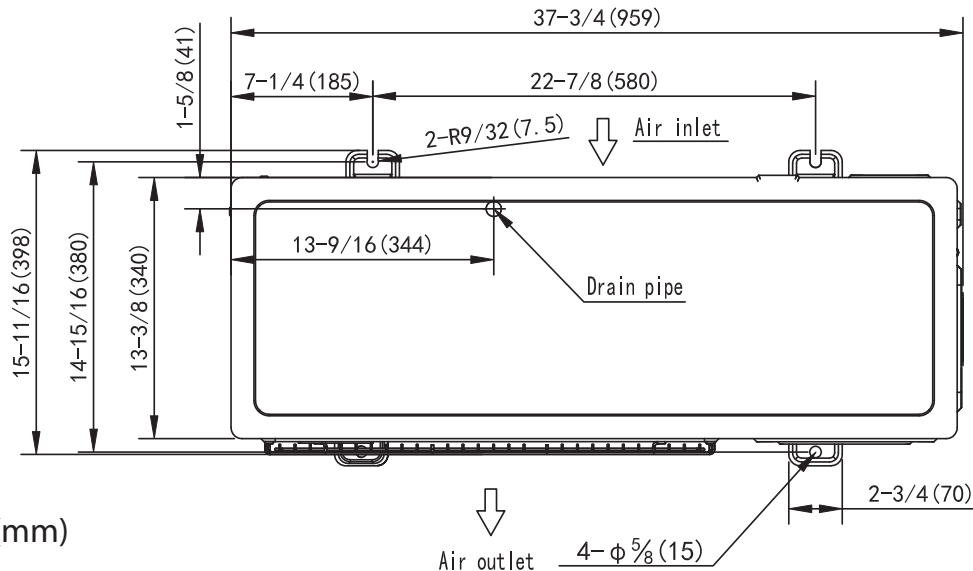
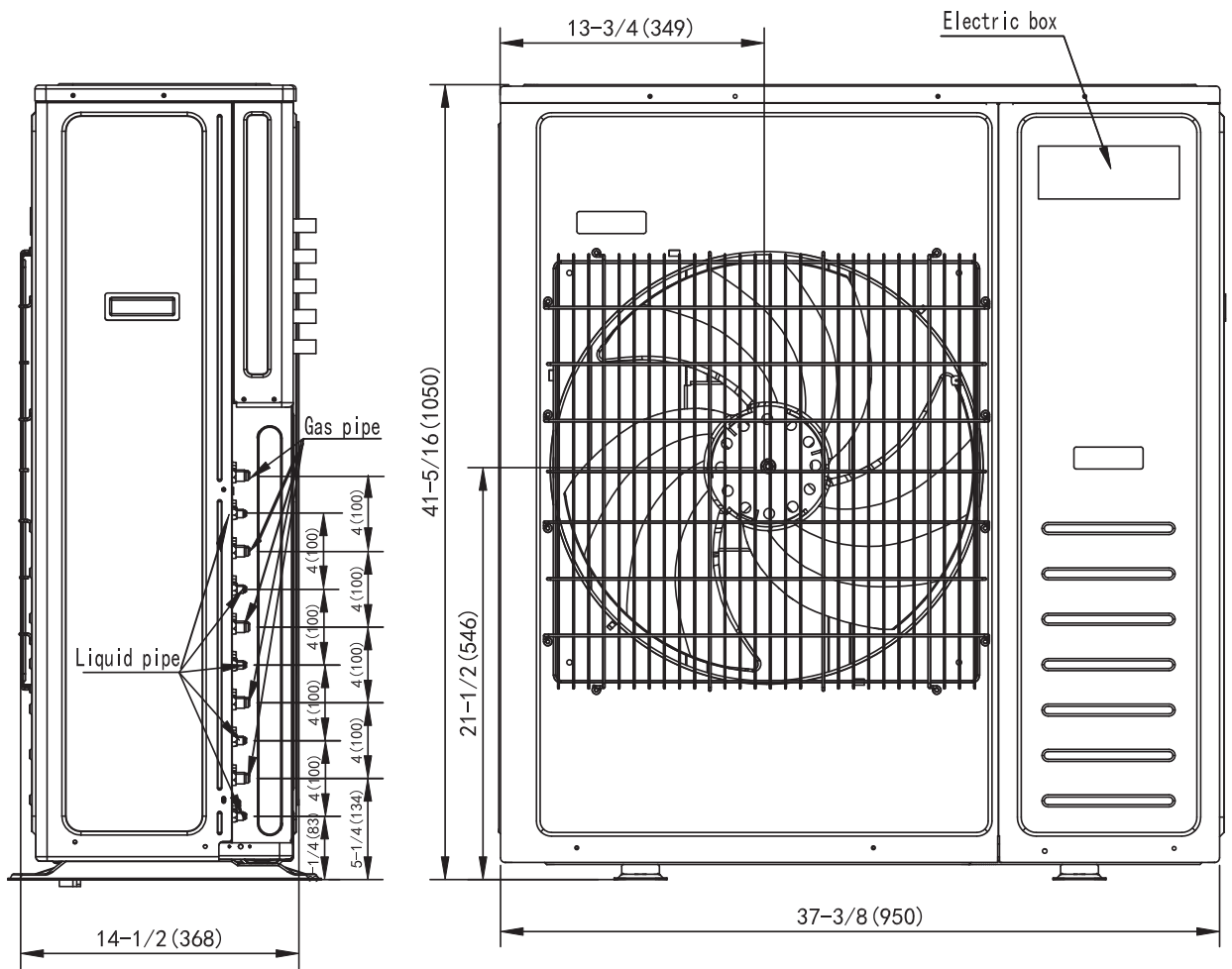
Product Dimensions: 36k Outdoor Units

Unit: Inches" (mm)



SPECIFICATIONS

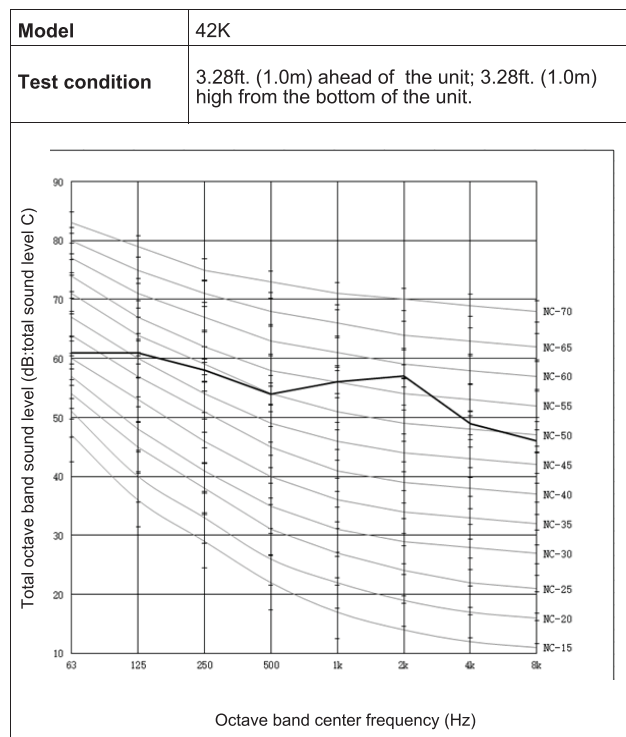
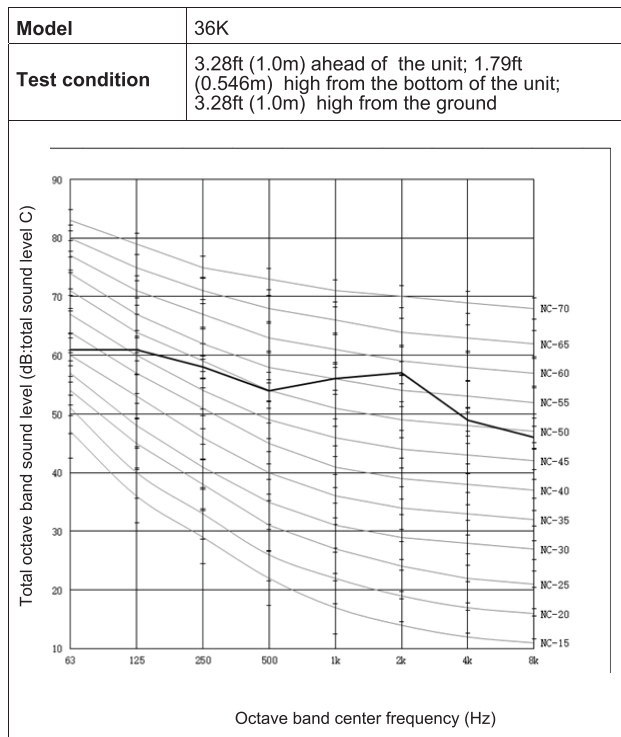
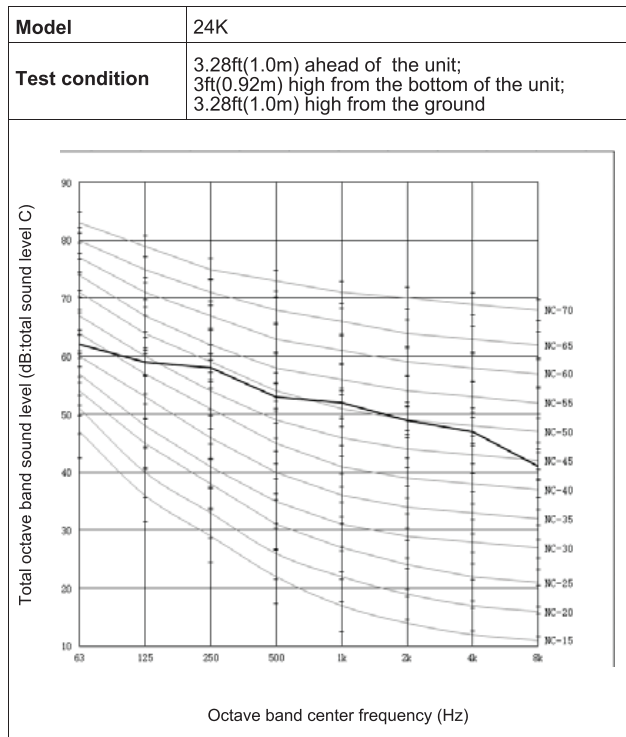
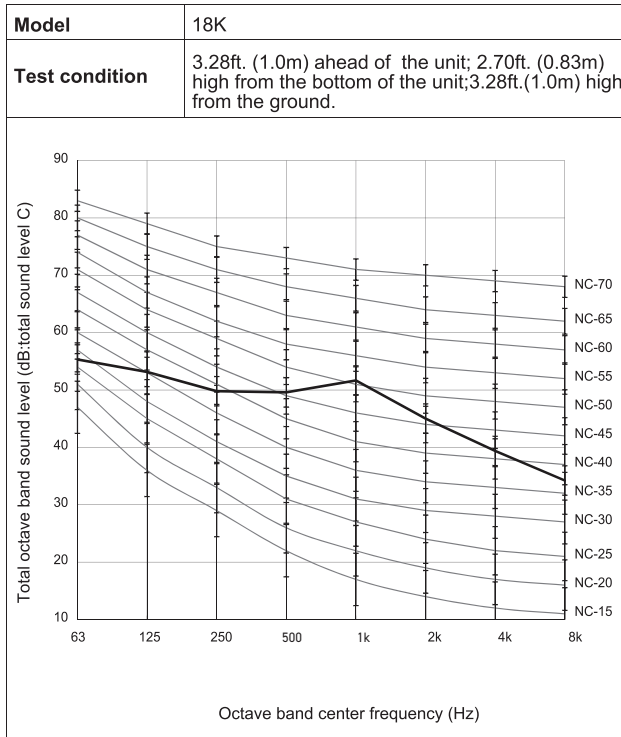
Product Dimensions: 42k Outdoor Units



Unit : Inches" (mm)

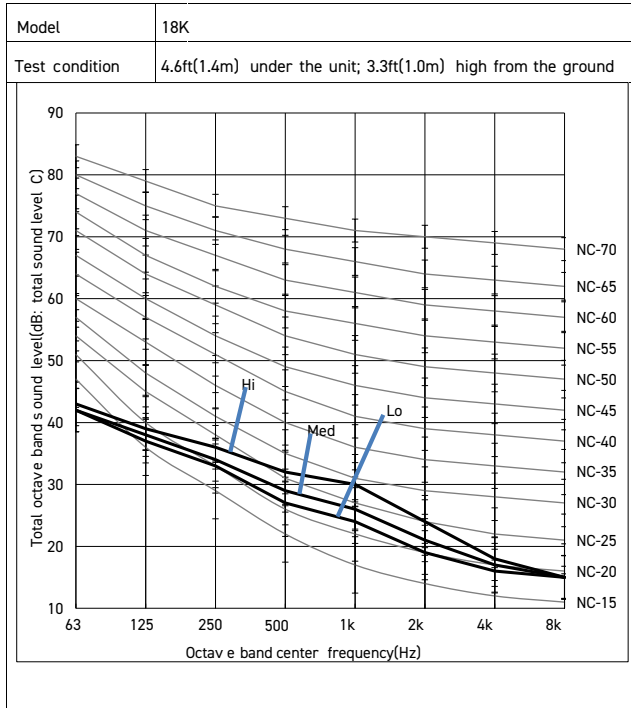
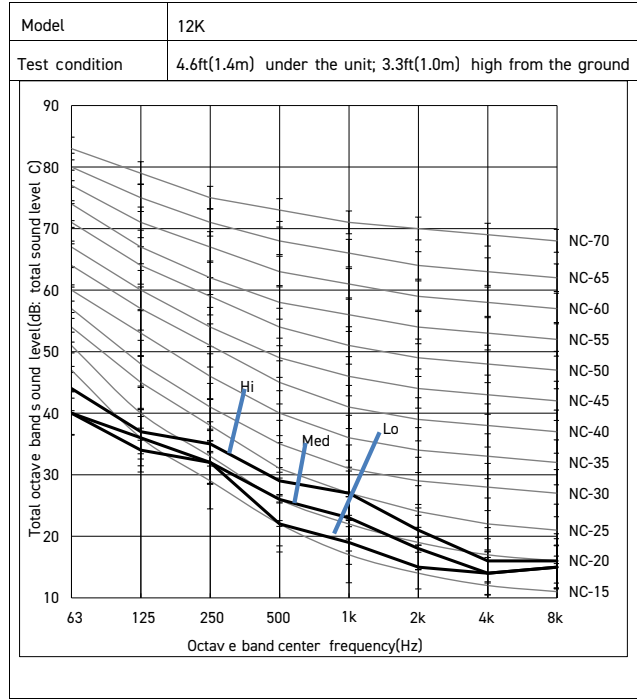
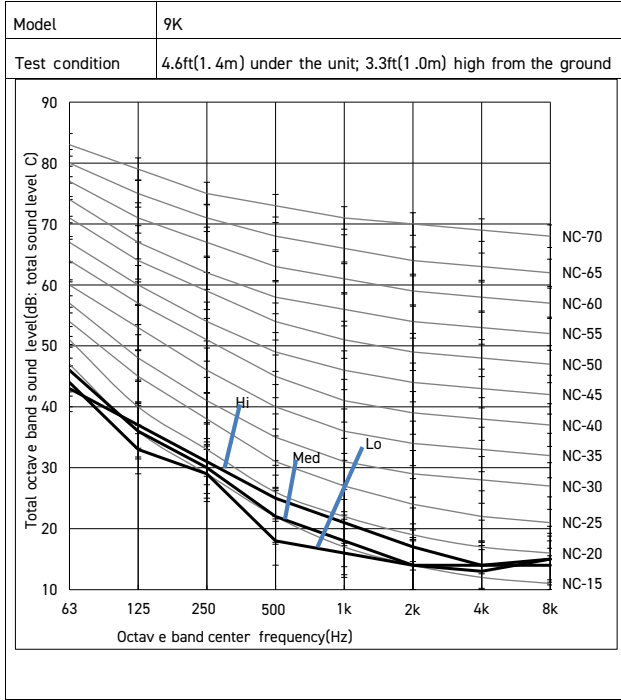
SPECIFICATIONS

Sound Pressure Data Outdoor Units



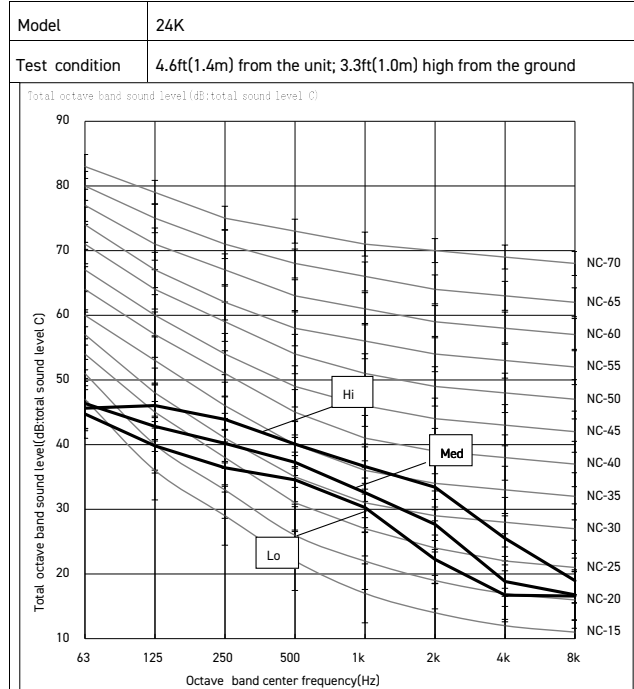
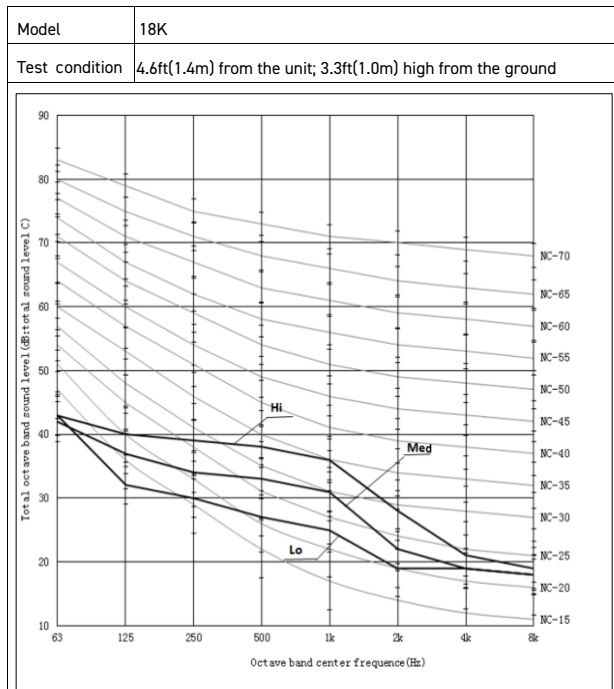
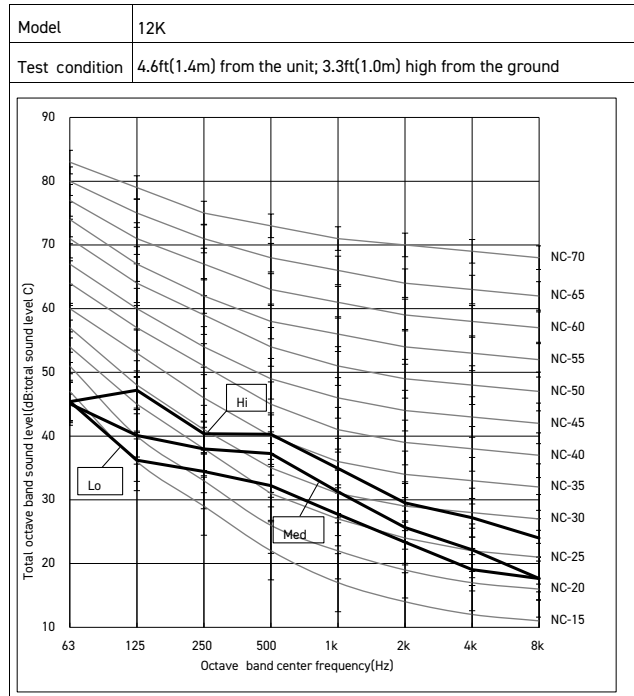
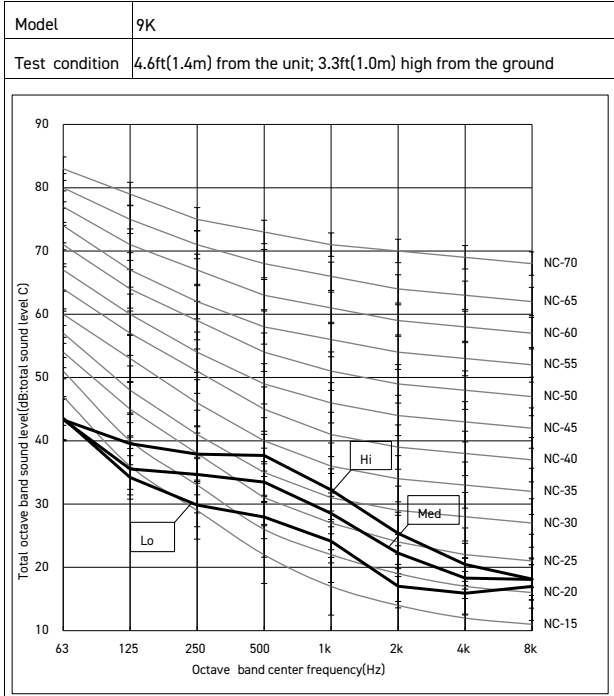
SPECIFICATIONS

Sound Pressure Data Indoor Ducted Units



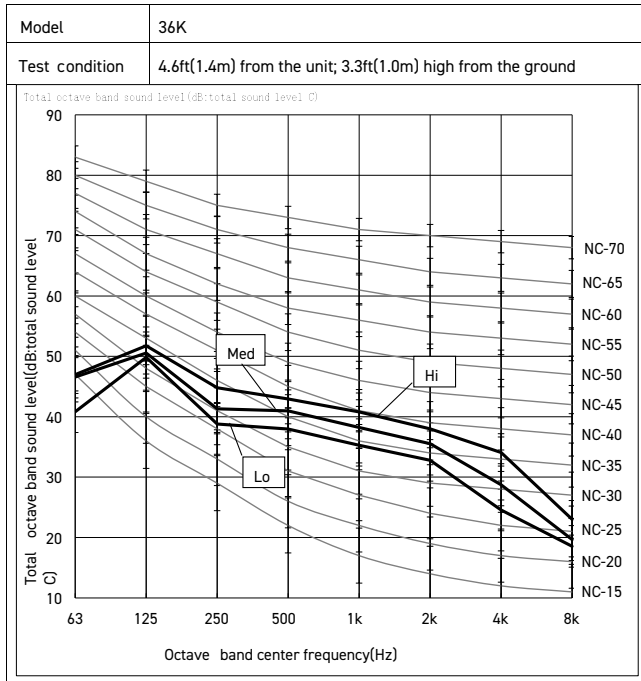
SPECIFICATIONS

Sound Pressure Data Cassettes



SPECIFICATIONS

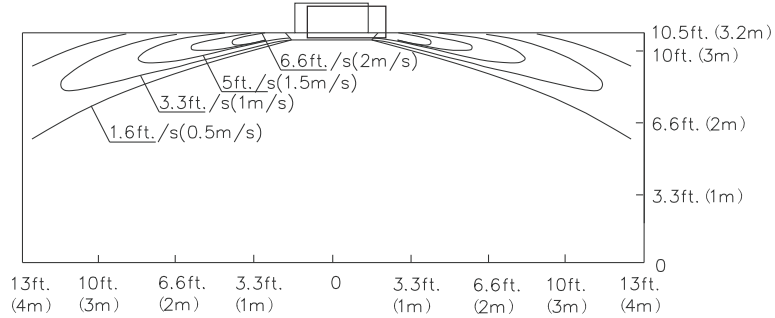
Sound Pressure Data Cassettes



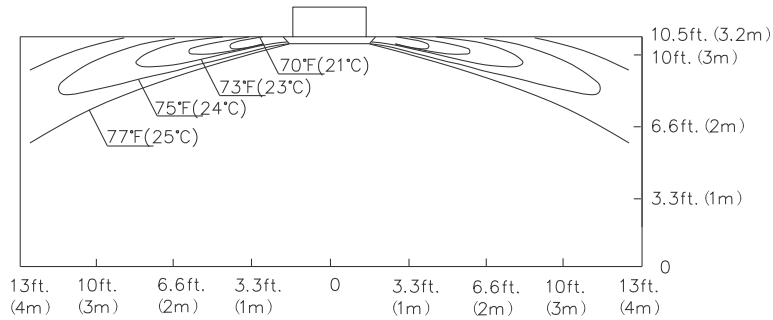
SPECIFICATIONS

Air Flow Distribution 24k Cassette

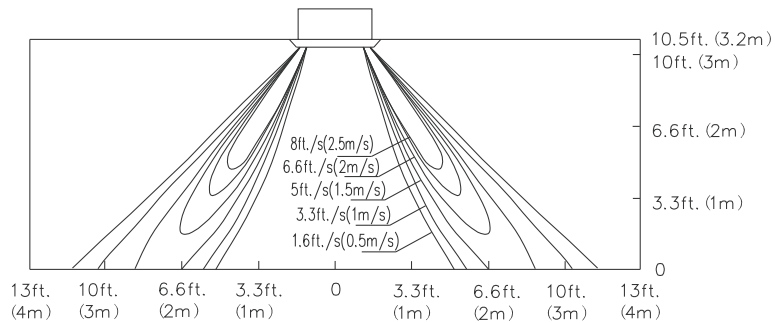
1) Cooling/Air Velocity Distribution



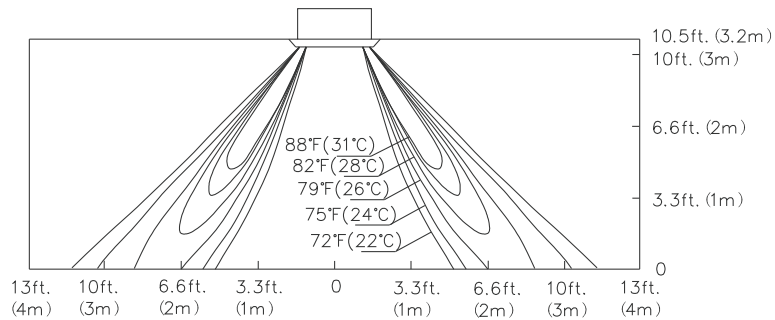
2) Cooling/ Air Temperature Distribution



3) Heating/ Air Velocity Distribution

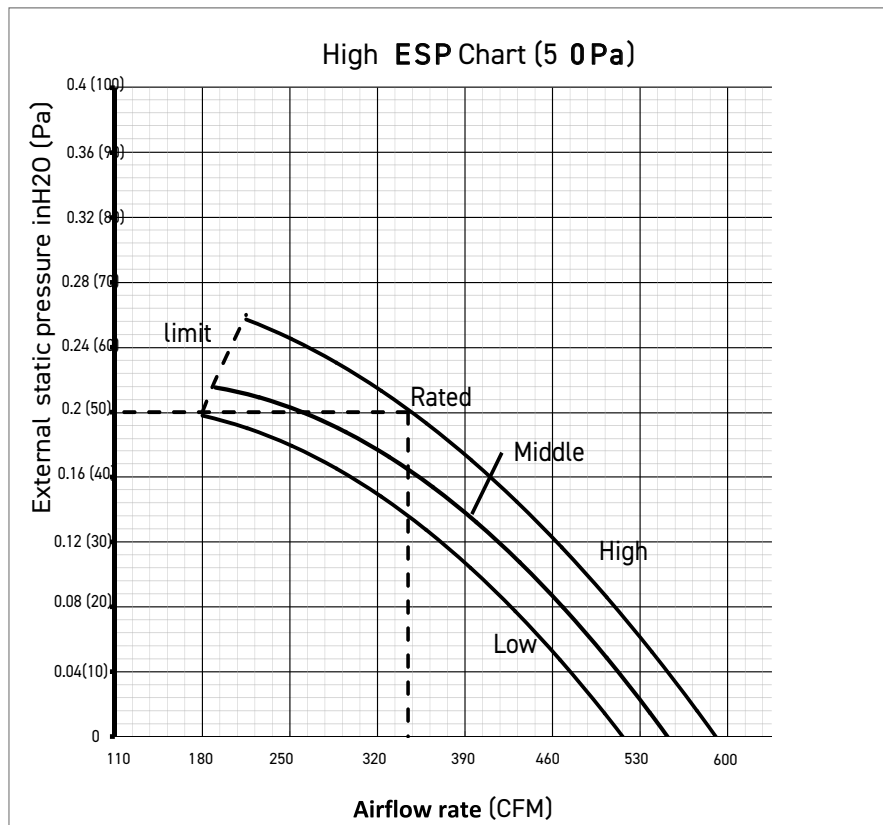
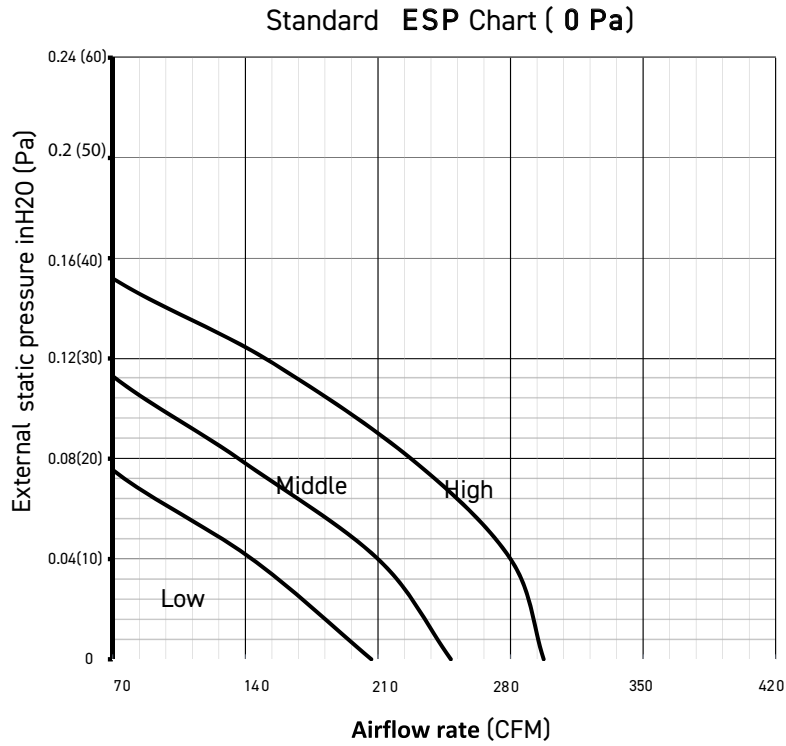


4) Heating/ Air Temperature Distribution



SPECIFICATIONS

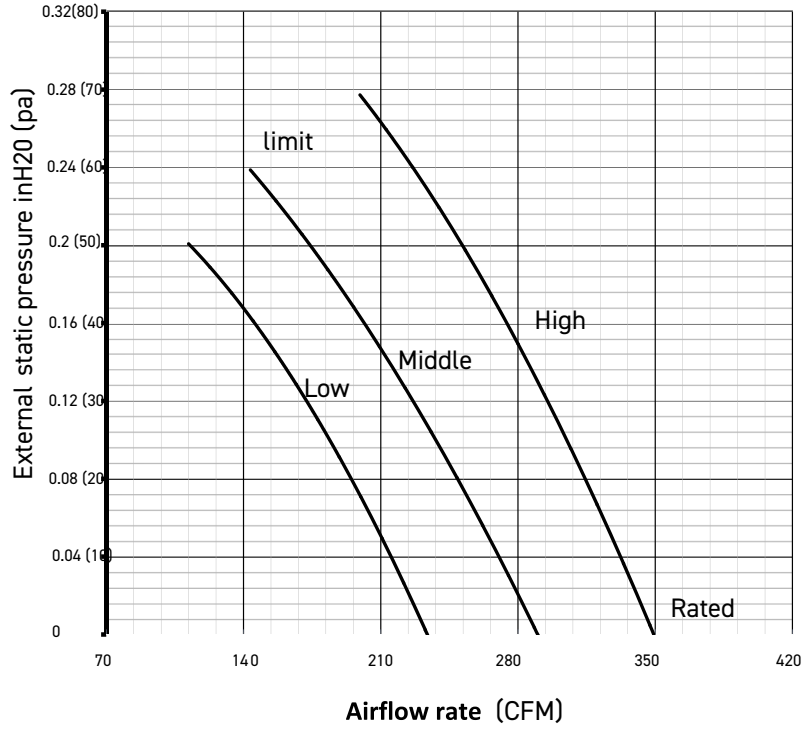
ESP (External Static Pressure) chart (Duct Type) 9k



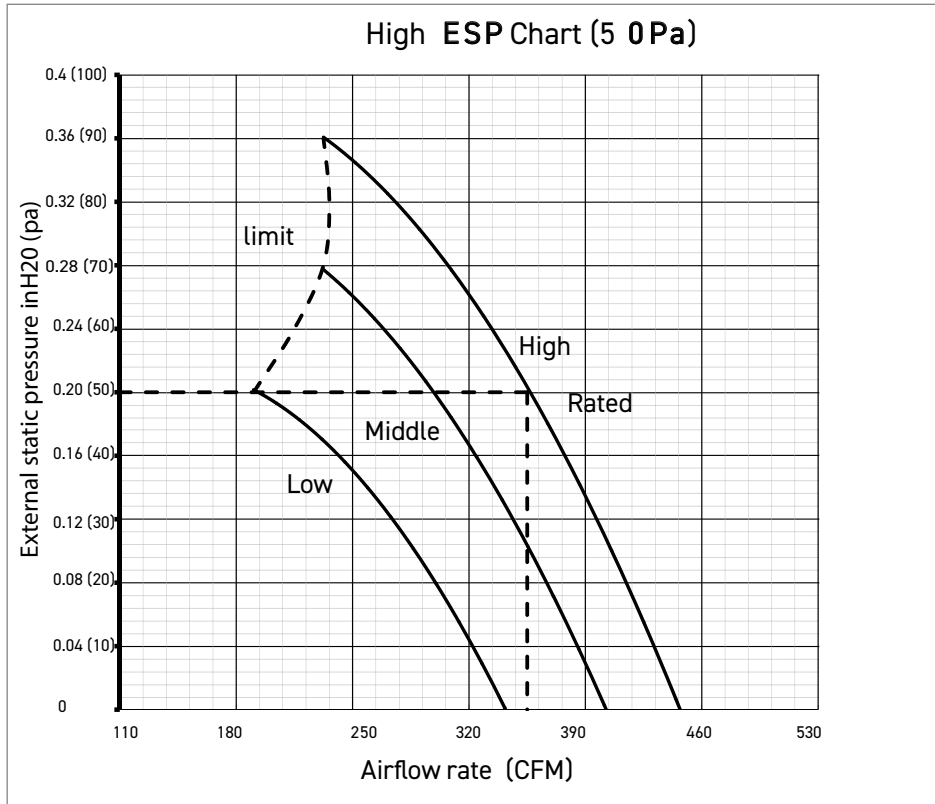
SPECIFICATIONS

ESP (External Static Pressure) chart (Duct Type) 12k

Standard ESP Chart (0 Pa)

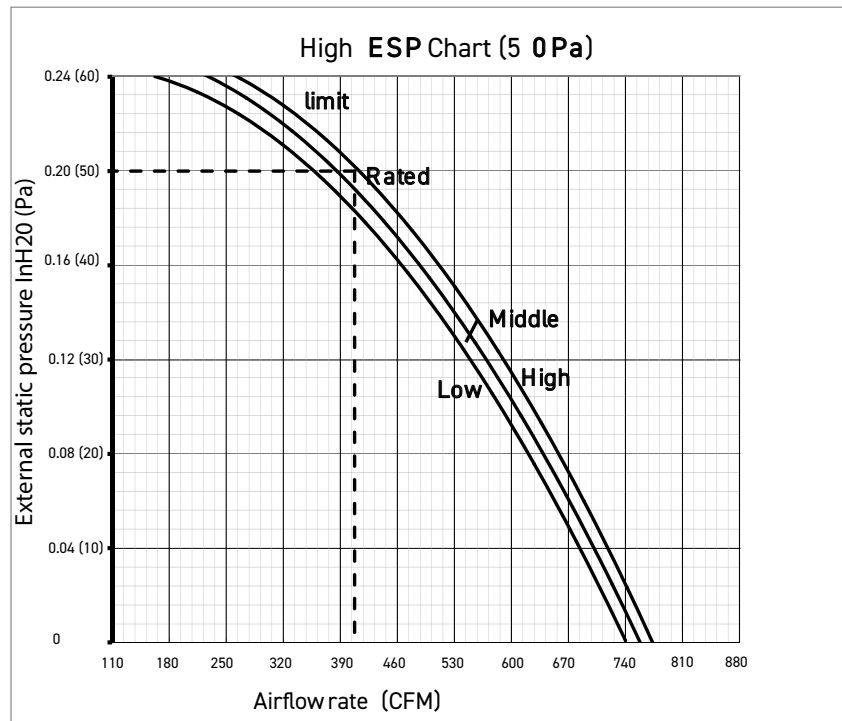
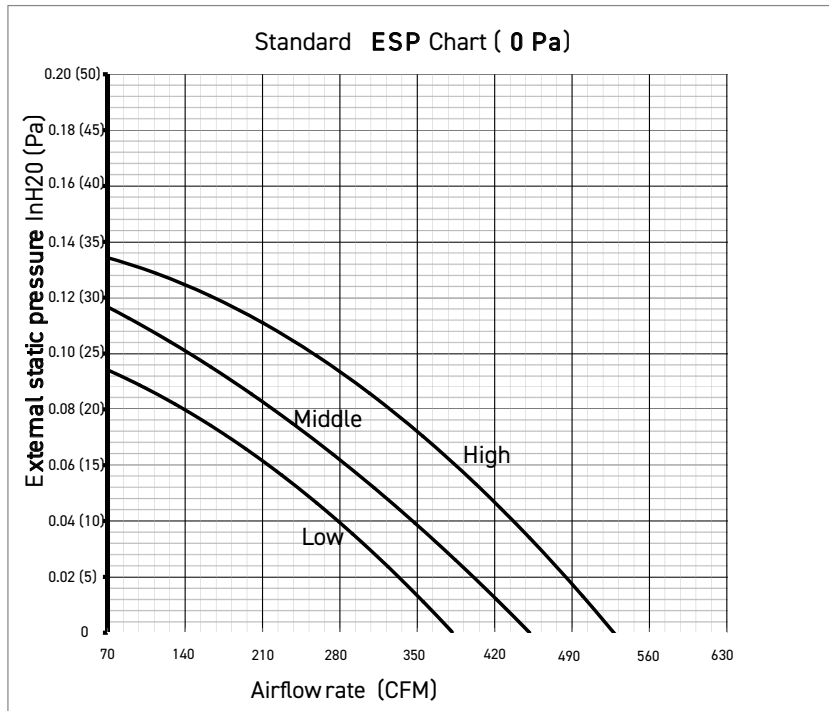


High ESP Chart (5 0 Pa)



