SERVICE MANUAL
R–410A Ductless Split System Air Conditioner and Heat Pump
MODELS: DLC4(A/H)–Outdoor, DLF4(A/H)–Indoor
SIZES: 9K, 12K, 18K, 24K, 30K, and 36K

INTRODUCTION

This Service Manual provides the necessary information to service, repair, and maintain the DLF4(A,H), DLC4(A/H)

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air–conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start–up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. In Canada, refer to current editions of the Canadian Electrical Code, CSA 22.1.

Recognize safety information. This is the safety–alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety–alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Do not bury more than 36 in. (914 mm) of refrigerant pipe in the ground. If any section of pipe is buried, there must be a 6 in. (152 mm) vertical rise to the valve connections on the outdoor units. If more than the recommended length is buried, refrigerant may migrate to the cooler buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start–up.

PRODUCT SPECIFICATIONS

Model – Indoor Unit				DLF4AH09J1A	DLF4HH09J1A	
Function				Cooling	Cooling	Heating
Rated Voltage				115V	115V	
Frequency (Inverter different Compressor speed)	High		Hz	70	70	63
	Standard		Hz	41	41	44
	Low		Hz	15	15	15
Total Capacity (Inverter different Compressor speed)	High		W/Btuh	3100 / 10600	3100 / 10600	3250 / 11100
	Standard		W/Btuh	2650 / 9000	2650 / 9000	2820 / 9500
	Low		W/Btuh	1300 / 4435	1300 / 4435	930 / 3200
Power Input (Inverter different Compressor speed)	High		W	1050	1050	1100
	Standard		W	634	634	700
	Low		W	180	180	220
Rated Input	High		W	1050	1050	1100
	Standard		W	634	634	700
Rated Current	High		A	16.8	16.8	17.0
	Standard		A	7.0	7.0	7.5
Air Volume			CFM	370	370	
Dehumidifying Volume			I/h	0.8	0.8	
EER / C.O.P				14.2	14.2	
SEER / HSPF				22	22 / 9.8	
Indoor Unit				DLF4AH09J1A	DLF4HH09J1A	
Fan Motor	Speed	SH	r/min	1260	1260	1320
		H	r/min	1050	1050	1200
		M	r/min	920	920	1100
		L	r/min	730	730	950
	Output		W	20	20	
	Capacitor		μF	4.0	4.0	
	RLA		A	0.38	0.38	
Fan	Type			Cross Flow Fan	Cross Flow Fan	
	Diameter–Length		Inch	ϕ3.6x25.4	ϕ3.6x25.4	
Evaporator				Aluminum Fin Copper Tube	Aluminum Fin Copper Tube	
	Pipe Diameter		Inch	ϕ0.3	ϕ0.3	
	Row–Fin Gap		Inch	2–0.06	2–0.06	
	Coil length (I) x height (H) x coil width (L)		Inch	25.4 x 10.5 x 1	25.4 x 10.5 x 1	
Swing Motor	Model			MP24AA	MP24AA	
	Output		W	2.4	2.4	
Fuse			A	3.15	3.15	
Sound Pressure Level		H	dB (A)	34	34	
		M	dB (A)	30	30	
		L	dB (A)	26	26	
Sound Pressure Level		H	dB (A)	44	44	
		M	dB (A)	40	40	
		L	dB (A)	36	36	
Dimension (WxHxD)			Inch	33 x 11 x 7	33 x 11 x 7	
Dimension of Package (WxHxD)			Inch	36 x 14 x 10	36 x 14 x 10	
Net Weight / Gross Weight			Inch	29 / 38	29 / 38	

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLF4AV09J1A	DLF4HV09J1A	
Compressor	Manufacturer		Sanyo	Sanyo	
	Model		C–6RZ110H1A	C–6RZ110H1A	
	Type		Twin Rotary	Twin Rotary	
	L.R.A.	A	33	33	
	R.L.A.	A	4.59 / 2.81	4.59 / 2.81	
	Power Input	W	775 / 735	775 / 735	
	Overload Protectorr		Int11I–3979	Int11I–3979	
Throttling Method			Electronic Expansion Valve Throttling	Electronic Expansion Valve Throttling	
Starting Method			Transducer Starting	Transducer Starting	
Working Temperature Range		°F	55 ~ 115	55 ~ 115	5 ~ 24
Heat Exchanger Coil	Coil		Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube	
	Pipe Diameter	inch	ϕ0.3	ϕ0.3	
	Rows–Fin Gap	inch	2–0.06	2–0.06	
Coil Length (I) x Height (H) x Width (L)		inch	31.5 x 19.5 x.05	31.5 x 19.5 x.05	
Fan Motor	Speed	rpm	900 / 650	900 / 650	900
	Output of Fan Motor	W	40	40	
	R.L.A.	A	0.17	0.17	
	Capacitor	μF	/	/	
Air Flow Volume of Outdoor Unit		Ft^3/min	1118	1118	
Fan	Type		Axial Fan	Axial Fan	
	Diameter	inch	15.7	15.7	
Defrosting Method			/	/	
Climate Type			T1	T1	
Isolation			I	I	
Moisture Protection			IP24	IP24	
Permissible Excessive Operating Pressure for the Discharge Side		Mpa	3.8	3.8	
Permissible Excessive Operating Pressure for the Suction Side		Mpa	1.2	1.2	
Sound Pressure Level		DB (A)	≤50	≤50	
Sound Power Level		DB (A)	≤63	≤63	
Dimensions (WxHxD)		inch	33 X 21 X 12.6	33 X 21 X 12.6	
Dimensions of Package (WxHxD)		inch	34.5 X 22.8 X 14.2	34.5 X 22.8 X 14.2	
Net Weight / Gross Weight		Lbs.	96 / 110	96 / 110	
Refrigerant	Name of Refrigerant		R410A	R410A	
	Weight	Oz.	42	42	
Connection Pipe	Length (m)	Ft.	16	16	
	Gas Additional Charge	Oz/ft	1.1613	1.1613	
	Liquid Pipe Diameter	inch	ϕ1/4	ϕ1/4	
	Gas Pipe Diameter	inch	ϕ3/8	ϕ3/8	
Max. Interunit height Difference		Ft.	33	33	
Max. Interunit Piping Length		Ft.	66	66	
* The above data is subject to change without notice. Please refer to the nameplate of the unit.					

PRODUCT SPECIFICATIONS

Model – Indoor Unit				DLF4AH12J1A	DLF4HH12J1A	
Function				Cooling	Cooling	Heating
Rated Voltage				115V	115V	
Frequency (Inverter different Compressor speed)	High		Hz	70	70	63
	Standard		Hz	41	41	44
	Low		Hz	15	15	15
Total Capacity (Inverter different Compressor speed)	High		W/Btuh	3100 / 10600	3100 / 10600	3250 / 11100
	Standard		W/Btuh	2650 / 9000	2650 / 9000	2820 / 9500
	Low		W/Btuh	1300 / 4435	1300 / 4435	930 / 3200
Power Input (Inverter different Compressor speed)	High		W	1050	1050	1100
	Standard		W	634	634	700
	Low		W	180	180	220
Rated Input	High		W	1050	1050	1100
	Standard		W	634	634	700
Rated Current	High		A	16.8	16.8	17.0
	Standard		A	7.0	7.0	7.5
Air Volume			CFM	370	370	
Dehumidifying Volume			I/h	0.8	0.8	
EER / C.O.P				14.2	14.2	
SEER / HSPF				22	22 / 9.8	
Indoor Unit				DLF4AH12J1A	DLF4HH12J1A	
Fan Motor	Speed	SH	r/min	1260	1260	1320
		H	r/min	1050	1050	1200
		M	r/min	920	920	1100
		L	r/min	730	730	950
	Output		W	20	20	
	Capacitor		μF	4.0	4.0	
	RLA		A	0.38	0.38	
Fan	Type			Cross Flow Fan	Cross Flow Fan	
	Diameter–Length		Inch	ϕ3.6x25.4	ϕ3.6x25.4	
Evaporator				Aluminum Fin Copper Tube	Aluminum Fin Copper Tube	
	Pipe Diameter		Inch	ϕ0.3	ϕ0.3	
	Row–Fin Gap		Inch	2–0.06	2–0.06	
	Coil length (I) x height (H) x coil width (L)		Inch	25.4 x 10.5 x 1	25.4 x 10.5 x 1	
Swing Motor	Model			MP24AA	MP24AA	
	Output		W	2.4	2.4	
Fuse			A	3.15	3.15	
Sound Pressure Level		H	dB (A)	34	34	
		M	dB (A)	30	30	
		L	dB (A)	26	26	
Sound Pressure Level		H	dB (A)	44	44	
		M	dB (A)	40	40	
		L	dB (A)	36	36	
Dimension (WxHxD)			Inch	33 x 11 x 7	33 x 11 x 7	
Dimension of Package (WxHxD)			Inch	36 x 14 x 10	36 x 14 x 10	
Net Weight / Gross Weight			Inch	29 / 38	29 / 38	

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4AV12J1A	DLC4HV12J1A	
Compressor	Manufacturer		Sanyo	Sanyo	
	Model		C–6RZ110H1A	C–6RZ110H1A	
	Type		Twin Rotary	Twin Rotary	
	L.R.A.	A	33	33	
	R.L.A.	A	4.59 / 2.81	4.59 / 2.81	
	Power Input	W	775 / 735	775 / 735	
	Overload Protectorr		Int11I–3979	Int11I–3979	
Throttling Method			Electronic Expansion Valve Throttling	Electronic Expansion Valve Throttling	
Starting Method			Transducer Starting	Transducer Starting	
Working Temperature Range		°F	55 ~ 115	55 ~ 115	5 ~ 75
Heat Exchanger Coil	Coil		Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube	
	Pipe Diameter	inch	ϕ0.4	ϕ0.4	
	Rows–Fin Gap	inch	2–0.06	2–0.06	
Coil Length (I) x Height (H) x Width (L)		inch	30.2 x 20 x0.9	30.2 x 20 x0.9	
Fan Motor	Speed	rpm	900 / 680	900 / 680	900
	Output of Fan Motor	W	40	40	
	R.L.A.	A	0.17	0.17	
	Capacitor	μF	/	/	
Air Flow Volume of Outdoor Unit		Ft^3/min	1118	1118	
Fan	Type		Axial Fan	Axial Fan	
	Diameter	inch	15.7	15.7	
Defrosting Method			/	Auto Defrost	
Climate Type			T1	T1	
Isolation			I	I	
Moisture Protection			IP24	IP24	
Permissible Excessive Operating Pressure for the Discharge Side		Mpa	3.8	3.8	
Permissible Excessive Operating Pressure for the Suction Side		Mpa	1.2	1.2	
Sound Pressure Level		DB (A)	≤53	≤53	
Sound Power Level		DB (A)	≤65	≤65	
Dimensions (WxHxD)		inch	33 X 21 X 12.6	33 X 21 X 12.6	
Dimensions of Package (WxHxD)		inch	34.5 X 22.8 X 14.2	34.5 X 22.8 X 14.2	
Net Weight / Gross Weight		Lbs.	107 / 118	107 / 118	
Refrigerant	Name of Refrigerant		R410A	R410A	
	Weight	Oz.	45.5	45.5	
Connection Pipe	Length (m)	Ft.	16	16	
	Gas Additional Charge	Oz/ft	1.1613	1.1613	
	Liquid Pipe Diameter	inch	ϕ1/4	ϕ1/4	
	Gas Pipe Diameter	inch	ϕ3/8	ϕ3/8	
Max. Interunit height Difference		Ft.	33	33	
Max. Interunit Piping Length		Ft.	66	66	
* The above data is subject to change without notice. Please refer to the nameplate of the unit.					

PRODUCT SPECIFICATIONS (Cont.)

Model			DLC4AV12K1A	DLC4HV12K1A
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity (Min – Max)		Btu/h	12000 (3100–13000)	12000 (3100–13000)
Heating Capacity (Min. – Max)		Btu/h	N/A	13000 (2400–14000)
Cooling Power Input (Min. – Max.)		W	1000 (365–1080)	1000 (365–1080)
Heating Power Input (Min. – Max.)		W	N/A	1000 (340–1360)
Cooling Current Input		A	4.5	4.5
Heating Current Input		A	N/A	5.2
Rated Input		W	1500	1500
Rated Current		A	15	15
Air Flow Volume (S/H/M/L)		CFM	335/277/253/218	335/277/253/218
Dehumidifying Volume		Pint/h	2.959	2.959
EER		Btu/hW	12	12
COP		Btu/hW	N/A	10.8
SEER			20	20
HSPF			N/A	9.2
Application Area		m^2	16–24	16–24
Model – Indoor Unit			DLF4AH12K1A	DLF4HH12K1A
Indoor Unit	Fan Type		Cross–flow	Cross–flow
	Fan Diameter Length (DXL)	inch	ϕ3.6x25.4	ϕ3.6x25.4
	Cooling Speed (S/H/M/L)	r/min	1330/1100/950/750	1330/1100/950/750
	Heating Speed (S/H/M/L)	r/min	N/A	1350/1170/1050/950
	Fan Motor Power Output	W	20	20
	Fan Motor RLA	A	0.2	0.2
	Fan Motor Capacitor	μF	1	1
	Evaporator Form	W	Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube
	Evaporator Pipe Diameter	inch	ϕ0.27	ϕ0.27
	Evaporator Row–fin Gap	inch	2–0.05	2–0.05
	Evaporator Coil Length (LxDxW)	inch	22.8x1x10.4	22.8x1x10.4
	Swing Motor Model		MP24AA	MP24AA
	Swing Motor Power Output	W	2.4	2.4
	Fuse Current	A	3.15	3.15
	Sound Pressure Level (S/H/M/L)	dB (A)	42/39/36/33	42/39/36/33
	Sound Power Level (S/H/M/L)	dB (A)	52/49/46/43	52/49/46/43
	Dimension (WxHxD)	inch	33.3X10.8X7	33.3X10.8X7
	Dimension of Carton Box (WxHxD)	inch	36X10X14	36X10X14
	Dimension of Package (WxHxD)	inch	36X10.1X14.6	36X10.1X14.6
	Net Weight	lb	22	22
	Gross Weight	lb	28.7	28.7

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4AV12K1A	DLC4HV12K1A
Compressor	Manufacturer		Mitsubishi	Mitsubishi
	Model		KNB092FTAMC	KNB092FTAMC
	Oil		FV50S	FV50S
	Type		Rotary	Rotary
	L.R.A.	A	13.8	13.8
	R.L.A.	A	3.2	3.2
	Power Input	W	860	860
	Overload Protector		INT11L–6578	INT11L–6578
Throttling Method			Electronic Expansion Valve	Electronic Expansion Valve
Set Temperature Range		°F	60.8 ~ 86	60.8 ~ 86
Cooling Operation Ambient Temperature Range		°F	0.4 ~ 109.4	0.4 ~ 109.4
Heating Operation Ambient Temperature Range		°F	N/A	–5 ~ 75.0
Condenser	Form		Aluminum Fin–copper Tube	Aluminum Fin–copper Tube
	Pipe Diameter	inch	ϕ0.37	ϕ0.37
	Rows–Fin Gap	inch	2–0.05	2–0.05
	Coil Length (LxDxW)	inch	29.4x1.7x22	29.4x1.7x22
Fan Motor	Speed	rpm	680 / 900	680 / 900
	Output of Fan Motor	W	30	30
	R.L.A.	A	0.13	0.13
	Capacitor	μF	N/A	N/A
Air Flow Volume of Outdoor Unit		CFM	941.6	941.6
Fan	Type		Axial Flow	Axial Flow
	Diameter	inch	15.748	15.748
Defrosting Method			N/A	Automatic Defrosting
Climate Type			T1	T1
Isolation			I	I
Moisture Protection			IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side		Mpa	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side		Mpa	2.5	2.5
Sound Pressure Level (H/M/L)		DB (A)	52/–/–	52/–/–
Sound Power Level (H/M/L)		DB (A)	62/–/–	62/–/–
Dimensions (WxHxD)		inch	33.4x23.2x12.6	33.4x23.2x12.6
Dimensions of Carton Box (WxHxD)		inch	34.5x14.2x24.8	34.5x14.2x24.8
Dimensions of Package (WxHxD)		inch	34.7x14.3x25.4	34.7x14.3x25.4
Net Weight / Gross Weight		Lbs.	88.2 / 97.02	88.2 / 97.02
Refrigerant	Name of Refrigerant		R410A	R410A
	Weight	Oz.	45.864	45.864
Connection Pipe	Length	inch	25	25
	Gas Additional Charge	Oz/ft	0.53	0.7
	Liquid Pipe Outer Diameter	inch	1/4	1/4
	Gas Pipe Outer Diameter	inch	3/8	3/8
Max. Interunit height Difference		Ft.	33	33
Max. Interunit Piping Length		Ft.	66	66

* The above data is subject to change without notice. Please refer to the nameplate of the unit.

PRODUCT SPECIFICATIONS (Cont.)

Model			DLC4AV18K1A	DLC4HV18K1A
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity (Min – Max)		Btu/h	18000 (5970–22350)	18000 (5970–22350)
Heating Capacity (Min. – Max)		Btu/h	N/A	19800 (4100–22000)
Cooling Power Input (Min. – Max.)		W	1500 (300–2650)	1500 (300–2650)
Heating Power Input (Min. – Max.)		W	N/A	1650 (335–2750)
Cooling Current Input		A	6.65	6.65
Heating Current Input		A	N/A	7.32
Rated Input		W	2650	2750
Rated Current		A	11.757	12.201
Air Flow Volume (S/H/M/L)		CFM	500/459/383/324	500/459/383/324
Dehumidifying Volume		Pint/h	0.852	0.852
EER		Btu/hW	12	12
COP		Btu/hW	N/A	12
SEER			18	18
HSPF			N/A	10
Application Area		m^2	27–42	27–42
Model – Indoor Unit			DLF4AH18K1A	DLF4HH18K1A
Indoor Unit	Fan Type		Cross–flow	Cross–flow
	Fan Diameter Length (DXL)	inch	ϕ3.86x28	ϕ3.86x28
	Cooling Speed (S/H/M/L)	r/min	1500/1200/1050/900	1500/1200/1050/900
	Heating Speed (S/H/M/L)	r/min	N/A	1500/1250/1150/1050
	Fan Motor Power Output	W	20	20
	Fan Motor RLA	A	0.32	0.32
	Fan Motor Capacitor	μF	1.5	1.5
	Evaporator Form	W	Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube
	Evaporator Pipe Diameter	inch	ϕ0.27	ϕ0.27
	Evaporator Row–fin Gap	inch	2–0.05	2–0.05
	Evaporator Coil Length (LxDxW)	inch	28x1x12	28x1x12
	Swing Motor Model		MP28VB	MP28VB
	Swing Motor Power Output	W	2.5	2.5
	Fuse Current	A	3.15	3.15
	Sound Pressure Level (S/H/M/L)	dB (A)	49/44/40/35	49/44/40/35
	Sound Power Level (S/H/M/L)	dB (A)	59/54/50/45	59/54/50/45
	Dimension (WxHxD)	inch	37X11.7X7.9	37X11.7X7.9
	Dimension of Carton Box (WxHxD)	inch	39.6X11.1X14.4	39.6X11.1X14.4
	Dimension of Package (WxHxD)	inch	39.7X11.2X15	39.7X11.2X15
	Net Weight	lb	28.665	28.665
	Gross Weight	lb	37.485	37.485

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4AV18K1A	DLC4HV18K1A
Compressor	Manufacturer		Mitsubishi	Mitsubishi
	Model		SNB130FGAMC	SNB130FGAMC
	Oil		FV50S–PVE	FV50S–PVE
	Type		Rotary	Rotary
	L.R.A.	A	13.8	13.8
	R.L.A.	A	4.1	4.1
	Power Input	W	1200	1200
	Overload Protector		INT11L–6578	INT11L–6578
Throttling Method			Electronic Expansion Valve	Electronic Expansion Valve
Set Temperature Range		°F	61 ~ 86	61 ~ 86
Cooling Operation Ambient Temperature Range		°F	14 ~ 109.0	14 ~ 109.0
Heating Operation Ambient Temperature Range		°F	N/A	19.4 – 75.0
Condenser	Form		Aluminum Fin–copper Tube	Aluminum Fin–copper Tube
	Pipe Diameter	inch	ϕ0.37	ϕ0.37
	Rows–Fin Gap	inch	2–0.05	2–0.05
	Coil Length (LxDxW)	inch	33x1.5x26	33x1.5x26
Fan Motor	Speed	rpm	800	800
	Output of Fan Motor	W	60	60
	R.L.A.	A	0.28	0.28
	Capacitor	μF	N/A	N/A
Air Flow Volume of Outdoor Unit		CFM	1883.2	1883.2
Fan	Type		Axial Flow	Axial Flow
	Diameter	inch	20.472	20.472
Defrosting Method			N/A	Automatic Defrosting
Climate Type			T1	T1
Isolation			I	I
Moisture Protection			IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side		Mpa	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side		Mpa	2.5	2.5
Sound Pressure Level (H/M/L)		DB (A)	55/–/–	55/–/–
Sound Power Level (H/M/L)		DB (A)	65/–/–	65/–/–
Dimensions (WxHxD)		inch	37.6x27.6x15.6	37.6x27.6x15.6
Dimensions of Carton Box (WxHxD)		inch	40.4x18x29	40.4x18x29
Dimensions of Package (WxHxD)		inch	40.5x18x29.5	40.5x18x29.5
Net Weight / Gross Weight		Lbs.	99.225 / 110.25	99.225 / 110.25
Refrigerant	Name of Refrigerant		R410A	R410A
	Weight	Oz.	49.392	49.392
Connection Pipe	Length	inch	25	25
	Gas Additional Charge	Oz/ft	0.2	0.2
	Liquid Pipe Outer Diameter	inch	1/4	1/4
	Gas Pipe Outer Diameter	inch	1/2	1/2
Max. Interunit height Difference		Ft.	33	33
Max. Interunit Piping Length		Ft.	82	82
* The above data is subject to change without notice. Please refer to the nameplate of the unit.				

PRODUCT SPECIFICATIONS (Cont.)

Model			DLC4AV24K1A	DLC4HV24K1A
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity (Min – Max)		Btu/h	21400 (9600–25000)	21400 (9600–25000)
Heating Capacity (Min. – Max)		Btu/h	N/A	23000 (4300–26000)
Cooling Power Input (Min. – Max.)		W	1780 (500–2650)	1780 (500–2650)
Heating Power Input (Min. – Max.)		W	N/A	2100 (400–2750)
Cooling Current Input		A	7.941	7.941
Heating Current Input		A	N/A	9.317
Rated Input		W	2650	2750
Rated Current		A	11.757	12.201
Air Flow Volume (S/H/M/L)		CFM	589/471/412/353	589/471/412/353
Dehumidifying Volume		Pint/h	1.183	1.183
EER		Btu/hW	12	12
COP		Btu/hW	N/A	10.95
SEER			18	18
HSPF			N/A	10
Application Area		m^2	27–42	27–42
Model – Indoor Unit			DLF4AH24K1A	DLF4HH24K1A
Indoor Unit	Fan Type		Cross–flow	Cross–flow
	Fan Diameter Length (DXL)	inch	ϕ3.86x30	ϕ3.86x30
	Cooling Speed (S/H/M/L)	r/min	1500/1200/1050/900	1500/1200/1050/900
	Heating Speed (S/H/M/L)	r/min	N/A	1450/1150/1020/950
	Fan Motor Power Output	W	260	260
	Fan Motor RLA	A	0.24	0.24
	Fan Motor Capacitor	μF	N/A	N/A
	Evaporator Form	W	Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube
	Evaporator Pipe Diameter	inch	ϕ0.27	ϕ0.27
	Evaporator Row–fin Gap	inch	2–0.06	2–0.06
	Evaporator Coil Length (LxDxW)	inch	30x1x15.5	30x1x15.5
	Swing Motor Model		MP35XX	MP35XX
	Swing Motor Power Output	W	3	3
	Fuse Current	A	3.15	3.15
	Sound Pressure Level (S/H/M/L)	dB (A)	53/45/41/37	53/45/41/37
	Sound Power Level (S/H/M/L)	dB (A)	63/55/51/47	63/55/51/47
	Dimension (WxHxD)	inch	39.7X12.4X8.6	39.7X12.4X8.6
	Dimension of Carton Box (WxHxD)	inch	42.2X15.5X12.3	42.2X15.5X12.3
	Dimension of Package (WxHxD)	inch	42.4X15.7X12.9	42.4X15.7X12.9
	Net Weight	lb	35.28	35.28
	Gross Weight	lb	46.305	46.305

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4AV24K1A	DLC4HV24K1A
Compressor	Manufacturer		Mitsubishi	Mitsubishi
	Model		SNB150FGAMC	SNB150FGAMC
	Oil		FV50S–PVE	FV50S–PVE
	Type		Rotary	Rotary
	L.R.A.	A	18.5	18.5
	R.L.A.	A	4.9	4.9
	Power Input	W	1420	1420
	Overload Protector		INT11L–6578	INT11L–6578
Throttling Method			Electronic Expansion Valve	Electronic Expansion Valve
Set Temperature Range		°F	61 ~ 86	61 ~ 86
Cooling Operation Ambient Temperature Range		°F	5 ~ 109.0	5 ~ 109.0
Heating Operation Ambient Temperature Range		°F	N/A	19.4 – 75.0
Condenser	Form		Aluminum Fin–copper Tube	Aluminum Fin–copper Tube
	Pipe Diameter	inch	ϕ0.27	ϕ0.27
	Rows–Fin Gap	inch	2–0.05	2–0.05
	Coil Length (LxDxW)	inch	38x1.5x29	38x1.5x29
Fan Motor	Speed	rpm	800	800
	Output of Fan Motor	W	90	90
	R.L.A.	A	1.1	1.1
	Capacitor	μF	4	4
Air Flow Volume of Outdoor Unit		CFM	2354	2354
Fan	Type		Axial Flow	Axial Flow
	Diameter	inch	21.732	21.732
Defrosting Method			N/A	N/A
Climate Type			T1	T1
Isolation			I	I
Moisture Protection			IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side		Mpa	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side		Mpa	2.5	2.5
Sound Pressure Level (H/M/L)		DB (A)	56/–/–	56/–/–
Sound Power Level (H/M/L)		DB (A)	66/–/–	66/–/–
Dimensions (WxHxD)		inch	38.6x31.1x16.8	38.6x31.1x16.8
Dimensions of Carton Box (WxHxD)		inch	42.5x19x33	42.5x19x33
Dimensions of Package (WxHxD)		inch	42.6x19x33.7	42.6x19x33.7
Net Weight / Gross Weight		Lbs.	119 / 132	119 / 132
Refrigerant	Name of Refrigerant		R410A	R410A
	Weight	Oz.	56.448	56.448
Connection Pipe	Length	inch	25	25
	Gas Additional Charge	Oz/ft	0.2	0.2
	Liquid Pipe Outer Diameter	inch	1/4	1/4
	Gas Pipe Outer Diameter	inch	5/8	5/8
Max. Interunit height Difference		Ft.	33	33
Max. Interunit Piping Length		Ft.	82	82
* The above data is subject to change without notice. Please refer to the nameplate of the unit.				

PRODUCT SPECIFICATIONS (Cont.)

Model			DLF4HH30K1A	DLF4HH36K1A
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity (Min – Max)		Btu/h	28000 (9500–30000)	33600 (7400–36000)
Heating Capacity (Min. – Max)		Btu/h	28400 (10000–33000)	34600 (1500–36000)
Cooling Power Input (Min. – Max.)		W	2780 (350–3400)	3650 (450–3800)
Heating Power Input (Min. – Max.)		W	2870 (450–3300)	3560 (560–3700)
Cooling Current Input		A	12.1	16.6
Heating Current Input		A	12.5	9.21
Rated Input		W	3475	4000
Rated Current		A	16.7	18.2
Air Flow Volume (S/H/M/L)		CFM	–/706/677/647/–	–/824/706/677/–
Dehumidifying Volume		Pint/h	1.42	1.166
EER		Btu/hW	10.7	9.21
COP		Btu/hW	9.93	9.72
SEER			16	16
HSPF			8.2	8.2
Application Area		m^2	377–550	495–753
Model – Indoor Unit			DLC4HV30K1A	DLC4HH36K1A
Indoor Unit	Fan Type		Cross–flow	Cross–flow
	Fan Diameter Length (DXL)	inch	ϕ4.25x20.58X2	ϕ4.25x20.58X2
	Cooling Speed (SH/H/ML/SL)	r/min	–/1410/1280/1200/–	–1550/1400/1300/–
	Heating Speed (SH/H/ML/SL)	r/min	–/1410/1280/1200/–	–1550/1400/1300/–
	Fan Motor Power Output	W	40	60
	Fan Motor RLA	A	0.4	0.47
	Fan Motor Capacitor	μF	3.5	3.5
	Input of Heater	W	–	–
	Evaporator Form	W	Aluminum Fin–Copper Tube	Aluminum Fin–Copper Tube
	Evaporator Pipe Diameter	inch	ϕ11/40	ϕ11/40
	Evaporator Row–fin Gap	inch	2–0.055	2–0.055
	Evaporator Coil Length (LxDxW)	inch	142.3x1x15	142.3x1x15
	Swing Motor Model		MP24BA	MP24BA
	Swing Motor Power Output	W	2	2
	Fuse Current	A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	–/57/54/46/–	–57/56/53/–
	Sound Power Level (SH/H/M/L/SL)	dB (A)	–/57/54/46/–	–/69/66/63/–
	Dimension (WxHxD)	inch	53.1X12.8X10.0	53.1X12.8X10.0
	Dimension of Carton Box (WxHxD)	inch	56.6X16.5X13.5	56.7X16.6X14.0
	Dimension of Package (WxHxD)	inch	56.7X16.6X14.0	56.7X16.6X14.0
	Net Weight	lb	44.1	44.1
	Gross Weight	lb	59.5	59.5

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4HV30K1A	DLC4HV36K1A
Compressor	Manufacturer		Zhuhai Landa	Mitsubishi
	Model		QXAS–D23ZX090	TNB306FPGMCMC
	Oil		PVE (FV50S)	FV50S
	Type		Rotary	Rotary
	L.R.A.	A	40	67
	R.L.A.	A	12	13.5
	Power Input	W	2450	3010
	Overload Protector		INT11L–6233	CS01F272H01
Throttling Method			Electronic Expansion Valve	Electronic Expansion Valve
Set Temperature Range		°F	61 ~ 86	61 ~ 86
Cooling Operation Ambient Temperature Range		°F	5 ~ 109.0	5 ~ 109.0
Heating Operation Ambient Temperature Range		°F	19.4–75.0	19.4 – 75.0
Condenser	Form		Aluminum Fin–copper Tube	Aluminum Fin–copper Tube
	Pipe Diameter	inch	ϕ01/3	ϕ3/8
	Rows–Fin Gap	inch	2–0.055	2–0.055
	Coil Length (LxDxW)	inch	37.5x1.5x29.4	37x1.7x30
Fan Motor	Speed	rpm	830	900
	Output of Fan Motor	W	90	170
	R.L.A.	A	0.45	0.73
	Capacitor	μF	N/A	N/A
Air Flow Volume of Outdoor Unit		CFM	2354	2589
Fan	Type		Axial Flow	Axial Flow
	Diameter	inch	ϕ21.73	ϕ21.73
Defrosting Method			Automatic Defrosting	Automatic Defrosting
Climate Type			T1	T1
Isolation			I	I
Moisture Protection			IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side		PSI	551	551
Permissible Excessive Operating Pressure for the Suction Side		PSI	174	174
Sound Pressure Level (H/M/L)		DB (A)	62/–/–	65/–/–
Sound Power Level (H/M/L)		DB (A)	72/–/–	75/–/–
Dimensions (WxHxD)		inch	38.6x31.1x16.8	38.6x31.1x16.8
Dimensions of Carton Box (WxHxD)		inch	42.5x19.1x33	42.5x19.1x33
Dimensions of Package (WxHxD)		inch	42.6x19x33.7	42.6x19x33.7
Net Weight / Gross Weight		Lbs.	154 / 163	161 / 170
Refrigerant	Name of Refrigerant		R410A	R410A
	Weight	Oz.	84.7	91.7
Connection Pipe	Length	inch	24.6	24.6
	Gas Additional Charge	Oz/ft	0.5	0.2
	Liquid Pipe Outer Diameter	inch	ϕ1/4	ϕ1/4
	Gas Pipe Outer Diameter	inch	ϕ5/8	ϕ5/8
Max. Interunit height Difference		Ft.	32.8	32.8
Max. Interunit Piping Length		Ft.	98.4	98.4
* The above data is subject to change without notice. Please refer to the nameplate of the unit.				

PRODUCT SPECIFICATIONS (Cont.)

Model			DLF4AH36K1A
Power Supply	Rated Voltage	V~	208/230
	Rated Frequency	Hz	60
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity (Min – Max)		Btu/h	33600 (7400–36000)
Heating Capacity (Min. – Max)		Btu/h	N/A
Cooling Power Input (Min. – Max.)		W	3650 (410–3800)
Heating Power Input (Min. – Max.)		W	N/A
Cooling Current Input		A	15.9
Heating Current Input		A	N/A
Rated Input		W	4200
Rated Current		A	18.2
Air Flow Volume (S/H/M/L)		CFM	–/824/706/677/–
Dehumidifying Volume		Pint/h	1.66
EER		Btu/hW	9.21
COP		Btu/hW	N/A
SEER			16
HSPF			N/A
Application Area		m^2	495–753
Model – Indoor Unit			DLF4AH36K1A
Indoor Unit	Fan Type		Cross–flow
	Fan Diameter Length (DXL)	inch	ϕ4.25x20.58X2
	Cooling Speed (SH/H/ML/SL)	r/min	–/1550/1400/12300/–
	Heating Speed (SH/H/ML/SL)	r/min	N/A
	Fan Motor Power Output	W	60
	Fan Motor RLA	A	0.47
	Fan Motor Capacitor	μF	3.5
	Input of Heater	W	N/A
	Evaporator Form	W	Aluminum Fin–Copper Tube
	Evaporator Pipe Diameter	inch	ϕ11/40
	Evaporator Row–fin Gap	inch	2–0.055
	Evaporator Coil Length (LxDxW)	inch	142.3x1x15
	Swing Motor Model		MP24BA
	Swing Motor Power Output	W	2
	Fuse Current	A	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	–/59/56/53/–
	Sound Power Level (SH/H/M/L/SL)	dB (A)	–/69/66/63/–
	Dimension (WxHxD)	inch	53.1X12.8X10.0
	Dimension of Carton Box (WxHxD)	inch	56.6X16.5X13.5
	Dimension of Package (WxHxD)	inch	56.7X16.6X14.0
	Net Weight	lb	44.1
	Gross Weight	lb	59.5

PRODUCT SPECIFICATIONS (Cont.)

Model – Outdoor Unit			DLC4AV36K1A
Compressor	Manufacturer		Mitsubishi
	Model		TNB306FPGMCMC
	Oil		FV50S
	Type		Rotary
	L.R.A.	A	67
	R.L.A.	A	13.5
	Power Input	W	3010
	Overload Protector		CS01F272H01
Throttling Method			Capillary
Set Temperature Range		°F	61 ~ 86
Cooling Operation Ambient Temperature Range		°F	5 ~ 109.0
Heating Operation Ambient Temperature Range		°F	19.4 – 75.0
Condenser	Form		Aluminum Fin–copper Tube
	Pipe Diameter	inch	ϕ3/8
	Rows–Fin Gap	inch	2–0.055
	Coil Length (LxDxW)	inch	37x1.7x30
Fan Motor	Speed	rpm	900
	Output of Fan Motor	W	170
	R.L.A.	A	0.73
	Capacitor	μF	N/A
Air Flow Volume of Outdoor Unit		CFM	2589
Fan	Type		Axial Flow
	Diameter	inch	ϕ21.73
Defrosting Method			N/A
Climate Type			T1
Isolation			I
Moisture Protection			IP24
Permissible Excessive Operating Pressure for the Discharge Side		PSI	551
Permissible Excessive Operating Pressure for the Suction Side		PSI	174
Sound Pressure Level (H/M/L)		DB (A)	65/–/–
Sound Power Level (H/M/L)		DB (A)	75/–/–
Dimensions (WxHxD)		inch	38.6x31.1x16.7
Dimensions of Carton Box (WxHxD)		inch	42.5x19.1x33.1
Dimensions of Package (WxHxD)		inch	42.6x19.2x33.6
Net Weight / Gross Weight		Lbs.	161 / 170
Refrigerant	Name of Refrigerant		R410A
	Weight	Oz.	91.7
Connection Pipe	Length	inch	24.6
	Gas Additional Charge	Oz/ft	0.2
	Liquid Pipe Outer Diameter	inch	ϕ1/4
	Gas Pipe Outer Diameter	inch	ϕ5/8
Max. Interunit height Difference		Ft.	32.8
Max. Interunit Piping Length		Ft.	98.4
* The above data is subject to change without notice. Please refer to the nameplate of the unit.			

