Service Manual

GE APPLIANCES

ENDURE™

Single Zone

Ductless Split Heat Pumps

Outdoor Models

ASH124UCDDA
ASH3036UCDDA
ASH4248UCDDA

Highwall

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA

Cassette

USYL24UCDDA
USYL30UCDDA
USYL36UCDDA
USYL42UCDDA
USYL48UCDDA

MSP Ducted

USYM24UCDDA
USYM30UCDDA
USYM36UCDDA
USYM42UCDDA
USYM48UCDDA

Before troubleshooting or servicing equipment, review equipment installation guides and confirm ALL installation requirements & specifications have been met. Including, but not limited to: wiring, clearance, ducting (where applicable), power, and line set requirements. Correct any installation issues before continuing.

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TABLE OF CONTENTS

Revision History

05/24 - *Edition release.*
09/24 - *Highwall schematic updates.*

TABLE OF CONTENTS

FOLLOW ALL WARNINGS, CAUTIONS, AND PRECAUTIONS BELOW, AND INDUSTRY BEST SAFETY PRACTICES AND STANDARDS. FAILURE TO DO SO MAY RESULT IN EQUIPMENT DAMAGE OR FAILURE, AND SERIOUS PERSONAL INJURY OR DEATH.

WARNINGS
Installation should be performed by the dealer or another professional. Improper installation may cause water leakage, electrical shock, or fire.
Install the heat pump according to the instructions given in this manual. Incomplete installation may cause water leakage, electrical shock, or fire.
Use only the supplied or specified installation parts. Use of other parts may cause the unit to come lose, water leakage, electrical shock, or fire.
Install the heat pump on a solid base that can support the unit's weight. An inadequate base or incomplete installation may cause injury in the event the unit falls off the base.
Electrical work should be carried out in accordance with the installation manual and national/local electrical wiring codes and rules of practice. Insufficient capacity or incomplete electrical work may cause electrical shock or fire.
Use a dedicated power circuit. Never use a power supply shared by another appliance.
For wiring, use a cable long enough to cover the entire distance with no splices. Do not use an extension cord. Do not put other loads on the power supply, use a dedicated power circuit. Failure to do so may cause abnormal heat, electric shock or fire.
Use only the specified wire types for electrical connections between the indoor and outdoor units. Firmly clamp the interconnecting wires so they receive no external stresses. Incomplete connections or clamping may cause terminal overheating or fire.
After completing interconnecting and supply wiring connections, route the cables so that they do not put undue force on the electrical covers or panels. Install covers over the wires. Incomplete cover installation may cause terminal overheating, electrical shock, or fire.
If any refrigerant has leaked out during the installation work, ventilate the room. The refrigerant produces a toxic gas if exposed to flame.
After all installation is complete, check for and repair any system refrigerant leaks. The refrigerant produces a toxic gas if exposed to flames.
When installing or relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R410A), such as air. The presence of air or other foreign substance in the refrigerant circuit causes an abnormal pressure rise or rupture, resulting in injury.
During pump-down, stop the compressor before removing the refrigerant piping. If the compressor is still running, and the stop valve is open during pump-down, air will be sucked into the system while the compressor is running. This will cause abnormal pressure and noncondensables added to the system.
Be sure to establish a ground. Do not ground the unit to a utility pipe, arrester, or telephone earth. An complete earth may cause electrical shock, or fire. A high surge current from lightning or other sources may cause damage to the heat pump.

CAUTIONS
Do not install the heat pump in a place where there is danger of exposure to flammable gas. If the gas builds up around the unit, it may catch fire.
Install drain piping according to the instructions of this manual. Inadequate piping may cause flooding.
Tighten the flare nut according to the specified torque using a torque wrench. If the flare nut is overtightened, the flare nut may eventually crack and cause refrigerant leakage.
Provide adequate measures to prevent the outdoor unit from being used as a shelter by rodents. Rodents making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.

NOTE

Our continued commitment to quality products may mean a change in specifications without notice.
Visit GEAppliancesAirandWater.com to access current specification tables online.

