



FRIEDRICH

Floating Air Pro Single- Zone Cassette and Ducted



	Type	Model
Outdoor	Condensor	FPHFR9A3A
Outdoor	Condensor	FPHFR12A3A
Outdoor	Condensor	FPHFR18A3A
Outdoor	Condensor	FPHFR24A3A
Outdoor	Condensor	FPHFR36A3A
Indoor	Cassette	FPHFC09A3A
Indoor	Cassette	FPHFC12A3A
Indoor	Cassette	FPHFC18A3A
Indoor	Cassette	FPHFC24A3A
Indoor	Cassette	FPHFC36A3A
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.

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

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

Your safety and the safety of others is very important.

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

This is a safety Alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others.



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

WARNING

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

CAUTION

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

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

Indicates property damage can occur if instructions are not followed.

NOTICE

WARNING



Refrigeration system under high pressure

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

Only certified refrigeration technicians should service this equipment.

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

Only use gauge sets designed for use with R410A.

Do not use standard R22 gauge sets.

INTRODUCTION

Important Safety Information

CAUTION

DO NOT OPERATE EQUIPMENT DURING ACTIVE STAGES OF CONSTRUCTION

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



WARNING

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



WARNING

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



WARNING



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, 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.

ELECTRICAL HAZARDS:

- Shutdown and/or disconnect all electrical power to the unit before performing inspections, maintenance, or service.
- Make sure to follow proper lockout/tag out procedures.
- Always work in the company of a qualified assistant if possible.
- Capacitors, even when disconnected from the electrical power source, retain an electrical charge potential capable of causing electric shock or electrocution. Wait a few minutes after shutdown to allow the capacitors to discharge the stored energy.
- Handle, discharge, and test capacitors according to safe, established, standards, and approved procedures.
- Extreme care, proper judgment, and safety procedures must be exercised if it becomes necessary to test or troubleshoot equipment with the power turned on to the unit.
- Do not spray water on the air conditioning unit while the power is on.
- Electrical component malfunction caused by water could result in electric shock or other electrically unsafe conditions when the power is restored and the unit is turned on, even after the exterior is dry.
- Use air conditioner on a single dedicated circuit within the specified amperage rating.
- Ensure the unit that the unit is properly grounded.
- Do not cut or modify the power supply cord or remove the ground prong of the plug.
- Never operate the unit on an extension cord.
- Follow all safety precautions and use approved protective safety equipment such as: gloves, goggles, and clothing. Ensure that properly insulated tools, and testing equipment are 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

Model Identification Guide

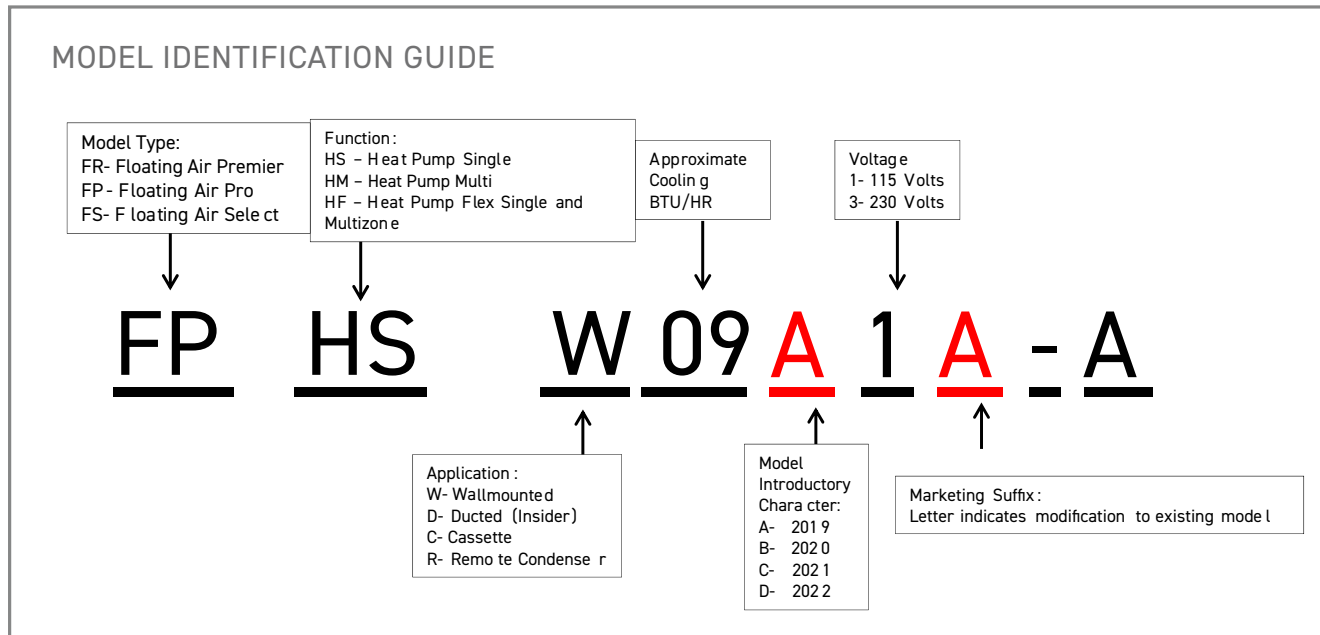


Figure 101

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/ 36k	

Figure 103

INTRODUCTION

Product Appearance- Outdoor Units



Figure 104

SPECIFICATIONS

Product Specifications Single-Zone-Cassette

PERFORMANCE RATINGS		9k	12k	18k	24k	36k
INDOOR MODEL		FPHFC09A3A FPHFC09A3B Wi-Fi™	FPHFC12A3A FPHFC12A3B Wi-Fi™	FPHFC18A3A FPHFC18A3B Wi-Fi™	FPHFC24A3A FPHFC24A3B Wi-Fi™	FPHSC36A3B Wi-Fi™
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	8000-19200	8600-25200	12600-36800
CAPACITY HEATING @470F (RATED)	Btu	9000	12000	11942	24000	42600
CAPACITY HEATING @170F (RATED)	Btu	5120	6800	7500	19600	27300
CAPACITY HEATING (MIN-MAX)	Btu	4340-12280	6000-14400	7000-21200	7600-28400	15000-42600
SENSIBLE HEAT RATIO		76%	77%	76%	76%	79%
COP (@47°F)		4.00	3.80	3.90	3.61	3.31
SEER		18	19	19	19	19.5
EER		12.5	12.5	12.7	12.5	10.6
HSPF		10.00	10.00	10.00	10.00	10.50
MOISTURE REMOVAL	Pts/h	2	3	5	5.1	7.61
AIRFLOW (LOW, MED, HIGH)	CFM	235/285/309	235/294/353	380/457/588	400/530/647	676/794/941
SOUND RATING - INDOOR H/M/L	dB(A)	40/33/28	35/32/29	38/35/33	43/39/36	49/43/39
SOUND RATING - OUTDOOR	dB(A)	52	54	68	54	61
OPERATING RANGE (COOLING)	°F	5-118	5-118	5-118	-4-118	-4-118
OPERATING RANGE (HEATING)	°F	-4-75	-4-75	-4-75	-4-75	-4-75
ELECTRICAL DATA						
POWER SOURCE	V, Ø, Hz	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
POWER AND COMMUNICATION CABLE	TYPE	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN
MINIMUM AMPACITY	A	23	23	23	23	27
COOLING WATTS	W	720	960	1420	1920	3380
COOLING AMPS	A	3.6	4.3	6.3	8.6	14.6
HEATING AMPS	A	3.5	4.1	6.5	8.7	14.0
MAX. TD FUSE/BREAKER	A	20	30	30	30	50
REFRIGERATION SYSTEM						
REFRIGERANT		R410a	R410a	R410a	R410a	R410a
COMPRESSOR TYPE		Rotary	Rotary	Rotary	Rotary	Rotary
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	75.3	111
MIN./MAX. LINE LENGTH	ft	10-82	10-82	10-98	25-164	25-164
MAX. HEIGHT DIFFERENCE	ft	33	49	49	98	98

Figure 201

SPECIFICATIONS

Product Specifications Single-Zone Concealed Ducted

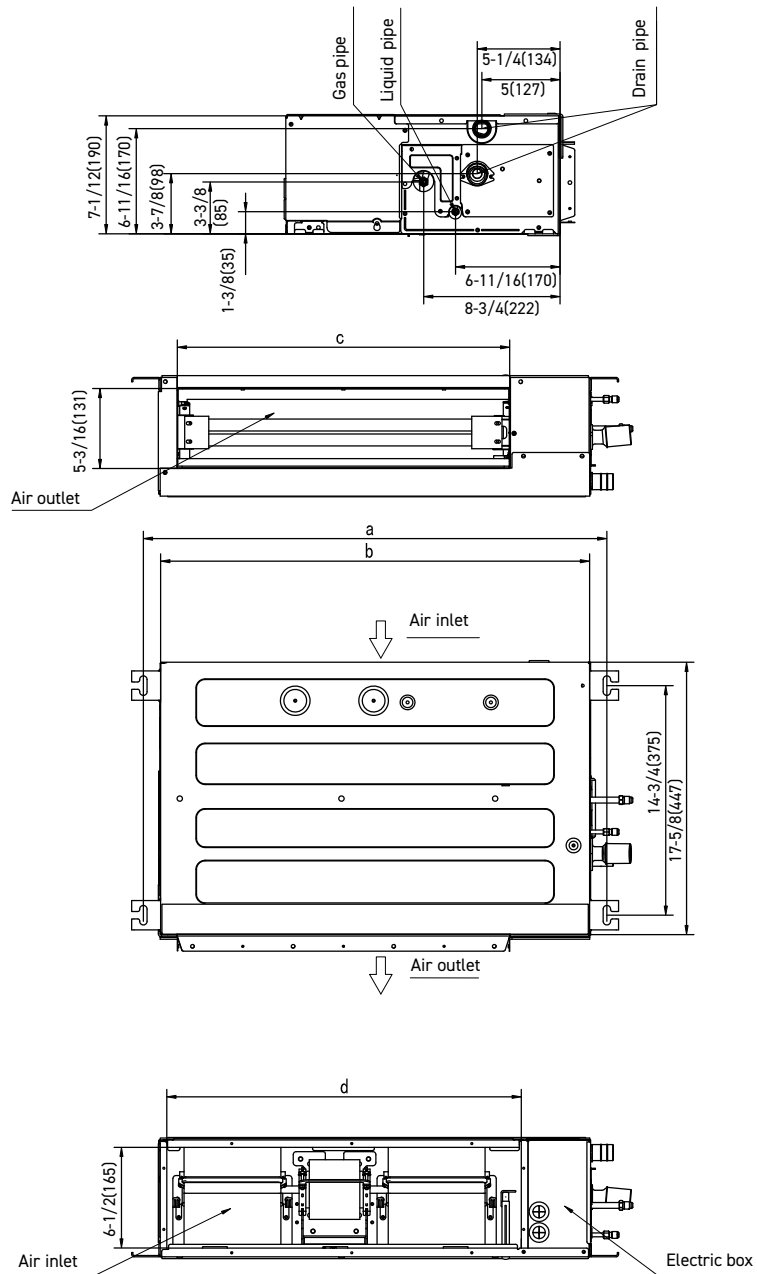
PERFORMANCE RATINGS		9k	12k	18k	24k	36k
INDOOR MODEL		FPHFD09A3A	FPHFD12A3A	FPHFD18A3A	FPHFD24A3A	FPHSD36A3A
OUTDOOR MODEL		FPHFR09A3A	FPHFR12A3A	FPHFR18A3A	FPHFR24A3A	FPHFR36A3A
SPECIFICATIONS						
CAPACITY COOLING (RATED)	Btu	9000	12000	18000	24000	36000
CAPACITY COOLING (MIN-MAX)	Btu	4850-11600	5800-13100	8000-19200	8600-25200	12600-36800
CAPACITY HEATING @470F (RATED)	Btu	9000	12000	18000	24000	36000
CAPACITY HEATING @170F (RATED)	Btu	6200	8200	14700	19600	22000
CAPACITY HEATING (MIN-MAX)	Btu	4340-12280	6000-14400	7000-21200	7600-28400	15000-42600
SENSIBLE HEAT RATIO		76%	76%	76%	76%	76%
COP (@47°F)		3.2	3.2	3.4	3.6	3
SEER		17	19	19	18	18
EER		12	11	12.2	12.5	10.9
HSPF		10.00	10.00	10.00	10.00	9.50
MOISTURE REMOVAL	Pts/h	2	3	5	5.1	7.61
AIRFLOW (LOW, MED, HIGH)	CFM	235/285/309	235/285/338	370/440/529	501/574/647	618/735/853
SOUND RATING - INDOOR H/M/L	dB(A)	29/27/26	36/33/30	38/35/33	38/36/34	49/43/39
SOUND RATING - OUTDOOR	dB(A)	52	54	68	54	61
OPERATING RANGE (COOLING)	°F	5-118	5-118	5-118	-4-118	-4-118
OPERATING RANGE (HEATING)	°F	-4-75	-4-75	-4-75	-4-75	-4-75
ELECTRICAL DATA						
POWER SOURCE	V, Ø, Hz	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1	208-230/60/1
POWER AND COMMUNICATION CABLE	TYPE	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN	14/4 AWG 600V THHN
MINIMUM AMPACITY	A	23.0	23.0	23.0	23.0	4.6
COOLING WATTS	W	750	1091	1610	2200	3300
COOLING AMPS	A	3.7	4.8	7.0	8.6	14.4
HEATING AMPS	A	4.1	4.8	7.3	8.7	15.2
MAX. TD FUSE/BREAKER	A	20	30	30	30	50
REFRIGERATION SYSTEM						
REFRIGERANT		R410a	R410a	R410a	R410a	R410a
COMPRESSOR TYPE		Rotary	Rotary	Rotary	Rotary	Rotary
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	75.3	111
MIN./MAX. LINE LENGTH	ft	10-82	10-82	10-98	25-164	25-164
MAX. HEIGHT DIFFERENCE	ft	33	49	49	98	98

Figure 202

SPECIFICATIONS

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

Unit: Inches “ (mm)



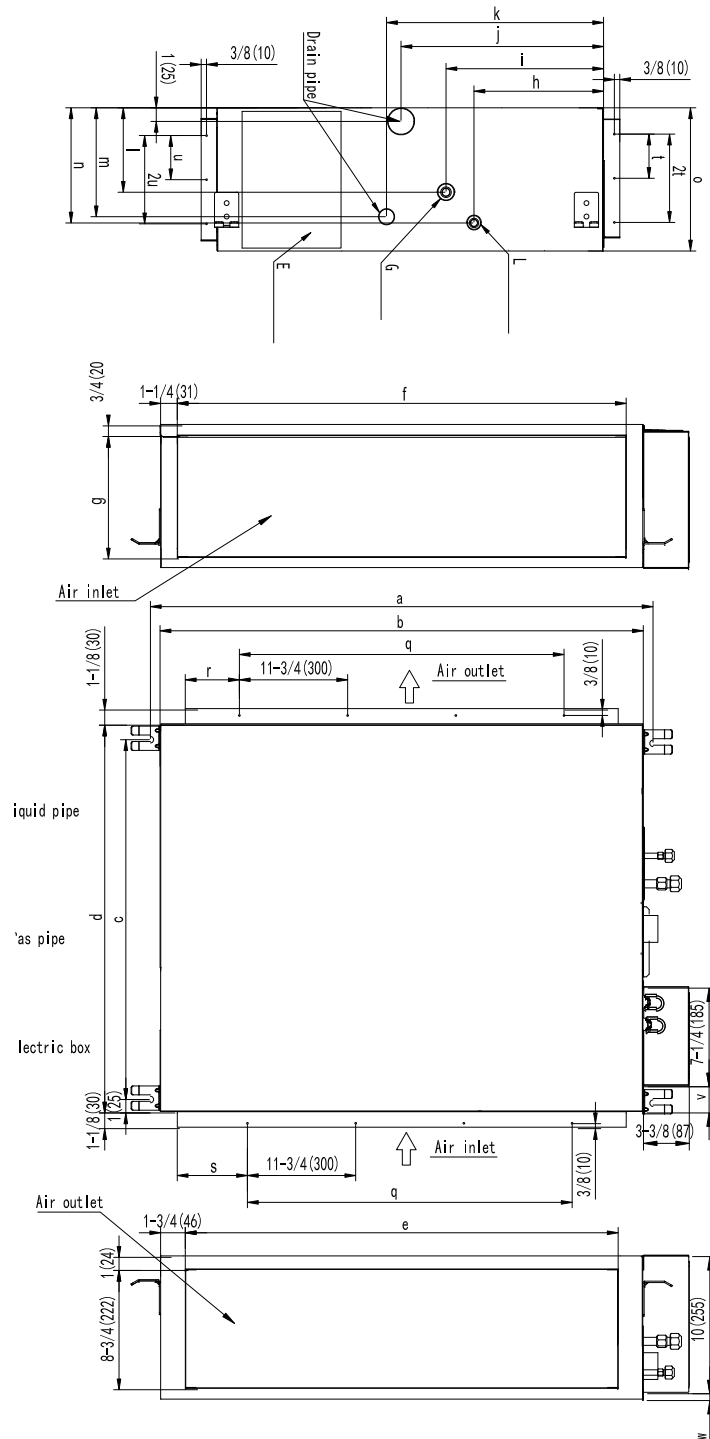
Model (Btu/h)	a	b	c	d
9K/12K	37-13/16 (961)	35-13/16 (910)	29-1/2 (749)	30 (786)
18K	48-7/16 (1231)	46-7/16 (1180)	40-1/8 (1019)	41-5/8 (1056)

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)

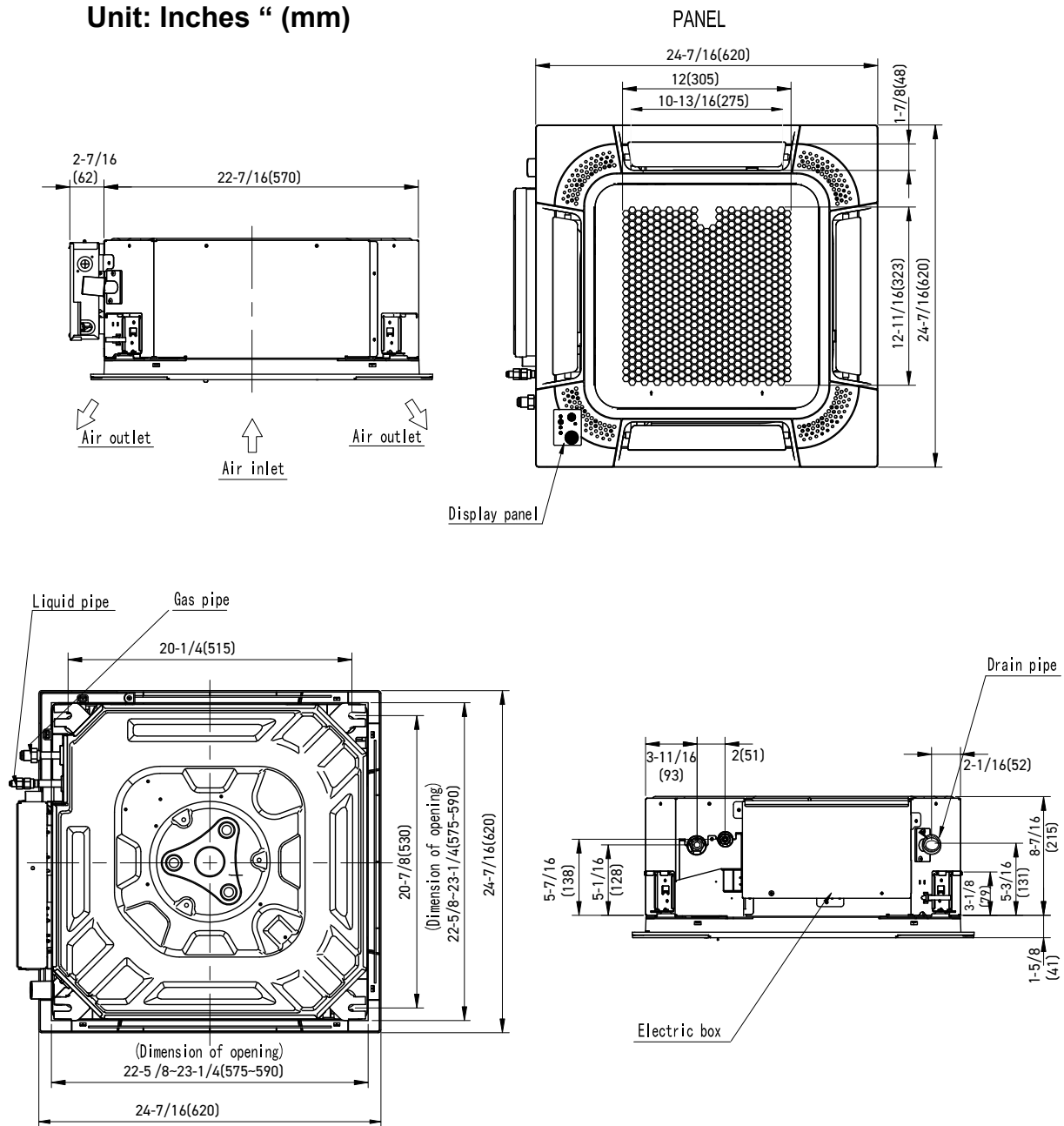


Figure 205

SPECIFICATIONS

Product Dimensions: 18-36k Cassette

Unit: Inches “ (mm)

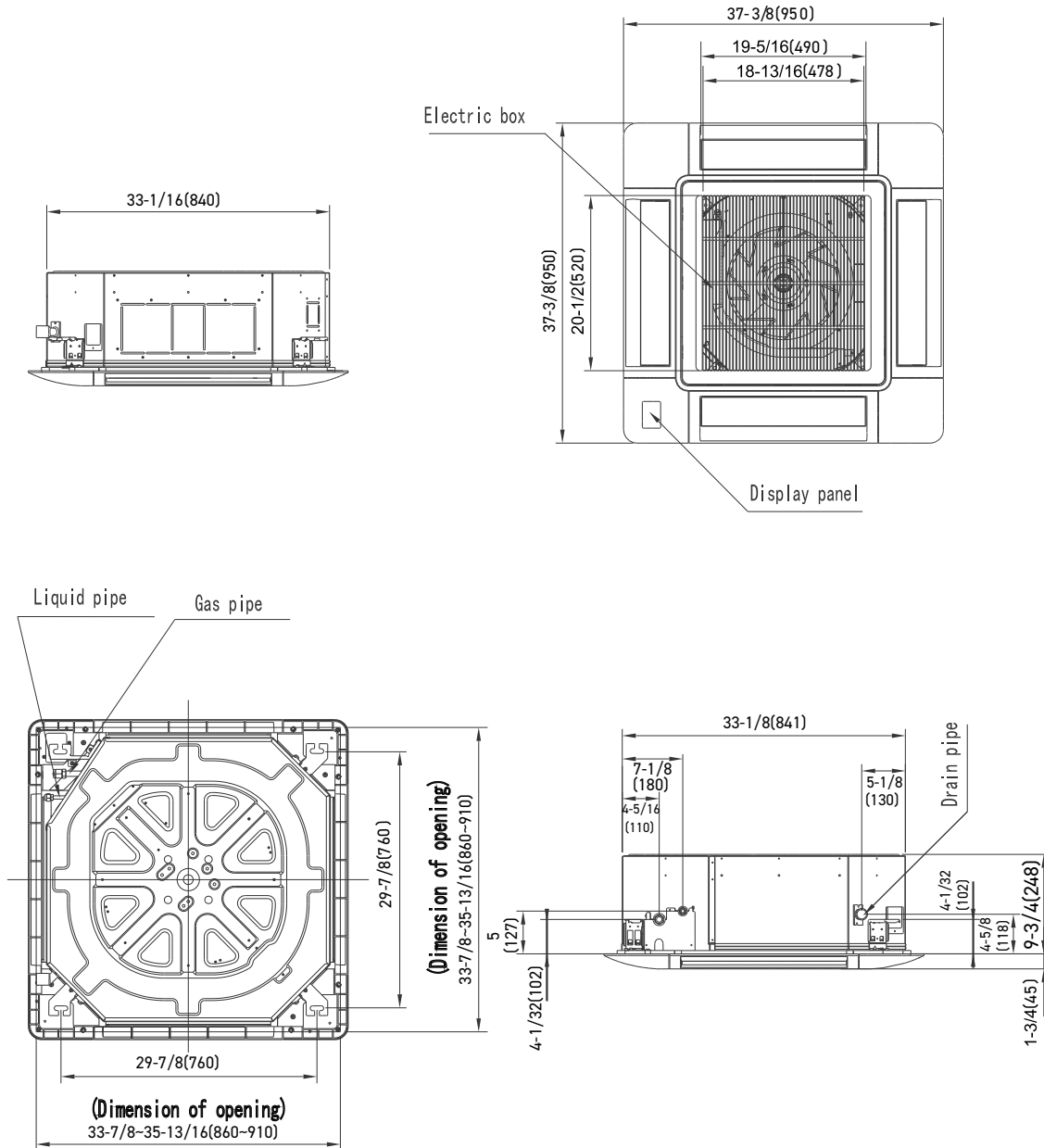


Figure 206

SPECIFICATIONS

Product Dimensions: 9-12k Outdoor Units

Inches“(mm)

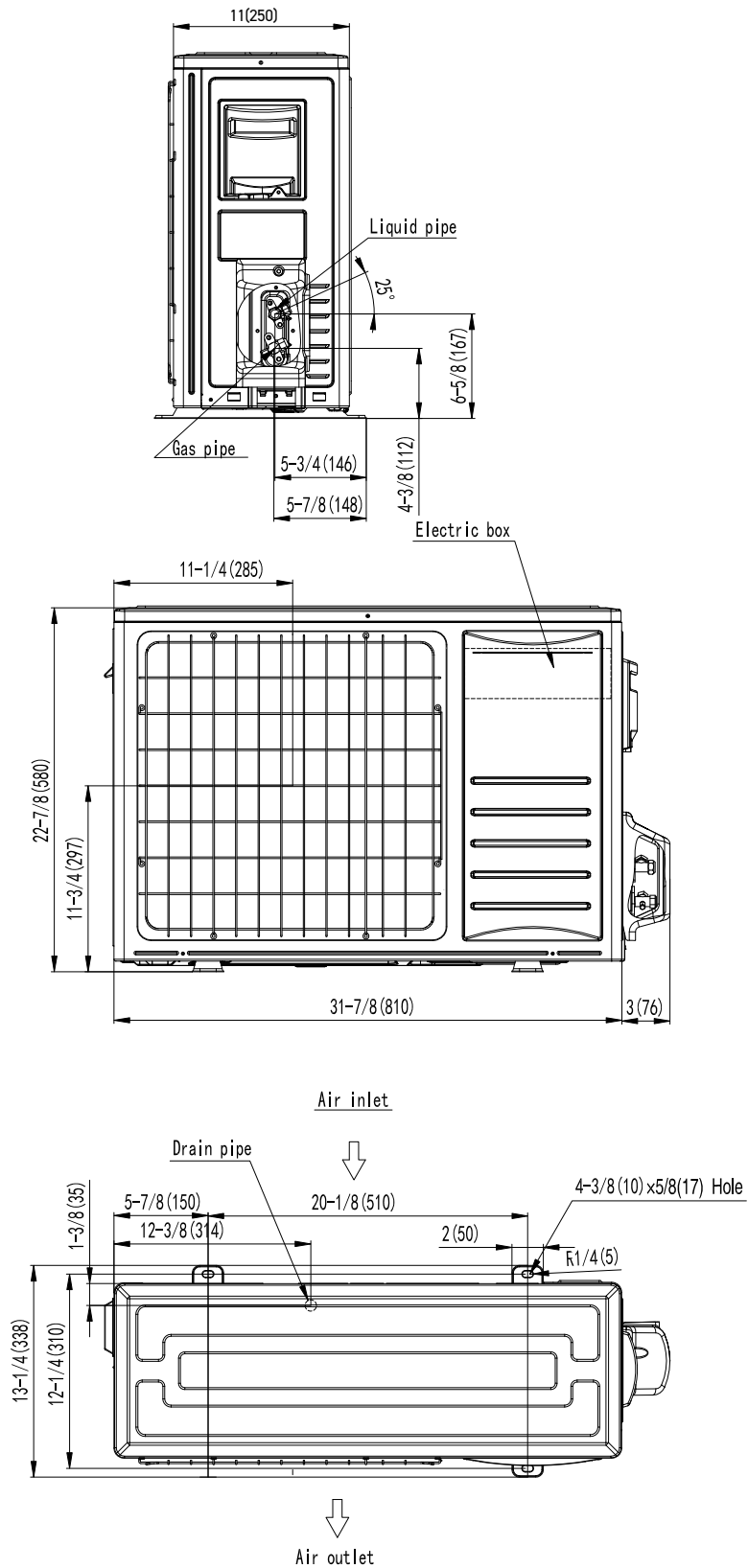


Figure 207

SPECIFICATIONS

Product Dimensions: 18k Outdoor Units

Inches“(mm)

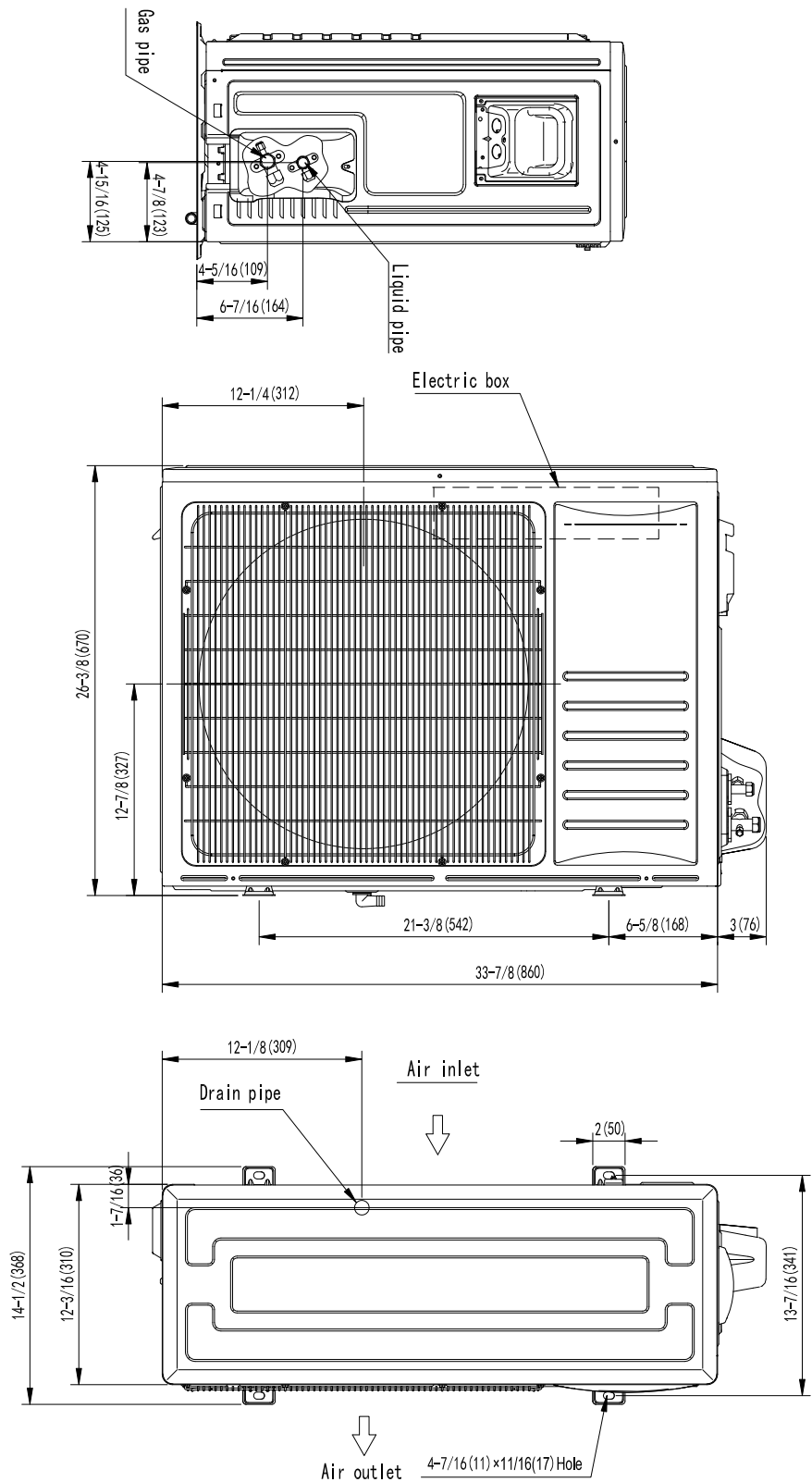


Figure 208

SPECIFICATIONS

Product Dimensions: 24k Outdoor Units

Unit: Inches “ (mm)

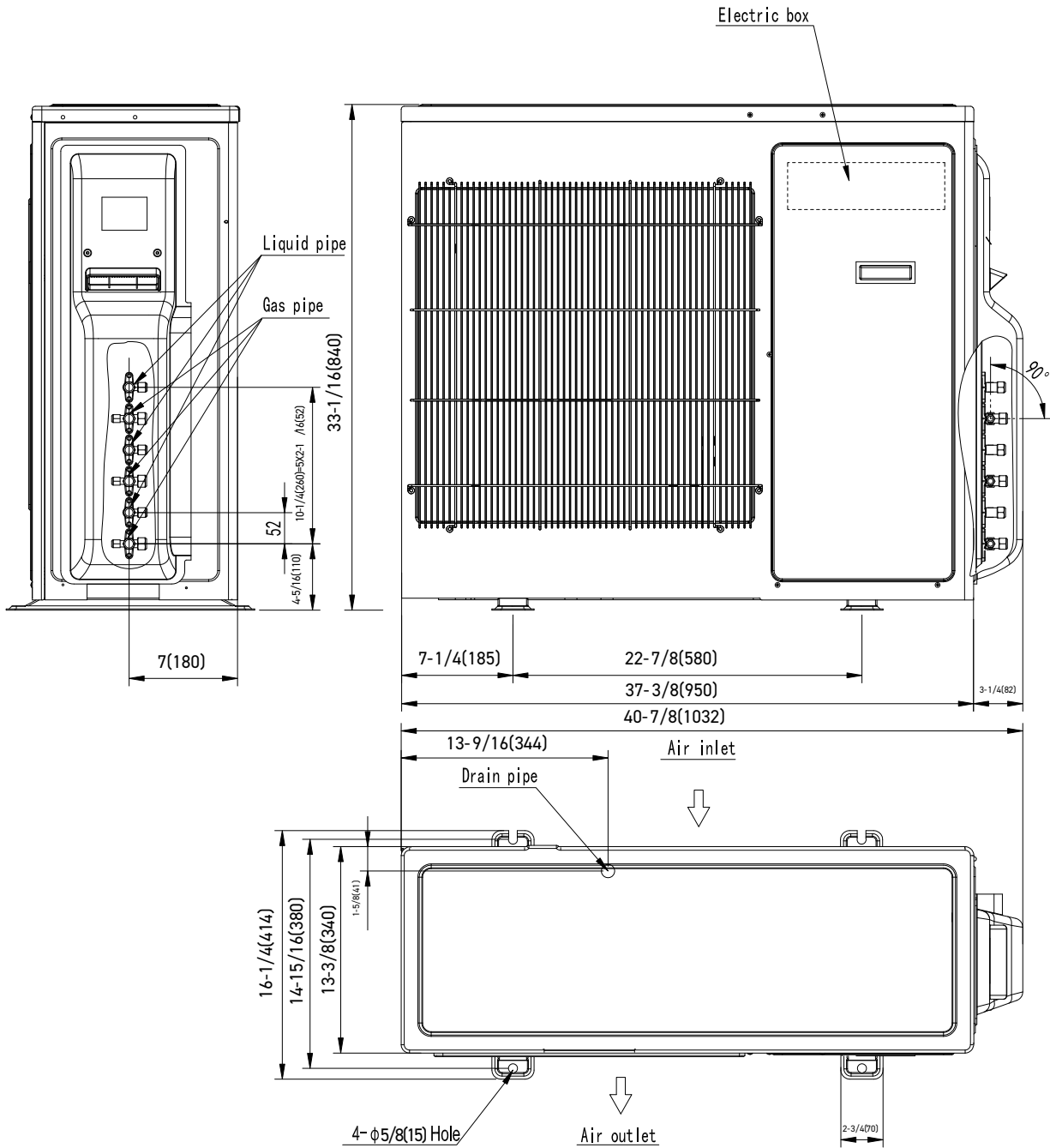


Figure 209

SPECIFICATIONS

Product Dimensions: 36k Outdoor Units

Inches" (mm)

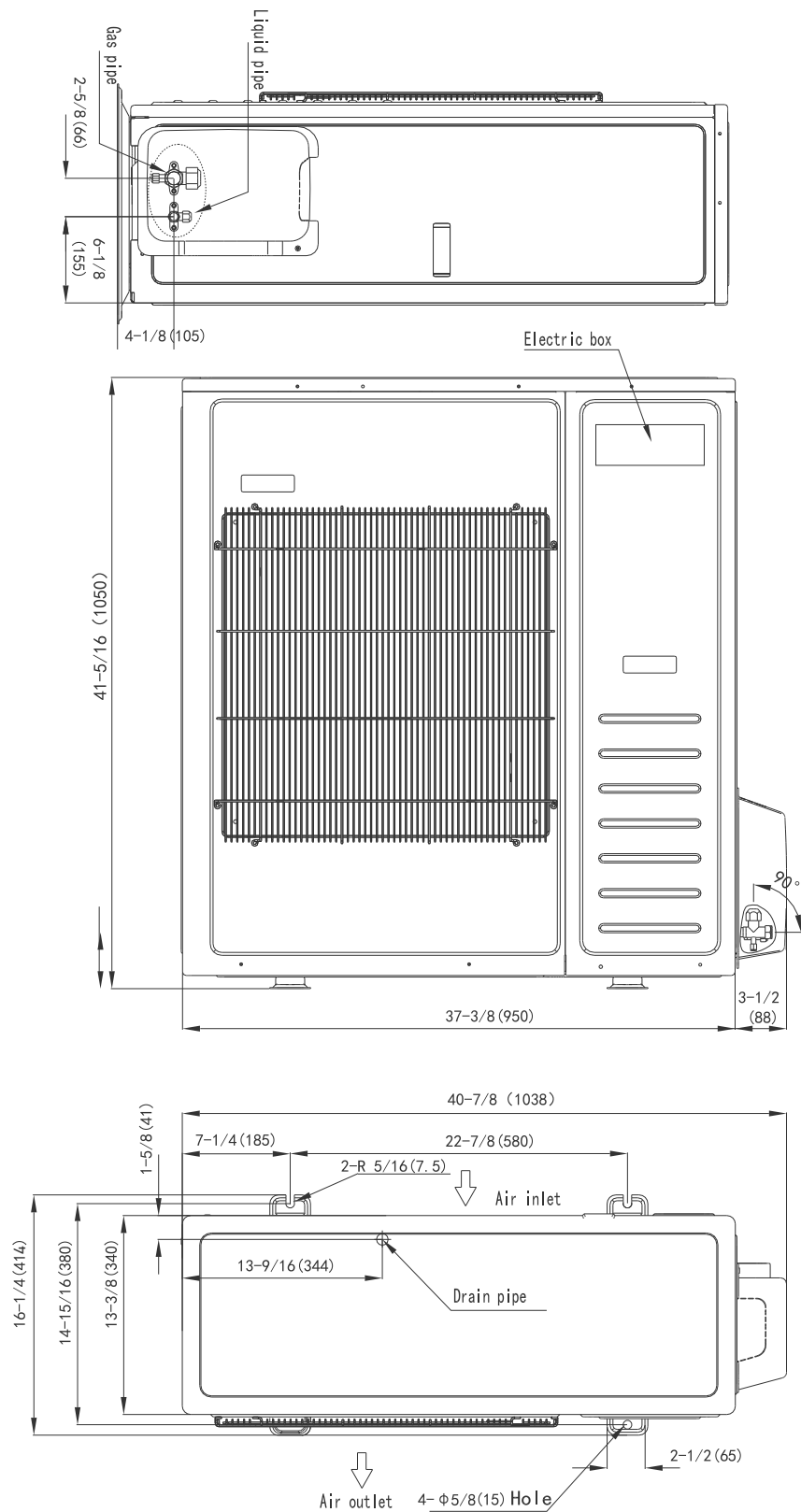


Figure 210

SPECIFICATIONS

Capacity Characteristics Chart Single Zone Ducted

"The Insider" - Concealed 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

Figure 212

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											
			61		64		68		70		72		75	
	°F DB	°F WB	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

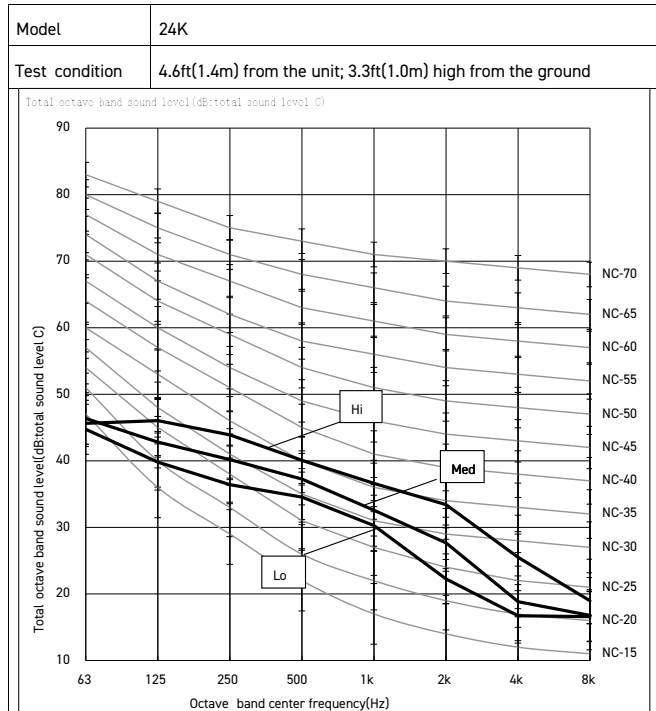
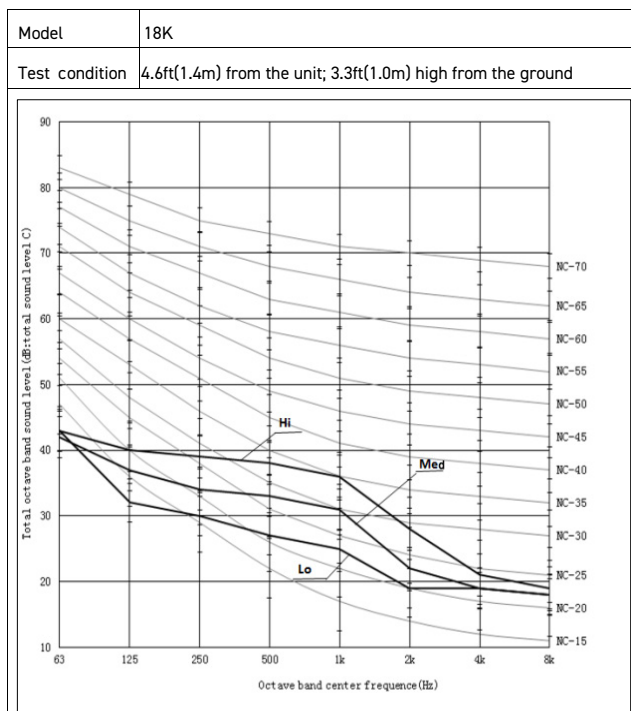
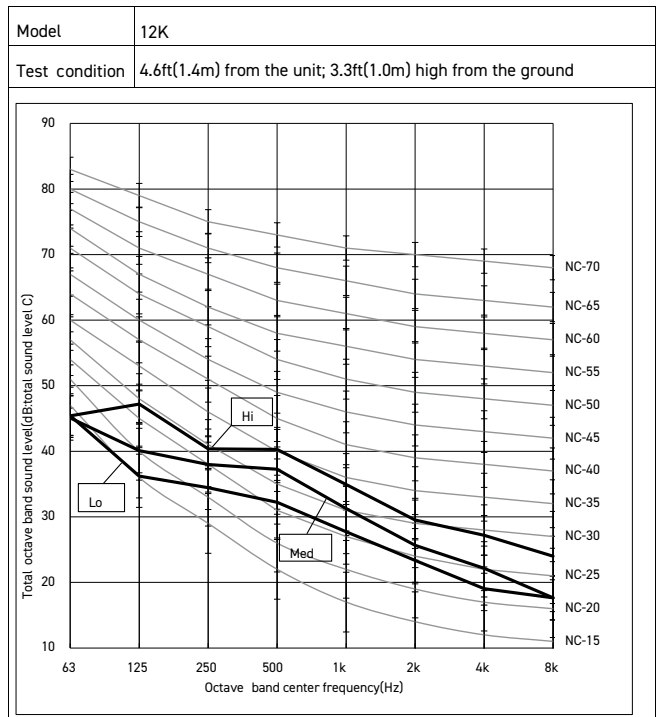
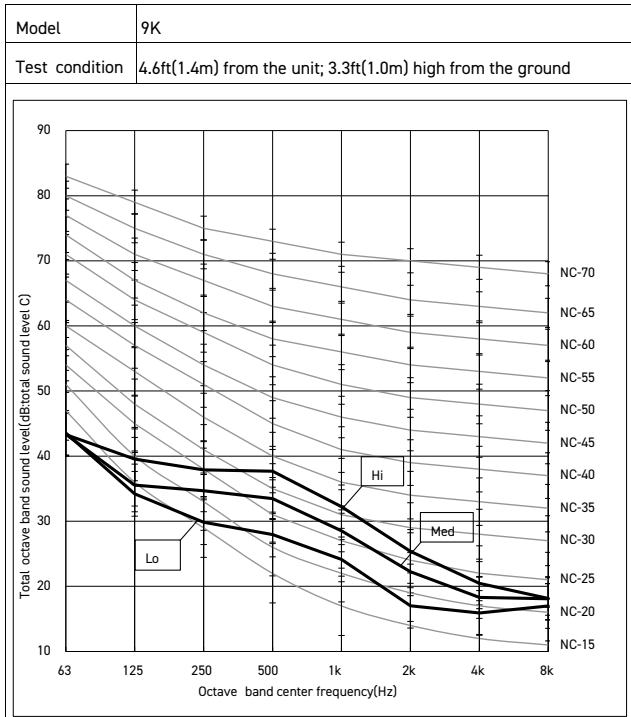