MODEL NOMENCLATURE

MODEL SERIES	D	L	C	4	A	V	0	9	J	1	A
Position Number	1	2	3	4	5	6	7	8	9	10	11
DLC = Outdoor DLF = Indoor	**Outdoor/Indoor**										
4AV = AC Outdoor 4AH = AC Indoor 4HV = HP Outdoor 4HH = HP Indoor						**Type**					
09 = 9k BTU 12 = 12k BTU 18 = 18k BTU 24 = 24k BTU 30 = 30k BTU 36 = 36k BTU								**Size**			
J = 115–1–60 K = 208/230–1–60									**Voltage**		
1A											**Factory Designation**

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org .

SERIAL NUMBER NOMENCLATURE

Position Number	1	2	3	4	5	6	7	8	9	10
Serial Number	V	1	0	2	2	1	2	3	4	5
Year										
Week										
Sequential Digits Unique for Each Factory										

STANDARD FEATURES AND ACCESSORIES

Ease of Operation	
Mounting Brackets	**S**
Low Voltage Connections	S
Comfort Features	
Microprocessor Controls	S
Wireless Remote Control	S
Rapid Cooling/Heating	S
Automatic Air Sweep	S
Cold Blow Prevention	S
Continuous Fan	S
Auto Restart Feature	S
Memory Function	S
Auto Changeover	S
Energy Saving Features	
Inverter Driven Compressor	S
Sleep Mode	S
24 Hour Stop/Start Timer*	S
Safety and Reliability	
Indoor Unit Freeze Protection	S
3 Minute Compressor Time Delay	S
High Compressor Discharge Temperature	S
Low Voltage Protection	S
Compressor Overload Protection	S
Compressor Over Current Protection	S
IPM Module Protection	S
Ease of Service and Maintenance	
Cleanable Filters	S
Diagnostic LED's ON Outdoor Board	S
Error Messages Displayed Front Panel	S
Application Flexibility	
Condensate Pump	A
Low Ambient Heating and Cooling on most models	A
Standard Warranty	
7 Year Compressor Limited Warranty	S
5 Year Parts Limited Warranty	S
Extended Warranty	
6 –10 Year Compressor Only	O
2 – 6 Year Parts Only	O
2 – 6 Year Parts Only; 1 – 6 Year Labor	O
2 – 6 Year Parts Only; 6 – 10 Year Compressor Only; 1 – 6 Year Labor	O

Legend
S = Standard
A = Accessory
O = Optional
* Sizes 09, 18, & 24K have a clock.

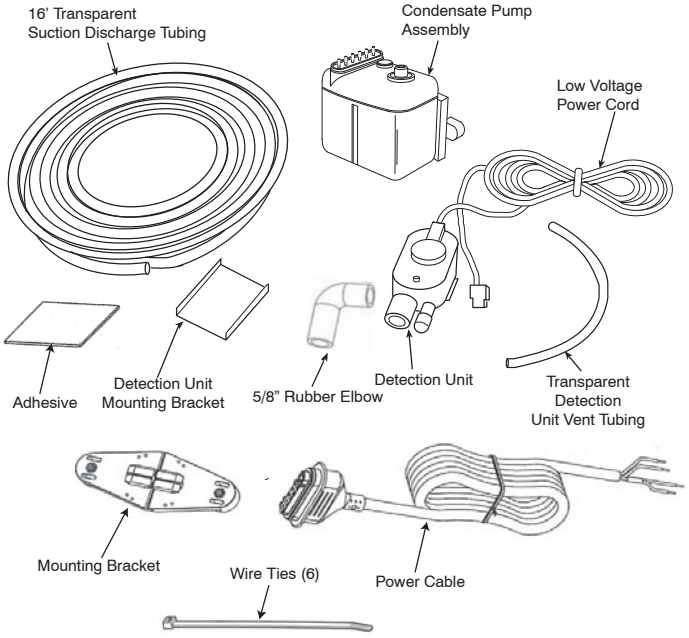


Figure 1 — Accessory Condensate Pump Kit

Table 1 – Accessory Condensate Pump Kit Contents

Item	Qty.
16 ft Transparent Suction/Discharge Tubing	1
Condensate Pump Assembly	1
Low voltage Power Cord	1
Transparent Detection Unit Vent Tubing	1
Power Cable	1
Wire Ties	6
Wall Mount Bracket	1
Adhesive	1
Detection Unit Mounting Bracket	1
⅝–in Rubber Elbow	1
Detection Unit	1

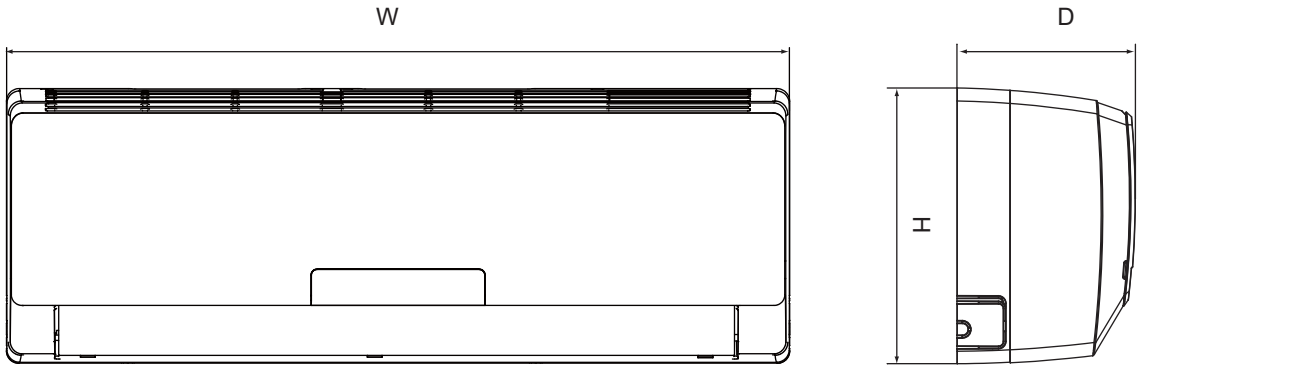
⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. Ensure power is disconnected to the fan coil unit. On some systems both the fan coil and the outdoor unit may be on the same disconnect. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

DIMENSIONS – INDOOR

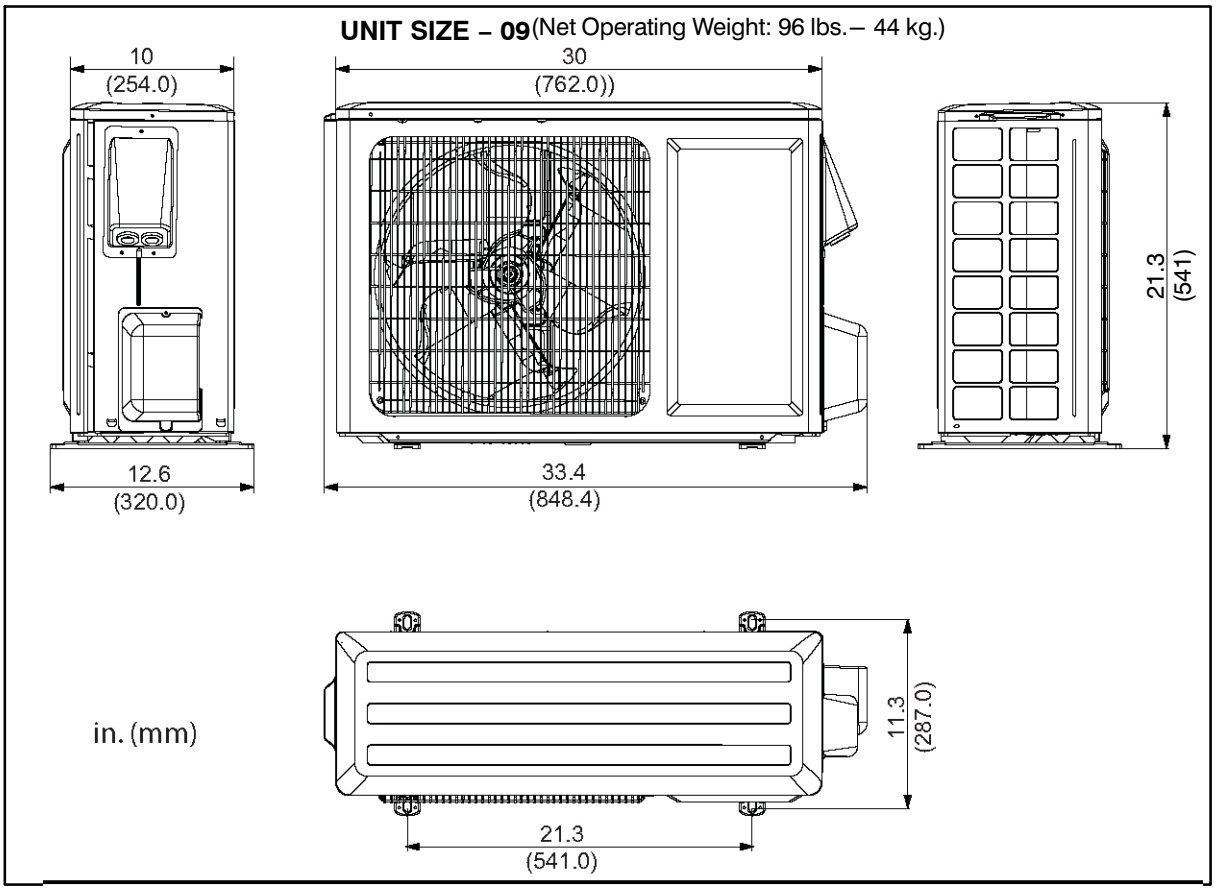


A12377

Unit Size	W In. (mm)	H In. (mm)	D In. (mm)	Net Operating Weight Lbs. (Kg)
9k	33.3 (846)	10.7 (272)	7.1 (180)	29 (13)
12k	33.3 (846)	10.7 (272)	7.1 (180)	29 (13)
18k	37.0 (940)	11.7 (297)	7.9 (201)	29 (13)
24k	39.7 (1008)	12.4 (315)	8.6 (218)	35 (16)
30k	53.1 (1349)	12.8 (325)	10.0 (54)	44.1 (20.0)
36k	53.1 (1349)	12.8 (325)	10.0 (54)	44.1 (20.0)

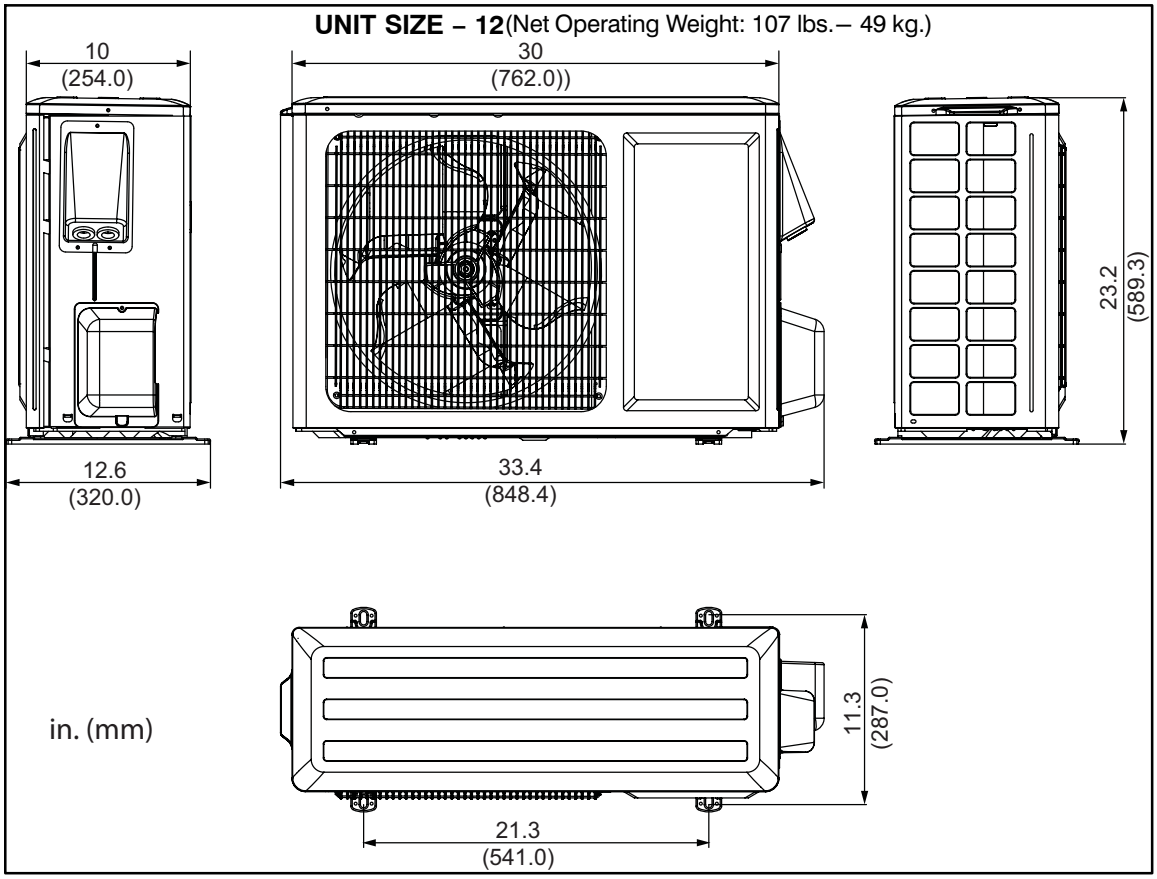
DIMENSIONS – OUTDOOR

UNIT SIZE – 09 (Net Operating Weight: 96 lbs.– 44 kg.)



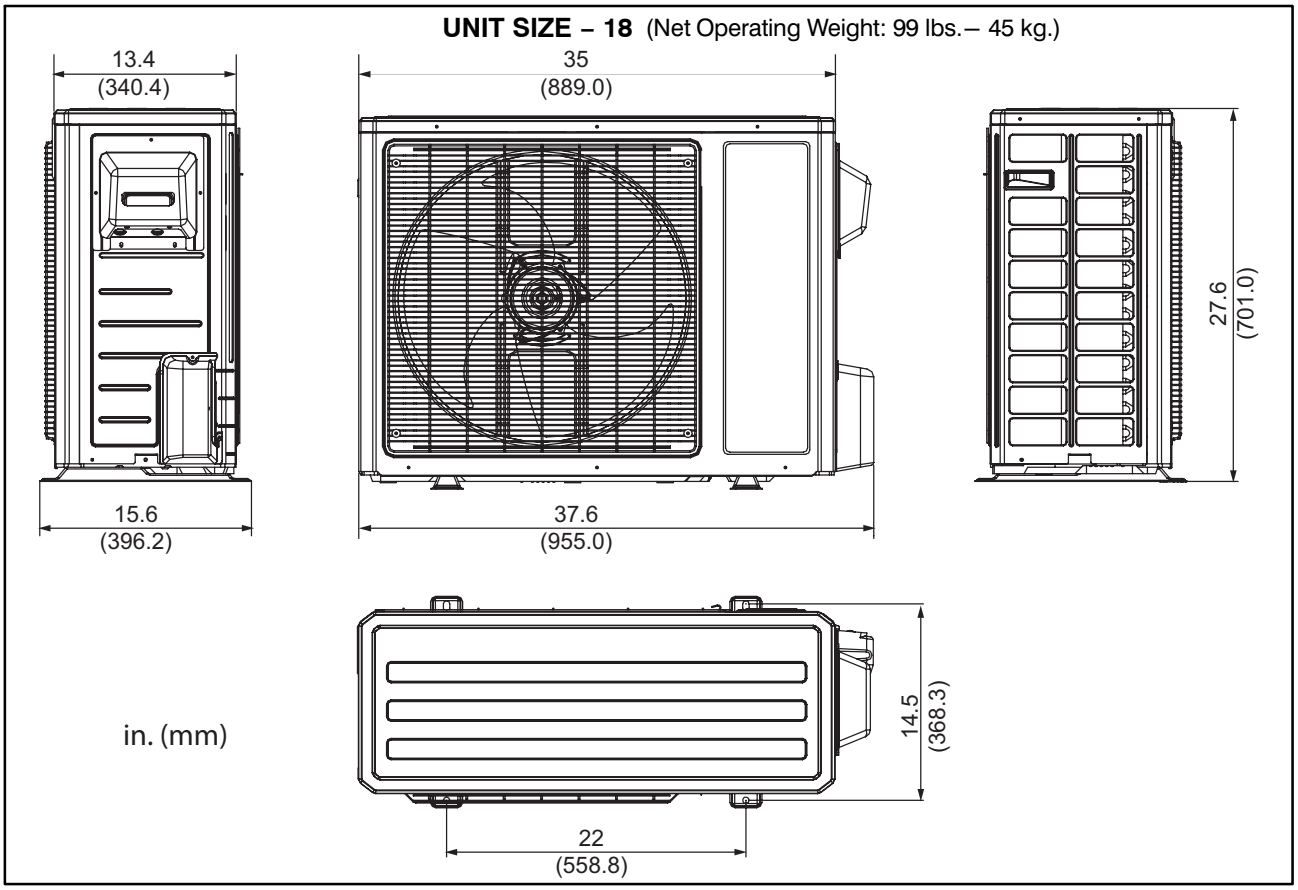
A12380

UNIT SIZE – 12 (Net Operating Weight: 107 lbs.– 49 kg.)



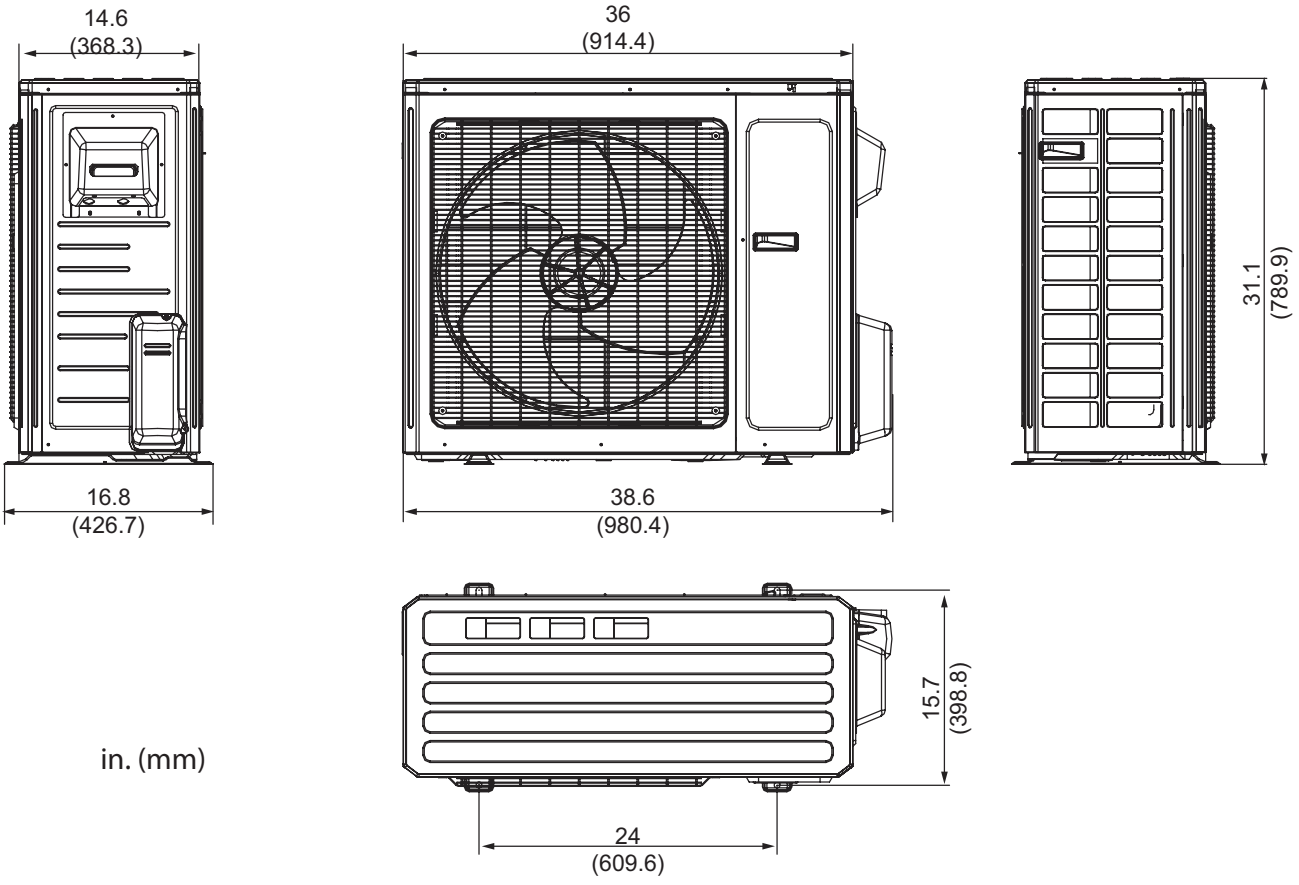
A12381

UNIT SIZE – 18 (Net Operating Weight: 99 lbs.– 45 kg.)



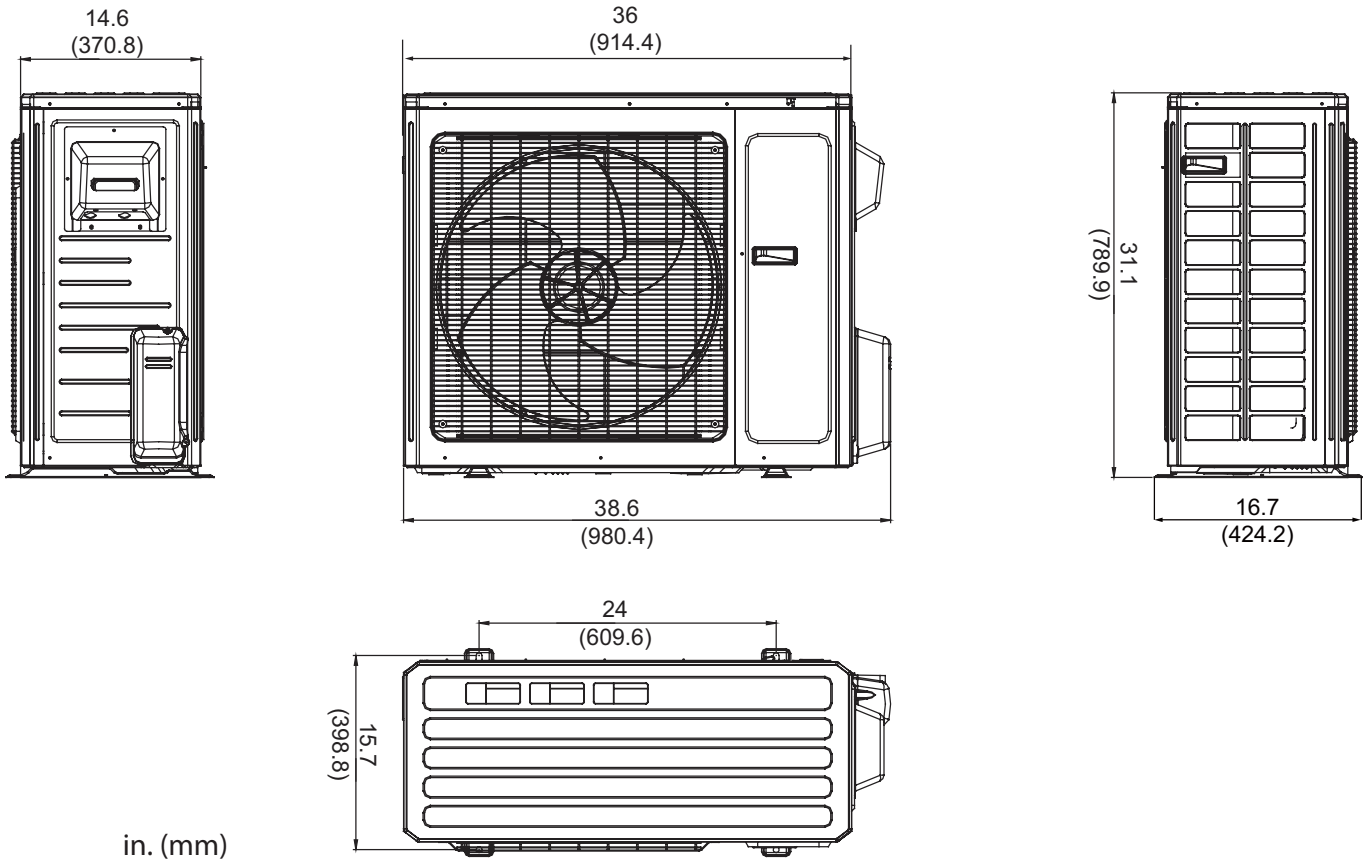
A12382

UNIT SIZE – 24 (Net Operating Weight: 121 lbs.– 55 kg.)



A12383

UNIT SIZE – 30 (Net Operating Weight: 154 lbs – 70 kg.)
36 (Net Operating Weight: 161 lbs – 73 kg.)



in. (mm)

A12379

CLEARANCES

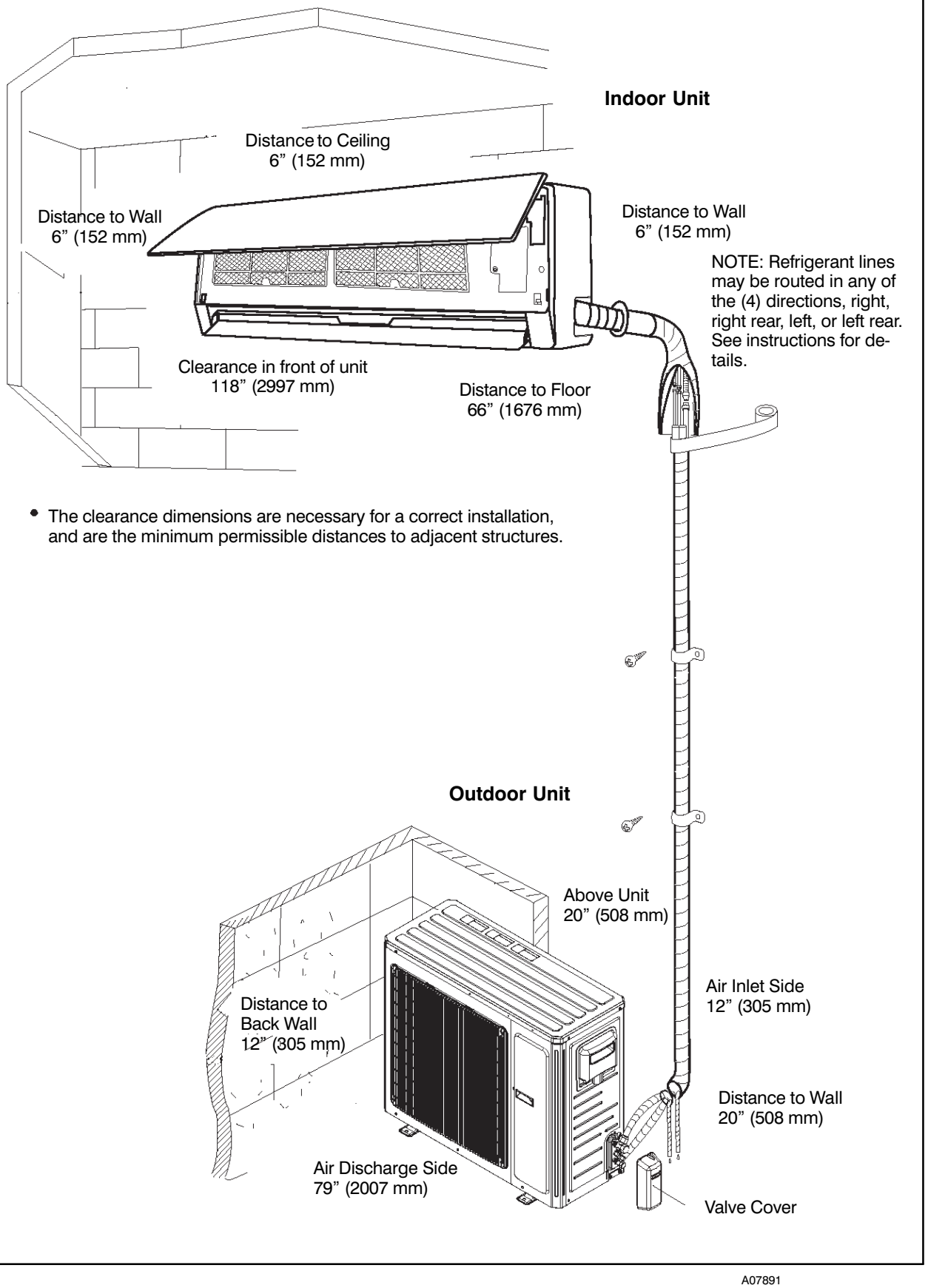


Figure 2 — Unit clearance

SYSTEM OPERATING ENVELOPES

Supply Voltage	115-1-60 AC		208/230-1-60 AC				
Model Size	9k	12k	12k	18k	24k	30k	36k
Indoor Operating Range (A/C and HP) °F (°C)	61 - 86 (16 - 30)						
Cooling Ambient Operating Range (A/C) °F (°C)	55 - 115 (13 - 46)	55 - 115 (13 - 46)	5 - 109 (-15 - 43)	5 - 109 (-15 - 43)	5 - 109 (-15 - 43)	N/A	64 - 109 (18 - 43)
Cooling Ambient Operating Range (HP) °F (°C)	55 - 115 (13 - 46)	55 - 115 (13 - 46)	5 - 109 (-15 - 43)	5 - 109 (-15 - 43)	5 - 109 (-15 - 43)	5 - 109 (-15 - 43)	64 - 109 (18 - 43)
Heating Ambient Operating Range (HP) °F (°C)	5 - 75 (-15 - 24)	5 - 75 (-15 - 24)	5 - 75 (-15 - 24)	19.4 - 75 (-7 - 24)	19.4 - 75 (-7 - 24)	19.4 - 75 (-7 - 24)	19.4 - 75 (-7 - 24)
Figure	3		4	5			6

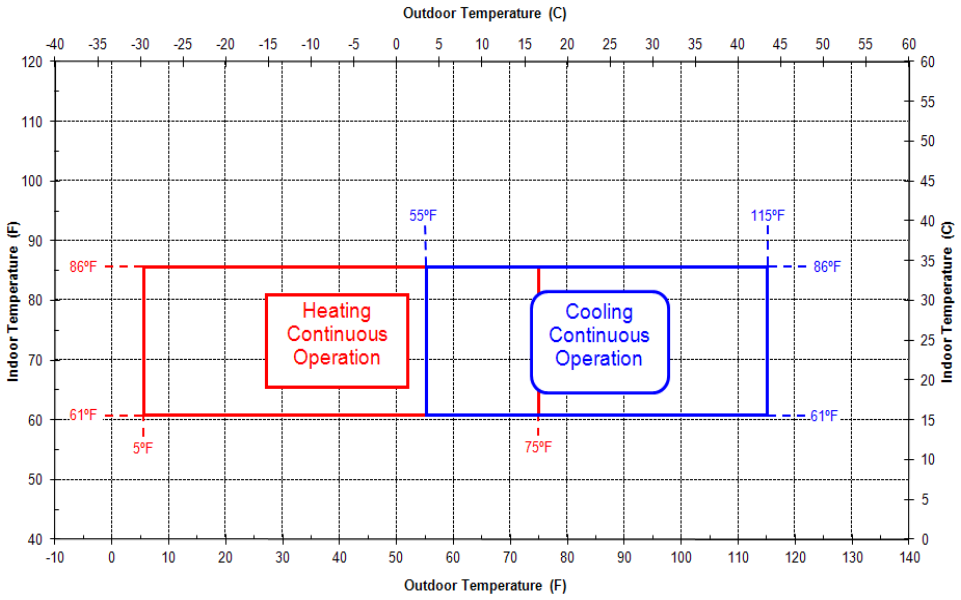


Figure 3 — 9k / 12k 115V System Operating Envelopes

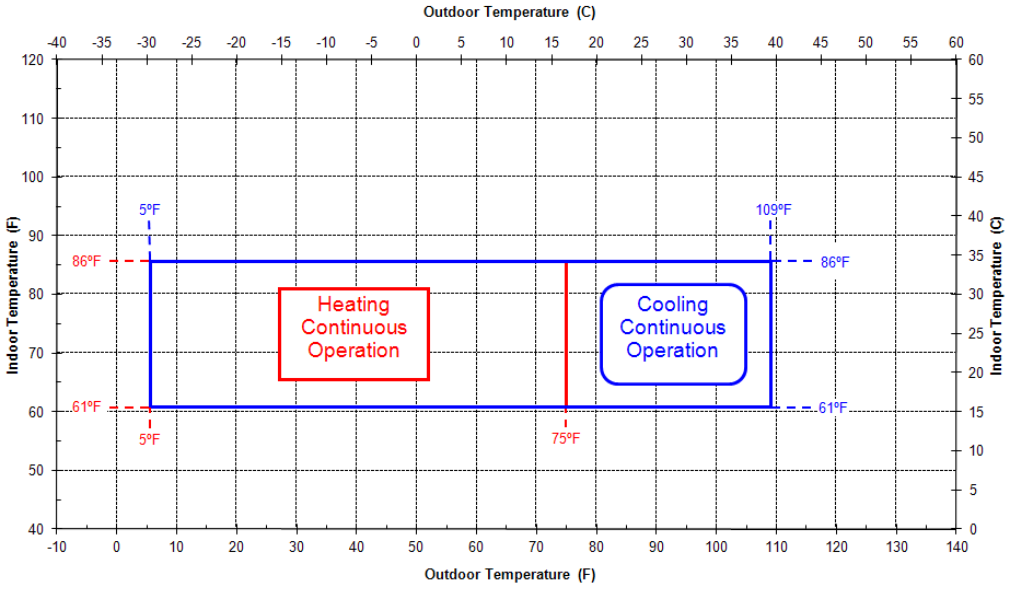


Figure 4 — 12k 230V System Operating Envelopes

SYSTEM OPERATING ENVELOPES (CONT.)