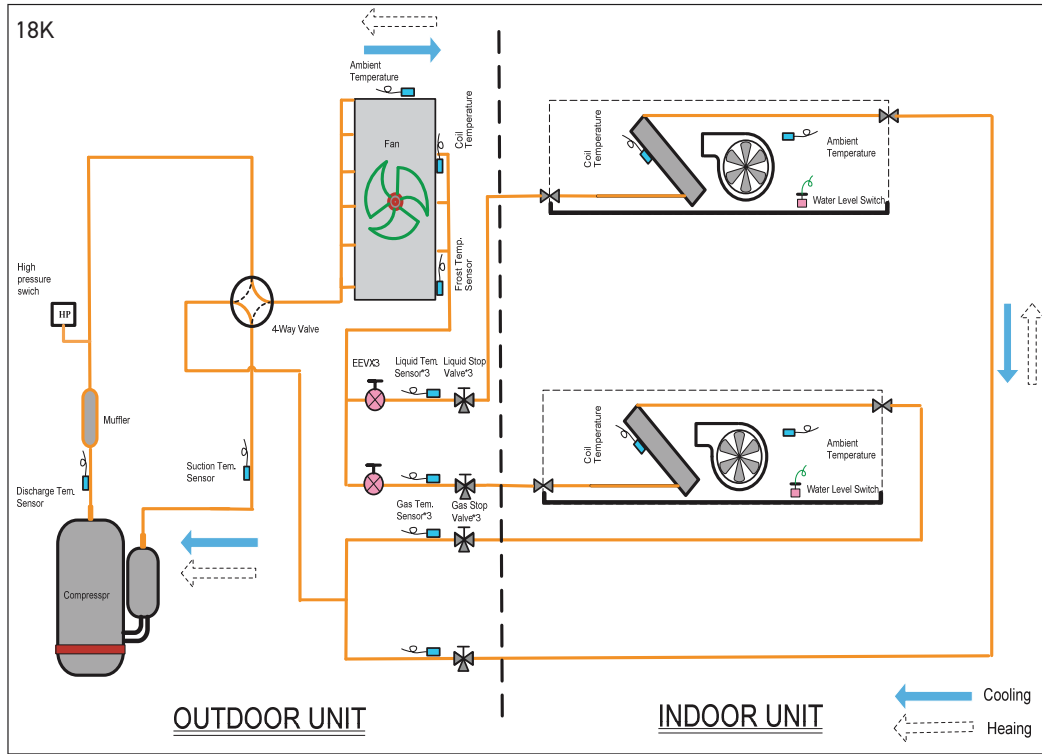
SPECIFICATIONS

ESP (External Static Pressure) chart (Duct Type) 18k

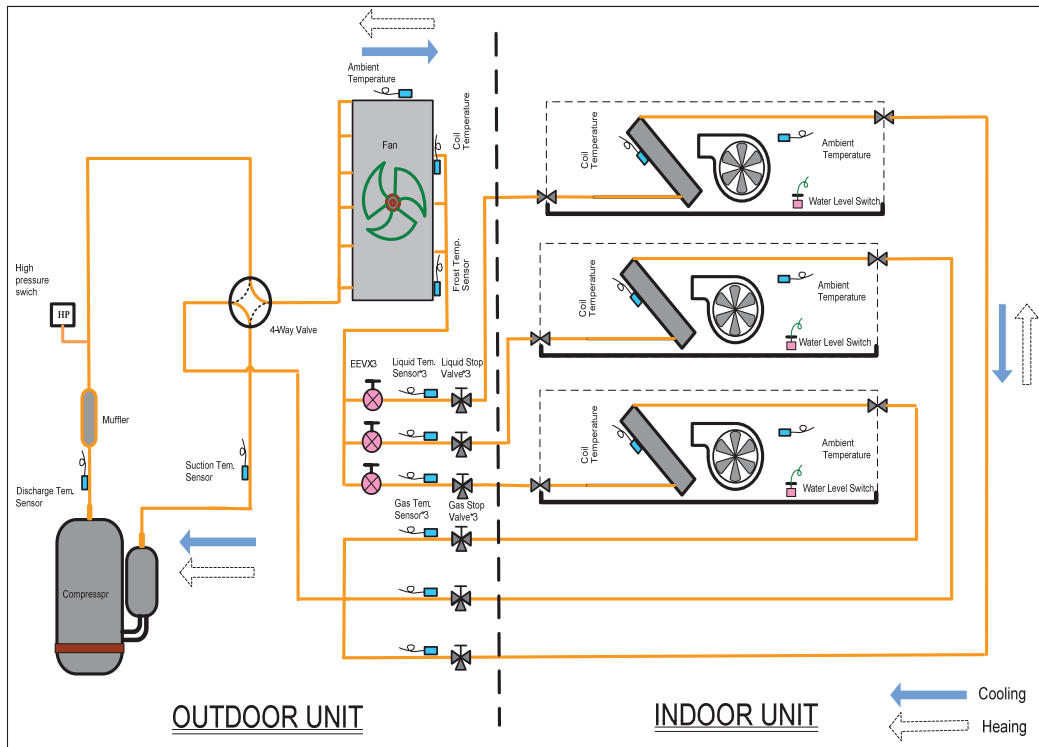


SPECIFICATIONS

Refrigerant Cycle 18k and 24k Outdoor Units



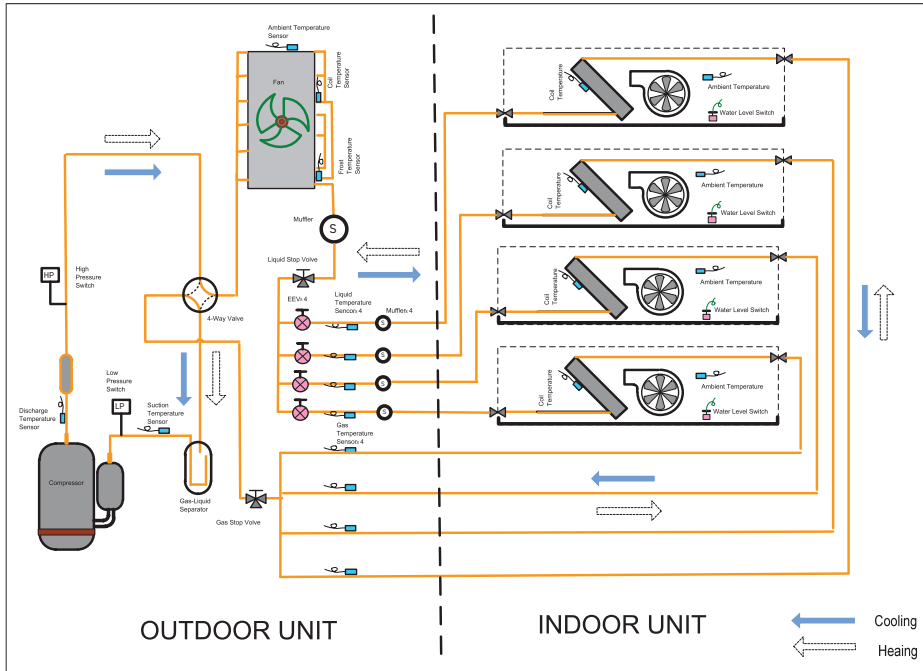
24K



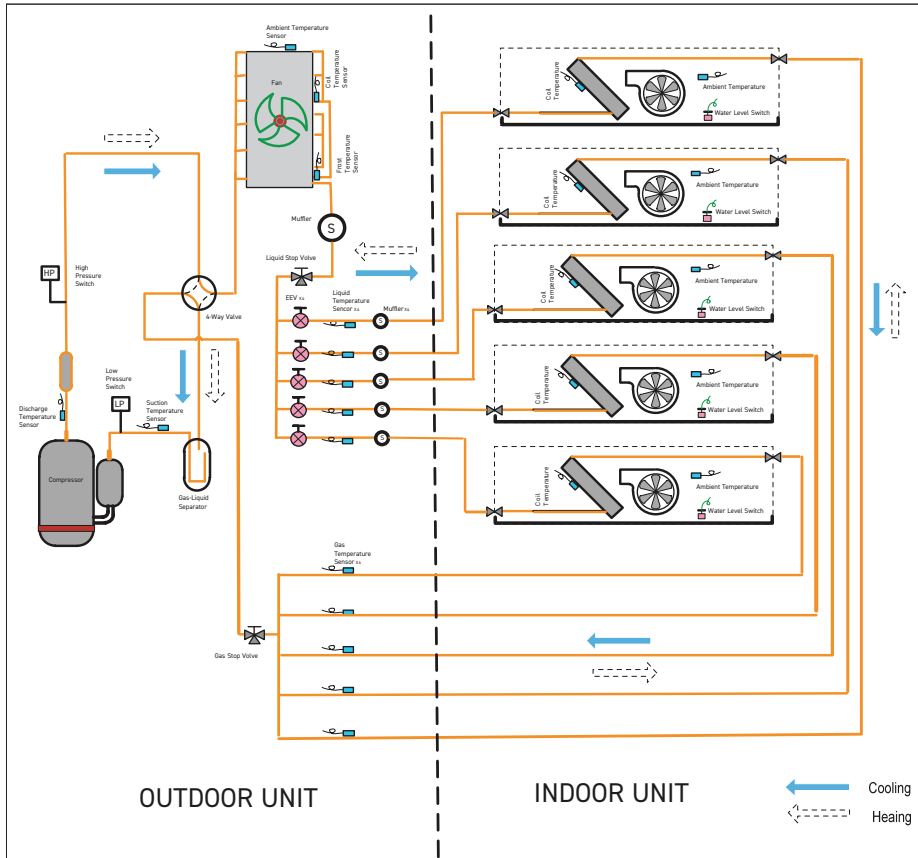
SPECIFICATIONS

Refrigerant Cycle 36k and 42k Outdoor Units

36K

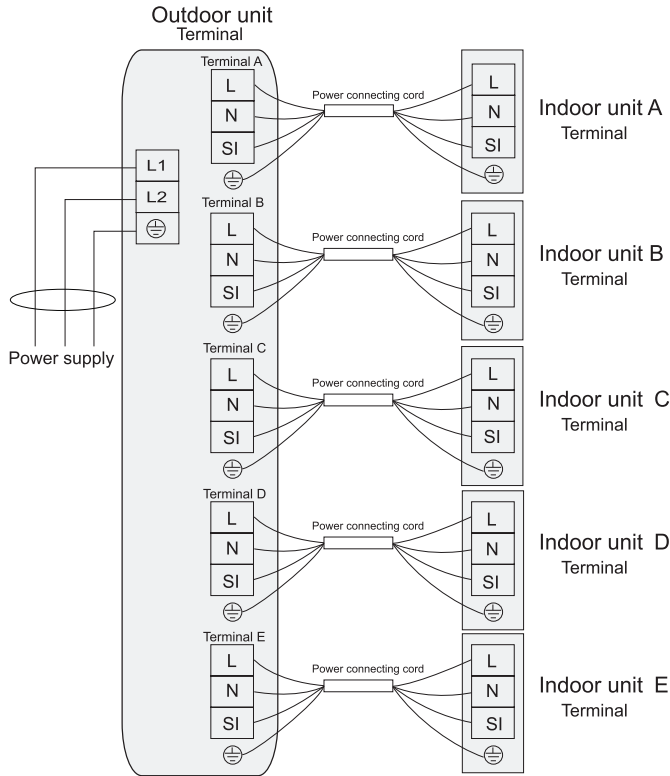


42K

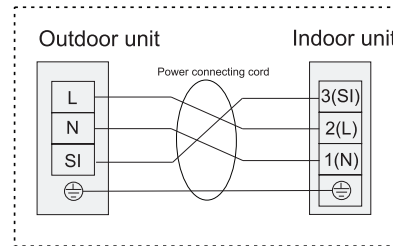


SPECIFICATIONS

Electrical Requirements 24k, 36K, AND 42K Outdoor Units



Note: For some indoor units



NOTES:

1. For 18K model, there is no INDOOR UNIT C, D and E.
2. For 24K model, there is no INDOOR UNIT D and E.
3. For 36K model, there is no INDOOR UNIT E.

Recommended wire size

Model (Capacity: Btu/h)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)			
18K	208/230V ~/60Hz	30	30	14AWG 2cable+Ground	14 AWG 3cable+Ground	30
24K	208/230V ~/60Hz	30	30	12AWG 2cable+Ground	14 AWG 3cable+Ground	30
36K	208/230V ~/60Hz	50	30	10AWG 2cable+Ground	14 AWG 3cable+Ground	50
42K	208/230V ~/60Hz	50	30	10AWG 2cable+Ground	14 AWG 3cable+Ground	50

Max. Running Current (A): REFER TO NAMEPLATE

NOTE:

- Use cooper power supply wires.
- Follow local codes and regulations when select field wires, and all the above are the minimum wire size.
- When transmitting cable length is longer than 49 ft. (15m), a larger wire size should be selected.
- Install main switch and ELB for each system separately. Select the high response type ELB that acts within 0.1second.

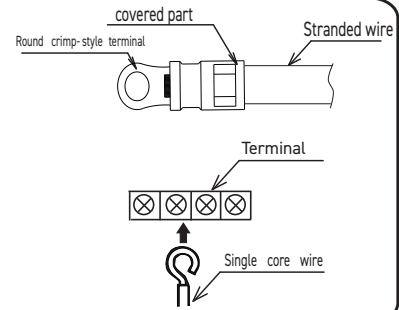
SPECIFICATIONS

Electrical Requirements 24k, 36K, AND 42K Outdoor Units

- (1) Follow local codes and regulations when selecting wire size and breakers

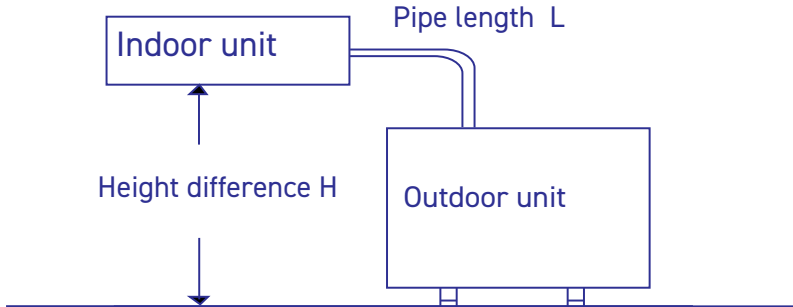
IMPORTANT

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



CORRECTION FACTORS

Piping Length Correction Factor



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

IMPORTANT: Height correction factor is used BEFORE length correction factor.

Height between indoor unit and outdoor unit (ft).

- $H > 0$: Position of outdoor unit is higher than position of indoor unit (ft).
- $H < 0$: Position of outdoor unit is lower than position of indoor unit (ft).

L:

Large pipe, one way length between indoor unit and outdoor unit (ft).

EL :

Equivalent one-way piping length between indoor unit and outdoor unit (ft).

90 Degree Bend Additional Feet Chart

Gas Diameter (mm/inch)	9.52 (3/8')	12.7 (1/2')	15.88 (5/8')
90° Elbow	0.15	0.2	0.25

Cooling

25ft(7.5m)	32.8ft(10m)	49ft(15m)	66ft(20m)
1	0.95	0.90	0.85

Heating

25ft(7.5m)	32.8ft(10m)	49ft(15m)	66ft(20m)
1	0.95	0.90	0.85

CORRECTION FACTORS

Piping Length Factor Chart

The correction factor of height between each indoor unit and outdoor unit

16ft(5m)	32.8ft(10m)	49ft(15m)	66ft(20m)	82ft(25m)	98ft(30m)
1.0	0.95	0.88	0.8	0.75	0.7

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

NOTE:

1. The above data reflects that the minimum height requirements have been met or exceeded during the installation. The height difference between the indoor and outdoor unit is based at 0ft/0m. Using reference chart above to calculate proper unit capacity.
2. Be sure to minimize length of connection pipes to optimize performance. If the outdoor unit is installed higher or lower than the indoor unit, it is necessary to apply height correction factor additionally to length correction factor to calculate cooling/heating.
If outdoor unit is higher, correction should be applied to cooling capacity, if outdoor unit is lower, correction should be applied to heating capacity.

CORRECTION FACTORS

Piping Length Correction Factor

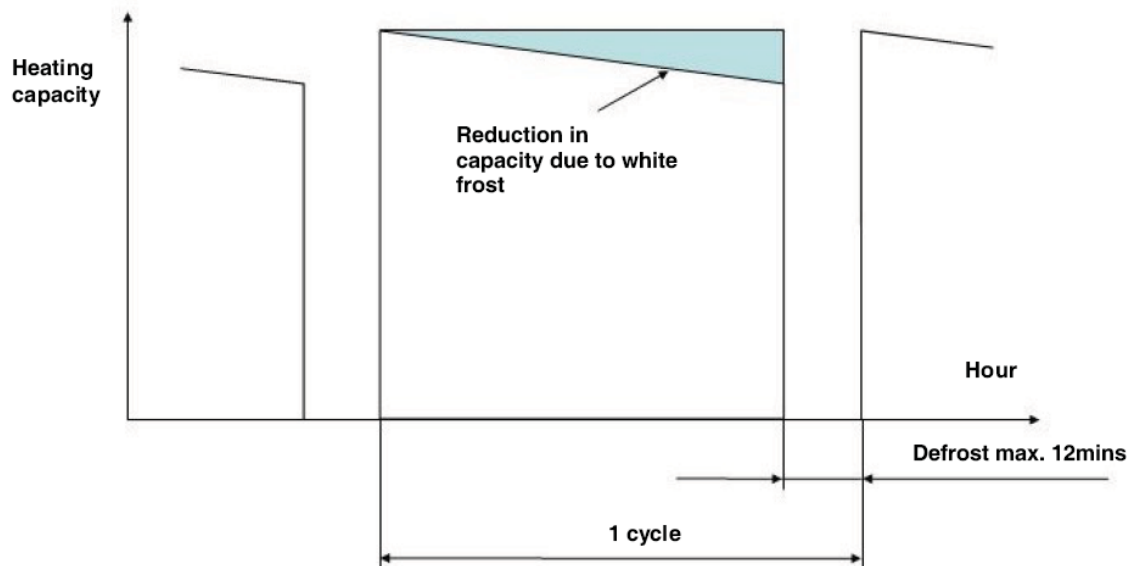
Correction factors according to defrosting operation

The heating capacity in the preceding paragraph excludes the condition of the frost or the defrosting operation period. In consideration of the frost or the defrosting operation, the heating capacity is corrected by the equation below.

Corrected heating capacity = Defrost Correction factor x unit capacity

OUTDOOR TEMPERATURE [°F(°C) DB]	5(-15)	14(-10)	23(-5)	32(0)	44.6(7)	50(10)	59(15)
Correction factor(humidity rate 85% RH)	0.95	0.95	0.92	0.84	1.0	1.0	1.0

Correction Factor



NOTE:

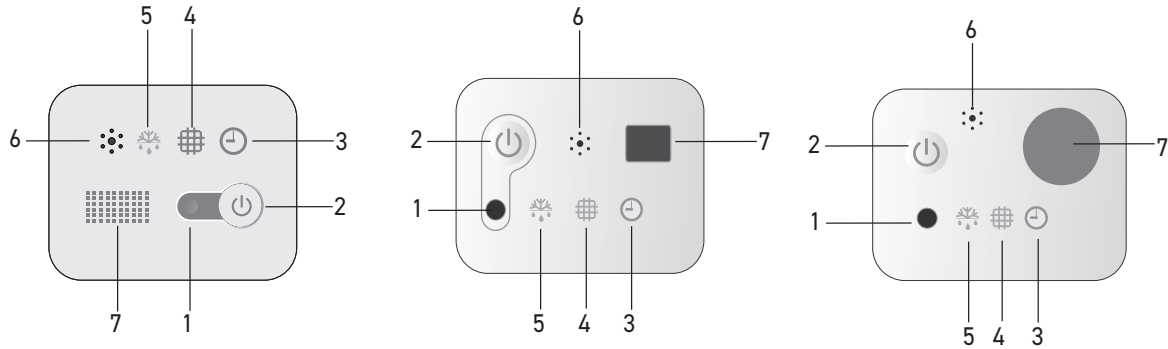
Correction Factor is not valid when the outdoor unit is covered or encapsulated with snow.

OPERATION

Display Panel

Display panel

Cassette Type



Description

- 1 Run indicator (Red)
It lights on during operation. It lights off during SLEEP mode.
- 2 Emergency switch
The filter clean indicator is reset when the switch is pressed. The unit will be started or stopped when the switch is pressed. The unit will be operated in forced cooling mode if press the switch continuously for more than 5s, the unit will operate in cooling mode.
- 3 Timer indicator (Green)
It lights on when timer is in use. It lights off when timer finishes.
- 4 Filter clean (Yellow)
It lights on when the filter should be cleaned.
- 5 Defrost indicator (Green)
It lights on during defrosting It lights off when defrosting is finished.
- 6 Buzzer
It beeps when the signal from remote controller is received.
- 7 Infrared receiver
Receives signal from the remote controller.

- ☑ • The figures in this manual are based on the external view of a standard model. Consequently, the shape may differ from that of the air conditioner you have selected.

OPERATION

Remote controller

The remote controller transmits signals to the system.

SMART (invalid for multi system)

Used to enter fuzzy logic operation directly, regardless of the unit is on or off.

POWER

The appliance will be started when it is energized or will be stopped when it is in operation, if you press this button.

SUPER

Used to start or stop the fast cooling/heating. (Fast cooling operates at high fan speed with 16°C (61°F) set temp automatically; Fast heating operates at auto fan speed with 30°C (86°F) set temp automatically)

IFEEL

Used to set IFEEL mode operation. Press it once, the IFEEL function will be started. Press it again, the IFEEL function will be shut off.

SWING

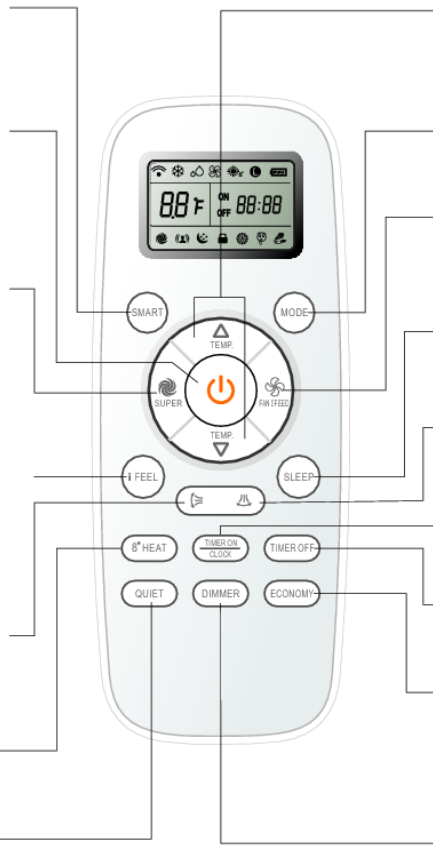
Used to stop or start vertical adjustment louver swinging and set the desired up/down airflow direction.

8 HEAT (optional)

Used to set 8 HEAT Mode.

QUIET

Used to set or cancel Quiet Mode operation.



TEMP + -

Used to adjust the room temperature and the timer, also real time.

MODE

Press this button to select the operation mode.

FAN

Used to select fan speed in sequence auto, higher, high, medium, low and lower.

SLEEP

Used to set or cancel Sleep Mode operation.

SWING

Used to stop or start Horizontal adjustment louver swinging and set the desired left/right airflow direction.

TIMER ON/CLOCK

Used to set or cancel the timer operation and used to set the current time.

TIMER OFF

Used to set or cancel the timer operation.

ECONOMY

Used to set or cancel Economy Mode operation.

DIMMER

When you press this button, all the display of indoor unit will be closed. Press any button to resume display.

Indication symbols on LCD:

	Cooling indicator		Dry indicator		Fan only indicator		8° Heating indicator		Heating indicator
	Auto fan speed		Higher fan speed		High fan speed		Medium fan speed		Low fan speed
	Lower fan speed		Sleep 1 indicator		Sleep 2 indicator		Sleep 3 indicator		Sleep 4 indicator
	Smart indicator		Quiet indicator		Economy indicator		Super indicator		Display set timer
	Signal transmit		Ifeel		Lock indicator		Display temperature		Battery power indicator

Figure 301
Remote Control Operation and Function

OPERATION

Remote Technical Parameters

Remote receiver distance (front of the air conditioner): 26ft.
Remote receiver angle: Less than 60 degrees.
Temperature control accuracy: $\pm 2.4^{\circ}\text{F}$.
Time Response: Less than 1 second.

Display Functions

Remote
Current control functions on the remote controller (See unit's "Installation and Operating Manual")
Display of the indoor unit displays set temperature or indoor temperature.

Indoor unit

Running LED lit during operation, flashing when in defrost.
Timer LED lit when the timer mode is active.
Sleep LED lit when the sleep mode is activated and turns off after 10 seconds.
Compressor LED lit when compressor is running.
Remote control receiver receives signals from the remote control.
Displays error codes if present. An error code is displayed according to the signal from the indoor CPU. The error code will flash for 5 seconds while displayed.

Indoor Unit Operation

Manual Operation "ON/OFF" Button:
When pressing the manual operation "ON/OFF" button after system is idle or in stand-by mode, the previous settings will be restored from last operation: Mode, Temperature, and Fan Speed. The air flow directional setting is not restored. When first powered, pressing the manual operation "ON/OFF" button will force the system would operate in "auto" mode and will enter stand-by mode by pressing the button again. Pressing and holding the manual operation "ON/OFF" button for 5 seconds will engage Test Mode and will beep 1 times. It will operate in cooling mode with the indoor fan speed set to high-speed and will ignore indoor temperature for 5 minutes. If the manual operation "ON/OFF" button is pressed again or a signal is received from the remote control, test mode will exit. If exited from the remote control the system will operate with the corresponding mode selected on the remote control.

I-Feel Function

The I-Feel function is set by the remote control. The room temperature value interpreted by the system will use the temperature on the remote control instead of the temperature reported by the ambient air sensor in the indoor unit. The remote control will automatically transmits a temperature signal every 10 minutes. The remote control will transmits a signal every 2 minutes if the temperature setpoint selected exceeds 2°F . If the indoor unit does not received a signal from the remote in 30 minutes, the selected temperature setpoint will depend on the ambient air sensor of the indoor unit.

Timer Function

Max Timer range is 24 hours.
Timer ON/OFF can be cycled anytime.
Timer accuracy is ± 1 minute.

The Timer can be adjusted by 1 min increments.
Timer On-OFF operational times can overlap.

Sleep Function

Sleep mode can only be used in Cooling, Heating and Dry mode.
If Sleep mode is selected in Cooling mode, the room temperature setting will increase 2.5°F every hour for 8 hours. Room temperature will not rise more than 2.5°F per hour. Temperature rise will cease at 79°F . Room temperature will not rise above 79°F .
If Sleep mode is selected in Heating mode, room temperature will be decreased by 2.5°F per hour for 3 hours but will not decrease more than 2.5°F per hour or 8°F for the duration of the mode.
In either mode, the indoor fan run in the LOW speed. Last user settings (air direction and temperature) can be used, or adjusted by user. The Running indicator will flash 10 times per 1-Hz frequency, then the unit will turn off all the light indicators except the Sleep. After 5 minutes, the Sleep indicator will turn off. All indicators will be standby unless the temperature or Time setting is adjusted. After setting these, the indicators will turn off after 10 seconds.

OPERATION

Sleep mode will cease after 8 hours of operation.

Using Sleep during Off-Timer Function

When using Sleep mode, if the next OFF-Timer setting less than 8 hours, Sleep mode will remain active until the OFF-Timer setting. If the next OFF-Timer setting more than 8 hours, it will override the OFF-Timer setting and will turn the system off 8 hours after engaging Sleep mode.

Auto Mode (SMART)

In Auto Mode (SMART) the system will automatically switch to Cooling, Heating, Dry or Fan Only modes based on the current room temperature. Air flow direction can be adjusted in any mode.

When the room temperature is 79°F or above, Cooling mode will activate.

When the room temperature is between 73°F and 79°F, Dry mode will activate. Fan Speed will drop to LOW after 3 minutes.

When the room temperature is between 70°F and 73°F, Fan only mode will activate. Fan Speed is automatically set to LOW, but can be adjusted when between these room temperatures.

When the room temperature is below 70°F, Heating mode will activate. The room temperature is set to 72°F.

Auto Mode ceases when another specific operation mode is selected. If changing between Cooling and Heating modes, the compressor ceased for operation for 5 minutes.

Cooling only appliance

a. When the room temperature exceeds 79°F, it will be ran in Cool mode, and the temperature is set to 79°F.

b. When the room temperature exceeds 73°F, but not more than 79°F, it will be operated in the Dry mode.

c. When the room temperature is not more than 73°F, it will be operated in the Fan only, the air volume is set to LOW and the fan speed can be adjusted

Cooling Mode

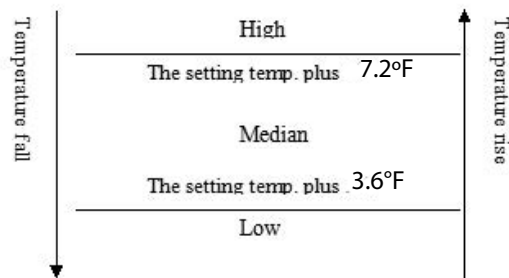
Outdoor Fan

The outdoor fan's speeds (except in single speed-selection motors) can be changed according to outdoor ambient temperatures demands. When operating at a fixed frequency, the outdoor fan is forced to operate at the highest speed.

Indoor Fan

While in Cooling or Heating modes, the indoor fan speed is controlled by the remote control: High, Medium, Low and Automatic setting. When in Automatic speed in the Cool mode for the first time, the fan speed will run at Low setting. After that, temperature and fan speed is selection in Automatic is shown in Fig.109

When the difference between the setpoint temperature and the room temperature is between 5F to 10F, the indoor fan speed will keep in Medium Speed. When the temperature difference is lower than 5F, Low fan speed will engage. When the temperature difference is above 10F, High fan speed will engage.



OPERATION

Air flow direction (Louvers) control

The louver is operated by a stepper motor and operates the horizontal swing of the louver automatically. Press the SWING button to start or stop the louver swing.
During the louver swing in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the close position plus 5°.
The horizontal louver is controlled by a step motor, press the SWING button to swing or stop the louver.
During the louver run in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the default position plus 5°.

Reversing (4-Way) Valve

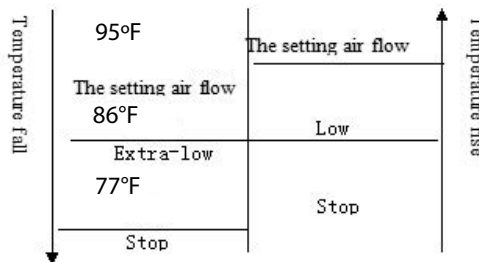
The Reversing Valve is energized in heating. When a cooling demand is given while in heating, the 4-way valve is interrupted immediately.

Heating Operation Temperature Compensation:

The temperature compensation is 5°F in heating mode. For example, if the set temperature is 77°F by the remote control, when the room temperature is detected with 88°F, the compressor will turn off.
The compensation is available only if the room temperature sensor of indoor unit is used. To cancel, use the I-Feel function on the remote controller.

Indoor fan motor operation

When in heating mode condition, the indoor fan motor operation is shown as following to prevent the cold air from coming out during the appliance operation when less than XX(degree)/F.30(degree)C.



When the setpoint temperature and the room temperature is between 3.6°F and 7.2°F, the indoor fan speed will keep its current speed.
Air flow direction control

Outdoor fan

The outdoor fan speed in except single speed motor models can be changed according to outdoor ambient temperatures.

Turbo Function

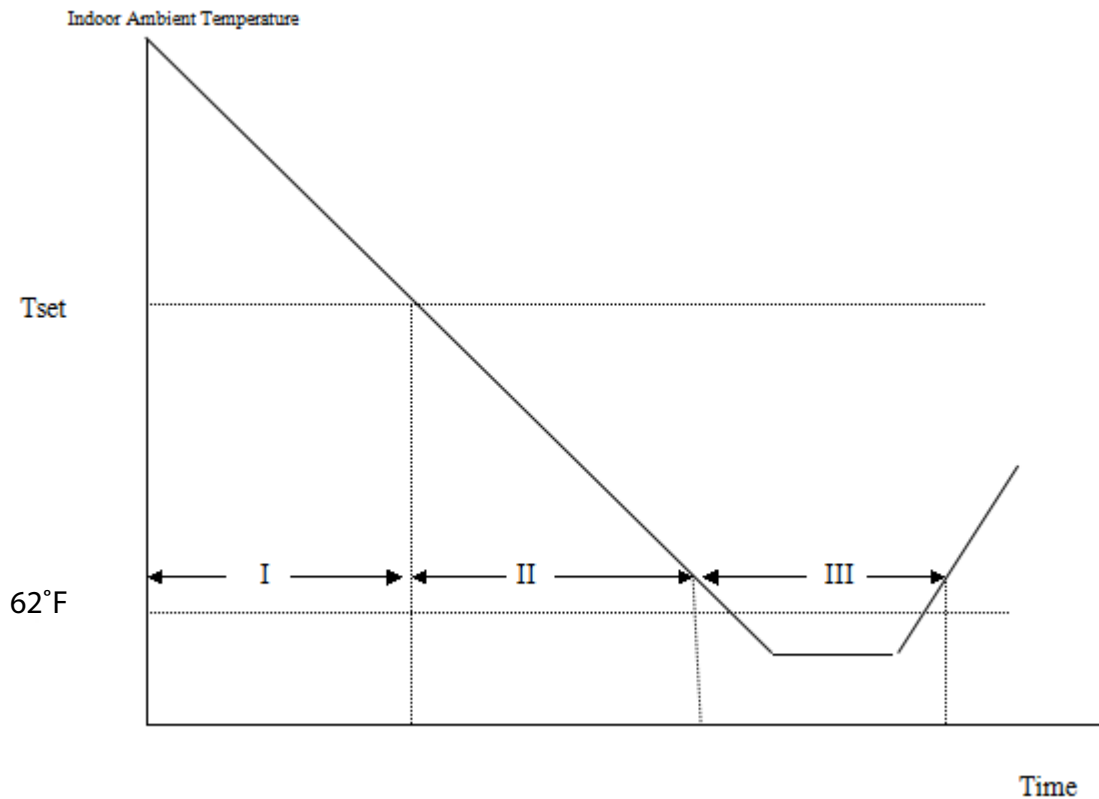
In cooling mode, when you press the Turbo button on the remote control, the unit will operate for 15 minutes with the following setting:

- The set temperature is 61°F(16°C);
- The indoor fan speed is set to highest speed;
- The compressor runs with high frequency.

OPERATION

Dehumidification mode

The dehumidifying mode is illustrated as follows:



Dehumidifying area I: Operation at the frequency in the range (30–60Hz) according to DeltaT (difference between ambient and indoor temperature).
 Dehumidifying area II: The compressor stops for 5 minutes and operators for 5 minutes at the lowest frequency.
 Dehumidifying area III: The compressor stops.

Deltat(°F)	(Hz)
32	30
33	30
34	40
35	50
36	60

OPERATION

Fan Only Mode Operation

In this mode, the compressor and outdoor fan stop, indoor fan operates under the pre-setting of air volume, the louver swing, and the indoor fan speed is defaulted to the current setting in as the Heating Mode.

Defrost

Conditions for Defrost Activation:

The following three conditions must be met to activate Defrost.

- Condition 1: Outdoor ambient sensor is below 28.4°F
- Condition 2: When the heating compressor consecutively runs for 40 minutes .
- Condition 3: The difference between the condenser coil pipe sensor outdoor ambient temperature sensor $\geq 10^{\circ}\text{F}$.

Defrosting actions:

- The compressor stops, the outdoor fan stops after a delay of 30 seconds; after 50 seconds the four-way valve is powered off; and in 10 seconds the compressor starts and runs at “defrosting frequency”.

Conditions for ending defrosting:

Defrosting ends if either of the below conditions is met.

- Condition 1: The accumulated time in defrost is longer than 12 minutes.
- Condition 2: If the temperature of outdoor coil is 57°F or higher. (EEPROM setting value in the current operating mode).

Post Defrost Cycle:

- The compressor stops, for 50 seconds later the reversing valve energizes, and another 10 seconds later the compressor and outdoor fan start normal heating operation.

OPERATION

Control Mode (Indoor Unit Mode Control)

General Technical Parameters

Remote to receiver distance: 26 ft (8m).
Remote receiver angle: Less than 80 degrees.
Temperature control accuracy: $\pm 33.8^{\circ}\text{F}$ (1°C)
Time error: Less than 1%.

Emergency Switch

Pressing the emergency button will activate the automatic mode of operation. Press the button to turn it on and press it again to turn it off.

Forced Cooling Operation:

When the unit is OFF, press and hold the emergency button until the unit beeps (approximately 5 seconds). The indoor unit will be forced into turbo operation. The flaps will sweep and the unit will operate in turbo mode regardless of room temperatures. Forced cooling operation will be canceled once it receives a signal from the remote control.

Indoor temperature Sensing

The indoor unit and remote controller are provided with a temperature sensor. The temperature sensor on the remote controller detects the room temperature and sends this value to the indoor unit. If the indoor control unit has not received remote control signal for a long time, it will automatically switch to the air conditioner body temperature sensor.

Timer function

Timer on

When start time is set by the remote controller, the air conditioner starts in the timer on condition. When the set time is up, the air conditioner will turn on and operates in the preset conditions after receiving a signal from the remote controller. If the air conditioner has not received a signal from the remote controller when the set time is up, it will automatically start and operate in the preset conditions.

Timer off

When a stop time is set by the remote controller, the air conditioner will start in the timer off condition. When the set time is up, the air conditioner will turn off after receiving a signal from the remote controller. If the air conditioner has not received a signal from the remote controller when the set time is up, it will turn off automatically. Neither the turning on nor turning off operation will cancel the timer function.

Auto Restart from Power Break

When the power supply is recovered after a break, all presets are still effective and the air-conditioner can run according to the previous setting.

How to set/ cancel:

It can be set with a wired remote controller.

For details, see internal control parameter adjustment.

Fault code

The fault code can be shown by digital tube on the indoor panel.

Filter clean

FC will light up when the air filter is clogged with dust.

How to set / cancel: It can be set or cancelled with wired remote controller.

For details, see internal control parameter adjustment.

OPERATION

Outdoor unit Control Mode

1. Cooling Anti-freeze Protection

To prevent freezing caused by too low temperature of indoor evaporator, the air conditioner will implement real-time detection over the indoor coil temperature. If the indoor coil temperature is too low, the compressor will be prohibited from increasing or decreasing the frequency or shutting down automatically.

2. Heating Overload Protection

To prevent system overload caused by excessive pressure in heating operation, the unit will implement real-time detection over the indoor fan-coil temperature: If the indoor coil temperature rises, the compressor will be prohibited from increasing the frequency; If the temperature continues to rise, the compressor will decrease the frequency; If the indoor coil temperature is too high, the compressor will stop working immediately. The compressor then will reboot after the indoor coil temperature reduces.

3. Cooling Overload Protection

To prevent system overload due to excessive pressure during cooling operation, the unit will implement real-time detection over the outdoor condenser coil temperature: If the outdoor coil temperature rise, the compressor will be prohibited from increasing the frequency; If the temperature continues to rise, the compressor will decrease the frequency; If the outdoor fan-coil temperature is too high, then the compressor will stop working immediately. The compressor will reboot after the outdoor coil temperature reduces.

4. Discharge Temperature Protection

To prevent working conditions of compressor from deteriorating due to high discharge temperature, the unit will implement real-time detection over the discharge temperature. If the discharge temperature rises, the compressor will be prohibited from increasing the frequency; if the temperature continues to rise, the compressor will decrease the frequency automatically; if the discharge temperature is too high, the compressor will stop working immediately. The compressor will then reboot when the discharge temperature returns to the normal condition.

5. Oil Return Control

When the compressor continues to operate at low frequency, there will be an oil return. The compressor increases the frequency, and thus returns the oil in refrigerant system to the compressor.

6. Operation Mode

Mode Category

Air conditioning mode is the operation mode set by users through the remote controller. Four modes are available: cooling, heating, dehumidification, and fan mode.

Mode conflict

The operating mode of outdoor unit is decided by the operating mode of the indoor unit that is booted first. Indoor units subsequently booted will determine whether it's own mode is conflict with the outdoor mode. If so, the indoor unit will automatically shut down after three beeps; If there is no conflict, the indoor unit will boot normally. The relationship of mode conflict is as follows:

Driven choice / Active mode	Cooling	Dehumidification	Heating	fan
Cooling	√	√	×	√
Dehumidification	√	√	×	√
Heating	×	×	√	×
Fan	√	√	×	√

√ Mode conflict will not happen

× Mode conflict will happen

OPERATION

Outdoor Unit Control Mode

7. Outdoor four-way Valve Control

Four-way valve of the outdoor machine shuts down when cooling but starts when heating. The operation of heating defrosting refers to defrosting operation and, when the heating remote shutdown, the four-way valve disconnects in 50s when the compressor stops working.

8. Start-up Protection

To prevent compressor from restart frequently in the condition that system pressure has not been completely balanced, it can't be restarted within 3 minutes.