Highwall Indoor

WIFI
Built-in WiFi

Compressor Type:
DC Inverter Driven Rotary

Voltage/Cycle/Phase:
208-230/60/1

		24	30	36
	Outdoor	ASH124UCDDA	ASH3036UCDDA	ASH3036UCDDA
	UPC	084691882275	084691882282	084691882282
	Indoor	ASYW24TRDFA	ASYW30TRDFA	ASYW36TRDFA
	UPC	084691882534	084691882541	084691882558
Cooling	Rated Capacity Btu/hr	24,000	30,000	32,400
	Capacity Range Btu/hr	6,000-26,000	7,000-34,000	7,200-36,000
	SEER2	21.0	19.0	18.0
	EER2	11.0	8.8	8.2
	Moisture Removal Pt./hr	6.33	7.78	7.92
Heating	Heating Capacity Range Btu/hr	4,000~28,500	6,000~32,500	6,500~38,000
	Rated Heating Capacity 47°F Btu/hr	26,000	32,000	37,000
	Max. Heating Capacity 5°F Btu/hr	22,000	25,800	26,200
	COP @ 5°F	1.8	1.8	1.8
	HSPF2 (IV)/HSPF2 (V)	10.0/8.0	9.0/7.3	9.0/7.3
Operating Range	Cooling w/o Wind Baffle °F(°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)
	Cooling w/ Wind Baffle °F(°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)
	Heating °F (°C)	-15°F~75°F (-26~46°C)	-15°F~75°F (-26~46°C)	-15°F~75°F (-26~46°C)
Outdoor Unit	Maximum Fuse Size A	25	30	30
	Minimum Circuit Amp A	21	26	26
	Outdoor Noise Level dB	60	60	60
	Dimension: Height in (mm)	37 7/8 (965)	37 7/8 (965)	37 7/8 (965)
	Dimension: Width in (mm)	37 1/2 (950)	37 1/2 (950)	37 1/2 (950)
	Dimension: Depth in (mm)	14 5/8 (370)	14 5/8 (370)	14 5/8 (370)
	Carton Dimension: Height in (mm)	46 3/8 (1175)	46 3/8 (1175)	46 3/8 (1175)
	Carton Dimension: Width in (mm)	41 3/8 (1050)	41 3/8 (1050)	41 3/8 (1050)
	Carton Dimension: Depth in (mm)	19 1/8 (485)	19 1/8 (485)	19 1/8 (485)
	Weight Ship/Net - lbs (kg)	196/158 (89/72)	196/158 (89/72)	196/158 (89/72)
	Base Pan Heater	Built-in	Built-in	Built-in
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto
	Cooling Airflow CFM (Turbo/High/Med/Low/Quiet)	810/750/635/520/440	875/810/660/520/440	920/875/700/520/440
	Heating Airflow CFM (Turbo/High/Med/Low/Quiet)			
	Cooling Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	1150/1100/950/ 800/700	1200/1150/975/ 800/700	1250/1200/1000/ 800/700
	Heating Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)			
	Indoor Sound Level dB Cooling (Turbo/High/ Med/Low/Quiet)	53/52/47/42/38	55/53/49/43/38	56/54/50/44/40
	Indoor Sound Level dB Heating (Turbo/High/ Med/Low/Quiet)			
	Dimension: Height in (mm)	14 1/2 (365)	14 1/2 (365)	14 1/2 (365)
	Dimension: Width in (mm)	51 7/8 (1316)	51 7/8 (1316)	51 7/8 (1316)
	Dimension: Depth in (mm)	10 7/8 (275)	10 7/8 (275)	10 7/8 (275)
	Carton Dimension: Height in (mm)	18 7/8 (478)	18 7/8 (478)	18 7/8 (478)
	Carton Dimension: Width in (mm)	55 7/8 (1418)	55 7/8 (1418)	55 7/8 (1418)
	Carton Dimension: Depth in (mm)	15 7/8 (402)	15 7/8 (402)	15 7/8 (402)
	Weight Ship/Net - lbs (kg)	56.2/46.3 (25.5/21)	56.2/46.3 (25.5/21)	56.2/46.3 (25.5/21)
	Drainpipe Size O.D. in	3/4	3/4	3/4
Refrigerant Lines	Line Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (5/8)	3/8 (5/8)
	IDU Flare Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (5/8)	3/8 (5/8)
	ODU Port Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)
	Lineset Adapter Required	None	3/4 to 5/8*	3/4 to 5/8*
	Refrigerant (Factory Charge Oz.)	R410A (85.0)	R410A (88.0)	R410A (88.0)
	Max. Line Length/Height Ft (mm)	165/100 (50/30)	165/100 (50/30)	165/100 (50/30)

The Endure Series 9/12/18K BTU models will continuously operate heating at -31°F(-35°C).