Figure 220

SPECIFICATIONS

Sound Pressure Data -Ducted Indoor

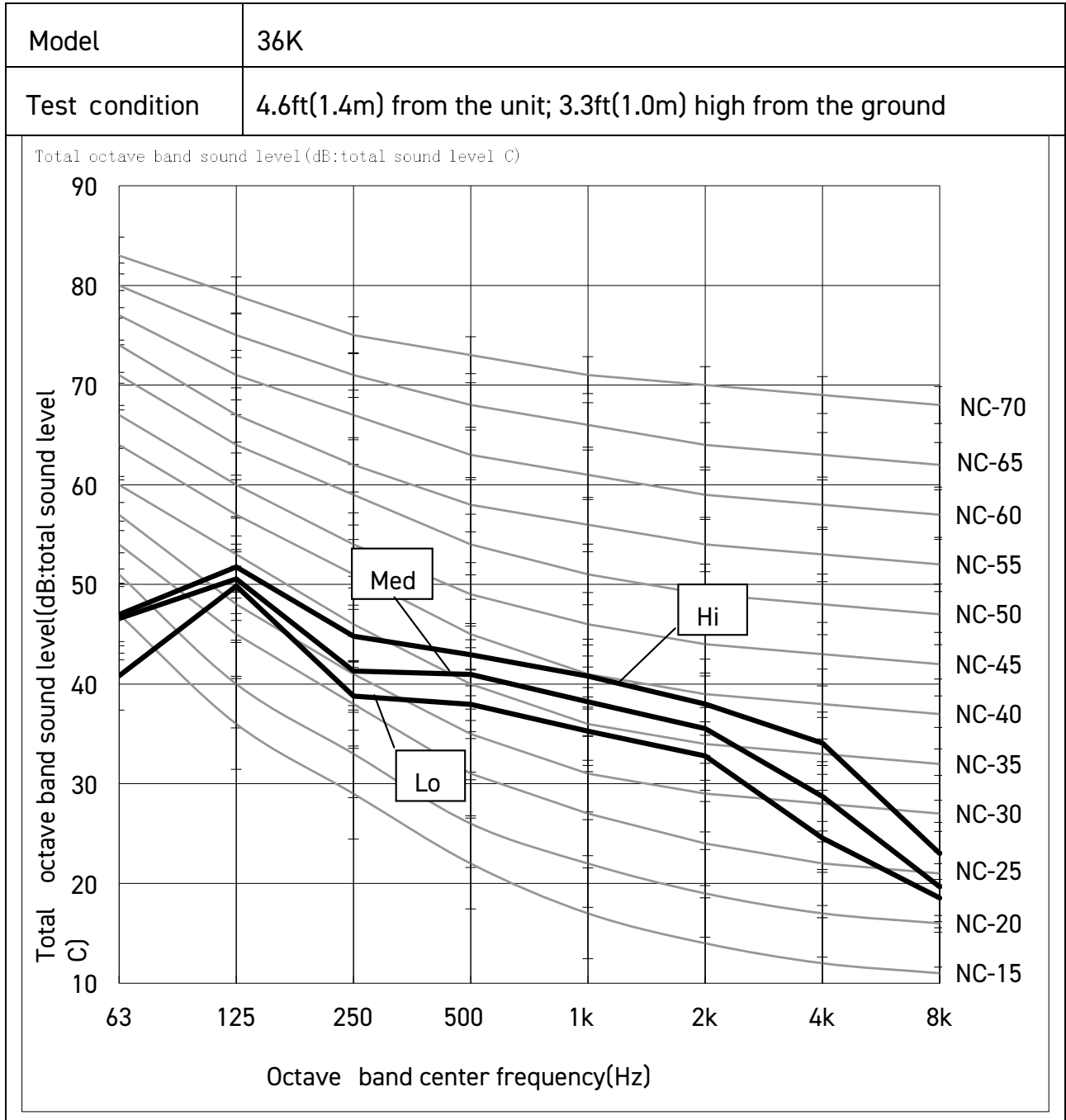


Figure 220

SPECIFICATIONS

Sound Pressure Data -Cassettes

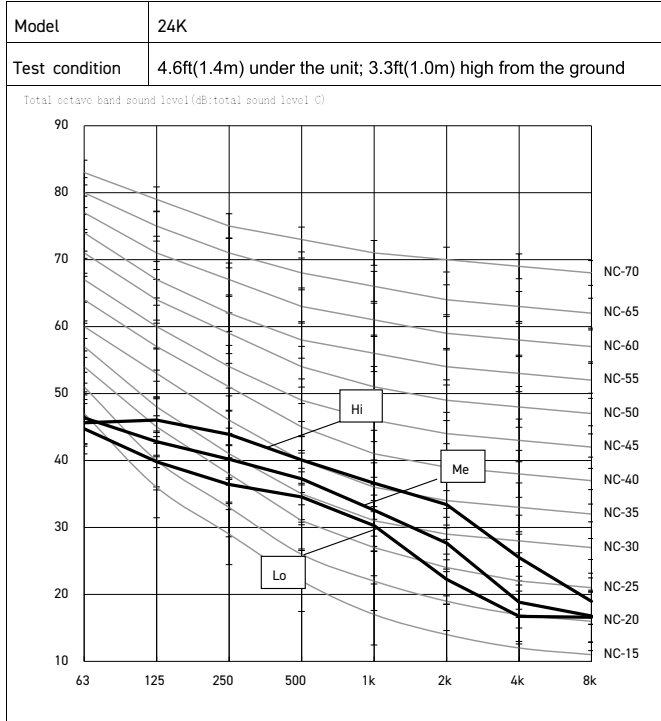
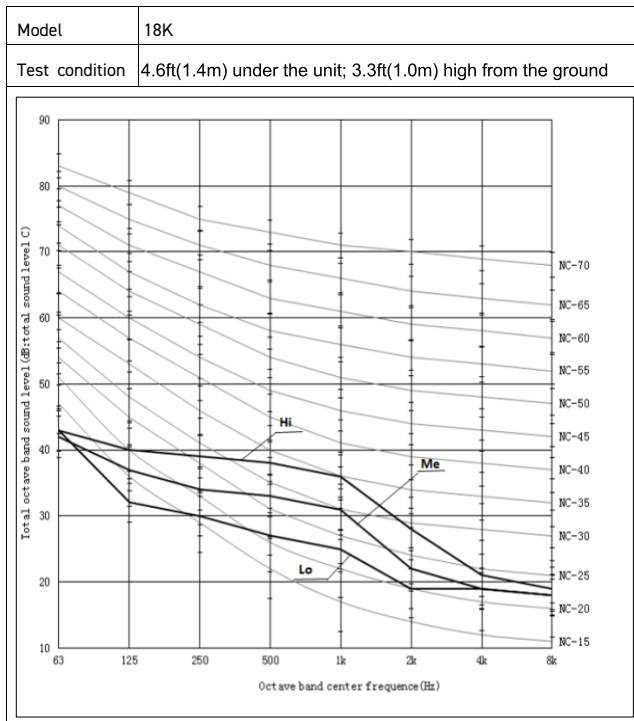
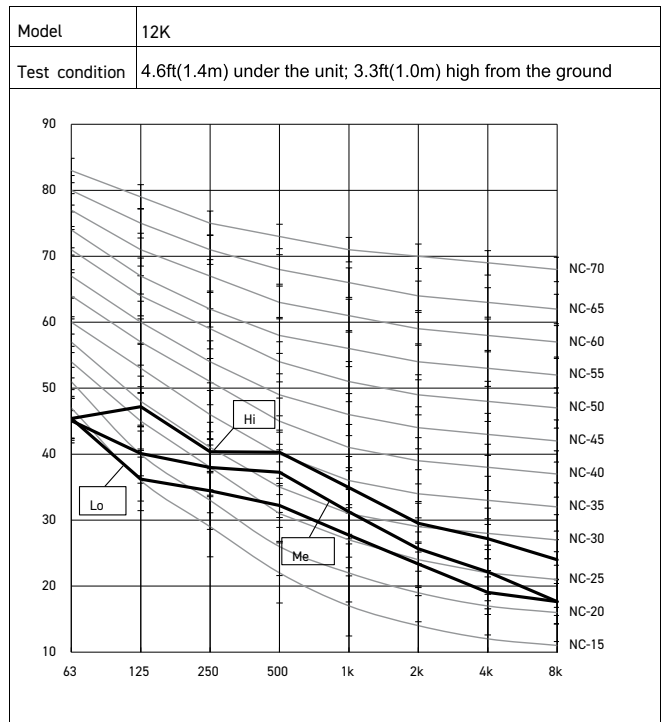
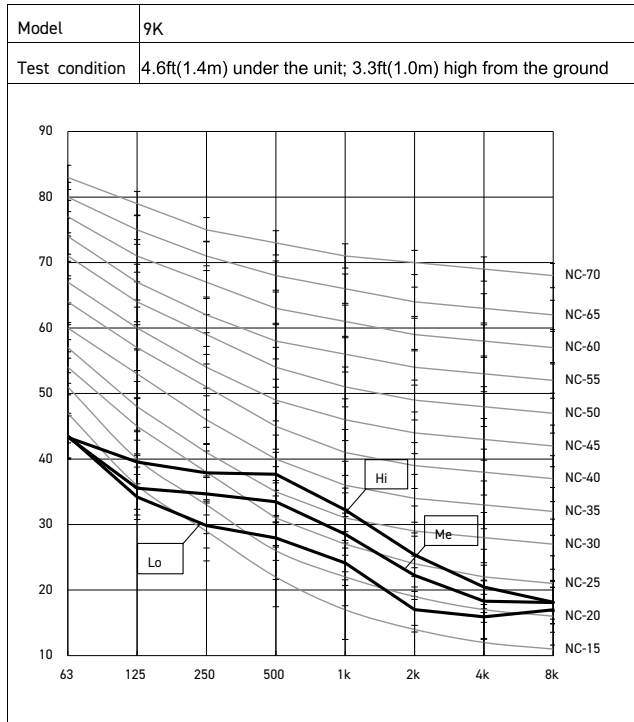


Figure 221

SPECIFICATIONS

Sound Pressure Data -Cassettes

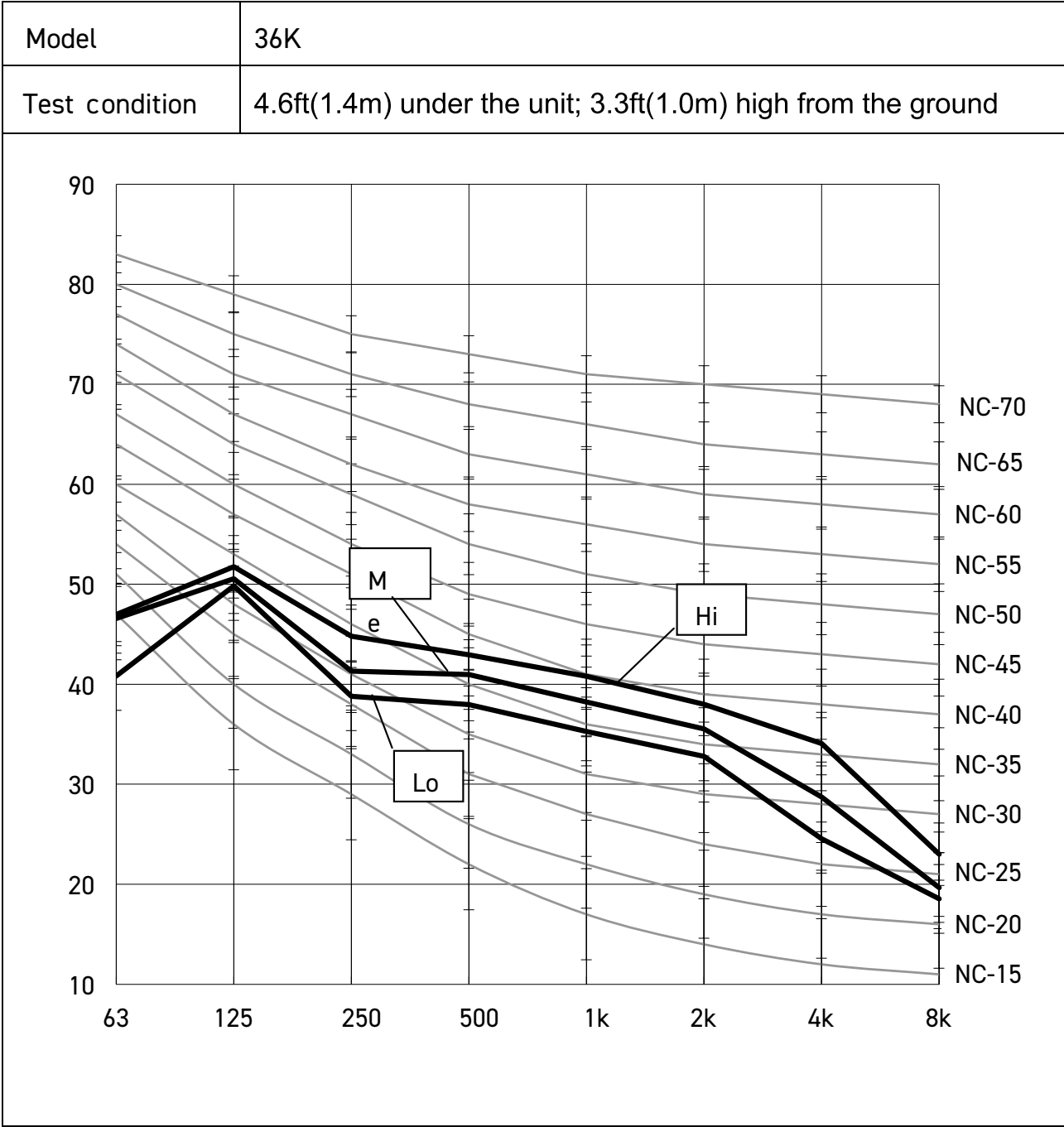


Figure 221

SPECIFICATIONS

Sound Pressure Data -Outdoor Units

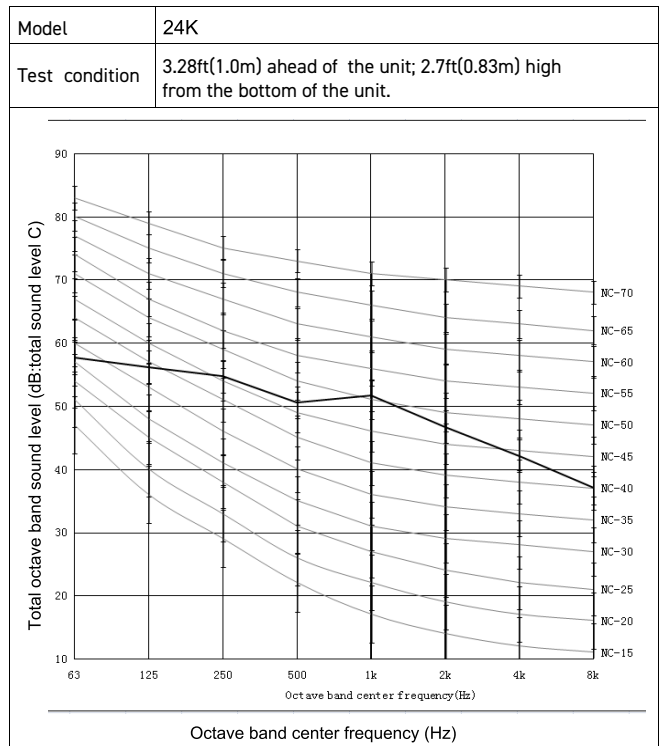
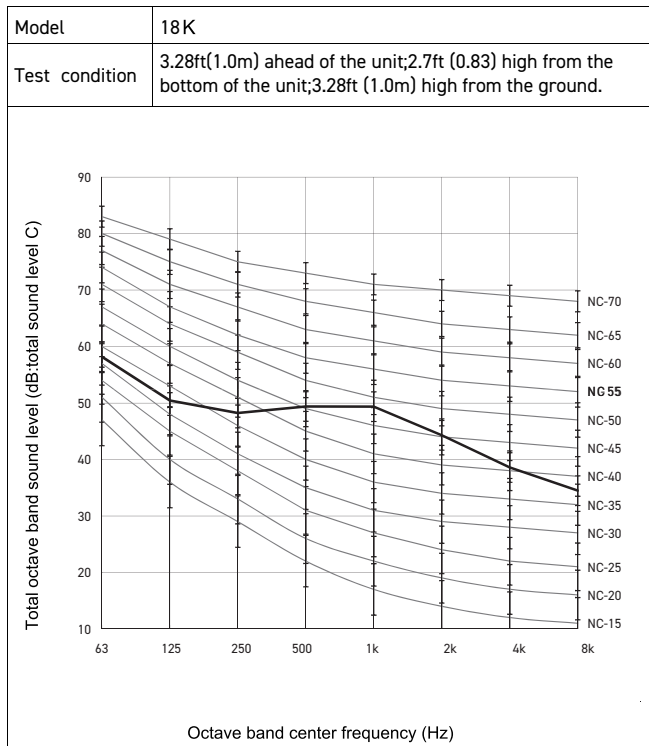
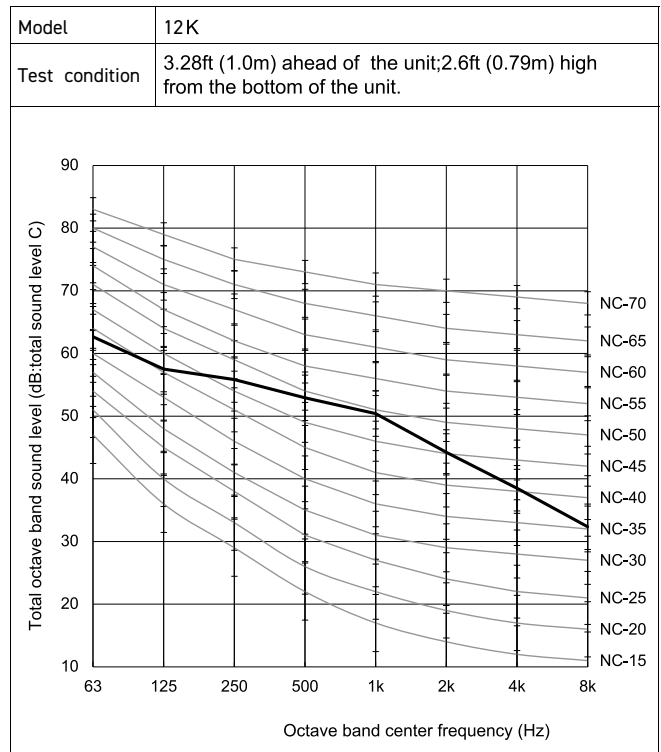
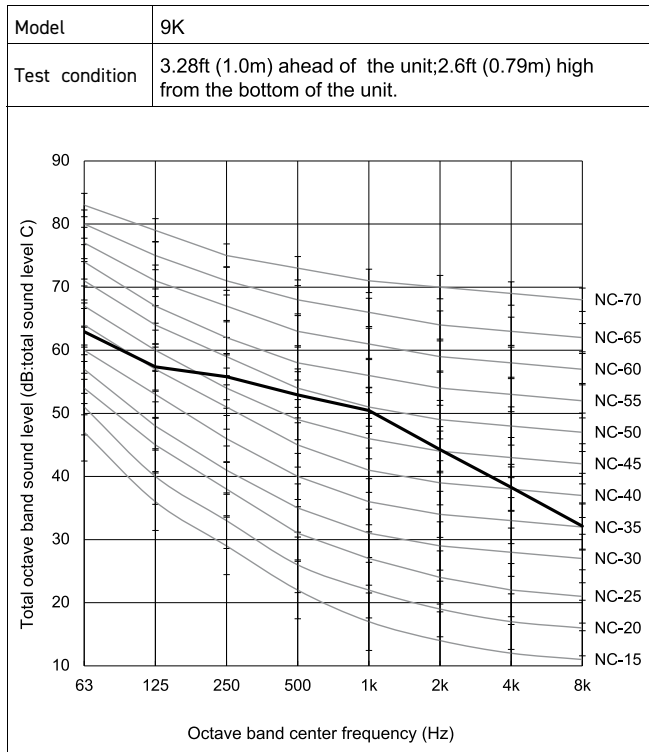


Figure 222

SPECIFICATIONS

Sound Pressure Data -Outdoor Units

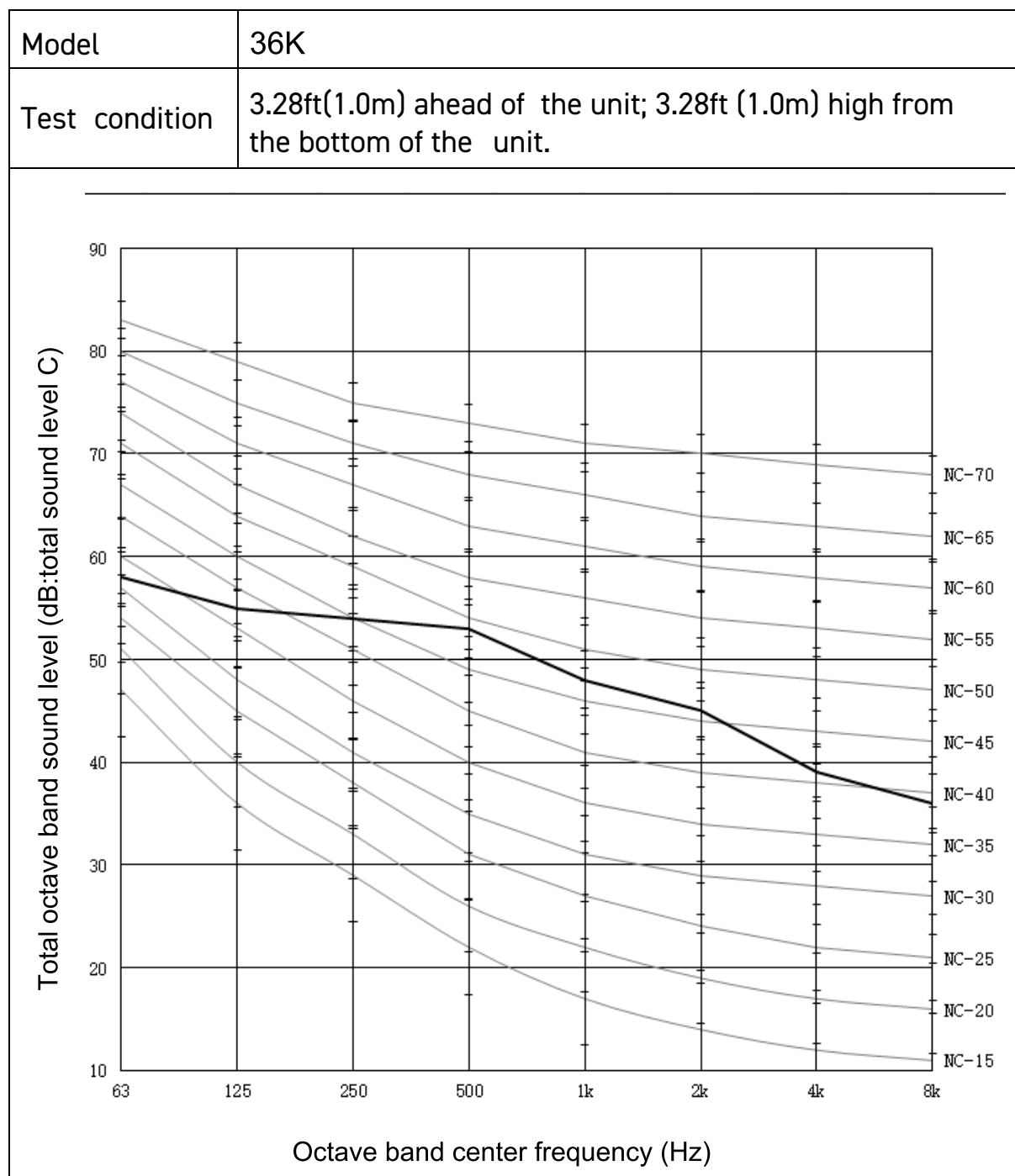
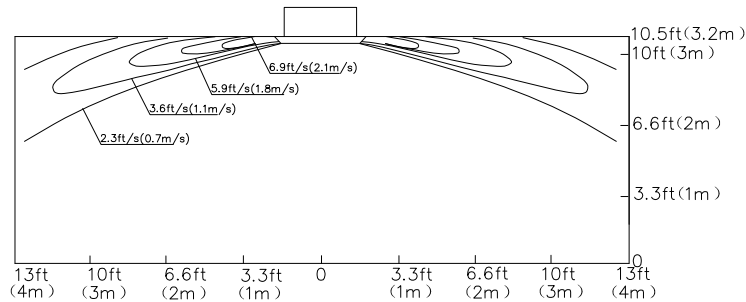


Figure 222

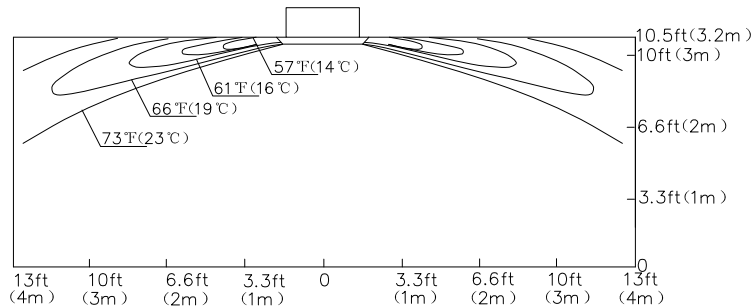
SPECIFICATIONS

Air Flow Distribution 9k

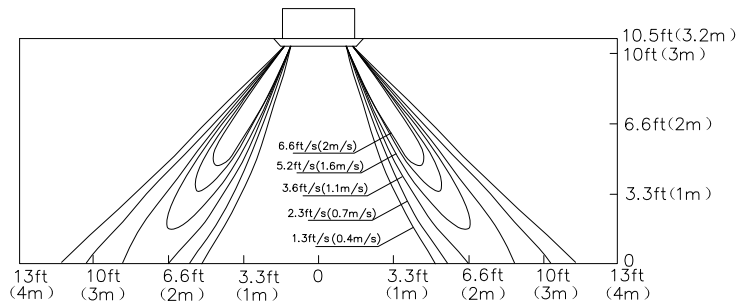
1) Cooling /AirVelocity Distribution



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

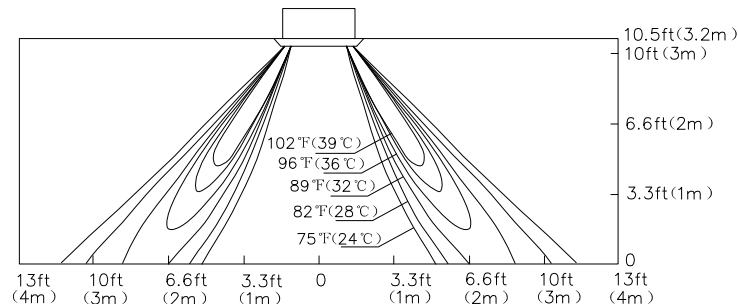
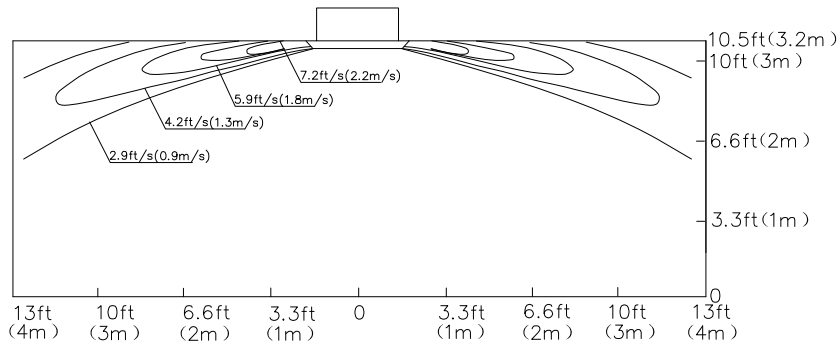


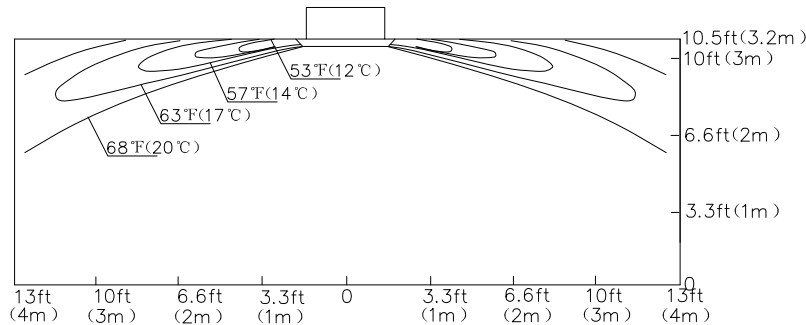
Figure 223

SPECIFICATIONS

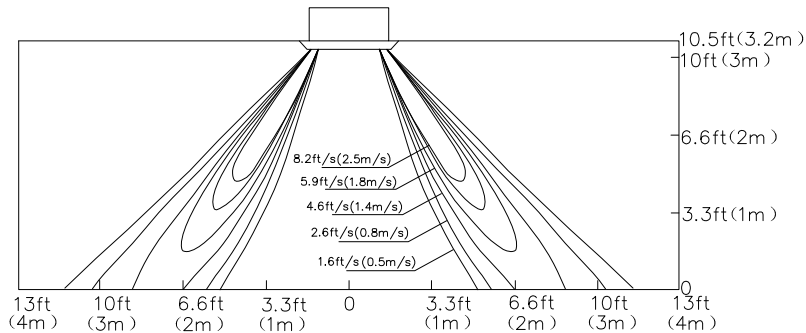
Air Flow Distribution 12k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

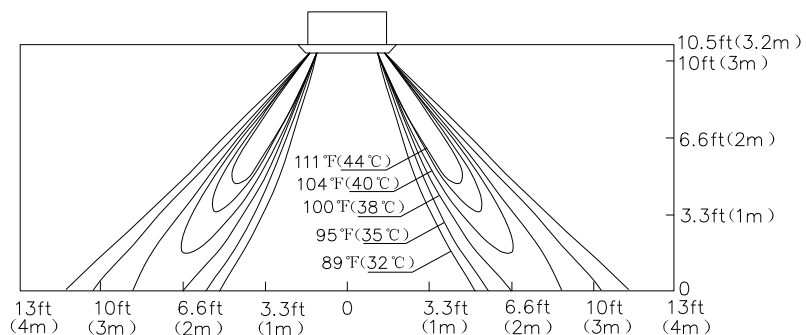
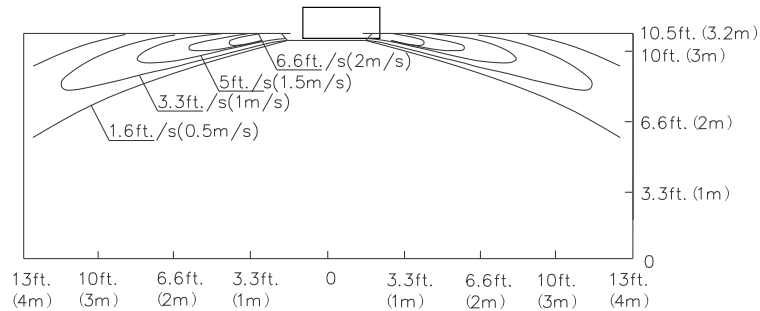


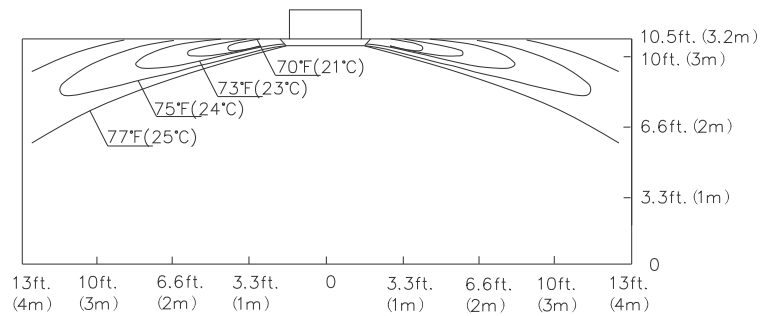
Figure 224

SPECIFICATIONS

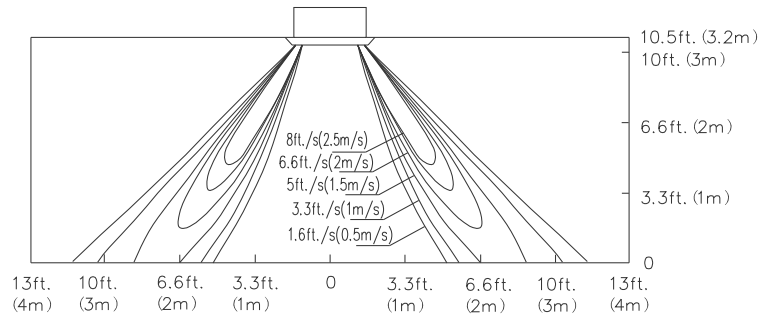
Air Flow Distribution 18-24k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

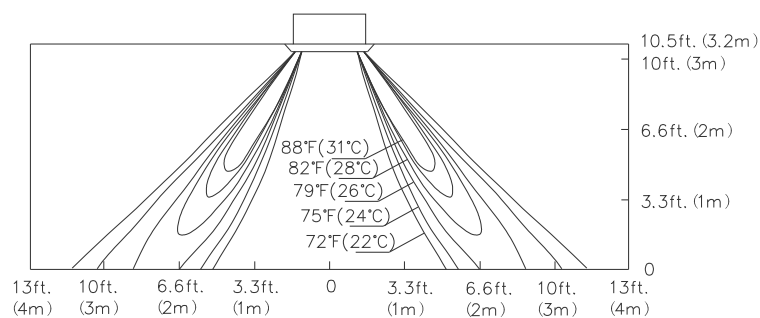
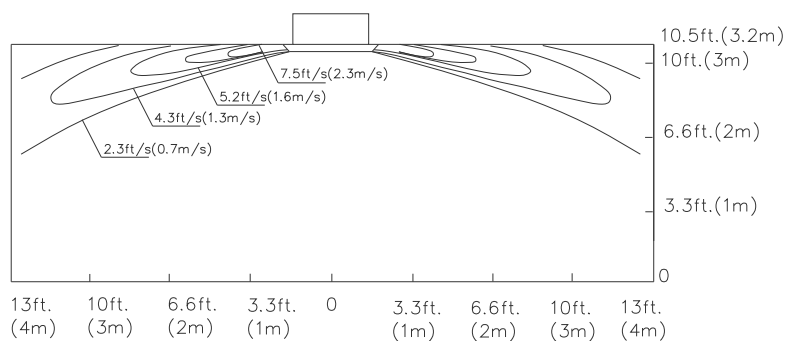


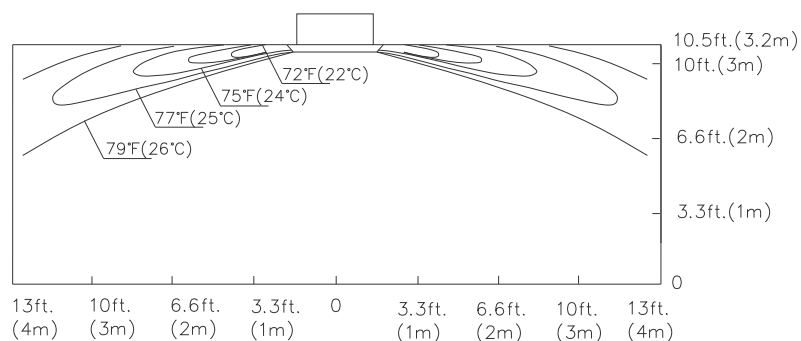
Figure 225

SPECIFICATIONS

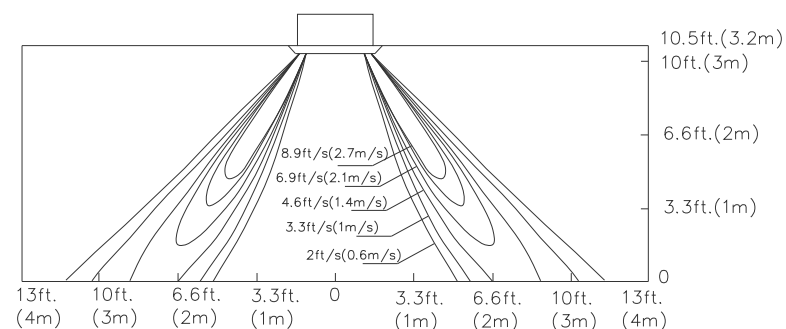
Air Flow Distribution 36k



2) Cooling/Air Temperature Distribution



3) Heating/Air Velocity Distribution



4) Heating/Air Temperature Distribution

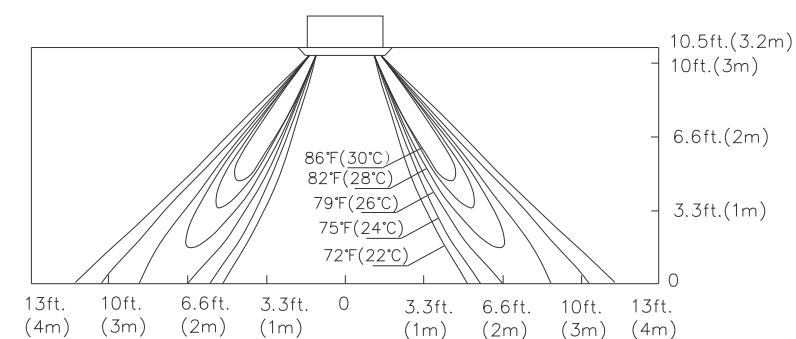
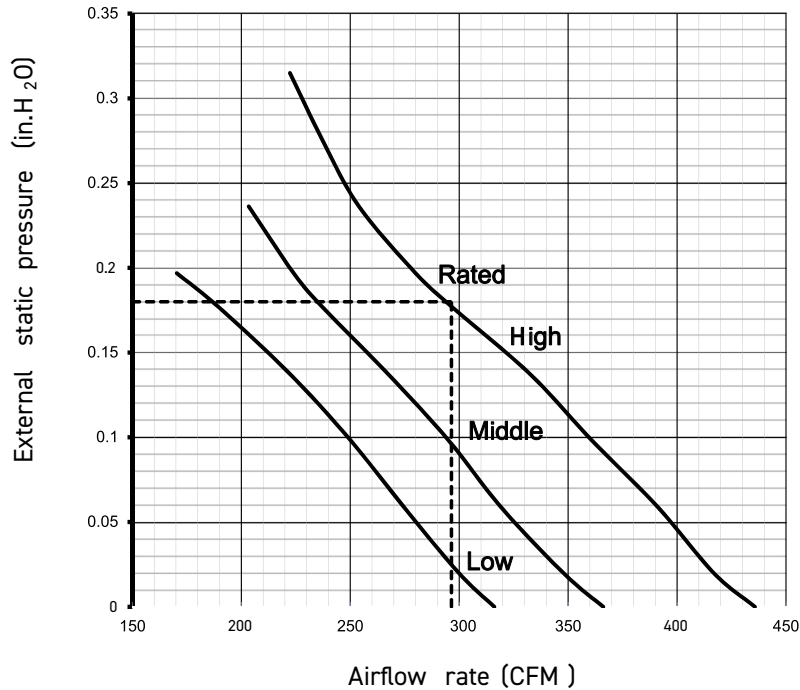


Figure 226

SPECIFICATIONS

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

Standard ESP Chart (0.18 in.H₂O)



Standard ESP Chart (0.2 in.H₂O)

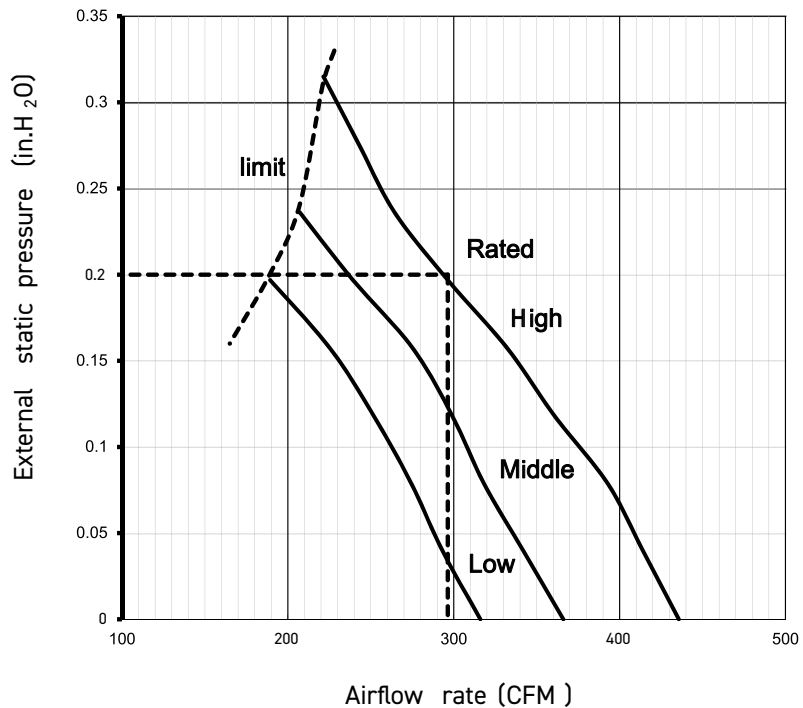
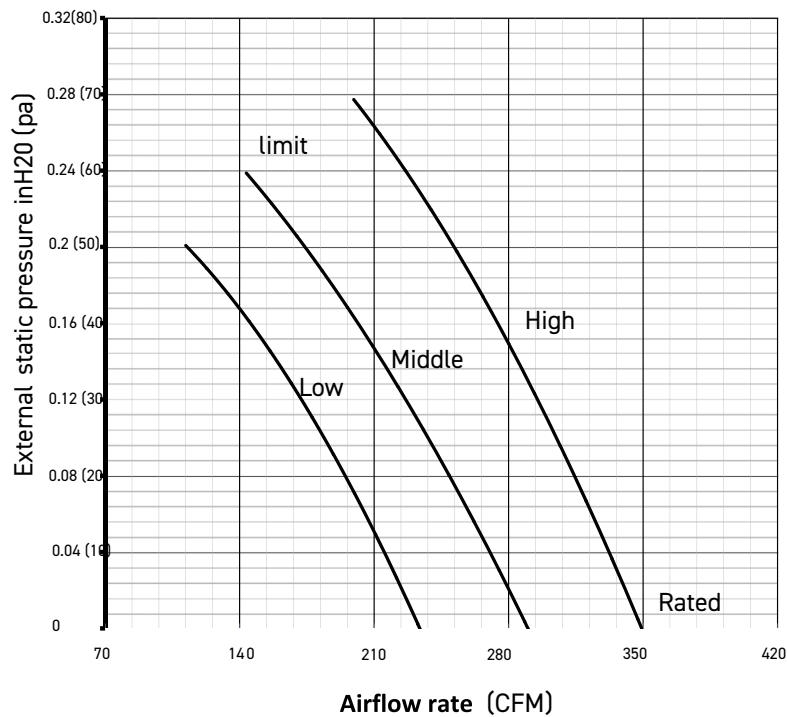


Figure 227

SPECIFICATIONS

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

Standard ESP Chart (0 Pa)



High ESP Chart (5 0 Pa)

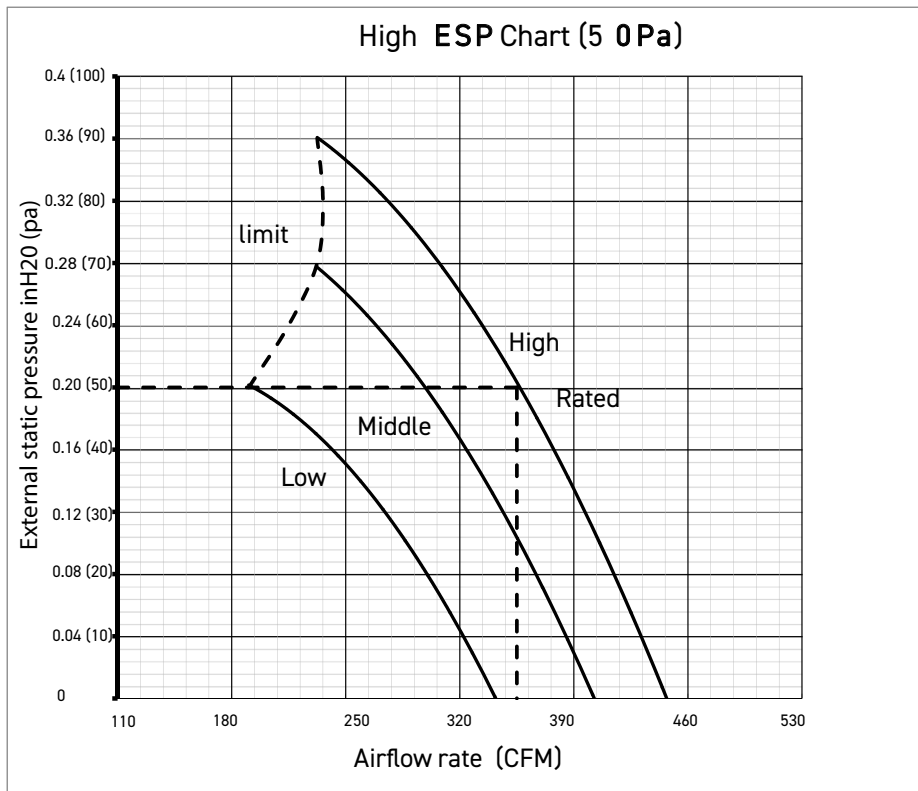


Figure 228

SPECIFICATIONS

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

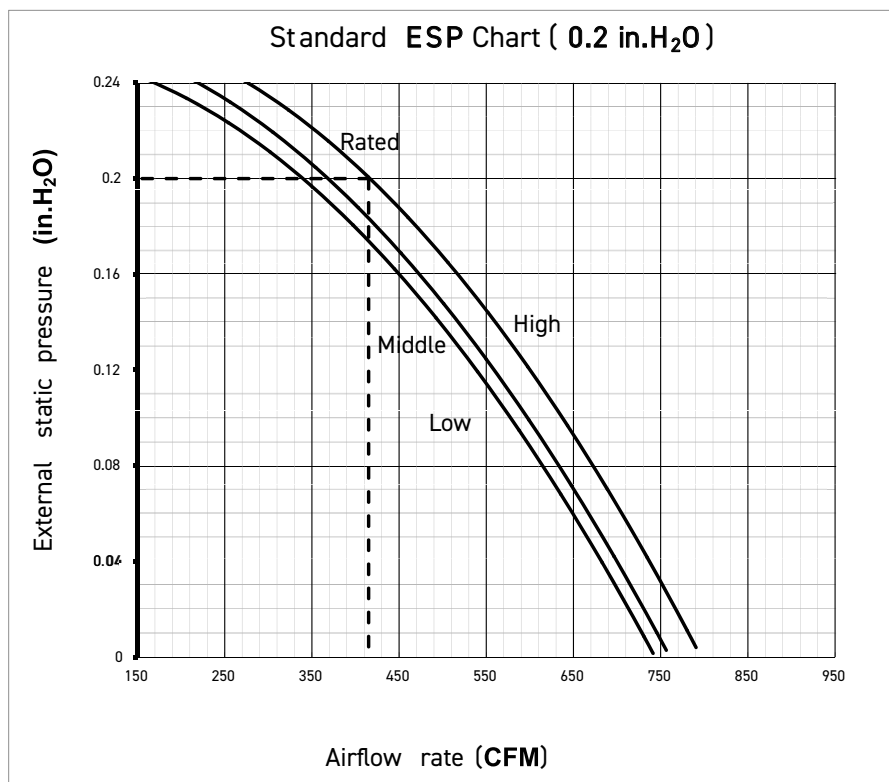
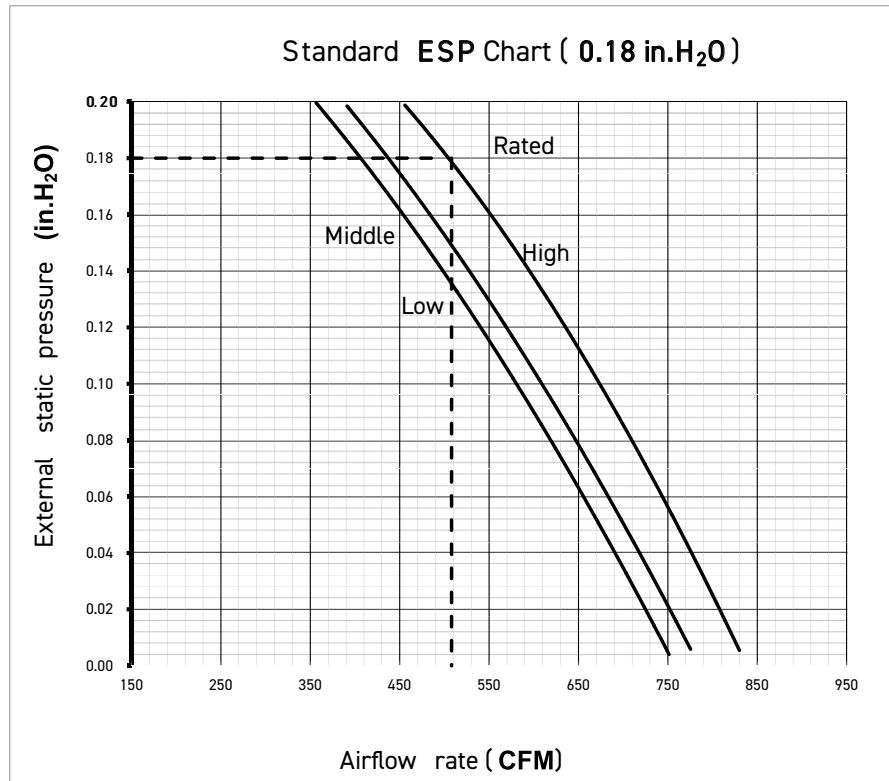


Figure 229

SPECIFICATIONS

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

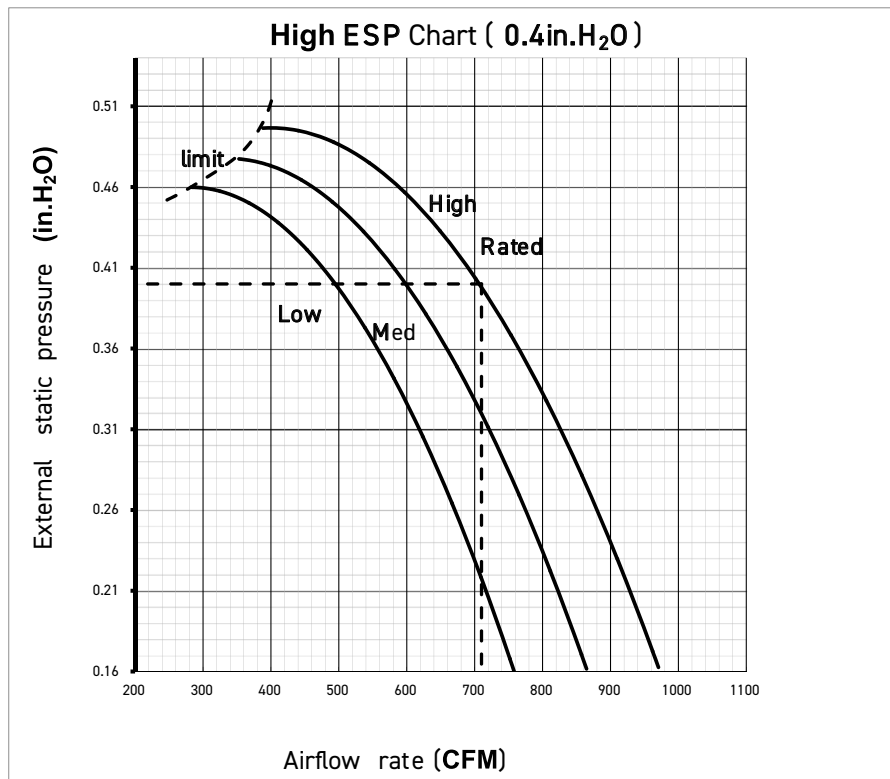
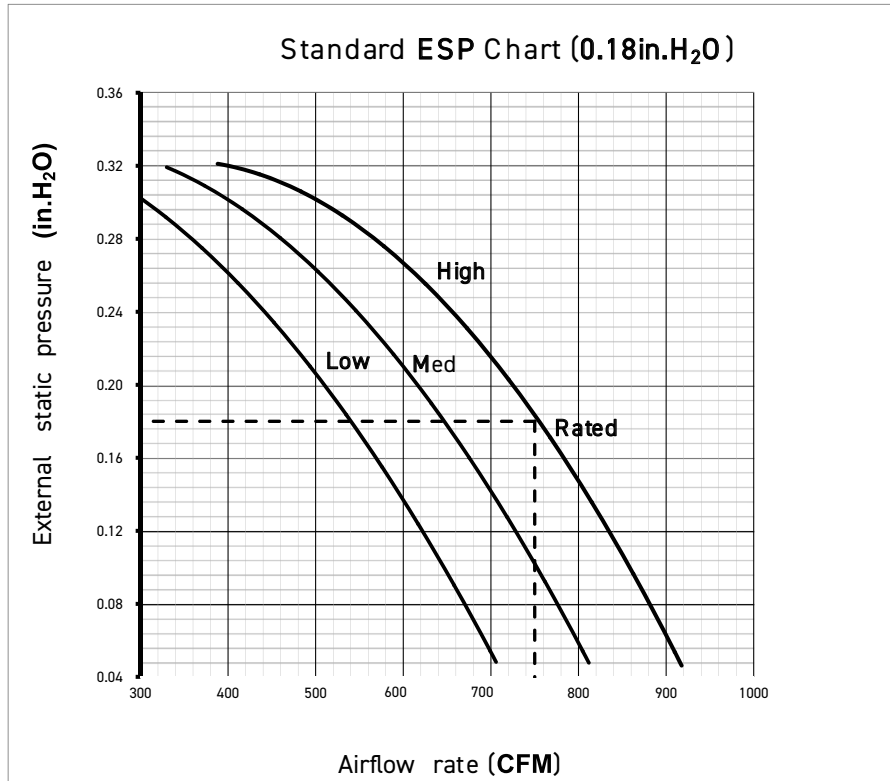
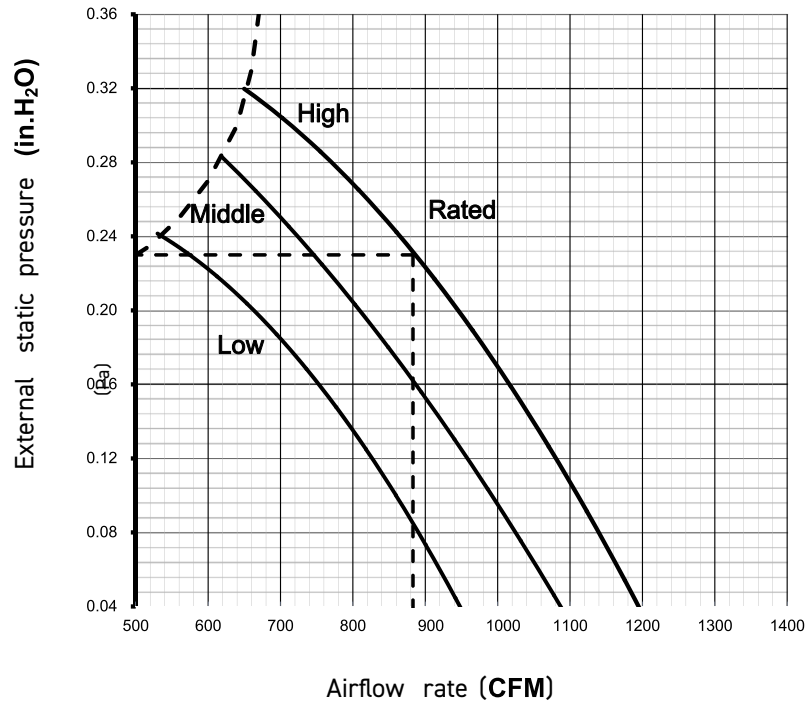