9. Pressure Protection

Pressure switch is normally kept open. When the pressure grows too high, the pressure switch will close and will enter pressure protection control. The frequency will automatically decrease. If the pressure is still unable to return to normal condition after decreasing frequency, compressor will stop and report the fault code of pressure protection.

OPERATION

Control Mode

Fan Only Mode

- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no setting temperature is displayed.
- (3) Indoor fan can be set to high/medium/low, but can not be set to auto.

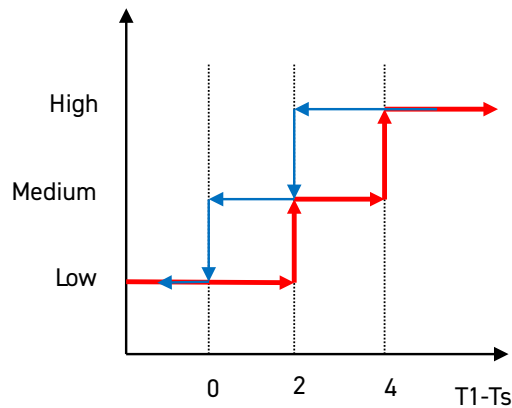
Cooling Mode

Indoor fan logic:

Runs all the time and the speed can be selected as high, (medium), low and auto.

The auto fan:

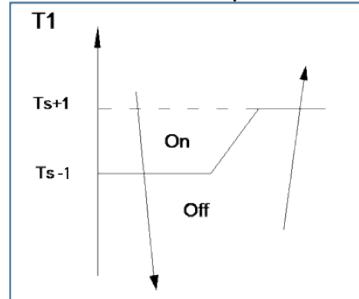
T_1 is indoor room temperature. T_s is setting temperature.



Compressor:

Once the compressor starts up, it will follow the below rules:

When indoor room temp. T_1 is lower than T_s , the compressor and outdoor fan will shut off. When T_1 is higher than $T_s + 1$, the compressor and outdoor fan will start up.



Outdoor fan:

Once the outdoor fan starts up, it will operate as follows:

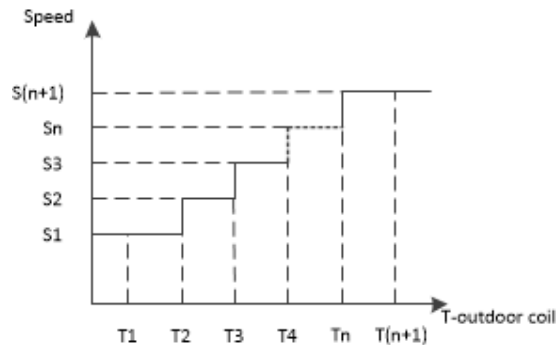
Single outdoor fan: The fan will start with irregular speeds for about 10 seconds, then will be throttled depending on outdoor coil and ambient air temperature.

Double outdoor fan: The upper and lower fan start with irregular speeds for about 10 seconds, then will be throttled depending on outdoor coil and ambient air temperature.

The lower fan will be 30rpm-60rpm less than the upper fan.

OPERATION

Control Logic Description



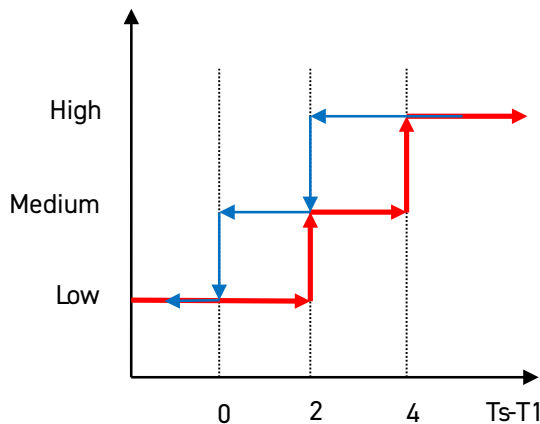
Heating Mode

Indoor fan:

The fan of the indoor unit will not run until the heat exchanger of the indoor unit reaches a high enough temperature. This prevents cold air blowing into the space. After the indoor coil reaches adequate temperature, the speed can be selected as high, medium, low, or auto.

Auto fan:

T1 is indoor room temperature. Ts is setting temperature.



Outdoor fan:

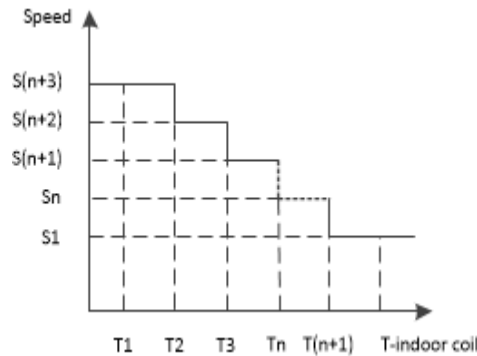
Once the outdoor fan starts up, it will operate as follows:

Single outdoor fan: The fan will start with irregular speeds for about 10 seconds, then will be throttled depending on outdoor coil and ambient air temperature.

Double outdoor fan: The upper and lower fan start with irregular speeds for about 10 seconds, then will be throttled depending on outdoor coil and ambient air temperature. The lower fan will be 30rpm-60rpm less than the upper fan.

OPERATION

Control Logic Description



Auto Mode

This mode can be chosen with remote controller and the setting temperature can be changed between 61°F~86°F(16°C~30 °C).

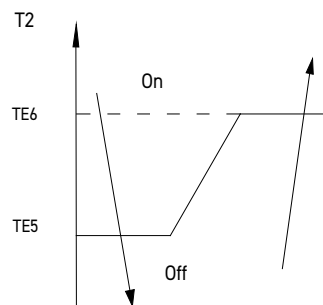
In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT ($\Delta T = T1 - Ts$).

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 5.4^\circ\text{F}$	Cooling
$-5.4^\circ\text{F} \leq \Delta T \leq 5.4^\circ\text{F}$	Fan-only
$\Delta T < -5.4^\circ\text{F}$	Heating

Indoor fan will run at auto fan of the relevant mode. The louver operates same as in relevant mode. If the compressor keep stopping for 10 minutes or the setting temperature is modified, the machine will choose mode according to ΔT again.

Evaporator low -temperature Protection

Condition:



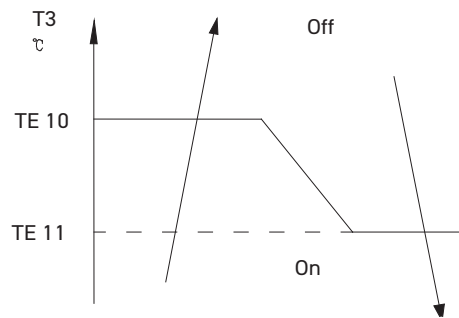
Cooling:

Indoor coil temperature ($T2$) is lower than $TE5$ (logical calculation between 28F-35F) for 2 minutes, Outdoor fan and compressor will turn off. When Indoor coil temperature ($T2$) is higher than $TE6$ (logical calculation between 50F-55F) the compressor and outdoor fan will restart.

OPERATION

Control Logic Description

Condenser High-temperature Protection



Conditions:

Cooling mode:

When the outdoor coil temp. sensor is higher than 142 F for more than 10 seconds, the compressor and outdoor fan will shutoff. When the sensor is lower than 122F, the compressor and outdoor fan will restart up.

Heating mode:

When the indoor coil temp. sensor is lower than 40F for 10 seconds, the compressor and outdoor fan will shutoff. When the sensor rises above 55F, the compressor and outdoor fan will restart up.

INSTALLATION

Outdoor Units

Piping Connections to Outdoor Unit

- Remove service valve cover(if provided) to access the service valves and refrigerant ports.
- Carefully bend and adjust length of refrigerant pipes to meet outdoor unit service valves connection with proper tools to avoid kinks.
- Apply a small amount of refrigerant oil to the flare connection on the refrigerant pipe.
- Properly align piping and tighten flare nut using a standard wrench and a torque wrench as shown in the indoor piping section.
- Carefully tighten flare nuts to correct torque level referring to the following Torque Table:

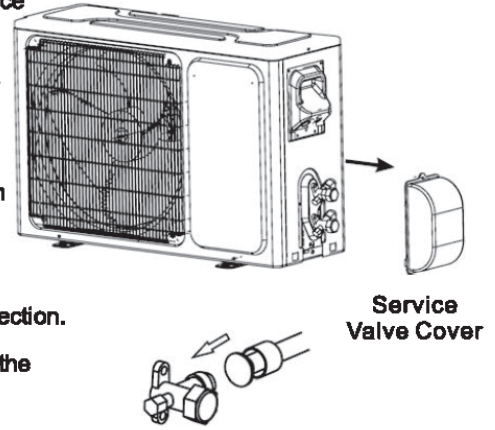


Fig. 432

Torque Table

Pipe diameter /inch	Nut Size /inch	Tightening Torque	
		ft-lbs	N-m
1/4	1/4	11 to 15	15 to 20
3/8	3/8	22 to 28	30 to 35
1/2	1/2	37 to 41	50 to 55
5/8	5/8	44 to 48	60 to 65
3/4	3/4	52 to 55	70 to 75

Note: Over tightening may damage flare connections and cause leaks.

Fig. 433

INSTALLATION

Outdoor Units

Additional Refrigerant Charge

Although refrigerant has been charged into this unit, additional refrigerant charge may be required according to the piping length.

The additional refrigerant precharge quantity should be determined and charged into the system according to the following procedure.

For configurations containing a mix of 7-18k indoor units:

1. Determine the Length of 1/4" Liquid line set used in the Installation. (L)
2. Use table 433.1 to determine how much additional refrigerant is required.

For configurations including 24k units

1. Determine the Length of 1/4" Liquid line set used in the Installation. (L1)
2. Determine the Length of 3/8" Liquid line set used in the Installation. (L2)
3. Use table 433.1 to determine how much additional refrigerant is required.

X is the additional refrigerant required for servicing according to the installation piping length.

If X is less than zero, no additional refrigerant is required.

Record the additional refrigerant quantity in order to facilitate future maintenance and servicing activities.

Outdoor Unit	Indoor Unit Configuration	Pre-Charged Refrigerant weight before shipping	(CF) Correction Factor for 3/8 line set (Only used with 24k indoor units)	(P) pre-charged 1/4" line set length	Additional refrigerant charge required (in ounces)
18k	7k-18k	63.49 oz.	N/A	50	$X = (L-P) * .16$
24k	7k-18k	81.13 oz	N/A	75	$X = (L-P) * .16$
36k	7k-18k	105.82 oz	N/A	100	$X = (L-P) * .16$
	7k-24k	105.82 oz	15.68	100	$X = (L1 * .16) + (L2 * .38) - CF$
42k	7k-18k	120 oz	N/A	125	$X = (L-P) * .16$
	7k-24k	120 oz	20	125	$X = (L1 * .16) + (L2 * .38) - CF$

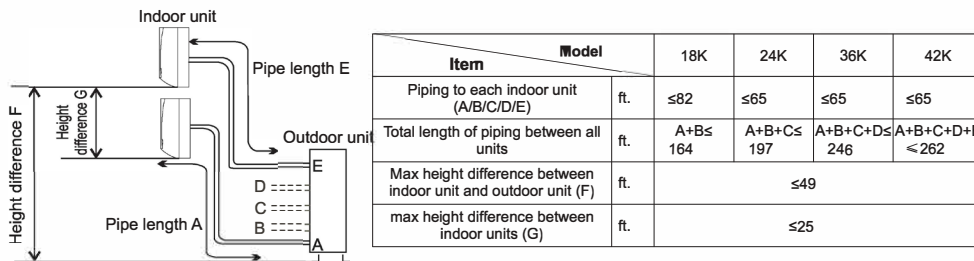
Table 433.1 (Determining Additional Required Refrigerant)

INSTALLATION

24 and 36k Outdoor Units

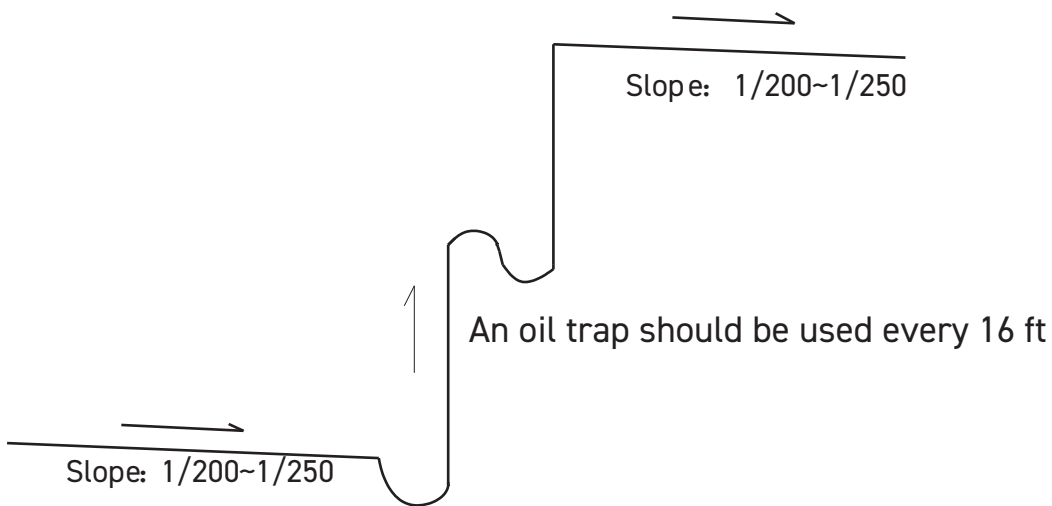
Piping Work and Refrigerant Charge

MAX.length allowed



Oiltrap

When the indoor unit is lower than the outdoor unit, and the height is larger than 16 feet, an oil bend should be employed for every 16 feet.



NOTE:

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

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 31.5psi 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 540psi. If pressure can not be adequate held, check integrity of flares and torque specifications. Once pressure is held adequately, purge the nitrogen charge to system pressure of 5-10psi. **DO NOT RETURN TO ATMOSPHERIC PRESSURE.**

2. 1st Vacuum Micron Test:

Connect hoses and vacuum pump to the outdoor unit. 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. 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.

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:

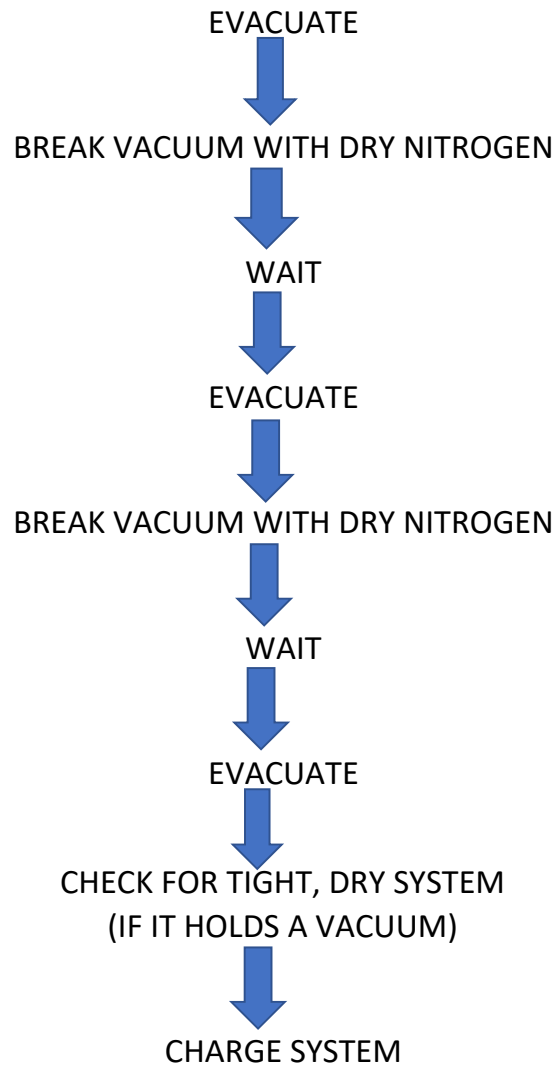
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 300 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 500 microns. Once held under 500 microns, the system is considered dry and tight.

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 ft, weight in the additional charge with an approved refrigerant scale as needed (Fig.437).

INSTALLATION

Leak Check, Evacuation, and Charging (Triple Evacuation)



INSTALLATION

Checklist

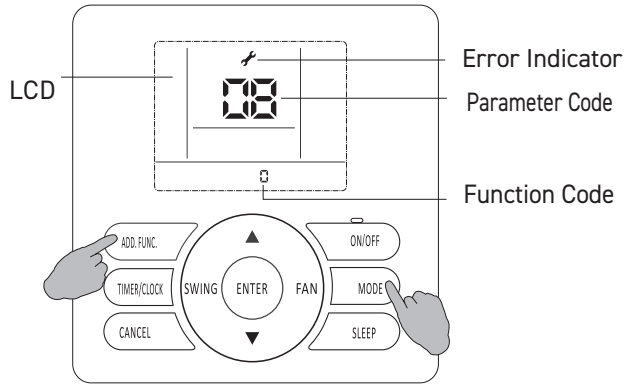
Check Unit following Installation

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.

INSTALLATION

Field Settings (ESP Setting) Duct Type Only

The static pressure can be freely adjusted by using specific wire remote controller.



YXE-C01U(E)/YXE-C02U(E)

Model (Capacity Btu/h)	The range of static pressure	Function code set
9K/12K/18K	0-0.015 in.Hg (0-50Pa)	0-50, more than 50 is 0.015 in.Hg (50 Pa), [default: 0 (0 in.Hg or 0Pa)]

Static pressure setting:

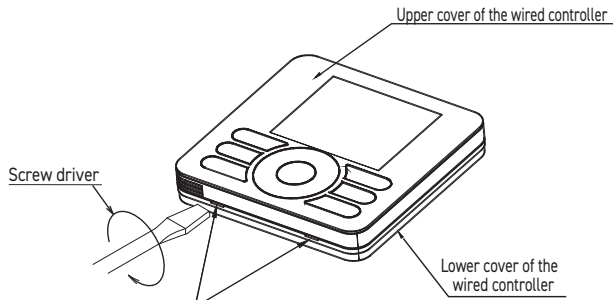
- 1 Hold down both "MODE" button and "ADD.FUNC." button for 3 seconds, symbol ⚡ and parameter code blinking at the same time.
- 2 Press "▲/▼" button to adjust parameter number until display "17", and press "ENTER" button to entering system parameter adaption state, symbol ⚡ stop blinking.
- 3 Select desired parameter code 10 by pressing "▲▼" button, and press "ENTER" button to confirm.
- 4 Select desired function code to rewrite the parameter values by pressing " / ▲ ▼ " button, and press "ENTER" button to confirm.
- 5 Press "ON/OFF" button or "CANCEL" button to quit.

INSTALLATION

Field Settings (Indoor Unit Parameter Revision)

1. Connect wire remote controller with indoor unit

Step 1: Removing the upper cover of the wired controller

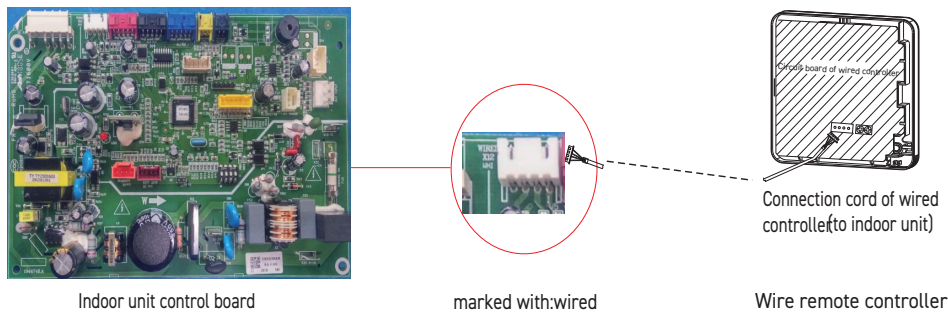


Insert a normal screw driver into the position, and gently rotate it. In this way, the upper cover can be easily removed.

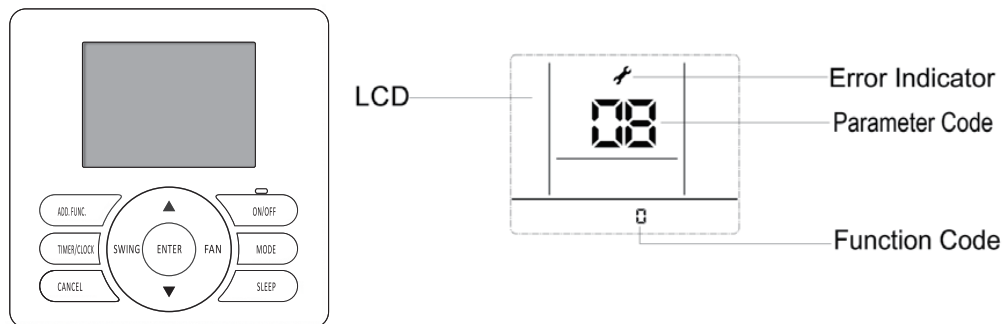
Note:

Control board of the remote controller is placed on upper cover. Please protect it from being scratched during removal and installation!



Step 2: Connecting wired controller with indoor unit



2. Changing system parameter



OPERATION:

- ① Hold down both "MODE" button and "AD D.FUNC ." button for 3 seconds, symbol  and parameter number blinking at the same time.
- ② Press "▲" "▼" button to adjust parameter number until display "17". And press "ENTER" button to entering system parameter adaption state, symbol  stop blinking, parameter number blink.
- ③ Select desired parameter code by pressing "▲"/ "▼" button following the table below, and press "ENTER" button to confirm.
- ④ Select desired function code by pressing "▲"/ "▼" button, and press "ENTER" button to confirm.

INSTALLATION

Field Settings (Indoor Unit Parameter Revision)

PARAMETER CODE	PARAMETER DESCRIPTION	PARAMETER VALUE&REPRESENTATION		NOTE
		DATA TYPE	REPRESENTATION (FUNCTION CODE)	
1	Self Recovery of Power Break	Integer	0: Cancel Self Recovery of Power Break function ; 1: Self Recovery of Power Break ; others: invalid	
2	Temperature Type	Integer	0: Centigrade Temperature ; 1: Fahrenheit Temperature ; others: invalid	
3	Temperature Display Type	Integer	0: Default display set temperature ; 1: Default display room temperature ; others: invalid	
4	Ratio of ambient temperature sensed by indoor temperature sensor(cooling mode)	Integer	0~10valid , more than 10 default is 10 0: 0% ; 1: 10% ; ... ; 10: 100%	0-entirely use temperature sensed b y wired remote controller; 10-entirely use temperature sensed b y indoor unit
5	Filter Clean Indication	Integer	0: Cancel Filter Clean prompt function ; 1: Set Filter Clean prompt function ; others: invalid	
6	Filter Clean Time Set	Integer	0~32 , more than 32 default is 32*1000h	
7	Installation Height Compensation	Integer	0~10m , more than 10m default is 10. =0,1,2 :no fan speed compensation; =3: increase fan speed; =4~10: increase more fan speed.	
8	Cooling Temperature Compensation (indoor unit temperature sensor)	Integer	0 : 0°C ; 1 : -0.5°C ; 2 : -1°C 3 : -1.5°C ; 4 : -2°C ; 5 : -2.5°C ; 6 : -3°C ; 7 : -3.5°C ; 8 : -4°C ; 9 : -4.5°C 10 : -5°C (The wired controller displays integer with the symbol.)	
9	Heating Temperature Compensation (indoor unit temperature sensor)	Integer	0 : 0°C ; 1 : -0.5°C ; 2 : -1°C 3 : -1.5°C ; 4 : -2°C ; 5 : -2.5°C ; 6 : -3°C ; 7 : -3.5°C ; 8 : -4°C ; 9 : -4.5°C 10 : -5°C (the wired controller displays integer with the symbol)	
10	Static Pressure Set	Integer	1~240 , function code=static pressure more than the limit static pressure default the limit static pressure , Default is 0(default static pressure, related to models)	Duct type (DC motor)
12	Ratio of temperature sensed by indoor temperature sensor(Heating mode)	Integer	0~10valid , more than 10 default is 10 0: 0% ; 1: 10% ; ... ; 10: 100%	0-entirely use temperature sensed b y wired remote controller; 10-entirely use temperature sensed b y indoor unit
13	Temperature Adjustment-Cooling	Character	-10~10 (Single Character with symbol)	Temperature displayed on wired controller
14	Temperature Adjustment-Heating	Character	-10~10 (Single Character with symbol)	Temperature displayed on wired controller
25	Access control, fire protection, ON/OFF function set	Integer	=0 , Access control, fire protection functions are all invalid ; =1 , Access control function is valid ; =2 , fire protection function is valid ; =3 , Access control, fire protection are all valid; =4 , ON/OFF function are all valid.	

INSTALLATION

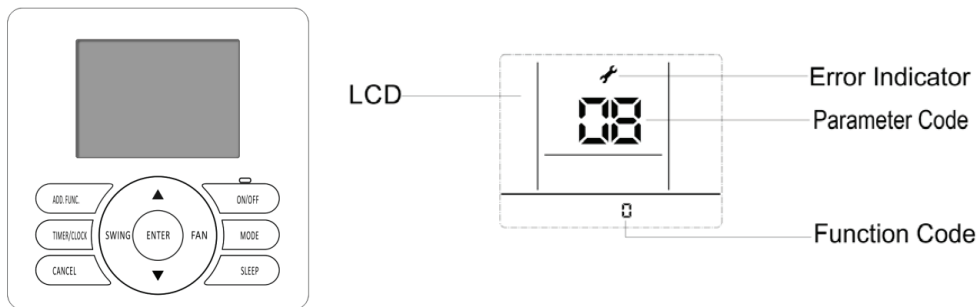
Field Settings (Running Parameter Query)

Running Parameter Query

Running parameters can be referred to by digital tube switch or specified wired remote control.

Operation:

1. Connect wired remote controller with indoor unit (same method as indoor parameter revise).
2. Changing system parameter.



OPERATION:

- ① Hold down both "MODE" button and "ADD.FUNC." button for 3 seconds, symbol and parameter number blinking at the same time.
- ② Press "▲" "▼" button to select parameter number as you need, parameter value will be displayed on the LCD.

Parameter Code	Parameter Description
06	Indoor unit air inlet temperature
07	Indoor unit coil sensor temperature
08	Out door unit ambient sensor temperature
09	Discharge temperature
10	Suction temperature
11	Out door coil temperature
12	Discharge pressure
13	Suction pressure
14	Out door EEV opening
15	AC current input
16	AC voltage
24	Fault code
25	Drive fault code
26	Indoor unit air outlet temperature
28	Compressor current
29	Indoor unit room temperature
30	Indoor unit coil inlet temperature
31	Indoor unit coil outlet temperature
32	Out door unit condenser inlet temperature
33	Out door unit condenser outlet temperature
43	Out door unit defrost temperature
57	Out door fan 1 speed
58	Out door fan 2 speed
60	Indoor fan speed

INSTALLATION

Field Settings (Function Settings)

Instructions for the function setting of access control, fire protection, ON/OFF

1. Factory setting

ON/OFF function is disabled as factory default while both the access control and fire protection functions are enabled.

To use or cancel the access control /fire protection /(ON/OFF) function, use the wired controller to modify the parameters of indoor unit.

Note:

Please refer to "Indoor unit parameter revise" section in TC Manual for how to use the wired controller to modify the parameters of indoor unit.

2. Function introduction

(1) Access control:

Control mode to control the machine startup & shutdown based on the ON and OFF state of the access control port.

(2) Fire protection:

Control mode to control the machine startup & shutdown based on the ON and OFF state of the fire protection port.

(3) ON/OFF :

Special control mode to achieve the control of indoor unit startup & shutdown based on the input state of the fire protection port of the indoor unit (no other way can control startup & shutdown) and output the fault status of indoor unit through OUT INPUT port.

3. Function setting

(1) Hardware connection

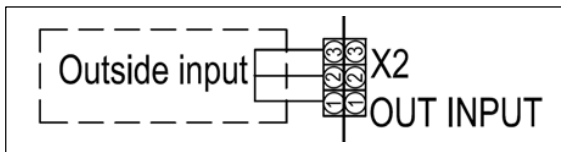


Figure 1 electrical wiring diagram

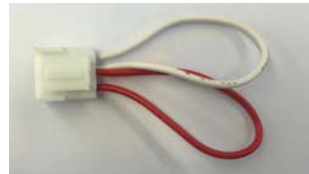


Figure 2 short wiring



Figure 3 main control board

3 pins of the OUT INPUT X2 socket shown in the electrical wiring diagram of Figure 1 will be in short circuited state by default factory setting (an external short circuit plug shown in Figure 2, and the OUT INPUT X2 socket of main control board as shown in Figure 3).

(Note: the socket number in circuit is subject to the actual serial number of PCB.)

INSTALLATION

Field Settings (Function Settings)

- 1) When using the door lock function, the red wire should be cut and connected to the door lock control switch attached to it (supplied by user), and the connecting wire should be 22AWG or above. In normal conditions, the unit operates normally once the switch is closed and shuts down once the switch is off.
- 2) When using the fire protection function, the red wire should be cut and connected to the fire protection lock control switch attached to it (supplied by user), and the connecting wire should be 22AWG or above. In normal conditions, the unit operates normally once the switch is closed and shuts down once the switch is off.
- 3) When using the ON/OFF function, the red wire should be cut and connected to the door lock control switch attached to it (supplied by user), and the connecting wire should be 22AWG or above. In normal conditions, the unit operates normally once the switch is closed and shuts down once the switch is off.

(2) Timing sequence description

Access control

- 1) Control of entrance card disconnection: the air conditioner will shut down if the access control signal is disconnected for 30 seconds. In this state, the indoor unit cannot start. If the user performs start operation, the wired controller will not respond and displays power-off status.
- 2) Control of entrance card connection: after the closed circuit of entrance card interface, power-on restrictions are released, the wired controller maintains power-off and the startup & shutdown control is enabled.

Fire protection

- 1) Access to fire protection: the air conditioner will shut down and stop blowing air after the access control signal is disconnected for 3 seconds. In this state, the indoor unit cannot be started. If the user performs start operation, the wired controller shall not respond and displays power-off status.
- 2) Cancellation of fire protection: after the short circuit of fire protection signal, release power-on restrictions, the wired controller maintains power-off status and the startup & shutdown control is enabled.

ON/OFF

- 1) In the situation where ON/OFF function is enabled, the port is closed and in short circuit, the indoor unit starts; the indoor unit shuts down once the port is disconnected;
- 2) Other operation information (such as mode, air speed, air door, and so on.) except for startup & shutdown can be set through the wired controller, remote-controller and WIFI module, priority is given to the latest command received.
- 3) In the mode of ON/OFF function, wired controller, remote-controller, WIFI module and access control cannot control the unit startup & shutdown, neither the operation mode, timer or sleeping mode.
- 4) There will be 12V signal output when machine fault occurs.

(3) Relative priorities of instructions

ON/OFF has the highest priority. The access control function shall be disabled when ON/OFF is enabled. Access control and fire prevention functions shall not affect each other.

NOTE:

Figures in the manual are only simple representation of the control board, it's may not comply with the appearance that you purchased.

INSTALLATION

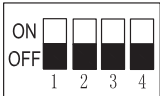


Field Settings (Outdoor units)

DIP Settings

Dip Switch Setting of Outdoor Unit

Mark of "■" indicates the position of dip switches.
Switch is valid when is ON.

Dip switch S4

Factory Setting	
Refrigerant Collection	
Manual Defrost	

Refrigerant collection function

By default setting is OFF.

OFF ----normal mode

ON ----refrigerant collection mode

When the power is ON, the dial changed from OFF to ON, enters into refrigerant collection mode.

During refrigerant recovery mode, system low pressure protect will not occurs, and compressor will stops after 5 minutes, and will turn to normal state when power on again.

Manual defrost function

By default setting is OFF.

OFF ----normal mode

ON----defrost mode

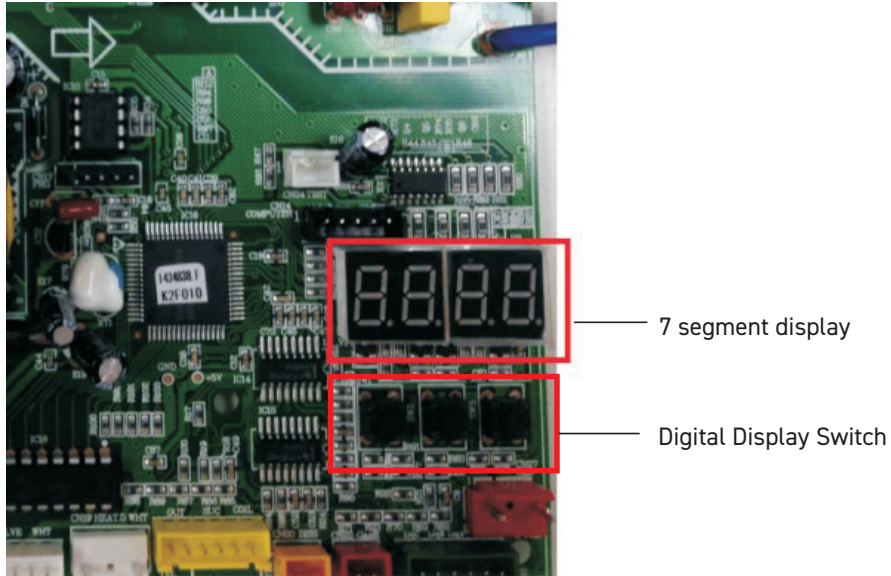
When the dial changed from OFF to ON, enters into defrost mode, and only valid once.

INSTALLATION

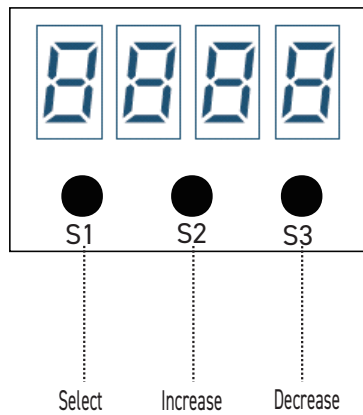
Field Settings (Outdoor units)

Running Parameter Query

Outdoor Running parameters can be checked by 7 segment display.



Outdoor control board



There are 3 buttons on the digital display board :

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

"P." -- Parameter of outdoor unit

"A." -- Parameter of indoor unit A

"b." -- Parameter of indoor unit B

"C."-- Parameter of indoor unit C

"d."-- Parameter of indoor unit D

"E."-- Parameter of indoor unit E

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

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

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

Parameters can be checked as following table below .

Note :

(1) ●:Valid ; ○ : Invalid.

(2) The right is therefore reserved to EE changing without notice.

INSTALLATION

Field Settings (Outdoor Units)

Parameter	Descriptions	Dual	Trio	Quattro	1 by 5
P.0	Fault codes	●	●	●	●
P.1	Compressor actual frequency	●	●	●	●
P.2	Compressor driving frequency	●	●	●	●
P.4	Compressor target frequency	●	●	●	●
P.5	Compressor exhaust temperature	●	●	●	●
P.6	Outdoor suction Temperature	●	●	●	●
P.7	Outdoor ambient temperature	●	●	●	●
P.8	Outdoor coil temperature	●	●	●	●
P.9	Outdoor defrosting temperature	●	●	●	●
P.10	IPM module temperature	●	●	●	●
P.11	Outdoor capacity requirement	●	●	●	●
P.12	IPM fault codes	●	●	●	●
P.13	Outdoor DC Motor target speed	●	●	●	●
P.14	AC input current	●	●	●	●
P.15	AC input voltage	●	●	●	●
P.16	DC bus voltage	●	●	●	●
P.17	Compressor phase current	●	●	●	●
P.18	Frequency limit code	●	●	●	●
P.20	Target suction overheating	●	●	●	●
P.21	Target exhaust overheating	●	●	●	●
P.22	Actual suction overheating (heating)	●	●	●	●
P.23	Actual exhaust overheating (heating)	●	●	●	●
A.1	Unit A fault codes	●	●	●	●
A.2	Unit A valve actual opening	●	●	●	●
A.4	Unit A liquid pipe temperature	●	●	●	●
A.5	Unit A gas pipe temperature	●	●	●	●
A.6	Unit A coil temperature	●	●	●	●
A.7	Unit A ambient temperature	●	●	●	●
A.8	Unit A set temperature	●	●	●	●
A.9	Unit A capacity	●	●	●	●
A.10	Unit A set fan speed	●	●	●	●
A.11	Unit A actual suction overheating	●	●	●	●
B.1	Unit B fault codes	●	●	●	●
B.2	Unit B valve actual opening	●	●	●	●
B.4	Unit B liquid pipe temperature	●	●	●	●
B.5	Unit B gas pipe temperature	●	●	●	●
B.6	Unit B coil temperature	●	●	●	●
B.7	Unit B ambient temperature	●	●	●	●
B.8	Unit B set temperature	●	●	●	●
B.9	Unit B capacity	●	●	●	●
B.10	Unit B set fan speed	●	●	●	●
B.11	Unit B actual suction overheating	●	●	●	●
C.1	Unit C fault codes	○	●	●	●
C.2	Unit C valve actual opening	○	●	●	●
C.4	Unit C liquid pipe temperature	○	●	●	●
C.5	Unit C gas pipe temperature	○	●	●	●
C.6	Unit C coil temperature	○	●	●	●
C.7	Unit C ambient temperature	○	●	●	●
C.8	Unit C set temperature	○	●	●	●
C.9	Unit C capacity	○	●	●	●
C.10	Unit C set fan speed	○	●	●	●
C.11	Unit C actual suction overheating	○	●	●	●
D.1	Unit D fault codes	○	○	●	●
D.2	Unit D valve actual opening	○	○	●	●
D.4	Unit D liquid pipe temperature	○	○	●	●
D.5	Unit D gas pipe temperature	○	○	●	●
D.6	Unit D coil temperature	○	○	●	●
D.7	Unit D ambient temperature	○	○	●	●

INSTALLATION

Field Settings (Outdoor Units)

Parameter	Descriptions	Dual	Trio	Quattro	1 by 5
D.8	Unit D set temperature	○	○	●	●
D.9	Unit D capacity	○	○	●	●
D.10	Unit D set fan speed	○	○	●	●
D.11	Unit D actual suction overheating	○	○	●	●
E.1	Unit E fault codes	○	○	○	●
E.2	Unit E valve actual opening	○	○	○	●
E.4	Unit E liquid pipe temperature	○	○	○	●
E.5	Unit E gas pipe temperature	○	○	○	●
E.6	Unit E coil temperature	○	○	○	●
E.7	Unit E ambient temperature	○	○	○	●
E.8	Unit E set temperature	○	○	○	●
E.9	Unit E capacity	○	○	○	●
E.10	Unit E set fan speed	○	○	○	●
E.11	Unit E actual suction overheating	○	○	○	●

INSTALLATION

Operation Test

Test Operation

System Checks

1. Conceal refrigerant pipes where possible.
2. Make sure drain hose slopes downward along entire length.
3. Ensure all refrigerant pipes and connections are properly insulated.
4. Fasten pipes to outside wall, when possible.
5. Seal and weatherproof wall hole which the interconnecting wires and refrigerant pipes pass through.

Perform test operation after completing gas leak and electrical safety check.

1. Turn on electrical disconnect to outdoor unit.
2. Push the "ON/OFF" button on Remote Controller to begin testing.
3. Push MODE button, select COOLING, HEATING, FAN mode to confirm all functions.

Indoor Unit

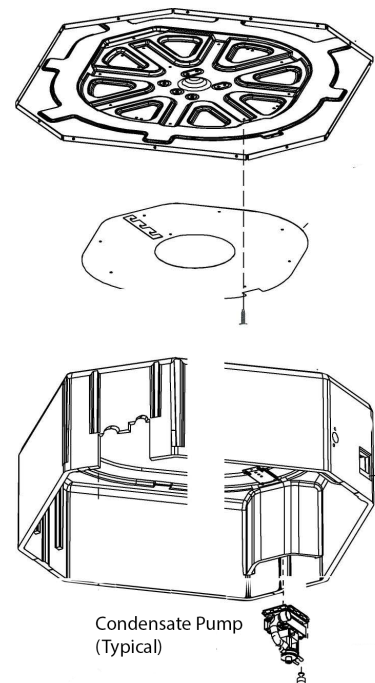
1. Do all Remote controller's buttons function properly?
2. Do the display panel lights work properly?
3. Does the swing louver function properly?
4. Does the drain work?