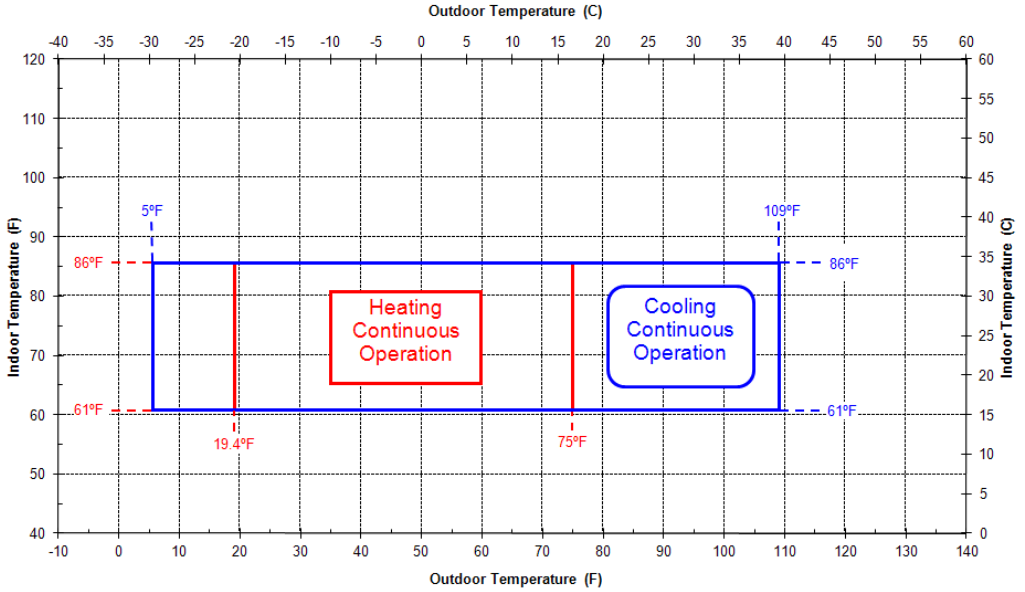


Figure 5 — 18k, 24k, and 30k 230V System Operating Envelopes

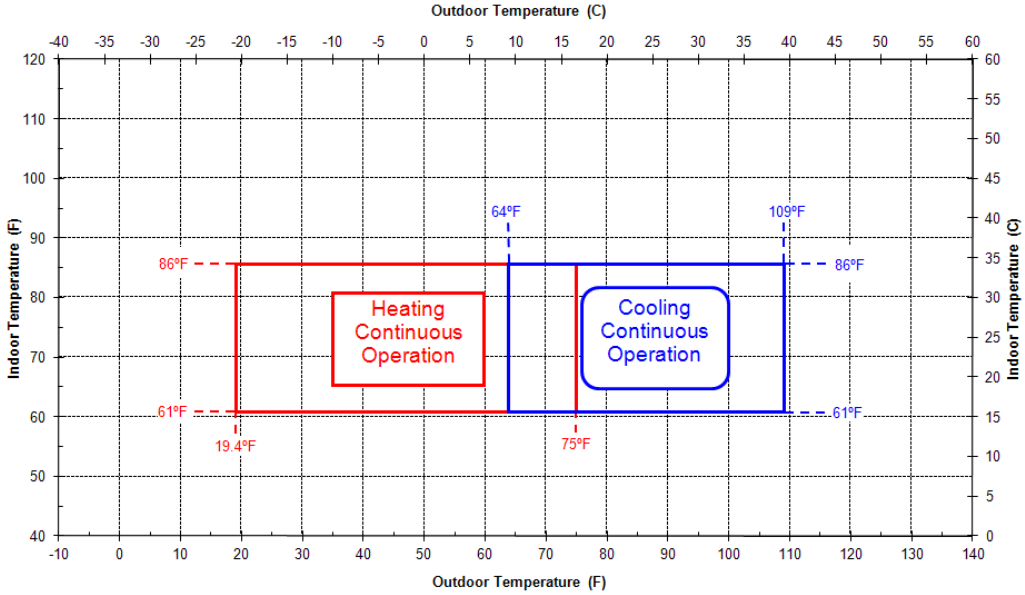


Figure 6 — 36k 230V System Operating Envelopes

ELECTRICAL DATA

Table 2 – Accessory Condensate Pump Kit Contents

Electrical Data Table													
Unit Size	System Voltage Volts–Ph.–Freq.	Operating Voltage (Min/Max)	Compressor		Outdoor Fan			Indoor Fan				MCA	Max Fuse/CB Amps (MOCP)
			RLA	LRA	FLA	HP	Output Watts	Volts	FLA	HP	Output Watts		
9K	115–1–60	103/127	16.03	33	0.17	0.054	30	115 V–AC	0.38	0.056	20	22	35
12K	115–1–60	103/127	17.53	33	0.17	0.058	30	115 V–AC	0.38	0.056	20	23	40
12K	208/230–1–60	187/253	6.47	13.8	0.14	0.058	30	208/230 V–AC	0.20	0.056	20	10	15
18K	208/230–1–60	187/253	9.70	13.8	0.32	0.156	60	208/230 V–AC	0.28	0.075	20	13	20
24K	208/230–1–60	187/253	11.04	18.5	1.10	0.224	90	176–375V–DC	0.24	0.068	60	16	25
30K	208/230–1–60	187/253	13.45	40	0.45	0.228	100	208/230 V–AC	0.40	0.106	40	20	30
36K–AC	208/230–1–60	187/253	16.92	67	0.73	0.268	170	208/230 V–AC	0.47	0.114	60	24	35
36K–HP	208/230–1–60	187/253	17.50	67	0.73	0.268	170	208/230 V–AC	0.47	0.114	60	24	40

LEGEND
FLA – Full Load Amps
LRA – Locked Rotor Amps
MCA – Minimum Circuit Amps
RLA – Rated Load Amps
MOCP – Maximum Over Current Protection

WIRING

The main power is supplied to the outdoor unit. The field supplied connecting cable from the outdoor unit to indoor unit consists of four wires and provides the power for the indoor unit as well as the communication signal and ground between the outdoor and indoor unit.

Two wires are high voltage AC power, one is low voltage DC signal and one is a ground wire.

Consult local building codes, NEC (National Electrical Code) or CEC (Canadian Electrical Code) for special requirements.

Voltage drop on the connecting cable should be kept to a minimum. Use cable size and max length below:

18 AWG	50 ft. (16m)
16 AWG	100 ft. (33m)

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

- Use copper conductors only with a minimum 300 volt rating and 2/64 inch thick insulation.

⚠ CAUTION

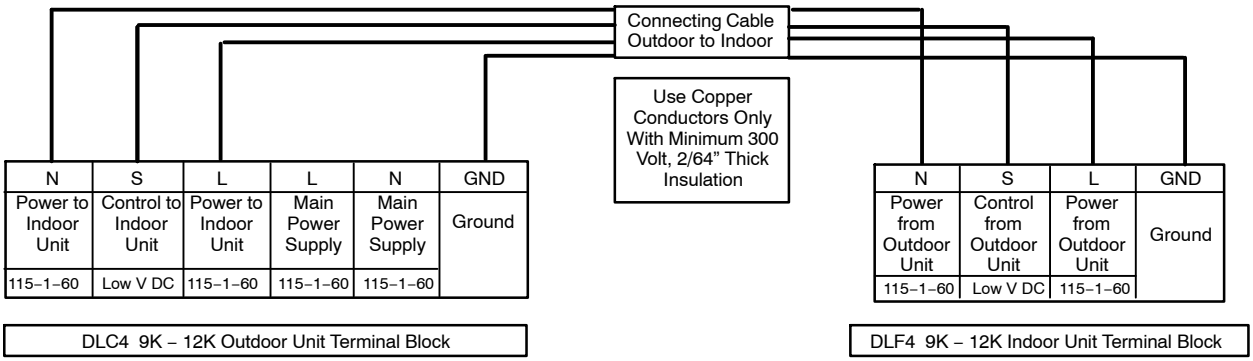
EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

- Be sure to comply with local codes while running wire from indoor unit to outdoor unit.
- Every wire must be connected firmly. Loose wiring may cause terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.
- No wire should be allowed to touch refrigerant tubing, compressor or any moving parts.
- Disconnecting means must be provided and shall be located within sight and readily accessible from the air conditioner.
- Connecting cable with conduit shall be routed through hole in the conduit panel.

CONNECTION DIAGRAMS

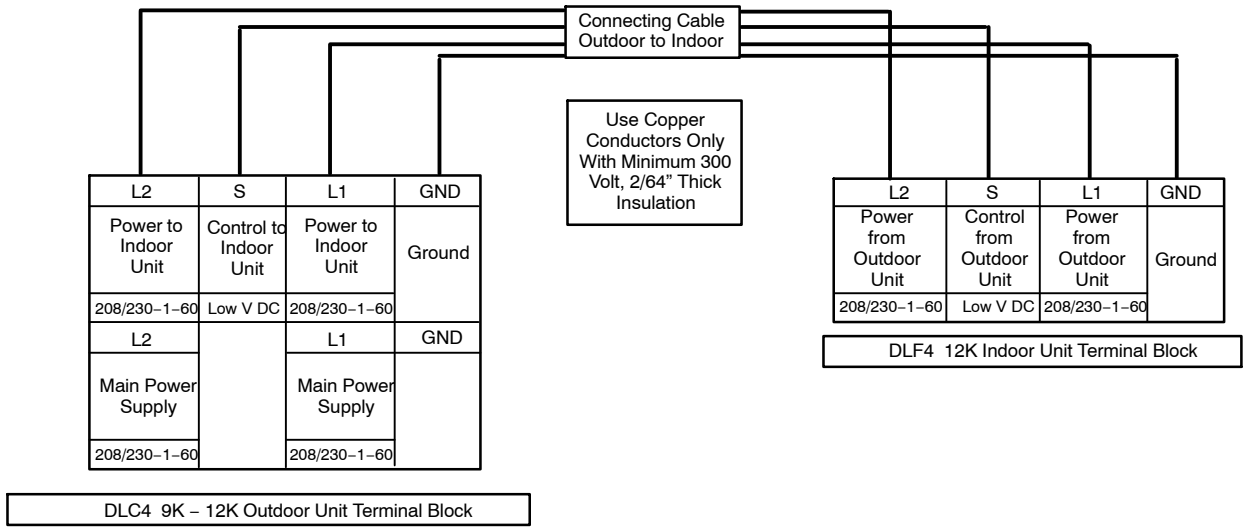
DLC4/DLF4 9K – 12K, 115–1–60 Connection Diagram



DLC4 9K – 12K Outdoor Unit Terminal Block

DLF4 9K – 12K Indoor Unit Terminal Block

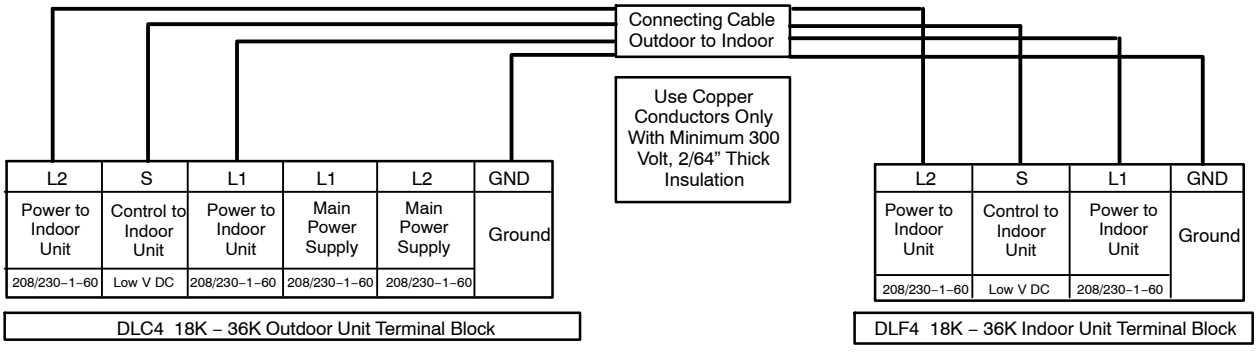
DLC4/DLF4 12K, 208/230–1–60 Connection Diagram



DLF4 12K Indoor Unit Terminal Block

DLC4 9K – 12K Outdoor Unit Terminal Block

DLC4/DLF4 18K – 36K, 208/230–1–60 Connection Diagram



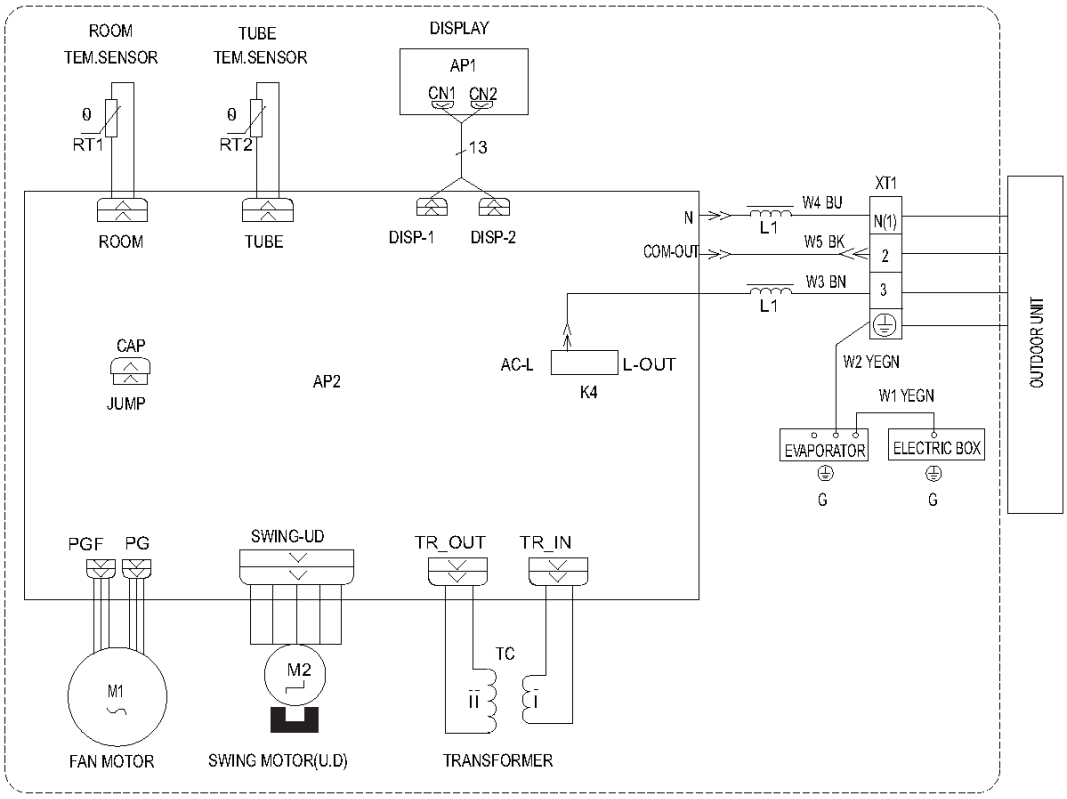
DLC4 18K – 36K Outdoor Unit Terminal Block

DLF4 18K – 36K Indoor Unit Terminal Block

Figure 7 — Connection Diagrams

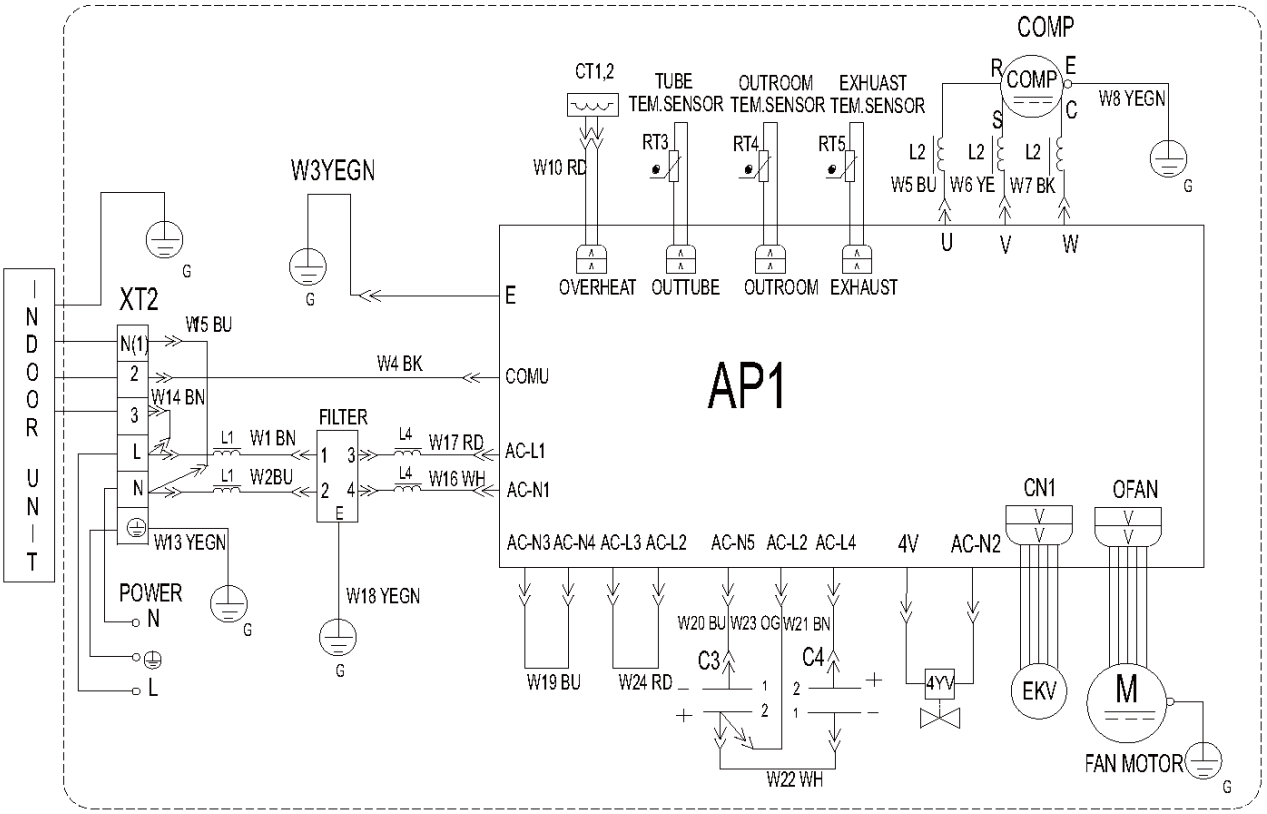
WIRING DIAGRAMS (CONT.)

Symbol	Color Symbol	Symbol	Parts Name
OG	Orange	⏚	Protective Earth
WH	White	COMP	Compressor
YE	Yellow	CT1,2	Overload
RD	Red	4V	4–Way Valve
YEGN	Yellow Green	XT	Terminal Block
BN	Brown		
BU	Blue		
BK	Black		

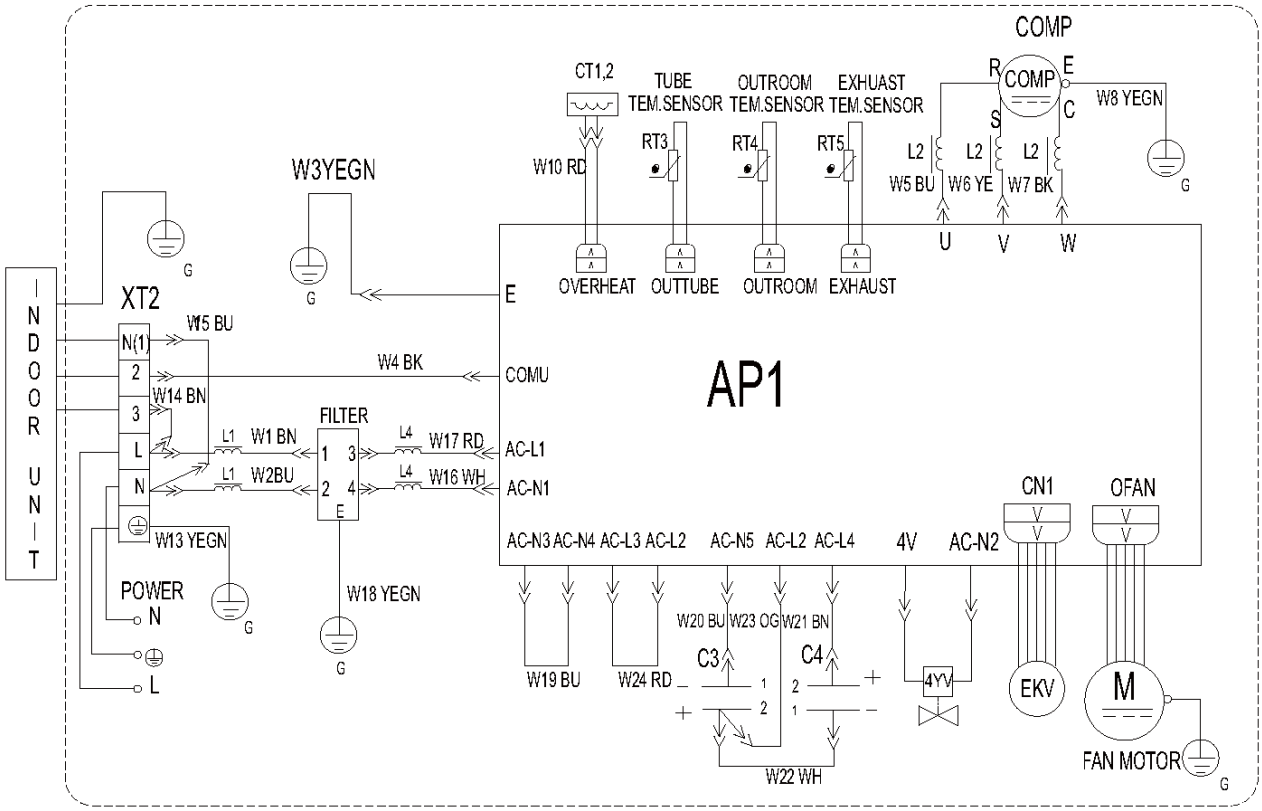


Size 9k and 12k, 115V, Indoor Unit

WIRING DIAGRAMS (CONT.)

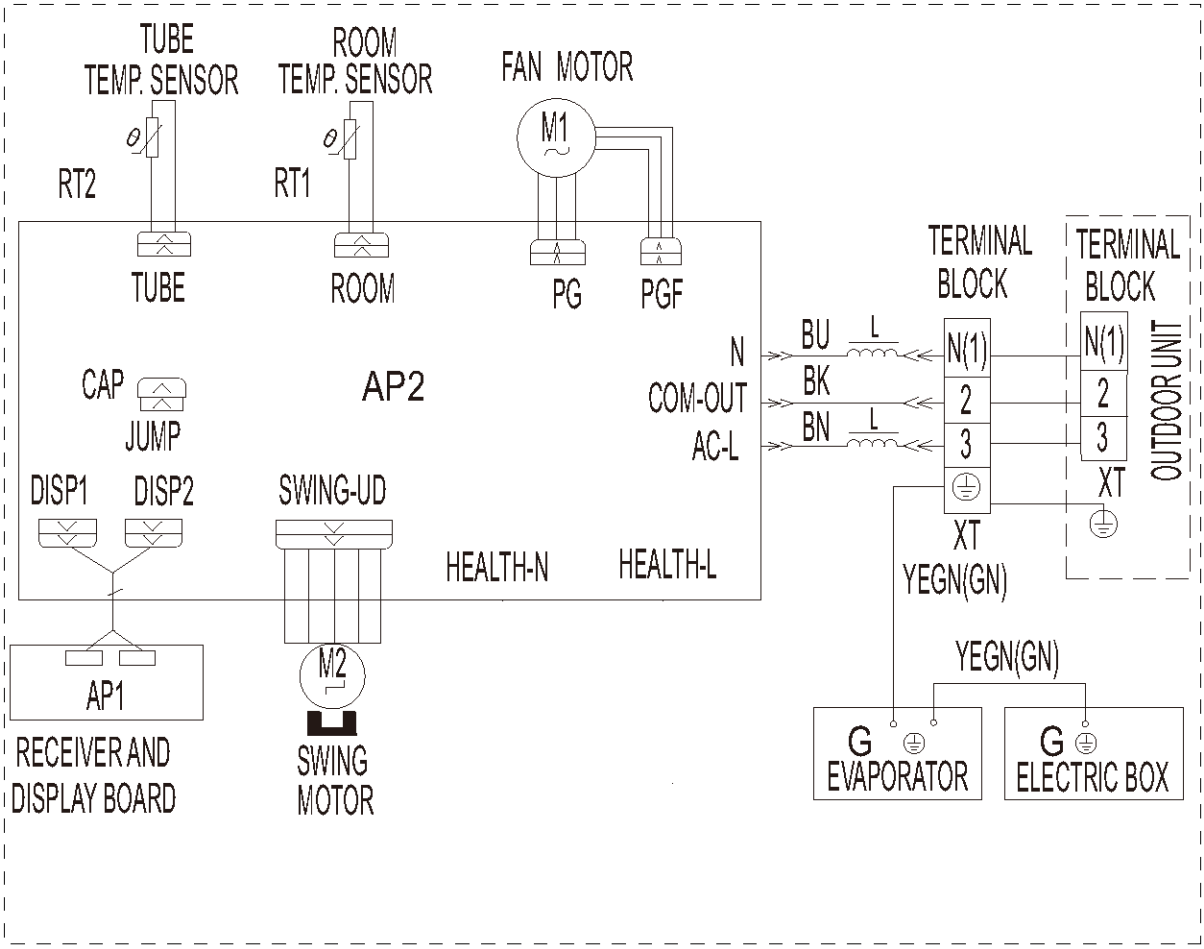


Size 9k and 12k, 115V, AC Outdoor Unit



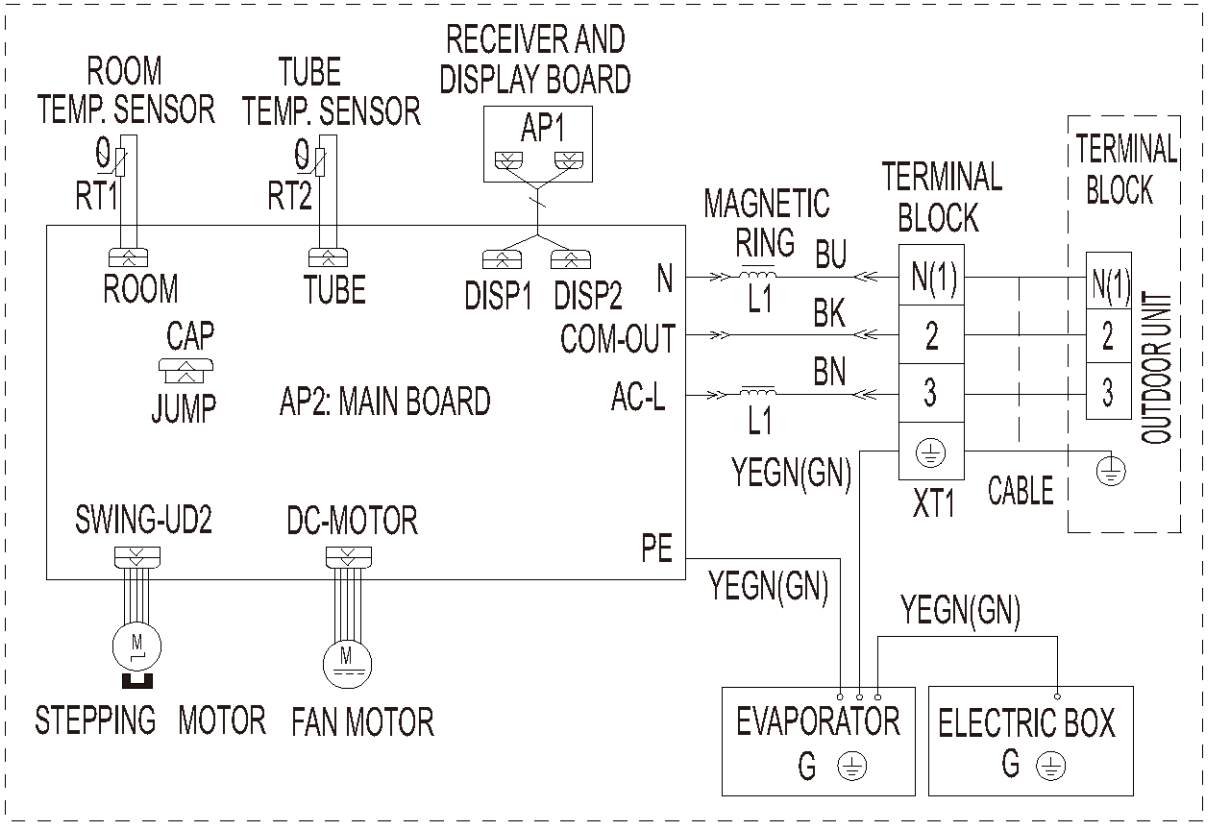
Size 9k and 12k, 115V, HP Outdoor Unit

WIRING DIAGRAMS (CONT.)

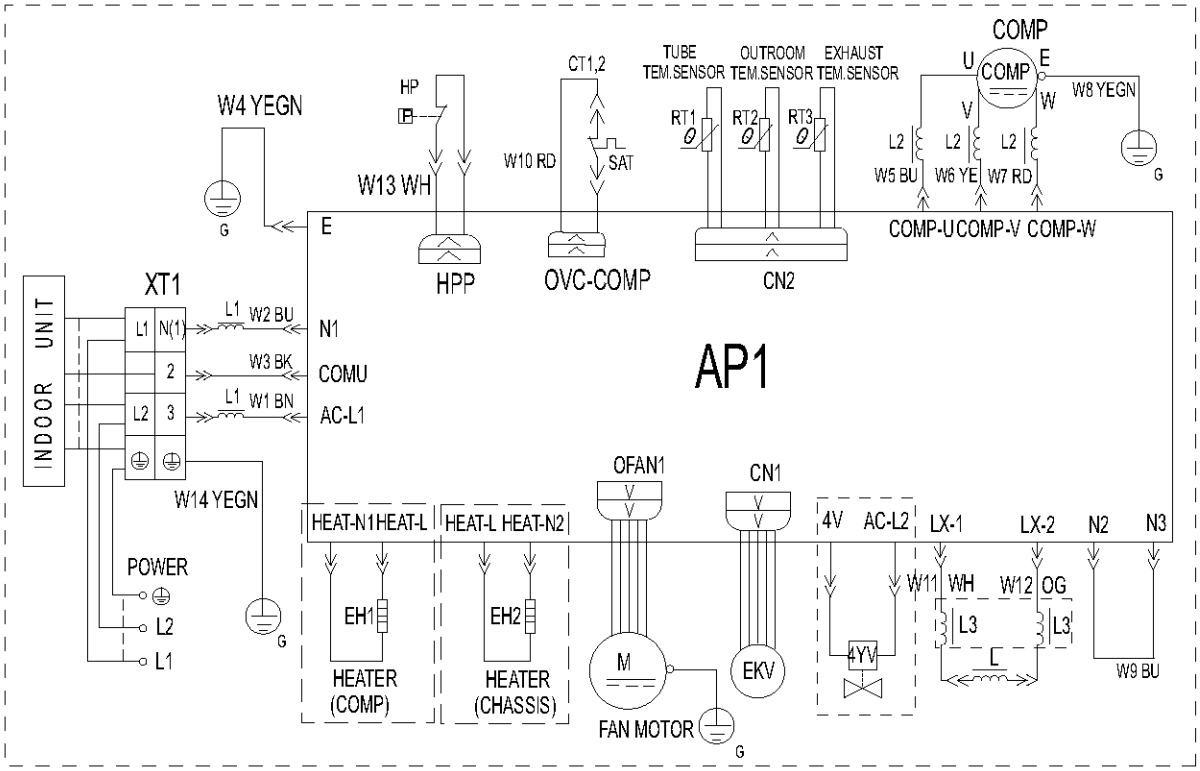


Size 12k and 18k, 230V, Indoor Unit

WIRING DIAGRAMS (CONT.)

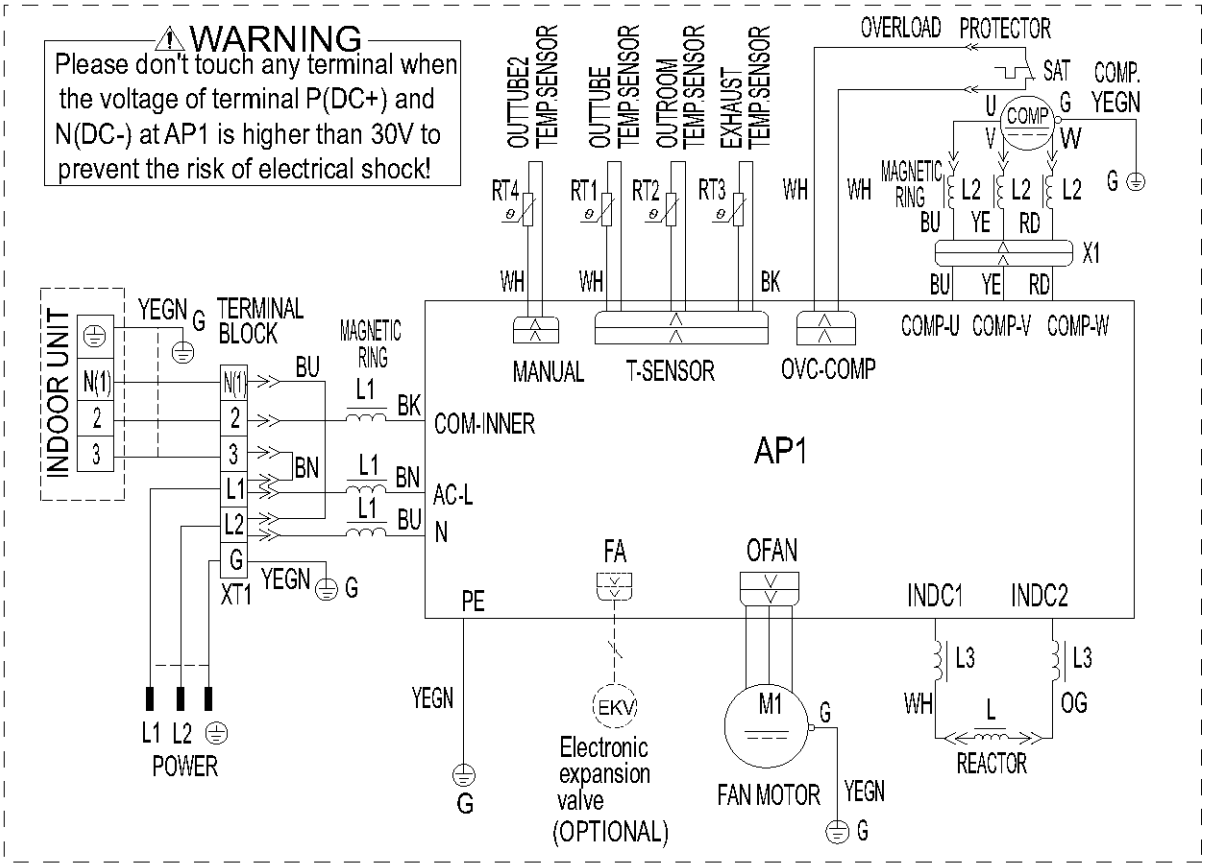


Size 24k, 230V, Indoor Unit

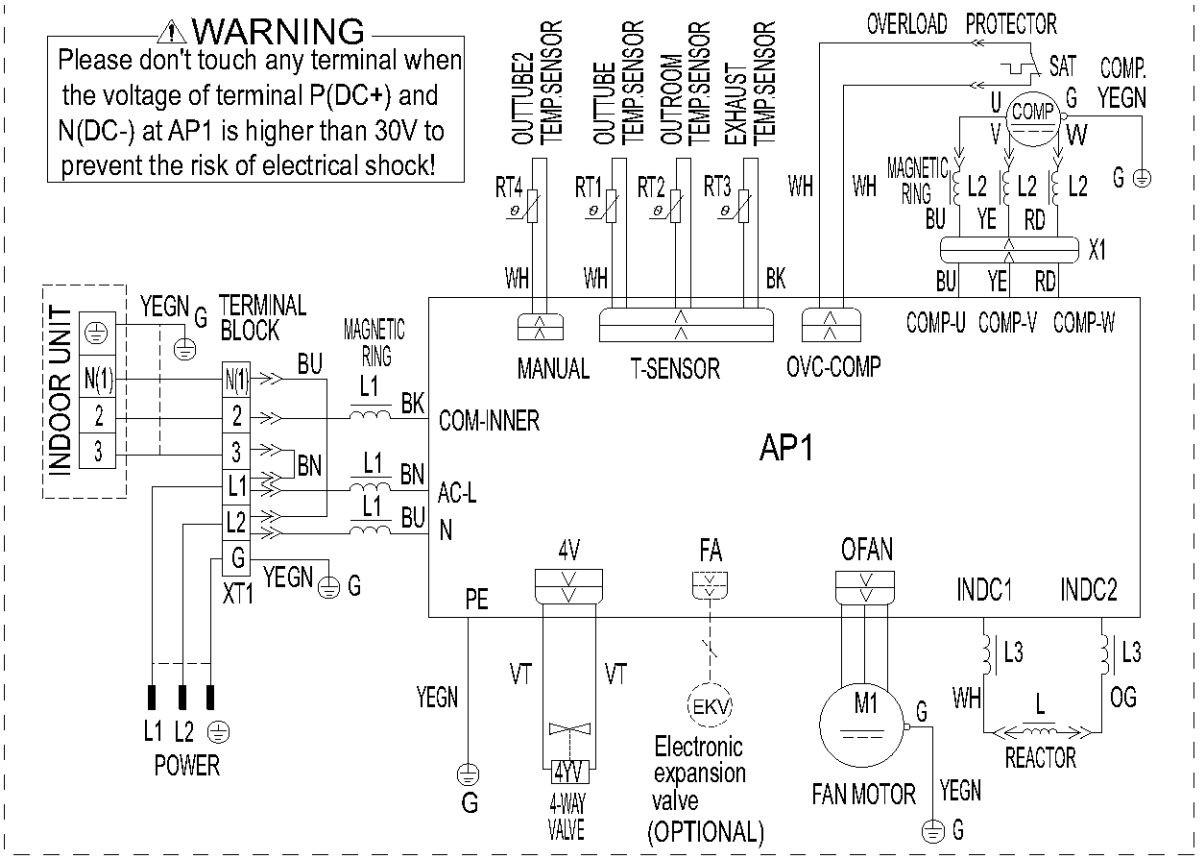


Size 12k, 230V, Outdoor Unit

WIRING DIAGRAMS (CONT.)

