



Floating Air® Pro Series Ductless Split Air Conditioners Single-Zone Cassette and Ducted R-410A Refrigerant



	Type	Model	Model Revision
Outdoor	Condensor	FPHFR9A3A	
Outdoor	Condensor	FPHFR12A3A	
Outdoor	Condensor	FPHFR18A3A	
Outdoor	Condensor	FPHFR24A3A	
Outdoor	Condensor	FPHFR36A3A	
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	Cassette	FPHFC36A3A	FPHFC36A3B Wi-Fi
Indoor	Ducted	FPHFD09A3A	
Indoor	Ducted	FPHFD12A3A	
Indoor	Ducted	FPHFD18A3A	
Indoor	Ducted	FPHFD24A3A	
Indoor	Ducted	FPHFD36A3A	
Indoor	Accessory	FPCG0912	
Indoor	Accessory	FPWC1	
Indoor	Accessory	FPCG182436	

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INTRODUCTION

Important Safety Information

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


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.

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

 WARNING	
	Refrigeration system under high pressure
	Do not puncture, heat, expose to flame or incinerate.
	Only certified refrigeration technicians should service this equipment.
	R410A systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used.
	Only use gauge sets designed for use with R410A. Do not use standard R22 gauge sets.

INTRODUCTION

Important Safety Information

CAUTION
DO NOT OPERATE EQUIPMENT DURING ACTIVE STAGES OF CONSTRUCTION

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

WARNING

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

WARNING

Refrigeration system under high pressure. Do not puncture, heat, expose to flame or incinerate. Only certified refrigeration technicians should service this equipment. R410A systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used. Only use gauge sets designed for use with R410A. Do not use R22 gauge sets. Failure to do so can result in property damage, personal injury, or death.

WARNING

Electrical shock hazard.

Turn OFF electric power before service or installation. Unit must be properly grounded.

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



Your safety and the safety of others are very important.

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

This is the safety Alert symbol.

This symbol alerts you to potential

hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION".

These words mean:



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



WARNING

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

- **REFRIGERATION SYSTEM REPAIR HAZARDS:**

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

- **MECHANICAL HAZARDS:**

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

- **PROPERTY DAMAGE HAZARDS**

- **FIRE DAMAGE HAZARDS:**

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

- **WATER DAMAGE HAZARDS:**

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

INTRODUCTION

Model Identification Guide

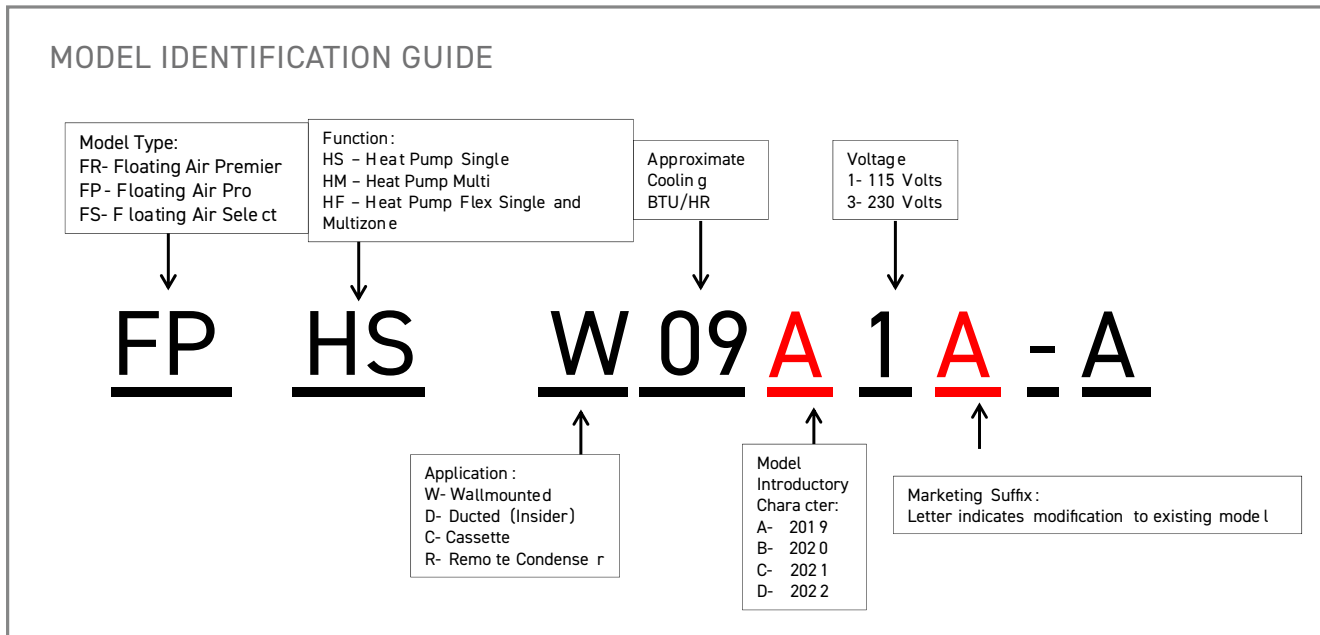


Figure 101

INTRODUCTION

Product Appearance - Ducted and Cassette

Duct type

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

Figure 102

Cassette type

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

Figure 103

INTRODUCTION

Product Appearance- Outdoor Units



9-12k BTU Units



18-36k BTU Units

Figure 104

SPECIFICATIONS

Product Specifications Single-Zone-Cassette

PERFORMANCE RATINGS		SINGLE ZONE - CASSETTE - HEAT PUMPS				
System Model No.		FPHC093A	FPHC123A	FPHC183A	FPHC243A	FPHC363A
Indoor Model		FPHFC09A3B	FPHFC12A3B	FPHFC18A3B	FPHFC24A3B	FPHSC36A3B
Outdoor Model		FPHFR09A3A	FPHFR12A3A	FPHFR18A3A	FPHFR24A3A	FPHFR36A3A
SPECIFICATIONS						
Capacity Cooling (Rated)	Btu	9000	12000	18000	24000	36000
Capacity Cooling (Min.-Max.)	Btu	4850-11600	5800-13100	4200-21000	8600-25200	15000-42600
Capacity Heating @47°F (Rated)	Btu	10000	12000	19000	24000	36000
Capacity Heating @17°F (Rated)	Btu	6000	7000	11000	19600	27200
Capacity Heating (Min.-Max.)	Btu	4340-12280	4400-14400	5600-24000	7600-28400	15000-42600
Capacity Heating (M1 Calc) @ 5°F		8300	8500	13200	19000	--
Capacity Heating (Min.-Max.) @ -4°F		2300-8300	2302-8387	2300-11500	2900-19923	--
Sensible Heat Ratio		76%	77%	76%	76%	79%
COP (@47°F)		4.1	3.8	3.9	3.6	3.3
HSPF/HSPF2		10.0/10.0	11.5/9.5	11.0/10.0	10.0/10.0	10.5/9.8
SEER/SEER2		22.0/20.5	23.0/20.5	22.0/20.5	19.0/18.5	19.5/18.0
EER		12.9	12.5	12.7	12.5	10.7
ENERGY STAR® *		YES	YES	YES	YES	--
Moisture Removal	Pts/h	2.0	3.0	1.9	5.1	7.6
Airflow (Low, Med, High)	CFM	309/274/232	324/294/235	588/500/394	647/530/400	941/794/676
Sound Rating - Indoor H/M/L	dB(A)	39/32/29	42/37/33	39/32/29	44/40/38	49/43/39
Sound Rating - Outdoor	dB(A)	52	54	68	54	61
Operating Range (Cooling)	°FDB	5-118	5-118	5-118	5-118	5-118
Operating Range (Heating)	°FWB	-4-75	-4-75	-4-75	-4-75	-4-75
Est. Yearly Operating Cost	\$	59	83	119	167	244
ELECTRICAL DATA						
Power Source	V	230/208-60-1	230/208-60-1	230/208-60-1	230/208-60-1	230/208-60-1
Minimum Ampacity	A	23	23	23	23	27
Cooling Watts	W	700	960	1420	1920	3380
Cooling Amps		3.6	4.3	6.5	8.6	14.6
Heating Amps		3.5	4.1	6.3	8.6	14.0
Max. TD Fuse/Breaker	A	15***	20***	20***	35***	45***
Power and Communication Cable No. x AWG		4 x 14AWG	4 x 14AWG	4 x 14AWG	4 x 14AWG	4 x 14AWG
REFRIGERATION SYSTEM						
Refrigerant		R410a	R410a	R410a	R410a	R410a
Compressor Type		Rotary Inverter	Rotary Inverter	Rotary Inverter	Rotary Inverter	Rotary Inverter
Connections		Flare	Flare	Flare	Flare	Flare
Liquid Line O.D.	in	1/4	1/4	1/4	3/8	3/8
Suction Line O.D.	in	3/8	3/8	1/2	5/8	3/4

Figure 201

SPECIFICATIONS

Product Specifications Single-Zone-Cassette

Factory Precharge	ft	25	25	25	25	25
Refrigerant Charge	oz	33.5	45.9	56.5	75	111
Min./Max. Line Length	ft	10-82	10-82	10-98	10-164	10-164
Max. Height Difference	ft	33	49	69	98	98
DIMENSIONS & WEIGHT						
Indoor Unit						
W X H X D	in	22 1/2 x 8 1/2 x 22 1/2	22 1/2 x 8 1/2 x 22 1/2	33 1/8 x 9 3/4 x 33 1/8	33 1/8 x 9 3/4 x 33 1/8	33 1/8 x 11 3/4 x 33 1/8
Net Weight	lbs	32	39.7	56	59.5	70.5
Shipping Weight	lbs	38.5	46.3	76	79.5	90.4
Indoor Unit Grille** W X H X D	in	24 1/2 x 24 1/2 x 10	24 1/2 x 24 1/2 x 10	35 7/8 x 35 7/8 x 13 1/2	35 7/8 x 35 7/8 x 13 1/2	35 7/8 x 35 7/8 x 13 1/2
Indoor Unit Grille** Net Weight	lbs	13.2	13.2	22.0	22.0	22.0
Indoor Grille Part Number		FPCG0912		FPCG182436		
Outdoor Unit						
W X H X D	in	37 x 25 x 16 1/2	37 x 25 x 16 1/2	39 x 17 3/4 x 28 3/4	43 x 36 1/4 x 18 1/8	43 x 36 1/4 x 18 1/8
Net Weight	lbs	75	75	108	155	192
Shipping Weight	lbs	85	82	117	166	215
Total Net Weight	lbs	107	108	164	214.5	262.5
Total Shipping Weight	lbs	123.5	121	191	245.5	305.4

Your operating costs will depend on your utility rates and use. The estimated operating cost is based on a electricity cost of \$.13 per kWh. For more information, visit www.ftc.gov/energy. *System meets ENERGY STAR® published minimums. **Models require grille. Sold separately. Due to continuing research in new energy-saving technology, specifications are subject to change without notice. *** Models produced in 2020 may have a different max Breaker size. Refer to the namplate data for verification.

Figure 201

SPECIFICATIONS

Product Specifications Single-Zone Concealed Ducted

PERFORMANCE RATINGS		Single Zone - The Insider® Concealed Ducted - Heat Pumps				
System Model No.		FPHD093	FPHD123	FPHD183	FPHD243	FPHD363
Indoor Model		FPHFD09A3A	FPHFD12A3A	FPHFD18A3A	FPHFD24A3A	FPHSD36A3A
Outdoor Model		FPHFR09A3A	FPHFR12A3A	FPHFR18A3A	FPHFR24A3A	FPHFR36A3A
SPECIFICATIONS						
Capacity Cooling (Rated)	Btu	9000	12000	18000	24000	36000
Capacity Cooling (Min.-Max.)	Btu	4850-11600	5800-13100	4200-21000	8600-25200	12500-37300
Capacity Heating @47°F (Rated)	Btu	11000	12000	18000	28000	36000
Capacity Heating @17°F (Rated)	Btu	6000	6600	12000	19200	26000
Capacity Heating (Min.-Max.)	Btu	4340-12280	4400-14400	5600-24000	7600-28400	15000-39800
Capacity Heating (M1 Calc) @ 5°F		--	--	--	--	--
Capacity Heating (Min.-Max.) @ -4°F		--	--	--	--	--
Sensible Heat Ratio		76%	76%	76%	76%	76%
SEER/SEER2		22.0/20.5	23.0/20.5	22.0/20.5	19.0/18.5	19.5/18.0
EER		12.0	11.0	11.4	10.5	10.9
COP (@47°F)		3.2	3.2	3.3	3.6	3.0
HSPF/HSPF2		10.0/9.6	10.0/9.0	10.0/9.5	11.0/9.5	9.5/9.5
ENERGY STAR®		YES	—	—	—	—
Moisture Removal	Pts/h	2.0	3.0	5.0	1.9	7.6
Airflow (Low, Med, High)	CFM	309/259/208	324/285/235	529/441/371	706/588/500	883/735/617
Sound Rating - Indoor H/M/L	dB(A)	35/33/32	36/34/33	38/37/36	42/38/36	43/40/38
Sound Rating - Outdoor	dB(A)	52	54	68	54	61
Operating Range (Cooling)	°F	5-118	5-118	5-118	5-118	5-118
Operating Range (Heating)	°F	-4-75	-4-75	-4-75	-4-75	-4-75
Est. Yearly Operating Cost	\$	63	83	122	176	376
ELECTRICAL DATA						
Power Source		230/208-60-1	230/208-60-1	230/208-60-1	230/208-60-1	230/208-60-1
Minimum Ampacity	A	23.0	23.0	23.0	23.0	21.0
Cooling Watts	W	750	1091	1670	2200	3300
Cooling Amps		3.7	4.8	7.6	10.3	14.4
Heating Amps		3.2	4.8	7.3	8.7	15.2
Max. TD Fuse/Breaker	A	15***	20***	20***	35***	45***
Power and Communication Cable	No. x AWG	4 x 14AWG	4 x 14AWG	4 x 14AWG	4 x 14AWG	4 x 14AWG

Figure 202

SPECIFICATIONS

Product Specifications Single-Zone Concealed Ducted

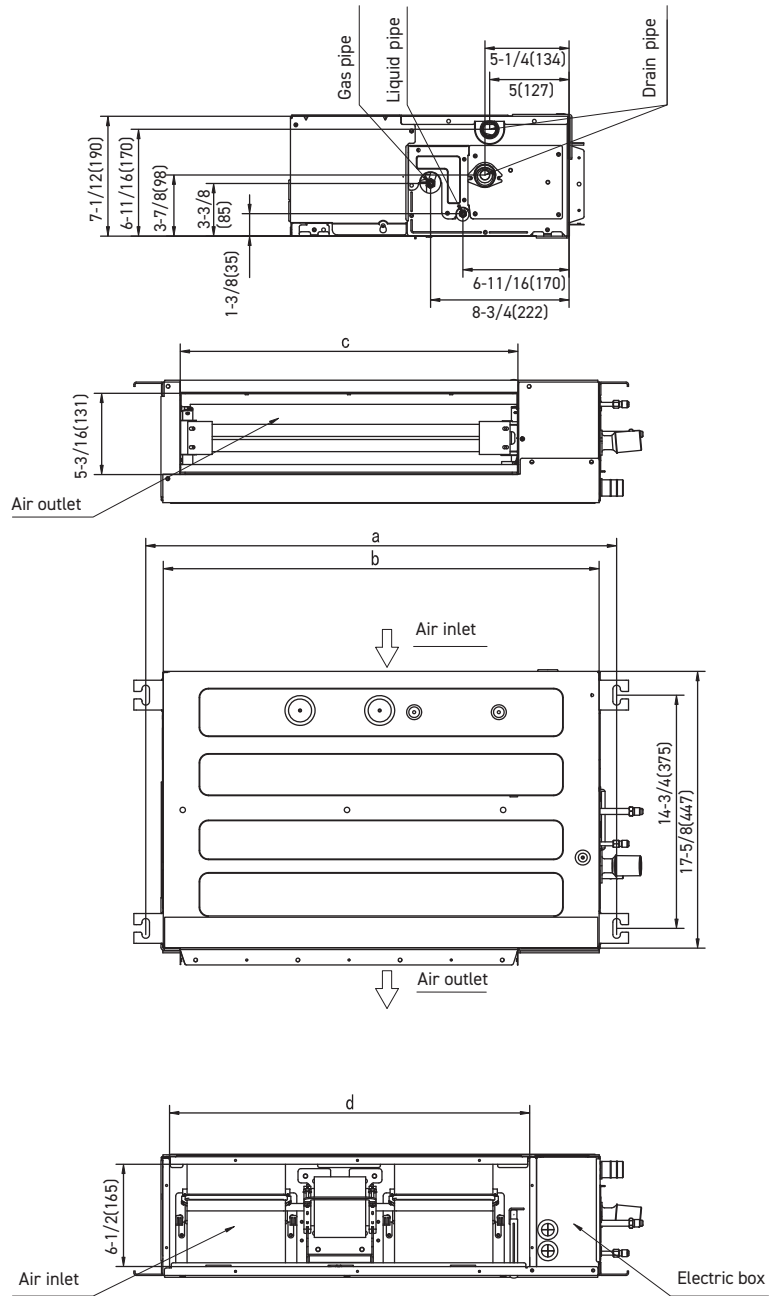
REFRIGERATION SYSTEM						
Refrigerant		R410a	R410a	R410a	R410a	R410a
Compressor Type		Rotary Inverter	Rotary Inverter	Rotary Inverter	Rotary Inverter	Rotary Inverter
Connections		Flare	Flare	Flare	Flare	Flare
Liquid Line O.D.	in.	1/4	1/4	1/4	3/8	3/8
Suction Line O.D.	in.	3/8	3/8	1/2	5/8	3/4
Factory Precharge	ft.	25	25	25	25	25
Refrigerant Charge	oz.	33.5	45.9	56.5	75.0	111
Min./Max. Line Length	ft.	10-82	10-82	10-98	10-164	10-164
Max. Height Difference	ft.	33	49	69	98	98
DIMENSIONS & WEIGHT						
Indoor Unit						
W X H X D	in.	35 7/8 x 7 1/2 x 17 5/8	35 7/8 x 7 1/2 x 17 5/8	46 1/2 x 7 1/2 x 17 5/8	35 3/8 x 10 5/8 x 28 3/8	51 1/8 x 13 3/4 x 31 1/2
Net Weight	lbs.	39.7	39.7	49.6	66.1	112.4
Shipping Weight	lbs.	46.3	46.3	57.3	77.2	132.3
Outdoor Unit						
W X H X D	in.	37 x 25 x 16 1/2	37 x 25 x 16 1/2	39 x 17 3/4 x 28 3/4	43 x 36 1/4 x 18 1/8	43 x 36 1/4 x 18 1/8
Net Weight	lbs.	75	75	108	155	192
Shipping Weight	lbs.	85	82	117	166	215
Total Net Weight	lbs.	107	108	108	214.5	262.5
Total Shipping Weight	lbs.	123.5	121	158	245.5	305.4

Your operating costs will depend on your utility rates and use. The estimated operating cost is based on a electricity cost of \$.13 per kWh. For more information, visit www.ftc.gov/energy. Due to continuing research in new energy-saving technology, specifications are subject to change without notice.. *** Models produced in 2020 may have a different max Breaker size. Refer to the namplate data for verification.

Figure 202

SPECIFICATIONS

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



Unit: Inches " (mm)

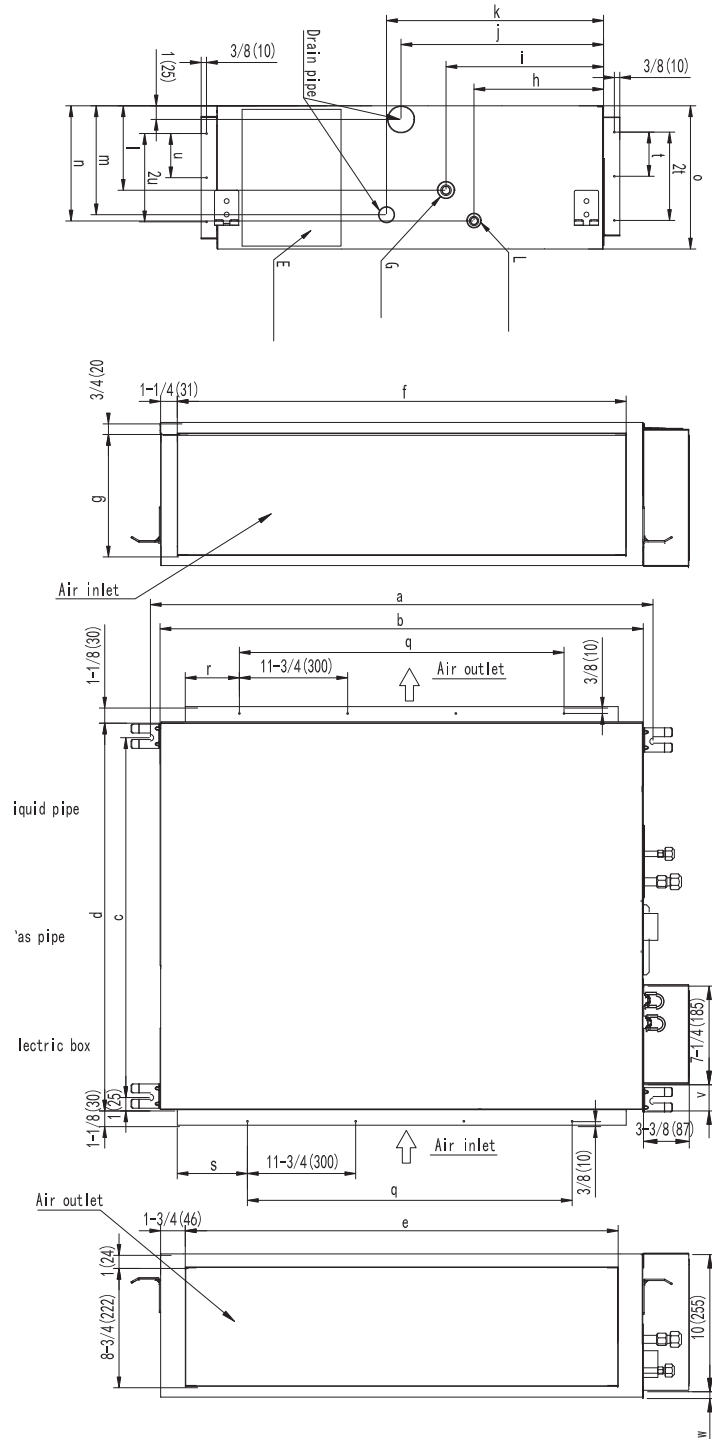
Model (Btu/h)	a	b	c	d
9K/12K	37-13/16 (961)	35-13/16 (910)	29-1/2 (749)	30 (786)
18K	48-7/16 (1231)	46-7/16 (1180)	40-1/8 (1019)	41-5/8 (1056)

Figure 203

SPECIFICATIONS

Product Dimensions: 24k Ducted Indoor Units

Unit: Inches"(mm)



	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	q	r	s	t	u	v	w
24K	36-3/4 (934)	35-3/8 (900)	26-3/8 (669)	28-3/8 (720)	31-3/4 (805)	32-7/8 (835)	9 (228)	9-1/2 (242)	11-5/8 (294)	14-7/8 (378)	16 (405)	6-1/8 (156)	8 (202)	8-3/8 (214)	10-5/8 (270)	23-5/8 (600)	4 (102)	4-5/8 (117)	3-1/4 (82)	3-1/4 (82)	1-7/8 (49)	1/4 (5)

Figure 204

SPECIFICATIONS

Product Dimensions: 9k and 12k Cassette

Unit: Inches" (mm)

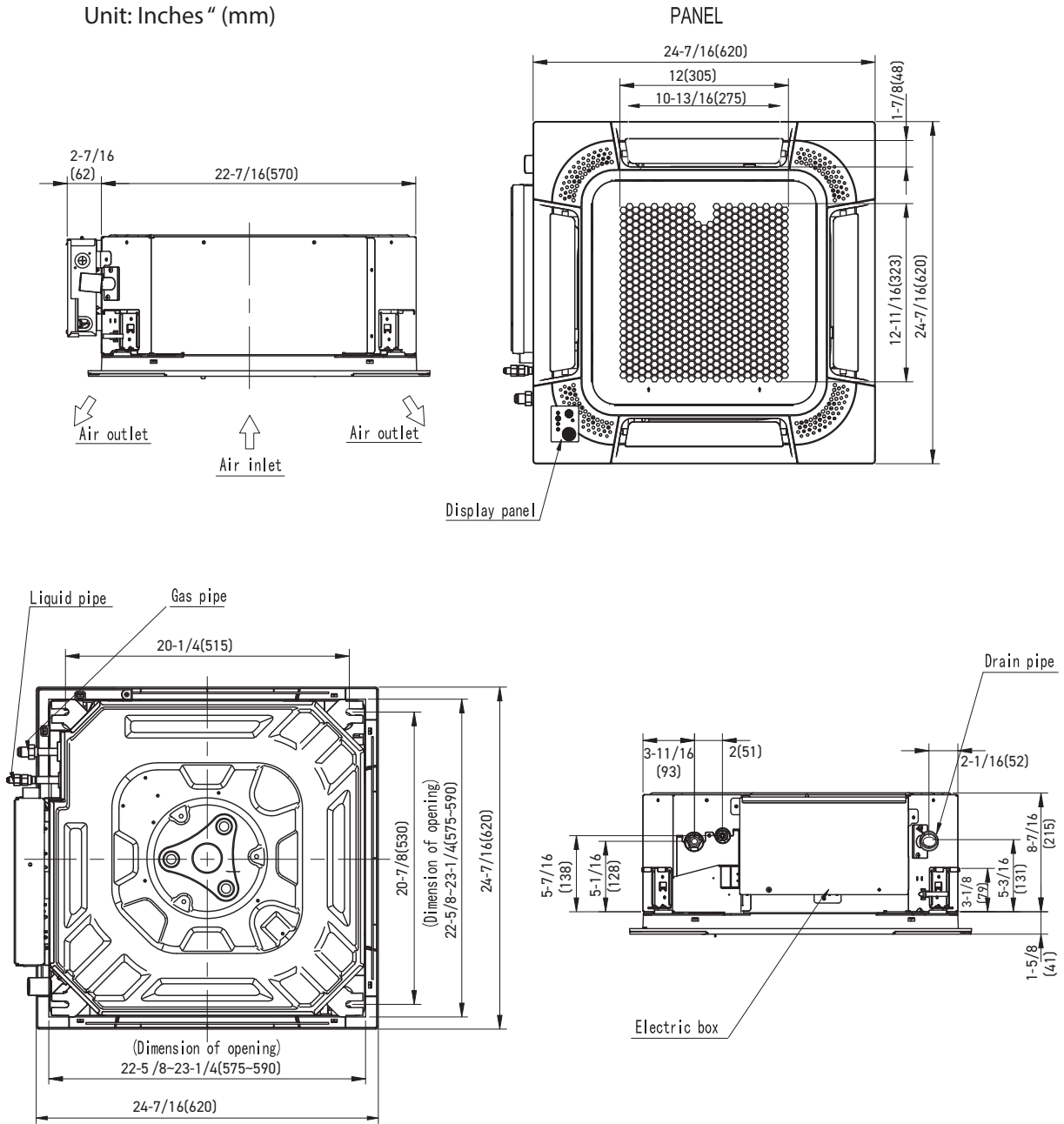


Figure 205

SPECIFICATIONS

Product Dimensions: 18-36k Cassette

Unit: Inches" (mm)

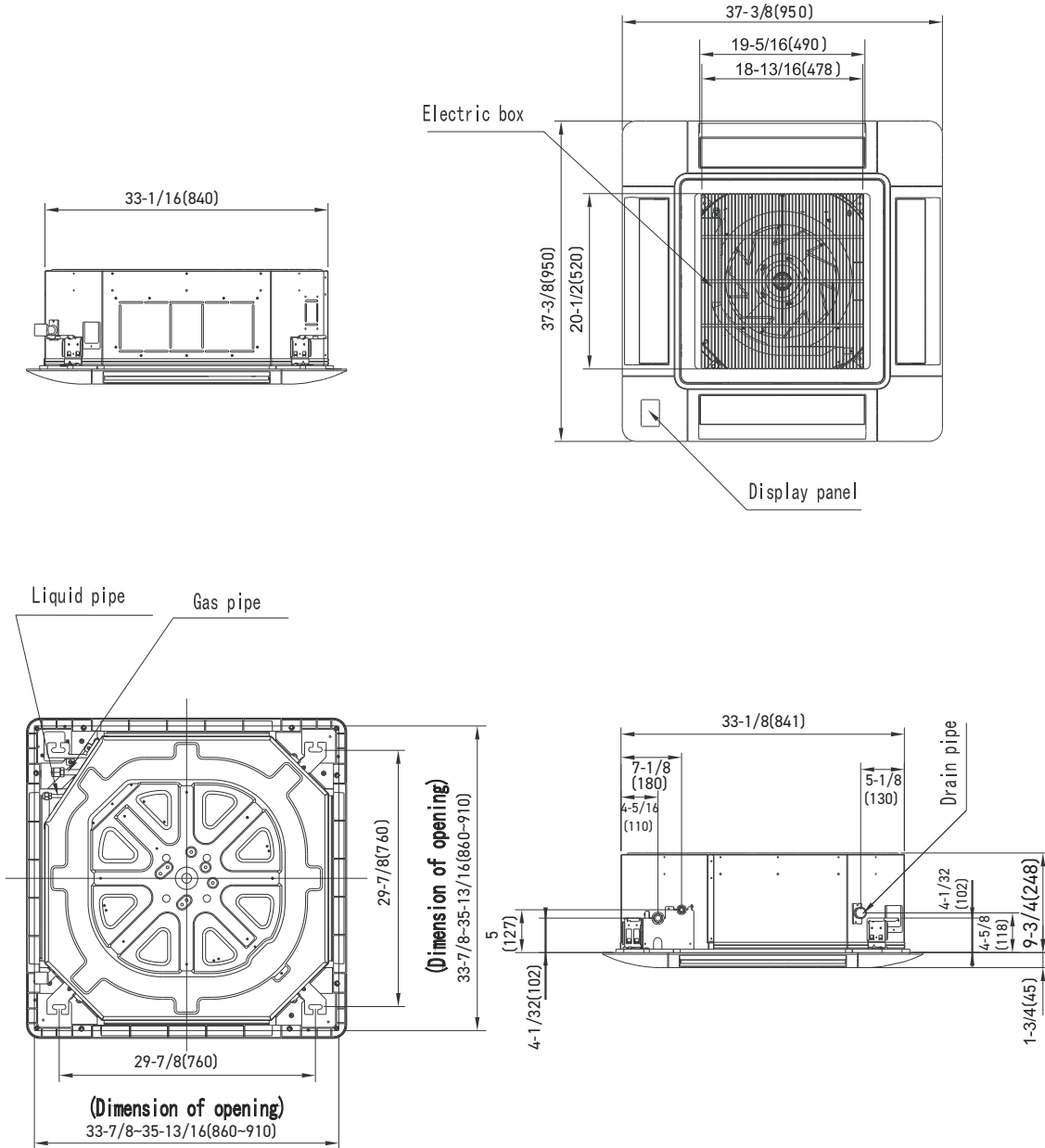


Figure 206

SPECIFICATIONS

Product Dimensions: 9-12k Outdoor Units

Inches“(mm)

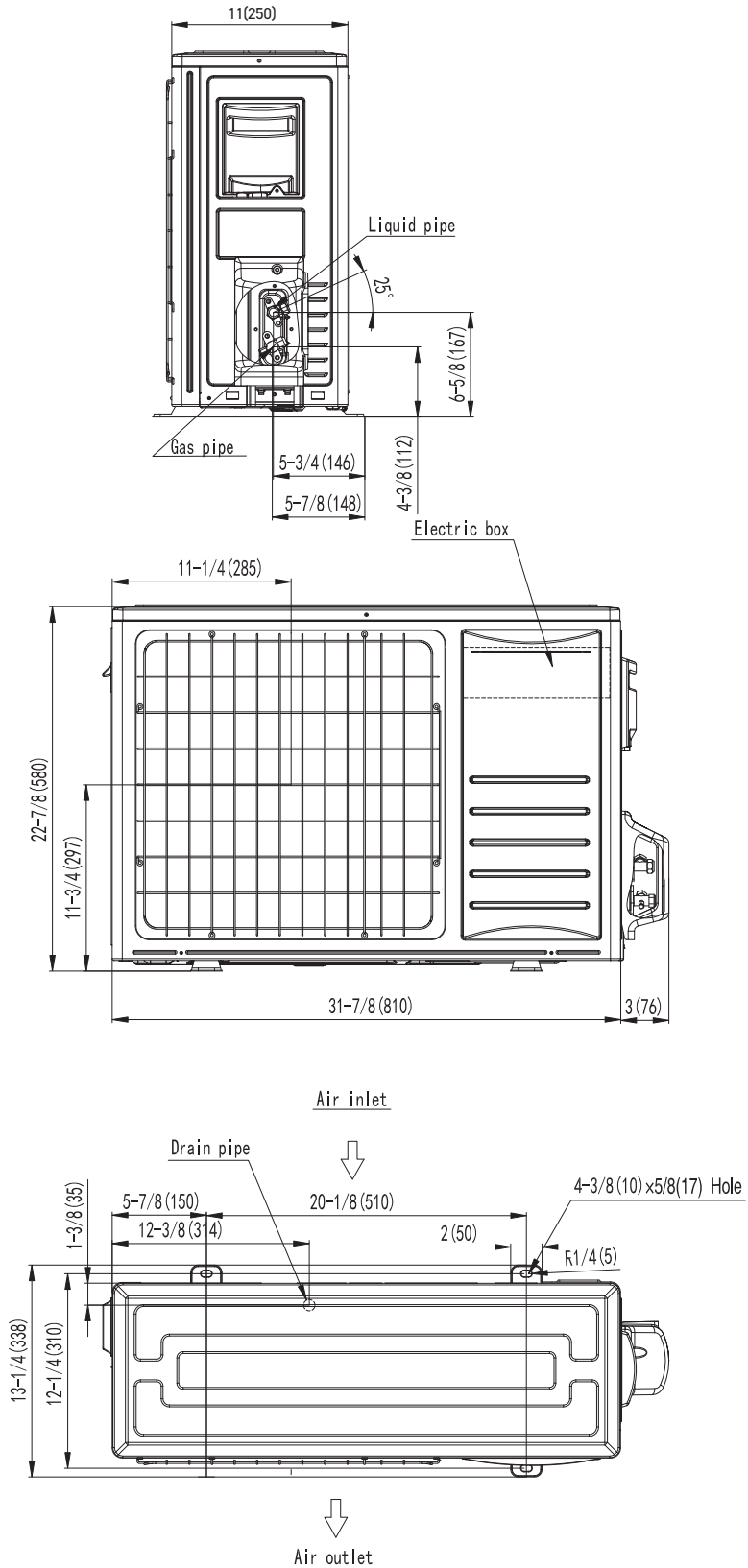


Figure 207

SPECIFICATIONS

Product Dimensions: 18k Outdoor Units

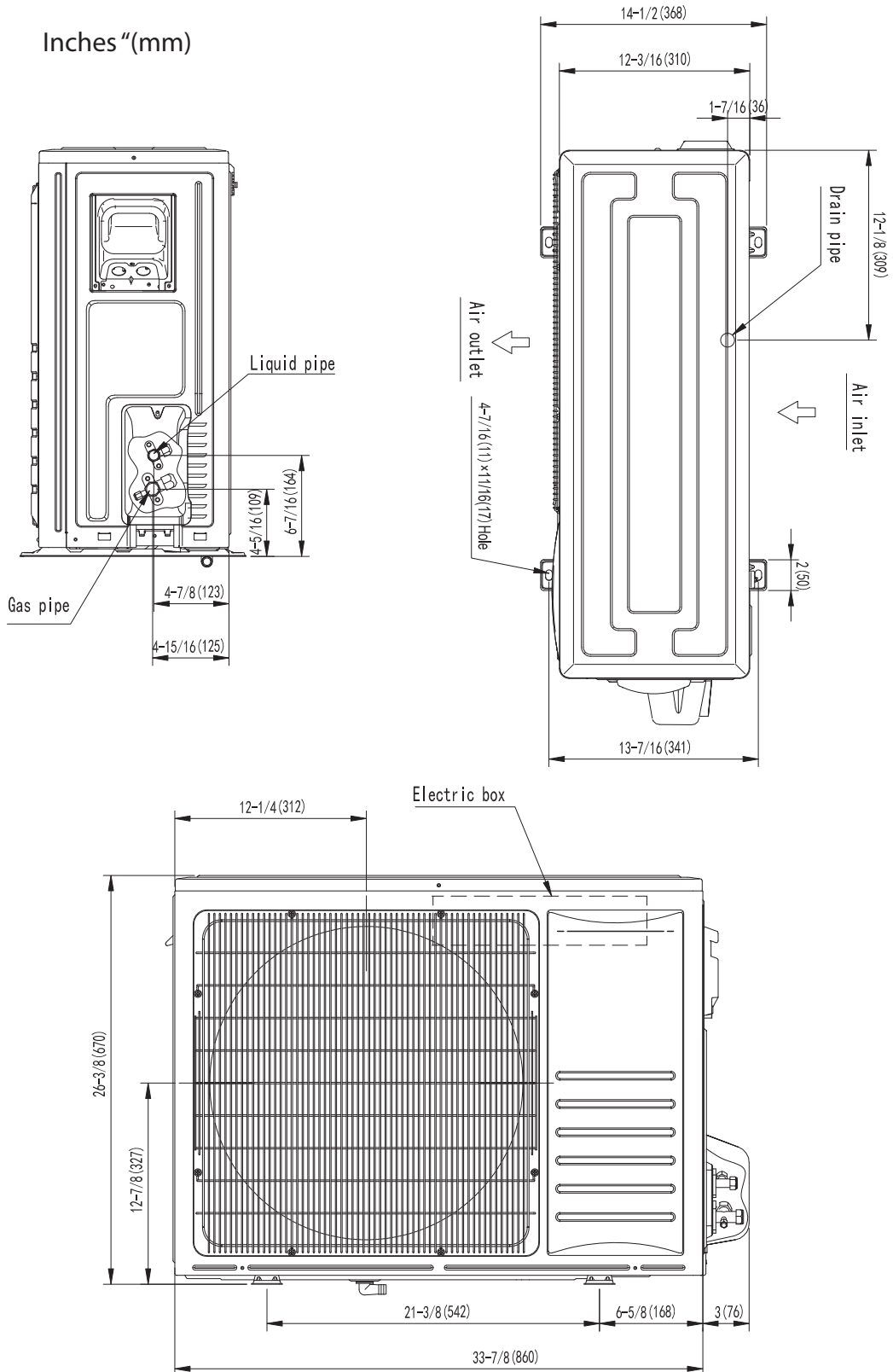


Figure 208

SPECIFICATIONS

Product Dimensions: 24k Outdoor Units

Unit: Inches" (mm)

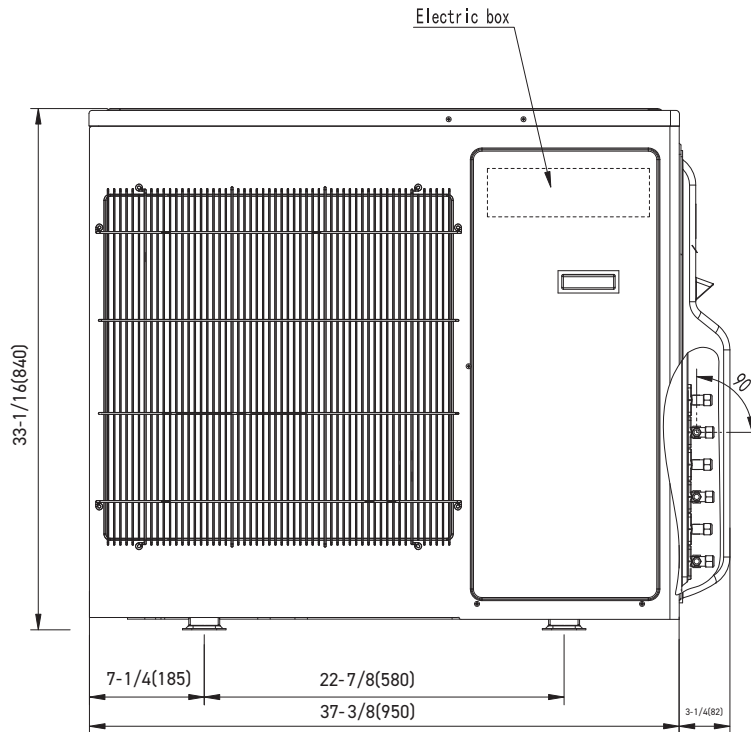
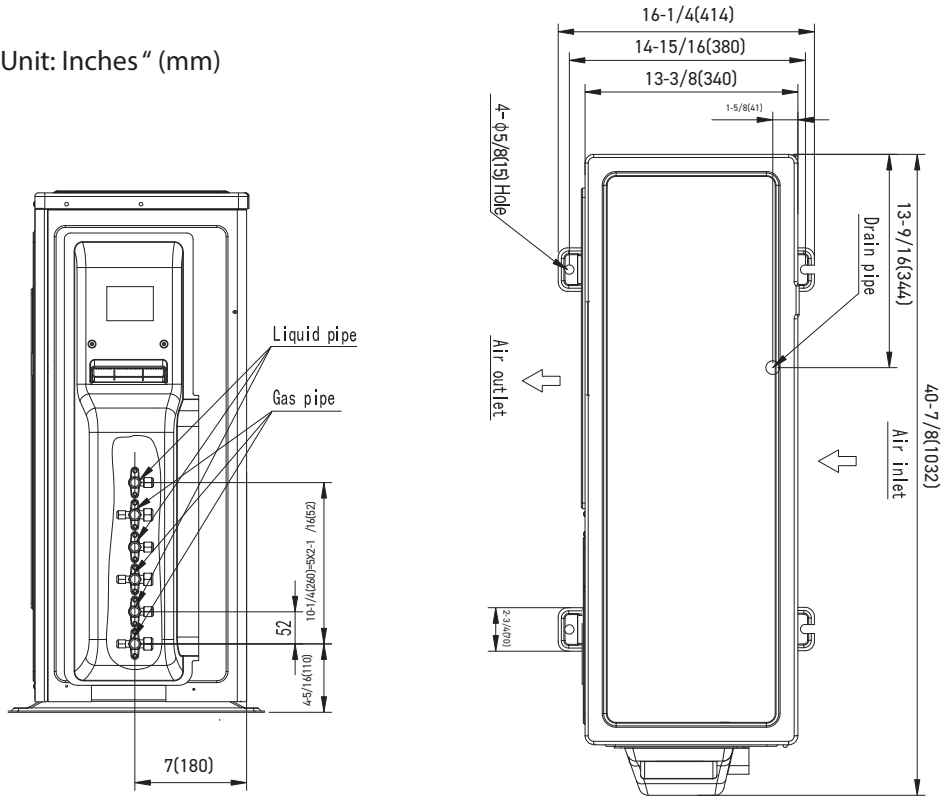


Figure 209

SPECIFICATIONS

Product Dimensions: 36k Outdoor Units

Inches" (mm)

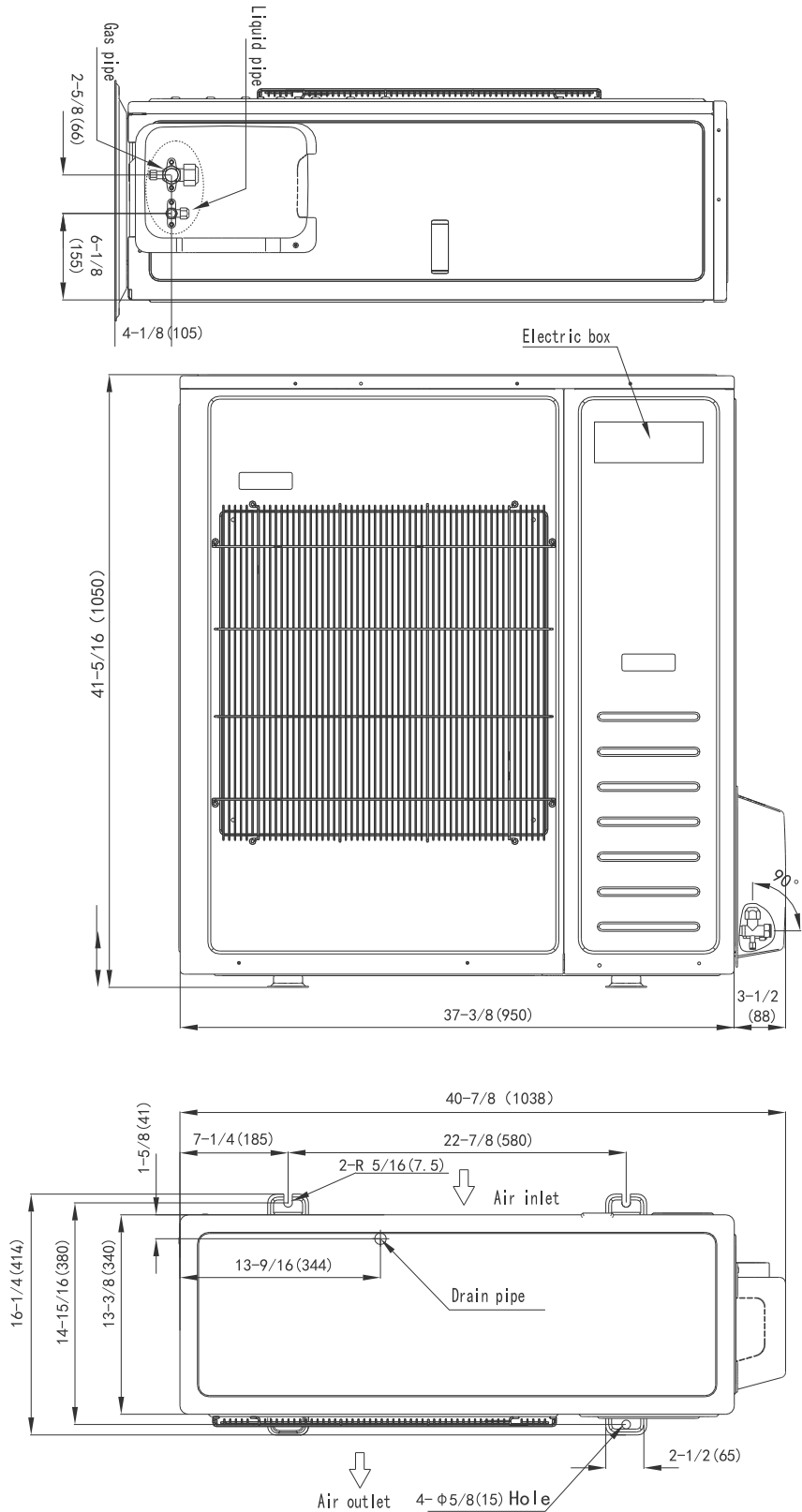


Figure 210

SPECIFICATIONS

Capacity Characteristics Chart Single Zone Ducted

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
9K	5	8.91	7.14	0.30	9.47	7.54	0.41	10.02	7.76	0.44	10.42	7.46	0.45	11.13	7.52	0.45	11.68	7.66	0.45
	10	8.90	7.19	0.31	9.45	7.60	0.42	10.01	7.82	0.45	10.41	7.51	0.46	11.12	7.58	0.46	11.67	7.72	0.46
	15	8.89	7.25	0.32	9.44	7.65	0.43	9.99	7.88	0.47	10.39	7.56	0.47	11.10	7.63	0.47	11.65	7.77	0.47
	20	8.88	7.29	0.32	9.43	7.71	0.44	9.98	7.93	0.48	10.38	7.62	0.48	11.08	7.68	0.48	11.63	7.83	0.48
	25	8.87	7.35	0.33	9.41	7.76	0.45	9.96	7.99	0.49	10.36	7.67	0.50	11.07	7.74	0.50	11.62	7.88	0.50
	30	8.85	7.40	0.34	9.40	7.82	0.46	9.95	8.04	0.50	10.35	7.73	0.51	11.05	7.79	0.51	11.60	7.94	0.51
	35	8.84	7.45	0.35	9.39	7.87	0.47	9.94	8.10	0.51	10.33	7.78	0.52	11.03	7.85	0.52	11.58	8.00	0.52
	40	8.82	7.50	0.36	9.38	7.92	0.48	9.92	8.16	0.53	10.32	7.83	0.53	11.02	7.90	0.53	11.57	8.05	0.53
	45	8.81	7.55	0.37	9.36	7.98	0.50	9.91	8.21	0.54	10.30	7.89	0.54	11.00	7.95	0.55	11.55	8.10	0.54
	50	8.80	7.60	0.38	9.35	8.03	0.51	9.89	8.27	0.55	10.29	7.94	0.56	10.99	8.01	0.56	11.53	8.16	0.56
	55	8.79	7.65	0.38	9.33	8.09	0.52	9.88	8.32	0.56	10.27	7.99	0.57	10.97	8.06	0.57	11.52	8.21	0.57
	60	8.78	7.70	0.39	9.32	8.14	0.53	9.86	8.38	0.57	10.26	8.04	0.58	10.95	8.11	0.59	11.50	8.27	0.58
	65	8.76	7.75	0.40	9.30	8.19	0.54	9.85	8.43	0.59	10.24	8.10	0.60	10.94	8.16	0.60	11.48	8.32	0.60
	70	8.75	7.80	0.41	9.29	8.24	0.55	9.84	8.49	0.60	10.23	8.15	0.61	10.92	8.22	0.61	11.46	8.37	0.61
	75	8.54	7.67	0.44	9.08	8.12	0.57	9.62	8.37	0.62	10.01	8.04	0.63	10.71	8.12	0.63	11.25	8.28	0.63
	80	8.33	7.54	0.46	8.87	7.99	0.59	9.41	8.24	0.63	9.80	7.93	0.64	10.49	8.02	0.65	11.03	8.18	0.66
	85	8.12	7.41	0.53	8.66	7.86	0.64	9.20	8.12	0.68	9.59	7.81	0.69	10.28	7.91	0.70	10.82	8.08	0.71
	90	7.91	7.26	0.59	8.45	7.72	0.69	8.99	7.98	0.72	9.38	7.69	0.74	10.06	7.80	0.75	10.60	7.97	0.76
	95	7.68	7.19	0.65	8.22	7.65	0.74	8.76	7.92	0.76	9.00	7.52	0.75	9.83	7.76	0.79	10.36	7.94	0.80
	100	7.50	7.00	0.68	8.03	7.46	0.75	8.57	7.73	0.77	8.88	7.41	0.76	9.64	7.59	0.79	10.17	7.77	0.80
105	7.31	6.80	0.71	7.85	7.26	0.77	8.38	7.55	0.77	8.77	7.29	0.78	9.45	7.42	0.79	9.99	7.61	0.80	
110	7.12	6.57	0.69	7.66	7.03	0.72	8.19	7.31	0.72	8.58	7.07	0.72	9.26	7.21	0.72	9.80	7.40	0.74	
115	6.93	6.38	0.62	7.47	6.83	0.63	8.01	7.12	0.62	8.39	6.89	0.60	9.08	7.04	0.61	9.61	7.23	0.62	
118	6.55	6.08	0.55	7.07	6.52	0.54	7.58	6.80	0.52	7.95	6.59	0.51	8.61	6.74	0.51	9.12	6.93	0.52	
122	6.42	5.97	0.53	6.93	6.41	0.51	7.44	6.69	0.49	7.80	6.48	0.47	8.45	6.63	0.47	8.96	6.82	0.48	