Outdoor Unit

1. Push the mode button to COOL and adjust the room setting to 61 F(16°C) deg. wait up to 3 minutes from compressor time guard. Does compressor and outdoor fan turn on in cooling mode?
2. Push the mode button to HEAT and adjust the room setting to 85°F(30°C). Wait up to 3 minutes for compressor time guard. Does compressor and outdoor fan turn on in heat mode?

Cassette and Ducted Condensate Pump Drain Line

The Condensate Drain Pump is capable of 26 inches of lift. Do not install drain line in a position that would exceed this lift capability. Exceeding the lift requirement can cause premature pump failure and/or drainage problems.



INSTALLATION

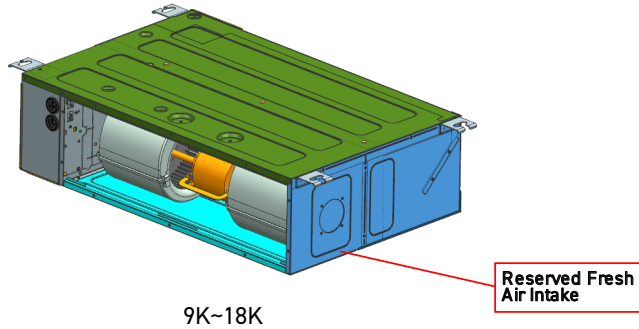
Fresh Air Intake

Duct (9K~18K)

Indoor unit can take fresh air from the reserved fresh air intake, the size of the fresh air intake hole is 2-1/2 in.(65mm) (9K~18K).

Please follow the steps below when needed.

- 1) Cut off the reserved metal circular hole on the base board.
- 2) Connect air duct with the fresh air intake.

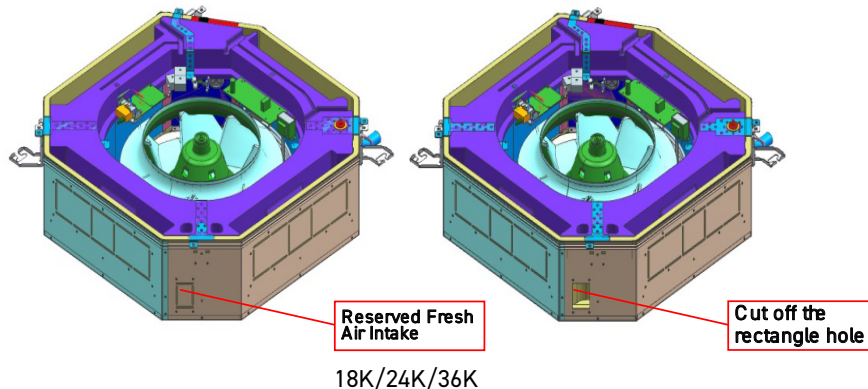
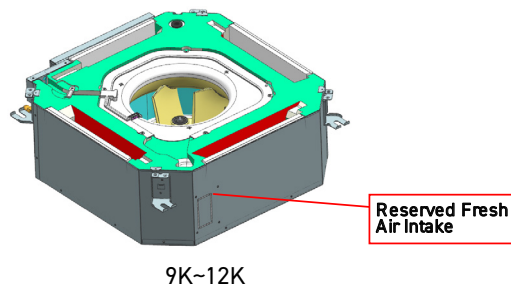


Cassette

It is possible to inject fresh air to indoor unit from the reserved fresh air intake, the size of the fresh air intake hole is 3-1/4in. × 1-11/16in. (83mm×43mm) (9K/12K), 3in. × 2-1/16in. (75mm×53mm) (18K/24K/36K).

Please follow the steps below when needed.

- 1) Cut off the reserved metal rectangular hole on the base board.
- 2) Cut off the foam material on the a rectangular hole
- 3) Create duct transition to fresh air piping.



MAINTENANCE

Front panel and shell maintenance

- 1 Cut off the power supply by moving the power switch in the direction of the arrow.**

Note: Turn off the appliance first before cutting off the power supply.


- 2 Open the front panel and the front shell refer to Fig.9~Fig.12 of INDOOR UNIT INSTALLATION.**


- 3 Wipe with a soft and dry cloth.**

Use soft moisture cloth to clean if the front panel is very dirty.



Use a dry and soft cloth to clean it.
- 4 Never use volatile substance such as gasoline or polishing powder to clean the appliance.**


- 5 Never sprinkle water onto the indoor unit**



Dangerous!
Electric shock!
- 6 Close the front panel and the front shell refer to Fig.22~Fig.28 of INDOOR UNIT INSTALLATION.**




Air filter maintenance


It is necessary to clean the air filter after using it for about 200 hours.

Clean it as follows:

- 1 Stop the appliance and remove the air filter.**




 1. Open the front panel.
 2. Press the handle of the filter gently from the front.
 3. Grasp the handle and slide out the filter.
- 2 Clean and reinstall the air filter.**

If the dirt is conspicuous, wash it with a solution of detergent in lukewarm water. After cleaning, dry well in shade.


- 3 Close the front panel again.**

■ *Clean the air filter every two weeks if the air conditioner operates in an extremely dusty environment.*

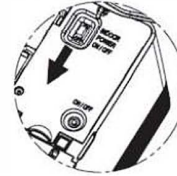
MAINTENANCE

-  The following is a deep cleaning and must be completed by a professional.
-  Users are strictly forbidden to operate privately, otherwise they will be at their own risk.

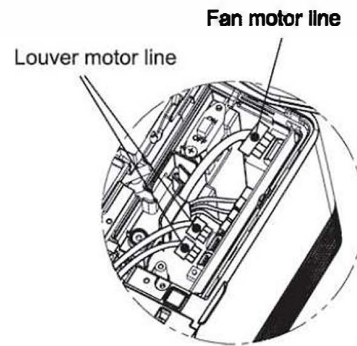
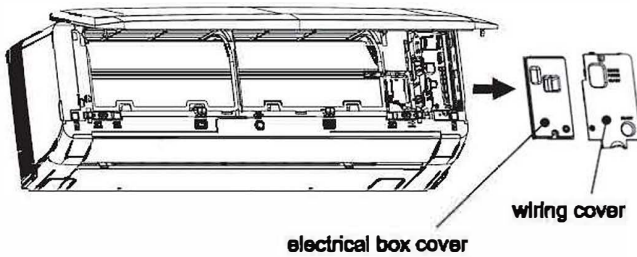
Front shell, air duct and fan maintenance

- 1** Cut off the power supply by moving the power switch in the direction of the arrow.

Note: Turn off the appliance first before cutting off the power supply.

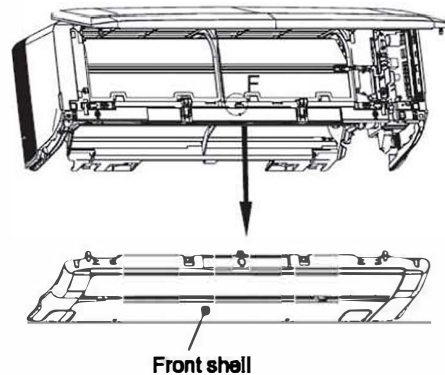
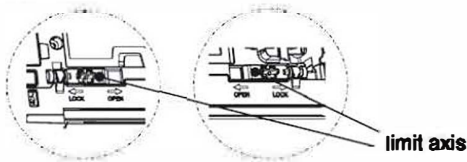


- 2** 1. Remove the wiring cover and the electrical box cover.
2. Disconnect the fan motor line and the louver motor line.



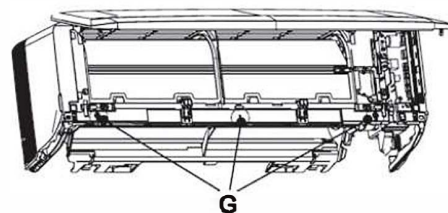
- 3** 1. Open the screw covers and remove the screws refer to Fig.414 of INDOOR UNIT INSTALLATION.
2. Open the limit axes.
3. Remove the front shell for cleaning.

Note: Pay attention to the limit of F position, some models have two places.
Note: when you want to clean the front shell with clean water, you must first remove all the motors on the front shell.



- 4** Remove the screws of the air duct (G position and H position)

Note: Some models do not have H position screws.



MAINTENANCE

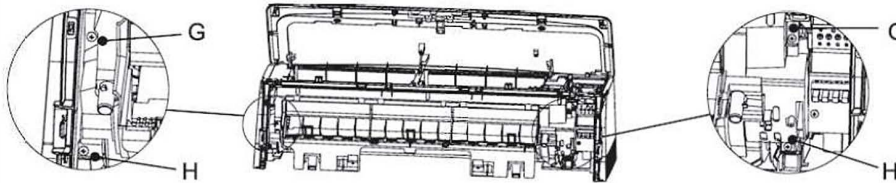
 The following is a deep cleaning and must be completed by a professional.

 Users are strictly forbidden to operate privately, otherwise they will be at their own risk.

Front shell, air duct and fan maintenance

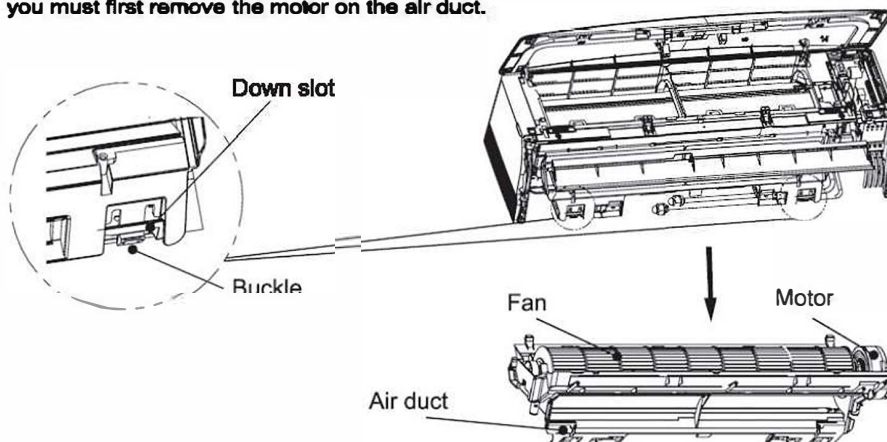
Remove the screws of the air duct. (G position and H position)

Note: Some models do not have H position screws.



- 5** 1. Press the 2 buckles of the air duct to disengage it from 2 down slots of the mounting plate.
2. Remove the air duct.

Note: when you want to clean the air duct and the fan with clean water, you must first remove the motor on the air duct.



- 6** After cleaning, install the machine against the disassemble sequence.

Note: If the front shell, the air duct and the fan are washed with water, they must be thoroughly dried before they can be installed.

TROUBLESHOOTING

Normal Malfunctions

Troubleshooting	Possible Reason of Abnormality	How to Deal With
Air conditioner can not start up	<ol style="list-style-type: none"> 1. Power supply failure; 2. Trip of breaker or blow of fuse; 3. Power voltage is too low; 4. Improper setting of remote controller ; 5. Remote controller is short of power. 	<ol style="list-style-type: none"> 1. Check power supply circuit; 2. Measure insulation resistance to ground to see if there is any leakage; 3. Check if there is a defective contact or leak current in the power supply circuit; 4. Check and set remote controller again; 5. Change batteries.
The compressor starts or stops frequently	The air inlet and outlet has been blocked.	Remove block obstacles.
Poor cooling/heating	<ol style="list-style-type: none"> 1. The outdoor heat exchanger is dirty, such as condenser; 2. There are heating devices indoors; 3. The air tightness is not enough. People come in and out too frequently. 4. Block of outdoor heat exchanger; 5. Improper setting of temperature. 	<ol style="list-style-type: none"> 1. Clean the heat exchanger of the outdoor unit, such as condenser ; 2. Remove heating devices; 3. Keep certain air tightness indoors; 4. Remove block obstacles; 5. Check and try to set temperature again.
Sound from deforming parts	During system starting or stopping, a sound might be heard. However, this is due to thermal deformation of plastic parts.	It is not abnormal, and the sound will disappear soon.
Water leakage	<ol style="list-style-type: none"> 1. Drainage pipe blocked or broken; 2. Wrap of refrigerant pipe joint is not closed completely. 	<ol style="list-style-type: none"> 1. Change drainage pipe. 2. Re-wrap and make it tight.

TROUBLESHOOTING

Test the jumper terminals

Note:

When the whole machine is powered up, if the external unit does not work, to rule out the communications failures, adopt screening method such as short circuit on the jumper terminals to see if the external unit can be started normally or similar method.

There are two blue terminals on the outdoor control panel, as shown above.

Application: Short out the terminals, and power up the outdoor unit, then the outdoor unit may run independently. It can be determined that there is no internal and external communication faults



TROUBLESHOOTING

Protection Circuit Fault Isolation

Protection diagnosis of the complete machine (all types of protection during operation, i.e. under-voltage, over-voltage and overcurrent protection)

Note: List all types of protection that may occur to the complete machine and describe the conditions and signs of the start, course and end of such protection.

Voltage protection

Protection against AC input over-voltage/under-voltage

1. Conditions for protection against AC input over-voltage/under-voltage:

If the input AC voltage is greater than "protective over-voltage value" or less than "protective under-voltage value" for five seconds, over-voltage/under-voltage protection starts. (E6)

2. Protection actions against AC input over-voltage/under-voltage

The system stops operation.

3. Conditions for ending AC input over-voltage/under-voltage:

If the input AC voltage is lower than "the protective over-voltage value" -10V, or higher than "the protective under-voltage value" +10V, the over-voltage/under-voltage protection will be released.

Current protection:

1. Protection against over-current

Conditions for over-current protection: if the current is equal to or greater than "current value for starting the refrigeration current protection (E2 value)" for six seconds, over-current protection starts.

Protection actions against over-current: indoor display screen and outdoor indicator give indications, the compressor and outdoor fan stop, but indoor fan runs normally.

Condition for ending over-current protection: when the current drops below "current value for releasing the refrigeration current protection (E2 value)", over-current protection will be released.

2. Frequency decreasing for over-current

Conditions for over-current frequency decreasing: if the current is equal to or greater than "current value for starting the refrigeration current protective frequency decreasing (E2 value)", over-current frequency decreasing starts.

Over-current frequency decreasing actions: the compressor will decrease frequency at rate of (E2 value)Hz/S. The indoor and outdoor fans run.

Conditions for ending over-current frequency decreasing: when the current drops below "current value for starting the refrigeration current protective prohibition of frequency rising (E2 value)", over-current under-clocking will be released.

Is the limit auto-reset

3. Prohibition of frequency increasing of compressor exhausting

Conditions for prohibition of frequency rising of compressor discharge

Condition 1: in the case of frequency decreasing of compressor discharge, the discharge temperature of the compressor drops below 39.2F

Condition 2: in normal operation, the discharge temperature of compressor reaches 41F.

Either of the above two conditions is met, prohibition of frequency rising of compressor discharge begins.

Actions relates to prohibition of frequency rising of compressor discharge: the frequency of compressor maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending prohibition of frequency rising of compressor discharge: if the temperature of compressor discharge rises above 42.8F, prohibition of frequency rising of compressor discharge will be released.

4. Prohibition of frequency for anti-overload of outdoor coiled pipe (cooling condenser temperature high) – To prevent compressor overload from tripping.

Condition for anti-overload prohibition of frequency of outdoor coil pipe: in the case of anti-overload frequency decreasing of outdoor coiled pipe, anti-overload prohibition of frequency of the unit begins when the temperature of outdoor coiled pipe drops below "the anti-overload frequency decreasing temperature of outdoor coiled pipe".

Actions relates to anti-overload prohibition of frequency of outdoor coiled pipe: the frequency of compressor maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending anti-overload prohibition of frequency of outdoor coiled pipe: if the temperature of outdoor coiled pipe drops below "temperature to release the anti-overload state of outdoor coiled pipe", anti-overload prohibition of frequency of outdoor coiled pipe will be released.

TROUBLESHOOTING

Compressor Fault Isolation

Judging the connecting terminals of inverter compressor:

It is impossible to identify terminals U, V and W of inverter compressor with multi-meter. Just connect the terminals in the same way as the original unit when replacing the compressor. A wrong connection will lead to reverse and loud noise of the compressor.

Resistance of compressor coil:

Measure the resistance between any two terminals, which are about a few Ohms, three phases having the same resistance

Electric Filter Board Fault Isolation

Visual examination: as the circuit is simple, the connection may be checked visually to see whether any loose or poor connection.

Voltage test: the voltage at the input end shall be the same as the voltage at the output end.

Electrical Communication Fault ISOLATION

Step one: to determine whether the connecting cables and tether cables of indoor/outdoor units are correctly wired. If not, change wiring order and test connection.

Step two: to determine whether there is loose connection.

Fasten the connection in the case of loose connection and then conduct verification.

Step three: measure the voltage between SI and N with multi-meter and see whether the voltage fluctuates between 0V and 24V. Please directly replace indoor and outdoor control boards if there are not voltage fluctuations

Indoor Fault Codes

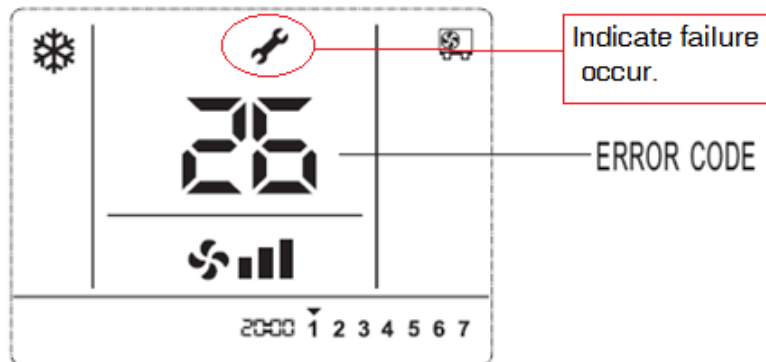
When the air conditioner failure occurs, the fault code will displays on control board, wire remote controller or display panel.

How to check fault codes

Indoor Unit

(1) Fault codes indicated by wire remote controller (see figure below)

MODEL:YXC-C01U/YXE-C01U/YXC-D01U/YXE-D01U(E)




When the airconditioner is malfunction,  will display on the LCD, and error codes will appear and blink.

FIG1. FAULT CODE DISPLAY ON WIRE REMOT CONTROLLER

TROUBLESHOOTING

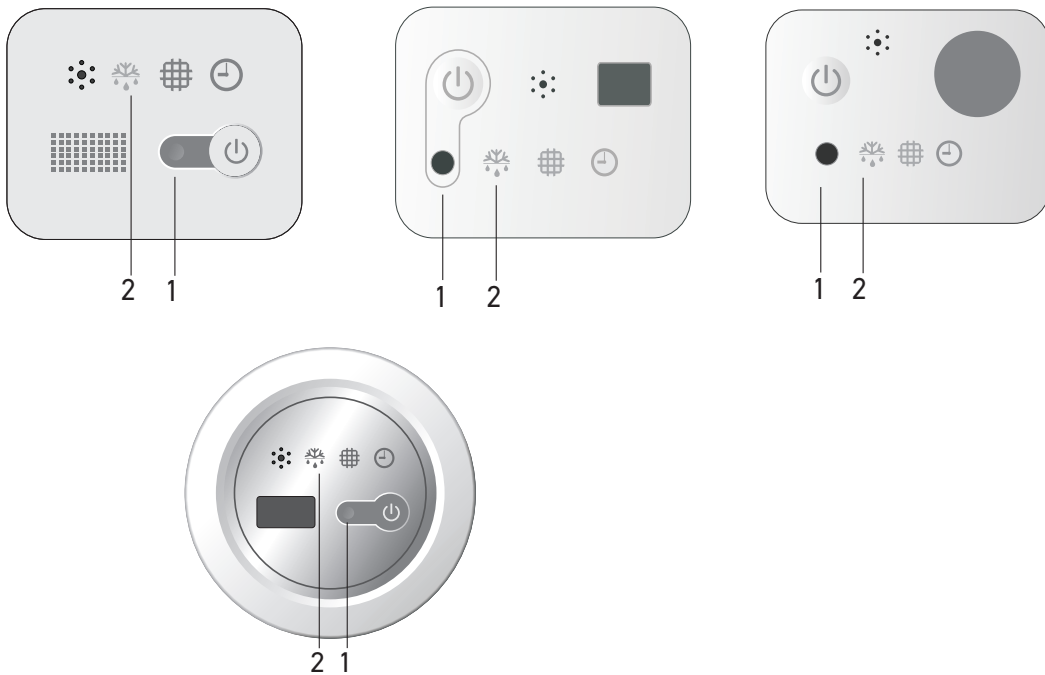
Indoor Fault Codes

(2) Fault codes indicated by LED lamps on display panel

Lamp RUN(LED2 ,red) and Lamp DEFROST (LED5 ,green) flashing , Lamp RUN display fault code ten digit number, lamp DEFROST display fault code single digit number (as shown fig. below).

For example , fault code 36: led RUN & defrost flash 3 times at the same time, and led DEFROST continue flash 3 times,reports No. 36 fault.

Display panel



- 1 Run indicator (Red)
Indicates the fault code ten digital number.
- 2 Defrost indicator (Green)
Indicates the fault code singal digital number.

LED FALSH CONTROL : flash 300mS(T1) , off 300mS(T2) , after 2000mS(T3)fault code repeat displays. (as shown below)

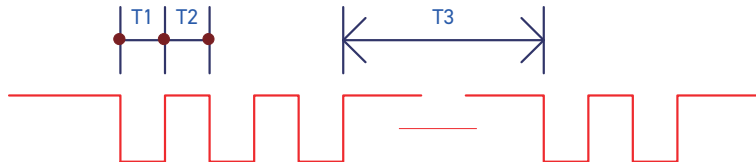


FIG. 2 LED flash control

TROUBLESHOOTING

Indoor Fault Code

Fault code	Fault Description	Possible Reason of Abnormality	How to Deal With	Re marks
51	Drainage protection	<ol style="list-style-type: none"> 1. The water level of the drain pan exceed safe level; 2. The cable of the water level switch connect loose; 3. The water level switch is failure; 4. The control board is failure. 	<ol style="list-style-type: none"> 1.1 Check whether there are something to block the drain hose or the height of the drain hose is too high; 1.2 Check the water pump and replace the water pump if the water pump is failure; 2. Reconnect the cable of the water level switch refer to the wiring diagram; 3. Replace the water level switch; 4. Replace the control board. 	
55	Mode Conflict Fault	The user set the conflicting mode for more than two indoor units	Reset the operate mode for the indoor unit, for the one outdoor unit, the user should avoid to set the conflicting operate mode with the indoor units .	
64	Communication between Indoor and Outdoor Unit Ducted and Cassette Units only	<ol style="list-style-type: none"> 1. The connection cable between the indoor unit and the outdoor unit connect wrong; 2. The communication cable connect loose; 3. The communication cable between the indoor unit and the outdoor unit is failure or the cable between the indoor control board to terminal is failure or the cable between the outdoor control board to the terminal is failure; 4. The indoor control board is failure; 5. The outdoor control board is failure. 	<ol style="list-style-type: none"> 1. Reconnect the connection cable refer to the indoor and outdoor wiring diagram; 2. Reconnect the communication cable refer to the indoor and outdoor wiring diagram; 3. Replace the communication cable refer to the indoor and outdoor wiring diagram; 4. Replace the indoor control board; 5. Replace the outdoor control board. 	
36	Communication between Indoor and Outdoor Unit Wall Mounted Units only	<ol style="list-style-type: none"> 1. The connection cable between the indoor unit and the outdoor unit connect wrong; 2. The communication cable connect loose; 3. The communication cable between the indoor unit and the outdoor unit is failure or the cable between the indoor control board to terminal is failure or the cable between the outdoor control board to the terminal is failure; 4. The indoor control board is failure; 5. The outdoor control board is failure. 	<ol style="list-style-type: none"> 1. Reconnect the connection cable refer to the indoor and outdoor wiring diagram; 2. Reconnect the communication cable refer to the indoor and outdoor wiring diagram; 3. Replace the communication cable refer to the indoor and outdoor wiring diagram; 4. Replace the indoor control board; 5. Replace the outdoor control board. 	
72	Indoor fan motor fault	<ol style="list-style-type: none"> 1. The cable of the indoor fan motor connect loose; 2. The cable of the indoor fan motor is failure; 3. The indoor fan motor is failure; 4. The indoor control board is failure. 	<ol style="list-style-type: none"> 1. Reconnect the cable of the fan motor; 2. Replace the cable of the fan motor; 3. Replace the fan motor; 4. Replace the indoor control board; 5. Check the indoor fan and ensure the indoor fan can run normally. 	
73	Indoor EEPROM Data 1 fault	<ol style="list-style-type: none"> 1. Indoor EE components is failure; 2. The control circuit of the EE components is failure; 3. The EE components has been inserted with opposite direction. 	<ol style="list-style-type: none"> 1. Replace the EE components; 2. Replace the indoor control board; 3. Reassembly the EE components of the indoor control board. 	

TROUBLESHOOTING

Indoor Fault Code

Fault code	Fault Description	Possible Reason of Abnormality	How to Deal With	Remarks
74	Indoor EEPROM Data 2 error	EE in MCU is failure, the unit can run, but the function user has set is ineffective.	Replace EE data in MCU.	
77	WiFi Ready to Pair	Switch accidentally depressed	Cycle unit power off and then on again	
81	Indoor ambient Temperature Sensor Fault	<ol style="list-style-type: none"> 1. The cable of the room temperature sensor connect loose; 2. The room temperature sensor is failure; 3. The sampling circuit is abnormally 	<ol style="list-style-type: none"> 1. Reconnect the cable of the room temperature sensor; 2. Replace the room temperature sensor; 3. Replace the indoor control board. 	
83	Evaporator Middle Temperature Sensor Fault	<ol style="list-style-type: none"> 1. The cable of the coil temperature sensor of the evaporator is failure; 2. The coil temperature sensor of the evaporator is failure; 3. The sampling circuit is abnormally 	<ol style="list-style-type: none"> 1. Reconnect the cable of the coil temperature sensor of the evaporator; 2. Replace the coil temperature sensor of the evaporator; 3. Replace the indoor control board. 	
FE (254)	Communication between main control board & Wiring remote controller Fault (display on wiring remote controller)	<ol style="list-style-type: none"> 1. The wiring between the wiring controller to the indoor control board connect loose; 2. The sequence of the wiring between the wiring controller to the indoor control board is wrong; 3. The wiring between the wiring controller to the indoor control board is failure; 4. The wiring controller is failure; 5. The indoor control board is abnormally. 	<ol style="list-style-type: none"> 1. Reconnect the wiring between the wiring controller to the indoor control board; 2. Replace the wiring between the wiring controller to the indoor control board; 3. Replace the wiring between the wiring controller to the indoor control board; 4. Replace the wiring controller; 5. Replace the indoor control Board. 	
ER	Communication between main control board & display board Fault (displays on display board)	<ol style="list-style-type: none"> 1. The wiring between the display board to the indoor control board connect loose; 2. The sequence of the wiring between the display board to the indoor control board is wrong; 3. The wiring between the display board to the indoor control board is failure; 4. The display board is failure; 5. The indoor control board is failure. 	<ol style="list-style-type: none"> 1. Reconnect the between the display board to the indoor control board; 2. Replace the wiring between the display board to the indoor control board; 3. Replace the wiring between the display board to the indoor control board; 4. Replace the display board; 5. Replace the indoor control board. 	

TROUBLESHOOTING

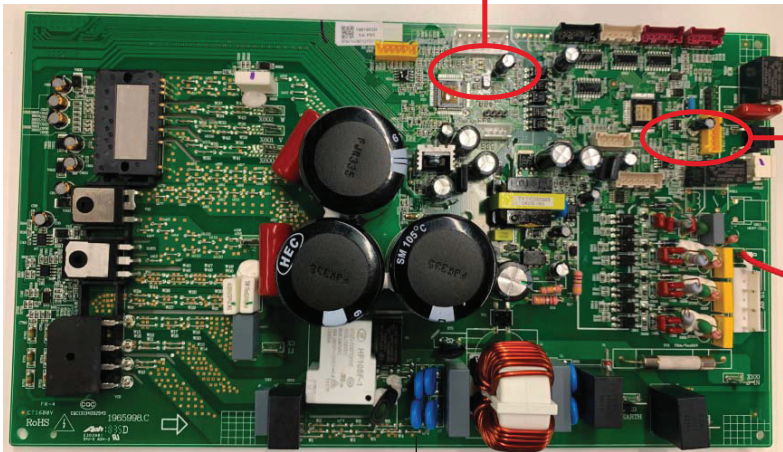
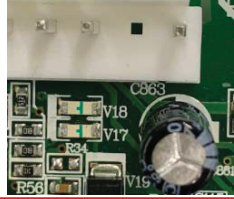
Outdoor Fault Codes

When the air conditioner failure occurs, the fault code will displays on control board.

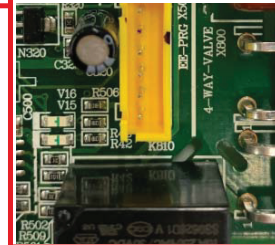
HOW TO CHECK FAULT CODES

1) 18K

Drive failure indicator
V17: Ten digit number
V18: Single digit number



Main control failure indicator
V15: Ten digit number
V16: Single digit number

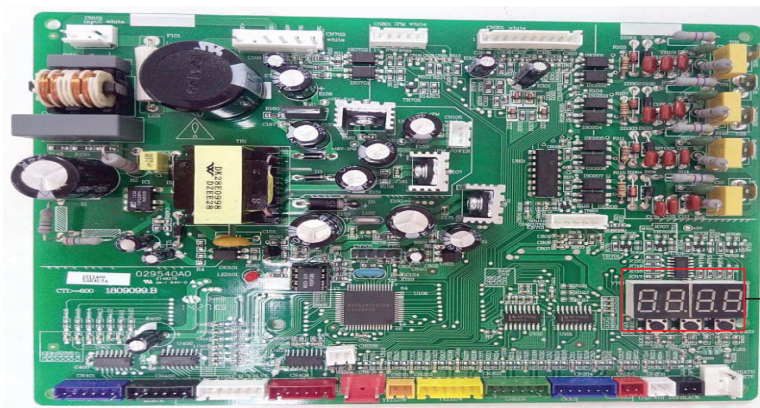


Main Control Board

2) 18K/24K/36K/42K

Main control failure

Fault code will display on 7 segment display on outdoor control board.

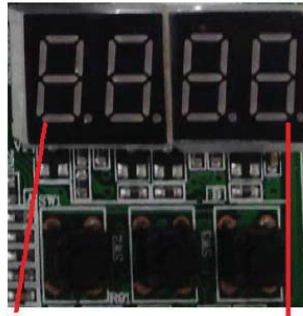


Outdoor Control Board

7 segment display

TROUBLESHOOTING

Outdoor Fault Codes



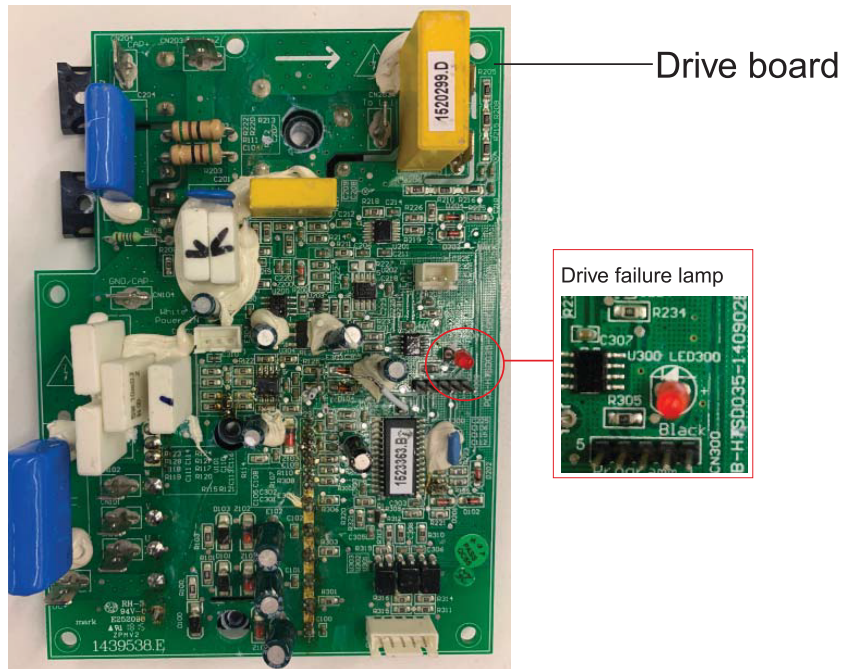
E shows failure occur

Display ERROR Code

Drive fault code display

The lamp of drive board flash shows failure occurs.

The drive failure lamp flicking times shows the failure code.



The drive failure lamp flicking times shows the failure code.

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	"1.The outdoor ambient temperature sensor is connected loosely; 2.The outdoor ambient temperature sensor fails to work; 3.The sampling circuit fails."	"1.Reconnect the outdoor ambient temperature sensor; 2.Replace the outdoor ambient temperature sensor components; 3.Replace the outdoor control board components."	
2	Outdoor coil temperature sensor fault	"1.The outdoor coil temperature sensor is connected loosely; 2.The outdoor coil temperature sensor fails to work; 3.The sampling circuit fails."	"1.Reconnect the outdoor coil temperature sensor; 2.Replace the outdoor coil temperature sensor components; 3.Replace the outdoor control board components."	
3	The unit over-current turn off fault	"1. Control board current sampling circuit fails; 2. The current is over high because the supply voltage is too low; 3. The compressor is blocked; 4. Overload in cooling mode; 5. Overload in heating mode."	"1. Replace the electrical control board components; 2. Normally protection 3. Replace the compressor 4. Please see the Note 3 5. Please see the Note 4 "	
4	EEprom Data error	"1.EE components fails; 2.EE components control circuit fails; 3.EE components are inserted incorrectly."	"1.Replace the EE components; 2.Replace the outdoor control board components; 3.Reassembly the EE components."	
5	Cooling freezing protection (the indoor coil temperature is too low) or heating overload (indoor coil temperature is too high)	"1.The indoor unit can not blow air normally; 2.The room temperature is too low in cooling mode or the room temperature is too high in heating; 3.The filter is dirty; 4.The duct resistance is too high to result in low air flow; 5.The setting fan speed is too low; 6.The indoor unit is not installed in accordance with the installation standards, and the air inlet is too close to the air outlet ."	"1.Check whether the indoor fan, indoor fan motor and evaporator work normally; 2.Normal protection; 3.Clean the filter; 4.Check the volume control valve, duct length etc.; 5.Set the speed with high speed; 6.Reinstall the indoor unit referring to the user manual to change the distance between the indoor unit and the wall or ceiling."	

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
7	The communication fault between the indoor unit and outdoor unit	"1. The connection cable is connected improperly between the indoor unit and outdoor unit; 2. The communication cable is connected loosely; 3. The communication cable fails; 4. The indoor control board fails; 5. The outdoor control board fails; 6. Communication circuit fuse open; 7. The specification of communication cable is incorrect."	"1. Reconnect the connection cable referring to the wiring diagram; 2. Reconnect the communication cable; 3. Replace the communication cable; 4. Replace the indoor control board; 5. Replace the outdoor control board; 6. Check the communication circuit, adjust the DIP switch and the short-circuit fuse. 7. Choose suitable communication cable referring to the user manual"	
13	Compressor overheat protector device	"1. The wiring of the overload protector is connected loosely. 2. The overload protector fails . 3. The refrigerant is not enough; 4. The installation pipe is much longer than the normal one, but extra refrigerant is not added ; 5. The expansion valve fails; 6. The outdoor control board fails."	"1. Reconnect the wiring of the overload protector; 2. Replace the overload protector; 3. Check the welding point of the unit to confirm whether it is leakage, and then recharge the refrigerant; 4. Add the refrigerant; 5. Replace expansion valve; 6. Replace the outdoor control board."	
14	The high pressure switch operation or the unit is turned off for high pressure protection	"1. The wiring of the high pressure protector is connected loosely; 2. The high pressure protector fails 3. The outdoor control board is abnormal; 4. Overload in cooling; 5. Overload in heating."	"1. Reconnect the wiring of the high pressure protector; 2. Replace the high pressure protector; 3. Replace the outdoor control board; 4. Please refer to the Note 3; 5. Please refer to the Note 4."	Applied to models with high pressure switch or pressure sensor
15	the low pressure switch protection or the unit turn off for low pressure protection	1. The wiring of the low pressure switch connect loose; 2. The low pressure switch is failure; 3.The refrigerant is not enough; 4.The expansion valve failure in heating mode; 5.The outdoor control board is abnormal.	1. Reconnect the wiring of the low pressure switch; 2. Replace the low pressure switch; 3.Check the welding point to confirm whether the unit is leakage, and then add some refrigerant; 4. Replace the expansion valve; 5. Replace the outdoor control board.	Applied to models with low pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to the Note 3.	

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
17	Discharge temperature sensor fault	"1.The wiring of the discharge temperature sensor is connected loosely; 2.The discharge temperature sensor fails; 3.The sampling circuit is abnormal."	"1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor fails; 3. The sampling circuit is abnormal."	
18	AC voltage is abnormal	1.The AC voltage>275V or <160V. 2.The AC voltage of sampling circuit on the driver board is abnormal.	"1. Normal protection, please check the supply power; 2. Replace the driver board."	
19	Suction temperature sensor fault	"1.The wiring of the suction temperature sensor is connected loosely; 2.The suction temperature sensor fails; 3.The sampling circuit is abnormal."	"1. Reconnect the wiring of the suction temperature sensor; 2. Replace the suction temperature sensor; 3. Replace the outdoor control board."	
22	The defrosting sensor fault	"1. The wiring of the defrosting sensor is connected loosely; 2. The defrosting sensor fails; 3. The sampling circuit is abnormal."	"1. Reconnect the wiring of the defrosting sensor; 2. Replace the defrosting sensor; 3. Replace the outdoor control board."	
23	Expansion valve A tube (thin) sensor fault	"1. The wiring of the sensor for the expansion valve A(thin tube) connect loose; 2. The sensor for the expansion A(thin tube) is failure; 3. The sampling circuit is abnormally"	"1. Reconnect the wiring of the sensor for the expansion valve A (thin tube); 2. Replace the sensor for the expansion valve A (thin tube); 3. Replace the outdoor control board."	
24	Expansion valve B (thin) tube sensor fault	"1. The wiring of the sensor for the expansion valve B (thin tube) connect loose; 2.The sensor for the expansion valve B(thin tube) is failure; 3.The sampling circuit is abnormally"	"1. Reconnect the wiring of the sensor for the expansion valve B(thin tube); 2.Replace the sensor for the expansion valve B(thin tube); 3. Replace the outdoor control board."	
25	Expansion valve C (liquid) pipe sensor fault	"1. The wiring of the sensor for the expansion valve C (liquid pipe) is connected loosely; 2. The sensor of the expansion valve C (liquid pipe) fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve C (liquid pipe). 2. Replace the sensor for the expansion valve C (liquid pipe); 3. Replace the outdoor control board."	
26	Expansion valve D (liquid) pipe sensor fault	"1.The wiring of the sensor for the expansion valve D (liquid pipe) is connected loosely; 2.The sensor of the expansion valve D (liquid pipe) fails; 3.The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve D (liquid pipe); 2. Replace the sensor for the expansion valve D (liquid pipe); 3. Replace the outdoor control board."	