Figure 230

SPECIFICATIONS

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

Standard ESP Chart (0.23 in.H₂O)



High ESP Chart (0.56 in.H₂O)

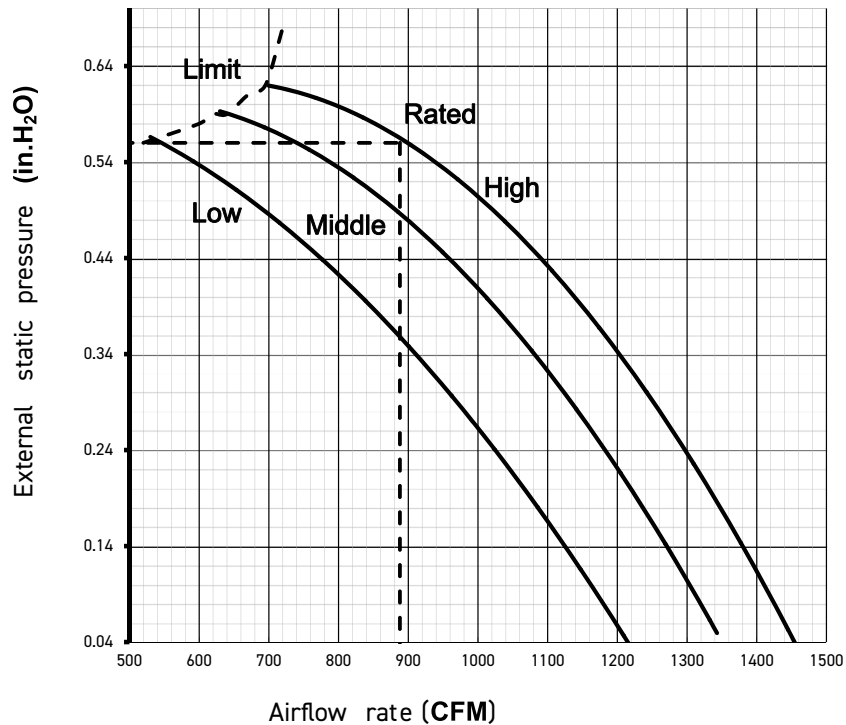
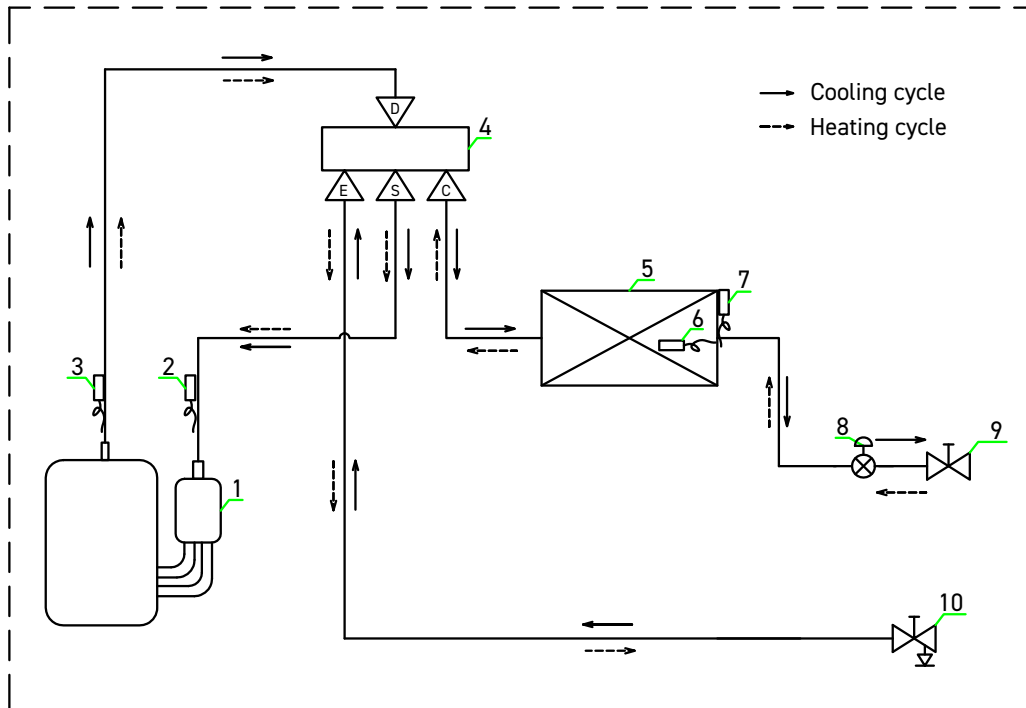


Figure 231

SPECIFICATIONS

Refrigerant Cycle 9-18k Outdoor Units

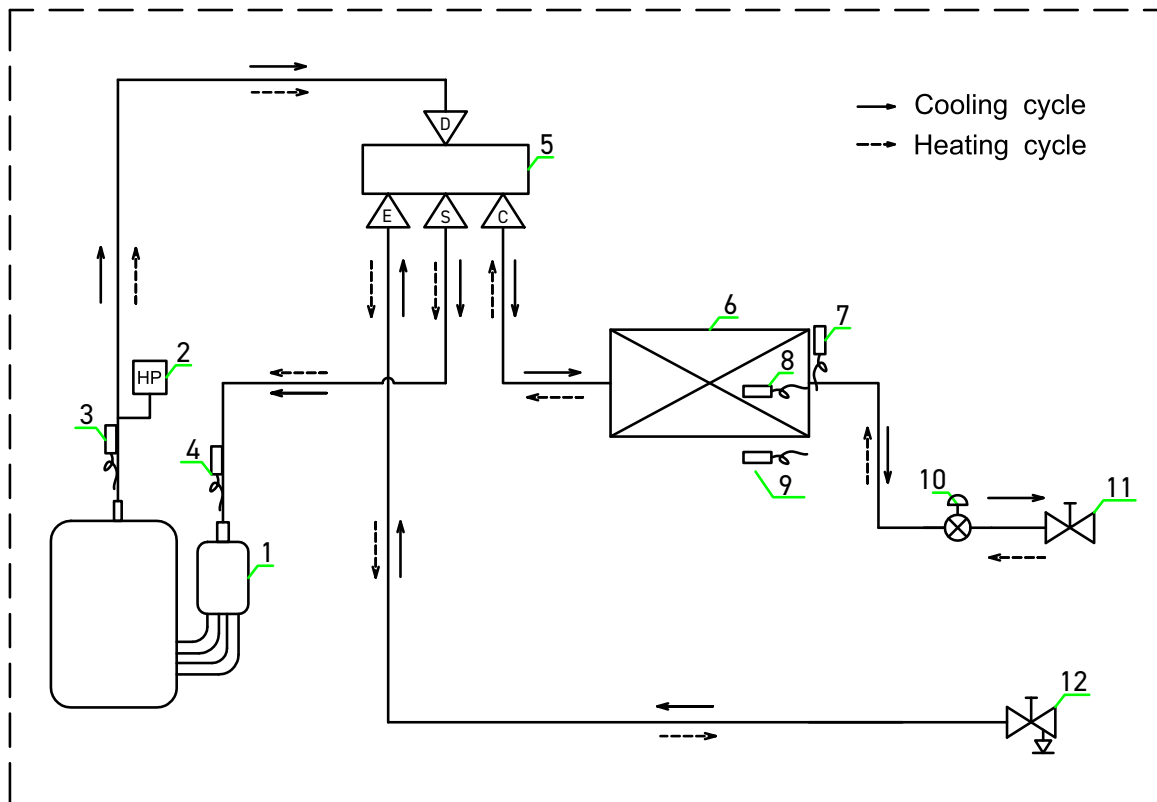


List of components	
1	Compressor
2	Suction temperature sensor
3	Discharge temperature sensor
4	4-way valve
5	Outdoor heat exchanger
6	Ambient temperature sensor
7	Coil temperature sensor
8	Electronic expansion valve
9	Stop valve (Liquid)
10	Stop valve (Gas)

Figure 232

SPECIFICATIONS

Refrigerant Cycle 24k Outdoor Units

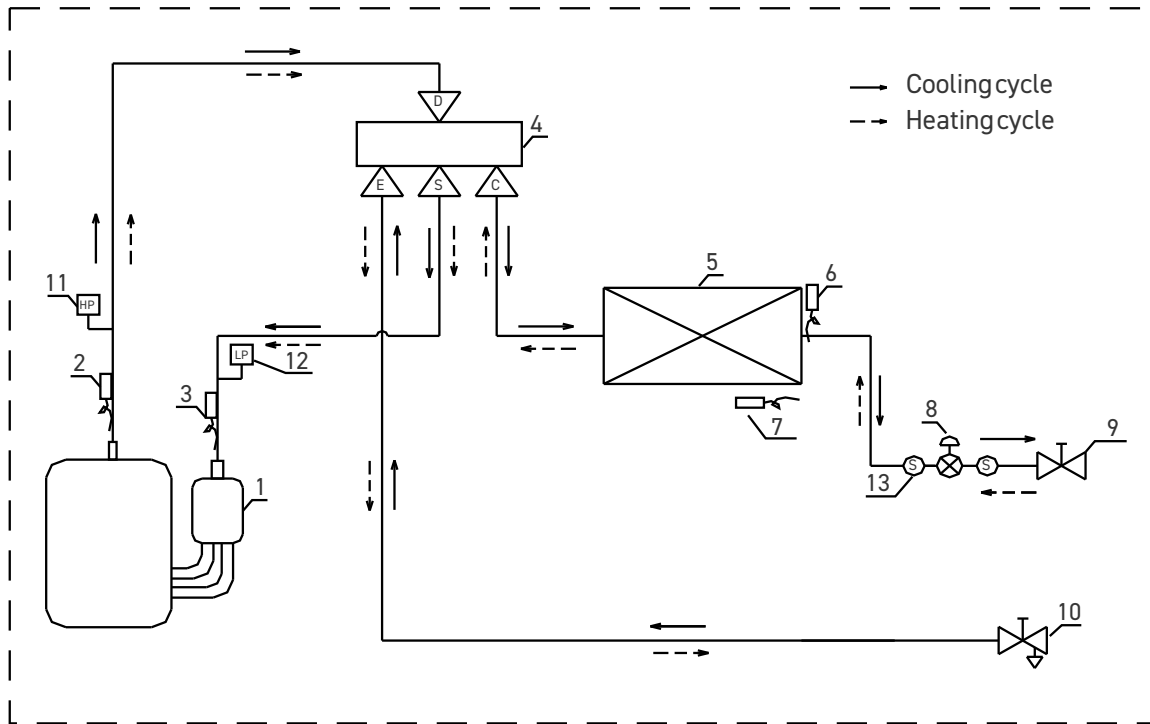


List of components			
1	Compressor	7	Coil temperature sensor
2	High pressure switch	8	Defrost temperature sensor
3	Discharge temperature sensor	9	Ambient temperature sensor
4	Suction temperature sensor	10	Electronic expansion valve
5	4-Way valve	11	Stop valve (Liquid)
6	Outdoor heat exchanger	12	Stop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

Figure 233

SPECIFICATIONS

Refrigerant Cycle 36k Outdoor Units

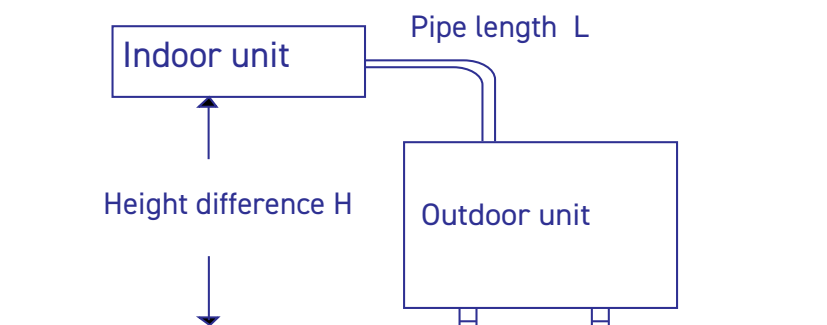


List of component names			
1	Compressor	8	Electronic expansion valve
2	Discharge temperature sensor	9	Stop valve
3	Suction temperature sensor	10	Stop valve
4	4-Way valve	11	High pressure switch
5	Outdoor heat exchange	12	Low pressure switch
6	Coil temperature sensor	13	Strainer
7	Ambient temperature 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. The above data reflects that the minimum height requirements have been met or exceeded during the installation. The height difference between the indoor and outdoor unit is based at 0ft/0m. Using reference chart above to calculate proper unit capacity.
2. Be sure to minimize length of connection pipes to optimize performance. If the outdoor unit is installed higher or lower than the indoor unit, it is necessary to apply height correction factor additionally to length correction factor to calculate cooling/heating.
If outdoor unit is higher, correction should be applied to cooling capacity, if outdoor unit is lower, correction should be applied to heating capacity.

CORRECTION FACTORS

Piping Length Correction Factor

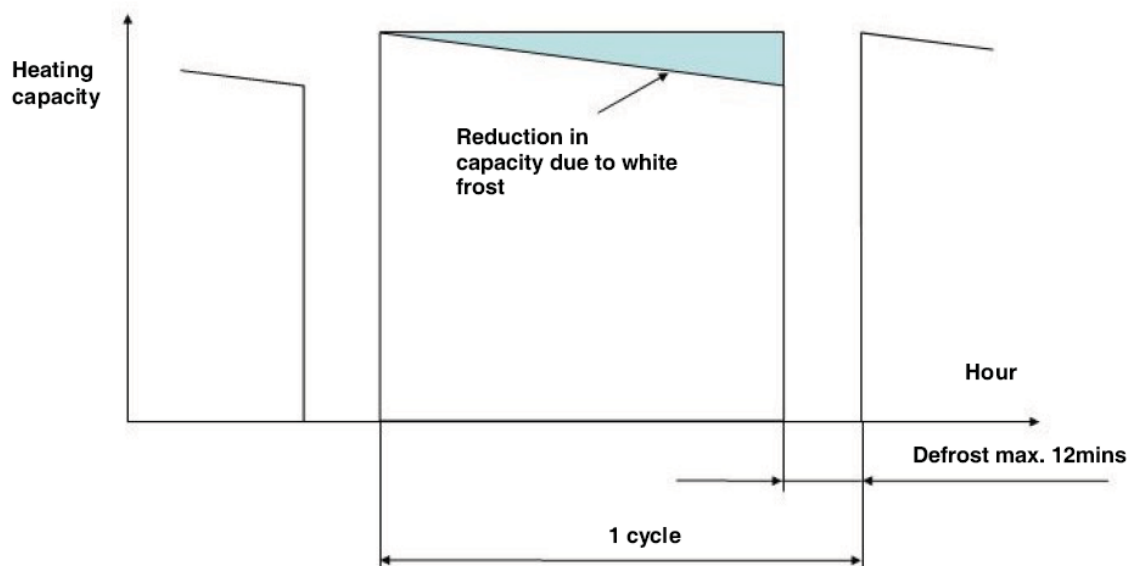
Correction factors according to defrosting operation

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

Corrected heating capacity = Defrost Correction factor x unit capacity

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

Correction Factor



NOTE:

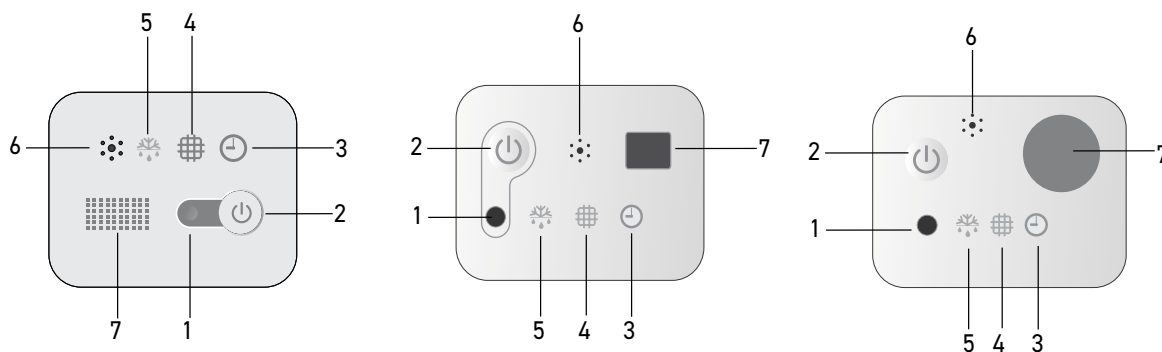
Correction Factor is not valid when the outdoor unit is covered or encapsulated with snow.

OPERATION

Display Panel


Display panel

Cassette Type



Description

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

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

OPERATION

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

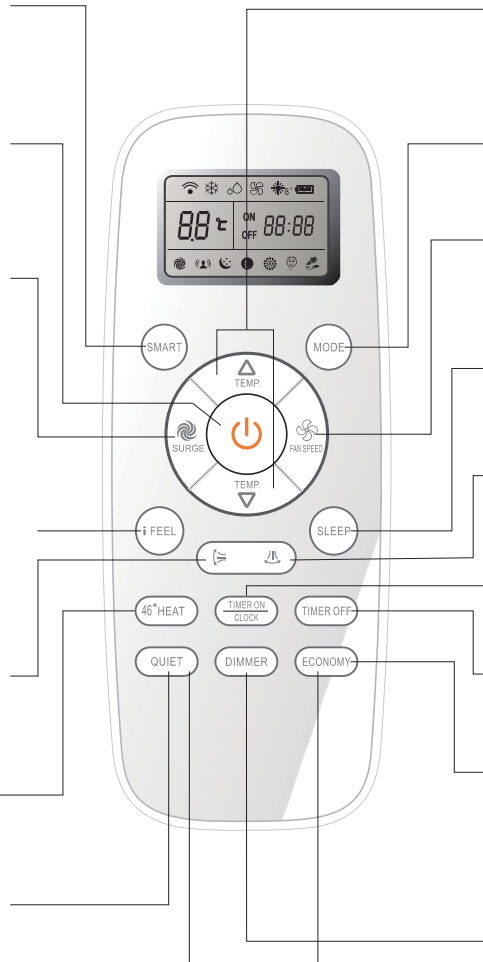
Used to set or cancel the timer operation.

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			OFF 88:88 Display current time
				Battery power indicator

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

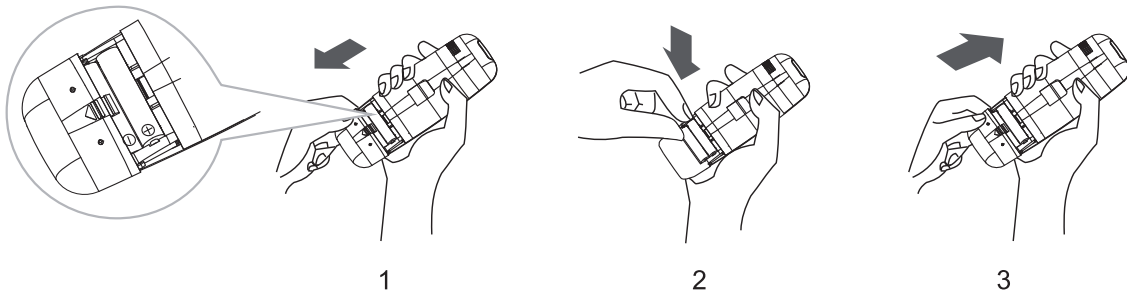
OPERATION

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.



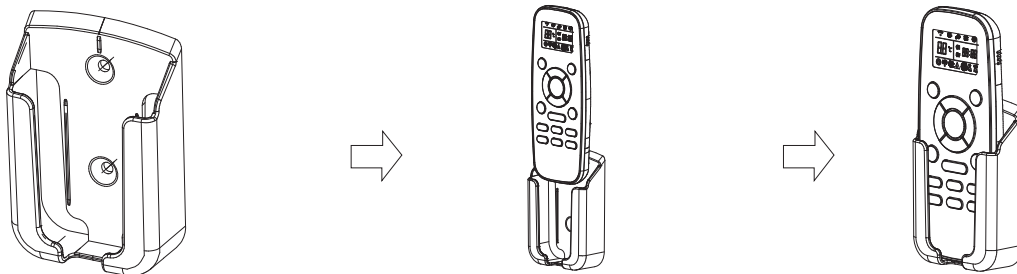
Note:

- 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

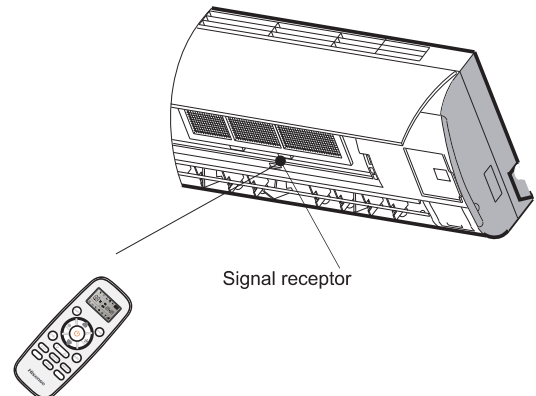
To operate system, point remote directly at unit (audible beep should sound when buttons are pressed). The remote can operate system up to 23ft away without interference.

⚠ 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:

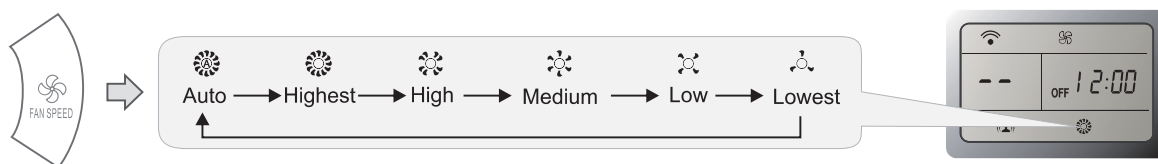


☑ **Heating mode is NOT available for cooling only air conditioner.**

◆ 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.**

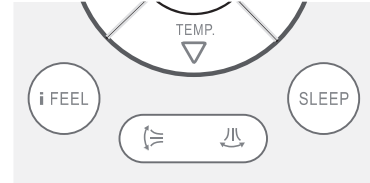
OPERATION



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.

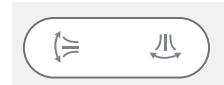
**Heating mode is only available for heat pump models.*


◆ Vertical airflow control (with the remote controller)

Use remote to adjust blade/louver angles.

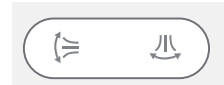
Press "  " button once.

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



Press "  " button again .

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

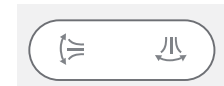



◆ Horizontal airflow control (with the remote controller)

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

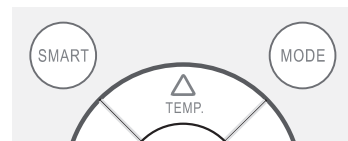
Cassette Remote Control

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. 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.*

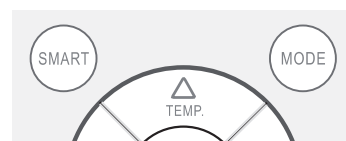
◆ What you can do in SMART mode?

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.

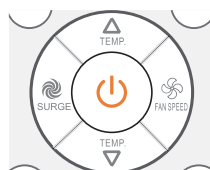
SURGE mode can be set when the appliance is in operation or in standby.

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

◆ How to set SURGE mode?

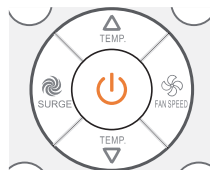
Press  button in cool mode.

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

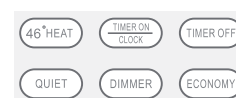
Timer Mode

TIMER ON/CLOCK and TIMER off.

◆ How to set **TIMER ON?**

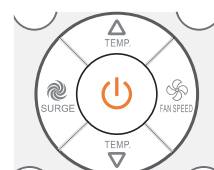
1. Press  button.

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



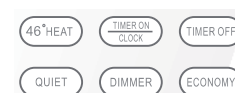
2. Press the  or  button.

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?

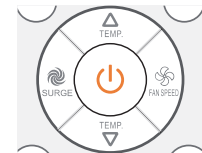
1. Press  button about 3 seconds.


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.

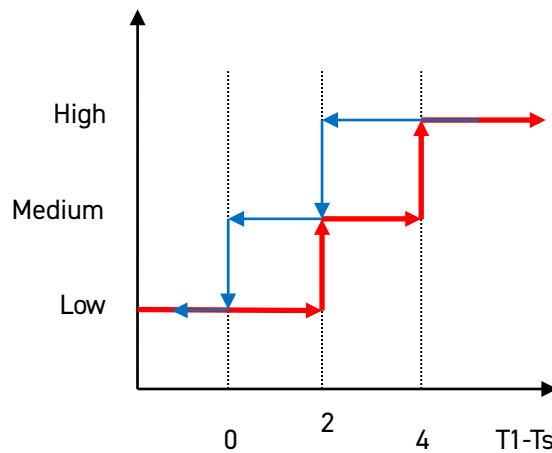
Cooling Mode

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.



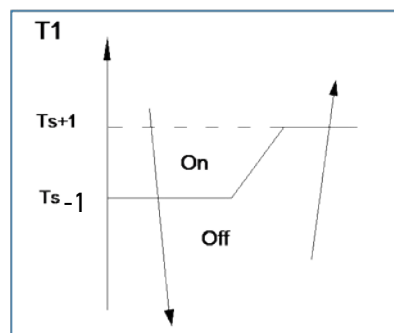
Inverter outdoor unit:

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:

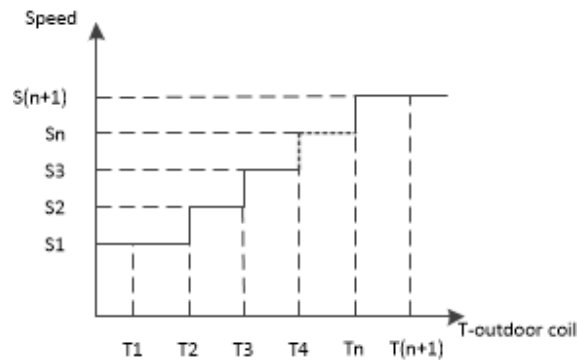
Once the outdoor fan start up, it will follow the below rules:

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



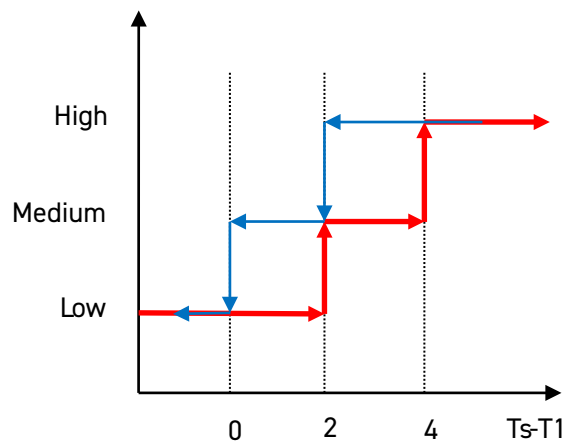
Heating Mode

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:

T_1 is indoor room temperature. T_s is setting temperature.



DC-Inverter outdoor unit :

Outdoor fan running rules:

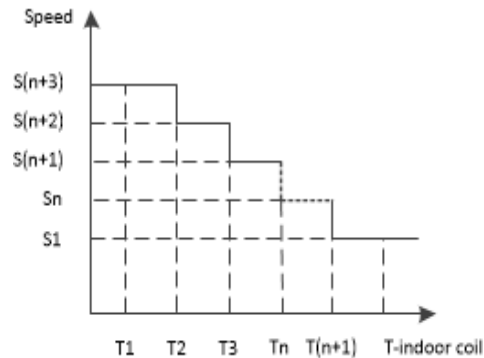
Once the outdoor fan start up, it will follow the below rules:

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

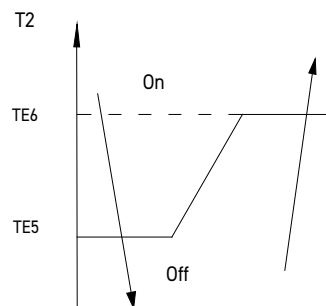
Indoor fan will run at auto fan of the relevant mode. The louver operates same as in relevant mode. If the compressor keeps stopping for 10 minutes or the setting temperature is modified, the machine will choose mode according to ΔT again.

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.

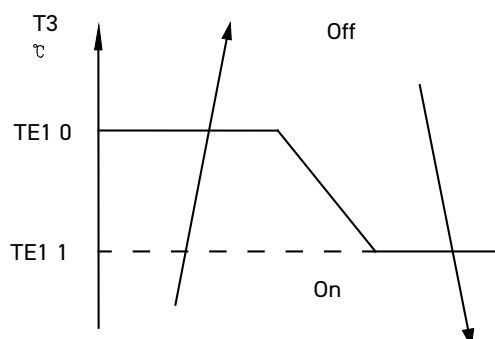
OPERATION

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:

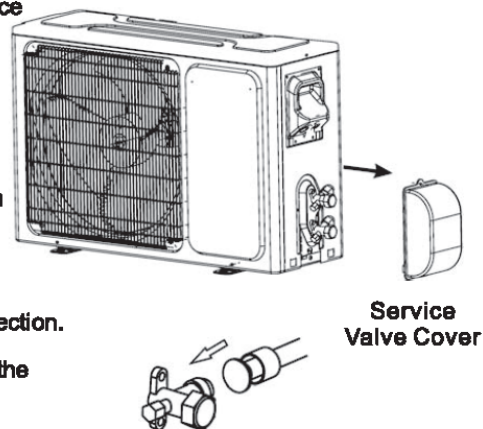


Fig. 432

Torque Table

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

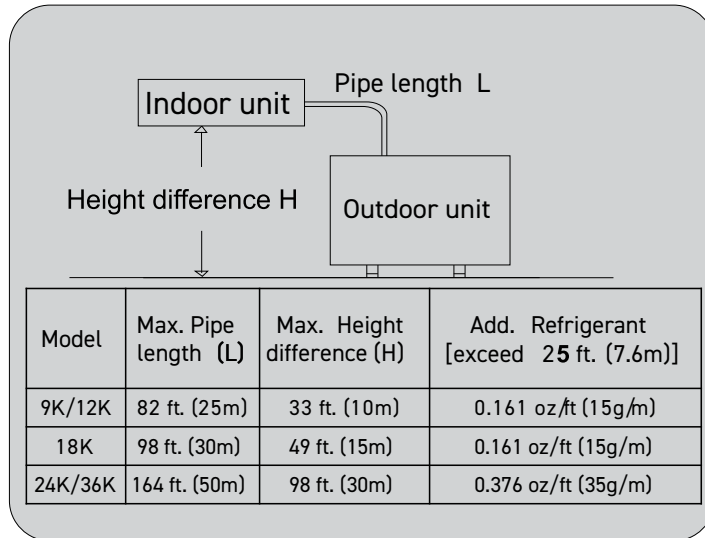
Note: Over tightening may damage flare connections and cause leaks.

Fig. 433

INSTALLATION

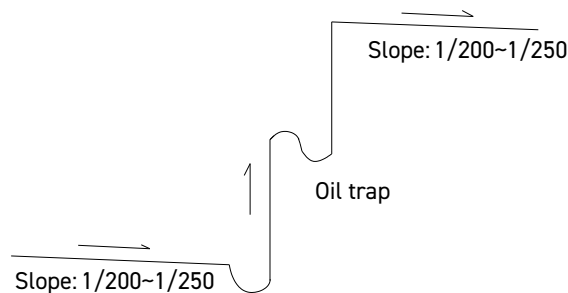
24 and 36k Outdoor Units

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:

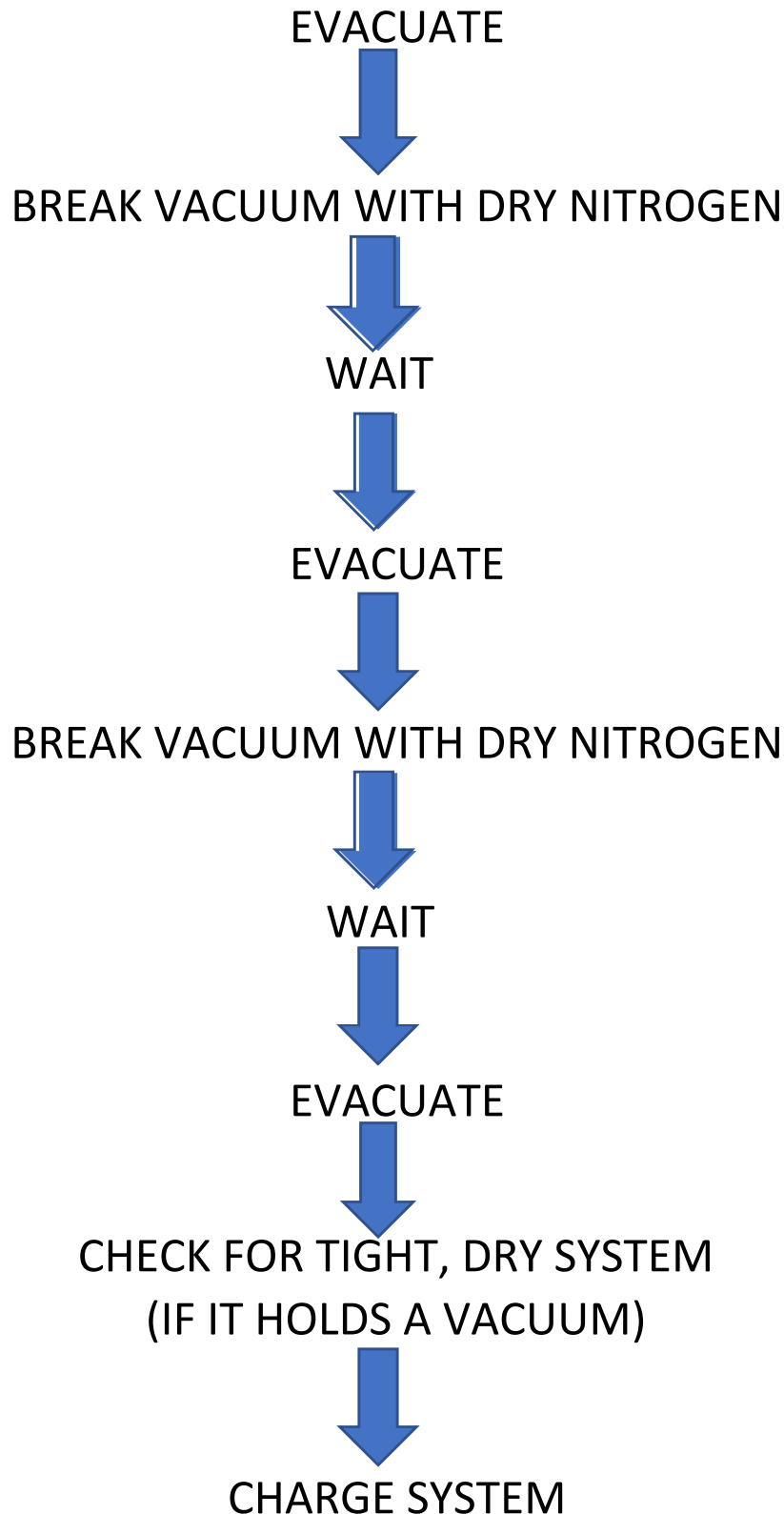
Reconnect vacuum pump and gauge and begin evacuation. Vacuum system to 300 microns. Close vacuum valve and check for micron rise. Vacuum should hold under 500 microns. Repeat 8.7.C and 8.7.D until achieved. Once held under 500 microns, the system is considered dry and tight.

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

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 wiring follow the specifications?	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	Dust and debris not removed after installation?	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?

INSTALLATION

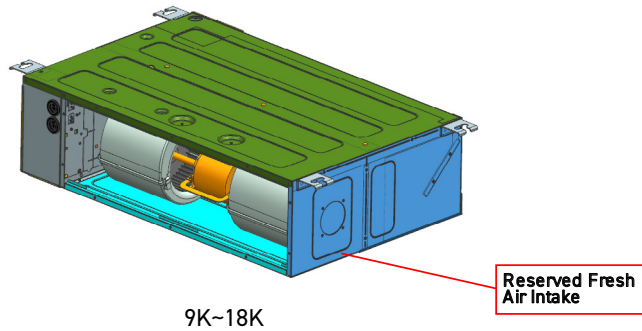
Fresh Air Intake

Duct (9K~18K)

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

Please follow the steps below when needed.

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

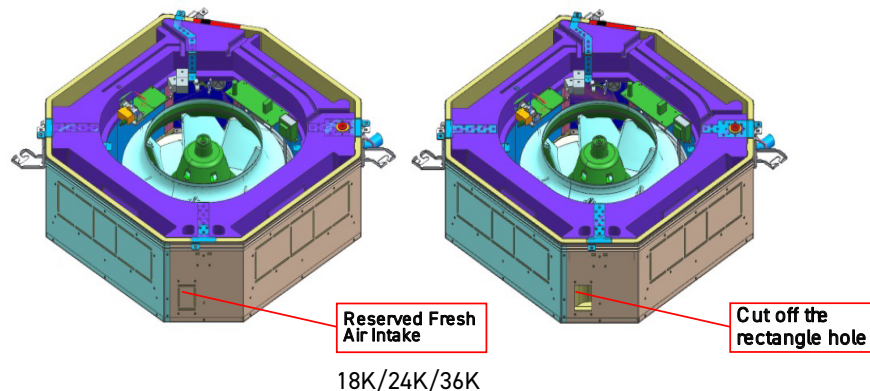
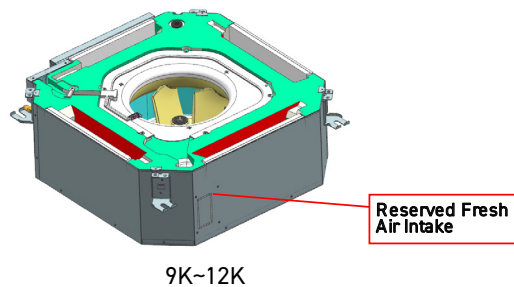


Cassette

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

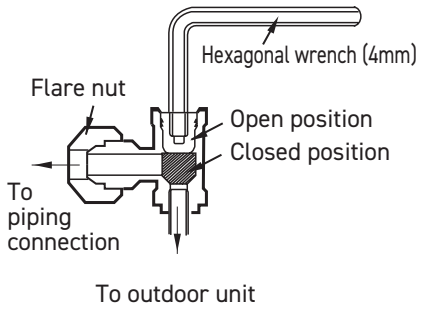
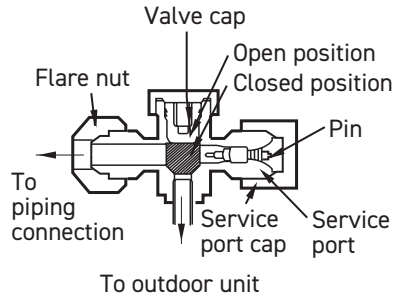
Please follow the steps below when needed.

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



R-410A SEALED SYSTEM REPAIR

Service Valves Appearance

		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
				
		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

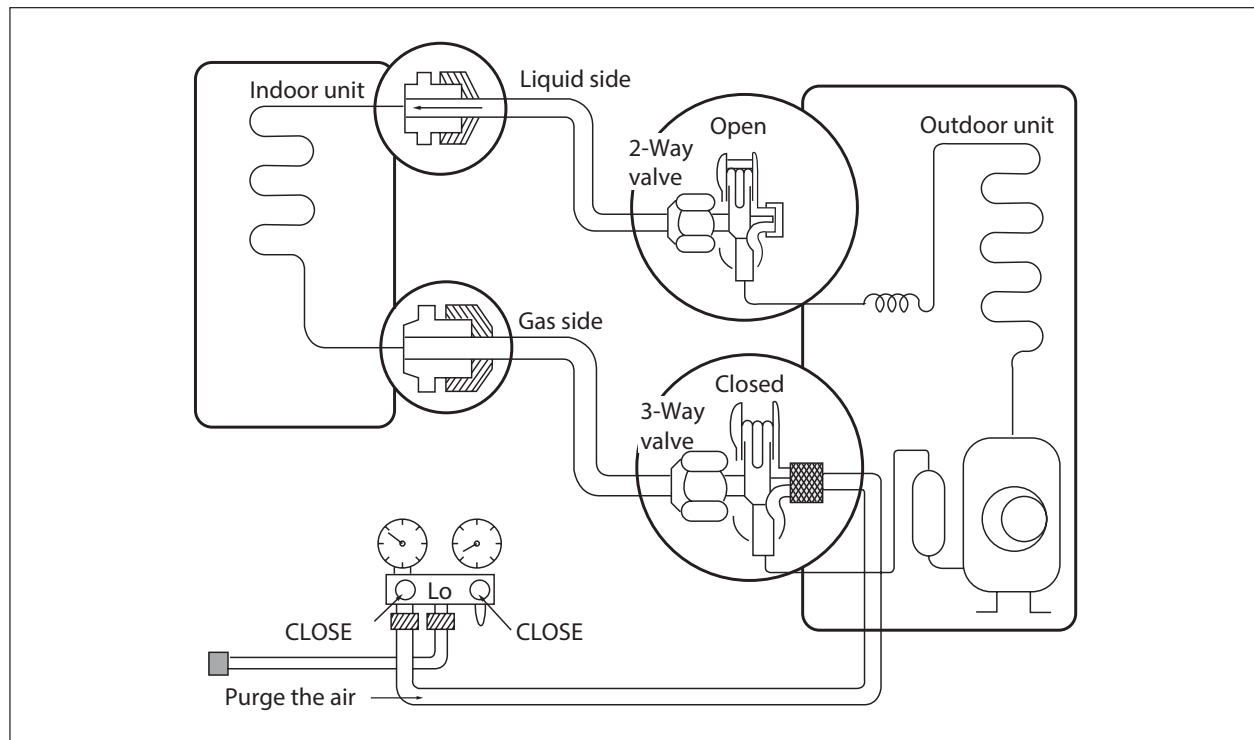


Fig. 505

• Procedure

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

- Remove the valve stem caps and confirm that the valve stems are in the raised position.
- Be sure to use a hexagonal wrench to operate the valve stems.

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

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

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

(4) Air purging of the charge hose.

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

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

(6) Operate the air conditioner at the cooling cycle and stop when the gauge indicates 0 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)

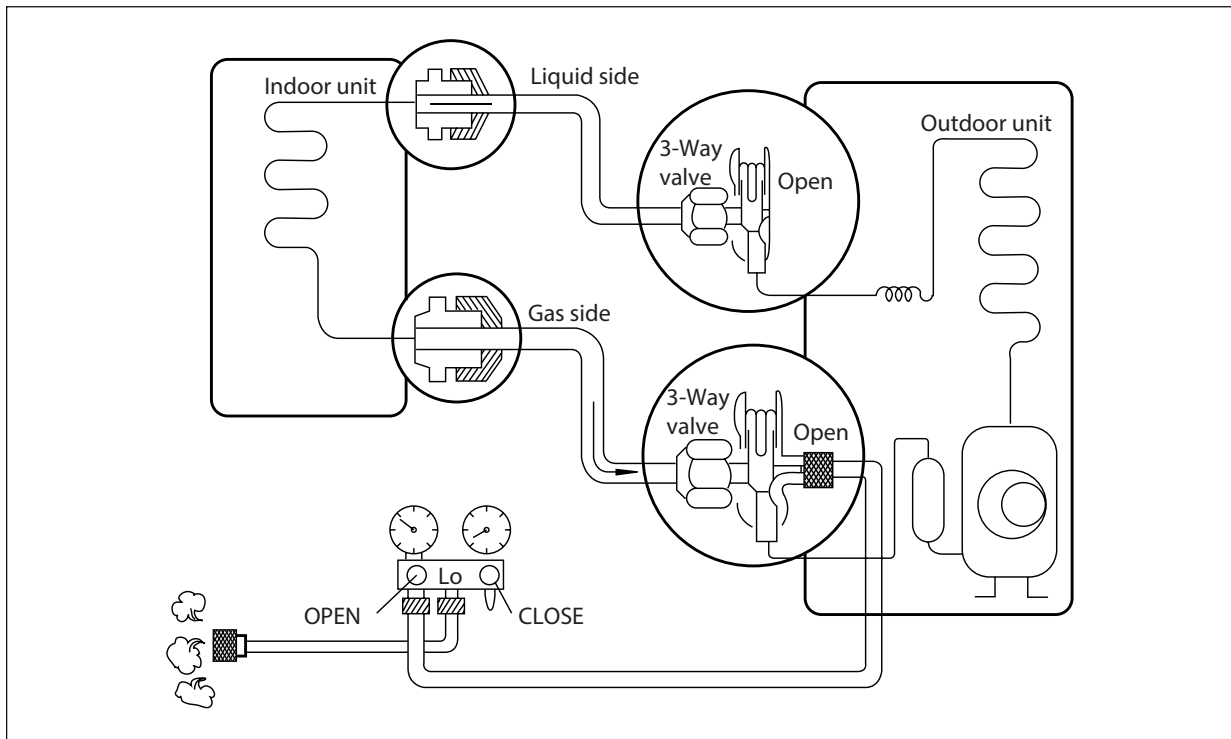


Fig. 506

• 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.

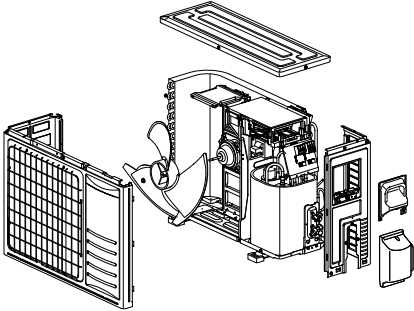
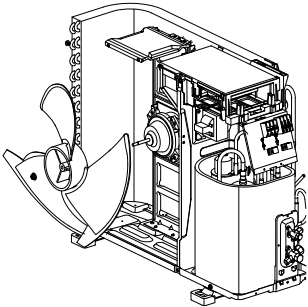
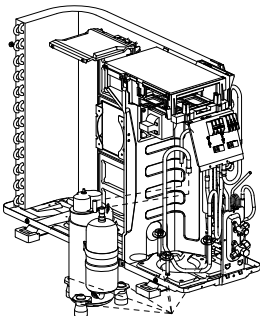
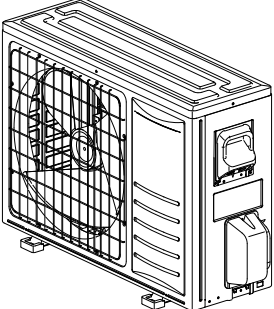
(5) Mount the valve stem nuts and the service port nut.

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

R-410A SEALED SYSTEM REPAIR

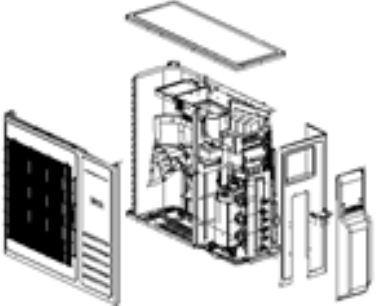
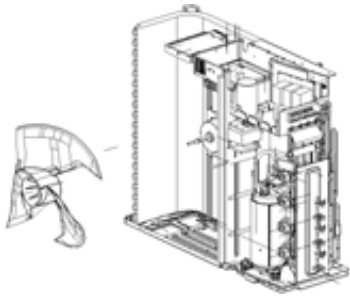
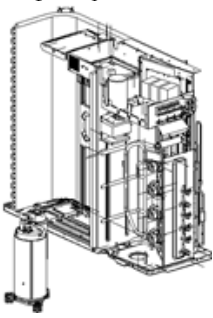
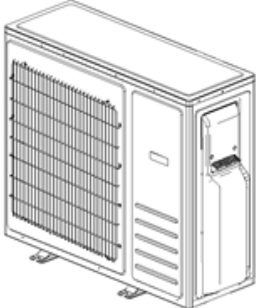
Replace 9-18k Outdoor unit Compressor and Motor

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 assy from compressor; 3. Remove the compressor mounting bolts; 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

R-410A SEALED SYSTEM REPAIR

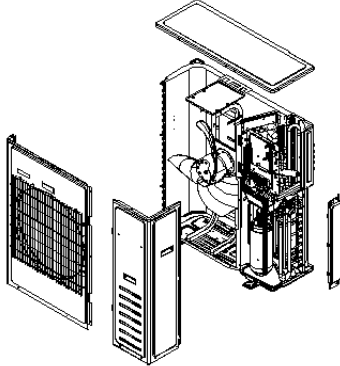
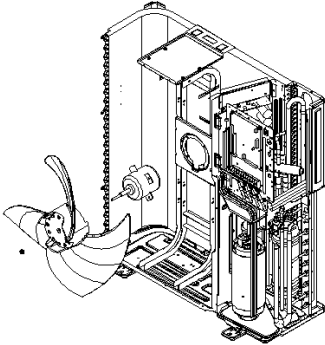
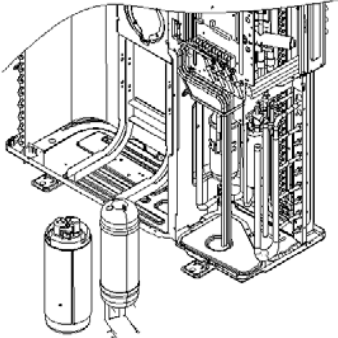
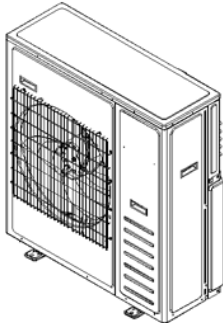
Replace 24k Outdoor unit Compressor and Motor

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

R-410A SEALED SYSTEM REPAIR

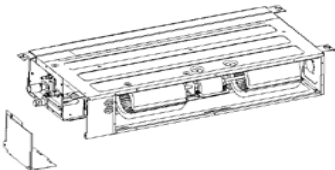
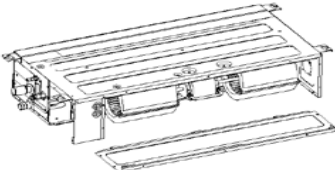
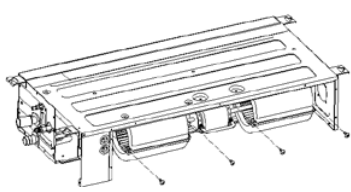
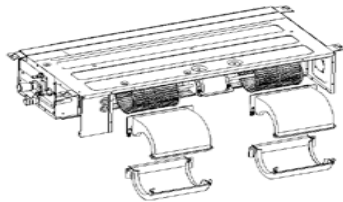
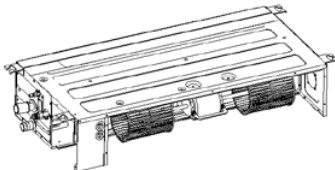
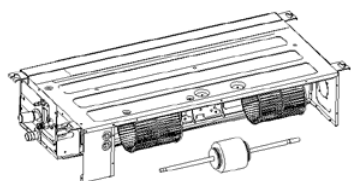
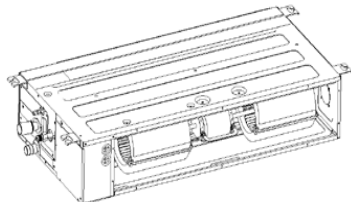
Replace 36k Outdoor unit Compressor and Motor

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		Assemble the unit in the reverse order of disassembly.