Heating Capacity Table															
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB												
	°F DB	°F WB	61		64		68		70		72		75		
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
9K	0	-0.4	4.46	0.63	4.20	0.65	4.19	0.66	4.10	0.67	4.02	0.67	3.85	0.70	
	5	4.5	5.21	0.64	4.97	0.66	4.90	0.67	4.79	0.68	4.71	0.69	4.52	0.71	
	10	9	5.72	0.64	5.49	0.67	5.37	0.69	5.26	0.69	5.17	0.70	4.97	0.72	
	17	15	6.28	0.66	6.06	0.68	5.89	0.70	5.77	0.71	5.68	0.72	5.46	0.74	
	20	19	6.62	0.67	6.41	0.69	6.20	0.71	6.08	0.72	5.99	0.73	5.76	0.75	
	25	23	7.18	0.68	6.97	0.70	6.72	0.73	6.60	0.74	6.50	0.75	6.25	0.77	
	30	28	7.75	0.70	7.50	0.72	7.25	0.74	7.11	0.76	7.01	0.77	6.75	0.79	
	35	32	8.31	0.72	8.05	0.74	7.77	0.76	7.63	0.78	7.52	0.79	7.25	0.81	
	40	36	8.73	0.74	8.49	0.76	8.22	0.78	8.08	0.80	7.96	0.81	7.68	0.84	
	45	41	9.27	0.76	9.04	0.79	8.78	0.81	8.63	0.83	8.51	0.84	8.20	0.87	
	47	43	9.48	0.77	9.27	0.80	9.00	0.83	8.85	0.84	8.73	0.85	8.42	0.88	
	50	46	9.50	0.77	9.31	0.79	9.08	0.81	8.95	0.83	8.85	0.84	8.55	0.86	
	55	51	9.55	0.76	9.39	0.78	9.22	0.80	9.11	0.81	9.03	0.81	8.76	0.83	
	60	56	9.60	0.75	9.47	0.77	9.35	0.78	9.28	0.79	9.21	0.79	8.98	0.80	
	63	59	9.62	0.75	9.52	0.76	9.44	0.77	9.37	0.78	9.32	0.78	9.10	0.79	
68	64	9.65	0.74	9.57	0.75	9.52	0.76	9.47	0.76	9.43	0.77	9.24	0.77		

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross) PI: Power Input (including the compressor, evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 211

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Ducted

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
12K	5	11.89	9.52	0.38	12.63	10.06	0.52	13.37	10.35	0.56	13.90	9.94	0.57	14.84	10.03	0.57	15.58	10.22	0.57
	10	11.87	9.59	0.39	12.61	10.13	0.53	13.35	10.43	0.58	13.88	10.02	0.59	14.82	10.10	0.59	15.56	10.29	0.59
	15	11.85	9.66	0.40	12.59	10.21	0.55	13.33	10.50	0.60	13.86	10.09	0.60	14.80	10.17	0.60	15.54	10.37	0.60
	20	11.84	9.73	0.41	12.57	10.28	0.56	13.31	10.58	0.61	13.84	10.16	0.62	14.78	10.25	0.62	15.51	10.44	0.62
	25	11.82	9.80	0.43	12.55	10.35	0.58	13.29	10.65	0.62	13.82	10.23	0.63	14.76	10.32	0.63	15.49	10.51	0.63
	30	11.80	9.87	0.44	12.54	10.42	0.59	13.27	10.73	0.64	13.80	10.30	0.65	14.74	10.39	0.65	15.47	10.59	0.65
	35	11.79	9.94	0.45	12.52	10.49	0.60	13.25	10.80	0.66	13.78	10.38	0.67	14.71	10.46	0.67	15.45	10.66	0.67
	40	11.77	10.00	0.46	12.50	10.57	0.62	13.23	10.88	0.67	13.76	10.45	0.68	14.69	10.53	0.68	15.42	10.73	0.68
	45	11.75	10.07	0.47	12.48	10.64	0.63	13.21	10.95	0.69	13.74	10.52	0.70	14.67	10.61	0.70	15.40	10.81	0.70
	50	11.74	10.14	0.48	12.46	10.71	0.65	13.19	11.02	0.70	13.72	10.59	0.72	14.65	10.68	0.72	15.38	10.88	0.72
	55	11.72	10.21	0.49	12.45	10.78	0.66	13.17	11.10	0.72	13.70	10.66	0.73	14.63	10.75	0.73	15.36	10.95	0.73
	60	11.70	10.27	0.50	12.43	10.85	0.68	13.15	11.17	0.73	13.68	10.73	0.74	14.61	10.82	0.75	15.33	11.02	0.74
	65	11.68	10.34	0.51	12.41	10.92	0.69	13.14	11.24	0.75	13.66	10.80	0.76	14.59	10.89	0.76	15.31	11.10	0.76
	70	11.67	10.41	0.52	12.39	10.99	0.71	13.12	11.32	0.77	13.64	10.87	0.78	14.57	10.96	0.78	15.29	11.17	0.78
	75	11.39	10.23	0.56	12.11	10.83	0.73	12.83	11.16	0.79	13.35	10.72	0.80	14.28	10.83	0.81	15.00	11.04	0.81
	80	11.11	10.06	0.59	11.83	10.65	0.75	12.55	10.99	0.81	13.07	10.57	0.82	13.99	10.69	0.84	14.71	10.91	0.84
	85	10.83	9.88	0.67	11.55	10.48	0.82	12.27	10.82	0.87	12.79	10.42	0.88	13.70	10.55	0.90	14.42	10.77	0.91
	90	10.55	9.69	0.75	11.27	10.29	0.88	11.98	10.65	0.93	12.50	10.26	0.94	13.42	10.40	0.96	14.14	10.63	0.97
	95	10.25	9.59	0.83	10.96	10.20	0.94	11.68	10.57	0.97	12.00	10.03	0.96	13.10	10.34	1.01	13.82	10.59	1.03
	100	10.00	9.33	0.87	10.71	9.94	0.96	11.43	10.31	0.98	11.85	9.88	0.97	12.85	10.12	1.01	13.57	10.37	1.03
105	9.75	9.07	0.91	10.46	9.69	0.98	11.18	10.06	0.99	11.69	9.72	0.99	12.60	9.90	1.01	13.32	10.15	1.03	
110	9.50	8.76	0.89	10.21	9.37	0.93	10.93	9.75	0.92	11.44	9.43	0.92	12.35	9.62	0.93	13.07	9.87	0.95	
115	9.25	8.50	0.80	9.96	9.11	0.81	10.68	9.49	0.79	11.19	9.19	0.77	12.10	9.39	0.78	12.82	9.65	0.80	
118	8.74	8.10	0.71	9.42	8.69	0.70	10.11	9.07	0.66	10.60	8.78	0.65	11.48	8.98	0.65	12.16	9.24	0.66	
122	8.56	7.97	0.68	9.24	8.55	0.66	9.92	8.92	0.62	10.40	8.65	0.60	11.27	8.84	0.60	11.94	9.10	0.62	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
12K	0	-0.4	5.94	0.70	5.60	0.73	5.59	0.74	5.46	0.75	5.36	0.75	5.14	0.78
	5	4.5	6.95	0.72	6.63	0.74	6.53	0.76	6.39	0.76	6.28	0.77	6.03	0.80
	10	9	7.63	0.72	7.32	0.75	7.16	0.77	7.01	0.78	6.89	0.79	6.62	0.81
	17	15	8.37	0.74	8.08	0.76	7.85	0.79	7.69	0.80	7.57	0.81	7.28	0.83
	20	19	8.82	0.75	8.54	0.77	8.27	0.80	8.11	0.81	7.98	0.82	7.68	0.84
	25	23	9.57	0.76	9.29	0.79	8.97	0.81	8.80	0.83	8.66	0.84	8.34	0.87
	30	28	10.33	0.79	10.01	0.81	9.67	0.84	9.49	0.85	9.35	0.87	9.00	0.89
	35	32	11.08	0.81	10.73	0.84	10.37	0.86	10.18	0.88	10.03	0.89	9.67	0.91
	40	36	11.65	0.83	11.32	0.86	10.96	0.88	10.77	0.90	10.62	0.91	10.23	0.94
	45	41	12.35	0.86	12.06	0.88	11.70	0.91	11.51	0.93	11.35	0.94	10.94	0.97
	47	43	12.63	0.87	12.35	0.90	12.00	0.93	11.80	0.94	11.65	0.95	11.22	0.98
	50	46	12.67	0.86	12.42	0.89	12.11	0.91	11.93	0.93	11.79	0.94	11.40	0.97
	55	51	12.73	0.86	12.52	0.88	12.29	0.90	12.15	0.91	12.04	0.91	11.68	0.93
	60	56	12.80	0.84	12.63	0.86	12.47	0.88	12.37	0.88	12.28	0.89	11.97	0.90
	63	59	12.83	0.84	12.69	0.85	12.58	0.87	12.50	0.87	12.43	0.87	12.14	0.88
68	64	12.87	0.84	12.76	0.84	12.70	0.86	12.63	0.86	12.58	0.86	12.31	0.87	

Remarks:

TC: Total Cooling Capacity (Gross)

SHC: Sensible Heat Capacity (Gross) PI: Power Input (including the compressor, evap. fan motor & cond. fan motor)

DB: Dry Bulb Temperature

WB: Wet Bulb Temperature

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Ducted

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
18K	5	17.83	14.28	0.67	18.94	15.08	0.90	20.05	15.53	0.98	20.84	14.91	0.99	22.26	15.04	0.99	23.36	15.32	0.99
	10	17.81	14.39	0.68	18.91	15.20	0.93	20.02	15.64	1.00	20.81	15.02	1.02	22.23	15.15	1.02	23.33	15.44	1.02
	15	17.78	14.49	0.70	18.89	15.31	0.95	19.99	15.75	1.04	20.78	15.13	1.04	22.19	15.26	1.05	23.30	15.55	1.04
	20	17.75	14.59	0.72	18.86	15.41	0.98	19.96	15.86	1.06	20.75	15.24	1.08	22.16	15.37	1.08	23.27	15.66	1.08
	25	17.73	14.69	0.74	18.83	15.53	1.00	19.93	15.98	1.09	20.72	15.35	1.10	22.13	15.47	1.10	23.24	15.77	1.10
	30	17.70	14.80	0.76	18.80	15.63	1.03	19.90	16.09	1.11	20.69	15.45	1.13	22.10	15.59	1.14	23.20	15.88	1.13
	35	17.68	14.90	0.78	18.77	15.74	1.05	19.88	16.20	1.14	20.66	15.56	1.16	22.07	15.69	1.16	23.17	15.99	1.16
	40	17.65	15.00	0.79	18.75	15.85	1.08	19.85	16.31	1.17	20.63	15.67	1.19	22.04	15.80	1.19	23.13	16.10	1.19
	45	17.63	15.11	0.82	18.72	15.95	1.10	19.82	16.43	1.19	20.60	15.77	1.21	22.01	15.91	1.22	23.10	16.21	1.21
	50	17.60	15.20	0.84	18.69	16.06	1.13	19.79	16.53	1.22	20.57	15.88	1.24	21.98	16.01	1.24	23.06	16.31	1.24
	55	17.57	15.31	0.85	18.67	16.17	1.15	19.76	16.64	1.25	20.54	15.98	1.27	21.94	16.12	1.27	23.03	16.43	1.27
	60	17.55	15.41	0.87	18.64	16.28	1.18	19.73	16.76	1.28	20.51	16.09	1.29	21.91	16.22	1.30	23.00	16.53	1.29
	65	17.52	15.50	0.89	18.61	16.38	1.20	19.70	16.86	1.30	20.48	16.19	1.33	21.88	16.33	1.33	22.97	16.64	1.33
	70	17.50	15.61	0.91	18.59	16.49	1.23	19.67	16.97	1.34	20.45	16.30	1.35	21.85	16.43	1.35	22.93	16.75	1.35
	75	17.08	15.35	0.97	18.16	16.24	1.27	19.25	16.73	1.37	20.03	16.08	1.39	21.41	16.24	1.40	22.49	16.56	1.41
	80	16.66	15.08	1.03	17.74	15.98	1.31	18.82	16.49	1.40	19.60	15.86	1.43	20.98	16.04	1.45	22.07	16.37	1.47
	85	16.24	14.81	1.17	17.32	15.71	1.42	18.40	16.23	1.51	19.18	15.62	1.54	20.55	15.82	1.56	21.63	16.16	1.59
	90	15.82	14.53	1.30	16.90	15.44	1.54	17.97	15.97	1.61	18.75	15.38	1.64	20.12	15.59	1.67	21.20	15.95	1.70
	95	15.37	14.38	1.44	16.44	15.30	1.64	17.51	15.85	1.70	18.00	15.05	1.67	19.65	15.51	1.75	20.72	15.88	1.79
	100	14.99	14.00	1.52	16.07	14.91	1.67	17.14	15.47	1.71	17.77	14.81	1.70	19.28	15.17	1.75	20.35	15.55	1.79
105	14.62	13.61	1.59	15.69	14.53	1.70	16.76	15.09	1.72	17.54	14.58	1.73	18.90	14.84	1.75	19.97	15.23	1.79	
110	14.24	13.14	1.54	15.32	14.06	1.61	16.39	14.63	1.60	17.16	14.15	1.59	18.53	14.42	1.61	19.60	14.81	1.65	
115	13.87	12.75	1.39	14.94	13.66	1.40	16.01	14.24	1.37	16.79	13.79	1.34	18.15	14.08	1.35	19.22	14.47	1.39	
118	13.10	12.15	1.23	14.13	13.04	1.21	15.16	13.60	1.15	15.90	13.17	1.13	17.21	13.47	1.13	18.24	13.85	1.15	
122	12.84	11.95	1.18	13.86	12.83	1.14	14.87	13.38	1.09	15.60	12.97	1.05	16.90	13.26	1.05	17.91	13.64	1.08	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
18K	0	-0.4	8.91	1.21	8.39	1.26	8.39	1.28	8.20	1.29	8.04	1.30	7.70	1.35
	5	4.5	10.43	1.23	9.94	1.28	9.79	1.31	9.59	1.32	9.42	1.33	9.04	1.38
	10	9	11.44	1.25	10.98	1.29	10.73	1.33	10.52	1.34	10.34	1.36	9.93	1.40
	17	15	12.56	1.27	12.12	1.31	11.77	1.36	11.54	1.38	11.36	1.40	10.92	1.43
	20	19	13.23	1.29	12.81	1.33	12.40	1.38	12.16	1.40	11.97	1.42	11.51	1.46
	25	23	14.36	1.32	13.93	1.36	13.45	1.41	13.19	1.43	12.99	1.46	12.50	1.50
	30	28	15.50	1.36	15.01	1.40	14.50	1.44	14.23	1.47	14.02	1.50	13.50	1.53
	35	32	16.62	1.39	16.09	1.44	15.55	1.48	15.27	1.51	15.04	1.53	14.50	1.58
	40	36	17.47	1.43	16.98	1.48	16.44	1.52	16.15	1.56	15.93	1.58	15.35	1.62
	45	41	18.53	1.48	18.09	1.53	17.55	1.58	17.26	1.61	17.03	1.63	16.41	1.68
	47	43	18.95	1.50	18.53	1.55	18.00	1.60	17.70	1.63	17.47	1.65	16.83	1.70
	50	46	19.01	1.49	18.62	1.53	18.16	1.58	17.90	1.61	17.69	1.62	17.10	1.67
	55	51	19.10	1.48	18.79	1.51	18.44	1.55	18.22	1.56	18.06	1.58	17.52	1.61
	60	56	19.19	1.46	18.94	1.48	18.71	1.51	18.55	1.53	18.42	1.53	17.95	1.56
	63	59	19.25	1.45	19.04	1.47	18.87	1.50	18.75	1.51	18.64	1.51	18.21	1.53
68	64	19.30	1.44	19.13	1.46	19.04	1.48	18.94	1.48	18.87	1.48	18.47	1.50	

Remarks:

TC: Total Cooling Capacity (Gross)

SHC: Sensible Heat Capacity (Gross) PI: Power Input (including the compressor, evap. fan motor & cond. fan motor)

DB: Dry Bulb Temperature

WB: Wet Bulb Temperature

Figure 213

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Ducted

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
24K	5	23.77	19.04	0.92	25.25	20.11	1.24	26.73	20.70	1.34	27.79	19.88	1.36	29.68	20.05	1.36	31.15	20.43	1.36
	10	23.74	19.18	0.94	25.21	20.26	1.27	26.69	20.85	1.37	27.75	20.03	1.40	29.64	20.20	1.40	31.11	20.58	1.40
	15	23.70	19.32	0.96	25.18	20.41	1.31	26.65	21.00	1.42	27.71	20.17	1.43	29.59	20.34	1.44	31.07	20.73	1.43
	20	23.67	19.45	0.98	25.14	20.55	1.34	26.61	21.15	1.45	27.67	20.32	1.48	29.55	20.49	1.48	31.02	20.88	1.48
	25	23.64	19.59	1.02	25.10	20.70	1.37	26.57	21.30	1.49	27.63	20.46	1.51	29.51	20.63	1.51	30.98	21.02	1.51
	30	23.60	19.73	1.04	25.07	20.84	1.41	26.53	21.45	1.52	27.59	20.60	1.55	29.47	20.78	1.56	30.93	21.17	1.55
	35	23.57	19.87	1.06	25.03	20.98	1.44	26.50	21.60	1.57	27.55	20.75	1.59	29.42	20.92	1.59	30.89	21.32	1.59
	40	23.53	20.00	1.09	25.00	21.13	1.48	26.46	21.75	1.60	27.51	20.89	1.63	29.38	21.06	1.63	30.84	21.46	1.63
	45	23.50	20.14	1.12	24.96	21.27	1.51	26.42	21.90	1.64	27.47	21.03	1.66	29.34	21.21	1.67	30.80	21.61	1.66
	50	23.47	20.27	1.15	24.92	21.41	1.55	26.38	22.04	1.67	27.43	21.17	1.71	29.30	21.35	1.71	30.75	21.75	1.71
	55	23.43	20.41	1.17	24.89	21.56	1.58	26.34	22.19	1.72	27.39	21.31	1.74	29.25	21.49	1.74	30.71	21.90	1.74
	60	23.40	20.54	1.19	24.85	21.70	1.61	26.30	22.34	1.75	27.35	21.45	1.77	29.21	21.63	1.79	30.66	22.04	1.77
	65	23.36	20.67	1.23	24.81	21.84	1.65	26.27	22.48	1.79	27.31	21.59	1.82	29.17	21.77	1.82	30.62	22.19	1.82
	70	23.33	20.81	1.25	24.78	21.98	1.68	26.23	22.63	1.83	27.27	21.73	1.85	29.13	21.91	1.85	30.57	22.33	1.85
	75	22.77	20.46	1.33	24.21	21.65	1.74	25.66	22.31	1.88	26.70	21.44	1.91	28.55	21.65	1.92	29.99	22.08	1.94
	80	22.21	20.11	1.41	23.65	21.30	1.80	25.09	21.98	1.92	26.13	21.14	1.96	27.97	21.38	1.99	29.42	21.82	2.02
	85	21.65	19.75	1.60	23.09	20.95	1.95	24.53	21.64	2.07	25.57	20.83	2.11	27.40	21.09	2.14	28.84	21.54	2.18
	90	21.09	19.37	1.79	22.53	20.58	2.11	23.96	21.29	2.21	25.00	20.51	2.24	26.83	20.79	2.29	28.27	21.26	2.32
95	20.49	19.17	1.98	21.92	20.40	2.24	23.35	21.13	2.32	24.00	20.06	2.29	26.20	20.68	2.40	27.63	21.17	2.45	
100	19.99	18.66	2.08	21.42	19.88	2.29	22.85	20.62	2.35	23.69	19.75	2.32	25.70	20.23	2.40	27.13	20.73	2.45	
105	19.49	18.14	2.18	20.92	19.37	2.34	22.35	20.12	2.36	23.38	19.44	2.37	25.20	19.79	2.40	26.63	20.30	2.45	
110	18.99	17.52	2.12	20.42	18.74	2.21	21.85	19.50	2.20	22.88	18.86	2.19	24.70	19.23	2.21	26.13	19.74	2.27	
115	18.49	17.00	1.90	19.92	18.21	1.92	21.35	18.98	1.88	22.38	18.38	1.84	24.20	18.77	1.85	25.63	19.29	1.90	
118	17.47	16.20	1.68	18.84	17.38	1.66	20.21	18.13	1.58	21.20	17.56	1.55	22.95	17.96	1.55	24.32	18.47	1.58	
122	17.12	15.93	1.61	18.48	17.10	1.57	19.83	17.84	1.49	20.80	17.29	1.44	22.53	17.68	1.44	23.88	18.19	1.48	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
24K	0	-0.4	11.88	1.48	11.19	1.54	11.18	1.56	10.93	1.58	10.72	1.58	10.27	1.65
	5	4.5	13.90	1.51	13.25	1.56	13.05	1.59	12.78	1.61	12.56	1.63	12.06	1.68
	10	9	15.26	1.52	14.64	1.58	14.31	1.62	14.02	1.64	13.79	1.65	13.25	1.71
	17	15	16.74	1.55	16.16	1.60	15.69	1.65	15.39	1.68	15.14	1.71	14.56	1.75
	20	19	17.64	1.58	17.08	1.62	16.53	1.68	16.22	1.71	15.97	1.73	15.35	1.78
	25	23	19.15	1.61	18.58	1.65	17.93	1.71	17.59	1.75	17.32	1.78	16.67	1.83
	30	28	20.66	1.65	20.01	1.71	19.33	1.76	18.97	1.79	18.69	1.83	18.00	1.87
	35	32	22.16	1.70	21.46	1.76	20.73	1.80	20.35	1.85	20.06	1.87	19.33	1.92
	40	36	23.29	1.74	22.64	1.80	21.92	1.85	21.53	1.90	21.24	1.92	20.47	1.98
	45	41	24.71	1.80	24.11	1.86	23.41	1.92	23.01	1.96	22.71	1.98	21.88	2.05
	47	43	25.27	1.83	24.71	1.89	24.00	1.95	23.61	1.98	23.29	2.01	22.44	2.07
	50	46	25.35	1.82	24.83	1.87	24.22	1.92	23.87	1.96	23.59	1.98	22.79	2.04
	55	51	25.47	1.80	25.05	1.85	24.59	1.89	24.30	1.91	24.08	1.92	23.36	1.97
	60	56	25.59	1.78	25.26	1.81	24.94	1.85	24.73	1.86	24.56	1.87	23.94	1.90
63	59	25.66	1.77	25.38	1.79	25.16	1.83	25.00	1.84	24.86	1.84	24.28	1.86	
68	64	25.74	1.76	25.51	1.78	25.39	1.80	25.26	1.80	25.15	1.81	24.63	1.83	

Remarks:

TC: Total Cooling Capacity (Gross)

SHC: Sensible Heat Capacity (Gross) PI: Power Input (including the compressor, evap. fan motor & cond. fan motor)

DB: Dry Bulb Temperature

WB: Wet Bulb Temperature

Figure 214

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Ducted

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
36K	5	10.41	8.33	1.32	11.05	8.80	1.78	11.70	9.06	1.92	12.17	8.70	1.96	12.99	8.78	1.96	13.64	8.94	1.96
	10	10.39	8.40	1.35	11.04	8.87	1.83	11.68	9.13	1.97	12.15	8.77	2.01	12.97	8.84	2.01	13.62	9.01	2.01
	15	10.37	8.46	1.38	11.02	8.93	1.87	11.67	9.19	2.04	12.13	8.83	2.06	12.95	8.90	2.07	13.60	9.07	2.06
	20	10.36	8.51	1.41	11.01	9.00	1.92	11.65	9.26	2.09	12.11	8.90	2.12	12.94	8.97	2.12	13.58	9.14	2.12
	25	10.35	8.58	1.46	10.99	9.06	1.97	11.63	9.32	2.14	12.10	8.96	2.17	12.92	9.03	2.17	13.56	9.20	2.17
	30	10.33	8.64	1.50	10.97	9.12	2.02	11.61	9.39	2.19	12.08	9.02	2.22	12.90	9.10	2.24	13.54	9.27	2.22
	35	10.32	8.70	1.53	10.96	9.18	2.07	11.60	9.46	2.25	12.06	9.08	2.29	12.88	9.16	2.29	13.52	9.33	2.29
	40	10.30	8.76	1.56	10.94	9.25	2.12	11.58	9.52	2.30	12.04	9.14	2.34	12.86	9.22	2.34	13.50	9.39	2.34
	45	10.29	8.82	1.61	10.93	9.31	2.17	11.57	9.59	2.35	12.02	9.21	2.38	12.84	9.28	2.40	13.48	9.46	2.38
	50	10.27	8.87	1.64	10.91	9.37	2.22	11.55	9.65	2.40	12.01	9.27	2.45	12.83	9.35	2.45	13.46	9.52	2.45
	55	10.26	8.93	1.68	10.90	9.44	2.27	11.53	9.71	2.47	11.99	9.33	2.50	12.80	9.41	2.50	13.44	9.59	2.50
	60	10.24	8.99	1.71	10.88	9.50	2.32	11.51	9.78	2.52	11.97	9.39	2.55	12.79	9.47	2.57	13.42	9.65	2.55
	65	10.23	9.05	1.76	10.86	9.56	2.37	11.50	9.84	2.57	11.95	9.45	2.61	12.77	9.53	2.61	13.40	9.71	2.61
	70	10.21	9.11	1.79	10.85	9.62	2.42	11.48	9.91	2.63	11.94	9.51	2.66	12.75	9.59	2.66	13.38	9.77	2.66
	75	9.97	8.96	1.91	10.60	9.48	2.50	11.23	9.77	2.70	11.69	9.39	2.75	12.50	9.48	2.76	13.13	9.67	2.78
	80	9.72	8.80	2.02	10.35	9.32	2.58	10.98	9.62	2.76	11.44	9.25	2.81	12.24	9.36	2.86	12.88	9.55	2.89
	85	9.48	8.65	2.30	10.11	9.17	2.80	10.74	9.47	2.98	11.19	9.12	3.03	11.99	9.23	3.08	12.62	9.43	3.12
	90	9.23	8.48	2.57	9.86	9.01	3.03	10.49	9.32	3.17	10.94	8.98	3.22	11.74	9.10	3.29	12.38	9.31	3.34
	95	8.97	8.39	2.84	9.60	8.93	3.22	10.22	9.25	3.34	10.51	8.78	3.29	11.47	9.05	3.45	12.10	9.27	3.52
100	8.75	8.17	2.99	9.38	8.70	3.29	10.00	9.03	3.37	10.37	8.65	3.34	11.25	8.86	3.45	11.88	9.07	3.52	
105	8.53	7.94	3.12	9.16	8.48	3.35	9.78	8.81	3.39	10.23	8.51	3.40	11.03	8.66	3.45	11.66	8.89	3.52	
110	8.31	7.67	3.04	8.94	8.20	3.17	9.56	8.54	3.16	10.02	8.26	3.14	10.81	8.42	3.17	11.44	8.64	3.26	
115	8.09	7.44	2.73	8.72	7.97	2.76	9.35	8.31	2.70	9.80	8.05	2.65	10.59	8.22	2.66	11.22	8.44	2.73	
118	7.65	7.09	2.42	8.25	7.61	2.38	8.85	7.94	2.27	9.28	7.69	2.22	10.05	7.86	2.22	10.65	8.09	2.27	
122	7.49	6.97	2.32	8.09	7.49	2.25	8.68	7.81	2.14	9.11	7.57	2.07	9.86	7.74	2.07	10.45	7.96	2.12	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
36K	0	-0.4	5.51	2.52	5.19	2.62	5.19	2.65	5.07	2.68	4.97	2.70	4.76	2.80
	5	4.5	6.45	2.56	6.15	2.65	6.05	2.71	5.93	2.74	5.82	2.77	5.59	2.86
	10	9	7.08	2.59	6.79	2.68	6.64	2.75	6.50	2.78	6.39	2.81	6.14	2.90
	17	15	7.76	2.64	7.49	2.72	7.28	2.81	7.14	2.86	7.02	2.90	6.75	2.98
	20	19	8.18	2.68	7.92	2.75	7.67	2.86	7.52	2.90	7.40	2.95	7.12	3.02
	25	23	8.88	2.74	8.62	2.81	8.32	2.92	8.16	2.98	8.03	3.02	7.73	3.11
	30	28	9.58	2.81	9.28	2.90	8.96	2.99	8.80	3.05	8.67	3.11	8.35	3.18
	35	32	10.28	2.89	9.95	2.99	9.61	3.07	9.44	3.14	9.30	3.18	8.96	3.27
	40	36	10.80	2.96	10.50	3.07	10.16	3.15	9.99	3.23	9.85	3.27	9.49	3.36
	45	41	11.46	3.07	11.18	3.17	10.85	3.27	10.67	3.33	10.53	3.38	10.14	3.48
	47	43	11.72	3.11	11.46	3.21	11.13	3.32	10.95	3.38	10.80	3.42	10.41	3.52
	50	46	11.75	3.09	11.52	3.18	11.23	3.27	11.07	3.33	10.94	3.36	10.57	3.47
	55	51	11.81	3.07	11.62	3.14	11.40	3.21	11.27	3.24	11.17	3.27	10.83	3.35
	60	56	11.87	3.02	11.71	3.08	11.57	3.14	11.47	3.17	11.39	3.18	11.10	3.23
63	59	11.90	3.01	11.77	3.05	11.67	3.11	11.59	3.12	11.53	3.12	11.26	3.17	
68	64	11.94	2.99	11.83	3.02	11.77	3.07	11.71	3.07	11.67	3.08	11.42	3.11	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 215

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Cassette

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
9K	5	8.91	7.14	0.28	9.47	7.54	0.38	10.02	7.76	0.41	10.42	7.46	0.42	11.13	7.52	0.42	11.68	7.66	0.42
	10	8.90	7.19	0.29	9.45	7.60	0.39	10.01	7.82	0.42	10.41	7.51	0.43	11.12	7.58	0.43	11.67	7.72	0.43
	15	8.89	7.25	0.29	9.44	7.65	0.40	9.99	7.88	0.43	10.39	7.56	0.44	11.10	7.63	0.44	11.65	7.77	0.44
	20	8.88	7.29	0.30	9.43	7.71	0.41	9.98	7.93	0.44	10.38	7.62	0.45	11.08	7.68	0.45	11.63	7.83	0.45
	25	8.87	7.35	0.31	9.41	7.76	0.42	9.96	7.99	0.46	10.36	7.67	0.46	11.07	7.74	0.46	11.62	7.88	0.46
	30	8.85	7.40	0.32	9.40	7.82	0.43	9.95	8.04	0.47	10.35	7.73	0.47	11.05	7.79	0.48	11.60	7.94	0.47
	35	8.84	7.45	0.33	9.39	7.87	0.44	9.94	8.10	0.48	10.33	7.78	0.49	11.03	7.85	0.49	11.58	8.00	0.49
	40	8.82	7.50	0.33	9.38	7.92	0.45	9.92	8.16	0.49	10.32	7.83	0.50	11.02	7.90	0.50	11.57	8.05	0.50
	45	8.81	7.55	0.34	9.36	7.98	0.46	9.91	8.21	0.50	10.30	7.89	0.51	11.00	7.95	0.51	11.55	8.10	0.51
	50	8.80	7.60	0.35	9.35	8.03	0.47	9.89	8.27	0.51	10.29	7.94	0.52	10.99	8.01	0.52	11.53	8.16	0.52
	55	8.79	7.65	0.36	9.33	8.09	0.48	9.88	8.32	0.53	10.27	7.99	0.53	10.97	8.06	0.53	11.52	8.21	0.53
	60	8.78	7.70	0.36	9.32	8.14	0.49	9.86	8.38	0.54	10.26	8.04	0.54	10.95	8.11	0.55	11.50	8.27	0.54
	65	8.76	7.75	0.37	9.30	8.19	0.50	9.85	8.43	0.55	10.24	8.10	0.56	10.94	8.16	0.56	11.48	8.32	0.56
	70	8.75	7.80	0.38	9.29	8.24	0.51	9.84	8.49	0.56	10.23	8.15	0.57	10.92	8.22	0.57	11.46	8.37	0.57
	75	8.54	7.67	0.41	9.08	8.12	0.53	9.62	8.37	0.57	10.01	8.04	0.58	10.71	8.12	0.59	11.25	8.28	0.59
	80	8.33	7.54	0.43	8.87	7.99	0.55	9.41	8.24	0.59	9.80	7.93	0.60	10.49	8.02	0.61	11.03	8.18	0.62
	85	8.12	7.41	0.49	8.66	7.86	0.60	9.20	8.12	0.63	9.59	7.81	0.64	10.28	7.91	0.65	10.82	8.08	0.67
	90	7.91	7.26	0.55	8.45	7.72	0.64	8.99	7.98	0.68	9.38	7.69	0.69	10.06	7.80	0.70	10.60	7.97	0.71
	95	7.68	7.19	0.61	8.22	7.65	0.69	8.76	7.92	0.71	9.00	7.52	0.70	9.83	7.76	0.74	10.36	7.94	0.75
	100	7.50	7.00	0.64	8.03	7.46	0.70	8.57	7.73	0.72	8.88	7.41	0.71	9.64	7.59	0.74	10.17	7.77	0.75
105	7.31	6.80	0.67	7.85	7.26	0.71	8.38	7.55	0.72	8.77	7.29	0.72	9.45	7.42	0.74	9.99	7.61	0.75	
110	7.12	6.57	0.65	7.66	7.03	0.68	8.19	7.31	0.67	8.58	7.07	0.67	9.26	7.21	0.68	9.80	7.40	0.69	
115	6.93	6.38	0.58	7.47	6.83	0.59	8.01	7.12	0.57	8.39	6.89	0.56	9.08	7.04	0.57	9.61	7.23	0.58	
118	6.55	6.08	0.51	7.07	6.52	0.51	7.58	6.80	0.48	7.95	6.59	0.47	8.61	6.74	0.47	9.12	6.93	0.48	
122	6.42	5.97	0.49	6.93	6.41	0.48	7.44	6.69	0.46	7.80	6.48	0.44	8.45	6.63	0.44	8.96	6.82	0.45	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
9K	0	-0.4	4.46	0.48	4.20	0.50	4.19	0.51	4.10	0.52	4.02	0.52	3.85	0.54
	5	4.5	5.21	0.49	4.97	0.51	4.90	0.52	4.79	0.53	4.71	0.53	4.52	0.55
	10	9	5.72	0.50	5.49	0.52	5.37	0.53	5.26	0.54	5.17	0.54	4.97	0.56
	17	15	6.28	0.51	6.06	0.52	5.89	0.54	5.77	0.55	5.68	0.56	5.46	0.57
	20	19	6.62	0.52	6.41	0.53	6.20	0.55	6.08	0.56	5.99	0.57	5.76	0.58
	25	23	7.18	0.53	6.97	0.54	6.72	0.56	6.60	0.57	6.50	0.58	6.25	0.60
	30	28	7.75	0.54	7.50	0.56	7.25	0.58	7.11	0.59	7.01	0.60	6.75	0.61
	35	32	8.31	0.56	8.05	0.58	7.77	0.59	7.63	0.60	7.52	0.61	7.25	0.63
	40	36	8.73	0.57	8.49	0.59	8.22	0.61	8.08	0.62	7.96	0.63	7.68	0.65
	45	41	9.27	0.59	9.04	0.61	8.78	0.63	8.63	0.64	8.51	0.65	8.20	0.67
	47	43	9.48	0.60	9.27	0.62	9.00	0.64	8.85	0.65	8.73	0.66	8.42	0.68
	50	46	9.50	0.60	9.31	0.61	9.08	0.63	8.95	0.64	8.85	0.65	8.55	0.67
	55	51	9.55	0.59	9.39	0.60	9.22	0.62	9.11	0.62	9.03	0.63	8.76	0.64
	60	56	9.60	0.58	9.47	0.59	9.35	0.60	9.28	0.61	9.21	0.61	8.98	0.62
	63	59	9.62	0.58	9.52	0.59	9.44	0.60	9.37	0.60	9.32	0.60	9.10	0.61
68	64	9.65	0.58	9.57	0.58	9.52	0.59	9.47	0.59	9.43	0.59	9.24	0.60	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 216

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Cassette

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
12K	5	11.89	9.52	0.38	12.63	10.06	0.52	13.37	10.35	0.56	13.90	9.94	0.57	14.84	10.03	0.57	15.58	10.22	0.57
	10	11.87	9.59	0.39	12.61	10.13	0.53	13.35	10.43	0.58	13.88	10.02	0.59	14.82	10.10	0.59	15.56	10.29	0.59
	15	11.85	9.66	0.40	12.59	10.21	0.55	13.33	10.50	0.60	13.86	10.09	0.60	14.80	10.17	0.60	15.54	10.37	0.60
	20	11.84	9.73	0.41	12.57	10.28	0.56	13.31	10.58	0.61	13.84	10.16	0.62	14.78	10.25	0.62	15.51	10.44	0.62
	25	11.82	9.80	0.43	12.55	10.35	0.58	13.29	10.65	0.62	13.82	10.23	0.63	14.76	10.32	0.63	15.49	10.51	0.63
	30	11.80	9.87	0.44	12.54	10.42	0.59	13.27	10.73	0.64	13.80	10.30	0.65	14.74	10.39	0.65	15.47	10.59	0.65
	35	11.79	9.94	0.45	12.52	10.49	0.60	13.25	10.80	0.66	13.78	10.38	0.67	14.71	10.46	0.67	15.45	10.66	0.67
	40	11.77	10.00	0.46	12.50	10.57	0.62	13.23	10.88	0.67	13.76	10.45	0.68	14.69	10.53	0.68	15.42	10.73	0.68
	45	11.75	10.07	0.47	12.48	10.64	0.63	13.21	10.95	0.69	13.74	10.52	0.70	14.67	10.61	0.70	15.40	10.81	0.70
	50	11.74	10.14	0.48	12.46	10.71	0.65	13.19	11.02	0.70	13.72	10.59	0.72	14.65	10.68	0.72	15.38	10.88	0.72
	55	11.72	10.21	0.49	12.45	10.78	0.66	13.17	11.10	0.72	13.70	10.66	0.73	14.63	10.75	0.73	15.36	10.95	0.73
	60	11.70	10.27	0.50	12.43	10.85	0.68	13.15	11.17	0.73	13.68	10.73	0.74	14.61	10.82	0.75	15.33	11.02	0.74
	65	11.68	10.34	0.51	12.41	10.92	0.69	13.14	11.24	0.75	13.66	10.80	0.76	14.59	10.89	0.76	15.31	11.10	0.76
	70	11.67	10.41	0.52	12.39	10.99	0.71	13.12	11.32	0.77	13.64	10.87	0.78	14.57	10.96	0.78	15.29	11.17	0.78
	75	11.39	10.23	0.56	12.11	10.83	0.73	12.83	11.16	0.79	13.35	10.72	0.80	14.28	10.83	0.81	15.00	11.04	0.81
	80	11.11	10.06	0.59	11.83	10.65	0.75	12.55	10.99	0.81	13.07	10.57	0.82	13.99	10.69	0.84	14.71	10.91	0.84
	85	10.83	9.88	0.67	11.55	10.48	0.82	12.27	10.82	0.87	12.79	10.42	0.88	13.70	10.55	0.90	14.42	10.77	0.91
	90	10.55	9.69	0.75	11.27	10.29	0.88	11.98	10.65	0.93	12.50	10.26	0.94	13.42	10.40	0.96	14.14	10.63	0.97
	95	10.25	9.59	0.83	10.96	10.20	0.94	11.68	10.57	0.97	12.00	10.03	0.96	13.10	10.34	1.01	13.82	10.59	1.03
	100	10.00	9.33	0.87	10.71	9.94	0.96	11.43	10.31	0.98	11.85	9.88	0.97	12.85	10.12	1.01	13.57	10.37	1.03
105	9.75	9.07	0.91	10.46	9.69	0.98	11.18	10.06	0.99	11.69	9.72	0.99	12.60	9.90	1.01	13.32	10.15	1.03	
110	9.50	8.76	0.89	10.21	9.37	0.93	10.93	9.75	0.92	11.44	9.43	0.92	12.35	9.62	0.93	13.07	9.87	0.95	
115	9.25	8.50	0.80	9.96	9.11	0.81	10.68	9.49	0.79	11.19	9.19	0.77	12.10	9.39	0.78	12.82	9.65	0.80	
118	8.74	8.10	0.71	9.42	8.69	0.70	10.11	9.07	0.66	10.60	8.78	0.65	11.48	8.98	0.65	12.16	9.24	0.66	
122	8.56	7.97	0.68	9.24	8.55	0.66	9.92	8.92	0.62	10.40	8.65	0.60	11.27	8.84	0.60	11.94	9.10	0.62	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
12K	0	-0.4	5.94	0.70	5.60	0.73	5.59	0.74	5.46	0.75	5.36	0.75	5.14	0.78
	5	4.5	6.95	0.71	6.63	0.74	6.53	0.75	6.39	0.76	6.28	0.77	6.03	0.80
	10	9	7.63	0.72	7.32	0.75	7.16	0.77	7.01	0.77	6.89	0.78	6.62	0.81
	17	15	8.37	0.73	8.08	0.76	7.85	0.78	7.69	0.80	7.57	0.81	7.28	0.83
	20	19	8.82	0.75	8.54	0.77	8.27	0.80	8.11	0.81	7.98	0.82	7.68	0.84
	25	23	9.57	0.76	9.29	0.78	8.97	0.81	8.80	0.83	8.66	0.84	8.34	0.87
	30	28	10.33	0.78	10.01	0.81	9.67	0.83	9.49	0.85	9.35	0.87	9.00	0.89
	35	32	11.08	0.80	10.73	0.83	10.37	0.85	10.18	0.87	10.03	0.89	9.67	0.91
	40	36	11.65	0.82	11.32	0.85	10.96	0.88	10.77	0.90	10.62	0.91	10.23	0.94
	45	41	12.35	0.85	12.06	0.88	11.70	0.91	11.51	0.93	11.35	0.94	10.94	0.97
	47	43	12.63	0.87	12.35	0.89	12.00	0.92	11.80	0.94	11.65	0.95	11.22	0.98
	50	46	12.67	0.86	12.42	0.89	12.11	0.91	11.93	0.93	11.79	0.94	11.40	0.96
	55	51	12.73	0.85	12.52	0.87	12.29	0.89	12.15	0.90	12.04	0.91	11.68	0.93
	60	56	12.80	0.84	12.63	0.86	12.47	0.87	12.37	0.88	12.28	0.89	11.97	0.90
	63	59	12.83	0.84	12.69	0.85	12.58	0.87	12.50	0.87	12.43	0.87	12.14	0.88
68	64	12.87	0.83	12.76	0.84	12.70	0.85	12.63	0.85	12.58	0.86	12.31	0.87	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 217