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
27	Expansion valve A (gas pipe) sensor fault	"1. The wiring of the sensor for the expansion valve A (gas pipe) is connected loosely; 2. The sensor of the expansion valve A (gas pipe) fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve A (gas pipe); 2. Replace the sensor for the expansion valve A (gas pipe); 3. Replace the outdoor control board."	
28	Expansion valve B (gas pipe) sensor fault	"1. The wiring of the sensor for the expansion valve B (gas pipe) connect is connected loosely; 2. The sensor of the expansion valve B (gas pipe) fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve B (gas pipe); 3. Replace the outdoor control board."	
29	Expansion valve C (gas pipe) sensor fault	"1. The wiring of the sensor for the expansion valve B (gas pipe) connect is connected loosely; 2. The sensor of the expansion valve C (gas pipe) is fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve C (gas pipe); 3. Replace the outdoor control board."	
30	Expansion valve D (gas pipe) sensor fault	"1. The wiring of the sensor for the expansion valve B (gas pipe) is connected loosely; 2. The sensor of the expansion valve D (gas pipe) fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve D (gas pipe); 3. Replace the outdoor control board."	
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 5, table 6.	See attached "analysis of the driving board fault".	
46	IPM and control board communication fault	"1.The cable between the control board and the driver board is connected loosely; 2.The cable between the control board and the driver board fails; 3.The driver board fails; 4.The control board fails."	"1.Reconnect the cable between the control board and the driver board; 2.Replace the communication cable between the control board and the driver board; 3.Replace the driver board; 4.Replace the control board."	

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
47	Too high discharge temperature fault	"1. The refrigerant of the unit is not enough; 2.The refrigerant of the unit is not enough due to that the installation pipe is longer. 3.Throttling service fails; 4.The outdoor ambient temperature is too high."	"1.Check the welding point to confirm whether the unit has leakage point and then add some refrigerant. 2.Add some refrigerant referring to the installation user manual; 3.Replace the throttling service (such as capillary expansion valve) 4.Normal protection."	
48	The outdoor DC fan motor fault (upper fan motor)	"1.The connecting wiring of the up DC fan motor is loose; 2.The cord of the upper DC fan motor fails; 3.The upper DC fan motor fails; 4.The drive circuit of the upper DC fan motor fails; 5.The outdoor fan has been blocked."	"1.Reconnect the wiring of the up DC fan motor; 2.Replace the upper DC fan motor; 3.Replace the upper DC fan motor; 4.Replace the driver board of the fan motor; 5.Check the outdoor fan and ensure the outdoor fan can run normally."	
49	"the outdoor DC fan motor fault (down fan motor)"	"1. The wiring of the down DC fan motor connect loose; 2. The cord of the down DC fan motor is failure; 3. The down DC fan motor is failure; 4. The drive circuit of the down DC fan motor is failure; 5. The outdoor fan has been blocked."	"1. Reconnect the wiring of the down DC fan motor; 2. Replace the down DC fan motor; 3. Replace the down DC fan motor; 4. Replace the driver board of the fan motor; 5. Check the outdoor fan and ensure the outdoor fan can run normally."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED UP TO AND INCLUDING THE YEAR 2020.
50	Expansion valve E (gas pipe) sensor fault	"1. The wiring of the sensor for the expansion valve E (gas pipe) is connected loosely; 2. The sensor of the expansion valve E (gas pipe) fails; 3. The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve E (gas pipe); 2. Replace the sensor for the expansion valve E (gas pipe); 3. Replace the outdoor control board."	THIS CODE IS ONLY APPLICABLE TO THE 42K MULTIZONE OUTDOOR UNIT.
53	Expansion valve D (liquid) pipe sensor fault	"1.The wiring of the sensor for the expansion valve D (liquid pipe) is connected loosely; 2.The sensor of the expansion valve D (liquid pipe) fails; 3.The sampling circuit fails."	"1. Reconnect the wiring of the sensor for the expansion valve D (liquid pipe); 2. Replace the sensor for the expansion valve D (liquid pipe); 3. Replace the outdoor control board."	THIS CODE IS ONLY APPLICABLE TO THE 42K MULTIZONE OUTDOOR UNIT.
74	Indoor EEPROM Data 2 fault	EE in MCU is fails, the unit can run, but the function user has set is ineffective.	Replace EE data in MCU.	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED IN THE YEAR 2021 OR LATER. THIS CODE CAN APPEAR IF THE CIRCUIT BOARDS ARE REPLACED ON OLDER MODELS.

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
81	Indoor ambient Temperature Sensor Fault	"1. The cable of the room temperature sensor is connect loosely; 2. The room temperature sensor fails; 3. The sampling circuit is abnormal."	"1. Reconnect the cable of the room temperature sensor; 2. Replace the room temperature sensor; 3. Replace the indoor control board."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED IN THE YEAR 2021 OR LATER. THIS CODE CAN APPEAR IF THE CIRCUIT BOARDS ARE REPLACED ON OLDER MODELS.
83	Evaporator Middle Temperature Sensor Fault	"1.The cable of the coil temperature sensor of the evaporator fails; 2.The coil temperature sensor of the evaporator fails; 3.The sampling circuit is abnormal."	"1. Reconnect the cable of the coil temperature sensor of the evaporator; 2. Replace the coil temperature sensor of the evaporator; 3. Replace the indoor control board."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED IN THE YEAR 2021 OR LATER THIS CODE CAN APPEAR IF THE CIRCUIT BOARDS ARE REPLACED ON OLDER MODELS.
91	"The unit turn off due to the IPM board over heating fault"	"1. The outdoor ambient is too high; 2. The speed of the out fan motor is too low if the fan motor is AC fan motor; 3.The outdoor unit has been installed without standard; 4.The supply power is too low."	"1. Normally protection; 2. Check the fan capacitor, and replace the fan capacitor if it is failure; 3. Reinstalled the outdoor unit refer to the installation user manual; 4.Normally protection."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED UP TO AND INCLUDING THE YEAR 2020.
96	Lacking of refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	If continue to see this code after confirming charge call Technical Assistance Center for additional help.
97	4-way valve commutation failure fault	"1.The connecting wiring of the 4- way valve coil is loose; 2.The 4-way valve coil fails; 3.The 4-way valve fails; 4.The driver board of the 4-way valve fails."	"1. Reconnect the wiring of the 4-way valve; 2. Replace the 4-way valve coil; 3. Replace the 4-way valve; 4.Replace the driver board of the 4-way valve."	
FE (254)	Communication between main control board & Wired controller Fault (display on wired controller)	"1. The wired controller and the indoor control board are connected loosely. 2. The sequence of the wiring between the wired controller to the indoor control board is wrong; 3. The wiring between the wired controller to the indoor control board fails; 4. The wired controller is fails; 5. The indoor control board is abnormal."	"1.Reconnect the wiring between the wired controller to the indoor control board; 2. Replace the wiring between the wired controller to the indoor control board; 3. Replace the wiring between the wired controller to the indoor control board; 4. Replace the wired controller; 5. Replace the indoor control Board."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED IN THE YEAR 2021 OR LATER THIS CODE CAN APPEAR IF THE CIRCUIT BOARDS ARE REPLACED ON OLDER MODELS.

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
ER	"Communication between main control board & display board Fault (displays on display board)"	"1.The wiring between the display board to the indoor control board is connected loosely; 2.The sequence of the wiring between the display board to the indoor control board is wrong; 3.The wiring between the display board to the indoor control board fails; 4.The display board fails; 5.The indoor control board fails."	"1. Reconnect the wiring between the display board to the indoor control board; 2. Replace the wiring between the display board to the indoor control board; 3. Replace the wiring between the display board to the indoor control board; 4. Replace the display board; 5. Replace the indoor control board."	THIS CODE IS ONLY APPLICABLE TO MODELS PRODUCED IN THE YEAR 2021 OR LATER .THIS CODE CAN APPEAR IF THE CIRCUIT BOARDS ARE REPLACED ON OLDER MODELS.

TROUBLESHOOTING

Outdoor Fault Codes

NOTE 1:

If the indoor unit can not start or the indoor unit stops itself after 30s, at the same time the unit do not display the fault code, please check the fire and the socket of the control board.

NOTE 2:

If the indoor unit displays the 75,76,77,78 fault code after you turn on the unit, please check the TEST seat of the indoor control board or the TEST detection circuit to see whether short circuit occurs.

NOTE 3: Overload in cooling mode

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

NOTE 4: Over load in heating mode

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

TROUBLESHOOTING

18K Outdoor Drive Fault Codes

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

TROUBLESHOOTING

24k, 36k, and 42k Outdoor Drive Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Q axis current detection, failure in drive control	1. Compressor wire is not connected properly; 2. Bad driver board components; 3. Compressor start load is too large; 4. Compressor demagnetization; 5. Compress or oil shortage serious wear of crankshaft; 6. The compressor insulation fails.	1. Check compressor wire; 2. Change driver board ; 3. Turn on the machine after the pressure is balanced again; 4. Change Compressor; 5. Change the Compressor; 6. Change the Compressor.
2	Phase current detection failure in drive control	1.Compressor voltage default phase; 2.Bad driver board components; 3.The compressor insulation fault.	1.Check compressor wire connection; 2.Change the driver board; 3. Change the Compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change driver board .
4	Speed estimation, failure in drive control	1.Bad driver board components; 2.Compressor shaft clamping; 3.The compressor insulation fails.	1.Change driver board ; 2.Change the Compressor ; 3.Change the Compressor .
5	IPM FO output fault	1. System overload or current overload. 2. Driver board fails; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1.Check the air-conditioner system; 2.Change the driver board; 3.Change the Compressor; 4. Change the Compressor.
6	Communication between driver board and control board fault	1.Communication wire connect not well; 2. Driver board fault; 3. Control board fault;	1. Check compressor wire connect. 2. Change the driver board; 3. Change the control board ;
7	AC voltage,overload voltage	1. Supply voltage input is too high or too low; 2. Driver board fails;	1.Check power supply; 2.Change the driver board;
8	DC voltage,overload voltage	1. Supply voltage input is too high ; 2. Driver board fault;	1. Check power supply; 2. Change the driver board;
9	AC voltage imbalance	Driver board fails;	Change the driver board;
10	The PFC current detection circuit fault before compressor is ON	Bad driver board components;	Change the driver board
11	AC voltage supply in outrange	1.Power supply abnormal, power frequency out of range; 2.Driver board fails;	1. Check the system; 2. Change the driver board;
12	Products of single-phase PFC over-current, FO output low level	1. System overload, current is too large 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Inverter over current (3-phase power supply air conditioners)	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the Compressor; 4. Change the Compressor.
13	Inverter over current	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the Compressor; 4. Change the Compressor.
14	PFC over current(single-phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1.3-Phase voltage imbalance; 2.The 3-phase power supply phase lost; 3. Power supply wiring wrong; 4. Driver board fault.	1, Check the power supply; 2. Check the power supply; 3. Check the power supply wiring connect; 4. Change the driver board.
15	The instantaneous power off detection	1.The power supply is not stable ; 2.The instantaneous power failure ; 3.Driver board fault;	1. Check the power supply; 2. Not fault; 3. Change the driver board.

TROUBLESHOOTING

24k, 36k, and 42k Outdoor Drive Fault Codes

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

TROUBLESHOOTING

Diagnosis and Solutions

Note: List all types of protection that may occur to the complete machine and describe the conditions and signs of the start, course and end of such protection.

Voltage protection

Protection against AC input over-voltage/under-voltage

1. Conditions for protection against AC input over-voltage/under-voltage:

If the input AC voltage is greater than “protective over-voltage value” or less than “protective under-voltage value” for five seconds, over-voltage/under-voltage protection starts.

2. Protection actions against AC input over-voltage/under-voltage

The system stops operation.

3. Conditions for ending AC input over-voltage/under-voltage:

If the input AC voltage is lower than “the protective over-voltage value” -10V, or higher than “the protective under-voltage value” +10V, the over-voltage/under-voltage protection will be released.

Current protection:

1. Protection against over-current

Conditions for over-current protection: if the current is equal to or greater than “current value for starting the refrigeration current protection (E2 value)” for six seconds, over-current protection starts.

Protection actions against over-current: indoor display screen and outdoor indicator give indications, the compressor and outdoor fan stop, but indoor fan runs normally.

Condition for ending over-current protection: when the current drops below “current value for releasing the refrigeration current protection (E2 value)”, over-current protection will be released.

2. Frequency decreasing for over-current

Conditions for over-current **frequency decreasing**: if the current is equal to or greater than “current value for starting the refrigeration current protective frequency decreasing (E2 value)”, over-current **frequency decreasing** starts.

Over-current **frequency decreasing** actions: the compressor will decrease frequency at rate of (E2 value)Hz/S. The indoor and outdoor fans run.

Conditions for ending over-current **frequency decreasing**: when the current drops below “current value for starting the refrigeration current protective prohibition of frequency rising (E2 value)”, over-current under-clocking will be released.

3. Prohibition of frequency increasing of compressor exhausting

Conditions for prohibition of frequency rising of compressor discharge

Condition 1: in the case of frequency decreasing of compressor discharge, the discharge temperature of the compressor drops below X 64.8°F

Condition 2: in normal operation, the discharge temperature of compressor reaches X 66.6°F

Either of the above two conditions is met, prohibition of frequency rising of compressor discharge begins.

TROUBLESHOOTING

Diagnosis and Solutions

maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending prohibition of frequency rising of compressor discharge: if the temperature of compressor discharge drops below $X6^{\circ}\text{C}$, prohibition of frequency rising of compressor discharge will be released.

4. Prohibition of frequency for anti-overload of outdoor coiled pipe

Condition for anti-overload prohibition of frequency of outdoor coiled pipe: in the case of anti-overload frequency decreasing of outdoor coiled pipe, anti-overload prohibition of frequency of the unit begins when the temperature of outdoor coiled pipe drops below “the anti-overload frequency decreasing temperature of outdoor coiled pipe”.

Actions relates to anti-overload prohibition of frequency of outdoor coiled pipe: the frequency of compressor maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending anti-overload prohibition of frequency of outdoor coiled pipe: if the temperature of outdoor coiled pipe drops below “temperature to release the anti-overload state of outdoor coiled pipe”, anti-overload prohibition of frequency of outdoor coiled pipe will be released.

7-4. Trouble Diagnosis of Compressor

Judging the connecting terminals of inverter compressor:

It is impossible to identify terminals U, V and W of inverter compressor with multi-meter. Just connect the terminals in the same way as the original unit when replacing the compressor. A wrong connection will lead to reverse and loud noise of the compressor.

Resistance of compressor coil:

Measure the resistance between any two terminals, which are about a few Ohms, three phases having the same resistance.

7-5. Trouble Diagnosis of Electric Filter Board

Visual examination: as the circuit is simple, the connection may be checked visually to see whether any loose or poor connection.

Voltage test: the voltage at the input end shall be the same as the voltage at the output end.

7-6. Trouble Diagnosis of Electric Communication

Step one: to determine whether the connecting cables and tether cables of indoor/outdoor units are correctly wired. If not, change wiring order and test connection.

Step two: to determine whether there is loose connection.

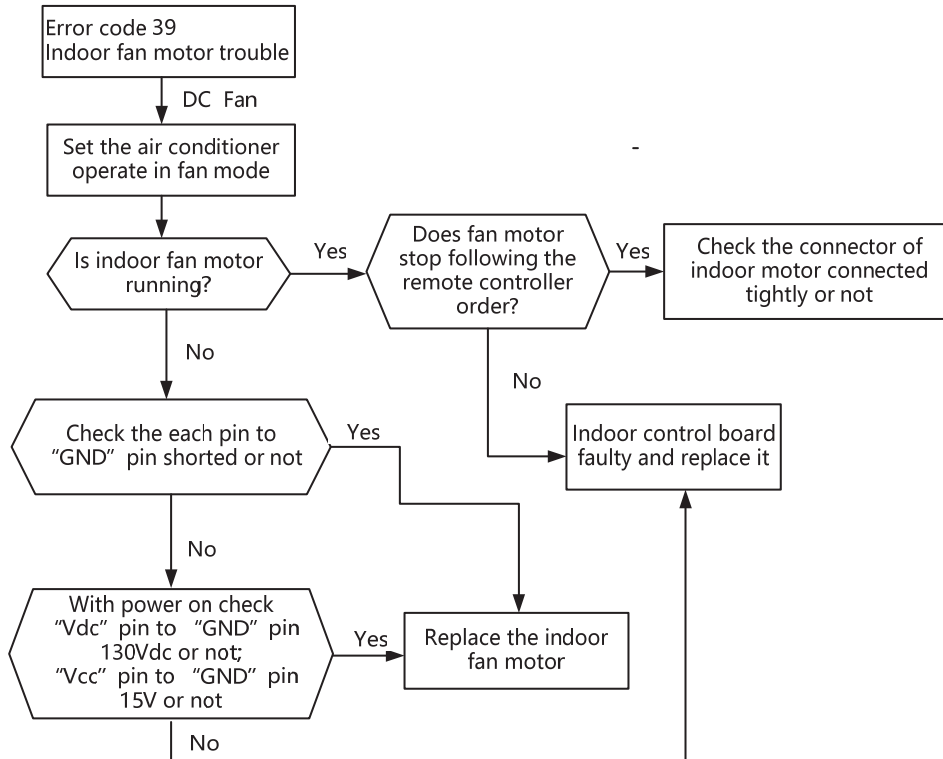
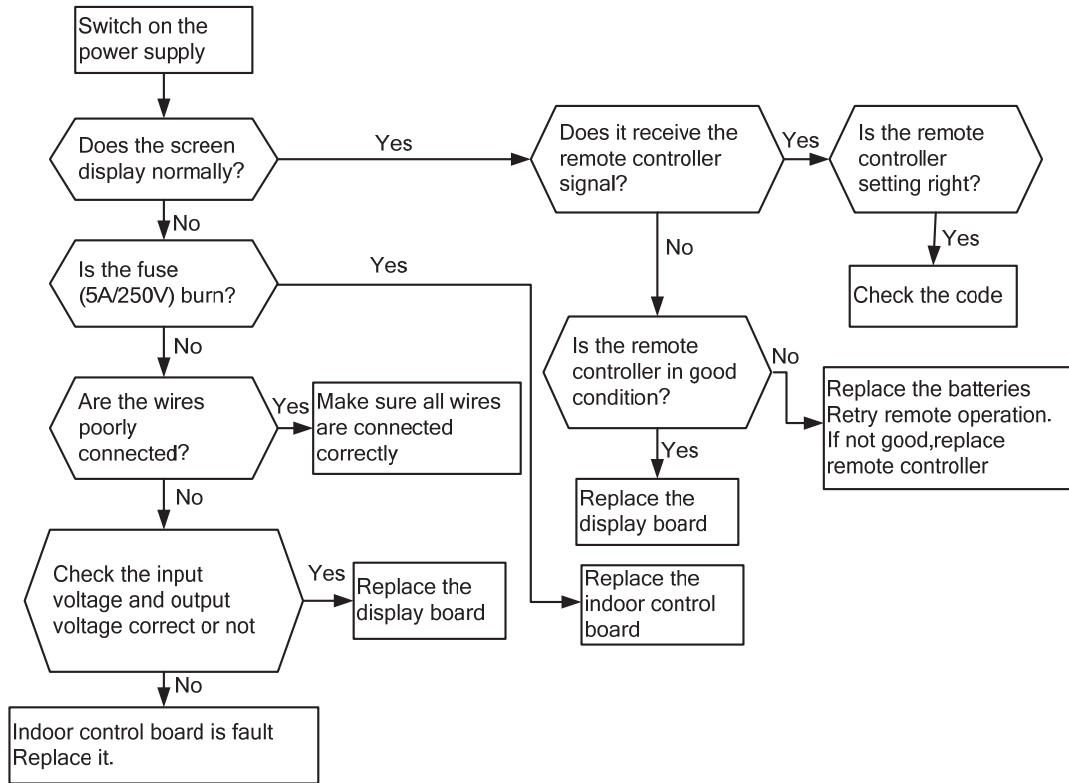
Fasten the connection in the case of loose connection and then conduct verification.

Step three: measure the voltage between SI and N with multi-meter and see whether the voltage fluctuates between 0vdc and 24vdc.

Replace indoor and outdoor control board if there aren't any voltage fluctuations.

TROUBLESHOOTING

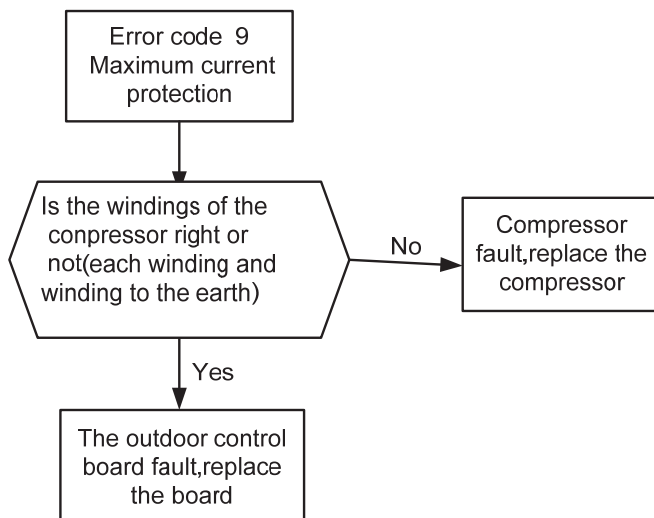
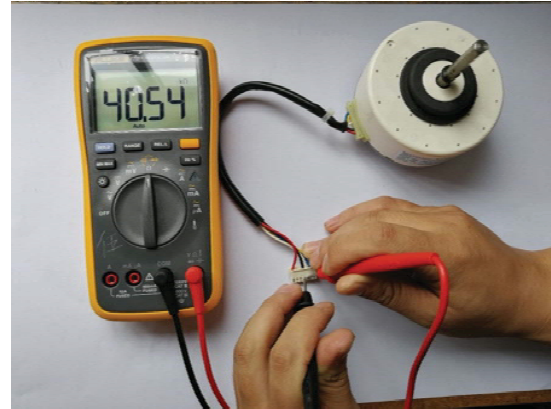
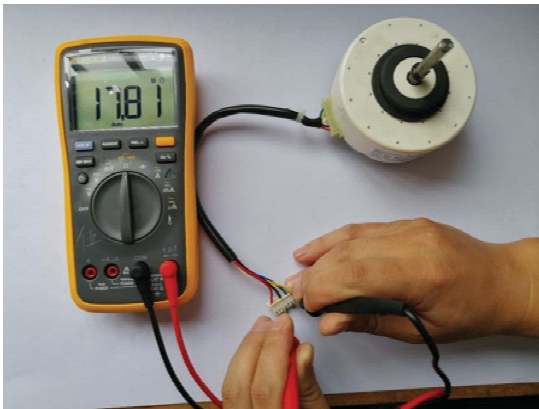
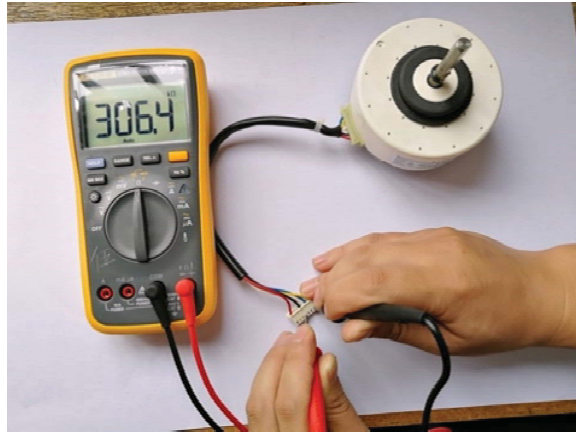
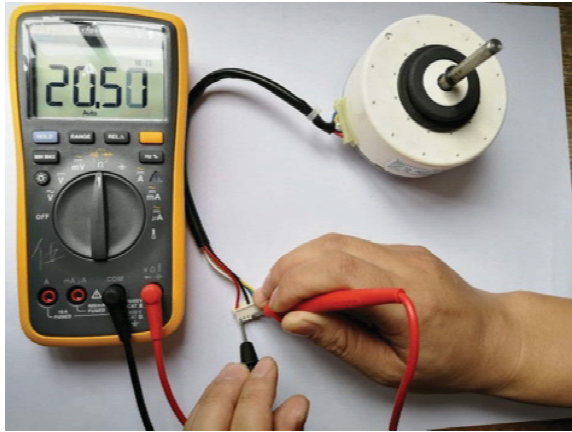
Diagnosis and Solutions



TROUBLESHOOTING

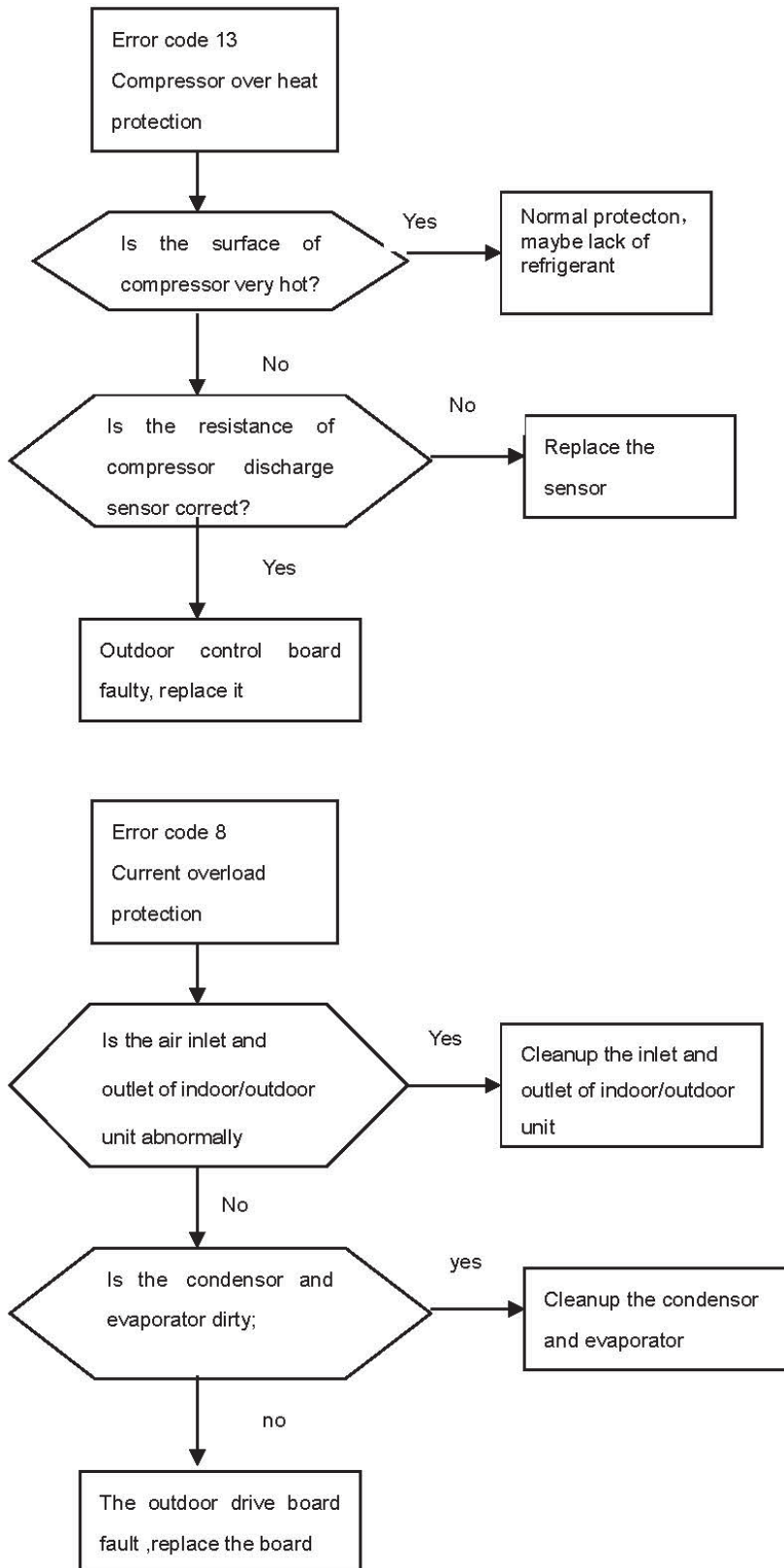
Diagnosis and Solutions

DC Fan test point:



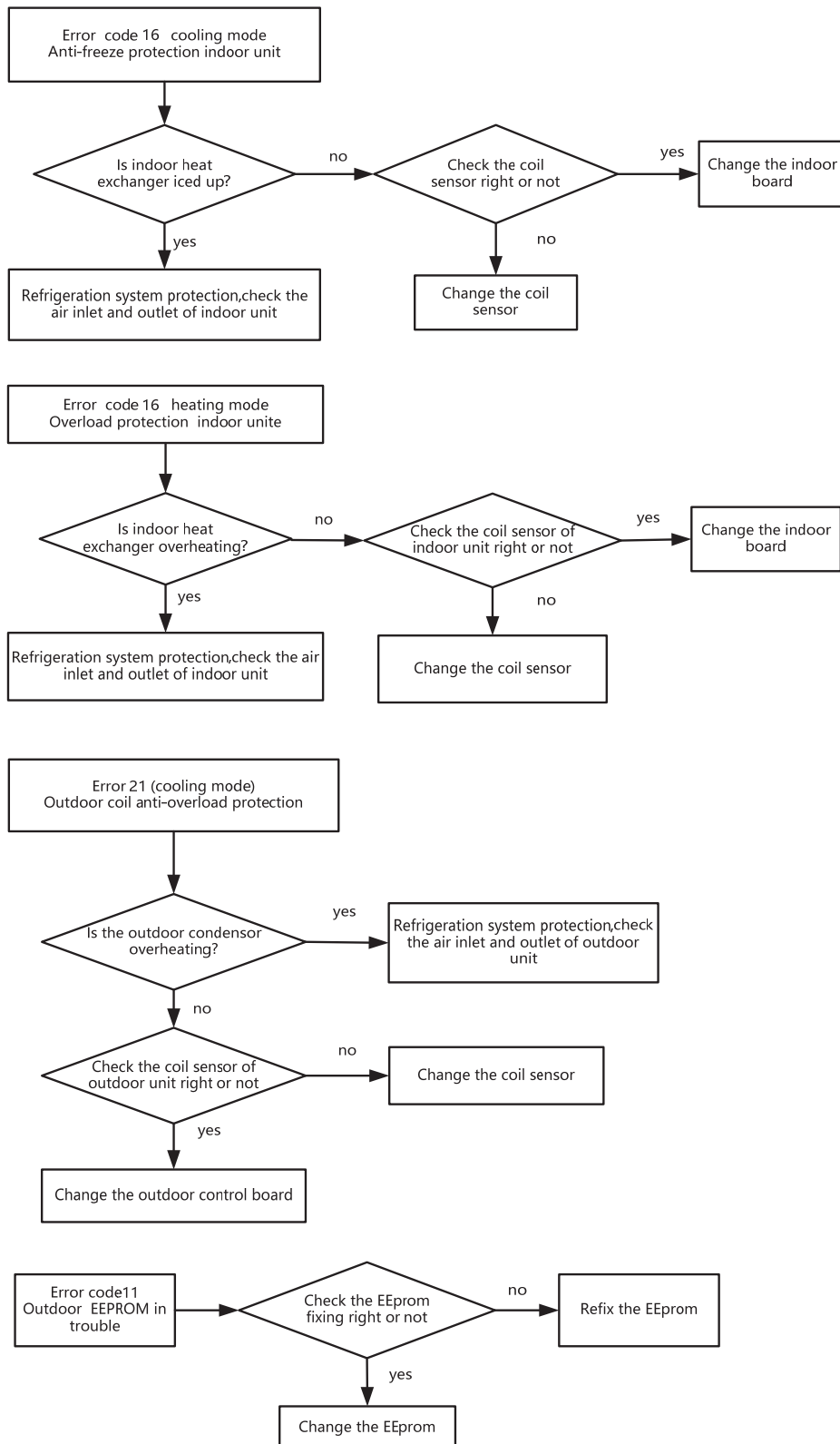
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Diagnosis and Solutions



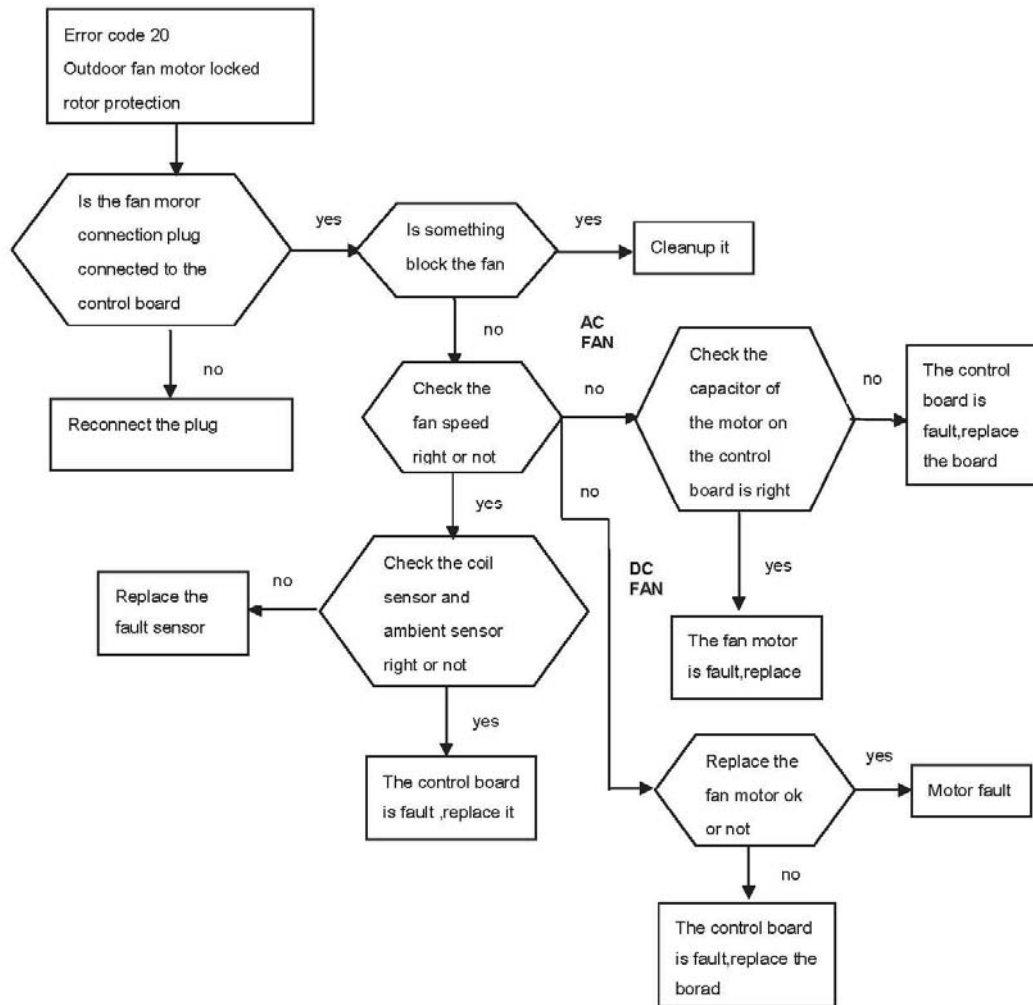
TROUBLESHOOTING

Diagnosis and Solutions



TROUBLESHOOTING

Diagnosis and Solutions

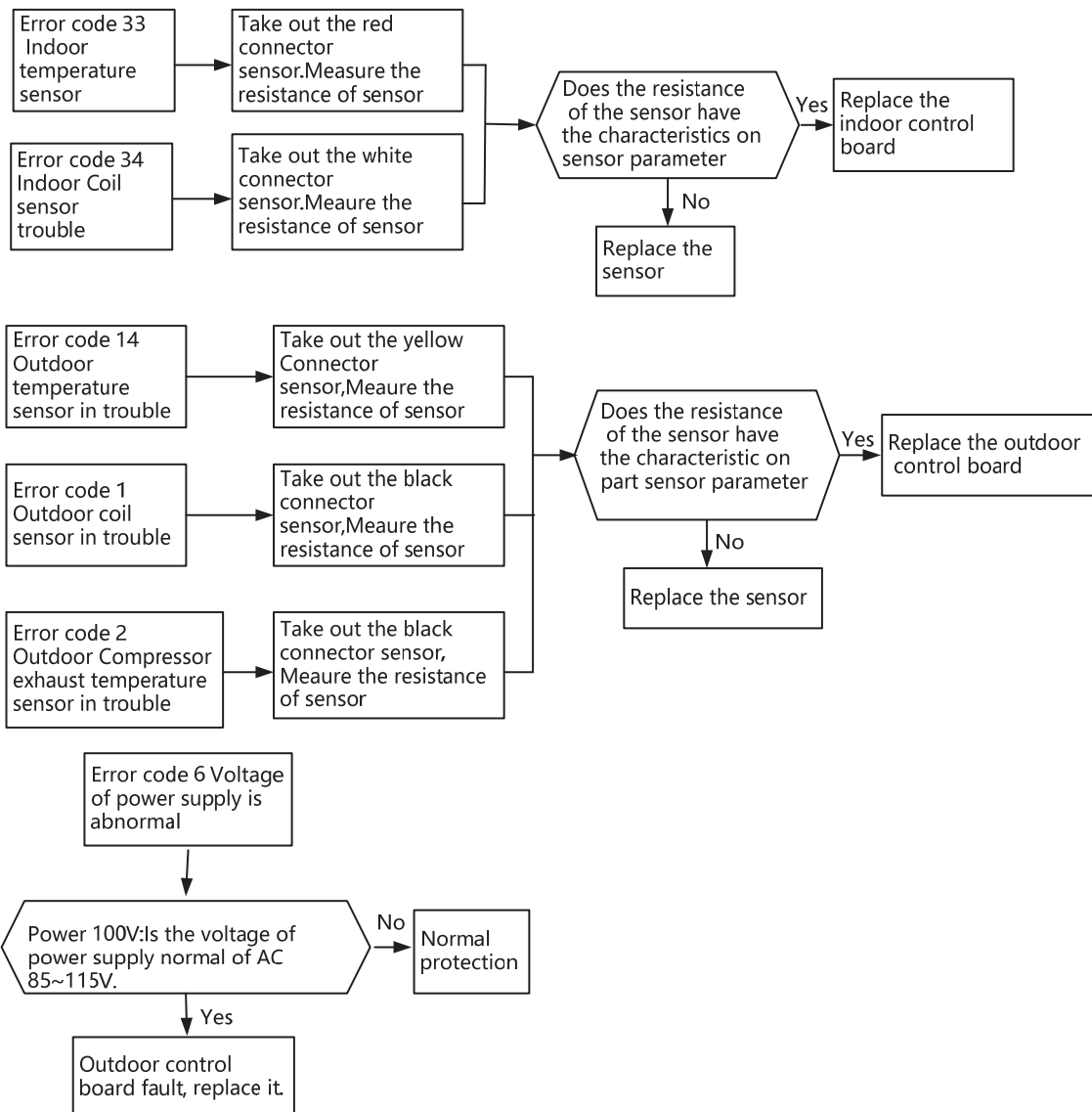


DC fan motor test point:



TROUBLESHOOTING

Diagnosis and Solutions



The Voltage protection values is different according to the model

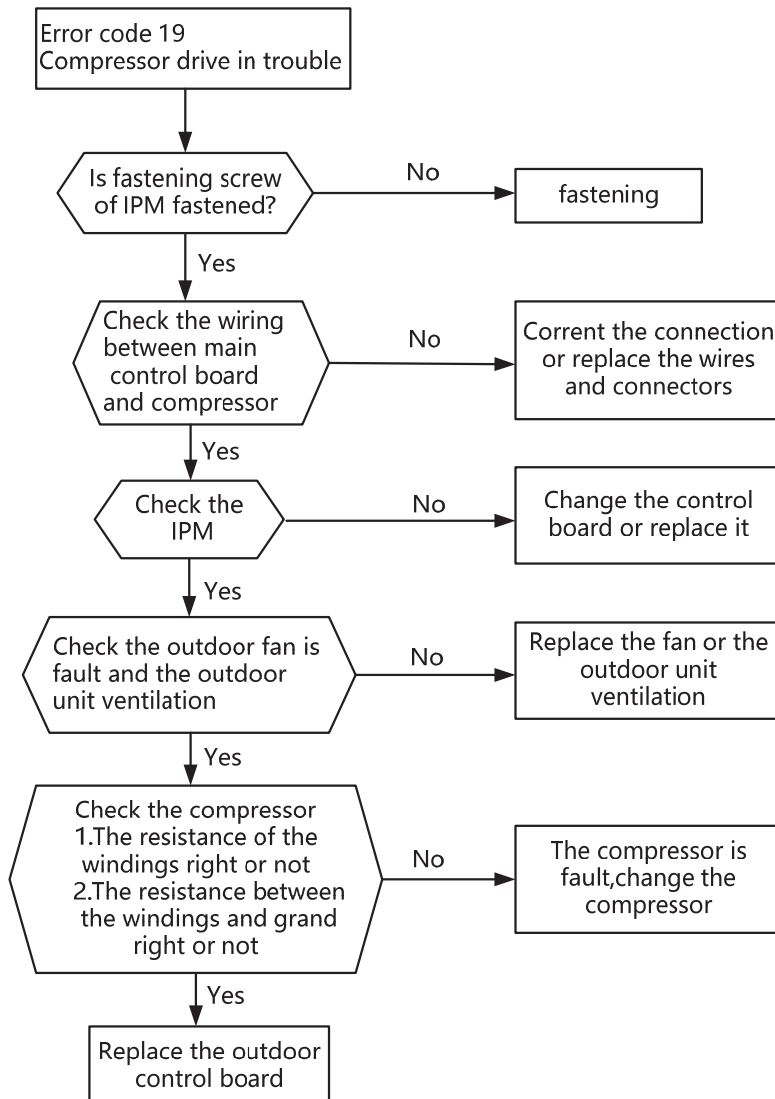
TROUBLESHOOTING

Diagnosis and Solutions

AC voltage test point:



Sensor test point:

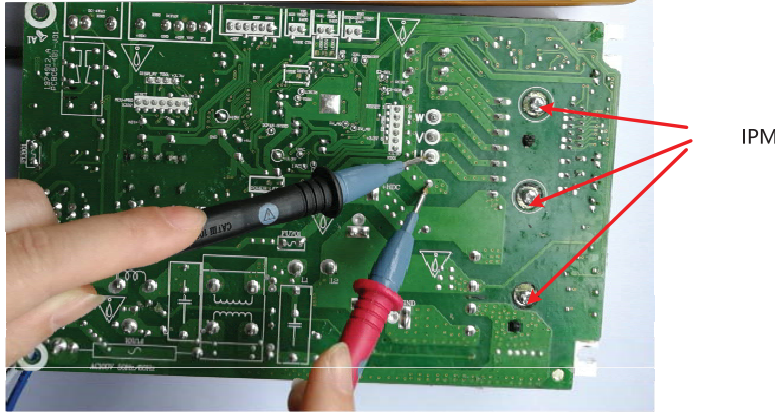


TROUBLESHOOTING

Diagnosis and Solutions

test point:

Check the screw of IPM fastening:



test point:

Forward of IPM P-U/P-V/P-W test :



Reverse of IPM P-U/P-V/P-W test:



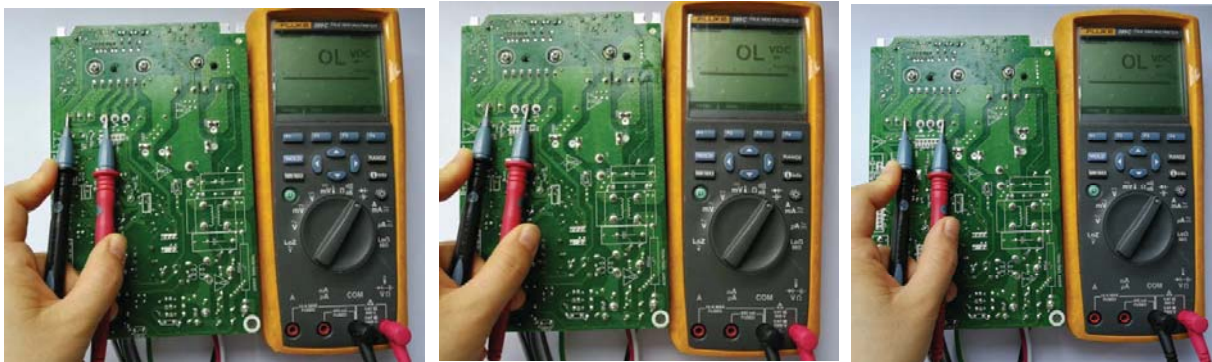
Forward of IPM N-U/N-V/N-W test :

TROUBLESHOOTING

Diagnosis and Solutions



Reverse of IPM N-U/N-V/N-W test :



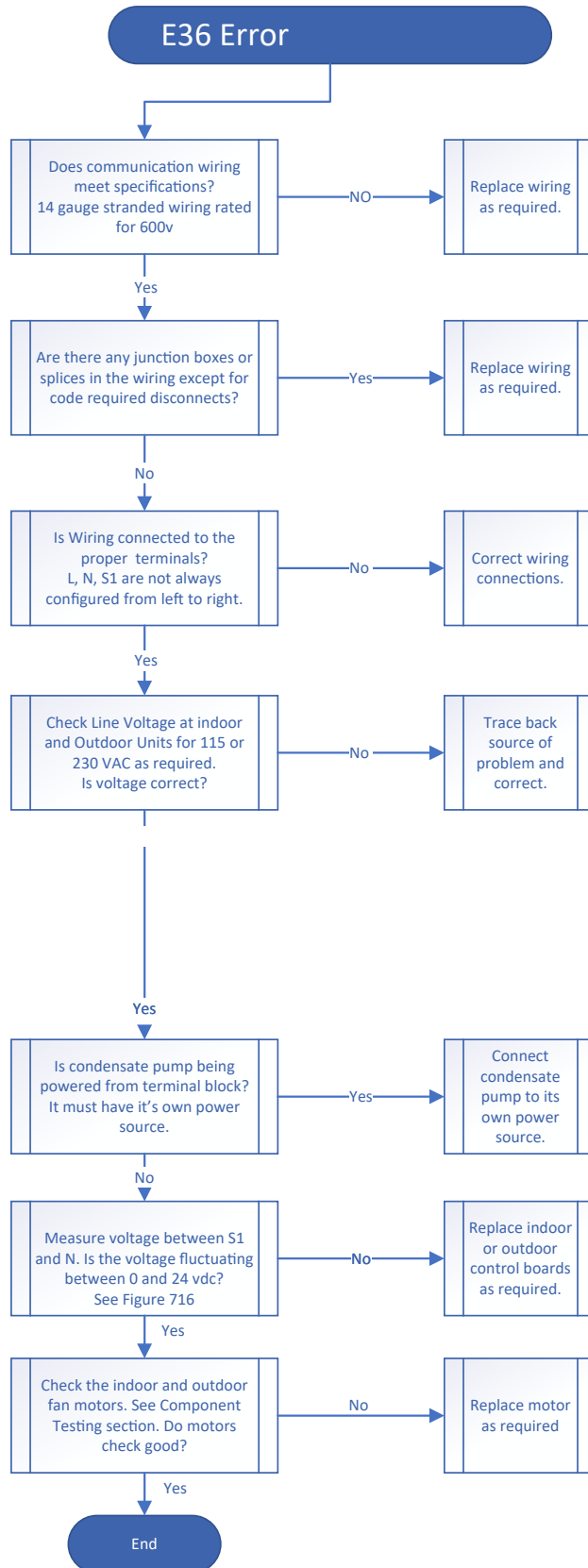
test point:

The resistance of the compressor U-W\V-W



TROUBLESHOOTING

E36 Error



See Figure 701

TROUBLESHOOTING

E36 Error

Check from SI to Neutral on the outdoor unit or indoor unit

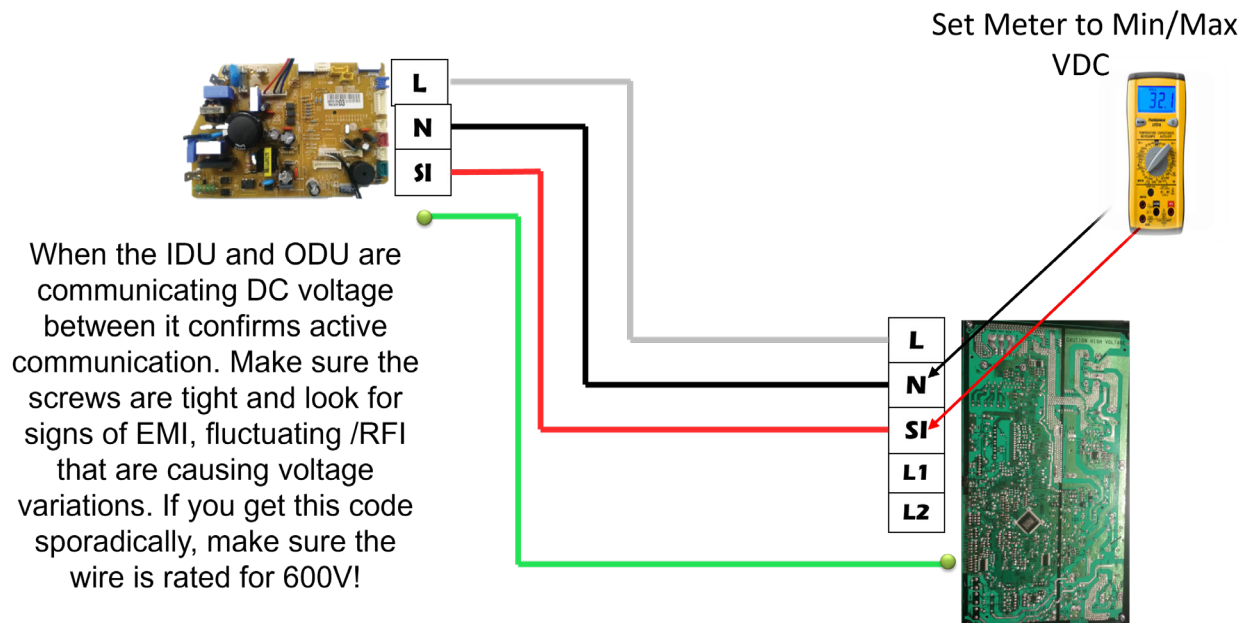


Fig. 701 (Checking Communication)

TROUBLESHOOTING

Blank Display/Indoor Unit Door Micro Switch

If the Display is blank, check to see if the door is properly closed.

If the door is properly closed, confirm that you have proper line voltage to the indoor unit.

If the indoor unit door is not properly closed, or if the door micro switch has malfunctioned the display may be blank. See Figure 702. When the micro-switch is not engaged, and the power button is depressed, there will be no display and the system will not operate or respond in any way. See Figure 703.

When the Timer On/Clock button is pressed you will see a temperature on the display, but still no system operation. After a few seconds, the display will drop the temperature leaving just the Wi-Fi and Timer icons. Still no indoor unit operation. See Figure 704.

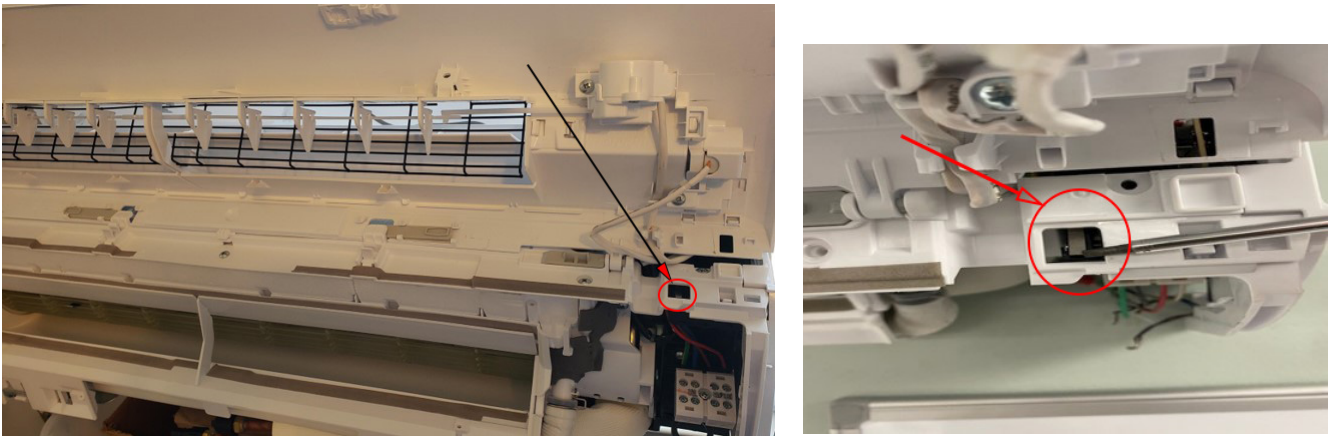


Fig. 702 (Door Micro Switch)



Fig. 703 (Blank Display)

TROUBLESHOOTING

Blank Display/Indoor Unit Door Micro Switch

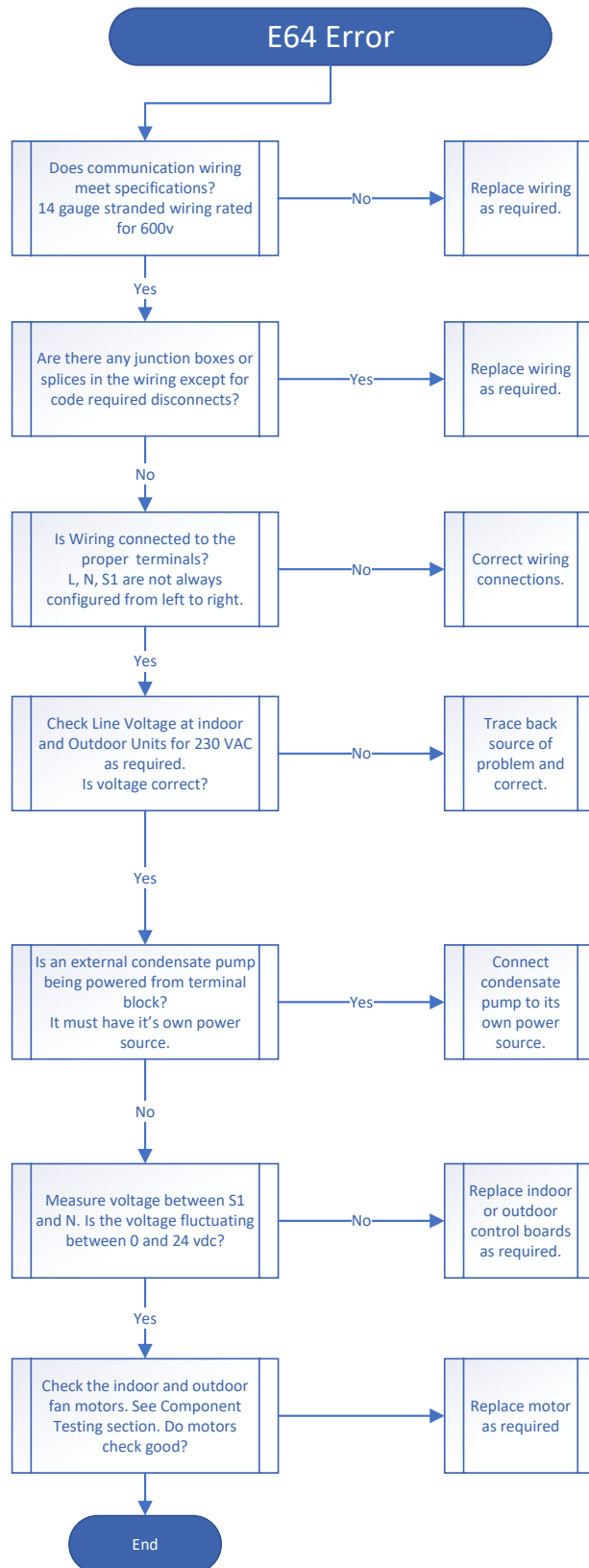
When the Timer On/Clock button is pressed you will see a temperature on the display, but still no system operation. After a few seconds, the display will drop the temperature leaving just the Wi-Fi and Timer icons. Still no indoor unit operation. See Figure 704.



Fig. 704 (Momentary Temp. Display)

TROUBLESHOOTING

E64 Error



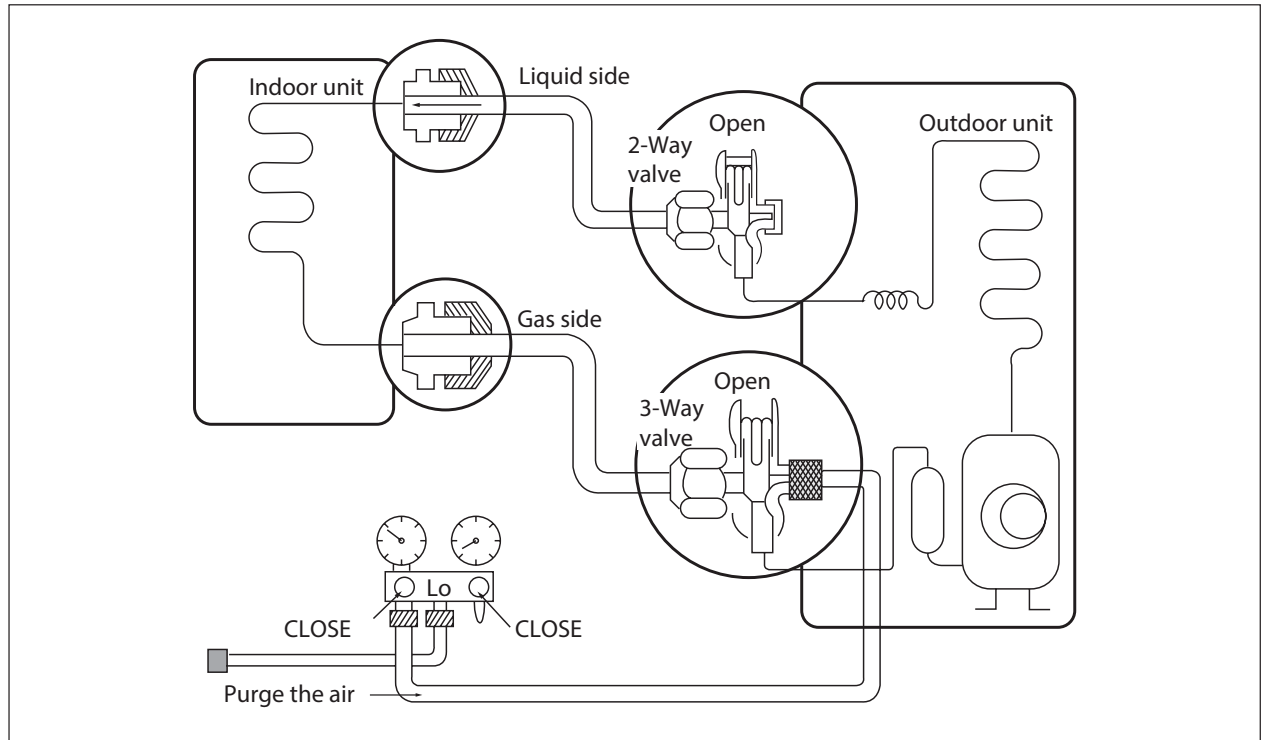
R-410A SEALED SYSTEM REPAIR

Service Valves Appearance

		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
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 vacuum pump)
Operation		Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transferring)	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 psi.

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

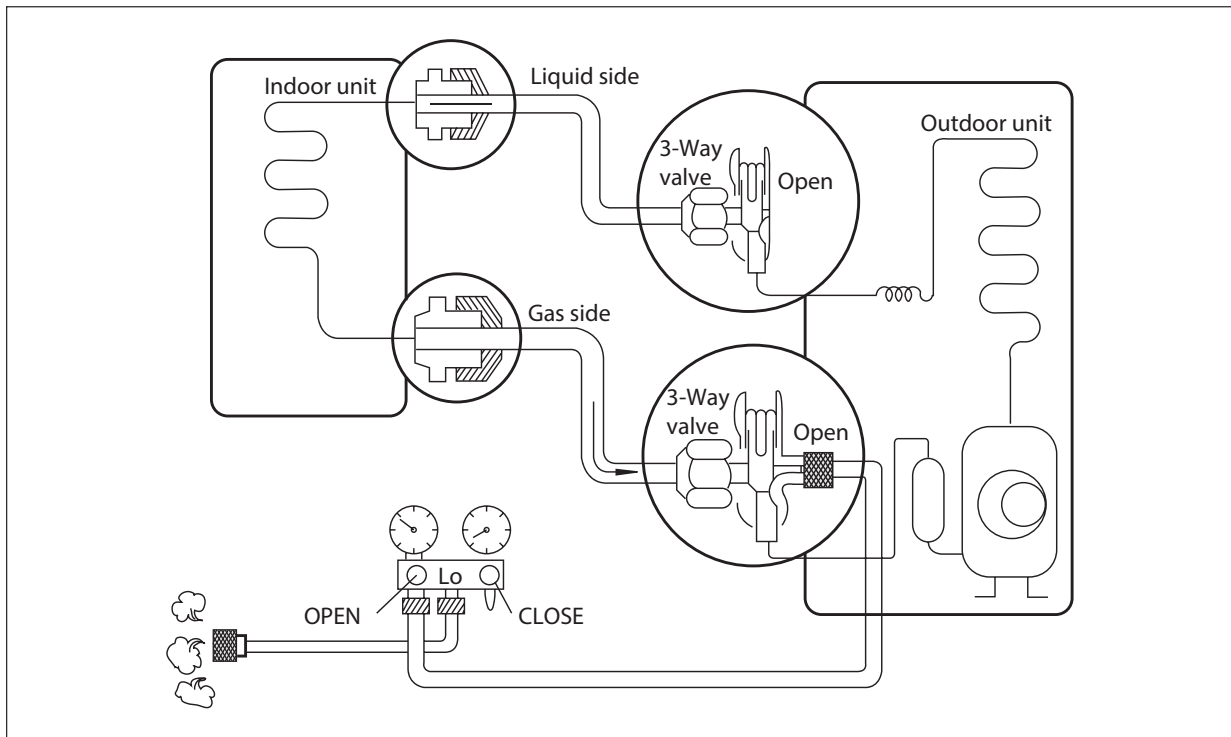
- Do this quickly so that the gauge ends up indicating 0-15 PSI.

(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.

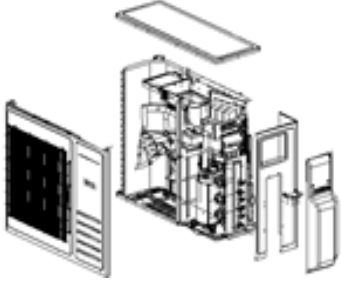
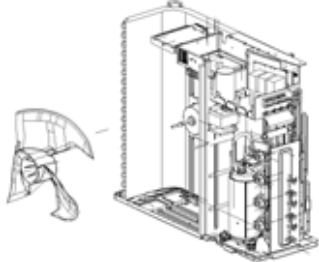
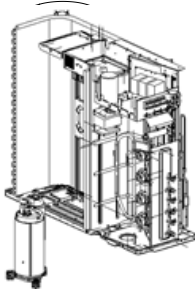
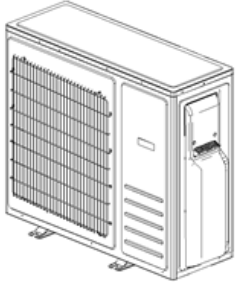
- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

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

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

R-410A SEALED SYSTEM REPAIR

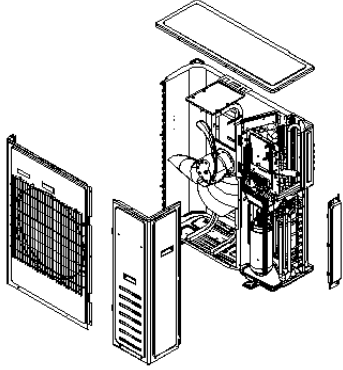
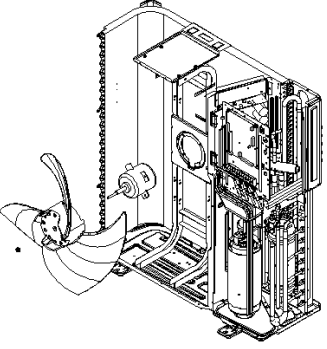
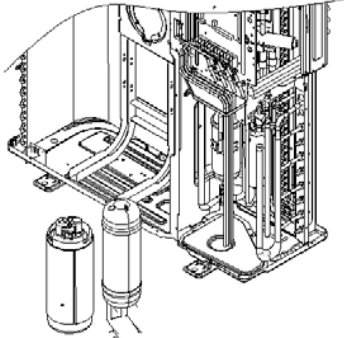
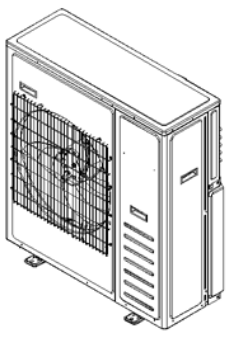
Replace 18/24k Outdoor unit Compressor and Motor

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.		
Step	Illustration	Handling Instruction
1.Remove external casing		<ol style="list-style-type: none"> 1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2.Remove motor		<ol style="list-style-type: none"> 1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter
3.Remove compressor		<ol style="list-style-type: none"> 1. Reclaim the refrigerant from the entire system. 2. Unsolder the 4 -way valve piping assy from compressor; 3. Remove the compressor mounting bolts; 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

R-410A SEALED SYSTEM REPAIR

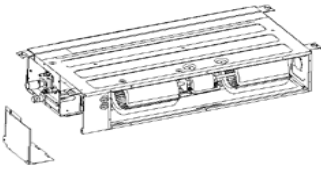
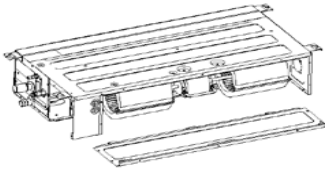
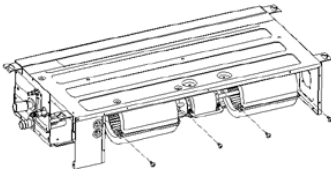
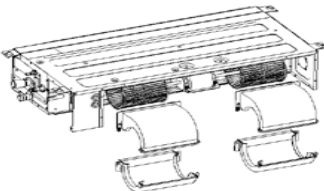
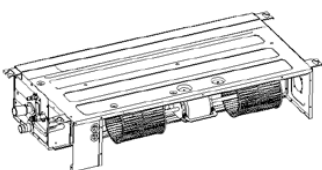
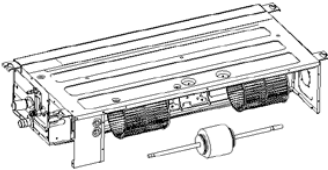
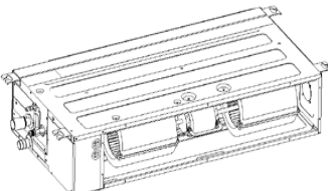
Replace 36/ 42k Outdoor unit Compressor and Motor

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

Step	Illustration	Handling Instruction
1. Remove external casing		<ol style="list-style-type: none"> 1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2. Remove motor		<ol style="list-style-type: none"> 1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter
3. Remove compressor		<ol style="list-style-type: none"> 1. Reclaim the ref rigerant From the entire system. 2. Unsolder the 4-way valve piping assy from compressor. 3. Remove the compressor mounting bolts. 4. Carefully remove the compressor from chassis.
4. Assemble unit		<p>Assemble the unit in the reverse order of disassembly.</p>

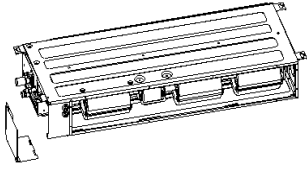
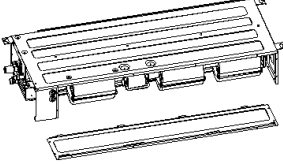
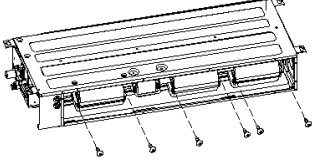
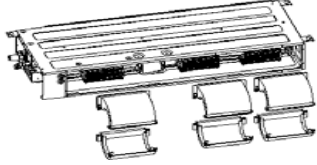
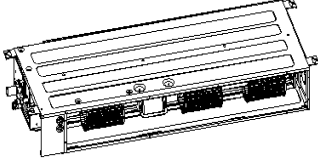
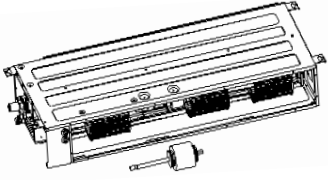
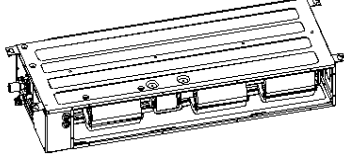
R-410A SEALED SYSTEM REPAIR

Replace 9k and 12k Duct Type unit Compressor and Motor

Removal and Assembly of Fan Motor		
Important: Before removing the fan, make sure power to the system is disconnected.		
Step	Illustration	Handling Instruction
1. Unplug the motor cables.		Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Remove the base board.		Loose and take out the screws fixing the base board, then remove the base board.
3. Remove the screws on fan sub-assembly.		Remove the screws on fan sub-assembly.
4. Removing the fan cage enclosure.		Rotate the fan cage housing toward supply opening and remove.
5. Loosen the fan and motor.		Use a hex wrench to loosen the screws holding the fan cage to the motor shaft. Remove outer housing holding motor in place.
6. Replace the motor.		Remove the motor from the support bracket. Then remove the fan cages from the motor shafts. Remove the motor from the air inlet and replace with new motor. Be sure to tighten the cages onto the motor shafts.
7. Reassembly of the unit.		Reassemble the unit in the reverse order of disassembly and test operation.

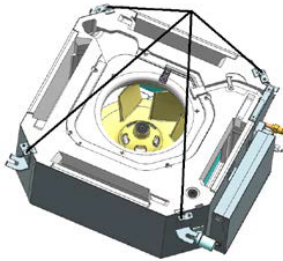
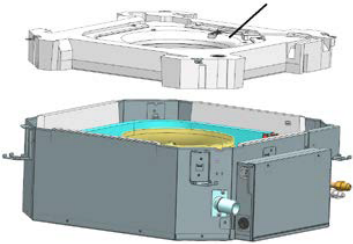
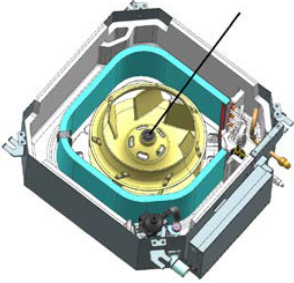
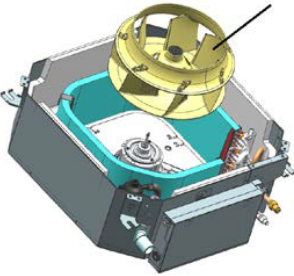
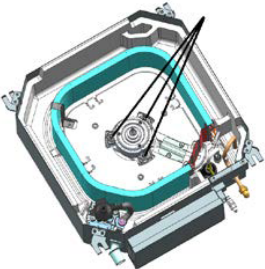
R-410A SEALED SYSTEM REPAIR

Replace 18k Duct Type unit Compressor and Motor

Removal and Assembly of Fan Motor		
Important: Before removing the fan, make sure power to the system is disconnected.		
Step	Illustration	Handling Instruction
1. Unplug the motor cables		Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Remove the base board		Loose and take out the screws fixing the base board, then remove the base board.
3. Remove the screws on fan sub-assembly.		Remove the screws on fan sub-assembly.
4. Removing the fan cage enclosure		Rotate the fan cage housing toward supply opening and remove.
5. Loosen the fan, crosshead and motor.		Use a hex wrench to loosen the screws holding the fan cage to the motor shaft, and the screws holding the crosshead to the motor shaft. Remove outer housing holding motor in place.
6. Replace the motor		Remove the motor from the support bracket. Then remove the fan cages from the motor shafts. Remove the motor from the air inlet and replace with new motor. Be sure to tighten the cages onto the motor shafts.
7. Reassembly of the unit		Reassemble the unit in the reverse order of disassembly and test operation.

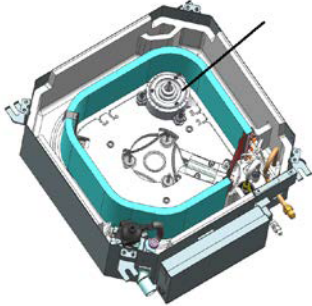
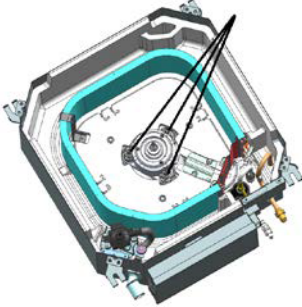
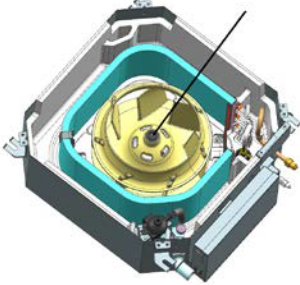
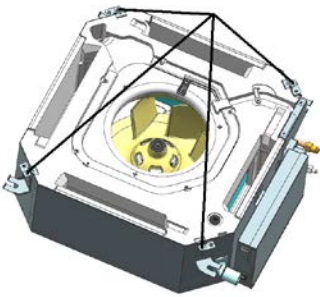
R-410A SEALED SYSTEM REPAIR

Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor

Replacement of Fan Motor		
Step	Illustration	Handling Instruction
1. Loosen the screws holding condensate pan.		Use screwdriver to loosen the screws holding the drain pan in place.
2. Remove the condensate pan		Carefully remove the condensate pan.
3. Loosen the bolt holding the fan blade in place		Use a wrench or socket to carefully remove the fan blade bolt.
4. Remove the fan blade		The fan blade can now be removed.
5. Loosen the bolts holding the motor in place		Use a wrench or socket to carefully remove the motor bolts.

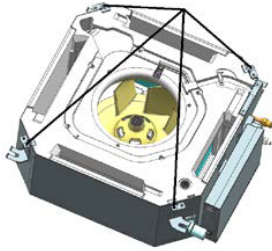
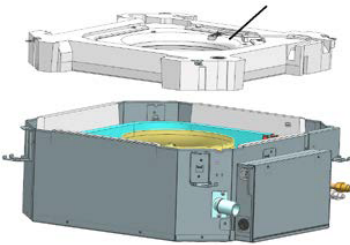
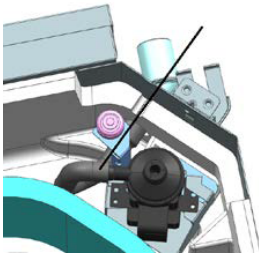

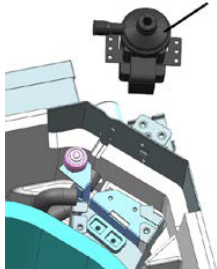
R-410A SEALED SYSTEM REPAIR

Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor

Replacement of Fan Motor		
Step	Illustration	Handling Instruction
6. Remove the motor and replace it		Remove the motor and replace it.
7. Tighten the bolts holding the motor		Use a wrench or socket to carefully tighten the motor bolts.
8. Mount the fan blade and tighten the bolt		Mount the fan blade and use a wrench or socket to carefully tighten the bolt holding the fan blade in place. Do not overtighten as damage may occur.
9. Reinstall the condensate pan and tighten the screws		Use a screwdriver to carefully tighten the screws holding the condensate pan in place. Take care to not overtighten as damage to pan will occur.

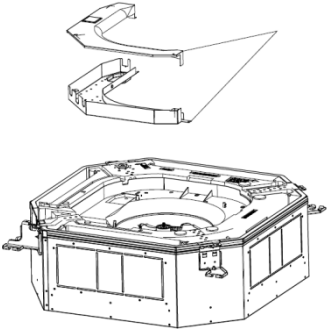
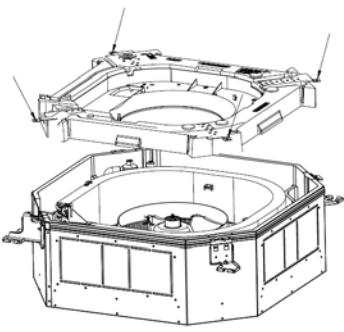
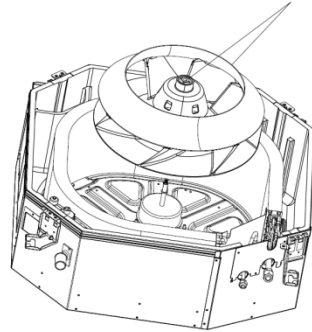
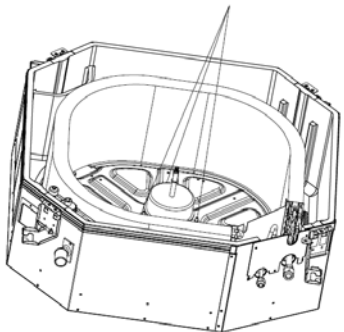
R-410A SEALED SYSTEM REPAIR

Replace 9k, 12k, and 18k Cassette Type unit Compressor and Motor

Removal and Installation of Condensate Pump		
Step	Illustration	Handling Instruction
1. Loosen the screws holding condensate pan.		Use screwdriver to loosen the screws holding the drain pan in place.
2. Remove the condensate pan.		Carefully remove the condensate pan.
3. Pull out the water outlet pipe.		Pull out the water outlet Pipe.
4. Loosen the screws holding the condensate pump.		Loosen the screws holding the condensate pump.
5. Take out the pump and replace it.		Take out the pump and replace it.

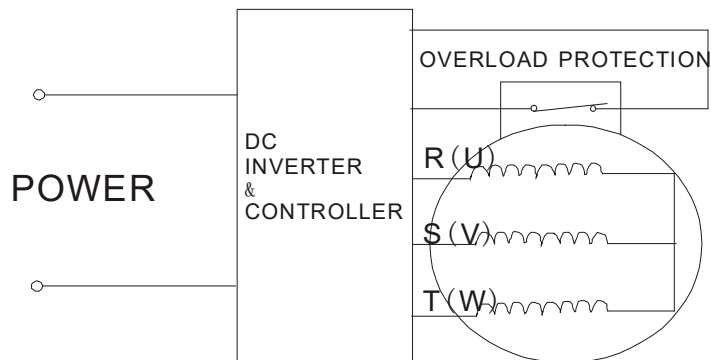
R-410A SEALED SYSTEM REPAIR

Replace 24k and 36k Cassette Compressor and Motor Type unit Compressor and Motor

Step	Illustration	Handling Instruction
<p>1. Loosen the screws holding the electric box cover and electric box.</p>		<p>Use screwdriver to loosen the Electric box.</p>
<p>2. Loosen the screws holding condensate pan and Remove the condensate pan.</p>		<p>Use screwdriver to loosen the screws holding the drain pan in place.</p>
<p>3. Loosen the bolts holding the fan blades in place and Remove the fan blade.</p>		<p>Use a wrench or socket to carefully remove the fan blade bolts.</p>
<p>4. Loosen the screws holding the motor in place and Remove the motor and replace it.</p>		<p>Use screwdriver to loosen the screws holding the motor.</p>

COMPONENTS TESTING

Compressor



Resistance Test.

The compressor is at fault if the resistance of winding is 0 (short circuit) or ∞ open circuit.

Common signs compressor is faulty:

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

Note:

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

Common Problems:

- Sound abnormality
- Runs in a sporadic rhythm.

COMPONENTS TESTING

Fan Motor

Resistance Test.

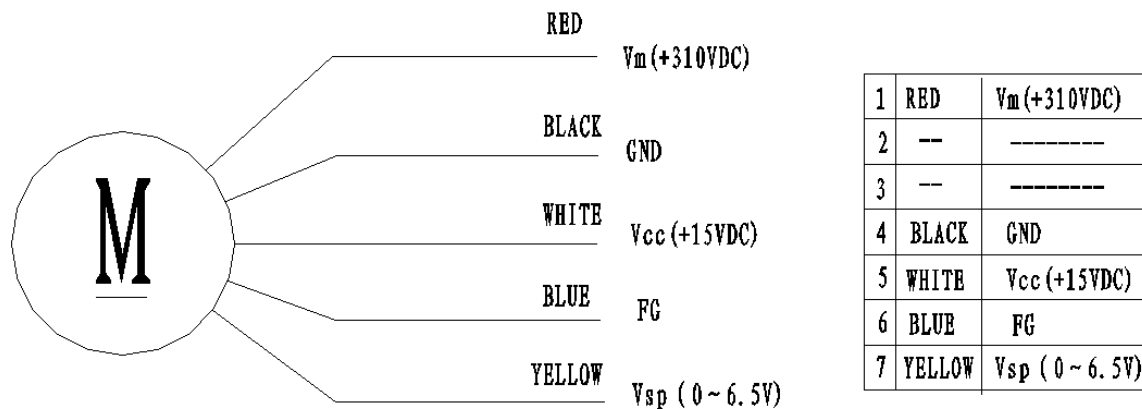
Test the resistance of the main winding. The indoor fan motor is faulted if the resistance of main winding 0 (short circuit) or ∞ open circuit.
DC Voltage test

Manually rotate indoor fan motor slowly for several revolutions, and measure voltage "YELLOW" and "GND" on motor. The voltage repeats 0V DC and 5V DC.