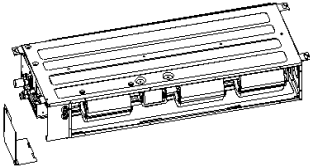
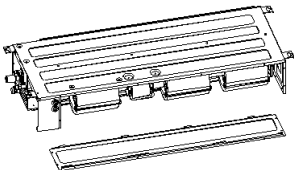
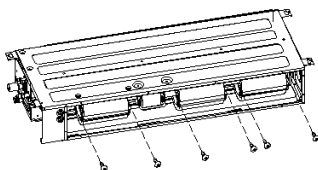
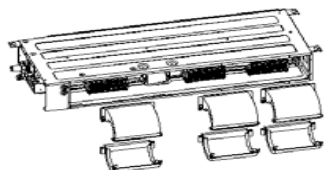
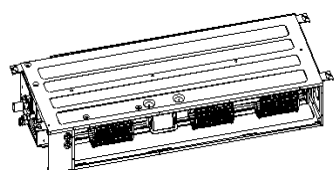
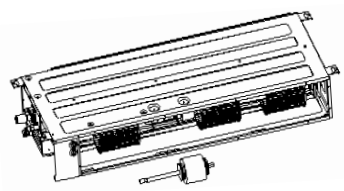
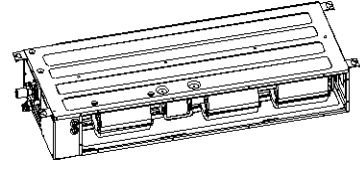
R-410A SEALED SYSTEM REPAIR

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.

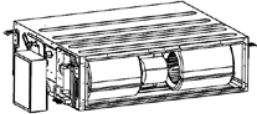
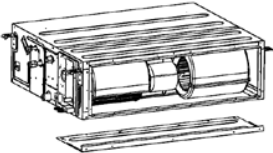
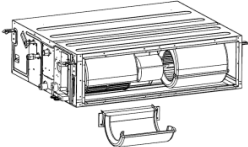
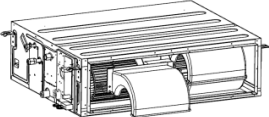
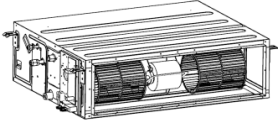
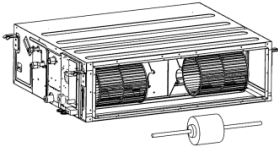
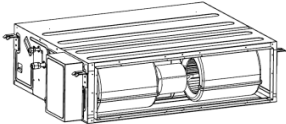
R-410A SEALED SYSTEM REPAIR

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.

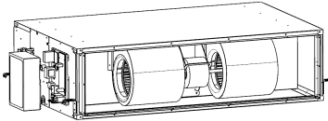
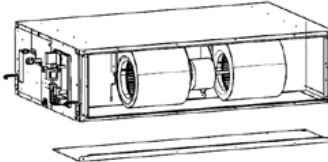
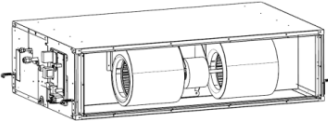
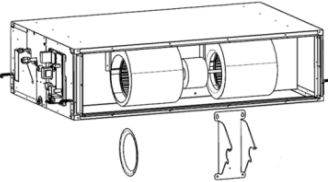
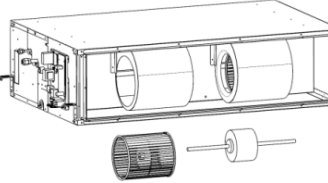
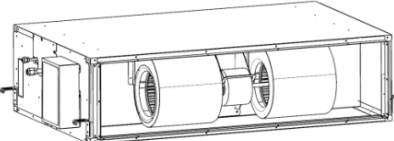
R-410A SEALED SYSTEM REPAIR

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.

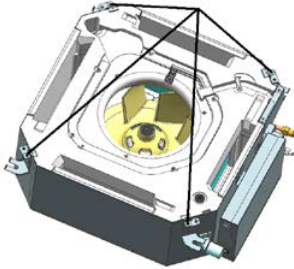
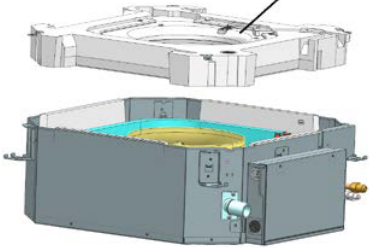
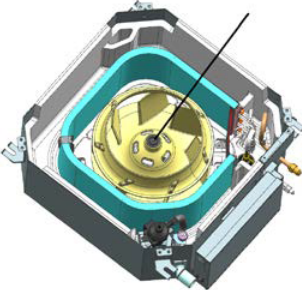
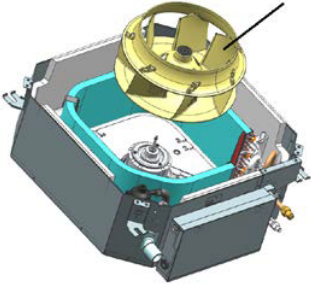
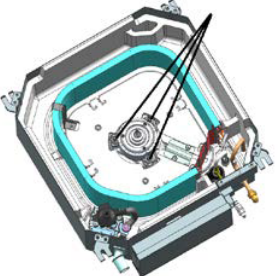
R-410A SEALED SYSTEM REPAIR

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.

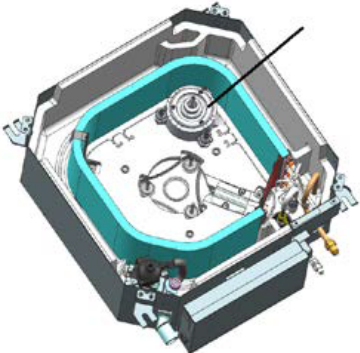
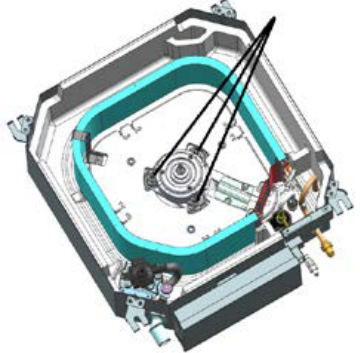
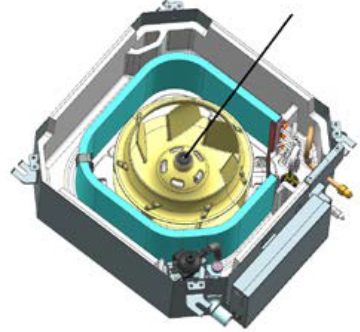
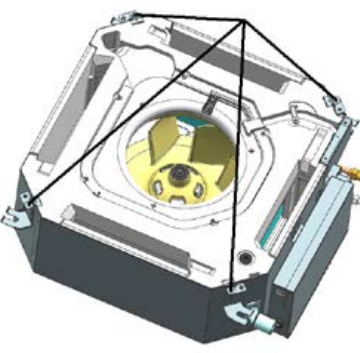
R-410A SEALED SYSTEM REPAIR

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.

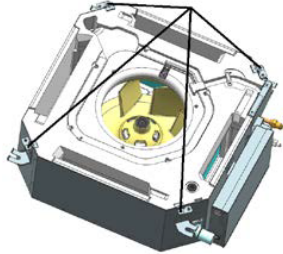
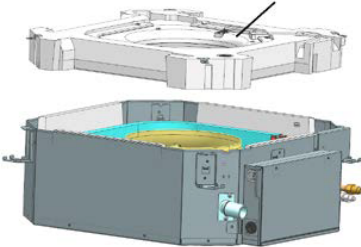
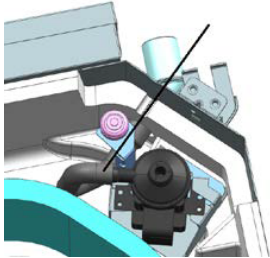

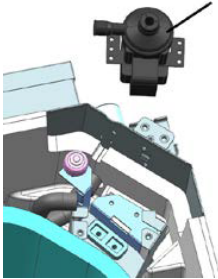
R-410A SEALED SYSTEM REPAIR

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.

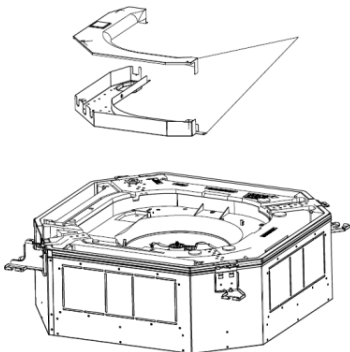
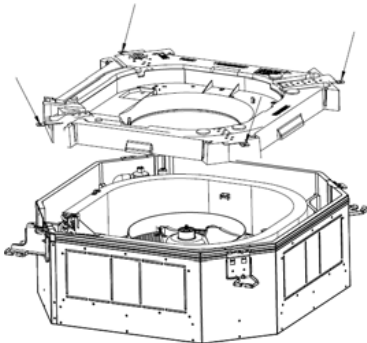
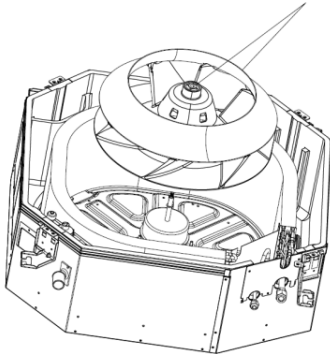
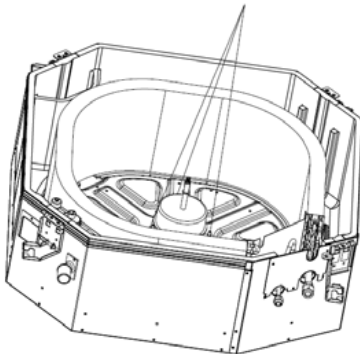
R-410A SEALED SYSTEM REPAIR

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

COMPONENTS TESTING

Resistance Table Of Outdoor Compressor Discharge Temperature

($R_0=187.25K\pm6.3\%$; $R_{100}=3.77K\pm2.5K$; $B0/100=3979K\pm1\%$)

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

Figure 601

COMPONENTS TESTING

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

Figure 601

COMPONENTS TESTING

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

Figure 601

COMPONENTS TESTING

Ambient Air Sensor In Indoor And Outdoor Unit

($R_0=15K\pm2\%$; $B0/100=3450K\pm2\%$)

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

Figure 602

COMPONENTS TESTING

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

Figure 602

COMPONENTS TESTING

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

Figure 602

COMPONENTS TESTING

Indoor Unit Fan Motor

Check parts unit

1. Indoor unit fan motor

Duct motor model (DC motor)

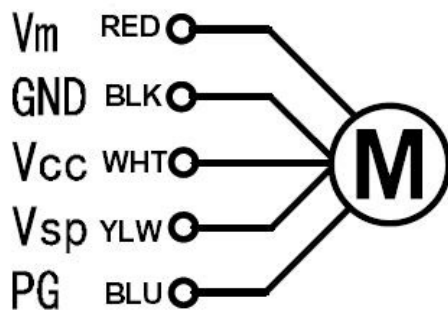
9K/12K/18K: SIC-68CVL-F160-2

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

Outdoor Unit Fan Motor and Compressor

Outdoor unit fan motor

DC motor

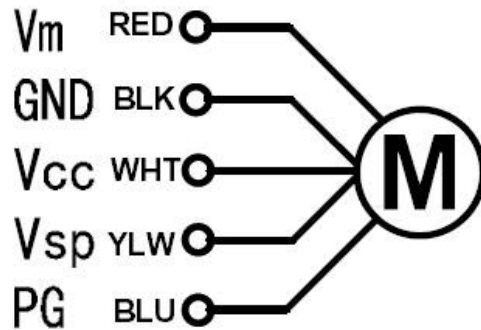
9K: SIC-52FV-F130-3

12K: SIC-62FV-D857-15

18K: ZWK511A805001

24K: SIC-71FW-D8121-1

36K: SIC-81FW-F1138-1



Compressor

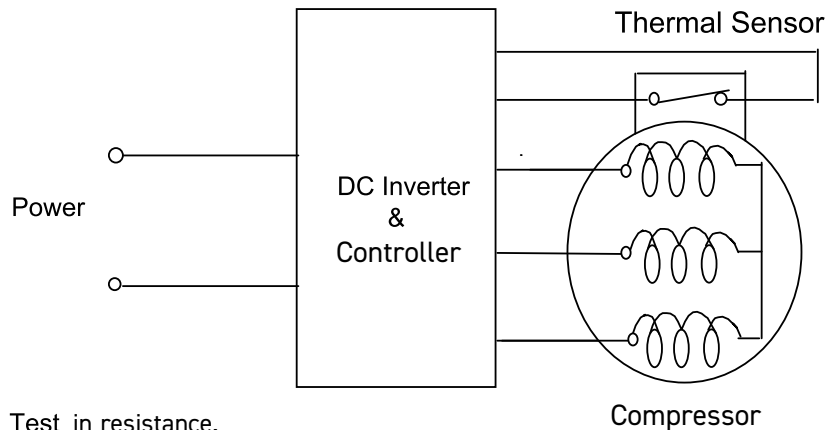
Compressor examine and repair

9K/12K: ASN108D43UFZA

18K: ATM150D23UFZ

24K: EATF250D22UMT

36K: ATF310D43UMT



Test in resistance.

TOOL: Multi-meter.

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

Familiar error:

1) Compressor motor lock.

2) Discharge pressure value approaches static pressure value

COMPONENTS TESTING

Outdoor Unit Fan Motor and Compressor

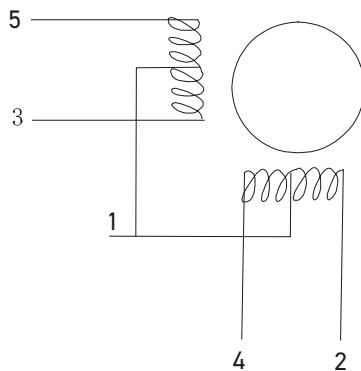
Notes :

- 1) Don't put a compressor on its side or turn over.
- 2) Please assemble the compressor in your air conditioner rapidly after removing the plugs.
Don't place the comp. in air for a long time.
- 3) Avoid compressor running in reverse caused by connecting electrical wire incorrectly.
- 4) Warning! In case AC voltage is impressed to compressor, the compressor performance will decrease because of its rotor magnetic force decreasing.

3. Inductance

- 1) Sound abnormality
- 2) Insulation resistance disqualification

5. Step motor



Test in resistance.

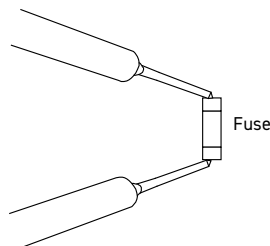
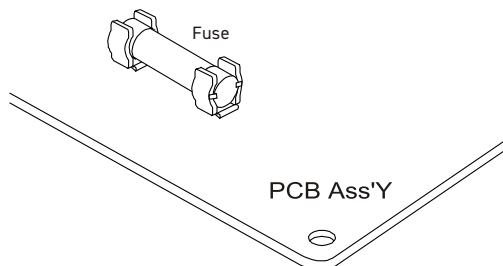
TOOL: Multimeter.

Test the resistance of winding. The stepper motor fails if the resistance of winding is 0 (short circuit) or ∞ (open circuit) .

6. Fuse

Check for continuity of fuse on PCB ASS'Y.

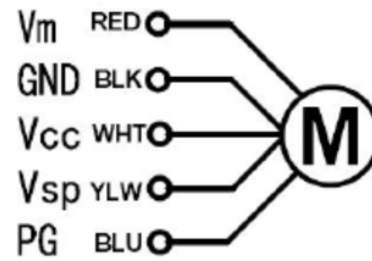
Remove the PCB ASS'Y from the electrical component box. Then pull out the fuse from the PCB ASS'Y .Check for continuity by a multimeter as shown below.



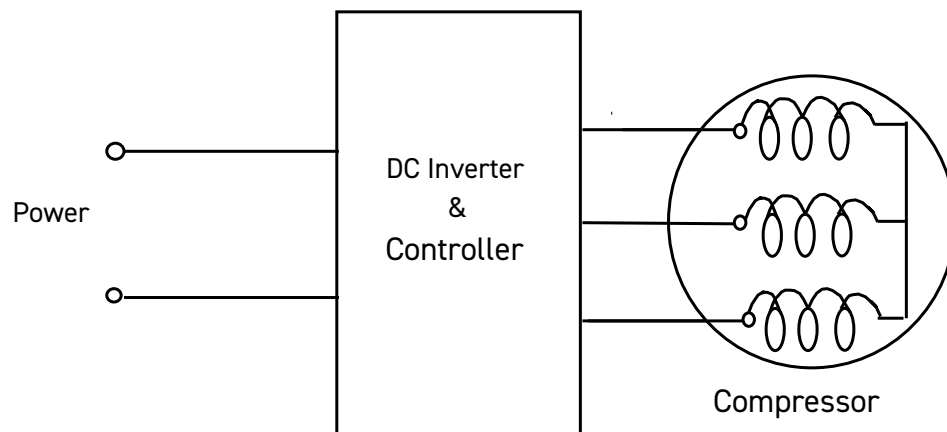
COMPONENTS TESTING

Test Fan Motor and Compressor

1. Fan motor



2. Compressor



COMPONENTS TESTING

Test Fan Motor and Compressor

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

Typical Symptoms

- 1) Compressor motor lock.
- 2) Discharge pressure value approaches static pressure value.
- 3) Compressor phases are not equal (+/- 0.1 Ohm).

Notes

- 1) Do not put a compressor on its side or turn over.
- 2) When changing compressor, do not leave exposed to ambient conditions for longer than needed.
- 3) Ensure compressor is wired properly before starting. Reverse wiring will permanently damage the compressor.
- 4) In cases with low voltage, the compressor may be de-rated in capacity.

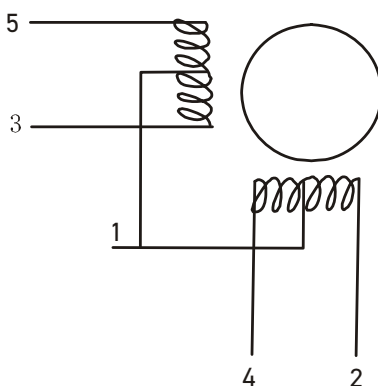
4. Inductance

- 1) Sound abnormality
- 2) Insulation resistance disqualification.

5. EEV - Stepper

TOOL: Multimeter.

Test the resistance of winding. The stepper motor is fault if the resistance of winding is 0 (short circuit) or ∞ (open circuit).



COMPONENTS TESTING

Check Refrigerant System

TEST SYSTEM FLOW

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

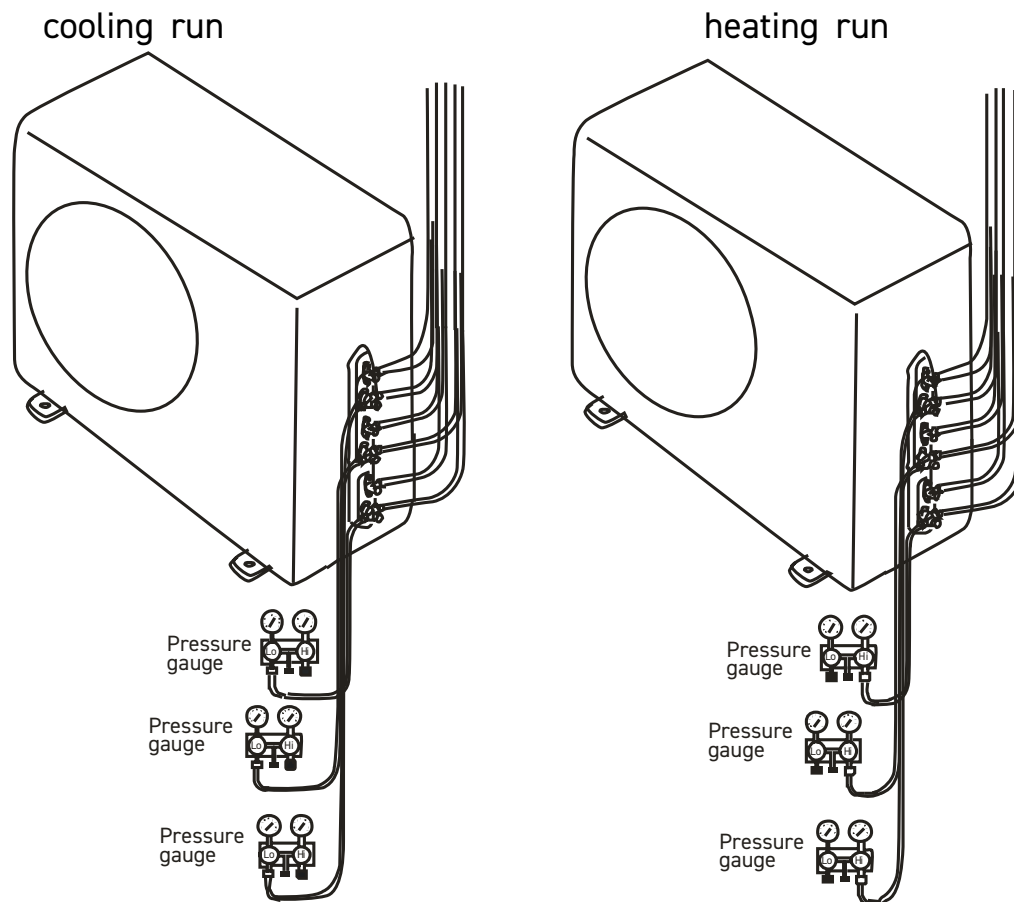
Tool: Pressure Gauge

Technique: ① see ② feel ③ test

SEE ----- Tube defrost.

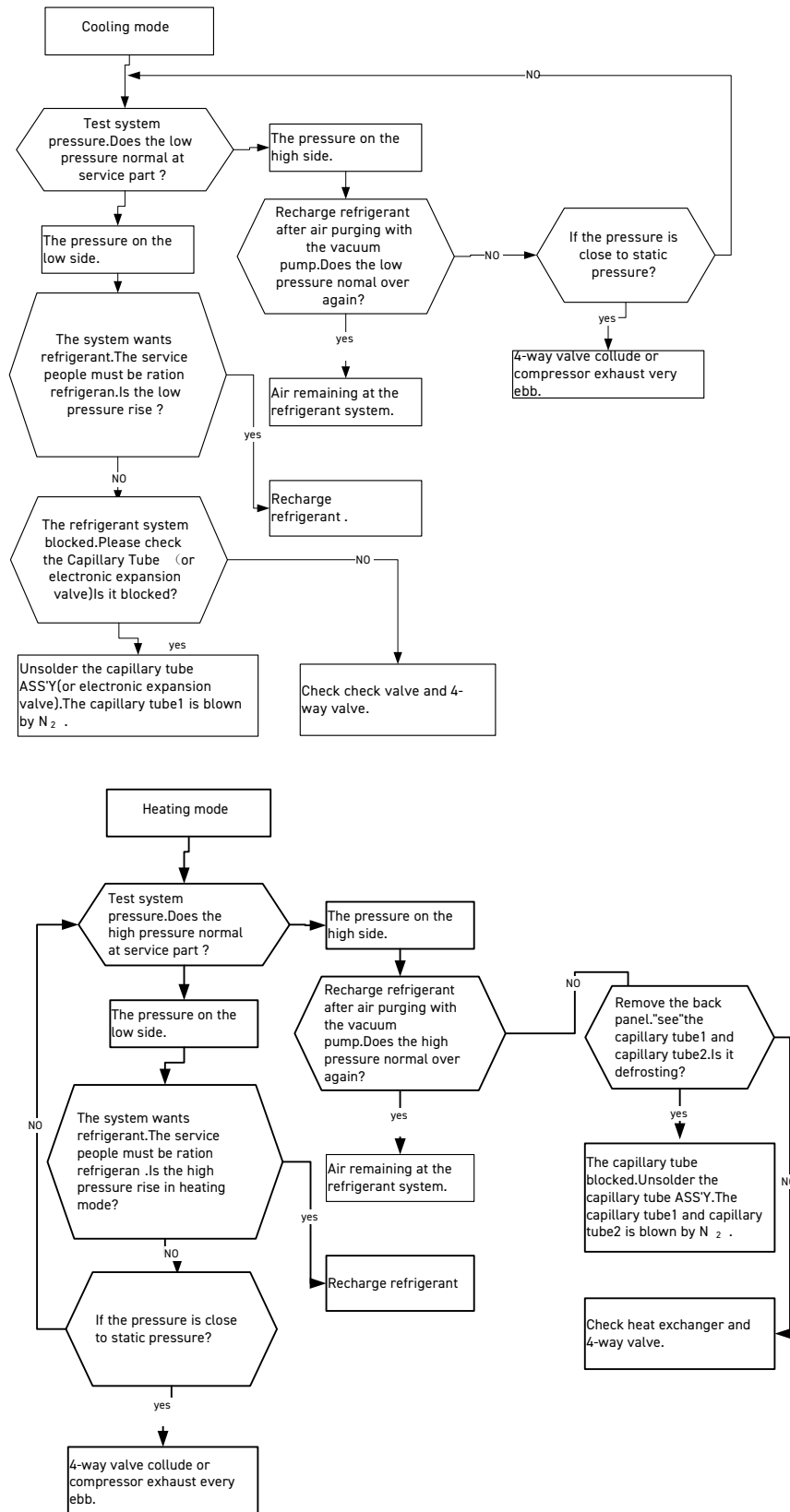
FEEL ----- The difference between tube's temperature.

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)

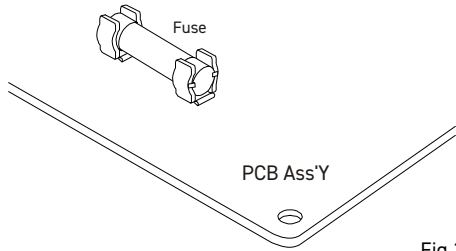


Fig.1

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

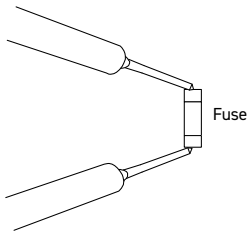


Fig.2

.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.

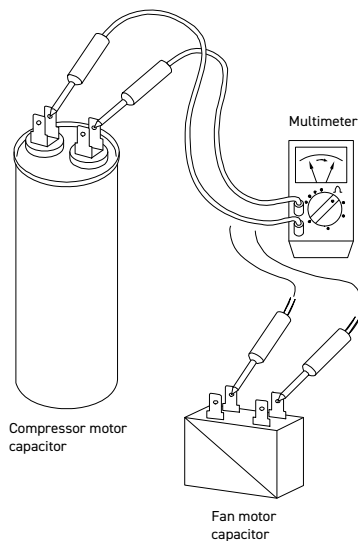
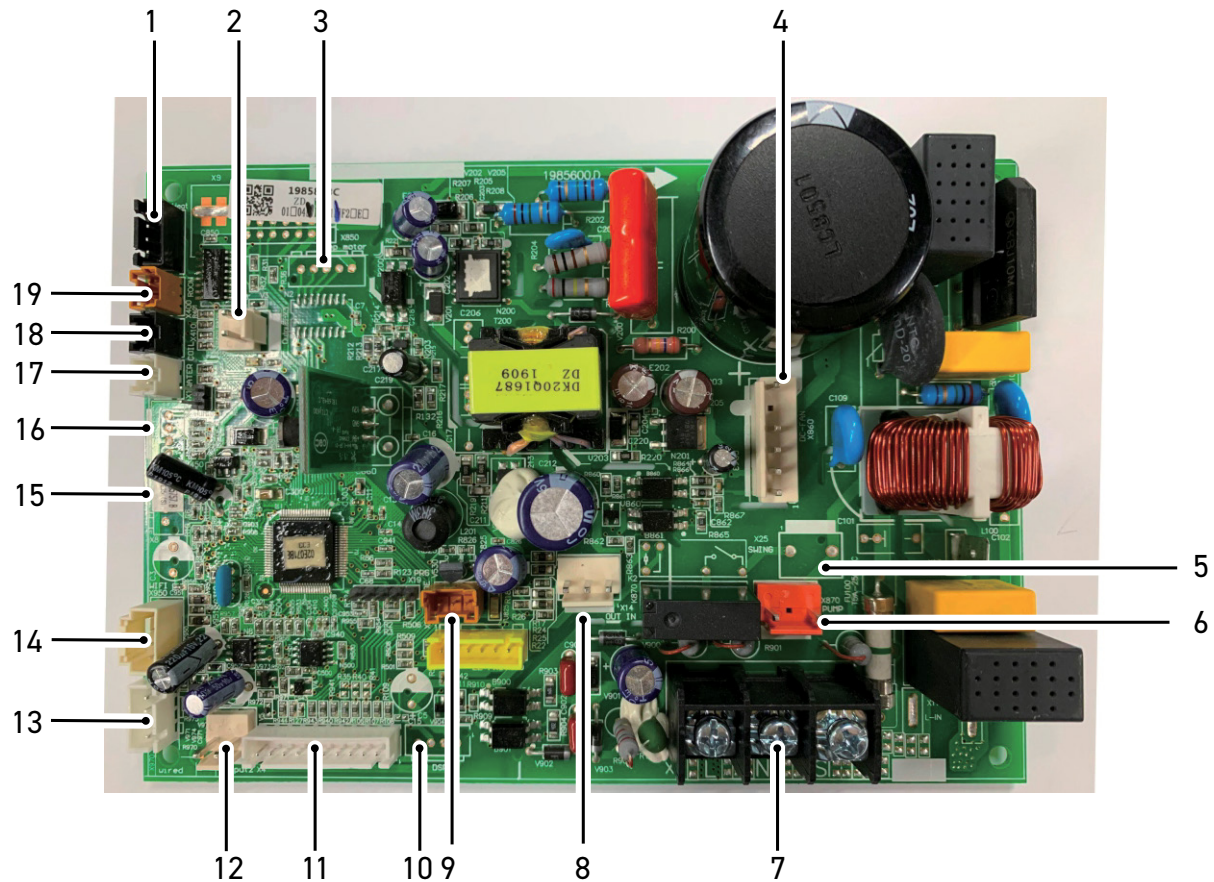


Fig.3

COMPONENTS TESTING

9-18k Ducted Control Board

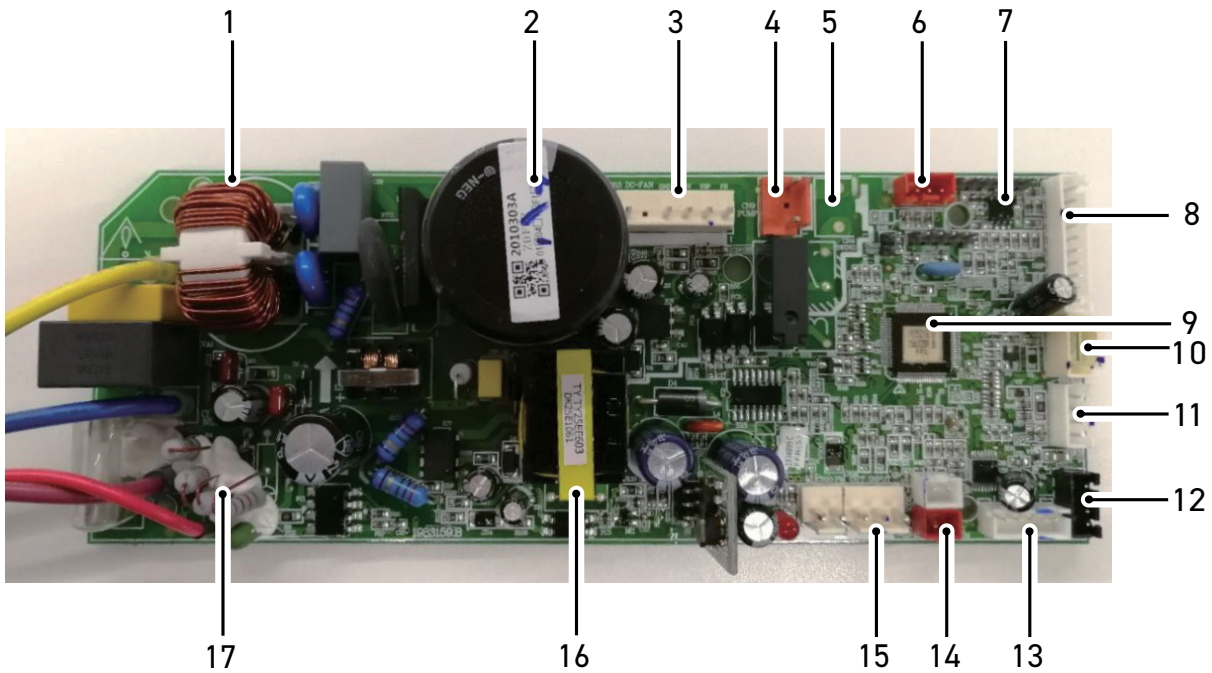


NO.	Description	NO.	Description
1	Heat	11	Disp
2	Output1	12	Output2
3	Step Motor	13	Wired.
4	DC Fan	14	Wi-Fi
5	Swing	15	Reserved
6	Pump	16	Humidity
7	L, N Power Input	17	Water Level Switch
8	Out	18	Coil Temp . Sensor
9	Nano	19	Ambient Temp . Sensor
10	Disp		

Figure 603

COMPONENTS TESTING

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

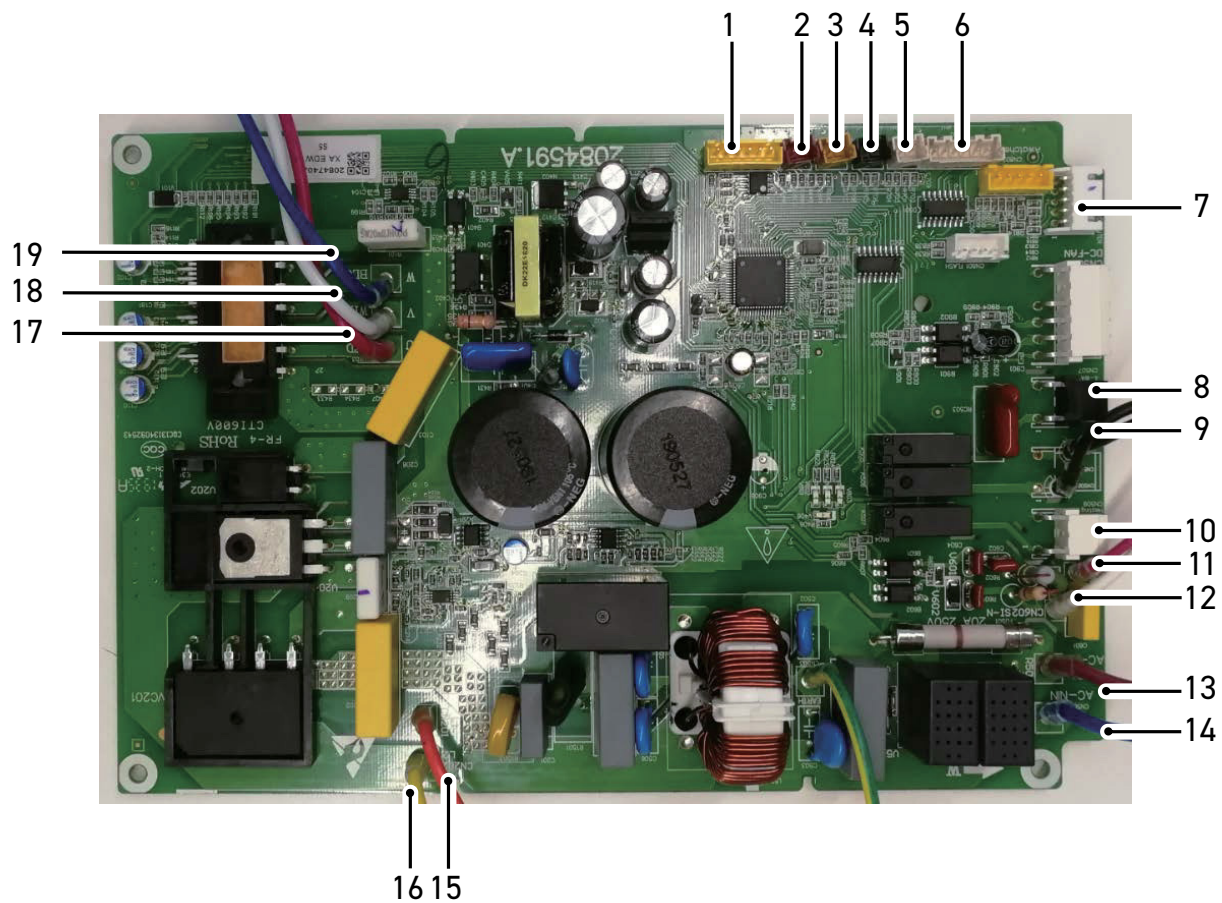


NO.	Description	NO.	Description
1	AC Power Filter	10	Wi-Fi
2	Main Control Component Code	11	Wired Controller
3	DC Motor	12	Electric Heater
4	Pump Motor	13	Step Motor
5	Swing Motor	14	Temp. Sensor
6	Water Level Switch	15	Out Input
7	EE	16	Switching Power Supply
8	Display	17	Communication with outdoor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

Figure 604

COMPONENTS TESTING

9-12k Outdoor Unit Control Board

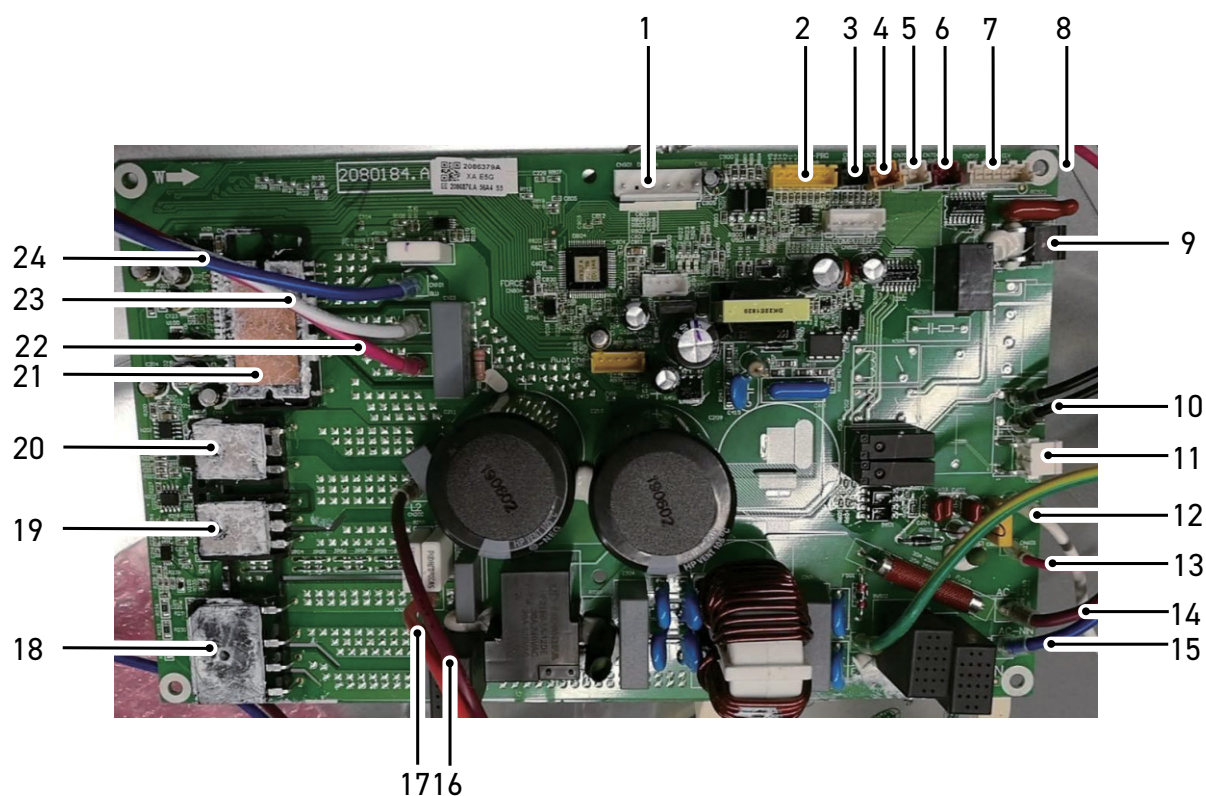


NO.	Description	NO.	Description
1	EE	11	SI
2	Overheat Switch	12	SI-N
3	Ambient Temperature Sensor	13	AC IN-L
4	Coil Temperature Sensor	14	AC IN-N
5	Discharge Temperature Sensor	15	Re actor L1
6	Electric expansion Valve	16	Re actor L2
7	Checker/Computer	17	Co mpressor U
8	4-Way Valve	18	Co mpressor V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

Figure 605

COMPONENTS TESTING

18k Outdoor Unit Control Board

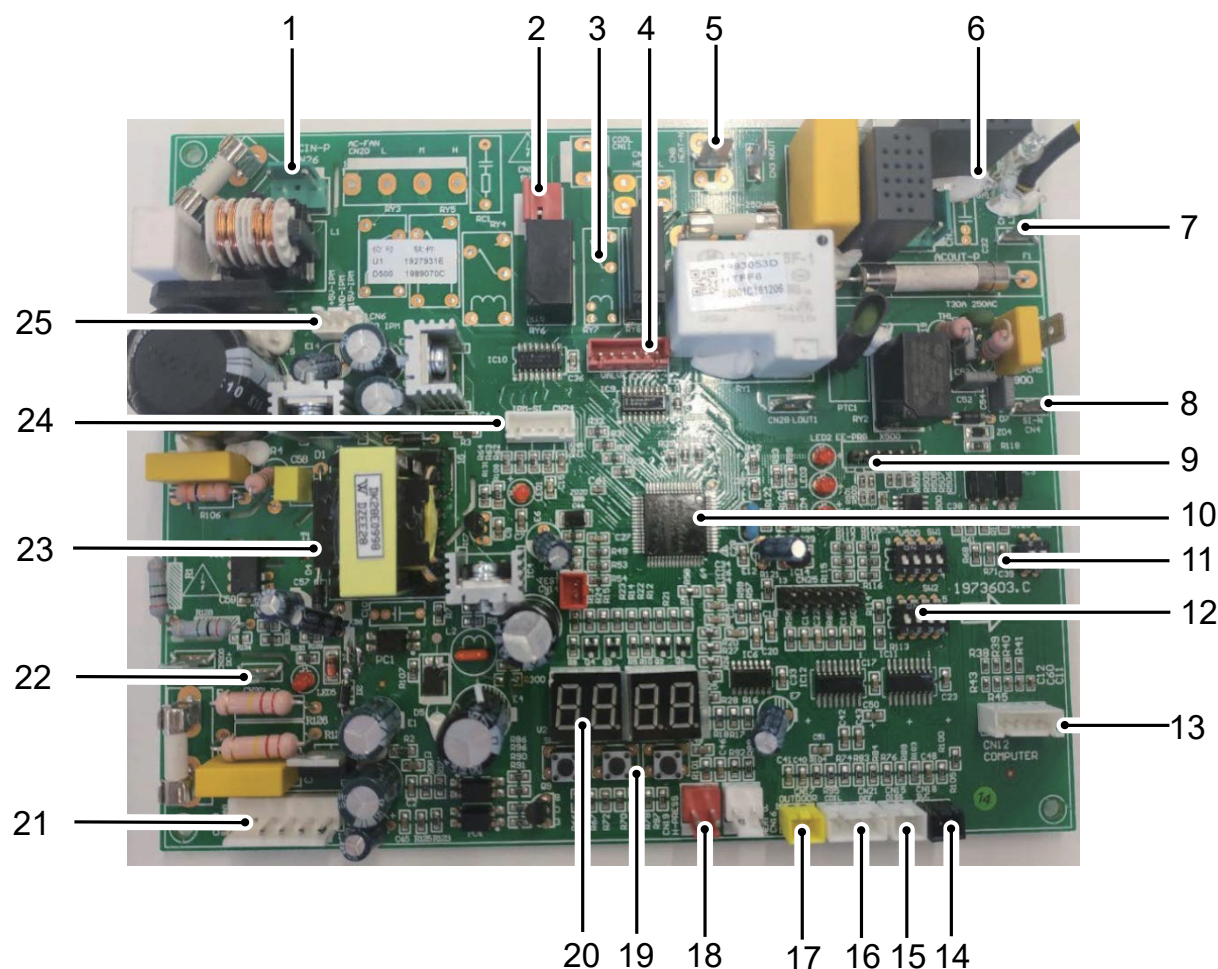


NO.	Description	NO.	Description
1	DC FAN	13	SI-L
2	EE	14	AC IN -L
3	Coil Temperature Sensor	15	AC IN -N
4	Ambient Temperature Sensor	16	Reactor L1
5	Discharge Temperature Sensor	17	Reactor L2
6	Overheat Protector	18	Rectifier Bridge
7	Electric expansion Valve	19	Diode
8	Electric Expansion Valve	20	IGBT
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

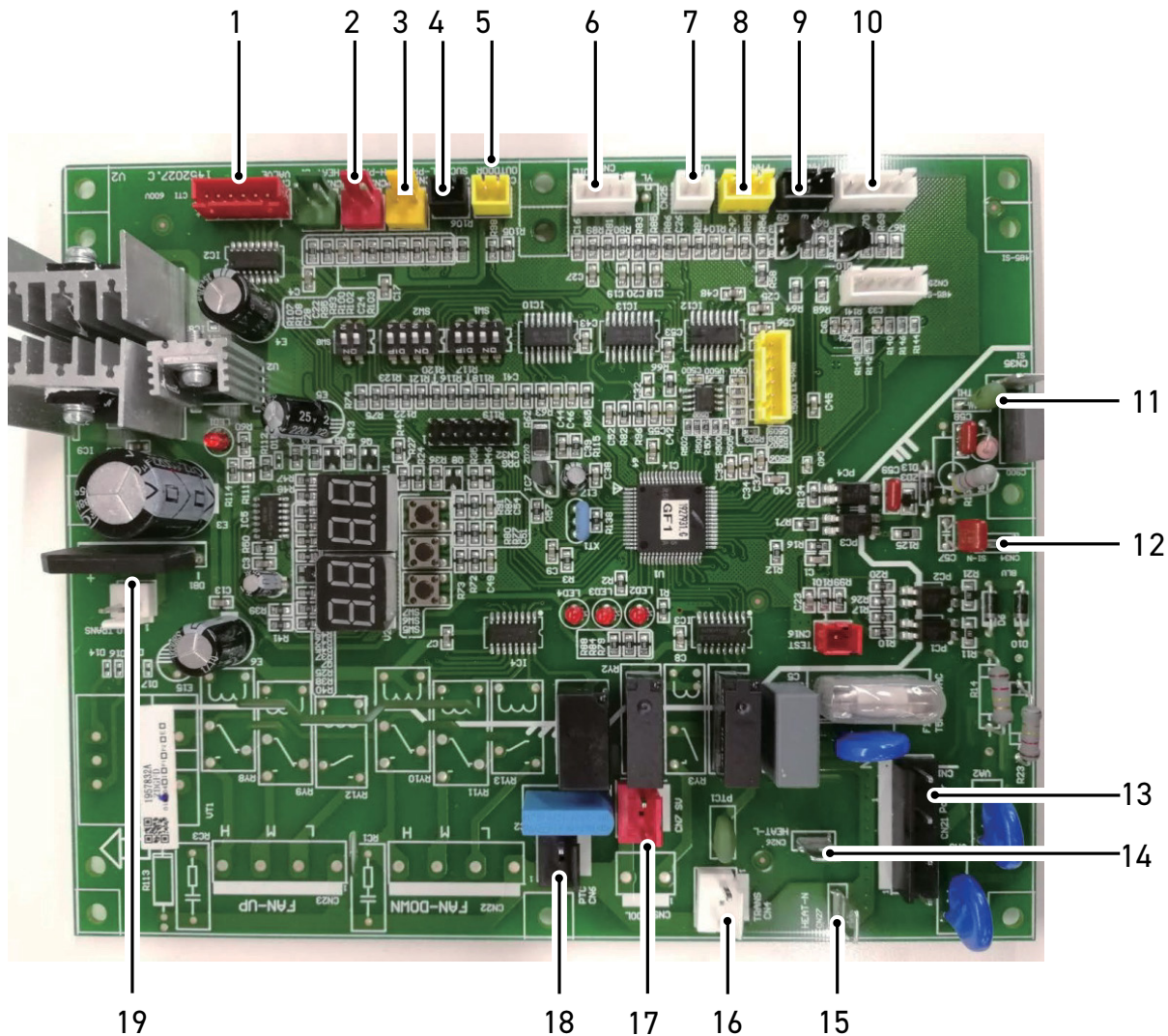


NO.	Description	NO.	Description
1	ACIN-P	14	Suction temperature Sensor
2	4-Way Valve	15	Discharge temperature Sensor
3	Tube electric heater	16	Coil & Defrost temperature Sensor
4	Electric Expansion Valve	17	Ambient temperature Sensor
5	Electric Heating Belt	18	High Pressure Switch
6	ACIN-P	19	Button
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



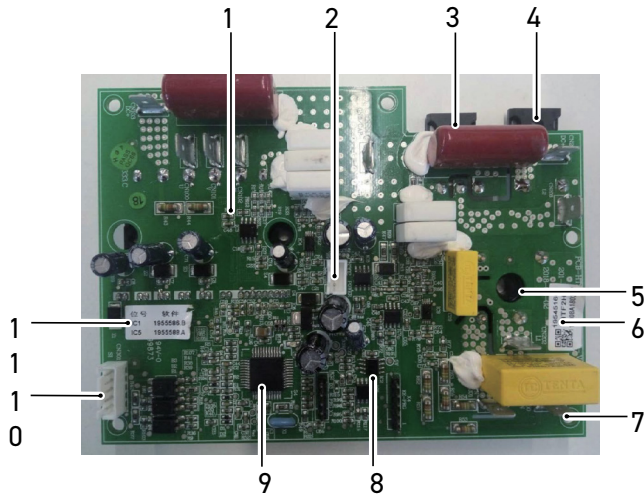
NO.	Description	NO.	Description
1	Electric Expansion Valve	11	Communication SI
2	High Pressure Switch	12	Communication SI -N
3	Low Pressure Switch	13	Power
4	Suction Temperature Sensor	14	Heater -L
5	Ambient Temperature Sensor	15	Heater -N
6	Coil/Defrost Temperature Sensor	16	Transformer 0 output Side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

Figure 608

COMPONENTS TESTING

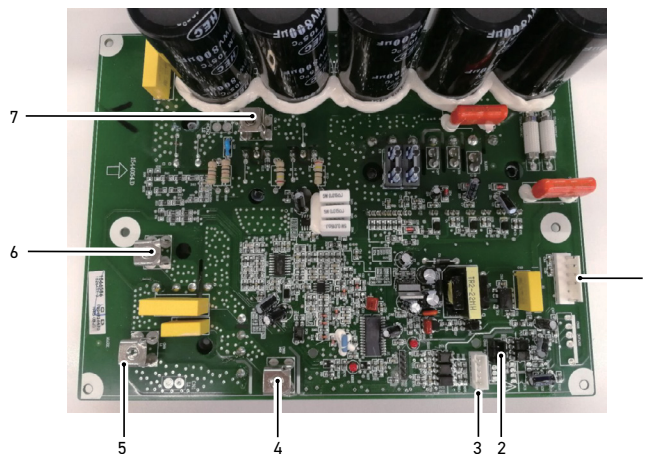
24-36k Outdoor Unit Drive Board

24k
Drive Board



N0.	Description	N0.	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



N0.	Description	N0.	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

Field Settings Outdoor Unit Dip Switch

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

After setting refrigerant piping length dip switch, cooling/heating performance can be improved.