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Cassette

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
18K	5	17.83	14.28	0.57	18.94	15.08	0.77	20.05	15.53	0.83	20.84	14.91	0.84	22.26	15.04	0.84	23.36	15.32	0.84
	10	17.81	14.39	0.58	18.91	15.20	0.79	20.02	15.64	0.85	20.81	15.02	0.87	22.23	15.15	0.87	23.33	15.44	0.87
	15	17.78	14.49	0.60	18.89	15.31	0.81	19.99	15.75	0.88	20.78	15.13	0.89	22.19	15.26	0.89	23.30	15.55	0.89
	20	17.75	14.59	0.61	18.86	15.41	0.83	19.96	15.86	0.90	20.75	15.24	0.92	22.16	15.37	0.92	23.27	15.66	0.92
	25	17.73	14.69	0.63	18.83	15.53	0.85	19.93	15.98	0.92	20.72	15.35	0.94	22.13	15.47	0.94	23.24	15.77	0.94
	30	17.70	14.80	0.65	18.80	15.63	0.87	19.90	16.09	0.94	20.69	15.45	0.96	22.10	15.59	0.97	23.20	15.88	0.96
	35	17.68	14.90	0.66	18.77	15.74	0.89	19.88	16.20	0.97	20.66	15.56	0.99	22.07	15.69	0.99	23.17	15.99	0.99
	40	17.65	15.00	0.67	18.75	15.85	0.92	19.85	16.31	0.99	20.63	15.67	1.01	22.04	15.80	1.01	23.13	16.10	1.01
	45	17.63	15.11	0.70	18.72	15.95	0.94	19.82	16.43	1.02	20.60	15.77	1.03	22.01	15.91	1.04	23.10	16.21	1.03
	50	17.60	15.20	0.71	18.69	16.06	0.96	19.79	16.53	1.04	20.57	15.88	1.06	21.98	16.01	1.06	23.06	16.31	1.06
	55	17.57	15.31	0.72	18.67	16.17	0.98	19.76	16.64	1.07	20.54	15.98	1.08	21.94	16.12	1.08	23.03	16.43	1.08
	60	17.55	15.41	0.74	18.64	16.28	1.00	19.73	16.76	1.09	20.51	16.09	1.10	21.91	16.22	1.11	23.00	16.53	1.10
	65	17.52	15.50	0.76	18.61	16.38	1.02	19.70	16.86	1.11	20.48	16.19	1.13	21.88	16.33	1.13	22.97	16.64	1.13
	70	17.50	15.61	0.77	18.59	16.49	1.04	19.67	16.97	1.14	20.45	16.30	1.15	21.85	16.43	1.15	22.93	16.75	1.15
	75	17.08	15.35	0.82	18.16	16.24	1.08	19.25	16.73	1.16	20.03	16.08	1.19	21.41	16.24	1.19	22.49	16.56	1.20
	80	16.66	15.08	0.87	17.74	15.98	1.11	18.82	16.49	1.19	19.60	15.86	1.21	20.98	16.04	1.24	22.07	16.37	1.25
	85	16.24	14.81	0.99	17.32	15.71	1.21	18.40	16.23	1.29	19.18	15.62	1.31	20.55	15.82	1.33	21.63	16.16	1.35
	90	15.82	14.53	1.11	16.90	15.44	1.31	17.97	15.97	1.37	18.75	15.38	1.39	20.12	15.59	1.42	21.20	15.95	1.44
	95	15.37	14.38	1.23	16.44	15.30	1.39	17.51	15.85	1.44	18.00	15.05	1.42	19.65	15.51	1.49	20.72	15.88	1.52
	100	14.99	14.00	1.29	16.07	14.91	1.42	17.14	15.47	1.46	17.77	14.81	1.44	19.28	15.17	1.49	20.35	15.55	1.52
105	14.62	13.61	1.35	15.69	14.53	1.45	16.76	15.09	1.46	17.54	14.58	1.47	18.90	14.84	1.49	19.97	15.23	1.52	
110	14.24	13.14	1.31	15.32	14.06	1.37	16.39	14.63	1.36	17.16	14.15	1.36	18.53	14.42	1.37	19.60	14.81	1.41	
115	13.87	12.75	1.18	14.94	13.66	1.19	16.01	14.24	1.16	16.79	13.79	1.14	18.15	14.08	1.15	19.22	14.47	1.18	
118	13.10	12.15	1.04	14.13	13.04	1.03	15.16	13.60	0.98	15.90	13.17	0.96	17.21	13.47	0.96	18.24	13.85	0.98	
122	12.84	11.95	1.00	13.86	12.83	0.97	14.87	13.38	0.92	15.60	12.97	0.89	16.90	13.26	0.89	17.91	13.64	0.92	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
18K	0	-0.4	8.91	1.02	8.39	1.07	8.39	1.08	8.20	1.09	8.04	1.10	7.70	1.14
	5	4.5	10.43	1.04	9.94	1.08	9.79	1.10	9.59	1.11	9.42	1.13	9.04	1.16
	10	9	11.44	1.05	10.98	1.09	10.73	1.12	10.52	1.13	10.34	1.15	9.93	1.18
	17	15	12.56	1.07	12.12	1.11	11.77	1.15	11.54	1.16	11.36	1.18	10.92	1.21
	20	19	13.23	1.09	12.81	1.12	12.40	1.16	12.16	1.18	11.97	1.20	11.51	1.23
	25	23	14.36	1.11	13.93	1.15	13.45	1.19	13.19	1.21	12.99	1.23	12.50	1.27
	30	28	15.50	1.15	15.01	1.18	14.50	1.22	14.23	1.24	14.02	1.27	13.50	1.30
	35	32	16.62	1.18	16.09	1.22	15.55	1.25	15.27	1.28	15.04	1.30	14.50	1.33
	40	36	17.47	1.21	16.98	1.25	16.44	1.28	16.15	1.31	15.93	1.33	15.35	1.37
	45	41	18.53	1.25	18.09	1.29	17.55	1.33	17.26	1.36	17.03	1.37	16.41	1.42
	47	43	18.95	1.27	18.53	1.31	18.00	1.35	17.70	1.37	17.47	1.39	16.83	1.43
	50	46	19.01	1.26	18.62	1.30	18.16	1.33	17.90	1.36	17.69	1.37	17.10	1.41
	55	51	19.10	1.25	18.79	1.28	18.44	1.31	18.22	1.32	18.06	1.33	17.52	1.36
	60	56	19.19	1.23	18.94	1.25	18.71	1.28	18.55	1.29	18.42	1.30	17.95	1.31
	63	59	19.25	1.22	19.04	1.24	18.87	1.27	18.75	1.27	18.64	1.27	18.21	1.29
68	64	19.30	1.22	19.13	1.23	19.04	1.25	18.94	1.25	18.87	1.25	18.47	1.27	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 218

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Cassette

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
24K	5	23.77	19.04	0.77	25.25	20.11	1.04	26.73	20.70	1.12	27.79	19.88	1.14	29.68	20.05	1.14	31.15	20.43	1.14
	10	23.74	19.18	0.79	25.21	20.26	1.07	26.69	20.85	1.15	27.75	20.03	1.17	29.64	20.20	1.17	31.11	20.58	1.17
	15	23.70	19.32	0.81	25.18	20.41	1.09	26.65	21.00	1.19	27.71	20.17	1.20	29.59	20.34	1.21	31.07	20.73	1.20
	20	23.67	19.45	0.83	25.14	20.55	1.12	26.61	21.15	1.22	27.67	20.32	1.24	29.55	20.49	1.24	31.02	20.88	1.24
	25	23.64	19.59	0.85	25.10	20.70	1.15	26.57	21.30	1.25	27.63	20.46	1.27	29.51	20.63	1.27	30.98	21.02	1.27
	30	23.60	19.73	0.87	25.07	20.84	1.18	26.53	21.45	1.28	27.59	20.60	1.30	29.47	20.78	1.31	30.93	21.17	1.30
	35	23.57	19.87	0.89	25.03	20.98	1.21	26.50	21.60	1.32	27.55	20.75	1.33	29.42	20.92	1.33	30.89	21.32	1.33
	40	23.53	20.00	0.91	25.00	21.13	1.24	26.46	21.75	1.34	27.51	20.89	1.36	29.38	21.06	1.36	30.84	21.46	1.36
	45	23.50	20.14	0.94	24.96	21.27	1.27	26.42	21.90	1.37	27.47	21.03	1.39	29.34	21.21	1.40	30.80	21.61	1.39
	50	23.47	20.27	0.96	24.92	21.41	1.30	26.38	22.04	1.40	27.43	21.17	1.43	29.30	21.35	1.43	30.75	21.75	1.43
	55	23.43	20.41	0.98	24.89	21.56	1.32	26.34	22.19	1.44	27.39	21.31	1.46	29.25	21.49	1.46	30.71	21.90	1.46
	60	23.40	20.54	1.00	24.85	21.70	1.35	26.30	22.34	1.47	27.35	21.45	1.49	29.21	21.63	1.50	30.66	22.04	1.49
	65	23.36	20.67	1.03	24.81	21.84	1.38	26.27	22.48	1.50	27.31	21.59	1.53	29.17	21.77	1.53	30.62	22.19	1.53
	70	23.33	20.81	1.05	24.78	21.98	1.41	26.23	22.63	1.54	27.27	21.73	1.56	29.13	21.91	1.56	30.57	22.33	1.56
	75	22.77	20.46	1.11	24.21	21.65	1.46	25.66	22.31	1.57	26.70	21.44	1.60	28.55	21.65	1.61	29.99	22.08	1.62
	80	22.21	20.11	1.18	23.65	21.30	1.51	25.09	21.98	1.61	26.13	21.14	1.64	27.97	21.38	1.67	29.42	21.82	1.69
	85	21.65	19.75	1.34	23.09	20.95	1.63	24.53	21.64	1.74	25.57	20.83	1.77	27.40	21.09	1.80	28.84	21.54	1.82
	90	21.09	19.37	1.50	22.53	20.58	1.77	23.96	21.29	1.85	25.00	20.51	1.88	26.83	20.79	1.92	28.27	21.26	1.95
	95	20.49	19.17	1.66	21.92	20.40	1.88	23.35	21.13	1.95	24.00	20.06	1.92	26.20	20.68	2.02	27.63	21.17	2.05
	100	19.99	18.66	1.75	21.42	19.88	1.92	22.85	20.62	1.97	23.69	19.75	1.95	25.70	20.23	2.02	27.13	20.73	2.05
105	19.49	18.14	1.82	20.92	19.37	1.96	22.35	20.12	1.98	23.38	19.44	1.99	25.20	19.79	2.02	26.63	20.30	2.05	
110	18.99	17.52	1.78	20.42	18.74	1.85	21.85	19.50	1.84	22.88	18.86	1.83	24.70	19.23	1.85	26.13	19.74	1.90	
115	18.49	17.00	1.59	19.92	18.21	1.61	21.35	18.98	1.57	22.38	18.38	1.55	24.20	18.77	1.56	25.63	19.29	1.59	
118	17.47	16.20	1.41	18.84	17.38	1.39	20.21	18.13	1.32	21.20	17.56	1.30	22.95	17.96	1.30	24.32	18.47	1.32	
122	17.12	15.93	1.35	18.48	17.10	1.32	19.83	17.84	1.25	20.80	17.29	1.21	22.53	17.68	1.21	23.88	18.19	1.24	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
24K	0	-0.4	11.88	1.48	11.19	1.54	11.18	1.56	10.93	1.58	10.72	1.58	10.27	1.65
	5	4.5	13.90	1.51	13.25	1.56	13.05	1.59	12.78	1.61	12.56	1.63	12.06	1.68
	10	9	15.26	1.52	14.64	1.58	14.31	1.62	14.02	1.64	13.79	1.65	13.25	1.71
	17	15	16.74	1.55	16.16	1.60	15.69	1.65	15.39	1.68	15.14	1.71	14.56	1.75
	20	19	17.64	1.58	17.08	1.62	16.53	1.68	16.22	1.71	15.97	1.73	15.35	1.78
	25	23	19.15	1.61	18.58	1.65	17.93	1.71	17.59	1.75	17.32	1.78	16.67	1.83
	30	28	20.66	1.65	20.01	1.71	19.33	1.76	18.97	1.79	18.69	1.83	18.00	1.87
	35	32	22.16	1.70	21.46	1.76	20.73	1.80	20.35	1.85	20.06	1.87	19.33	1.92
	40	36	23.29	1.74	22.64	1.80	21.92	1.85	21.53	1.90	21.24	1.92	20.47	1.98
	45	41	24.71	1.80	24.11	1.86	23.41	1.92	23.01	1.96	22.71	1.98	21.88	2.05
	47	43	25.27	1.83	24.71	1.89	24.00	1.95	23.61	1.98	23.29	2.01	22.44	2.07
	50	46	25.35	1.82	24.83	1.87	24.22	1.92	23.87	1.96	23.59	1.98	22.79	2.04
	55	51	25.47	1.80	25.05	1.85	24.59	1.89	24.30	1.91	24.08	1.92	23.36	1.97
	60	56	25.59	1.78	25.26	1.81	24.94	1.85	24.73	1.86	24.56	1.87	23.94	1.90
	63	59	25.66	1.77	25.38	1.79	25.16	1.83	25.00	1.84	24.86	1.84	24.28	1.86
68	64	25.74	1.76	25.51	1.78	25.39	1.80	25.26	1.80	25.15	1.81	24.63	1.83	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 218

SPECIFICATIONS

Capacity Characteristics Chart

Single Zone Cassette

Cooling Capacity Table																			
Model (Btu/h)	Outdoor Air Temp. (°F DB)	Indoor Air Temp. °F DB / °F WB																	
		68 / 57			73 / 61			77 / 64			80 / 67			86 / 72			90 / 75		
		TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
36K	5	10.58	8.47	1.29	11.24	8.95	1.74	11.89	9.21	1.89	12.37	8.85	1.92	13.21	8.92	1.92	13.86	9.09	1.92
	10	10.56	8.53	1.32	11.22	9.01	1.79	11.88	9.28	1.94	12.35	8.91	1.97	13.19	8.99	1.97	13.84	9.16	1.97
	15	10.55	8.60	1.36	11.20	9.08	1.84	11.86	9.34	2.00	12.33	8.97	2.02	13.17	9.05	2.03	13.82	9.22	2.02
	20	10.53	8.65	1.39	11.19	9.14	1.89	11.84	9.41	2.05	12.31	9.04	2.08	13.15	9.12	2.08	13.80	9.29	2.08
	25	10.52	8.72	1.44	11.17	9.21	1.94	11.82	9.48	2.10	12.29	9.10	2.13	13.13	9.18	2.13	13.78	9.35	2.13
	30	10.50	8.78	1.47	11.16	9.27	1.98	11.80	9.54	2.15	12.28	9.17	2.18	13.11	9.25	2.19	13.76	9.42	2.18
	35	10.49	8.84	1.50	11.14	9.34	2.03	11.79	9.61	2.21	12.26	9.23	2.24	13.09	9.31	2.24	13.74	9.49	2.24
	40	10.47	8.90	1.53	11.12	9.40	2.08	11.77	9.68	2.26	12.24	9.30	2.29	13.07	9.37	2.29	13.72	9.55	2.29
	45	10.46	8.96	1.58	11.11	9.46	2.13	11.76	9.74	2.31	12.22	9.36	2.34	13.06	9.44	2.36	13.70	9.62	2.34
	50	10.44	9.02	1.61	11.09	9.53	2.18	11.74	9.81	2.36	12.21	9.42	2.40	13.04	9.50	2.40	13.68	9.68	2.40
	55	10.43	9.08	1.65	11.08	9.59	2.23	11.72	9.87	2.42	12.19	9.48	2.45	13.02	9.56	2.45	13.66	9.74	2.45
	60	10.41	9.14	1.68	11.06	9.66	2.28	11.70	9.94	2.47	12.17	9.54	2.50	13.00	9.62	2.52	13.64	9.81	2.50
	65	10.39	9.20	1.73	11.04	9.72	2.32	11.69	10.00	2.52	12.15	9.61	2.57	12.98	9.69	2.57	13.62	9.87	2.57
	70	10.38	9.26	1.76	11.03	9.78	2.37	11.67	10.07	2.58	12.13	9.67	2.61	12.96	9.75	2.61	13.60	9.94	2.61
	75	10.13	9.10	1.87	10.77	9.63	2.45	11.42	9.93	2.65	11.88	9.54	2.69	12.70	9.63	2.71	13.34	9.82	2.73
	80	9.88	8.95	1.98	10.52	9.48	2.53	11.16	9.78	2.71	11.63	9.41	2.76	12.45	9.51	2.81	13.09	9.71	2.84
	85	9.63	8.79	2.26	10.27	9.32	2.74	10.91	9.63	2.92	11.38	9.27	2.97	12.19	9.38	3.02	12.83	9.58	3.07
	90	9.38	8.62	2.52	10.02	9.16	2.97	10.66	9.47	3.11	11.12	9.13	3.16	11.94	9.25	3.23	12.58	9.46	3.28
	95	9.12	8.53	2.79	9.75	9.08	3.16	10.39	9.40	3.28	10.68	8.93	3.23	11.66	9.20	3.39	12.29	9.42	3.45
	100	8.89	8.30	2.94	9.53	8.85	3.23	10.17	9.18	3.31	10.54	8.79	3.28	11.44	9.00	3.39	12.07	9.22	3.45
105	8.67	8.07	3.07	9.31	8.62	3.29	9.94	8.95	3.32	10.40	8.65	3.34	11.21	8.81	3.39	11.85	9.03	3.45	
110	8.45	7.80	2.98	9.09	8.34	3.11	9.72	8.68	3.10	10.18	8.39	3.08	10.99	8.56	3.11	11.63	8.78	3.19	
115	8.23	7.56	2.68	8.86	8.10	2.71	9.50	8.45	2.65	9.96	8.18	2.60	10.77	8.35	2.61	11.40	8.58	2.68	
118	7.77	7.21	2.37	8.38	7.73	2.34	8.99	8.07	2.23	9.43	7.81	2.18	10.21	7.99	2.18	10.82	8.22	2.23	
122	7.62	7.09	2.28	8.22	7.61	2.21	8.82	7.94	2.10	9.26	7.69	2.03	10.02	7.87	2.03	10.63	8.09	2.08	

Heating Capacity Table														
Model (Btu/h)	Outdoor Air Temp. (°F DB)		Indoor Air Temp. °F DB / °F WB											
	°F DB	°F WB	61		64		68		70		72		75	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
36K	0	-0.4	6.08	2.86	5.72	2.98	5.72	3.01	5.59	3.05	5.48	3.06	5.25	3.18
	5	4.5	7.11	2.91	6.78	3.01	6.68	3.08	6.54	3.11	6.42	3.15	6.17	3.25
	10	9	7.80	2.95	7.49	3.05	7.32	3.13	7.17	3.16	7.05	3.20	6.77	3.30
	17	15	8.56	3.00	8.26	3.10	8.03	3.20	7.87	3.25	7.75	3.30	7.45	3.38
	20	19	9.02	3.05	8.74	3.13	8.46	3.25	8.30	3.30	8.17	3.35	7.85	3.43
	25	23	9.79	3.11	9.50	3.20	9.17	3.32	9.00	3.38	8.86	3.43	8.53	3.53
	30	28	10.57	3.20	10.24	3.30	9.89	3.40	9.70	3.47	9.56	3.53	9.21	3.62
	35	32	11.34	3.28	10.97	3.40	10.60	3.48	10.41	3.57	10.26	3.62	9.89	3.72
	40	36	11.91	3.37	11.58	3.48	11.21	3.58	11.01	3.67	10.86	3.72	10.47	3.82
	45	41	12.64	3.48	12.33	3.60	11.97	3.72	11.77	3.79	11.61	3.84	11.19	3.96
	47	43	12.92	3.53	12.64	3.65	12.28	3.77	12.07	3.84	11.91	3.89	11.48	4.01
	50	46	12.96	3.52	12.70	3.62	12.39	3.72	12.21	3.79	12.06	3.82	11.66	3.94
	55	51	13.03	3.48	12.81	3.57	12.57	3.65	12.43	3.69	12.32	3.72	11.95	3.80
	60	56	13.09	3.43	12.92	3.50	12.76	3.57	12.65	3.60	12.56	3.62	12.24	3.67
	63	59	13.12	3.42	12.98	3.47	12.87	3.53	12.78	3.55	12.71	3.55	12.42	3.60
68	64	13.16	3.40	13.05	3.43	12.99	3.48	12.92	3.48	12.87	3.50	12.60	3.53	

Remarks:
 TC: Total Cooling Capacity (Gross)
 SHC: Sensible Heat Capacity (Gross)
 PI: Power Input (including the compressor,
 evap. fan motor & cond. fan motor)
 DB: Dry Bulb Temperature
 WB: Wet Bulb Temperature

Figure 219

SPECIFICATIONS

Sound Pressure Data- Ducted Indoor

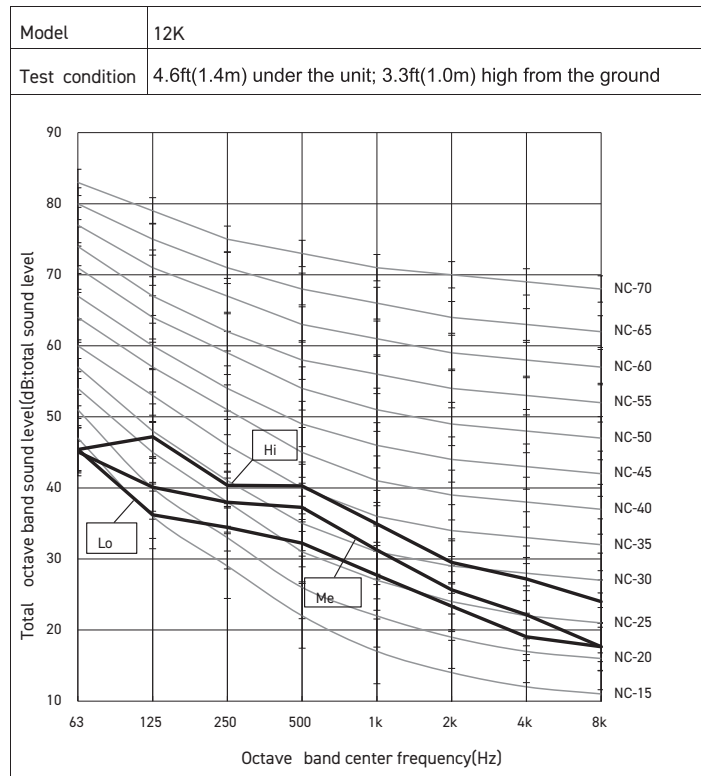
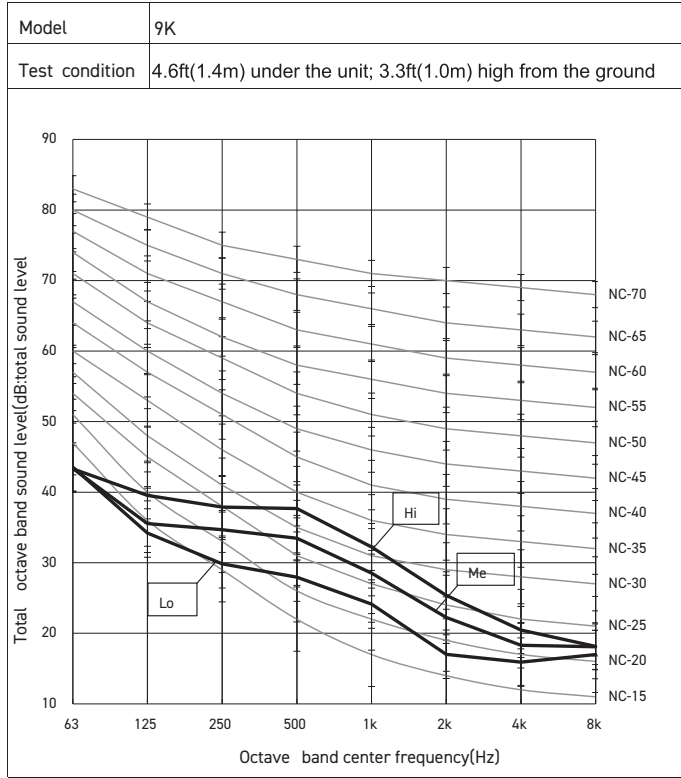


Figure 220

SPECIFICATIONS

Sound Pressure Data -Ducted Indoor

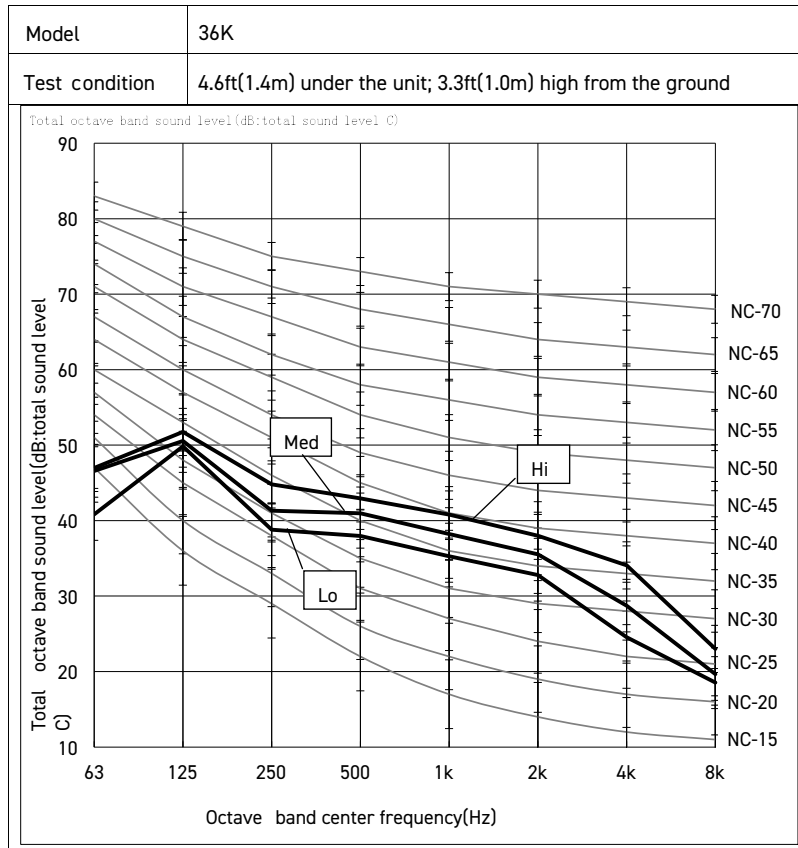


Figure 220

SPECIFICATIONS

Sound Pressure Data -Cassettes

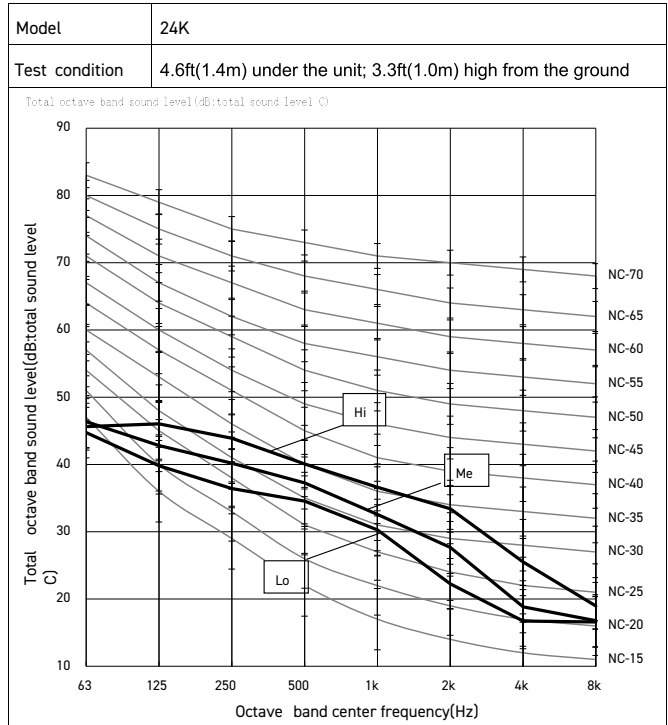
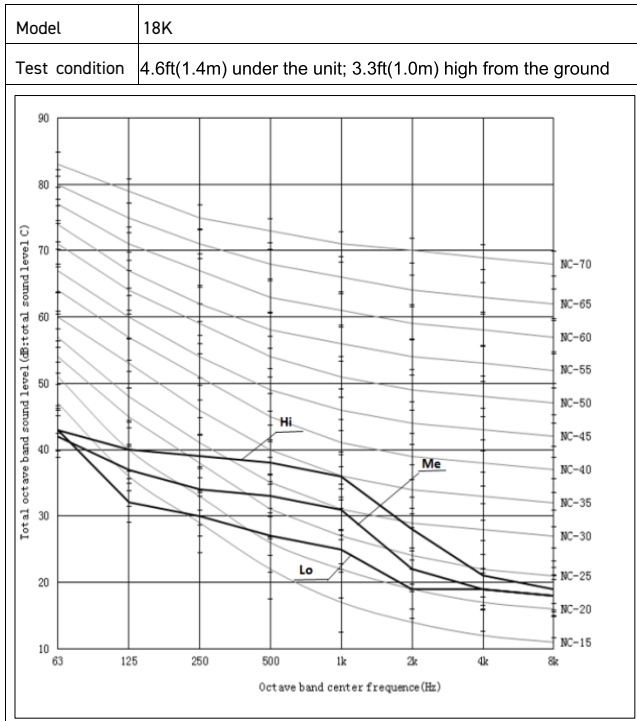
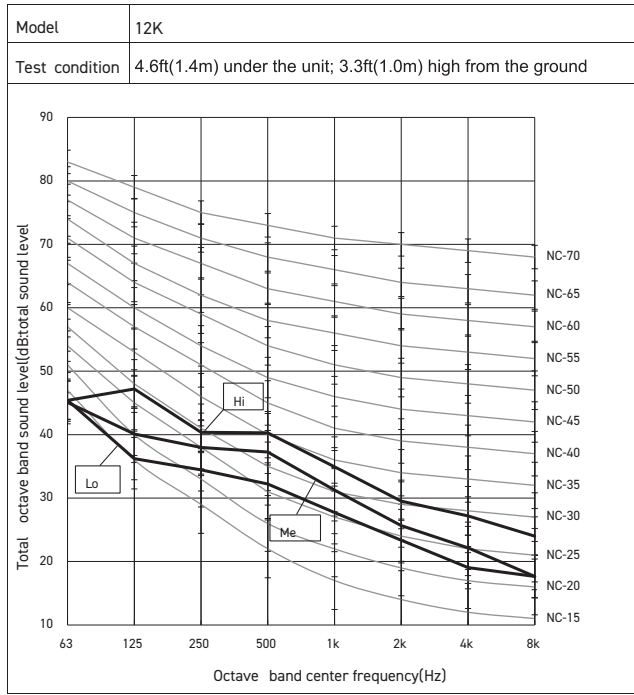
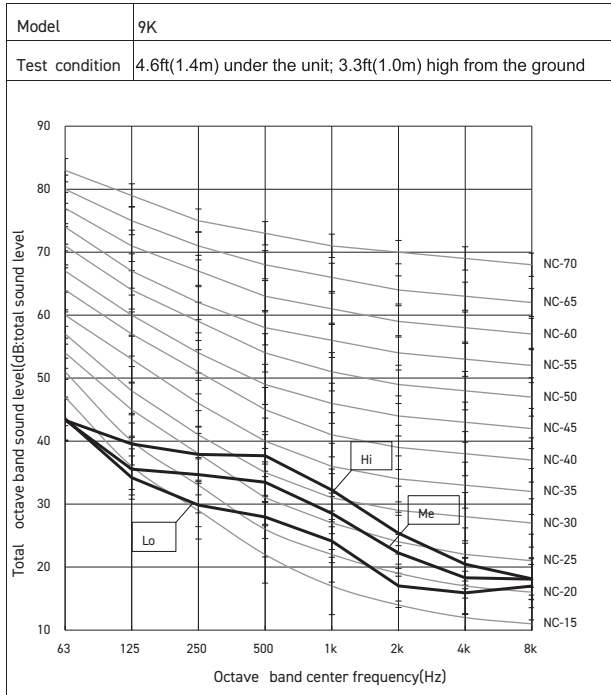


Figure 221

SPECIFICATIONS

Sound Pressure Data -Cassettes

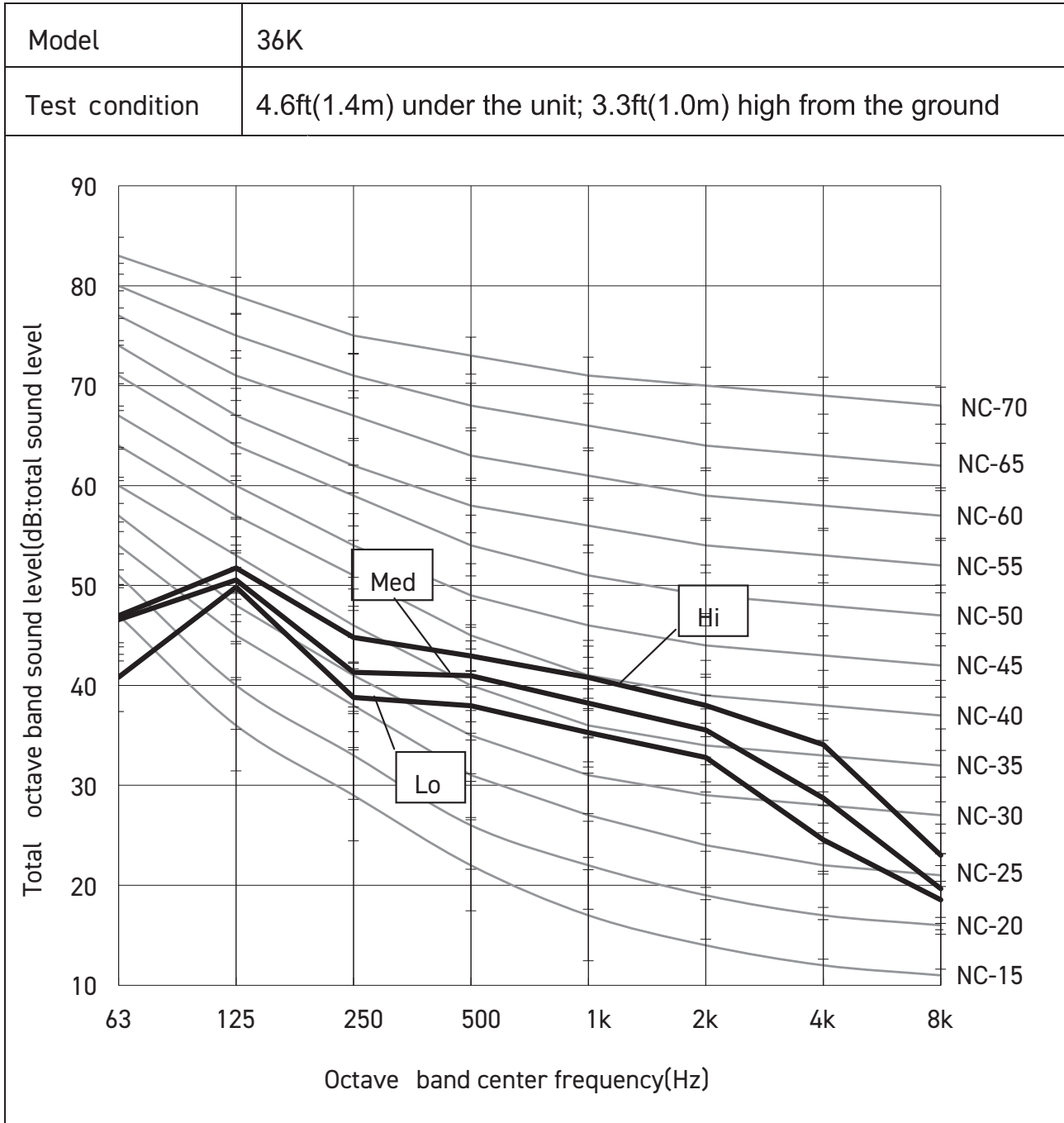


Figure 221

SPECIFICATIONS

Sound Pressure Data -Outdoor Units

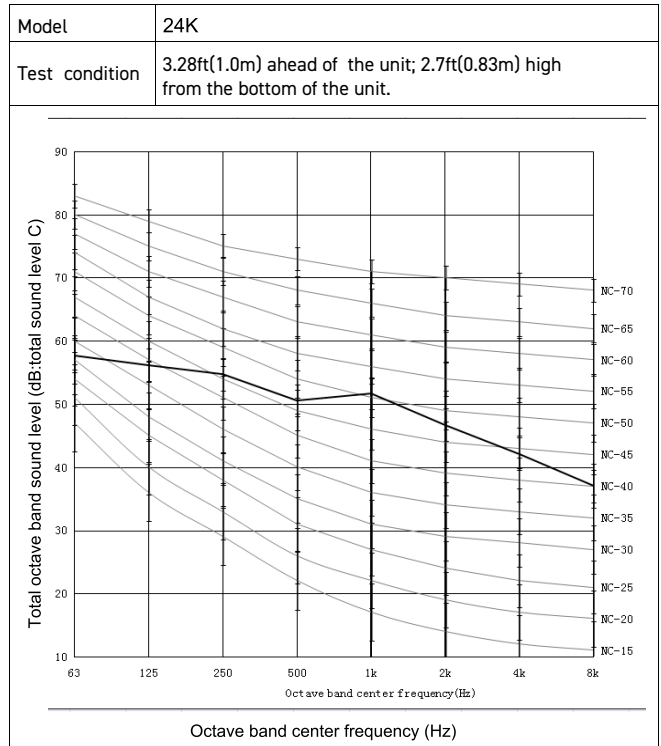
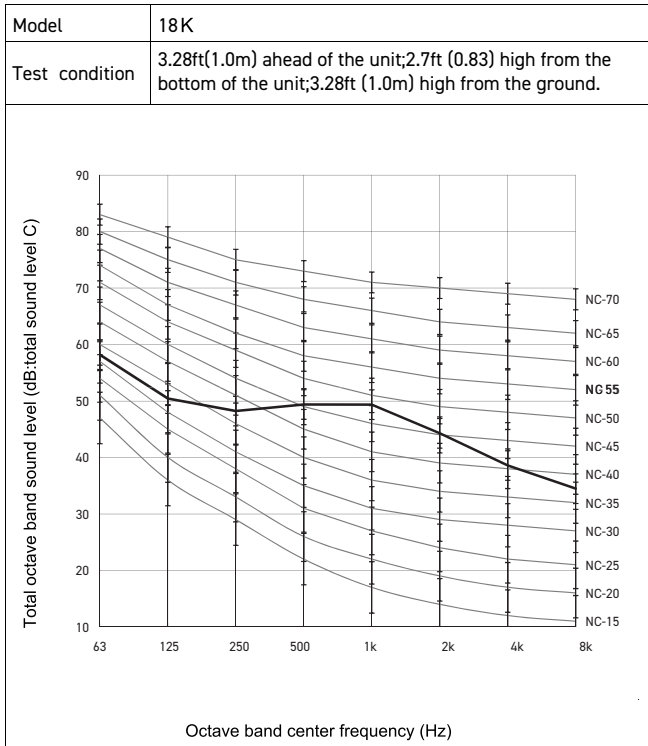
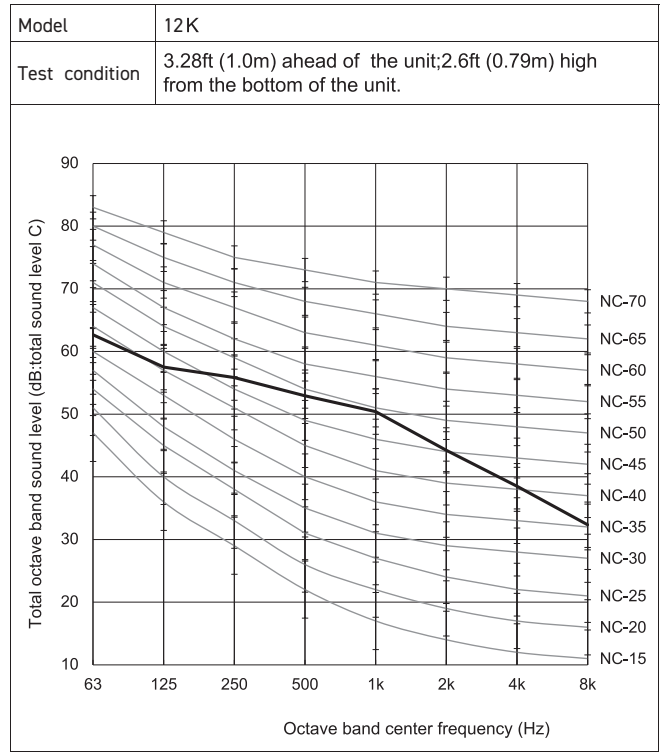
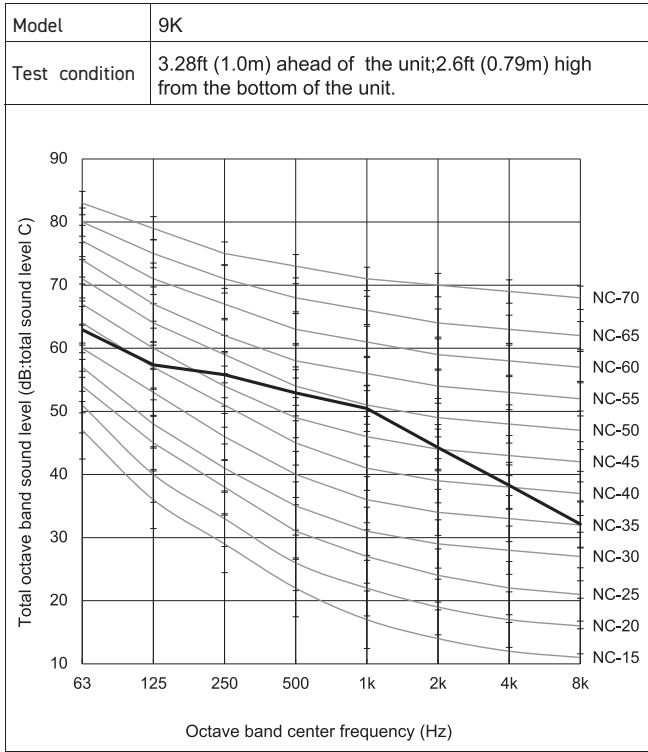


Figure 222

SPECIFICATIONS

Sound Pressure Data -Outdoor Units

Model	36K
Test condition	3.28ft(1.0m) ahead of the unit; 3.28ft (1.0m) high from the bottom of the unit.