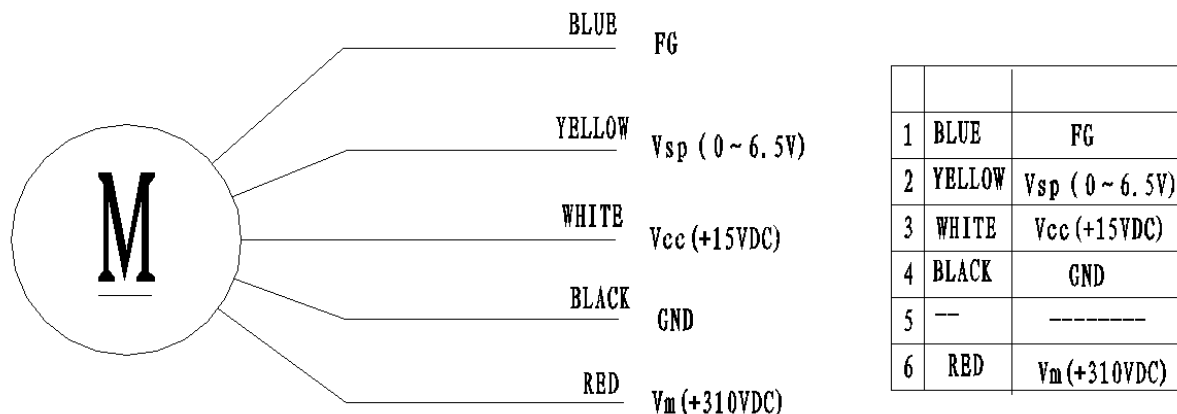
Notes:

- Do not hold motor by lead wires.
- Do not connect or disconnect the molex connector while power ON.
- Do not drop motor against hard material. Malfunction may not be observed at early stage after such shock. But it may be found later, this type of mishandling voids our warranty.

Indoor DC Fan Motor



Outdoor DC Fan Motor



COMPONENTS TESTING

EEV Stepper Coil

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

Check Resistance of EEV stepper coil.

Using an ohmmeter check all wires against each other.

5 wire EEV

Grey to all colors is 45 +/- 10%

All other colors to each other are 95 +/- 10%

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



COMPONENTS TESTING

Check Refrigerant System (Outdoor)

TEST SYSTEM FLOW

- Conditions: ① Compressor is running.
② The air condition should be in installed in good ventilation.

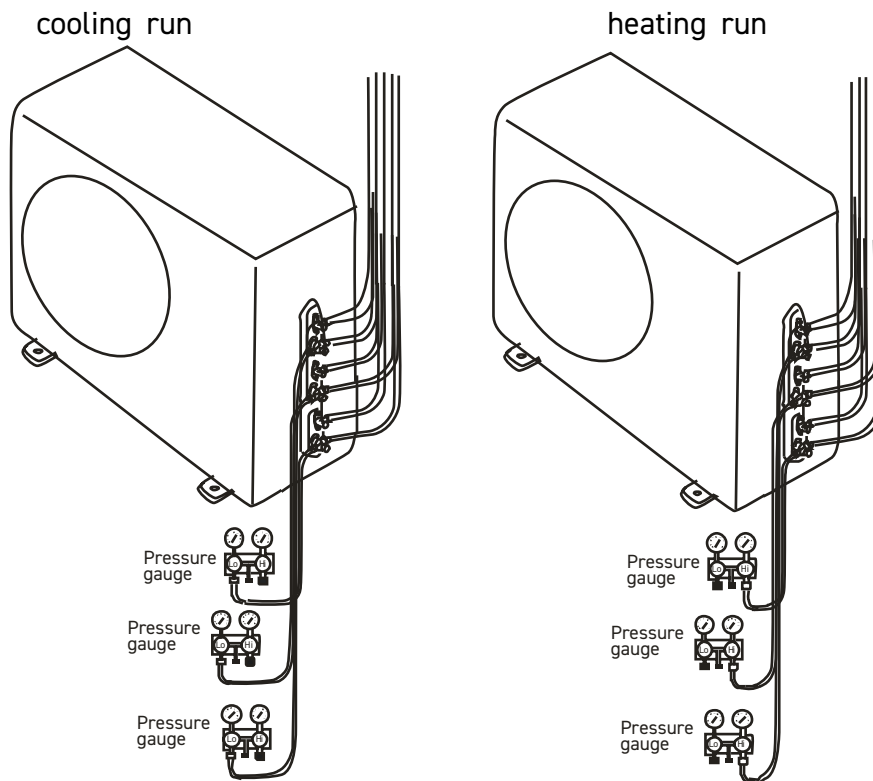
Tool: Pressure Gauge

Technique: ① see ② feel ③ test

SEE ----- Tube defrost.

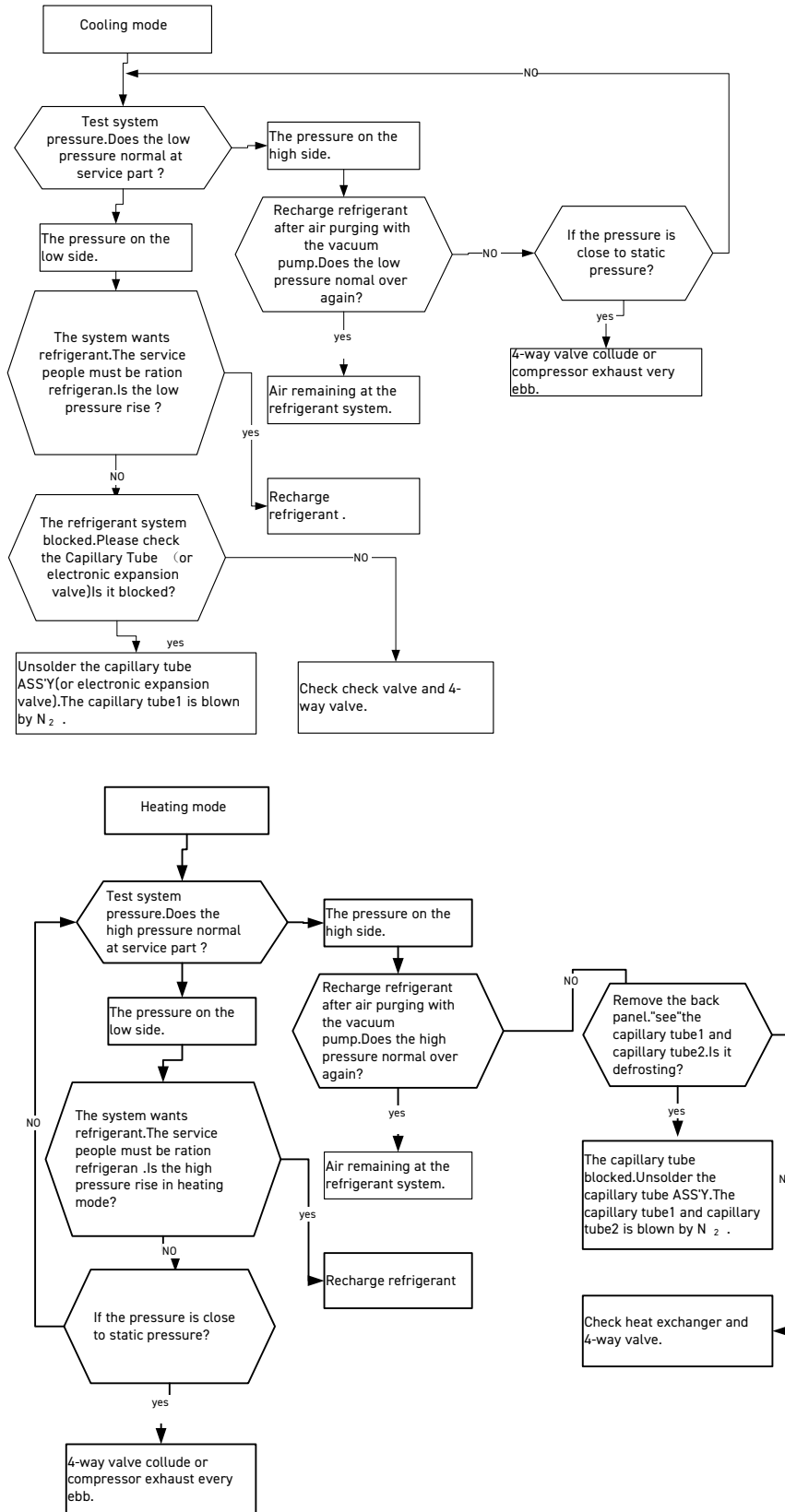
FEEL ----- The difference between tube's temperature.

TEST ----- Test pressure.



COMPONENTS TESTING

Test System Flow (Outdoor)



COMPONENTS TESTING

Check Fuse and Capacitor

FUSE

Checking continuity of fuse on PCB ASS'Y.

Remove the PCB ASS'Y from the electrical component box. Then pull out the fuse from the PCB ASS'Y (Fig.1)

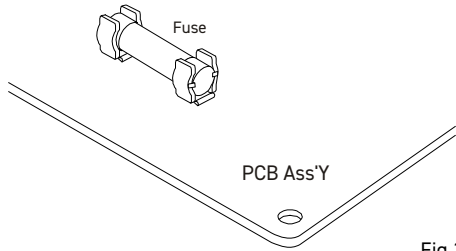


Fig.1

2) Check for continuity by a multimeter as shown in Fig.2.

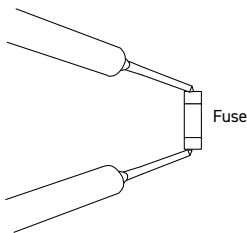


Fig.2

.CAPACITOR

- 1) Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig.3.
- 2) Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.
- 3) The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.
- 4) The range of deflection and deflection time differ according to the capacity of the capacitor.

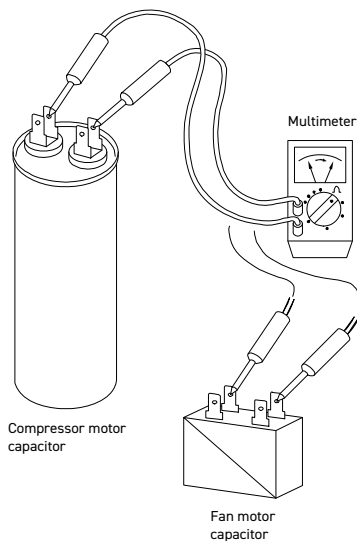
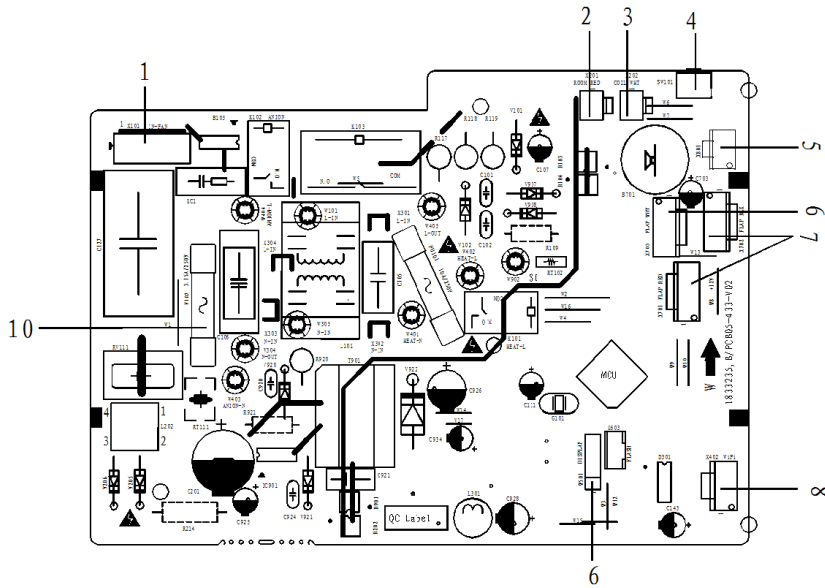


Fig.3

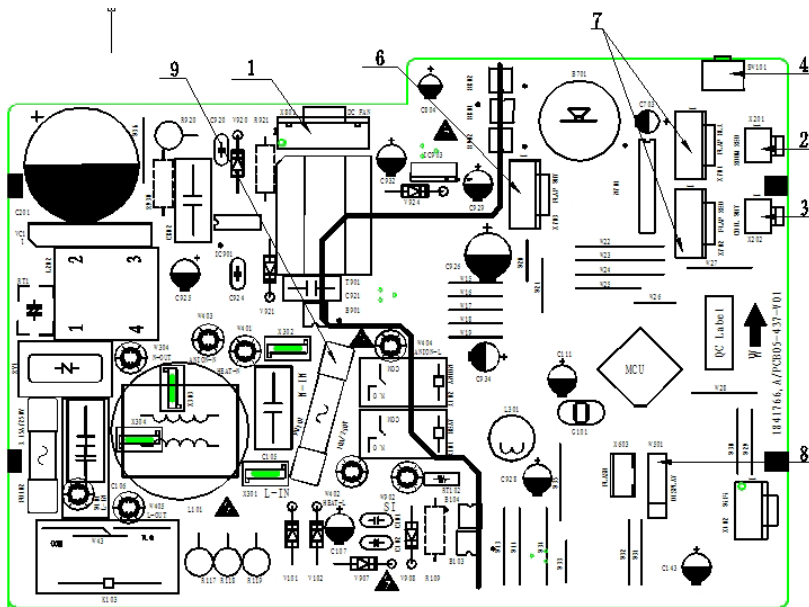
COMPONENTS TESTING

7k Indoor Wall Mount Printed Circuit Board



1	Interface of PG motor
2	Room temperature sensor
3	Pipe temperature sensor
4	Switch button
5	Feedback from PG motor
6	Up/Down swing
7	Left/Right swing
8	Wiring control or wifi interface
9	Display interface
10	Protective tube

Figure 701
7k Indoor Unit Printed Circuit Board Identification

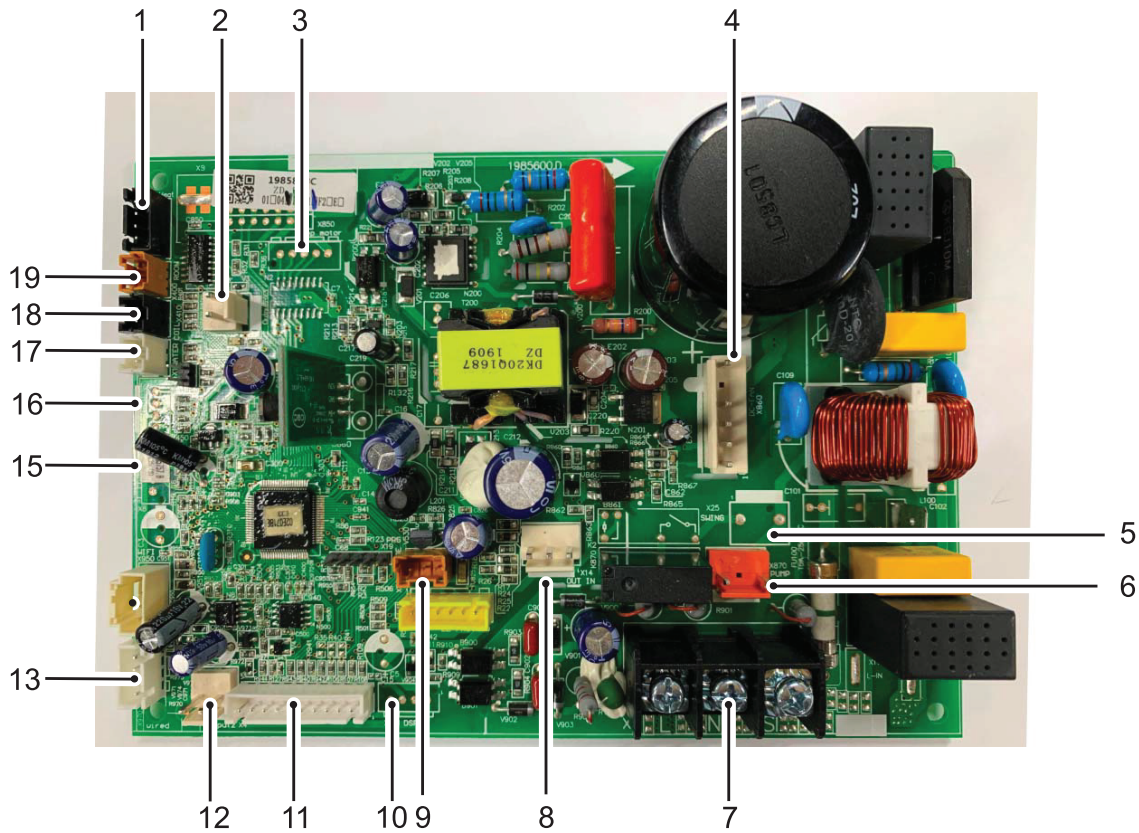


1	Interface of PG motor
2	Room temperature sensor
3	Pipe temperature sensor
4	Switch button
6	Up/Down swing
7	Left/Right swing
8	Display interface
9	Protective tube

Figure 702
7k Indoor Unit Printed Circuit Board Identification

COMPONENTS TESTING

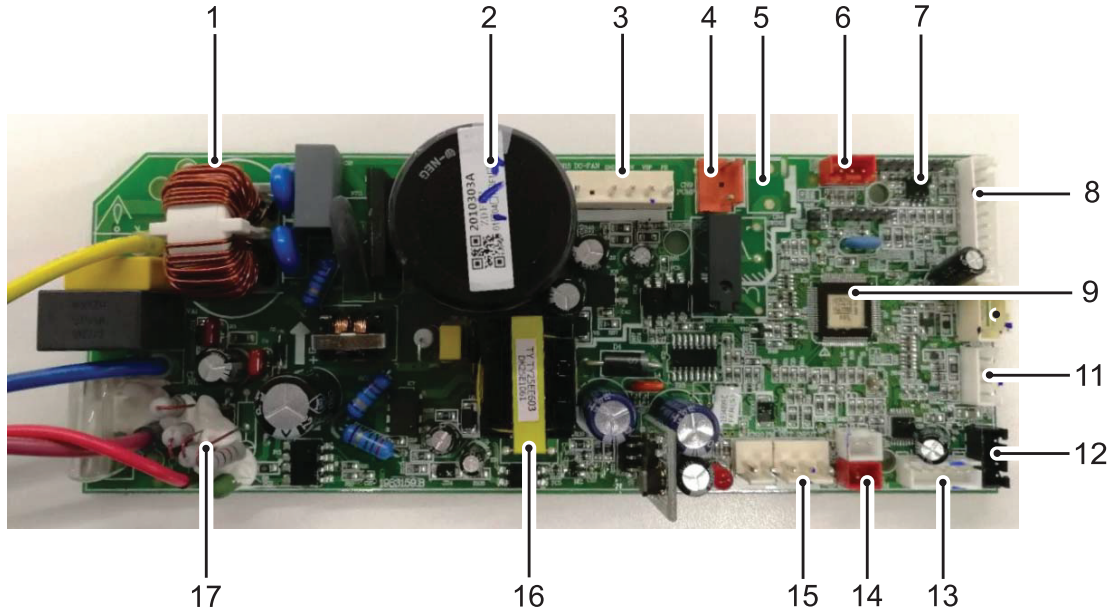
Ducted 9,12, and 18k Ducted Indoor Units Control Board



NO.	Description	NO.	Description
1	Heat	11	Disp
2	Output1	12	Output2
3	Step Motor	13	Wired.
4	DC Fan		
5	Swing	15	Reserved
6	Pump	16	Humidity
7	L, N Power Input	17	Water Level Switch
8	Out	18	Coil Temp. Sensor
9	Nano	19	Ambient Temp. Sensor
10	Disp		

COMPONENTS TESTING

Ducted 24k and 9-24k Cassette Indoor Units Control Board

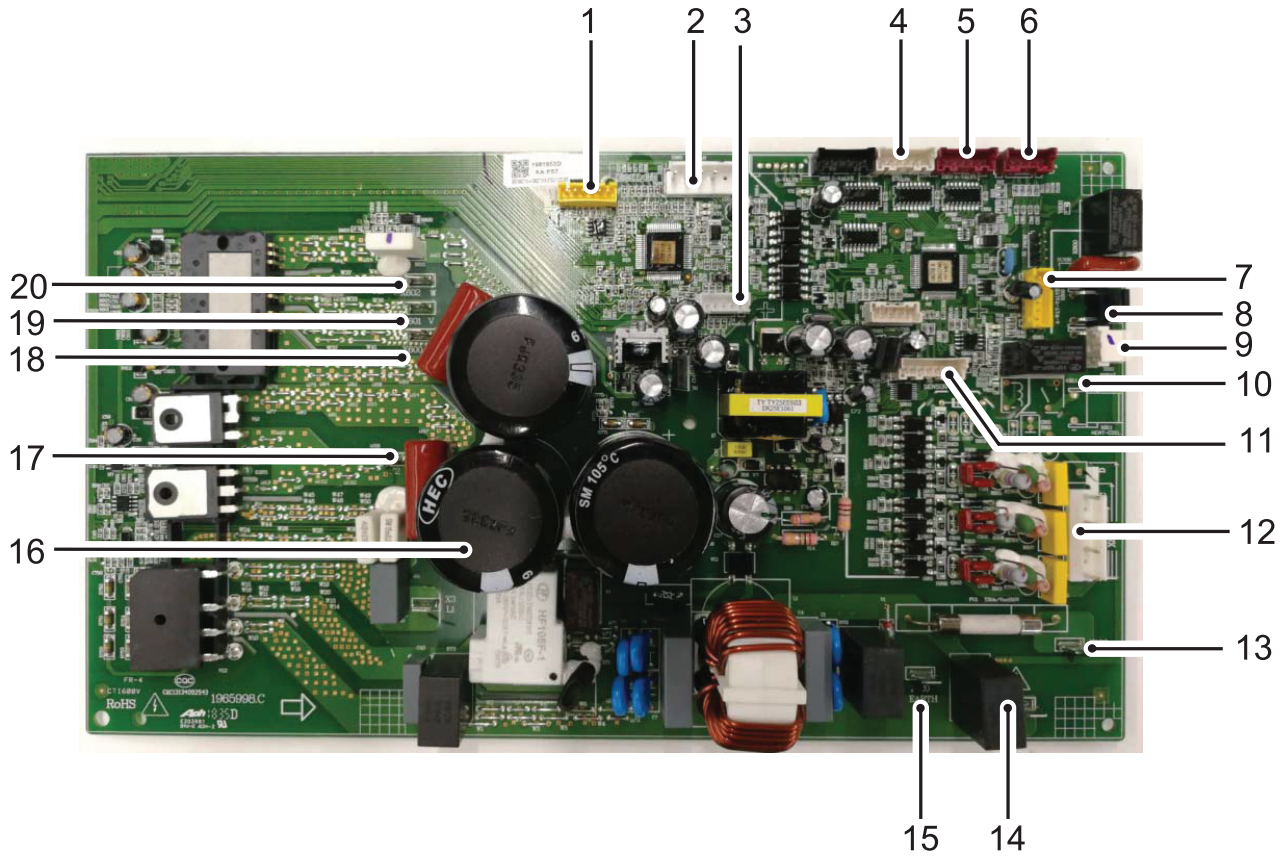


NO.	Description	NO.	Description
1	AC Power Filter		
2	Main Control Component Code	11	Wired Controller
3	DC Motor	12	Electric Heater
4	Pump Motor	13	Step Motor
5	Swing Motor	14	Temp. Sensor
6	Water Level Switch	15	Out Input
7	EE	16	Switching Power Supply
8	Display	17	Communication with outdoor unit
9	MCU		

COMPONENTS TESTING

18k Outdoor Main Printed Circuit Boards

Main control board



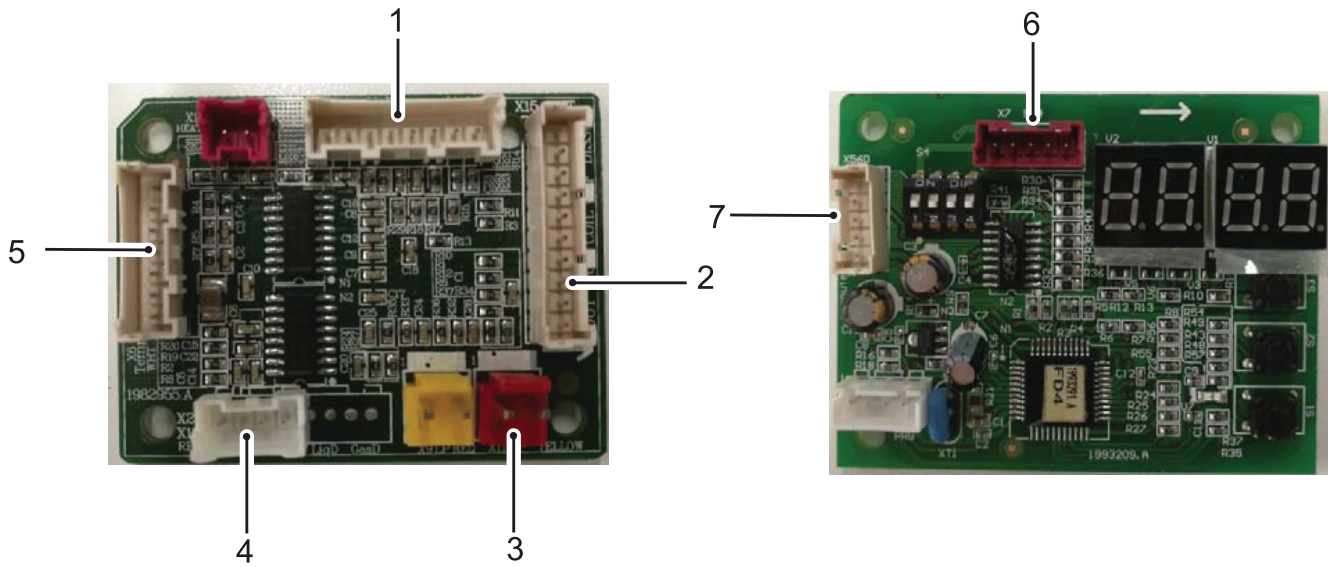
NO.	Description	NO.	Description
1	Driver EE Data Socket	11	Sensor Signal from Sensor Board
2	DC Motor	12	Communication Signal to Indoor
3	Only for developer	13	AC Power Lin
4	Electronic Expansion Valve B	14	AC Power Nin
5	Electronic Expansion Valve A	15	Earth
6	For developer	16	Reactor L1
7	Main EE data socket	17	Reactor L2
8	4-way Valve	18	Compressor U
9	Electric Heating Belt	19	Compressor V
10	Base Heater	20	Compressor W

COMPONENTS TESTING

18k Outdoor Main Printed Circuit Boards

Sensor PCB

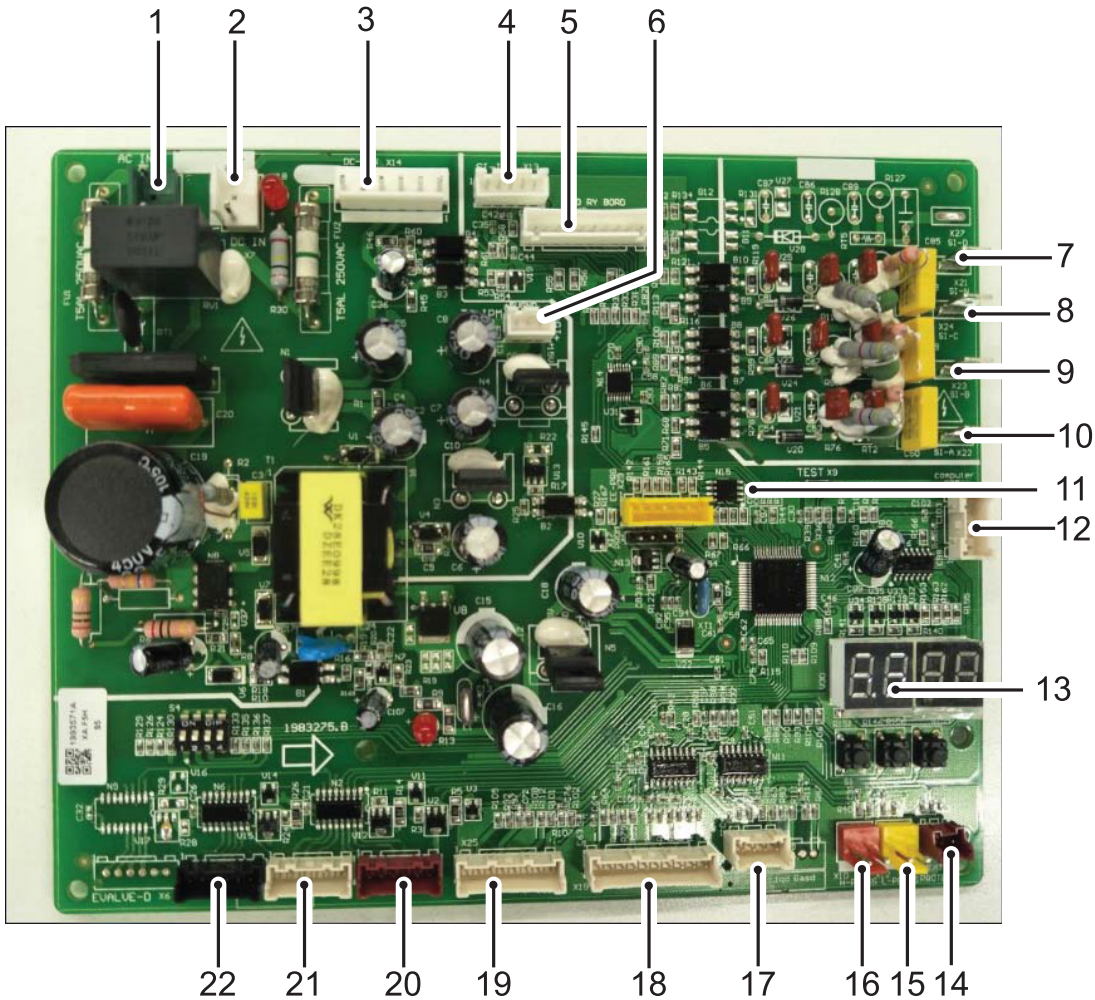
Display PCB



NO.	Description
1	Gas B/Liquid B/Gas A/Liquid A sensor
2	Discharge Sensor/ Defrost Sensor /Coil Sensor /Suction Sensor/ Outdoor Sensor
3	High Pressure Switch
4	Liquid C/ Gas C/Liquid D/Gas D sensor (Invalid for 18K)
5	Sensor Signal to Main Board
6	Select Switch Signal to Mainboard to Indoor
7	Communication signal to main board

COMPONENTS TESTING

24k Outdoor Main Printed Circuit Board

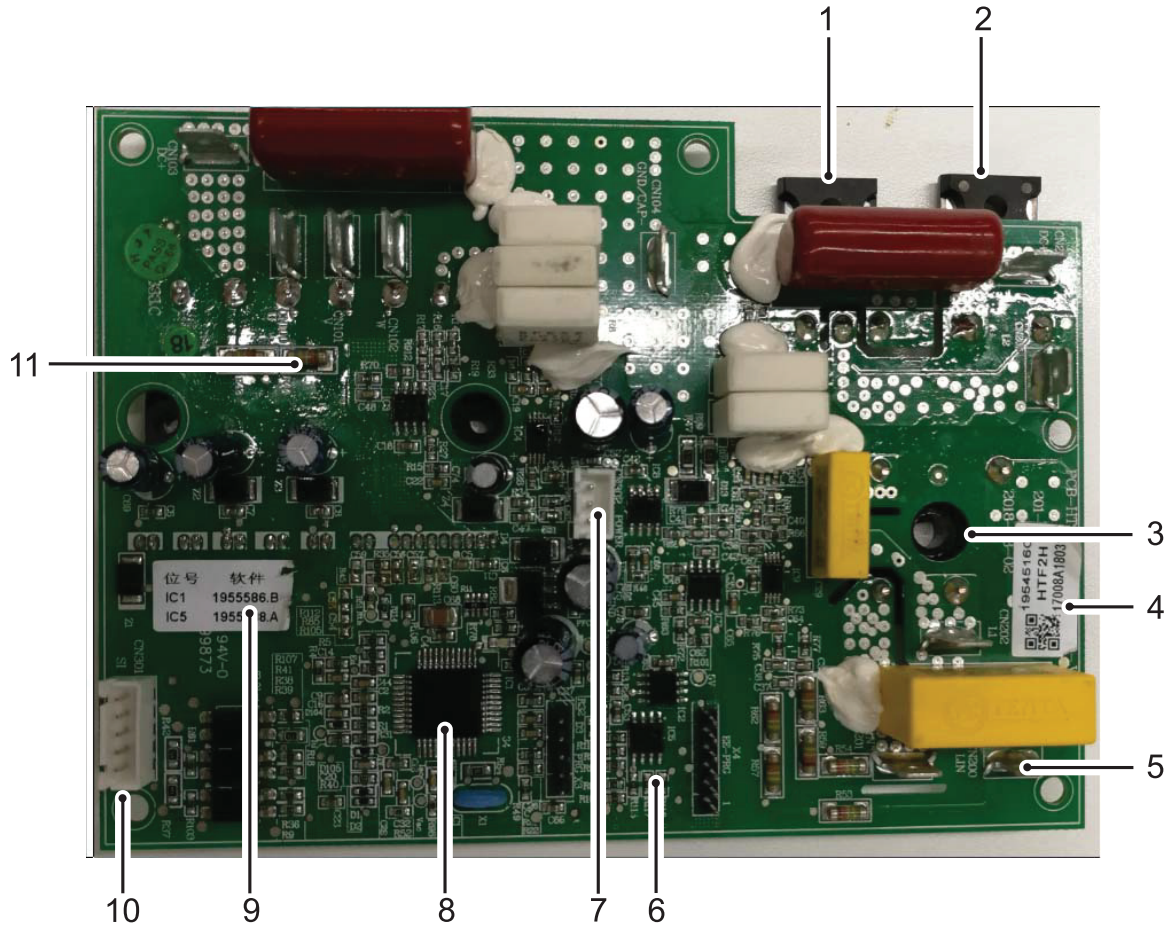


NO.	Description	NO.	Description
1	AC Power	12	Computer Monitor
2	DC Power	13	7-Segment display
3	DC fan	14	Compressor Overheat Protection Switch
4	IPM-SI	15	Low Pressure Switch
5	Signal to filter board	16	High Pressure Switch
6	15V & 5V Power	17	Liquid C/Gas C Sensor
7	SI-N	18	Discharge/defrost/Coil/Suction/Ambient Sensor
8	SI-C	19	Liquid A/Gas A/ Liquid B/Gas B Sensor
9	SI-B	20	Electronic Expansion Valve A
10	SI-A	21	Electronic Expansion Valve B
11	EE Program	22	Electronic Expansion Valve C

COMPONENTS TESTING

24k Outdoor Drive Printed Circuit Board

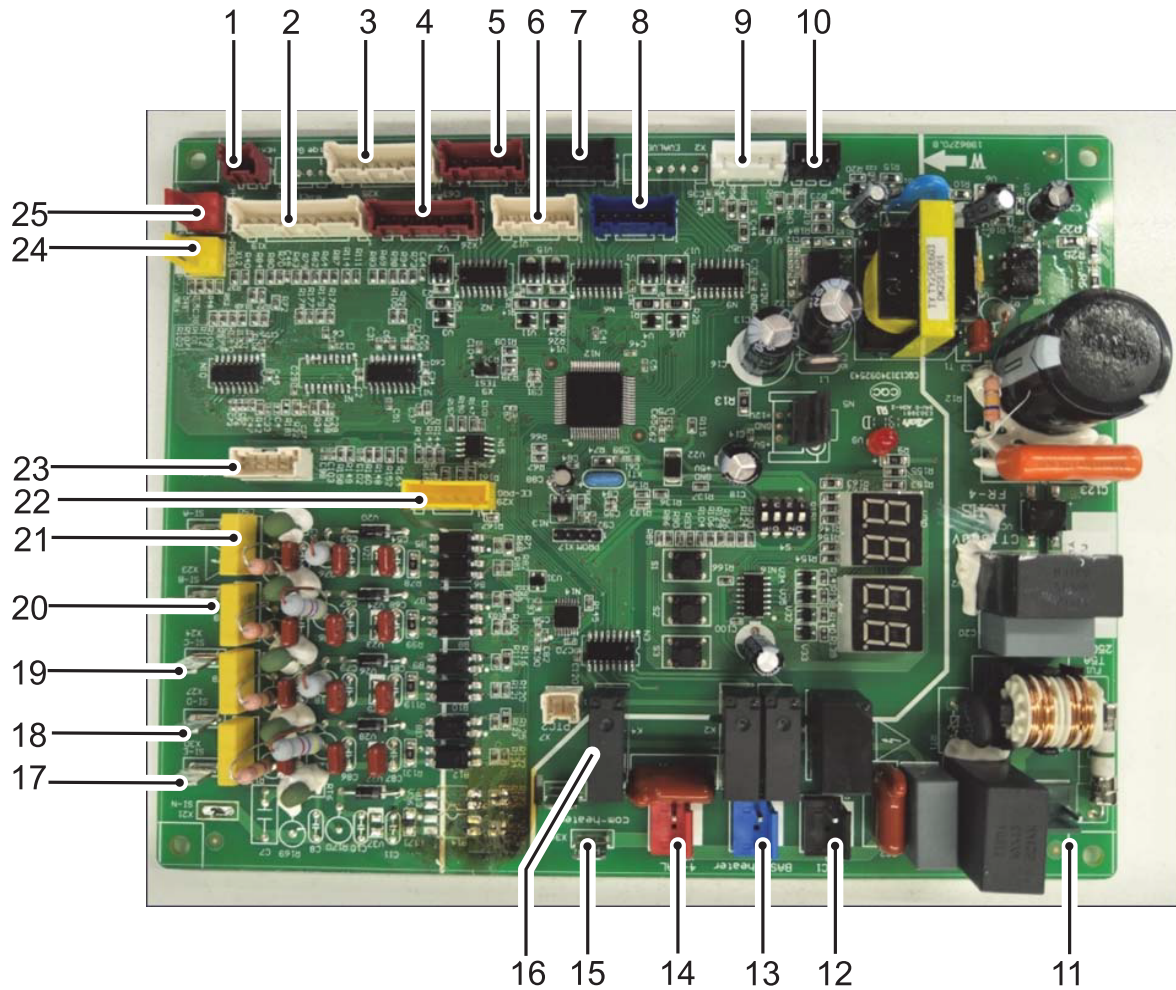
Drive board



NO.	Description	NO.	Description
1	IGBT	7	15V & 5V Power
2	Diodes	8	MCU
3	Rectifier Bridge	9	CPU Code
4	Drive Board Code	10	Communication with Upper System
5	AC Power Input	11	IPM Module
6	EE		