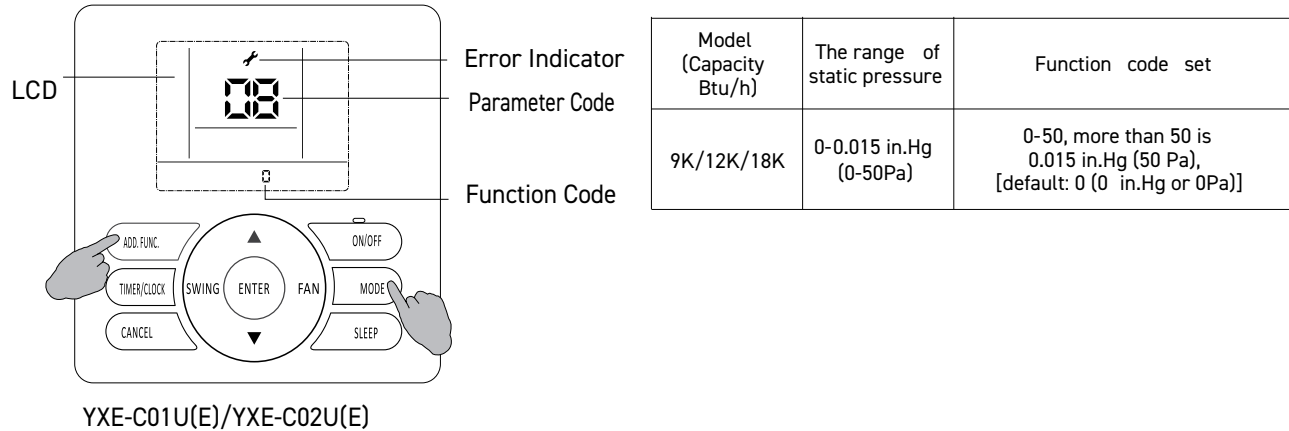
Diagram illustrating the effect of a NOT gate on a 4-bit input. The input is 1111 (ON/OFF), and the output is 0001 (ON/OFF).

111

COMPONENTS TESTING

Field Settings (ESP Setting) Duct Type Only

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



Static pressure setting:

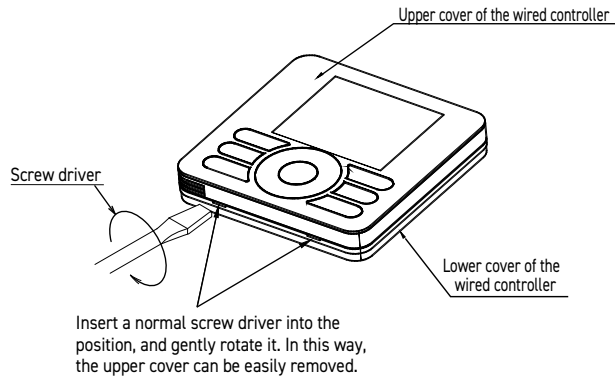
- 1 Hold down both "MODE" button and "ADD.FUNC." button for 3 seconds, symbol and parameter code blinking at the same time.
- 2 Press "▲/▼" button to adjust parameter number until display "17", and press "ENTER" button to entering system parameter adaption state, symbol stop blinking.
- 3 Select desired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

COMPONENTS TESTING

Field Settings (Indoor Unit Parameter Revision)

1. Connect wire remote controller with indoor unit

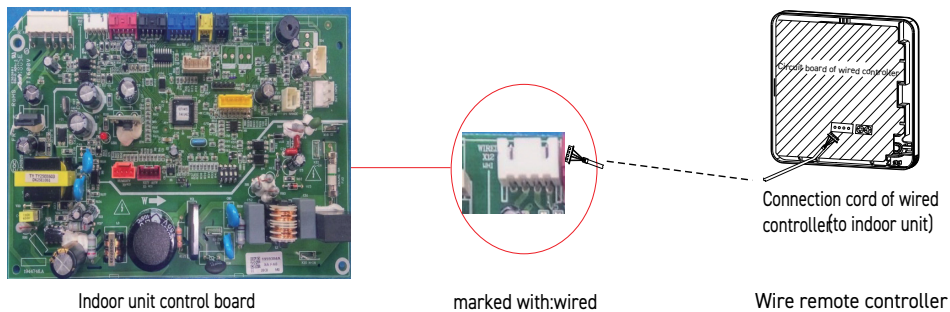
Step 1: Removing the upper cover of the wired controller



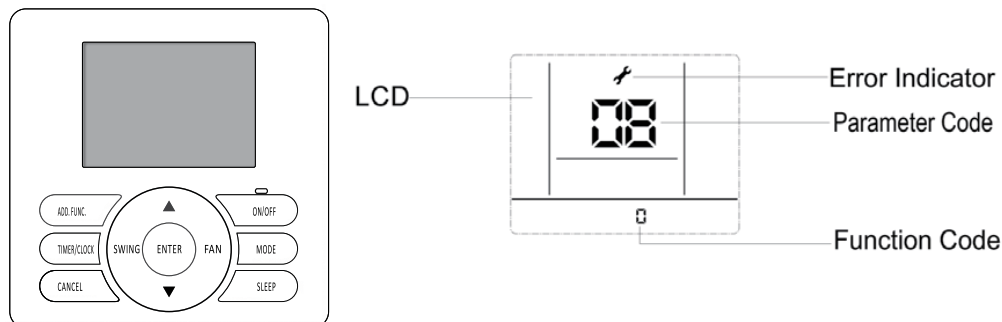
Note:

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

Step 2: Connecting wired controller with indoor unit



2. Changing system parameter



OPERATION:

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

COMPONENTS TESTING

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.	

COMPONENTS TESTING

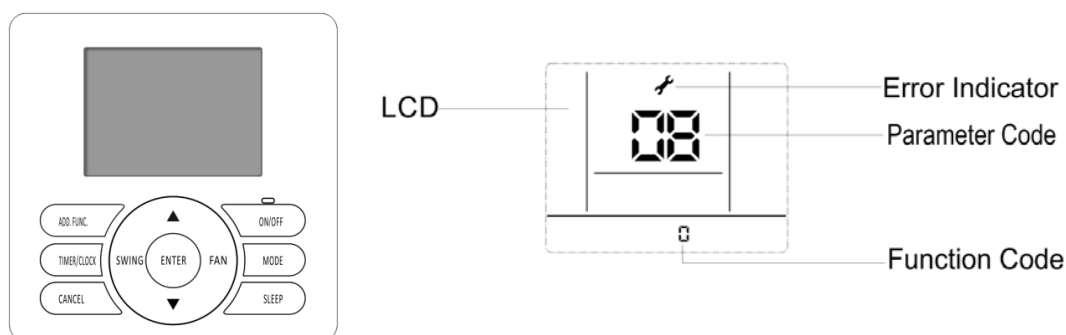
Field Settings (Running Parameter Query)

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.



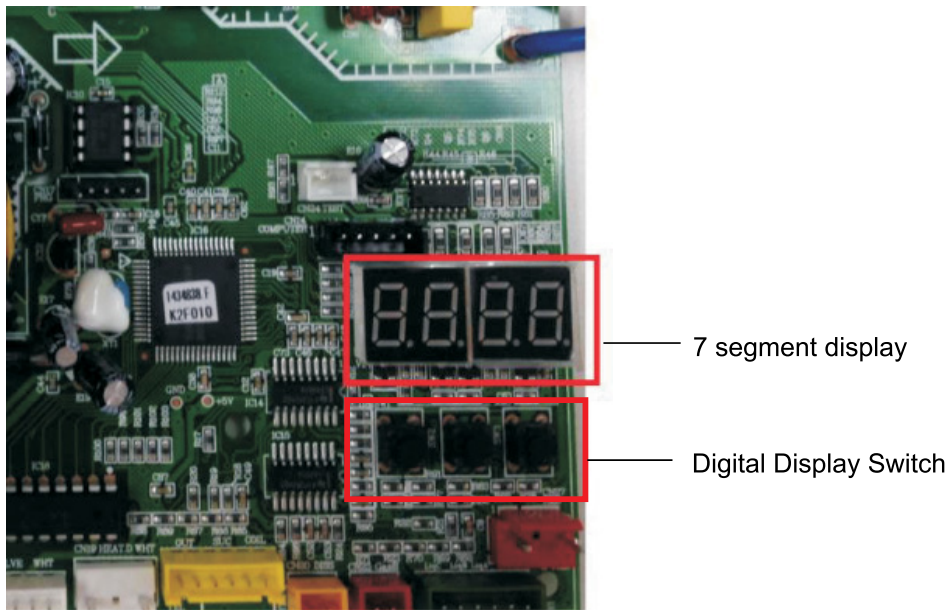
OPERATION:

- 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	Outdoor unit ambient sensor temperature
09	Discharge temperature
10	Suction temperature
11	Outdoor coil temperature
12	Discharge pressure
13	Suction pressure
14	Outdoor 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	Outdoor unit condenser inlet temperature
33	Outdoor unit condenser outlet temperature

COMPONENTS TESTING

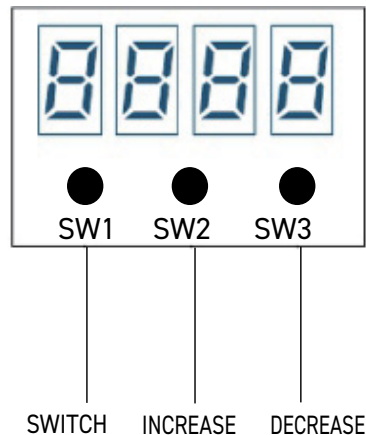
Field Settings (Query by 7 segment display)



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.

COMPONENTS TESTING

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

COMPONENTS TESTING

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

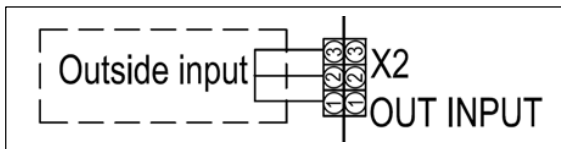


Figure 1 electrical wiring diagram

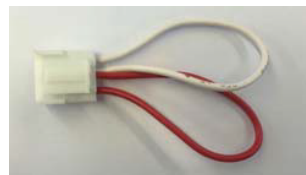


Figure 2 short wiring



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.)

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.

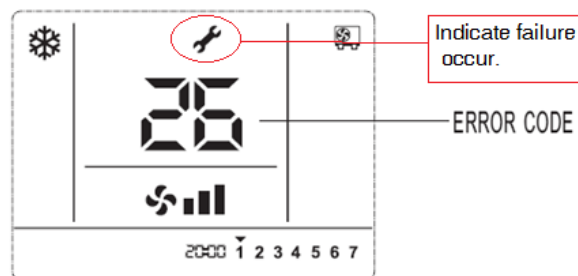
Troubleshooting according to fault codes

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.

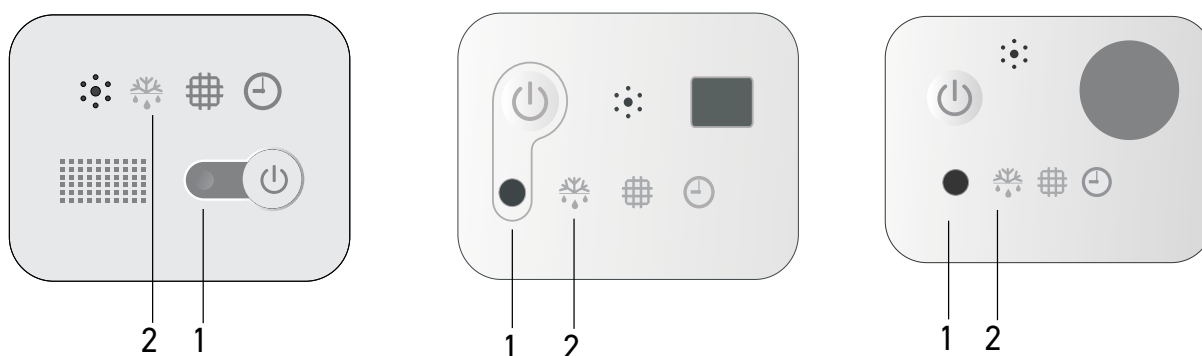
FIG1. FAULT CODE DISPLAY ON WIRE REMOT CONTROLLER

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)

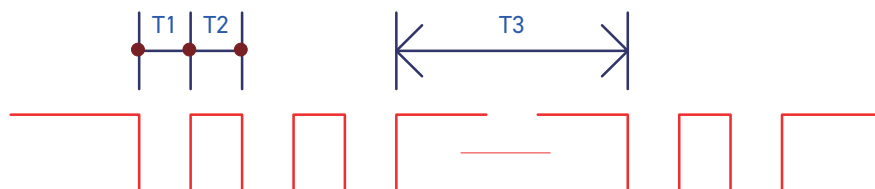


FIG. 2 LED flash control

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.

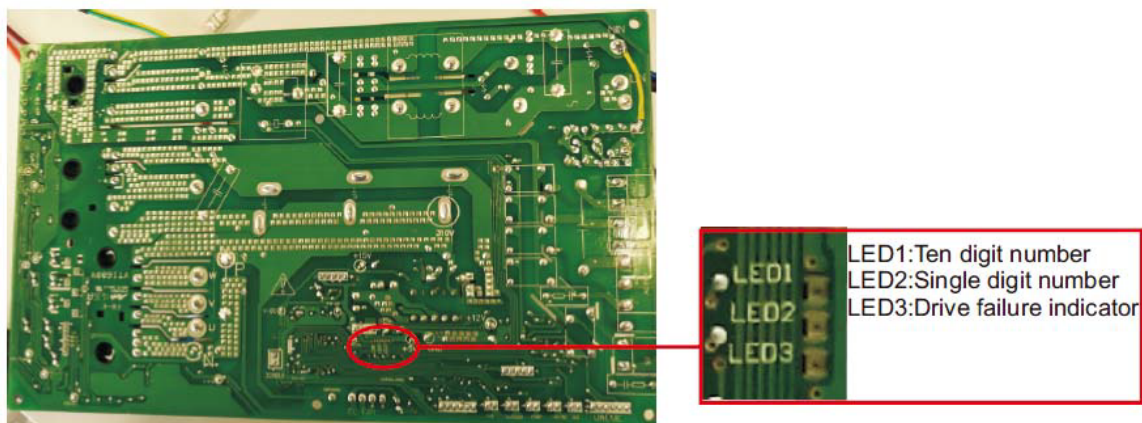
When LED3 is off, LED1 and LED 2 indicate main control fault code.

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

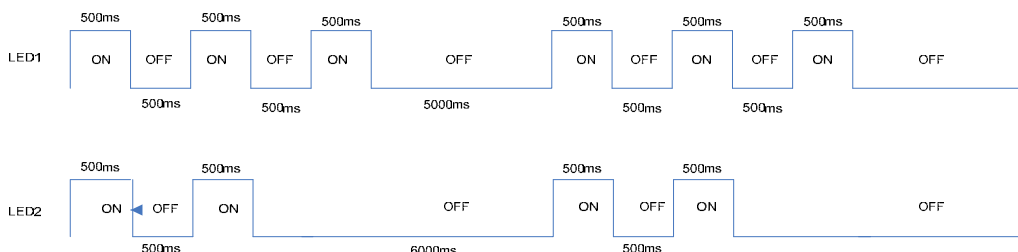
When LED3 is flickering and LED1, LED 2 are all off, indicate compressor is preheating. Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

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

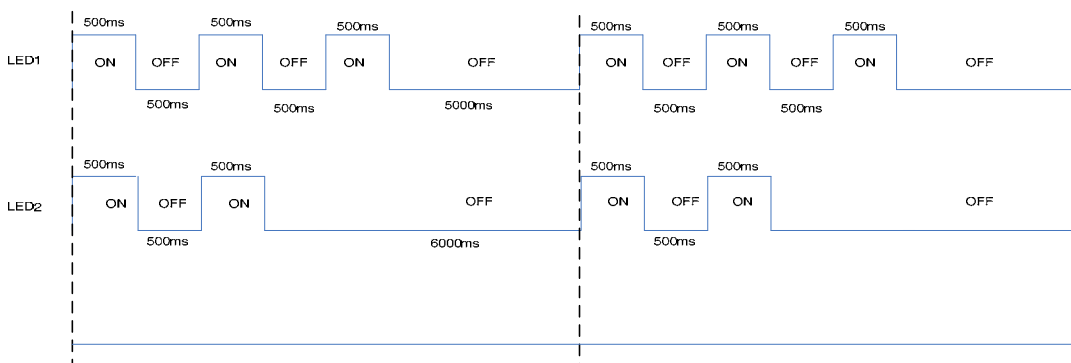
LED lamps will be off when there is no failure, protection or preheating.



For example, outdoor main control fault 32:



For example, outdoor drive fault 32:

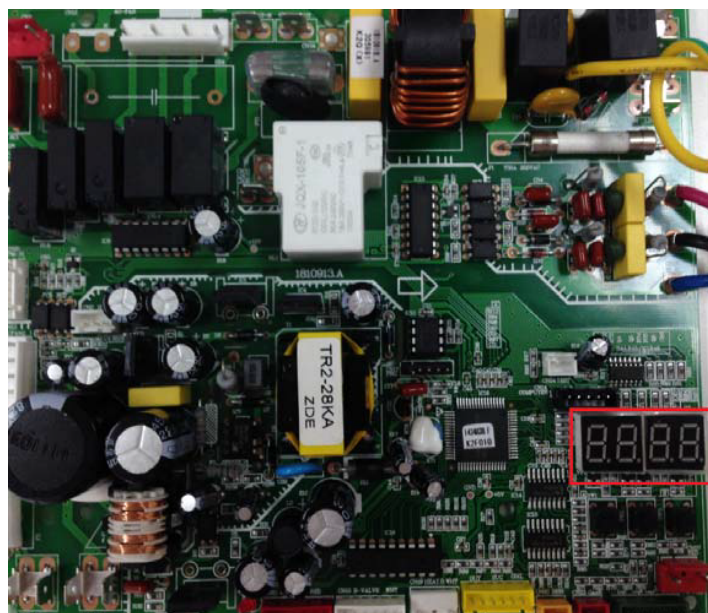


TROUBLESHOOTING

24-36k Outdoor Units

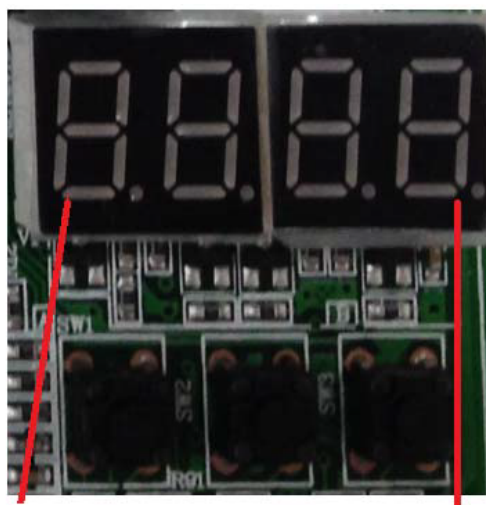
Main control fault display

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

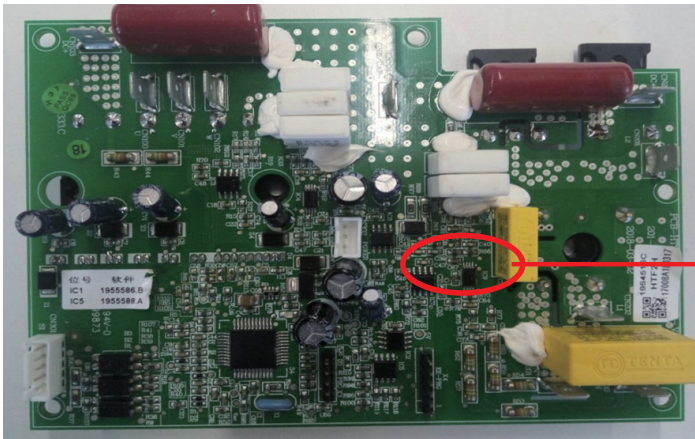
24-36k Outdoor Units

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	1.The outdoor ambient temperature sensor is connected loosely; 2.The outdoor ambient temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor ambient temperature sensor; 2.Replace the outdoor ambient temperature sensor components; 3.Replace the outdoor control board components.	
2	Outdoor coil temperature sensor fault	1.The outdoor coil temperature sensor is connected loosely ; 2.The outdoor coil temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor coil temperature sensor; 2.Replace the outdoor coil temperature sensor components; 3.Replace the outdoor control board components.	
3	The unit over-current turn off fault	1. Control board current sampling circuit fails; 2. The current is over high because the supply voltage is too low; 3. The compressor is blocked; 4. Overload in cooling mode ; 5. Overload in heating mode .	1. Replace the electrical control board components; 2. Normal protection ; 3. Replace the compressor ; 4. Please see NOTE 3; 5. Please see NOTE 4.	
4	EEPROM Data error	1.EE components fails; 2.EE components control circuit fails; 3.EE components are inserted incorrectly.	1.Replace the EE components; 2.Replace the outdoor control board components; 3.Reassemble the EE components.	
5	Cooling freezing protection (the indoor coil temperature is too low) or heating overload (indoor coil temperature is too high)	1.The indoor unit can not blow air normally; 2.The room temperature is too low in cooling mode or the room temperature is too high in heating; 3.The filter is dirty; 4.The duct resistance is too high to result in low air flow; 5.The setting fan speed is too low; 6.The indoor unit is not installed in accordance with the installation standards , and the air inlet is too close to the air outlet .	1.Check whether the indoor fan, indoor fan motor and evaporator work normally; 2.Normal protection; 3.Clean the filter; 4.Check the volume control valve, duct length etc.; 5.Set the speed with high speed; 6.Reinstall all 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	1.The connection cable is connected improperly between the indoor unit and outdoor unit; 2.The communication cable is connected loosely; 3.The communication cable fails; 4.The indoor control board fails; 5.The outdoor control board fails; 6.Communication circuit fuse open; 7.The specification of communication cable is incorrect.	1.Reconnect the connection cable referring to the wiring diagram; 2.Reconnect the communication cable; 3.Replace the communication cable; 4.Replace the indoor control board; 5.Replace the outdoor control board; 6.Check the communication circuit, adjust the DIP switch and the short-circuit fuse. 7.Choose suitable communication cable referring to the user manual	

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 reason s for abnormality	How to deal with	Re marks
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	1. The cable of the room temperature sensor is connect ed loosely; 2. The room temperature sensor fails; 3. The sampling circuit is abnormal .	1. Reconnect the cable of the room temperature sensor; 2. Replace the room temperature sensor; 3. Replace the indoor control board.	
83	Evaporator Middle Temperature Sensor Fault	1.The cable of the coil temperature sensor of the evaporator fails; 2.The coil temperature sensor of the evaporator fails; 3.The sampling circuit is abnormal .	1. Reconnect the cable of the coil temperature sensor of the evaporator; 2. Replace the coil temperature sensor of the evaporator; 3. Replace the indoor control board.	
FE (254)	Communication between main control board & Wired controller Fault (display on wired controller)	1. The wired controller and the indoor control board are connect ed loosely. 2. The sequenc e of the wiring between the wired controller to the indoor control board is wrong; 3. The wiring between the wired controller to the indoor control board fails; 4. The wired controller is fails; 5. The indoor control board is abnormal .	1.Reconnect the wiring between the wired controller to the indoor control board; 2. Replac e the wiring between the wired controller to the indoor control board; 3. Replac e the wiring between the wired controller to the indoor control board; 4. Replac e the wired controller; 5. Replac e the indoor control board.	
ER	Communication between main control board & display board Fault (displays on display board)	1.The wiring between the display board to the indoor control board is connect ed loosely; 2.The sequenc e of the wiring between the display board to the indoor control board is wrong; 3.The wiring between the display board to the indoor control board fails; 4.The display board fails; 5.The indoor control board fails.	1. Reconnect the wiring between the display board to the indoor control board; 2. Replac e the wiring between the display board to the indoor control board; 3. Replac e the wiring between the display board to the indoor control board; 4. Replac e the display board; 5. Replac e 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		
5	Loss phase detection fault (speed pulsation)	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.
6	Loss phase detection fault (current imbalance)		
7	Inverter IPM fault (edge)		
8	Inverter IPM fault (level)	1. System overload or current overload; 2. Driver board fault. 3. Compressor oil shortage, serious wear of crankshaft ; 4. The compressor insulation fault.	1. Check the system. 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
9	PFC_IPM IPM fault (edge)		
10	PFC_IPM IPM fault (level)		
11	PFC power detection of failure	1. The power supply is not stable; 2. Instantaneous power off; 3. Driver board failure.	1. Check the power supply. 2. No need to deal with . 3. Change the driver board.
12	PFC overload current detection of failure.	1. System overload, current is too high; 2. Driver board fails; 3. PFC fails.	1. Check the system; 2. Change the driver board; 3. Change the PFC.
13	DC voltage detected abnormal .	1. Input voltage is too high or too low; 2. Driver board fails.	1. Check the power supply; 2. Change the driver board.
14	PFC LOW voltage detected failure.		
15	AD offset abnormal detected failure.	Driver board fails.	Change the driver board.
16	Inverter PWM logic set fault.		
17	Inverter PWM initialization failure		
18	PFC_PWM logic set fault.		
19	PFC_PWM initialization fault.		
20	Temperature abnormal.		
21	Shunt resistance unbalance adjustment fault		
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 out of range	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 abnormality	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.

WIRING DIAGRAMS

9-18k Outdoor Units

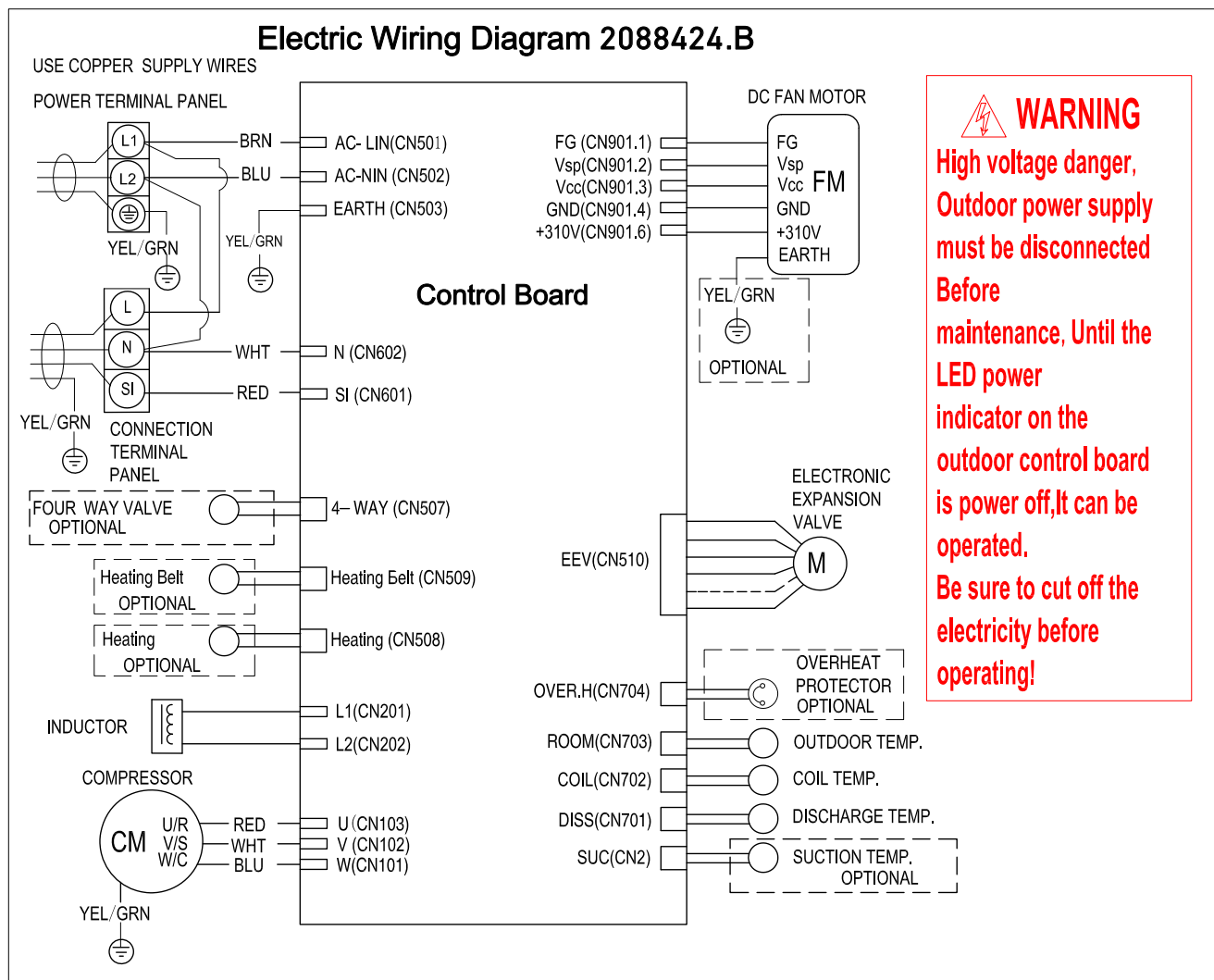
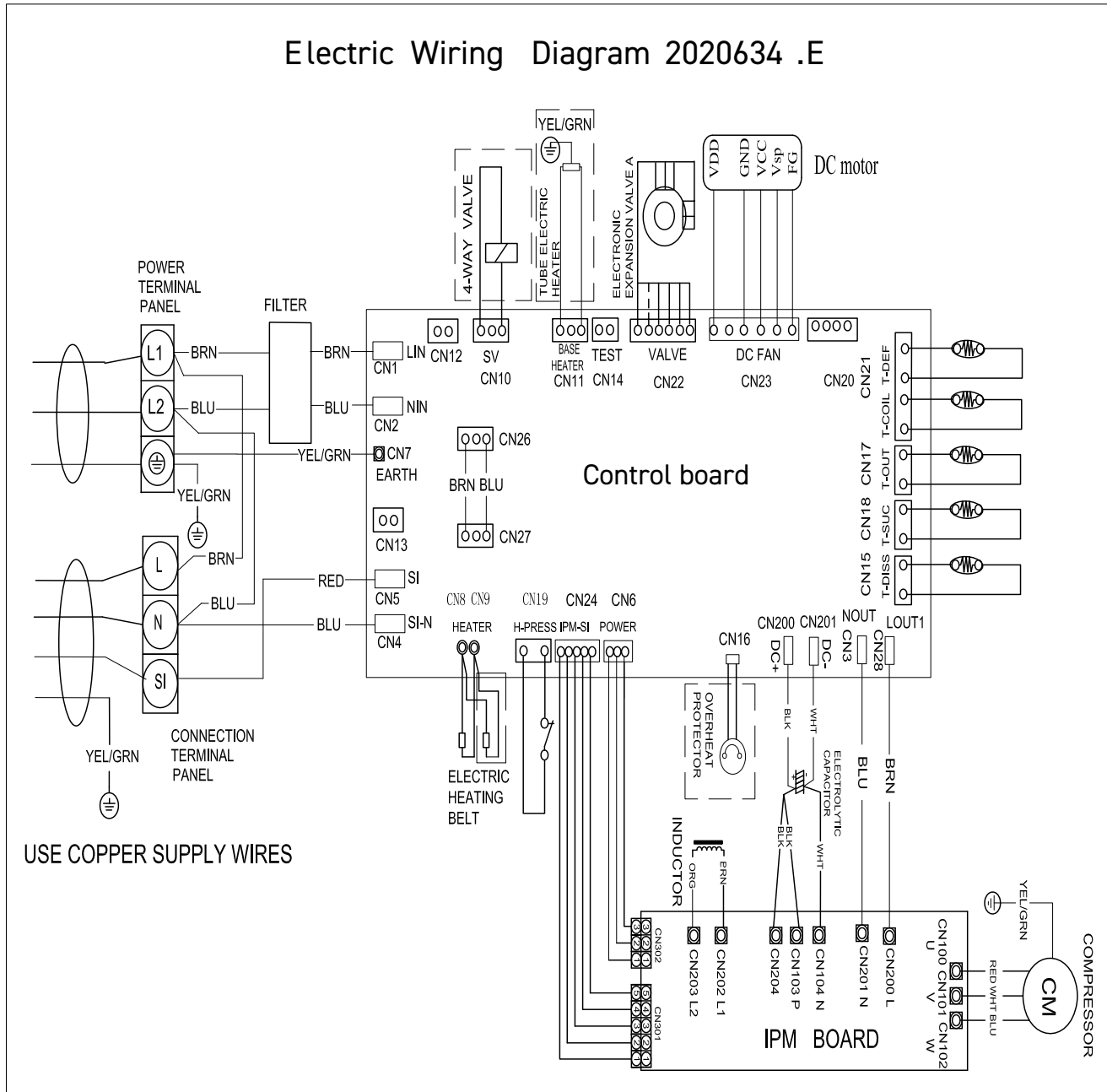