Cooling below 23°F (-5°C) requires wind baffle.

*Adapter shipped with outdoor unit. Install on outdoor unit.

SPECIFICATIONS

NOTE

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Cassette Indoor

Compressor Type:
DC Inverter Driven Rotary

Voltage/Cycle/Phase:
208-230/60/1

		24	30	36	42	48
	Outdoor	ASH124UCDDA	ASH3036UCDDA	ASH3036UCDDA	ASH4248UCDDA	ASH4248UCDDA
	UPC	084691882275	084691882282	084691882282	084691882299	084691882299
	Indoor	USYL24UCDDA	USYL30UCDDA	USYL36UCDDA	USYL42UCDDA	USYL48UCDDA
	UPC	084691882381	084691882398	084691882404	084691882411	084691882428
Cooling	Rated Capacity Btu/hr	24,000	30,000	36,000	42,000	47,000
	Capacity Range Btu/hr	11,000~26,000	11,500~31,500	11,500~37,000	11,500~43,000	12,000~48,000
	SEER2/EER2	19.0/11.0	18.0/10.6	18.0/9.5	18.0/8.7	17.0/8.0
	Moisture Removal Pt./hr	6.9	9.8	9.8	12.0	12.0
Heating	Rated Heating Capacity 47°F Btu/hr	26,000	31,000	37,000	44,000	47,000
	Max. Heating Capacity 5°F Btu/hr	19,000	26,800	26,600	32,800	33,000
	COP @ 5°F	1.8	1.8	1.8	1.75	1.65
	Heating Capacity Range Btu/hr	6,800~27,000	5,500~33,000	5,500~38,000	9,000~46,000	9,000~48,000
	HSPF2 (IV)/HSPF2 (V)	8.6/7.1	9.2/7.4	9.0/7.3	8.5/6.8	8.5/6.9
Operating Range	Cooling w/o Wind Baffle °F (°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)
	Cooling w/ Wind Baffle °F (°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)
	Heating °F (°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)
Outdoor Unit	Maximum Fuse Size A	25	30	30	40	40
	Minimum Circuit Amp A	21	26	26	35	35
	Dimension: Height in (mm)	37 7/8 (965)	37 7/8 (965)	37 7/8 (965)	53 1/8 (1350)	53 1/8 (1350)
	Dimension: Width in (mm)	37 1/2 (950)	37 1/2 (950)	37 1/2 (950)	37 1/2 (950)	37 1/2 (950)
	Dimension: Depth in (mm)	14 5/8 (370)	14 5/8 (370)	14 5/8 (370)	14 5/8 (370)	14 5/8 (370)
	Carton Dimension: H x W x D in (mm)	46 3/8 (1175) x 41 3/8 (1050) x 19 1/8 (485)			61 3/4 (1568) x 41 3/8 (1050) x 19 1/8 (485)	
	Weight Ship/Net - lbs (kg)	196/159 (89/72)	196/159 (89/72)	196/159 (89/72)	262/216 (119/98)	262/216 (119/98)
	Base Pan Heater	Built-in	Built-in	Built-in	Built-in	Built-in
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto	5 + Auto	5 + Auto
	Airflow CFM (Turbo/High/Med/Low/Quiet)	880/824/752/587/482	1034/967/871/780/710	1034/967/871/780/710	1282/1236/967/830/740	1282/1236/967/830/740
	Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	620/580/540/430/360	800/730/650/550/450	800/730/650/550/450	830/800/730/600/500	830/800/730/600/500
	Indoor Sound Level dB (Turbo/High/Med/Low/Quiet)	48/46/44/39/37	54/51/50/48/46	54/51/50/48/46	55/54/51/48/46	55/54/51/48/46
	Dimension: Height in (mm)	9 3/4 (246)	11 3/8 (288)	11 3/8 (288)	11 3/8 (288)	11 3/8 (288)
	Dimension: Width in (mm)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)
	Dimension: Depth in (mm)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)	33 1/8 (840)
	Carton Dimension: H x W x D in (mm)	13 7/8 x 38 5/8 x 38 5/8 (350 x 980 x 980)	15 1/2 x 38 5/8 x 38 5/8 (390 x 980 x 980)	15 1/2 x 38 5/8 x 38 5/8 (390 x 980 x 980)	15 1/2 x 38 5/8 x 38 5/8 (390 x 980 x 980)	15 1/2 x 38 5/8 x 38 5/8 (390 x 980 x 980)
	Drain Pipe Size O.D in	1 1/4*	1 1/4*	1 1/4*	1 1/4*	1 1/4*
	Internal Condensate Pump	Standard	Standard	Standard	Standard	Standard
	Max. Drain-Lift height in(mm)	47 1/4 (1200)	47 1/4 (1200)	47 1/4 (1200)	47 1/4 (1200)	47 1/4 (1200)
	Weight Ship/Net - lbs	90/64 (41/29)	95/66 (43/30)	95/66 (43/30)	95/66 (43/30)	95/66 (43/30)
Grille	Model Number	PB-950KD	PB-950KD	PB-950KD	PB-950KD	PB-950KD
Refrigerant Lines	Line Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	IDU Flare Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	ODU Port Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	Lineset Adapter Required	None	None	None	None	None
	Refrigerant (Factory Charge Oz.)	R410A (85.0)	R410A (88.0)	R410A (88.0)	R410A (141.0)	R410A (141.0)
	Max. Line Length/Height Ft (mm)	165/100 (50/30)	165/100 (50/30)	165/100 (50/30)	230/100 (70/30)	230/100 (70/30)