COMPONENTS TESTING

36k/ 42k Outdoor Main Printed Circuit Board

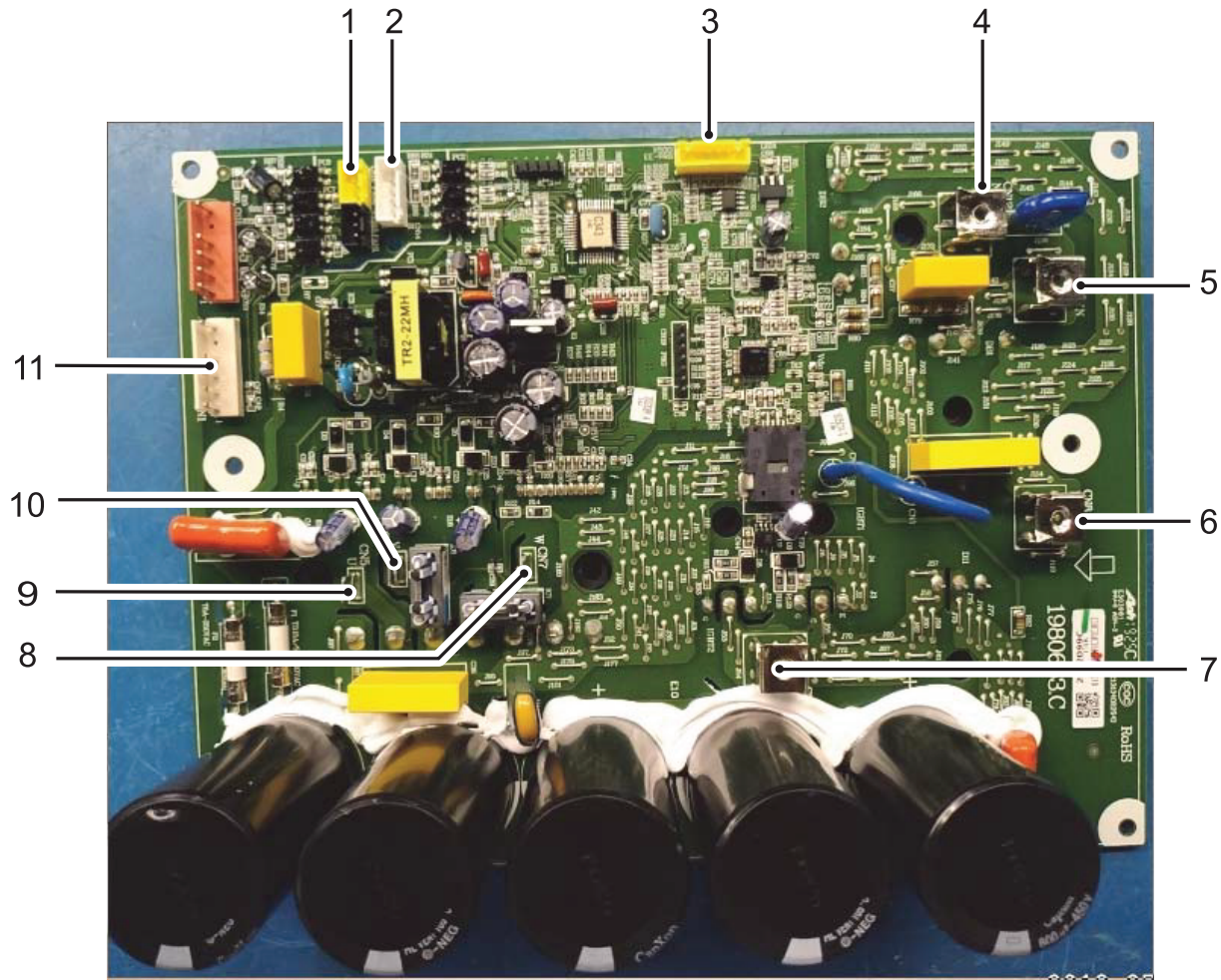


NO.	Description	NO.	Description
1	Compressor Overheat Protection Switch	14	4-Way Valve
2	Discharge/Defrost/ Coil/Suction/Ambient Sensor	15	Compressor Heater-N
3	Liquid A/Gas A/ Liquid B/Gas B Sensor	16	Compressor Heater-L
4	Liquid C/Gas C/ Liquid D/Gas D Sensor	17	SI-N
5	Electronic Expansion Valve A	18	SI-D
6	Electronic Expansion Valve B	19	SI-C
7	Electronic Expansion Valve C	20	SI-B
8	Electronic Expansion Valve D	21	SI-A
9	IPM-SI	22	EE
10	Driver	23	Checker/ Computer
11	AC In	24	Low Pressure Switch
12	AC Contactor	25	High Pressure Switch
13	Base Heater		

COMPONENTS TESTING

36k/ 42k Outdoor Drive Printed Circuit Board

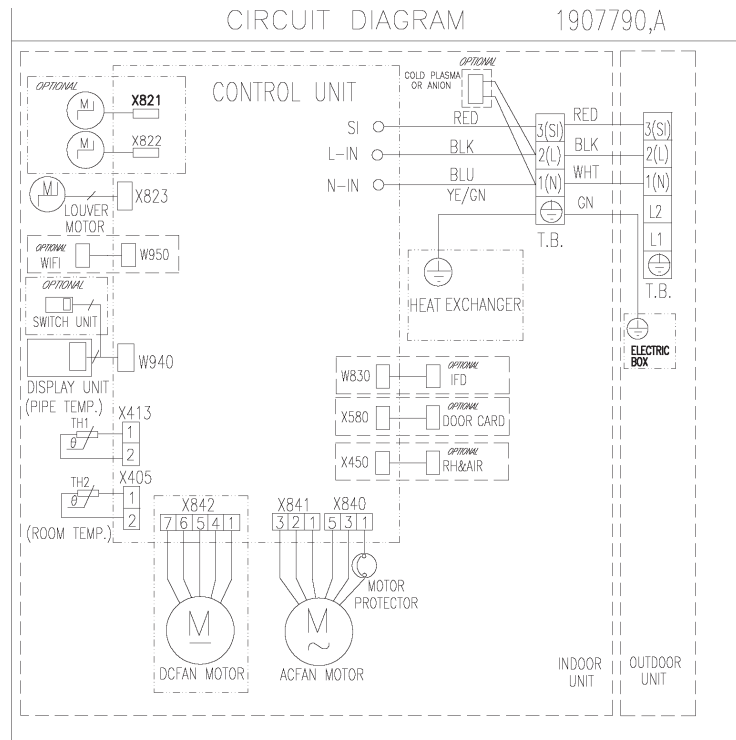
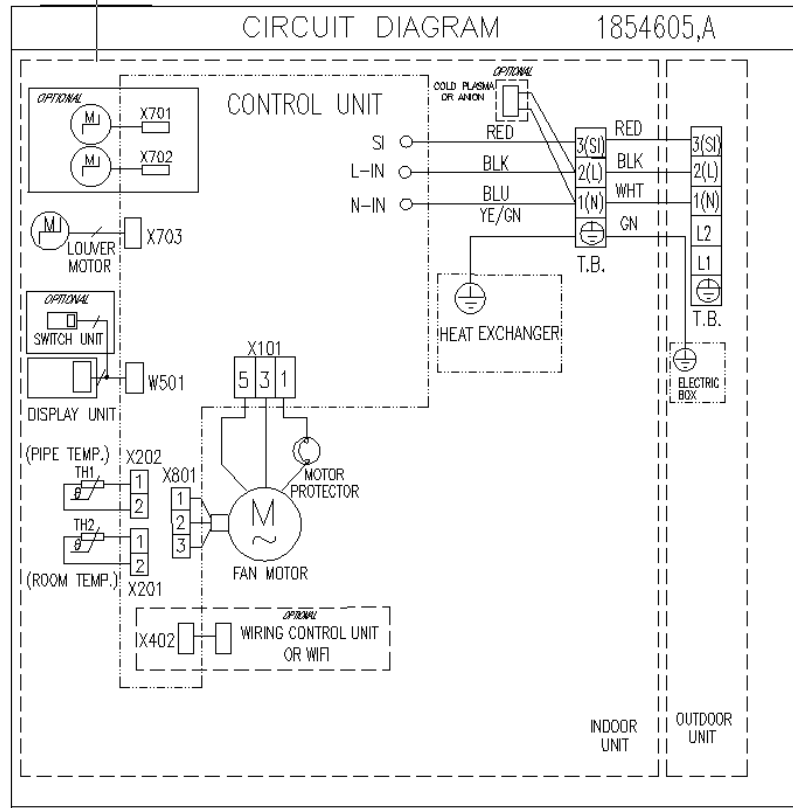
Drive board



NO.	Description	NO.	Description
1	DC Fan Signal	7	Reactor L2
2	IPM-SI	8	Compressor W
3	EE	9	Compressor U
4	NIN	10	Compressor V
5	LIN	11	Driver
6	Reactor L1		

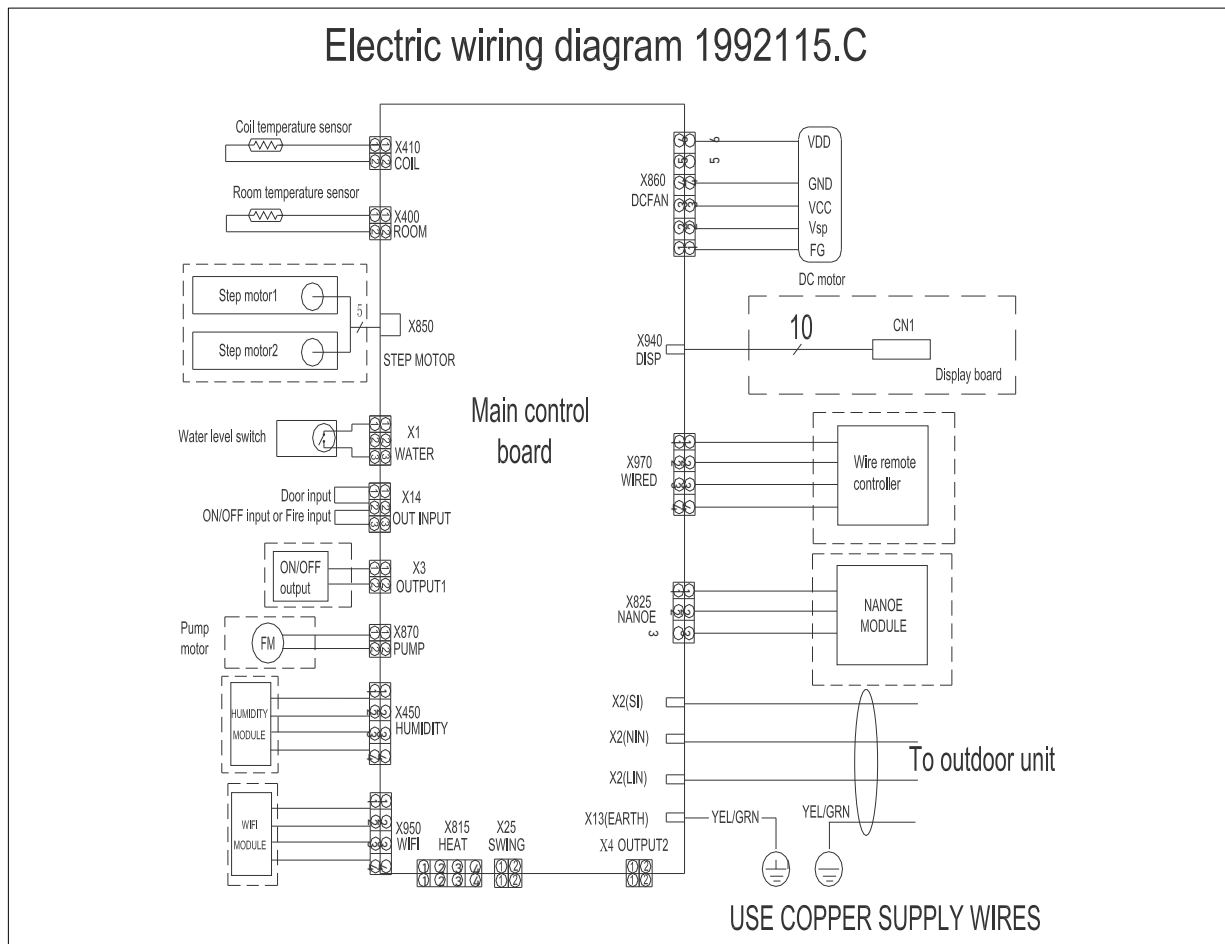
WIRING DIAGRAMS

7k Wall Units



WIRING DIAGRAMS

Ducted Indoor Units 9k, 12k, and 18k



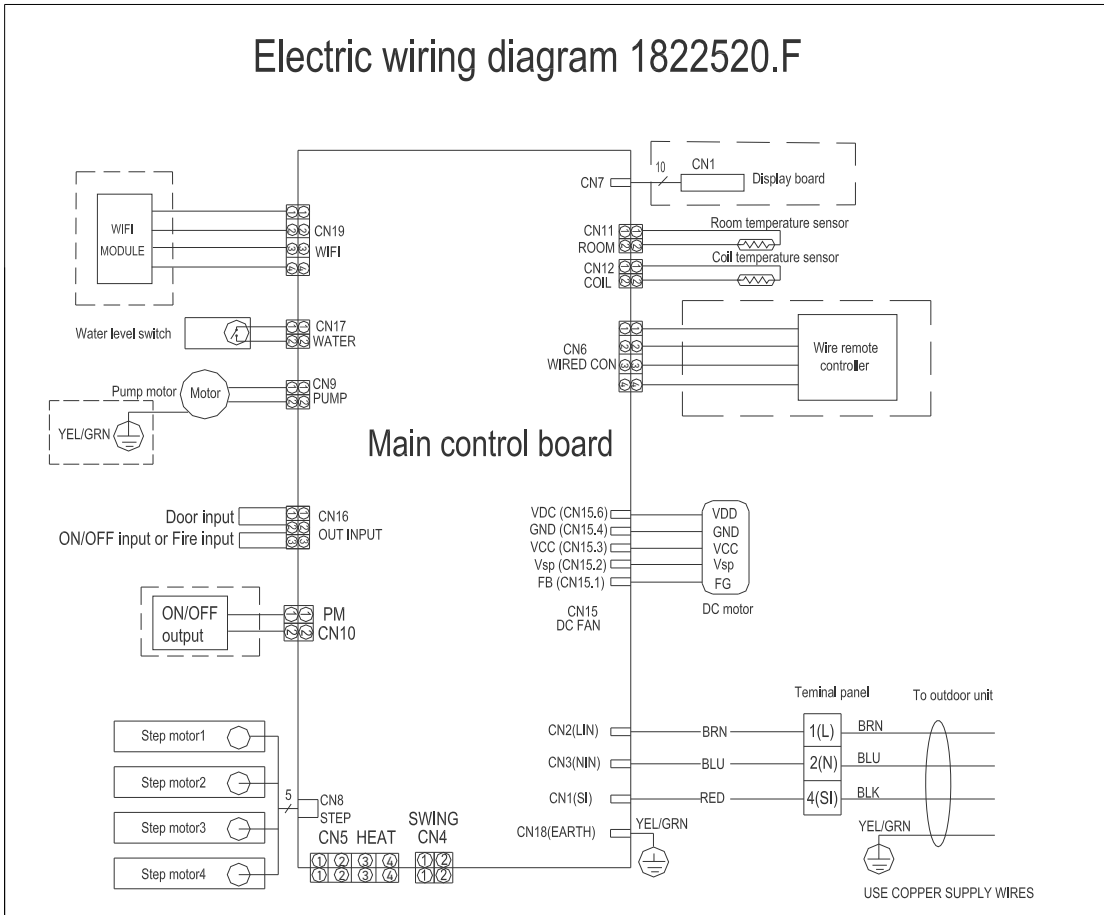
Remark:
 Dashed parts are not available in some models.
 Details see the table below.

Duct	Indoor units model	Step motor	Pump motor	Humidity	WIFI Module	NANOE Module	Display board	Wired remote controller	ON/OFF output
	9K-18K							●	●

●--available part

WIRING DIAGRAMS

9k-36k Indoor Cassette Units



Remark:
Dashed parts are not available in some models.
Details see the table below.

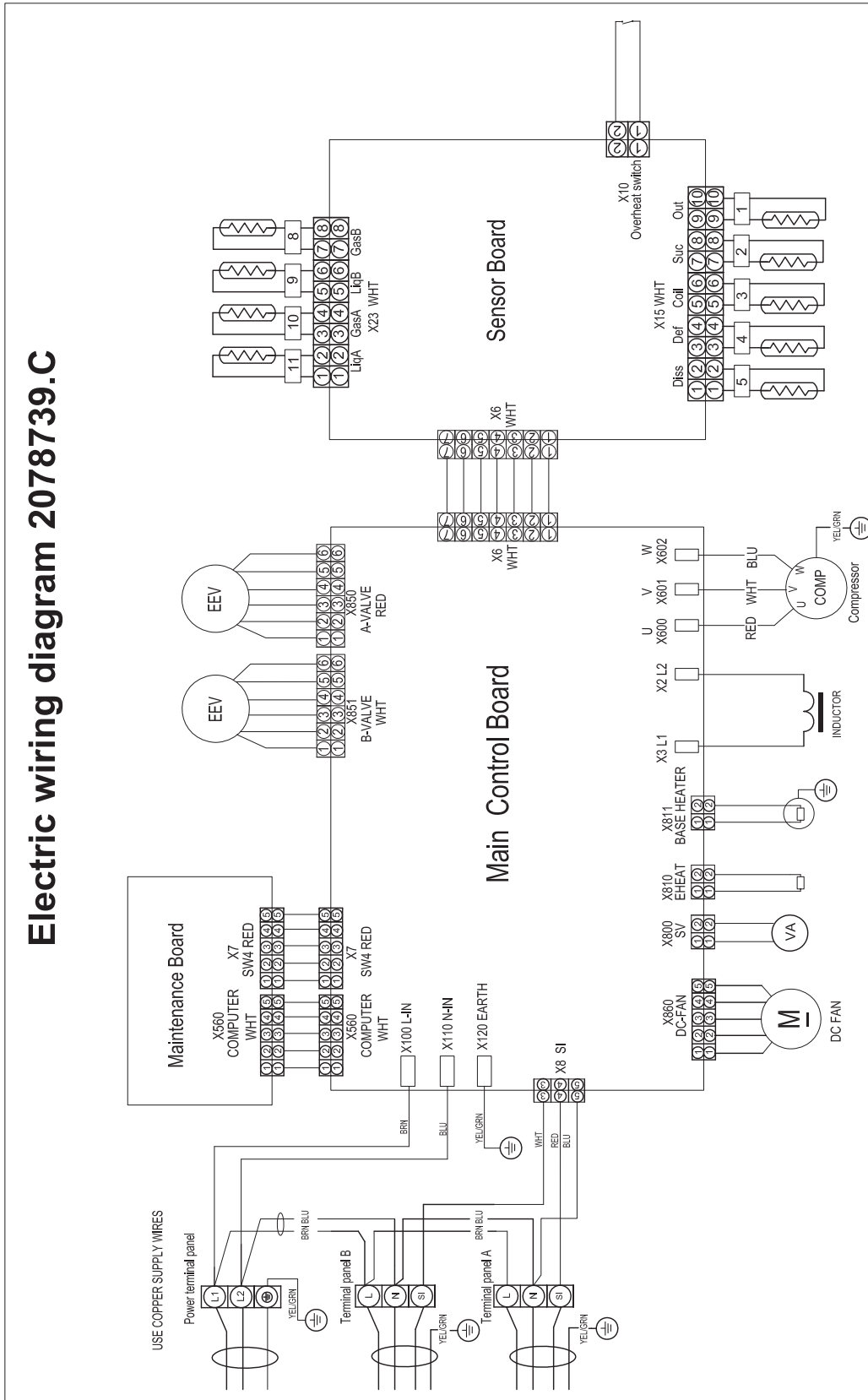
	Indoor units model	Step motor	Pump motor	WiFi module	Display board	Wire remote controller	ON/OFF output
Cassette	9K~36K	●	●		●		

●--available part

WIRING DIAGRAMS

18k Outdoor Units

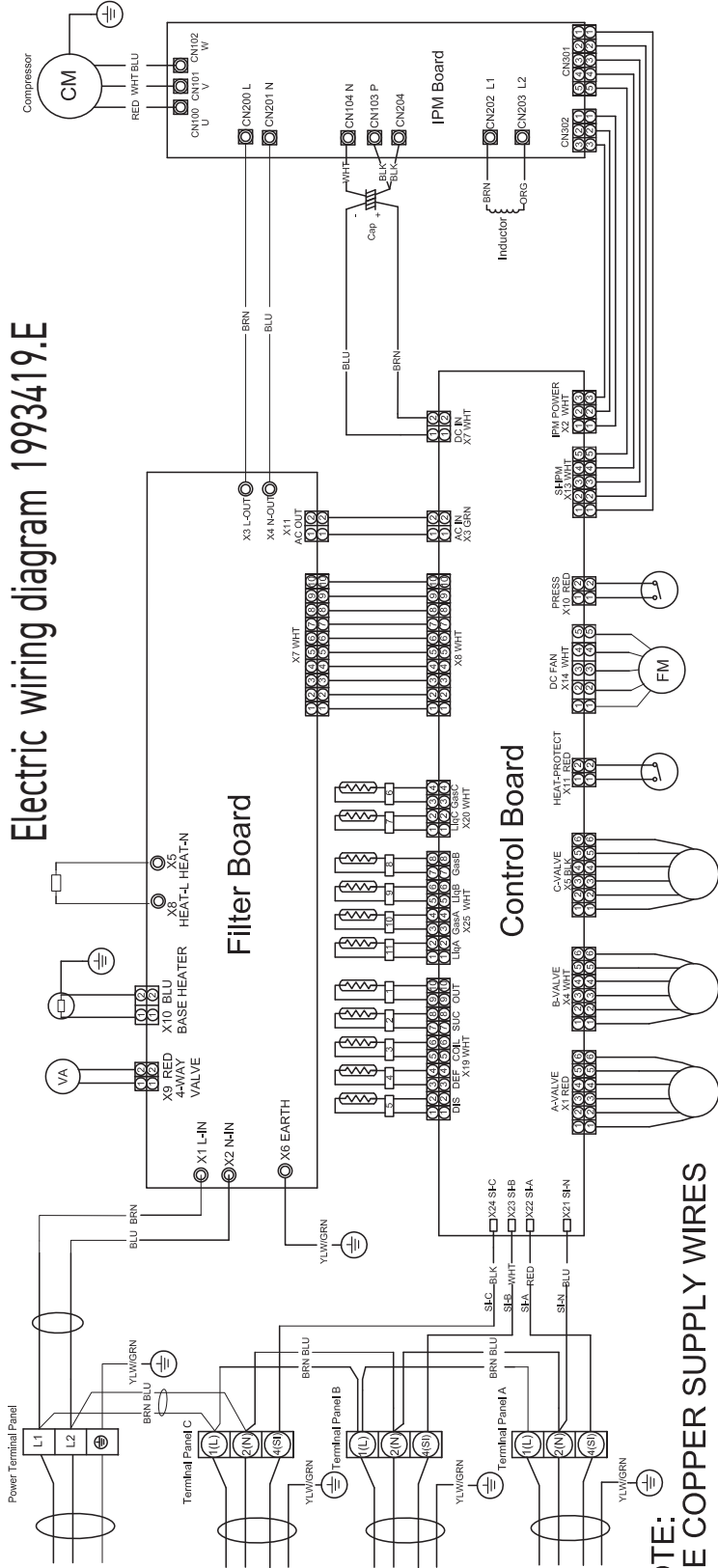
Electric wiring diagram 2078739.C



WIRING DIAGRAMS

24k Outdoor Units

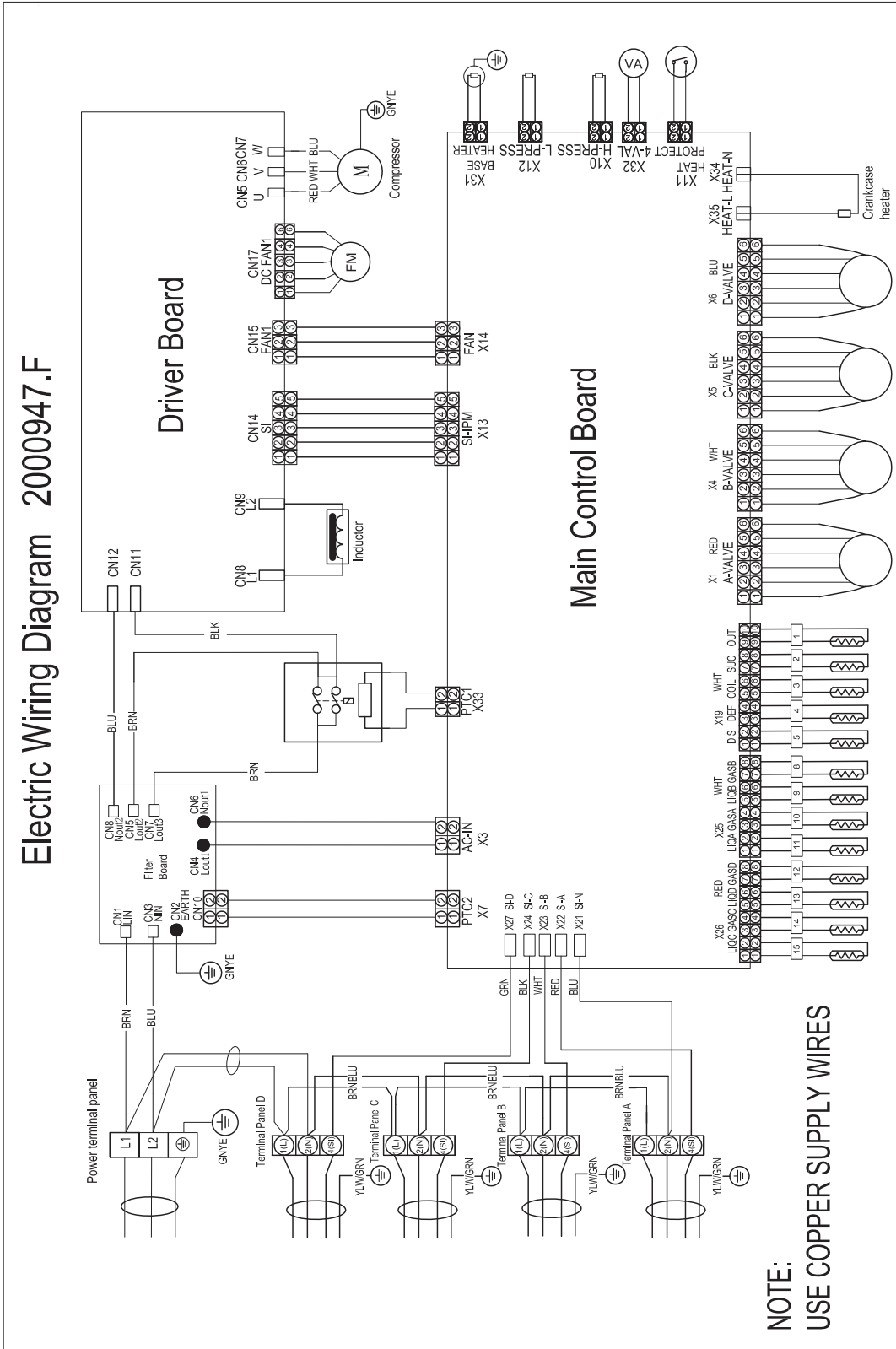
Electric wiring diagram 1993419.E



NOTE:
USE COPPER SUPPLY WIRES

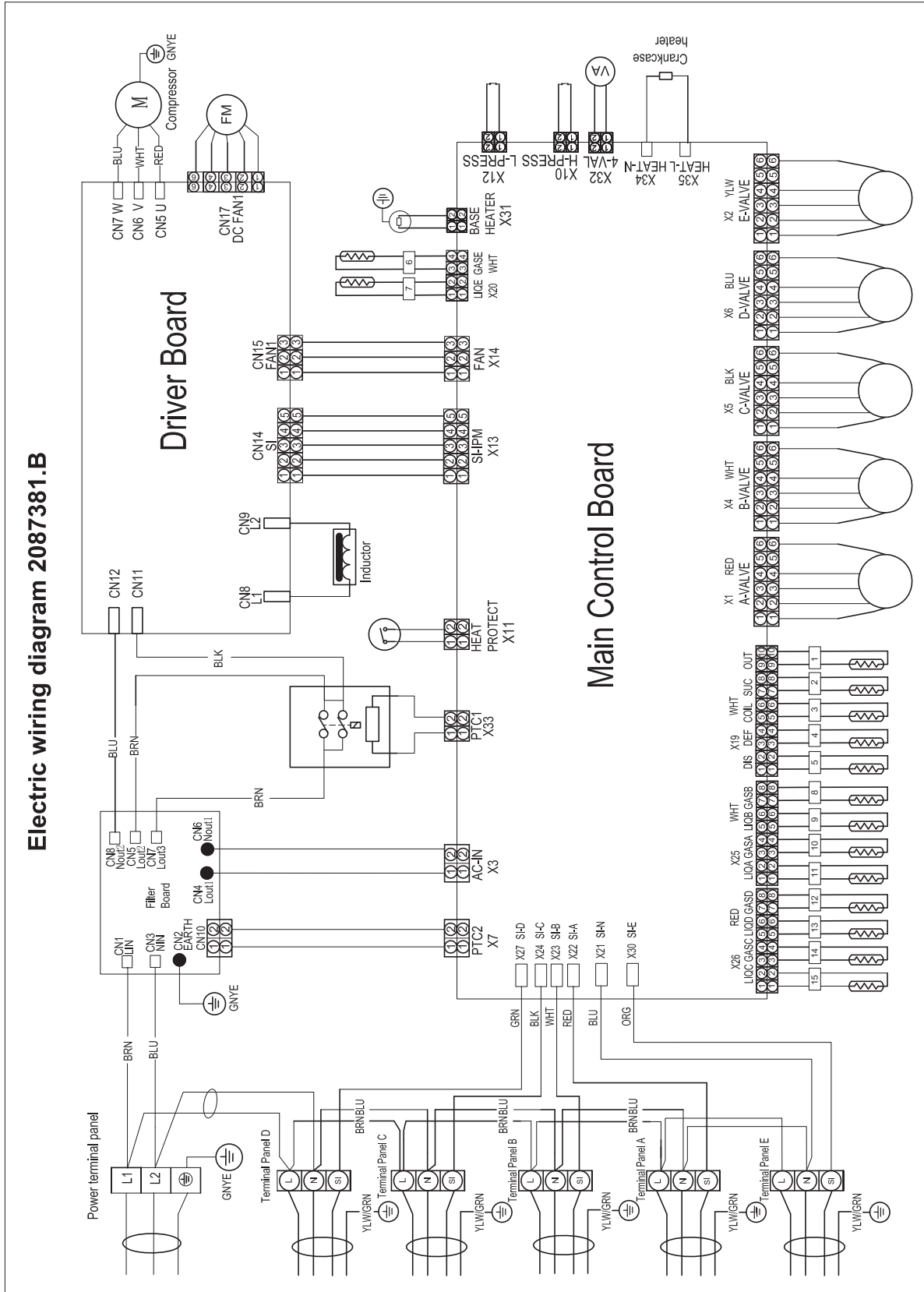
WIRING DIAGRAMS

36k Outdoor Units



WIRING DIAGRAMS

42k Outdoor Units



APPENDIX

Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: $T_f = T_c \times 1.8 + 32$

Set temperature

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)
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 (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)
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

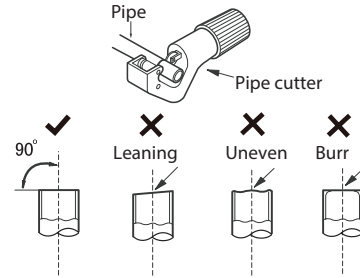
Pipe Expanding Method

⚠ Note:

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

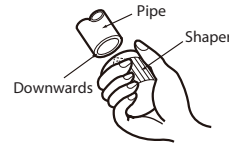
A: Cut the pip

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

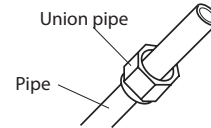
Remove the burrs with shaper and prevent the burrs from getting into the pipe.



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.



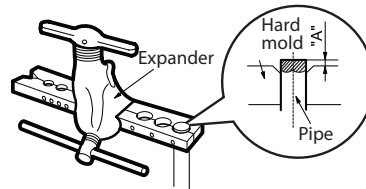
E: Expand the port

Expand the port with expander.

⚠ Note:

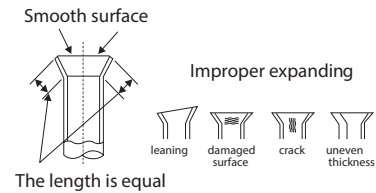
"A" is different according to the diameter, please refer to the sheet below:

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.



APPENDIX

Resistance Table Coil And Room Sensor R(32°F)=15k

Temp. (°F)	Resistance (kΩ)	Voltage	Temp. (°F)	Resistance (kΩ)	Voltage	Temp. (°F)	Resistance (kΩ)	Voltage
-4	38.757	0.58143512	64.4	7.051	2.09859271	132.8	1.877	3.654865988
-2.2	36.844	0.60795346	66.2	6.778	2.14682606	134.6	1.818	3.686036427
-0.4	35.038	0.63530819	68	6.516	2.19524793	136.4	1.76	3.717201166
1.4	33.331	0.66352684	69.8	6.267	2.24333597	138.2	1.705	3.747244673
3.2	31.719	0.69257720	71.6	6.028	2.29151689	140	1.652	3.776658768
5	30.196	0.72246147	73.4	5.8	2.33944954	141.8	1.6	3.805970149
6.8	28.755	0.75321223	75.2	5.581	2.38741691	143.6	1.551	3.834009923
8.6	27.392	0.78480857	77	5.372	2.43506494	145.4	1.503	3.861880963
10.4	26.103	0.81722911	78.8	5.172	2.48247664	147.2	1.457	3.888973616
12.2	24.882	0.85051031	80.6	4.981	2.52951096	149	1.413	3.91524643
14	23.727	0.88458737	82.4	4.797	2.57653834	150.8	1.37	3.941267388
15.8	22.632	0.91951536	84.2	4.622	2.62291710	152.6	1.328	3.967019291
17.6	21.594	0.95527085	86	4.453	2.66931854	154.4	1.289	3.991234935
19.4	20.611	0.99179340	87.8	4.292	2.715076661	156.2	1.25	4.015748031
21.2	19.678	1.02913875	89.6	4.137	2.76063657	158	1.213	4.039284017
23	18.794	1.06721353	91.4	3.989	2.805589174	159.8	1.177	4.062450215
24.8	17.954	1.10609872	93.2	3.847	2.850117358	161.6	1.142	4.085229093
26.6	17.158	1.14565549	95	3.711	2.894109636	163.4	1.109	4.106941536
28.4	16.401	1.18599135	96.8	3.58	2.937788018	165.2	1.076	4.12888601
30.2	15.683	1.22696435	98.6	3.455	2.980713033	167	1.045	4.149715216
32	15	1.26865672	100.4	3.335	3.023117961	168.8	1.015	4.17007359
33.8	14.351	1.31098658	102.2	3.219	3.065272268	170.6	0.986	4.189944134
35.6	13.734	1.35393437	104	3.108	3.106725146	172.4	0.957	4.210004953
37.4	13.148	1.39741342	105.8	3.001	3.147759536	174.2	0.93	4.228855721
39.2	12.589	1.44157386	107.6	2.899	3.187898487	176	0.904	4.247168554
41	12.058	1.48618720	109.4	2.801	3.227439565	177.8	0.878	4.265640683
42.8	11.553	1.53125563	111.2	2.706	3.266717909			
44.6	11.071	1.57689691	113	2.615	3.305249514			
46.4	10.613	1.62286005	114.8	2.528	3.342947037			
48.2	10.176	1.66928515	116.6	2.444	3.380169671			
50	9.76	1.71601615	118.4	2.363	3.416856492			
51.8	9.363	1.76311968	120.2	2.286	3.45247766			
53.6	8.985	1.81043663	122	2.211	3.487894953			
55.4	8.624	1.85805887	123.8	2.139	3.522585993			
57.2	8.279	1.90597205	125.6	2.07	3.556485356			
59	7.951	1.95387327	127.4	2.003	3.590032381			
60.8	7.637	2.00204130	129.2	1.939	3.622673675			
62.6	7.337	2.05033368	131	1.877	3.654865988			

Note: the AD value in the table is calculated on the basis of the pull-down resistor is 5.1K

APPENDIX

Resistance Table Of Outdoor Compressor Temperature Sensor

R(32°F)=187.25k

Temp. (°F)	Resistance (kΩ)	Voltage	Temp. (°F)	Resistance (kΩ)	Voltage	Temp. (°F)	Resistance (kΩ)	Voltage
-4	542.867	0.06185563	64.4	78.854	0.39694585	132.8	6.624	2.532777116
-2.2	512.839	0.06543004	66.2	75.381	0.41372093	134.6	6.414	2.573028606
-0.4	484.672	0.06917993	68	72.082	0.43102355	136.4	6.212	2.612972641
1.4	458.239	0.07311215	69.8	68.948	0.44885674	138.2	6.017	2.652726847
3.2	433.423	0.07723358	71.6	65.968	0.46723835	140	5.829	2.692216328
5	410.115	0.08155140	73.4	63.136	0.48615877	141.8	5.648	2.731362468
6.8	388.213	0.08607312	75.2	60.443	0.50562884	143.6	5.474	2.770083102
8.6	367.625	0.09080590	77	57.88	0.52566481	145.4	5.306	2.808524698
10.4	348.264	0.09575738	78.8	55.367	0.54691396	147.2	5.144	2.846617549
12.2	330.048	0.10093573	80.6	52.978	0.56877112	149	4.988	2.884289108
14	312.904	0.10634837	82.4	50.707	0.59123237	150.8	4.837	2.921715219
15.8	296.761	0.11200385	84.2	48.547	0.61430611	152.6	4.692	2.958579882
17.6	281.556	0.11790981	86	46.492	0.63799445	154.4	4.552	2.995066949
19.4	267.227	0.12407536	87.8	44.537	0.66229036	156.2	4.417	3.031113488
21.2	253.72	0.13050821	89.6	42.676	0.68720188	158	4.286	3.066931265
23	240.982	0.13721739	91.4	40.904	0.71272849	159.8	4.161	3.10190676
24.8	228.965	0.14421140	93.2	39.217	0.73885738	161.6	4.039	3.13682074
26.6	217.624	0.15149895	95	37.609	0.76561057	163.4	3.922	3.171050177
28.4	206.917	0.15908889	96.8	36.077	0.79296593	165.2	3.776	3.214826021
30.2	196.805	0.16699001	98.6	34.616	0.82093877	167	3.703	3.237170332
32	187.25	0.17521257	100.4	33.224	0.84949031	168.8	3.602	3.268602192
33.8	177.957	0.18402550	102.2	31.895	0.87866649	170.6	3.501	3.300650422
35.6	169.186	0.19319719	104	30.628	0.90841082	172.4	3.409	3.33039475
37.4	160.903	0.20273937	105.8	29.419	0.93873381	174.2	3.317	3.360680043
39.2	153.179	0.21252789	107.6	28.264	0.96965549	176	3.228	3.390506582
41	145.685	0.22297275	109.4	27.162	1.00111890	177.8	3.141	3.420179056
42.8	138.696	0.23368340	111.2	26.109	1.03315203			
44.6	132.086	0.24480509	113	25.103	1.06573050			
46.4	125.833	0.25634646	114.8	24.142	1.09883007			
48.2	119.916	0.26831655	116.6	23.223	1.13246511			
50	114.315	0.28072493	118.4	22.345	1.16658089			
51.8	109.01	0.29358432	120.2	21.505	1.20120120			
53.6	103.984	0.30690352	122	20.701	1.23631868			
55.4	99.222	0.32068816	123.8	7.8	2.328767123			
57.2	94.708	0.33494897	125.6	7.546	2.369998606			
59	90.427	0.34969710	127.4	7.301	2.411176512			
60.8	86.366	0.36494000	129.2	7.065	2.452217815			
62.6	82.512	0.38068793	131	6.843	2.492120501			

Note: the AD value in the table is calculated on the basis of the pull-down resistor is 5.1K

APPENDIX

Available Accessories

CEILING CASSETTE GRILLES

Decorative Grille	
FPCG0912	FPCG182436
Fits FPHFC09A3B FPHFC12A3B	Fits FPHFC18A3B FPHFC24A3B FPHFC36A3B



WALL CONTROLLERS



FPWC1

FPWC1 Optional wired wall controller for Floating Air Premier single zone and Floating Air[®] Pro, single and multizone models. Does not work with FPHSW36A3B at this time. Please check with your Friedrich representative for options. Cable length = 24 ft (8m)

APPENDIX

Interactive Parts Viewer

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

Please click on the link below:

[Interactive Parts Viewer](#)

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

Limited Warranty

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

APPENDIX

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 Refrigeration & 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](https://www.totalhomesupply.com/brands/Friedrich.html)



FRIEDRICH

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