Figure 804

WIRING DIAGRAMS

24k Outdoor Units

Electric Wiring Diagram 2020634 .E



WIRING DIAGRAMS

36k Outdoor Units

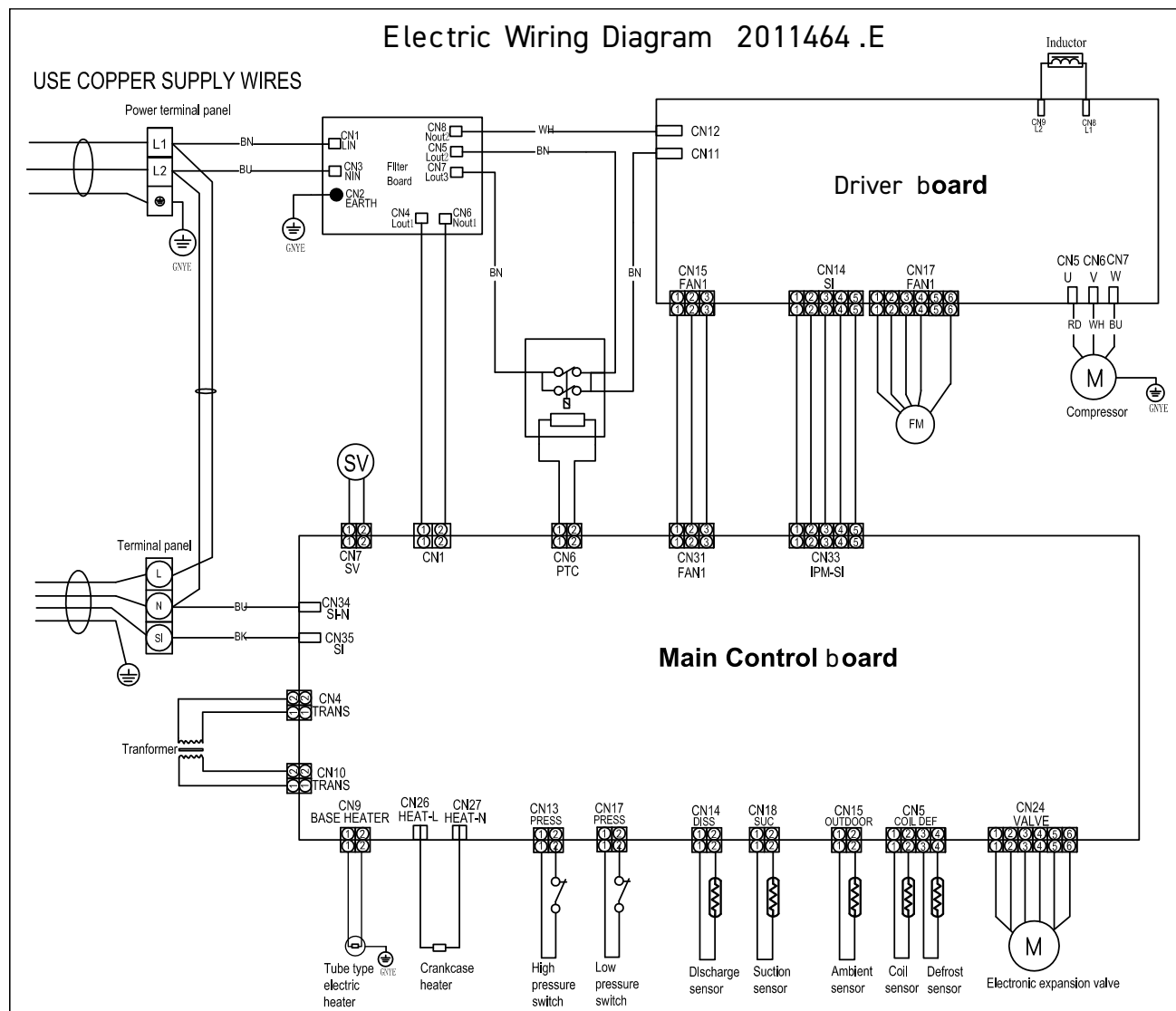


Figure 806

WIRING DIAGRAMS

9k-36k Indoor Cassette Units

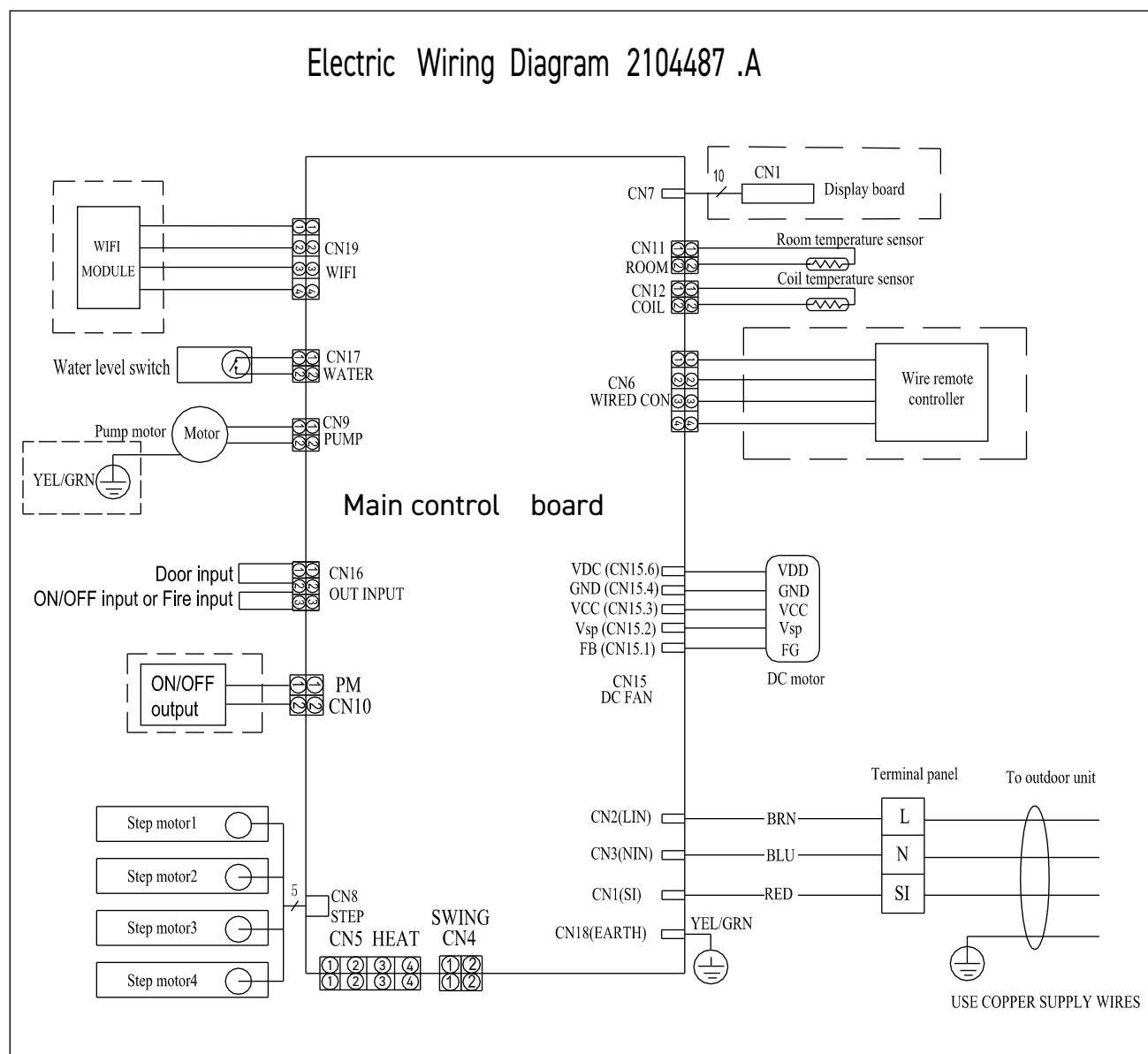


Figure 803

WIRING DIAGRAMS

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

Electric Wiring Diagram 1992115.D

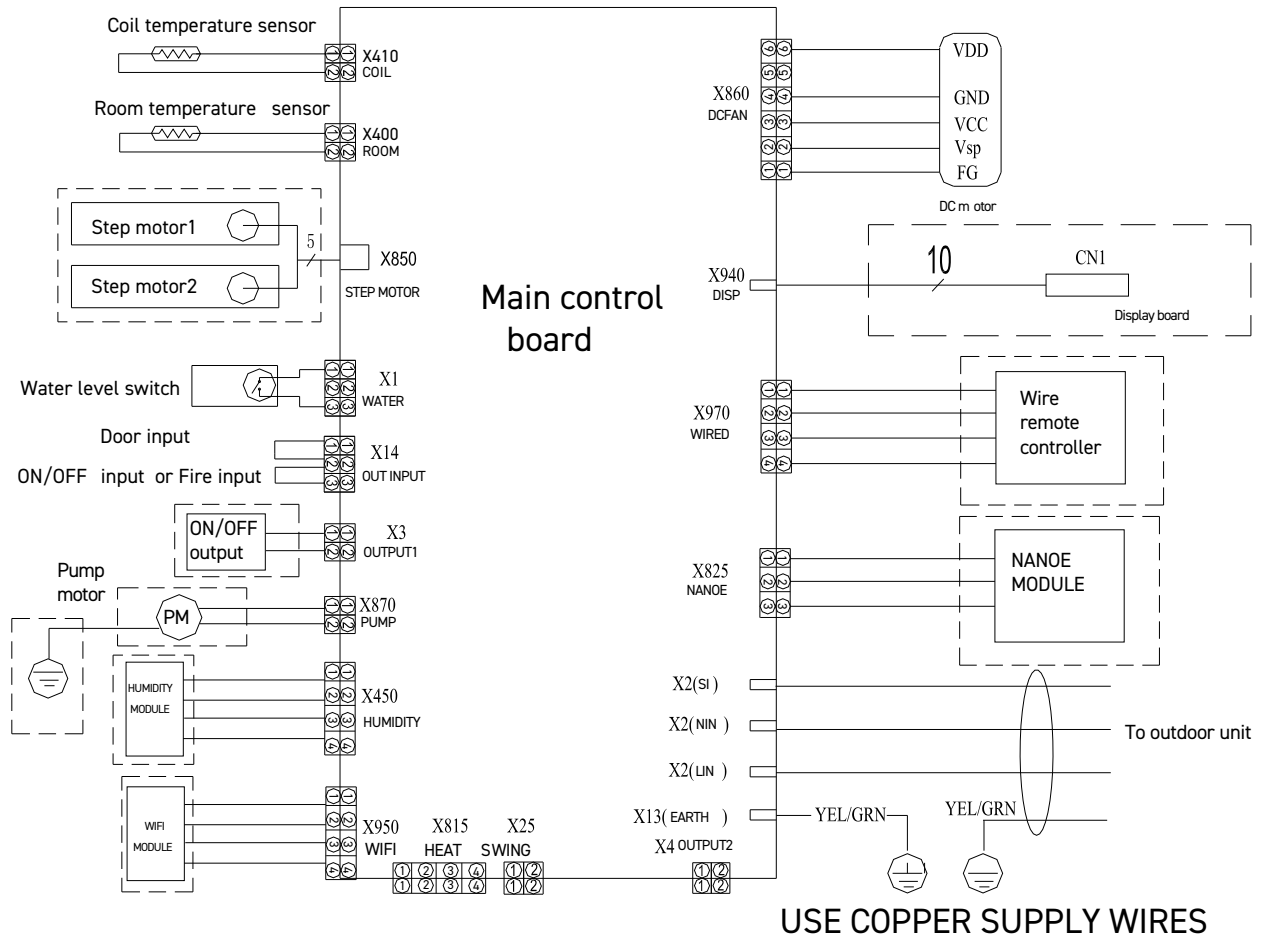


Figure 801

WIRING DIAGRAMS

Ducted Indoor Units 24-36k

Electric Wiring Diagram 2104500 .A

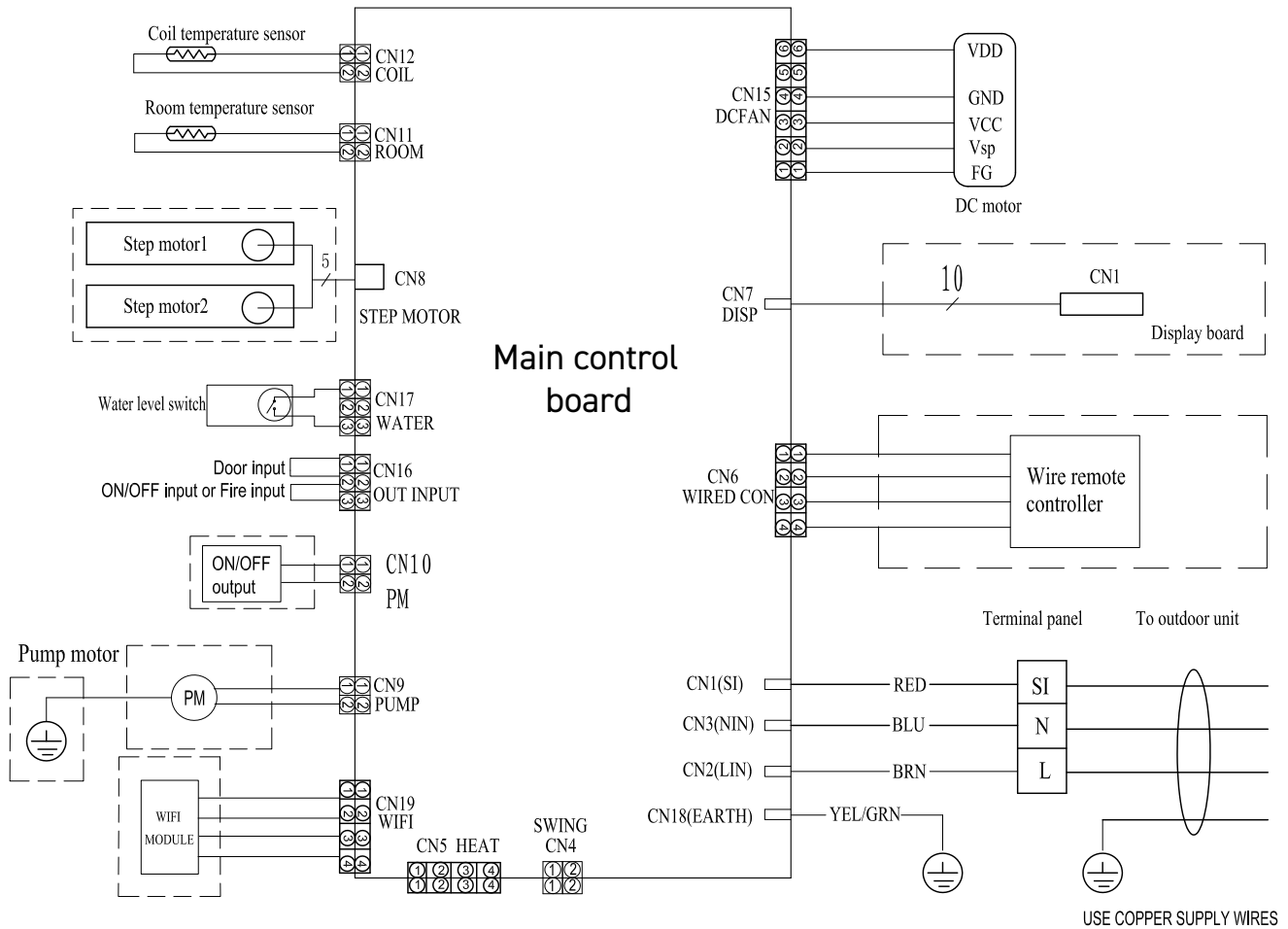


Figure 802

PARTS CATALOG

9K Outdoor Condensor

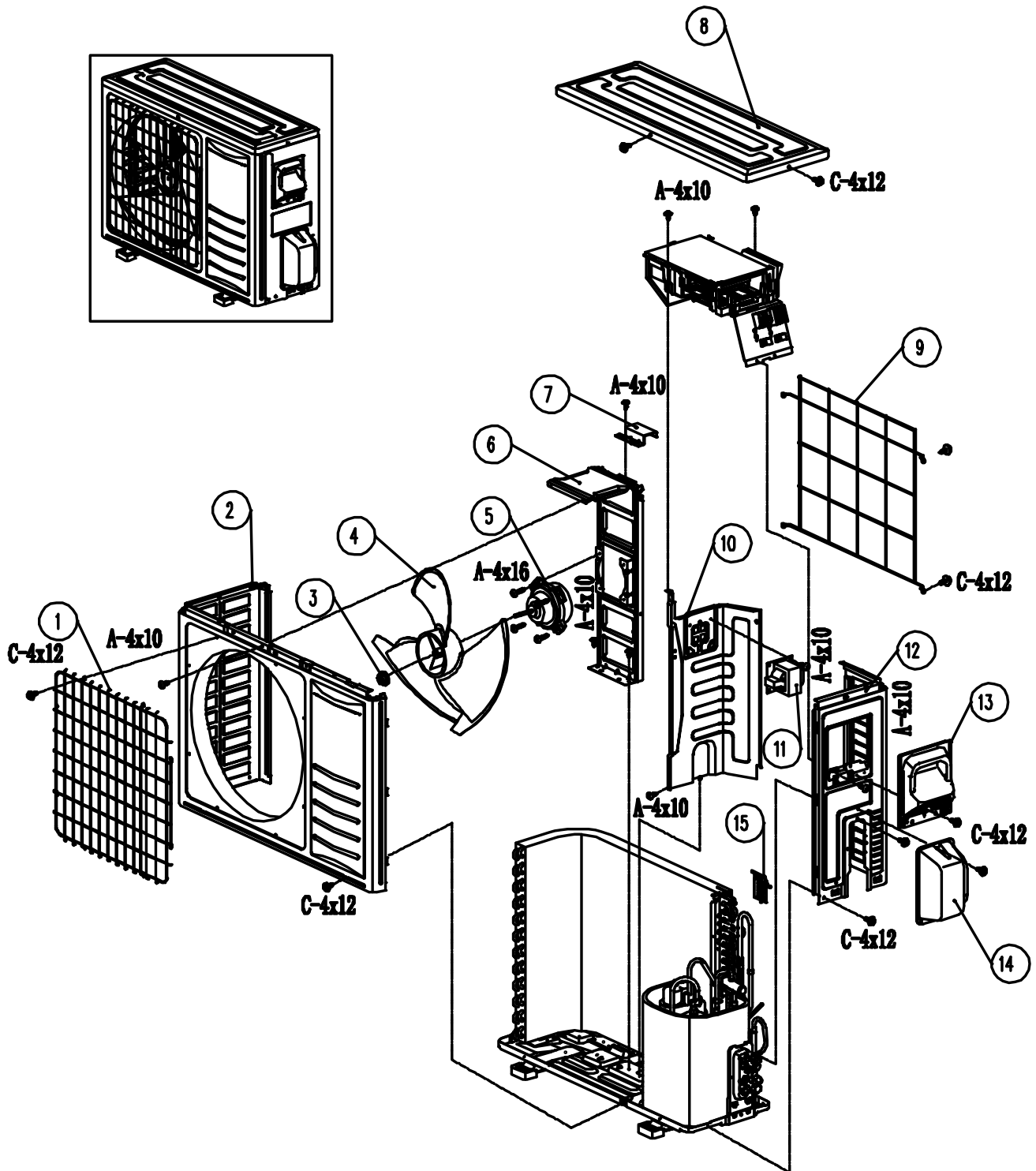


Figure 901A

PARTS CATALOG

9K Outdoor Condensor

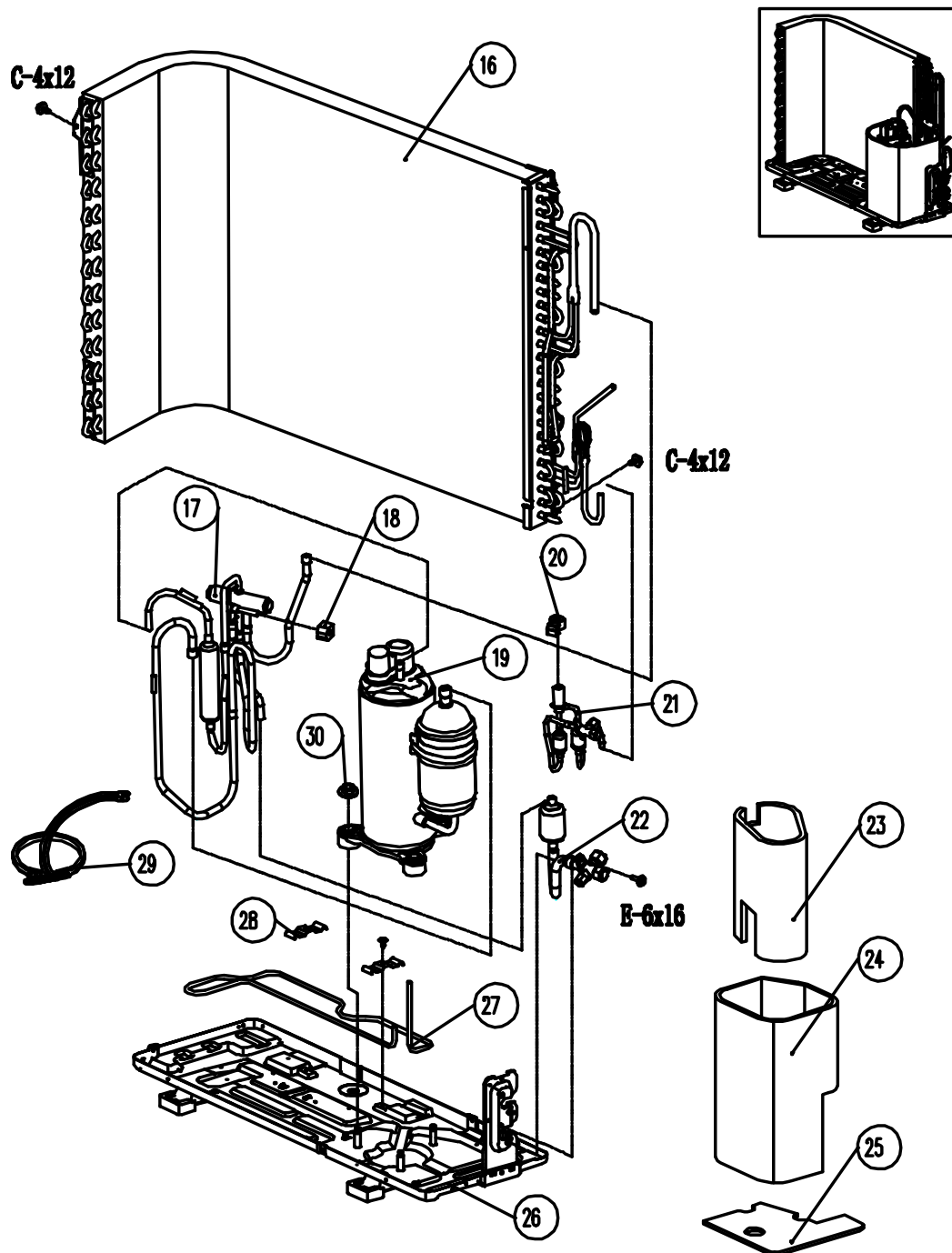


Figure 901B

PARTS CATALOG

9K Outdoor Condensor

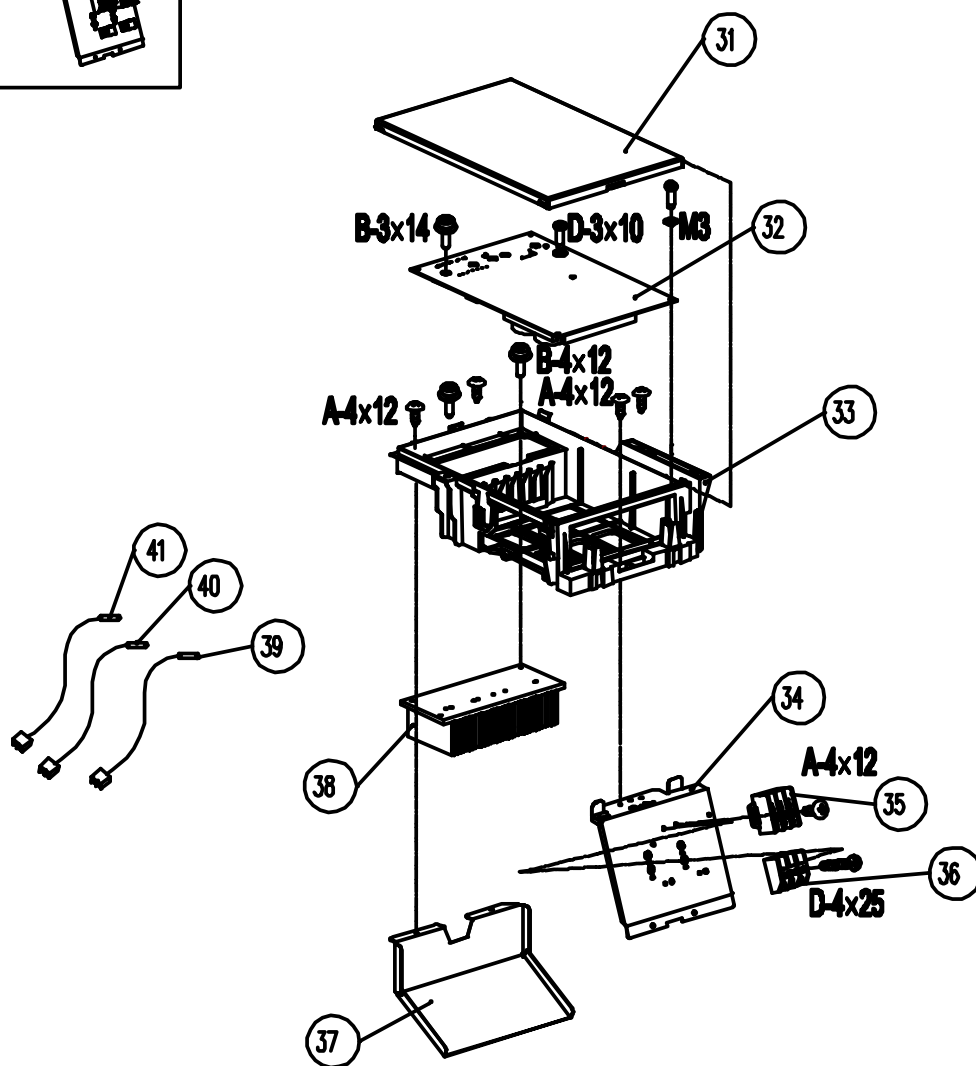
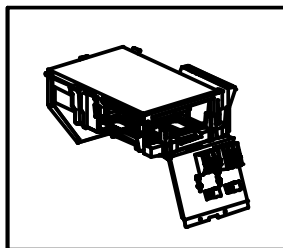


Figure 901C

PARTS CATALOG

9K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67401110	1847918 - Fan Guard	FPHFR09A3A	1
2	67401111	2103279 - Panel	FPHFR09A3A	1
3	67401112	1203994 - Hex Nuts	FPHFR09A3A	1
4	67400181	1556766 - Propeller Fan Blade	FPHFR09A3A	1
5	67401113	1932167 - DC Motor	FPHFR09A3A	1
6	67401114	2009048 - Motor Supporter	FPHFR09A3A	1
7	67401115	1550928 - Connecting Board	FPHFR09A3A	1
8	67401116	1972348 - Upper Board	FPHFR09A3A	1
9	67401117	1926335 - Back Guard	FPHFR09A3A	1
10	67401118	1570578 - Clapboard	FPHFR09A3A	1
11	67400283	1829624 - PFC Inductance	FPHFR09A3A	1
12	67401119	1971738 - Right Side Board	FPHFR09A3A	1
13	67401120	1863156 - Wiring Distribution Cover	FPHFR09A3A	1
14	67401121	1825563 - Valve Cover	FPHFR09A3A	1
15	67400211	1546721 - Sensor Mounting Plate	FPHFR09A3A	1
16	67401122	1972384 - Condenser	FPHFR09A3A	1
17	67401123	1924673 - Four-way Valve	FPHFR09A3A	1
18	67400193	1511783 - Four-way Valve Coil	FPHFR09A3A	1
19	67401124	1841376 - Inverter Compressor	FPHFR09A3A	1
20	67401125	1511786 - Electronic Expansion Valve Coil	FPHFR09A3A	1
21	67401126	1559574 - Electronic Expansion Valve	FPHFR09A3A	1
22	67401127	1555574 - Stop Valve	FPHFR09A3A	1
23	67401128	1836723 - Inner Noise-insulation Cotton	FPHFR09A3A	1
24	67401129	1566098 - Outer Noise-insulation Cotton	FPHFR09A3A	1
25	67401130	1881249 - Bottom Noise-insulation Cotton	FPHFR09A3A	1
26	67401131	1961881 - Base Holder	FPHFR09A3A	1
27	67401132	1854766 - Tube Electric Heater	FPHFR09A3A	1
28	67401133	1805723 - Fixing Clip	FPHFR09A3A	1
29	67401134	1926233 - Electric Heating Belt	FPHFR09A3A	1
30	67401135	1226723 - Compressor Hex Nuts	FPHFR09A3A	1
31	67401136	1899954 - Electric Box Cover	FPHFR09A3A	1
32	67401137	2084740 - Outdoor Main Control Board Component	FPHFR09A3A	1
33	67401138	2089057 - Electric Box	FPHFR09A3A	1

Figure 901

PARTS CATALOG

9K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
34	67401139	1926317 - Terminal Connecting Board	FPHFR09A3A	1
35	67401047	2078758 - Power Terminal Panel	FPHFR09A3A	1
36	67400365	1993154 - Connection Terminal Panel	FPHFR09A3A	1
37	67401140	1881059 - Baffle	FPHFR09A3A	1
38	67401141	1832676 - Radiator	FPHFR09A3A	1
39	67400208	1822633 - Coil Temperature Sensor	FPHFR09A3A	1
40	67401142	1837502 - Discharge Temperature Sensor	FPHFR09A3A	1
41	67400210	1831029 - Outdoor Temperature Sensor	FPHFR09A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 901

PARTS CATALOG

12K Outdoor Condensor

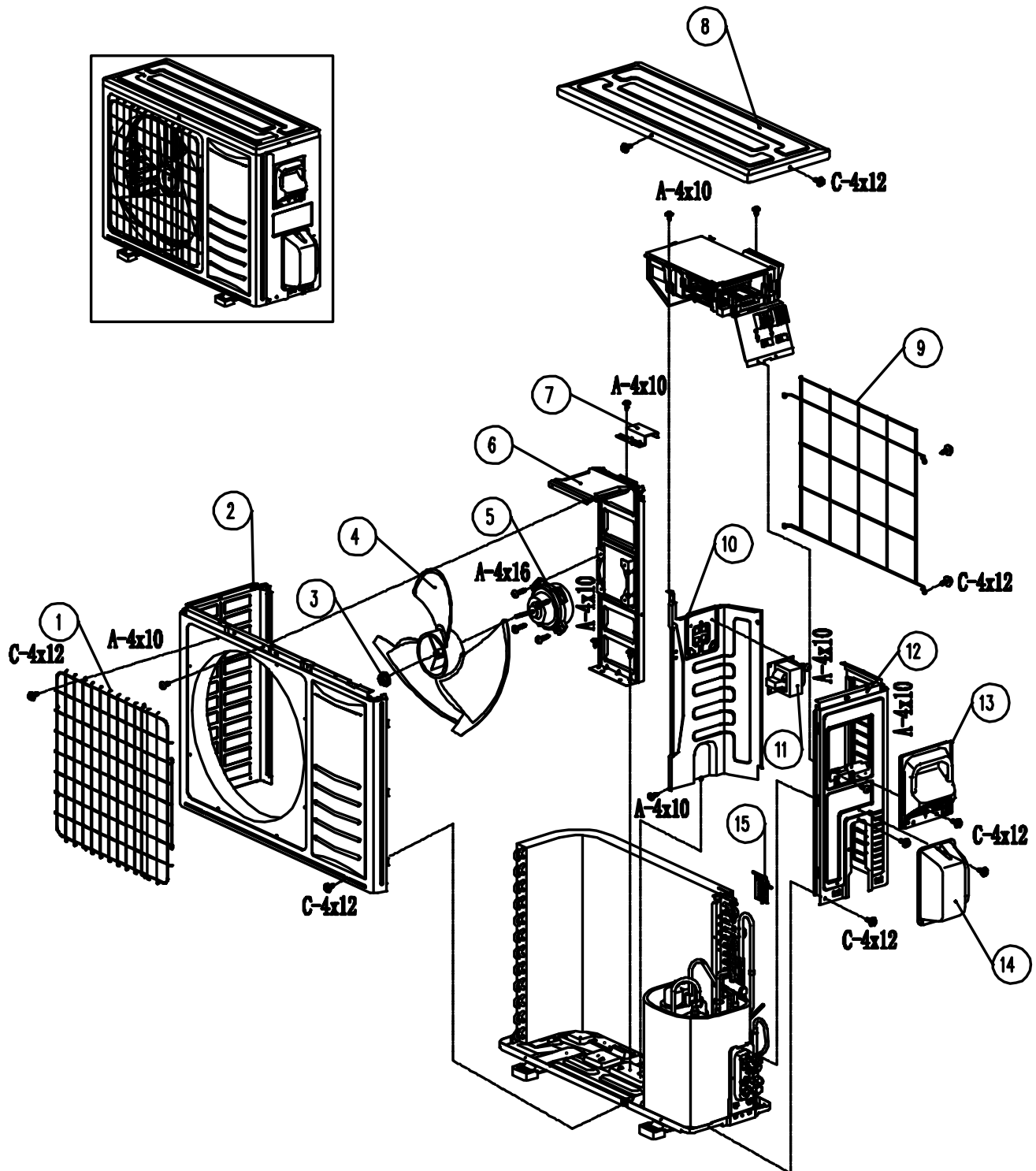
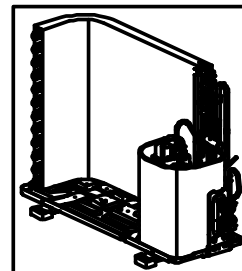


Figure 902A

12K Outdoor Condensor



146

PARTS CATALOG

12K Outdoor Condensor

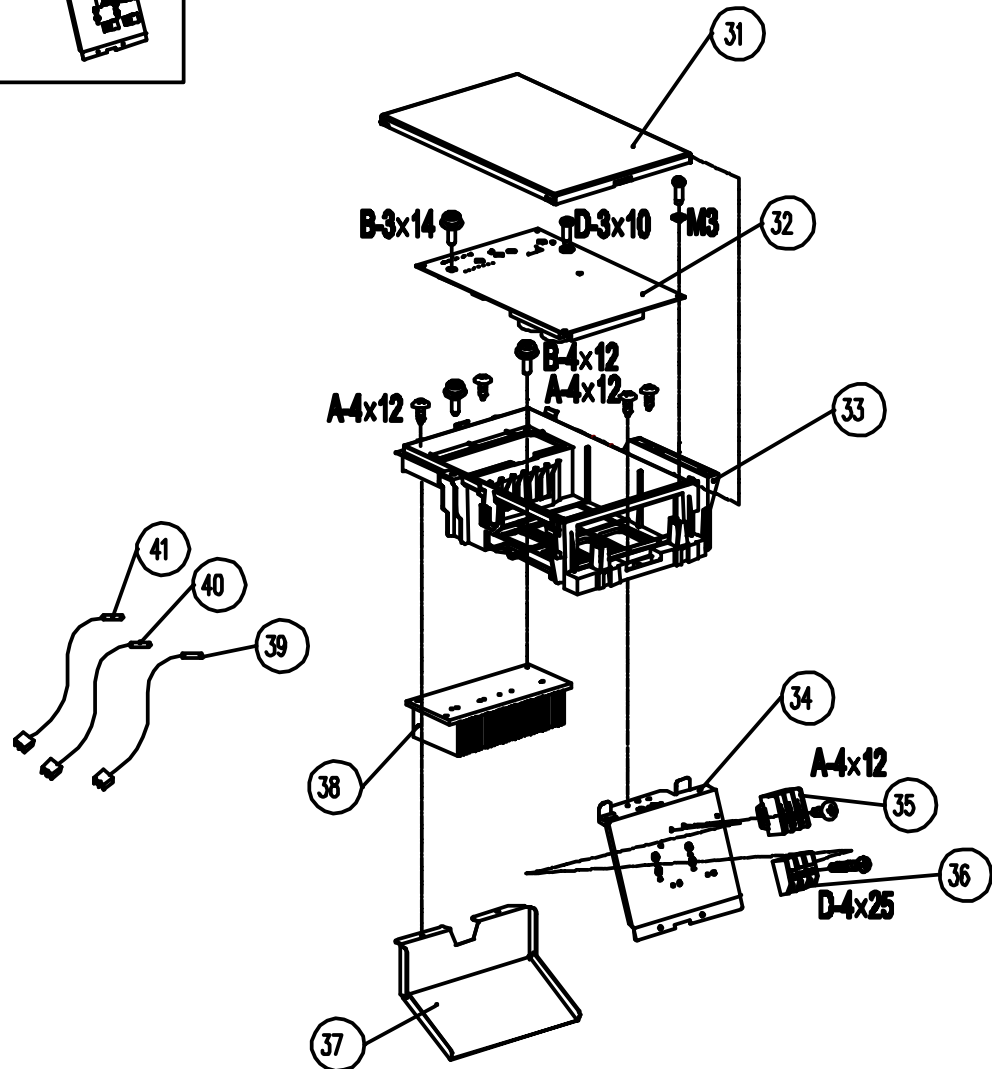
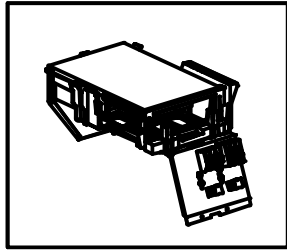


Figure 902C

PARTS CATALOG

12K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67401110	1847918 - Fan Guard	FPHFR12A3A	1
2	67401111	2103279 - Panel	FPHFR12A3A	1
3	67401112	1203994 - Hex Nuts	FPHFR12A3A	1
4	67400181	1556766 - Propeller Fan Blade	FPHFR12A3A	1
5	67401113	1932167 - DC Motor	FPHFR12A3A	1
6	67401114	2009048 - Motor Supporter	FPHFR12A3A	1
7	67401017	1834430 - Connecting Board	FPHFR12A3A	1
8	67401116	1972348 - Upper Board	FPHFR12A3A	1
9	67401117	1926335 - Back Guard	FPHFR12A3A	1
10	67401118	1570578 - Clapboard	FPHFR12A3A	1
11	67400283	1829624 - PFC Inductance	FPHFR12A3A	1
12	67401119	1971738 - Right Side Board	FPHFR12A3A	1
13	67401120	1863156 - Wiring Distribution Cover	FPHFR12A3A	1
14	67401121	1825563 - Valve Cover	FPHFR12A3A	1
15	67400211	1546721 - Sensor Mounting Plate	FPHFR12A3A	1
16	67401143	1973572 - Condenser	FPHFR12A3A	1
17	67401144	2081826 - Four-way Valve	FPHFR12A3A	1
18	67400193	1511783 - Four-way Valve Coil	FPHFR12A3A	1
19	67401124	1841376 - Inverter Compressor	FPHFR12A3A	1
20	67400396	1848625 - Electronic Expansion Valve Coil	FPHFR12A3A	1
21	67401145	2107067 - Electronic Expansion Valve	FPHFR12A3A	1
22	67401127	1555574 - Stop Valve	FPHFR12A3A	1
23	67401128	1836723 - Inner Noise-insulation Cotton	FPHFR12A3A	1
24	67401129	1566098 - Outer Noise-insulation Cotton	FPHFR12A3A	1
25	67401130	1881249 - Bottom Noise-insulation Cotton	FPHFR12A3A	1
26	67401131	1961881 - Base Holder	FPHFR12A3A	1
27	67401132	1854766 - Tube Electric Heater	FPHFR12A3A	1
28	67401133	1805723 - Fixing Clip	FPHFR12A3A	1
29	67401134	1926233 - Electric Heating Belt	FPHFR12A3A	1
30	67401135	1226723 - Compressor Hex Nuts	FPHFR12A3A	1
31	67401136	1899954 - Electric Box Cover	FPHFR12A3A	1
32	67401146	2089130 - Outdoor Main Control Board Component	FPHFR12A3A	1

Figure 902

PARTS CATALOG

12K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
33	67401138	2089057 - Electric Box	FPHFR12A3A	1
34	67401139	1926317 - Terminal Connecting Board	FPHFR12A3A	1
35	67401047	2078758 - Power Terminal Panel	FPHFR12A3A	1
36	67400365	1993154 - Connection Terminal Panel	FPHFR12A3A	1
37	67401140	1881059 - Baffle	FPHFR12A3A	1
38	67401141	1832676 - Radiator	FPHFR12A3A	1
39	67400208	1822633 - Coil Temperature Sensor	FPHFR12A3A	1
40	67401142	1837502 - Discharge Temperature Sensor	FPHFR12A3A	1
41	67400210	1831029 - Outdoor Temperature Sensor	FPHFR12A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 902

PARTS CATALOG

18K Outdoor Condensor

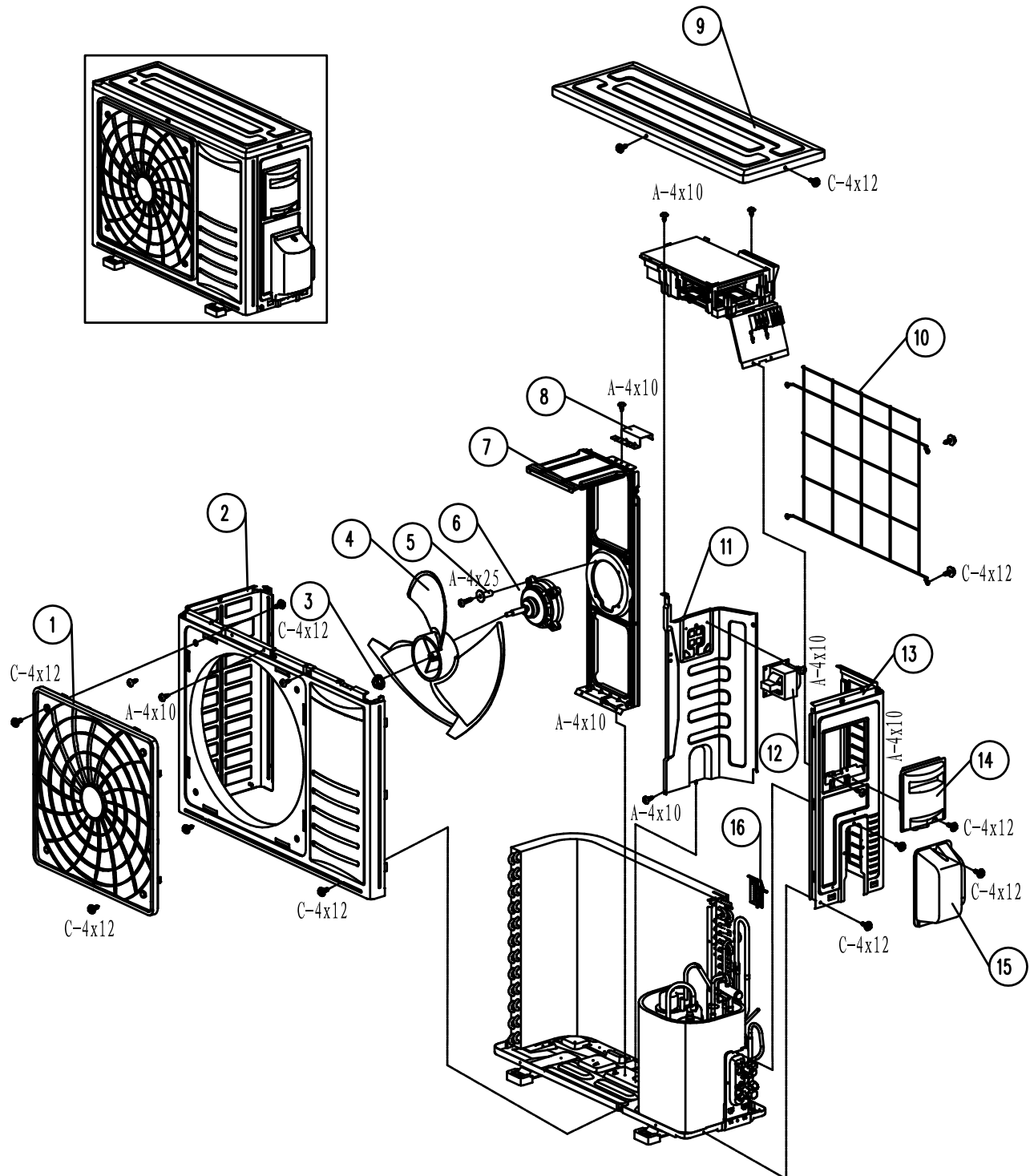


Figure 903A

PARTS CATALOG

18K Outdoor Condensor

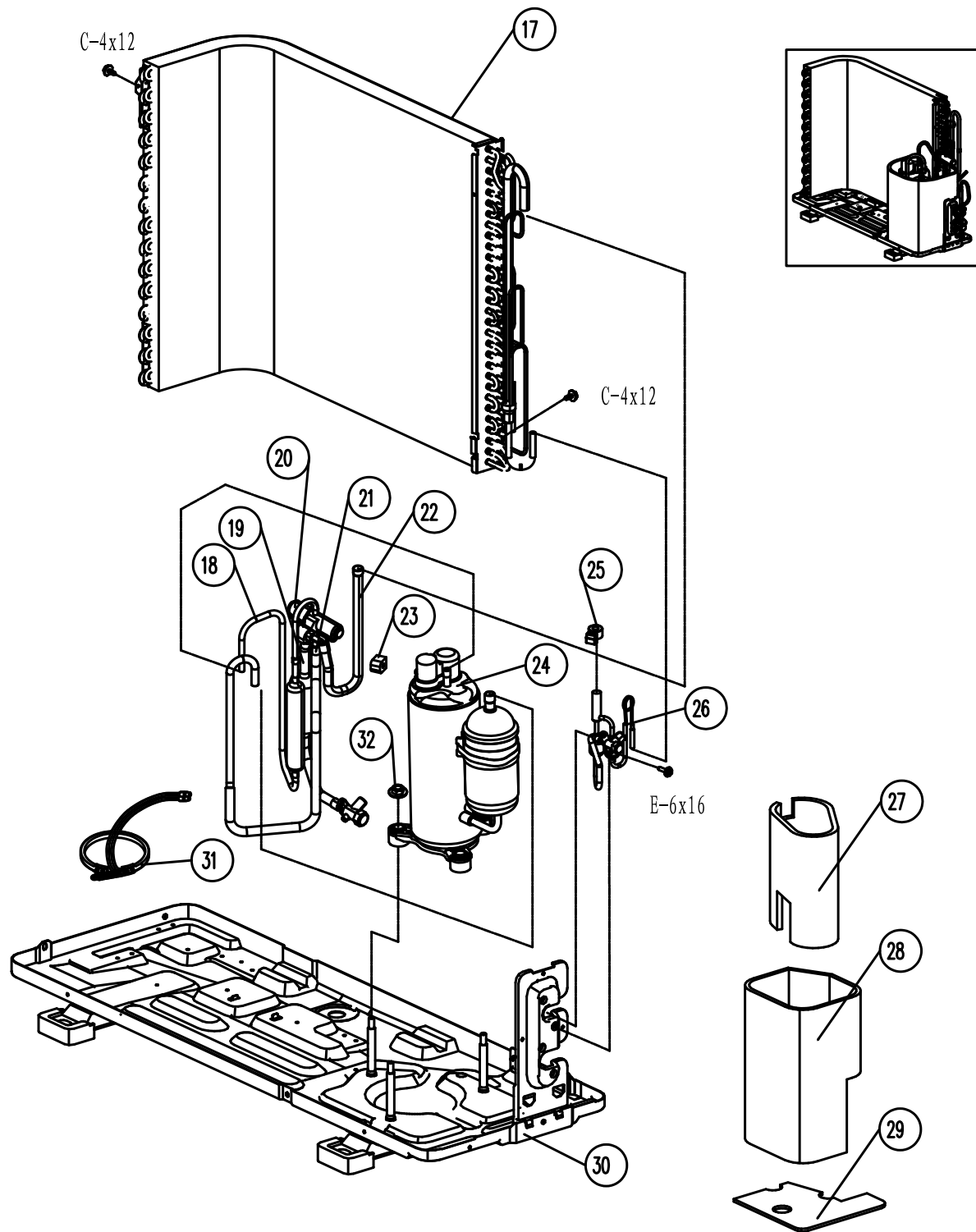


Figure 903B

PARTS CATALOG

18K Outdoor Condensor

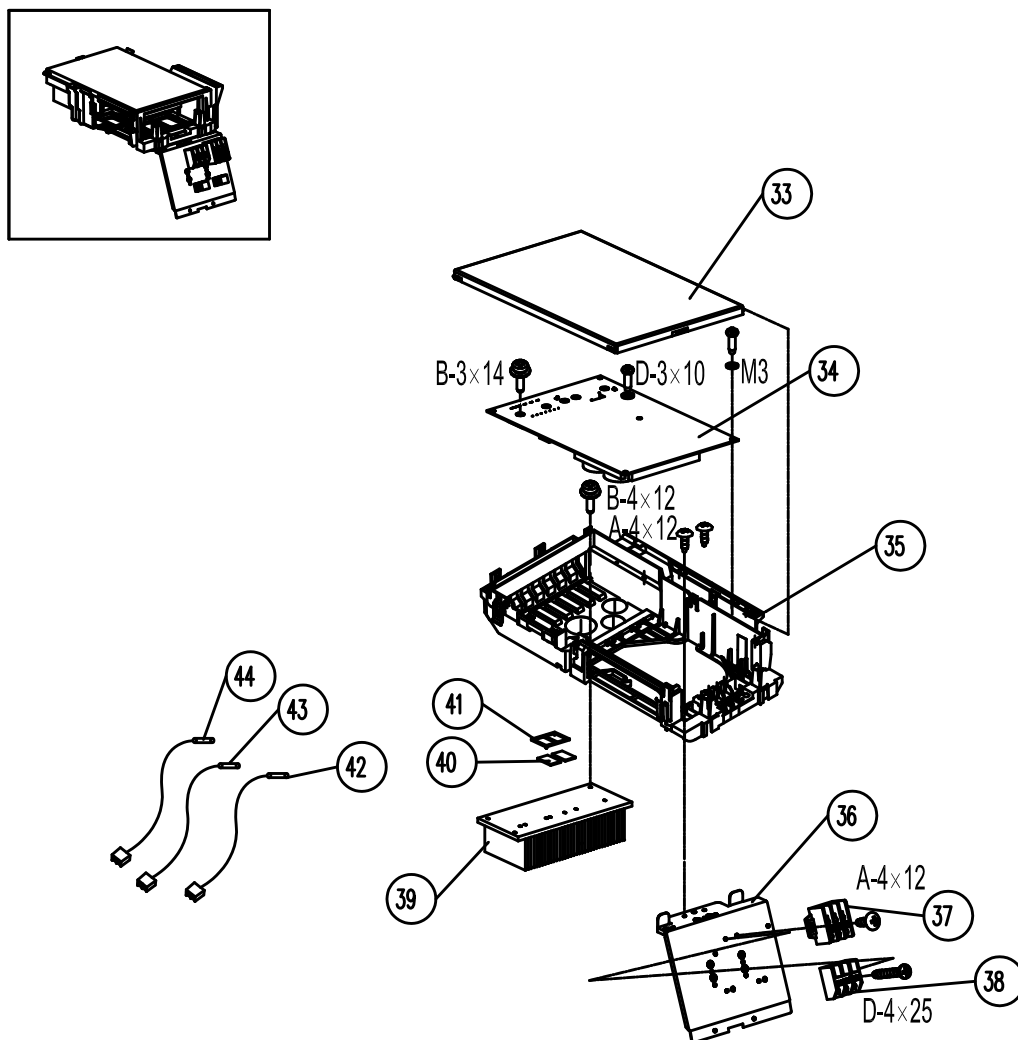


Figure 903C

PARTS CATALOG

18K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67401011	1844024 - Fan Guard	FPHFR18A3A	1
2	67401012	2091948 - Panel	FPHFR18A3A	1
3	67401013	1263647 - Hex Nuts	FPHFR18A3A	1
4	67401014	1559520 - Propeller Fan Blade	FPHFR18A3A	1
5	67401015	1803035 - Axis Sheath	FPHFR18A3A	1
6	67400296	1859837 - DC Motor	FPHFR18A3A	1
7	67401016	1963835 - Motor Supporter	FPHFR18A3A	1
8	67401017	1834430 - Connecting Board	FPHFR18A3A	1
9	67401147	1972357 - Upper Board	FPHFR18A3A	1
10	67401019	1929744 - Back Guard	FPHFR18A3A	1
11	67401148	1972622 - Clapboard	FPHFR18A3A	1
12	67400268	1302261 - PFC Inductance	FPHFR18A3A	1
13	67401149	1971724 - Right Side Board	FPHFR18A3A	1
14	67401120	1863156 - Wiring Distribution Cover	FPHFR18A3A	1
15	67401121	1825563 - Valve Cover	FPHFR18A3A	1
16	67400211	1546721 - Sensor Mounting Plate	FPHFR18A3A	1
17	67401150	1993892 - Condenser	FPHFR18A3A	1
17.5	67401165	2089087 - 4-way valve assembly ITEMS 18-22	FPHFR18A3A	1
18	67401151	2089009 - D tube assembly	FPHFR18A3A	1
19	67401152	2089005 - valve assembly	FPHFR18A3A	1
20	67400457	1258444 - 4-way valve	FPHFR18A3A	1
21	67401153	2089022 - S tube assembly	FPHFR18A3A	1
22	67401154	1995553 - C tube	FPHFR18A3A	1
23	67400193	1511783 - Four-way Valve Coil	FPHFR18A3A	1
24	67401166	1834267 - Inverter Compressor	FPHFR18A3A	1
25	67400396	1848625 - Electronic Expansion Valve Coil	FPHFR18A3A	1
26	67401155	2089001 - Electronic Expansion Valve	FPHFR18A3A	1
27	67401156	1566329 - Noise-insulation Cotton	FPHFR18A3A	1
28	67401157	1556828 - Noise-insulation Cotton	FPHFR18A3A	1
29	67401158	1556825 - Noise-insulation Cotton	FPHFR18A3A	1
30	67401159	2087547 - Base Holder	FPHFR18A3A	1
31	67401160	1876827 - Electric Heating Belt	FPHFR18A3A	1
32	67401135	1226723 - Hex Nuts	FPHFR18A3A	1
33	67401161	1987100 - Electric Box Cover	FPHFR18A3A	1
34	67401162	2086379 - Outdoor Main Control Board Component	FPHFR18A3A	1

Figure 903

PARTS CATALOG

18K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
35	67401163	1987098 - Electric Box	FPHFR18A3A	1
36	67401017	1834430 - Connecting Board	FPHFR18A3A	1
37	67401047	2078758 - Power Terminal Panel	FPHFR18A3A	1
38	67400365	1993154 - Connection Terminal Panel	FPHFR18A3A	1
39	67401164	1964513 - Radiator	FPHFR18A3A	1
40	67401042	1440764 - Insulative Spacer Block	FPHFR18A3A	1
41	67401041	1487330 - Mounting Plate	FPHFR18A3A	1
42	67400208	1822633 - Coil Temperature Sensor	FPHFR18A3A	1
43	67401142	1837502 - Discharge Temperature Sensor	FPHFR18A3A	1
44	67400210	1831029 - Outdoor Temperature Sensor	FPHFR18A3A	1
--ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 903

PARTS CATALOG

24K Outdoor Condensor

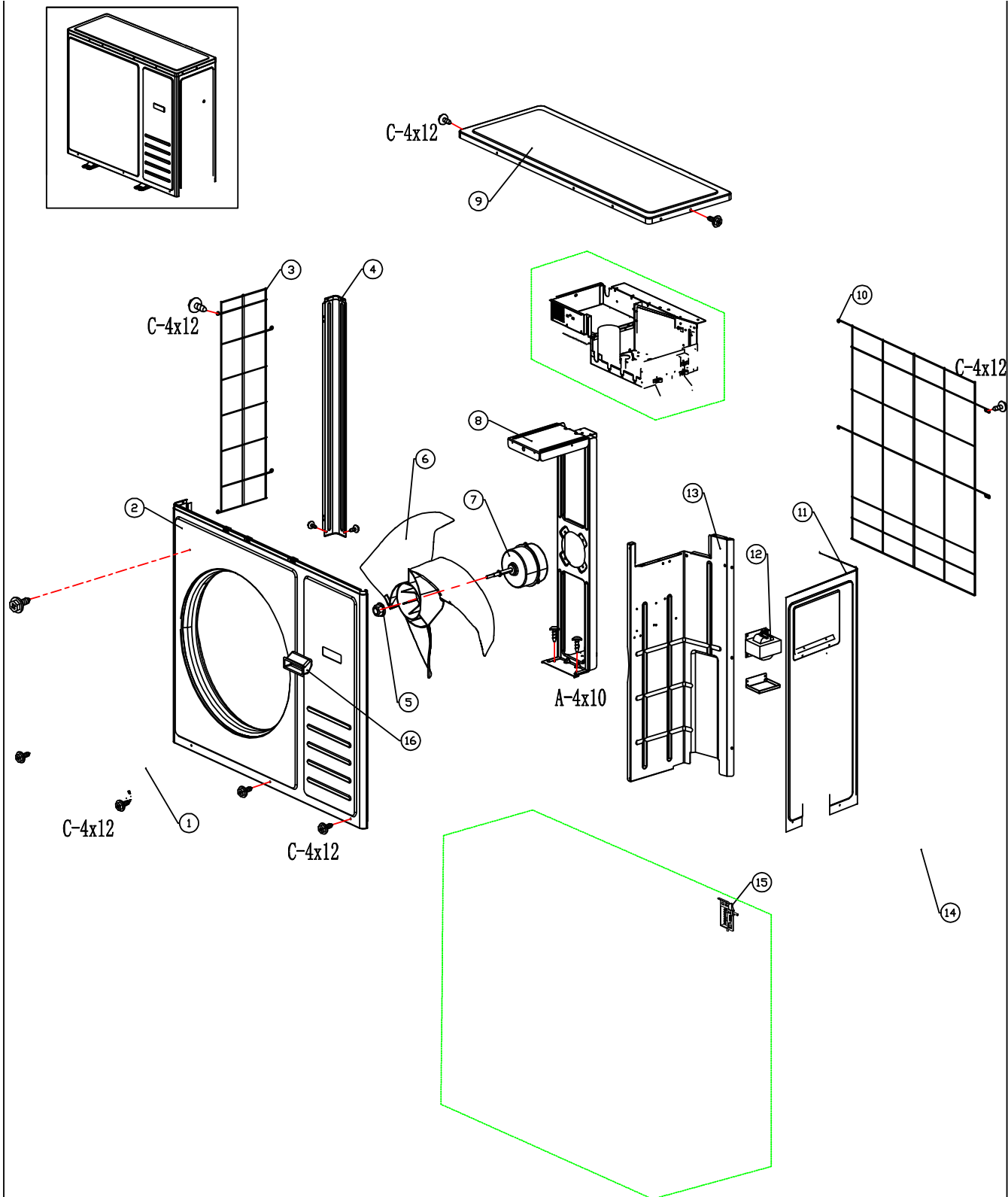
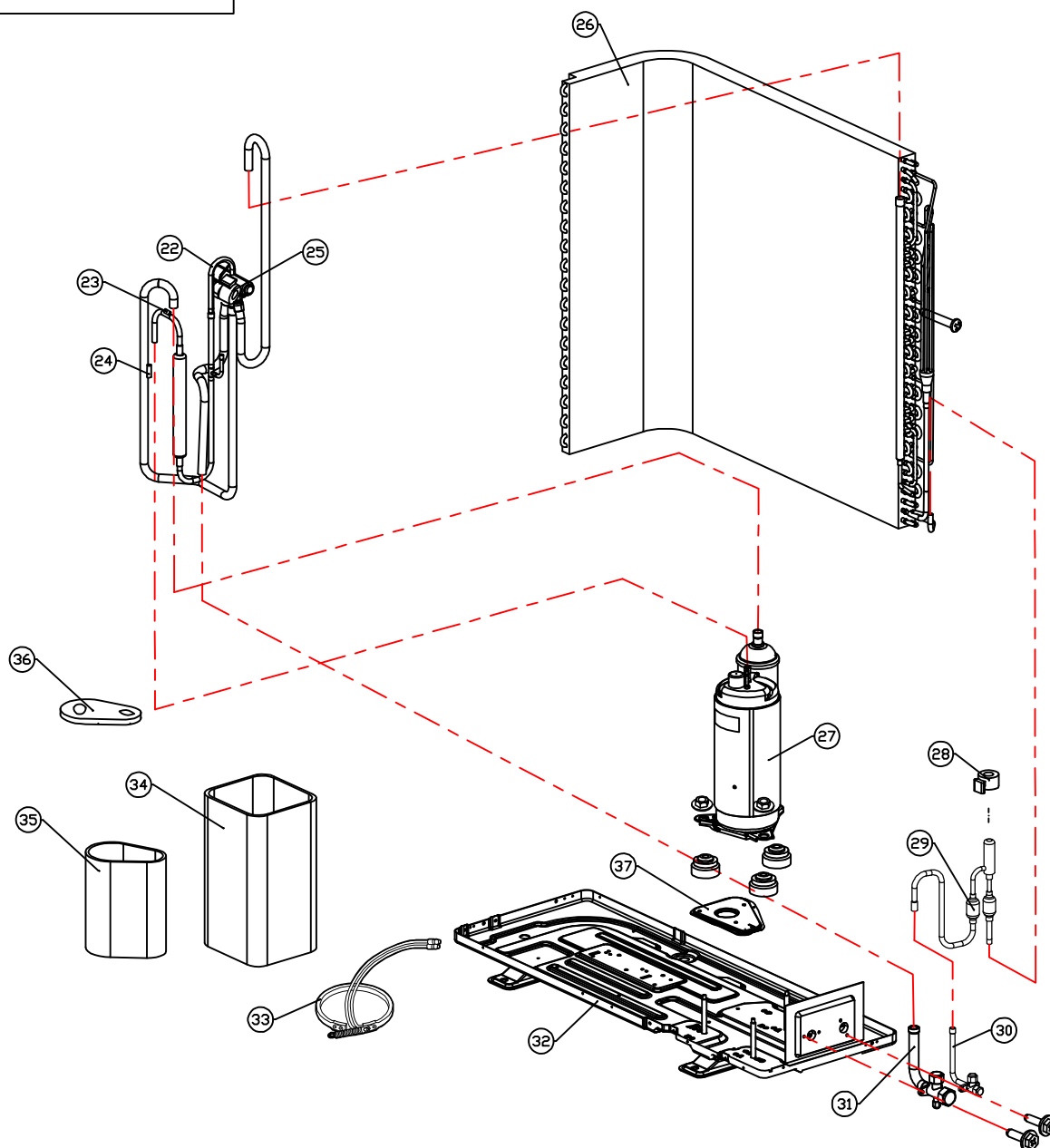
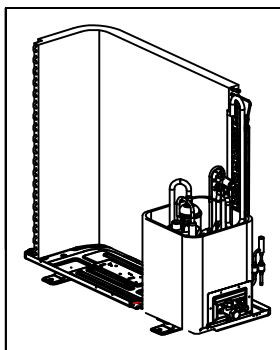


Figure 904A

PARTS CATALOG

24K Outdoor Condensor



E6x16

Figure 904B

PARTS CATALOG

24K Outdoor Condensor

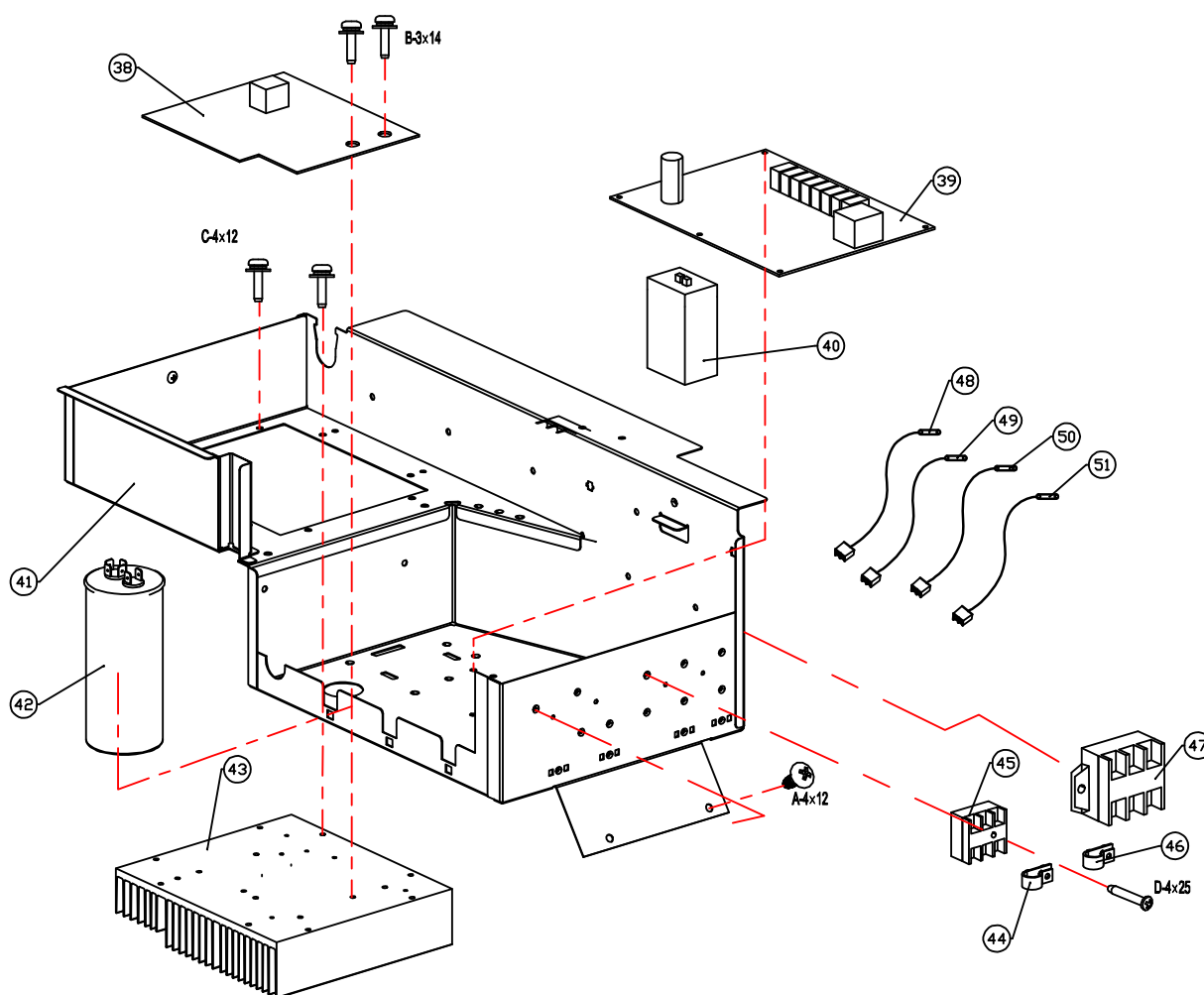
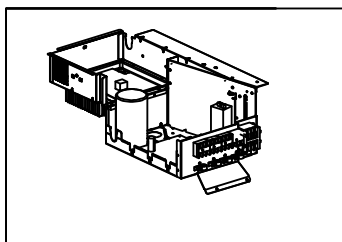