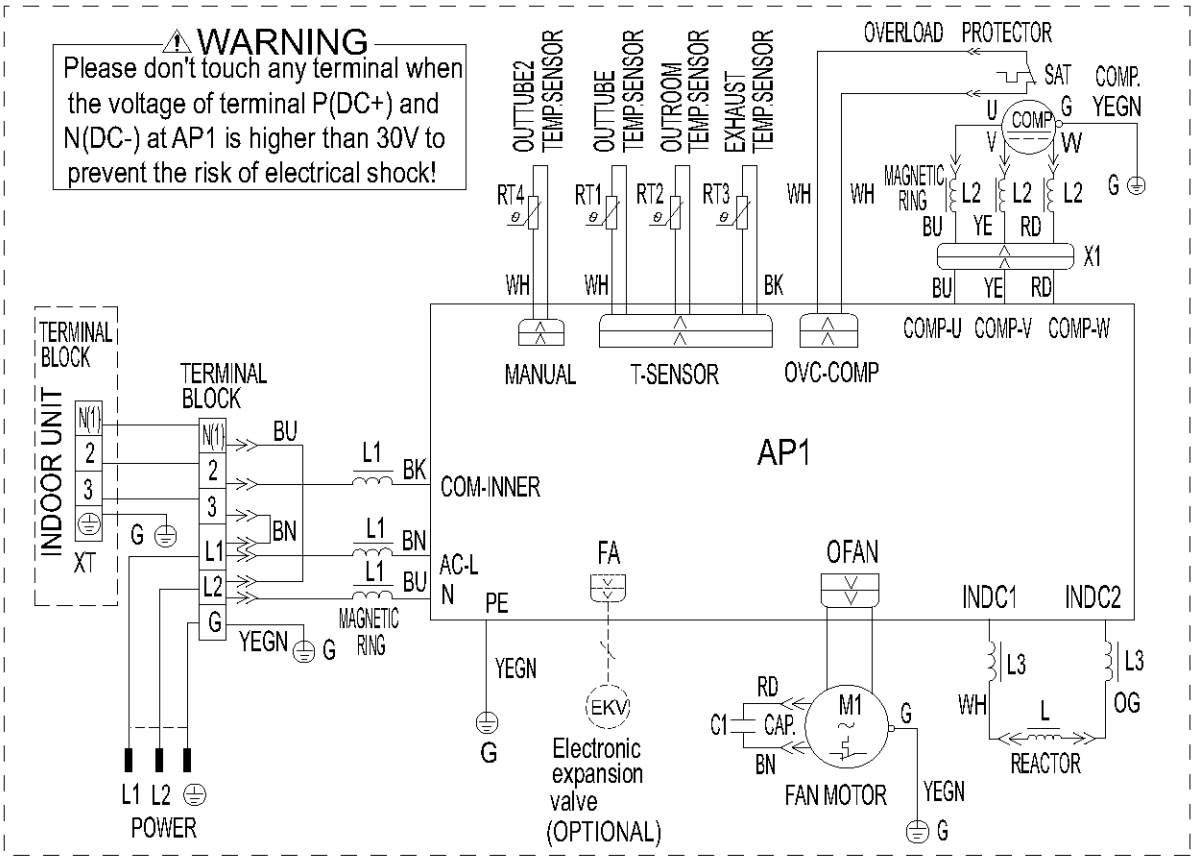


Size 18k, 230V, AC, Outdoor Unit

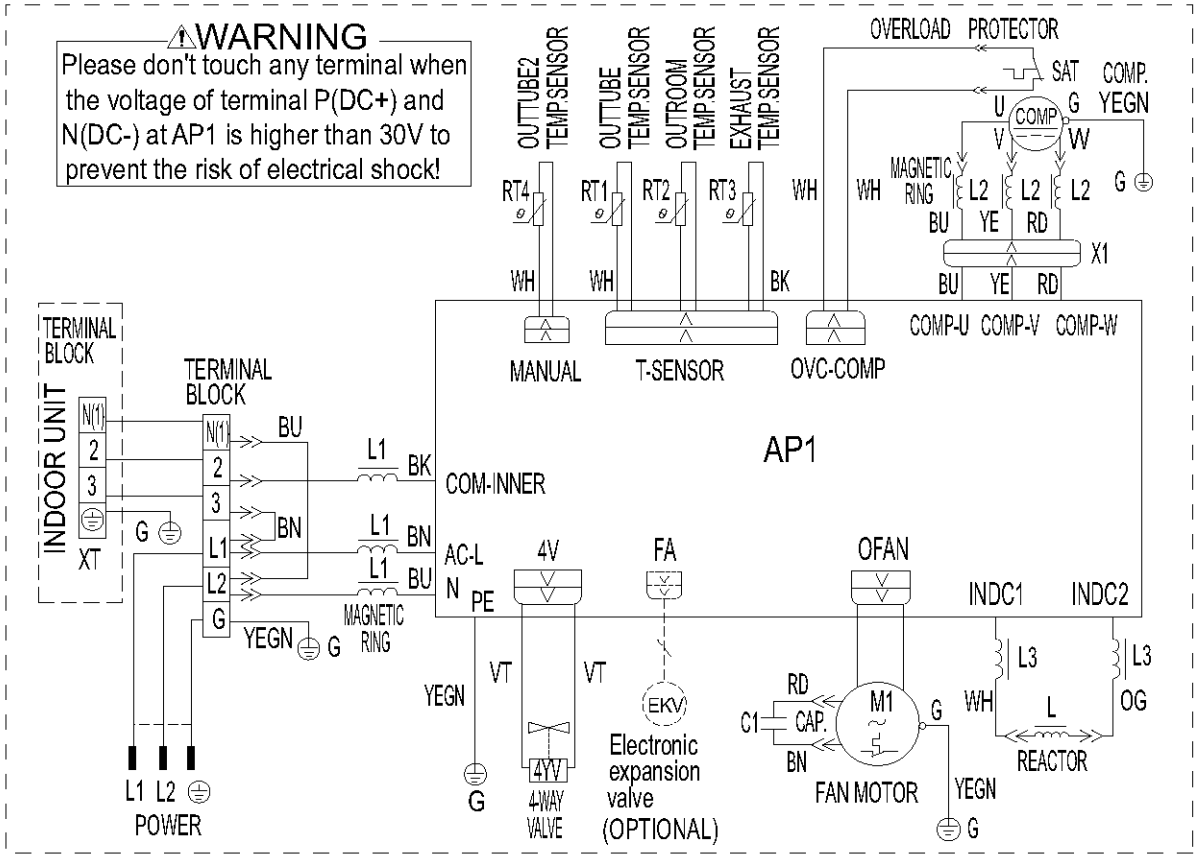


Size 18k, 230V, HP, Outdoor Unit

WIRING DIAGRAMS (CONT.)



Size 24k, 230V, AC, Outdoor Unit



Size 24k, 230V, HP, Outdoor Unit

WIRING DIAGRAMS (CONT.)

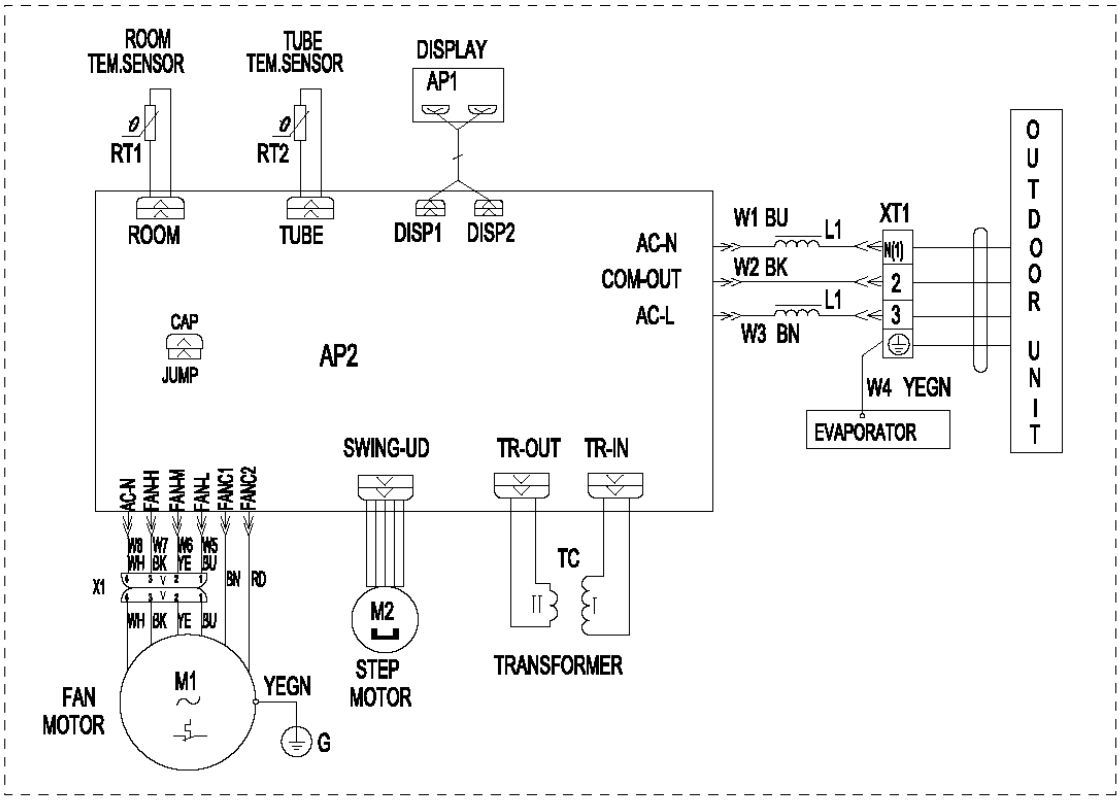
Indoor Unit

Symbo	Part name	Symbol	Color symbol	Symbol	Color symbol
⏚	PROTECTIVE EARTH	**BU**	BLUE	**BN**	BROWN
		YE	YELLOW	**BK**	BLACK
/	/	**RD**	RED	**YEGN**	YELLOW GREEN
/	/	**VT**	VIOLET	**OG**	ORANGE

Outdoor Unit

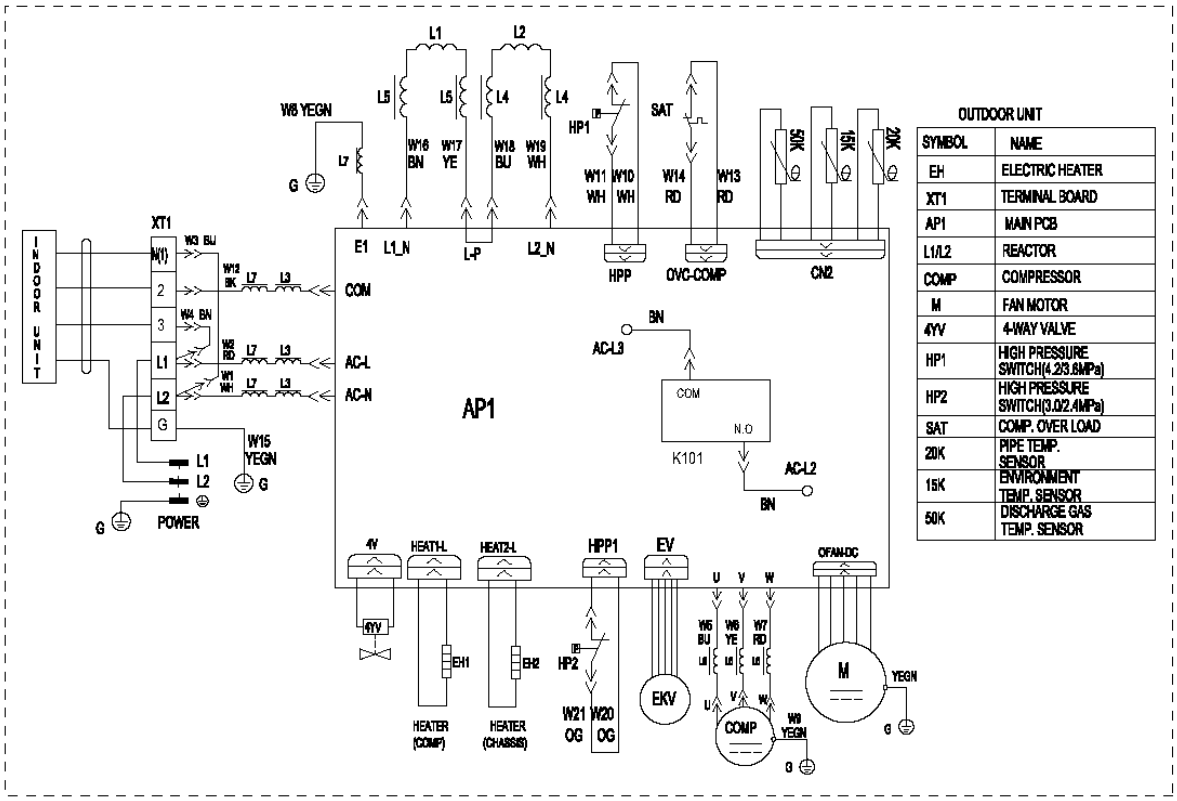
Symbol	Parts name	Symbol	Color symbol	Symbol	Color symbol
SAT	OVERLOAD	**BU**	BLUE	**VT**	VIOLET
COMP	COMPRESSOR	**YE**	YELLOW	**OG**	ORANGE
⏚	PROTECTIVE EARTH	**RD**	RED	**BK**	BLACK
		BN	BROWN	**YEGN**	YELLOW GREEN

- **Indoor Unit**



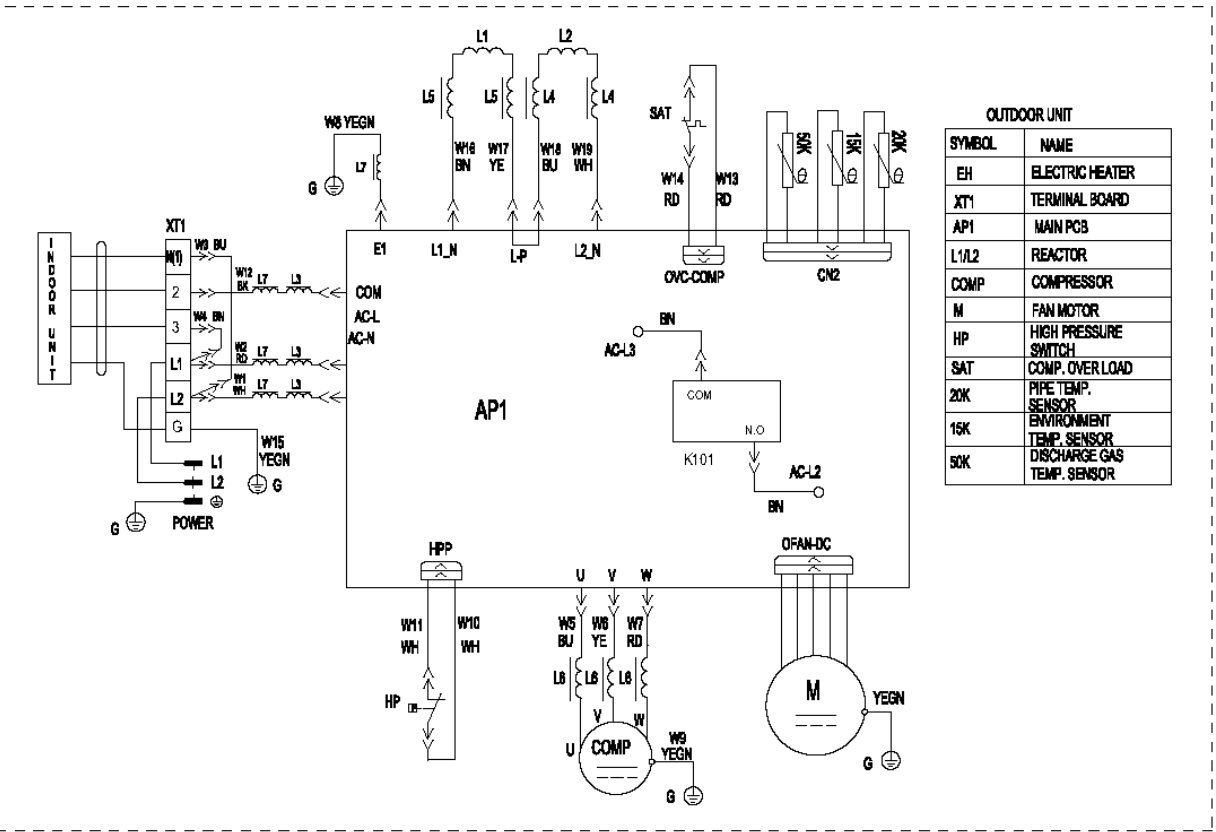
Size 30k & 36k, 230V, AC & HP, Indoor Unit

WIRING DIAGRAMS (CONT.)



OUTDOOR UNIT	
SYMBOL	NAME
EH	ELECTRIC HEATER
XT1	TERMINAL BOARD
AP1	MAIN PCB
L1/L2	REACTOR
COMP	COMPRESSOR
M	FAN MOTOR
4YV	4-WAY VALVE
HP1	HIGH PRESSURE SWITCH(4.2/3.6MPa)
HP2	HIGH PRESSURE SWITCH(3.0/2.4MPa)
SAT	COMP. OVER LOAD
20K	PIPE TEMP. SENSOR
15K	ENVIRONMENT TEMP. SENSOR
50K	DISCHARGE GAS TEMP. SENSOR

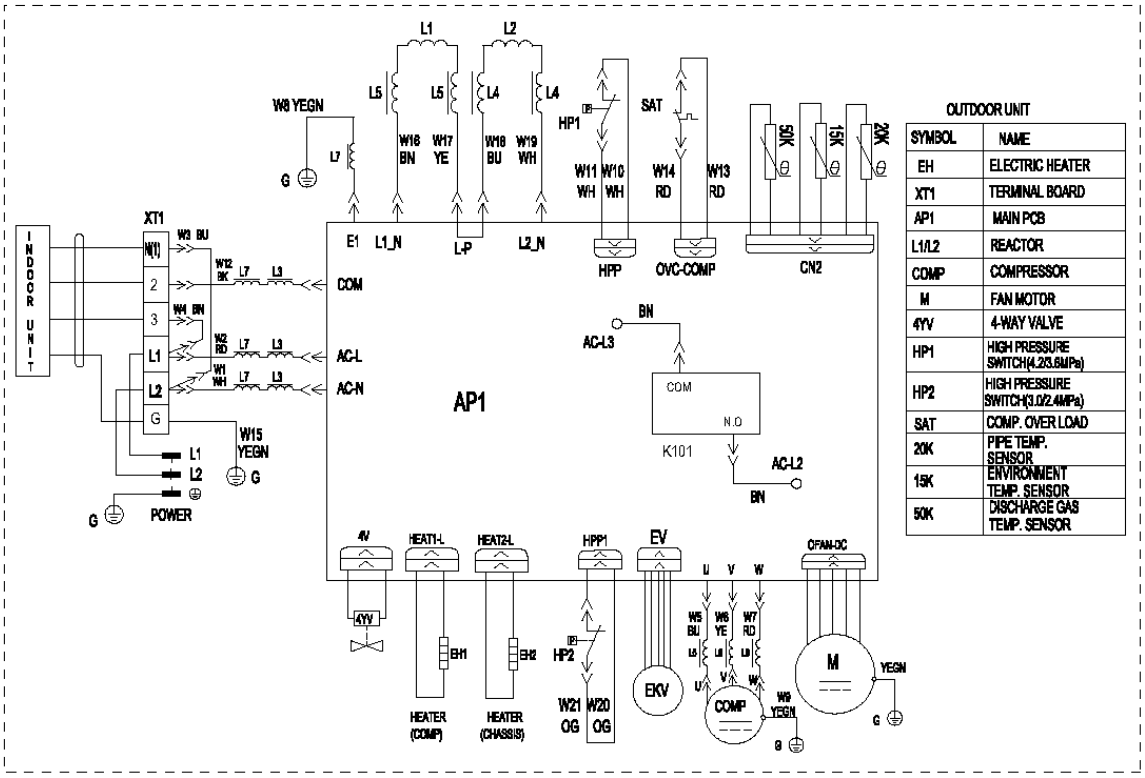
Size30k, 230V, HP, Outdoor Unit



OUTDOOR UNIT	
SYMBOL	NAME
EH	ELECTRIC HEATER
XT1	TERMINAL BOARD
AP1	MAIN PCB
L1/L2	REACTOR
COMP	COMPRESSOR
M	FAN MOTOR
HP	HIGH PRESSURE SWITCH
SAT	COMP. OVER LOAD
20K	PIPE TEMP. SENSOR
15K	ENVIRONMENT TEMP. SENSOR
50K	DISCHARGE GAS TEMP. SENSOR

Size 36k, 230V, AC, Outdoor Unit

WIRING DIAGRAMS (CONT.)

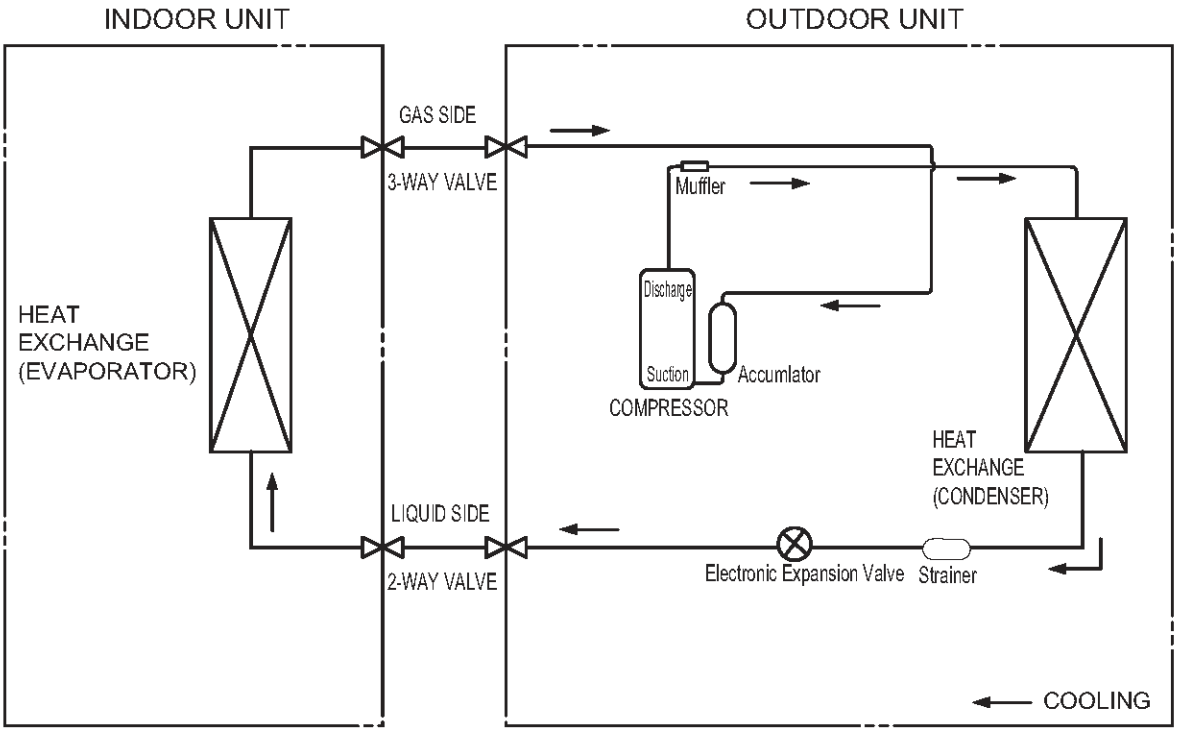


Size36k, 230V, HP, Outdoor Unit

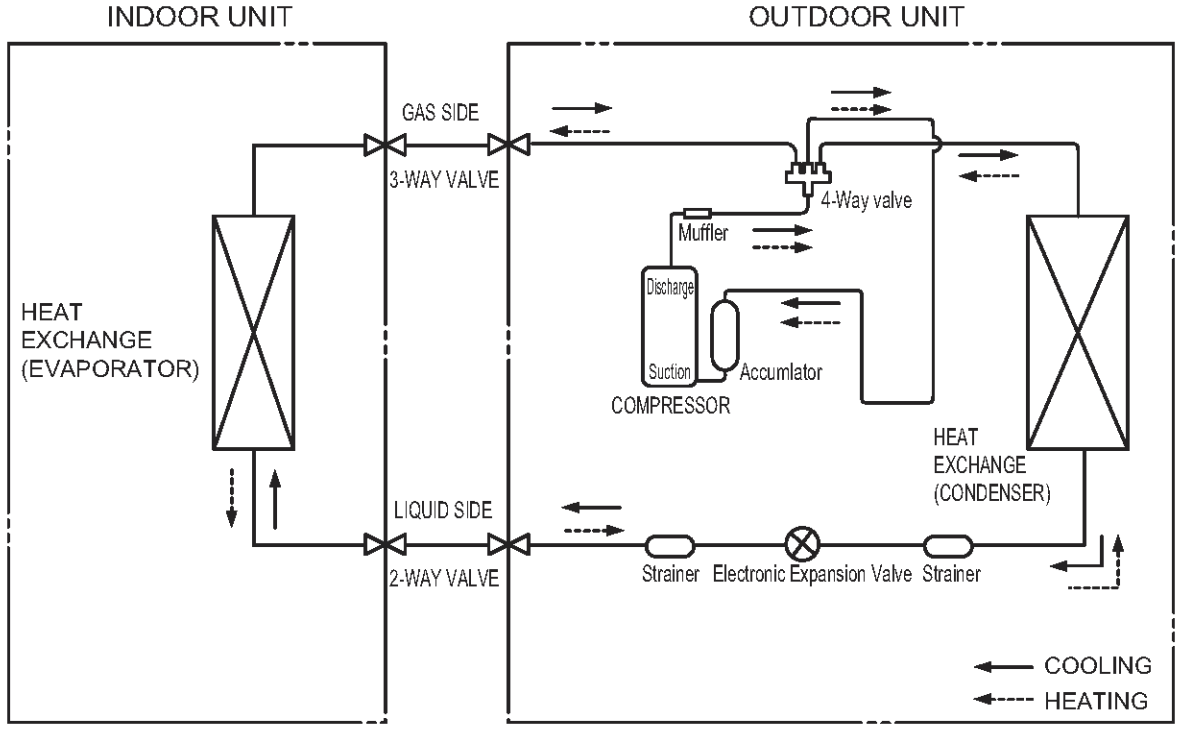
These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

REFRIGERANT SYSTEM DIAGRAM

Cooling Only Models Size 9k, 12k, 115V and Size 12k 18k, 24k 230 V



Cooling and Heating Models Size 12k, 115V and Size 12k 18k, 24k 230 V



Refrigerant pipe diameter
Liquid : 1/4" Gas : 3/8"(For 09&12K Unit)
Liquid : 1/4" Gas : 1/2"(For 18K Unit)
Liquid : 1/4" Gas : 5/8"(For 24K Unit)

Figure 8 — Refrigerant System Diagrams

REFRIGERANT SYSTEM DIAGRAM

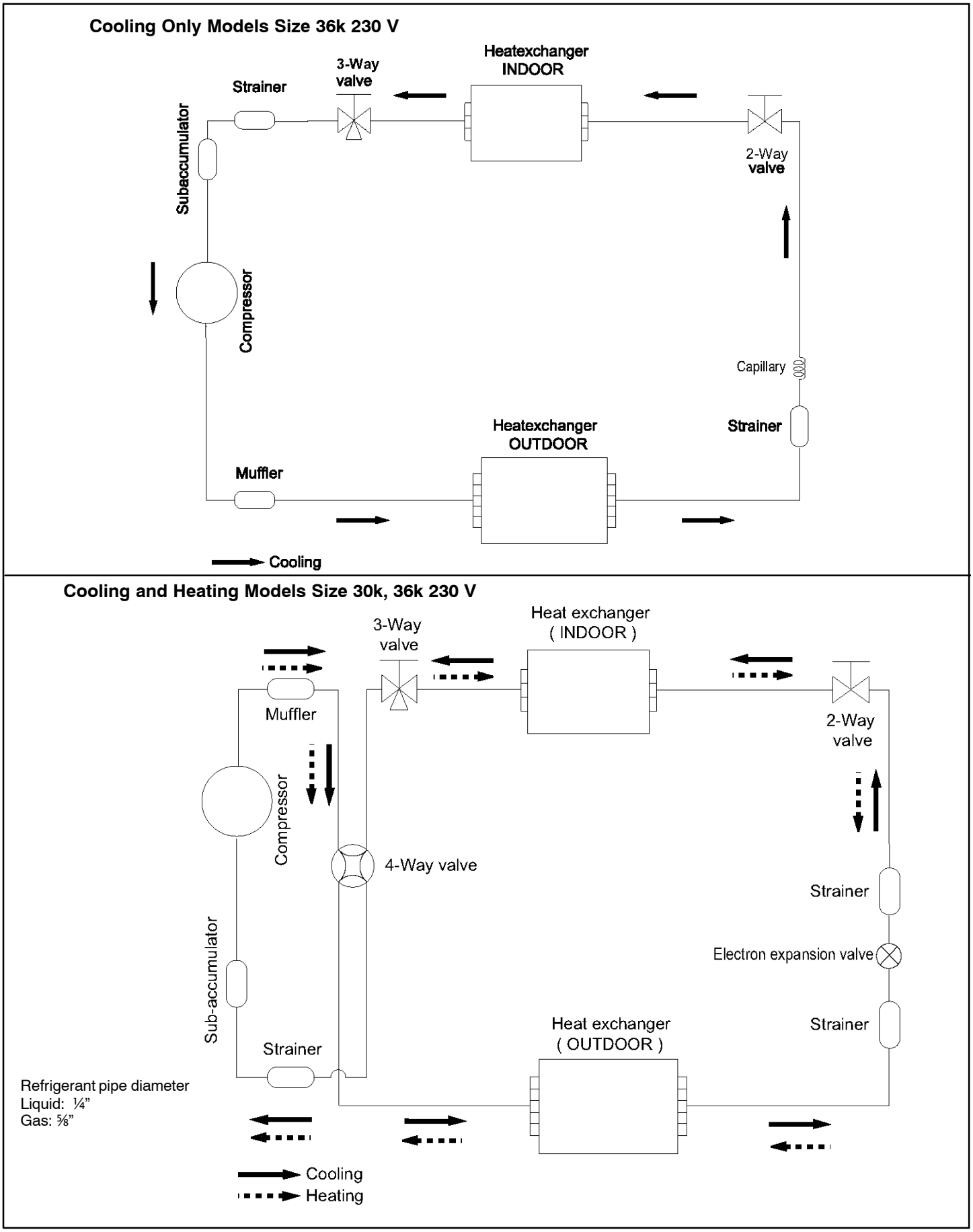


Figure 9 — Refrigerant System Diagrams

REFRIGERANT LINES

Refrigerant Line Routing

The refrigerant lines may be routed in any of the four directions shown in Figure 4.

For maximum serviceability, it is recommended to have refrigerant line flare connections and the drain connection on the outside of the wall that the fan coil is mounted on.

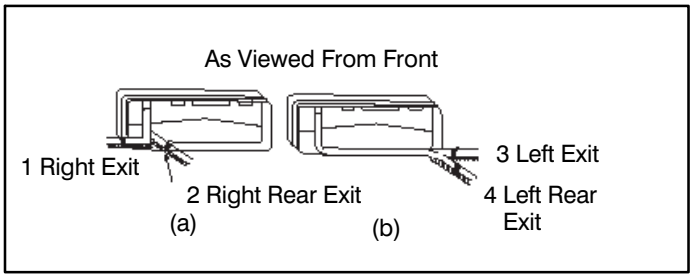


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Figure 10 — Refrigerant Line Routing

Determine pipe hole position using the mounting plate as a template. Drill pipe hole diameter per chart below. The outside pipe hole is ½ in. (13mm) min. Lower than inside pipe hole, so it slants slightly downward. See figure 5.

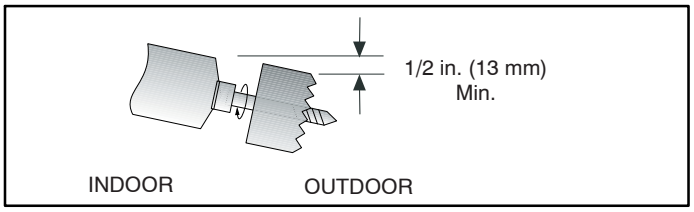

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Figure 11 — Drill Holes

Hole SIZES	
Unit Size	**Hole Diameter, In. (mm)**
9K, 12K, 18K	2.2 (56)
24K, 30K, 36K	2.8 (71)

If piping is going through the right or left side:

Use a small saw blade to carefully remove the corresponding plastic covering on side panel and drill the appropriate size hole where the pipe is going through the wall. See table above.

Remove knockout 1 to run just the wiring. Remove knockout 1 and 2 or knockout 1, 2, and 3 if running both piping and wiring through the side of the unit. See Figure 11.

NOTE: If required, a condensate pump is available for the application.

General Guidelines

The units are shipped with full charge of R–410A refrigerant. All charges, line sizing, and capacitiies are based on runs of 25ft. (7.6m). For runs over 25ft. (7.6m) consult long line section for charge adjustments.

Refrigerant lines should not be buried in the ground. If it is necessary to bury the lines, not more than 36 inches (914mm) should be buried. Provide a minimum of 6 inch (152mm) vertical rise to service valves to prevent refrigerant migration.

Both lines must be insulated. Use a minimum of ½ inch (12.7mm) thick insulation. Closed–cell insulation is recommended in al long–line applications.

Special consideration should be given to isolating interconnecting tubing from the building structure. Isolate the tubing so that vibration or noise is not transmitted into the structure.

Long Line Applications

No change in line sizing is required.

Add refrigeration per table below.

R–410A Refrigerant Charge Table						
	Charge Amount * LBS (kg)		Additional Charge Amount ** oz/ft (g/m)		Metering Device ***	
Unit Size	**Cool Only**	**Heat Pump**	**Cool Only**	**Heat Pump**	**Cool Only**	**Heat Pump**
9K	2.64 (1.20)	2.64 (1.20)	0.16 (15)	0.22 (20)	EXV	EXV
12K	2.86 (1.30)	2.86 (1.30)	0.16 (15)	0.22 (20)	EXV	EXV
18K	3.09 (1.40)	3.09 (1.40)	0.16 (15)	0.22 (20)	EXV	EXV
24K	3.53 (1.60)	3.53 (1.60)	0.16 (15)	0.54 (50)	EXV	EXV
30K	––––	5.29 (2.40)	––––	0.54 (50)	––––	EXV
36K	5.30 (2.40)	5.73 (2.60)	0.54 (50)	0.54 (50)	CAP	EXV

* Charge is for piping that runs up to 25 ft. (7.6 m)

** For piping runs greater than 25 ft. (7.6 m), add this amount of charge per foot of extra piping, up to the allowable length, specified in the above table.

*** EXV – Electronic Expansion Device

REFRIGERANT LINE LENGTHS ft. (m)			
Unit Size	**Max Line Length**	**Max Elevation (ID over OD)**	**Max Elevation (OD over ID)**
9K	50 (15)	33 (10)	33 (10)
12K	66 (20)	33 (10)	33 (10)
18, 24K	82 (25)	33 (10)	33 (10)
30, 36K	98 (30)	33 (10)	33 (10)

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant tubes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the procedure outlined below is followed. Always break a vacuum with dry nitrogen.

SYSTEM VACUUM AND CHARGE

Using Vacuum Pump

Completely tighten flare nuts A, B, C, D, connect manifold gage charge hose to a charge port of the low side service valve. (See Fig. 13.)

Connect charge hose to vacuum pump.

Fully open the low side of manifold gage. (See Fig. 14)

Start vacuum pump

Evacuate using either deep vacuum or triple evacuation method.

After evacuation is complete, fully close the low side of manifold gage and stop operation of vacuum pump.

The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft (8 m), add 0.1 oz. per foot of extra piping up to the maximum allowable length.

Disconnect charge hose from charge connection of the low side service valve.

Fully open service valves B and A.

Securely tighten caps of service valves.

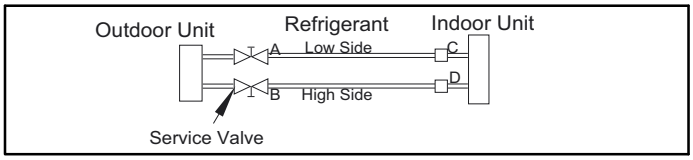

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Figure 12 — Service Valve

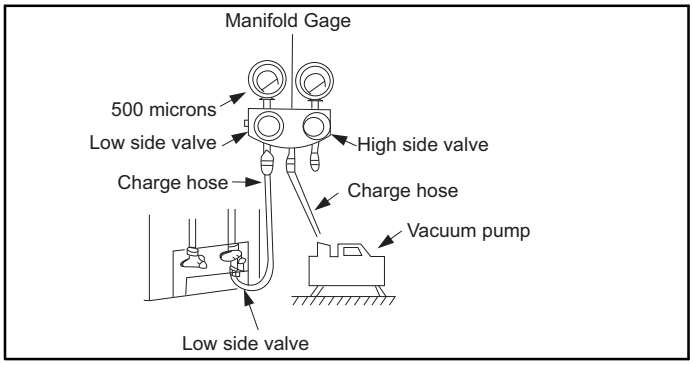

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Figure 13 — Manifold

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 15)

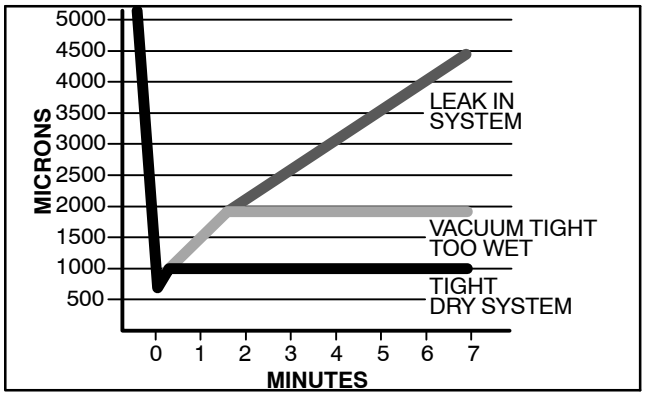

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Figure 14 — Deep Vacuum Graph

Triple Evacuation Method

The triple evacuation method should only be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum and system does not contain any liquid water.