The Endure Series 9/12/18K BTU models will continuously operate heating at -31°F(-35°C).
Cooling below 23°F (-5°C) requires wind baffle.

*Condensate drain adapter shipped with the indoor unit is designed to accept a 3/4" PVC pipe.

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MSP Ducted Indoor

ENDURE™

Compressor Type:
DC Inverter Driven Rotary

Voltage/Cycle/Phase:
208-230/60/1

		24	30	36	42	48
	Outdoor	ASH124UCDDA	ASH3036UCDDA	ASH3036UCDDA	ASH4248UCDDA	ASH4248UCDDA
	UPC	084691882275	084691882282	084691882282	084691882299	084691882299
	Indoor	USYM24UCDDA	USYM30UCDDA	USYM36UCDDA	USYM42UCDDA	USYM48UCDDA
	UPC	084691891895	084691882343	084691882350	084691882367	084691882374
Cooling	Rated Capacity Btu/hr	24,000	30,000	34,000	42,000	46,000
	Capacity Range Btu/hr	7,200~26,000	12,000~32,000	12,000~35,000	10,000~43,000	9,500~47,000
	SEER2	16.5	15.2	15.0	15.2	15.2
	EER2	9.5	9.0	8.0	7.8	7.3
	Moisture Removal Pt./hr	9.6	9.6	9.6	11.0	11.0
Heating	Heating Capacity Range Btu/hr	4,000~28,500	6,500~32,500	6,500~38,000	10,000~46,500	10,000~49,000
	Rated Heating Capacity 47°F Btu/hr	26,000	32,000	36,000	45,000	48,000
	Max. Heating Capacity 5°F Btu/hr	20,000	23,800	25,600	36,800	35,600
	COP @ 5°F	1.8	1.8	1.8	1.75	1.75
	HSPF2 (IV)/HSPF2 (V)	8.1/6.9	9.0/7.3	9.0/7.3	8.7/7.1	8.8/7.1
Operating Range	Cooling w/o Wind Baffle °F (°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)	23°F~115°F (-5~46°C)
	Cooling w/Wind Baffle °F (°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)	-4°F~115°F (-20~46°C)
	Heating °F (°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)	-15°F~75°F (-26~4°C)
Outdoor Unit	Maximum Fuse Size A	25	30	30	40	40
	Minimum Circuit Amp A	21	26	26	35	35
	Outdoor Noise Level dB	60	60	60	60	60
	Dimension: H x W x D in (mm)	37 7/8 x 37 1/2 x 14 5/8 (965 x 950 x 370)			53 1/8 x 37 1/2 x 14 5/8 (1350 x 950 x 370)	
	Carton Dimension: H x W x D in (mm)	46 3/8 x 41 3/8 x 19 1/8 (1175 x 1050 x 485)			61 3/4 x 41 3/8 x 19 1/8 (1568 x 1050 x 485)	
	Weight Ship/Net - lbs (kg)	196/159 (89/72)	196/159 (89/72)	196/159 (89/72)	262/216 (119/98)	262/216 (119/98)
	Base Pan Heater	Built-in	Built-in	Built-in	Built-in	Built-in
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto	5 + Auto	5 + Auto
	Airflow CFM (Turbo/High/Med/Low/Quiet)	927/844/667/564/482	1236/1130/953/812/688	1236/1130/953/812/688	1412/1353/1141/965/847	1412/1353/1141/965/847
	Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	1070/1030/880/790/740	1010/970/850/760/700	1010/970/850/760/700	1140/1120/980/860/800	1140/1120/980/860/800
	Indoor Sound Level dB (Turbo/High/Med/Low/Quiet)	44/43/42/40/38	46/45/41/38/36	46/45/41/38/36	49/48/45/42/40	49/48/45/42/40
	Dimension: H x W x D in (mm)	9 3/4 x 43 1/4 x 27 1/2 (248 x 1100 x 700)	9 7/8 x 59 1/8 x 27 5/8 (248 x 1500 x 700)			
	Carton Dimension: H x W x D in (mm)	13 7/8 x 52 x 34 1/8 (350 x 1319 x 866)	13 7/8 x 67 3/8 x 34 1/8 (350 x 1710 x 866)			
	Weight Ship/Net - lbs (kg)	121/92.6 (55/42)	159/119 (72/54)	159/119 (72/54)	159/119 (72/54)	159/119 (72/54)
	Max. External Static Pressure in.W.G (Pa)	0.6 (150)	0.6 (150)	0.6 (150)	0.6 (150)	0.6 (150)
	Internal Condensate Pump	Standard	Standard	Standard	Standard	Standard
	Drain Pipe Size O.D in	1**	1**	1**	1**	1**
	Max. Drain-lift height in (mm)	27 9/16 (700)	27 9/16 (700)	27 9/16 (700)	27 9/16 (700))	27 9/16 (700)
Refrigerant Lines	Line Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	IDU Flare Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	ODU Port Size: Liquid (Suction) in.	3/8 (5/8)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)	3/8 (3/4)
	Lineset Adapter Required	None	None	None	None	None
	Refrigerant (Factory Charge Oz.)	R410A (85.0)	R410A (88.0)	R410A (88.0)	R410A (141.0)	R410A (141.0)
	Max. Line Length/Height Ft (mm)	165/100 (50/30)	165/100 (50/30)	165/100 (50/30)	230/100 (70/30)	230/100 (70/30)