Figure 904C

PARTS CATALOG

24K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400388	2010128 - Fan Guard	FPHFR24A3A	1
2	67400336	1382485 - front panel	FPHFR24A3A	1
3	67400337	1469450 - Left guard filter	FPHFR24A3A	1
4	67400998	1382782 - mounting plate	FPHFR24A3A	1
5	67400999	1231108 - Welding hex nuts	FPHFR24A3A	1
6	67400340	1899961 - propeller fan	FPHFR24A3A	1
7	67400341	1421124 - FAN MOTOR	FPHFR24A3A	1
8	67401091	1880176 - motor supporter assy	FPHFR24A3A	1
9	67400343	1908421 - upper cover	FPHFR24A3A	1
10	67400344	1469447 - back guard filter	FPHFR24A3A	1
11	67401092	1493224 - side panel parts	FPHFR24A3A	1
12	67400268	1302261 - PFC inductance	FPHFR24A3A	1
13	67401093	1536443 - separate plate assy	FPHFR24A3A	1
14	67401051	1472878 - valve cover	FPHFR24A3A	1
15	67400211	1546721 - sensor mounting plate	FPHFR24A3A	1
16	67401007	1202703 - Handle	FPHFR24A3A	1
17	67400921	2012524 - baffle	FPHFR24A3A	1
17.5	67401109	2009069 - 4-way valve assembly ITEMS 18-22	FPHFR24A3A	1
18	67400922	1993788 - fixed board	FPHFR24A3A	1
19	67400351	1993517 - Tube electric heater	FPHFR24A3A	1
20	67401094	2023540 - Terminal Board	FPHFR24A3A	1
21	67401095	2017892 - Handle	FPHFR24A3A	1
22	67401096	1225658 - Four-way Valve	FPHFR24A3A	1
23	67401097	2019842 - D tube assembly	FPHFR24A3A	1
24	67401098	2019886 - S tube assembly	FPHFR24A3A	1
25	67401064	1302932 - Four-way Valve Coil	FPHFR24A3A	1
26	67401099	1933256 - condenser ASS'Y	FPHFR24A3A	1
27	67400363	1993782 - compressor	FPHFR24A3A	1
28	67401100	1385852 - Electronic Expansion Valve Coil	FPHFR24A3A	1
29	67401101	1458701 - Electronic Expansion Valve	FPHFR24A3A	1
30	67401102	1469359 - 1/4 stop valveASS'Y	FPHFR24A3A	1
31	67401103	1469377 - 5/8 stop valveASS'Y	FPHFR24A3A	1
32	67401058	2003631 - Base Holder Part	FPHFR24A3A	1
33	67400366	1391303 - Crankcase Heater	FPHFR24A3A	1
34	67400401	2025749 - Noise-Insulation Cotton	FPHFR24A3A	1
35	67400399	2025799 - Noise-Insulation Cotton	FPHFR24A3A	1

Figure 904

PARTS CATALOG

24K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
36	67401104	2025750 - noise-insulation cotton	FPHFR24A3A	1
37	67400945	2008554 - Mounting Plate	FPHFR24A3A	1
38	67401105	2004833 - Drive plate assembly	FPHFR24A3A	1
39	67401106	2009368 - Control Board	FPHFR24A3A	1
40	67401107	1944799 - Power Filter	FPHFR24A3A	1
41	67400934	2013786 - elec joint box assy	FPHFR24A3A	1
42	67400373	1469172 - Aluminum electrolytic capacitor	FPHFR24A3A	1
43	67400374	1933518 - radiator	FPHFR24A3A	1
44	#N/A	#N/A	FPHFR24A3A	1
45	67400365	1993154 - Wire Terminal Board	FPHFR24A3A	1
46	#N/A	#N/A	FPHFR24A3A	1
47	67400364	1993161 - Wire Terminal Board	FPHFR24A3A	1
48	67401071	1395042 - Compressor Discharge Temperature Sensor (White)	FPHFR24A3A	1
49	67401072	1421856 - Suction Line Temperature Sensor (Black)	FPHFR24A3A	1
50	67401108	1457946 - Coil Pipe Temperature Sensor (White)	FPHFR24A3A	1
51	67401074	1902722 - Ambient Temperature Sensor (Yellow)	FPHFR24A3A	1
--ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 904

PARTS CATALOG

36K Outdoor Condensor

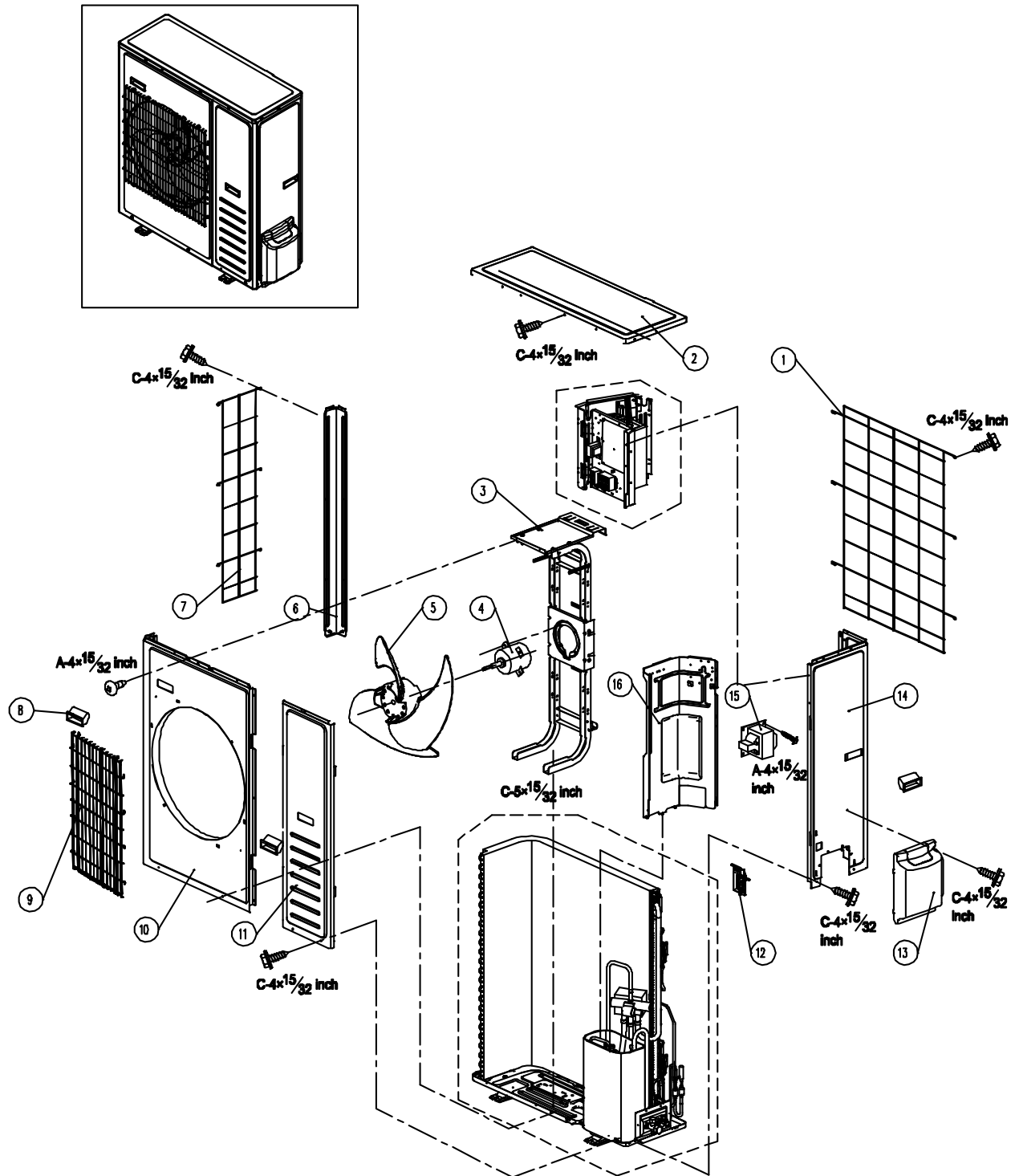


Figure 905A

PARTS CATALOG

36K Outdoor Condensor

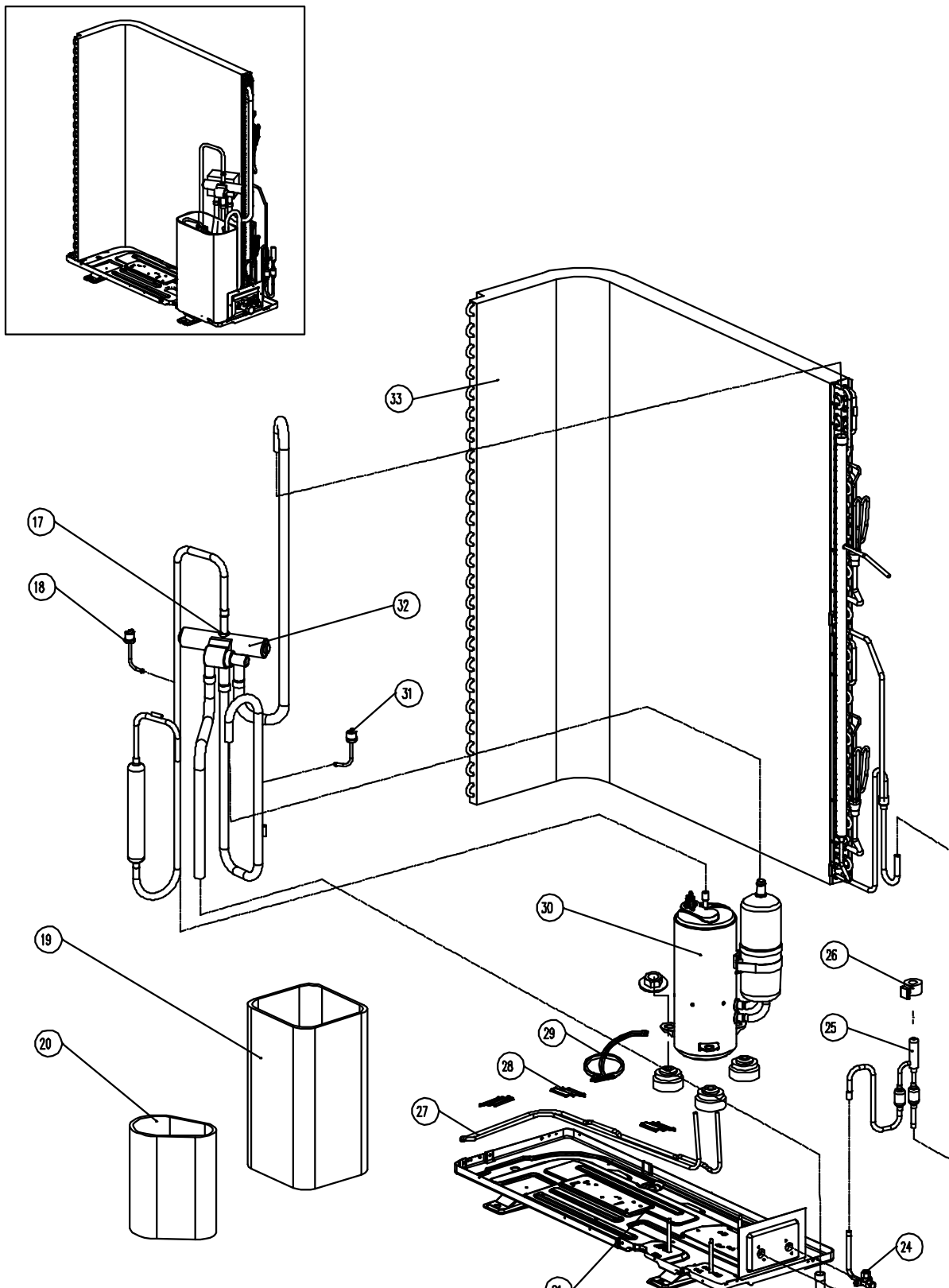


Figure 905B

PARTS CATALOG

36K Outdoor Condensor

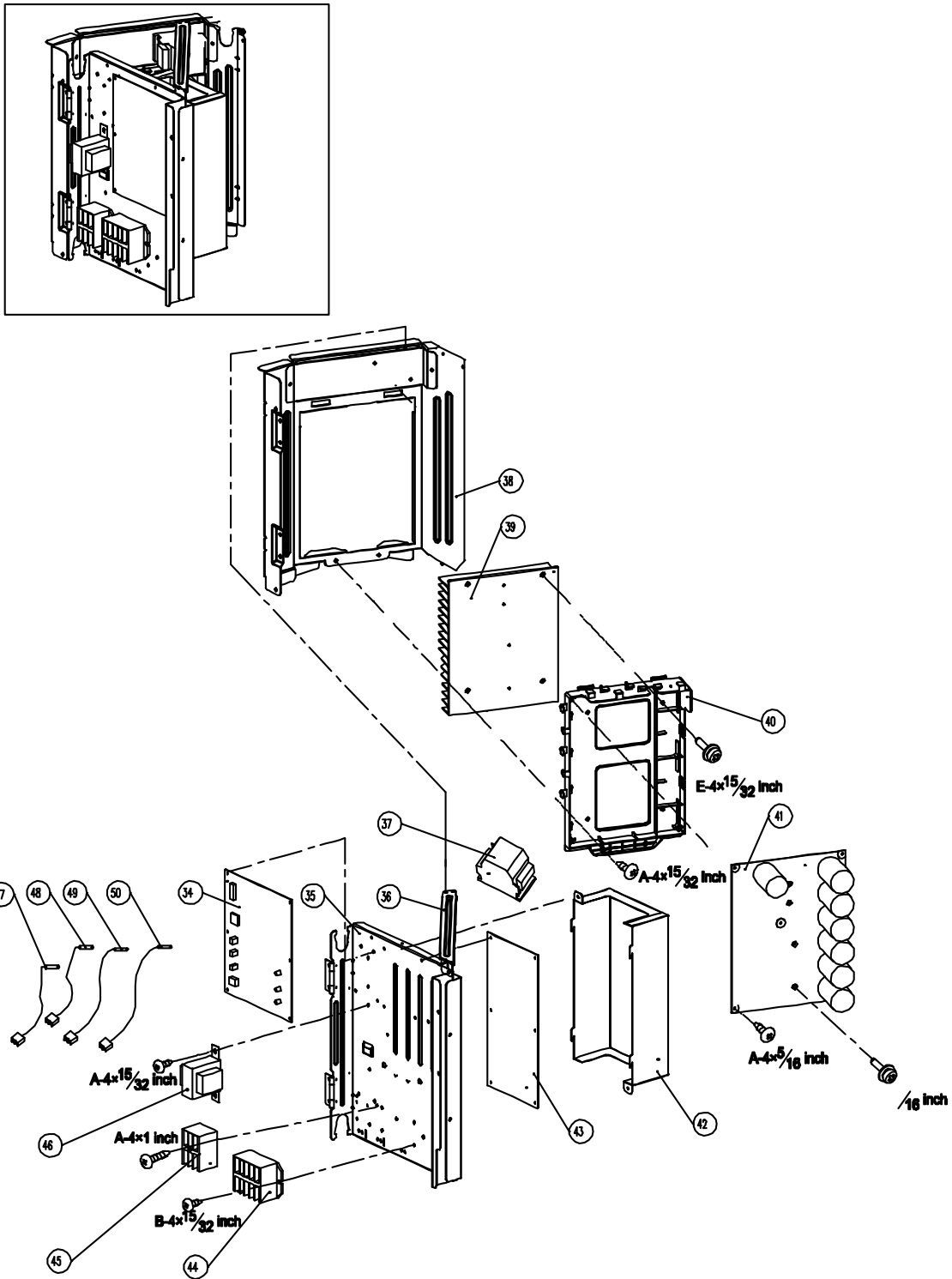


Figure 905C

PARTS CATALOG

36K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400380	1556829 - Guard Filter	FPHFR36A3A	1
2	67400381	1400459 - Upper Board	FPHFR36A3A	1
3	67401049	1893556 - Motor Supporter	FPHFR36A3A	1
4	67400383	1498534 - DC Motor	FPHFR36A3A	1
5	67400384	1947347 - Propeller Fan Blade	FPHFR36A3A	1
6	67400386	1424902 - Mounting Plate	FPHFR36A3A	1
7	67400387	1482994 - Left Guard	FPHFR36A3A	1
8	67401007	1202703 - Handle	FPHFR36A3A	1
9	67400388	2010128 - Fan Guard	FPHFR36A3A	1
10	67400389	1424895 - Panel	FPHFR36A3A	1
11	67401050	1424898 - Panel	FPHFR36A3A	1
12	67400211	1546721 - sensor mounting plate	FPHFR36A3A	1
13	67401051	1472878 - Valve Cover	FPHFR36A3A	1
14	67401052	2021033 - Side Board	FPHFR36A3A	1
15	67400349	1400760 - PFC inductance	FPHFR36A3A	1
16	67401053	1499431 - clapboard part	FPHFR36A3A	1
17	67401054	1926184 - Four-way Valve	FPHFR36A3A	1
18	67401055	1820200 - High Pressure Switch	FPHFR36A3A	1
19	67401056	1474093 - Outer Noise-Insulation Cotton	FPHFR36A3A	1
20	67401057	1480149 - Inner Noise-Insulation Cotton	FPHFR36A3A	1
21	67401058	2003631 - Base Holder Part	FPHFR36A3A	1
22	67400945	2008554 - Mounting Plate	FPHFR36A3A	1
23	67401059	1839787 - Low Side Service Valve	FPHFR36A3A	1
24	67401060	1335465 - High Side Service Valve	FPHFR36A3A	1
25	67401061	1463769 - Electronic Expansion Valve	FPHFR36A3A	1
26	67401062	1465154 - Electromagnetic Expansion Valve Coil	FPHFR36A3A	1
27	67400402	2000085 - Tube type electric heater	FPHFR36A3A	1
28	67400922	1993788 - fixed board	FPHFR36A3A	1
29	67400366	1391303 - Crankcase Heater	FPHFR36A3A	1
30	67400740	1926428 - Inverter compressor	FPHFR36A3A	1
31	67401063	1821777 - Low Pressure Switch	FPHFR36A3A	1
32	67401064	1302932 - Four-way Valve Coil	FPHFR36A3A	1
33	67401065	1926166 - Condenser	FPHFR36A3A	1
34	67401066	2008654 - Outdoor Main Control Board Component	FPHFR36A3A	1

Figure 905

PARTS CATALOG

36K Outdoor Condensor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
35	67401067	1464292 - Mounting Plate Essy	FPHFR36A3A	1
36	#N/A	#N/A	FPHFR36A3A	1
37	67400405	1343638 - AC Contactor	FPHFR36A3A	1
38	67401010	1464281 - Compressor Mounting Plate Parts	FPHFR36A3A	1
39	67400406	1916769 - Radiator	FPHFR36A3A	1
40	67400951	1519508 - Driver Board Heatsink	FPHFR36A3A	1
41	67401068	1917312 - Drive plate assembly	FPHFR36A3A	1
42	#N/A	#N/A	FPHFR36A3A	1
43	67401069	2020306 - Filter board	FPHFR36A3A	1
44	67400364	1993161 - Wire Terminal Board	FPHFR36A3A	1
45	67400365	1993154 - Wire Terminal Board	FPHFR36A3A	1
46	67401070	1483085 - Linear Transformer	FPHFR36A3A	1
47	67401071	1395042 - Temperature Sensor Compressor Discharge (White)	FPHFR36A3A	1
48	67401072	1421856 - Suction Line Temperature Sensor (Black)	FPHFR36A3A	1
49	67401073	1464346 - Coil Pipe Temperature Sensor (White)	FPHFR36A3A	1
50	67401074	1902722 - Ambient Temperature Sensor (Yellow)	FPHFR36A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 905

PARTS CATALOG

9K, 12K Indoor Cassette

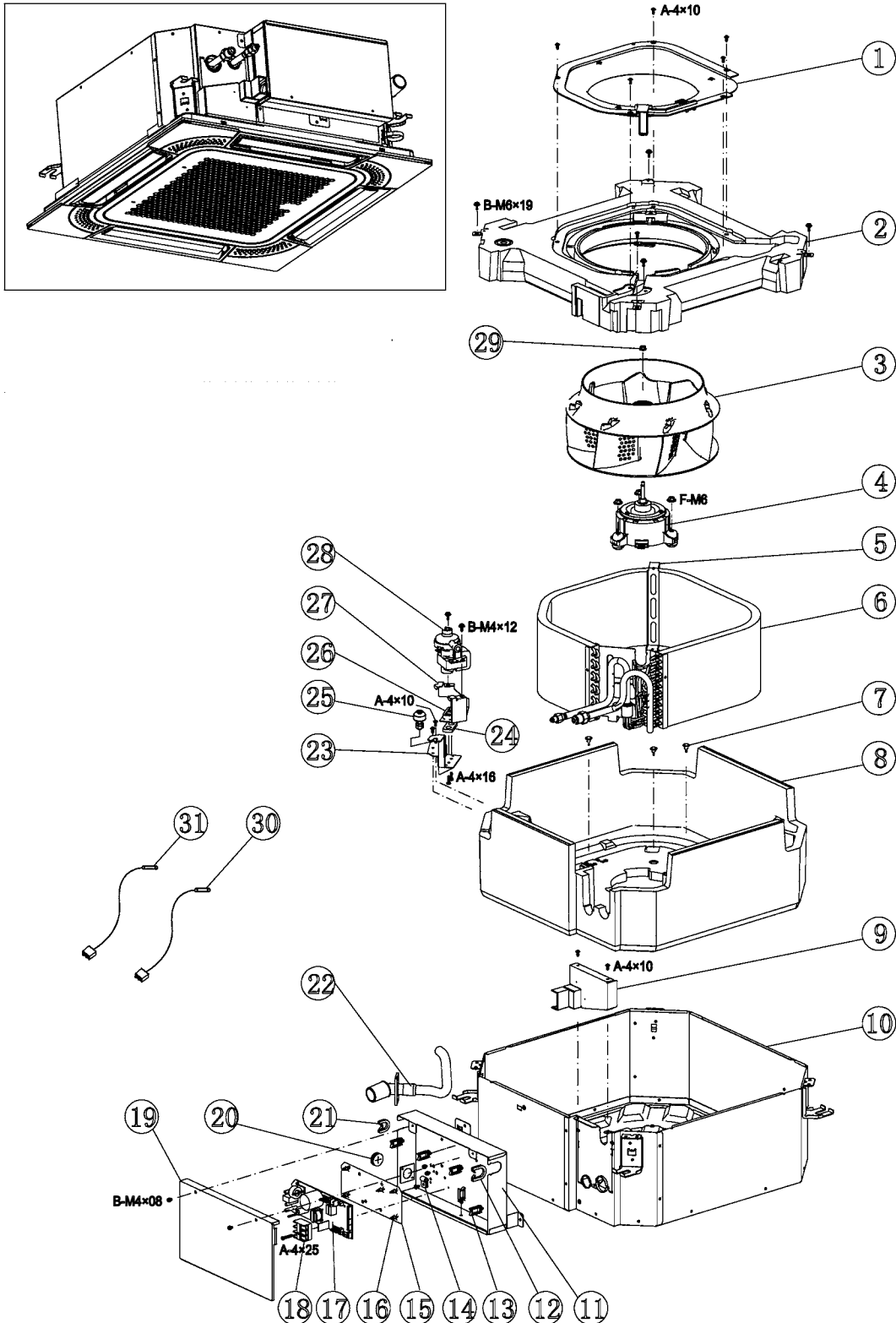


Figure 906

PARTS CATALOG

9K, 12K Indoor Cassette

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400976	Air guiding plate	FPHC09A3A, FPHC12A3A	1
2	67400977	Water drain tube	FPHC09A3A, FPHC12A3A	1
3	67400425	Centrifugal fan blade	FPHC09A3A, FPHC12A3A	1
4	67400426	DC motor	FPHC09A3A, FPHC12A3A	1
5	67400843	Fixed board	FPHC09A3A, FPHC12A3A	1
6	67400422	Evaporator assembly	FPHC09A3A	1
6A	67400427	Evaporator assembly	FPHC12A3A	1
7	67400844	Screws	FPHC09A3A, FPHC12A3A	1
8	67400845	Fan volute assembly	FPHC09A3A, FPHC12A3A	1
9	67400828	fixed board	FPHC09A3A, FPHC12A3A	1
10	67400847	shell	FPHC09A3A, FPHC12A3A	1
11	67400848	electric box assembly	FPHC09A3A, FPHC12A3A	1
12	67400978	clamp	FPHC09A3A, FPHC12A3A	1
13	67400979	clamp	FPHC09A3A, FPHC12A3A	1
14	67401011	clamp	FPHC09A3A	1
14A	67401012	clamp	FPHC12A3A	1
15	67400428	insulative spacer block	FPHC09A3A, FPHC12A3A	1
16	67400429	supporting leg	FPHC09A3A, FPHC12A3A	1
17	67400423	Indoor PCB	FPHC09A3A	1
17A	67400430	Indoor Main Control Board Component	FPHC12A3A	1
18	67400365	Wire terminal board	FPHC09A3A, FPHC12A3A	1
19	67400424	electric box cover	FPHC09A3A, FPHC12A3A	1
20	67400833	rubber ring	FPHC09A3A, FPHC12A3A	1
21	67400980	Over clamp	FPHC09A3A, FPHC12A3A	1
22	67400853	Water pipe	FPHC09A3A, FPHC12A3A	1
23	67400854	fixed board	FPHC09A3A, FPHC12A3A	1
24	67400981	rubber cushion	FPHC09A3A, FPHC12A3A	1
25	67400447	Water position switch	FPHC09A3A, FPHC12A3A	1
26	67400982	rubber cushion	FPHC09A3A, FPHC12A3A	1
27	67400857	mounting plate	FPHC09A3A, FPHC12A3A	1
28	67400433	Pump motor	FPHC09A3A, FPHC12A3A	1
29	67400983	Hexagon nuts	FPHC09A3A, FPHC12A3A	1
30	67400208	Temperature sensor	FPHC09A3A, FPHC12A3A	1
31	67400435	Temperature sensor	FPHC09A3A, FPHC12A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 906

PARTS CATALOG

18K Indoor Cassette

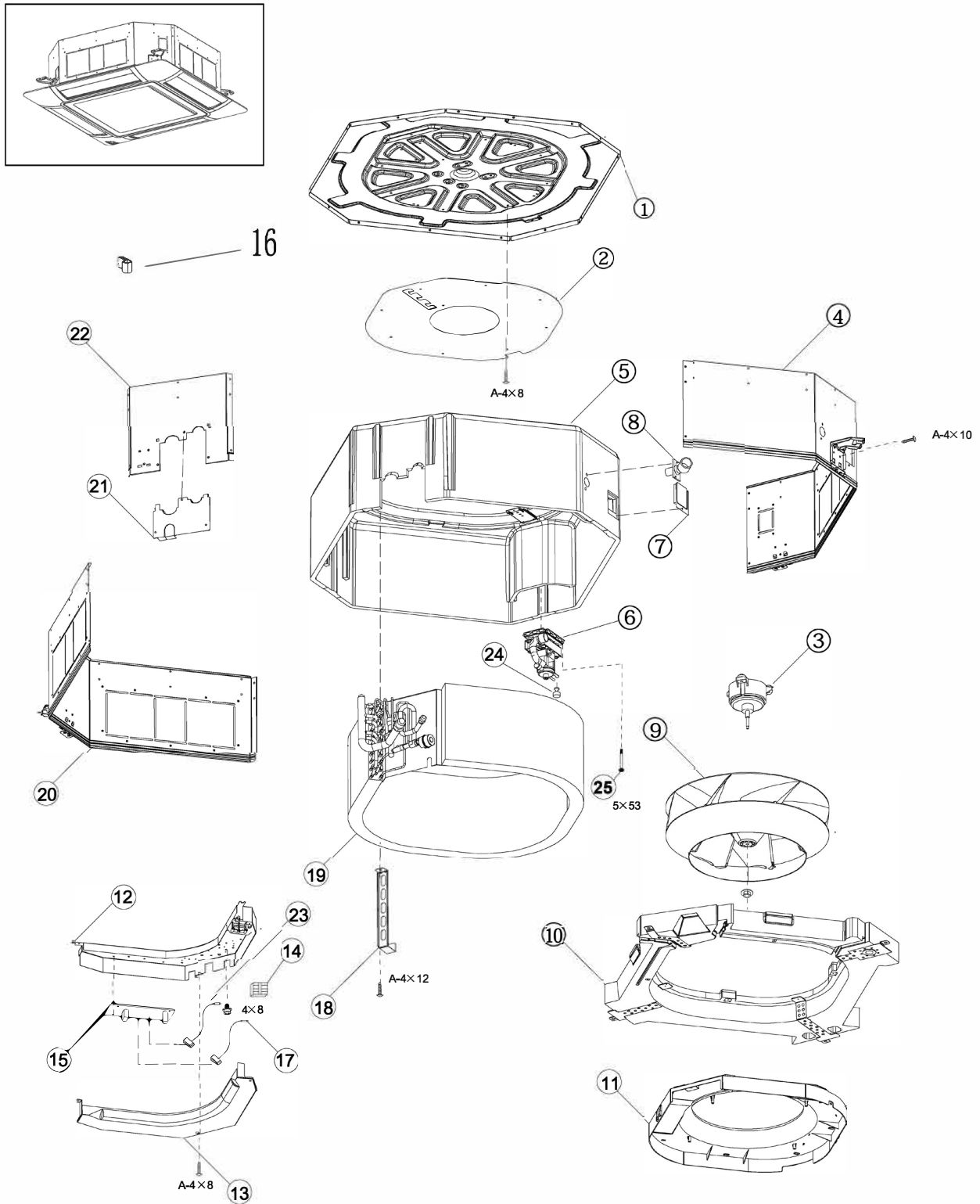


Figure 907

PARTS CATALOG

18K Indoor Cassette

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
FIGURE 905				
1	67400872	Base	FPHC18A3A	1
2	67400984	Air Duct Plate	FPHC18A3A	1
3	67400438	Fan Motor	FPHC18A3A	1
4	67400985	Side Panel	FPHC18A3A	1
5	67400986	Fan Snail Shell	FPHC18A3A	1
6	67400439	Pump Motor	FPHC18A3A	1
7	67400987	Cover	FPHC18A3A	1
8	67400440	Drainage Hose	FPHC18A3A	1
9	67400441	Centrifugal Fan	FPHC18A3A	1
10	67400442	Water Collecting Box	FPHC18A3A	1
11	67400988	Mounting Plate	FPHC18A3A	1
12	67400865	Elec Joint Box	FPHC18A3A	1
13	67400989	Elec Joint Box Cover	FPHC18A3A	1
14	67400365	Terminal Panel	FPHC18A3A	1
15	67400436	Main Control Board	FPHC18A3A	1
16	67400990	Cross Recessed Cheese Head Screws	FPHC18A3A	1
17	67400444	Coil Temperature Sensor	FPHC18A3A	1
18	67400991	Mounting Plate	FPHC18A3A	1
19	67400437	Evaporator	FPHC18A3A	1
20	67400992	Side Panel	FPHC18A3A	1
21	67400993	Connecting Plate	FPHC18A3A	1
22	67400994	Side Panel	FPHC18A3A	1
23	67400446	Ambient Temperature Sensor	FPHC18A3A	1
24	67400447	Water Level Switch	FPHC18A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 907

PARTS CATALOG

24K Indoor Cassette

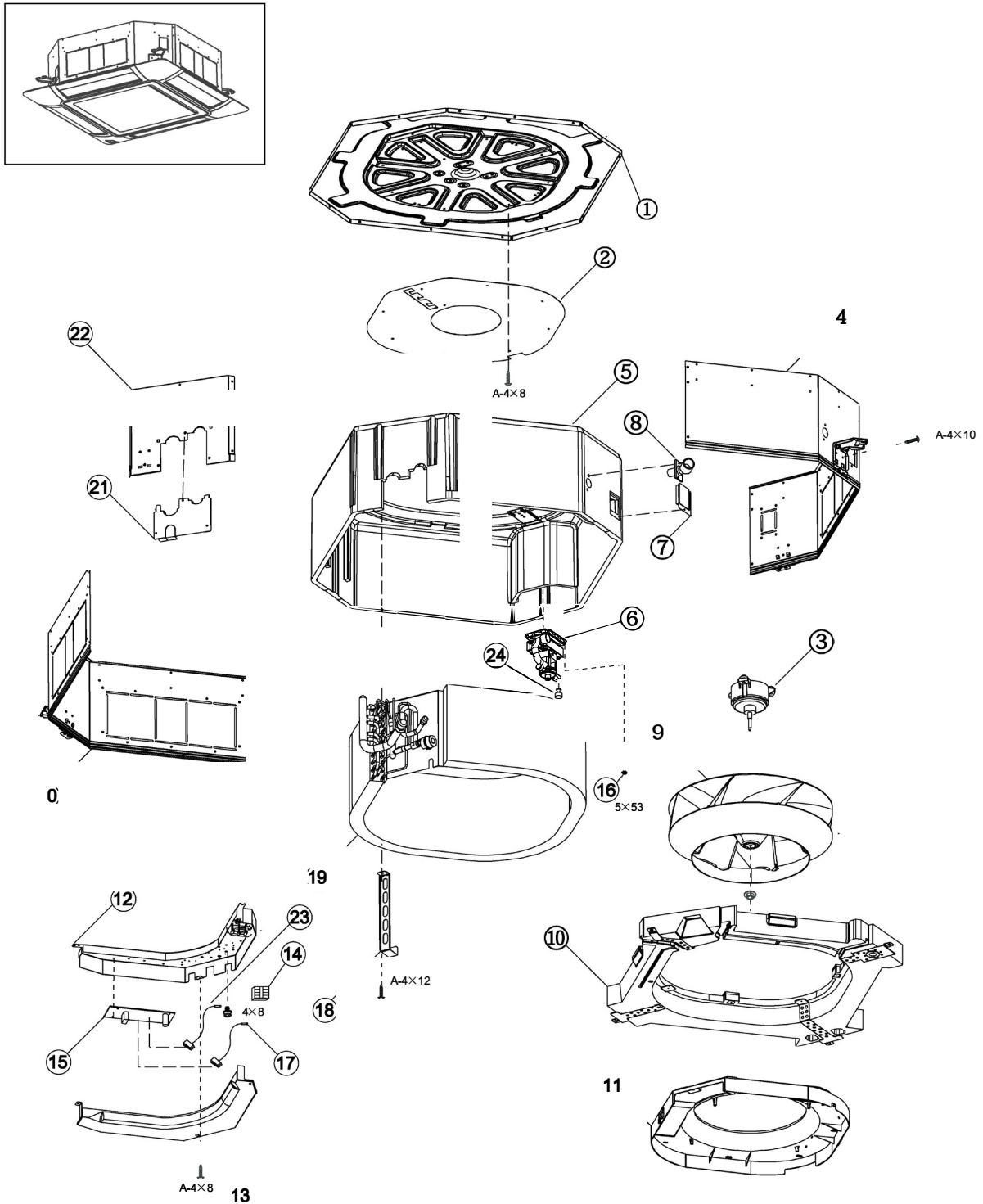


Figure 908

PARTS CATALOG

24K Indoor Cassette

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400872	Base	FPHC24A3A	1
2	67400984	Air Duct Plate	FPHC24A3A	1
3	67400438	Fan Motor	FPHC24A3A	1
4	67400985	Side Panel	FPHC24A3A	1
5	67400986	Fan Snail Shell	FPHC24A3A	1
6	67400439	Pump Motor	FPHC24A3A	1
7	67400987	Cover	FPHC24A3A	1
8	67400440	Drainage Hose	FPHC24A3A	1
9	67400441	Centrifugal Fan	FPHC24A3A	1
10	67400442	Water Collecting Box	FPHC24A3A	1
11	67400988	Mounting Plate	FPHC24A3A	1
12	67400865	Elec Joint Box	FPHC24A3A	1
13	67400989	Elec Joint Box Cover	FPHC24A3A	1
14	67400365	Terminal Panel	FPHC24A3A	1
15	67400443	Main Control Board	FPHC24A3A	1
16	67400990	Cross Recessed Cheese Head Screws	FPHC24A3A	1
17	67400444	Coil Temperature Sensor	FPHC24A3A	1
18	67400991	Mounting Plate	FPHC24A3A	1
19	67400445	Evaporator	FPHC24A3A	1
20	67400992	Side Panel	FPHC24A3A	1
21	67400993	Connecting Plate	FPHC24A3A	1
22	67400994	Side Panel	FPHC24A3A	1
23	67400446	Ambient Temperature Sensor	FPHC24A3A	1
24	67400447	Water Level Switch	FPHC24A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 908

PARTS CATALOG

36K Indoor Cassette

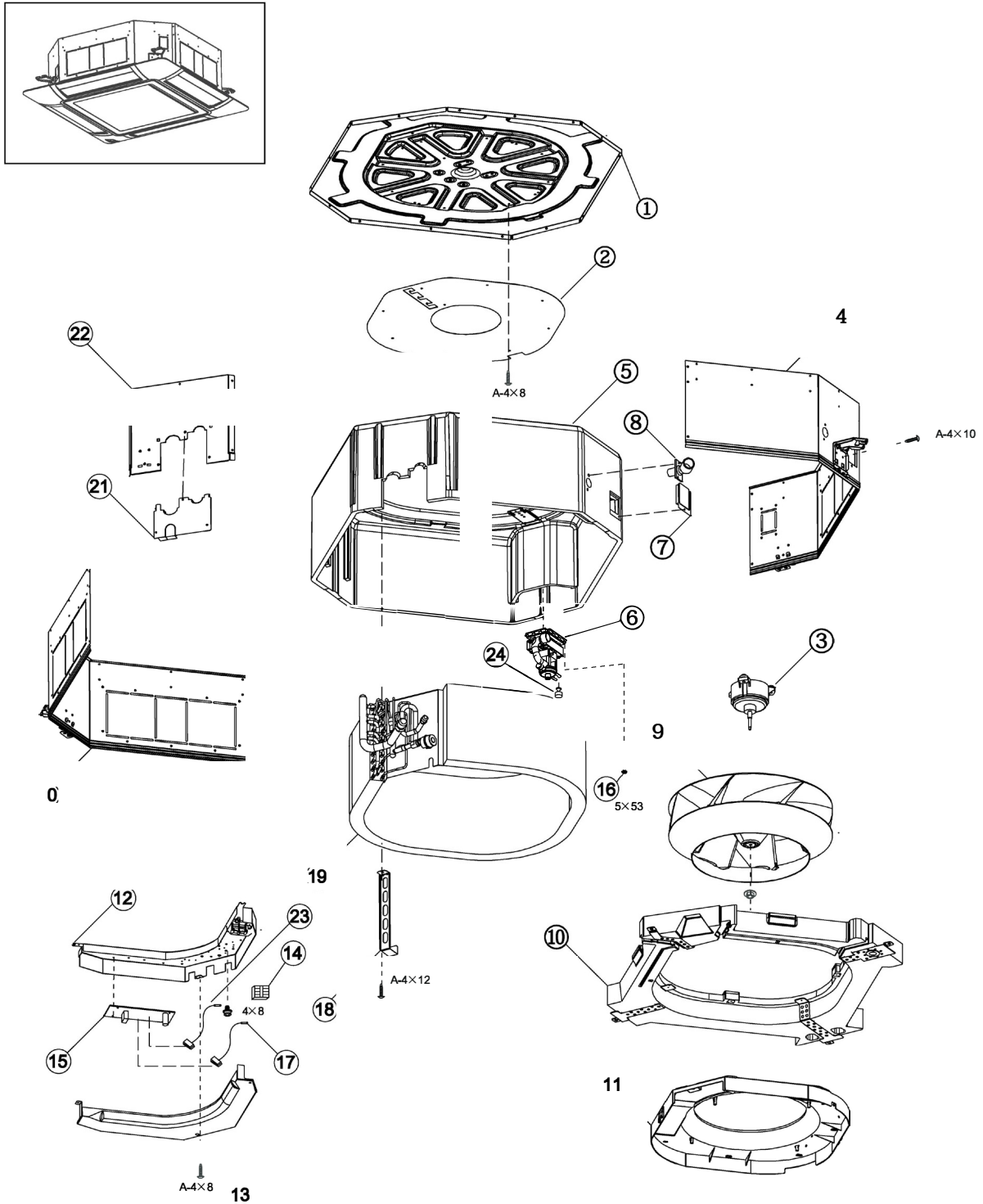


Figure 909

PARTS CATALOG

36K Indoor Cassette

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400872	1913587 - Base	FPHFC36A3A	1
2	67400984	1416128 - Air Duct Plate	FPHFC36A3A	1
3	67401175	1416353 - Fan Motor	FPHFC36A3A	1
4	67401176	1509689 - Side Panel	FPHFC36A3A	1
5	67401177	1510203 - Fan Snail Shell	FPHFC36A3A	1
6	67400439	1514478 - Pump Motor	FPHFC36A3A	1
7	67400987	1515344 - Cover	FPHFC36A3A	1
8	67400440	1515168 - Drainage Hose	FPHFC36A3A	1
9	67400441	1416022 - Centrifugal Fan	FPHFC36A3A	1
10	67401178	1415926 - Water Collecting Box	FPHFC36A3A	1
11	67401179	1416069 - Mounting Plate	FPHFC36A3A	1
12	67400865	2014260 - Elec Joint Box	FPHFC36A3A	1
13	67400989	1415950 - Elec Joint Box Cover	FPHFC36A3A	1
14	67400365	1993154 - Terminal Panel	FPHFC36A3A	1
15	67401180	2108565 - Indoor Main Control Board Component	FPHFC36A3A	1
16	67400990	1462582 - Cross Recessed Cheese Head Screws	FPHFC36A3A	1
17	67400444	1413278 - Coil Temperature Sensor white	FPHFC36A3A	1
18	67401181	1416488 - Mounting Plate	FPHFC36A3A	1
19	67401182	2035334 - Evaporator	FPHFC36A3A	1
20	67401183	1509680 - Side Panel	FPHFC36A3A	1
21	67400993	1515050 - Connecting Plate	FPHFC36A3A	1
22	67401184	1509692 - Side Panel	FPHFC36A3A	1
23	67400446	1428008 - Ambient Temperature Sensor red	FPHFC36A3A	1
24	67400447	1362154 - Water Level Switch	FPHFC36A3A	1
-25	67401169	2081569 - Communication converter board assembly WIFI Module	FPHFC36A3A	1
-26	67401168	4115759 - Remote Controller	FPHFC36A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 909

PARTS CATALOG

9K, 12K, Ducted Indoor

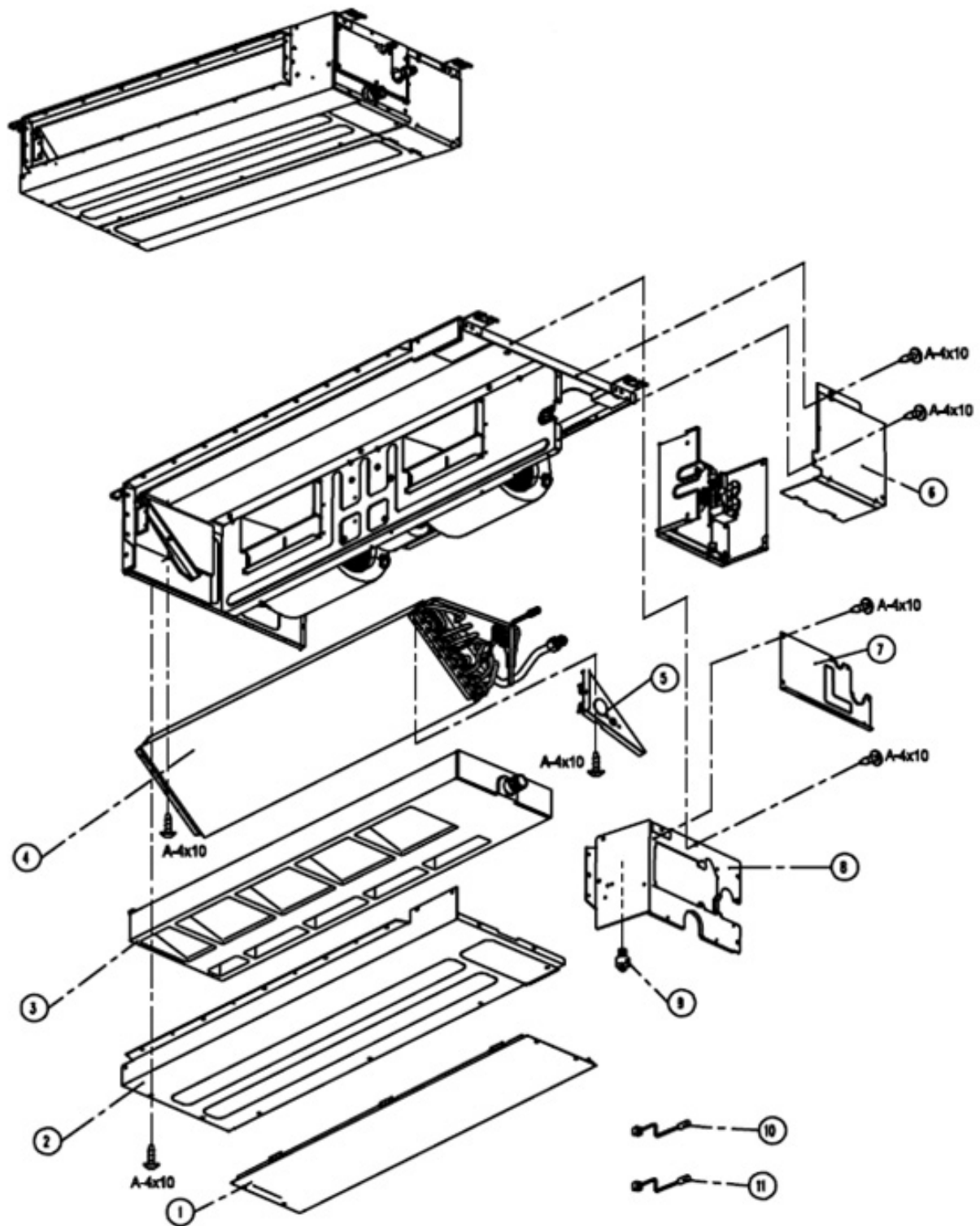


Figure 910A

PARTS CATALOG

9K, 12K, Ducted Indoor

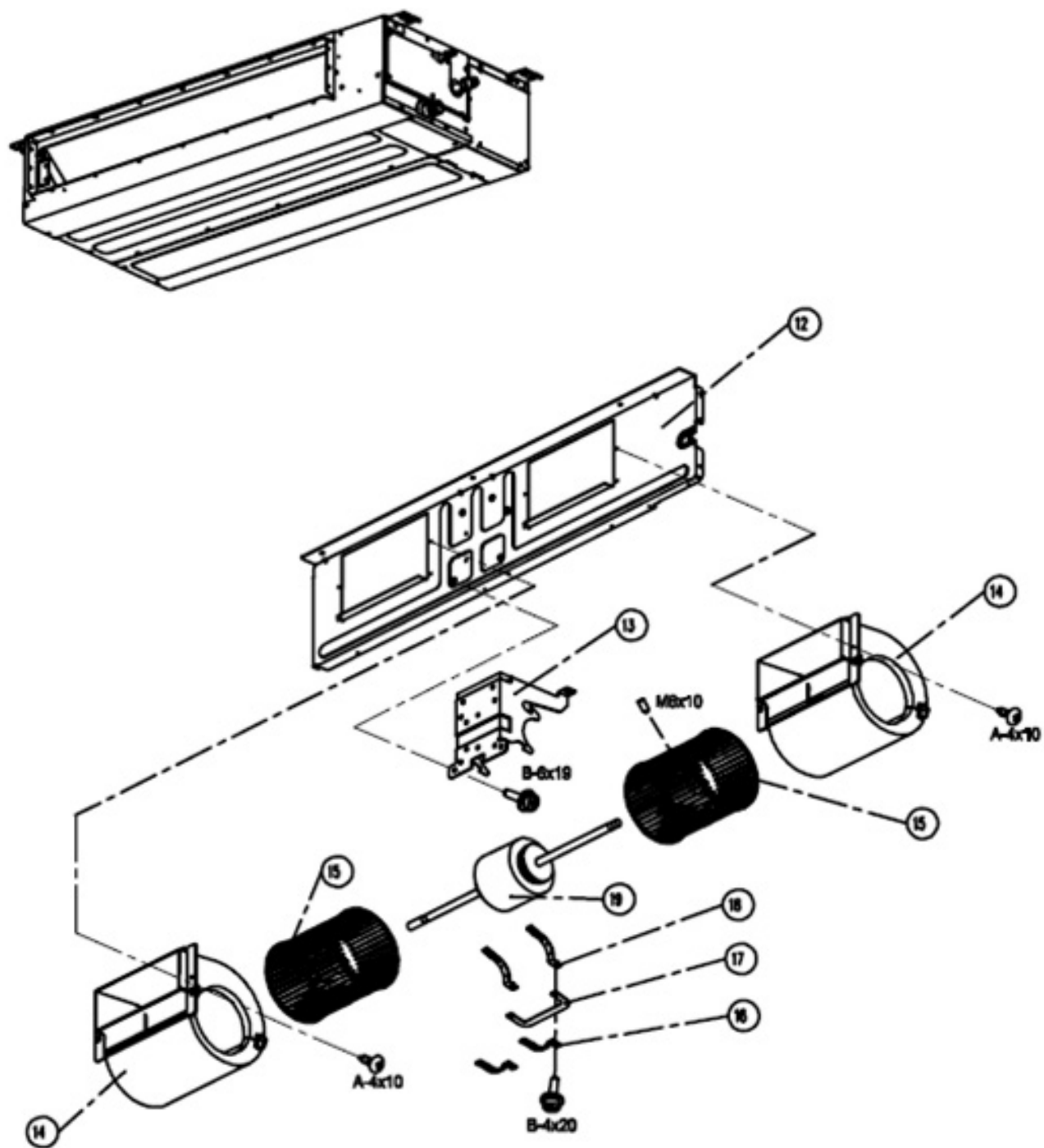


Figure 910B

PARTS CATALOG

9K, 12K, Ducted Indoor

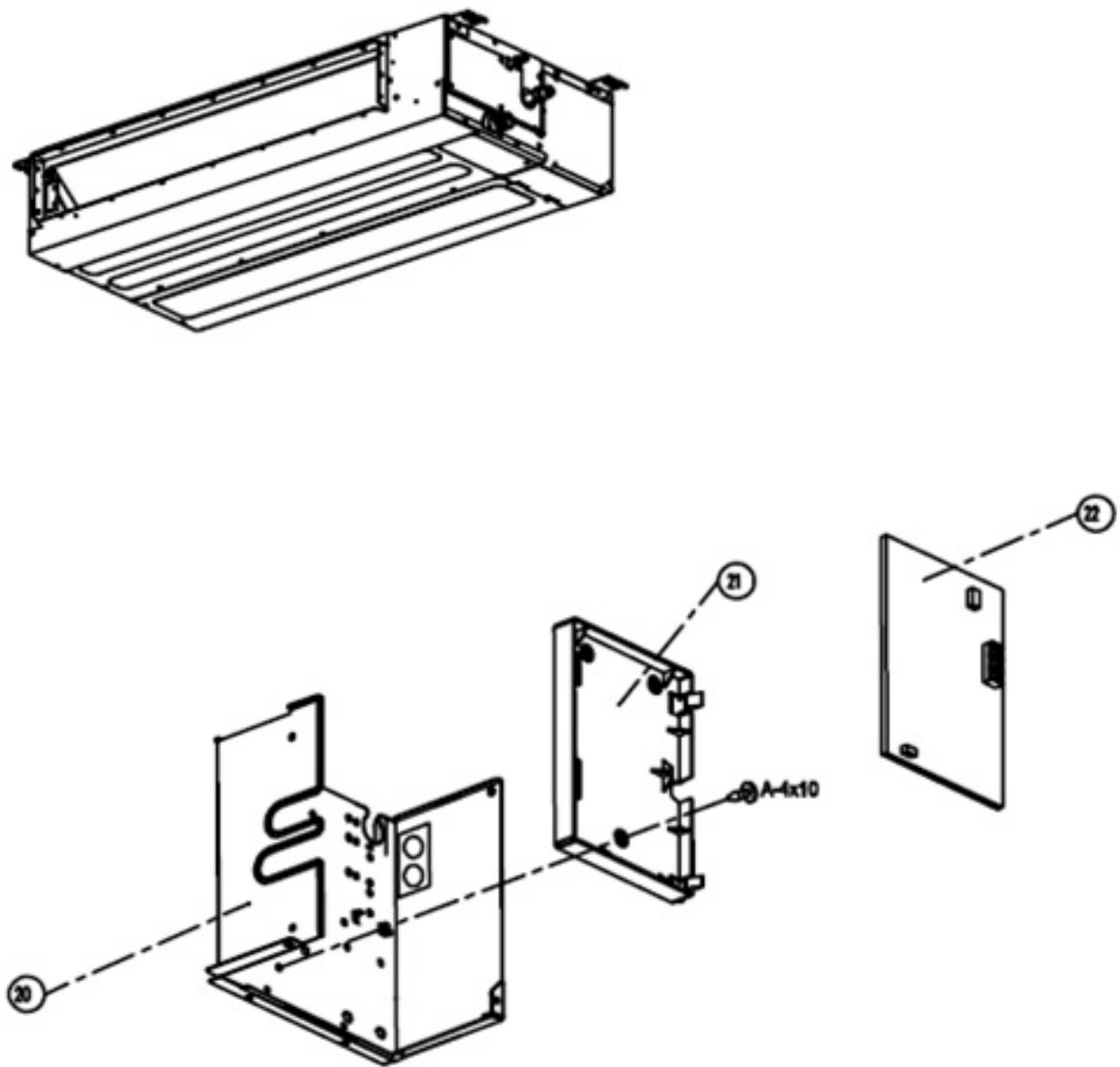


Figure 910C

PARTS CATALOG

9K, 12K Ducted Indoor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400885	Base Plate	FPHD09A3A, FPHD12A3A	1
2	67400886	Bottom Plate	FPHD09A3A, FPHD12A3A	1
3	67400887	Water Drain	FPHD09A3A, FPHD12A3A	1
4	67400409	Evaporator	FPHD09A3A, FPHD12A3A	1
5	67400902	Supporting	FPHD09A3A, FPHD12A3A	1
6	67400889	Electric Box Cover	FPHD09A3A, FPHD12A3A	1
7	67400904	Seal Plate	FPHD09A3A, FPHD12A3A	1
8	67400891	Rght Side Board	FPHD09A3A, FPHD12A3A	1
9	67400414	Water Position Switch	FPHD09A3A, FPHD12A3A	1
10	67400415	Temperature Sensor	FPHD09A3A, FPHD12A3A	1
11	67400416	Temperature Sensor	FPHD09A3A, FPHD12A3A	1
12	67400892	Fan Board	FPHD09A3A, FPHD12A3A	1
13	67400907	Motor Supporter	FPHD09A3A, FPHD12A3A	1
14	67400894	Fan Snail Shell	FPHD09A3A, FPHD12A3A	1
15	67400417	Fan	FPHD09A3A, FPHD12A3A	1
16	67400911	Hooking	FPHD09A3A, FPHD12A3A	1
17	67400896	Connecting Rod	FPHD09A3A, FPHD12A3A	1
18	67400897	Hooking	FPHD09A3A, FPHD12A3A	1
19	67400411	DC Motor	FPHD09A3A, FPHD12A3A	1
20	67400915	Elec Joint Box	FPHD09A3A, FPHD12A3A	1
21	67400420	Electric Box	FPHD09A3A, FPHD12A3A	1
22	67400995	PCB	FPHD09A3A	1
22a	67400421	PCB	FPHD12A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 910