Refer to Fig. 16 and proceed as follows:

Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.

Close service valves and shut off vacuum pump.

Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.

Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.

Repeat this procedure as indicated in Fig. 16. System will then be free of any contaminants and water vapor.

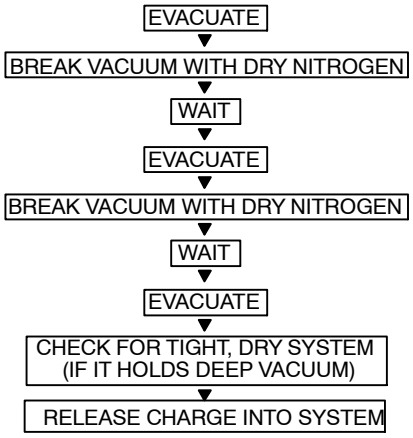

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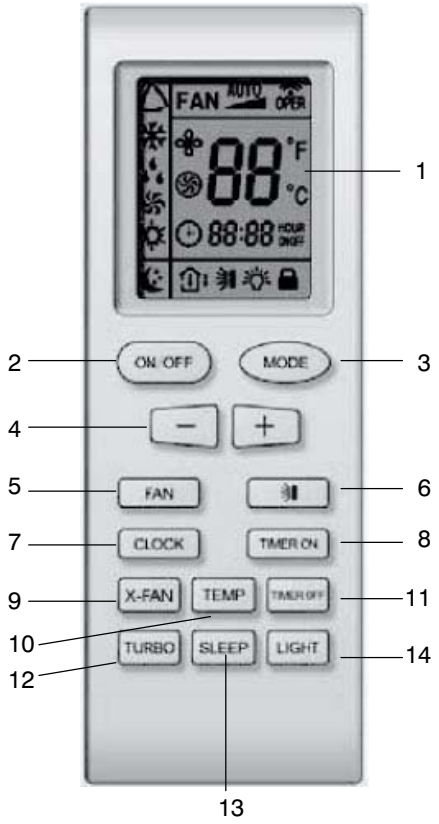
Figure 15 — Triple Evacuation Method

Final Tubing Check

IMPORTANT: Check to be certain factory tubing on both indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to feeder tubes, making sure wire ties on feeder tubes are secure and tight.

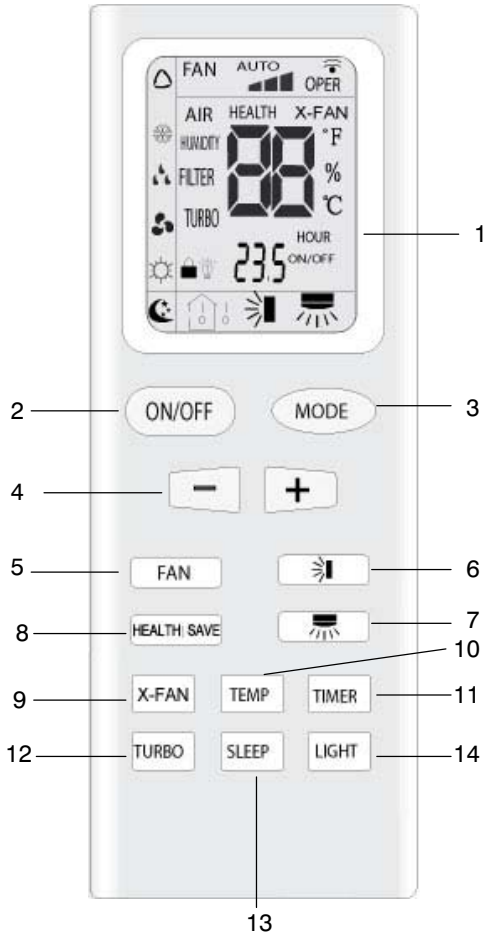
Remote Control and Functions



Remote Control, Size 09–24

1. Remote Control Display
2. ON/OFF Button
3. MODE Button
4. Setpoint Clock, Timer Up (+) and Down (–) Buttons
5. Fan Speed
6. Horizontal Louver Swing Button
7. Clock Button
8. Timer ON Button
9. Dry Coil Button
10. Temperature Button
11. Timer OFF Button
12. Turbo Mode Button
13. Sleep Mode button
14. Light Button to Turn ON or OFF Display on Front Panel

A12434

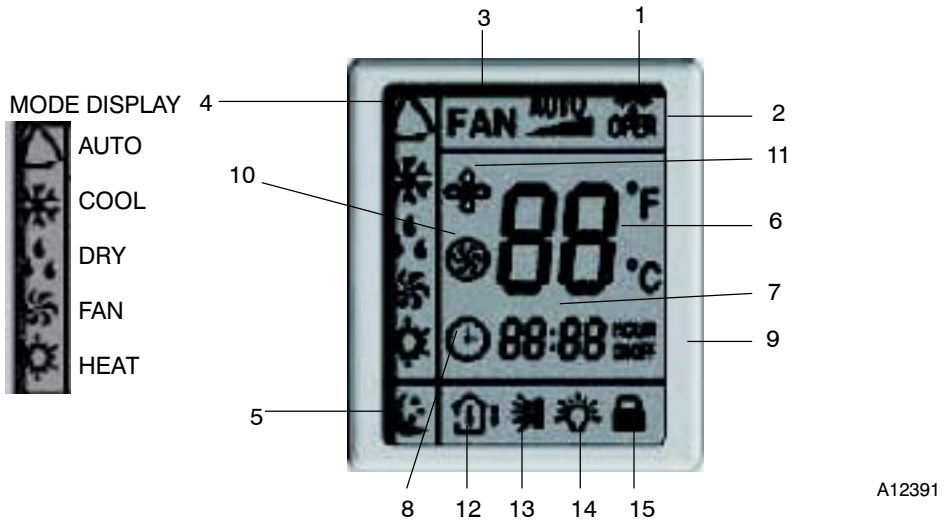


Remote Control, Size 30–36

1. Remote Control Display
2. ON/OFF Button
3. MODE Button
4. Setpoint, Timer Up (+) and Down (–) Buttons
5. Fan Speed
6. Horizontal Louver Swing Button
7. Left/Right Louver Swing Button (Not available with these models)
8. HEALTH/SAVE Button (Not available with these models)
9. Dry Coil Button
10. Temperature Button (Not available with these models)
11. Timer Button
12. Turbo Mode Button (Not available with these models)
13. Sleep Mode button
14. Light Button to Turn ON or OFF Display on Front Panel

A12390

Remote Control Display, Size 09–24



NOTE: Symbols shown in this manual are for the purpose of demonstration. During actual operation, only the relevant symbols are displayed.

TRANSMISSION INDICATOR: Illuminates when remote control transmits signals to the indoor unit.

This symbol appears when the unit is turned on by the remote control, and disappears when the unit is turned off.

FAN SPEED DISPLAY: Indicates the set fan speed. AUTO is displayed when unit is running in AUTO mode.

MODE DISPLAY: Indicates the current operation mode “AUTO”, “COOL”, “DRY”, “FAN ONLY”, or “HEAT”

SLEEP DISPLAY: Indicates unit is running in SLEEP mode.

TEMPERATURE DISPLAY: Temperature setting from 61°F (16°C) to 86°F (30°C) will be displayed. If FAN mode is selected, there will be no temperature displayed.

CLOCK DISPLAY: Indicates the current time (0 to 24 hours).

CLOCK INDICATOR: Displayed with time and is not displayed when setting ON/OFF timer.

TIMER ON / **TIMER OFF DISPLAY:** ON is displayed if TIMER ON is set. OFF is displayed if TIMER OFF is set. ON OFF displayed if both ON and OFF timers are set.

TURBO DISPLAY: Indicates unit is running in Turbo Mode.

DRY COIL DISPLAY: Indicates unit is running in DRY COIL mode where the fan continues to run after the unit is shut off to dry the coil.

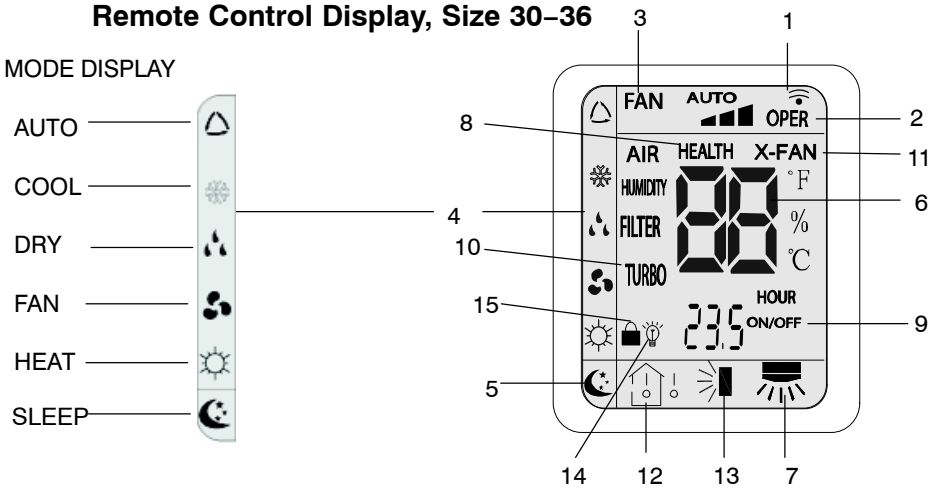
TEMPERATURE DISPLAY: Indicates if room temperature or set point temperature is being displayed on the front panel.

SWING DISPLAY: Sets louver position or set louvers to continuously move for better air distribution.

LIGHT DISPLAY: Indicates if LED display on the front panel is illuminated.

LOCK DISPLAY: Indicates if remote control is locked.

Remote Control Display, Size 30–36



NOTE: Symbols shown in this manual are for the purpose of demonstration. During actual operation, only the relevant symbols are displayed.

TRANSMISSION INDICATOR: Illuminates when remote control transmits signals to the indoor unit.

This symbol appears when the unit is turned on by the remote control, and disappears when the unit is turned off.

FAN SPEED DISPLAY: Indicates the set fan speed. AUTO is displayed when unit is running in AUTO mode.

MODE DISPLAY: Indicates the current operation mode “AUTO”, “COOL”, “DRY”, “FAN ONLY”, or “HEAT”

SLEEP DISPLAY: Indicates unit is running in SLEEP mode.

TEMPERATURE DISPLAY: Temperature setting from 61°F (16°C) to 86°F (30°C) will be displayed. If FAN mode is selected, there will be no temperature displayed.

Battery Installation

Two AAA 1.5 v alkaline batteries (included) are required for operation of the remote control.

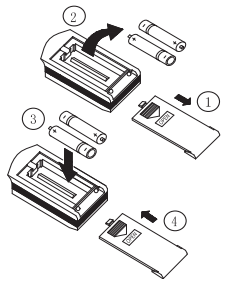
To install or replace batteries :

Slide the back cover off the control to open the battery compartment.

Remove old batteries if you are replacing the batteries.

Insert batteries. Follow the polarity markings inside the battery compartment.

Replace battery compartment cover.



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Left/Right Louver Swing: Not available on these models.

Health/Save: Not available on these models.

SETTING ON / OFF TIMES: 0.5 to 24 hours.

TURBO DISPLAY: Not available on these models.

DRY COIL DISPLAY: Indicates unit is running in DRY COIL mode where the fan continues to run after the unit is shut off to dry the coil.

TEMPERATURE DISPLAY: Not available on these models.

SWING DISPLAY: Sets louver position or set louvers to continuously move for better air distribution.

LIGHT DISPLAY: Indicates if LED display on the front panel is illuminated.

LOCK DISPLAY: Indicates if remote control is locked.

NOTE:

1. When replacing batteries, do not use old batteries or a different type battery. This may cause the remote control to malfunction.
2. If the remote is not going to be used for several weeks, remove the batteries. Otherwise battery leakage may damage the remote control.
3. The average battery life under normal use is about 6 months.
4. Replace the batteries when there is no audible beep from the indoor unit or if the Transmission Indicator fails to light.

Function and Controls

Description of Each Control Operation

Temperature Parameters

◆Indoor preset temperature (T_{preset})

◆Indoor ambient temperature ($T_{amb.}$)

Basic Functions

Once energized, in no case should the compressor be restarted within less than 3 minutes. In the situation that memory function is available, for the first energization, if the compressor is at stop before de–energization, the compressor will be started without a 3–minute lag; if the compressor is in operation before de–energization, the compressor will be started with a 3–minute lag; and once started, the compressor will not be stopped within 6 minutes regardless of changes in room temperature;

Cooling Mode

Working Conditions and Cooling Process.

When $T_{amb} \geq T_{preset}$, the unit will enter cooling operation, in which case the indoor fan, the outdoor fan and the compressor will work and the indoor fan will run at preset speed.

When $T_{amb} \leq T_{preset} - 3.6°F$, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will run at preset speed.

When $T_{preset} - 3.6°F < T_{amb.} < T_{preset} + 1.8°F$, the unit will remain at its previous state.

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

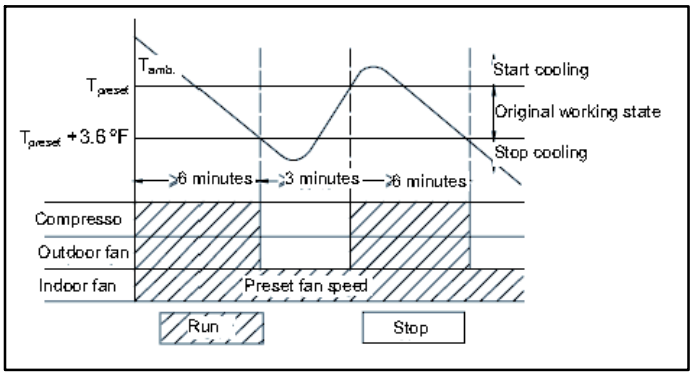


Figure 16 — Cooling Mode

Total Current Table				
	Variables			
Unit Size - V	A	B	C	D
9k--115V	10A	12A	14A	16A
12K-115V	14A	16A	18A	20A
12K-230V	6A	7A	8A	9A
18k-230V	8A	9A	10A	11A
24K-230V	10A	11A	12A	13A
30K-230V	16A	17A	18A	20A
36K-230V	16A	17A	18A	20A

PROTECTION

Antifreeze Protection

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

If $T_{evap} \leq 35.6°F$, the compressor will operate at reduced frequency.

If $T_{evap} \leq 30.2°F$ is detected for duration of 3 minutes, the compressor will stop, and after 60 seconds, the outdoor fan will stop; and under cooling mode, the indoor fan and the swing motor will remain at the original state.

If $T_{evap.}$ 42.8°F and the compressor has remained at OFF for at least 3 minutes, the compressor will resume its original operation state.

Total current up and frequency down protection

If $I_{total} \leq A$, frequency rise will be allowed; if $I_{total} \geq B$, frequency rise will not be allowed; if $I_{total} \geq C$, the compressor will run at reduced frequency; and if $I_{total} \geq D$, the compressor will stop and the outdoor fan will stop with a time lag of 30s. Lag will be 60s for size 30 and 36 units.

Dehumidifying Mode

Working Conditions and Dehumidifying Process

If $T_{amb} > T_{preset}$, the unit will enter cooling and dehumidifying mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If $T_{preset} - 3.6°F \leq T_{amb} \leq T_{preset}$, the compressor remains at its original operation state.

If $T_{amb.} < T_{preset} - 3.6°F$, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will operate at low speed.

Protection

Protection is the same as that under the cooling mode.

Heating Mode

Working Conditions and Heating Process

If $T_{amb.} \leq T_{preset} + 3.6°F$, the unit enters heating mode, in which case the four–way valve, the compressor and the outdoor fan will operate simultaneously, and the indoor fan will run at preset speed in the condition of preset cold air prevention.

If $T_{amb.} \geq T_{preset} + 9°F$, the compressor will stop, the outdoor fan will stop with a time lag of 60s, and the indoor fan will stop after 60–second blow at low speed

If $T_{preset} + 3.6°F < T_{amb.} < T_{preset} + 9°F$, the unit will maintain its original operating status.

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

Defrost Mode

Condition and Defrost Process

When $T_{outdoor\ amb.} \geq 41°F$ and the compressor has run for 3 hour, if $T_{outdoor\ tube} < 0°F$ is continuously detected for 1 minute, the unit will enter defrost. [Note: the accumulated time is cleared if one of the below condition is met. $T_{outdoor\ ambient} > 41°F$, the compressor starts up after switching to cooling or dry mode, when defrosting is finished; for other situations besides above conditions, the accumulated time will not be cleared (including the unit stops when reaching the temperature point, the unit stops for protection, switching to fan mode, et.)]

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

a. $T_{outdoor\ amb.} > 41°F$, $T_{outdoor\ tube} \leq 28.4°F$;

b. $28.4°F \leq T_{outdoor\ amb.} < 41°F$, $T_{outdoor\ tube} \leq 21.2°F$;

c. $23°F \leq T_{outdoor\ amb.} < 28.4°FC$, $T_{outdoor\ tube} \leq 17.6°F$;

d. 14°F ≤ $T_{outer\ amb.}$ <23°F, $T_{outer\ tube}$ – $T_{compensatorys}$ ≤ ($T_{outdoor\ amb.}$ –5.4°F)

e. $T_{outdoor\ amb.}$>14°F $T_{outer\ tube}$ – $T_{compensatorys}$ ≤ ($T_{outdoor\ amb.}$ –5.4°F)

After energization, for the first defrost, $T_{compensation}$ =0 °F; if it is not the first defrost, $T_{compensation}$ will be determined by $T_{outdoor\ pipe}$ when defrost ends.

a. $T_{outdoor\ pipe}$ >35.6°F; $T_{compensation}$ = 0°F;

b. $T_{outdoor\ pipe}$ ≤ 35.6°F; $T_{compensation}$ = 5.4°F;

During defrosting, if operation time for compressor doesn't reach 3 minutes, the condenser will not defrost in the next 2 hours. At the time of defrost the compressor stops operation, and 30 seconds later, the outdoor fan stops operation. In an additional 30 seconds, the 4–way valve will stop operation. 30 seconds later, compressor will increase it's frequency to 85 Hz for defrosting. Defrost will last for 450 seconds, or until the outdoor pipe ≥ 50°F. When defrost is complete the compressor will decrease its frequency. 30 seconds later the compressor will stop operation. In 30 seconds the 4–way valve will be started up. 60 seconds later the compressor and outdoor fan will operate.

Protection

◆Cold air prevention

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

1 In the case of $T_{indoor\ amb.}$ <75.2°F : if T_{tube} ≤ 107.6°F and the indoor fan is stopped, the indoor fan will begin to run at low speed with a time lag of 2 minutes. Within 2 minutes, if T_{tube} >104°F, the indoor fan also will run at low speed; and after 1–minute operation at low speed, the indoor fan will be ramped to operation at a preset speed. Within 1–minute of low speed operation or 2–minutes of non–operation, if T_{tube}>108°F, the fan will run at preset speed.

2 In the case of $T_{indoor\ amb.}$ ≥ 75°F: if T_{tube} ≤ 108°F, the indoor fan will run at low speed, and after one minute, the indoor fan will be ramped to preset speed. Within one–minute low speed operation, if T tube>107.6°F, the indoor fan will be ramped to preset speed.

Note: $T_{indoor\ amb.}$ indicated in 1 and 2 refers to, the indoor ambient temperature before the command to start the compressor is performed, or after the unit is withdrawn from defrost and the defrost symbol is cleared.

Total current up and frequency down protection

If the total current I_{total} ≤W, frequency rise will be allowed; if I_{total} ≥X frequency rise will not be allowed; if I_{total} ≥Y, the compressor will run at reduced frequency; and if I_{total} ≥Z, the compressor will stop and the outdoor fan will stop with a time lag of 30s.

Fan Mode

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

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

AUTO Mode

Working conditions and Auto mode process:

Under AUTO mode, standard cooling temperature T_{preset} is 77°F and standard heating temperature T_{preset} is 64.4°F.

Once energized, if T_{amb} ≤68°F, the unit will be started under heating mode; if 68°F < $T_{amb.}$< 77°F, the unit will run under fan mode and the run indicator will be bright; and if T_{amb} ≥77°F, the unit will be started under cooling mode.

Under AUTO mode, if $T_{amb.} \geq T_{preset}$ is detected, the unit will select to run under cooling mode, in which case the preset temperature is 77°F; if $T_{amb.} \leq T_{preset}$ –3.6°F, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run at preset speed. If T_{preset} –(–3.6°F)< $T_{amb.}$< T_{preset} , the unit will remain in its original state.

Under AUTO mode, if $T_{amb.} \leq T_{preset}$ +3.6°F is detected, the unit will select to run under heating mode, in which case the preset temperature is 64.4°F; if $T_{amb.} \geq T_{preset}$ +9°F, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will blow residual heat; and if T_{preset} +3.6°F < $T_{amb.}$ < T_{preset} +9°F, the unit will remain in its original state. The cooling–only unit will run under fan mode.

Under AUTO mode, if 68°F < $T_{amb.}$ < 77°F, the unit will remain in its original state.

Protection

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

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

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

(6) Common Protection Functions and Fault Display under

COOL, HEAT, DRY and AUTO Modes

Overload protection

T tube : measured temperature of outdoor heat exchanger under cooling mode; and measured temperature of indoor heat exchanger under heating mode.

1) Cooling overload

a. If T_{tube} ≤ 125.6°F, the unit will return to its original operation state.

b. If T_{tube} ≥ 131°F, frequency rise is not allowed.

c. If T_{tube} ≥ 136.4°F, the compressor will run at reduced frequency.

d. If T_{tube} ≥ 143.6°F, the compressor will stop and the indoor fan will run at preset speed.

2) Heating overload

a. If T_{tube} ≤ 125.6°F, the unit will return to its original operation state.

b. If T_{tube} ≥ 131°F, frequency rise is not allowed.

c. If T_{tube} w136.4°F, the compressor will run at reduced frequency.

d. If T_{tube} ≥ 143.6°F, the compressor will stop and the indoor fan will blow residual heat and then stop.

Exhaust temperature protection of compressor

If exhaust temperature ≥ 208.4°F, frequency is not allowed to rise.

If exhaust temperature ≥ 217.4°F, the compressor will run at reduced frequency.

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

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

Communication fault

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

Module protection

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

Overload protection

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

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

Faults of temperature sensors

Description of Sensors	Faults
Indoor Ambient Temperature	The sensor is open or short–circuited for 30 consecutive seconds
Indoor Tube Temperature	The sensor is open or short–circuited for 30 consecutive seconds
Outdoor Ambient Temperature	The sensor is open or short–circuited for 30 consecutive seconds
Outdoor Tube Temperature	The sensor is open or short–circuited for 30 consecutive seconds, and no detection is performed within 10 minutes after defrost begins
Exhaust	After the compressor has run for 3 minutes, the sensor is open or short–circuited for 30 consecutive seconds
Overload	After the compressor has run for 3 minutes, the sensor is open or short–circuited for 30 consecutive seconds

Other Controls

(1) ON/OFF

Press the remote button ON/OFF: the on–off state will be changed once each time you press the button.

(2) Mode Selection:

Press the remote button MODE, then select: AUTO, COOL, DRY, FAN, HEAT, or AUTO.

(3) Temperature Setting Option Button

Each time you press the remote button TEMP+ or TEMP–, the setting temperature will be up or down by 1°F. Regulating Range: 61–86°F , the button is useless under the AUTO mode.

(4) Time Switch

You can start and stop the machine according to the setting time with the remote controller.

(5) SLEEP State Control

a. When the air conditioner is in the COOL or DRY mode, and the SLEEP mode has been set, after about 1 hour, the pre–setting T will raise 1.8°F. It will raise another 1.8°F again after 2 hours. It will raise 3.6°F in 2 hours, then it will run on at the setting temperature and fan speed.

b. When the air conditioner is in the HEAT mode, and the Timer has been set, after about 1 hour, the pre–setting T will reduce 1.8°F, and it will reduce another 1.8°F again after 2 hours. It will reduce 3.6°F in 2 hours, then it will run on at the setting temperature and blower speed.

c. The set point stays the same under the FAN mode and AUTO mode.

(6) Indoor Fan Control

The Indoor Fan can be set to HIGH, MED, LOW by remote control, and the Indoor Fan will be respectively run at high, medium, low speed. It can also be set as AUTO.

In moisture removal mode, the Indoor Fan will be set to low speed.

(7) Buzzer Control

The buzzer will send a “Beep” sound when the air conditioner is powered up or receives the information sent by the remote control or there is a button pushed.

(8) Auto button

If the controller is on, it will stop when the button is pressed. If the controller is off, it will start when the button is pressed. The swing light will be on, and the main unit will run based on the remote controls current settings.

(9) Up–and–Down Swinging Control

When the power is turned on, the up–and–down motor will first move the air deflector to 0 counter–clockwise. The air outlet will be closed.

After starting the machine, if you don’t set the swinging function, heating mode and auto–heating mode, the up–and–down air deflector will move to D clockwise; under other modes, the up–and–down air deflector will move to L1. If you set the swing function when you start the machine, then the deflector will swing between L and D. The air deflector has 7 swing states: Location L, Location A, Location B, Location C, Location D, Location L to Location D, stop at any location between L–D (the included angle between L~D is the same). The air deflector will be closed at 0 location, and the swing is function only works if the indoor fan is running.

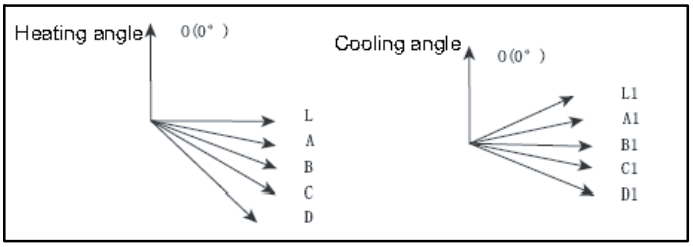


Figure 17 — Swing Angles for Heating and Cooling

(10) Display

a. Operation pattern and mode pattern display

All the display patterns will display for a time when the unit is powered on, the operation indication icon will display in red under standby status. When the machine is started by remote controller, the indication icon will light and display the current operation mode (the mode light includes: Cooling, Heating and Dry). If you press the light button, all the display icons will go dark.

b. Double–8 display

According to the settings of the remote control, the display may show the current temperature (the temperature scope is from 61°F to 86°F) on the indoor ambient temperature. The heating and air supply temperature will display 77°F under auto–mode, the temperature will display 64°F under the heating mode, and the temperature will display H1 under the defrosting mode.(If you set the celsius temperature display, the display will show according to celsius temperature)

(11) Protection function and failure display

E2: Freeze–proofing E4: Exhaust protection E5: Overcurrent protection

E6: Communication failure E8: Overload protection

F1: Indoor ambient sensor start and short circuit (continuously measured failure for 30S)

F2: Indoor evaporator sensor start and short circuit (continuously measured failure for 30S)

F3: Outdoor ambient sensor start and short circuit (continuously measured failure for 30S)

F2: Outdoor condenser sensor start and short circuit (continuously measured failure for 30S, and not measured within 10 minutes after defrosted)

F5: Outdoor exhaust sensor start and short circuit (continuously measured failure for 30S after the compressor has operated 3 minutes)

H3: Overload protection of compressor H5: Module protection

PH: High–voltage protection PL: Low–voltage protection

P1: Nominal cooling and heating P2: Maximum cooling and heating

P3: Medium cooling and heating P0: Minimum cooling and

heating
(12) Drying Function
You may start or stop the dry function under the cooling and dry modes. Automatic heating and air modes do not support the dry function).

(13) Memory function when interrupting the power supply Memory content: mode, swing function, light, set temperature and blower speed.
After power is interrupted, the machine will start according to the content of the memory automatically. If the last remote control command has not set a timed function, the system will remember the last remote control command and operate accordingly. If the last remote control command has set a timed function and the power supply is interrupted before the time expires, the system will remember the timed function of the last remote control command, the timed time will be recounted from power on. If the last remote control command has set a timed function, the time is up and the system is started or stopped according to the set time when the power supply is interrupted, the system will remember the operation status before the power supply was interrupted, and not carry out the timed action; The time clock will not be remembered.

Detection of Temperature Sensor Malfunction

(1) Indoor Temperature Sensor
Malfunctions of the temperature sensor can be detected at any time.
(2) Indoor Pipe Temperature Sensor
During defrost, a temperature sensor malfunction will not be detected. Five minutes after finishing defrost, the system will again begin to detect temperature sensor malfunctions. At all other times, a temperature sensor malfunction will be detected.
1. When a short–circuit occurs to the temperature sensor for 30 seconds: The temperature sensor overheats. In this case to protect the system, the entire unit will stop. At the same time, the temperature protection and temperature sensor malfunction will be shown.
2. When an open circuit of the temperature sensor occurs for 30s: The unit will stop and the temperature sensor malfunction will be displayed

Frequency Control

When starting the compressor, or when conditions have varied due to the changes in the room, the frequency must be initialized according to the ΔD value of the indoor unit and the Q value of the indoor unit. Q value: Indoor unit output determined from indoor unit volume, air flow rate and other factors.

Compressor Protection Function

When turning the compressor from OFF to ON, the system will ramp the frequency up from a lower starting limit to protect the compressor.

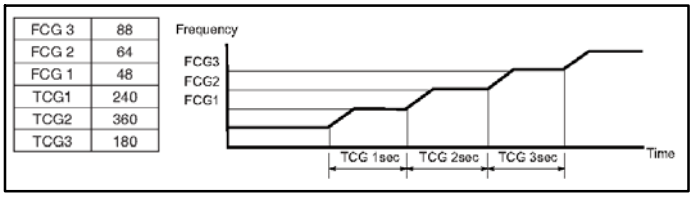


Figure 18 — Compressor Frequency (When the compressor is turned off, it cannot be turned back on for 3 minutes ((except after defrost)).

Discharge Pipe Control
The discharge pipe temperature is used as the compressor's internal temperature. If the discharge pipe temperature rises above a certain level, the operating frequency upper limit is set to keep this temperature from going up further.

Input Current Control
Detects an input current with the current transformer as the compressor is running, and sets the upper frequency limit from the input current.
In the case of a heat pump, this control is the upper limit control function of the frequency, which takes priority over the lower limit of four way valves activation compensation.

Freeze–up Protection Control

During cooling operation, the signals being sent from the indoor unit allow operating frequency limitation and then prevent freezing of the indoor heat exchanger.

Heating Peak–cut Control: Heat–Pump Only
During heating operation, the signals being sent from the indoor unit allow operating frequency limitation and prevent abnormally high pressure.

Defrost Control: Heat Pump Only
Defrosting is carried out by the cooling cycle (reverse cycle). The defrost time must be complete or the outdoor heat exchanger temperature must be more than its preset value when finishing.
Conditions for Starting Defrost
The starting conditions must be determined by the outdoor air temperature and heat exchanger temperature. When the system is in heating operation, 6 minutes after the compressor is started, and more than 44 minutes of accumulated time has passed since the start of the operation or end of defrost.
Conditions for Canceling Defrost
The heat exchanger temperature must be between (39°F–72°F)

Fan Control
Fan control is carried out according to the following priority.
1. Fan ON control for electric component cooling fan
2. Fan control when defrosting
3. Fan OFF delay when stopped
4. ON/OFF control in cooling operation
5. Speed control when frequency adjustment function is working
6. Fan control in forced operation
7. Fan control in indoor/outdoor unit silent operation
8. Fan control in powerful mode
9. Fan control in normal operation

Fan OFF Control when Stopped
***** Fan OFF delay for 60 seconds must be made when the compressor is stopped.
Speed Control in indoor/outdoor unit silent operation
1. When in Cooling Operation
When the outdoor air temperature is lower than 99°F, the speed tap must be set to Low.
2. When in Heating Operation
When the outdoor air temperature is higher than 39°F, the speed tap must be set to Low (only for heat pump model).

Troubleshooting

Precautions for Performing Inspections and Repairs
Be cautious during installation and maintenance. Follow all rules and regulations to avoid electric shock and to prevent injury or damage.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. Ensure power is disconnected to the fan coil unit. On some systems both the fan coil and the outdoor unit may be on the same disconnect. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

***** Static maintenance is maintenance during de–energization of the air conditioner.
For static maintenance, make sure that the unit is de–energized and the plug is disconnected.
*****dynamic maintenance is the maintenance during energization of the unit.
Before dynamic maintenance, check the electricity and ensure that there is a good ground. Check if there is electricity on the case and copper pipe of the air conditioner with a voltage tester.
Take sufficient care to avoid directly touching any of the circuit parts without first turning off the power.
At times such as when the circuit board is to be replaced, place the circuit board assembly in a vertical position.
Diagnose troubles according to the trouble diagnosis procedure as described below.(Refer to the check points in servicing written on the wiring diagrams attached to the indoor/outdoor units.)

No.	Trouble Shooting Procedure
1	Confirmation
2	Code displays interpretation of error codes.
3	Basic System Check

Precautions when inspecting the control section of the outdoor unit:
A large–capacity electrolytic capacitor is used in the outdoor unit controller (inverter).When the power supply is turned off,charge(charging voltage DC280V to 380V)remains and takes a long time to discharge.
Do Not open the outdoor unit for 20 minutes after power has been turned OFF..

Confirmation

(1)Confirmation of Power Supply
Confirm that the power breaker operates normally and provides power;
(2)Confirmation Voltage
Confirm that voltage is AC 220–240 ±10%.
If voltage is not in this range, the unit may not operate normally.
Display and Interpretation of Error Codes

TROUBLESHOOTING

The unit has onboard diagnostics. Error codes will appear on the LED display on the front panel of the indoor unit in place of the temperature display. Error codes are also displayed on the outdoor unit microprocessor board with colored LED lights. The tables explain the error codes for the specific models.

UNITS 9K & 12K, 115 Volts					
	Display on Indoor Unit	State of the Lamps of Outdoor Unit PCB			
Malfunction	Error Code	Green–LED2	Red–LED3	Yellow_LED4	Reasons
Stop for anti–freeze protection of indoor –unit	E2		Flash 4 Times	Flash 3 Times	Refrigerant leakage. Indoor unit air flow blocked. Filter dirty.
Stop for discharge temp protection	E4			Flash 7 Times	Low refrigerant. Capillary blocked. Ambient temp is abnormal.
Stop for low voltage protection	E5			Flash 5 Times	Low voltage. Ambient temp is abnormal.
Stop for communication malfunction	E6	No Flash			Communication line failure. Main PCB failure. Outside interference. Wiring error. Condensate pump failure.
Stop for compressor overload protection	H3			Flash 8 Times	Compressor overheat. Low refrigerant. Capillary blocked.
Overload protection	H4			Flash 6 Times	Ambient temp is abnormal. Heat exchanger blocked.
Stop for IPM module protection	H5			Flash 4 Times	IPM module over temperature. Low voltage. Silica grease problem.
DC motor (indoor unit) does not operate	H6				DC motor control terminal contact problem. Fan does not rotate smoothly due to incorrect installation. Motor or control panel is damaged.
Indoor ambient temperature sensor malfunction	F1				Bad terminal connection. Temp sensor malfunction.
Indoor tube temperature sensor malfunction	F2				Bad terminal connection. Temp sensor malfunction.
Outdoor ambient temperature sensor malfunction	F3		Flash 6 Times		Bad terminal connection. Temp sensor malfunction.
Outdoor tube temperature sensor malfunction	F4		Flash 5 Times		Bad terminal connection. Temp sensor malfunction.
Outdoor discharge temperature sensor malfunction	F5		Flash 7 Times		Bad terminal connection. Temp sensor malfunction.
Automatic defrosting	H1			Flash 2 Times	H1 signal normal operation, heat pump only.
Remark	1. Error codes only can be seen in the type which has the temperature display PCB. Some types do not have this function and have only the LED's on the outdoor PCB. 2. If there is normal communication between the Indoor and Outdoor unit the green LED will be on., and flashing.				