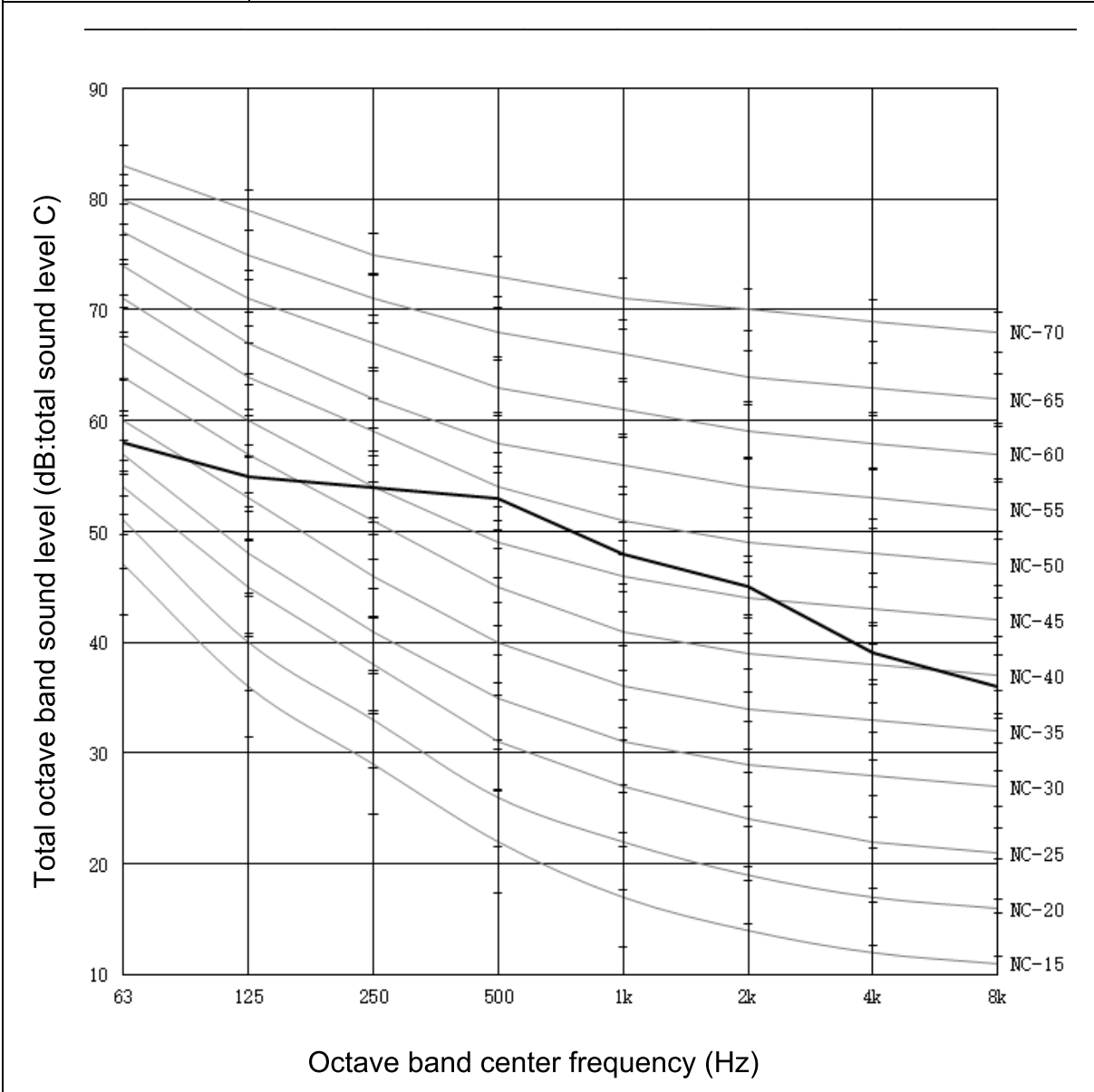
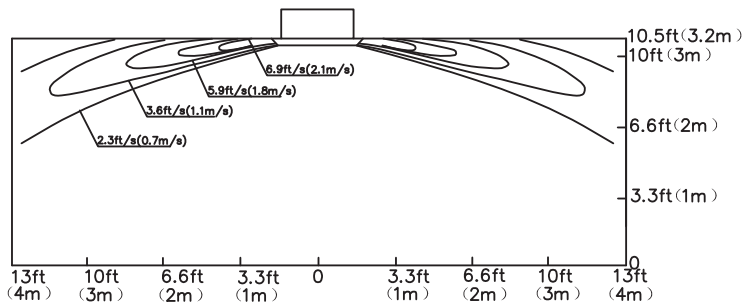


Figure 222

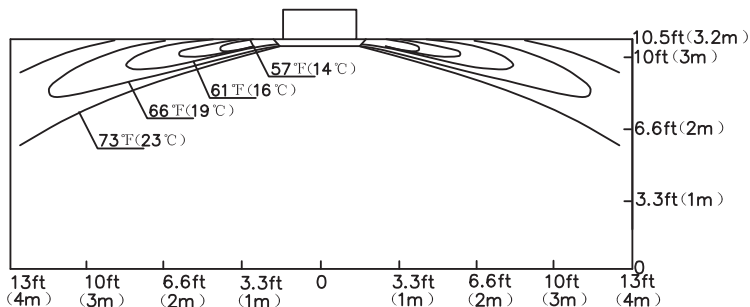
SPECIFICATIONS

Air Flow Distribution 9k

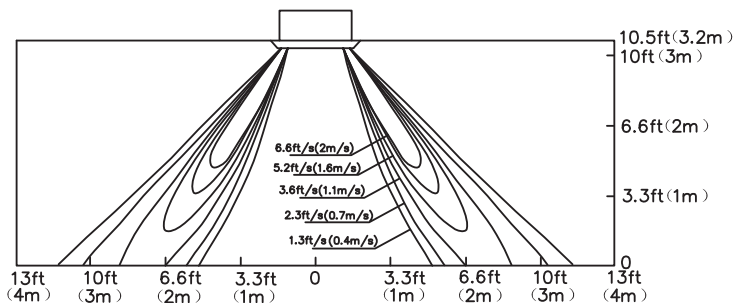
1) Cooling /AirVelocity Distribution



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

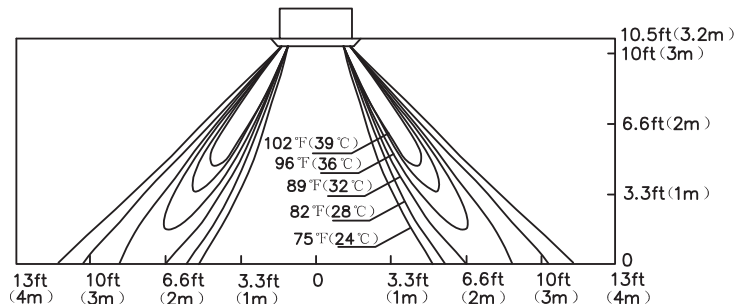
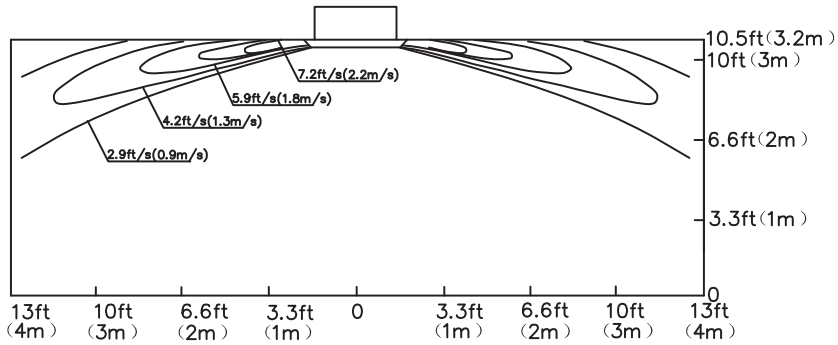


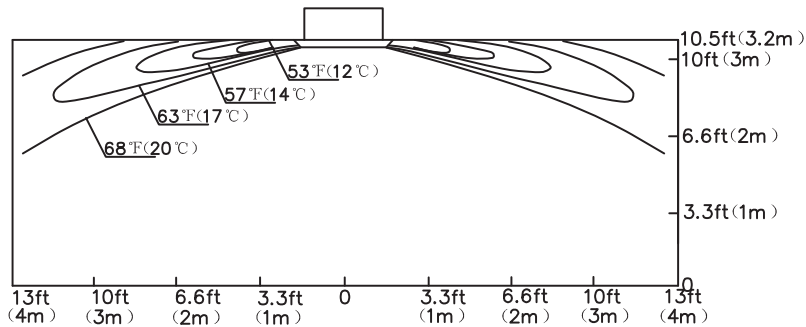
Figure 223

SPECIFICATIONS

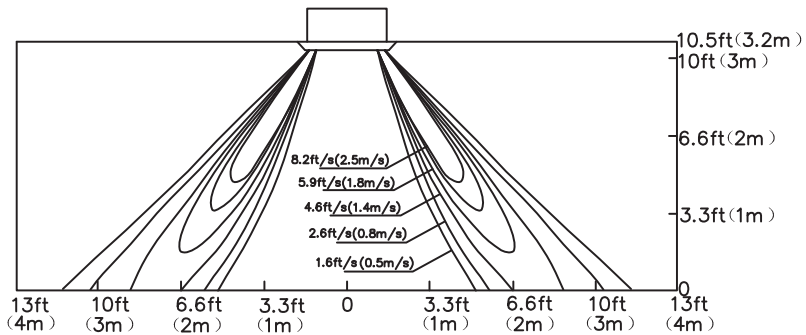
Air Flow Distribution 12k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

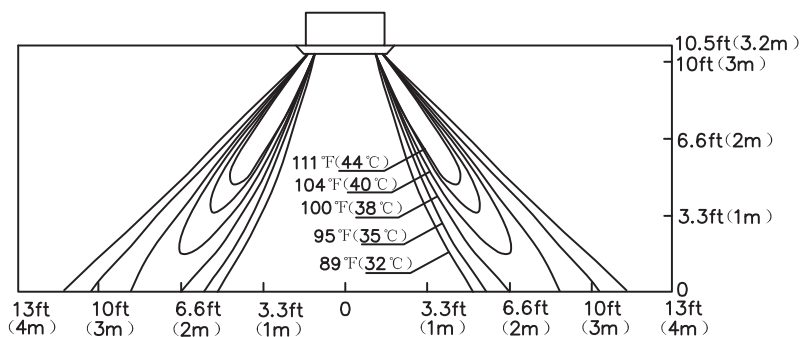
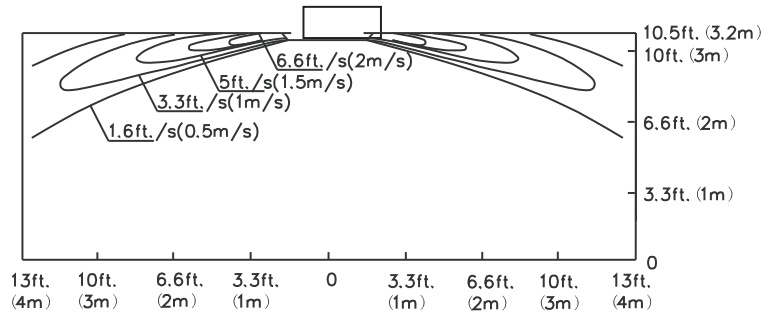


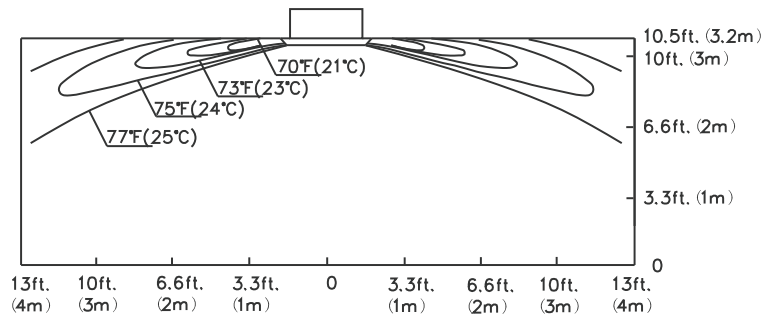
Figure 224

SPECIFICATIONS

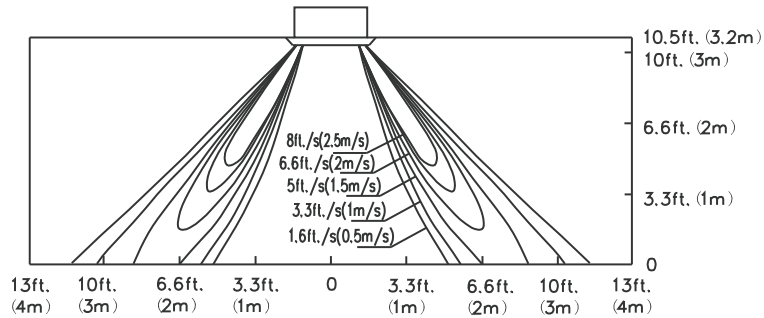
Air Flow Distribution 18-24k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

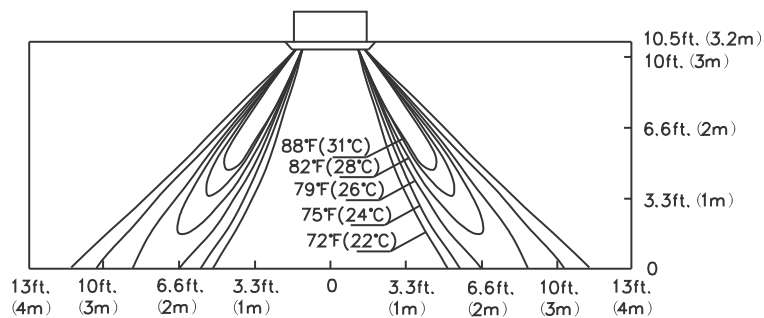
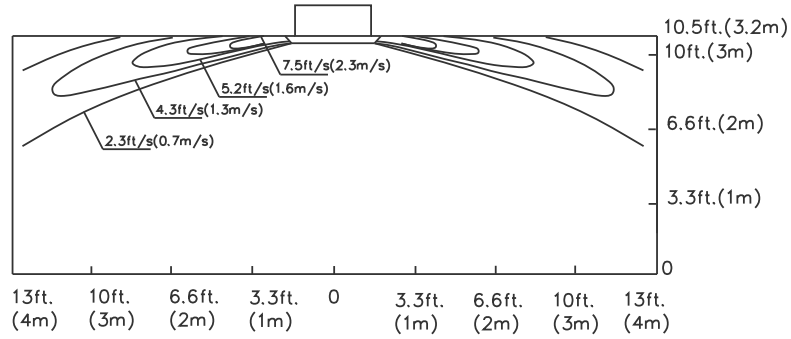


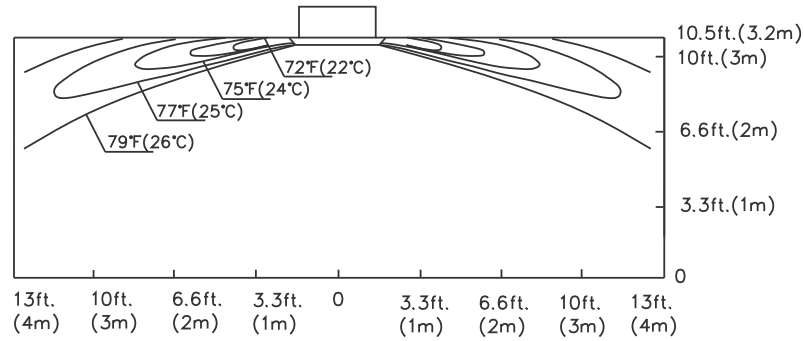
Figure 225

SPECIFICATIONS

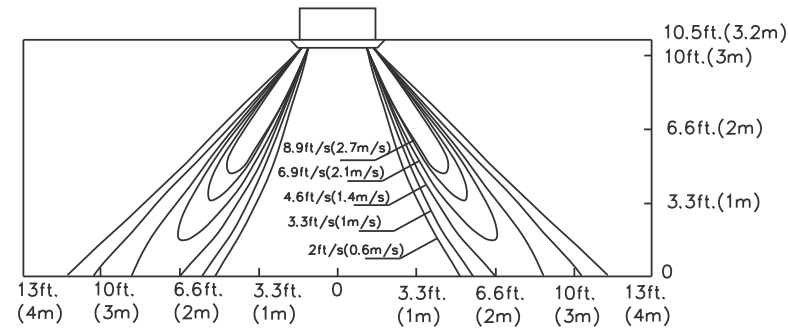
Air Flow Distribution 36k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

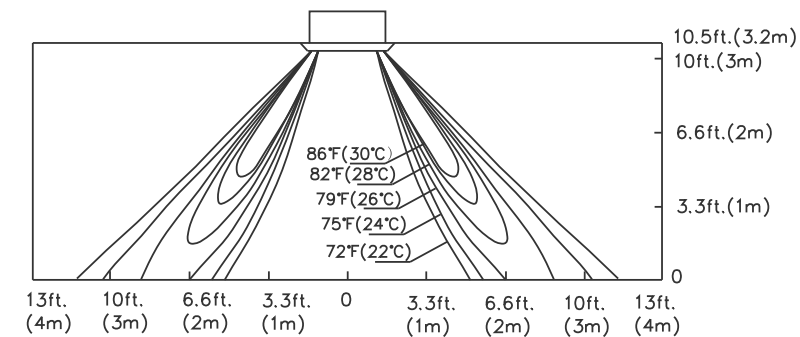


Figure 226

SPECIFICATIONS

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

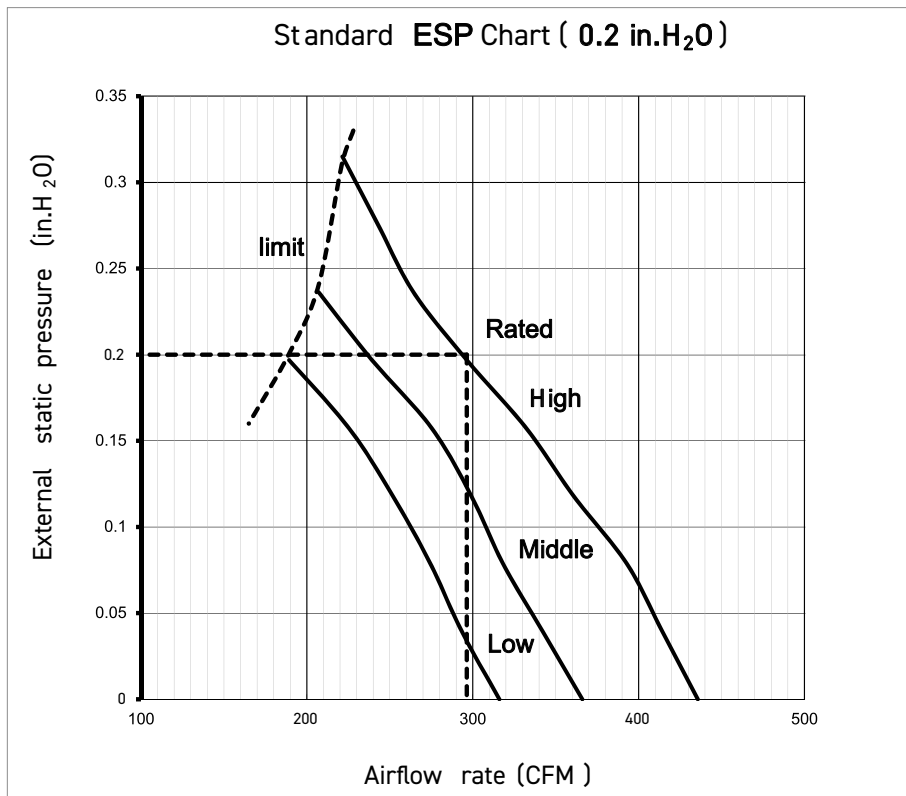
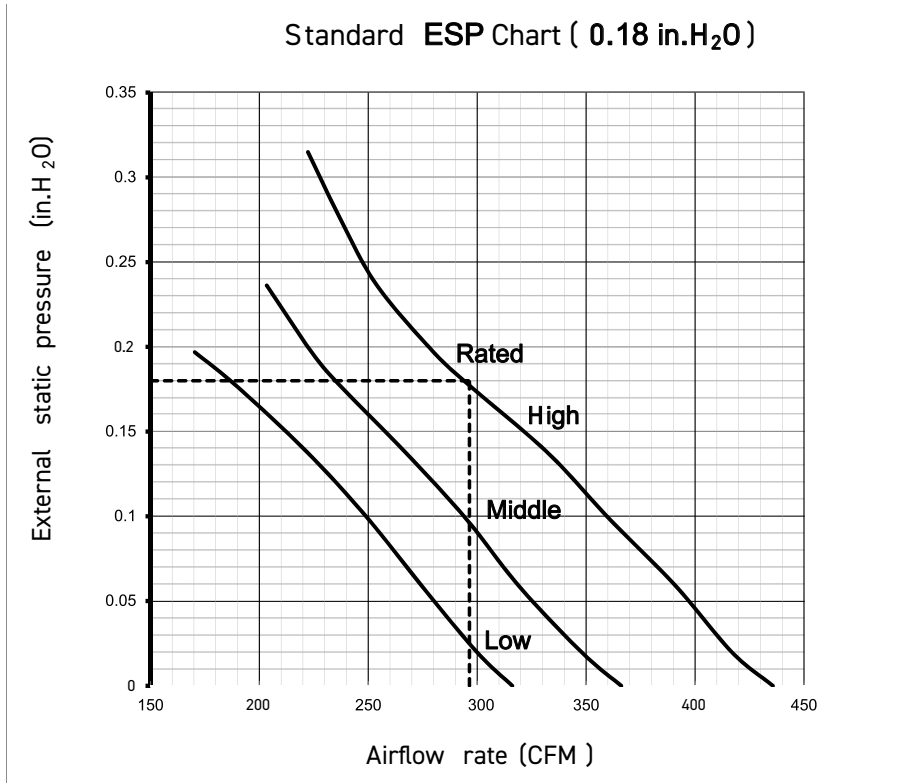
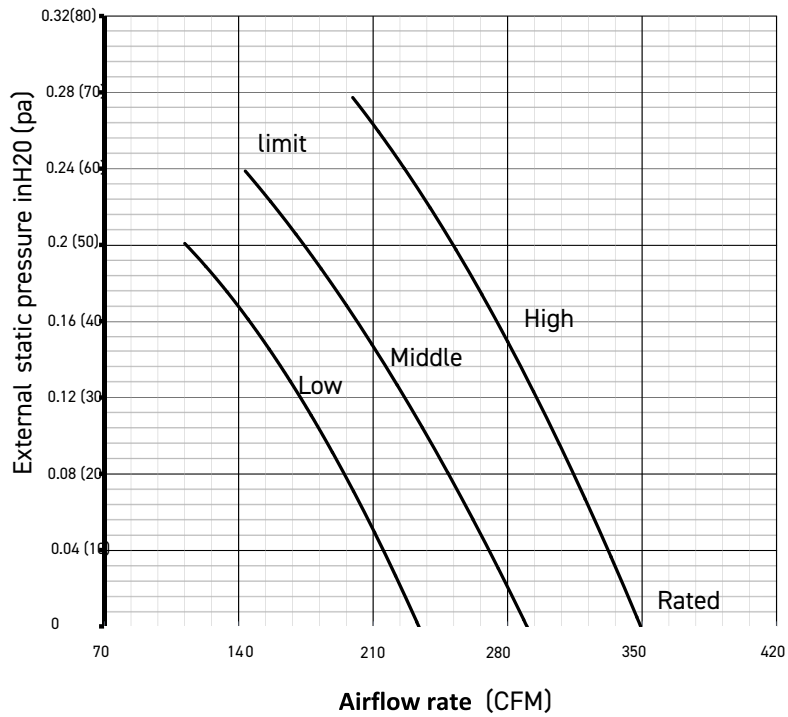


Figure 227

SPECIFICATIONS

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

Standard ESP Chart (0 Pa)



High ESP Chart (5 0 Pa)

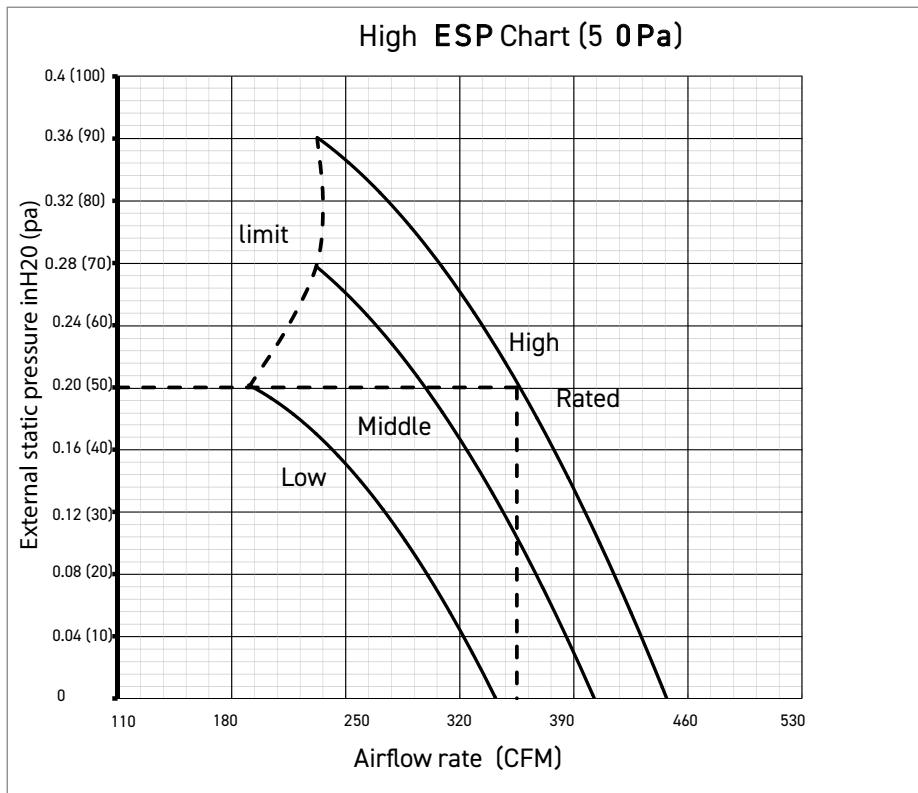


Figure 228

SPECIFICATIONS

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

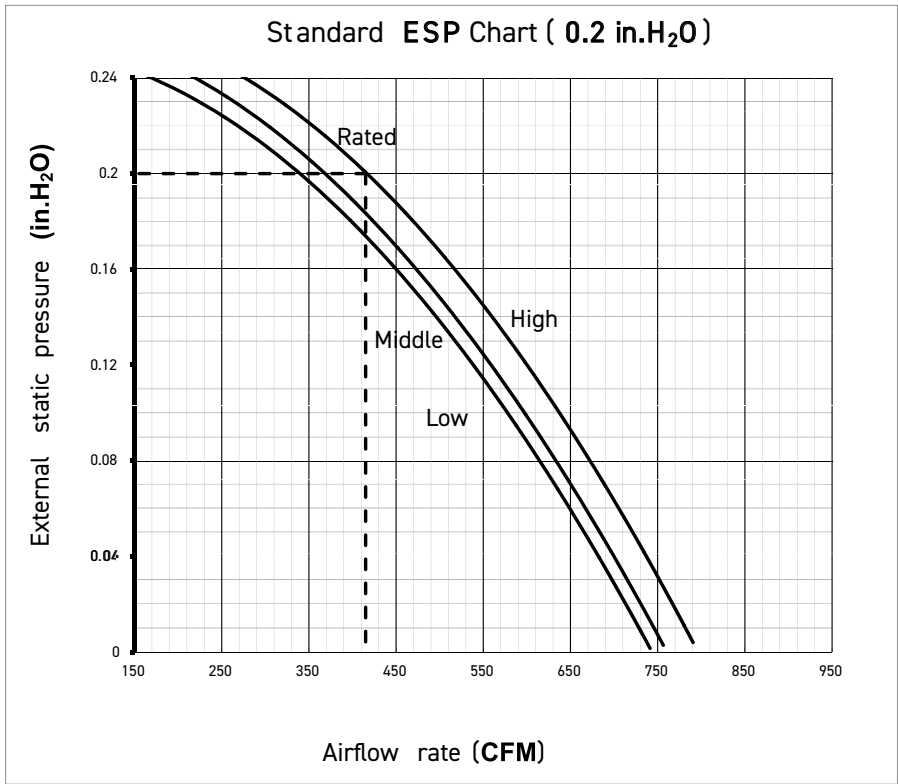
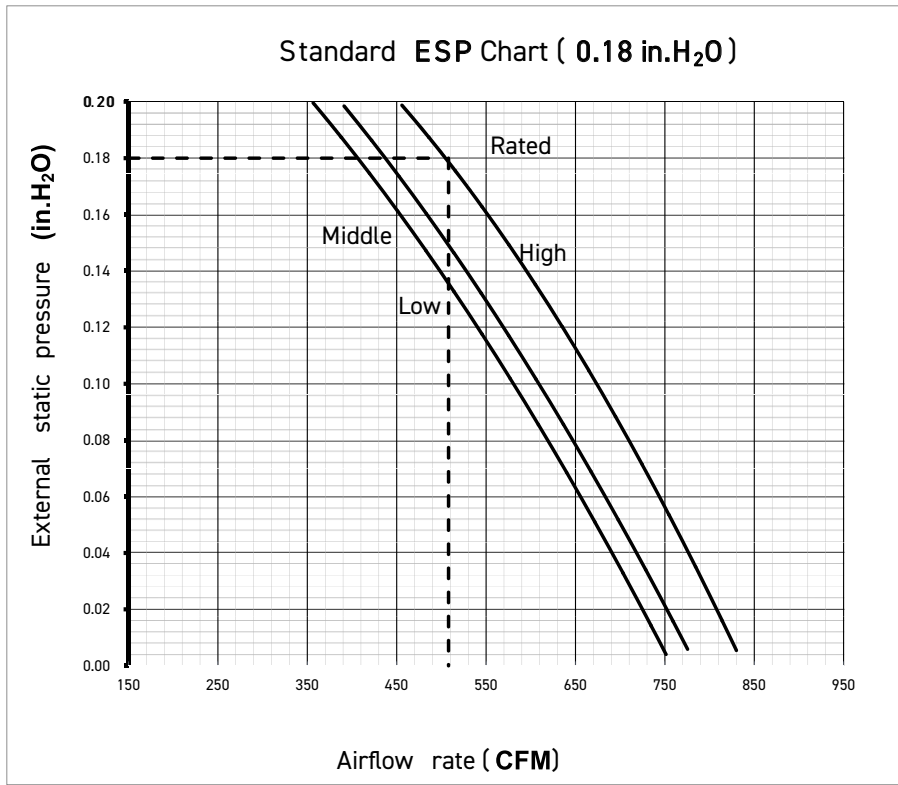


Figure 229

SPECIFICATIONS

ESP (External Static Pressure) chart (Duct Type) 24k

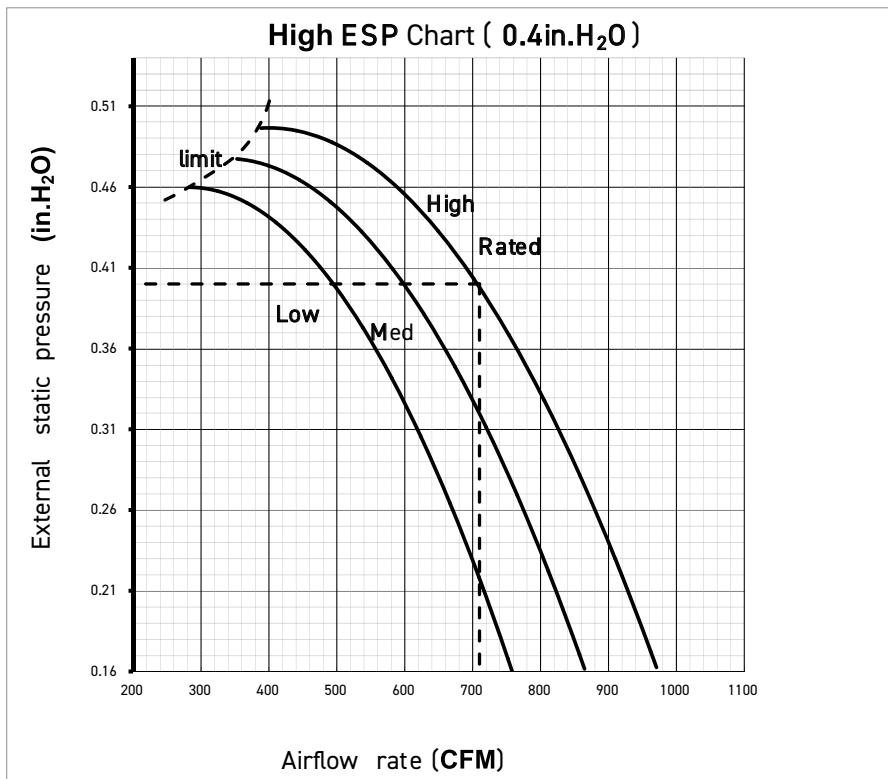
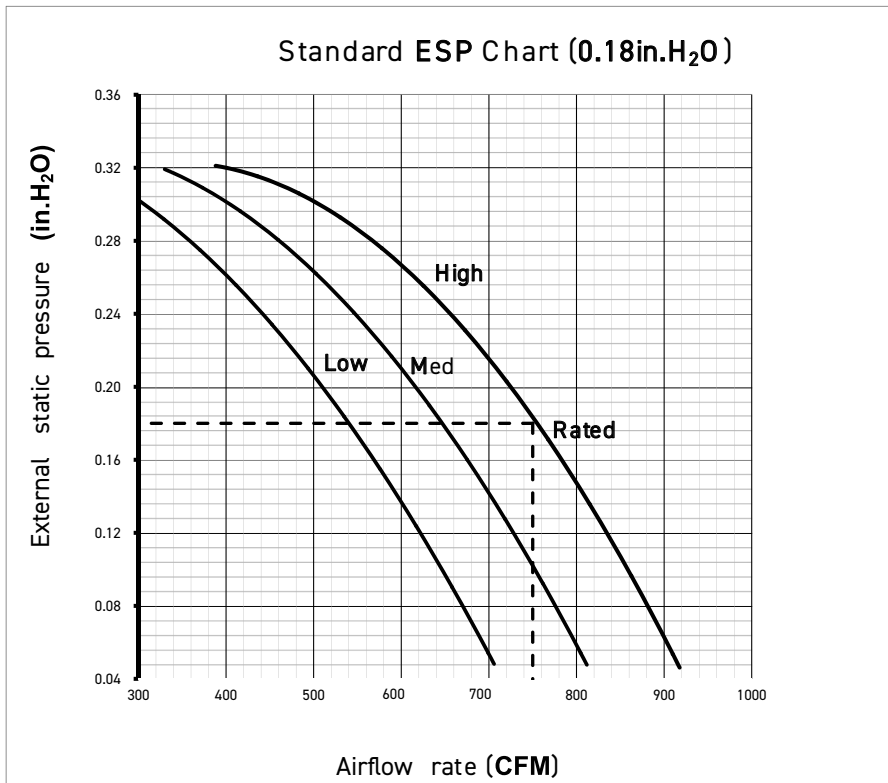


Figure 230

SPECIFICATIONS

ESP (External Static Pressure) chart (Duct Type) 36k

Standard ESP Chart (0.23 in.H₂O)

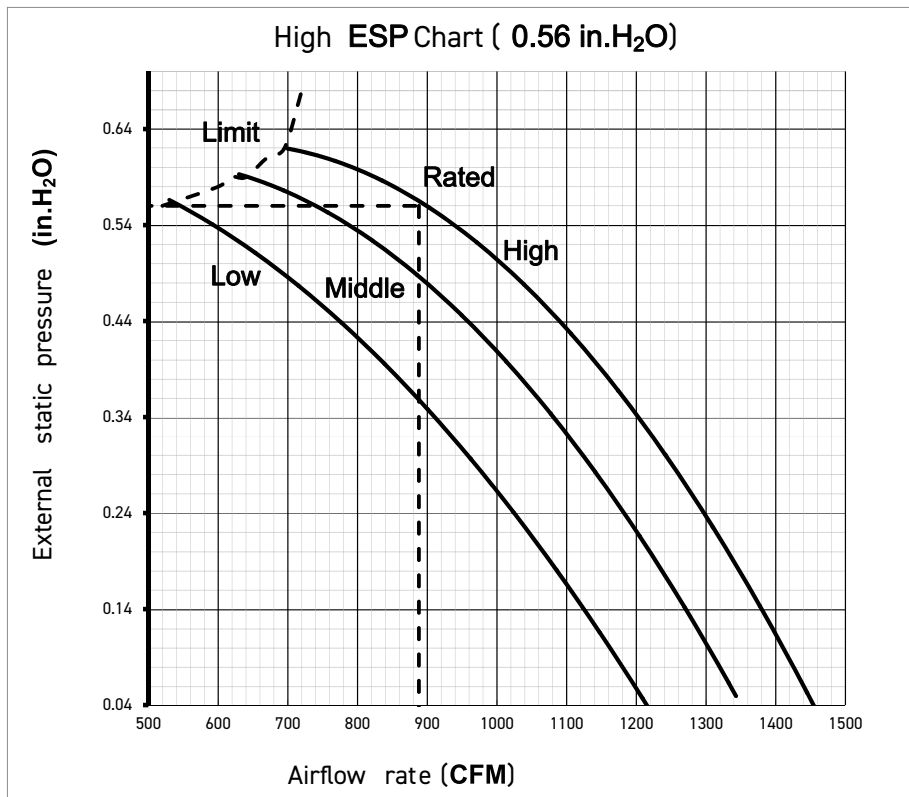
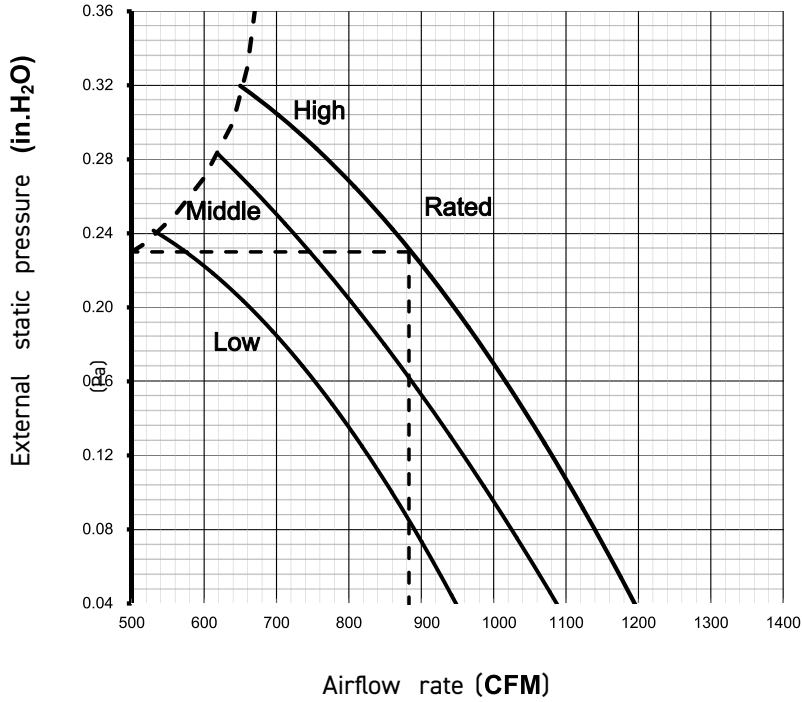
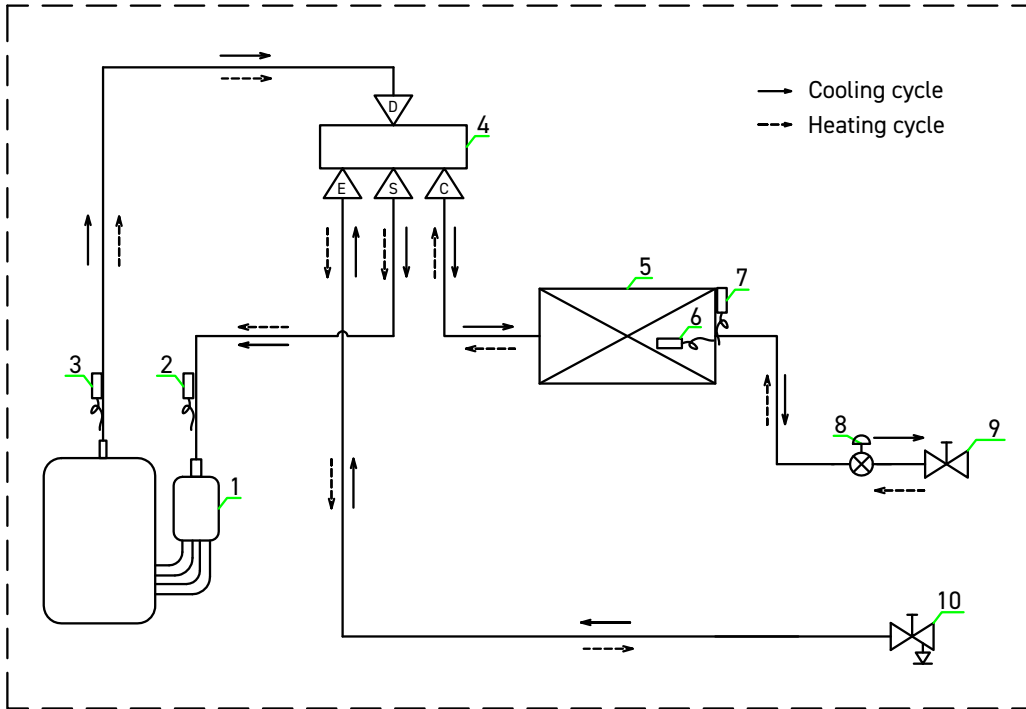


Figure 231

SPECIFICATIONS

Refrigerant Cycle 9-18k Outdoor Units

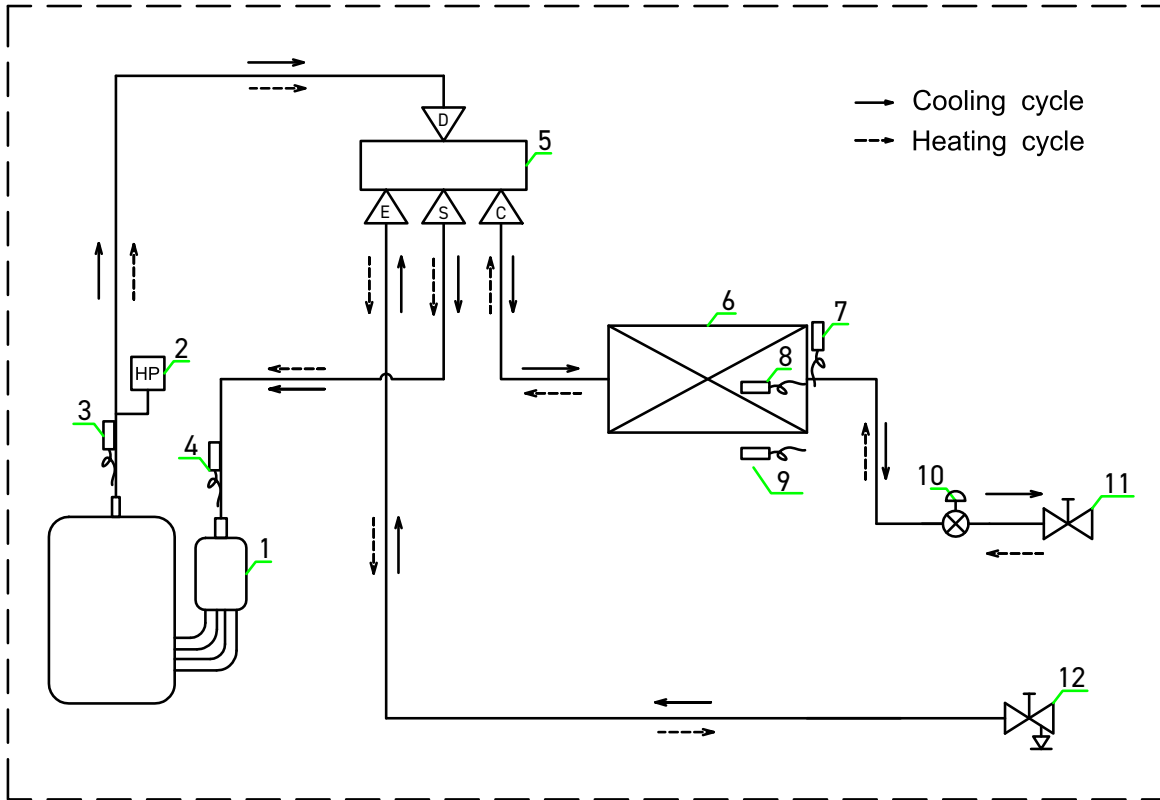


List of components	
1	Compressor
2	Suction temperature sensor
3	Discharge temperature sensor
4	4-way valve
5	Outdoor heat exchanger
6	Ambient temperature sensor
7	Coil temperature sensor
8	Electronic expansion valve
9	Stop valve (Liquid)
10	Stop valve (Gas)

Figure 232

SPECIFICATIONS

Refrigerant Cycle 24k Outdoor Units

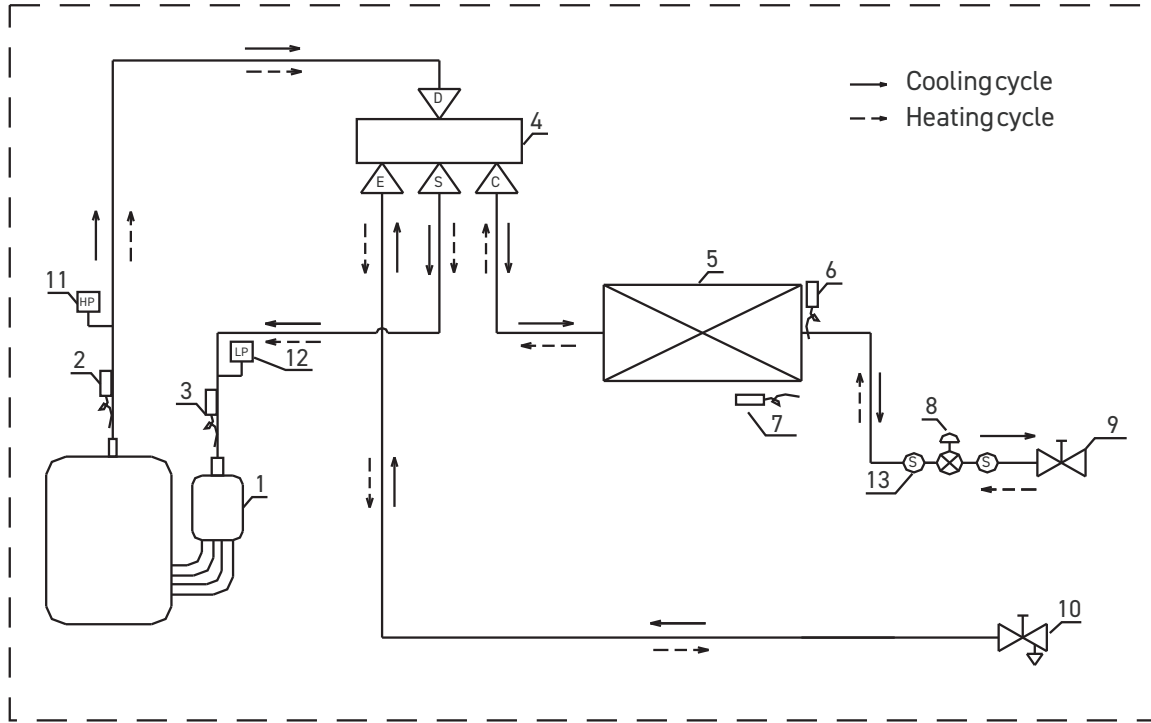


List of components			
1	Compressor	7	Coil temperature sensor
2	High pressure switch	8	Defrost temperature sensor
3	Discharge temperature sensor	9	Ambient temperature sensor
4	Suction temperature sensor	10	Electronic expansion valve
5	4-Way valve	11	Stop valve (Liquid)
6	Outdoor heat exchanger	12	Stop valve (Gas)

Figure 233

SPECIFICATIONS

Refrigerant Cycle 36k Outdoor Units

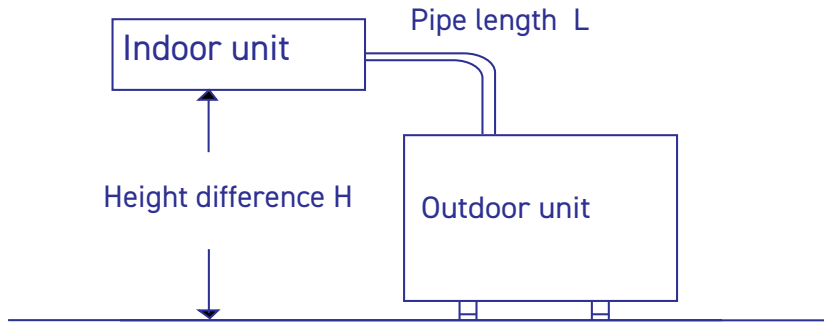


List of component names			
1	Compressor	8	Electronic expansion valve
2	Discharge temperature sensor	9	Stop valve
3	Suction temperature sensor	10	Stop valve
4	4-Way valve	11	High pressure switch
5	Outdoor heat exchanger	12	Low pressure switch
6	Coil temperature sensor	13	Strainer
7	Ambient temperature sensor		

Figure 234

CORRECTION FACTORS

Height Correction Factors



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')	19.05 (3/4')
90° Elbow	0.15	0.2	0.25	0.35

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

CORRECTION FACTORS

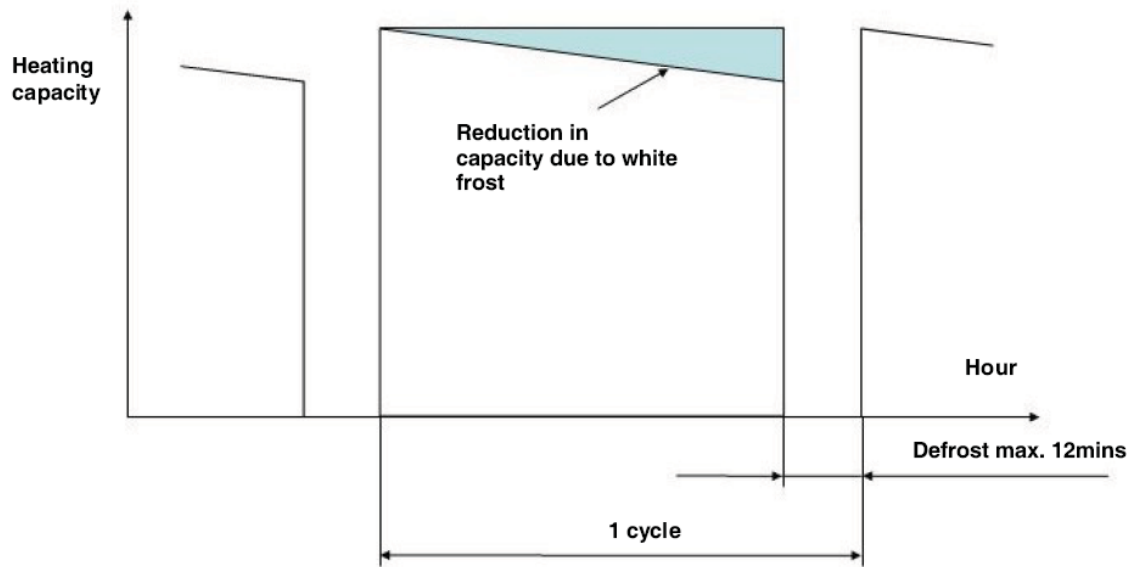
Correction factors according to defrosting operation

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)	0.84	0.92	0.95	0.95	1.0	1.0	1.0

Correction Factor



NOTE:

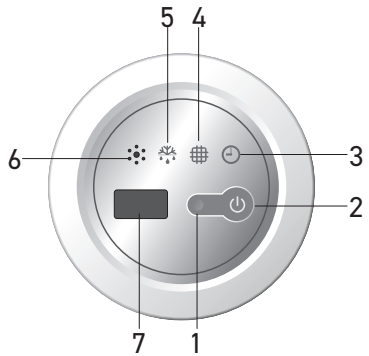
Correction Factor is not valid when the outdoor unit is covered or encapsulated with snow.