PARTS CATALOG

18K Ducted Indoor

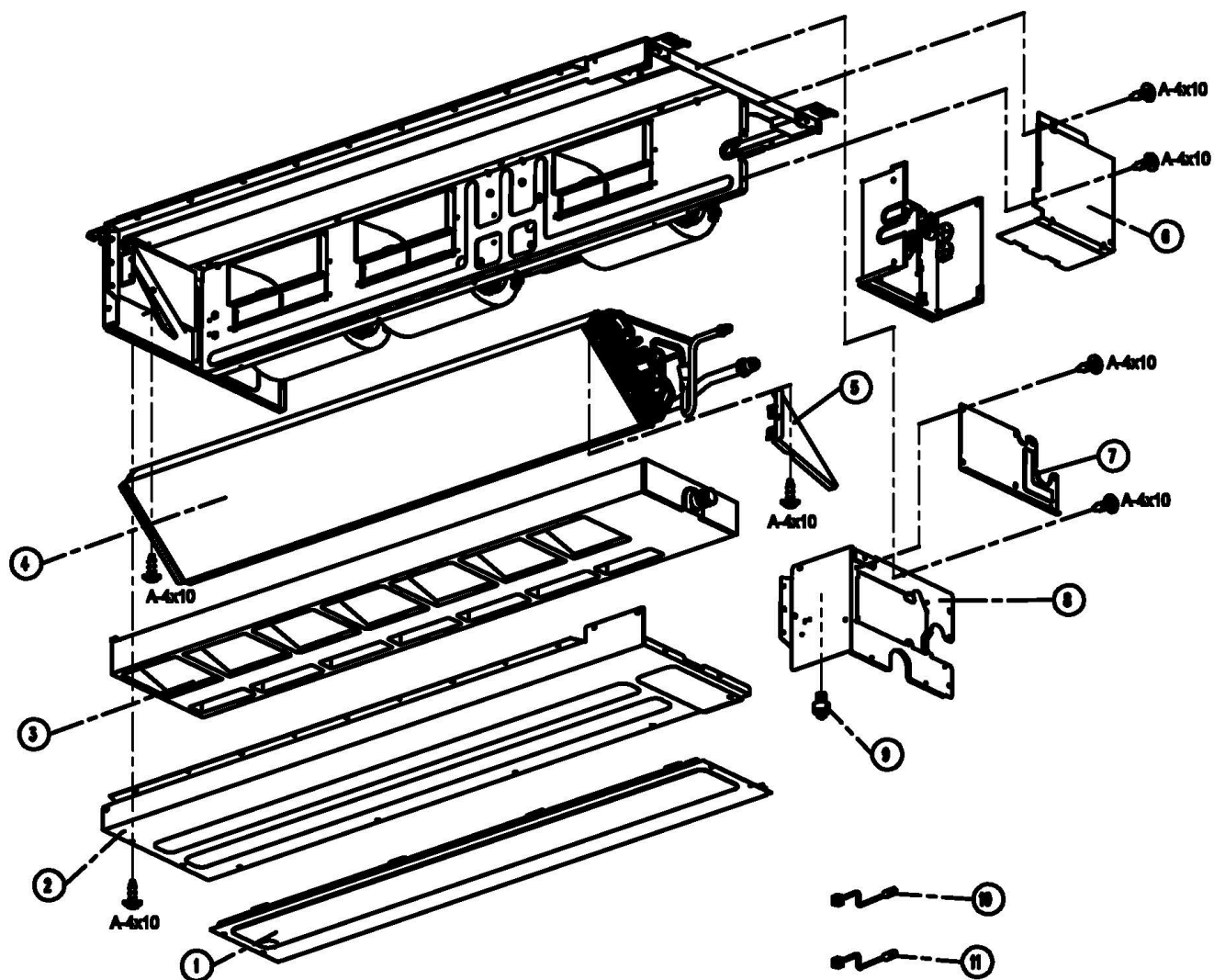
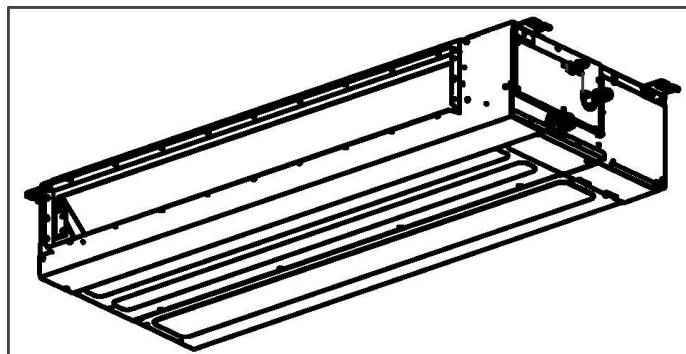


Figure 911A

18K Ducted Indoor



PARTS CATALOG

18K Ducted Indoor

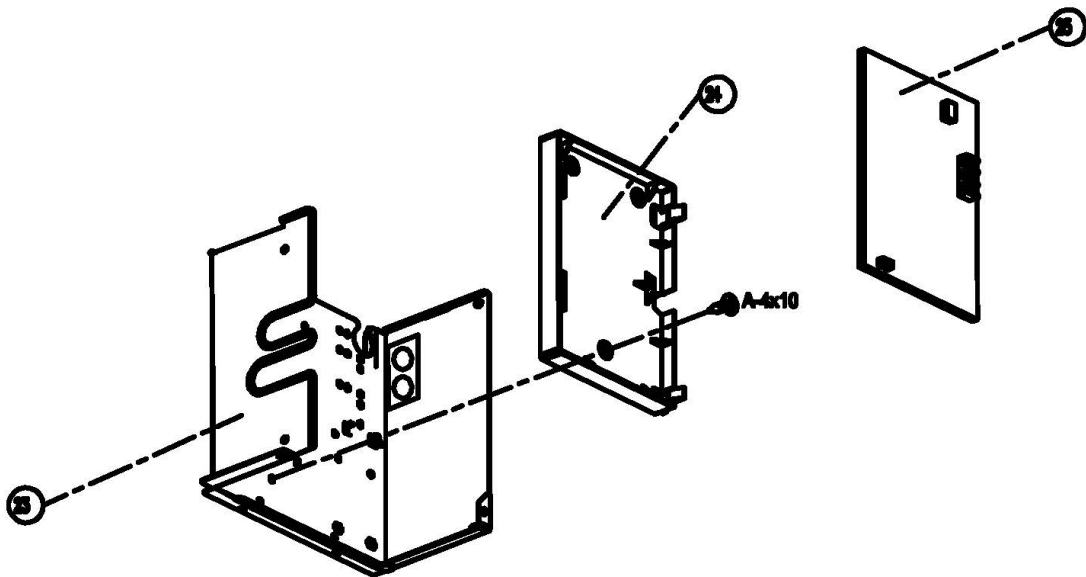
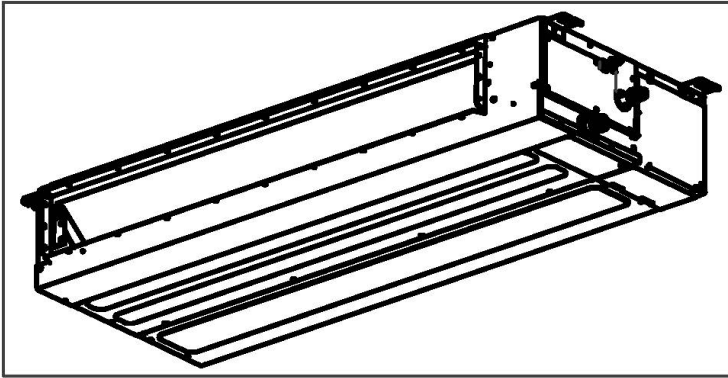


Figure 911C

PARTS CATALOG

18K Ducted Indoor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400899	Base Plate	FPHD18A3A	1
2	67400900	Bottom Plate	FPHD18A3A	1
3	67400901	Water Drain	FPHD18A3A	1
4	67400412	Evaporator	FPHD18A3A	1
5	67400902	Supporting	FPHD18A3A	1
6	67400889	Electric Box Cover	FPHD18A3A	1
7	67400904	Seal Plate	FPHD18A3A	1
8	67400891	Rght Side Board	FPHD18A3A	1
9	67400414	Water Position Switch	FPHD18A3A	1
10	67400415	Temperature Sensor	FPHD18A3A	1
11	67400416	Temperature Sensor	FPHD18A3A	1
12	67400906	Fan Board	FPHD18A3A	1
13	67400907	Motor Supporter	FPHD18A3A	1
14	67400894	Fan Snail Shell	FPHD18A3A	1
15	67400417	Fan	FPHD18A3A	1
16	67400418	Bearing	FPHD18A3A	1
17	67400909	Axes	FPHD18A3A	1
18	67400996	Crosshead	FPHD18A3A	1
19	67400911	Hooking	FPHD18A3A	1
20	67400896	Connecting Rod	FPHD18A3A	1
21	67400897	Hooking	FPHD18A3A	1
22	67400419	DC Motor	FPHD18A3A	1
23	67400915	Elec Joint Box	FPHD18A3A	1
24	67400915	Electric Box	FPHD18A3A	1
25	67400916	PCB	FPHD18A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 911

PARTS CATALOG

24k Ducted Indoor

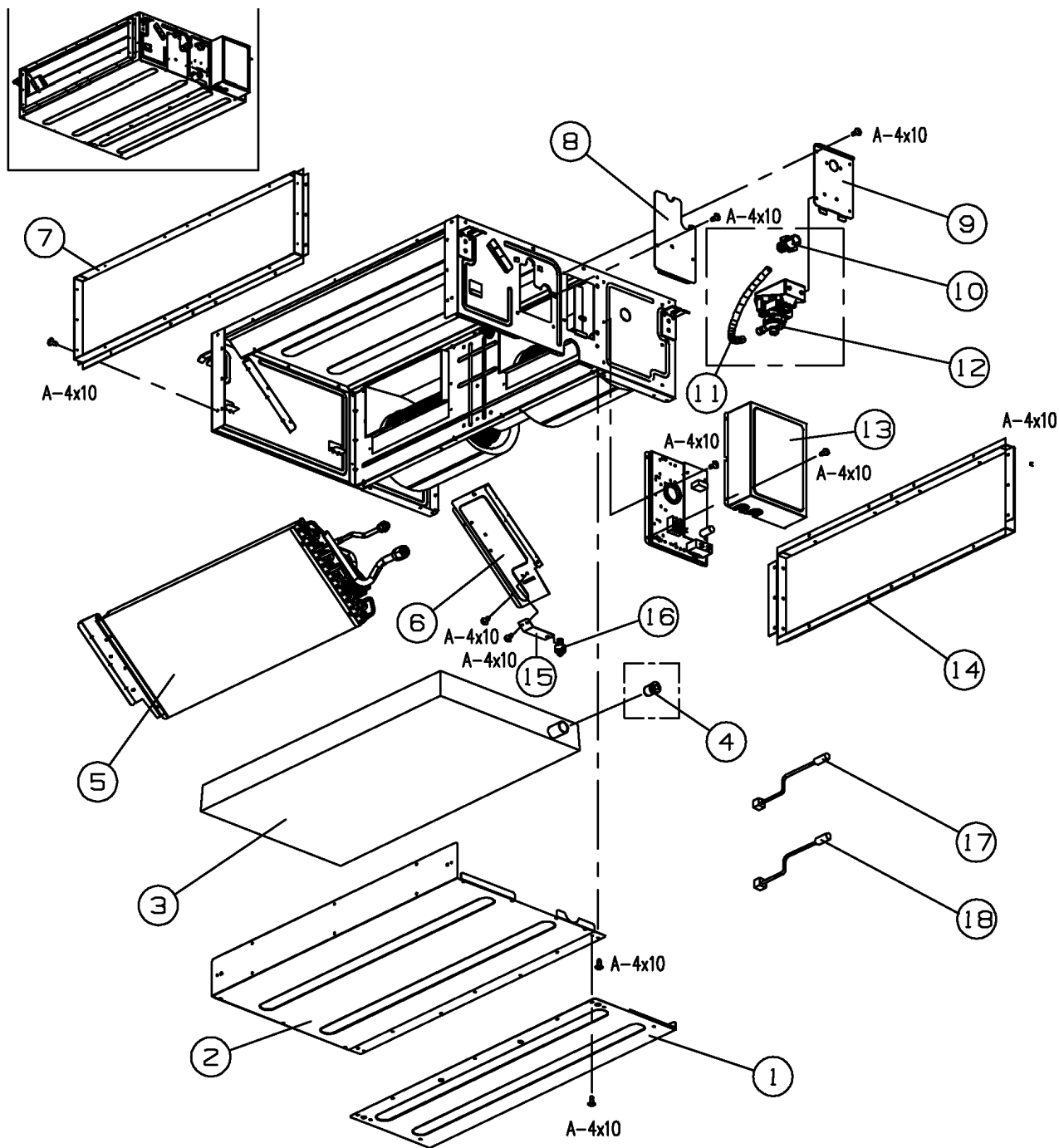


Figure 912A

PARTS CATALOG

24k Ducted Indoor

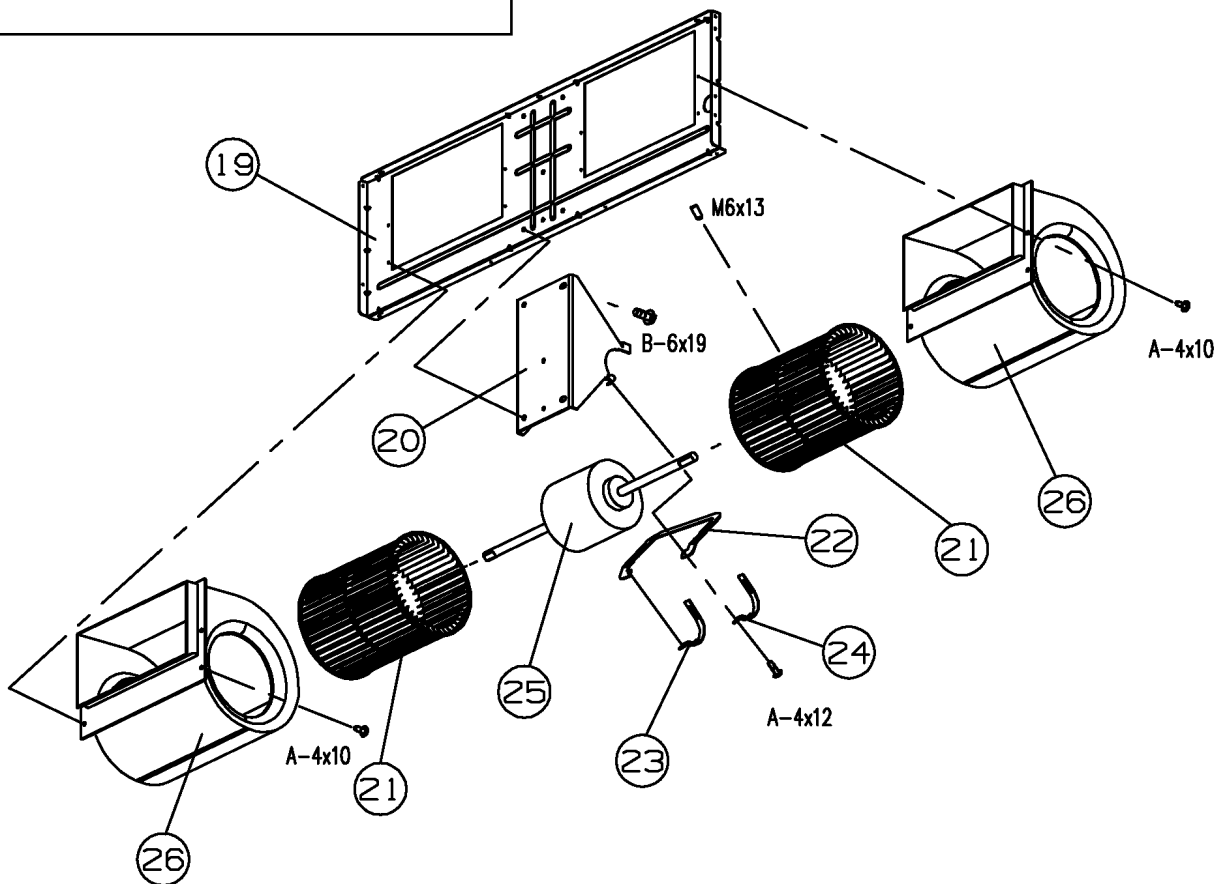
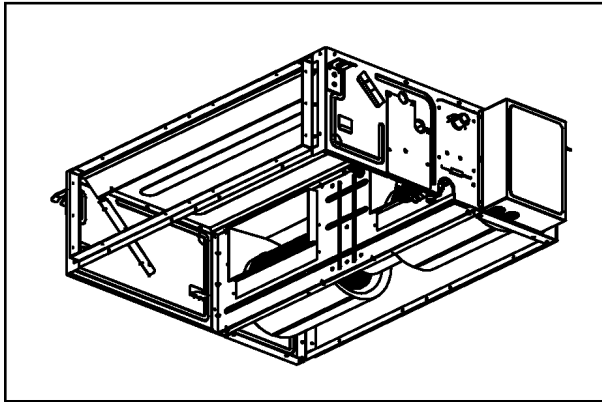


Figure 912B

PARTS CATALOG

24k Ducted Indoor

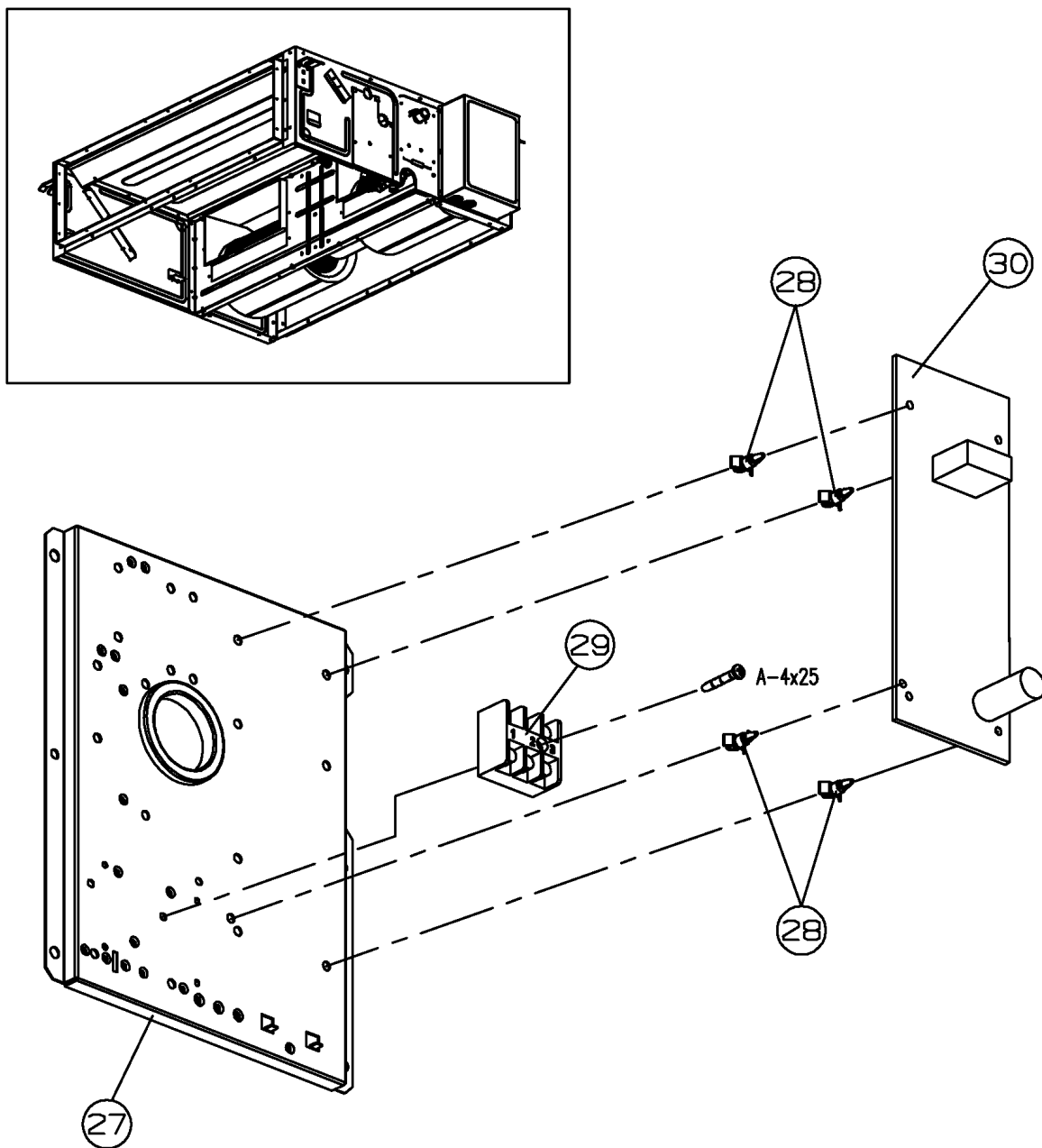


Figure 912C

PARTS CATALOG

24k Ducted Indoor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67400952	Base Plate	FPHD24A3A	1
2	67400953	Base Holder	FPHD24A3A	1
3	67400954	Water Drain	FPHD24A3A	1
4	67400955	Rubber Plug	FPHD24A3A	1
5	67400956	Evaporator assembly	FPHD24A3A	1
6	67400957	Supporting	FPHD24A3A	1
7	67400958	Outlet Flange Border	FPHD24A3A	1
8	67400959	Supporting	FPHD24A3A	1
9	67400960	Supporting	FPHD24A3A	1
10	67400961	Tie-in	FPHD24A3A	1
11	67400962	Water Pipe	FPHD24A3A	1
12	67400433	Pump Motor	FPHD24A3A	1
13	67400963	Electric Box Cover	FPHD24A3A	1
14	67400964	Inlet Flange Border	FPHD24A3A	1
15	67400965	Float Bracket	FPHD24A3A	1
16	67400447	Water Position Switch	FPHD24A3A	1
17	67400444	Coil Temperature Sensor	FPHD24A3A	1
18	67400255	Ambient Temperature Sensor	FPHD24A3A	1
19	67400966	Supporting	FPHD24A3A	1
20	67400967	Motor Bracket	FPHD24A3A	1
21	67400968	Centrifugal Fan Blade	FPHD24A3A	1
22	67400969	Center Staff	FPHD24A3A	1
23	67400970	Motor Hoop	FPHD24A3A	1
24	67400971	Motor Hoop	FPHD24A3A	1
25	67400972	DC Motor	FPHD24A3A	1
26	67400973	Fan Snail Shell	FPHD24A3A	1
27	67400974	Electric Box	FPHD24A3A	1
28	67400429	Supporting Leg	FPHD24A3A	1
29	67400365	Wire Terminal Board	FPHD24A3A	1
30	67400975	Main Control Board	FPHD24A3A	1
-31	67400997	Wire control components	FPHD24A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 912

PARTS CATALOG

36k Ducted Indoor

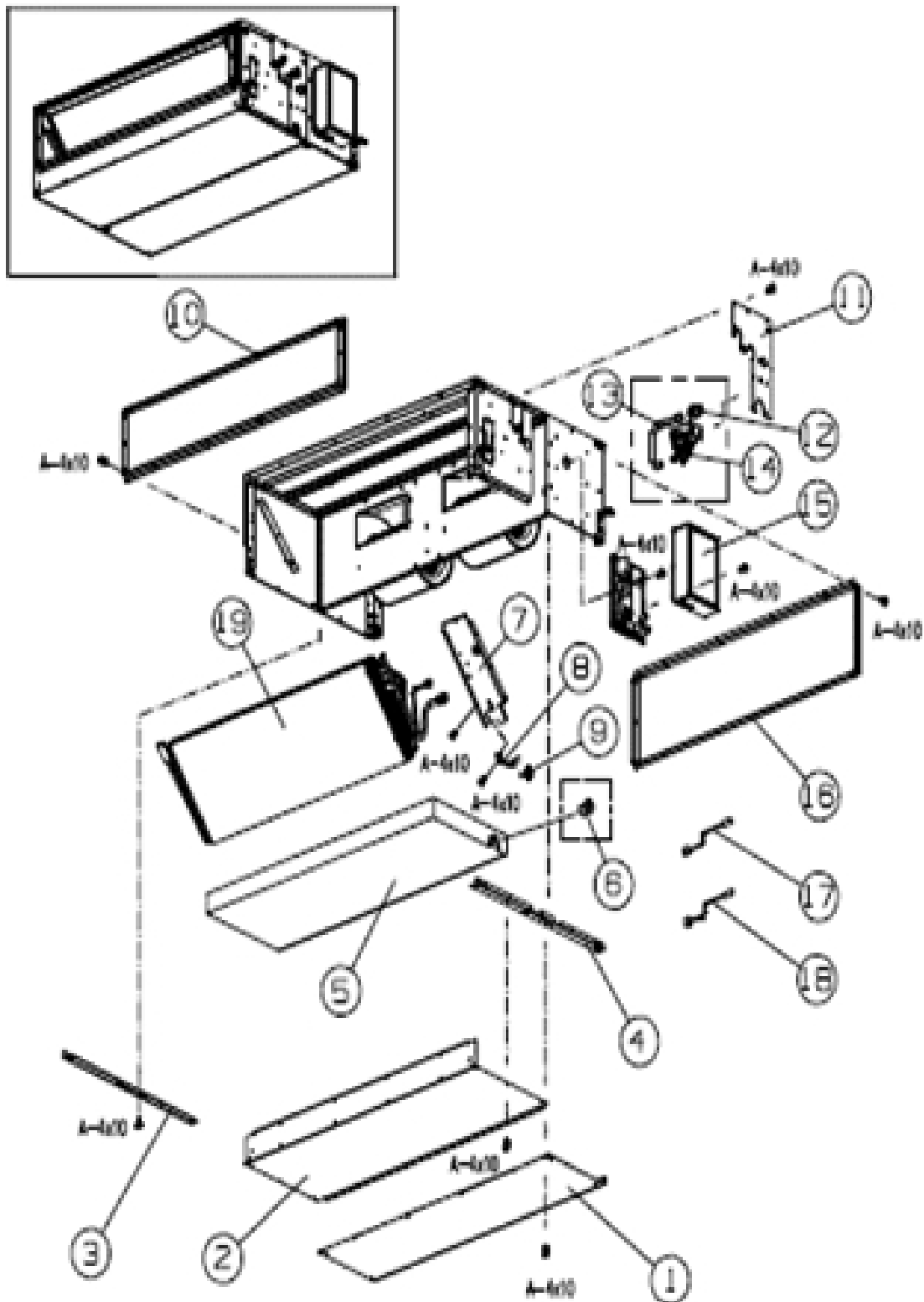


Figure 913A

PARTS CATALOG

36K Indoor Ducted

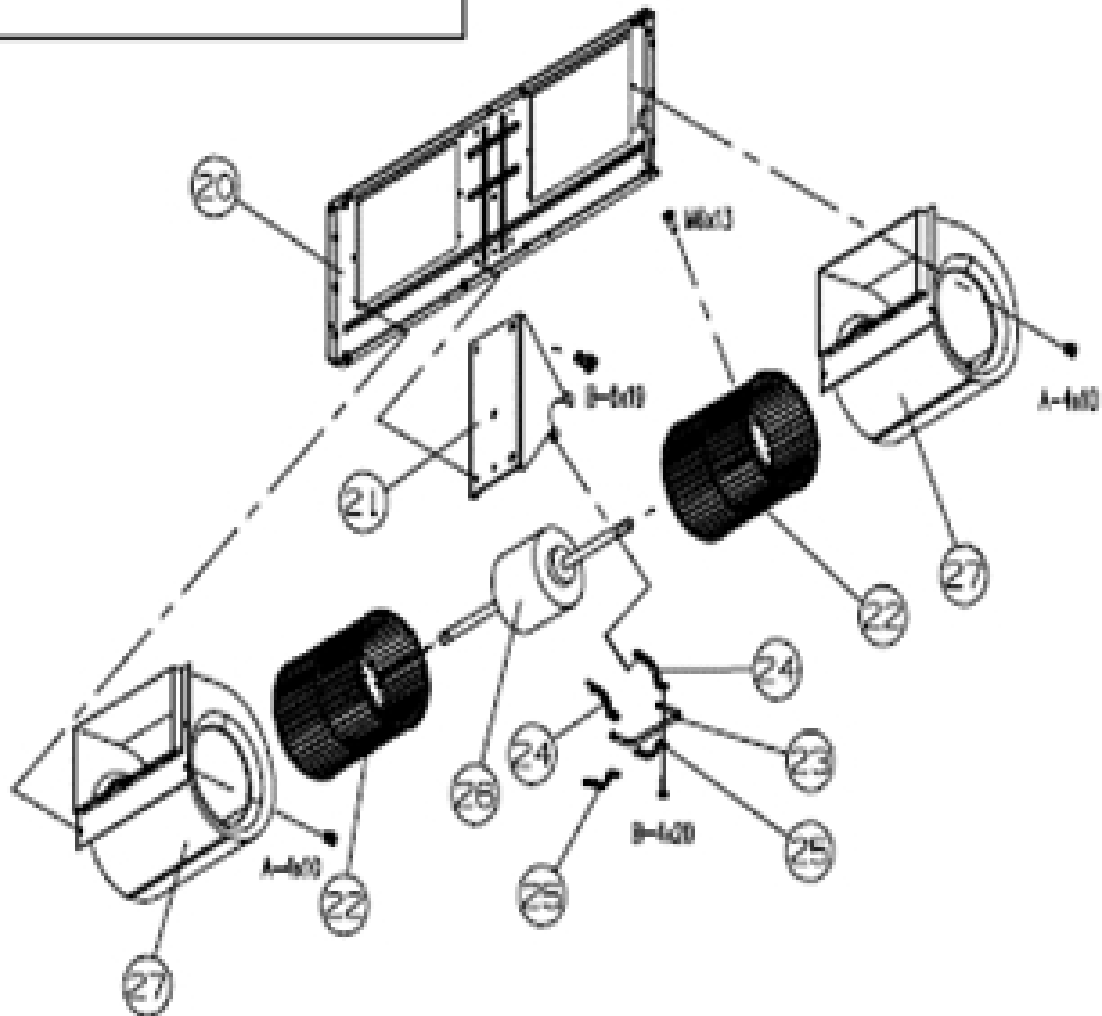
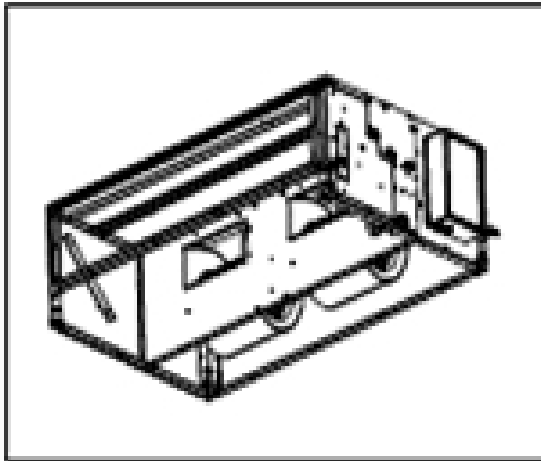


Figure 913B

PARTS CATALOG

36K Indoor Ducted

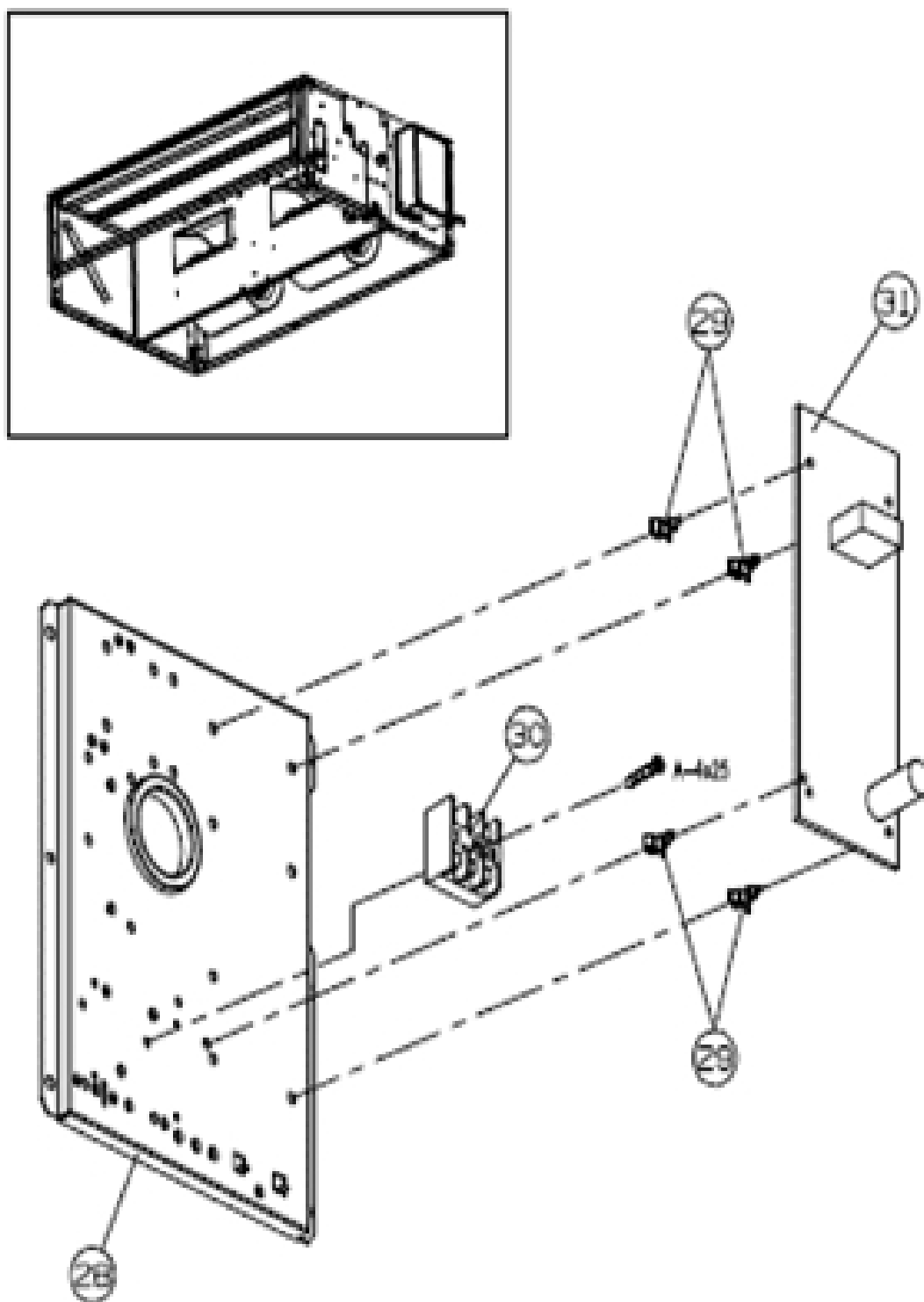


Figure 913C

PARTS CATALOG

36k Ducted Indoor

ITEM	PART NUMBER	PART DESCRIPTION	USED ON MODEL	QTY
1	67401075	1506706 - Base Plate	FPHFD36A3A	1
2	67401076	1506966 - Top Plate	FPHFD36A3A	1
3	67401077	1506775 - Mounting Plate	FPHFD36A3A	1
4	67401078	1506769 - Mounting Plate	FPHFD36A3A	1
5	67401079	1401329 - Water Drain	FPHFD36A3A	1
6	67400955	1360977 - Rubber Plug	FPHFD36A3A	1
7	#N/A	#N/A	FPHFD36A3A	1
8	67401080	1506827 - Float Bracket	FPHFD36A3A	1
9	67400447	1362154 - Water Position Switch	FPHFD36A3A	1
10	67401082	1506878 - Air Outlet	FPHFD36A3A	1
11	67401081	1822423 - Pump Supporting Bracket	FPHFD36A3A	1
12	67400961	1368850 - Tie-in	FPHFD36A3A	1
13	67400962	1368846 - Water Pipe	FPHFD36A3A	1
14	67400433	1397768 - Pump Motor	FPHFD36A3A	1
15	67400963	2080728 - Electric Box Cover	FPHFD36A3A	1
16	67401082	1506878 - Air Inlet	FPHFD36A3A	1
17	67400444	1413278 - Coil Temperature Sensor	FPHFD36A3A	1
18	67400323	1473879 - Ambient Temperature Sensor	FPHFD36A3A	1
19	67401083	1892226 - Evaporator assembly	FPHFD36A3A	1
20	67401084	1506712 - Clapboard	FPHFD36A3A	1
21	67401085	1849379 - Motor Supporter	FPHFD36A3A	1
22	67401086	1388001 - Centrifugal Fan Blade	FPHFD36A3A	1
23	67401087	1851355 - Center Staff	FPHFD36A3A	1
24	67400897	1537915 - Hooking	FPHFD36A3A	1
25	67400911	1537916 - Hooking	FPHFD36A3A	1
26	67401088	1852171 - DC Motor	FPHFD36A3A	1
27	67401089	1901093 - Fan Snail Shell	FPHFD36A3A	1
28	67400974	1484990 - Electric Box	FPHFD36A3A	1
29	67400429	1204016 - Supporting Leg	FPHFD36A3A	1
30	67400365	1993154 - Wire Terminal Board	FPHFD36A3A	1
31	67401090	2081219 - Main Control Board	FPHFD36A3A	1
-32	67400997	4116375 - Wire control components	FPHFD36A3A	1
-ITEMS ARE NON- ILLUSTRATED				
*ITEMS ARE NON-STOCKED, WILL NORMALLY REQUIRE 2-3 WEEKS LEAD TIME				

Figure 913D

APPENDIX

Appendix 1: Reference Sheet of Celsius and Farenheit

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

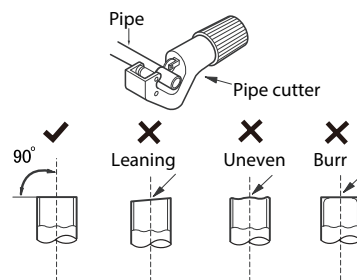
Appendix 2: Pipe Expanding Method

⚠ Note:

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

A: Cut the pip

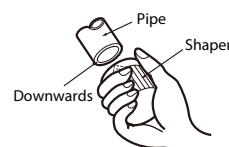
Confirm the pipe length according to the distance of indoor unit and outdoor unit.
Cut the required pipe with pipe cutter.



B: Remove the burrs

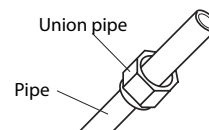
Remove the burrs with shaper and prevent the burrs from getting into the pipe.

C: Put on suitable insulating pipe



D: Put on the union nut

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



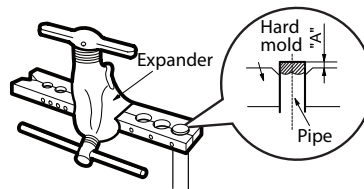
E: Expand the port

Expand the port with expander.

⚠ Note:

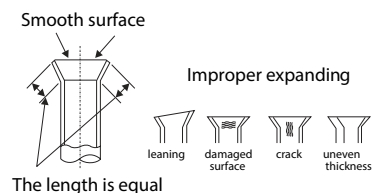
"A" is different according to the diameter, please refer to the sheet below:

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



F: Inspection

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



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



Friedrich Air Conditioning Company
10001 Reunion Place, Suite 500
San Antonio, TX 788.5
31.5-541-6645
www.friedrich.com

FLOATING AIR DUCTLESS SPLIT SYSTEMS

LIMITED WARRANTY

1. A) FIVE YEAR WARRANTY - FRIEDRICH AIR CONDITIONING CO. (FRIEDRICH) warrants to the original end-user of this product that should it prove defective due to improper workmanship and/or material under normal use for a period of five years from the date of installation, FRIEDRICH will repair or replace, at its option, any defective part without charge for the part. Replacement parts are warranted for the remainder of the original warranty period.

B) THIS WARRANTY DOES NOT INCLUDE LABOR or other cost incurred for servicing, repairing, removing, installing, shipping, or handling of either defective or replacement parts, or complete unit. Such cost may be covered by a separate warranty provided by the installing contractor.

C) Seven YEAR COMPRESSOR WARRANTY- During the seven year warranty period from the date of installation, should the compressor prove defective due to improper workmanship and/or material, FRIEDRICH will furnish a replacement compressor, at no charge, which is warranted for the remainder of the original warranty period. LABOR IS NOT INCLUDED FOR INSTALLING REPLACEMENT COMPRESSOR.

These warranties apply only while the unit remains at the original site and only to units installed inside the continental United States, Alaska, Hawaii, Puerto Rico, Mexico and Canada. The warranty applies only if the unit is installed and operated in accordance with the printed instructions and in compliance with applicable local installation and building codes and good trade practices. For international warranty information, contact the Friedrich Air Conditioning Company - International Division.

D) NOTICE: To obtain service and/or warranty parts replacement, you must notify an authorized FRIEDRICH Air Conditioning Co. distributor, dealer, or contractor of any defect within the applicable warranty period.

2. Any defective part to be replaced must be made available to FRIEDRICH in exchange for the replacement part. You must present proof of the original date of installation of the product in order to establish the effective date of the warranty. Otherwise, the effective date will be deemed to be the date of manufacture plus thirty days. The return of the owner registration card is not a condition of warranty coverage. However, please detach and return it so that we can contact you should a question of safety arise which could affect you.

3. TO OBTAIN WARRANTY SERVICE, please contact your authorized FRIEDRICH distributor, dealer, or the contractor who installed the equipment. If your dealer or contractor needs assistance, the authorized FRIEDRICH distributor is available for consultation, and FRIEDRICH supports the efforts of the distributor.

4. This limited warranty applies only to units remaining at the site of the original installation (except for mobile home installations) and only to units installed within the continental United States, Alaska, Hawaii, and Canada. This limited warranty applies only if the unit is installed and operated in accordance with FRIEDRICH instructions and in compliance with applicable local installation and building codes and good trade practices.

5. THIS WARRANTY DOES NOT COVER damages caused by: (a) accident, abuse, negligence, or misuse; (b) operating the product in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals; (c) modification, alteration, poor service practices; (d) improper matching or application of the product or components; (e) failure to provide proper maintenance and service to the product according to manufacture's instructions; (f) installation or operating of the product in a manner contrary to the instructions of the manufacturer; (g) lightning, fluctuations in electrical power or other Acts of God. This LIMITED WARRANTY also excludes all cost of installation, disconnection or dismantling the product, parts used in connection with normal maintenance such as air filters or belts and owner-required maintenance. Consult the instructions enclosed with the product for information regarding recommended maintenance.

6. No one is authorized to change this LIMITED WARRANTY in any respect, or to create any other obligation or liability in connection with this product.

7. YOUR ONLY REMEDIES ARE PROVIDED IN THIS LIMITED WARRANTY. ANY EXPRESS WARRANTY NOT PROVIDED HEREIN, AND ANY REMEDY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, IS HEREBY EXCLUDED AND DISCLAIMED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO A TERM OF ONE YEAR FROM THE DATE OF ORIGINAL INSTALLATION. UNDER NO CIRCUMSTANCES SHALL FRIEDRICH BE LIABLE TO THE OWNER OR ANY OTHER PERSON FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THIS PRODUCT, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT OR OTHERWISE.

8. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental, special or consequential damages, so the above limitations or exclusions may not apply to you.

9. This warranty gives you specific legal rights, and you may have other rights which vary from state to state and province to province.

CUSTOMER SATISFACTION and QUALITY ASSURANCE

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

FRIEDRICH AUTHORIZED PARTS DEPOTS

AAA Refrigeration Service
1322 24th Street, Suite B Kenner,
Louisiana 70062
504-464-7444
877-813-7444

The Gabbert Company
6868 Ardmore
Houston, Texas 77054
713-747-4110
315-458-4110

Reeve Air Conditioning, Inc.
2501 South Park Road
Hallandale, Florida 33009
954-962-0252
315-962-13.33

Alamo Service Company
1450 North Flores Street
San Antonio, Texas 78218
210-227-2450
31.5-328-2450

Johnstone Supply of Woodside
27-01 Brooklyn Queens Expway
Woodside, New York 11377
718-545-5464
315-431-1143



FRIEDRICH

TECHNICAL SUPPORT CONTACT INFORMATION

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www.friedrich.com