UNIT 12K, 230 Volts								
	Indoor Unit Displaying Method				State of lamps of outdoor unit PCB			
	Double 8 Code Display	Indicator Display (LED Flash 0.5s–ON/0.5s–OFF						
Malfunction	**Error Code**	**Running LED**	**Cooling LED**	**Heating LED**	**Green LED2**	**Red LED3**	**Yellow LED4**	**Reasons**
Stop for anti–freeze protection of indoor –unit	E2	flash 2 times				Flash 4 Times	Flash 3 Times	Refrigerant leakage. Indoor unit air flow blocked. Filter dirty.
Stop for discharge temp protection	E4	flash 4 times					Flash 7 Times	Low refrigerant. Capillary blocked. Ambient temp is abnormal.
Overcurrent protection	E5	flash 5 times					Flash 5 Times	Low voltage, ambient temp is abnormal.
Stop for communication error	E6	flash 6 times			No Flash			Communication line failure. Main PCB failure. Outside interference. Wiring error. Condensate pump failure.
Stop for compressor overload protection	H3			flash 3 times			Flash 8 Times	Compressor overheat. Low refrigerant. Capillary blocked.
Overload protection	H4			flash 4 times			Flash 6 Times	Ambient temp is abnormal. Heat exchanger blocked.
Stop for IPM module protection	H5			flash 5 times			Flash 4 Times	IPM module over temperature. Low voltage. Silica grease problem
Indoor unit fan motor does not operate	H6	flash 11 times						Motor control terminal contact problem. Fan does not rotate smoothly due to incorrect installation. Motor or control panel is damaged.
Indoor ambient temperature sensor malfunction	F1		flash 1 times					Bad terminal connection. Temp sensor malfunction.
Indoor tube temperature sensor malfunction	F2		flash 2 times					Bad terminal connection. Temp sensor malfunction.
Outdoor ambient temperature sensor malfunction	F3		flash 3 times			Flash 6 Times		Bad terminal connection. Temp sensor malfunction.
Outdoor tube temperature sensor malfunction	F4		flash 4 times			Flash 5 Times		Bad terminal connection. Temp sensor malfunction.
Outdoor discharge temperature sensor malfunction	F5		flash 5 times			Flash 7 Times		Bad terminal connection. Temp sensor malfunction.
Jumper connection malfunction protection	C5	flash 15 times						No jumper on controller or installed improperly or damaged. Corresponding circuit on mainboard has malfunction.
Unit match protection	LP						Flash 16 Times	Indoor and outdoor units not matched.
Indoor fan speed detection circuit malfunction	U8							Abnormal speed detection circuit on mainboard.
PFC overcurrent malfunction	HC			flash 6 times			Flash 14 Times	Overcurrent on PFC.
High power protection	L9						Flash 9 Times	System power is too high.
High voltage protection	PH		flash 11 times				Flash 13 Times	DC side voltage is too high.
Low voltage protection	PL			flash 21 times			Flash 12 Times	DC side voltage is too low.
Automatic defrosting	H1			flash 1 times			Flash 2 Times	H1 signal normal operation, heat pump only.
Remark	1. Error codes only can be seen in the type which has the temperature display PCB. Some types do not have this function and have only the LED's on the outdoor PCB. 2. If there is normal communication between the Indoor and Outdoor unit the green LED will be on, and flashing.							

UNIT 18K & 24K, 230 Volts										
	Indoor Unit Display				Outdoor unit display (LED's have 3 modes) □OFF, ■ON, ☆Flash					
		Indicator Display (LED Flash 0.5s–ON/0.5s–OFF								
Malfunction	Error Code Display	Running LED	Cooling LED	Heating_ LED	D40 /D5	D41 /D6	D42/ D16	D43/ D30	Operation Status	Malfunction
System High Pressure protection	E1	flash 1 times			□	☆	☆	☆	Cooling or Dehumidifying, compressor and outdoor fan motor stop, indoor fan motor runs. Heating: all stop.	1. System high press, excess refrigerant. 2. Dirty outdoor heat exchanger. 3. Outdoor ambient temp is too high.
Anti–freezing protection	E2	flash 2 times			■	□	■	□	Cooling or Dehumidifying, compressor and outdoor fan motor stop, indoor fan motor runs. Heating: all stop.	1. Indoor unit return blocked. 2. Low indoor fan motor speed. 3. Evaporator is dirty.
Compressor discharge high temp protection	E4	flash 4 times			■	□	■	☆	Cooling or Dehumidifying, compressor and outdoor fan motor stop, indoor fan motor runs. Heating: all stop.	Refer to compressor discharge protection temp.
AC overload protection	E5	flash 5 times			□	■	☆	□	Cooling or Dehumidifying, compressor and outdoor fan motor stop, indoor fan motor runs. Heating: all stop.	1. Power supply is unstable, too much variation. 2. Power supply voltage is low.
Indoor/Outdoor communication malfunction	E6	flash 6 times			□	□	□	☆	Cooling, compressor stop, and indoor fan motor runs, Heating:all stop.	Communication line failure. Main PCB failure. Outside interference, Wiring error. Condensate pump failure.
Anti–High temp protection	E8	flash 8 times			■	□	■	■	Cooling, compressor stop, and indoor fan motor runs, Heating:all stop.	Refer to troubleshooting section of manual.
Indoor unit fan motor no feedback	H6	flash 11 times							System will stop	1. Indoor control board AP1 malfunction. 2. Indoor motor M1 malfunction.
Jumper connection malfunction protection	C5	flash 15 times							System will stop	Indoor control board AP1 jumper not inserted or broken
Indoor ambient temperature sensor malfunction	F1		flash 1 times						Cooling, Dehumidifying; indoor fan motor runs, all else stop. Heating all stops	1. Room temp sensor is not connected to the control board AP1. 2. Room temp sensor is damaged.
Indoor evaporator sensor open circuit/short circuit	F2		flash 2 times						Cooling, Dehumidifying; indoor fan motor runs, all else stop. Heating all stops	1. Tube temp sensor is not connected to the control board AP1. 2. Tube temp sensor is damaged.
Outdoor ambient sensor open circuit/short circuit	F3		flash 3 times		□	□	☆	■	Cooling, Dehumidifying; compressor will stop, and indoor fan motor runs. Heating all stop.	Outdoor temp sensor not connected or damaged, check sensor resistance value
Outdoor condenser sensor open circuit/short circuit	F4		flash 4 times		□	□	☆	□	Cooling, Dehumidifying; compressor will stop, and indoor fan motor runs. Heating all stop.	Outdoor temp sensor not connected or damaged, check sensor resistance value.
Compressor discharge temp sensor open circuit/short circuit	F5		flash 5 times		□	□	☆	☆	Cooling, Dehumidifying will run for 3 mins, then compressor will stop, and indoor fan motor will start, Heating will run 3 mins then stop.	1. Discharge temp sensor not connected or damaged, check sensor resistance values. 2. Sensor head not located correctly.

UNIT 18K & 24K, 230 Volts (Cont.)										
	Indoor Unit Display				Outdoor unit display (LED's have 3 modes) □OFF, ■ON, ☆Flash					
		Indicator Display (LED Flash 0.5s–ON/0.5s–OFF								
Malfunction	Error Code Display	Running LED	Cooling LED	Heating_ LED	D40 /D5	D41 /D6	D42/ D16	D43/ D30	Operation Status	Malfunction
Overload limit, compressor speed reduction	F6		flash 6 times		■	□	☆	☆	Operation normal, compressor speed reduced.	Refer to troubleshooting section of manual.
Over current compressor speed reduction	F8		flash 8 times		■	■	□	■	Operation normal, compressor speed reduced.	1. System voltage is too low. 2. System voltage is high.
Compressor discharge temp high, compressor speed reduction	F9		flash 9 times		■	■	□	□	Operation normal, compressor speed reduced.	1. Load is too great, ambient temp is too high 2. Refrigerant is low 3. Electric expansion valve malfunction
DC voltage is too high	PH		flash 11 times		□	■	□	☆	Cooling; compressor stops, and outdoor fan runs. Heating all stop	1. Check voltage at terminal L and N. If higher than 265VAC, cut off power supply and restart system. 2. If input voltage is normal, check the voltage at capacitor on AP1. Replace AP1 if the capacitor voltage range is 200–280v.
System current too high	U9		flash 13 times		□	■	☆	■	Cooling, Dehumidifying; compressor stops, and indoor fan motor runs. Heating all stop.	AP1 malfunction, replace the AP1 in outdoor unit.
Compressor current too high	P5		flash 15 times		□	☆	□	□	Cooling, Dehumidifying; compressor stops, and indoor fan motor runs. Heating all stop.	Refer to service manual (IPM protection, compressor speed reduction, compressor overcurrent protection)
Defrost	H1			flash 1 times					Heating mode, compressor runs, indoor/outdoor fan motor stop	Normal Operation
Compressor overload protection	H3			flash 3 times	□	☆	☆	□	Cooling, Dehumidifying; compressor stops, and indoor fan motor runs. Heating all stop.	1. Compressor terminal loose, the resistance should be lower than 1 ohm. 2. Refer to service manual. (discharge/overload protection)
System overload protection	H4			flash 4 times					Cooling, Dehumidifying; compressor stops, and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.
IPM protection	H5			flash 5 times	■	□	■	■	Cooling, Dehumidifying; compressor stops, and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.

UNIT 18K & 24K, 230 Volts (Cont.)										
	Indoor Unit Display				Outdoor unit display (LED's have 3 modes) □OFF, ■ON, ☆Flash					
	Error Code Display	Indicator Display (LED Flash 0.5s–ON/0.5s–OFF								
Malfunction		Running LED	Cooling LED	Heating_ LED	D40 /D5	D41 /D6	D42/ D16	D43/ D30	Operation Status	Malfunction
PFC protection	HC			flash 6 times	□	■	☆	☆	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.
Compressor speed reduction	H7			flash 7 times	□	☆	■	☆	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.
Heating, high temp	H0			flash 10 times	■	□	☆	☆	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.
Start–up failure	LC			flash 11 times	□	☆	□	☆	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Refer to troubleshooting section of manual.
Compressor current circuit malfunction	U1			flash 13 times	□	☆	■	□		Replace outdoor board AP1.
EEPROM malfunction	EE			flash 15 times	□	□	□	■	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Replace outdoor board AP1.
Capacitor charge malfunction	PU			flash 17 times	□	■	□	■	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Refer to capacitor charging in this service manual.
Module Sensor circuit malfunction	P7			flash 18 times	□	□	■	☆	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Replace the outdoor boar AP1.
Module over temp protection	P8			flash 19 times	■	□	☆	■	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Check the IPM heat sink or replace outdoor board AP1.
Low DC bus voltage	U3			flash 20 times	□	■	■	■	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	Supply voltage is not stable.
Low DC bus voltage protection	PL			flash 21 times	□	■	■	□	Cooling, Dehumidifying; compressor stops and indoor fan motor runs. Heating all stop.	1. Check supply voltage, if voltage lower than 150VAC, restart the unit when the power supply is normal. 2. Check reactor L connection.
IPM temp high limit/decrease compressor run speed	EU				■	■	■	☆	Operation normal, compressor speed reduced	Check the IPM heat sink or replace outdoor board AP1.
Four–way valve malfunction	U7				■	□	☆	□	In heating mode, all stop	1. Supply voltage is lower than 175VAC. 2. 4–way valve. terminal loose/broken 3. 4–way valve damaged.

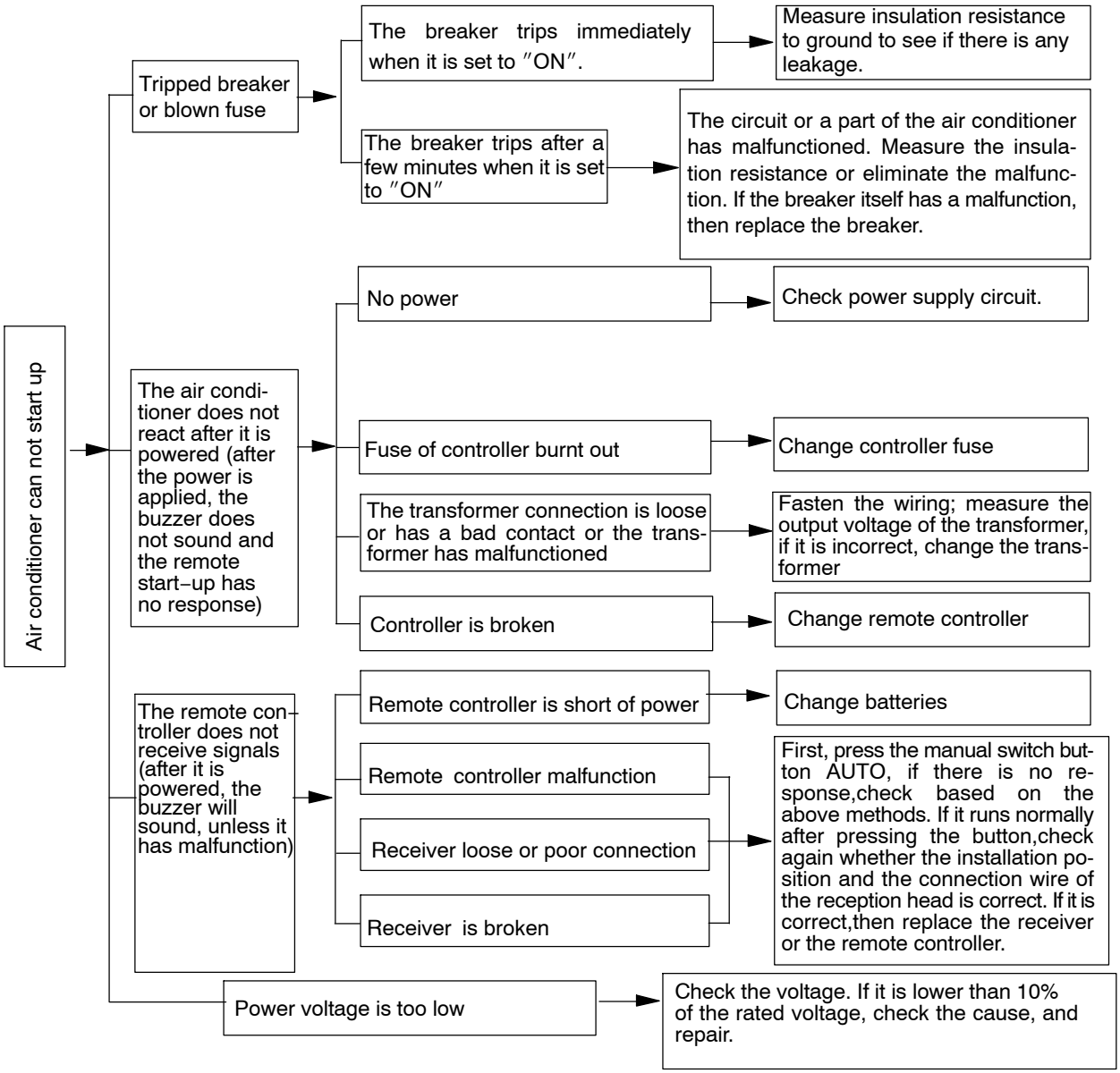
UNIT 18K & 24K, 230 Volts (Cont.)										
	Indoor Unit Display				Outdoor unit display (LED's have 3 modes) □OFF, ■ON, ☆Flash					
	Error Code Display	Indicator Display (LED Flash 0.5s–ON/0.5s–OFF								
Malfunction		**Running LED**	**Cooling LED**	**Heating_ LED**	**D40 /D5**	**D41 /D6**	**D42/ D16**	**D43/ D30**	**Operation Status**	**Malfunction**
Outdoor unit error	U9				■	■	☆	□	Cooling: compressor will stop, and indoor fan runs. Heating all stop	Replace outdoor board AP1.
Indoor freeze protection	FH				■	■	■	□	Operation normal, compressor speed reduced	Indoor unit return air blocked or fan speed is too low,
Fan module protection	L3				■	□	□	□	Cooling: outdoor fan motor and compressor stop; and indoor fan runs. Heating all stop	1. Outdoor fan terminals loose, correct problem. 2. Motor damaged, replace motor. 3. Fan motor module on mainboard is damaged; replace mainboard AP1.
Remark	1. Error codes only can be seen in the type which has the temperature display PCB. Some types do not have this function and have only the LED's on the outdoor PCB. 2. If there is normal communication between the Indoor and Outdoor unit the green LED will be on and flashing.									

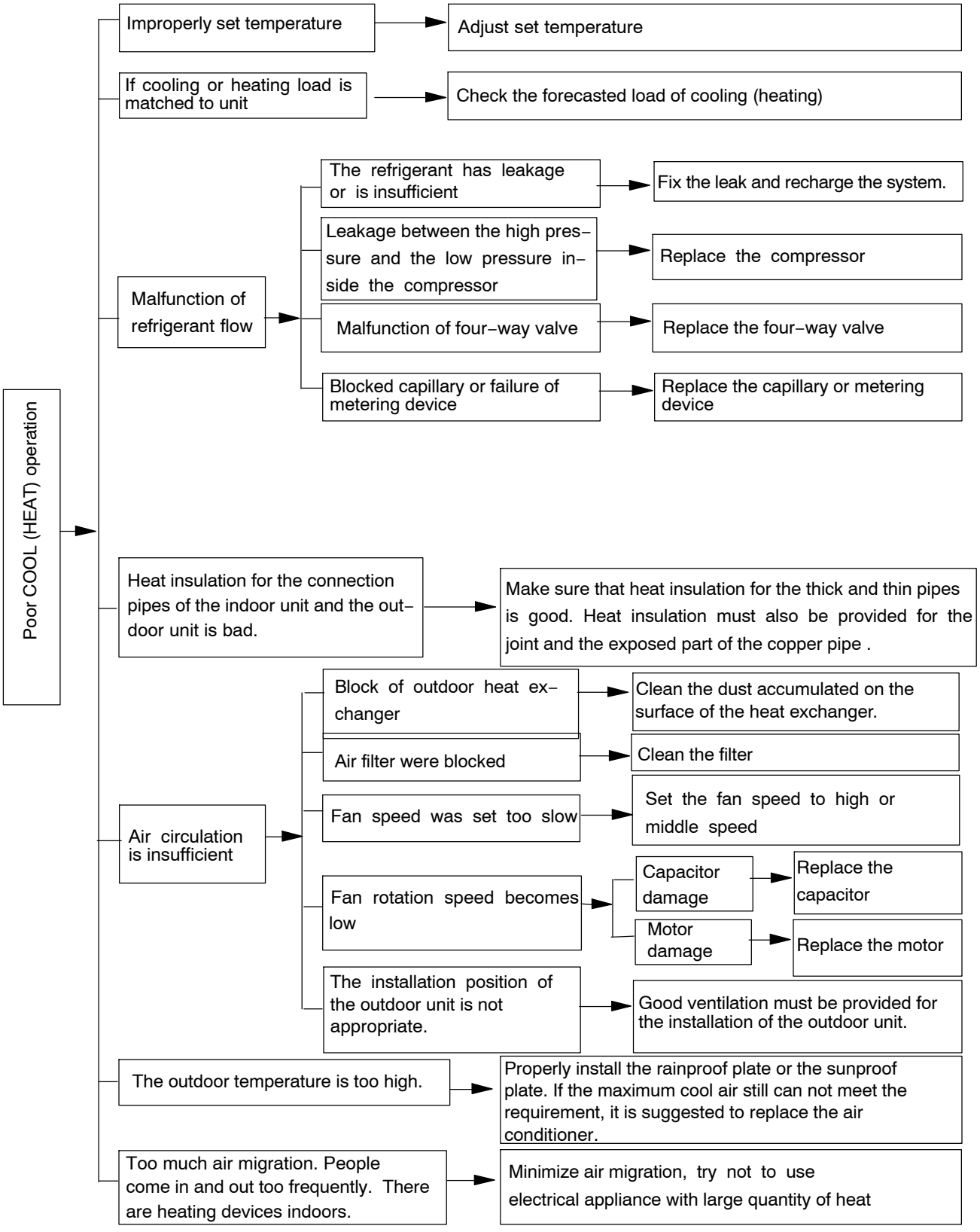
UNITS 30K & 36K, 230 Volts					
	Display on Indoor Unit	State of the Lamps of Outdoor Unit PCB			
Malfunction	Error Code	Yellow	Red	Green	Reasons
Compressor running (normal)		Flash 1 times			Normal
Auto defrost (normal)	H1	Flash 2 times			Normal
Anti–freezing protection	E2	Flash 3 times			Refrigerant leakage. Indoor unit air flow blocked. Filter dirty.
Stop for IPM module protection (over current)	H5	Flash 4 times			IPM module over current. Outdoor unit air flow blocked.
Stop for over current protection	E5	Flash 5 times			Outdoor unit over current. Ambient temp is abnormal
Overload protection	H4	Flash 6 times			Ambient temp is abnormal. Heat exchanger blocked
Stop for discharge temp	E4	Flash 7 times			Low refrigerant. Capillary blocked. Ambient temp is abnormal.
Stop of compressor overload protection	H3	Flash 8 times			Compressor shell too hot. Low refrigerant. Capillary blocked
Stop for over power protection	L9	Flash 9 times			Ambient temp is abnormal.
Stop for IPM module protection (overheat)	H5	Flash 10 times			IPM module too hot. Outdoor unit air flow blocked.
Stop for EEPROM read–write malfunction	EE	Flash 11 times			The EEPROM on the outdoor PCB mainboard cannot read or write.
Stop for low voltage protection	PL	Flash 12 times			DC voltage is low.
Stop for high voltage protection	PH	Flash 13 times			DC voltage is high.
Stop for PFC circuit over current protection	HC	Flash 14 times			The PFC circuit is over current.
No feedback of indoor fan motor	H6				Indoor fan is abnormal.
Stop for ID and OD don't match	LP	Flash 16 times			Indoor unit and outdoor unit don't match.
Compressor frequency limited by over current protection			Flash 1 times		Outdoor unit over current. Ambient temp is abnormal.
Compressor frequency limited by discharge temp protection			Flash 2 times		Low refrigerant. Capillary blocked. Ambient temp is abnormal.
Compressor frequency limited by overload protection			Flash 3 times		Ambient temp is abnormal. Heat exchanger blocked
Compressor frequency limited by anti–freezing protection			Flash 4 times		Refrigerant leakage. Indoor unit air flow blocked. Filter dirty.
Outdoor pipe temp sensor malfunction	F4		Flash 5 times		Circuit open or circuit short for outdoor condenser pipe temp sensor
Outdoor ambient temp sensor malfunction	F3		Flash 6 times		Circuit open or circuit short for outdoor environment temp sensor.
Outdoor discharge temp sensor malfunction	F5		Flash 7 times		Circuit open or circuit short for outdoor gas–discharge pipe temp sensor.
Normal operation			Flash 8 times		Normal compressor operation.
Compressor frequency limited by IPM protection			Flash 11 times		IPM module too hot. Outdoor unit air flow blocked.
Compressor frequency limited by over power protection			Flash 13 times		Ambient temp is abnormal.
Indoor ambient temp sensor malfunction	F1				Circuit open or circuit short for indoor environment temp sensor.
Indoor tube temp sensor malfunction	F2				Circuit open or circuit short for indoor evaporator pipe temp sensor.
Stop for communication malfunction	E6			Off	Communication line failure. Main PCB failure. Interfere source. Wiring error. Condensate pump failure.
Communication normal				Flash 1 times	Communication is normal.
Jumper cap malfunction protection	C5				The jumper is wrong or missing.
No feedback of outdoor fan motor			Flash 14 times		
High pressure protection	E1		Flash 16 times		
NOTE: The lamps Flash 0.5s ON, 0.5s OFF, between two error cycles, it will be 2s off.					

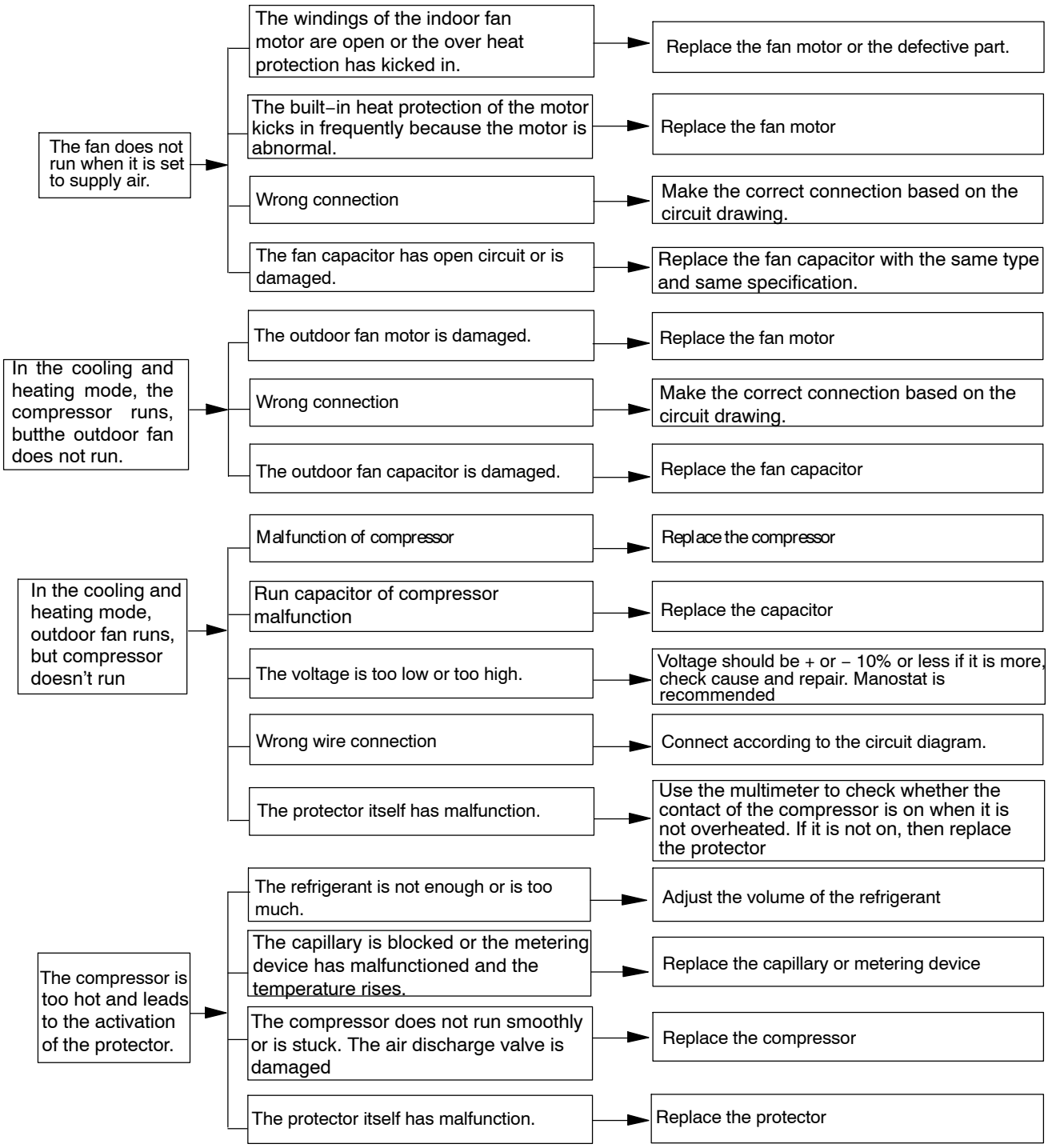
Troubleshooting

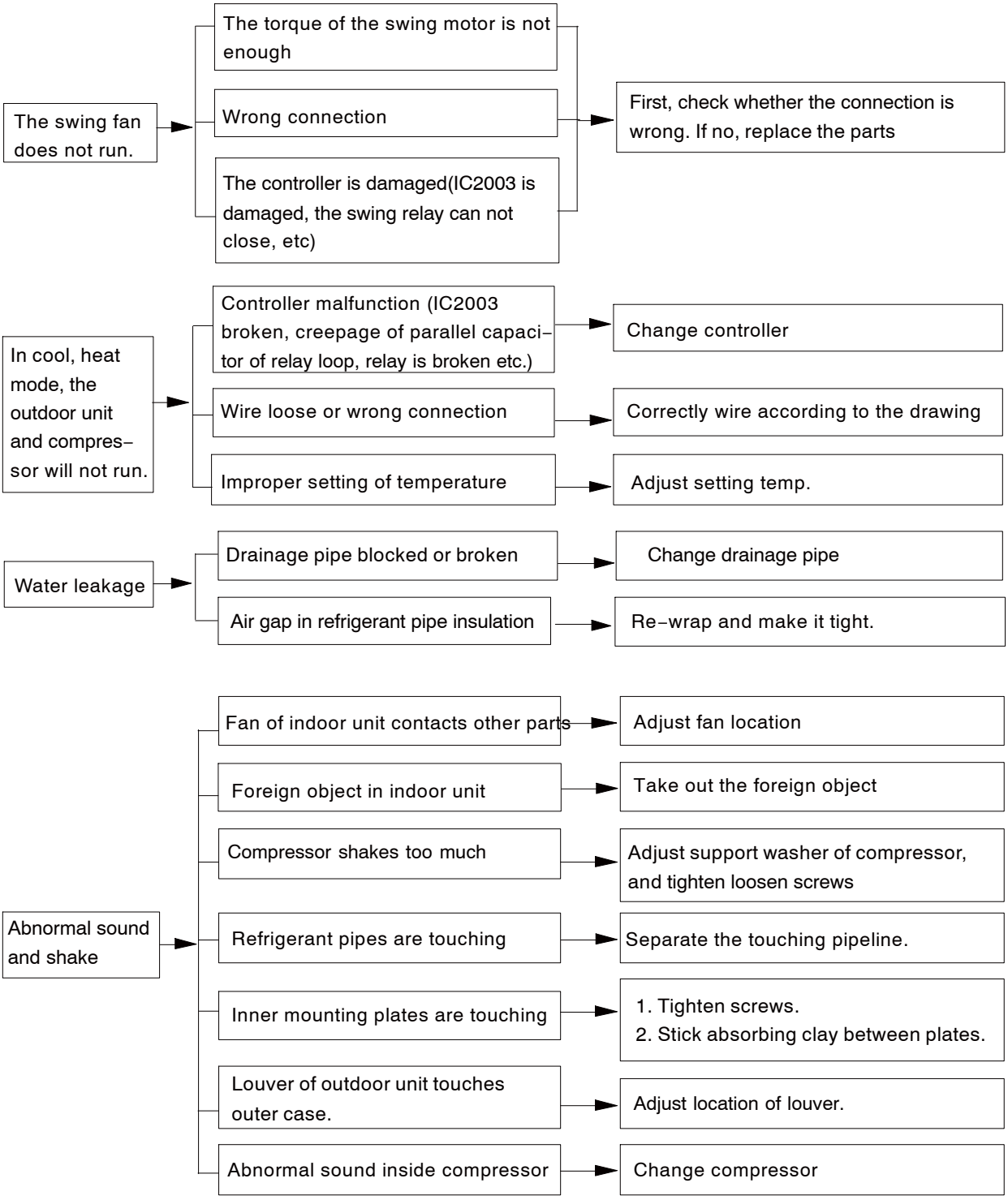
9.1 Malfunction Analysis

Note: When replacing the controller, make sure to insert the jumper into the new controller, otherwise the unit will display C5




Poor COOL (HEAT) operation
Improperly set temperature
Adjust set temperature
If cooling or heating load is matched to unit
Check the forecasted load of cooling (heating)
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Fix the leak and recharge the system.
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four–way valve
Replace the four–way valve
Blocked capillary or failure of metering device
Replace the capillary or metering device
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint and the exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
Set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
Too much air migration. People come in and out too frequently. There are heating devices indoors.
Minimize air migration, try not to use electrical appliance with large quantity of heat


The fan does not run when it is set to supply air.
The windings of the indoor fan motor are open or the over heat protection has kicked in.
Replace the fan motor or the defective part.
The built–in heat protection of the motor kicks in frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor with the same type and same specification.
In the cooling and heating mode, the compressor runs, butthe outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing.
The outdoor fan capacitor is damaged.
Replace the fan capacitor
In the cooling and heating mode, outdoor fan runs, but compressor doesn't run
Malfunction of compressor
Replace the compressor
Run capacitor of compressor malfunction
Replace the capacitor
The voltage is too low or too high.
Voltage should be + or – 10% or less if it is more, check cause and repair. Manostat is recommended
Wrong wire connection
Connect according to the circuit diagram.
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the activation of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked or the metering device has malfunctioned and the temperature rises.
Replace the capillary or metering device
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector


The swing fan does not run.
The torque of the swing motor is not enough
Wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts
In cool, heat mode, the outdoor unit and compres–sor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capaci–tor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.
Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Air gap in refrigerant pipe insulation
Re–wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts
Adjust fan location
Foreign object in indoor unit
Take out the foreign object
Compressor shakes too much
Adjust support washer of compressor, and tighten loosen screws
Refrigerant pipes are touching
Separate the touching pipeline.
Inner mounting plates are touching
1. Tighten screws.
2. Stick absorbing clay between plates.
Louver of outdoor unit touches outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor

Analysis or processing of some of the malfunction display:

1 Compressor discharge protection

Possible causes: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short circuit of condenser; the system has non–condensing gas (such as air, water etc.); blockage of capillary assy (including filter); malfunction of metering device; leakage inside four–way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2 Low voltage over–current protection

Possible cause: Sudden drop of supply voltage.

3 Communication malfunction

Processing method: Check if communicating signal cable is connected reliably.

4 Sensor open or short circuit

Processing method: check whether sensor is normal, connected with the corresponding position on the controller and if damage of lead wire is found.

5 Compressor over load protection

Possible causes: insufficient or too much refrigerant; blockage of capillary or metering device and increase of suction temp.; improper running of compressor, stuck bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrigerant amount; replace the capillary or metering device; replace the compressor; use universal meter to check if the contactor of compressor is fine when it is not overheated, if not replace the protector.

6 System malfunction

i.e. overload protection. When tube temperature (check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protection will be activated.

Possible causes: Outdoor temperature is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction. Please refer to the malfunction analysis in the previous section for handling method.

7 IPM Module protection

Precessing method: Once the module malfunction happens, if it persists for a long time and cannot be self cancelled, cut off the power and turn off the unit, and then re–energize the unit again after about 10 min. After repeating the procedure for several times, if the malfunction still exists, replace the module.

9.3 Basic System Check

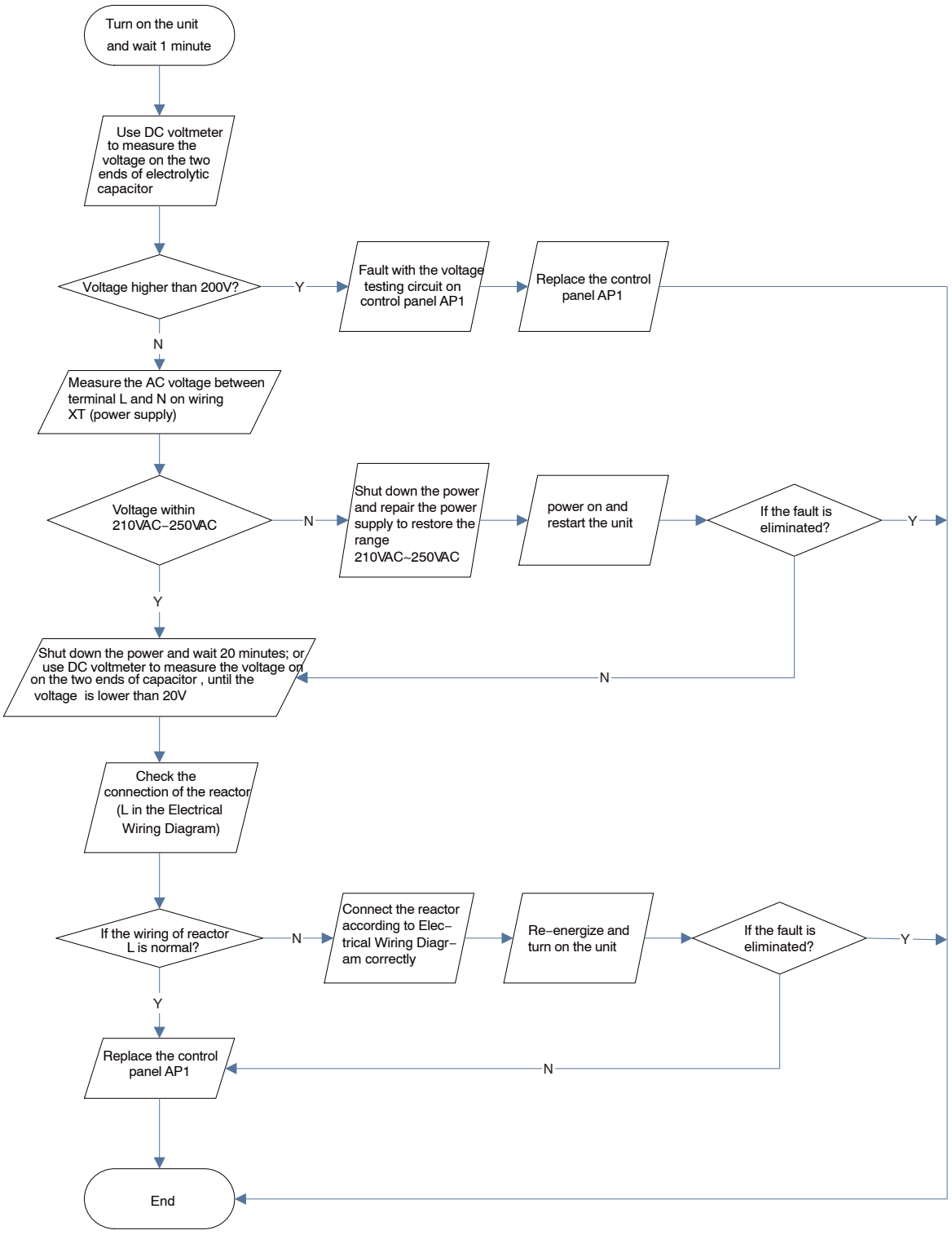
Applicable for 09 & 12K model

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

Main Check Points:

- Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210 AC ~240 VAC.
- Is the reactor (L) correctly connected? Is the connection loose of disconnected? Is the reactor (L) damaged?