OPERATION

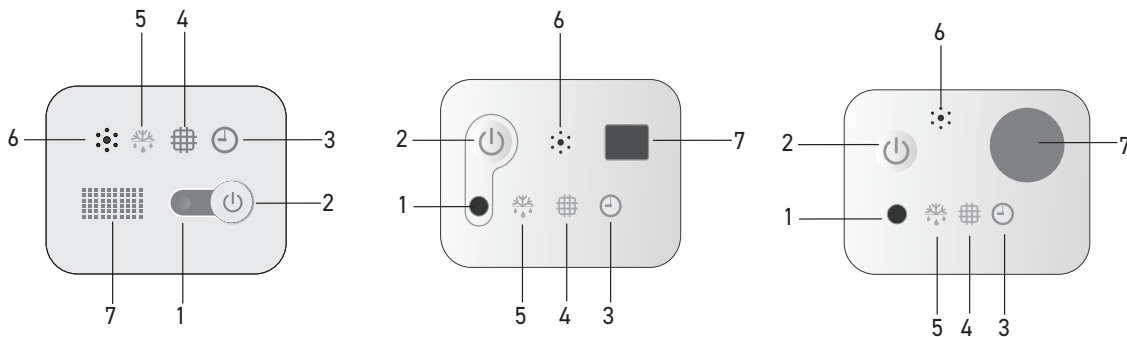
Display Panel

Display panel

DuctType



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

Cassette Remote Control Button Identification

The remote controller transmits signals to the system.

SMART (Multizone system not capable of auto change over function)

Used to enter auto change over operation directly, regardless if the unit is on or off.

POWER
System ON/OFF

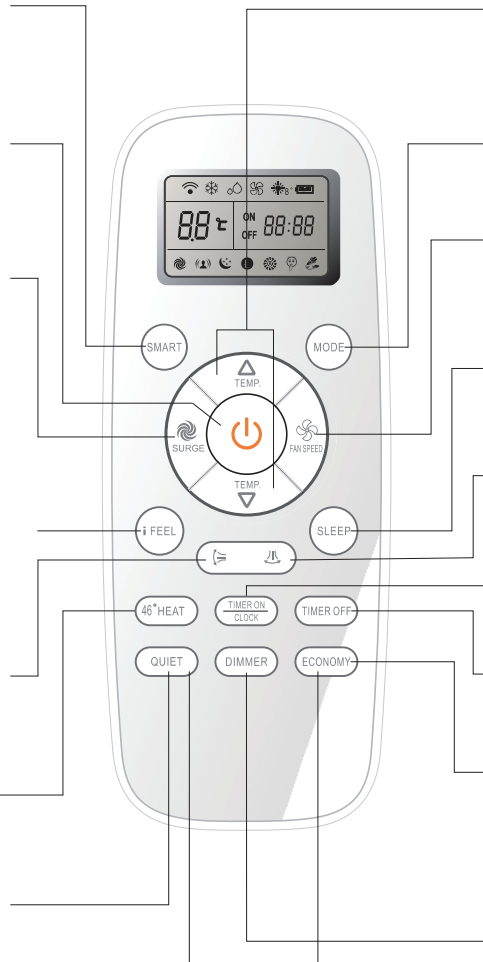
SURGE
Used to start or stop the fast cooling/heating. (Fast cooling operates at high fan speed with 61°F set temp automatically; Fast heating operates at auto fan speed with 86°F set temp automatically)

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. If the IFEEL function can't be shut off, please try to press this button about 5 seconds.

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

46° HEAT (optional)
Used to set 46° HEAT Mode.

QUIET
Used to set or cancel Quiet Mode operation.
Press both **Quiet** and **Economy** buttons for 5 seconds to disable the heat pump function



TEMP + -
Used to adjust the room temperature and the timer and time

MODE
Press this button to select the operation mode.

FAN
Used to select fan speed in sequence auto, highest, high, medium, low and lowest.

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	46° 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	ON 88:88 Display set timer
Signal transmit	Ifeel	88 °C Display temperature	OFF 88:88 Display current time	Battery power indicator

Note: Each mode and relevant function will be further specified in following pages.

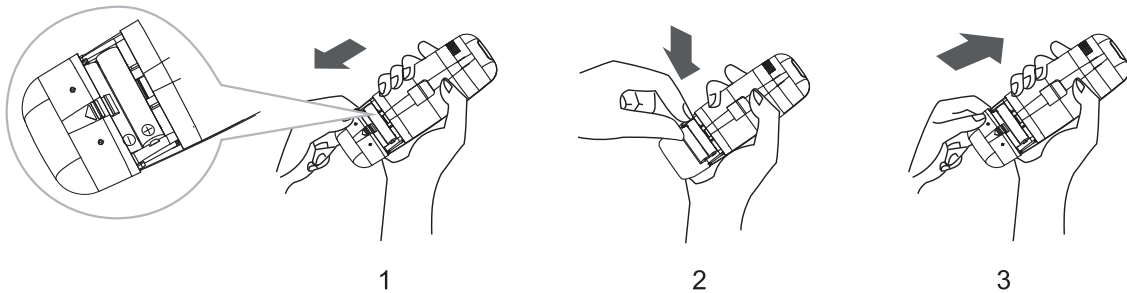
OPERATION

Cassette Remote Control

Batteries

◆ How to Insert the Batteries

1. Remove the battery cover according to the arrow direction.
2. Insert new batteries making sure that the (+) and (-) of battery are matched correctly.
3. Reattach the cover by sliding it back into position.



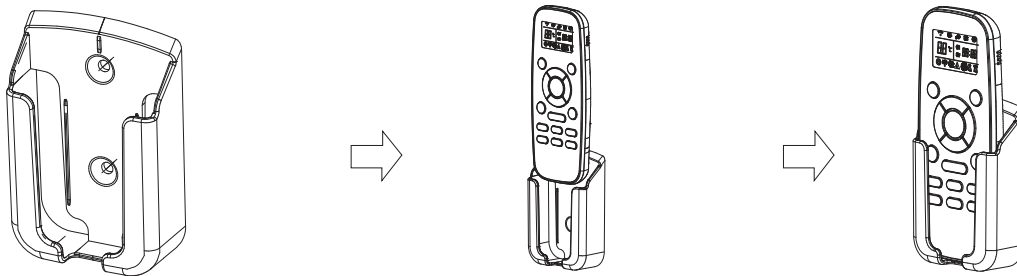
Note:

- Use 2 LR03 AAA(1.5volt) batteries. Do not use rechargeable batteries. Replace batteries with new ones of the same type when the display becomes dim.

◆ Storage and Tips for Using the Remote Controller

The remote controller may be stored mounted on a wall with a holder.

Note: The remote controller holder is an optional part.



◆ How to Use

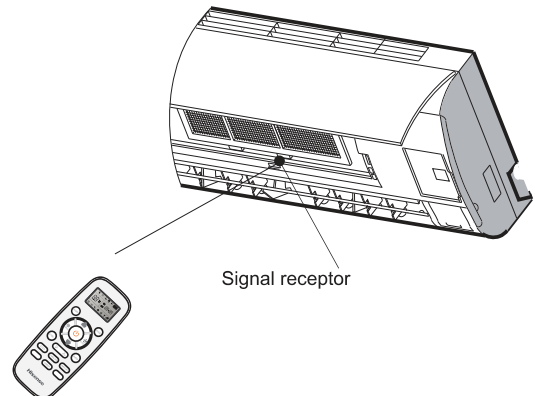
To operate system, point remote directly at unit (audible beep should sound when buttons are pressed). The remote can operate system up to 23ft away without interference.

⚠ CAUTIONS

For appropriate signal transmission between remote controller and indoor unit, keep the signal receiver away from the following items:

- Direct sunlight or other strong lights or heat
- Flat panel television screen or other electrical appliances that react to the remote controller

Additionally, the air conditioner will not operate if curtains, doors or other materials block the signals from the remote controller to the indoor unit. If the signal may not be transmitted properly, either move these materials or consult your local dealer.



OPERATION

Cassette Remote Control

Operation Modes

◆ Selecting mode

Press  button

Result : The operation modes changed in sequence:

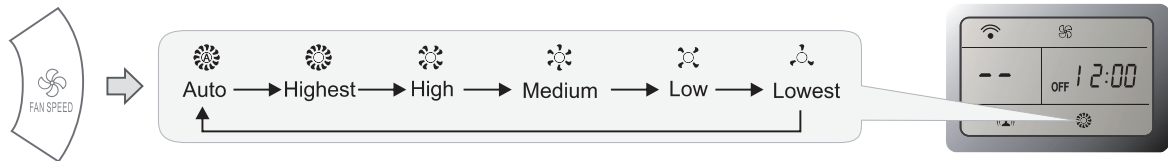


☑ **Heating mode is NOT available for cooling only air conditioner.**

◆ FAN mode

Press  button

Result : The fan speed is changed in sequence:



☑ **At "FAN ONLY" mode, the "AUTO" is not available.**
At "DRY" mode, Fan speed is set at "AUTO" automatically, "FAN" button is ineffective in this case.

◆ Setting temperature

Press  button once

Result : Raise temperature setting by 1°F

Press  button once

Result : Lower temperature setting by 1°F



Range of available set temperature	
*HEATING, COOLING	61°F~86°F
DRY	19°F~45°F
FAN ONLY	unable to set

*Note: Heating mode is NOT available for cooling only models.
 *Note: At "Dry" mode, a decrease or rise of up to 45°F can be set with Remote controller if you still feel uncomfortable.

◆ Turning on

Press  button.

Result : The RUN indicator of the indoor unit lights up.

SWING, SMART, TIMER ON, TIMER OFF, CLOCK, 46° HEAT, SLEEP and SURGE operation modes will be specified in the following pages.

- ☑ • Changing modes during operation, sometimes the unit does not response at once. Wait 3 minutes.
- During heating operation, air flow is not discharged at the beginning. After 2—5 minutes, the air flow will be discharged until temperature of indoor heat exchanger rises.
- Wait 3 minutes before restarting the appliance.

OPERATION


Cassette Remote Control

Airflow direction Control

Vertical airflow(Horizontal airflow) Blade angle will adjust based on remote setting.

Operation mode	Direction of airflow
COOLING, DRY	horizontal
*HEATING, FAN ONLY	downward




The direction of airflow can be also adjusted by pressing the "  " button of the remote controller.

**Heating mode is only available for heat pump models.*


◆ Vertical airflow control (with the remote controller)

Use remote to adjust blade/louver angles.

Press "  " button once.

Result : The vertical adjustment louver will swing up and down automatically.



Press "  " button again .

Result : The louvers swing to a suitable angle as desired.




◆ Horizontal airflow control (with the remote controller)

Use remote to adjust blade/louver angles.

Press "  " button once.

Result : The horizontal adjustment louver will swing left and right automatically.



Press "  " button again .

Result : The louvers swing to a suitable angle as desired.



OPERATION

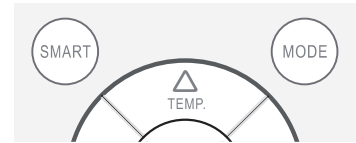
Cassette Remote Control

Smart Mode

◆ How to set SMART mode?

Press the  button.

Result : Enters **SMART** mode(auto change over operation) regardless of the units ON/OFF status. Temperature and fan speed are automatically set based on actual room temperature.





Heat pump models

Indoor temperature	Operation mode	Target temperature
70°F or below	HEATING	72°F
70°F-73°F	FAN ONLY	
73°F-79°F	DRY	Room temperature decrease 2°F after operate for 3 minutes
Over 79°F	COOLING	79°F

- ☑ **SMART mode will not work when system is set to SURGE Mode.**
 - ☑ **Pressing MODE will cancel SMART mode.**
- Note: Temperature, airflow and direction are controlled automatically in SMART mode. However, you can choose an offset of -7 to 7 if SMART mode preset is not comfortable.*

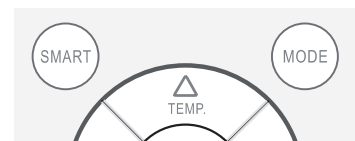
◆ What you can do in SMART mode?

Issue	Button	Adjust
Not enough air flow in SMART mode.		Indoor fan speed alternates among Highest, High, Medium, low and Lowest each time when this button is pressed.
Airflow is not directed properly.		Pressing SWING button once will change blade/louver position, pressing SWING again will stop swing function.

◆ How to cancel the SMART mode?

Press the  button.

Result : The SMART mode will be cancelled.



OPERATION


Cassette Remote Control

46°Heat Mode

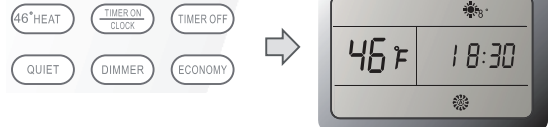
46°HEAT mode is used to set 46° heating mode.

In 46°HEAT mode, the fan speed is set at "AUTO" automatically.

◆ How to set 46°HEAT mode?

Press  button at the heating mode.

Result : The 46° heat mode will be started.



◆ How to cancel 46°HEAT mode?

Press any button except for ,  and .

Result : The display  will disappear and the 46°HEAT mode will be cancelled.

Note:

In 46°HEAT mode, the default temperature is set 46°F.

46°HEAT mode can be set only when the air conditioner works in the heating mode.

SURGE mode

SURGE mode is used to start or stop fast cooling or heating.

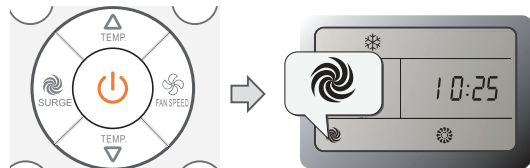
SURGE mode can be set when the appliance is in operation or in standby.

In SURGE mode, you can set airflow direction or timer.

◆ How to set SURGE mode?

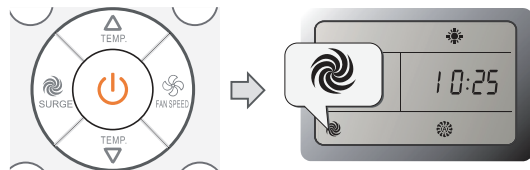
Press  button in cool mode.

Result : At higher fan speed ,the set temperature automatically to 61°F



Press  button in heat mode.

Result : At auto fan speed ,the set temperature automatically to 86°F



◆ How to cancel SURGE mode?

Press SURGE , MODE, FAN, ON/OFF,SLEEP or TEMPERATURE SETTING button.

Result : Display will return to previous mode
Exit from SURGE mode.



Note:

SMART button is not available in SURGE mode.

Surge mode will operate for 15 minutes unless user cancels the function.

OPERATION

Cassette Remote Control

Timer Mode

TIMER ON/CLOCK and TIMER off.

◆ How to set **TIMER ON?**

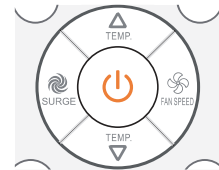
1. Press  button.

Result : "ON 12:00" flashes on the LCD.



2. Press the  or  button.

Result : Pressing UP/DOWN button once will change minutes, long press will adjust by block of tens. To set hours hold button to reach desired hour.



3. When your desired time displayed on LCD, press the **TIMER ON** button and confirm it.

Result : A "beep" can be heard.
"ON" stops flashing.
The **TIMER** indicator on the indoor unit lights up.



4. Timer will be displayed on the remote for 5 seconds and set time will reappear.

◆ How to cancel **TIMER ON?**

Press the  button again.

Result : A "beep" can be heard and the indicator disappears, the time on mode has been canceled.

Note: It is similar to set **TIMER OFF**, you can make the appliance switch off automatically at your desired time.



QUIET mode

In this mode, the air conditioner will work with low noise performance by low compressor frequency and low fan speed.

Note: Press **MODE, FAN, SMART, SURGE** button can cancel **QUIET** mode.



ECONOMY mode

In this mode, the air conditioner will bring you energy saving performance by lowering operating current.

OPERATION

Cassette Remote Control

Clock Button

◆ How to adjust the real time?

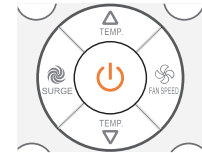
1. Press  button about 3 seconds.


Result : The time flashes on the LCD.



2. Press  and  buttons.

Result : Pressing UP/DOWN button once will change minutes, long press will adjust by block of tens. To set hours hold button to reach desired hour.



3. Press  button again about 3 seconds.

Result : The real time is set.



IFEEL mode

The built temperature sensor will sense the surrounding temperature, and transmit this back to the unit. This temperature will be your set point until you make another adjustment to the set point.

◆ How to set IFEEL mode ?

Press the  button.


Result : The transmit signal in the display will appear, and the IFEEL function will be started.



Note:

*Place remote in a location where the signal will be well received by unit.
IFEEL should be used to adjust room temperature for momentary comfort.
To get the best efficiency from your system allow the unit to operate at a set point.
This will allow the system to fluctuate with the changing room loads.*

◆ How to cancel IFEEL mode?

Press the  button once again.

Result : The transmit signal in the display will disappear, and the IFEEL function will be shut off.




Note:

If IFEEL function fails to cancel, try holding button for 5 seconds.

Dimmer button

◆ How to set the DIMMER ?

Press the  button to turn off the light and the display in the unit.

Note:

If light is set to off a request from the remote to change a function will turn it on again. User will need to turn it off if that is the desired condition.



OPERATION

Cassette Remote Control

Sleep Mode

SLEEP mode can be set in **COOLING** ,**HEATING** or **DRYING** mode.

This function gives you a more comfortable environment for sleep.

- The appliance will stop operation automatically after operating for 8 hours.
- Fan speed is automatically set at low speed.

◆ How to set **SLEEP** mode ?

Each time  button is pressed.

Result : The operation mode is changed in sequence:



SLEEP mode 1:

- Set temperature will rise by 2°F at most if the appliance operates in cooling mode for 2 hours constantly, then keeps steady.
- Set temperature will decrease by 2°F at most if the appliance operates in heating mode for 2 hours constantly, then keeps steady.

SLEEP mode 2:

- Set temperature will rise by 2°F if the appliance operates in cooling mode for 2 hours constantly, decrease by 1°F after 6 hours, then decrease by 1°F after 7 hours.
- Set temperature will decrease by 2°F if the appliance operates in heating mode for 2 hours constantly, rise by 1°F after 6 hours, then rise by 1°F after 7 hours.

SLEEP mode 3:

- Set temperature will rise by 1°F if the appliance operates in cooling mode for 1 hour , rise by 2°F after 2 hours, then decrease by 2°F after 6 hours, decrease by 1°F after 7 hours.
- Set temperature will decrease by 2°F if the appliance operates in heating mode for 1 hour , decrease by 2°F after 2 hours, then rise by 2°F after 6 hours, rise by 2°F after 7 hours.

SLEEP mode 4:

- Set point will remain steady.

Note: Press SURGE , SMART, MODE or FAN button cancel SLEEP mode.

Note: By pressing "Sleeping mode" four times, or selecting other modes like SURGE, SMART, OR FAN, you could cancel the sleeping function of those units without four sleeping curves.

Note: Heating is NOT available for cooling only air conditioner.

OPERATION

Indoor Unit Control Mode

Main general technical parameters

- (1) Remote receiver distance: 8 m.
- (2) Remote receiver angle: Less than 80 degrees.
- (3) Temperature control accuracy: ± 1 .
- (4) Time error: Less than 1%.

Functions of the control function

(1) Emergency switch

Pressing the emergency button can start or stop the unit, or the unit can start up according to the automatic mode of operation. Press this button to turn ON the unit, the unit will run in auto mode, and press it again to turn the unit off. When the unit is OFF, press and hold the emergency switch for 5 seconds, with 3 beeps, the indoor unit would turn to emergency running. In such situation, the unit would be forced to turn to cooling operation with high speed, the flaps sweeping and the unit's operation is irrelevant with room temperature.

If a remote signal has been received during the emergency run, the machine will operate upon the command of such a remote signal

(2) Operator-machine communication.

The air conditioner and remote controller is provided with a temperature sensor. The remote controller on the temperature sensor detects the default settings of room temperature. 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.

(3) Timer function

A. Timer on

When set to start in a time 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.

B. Timer off

When set to stop in a set time 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.

C, Neither the turning on nor turning off operation will cancel the timer function.

(4) Sleep

A. In the heating, cooling or dehumidifying mode, press the "Sleep" button on the remote controller to start or cancel the sleep function in turn, and at the same time the sleep icon on the display screen will be on or off accordingly.

B. In the heating mode, the set temperature will decrease automatically after the sleep function is started.

C. In the cooling mode, the set temperature will rise automatically after the sleep function is started.

D. By default, the setting is to cancel the sleep function. Turning off the unit will also cancel the sleep function.

(5) Highly efficient run function (only for some remote controller)

In Cooling, Dehumidification, Fan mode, press the "HIGH POWER" to enter the refrigeration mode, set the temperature automatically adjusting to lowest temp; the Fan speed is powerful speed; frequency is high frequency operation.

In heating mode, press the "HIGH POWER" to enter the refrigeration mode, set the temperature automatically to adjust to highest temp.; the Fan speed is powerful speed; frequency is high frequency operation.

Mute function (only for some remote controller)

In the indoor unit operation mode, you may turn on or turn off mute function with mute key. The air conditioner will run with mute fan speed in mute mode.

(6) Prevention cooling wind prevention mode

In the heating-run, to prevent the indoor fan from blowing cold air, the indoor fan will stop or run slowly until the coil is warm.

(7) Blowing waste heating and waste cooling function

In the heating mode, when the air conditioner is turned off, the indoor heat exchanger temperature is still higher, so the air conditioner will run the waste heat.

In the cooling and dehumidification mode, after the compressor stops, indoor unit will continue to set the speed of operation for a period of time.

(8) Dehumidifying method:

If remote control setting is in dehumidifying mode, indoor unit is forced to run at low speed (high power key or a strong bond also maintains a low wind speed), and the outdoor unit runs according to the refrigeration mode operation.

OPERATION

Indoor Unit Control Mode

(9) Auto re-start 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 /canceled with wired remote controller.

For details, see internal control parameter adjustment.

Fault code

The fault code can be shown by LED lamps or will display on the wired controller. 2.11 Filter cleaning

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

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

For details, see internal control parameter adjustment.

OPERATION

Outdoor Unit Control Mode

Control function

Cooling Anti-Freeze Protection

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

Overload Protection

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

Exhaust temperature protection

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

Oil-return Control

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

Operation Mode

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

Four-way Valve Control

Four-way valve of the outdoor unit shuts down when cooling and defrosting but starts when heating. During the heating process, the four-way valve stops working for a period of time after compressor is disconnected.

Start-up Protection

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

Pressure Protection

When the pressure increases to a preset value, the pressure switch will automatically protect the unit. The compressor will stop and report the fault code protection.

OPERATION

Control Logic Description

- (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.

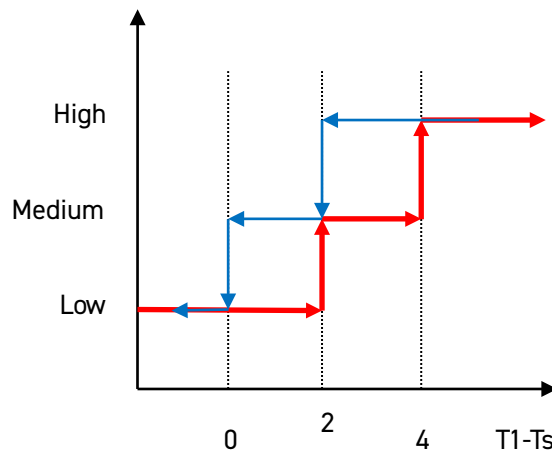
Cooling Mode

Indoor fan running rules:

In cooling mode, indoor fan 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.



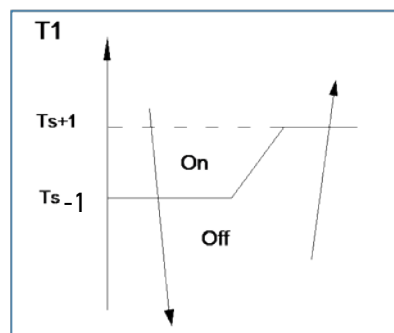
Inverter outdoor unit:

Compressor and outdoor fan running rules:

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 running rules:

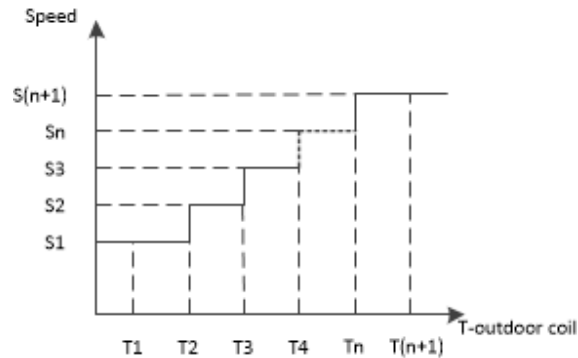
Once the outdoor fan start up, it will follow the below rules:

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

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

OPERATION

Control Logic Description



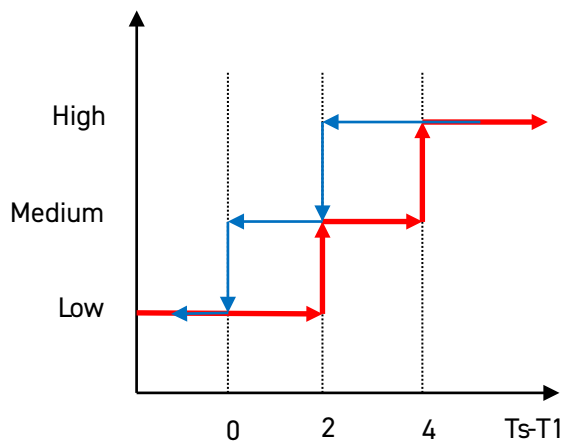
Heating Mode

Indoor fan running rules:

The indoor unit fan will not run until the indoor unit heat exchanger reaches a high enough temperature. This is because the cold air prevention system is operating. After several minutes, the speed can be selected to high, medium, low, or auto.

The auto fan:

T1 is indoor room temperature. Ts is setting temperature.



DC-Inverter outdoor unit :

Outdoor fan running rules:

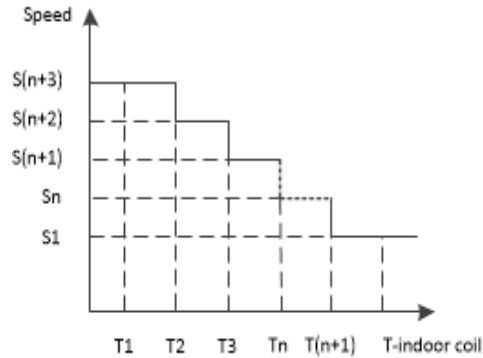
Once the outdoor fan start up, it will follow the below rules:

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

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

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

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 3.7^\circ\text{F}(3^\circ\text{C})$	Cooling
$27^\circ\text{F}(-3^\circ\text{C}) \leq \Delta T \leq 37^\circ\text{F}(3^\circ\text{C})$	Fan-only
$\Delta T < 27^\circ\text{F}(-3^\circ\text{C})$	Heating

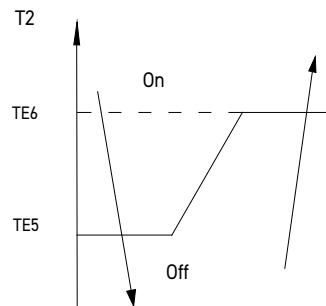
Indoor fan will run at auto fan of the relevant mode. The louver operates same as in relevant mode. If the compressor keeps stopping for 10 minutes or the setting temperature is modified, the machine will choose mode according to ΔT again.

Evaporator Low-temperature Protection

DC-Inverter

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

Condition:



Cooling mode: When the indoor coil temp. T2 keeps lower than TE5 for 120 seconds, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart.

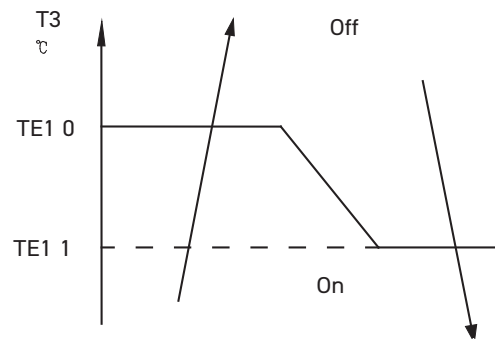
OPERATION

Control Logic Description

Condenser High-temperature Protection

DC -Inverter outdoor unit

AC will enter T3 protection if any of the following conditions is satisfied.



Condition1:

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

Condition2:

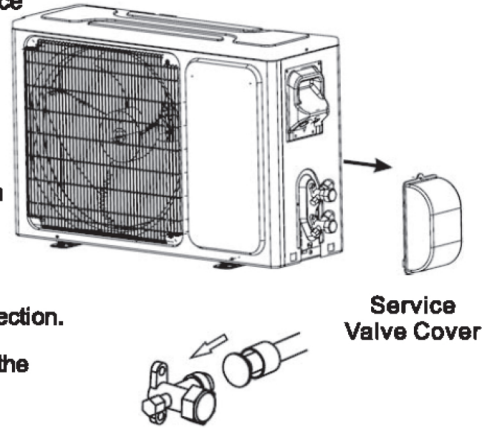
Heating mode: When the indoor coil temp. $T3$ keeps higher than $T2$ for 10 seconds, the compressor and outdoor fan will shut off. When $T3$ is lower than $T1$, the compressor and outdoor fan will restart up.

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:



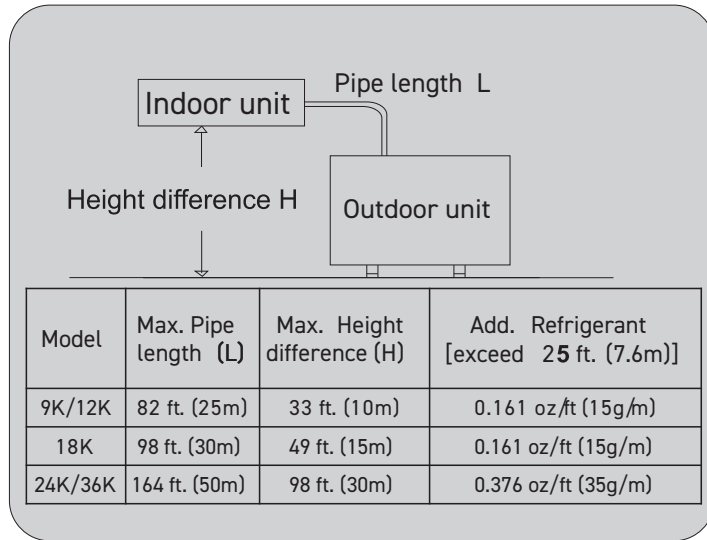
Torque Table

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

CAUTION: Over-tightening may damage flare connections and cause leaks.

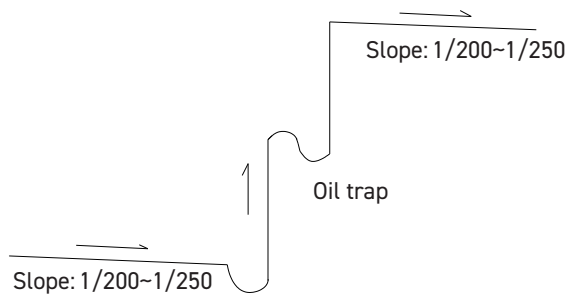
INSTALLATION

Piping Work and Refrigerant Charge



13.2 Oil trap

When the indoor unit is lower than outdoor unit and height difference is larger than 16.4 ft (5m), set an oil trap every 16.4 ft (5m) (height difference) on suction piping.



NOTE:

- 1) To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
- 2) The horizontal piping should slope down along the refrigerant flow direction, to bring the oil back to compressor, the slope is about 1/200 to 1/250.
- 3) 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 as shown in Fig.28. Start the vacuum pump and vacuum to 1000 microns. Close the valve to the vacuum pump and check for micron rise for 15 minutes. If microns rise to near atmospheric pressure, there is a potential leak; follow Section 8.7.A. If microns rise over 5000, the system is very wet and will require further nitrogen purges.

3. 2nd Nitrogen Break:

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

4. 2nd Vacuum Micron Test:

Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 500 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 1000 microns. Repeat 8.7.C and 8.7.D until achieved.

5. 3rd Nitrogen Break:

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

6. 3rd Final Vacuum Micron Test:

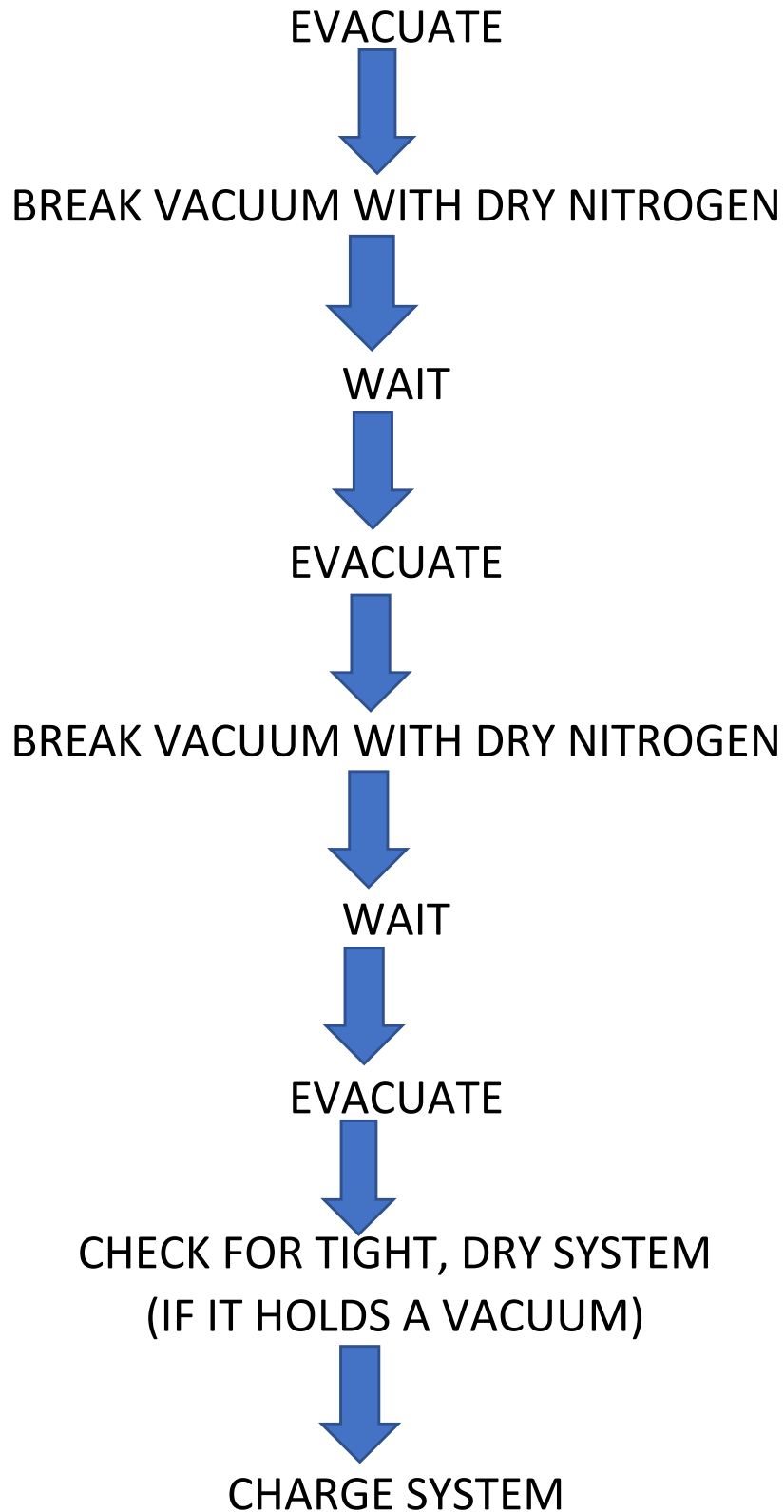
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 300 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 500 microns. Repeat 8.7.C and 8.7.D until achieved. Once held under 500 microns, the system is considered dry and tight.

7. Charging the system:

Unscrew Service Valve Caps to expose the inner hexagon head. Use an allen-head spanner or service wrench with appropriate adapter to release the refrigerant into the system. If the calculated line set length is over 24.9ft, weight in the additional charge with an approved refrigerant scale as needed (Fig.28B).

INSTALLATION

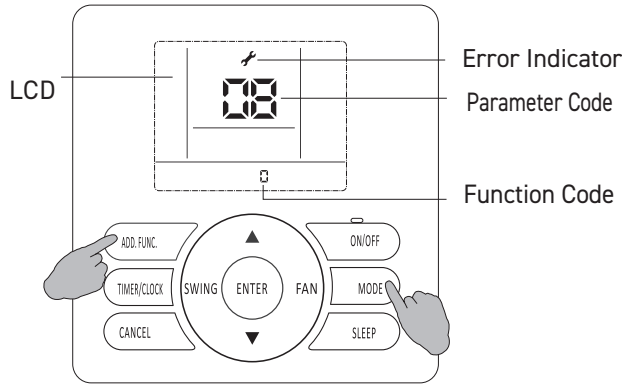
Leak Check, Evacuation, and Charging (Triple Evacuation)



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:

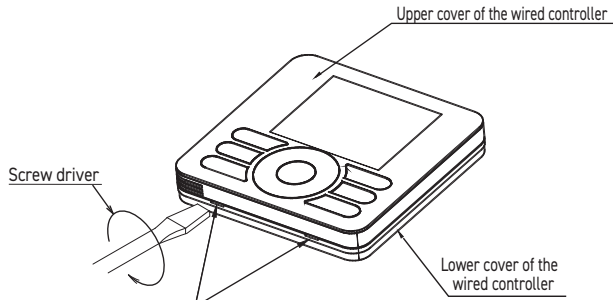
- 1 Hold down both "MODE" button and "ADD.FUNC." button for 3 seconds, symbol ⚡ and parameter code blinking at the same time.
- 2 Press "▲/▼" button to adjust parameter number until display "17", and press "ENTER" button to entering system parameter adaption state, symbol ⚡ stop blinking. button , and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

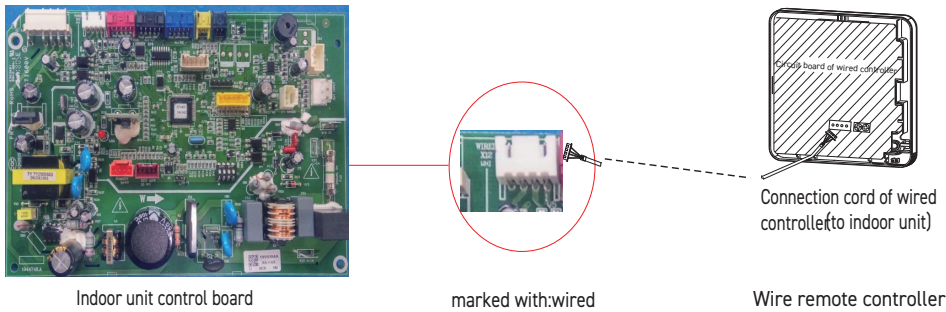


Insert a normal screw driver into the position, and gently rotate it. In this way, the upper cover can be easily removed.

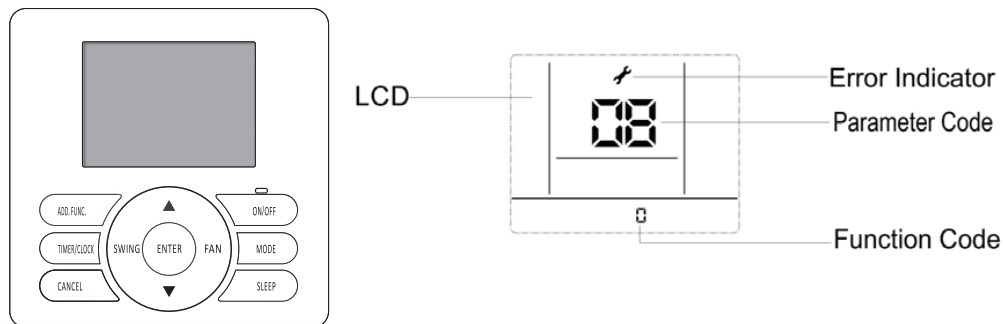
Note:

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 "ADD.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

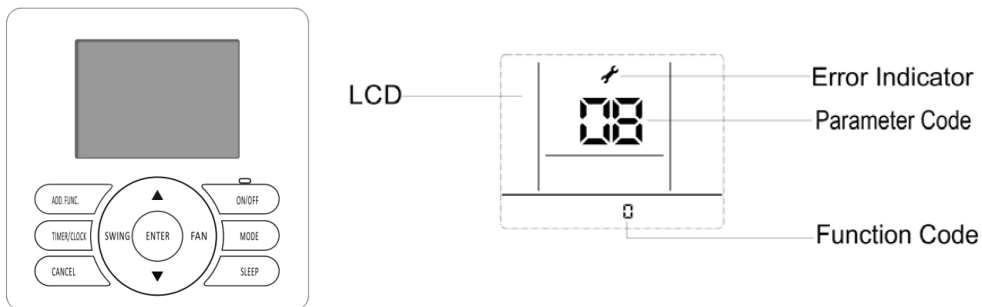
Field Settings (Running Parameter Query)

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.



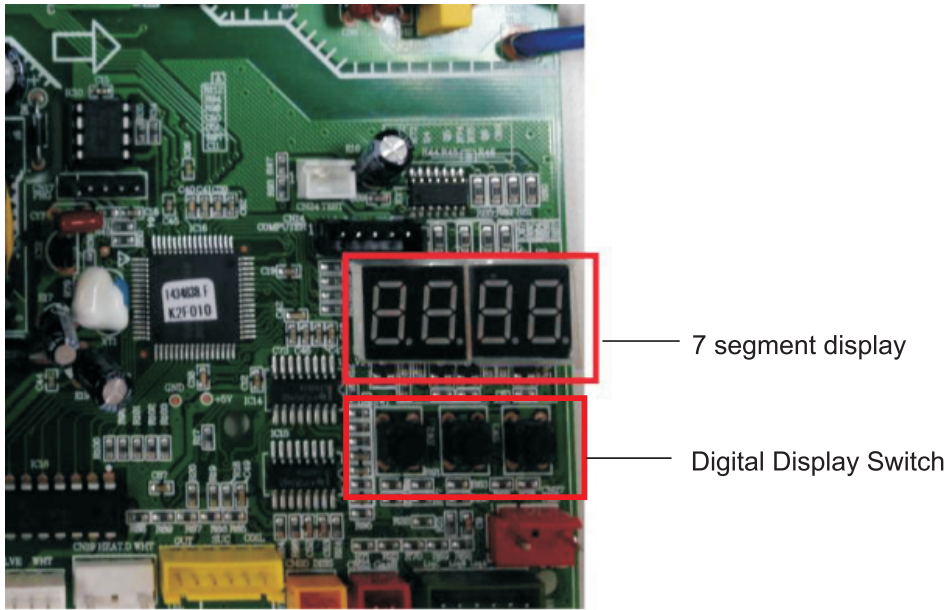
OPERATION:

- 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

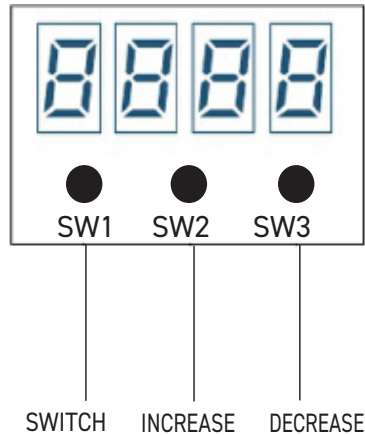
Field Settings (Query by 7 segment display)



DC-Inverter outdoor control board

7 segment display Introduction

It can be used to check outdoor running parameters.



There are 3 buttons on the digital display board :

- 1) SWITCH button: Indoor parameters and outdoor parameters can be selected in turn by pressing it.
“P.”-outdoor unit parameter, “H.”-indoor unit parameter;
- 2) INCREASE button: Each time it is pressed, the number rises by 1,hold down it, the number will be rapidly increased;
- 3) DECREASE button: Each time it is pressed, the number lowers by 1,hold down it, the number will be rapidly decreased.
- 4) The parameters will be displayed after 3s when the checking numbers are selected.

INSTALLATION

Field Settings (Running Parameter Query)

Parameters can be checked as following table below.

Parameter code	Descriptions
0	Protect Code or Fault code
P.1	Target Frequency
P.2	Driving Frequency
P.4	Outdoor EEV Opening
P.5	Outdoor EEV Target Opening
P.6	Upper DC Motor Revolving Speed
P.8	AC Input Voltage
P.9	Current
P.10	Modular Temperature
P.11	Capacity Needed
P.12	Modular Fault
P.20	Outdoor Ambient Temperature
P.21	Outdoor Coil Temperature
P.22	Outdoor Defrost Temperature
P.23	Suction Temperature
P.24	Discharge Temperature
H.1	Indoor Unit Fault
H.2	Indoor Ambient Temperature
H.3	Indoor Coil Temperature
H.4	Indoor Setting Temperature

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

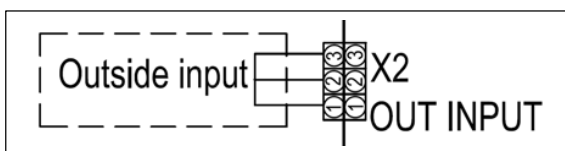


Figure 1 electrical wiring diagram

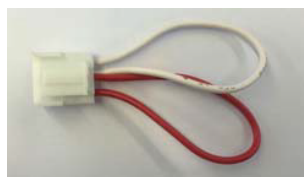


Figure 2 short wiring



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.)









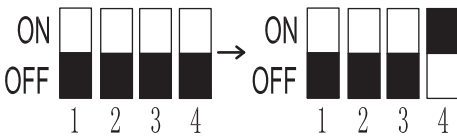




INSTALLATION

Field Settings Outdoor Unit Dip Switch

DIP Switch Setting of Outdoor Unit (24K/36K)

Turn off all power sources before setting. Without turning off, the switches settings are not refreshed and might be invalid. Mark of "■" indicates the position of DIP switches.

Setting is required

SW2-1	Refrigerant Piping Length Setting	SW2-4	Refrigerant Collection						
<div data-bbox="212 787 436 858" style="border: 1px solid black; padding: 2px;">Setting is required</div> <table border="1" data-bbox="212 884 846 1226"> <thead> <tr> <th colspan="2" data-bbox="212 884 846 957">Actual Piping Length L(m)</th> </tr> <tr> <th data-bbox="212 957 579 1026">L<15</th> <th data-bbox="579 957 846 1026">15≤L<Max. length allowed</th> </tr> </thead> <tbody> <tr> <td data-bbox="212 1026 579 1226"> Setting before shipment ON  OFF  1 2 3 4 </td> <td data-bbox="579 1026 846 1226"> ON  OFF  1 2 3 4 </td> </tr> </tbody> </table> <p data-bbox="191 1245 824 1312">After setting refrigerant piping length dip switch, cooling/heating performance can be improved.</p>		Actual Piping Length L(m)		L<15	15≤L<Max. length allowed	Setting before shipment ON  OFF  1 2 3 4	ON  OFF  1 2 3 4		
Actual Piping Length L(m)									
L<15	15≤L<Max. length allowed								
Setting before shipment ON  OFF  1 2 3 4	ON  OFF  1 2 3 4								

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

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

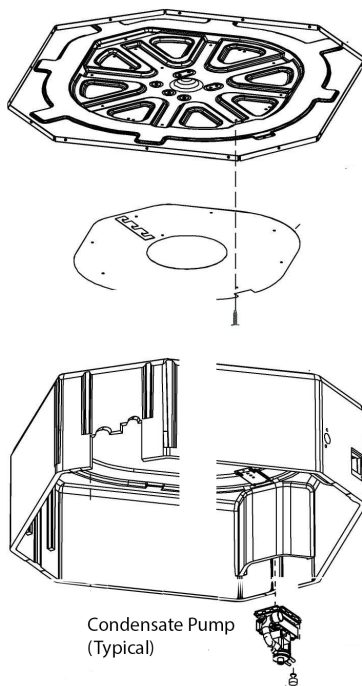
1. Do all Remote controller's buttons function properly?
2. Do the display panel lights work properly?
3. Does the swing louver function properly?
4. Does the drain work?

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) deg. 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

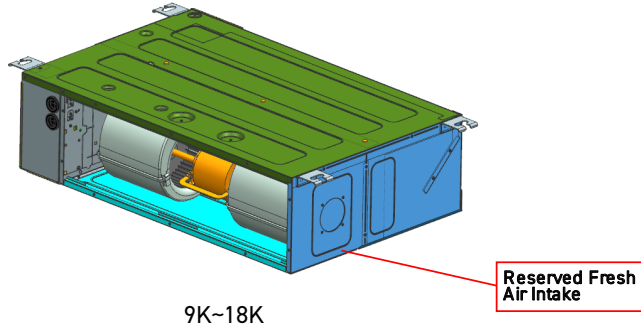
Fresh Air Intake

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.

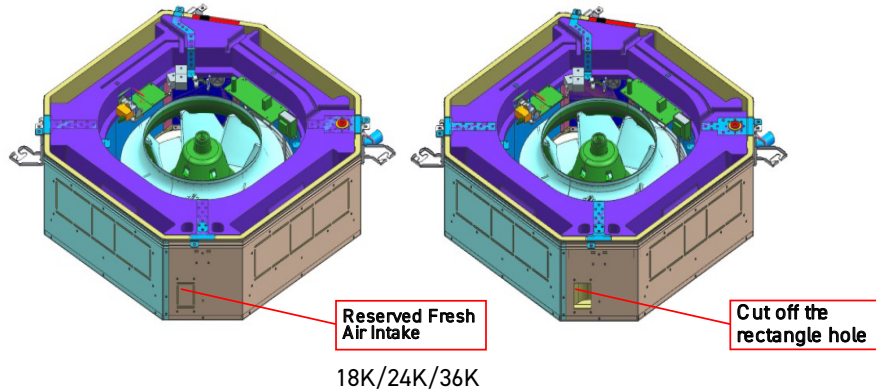
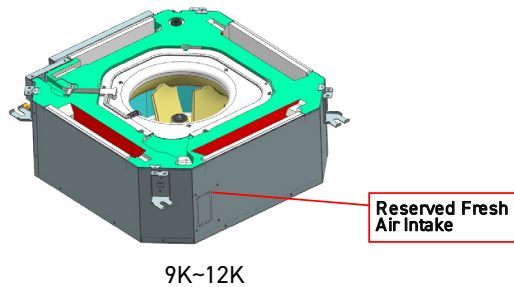


Cassette

It is possible to inhale 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) Connect air duct with the fresh air intake.



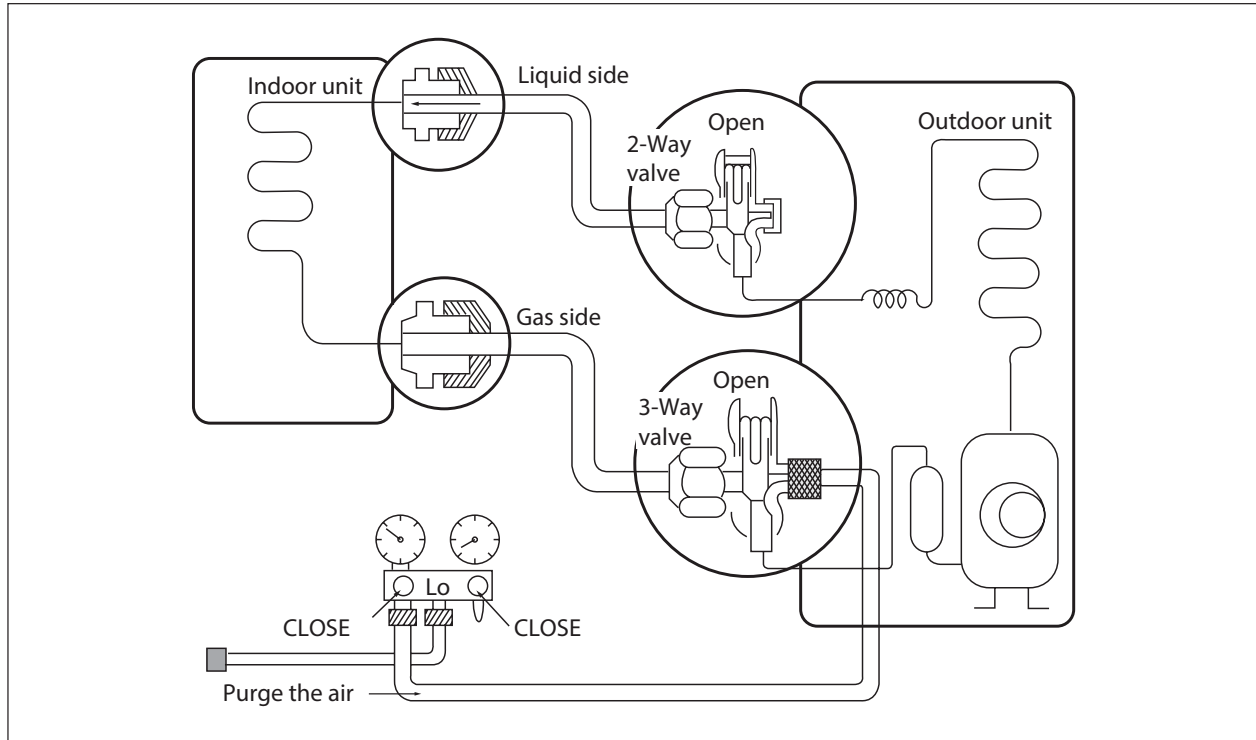
R-410A SEALED SYSTEM REPAIR

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 vacumm 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 on the cooling cycle and stop when the gauge indicates 14 PSI.

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

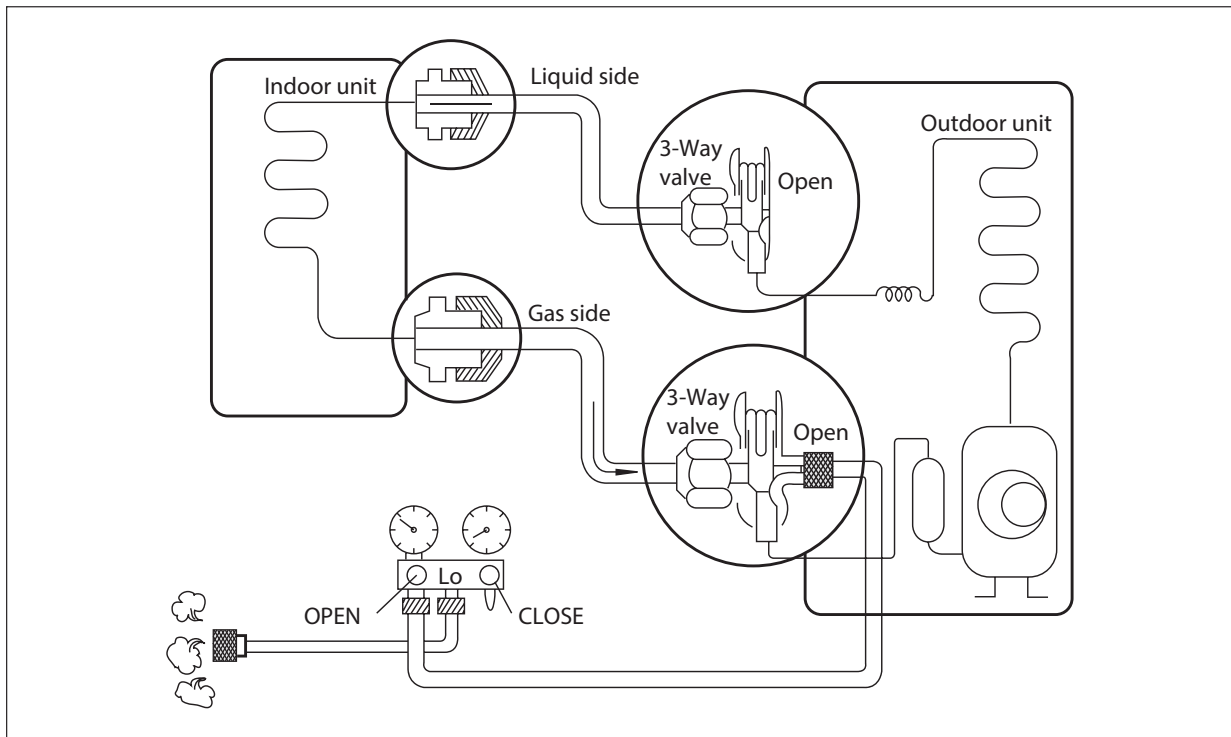
- Do this quickly so that the gauge ends up indicating 0-15 PSI.

(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.

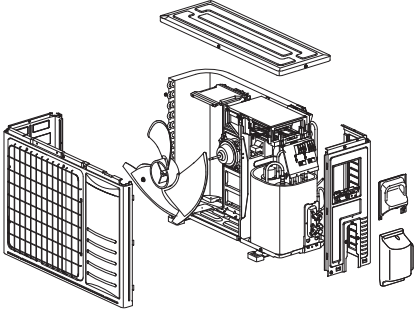
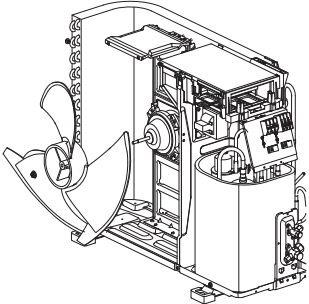
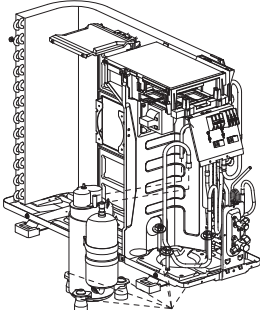
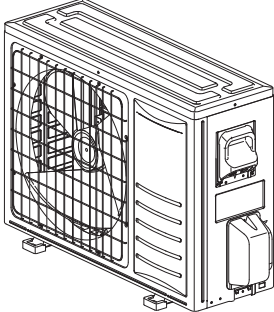
(5) Mount the valve stem nuts and the service port nut.

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

R-410A SEALED SYSTEM REPAIR

Replace 9-18k Outdoor unit Compressor and Motor

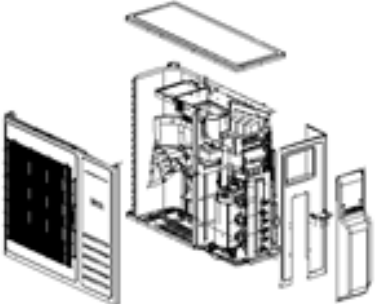
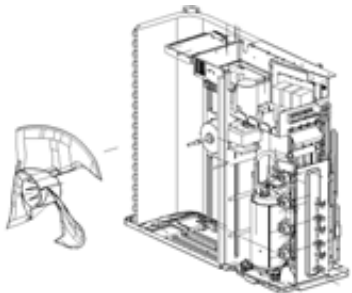
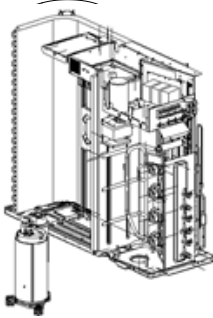
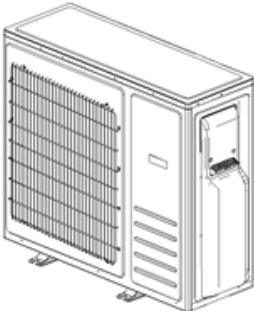
Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

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 assembly 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 24k Outdoor unit Compressor and Motor

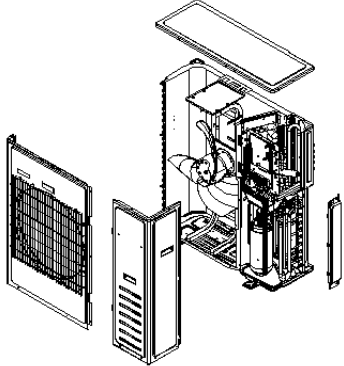
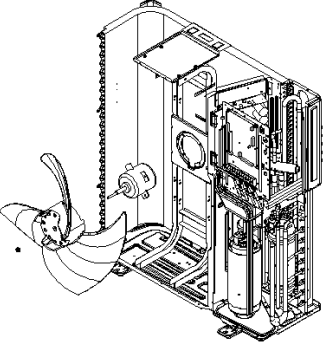
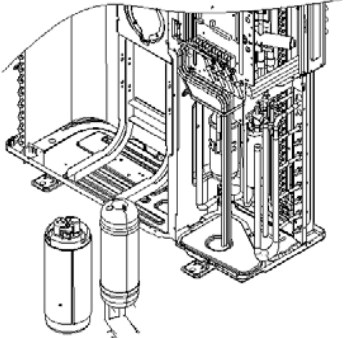
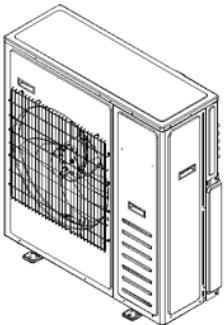
Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

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		<p>Assemble the unit in the reverse order of disassembly.</p>

R-410A SEALED SYSTEM REPAIR

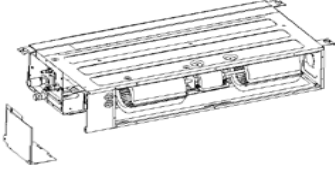
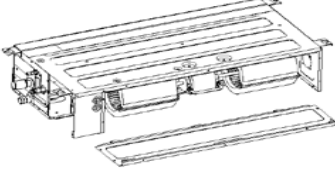
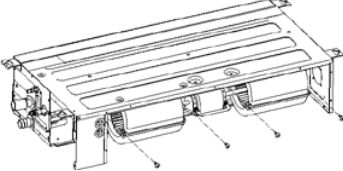
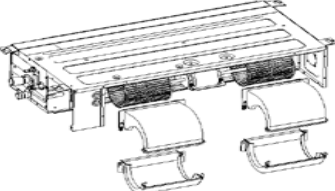
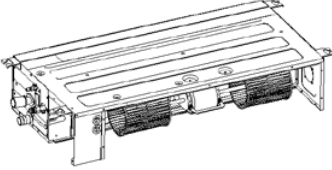
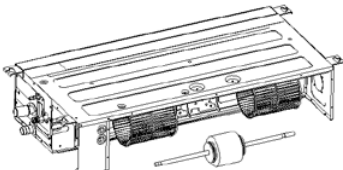
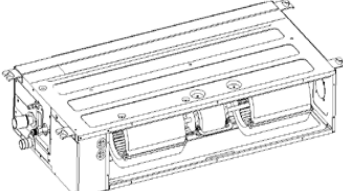
Replace 36k Outdoor unit Compressor and Motor

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

Step	Illustration	Handling Instruction
1. Remove external casing		<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>

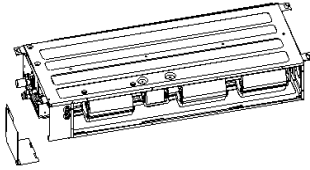
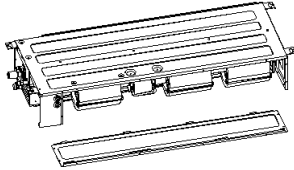
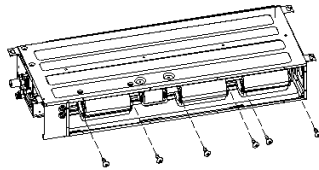
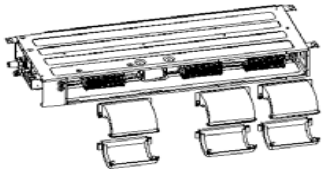
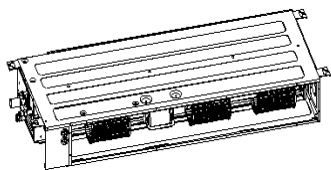
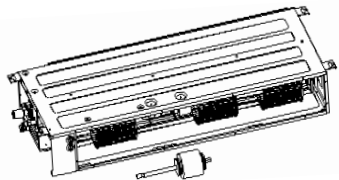
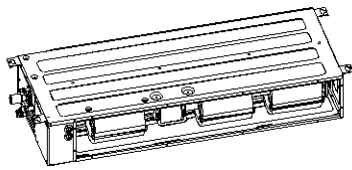
R-410A SEALED SYSTEM REPAIR

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.

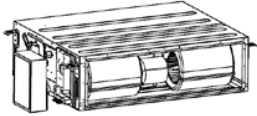
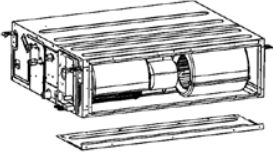
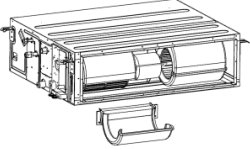
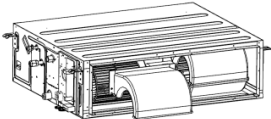
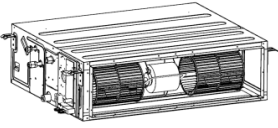
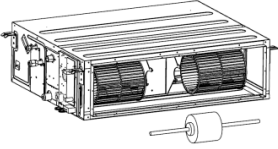
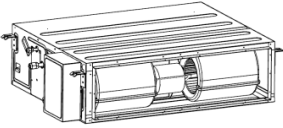
R-410A SEALED SYSTEM REPAIR

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.

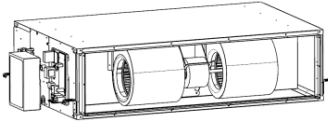
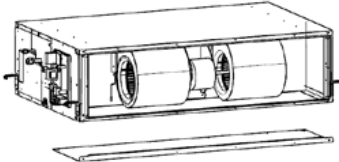
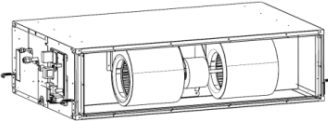
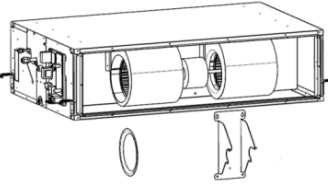
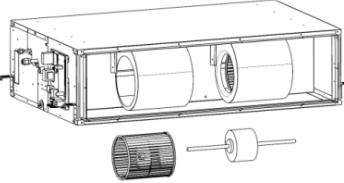
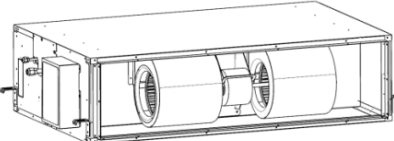
R-410A SEALED SYSTEM REPAIR

Replace 24k 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		Loosen 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.

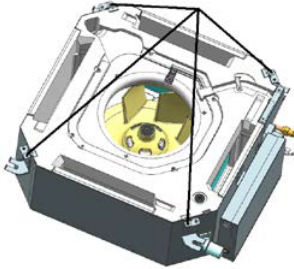
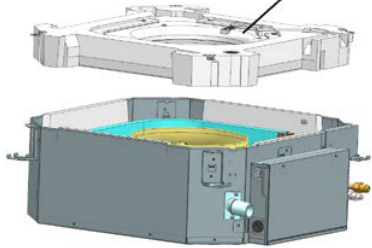
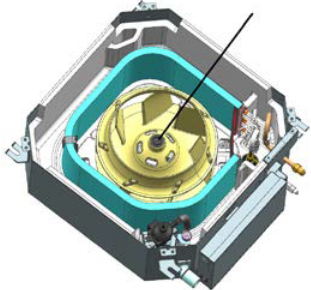
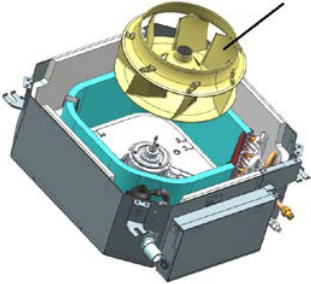
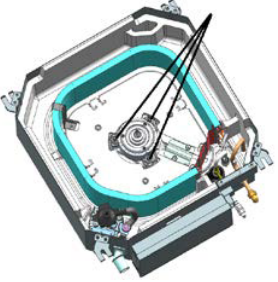
R-410A SEALED SYSTEM REPAIR

Replace 36k 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		Loosen and take out the screws fixing the base board, then remove the base board.
3. Loosen the fan and motor.		Use an offset spanner to loosen the screws holding the fan cage to the motor shaft. Remove outer housing holding motor in place.
4. Remove the diversion circle and support bracket.		Use screwdriver to remove the diversion circle and support bracket.
5. Replace the motor		Remove the fan cage from the motor shaft. Remove the motor from the air inlet and replace with new motor. Be sure to tighten the cages onto the motor shafts.
6. Reassembly of the unit		Reassemble the unit in the reverse order of disassembly and test operation.

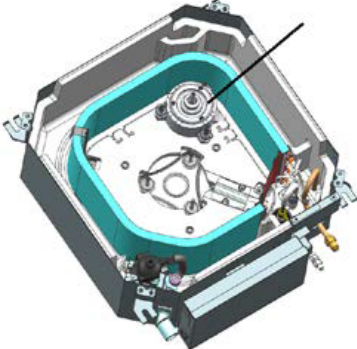
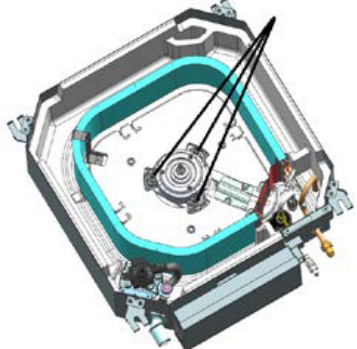
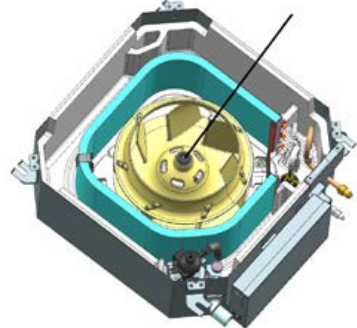
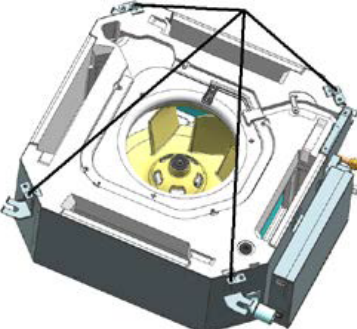
R-410A SEALED SYSTEM REPAIR

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.

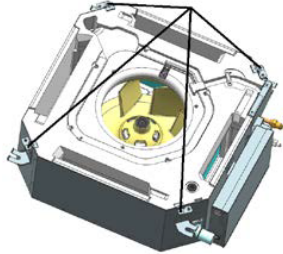
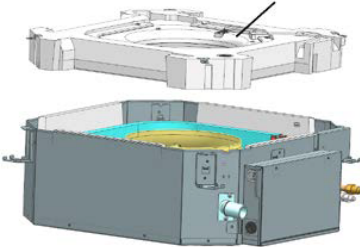
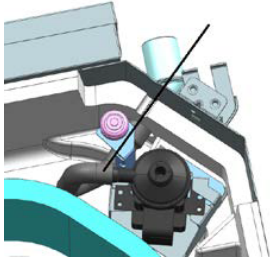

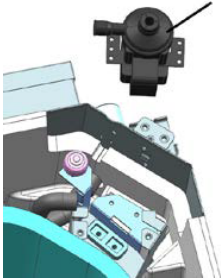
R-410A SEALED SYSTEM REPAIR

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.

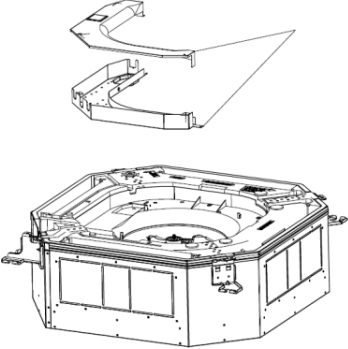
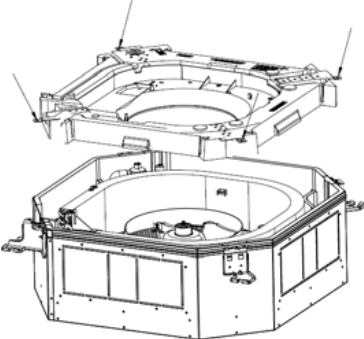
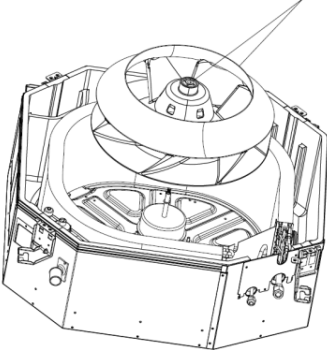
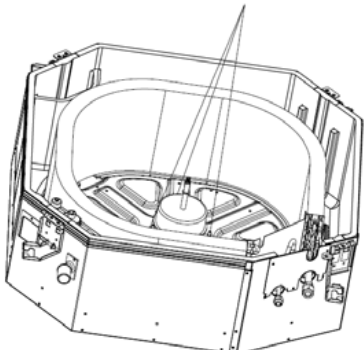
R-410A SEALED SYSTEM REPAIR

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>

TROUBLESHOOTING

Troubleshooting	Possible Reasons for 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 is 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.

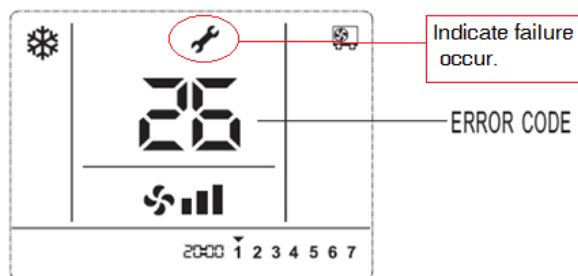
Troubleshooting according to fault codes

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

How to check fault codes

Indoor Unit

(1) Fault codes indicated by wired controller




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

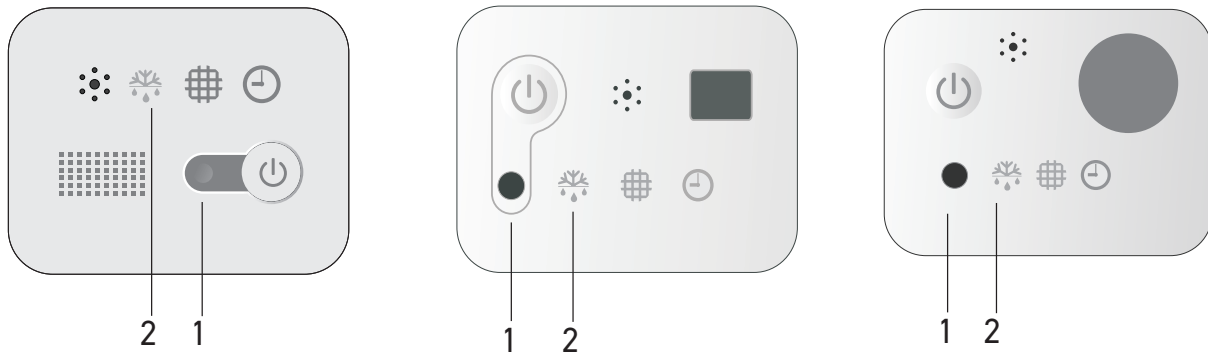
FIG1. FAULT CODE DISPLAY ON WIRE REMOT CONTROLLER

TROUBLESHOOTING

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

Lamp RUN (LED2, Red) and Lamp DEFROST (LED5, Green) flash. Lamp RUN displays fault code represented by 2-digit number, lamp DEFROST displays fault code represented by 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 flashing 3 times, reports No. 36 fault.

Display panel



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

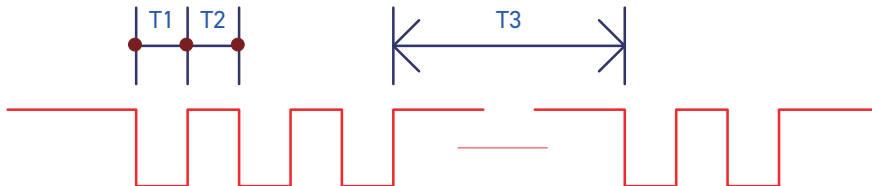


FIG. 2 LED flash control

TROUBLESHOOTING

9-18k Outdoor Unit

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

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

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

LED1 indicates fault code represented by 2-digit number, LED2 indicates fault code represented by single digit number and LED3 indicates outdoor drive control fault.

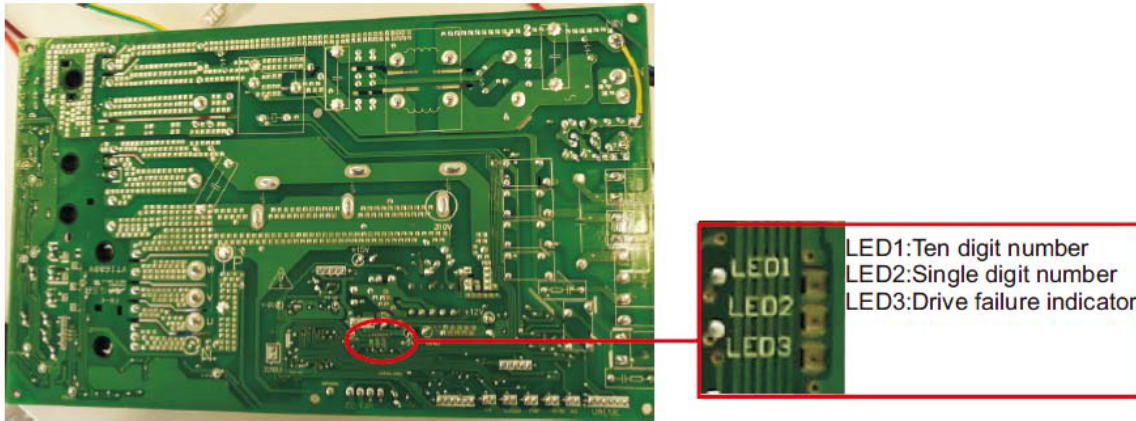
When LED3 is off, LED1 and LED 2 indicate main control fault code.

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

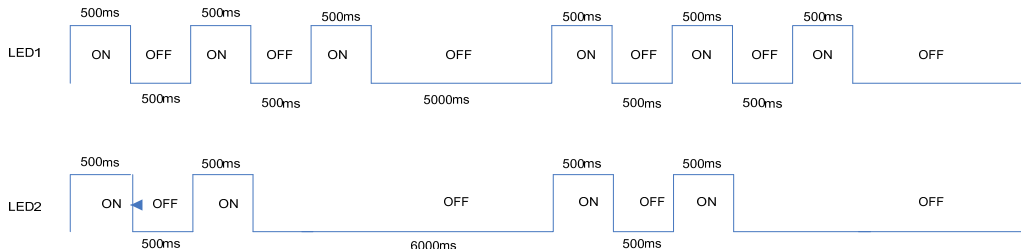
When LED3 is flickering and LED1, LED 2 are all off, indicate compressor is preheating. Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

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

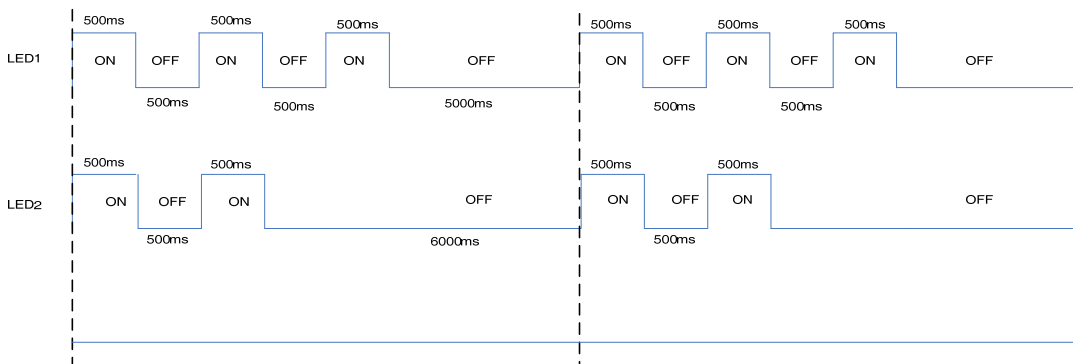
LED lamps will be off when there is no failure, protection or preheating.



For example, outdoor main control fault 32:



For example, outdoor drive fault 32:

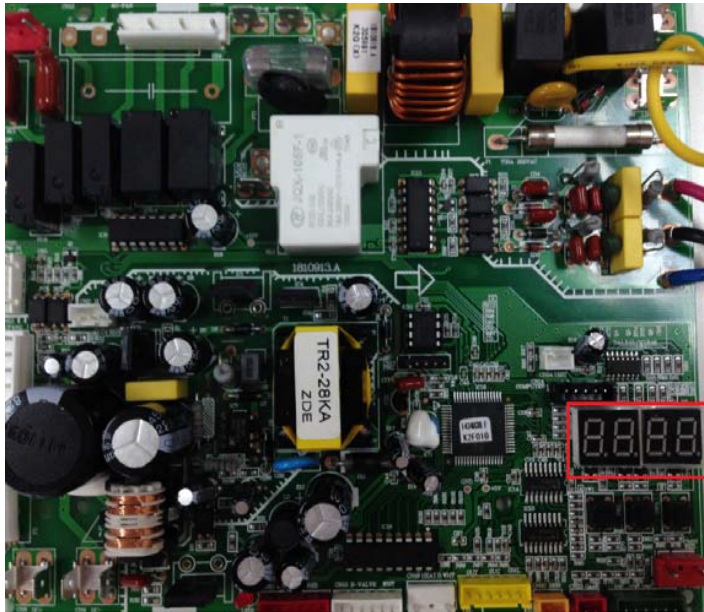


TROUBLESHOOTING

24-36k Outdoor Units

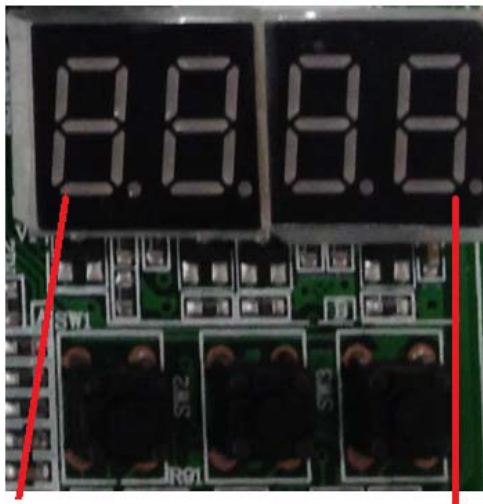
Main control fault display

Fault code will be displayed on digital tube board.



Outdoor Control Board

Digital Tube



E shows failure occur

Display ERROR Code

Drive fault code display

The lamp of drive board flashing shows failure occurs.

TROUBLESHOOTING

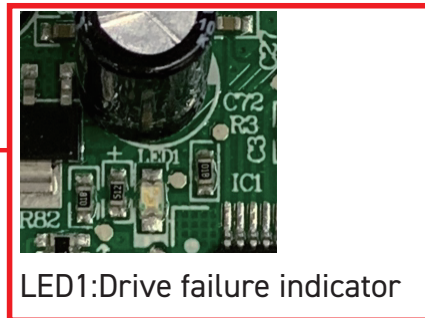
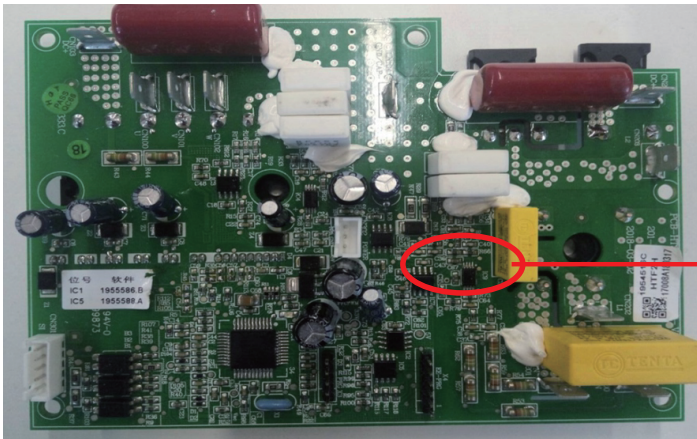
24-36k Outdoor Units

Drive fault code display

The lamp of drive board flashing shows failure occurs.

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

Single phase models:



LED1: Drive failure indicator

TROUBLESHOOTING

Outdoor Unit Fault Code

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	<ol style="list-style-type: none"> 1.The outdoor ambient temperature sensor is connected loosely; 2.The outdoor ambient temperature sensor fails to work; 3.The sampling circuit fails. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1.The outdoor coil temperature sensor is connected loosely ; 2.The outdoor coil temperature sensor fails to work; 3.The sampling circuit fails. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 . 	<ol style="list-style-type: none"> 1. Replace the electrical control board components; 2. Normal protection ; 3. Replace the compressor ; 4. Please see NOTE 3; 5. Please see NOTE 4. 	
4	EEProm Data error	<ol style="list-style-type: none"> 1.EE components fails; 2.EE components control circuit fails; 3.EE components are inserted incorrectly. 	<ol style="list-style-type: none"> 1.Replace the EE components; 2.Replace the outdoor control board components; 3.Reassemble the EE components. 	
5	Cooling freezing protection (the indoor coil temperature is too low) or heating overload (indoor coil temperature is too high)	<ol style="list-style-type: none"> 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 . 	<ol style="list-style-type: none"> 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. 	
7	The communication fault between the indoor unit and outdoor unit	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 	

TROUBLESHOOTING

Outdoor Fault Code

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
13	Compressor overheat protector device	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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 NOTE 3; 5. Please refer to NOTE 4. 	Applied to models with high pressure switch or pressure sensor
15	The low pressure switch protection or the unit is turned off for low pressure protection	<ol style="list-style-type: none"> 1. The wiring of the low pressure switch is connected loosely; 2. The low pressure switch fails; 3. The refrigerant is not enough; 4. The expansion valve fails in heating mode; 5. The outdoor control board is abnormal. 	<ol style="list-style-type: none"> 1. Reconnect the wiring of the low pressure switch; 2. Replace the low pressure switch; 3. Check the welding point to confirm whether the unit leaks, and add some refrigerant; 4. Replace the expansion valve; 5. Replace the outdoor control board. 	Applied to models with low pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to NOTE 3.	
17	Discharge temperature sensor fault	<ol style="list-style-type: none"> 1. The wiring of the discharge temperature sensor is connected loosely; 2. The discharge temperature sensor fails; 3. The sampling circuit is abnormal. 	<ol style="list-style-type: none"> 1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor; 3. Replace the outdoor control board. 	
18	AC voltage is abnormal	<ol style="list-style-type: none"> 1. The AC voltage >275V or <160V; 2. The AC voltage of sampling circuit on the driver board is abnormal. 	<ol style="list-style-type: none"> 1. Normal protection, please check the supply power; 2. Replace the driver board. 	
19	Suction temperature sensor fault	<ol style="list-style-type: none"> 1. The wiring of the suction temperature sensor is connected loosely; 2. The suction temperature sensor fails; 3. The sampling circuit is abnormal. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. The wiring of the defrosting sensor is connected loosely; 2. The defrosting sensor fails; 3. The sampling circuit is abnormal. 	<ol style="list-style-type: none"> 1. Reconnect the wiring of the defrosting sensor; 2. Replace the defrosting sensor; 3. Replace the outdoor control board. 	
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 5, table 6.	See attached "analysis of the driving board fault".	

TROUBLESHOOTING

Outdoor Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
46	IPM and control board communication fault	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Reconnect the cable between the control board and the driver board; 2. Replace the communication cable between the control board and the driver board; 3. Replace the driver board; 4. Replace the control board. 	
47	Too high discharge temperature fault	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check the welding point to confirm whether the unit has leakage point, and add some refrigerant; 2. Add some refrigerant referring to the installation user manual; 3. Replace the throttling service (such as capillary, expansion valve); 4. Normally protection. 	
48	The outdoor DC fan motor fault (upper fan motor)	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> 1. The connecting wiring of the down DC fan motor is loose; 2. The cord of the down DC fan motor fails; 3. The down DC fan motor fails; 4. The drive circuit of the down DC fan motor fails; 5. The outdoor fan has been blocked. 	<ol style="list-style-type: none"> 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. 	
91	The unit turn off due to the IPM board over heating fault	<ol style="list-style-type: none"> 1. The outdoor ambient temp. is too high; 2. The speed of the out fan motor is too low if the fan motor is AC fan motor; 3. The outdoor unit is not installed in accordance with the standard; 4. The supply power is too low. 	<ol style="list-style-type: none"> 1. Normal 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. Normal protection. 	
96	Lacking of refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	
97	4-way valve commutation failure fault	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	

TROUBLESHOOTING

Indoor Unit Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
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 is connected loosely; 3. The water level switch fails; 4. The control board fails. 	<ol style="list-style-type: none"> 1.1 Check whether there is something blocking 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 fails; 2. Reconnect the cable of the water level switch referring 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 operation mode for the indoor unit, for with one outdoor unit, the user should avoid setting the conflicting operation mode with the indoor units.	
64	Communication between Indoor & Outdoor unit Fault	<ol style="list-style-type: none"> 1. The indoor unit and the outdoor unit are not connected properly; 2. The communication cable is connected loosely; 3. The communication cable between the indoor unit and the outdoor unit is failure or the cable between the indoor control board to terminal fails or the cable between the outdoor control board to the terminal fails; 4. The indoor control board fails; 5. The outdoor control board fails. 	<ol style="list-style-type: none"> 1. Reconnect the connection cable referring to the indoor and outdoor wiring diagram; 2. Reconnect the communication cable referring to the indoor and outdoor wiring diagram; 3. Replace the communication cable referring to the indoor and outdoor wiring diagram; 4. Replace the indoor control board; 5. Replace the outdoor control board. 	
71	Indoor unit zero check fault	<ol style="list-style-type: none"> 1. The motor wire is loosen; 2. The motor connection is open; 3. The motor fails; 4. Control board fails. 5. Indoor fan is baffled. 	<ol style="list-style-type: none"> 1. Replace the motor wire and make sure the wire connect is well; 2. Replace the motor wire; 3. Change the motor; 4. Change the indoor control board; 5. Check and elimination of fan motor rotation. 	
72	Indoor fan motor fault	<ol style="list-style-type: none"> 1. The cable of the indoor fan motor is connected loosely; 2. The cable of the indoor fan motor fails; 3. The indoor fan motor fails; 4. The indoor control board fails. 	<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 fails; 2. The control circuit of the EE components fails; 3. The EE components has been inserted in 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 Unit Fault Codes

Fault code	Fault Description	Possible Reason of Abnormality	How to Deal With	REMARKS
12	voltage absent phase	Three-phase power is abnormal; The outdoor wiring connect wrong; The outdoor control board is failure.	1. Normally protection 2. Check the wiring connection refer to the wiring diagram; 3. Replace the outdoor control board	Application of three-phase power supply models
13	Compressor overheat protector device	1. The wiring of the overload protector connect loose. 2. The overload protector is failure . 3. The refrigerant is not enough; 4. The installation pipe is too long than normal, but not add the enough refrigerant; 5. The expansion valve is failure; 6. The outdoor control board is failure	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 operate or the unit turn off for high pressure protection	1. The wiring of the high pressure protector connect loose; 2. The high pressure protector is failure; 3. The outdoor control board is abnormal; 4. Overload in cooling; 5. Overload in heating.	1. Reconnect the wiring 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.	
17	Discharge temperature sensor fault	1. The wiring of the discharge temperature sensor connect loose; 2. The discharge temperature sensor is failure; 3. The sampling circuit is abnormal.	1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor; 3. Replace the outdoor control board.	
18	AC voltage is abnormal	1. The AC voltage >275V or <160V. 2. The AC voltage of sampling circuit on the driver board is abnormally	1. Normally protection, please check the supply power; 2. Replace the driver board.	
19	Suction temperature sensor fault	1. The wiring of the suction temperature sensor connect loose; 2. The suction temperature sensor is failure; 3. The sampling circuit is abnormally	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 connect loose; 2. The defrosting sensor is failure; 3. The sampling circuit is abnormally	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.	

TROUBLESHOOTING

Indoor Unit Fault Codes

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
74	Indoor EEPROM Data 2 fault	EE in MCU fails, the unit can run, but the function user has set is ineffective.	Replace EE data in MCU.	
81	Indoor ambient Temperature Sensor Fault	<ol style="list-style-type: none"> 1. The cable of the room temperature sensor is connected loosely; 2. The room temperature sensor fails; 3. The sampling circuit is abnormal. 	<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 fails; 2. The coil temperature sensor of the evaporator fails; 3. The sampling circuit is abnormal. 	<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 & Wired controller Fault (display on wired controller)	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	
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 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. 	<ol style="list-style-type: none"> 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. 	

TROUBLESHOOTING

Indoor Unit 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 it within allowable temperature range
3	Short-circuit occurs in the air outlet and air inlet of the outdoor unit.	Adjust the installation of the outdoor unit referring to the user manual.
4	The outdoor heat exchanger is dirty, such as condenser.	Clean the heat exchanger of the outdoor unit, such as condenser.
5	The speed of the outdoor fan motor is too low.	Check the outdoor fan motor and fan capacitor.
6	The outdoor fan is broken or the outdoor fan is blocked.	Check the outdoor fan.
7	The air inlet and outlet 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

Drive fault code (3.0/3.5HP)

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

TROUBLESHOOTING

Drive Fault Code (24K/36K)

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. The compressor is short of oil, and the crankshaft is worn seriously; 6. The compressor insulation fails.	1. Check the compressor wire; 2. Change the driver board; 3. Turn on the unit after the pressure is balanced again; 4. Change the compressor; 5. Change the compressor; 6. Change the compressor.
2	Phase current detection, failure in drive control	1. Compressor voltage default phase; 2. Bad driver board components; 3. The compressor insulation fault.	1. Check the compressor wire connection; 2. Change the driver board; 3. Change the Compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change the driver board.
4	Speed estimation, failure in drive control	1. Bad driver board components; 2. Compressor shaft is clamped; 3. The compressor insulation fails.	1. Change the driver board; 2. Change the Compressor; 3. Change the Compressor.
5	IPM FO output fault	1. System overload or current overloads. 2. Driver board fails; 3. The compressor is short of oil, and the crankshaft is worn seriously; 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 connection is not well; 2. Driver board fault; 3. Control board fault.	1. Check the 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 the 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 the 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 is abnormal, power frequency is 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 at 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. The compressor is short of oil, and the crankshaft is worn seriously; 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. The compressor is short of oil, and the crankshaft is worn seriously; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the Compressor; 4. Change the Compressor.
14	PFC over current (single phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1. 3-Phase voltage imbalance; 2. The 3-phase power supply phase lost; 3. Power supply wiring is wrong; 4. Driver board fault.	1. Check the power supply; 2. Check the power supply; 3. Check the power supply wiring 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.