Fault diagnosis process:

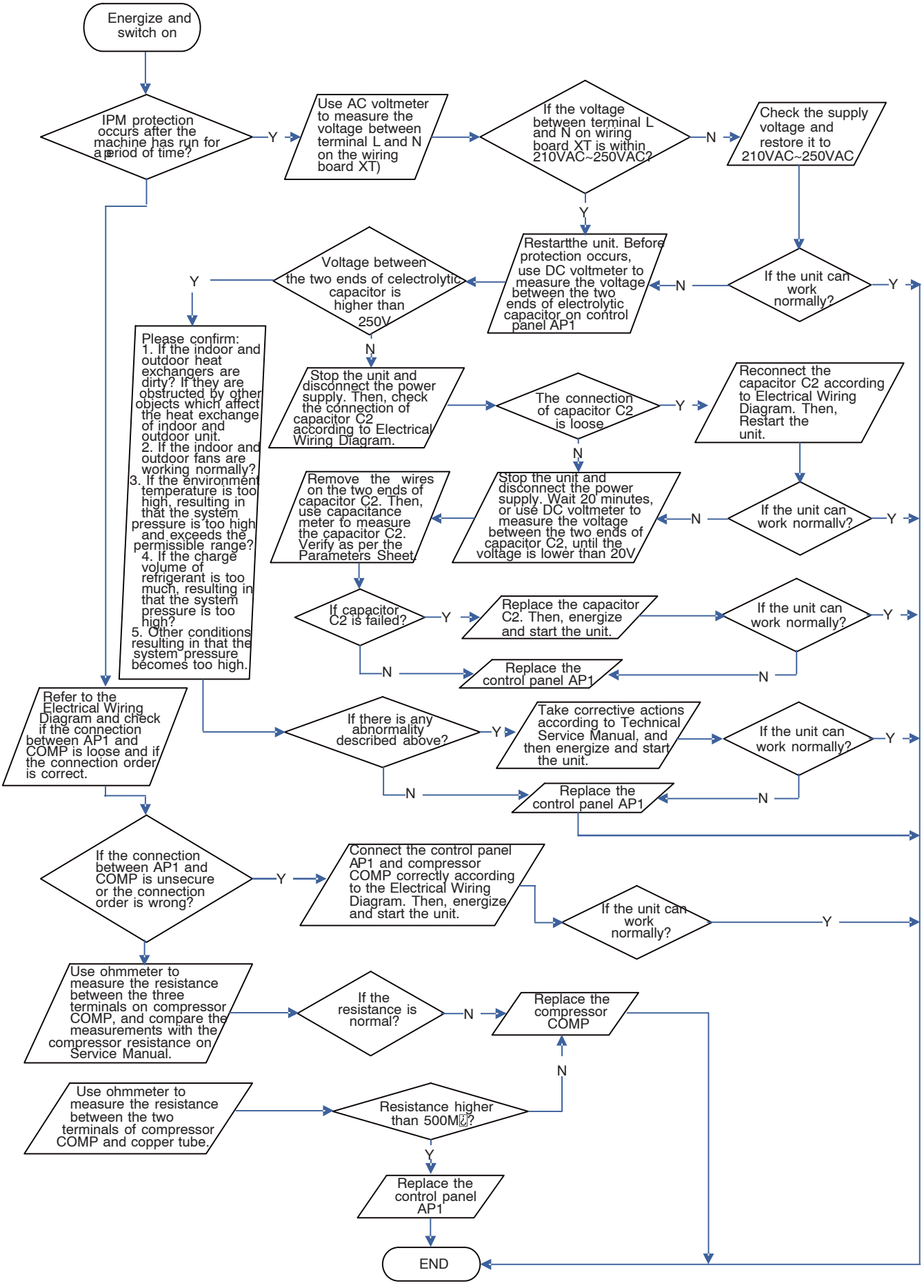


(2) IPM Protection, Out–of–step Fault, Compressor Phase Over current (AP1 below refers to the outdoor control panel)

Main check points:

- Is the connection between control panel AP1 and compressor COMP secure? Loose? Is the connection in correct order?
- Is the voltage input of the machine within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
- Is the compressor coil resistance normal? Is the insulation of compressor coil against the copper tube in good condition?
- Is the working load of the machine too high?
- Is the charge volume of refrigerant correct?

Fault diagnosis process:

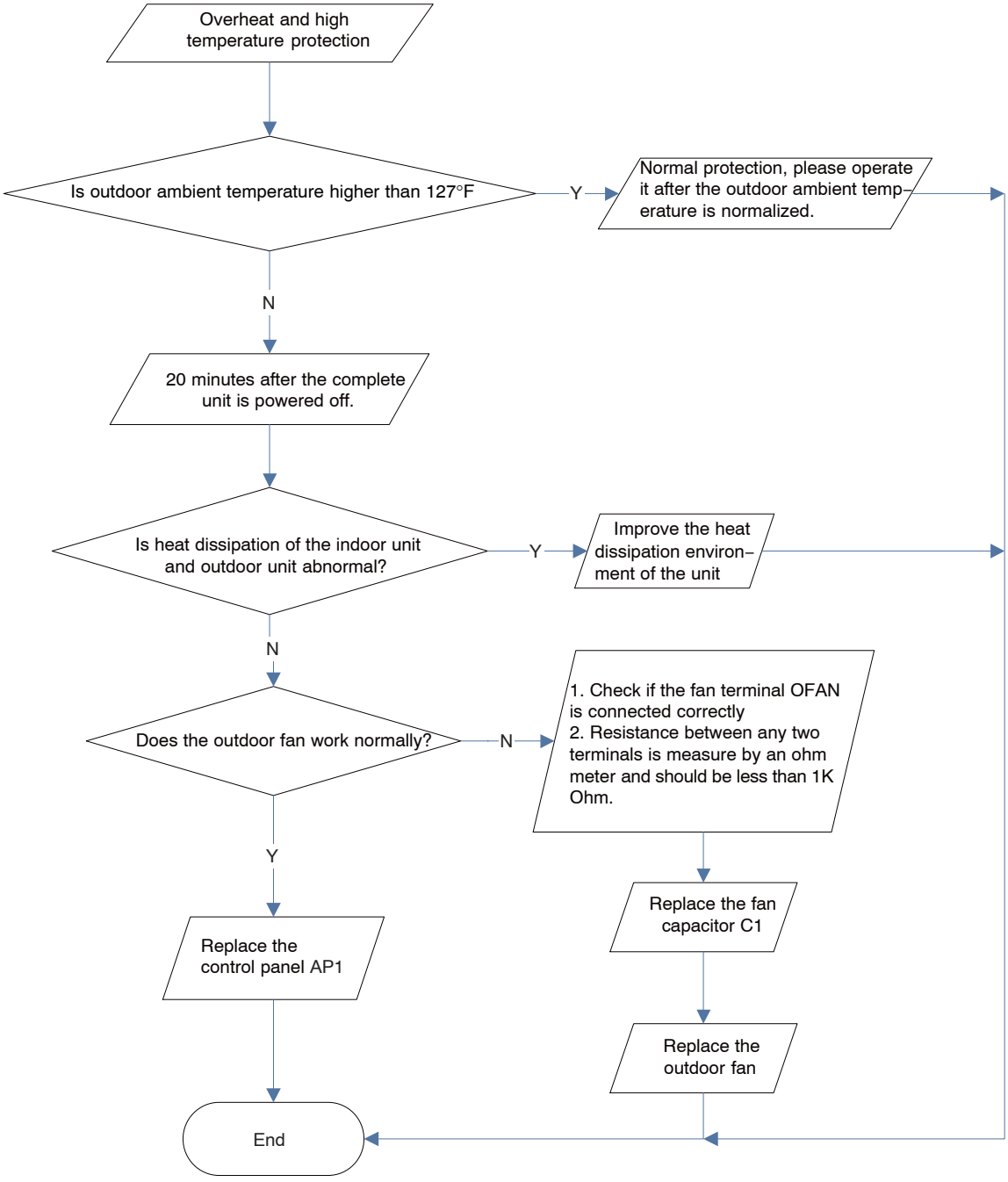

Energize and switch on
IPM protection occurs after the machine has run for a period of time?
Y
Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
N
Check the supply voltage and restore it to 210VAC~250VAC
Y
Restartthe unit. Before protection occurs, use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1
N
If the unit can work normally?
Y
Voltage between the two ends of celectrolytic capacitor is higher than 250V
Y
N
Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? If they are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are working normally?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the permissible range?
4. If the charge volume of refrigerant is too much, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high.
Stop the unit and disconnect the power supply. Then, check the connection of capacitor C2 according to Electrical Wiring Diagram.
The connection of capacitor C2 is loose
Y
Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
N
Remove the wires on the two ends of capacitor C2. Then, use capacitance meter to measure the capacitor C2. Verify as per the Parameters Sheet
Stop the unit and disconnect the power supply. Wait 20 minutes, or use DC voltmeter to measure the voltage between the two ends of capacitor C2, until the voltage is lower than 20V
N
If the unit can work normallv?
Y
If capacitor C2 is failed?
Y
Replace the capacitor C2. Then, energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
Refer to the Electrical Wiring Diagram and check if the connection between AP1 and COMP is loose and if the connection order is correct.
If there is any abnormality described above?
Y
Take corrective actions according to Technical Service Manual, and then energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
If the connection between AP1 and COMP is unsecure or the connection order is wrong?
Y
Connect the control panel AP1 and compressor COMP correctly according to the Electrical Wiring Diagram. Then, energize and start the unit.
If the unit can work normally?
Y
Use ohmmeter to measure the resistance between the three terminals on compressor COMP, and compare the measurements with the compressor resistance on Service Manual.
If the resistance is normal?
N
Replace the compressor COMP
N
Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
Resistance higher than 500MΩ?
Y
Replace the control panel AP1
END

(3) High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

Detection:

- Is outdoor ambient temperature in normal range°?
- Are the outdoor and indoor fans operating normally?
- Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:

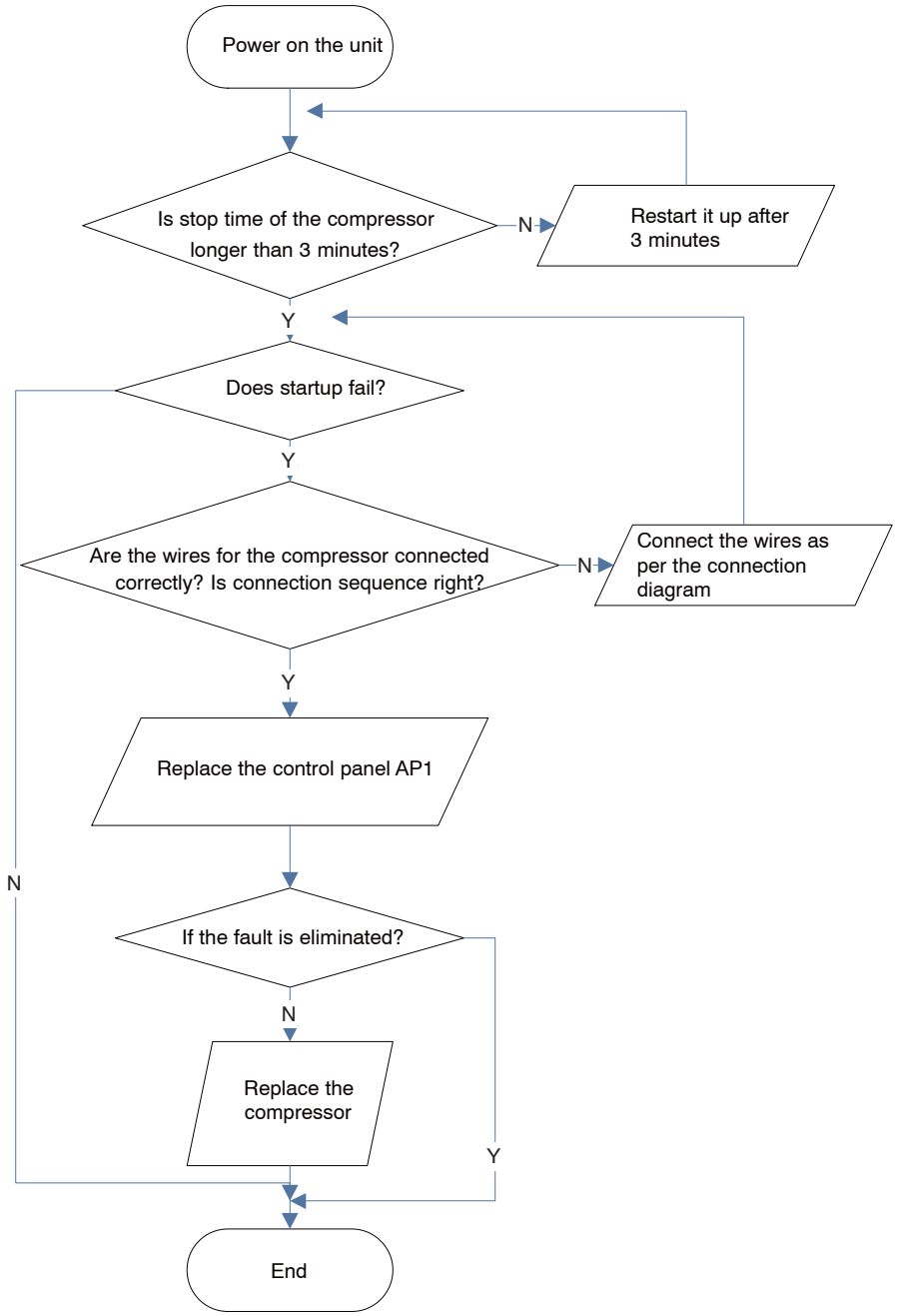


(4) Start–up failure (following AP1for outdoor unit control board)

Detection

- Whether the compressor wiring is connected correctly?
- Is the compressor broken?
- Has the compressor stopped long enough before re–start

Fault diagnosis process:

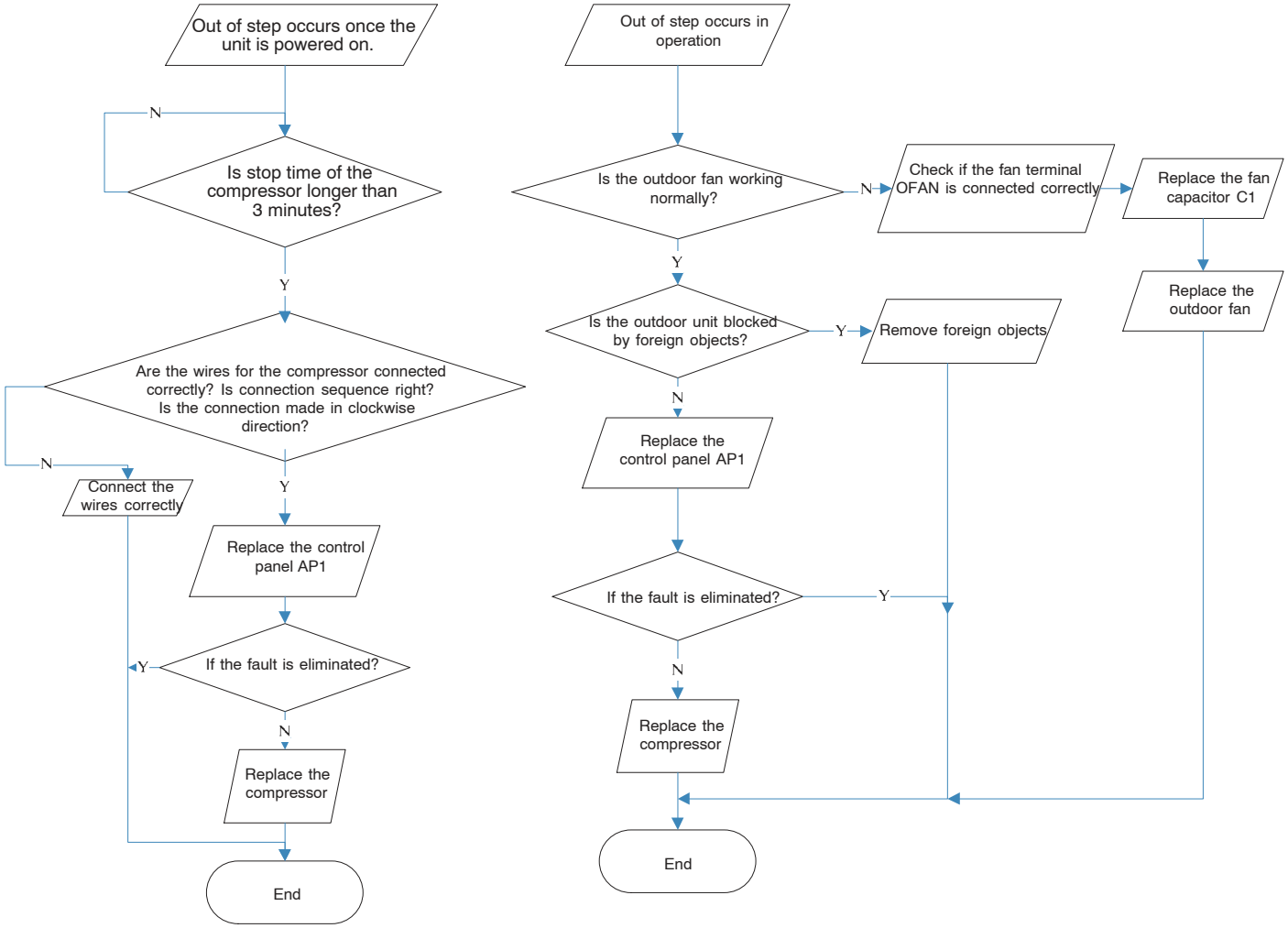


(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Detection:

- Is the system pressure too high?
- Is the input voltage too low?

Fault diagnosis process:

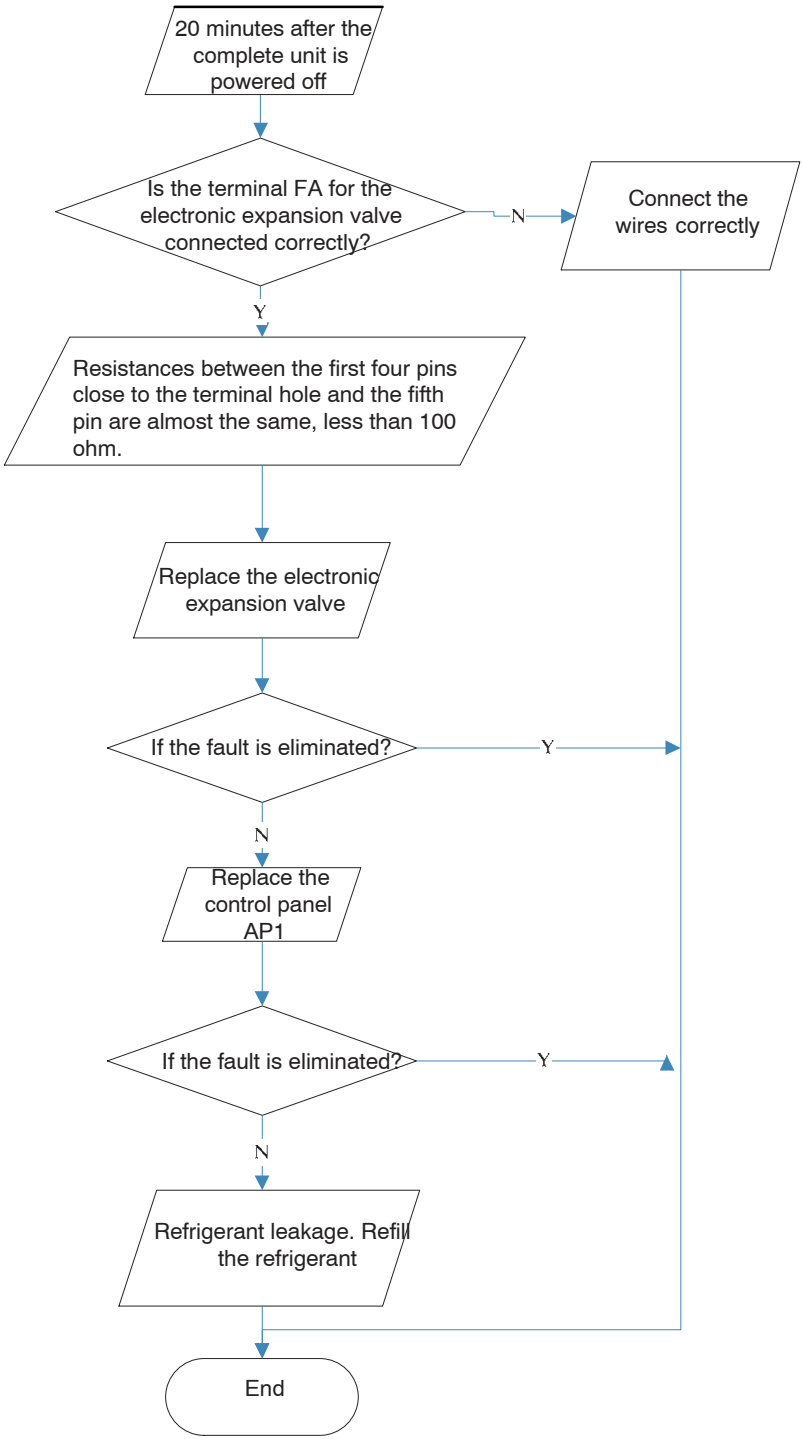


(6) Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Detection:

- Is the PMV connected well or not? Is the PMV damaged?
- Has refrigerant leaked?

Fault diagnosis process:

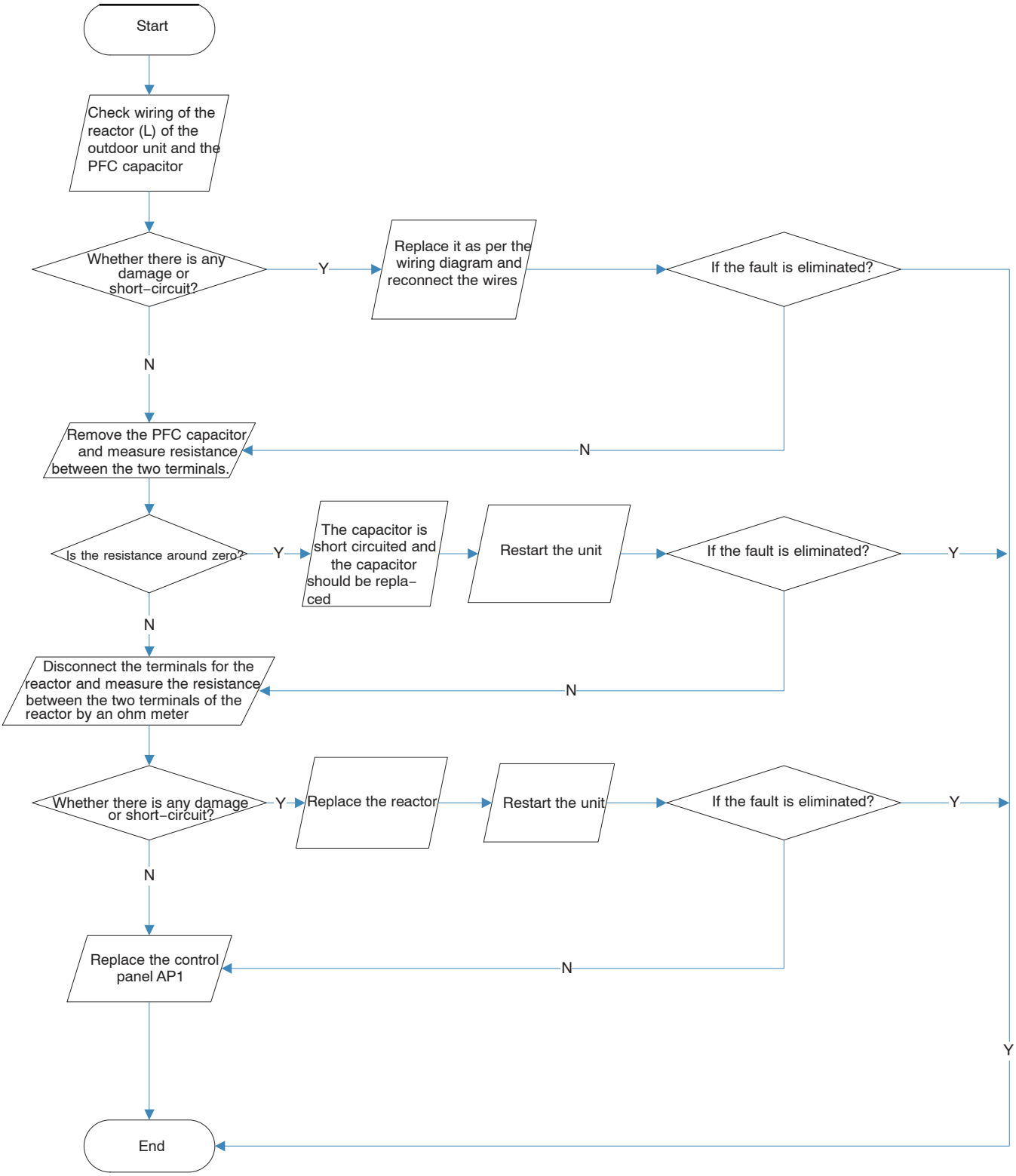


(7) Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Detection:

- Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:

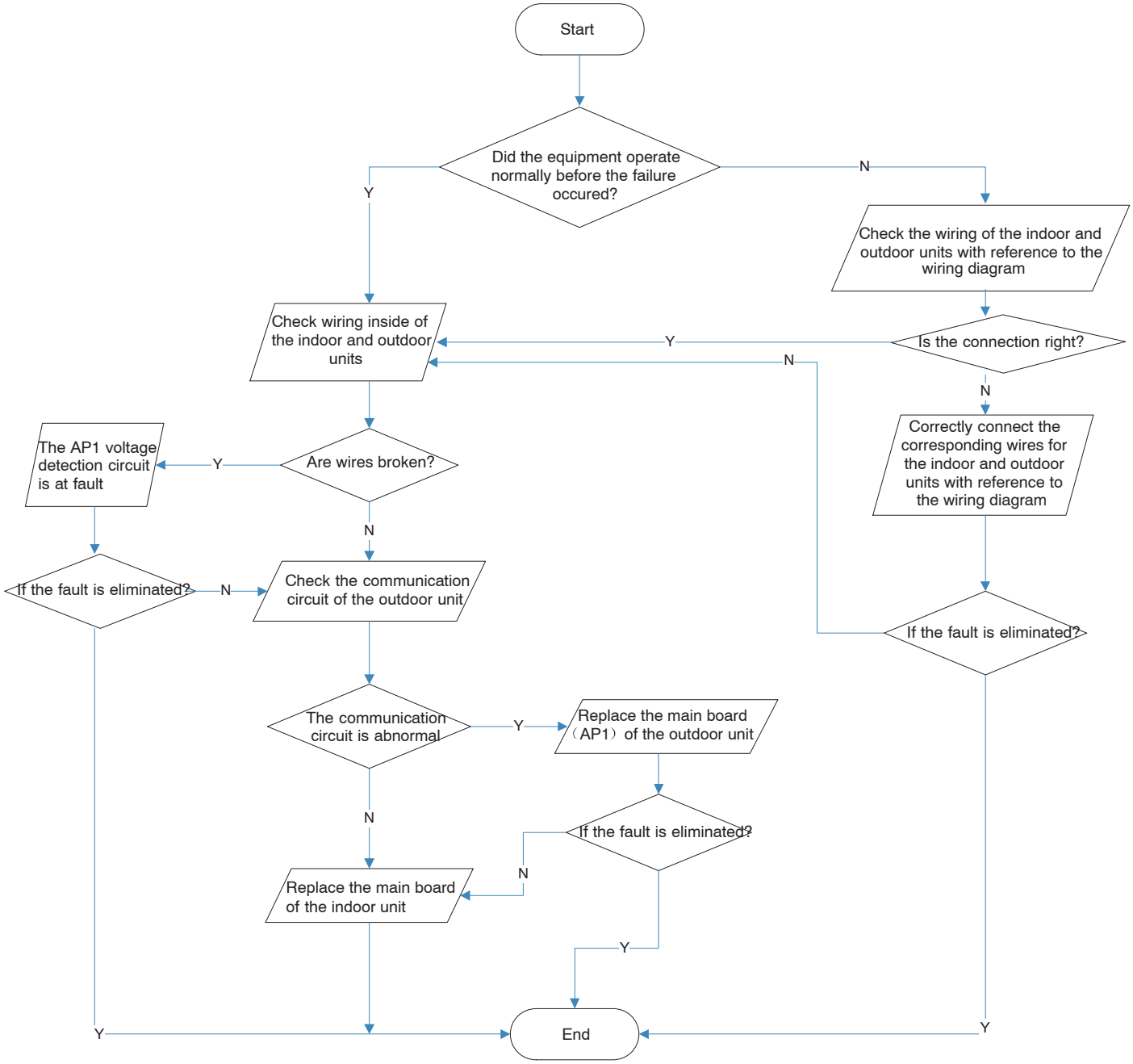


(8) Communication malfunction: (following AP1 for outdoor unit control board)

Detection:

- Is there any damage to the indoor unit mainboard communication circuit? Is communication circuit damaged?
- Are the indoor and outdoor units connection wire, and indoor and outdoor units inside wiring correct or not, is there any damage?

Fault diagnosis process:



Application for 18 & 24K model

Confirm the malfunction type according to the malfunction indicator of indoor/outdoor unit and malfunction sheet (usually the sheet will be stuck on the electric box cover or top cover of the unit).

As long as there is a malfunction, the indicator of the outdoor controller board will display the corresponding malfunction directly; Some malfunctions will be displayed on the indoor unit directly and some malfunctions will be seen on the remote controller by pressing light button for 4 times in 3 seconds.

In the below malfunction diagnosis process, “Y” means “Yes”, “N” means “No”;

In the below malfunction diagnosis process, controller board AP1 is for outdoor controller board;

Before proceeding to the malfunction check, discharge the electrolytic capacitor according to the method mentioned before and make sure the voltage is below 20V. Otherwise, it may cause electric shock or brake the controller board!

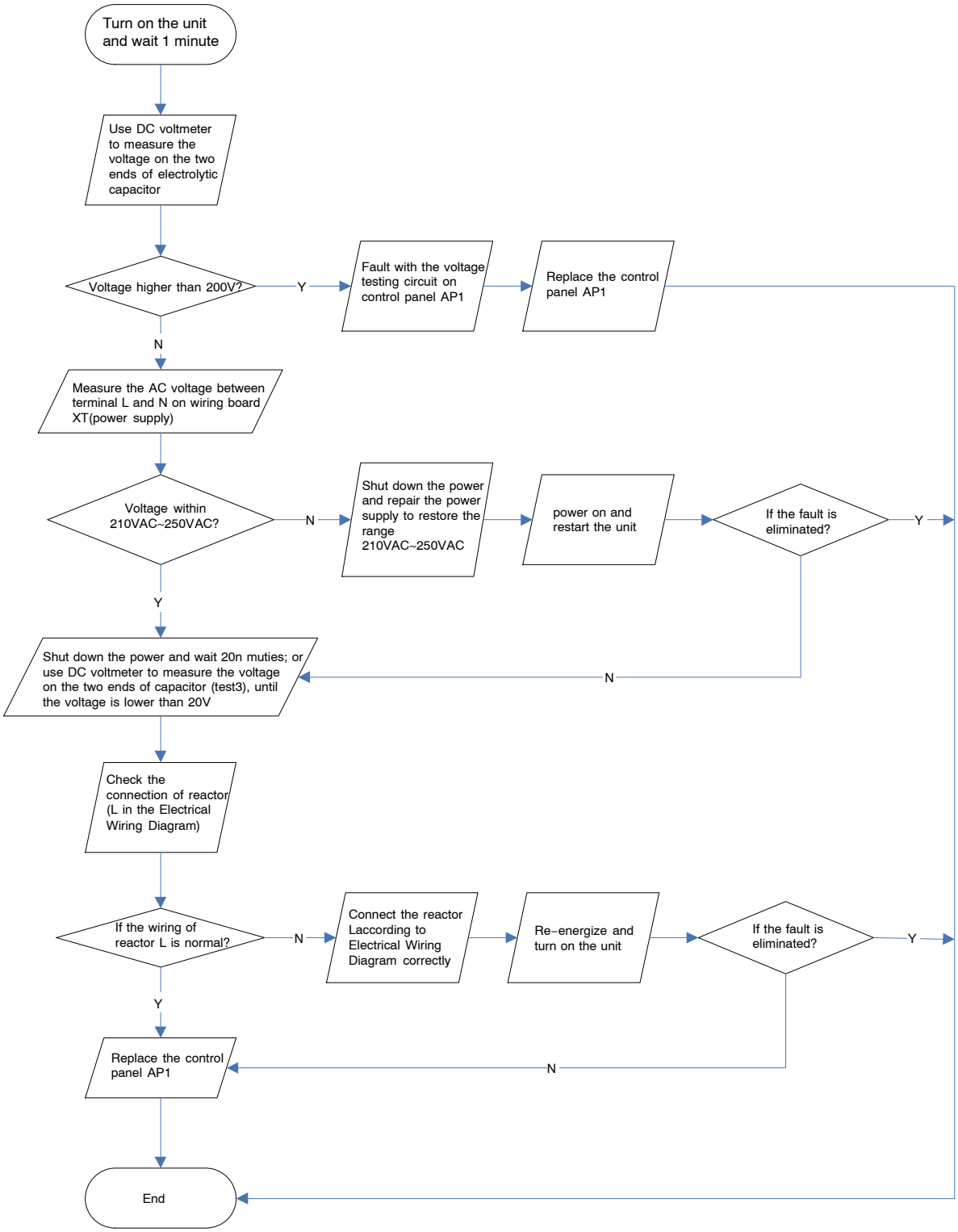
(1) Capacitor charging malfunction (outdoor unit malfunction)

D5	D6	D16	D30
□	■	□	■

Detection:

- Detect if the voltage of L and N terminal of wiring board is between 210AC ~ 240AC by AC volt meter;
- Is reactor (L) well connected? Is connection wire loose or disconnected? Is reactor (L) damaged?

Malfunction diagnosis process:



(2) IPM protection, desynchronizing malfunction, phase current of compressor is overcurrent (outdoor unit malfunction)

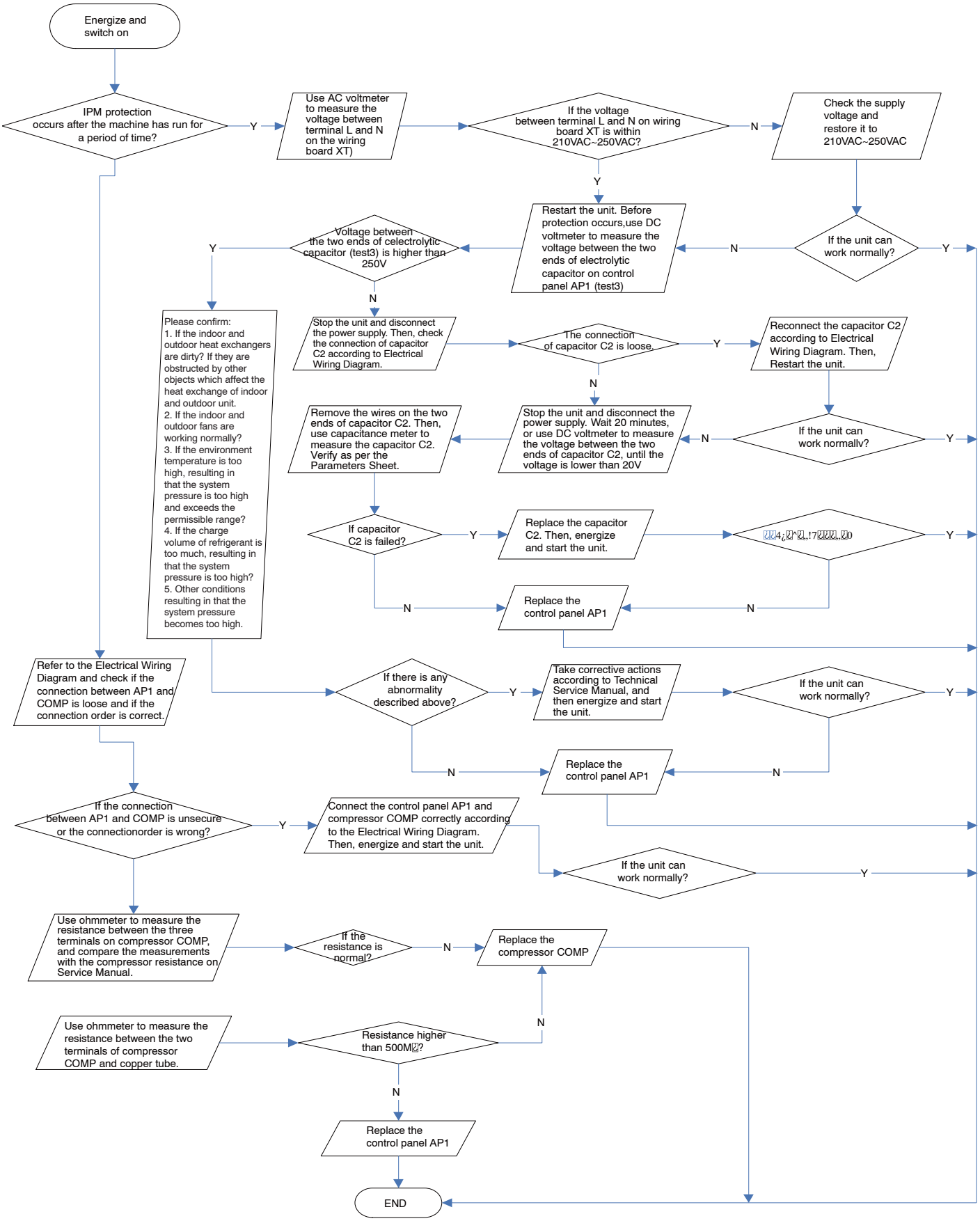
Outdoor unit malfunction indicator status

Malfunction	D5	D6	D16	D30
IPM protection	☐	☆	☐	■
Desynchronizing malfunction	☐	☆	■	☆
Compressor overcurrent	☐	☆	☐	☐

Detection:

- If control board AP1 and compressor COMP are well connected? If they are loose? If the connection sequence is correct?
- Is voltage input in the normal range (Test the voltage between L, N of wiring board XT by DC voltage meter)?
- If coil resistance of compressor is normal?
- If the work load of unit is heavy? If the refrigerant charging is appropriate?