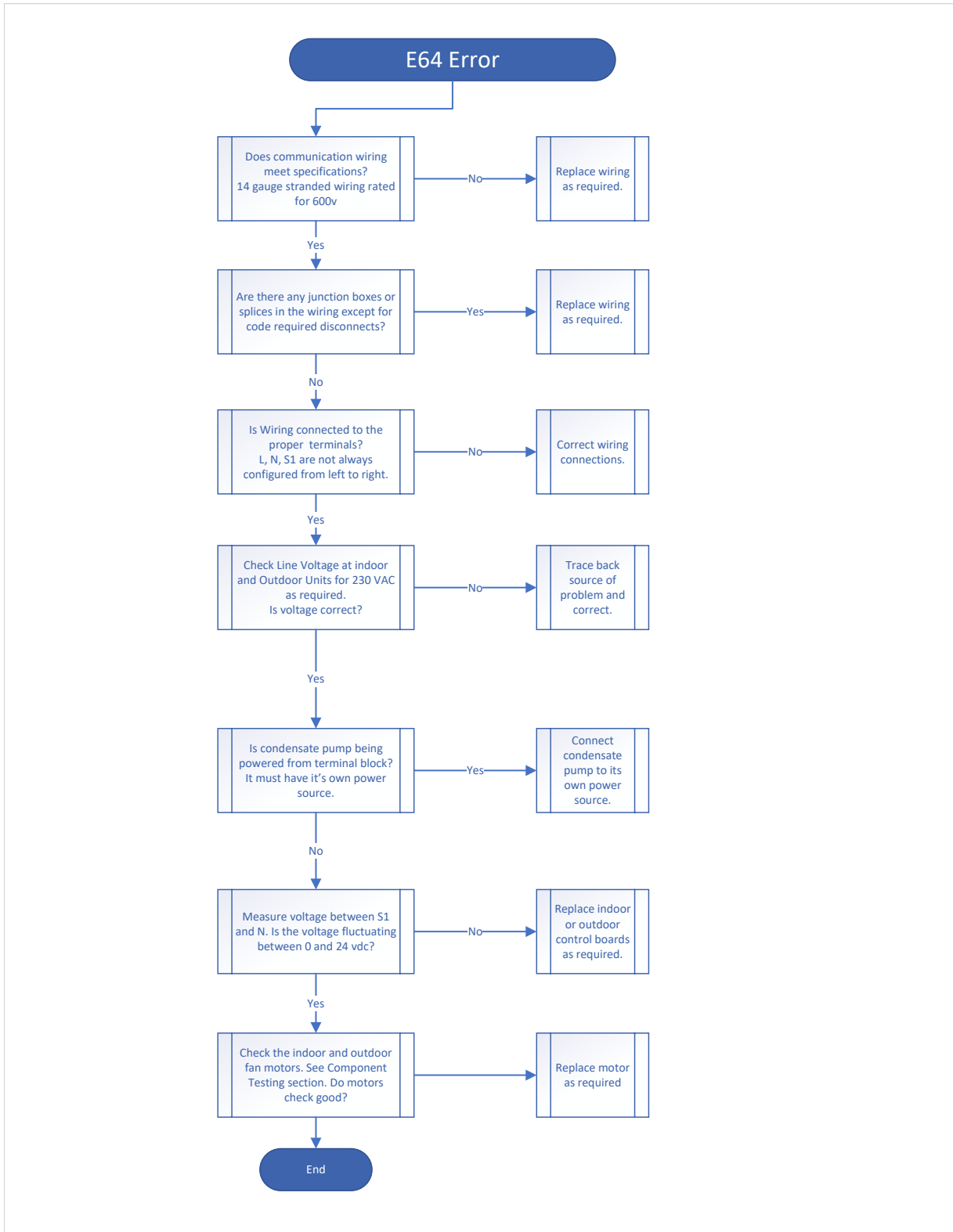
TROUBLESHOOTING

Drive Fault Code (24K/36K)

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 ly	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

E64 Fault Code



See Figure 701

TROUBLESHOOTING

E64 Fault Code

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

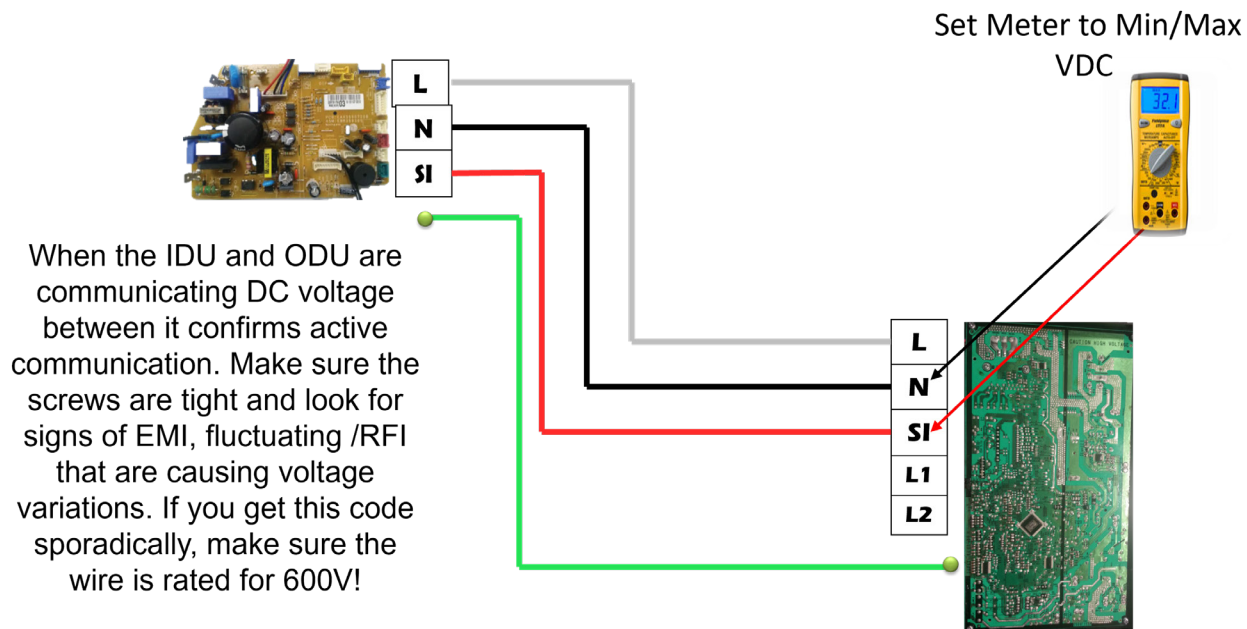


Figure 701

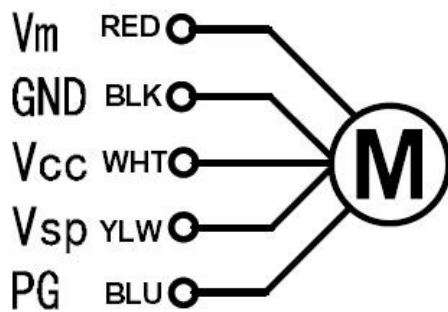
COMPONENTS TESTING

Indoor Unit Fan Motor

Check parts unit

1. Indoor unit fan motor
Duct motor model (DC motor)
9K/12K/18K: SIC-68CVL-F160-2

Cassette motor model (DC motor)
9K/12K: SIC-62FW-D857-15
18K/24K: EHDS50AQH
36K: SIC-72FW-D8124-2B



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:

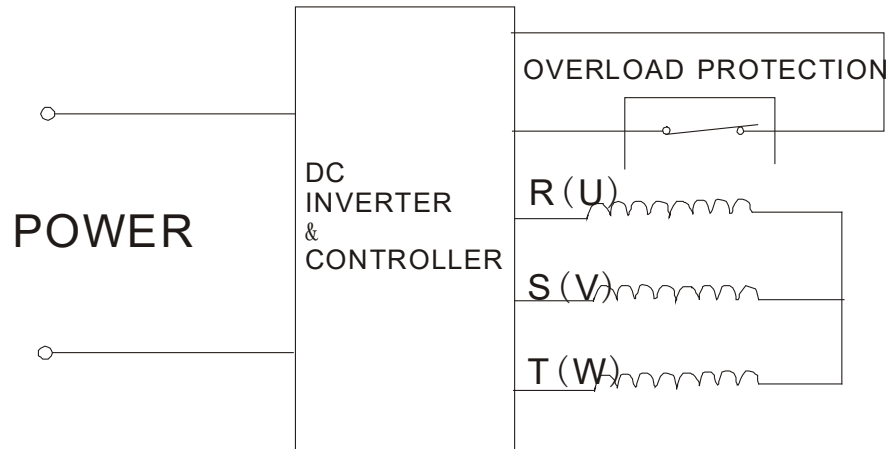
- Don't put a compressor on its side or turn over.
- Assemble the compressor quickly after removing the plugs. Prolonged exposure will damage the internal components of the compressor.
- Ensure wiring is correct before operating. Reverse operation will permanently damage the compressor.
- Electric Reactor

Common Problems:

- Sound abnormality
- Runs in a sporadic rhythm.

COMPONENTS TESTING

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.

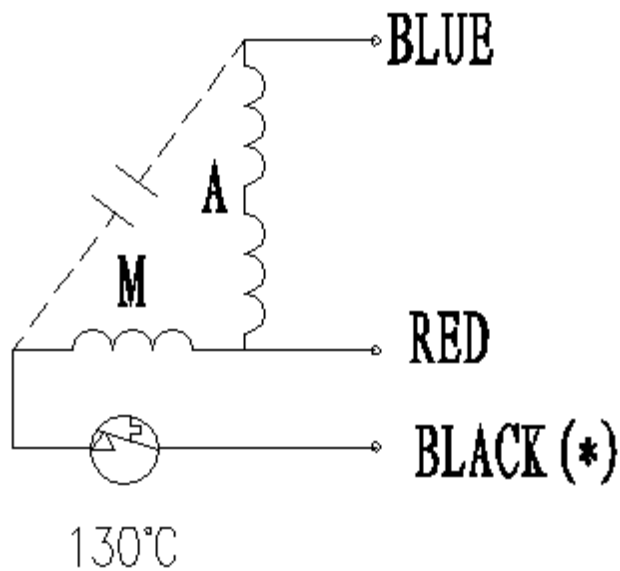
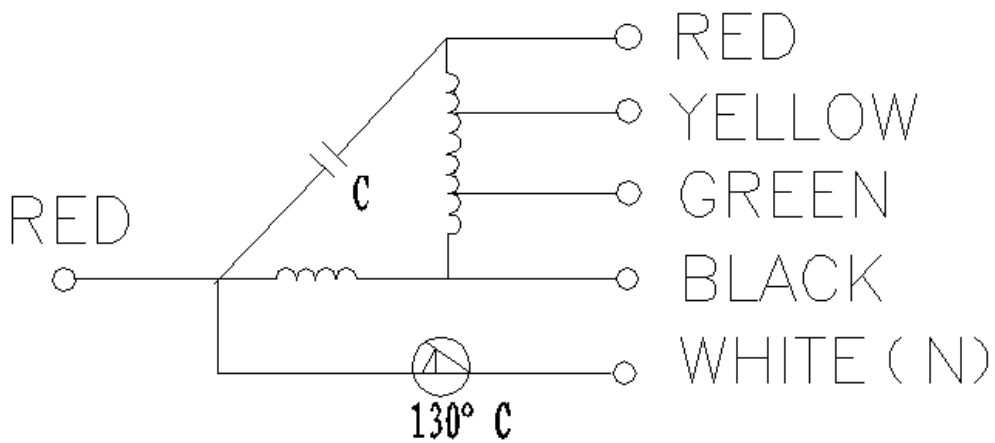
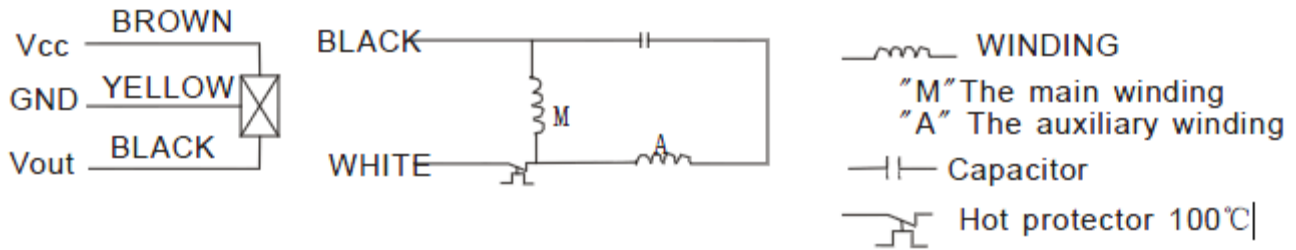
- **Electric Reactor**

Common Problems:

- Sound abnormality
- Runs in a sporadic rhythm.

COMPONENTS TESTING

Fan Motors



COMPONENTS TESTING

Fan Motors

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.

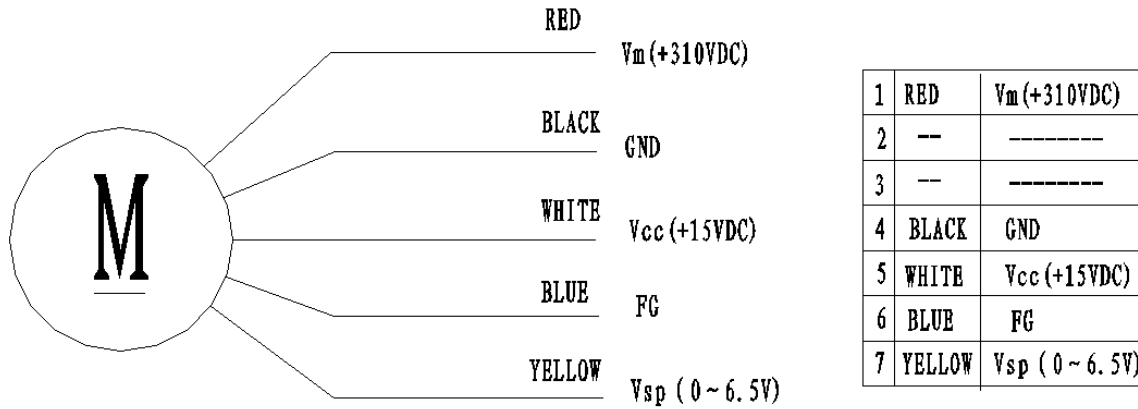
DC Voltage test

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.

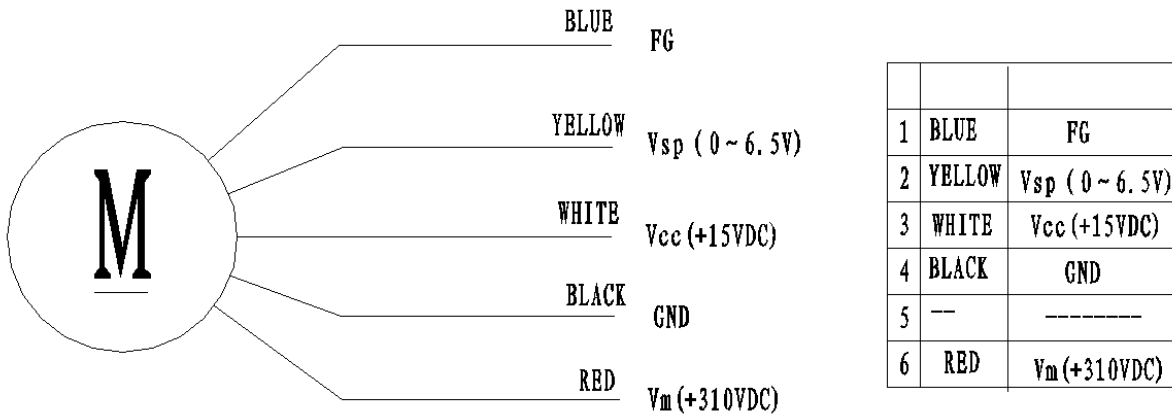
Notes:

- 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

TEST SYSTEM FLOW

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

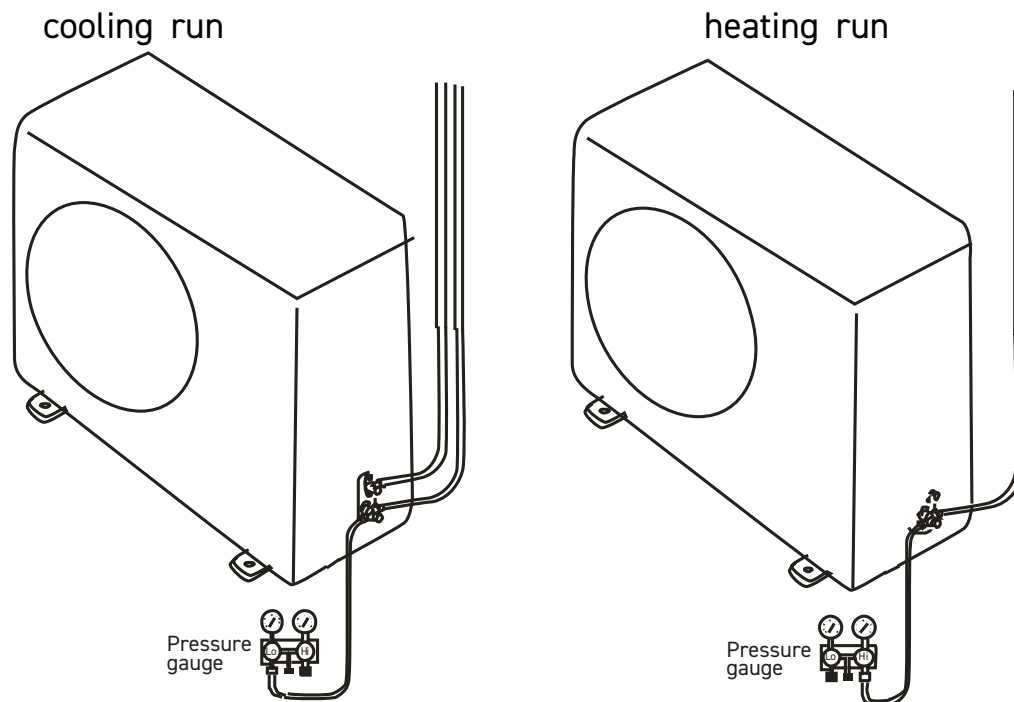
Tool: Pressure Gauge

Technique: ① see ② feel ③ test

SEE ----- Tube defrost.

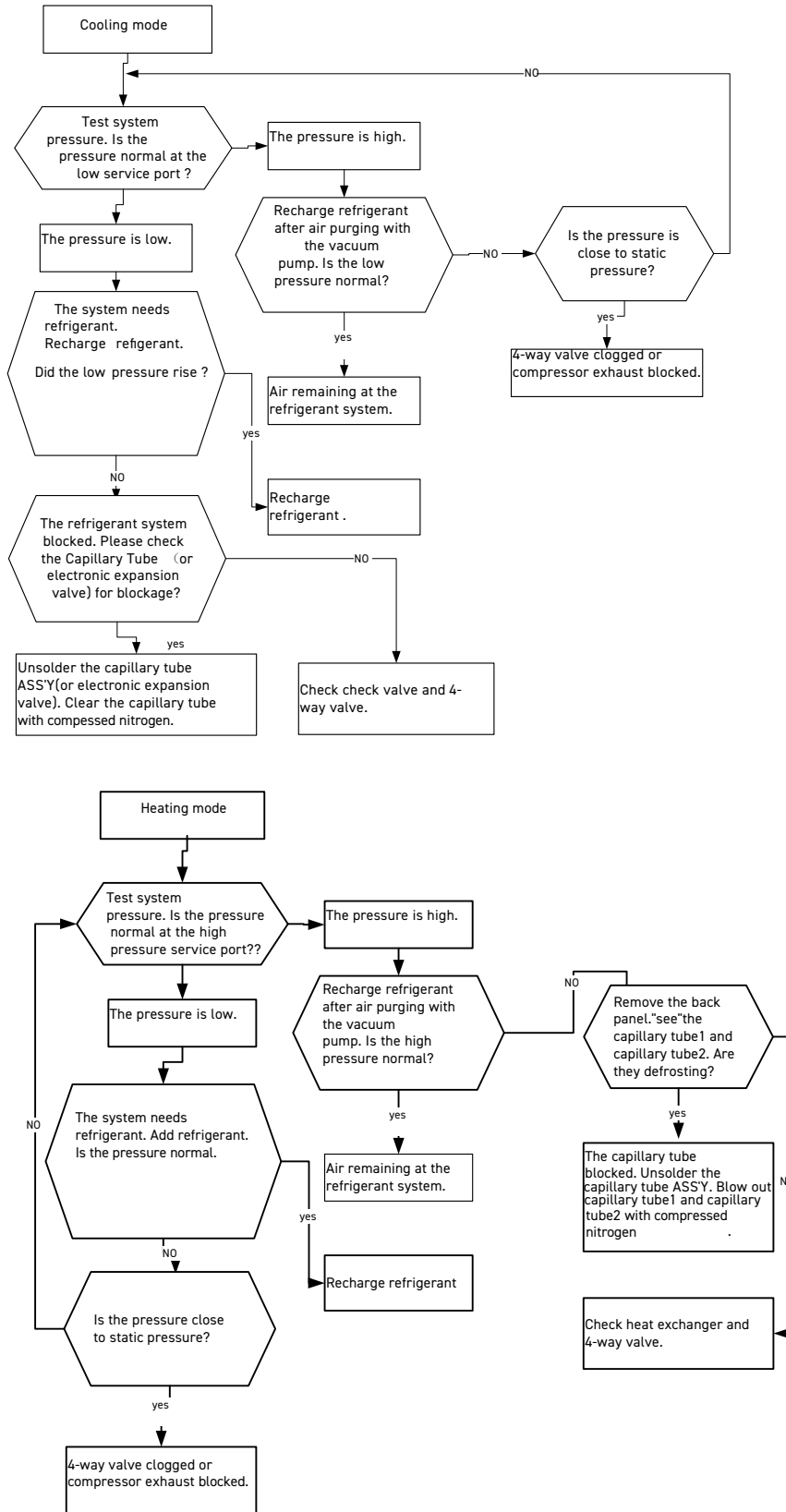
FEEL ----- The difference between tube's temperature.

TEST ----- Test pressure.



COMPONENTS TESTING

Test System Flow



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)

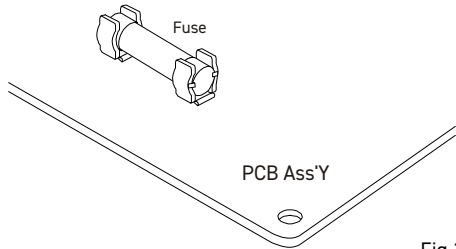


Fig.1

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

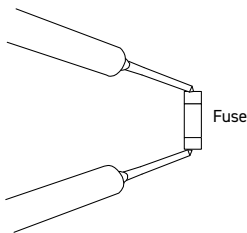


Fig.2

.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.

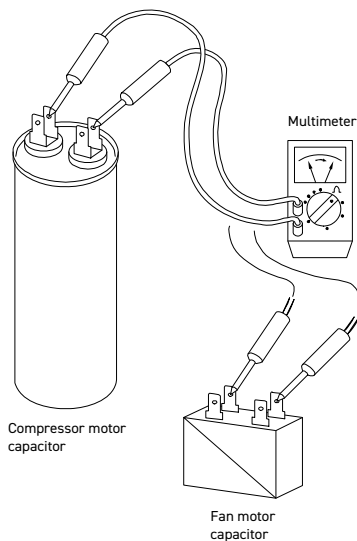
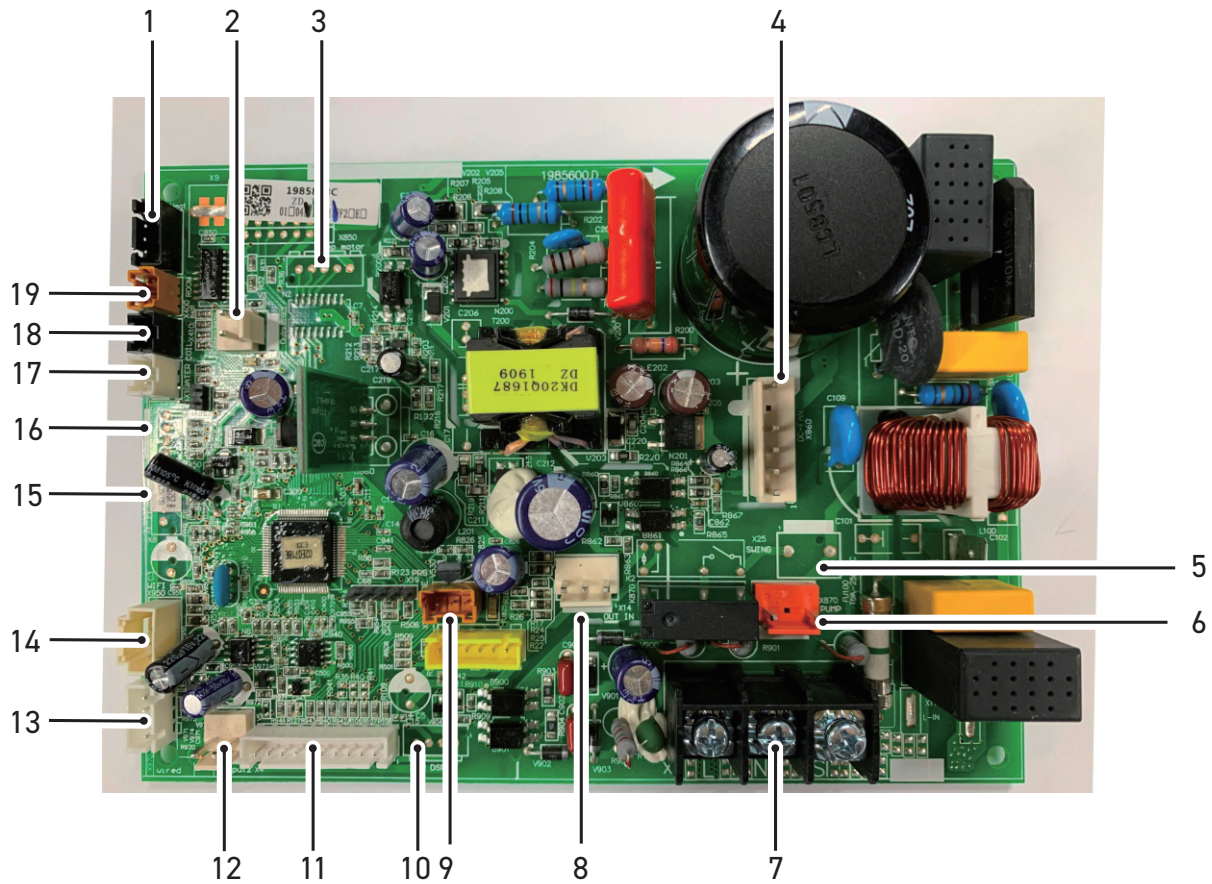


Fig.3

COMPONENTS TESTING

9-18k Ducted Control Board

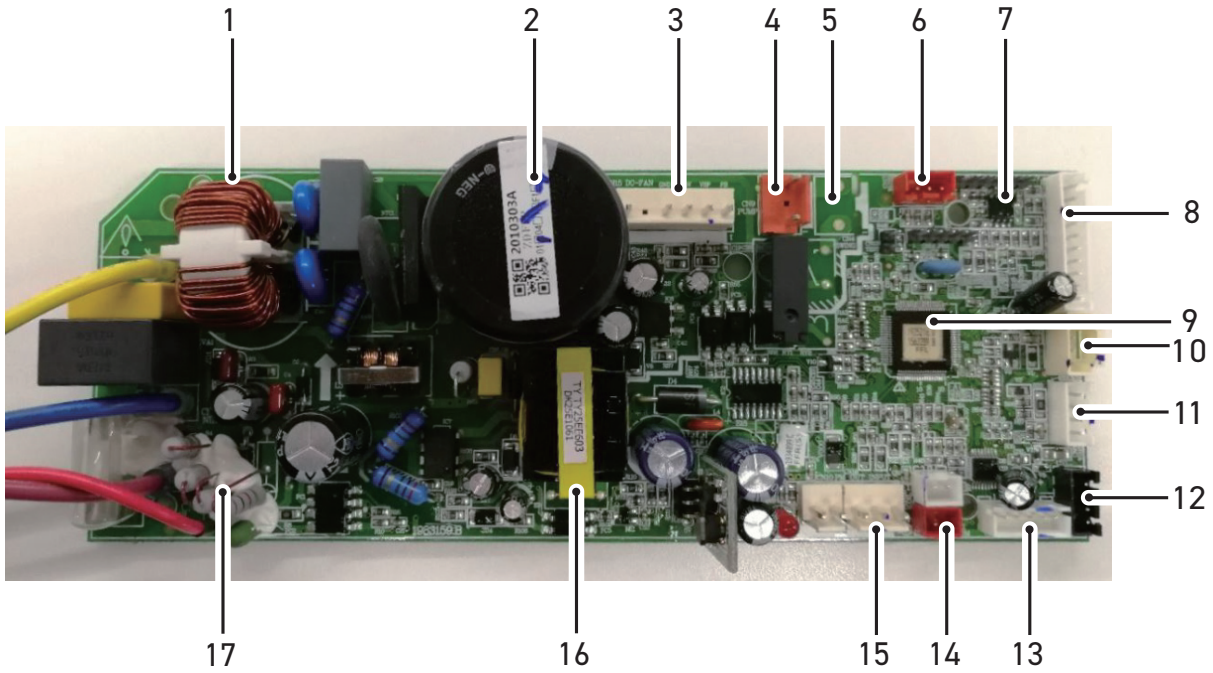


NO.	Description	NO.	Description
1	Heat	11	Disp
2	Output1	12	Output2
3	Step Motor	13	Wired.
4	DC Fan	14	Wi-Fi
5	Swing	15	Reserved
6	Pump	16	Humidity
7	L, N Power Input	17	Water Level Switch
8	Out	18	Coil Temp . Sensor
9	Nano	19	Ambient Temp . Sensor
10	Disp		

Figure 603

COMPONENTS TESTING

24-36k Ducted units and 9-36k Cassettes Control Board

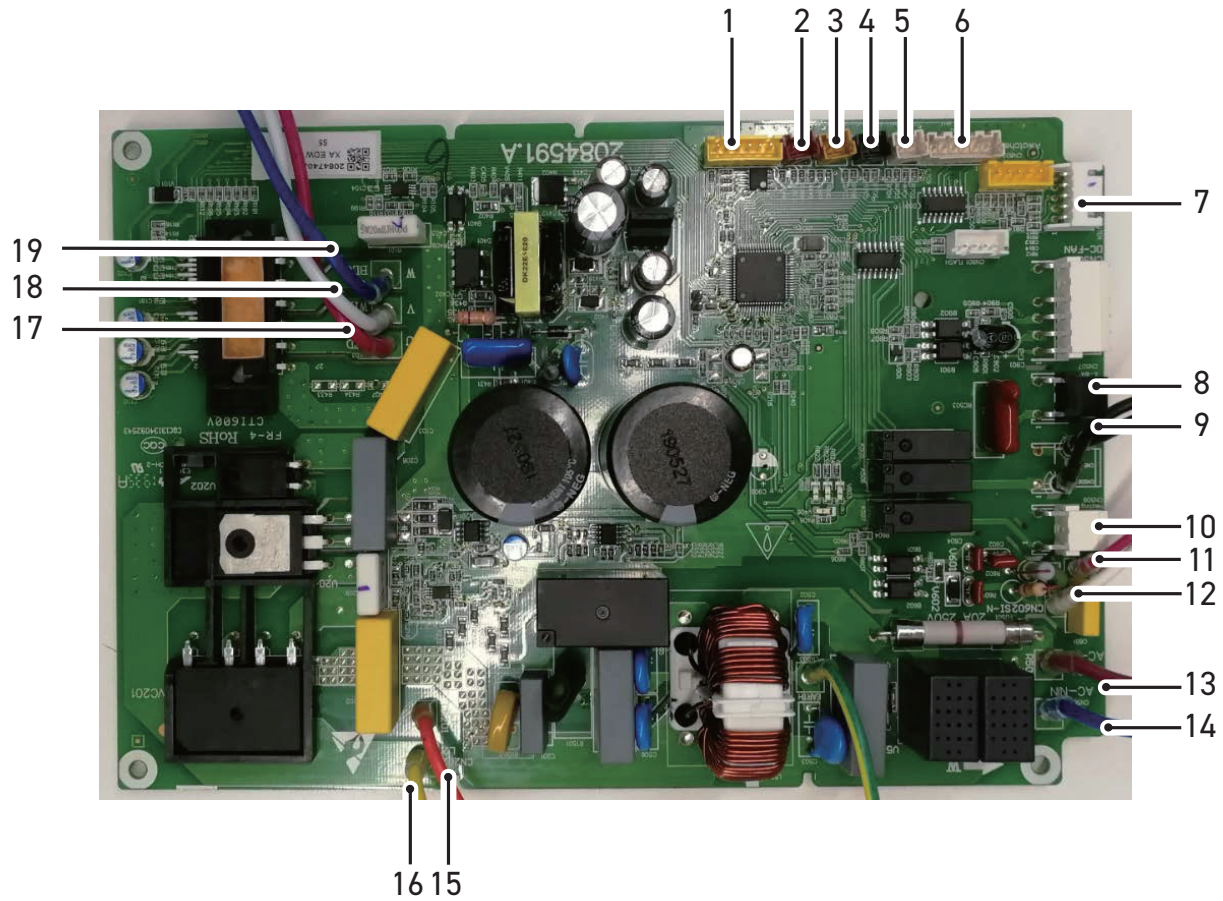


NO.	Description	NO.	Description
1	AC Power Filter	10	Wi-Fi
2	Main Control Component Code	11	Wired Controller
3	DC Motor	12	Electric Heater
4	Pump Motor	13	Step Motor
5	Swing Motor	14	Temp. Sensor
6	Water Level Switch	15	Out Input
7	EE	16	Switching Power Supply
8	Display	17	Communication with outdoor unit
9	MCU		

Figure 604

COMPONENTS TESTING

9-12k Outdoor Unit Control Board

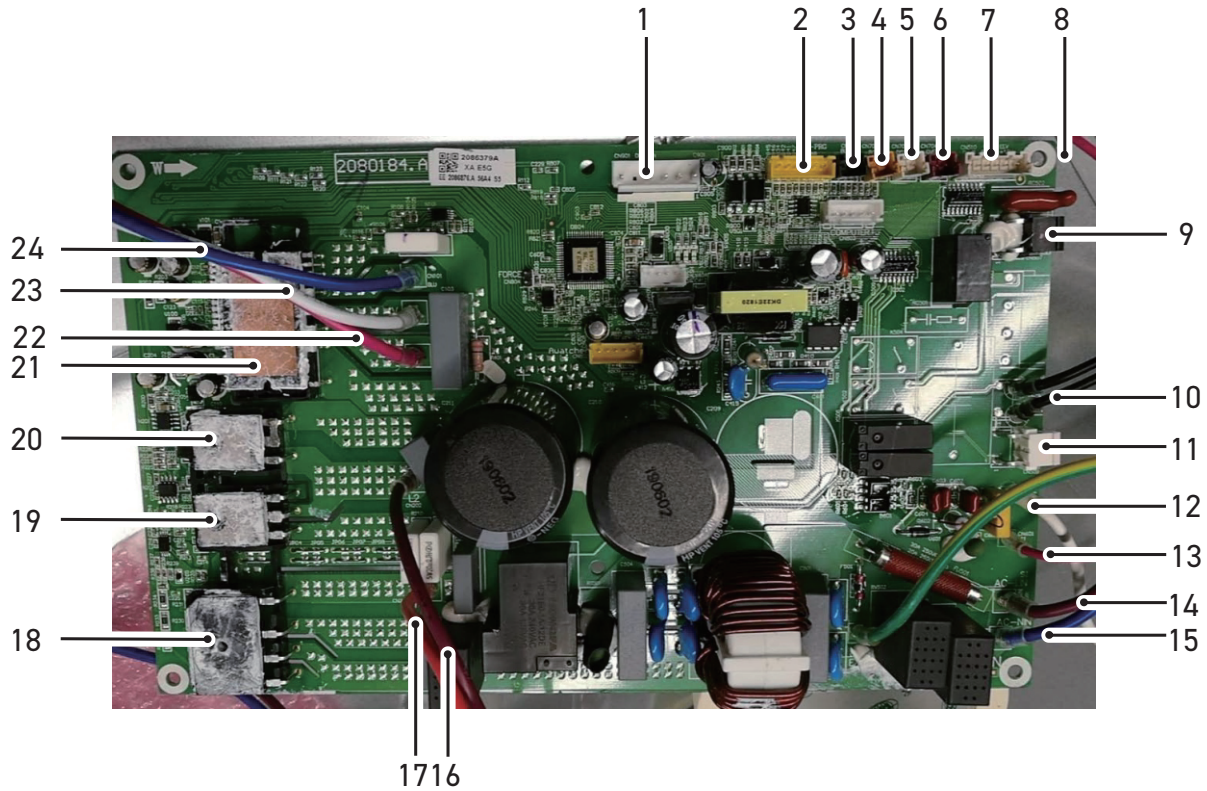


NO.	Description	NO.	Description
1	EE	11	SI
2	Overheat Switch	12	SI-N
3	Ambient Temperature Sensor	13	AC IN-L
4	Coil Temperature Sensor	14	AC IN-N
5	Discharge Temperature Sensor	15	Re actor L1
6	Electric expansion Valve	16	Re actor L2
7	Checker/Computer	17	Co mpressor U
8	4-W ay Valve	18	Co mpressor V
9	Heater (L/N)	19	Co mpressor W
10	Heating Belt		

Figure 605

COMPONENTS TESTING

18k Outdoor Unit Control Board

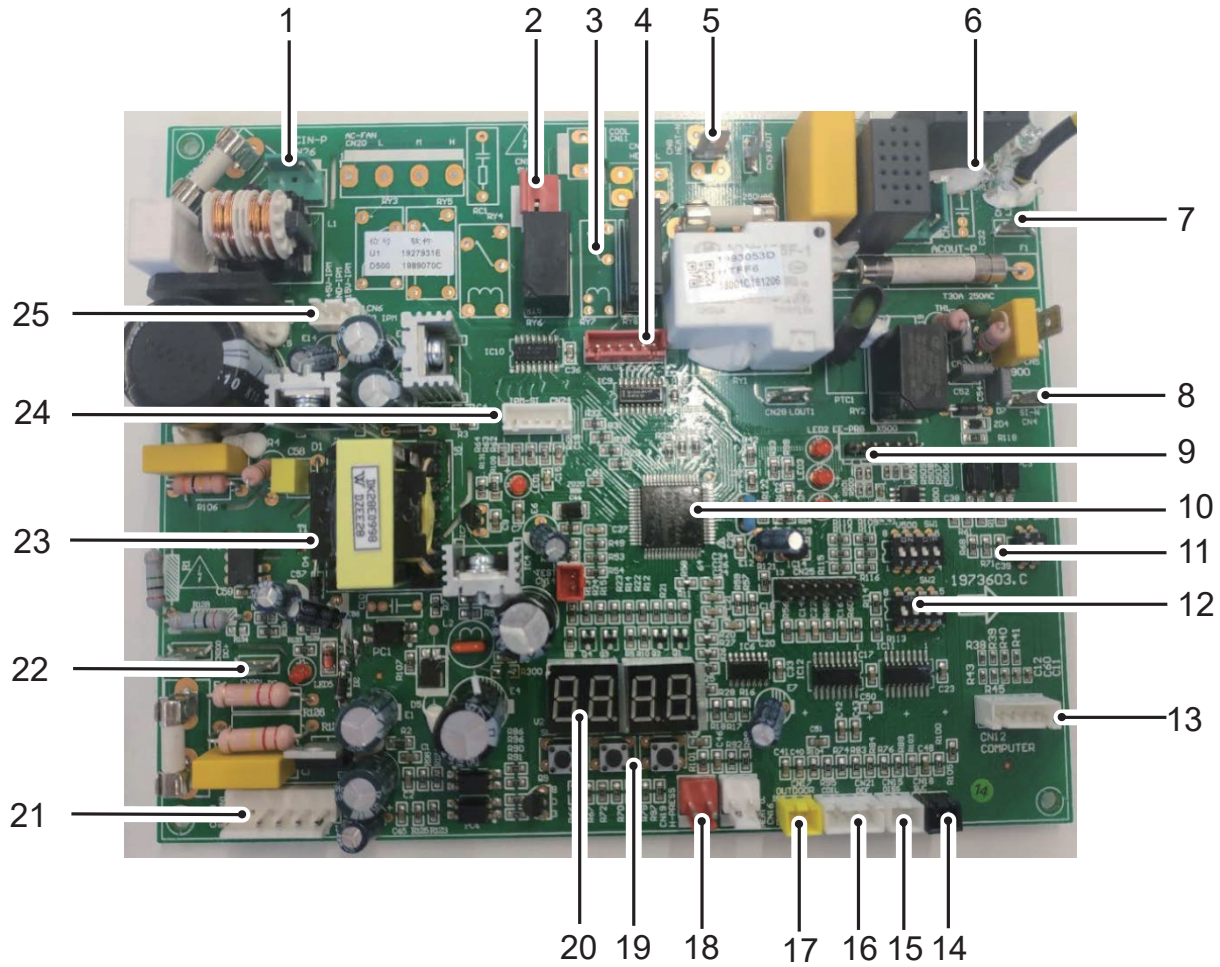


NO.	Description	NO.	Description
1	DC FAN	13	SI-L
2	EE	14	AC IN -L
3	Coil Temperature Sensor	15	AC IN -N
4	Ambient Temperature Sensor	16	Reactor L1
5	Discharge Temperature Sensor	17	Reactor L2
6	Overheat Protector	18	Rectifier Bridge
7	Electric expansion Valve	19	Diode
8	Electric Expansion Valve	20	IGBT
9	4-Way Valve	21	IPM
10	Heater (L/N)	22	Compressor U
11	Heating Belt	23	Compressor V
12	SI-N	24	Compressor W

Figure 606

COMPONENTS TESTING

24k Outdoor Unit Control Board

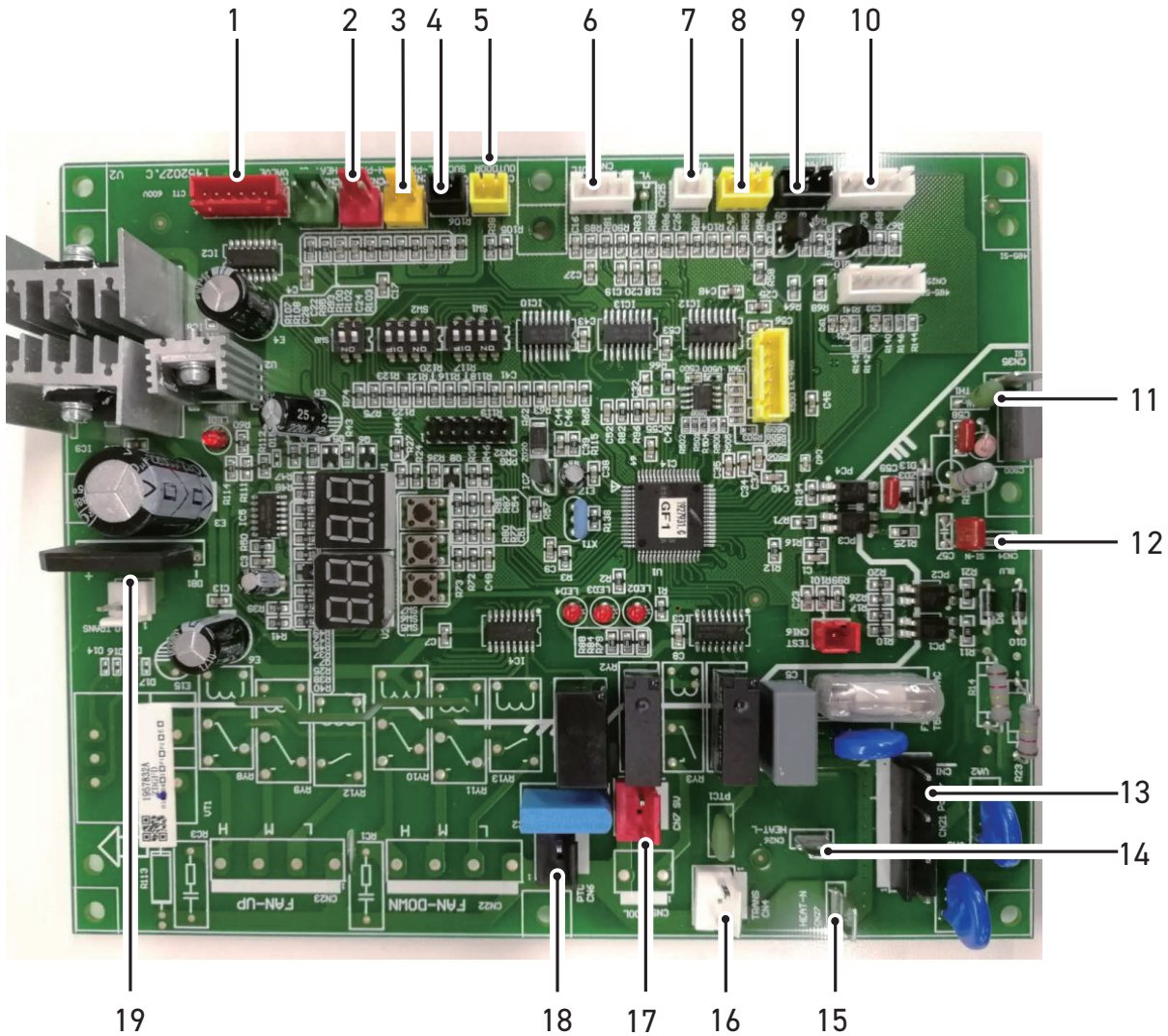


NO.	Description	NO.	Description
1	ACIN-P	14	Suction temperature Sensor
2	4-Way Valve	15	Discharge temperature Sensor
3	Tube electric heater	16	Coil & Defrost temperature Sensor
4	Electric Expansion Valve	17	Ambient temperature Sensor
5	Electric Heating Belt	18	High Pressure Switch
6	ACIN-P	19	Button
7	AC Power Input	20	7-Segment Display
8	Communication with Indoor Unit	21	DC motor
9	EE	22	DC-310V Supply
10	MCU Component	23	Switching Power Supply
11	Protector for Electric Heater Belt First Power ON	24	Drive Board Communication
12	DIP Switch	25	Drive Board Power Supply
13	Monitor/Checker/Computer		

Figure 607

COMPONENTS TESTING

36k Outdoor Unit Control Board



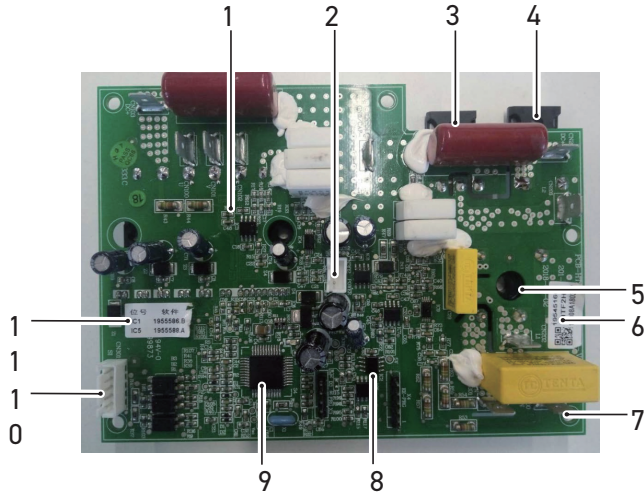
NO.	Description	NO.	Description
1	Electric Expansion Valve	11	Communication SI
2	High Pressure Switch	12	Communication SI -N
3	Low Pressure Switch	13	Power
4	Suction Temperature Sensor	14	Heater -L
5	Ambient Temperature Sensor	15	Heater -N
6	Coil/Defrost Temperature Sensor	16	Transformer 0 output Side
7	Discharge Temperature Sensor	17	4-Way Valve
8	DC Fan 2 -SI	18	PTC
9	DC Fan 1-SI	19	Transformer 0 output Side
10	IPM-SI		