Malfunction diagnosis process:


Energize and switch on
IPM protection occurs after the machine has run for a period of time?
Y
Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
N
Check the supply voltage and restore it to 210VAC~250VAC
Y
Restart the unit. Before protection occurs,use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1 (test3)
N
If the unit can work normally?
Y
Voltage between the two ends of celectrolytic capacitor (test3) is higher than 250V
Y
N
Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? If they are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are working normally?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the permissible range?
4. If the charge volume of refrigerant is too much, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high.
Stop the unit and disconnect the power supply. Then, check the connection of capacitor C2 according to Electrical Wiring Diagram.
The connection of capacitor C2 is loose.
Y
Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
N
Stop the unit and disconnect the power supply. Wait 20 minutes, or use DC voltmeter to measure the voltage between the two ends of capacitor C2, until the voltage is lower than 20V
N
If the unit can work normallv?
Y
Remove the wires on the two ends of capacitor C2. Then, use capacitance meter to measure the capacitor C2. Verify as per the Parameters Sheet.
If capacitor C2 is failed?
Y
Replace the capacitor C2. Then, energize and start the unit.
Y
N
Replace the control panel AP1
N
Refer to the Electrical Wiring Diagram and check if the connection between AP1 and COMP is loose and if the connection order is correct.
If there is any abnormality described above?
Y
Take corrective actions according to Technical Service Manual, and then energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
If the connection between AP1 and COMP is unsecure or the connectionorder is wrong?
Y
Connect the control panel AP1 and compressor COMP correctly according to the Electrical Wiring Diagram. Then, energize and start the unit.
If the unit can work normally?
Y
Use ohmmeter to measure the resistance between the three terminals on compressor COMP, and compare the measurements with the compressor resistance on Service Manual.
If the resistance is normal?
N
Replace the compressor COMP
Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
Resistance higher than 500M?
N
N
Replace the control panel AP1
END

(3) Diagnosis for high temperature, overload protection (check outdoor unit in cooling mode and check indoor unit in heating mode)

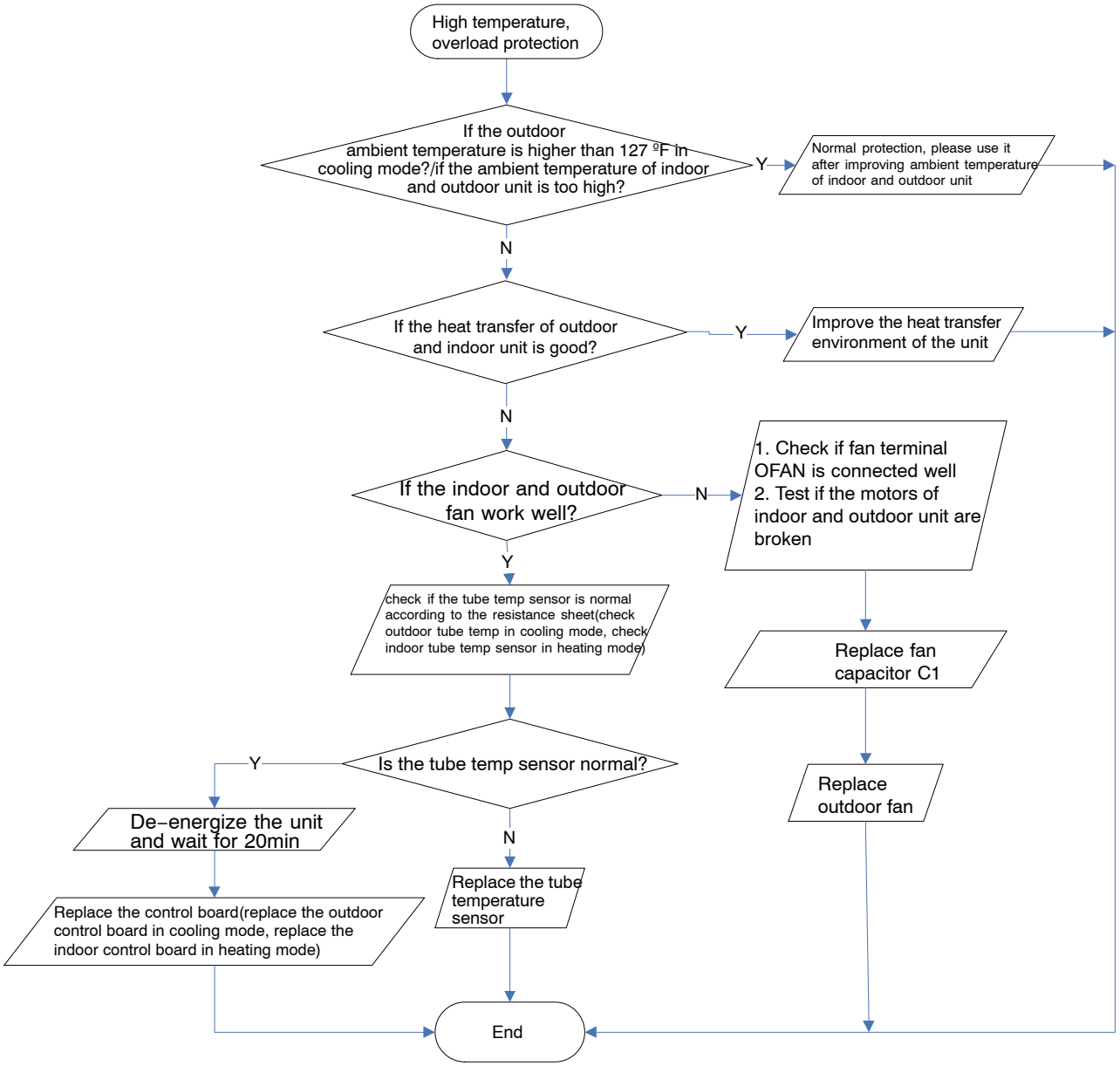
Outdoor unit malfunction indicator status

D5	D6	D16	D30
■	□	■	■

Detection:

- If the outdoor ambient temperature is in normal range;
- If the indoor and outdoor fan are running normally;
- If the heat transfer environment inside and outside the unit is good (including if the fan speed is too low)?
- If the tube temperature sensor of indoor and outdoor unit is normal?

Malfunction diagnosis process:



(4) Diagnosis for failure start up malfunction (outdoor unit malfunction)

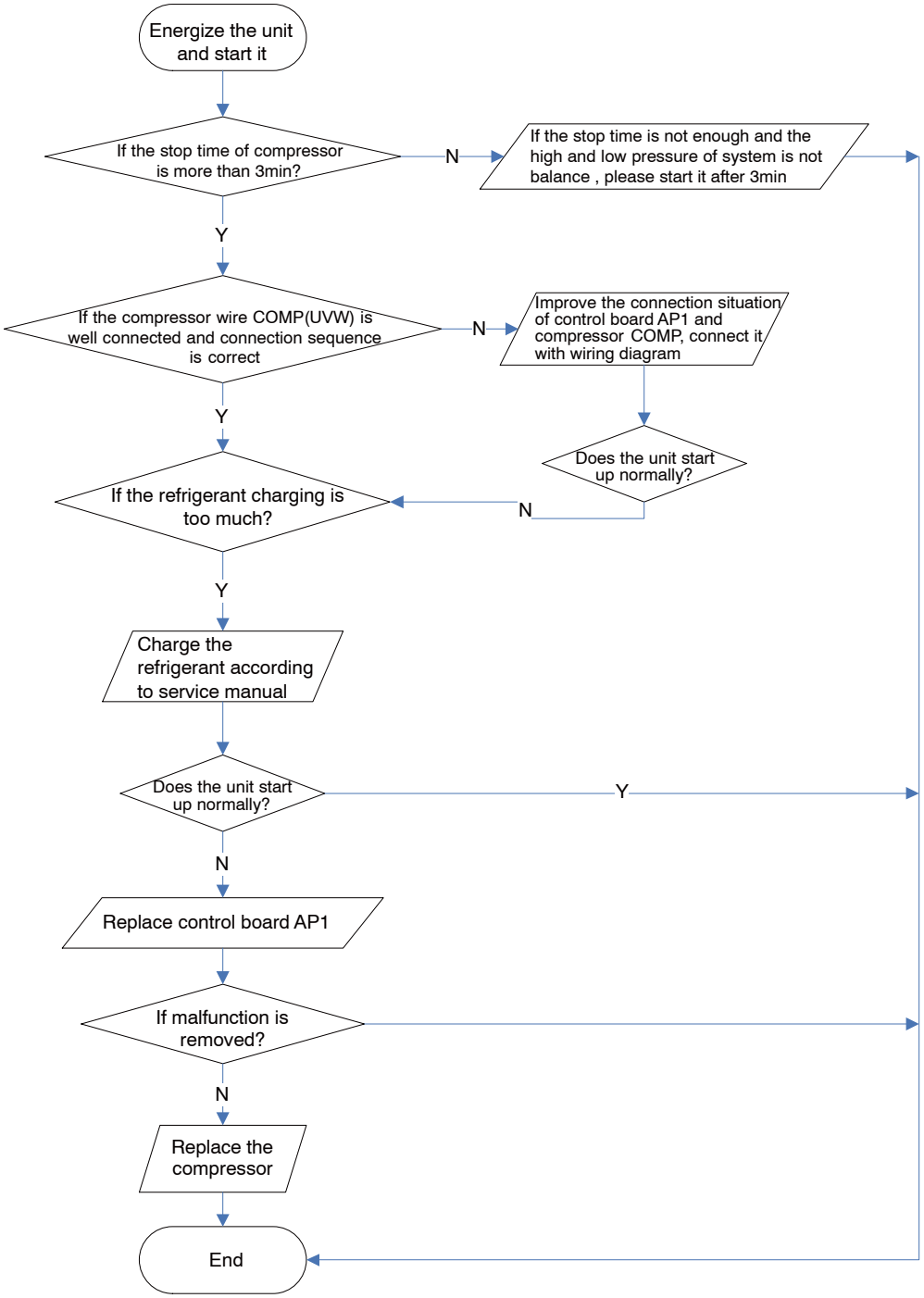
Outdoor unit malfunction indicator status

D5	D6	D16	D30
☐	☆	☐	☆

Detection:

- If the compressor wiring is correct?
- If the compressor has been off long enough?
- If the compressor is damaged?
- If the refrigerant charging is too much?

Malfunction diagnosis process:



(5) Diagnosis for compressor synchronization (outdoor unit malfunction)

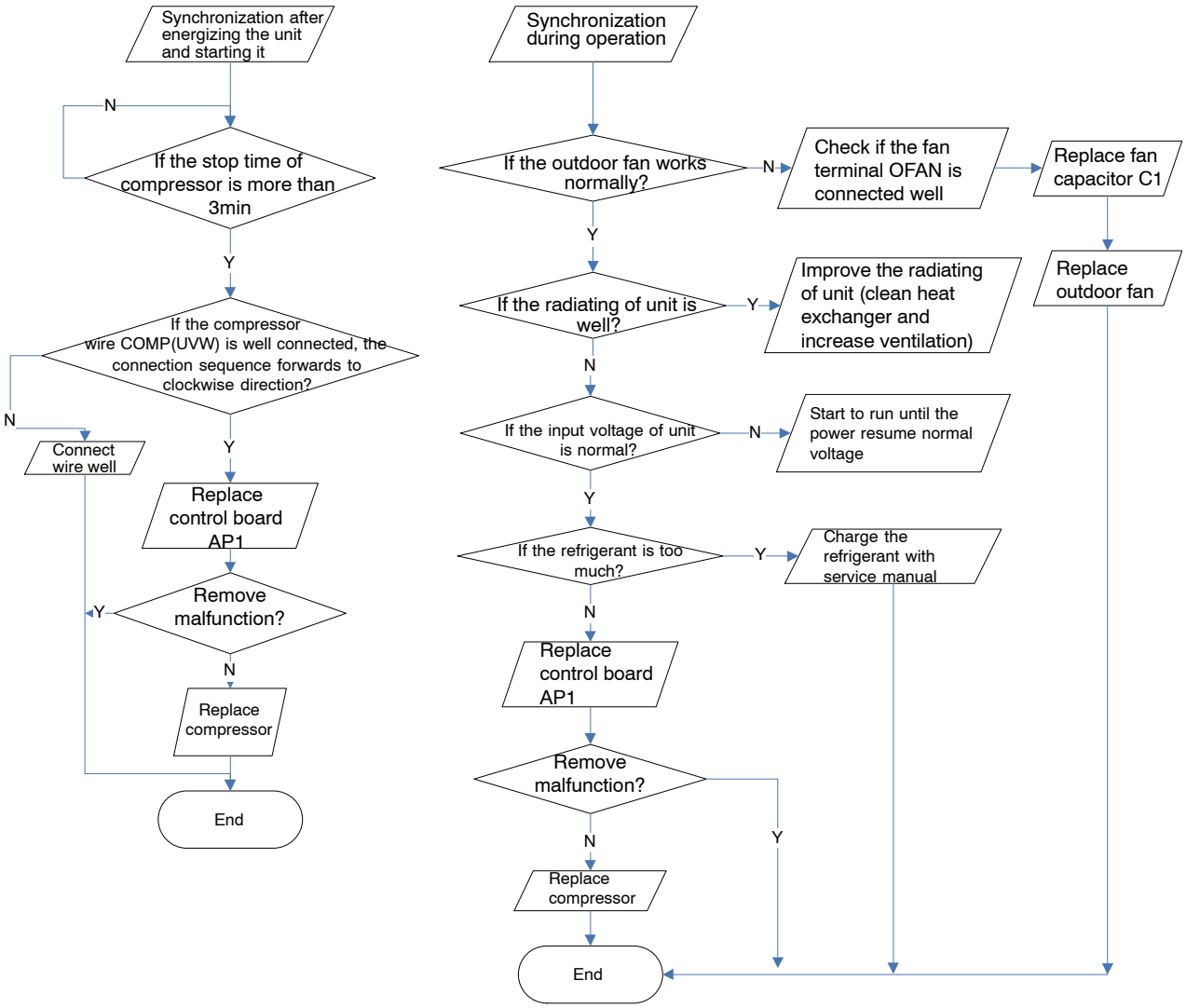
Outdoor unit malfunction indicator status

D5	D6	D16	D30
□	☆	■	☆

Detection:

- If the system pressure is too high?
- If the working voltage is too low?

Malfunction diagnosis process:



(6) Diagnosis for overload and discharge malfunction (outdoor unit malfunction)

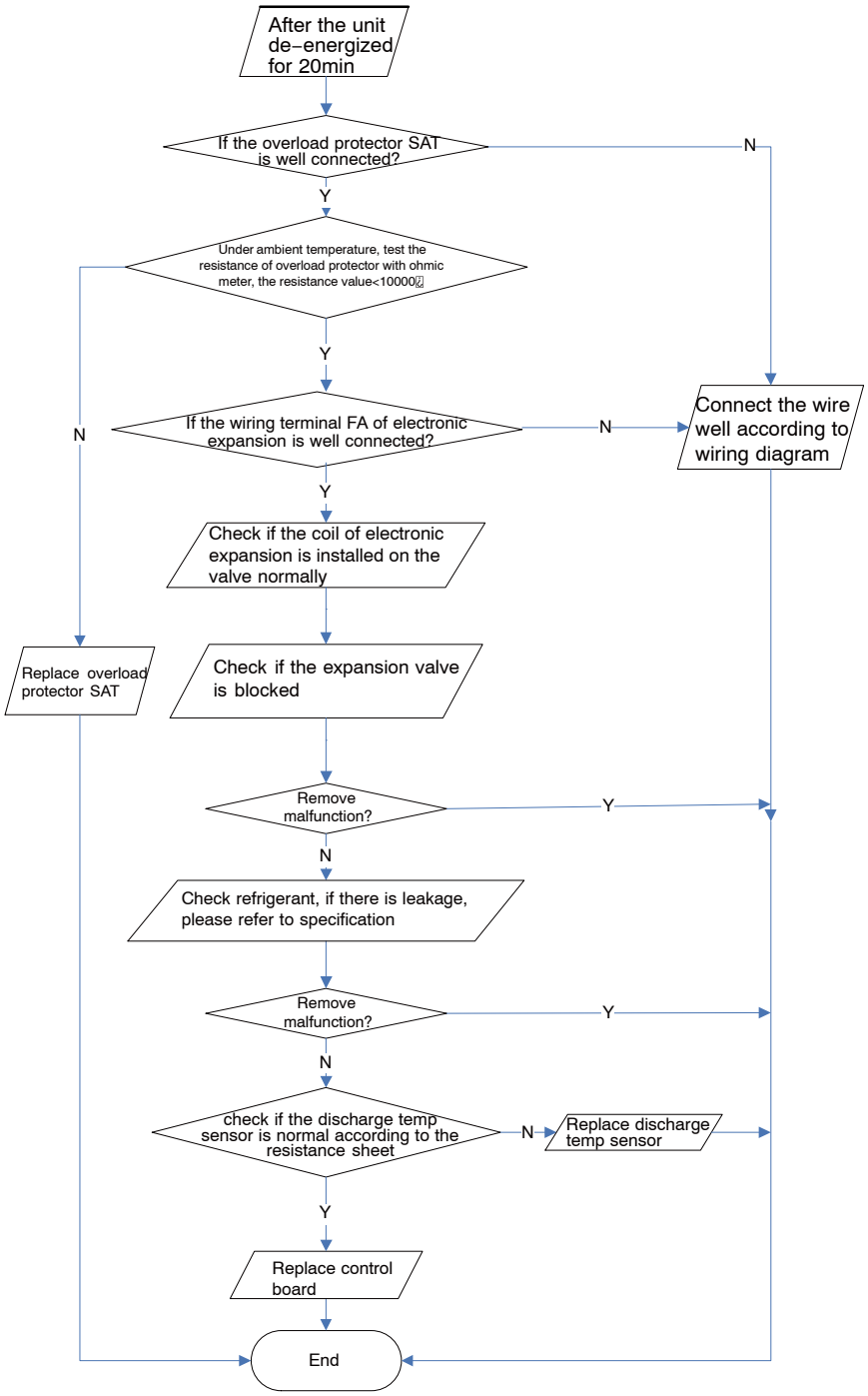
Outdoor unit malfunction indicator status

Malfunction	D5	D6	D16	D30
Overload	□	☆	☆	□
Discharge	■	□	■	☆

Detection:

- If the electronic expansion valve is connected correctly? Is the expansion valve damage?
- If the refrigerant leaked?
- If the overload protector is damage?
- If the discharge temp sensor is damage?

Malfunction diagnosis process:



(7) Communication malfunction

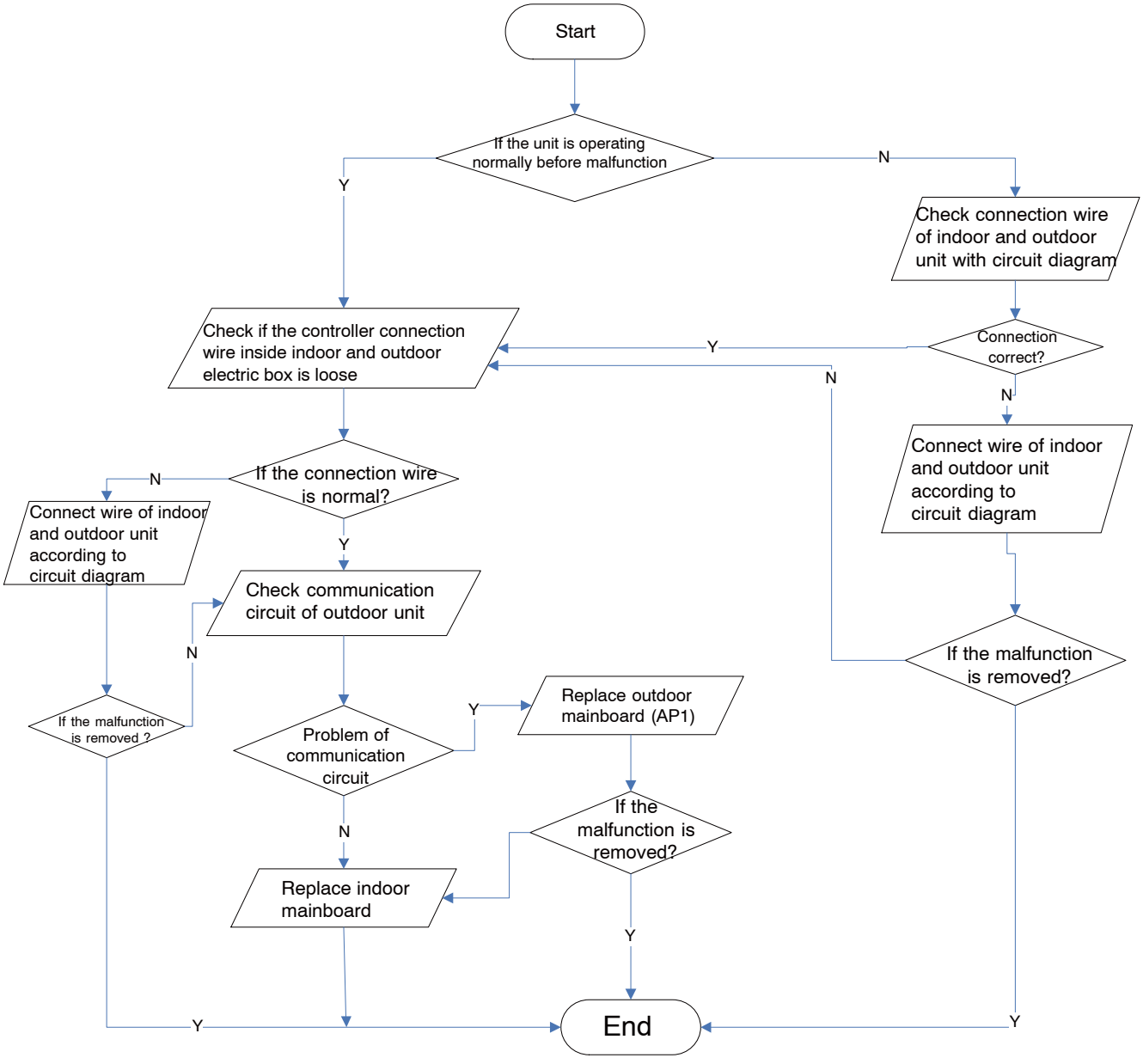
Outdoor unit malfunction indicator status

D5	D6	D16	D30
☐	☐	☐	☆

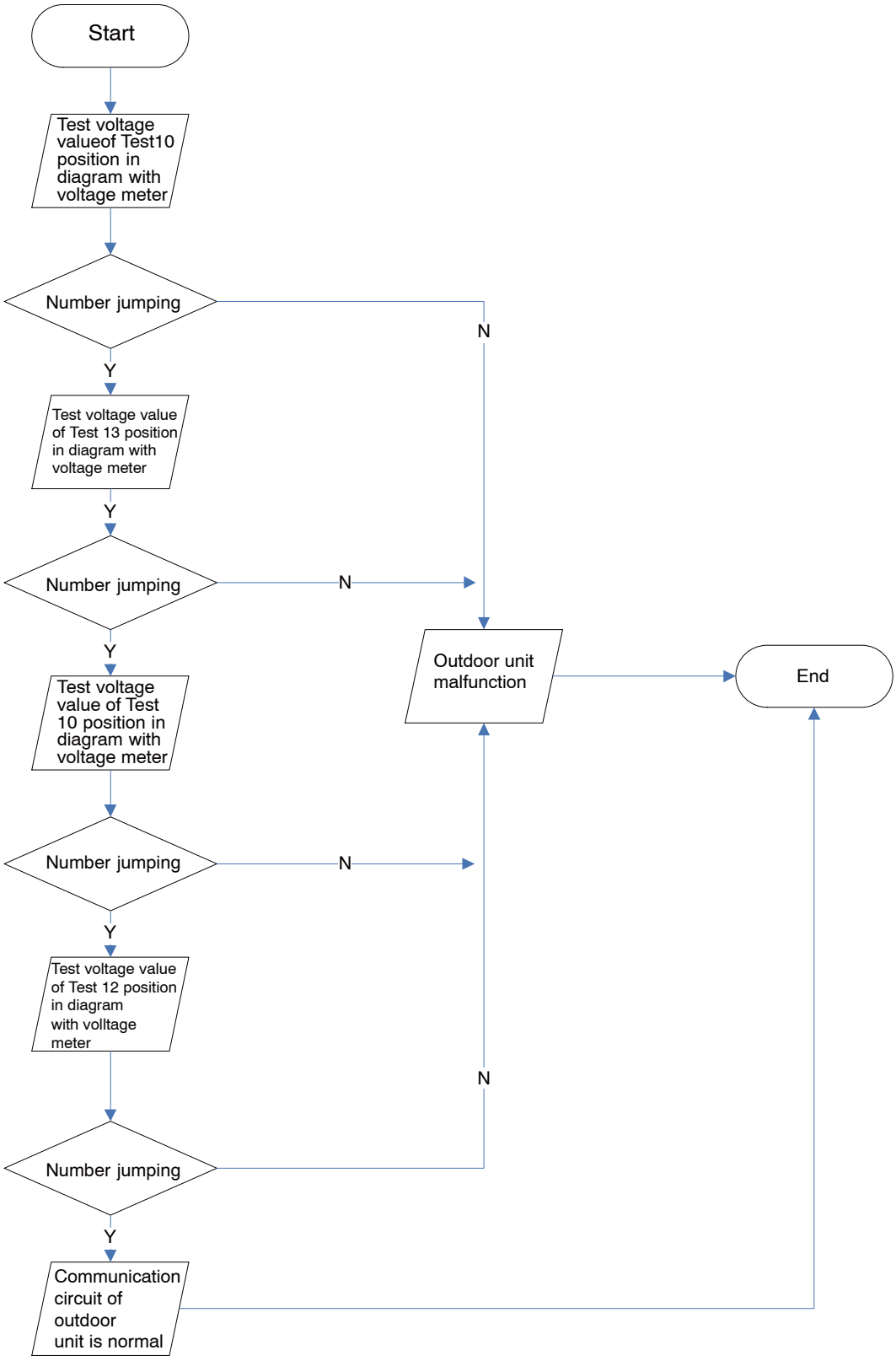
Detection:

- Check if the connection wire and the built–in wiring of indoor and outdoor unit is connected and not damaged;
- If the communication circuit of indoor mainboard is damaged? If the communication circuit of outdoor mainboard (AP1) is damaged?

Malfunction diagnosis process:



Diagnosis process for outdoor communication circuit (refer to the key detection points of outdoor unit)



Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)									
Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)
-2.2	138.1		68	18.75		138.2	3.848		208.4	1.071
-0.4	128.6		69.8	17.93		140	3.711		210.2	1.039
1.4	121.6		71.6	17.14		141.8	3.579		212	1.009
3.2	115		73.4	16.39		143.6	3.454		213.8	0.98
5	108.7		75.2	15.68		145.4	3.333		215.6	0.952
6.8	102.9		77	15		147.2	3.217		217.4	0.925
8.6	97.4		78.8	14.36		149	3.105		219.2	0.898
10.4	92.22		80.6	13.74		150.8	2.998		221	0.873
12.2	87.35		82.4	13.16		152.6	2.896		222.8	0.848
14	82.75		84.2	12.6		154.4	2.797		224.6	0.825
15.8	78.43		86	12.07		156.2	2.702		226.4	0.802
17.6	74.35		87.8	11.57		158	2.611		228.2	0.779
19.4	70.5		89.6	11.09		159.8	2.523		230	0.758
21.2	66.88		91.4	10.63		161.6	2.439		231.8	0.737
23	63.46		93.2	10.2		163.4	2.358		233.6	0.717
24.8	60.23		95	9.779		165.2	2.28		235.4	0.697
26.6	57.18		96.8	9.382		167	2.206		237.2	0.678
28.4	54.31		98.6	9.003		168.8	2.133		239	0.66
30.2	51.59		100.4	8.642		170.6	2.064		240.8	0.642
32	49.02		102.2	8.297		172.4	1.997		242.6	0.625
33.8	46.6		104	7.967		174.2	1.933		244.4	0.608
35.6	44.31		105.8	7.653		176	1.871		246.2	0.592
37.4	42.14		107.6	7.352		177.8	1.811		248	0.577
39.2	40.09		109.4	7.065		179.6	1.754		249.8	0.561
41	38.15		111.2	6.791		181.4	1.699		251.6	0.547
42.8	36.32		113	6.529		183.2	1.645		253.4	0.532
44.6	34.58		114.8	6.278		185	1.594		255.2	0.519
46.4	32.94		116.6	6.038		186.8	1.544		257	0.505
48.2	31.38		118.4	5.809		188.6	1.497		258.8	0.492
50	29.9		120.2	5.589		190.4	1.451		260.6	0.48
51.8	28.51		122	5.379		192.2	1.408		262.4	0.467
53.6	27.18		123.8	5.197		194	1.363		264.2	0.456
55.4	25.92		125.6	4.986		195.8	1.322		266	0.444
57.2	24.73		127.4	4.802		197.6	1.282		267.8	0.433
59	23.6		129.2	4.625		199.4	1.244		269.6	0.422
60.8	22.53		131	4.456		201.2	1.207		271.4	0.412
62.6	21.51		132.8	4.294		203	1.171		273.2	0.401
64.4	20.54		134.6	4.139		204.8	1.136		275	0.391
66.2	19.63		136.4	3.99		206.6	1.103		276.8	0.382

Appendix 2: Resistance Table of Outdoor and Indoor Tube Temperature Sensors(20K)

Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)	Temp.(°F)	Resistance(kΩ)
-2.2	181.4	68	25.01	138.2	5.13	208.4	1.427
-0.4	171.4	69.8	23.9	140	4.948	210.2	1.386
1.4	162.1	71.6	22.85	141.8	4.773	212	1.346
3.2	153.3	73.4	21.85	143.6	4.605	213.8	1.307
5	145	75.2	20.9	145.4	4.443	215.6	1.269
6.8	137.2	77	20	147.2	4.289	217.4	1.233
8.6	129.9	78.8	19.14	149	4.14	219.2	1.198
10.4	123	80.6	18.13	150.8	3.998	221	1.164
12.2	116.5	82.4	17.55	152.6	3.861	222.8	1.131
14	110.3	84.2	16.8	154.4	3.729	224.6	1.099
15.8	104.6	86	16.1	156.2	3.603	226.4	1.069
17.6	99.13	87.8	15.43	158	3.481	228.2	1.039
19.4	94	89.6	14.79	159.8	3.364	230	1.01
21.2	89.17	91.4	14.18	161.6	3.252	231.8	0.983
23	84.61	93.2	13.59	163.4	3.144	233.6	0.956
24.8	80.31	95	13.04	165.2	3.04	235.4	0.93
26.6	76.24	96.8	12.51	167	2.94	237.2	0.904
28.4	72.41	98.6	12	168.8	2.844	239	0.88
30.2	68.79	100.4	11.52	170.6	2.752	240.8	0.856
32	65.37	102.2	11.06	172.4	2.663	242.6	0.833
33.8	62.13	104	10.62	174.2	2.577	244.4	0.811
35.6	59.08	105.8	10.2	176	2.495	246.2	0.77
37.4	56.19	107.6	9.803	177.8	2.415	248	0.769
39.2	53.46	109.4	9.42	179.6	2.339	249.8	0.746
41	50.87	111.2	9.054	181.4	2.265	251.6	0.729
42.8	48.42	113	8.705	183.2	2.194	253.4	0.71
44.6	46.11	114.8	8.37	185	2.125	255.2	0.692
46.4	43.92	116.6	8.051	186.8	2.059	257	0.674
48.2	41.84	118.4	7.745	188.6	1.996	258.8	0.658
50	39.87	120.2	7.453	190.4	1.934	260.6	0.64
51.8	38.01	122	7.173	192.2	1.875	262.4	0.623
53.6	36.24	123.8	6.905	194	1.818	264.2	0.607
55.4	34.57	125.6	6.648	195.8	1.736	266	0.592
57.2	32.98	127.4	6.403	197.6	1.71	267.8	0.577
59	31.47	129.2	6.167	199.4	1.658	269.6	0.563
60.8	30.04	131	5.942	201.2	1.609	271.4	0.549
62.6	28.68	132.8	5.726	203	1.561	273.2	0.535
64.4	27.39	134.6	5.519	204.8	1.515	275	0.521
66.2	26.17	136.4	5.32	206.6	1.47	276.8	0.509

Appendix 3: Resistance Table of Outdoor Discharge Temperature Sensor(50K)									
Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)
-20.2	853.5		50	98		120.2	18.34		190.4	4.754
-18.4	799.8		51.8	93.42		122	17.65		192.2	4.609
-16.6	750		53.6	89.07		123.8	16.99		194	4.469
-14.8	703.8		55.4	84.95		125.6	16.36		195.8	4.334
-13	660.8		57.2	81.05		127.4	15.75		197.6	4.204
-11.2	620.8		59	77.35		129.2	15.17		199.4	4.079
-9.4	580.6		60.8	73.83		131	14.62		201.2	3.958
-7.6	548.9		62.6	70.5		132.8	14.09		203	3.841
-5.8	516.6		64.4	67.34		134.6	13.58		204.8	3.728
-4	486.5		66.2	64.33		136.4	13.09		206.6	3.619
-2.2	458.3		68	61.48		138.2	12.62		208.4	3.514
-0.4	432		69.8	58.77		140	12.17		210.2	3.413
1.4	407.4		71.6	56.19		141.8	11.74		212	3.315
3.2	384.5		73.4	53.74		143.6	11.32		213.8	3.22
5	362.9		75.2	51.41		145.4	10.93		215.6	3.129
6.8	342.8		77	49.19		147.2	10.54		217.4	3.04
8.6	323.9		78.8	47.08		149	10.18		219.2	2.955
10.4	306.2		80.6	45.07		150.8	9.827		221	2.872
12.2	289.6		82.4	43.16		152.6	9.489		222.8	2.792
14	274		84.2	41.34		154.4	9.165		224.6	2.715
15.8	259.3		86	39.61		156.2	8.854		226.4	2.64
17.6	245.6		87.8	37.96		158	8.555		228.2	2.568
19.4	232.6		89.6	36.38		159.8	8.268		230	2.498
21.2	220.5		91.4	34.88		161.6	7.991		231.8	2.431
23	209		93.2	33.45		163.4	7.726		233.6	2.365
24.8	198.3		95	32.09		165.2	7.47		235.4	2.302
26.6	199.1		96.8	30.79		167	7.224		237.2	2.241
28.4	178.5		98.6	29.54		168.8	6.998		239	2.182
30.2	169.5		100.4	28.36		170.6	6.761		240.8	2.124
32	161		102.2	27.23		172.4	6.542		242.6	2.069
33.8	153		104	26.15		174.2	6.331		244.4	2.015
35.6	145.4		105.8	25.11		176	6.129		246.2	1.963
37.4	138.3		107.6	24.13		177.8	5.933		248	1.912
39.2	131.5		109.4	23.19		179.6	5.746		249.8	1.863
41	125.1		111.2	22.29		181.4	5.565		251.6	1.816
42.8	119.1		113	21.43		183.2	5.39		253.4	1.77
44.6	113.4		114.8	20.6		185	5.222		255.2	1.725
46.4	108		116.6	19.81		186.8	5.06		257	1.682
48.2	102.8		118.4	19.06		188.6	4.904		258.8	1.64