Figure 608

COMPONENTS TESTING

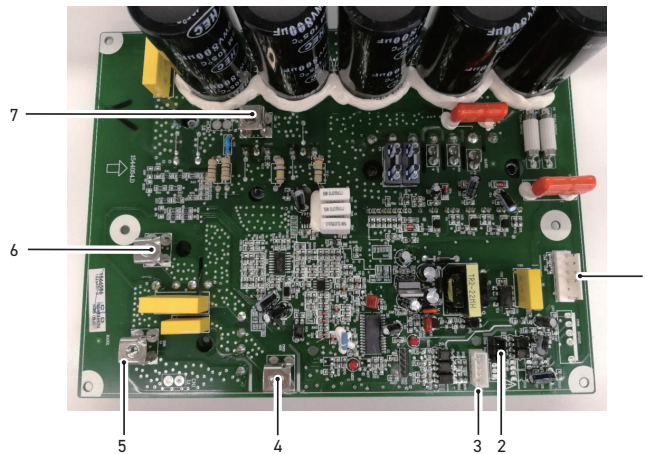
24-36k Outdoor Unit Drive Board

24k
Drive Board



NO.	Description	NO.	Description
1	IPM Module	7	AC Power Input
2	12V&5V Power	8	EE
3	IGBT	9	MCU Component
4	Diodes	10	Communication with Upper System
5	Rectifier Bridge	11	CPU code
6	Drive Board Code		

36K
Drive board



NO.	Description	NO.	Description
1	DC FAN motor	5	AC Power LIN
2	DC -FAN -SI	6	Reactor -L1
3	IPM-SI	7	Reactor L2
4	AC Power NIN		

Figure 609

WIRING DIAGRAMS

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

Electric Wiring Diagram 1992115.D

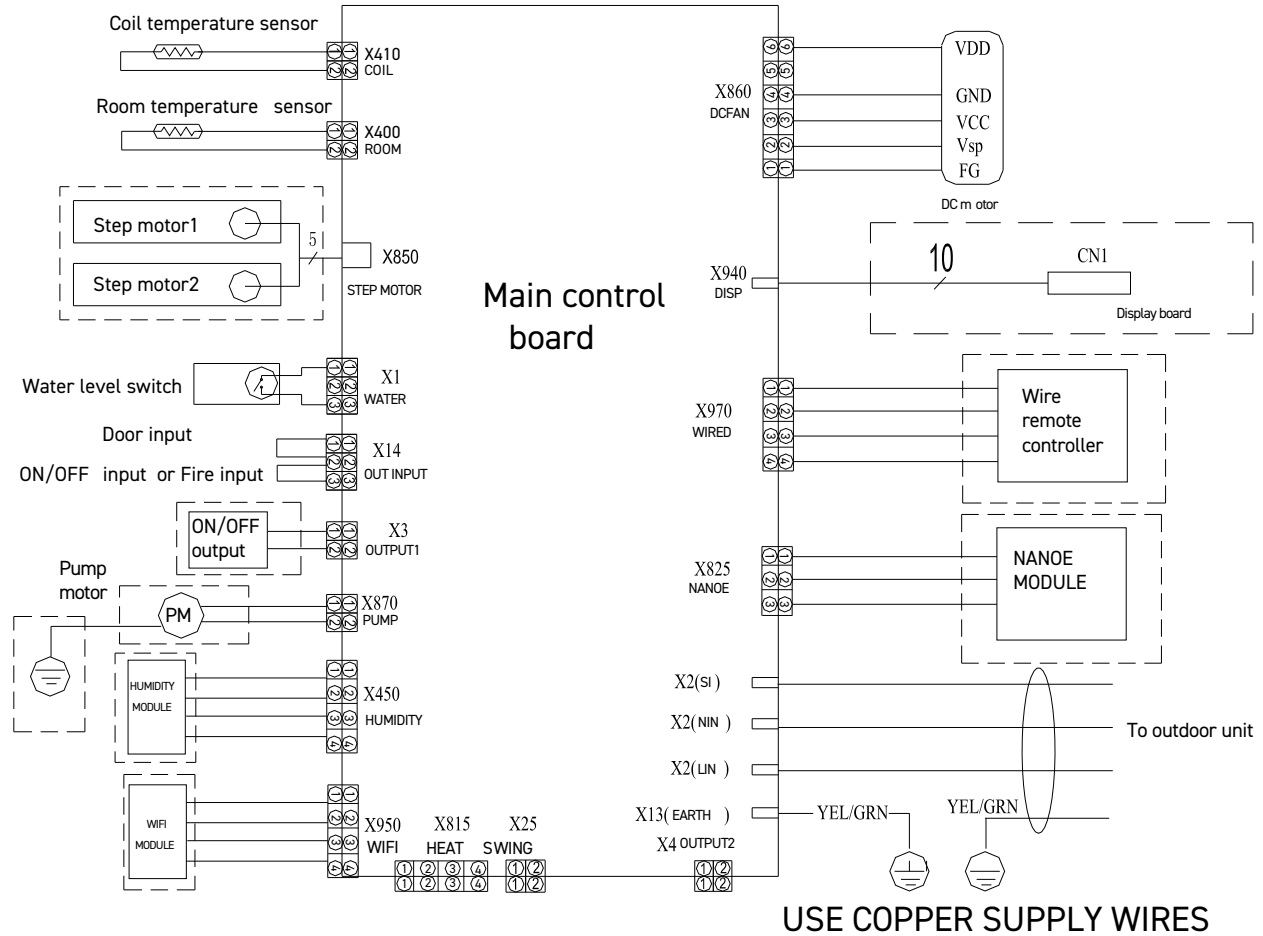


Figure 801

WIRING DIAGRAMS

Ducted Indoor Units 24-36k

Electric Wiring Diagram 2104500 .A

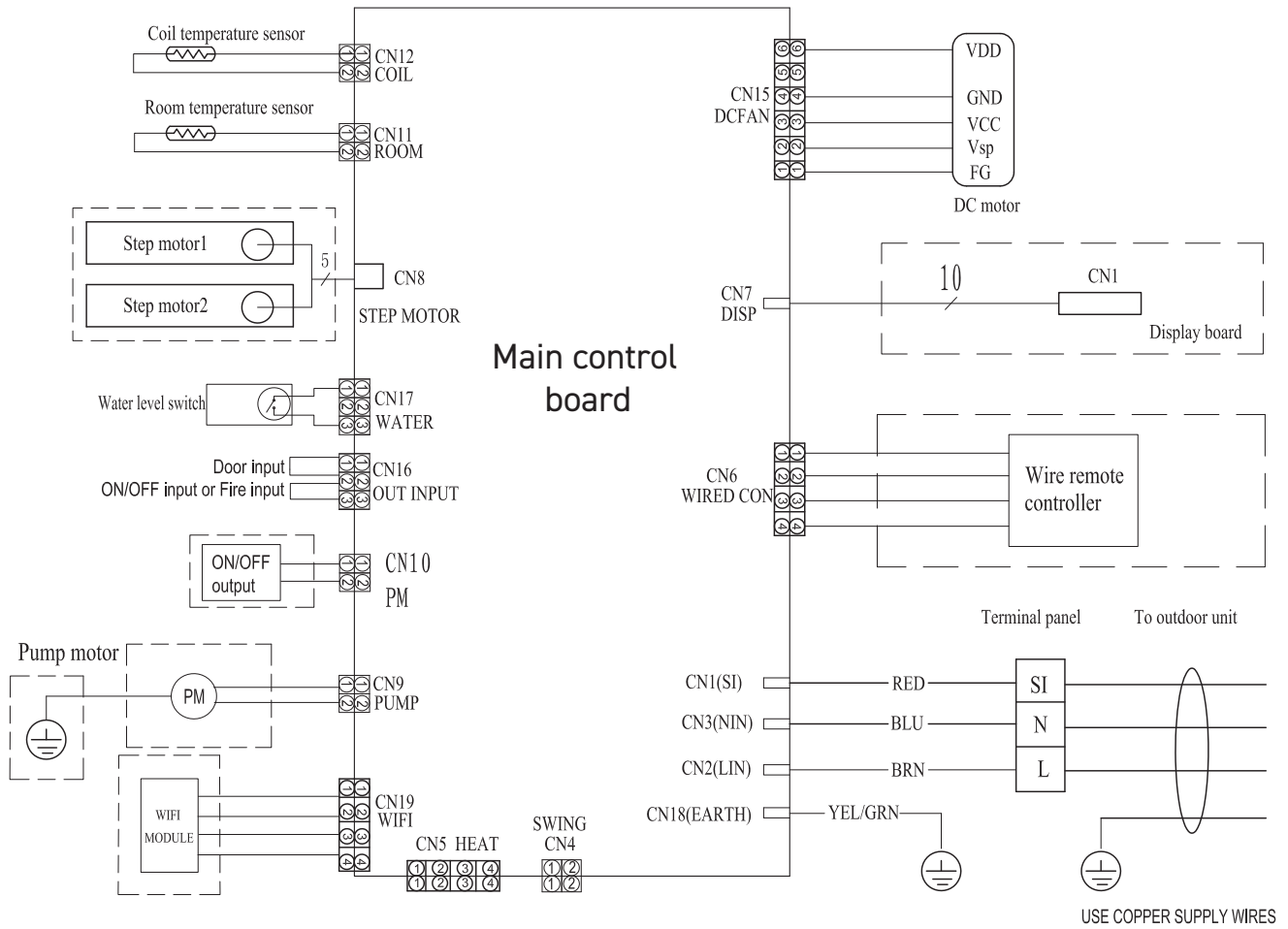


Figure 802

WIRING DIAGRAMS

9k-36k Indoor Cassette Units

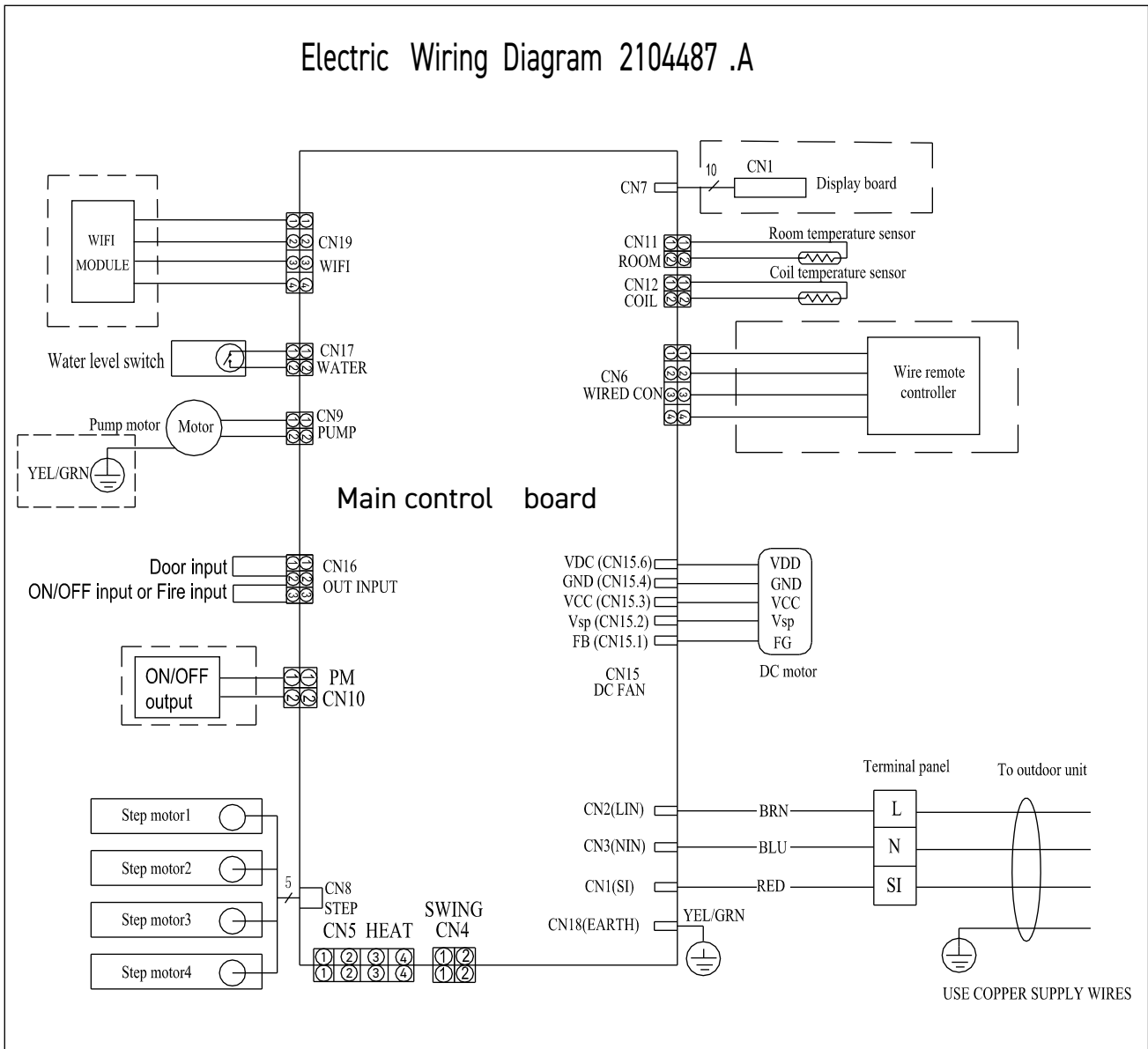


Figure 803

WIRING DIAGRAMS

9-18k Outdoor Units

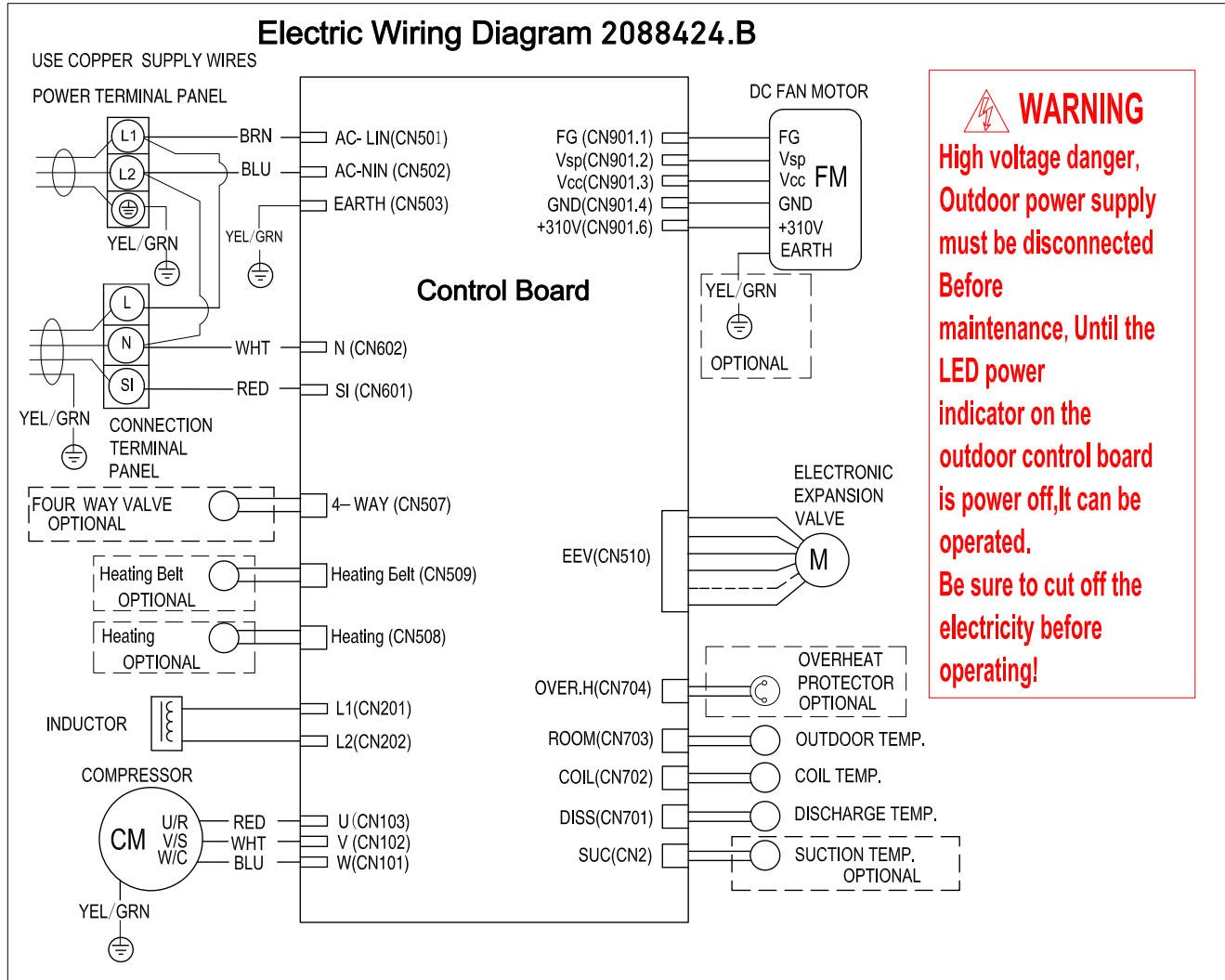


Figure 804

WIRING DIAGRAMS

24k Outdoor Units

Electric Wiring Diagram 2020634 .E

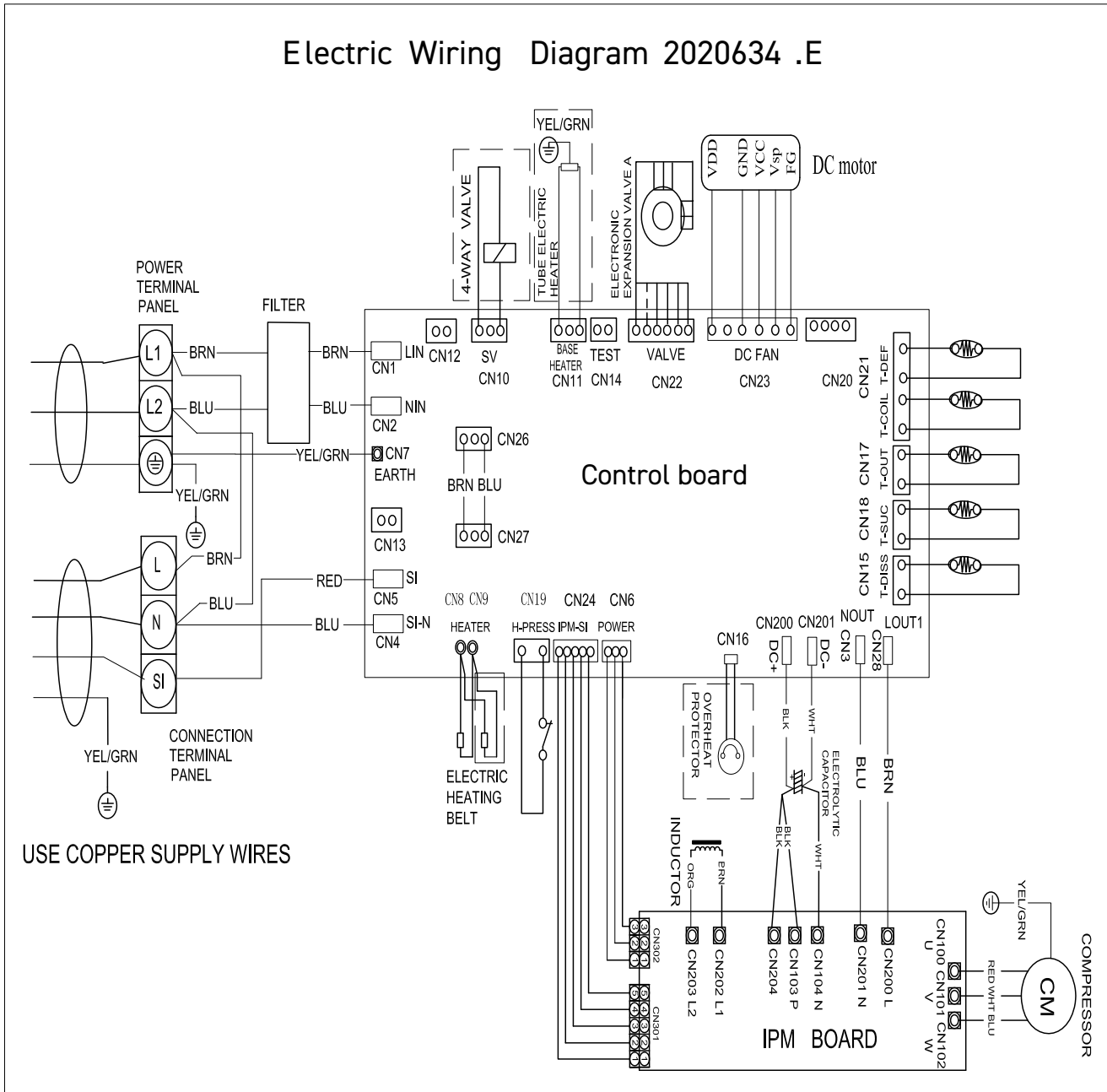


Figure 805

WIRING DIAGRAMS

36k Outdoor Units

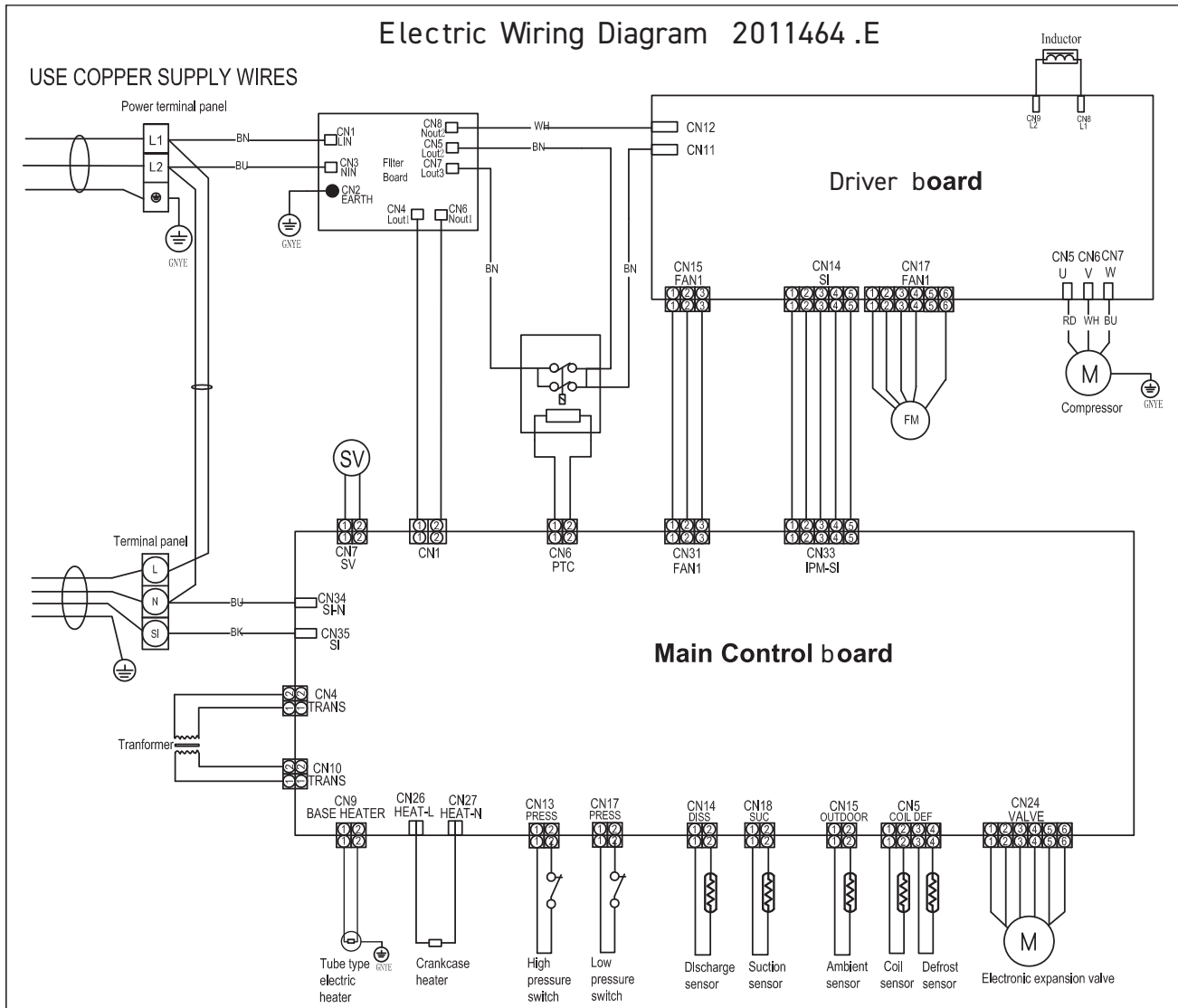


Figure 806

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

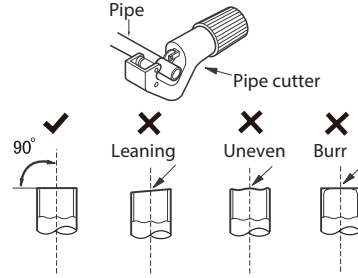
Pipe Expanding Method

⚠ Note:

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

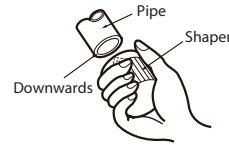
A: Cut the pipe

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



B: Remove the burrs

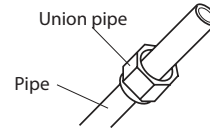
Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C: Put on suitable insulating pipe

D: Put on the union nut

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



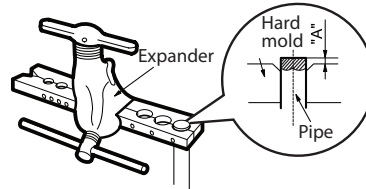
E: Expand the port

Expand the port with expander.

⚠ Note:

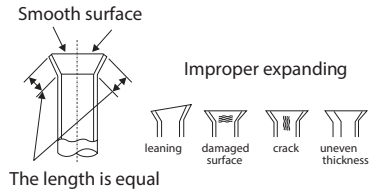
"A" is different according to the diameter, please refer to the sheet below:

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



F: Inspection

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



APPENDIX

Resistance Table Of Outdoor Compressor Discharge Temperature

($R_0=187.25K\pm 6.3\%$; $R_{100}=3.77K\pm 2.5K$; $B_0/100=3979K\pm 1\%$)

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-22	-30	908.2603	985.5274	1065.1210	-7.84	7.47
-20	-29	855.3955	927.6043	1001.9150	-7.78	7.42
-18	-28	805.9244	873.4324	924.8368	-7.73	5.56
-17	-27	759.6097	822.7471	887.5944	-7.67	7.31
-15	-26	716.2320	775.3041	835.9165	-7.62	7.25
-13	-25	675.5881	730.8775	787.5529	-7.56	7.20
-11	-24	637.4902	689.2583	742.2720	-7.51	7.14
-9	-23	601.7645	650.2533	699.8601	-7.46	7.09
-8	-22	568.2499	613.6835	660.1191	-7.40	7.03
-6	-21	536.7970	579.3832	622.8658	-7.35	6.98
-4	-20	507.2676	547.1989	587.9307	-7.30	6.93
-2	-19	497.5332	516.9882	555.1565	-3.76	6.88
0	-18	453.4748	488.6192	524.3977	-7.19	6.82
1	-17	428.9819	461.9693	495.5191	-7.14	6.77
3	-16	405.9517	436.9251	486.3954	-7.09	10.17
5	-15	384.2888	413.3808	442.9105	-7.04	6.67
7	-14	363.9047	391.2386	418.9563	-6.99	6.62
9	-13	344.7169	370.4072	396.4325	-6.94	6.56
10	-12	326.6497	350.8019	375.2461	-6.88	6.51
12	-11	309.6286	332.3441	355.3104	-6.83	6.46
14	-10	293.5903	314.9620	336.5448	-6.79	6.41
16	-9	278.4719	298.5822	318.3744	-6.74	6.22
18	-8	264.2156	283.1464	302.2294	-6.69	6.31
19	-7	250.7678	268.5936	286.5448	-6.64	6.26
21	-6	238.0783	254.8686	271.7603	-6.59	6.22
23	-5	226.1003	241.9200	257.8193	-6.54	6.17
25	-4	214.7903	229.6997	244.6593	-6.49	6.11
27	-3	204.1073	218.1630	232.2612	-6.44	6.07
28	-2	194.0135	207.2681	220.5495	-6.39	6.02
30	-1	184.4732	196.9759	209.4913	-6.35	5.97
32	0	175.4533	187.2500	199.0468	-6.30	5.93
34	1	166.8952	178.0255	189.1529	-6.25	5.88
36	2	158.8023	169.3067	179.8058	-6.20	5.84
37	3	151.1467	161.0633	170.9724	-6.16	5.80
39	4	143.9026	153.2667	162.6216	-6.11	5.75
41	5	137.0455	145.8905	154.7246	-6.06	5.71
43	6	130.5528	138.9097	147.2544	-6.02	5.67
45	7	124.4033	132.3011	140.1856	-5.97	5.62
46	8	118.5769	126.0429	133.4946	-5.92	5.58
48	9	113.0550	120.1146	127.1591	-5.88	5.54
50	10	107.8202	114.4973	121.1586	-5.83	5.50
52	11	102.8560	109.1728	115.4734	-5.79	5.46
54	12	98.1470	104.1246	110.0855	-5.74	5.41
55	13	93.6787	99.3367	104.9778	-5.70	5.37
57	14	89.4378	94.7946	100.1342	-5.65	5.33
59	15	85.4114	90.4842	95.5398	-5.61	5.29
61	16	81.5875	86.3926	91.1805	-5.56	5.25
63	17	77.9551	82.5076	87.0430	-5.52	5.21
64	18	74.5034	78.8177	83.1150	-5.47	5.17

APPENDIX

Resistance Table Of Outdoor Compressor Discharge Temperature

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
66	19	71.2227	75.3122	79.3848	-5.43	5.13
68	20	68.1036	71.9808	75.8414	-5.39	5.09
70	21	65.1373	68.8141	72.4746	-5.34	5.05
72	22	62.3155	65.8032	69.2746	-5.30	5.01
73	23	59.6306	62.9395	66.2324	-5.26	4.97
75	24	57.0752	60.2152	63.3395	-5.21	4.93
77	25	54.6424	57.6227	60.5877	-5.17	4.89
79	26	52.3258	55.1551	57.9695	-5.13	4.85
81	27	50.1192	52.8058	55.4778	-5.09	4.82
82	28	48.0168	50.5684	53.1058	-5.05	4.78
84	29	46.0133	48.4371	50.8472	-5.00	4.74
86	30	44.1034	46.4046	48.6960	-4.96	4.71
88	31	42.2825	44.4711	46.6466	-4.92	4.66
90	32	40.5458	42.6261	44.6937	-4.88	4.63
91	33	38.8891	40.8668	42.8323	-4.84	4.59
93	34	37.3084	39.1890	41.0576	-4.80	4.55
95	35	35.7998	37.5883	39.3653	-4.76	4.51
97	36	34.3596	36.0609	37.7511	-4.72	4.48
99	37	32.9844	34.6030	36.2109	-4.68	4.44
100	38	31.6710	33.2113	34.7412	-4.64	4.40
102	39	30.4164	31.8823	33.3383	-4.60	4.37
104	40	29.2176	30.6130	31.9988	-4.56	4.33
106	41	28.0718	29.4004	30.7197	-4.52	4.29
108	42	26.9765	28.2417	29.4979	-4.48	4.26
109	43	25.9293	27.1342	28.3306	-4.44	4.22
111	44	24.9277	26.0755	27.2150	-4.40	4.19
113	45	23.9697	25.0632	26.1488	-4.36	4.15
115	46	23.0530	24.0950	25.1293	-4.32	4.12
117	47	22.1757	23.1688	24.1545	-4.29	4.08
118	48	21.3360	22.2826	23.2221	-4.25	4.05
120	49	20.5321	21.4345	22.3301	-4.21	4.01
122	50	19.7623	20.6226	21.4766	-4.17	3.98
124	51	19.0261	19.8468	20.6612	-4.14	3.94
126	52	18.3211	19.1040	19.8808	-4.10	3.91
127	53	17.6458	18.3926	19.1338	-4.06	3.87
129	54	16.9986	17.7113	18.4185	-4.02	3.84
131	55	16.3784	17.0537	17.7335	-3.96	3.83
133	56	15.7839	16.4332	17.0774	-3.95	3.77
135	57	15.2139	15.8338	16.4488	-3.92	3.74
136	58	14.6673	15.2592	15.8464	-3.88	3.71
138	59	14.1430	14.7083	15.2690	-3.84	3.67
140	60	13.6400	14.1799	14.7154	-3.81	3.64
142	61	13.1573	13.6730	14.1846	-3.77	3.61
144	62	12.6941	13.1868	13.6756	-3.74	3.57
145	63	12.2494	12.7202	13.1872	-3.70	3.54
147	64	11.8224	12.2723	12.7186	-3.67	3.51
149	65	11.4124	11.8424	12.2690	-3.63	3.48
151	66	11.0185	11.4295	11.8373	-3.60	3.45
153	67	10.6401	11.0331	11.4230	-3.56	3.41
154	68	10.2765	10.6522	11.0251	-3.53	3.38
156	69	9.9271	10.2863	10.6429	-3.49	3.35
158	70	9.5912	9.9348	10.2756	-3.46	3.32
160	71	9.2682	9.5968	9.9231	-3.42	3.29
162	72	8.9576	9.2720	9.5841	-3.39	3.26
163	73	8.6589	8.9597	9.2583	-3.36	3.23
165	74	8.3716	8.6594	8.9451	-3.32	3.19

APPENDIX

Resistance Table Of Outdoor Compressor Discharge Temperature

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
167	75	8.0951	8.3705	8.6440	-3.29	3.16
169	76	7.8290	8.0926	8.3544	-3.26	3.13
171	77	7.5730	7.8252	8.0758	-3.22	3.10
172	78	7.3264	7.5679	7.8078	-3.19	3.07
174	79	7.0891	7.3202	7.5499	-3.16	3.04
176	80	6.8605	7.0818	7.3018	-3.12	3.01
178	81	6.6403	6.8522	7.0629	-3.09	2.98
180	82	6.4282	6.6311	6.8329	-3.06	2.95
181	83	6.2239	6.4182	6.6115	-3.03	2.92
183	84	6.0269	6.2131	6.3982	-3.00	2.89
185	85	5.8371	6.0154	6.1928	-2.96	2.86
187	86	5.6542	5.8249	5.9949	-2.93	2.84
189	87	5.4777	5.6413	5.8042	-2.90	2.81
190	88	5.3076	5.4644	5.6205	-2.87	2.78
192	89	5.1435	5.2937	5.4433	-2.84	2.75
194	90	4.9853	5.1292	5.2726	-2.81	2.72
196	91	4.8326	4.9705	5.1079	-2.77	2.69
198	92	4.6852	4.8174	4.9492	-2.74	2.66
199	93	4.5430	4.6697	4.7960	-2.71	2.63
201	94	4.4058	4.5272	4.6483	-2.68	2.61
203	95	4.2733	4.3896	4.5058	-2.65	2.58
205	96	4.1453	4.2568	4.3683	-2.62	2.55
207	97	4.0218	4.1287	4.2355	-2.59	2.52
208	98	3.9024	4.0049	4.1074	-2.56	2.50
210	99	3.7872	3.8854	3.9837	-2.53	2.47
212	100	3.6758	3.7700	3.8643	-2.50	2.44
214	101	3.5661	3.6585	3.7512	-2.53	2.47
216	102	3.4601	3.5509	3.6419	-2.56	2.50
217	103	3.3577	3.4468	3.5362	-2.59	2.53
219	104	3.2588	3.3463	3.4341	-2.61	2.56
221	105	3.1632	3.2491	3.3353	-2.64	2.58
223	106	3.0708	3.1551	3.2398	-2.67	2.61
225	107	2.9816	3.0643	3.1475	-2.70	2.64
226	108	2.8953	2.9765	3.0582	-2.73	2.67
228	109	2.8118	2.8915	2.9717	-2.76	2.70
230	110	2.7311	2.8093	2.8881	-2.78	2.73
232	111	2.6531	2.7299	2.8072	-2.81	2.75
234	112	2.5776	2.6530	2.7289	-2.84	2.78
235	113	2.5046	2.5785	2.6531	-2.87	2.81
237	114	2.4340	2.5065	2.5798	-2.89	2.84
239	115	2.3656	2.4368	2.5087	-2.92	2.87
241	116	2.2995	2.3693	2.4400	-2.95	2.90
243	117	2.2354	2.3040	2.3733	-2.98	2.92
244	118	2.1734	2.2407	2.3088	-3.00	2.95
246	119	2.1134	2.1795	2.2463	-3.03	2.97
248	120	2.0553	2.1201	2.1858	-3.06	3.01
250	121	1.9991	2.0626	2.1271	-3.08	3.03
252	122	1.9446	2.0070	2.0702	-3.11	3.05
253	123	1.8918	1.9530	2.0151	-3.13	3.08
255	124	1.8406	1.9007	1.9617	-3.16	3.11
257	125	1.7911	1.8500	1.9099	-3.18	3.14
259	126	1.7430	1.8009	1.8597	-3.22	3.16
261	127	1.6965	1.7533	1.8110	-3.24	3.19
262	128	1.6514	1.7071	1.7638	-3.26	3.21
264	129	1.6076	1.6623	1.7180	-3.29	3.24
266	130	1.5652	1.6189	1.6736	-3.32	3.27

APPENDIX

Ambient Air Sensor Indoor And Outdoor Unit

(R₀=15K±2% ; B₀/100=3450K±2%)

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-22	-30	60.78	64.77	68.99	-6.16	6.12
-20	-29	57.75	61.36	65.16	-5.88	5.83
-18	-28	54.89	58.15	61.58	-5.61	5.57
-17	-27	52.19	55.14	58.23	-5.35	5.31
-15	-26	49.63	52.30	55.08	-5.11	5.05
-13	-25	47.21	49.62	52.13	-4.86	4.81
-11	-24	44.92	47.10	49.37	-4.63	4.60
-9	-23	42.76	44.73	46.78	-4.40	4.38
-8	-22	40.71	42.49	44.34	-4.19	4.17
-6	-21	38.77	40.38	42.05	-3.99	3.97
-4	-20	36.93	38.39	39.90	-3.80	3.78
-2	-19	35.18	36.51	37.87	-3.64	3.59
0	-18	33.53	34.74	35.97	-3.48	3.42
1	-17	31.96	33.06	34.17	-3.33	3.25
3	-16	30.48	31.47	32.49	-3.15	3.14
5	-15	29.07	29.97	30.89	-3.00	2.98
7	-14	27.73	28.56	29.39	-2.91	2.82
9	-13	26.46	27.22	27.98	-2.79	2.72
10	-12	25.26	25.95	26.64	-2.66	2.59
12	-11	24.11	24.75	25.38	-2.59	2.48
14	-10	23.03	23.61	24.19	-2.46	2.40
16	-9	21.99	22.53	23.06	-2.40	2.30
18	-8	21.01	21.51	22.00	-2.32	2.23
19	-7	20.08	20.54	20.99	-2.24	2.14
21	-6	19.19	19.62	20.04	-2.19	2.10
23	-5	18.35	18.74	19.14	-2.08	2.09
25	-4	17.55	17.92	18.29	-2.06	2.02
27	-3	16.78	17.13	17.48	-2.04	2.00
28	-2	16.06	16.38	16.71	-1.95	1.97
30	-1	15.36	15.67	15.98	-1.98	1.94
32	0	14.70	15.00	15.29	-2.00	1.90
34	1	14.08	14.36	14.64	-1.95	1.91
36	2	13.48	13.75	14.02	-1.96	1.93
37	3	12.91	13.17	13.43	-1.97	1.94
39	4	12.36	12.62	12.87	-2.06	1.94
41	5	11.85	12.09	12.34	-1.99	2.03
43	6	11.35	11.59	11.83	-2.07	2.03
45	7	10.88	11.11	11.35	-2.07	2.11
46	8	10.43	10.66	10.89	-2.16	2.11
48	9	9.999	10.230	10.450	-2.26	2.11
50	10	9.590	9.816	10.040	-2.30	2.23
52	11	9.199	9.422	9.647	-2.37	2.33
54	12	8.826	9.047	9.269	-2.44	2.40
55	13	8.470	8.689	8.910	-2.52	2.48
57	14	8.129	8.347	8.567	-2.61	2.57
59	15	7.804	8.021	8.240	-2.71	2.66
61	16	7.493	7.709	7.928	-2.80	2.76
63	17	7.196	7.412	7.630	-2.91	2.86
64	18	6.912	7.127	7.346	-3.02	2.98
66	19	6.640	6.855	7.074	-3.14	3.10
68	20	6.381	6.595	6.815	-3.24	3.23
70	21	6.132	6.347	6.567	-3.39	3.35
72	22	5.894	6.109	6.330	-3.52	3.49

APPENDIX

Ambient Air Sensor In Indoor And Outdoor Unit

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
73	23	5.667	5.882	6.103	-3.66	3.62
75	24	5.449	5.664	5.886	-3.80	3.77
77	25	5.240	5.456	5.678	-3.96	3.91
79	26	5.048	5.260	5.478	-4.03	3.98
81	27	4.864	5.072	5.286	-4.10	4.05
82	28	4.687	4.891	5.101	-4.17	4.12
84	29	4.517	4.717	4.924	-4.24	4.20
86	30	4.355	4.550	4.753	-4.29	4.27
88	31	4.198	4.390	4.589	-4.37	4.34
90	32	4.048	4.236	4.431	-4.44	4.40
91	33	3.904	4.089	4.280	-4.52	4.46
93	34	3.766	3.946	4.134	-4.56	4.55
95	35	3.663	3.810	3.994	-3.86	4.61
97	36	3.506	3.679	3.859	-4.70	4.66
99	37	3.383	3.552	3.729	-4.76	4.75
100	38	3.265	3.431	3.604	-4.84	4.80
102	39	3.152	3.314	3.484	-4.89	4.88
104	40	3.043	3.202	3.368	-4.97	4.93
106	41	2.938	3.094	3.257	-5.04	5.00
108	42	2.838	2.990	3.149	-5.08	5.05
109	43	2.741	2.890	3.046	-5.16	5.12
111	44	2.648	2.793	2.946	-5.19	5.19
113	45	2.558	2.701	2.850	-5.29	5.23
115	46	2.472	2.611	2.758	-5.32	5.33
117	47	2.389	2.525	2.669	-5.39	5.40
118	48	2.309	2.443	2.583	-5.49	5.42
120	49	2.232	2.363	2.500	-5.54	5.48
122	50	2.158	2.286	2.421	-5.60	5.58
124	51	2.087	2.212	2.344	-5.65	5.63
126	52	2.018	2.140	2.269	-5.70	5.69
127	53	1.952	2.072	2.198	-5.79	5.73
129	54	1.888	2.005	2.129	-5.84	5.82
131	55	1.827	1.941	2.062	-5.87	5.87
133	56	1.767	1.880	1.998	-6.01	5.91
135	57	1.710	1.820	1.936	-6.04	5.99
136	58	1.655	1.763	1.876	-6.13	6.02
138	59	1.602	1.707	1.818	-6.15	6.11
140	60	1.551	1.654	1.762	-6.23	6.13
142	61	1.502	1.602	1.709	-6.24	6.26
144	62	1.452	1.553	1.657	-6.50	6.28
145	63	1.409	1.505	1.606	-6.38	6.29
147	64	1.364	1.458	1.558	-6.45	6.42
149	65	1.322	1.413	1.511	-6.44	6.49
151	66	1.280	1.370	1.466	-6.57	6.55
153	67	1.241	1.328	1.422	-6.55	6.61
154	68	1.202	1.288	1.379	-6.68	6.60
156	69	1.165	1.249	1.339	-6.73	6.72
158	70	1.129	1.211	1.299	-6.77	6.77
160	71	1.095	1.175	1.261	-6.81	6.82
162	72	1.061	1.140	1.224	-6.93	6.86
163	73	1.029	1.106	1.188	-6.96	6.90
165	74	0.9977	1.073	1.153	-7.02	6.94
167	75	0.9676	1.041	1.120	-7.05	7.05
169	76	0.9385	1.011	1.088	-7.17	7.08
171	77	0.9104	0.9810	1.056	-7.20	7.10
172	78	0.8833	0.9523	1.026	-7.25	7.18

APPENDIX

Ambient Air Sensor In Indoor And Outdoor Unit

T [°F]	T [°C]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
174	79	0.8570	0.9246	0.9971	-7.31	7.27
176	80	0.8316	0.8977	0.9687	-7.36	7.33
178	81	0.8071	0.8717	0.9412	-7.41	7.38
180	82	0.7834	0.8466	0.9146	-7.47	7.43
181	83	0.7604	0.8223	0.8888	-7.53	7.48
183	84	0.7382	0.7987	0.8639	-7.57	7.55
185	85	0.7167	0.7759	0.8397	-7.63	7.60
187	86	0.6958	0.7537	0.8161	-7.68	7.65
189	87	0.6755	0.7322	0.7933	-7.74	7.70
190	88	0.6560	0.7114	0.7712	-7.79	7.75
192	89	0.6371	0.6913	0.7498	-7.84	7.80
194	90	0.6188	0.6718	0.7291	-7.89	7.86
196	91	0.6011	0.6530	0.7051	-7.95	7.39
198	92	0.5840	0.6348	0.6897	-8.00	7.96
199	93	0.5674	0.6171	0.6709	-8.05	8.02
201	94	0.5514	0.6000	0.6527	-8.10	8.07
203	95	0.5359	0.5835	0.6350	-8.16	8.11
205	96	0.5209	0.5675	0.6179	-8.21	8.16
207	97	0.5064	0.5519	0.6014	-8.24	8.23
208	98	0.4923	0.5369	0.5853	-8.31	8.27
210	99	0.4787	0.5224	0.5698	-8.37	8.32
212	100	0.4655	0.5083	0.5547	-8.42	8.36
214	101	0.4528	0.4946	0.5401	-8.45	8.42
216	102	0.4404	0.4814	0.5259	-8.52	8.46
217	103	0.4284	0.4685	0.5121	-8.56	8.51
219	104	0.4168	0.4561	0.4988	-8.62	8.56
221	105	0.4056	0.4440	0.4859	-8.65	8.62
223	106	0.3947	0.4323	0.4733	-8.70	8.66
225	107	0.3841	0.4210	0.4611	-8.76	8.70
226	108	0.3739	0.4100	0.4493	-8.80	8.75
228	109	0.3640	0.3993	0.4379	-8.84	8.81
230	110	0.3544	0.3890	0.4267	-8.89	8.84
232	111	0.3450	0.3789	0.4159	-8.95	8.90
234	112	0.3360	0.3692	0.4055	-8.99	8.95
235	113	0.3272	0.3597	0.3953	-9.04	9.01
237	114	0.3187	0.3505	0.3854	-9.07	9.06
239	115	0.3104	0.3416	0.3758	-9.13	9.10
241	116	0.3024	0.3330	0.3665	-9.19	9.14
243	117	0.2947	0.3246	0.3574	-9.21	9.18
244	118	0.2871	0.3164	0.3468	-9.26	8.77
246	119	0.2798	0.3085	0.3401	-9.30	9.29
248	120	0.2727	0.3008	0.33	-9.34	9.34

APPENDIX

Available Accessories

CONTROLLER

FPWC1

Wired wall controller option for Floating Air Premier and Pro Single/Multizone



CEILING CASSETTE GRILLES (REQUIRED ACCESSORY)

Required decorative grille for ceiling cassette models

Decorative Grille	
FPCG0912	FPCG182436
FPHFC09A3A, FPHFC12A3A	FPHFC18A3A, FPHFC24A3A

Decorative Grille	
DCG2436	
MC24Y3J	MC36Y3J

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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