The Endure Series 9/12/18K BTU models will continuously operate heating at -31°F(-35°C).
Cooling below 23°F (-5°C) requires wind baffle.

*Refrigerant lineset adapter shipped with outdoor unit; install on outdoor unit.
**Condensate drain adapter shipped with the indoor unit is designed to accept a 3/4" PVC pipe.

Introduction to System

Single Zone Ductless Split System Heat Pumps feature a wall mounted indoor fan/evaporator unit that receives refrigerant from an inverter driven variable speed outdoor condensing unit. The system operation is controlled with a remote control.

The outdoor unit features a variable speed rotary compressor, EEV metering device and DC fan motor. These systems use R410A refrigerant and PVE oil. The outdoor units are 208/230 volt rated systems. They come factory charged for up to 25 ft. of interconnecting piping.

The indoor units are wall mounted. They feature a DC blower motor and a DC louver motor. The unit has a room temperature sensor and an evaporator tube temperature sensor. The wall unit is powered by voltage from the outdoor unit.

Specifications for Proper Operation

PVE oil is non-reactive to water and will not go into hydrolysis. There is no need to add a refrigeration drier when servicing or installing this system.

The indoor wall mounted unit receives operating voltage and communication data signals on #14 AWG wire that connects between the indoor and outdoor units.

The field-supplied refrigerant tubing connects using flare type fittings at both the indoor and outdoor units. Tubing must be sized per the specifications. Both lines must be insulated. The only method of checking charge or adjusting charge is by weight method explained in this manual (no exceptions).

A field installed condensate pump may be added to the system. Always follow the manufacturer's installation instructions when installing a condensate pump.

Proper clearances at both indoor and outdoor units must be maintained. Improper clearances cause incorrect refrigerant pressures and coil freezing.

System Fundamentals

The indoor unit will sense room temperature at the point where the wall unit is installed.

The inverter compressor system in the outdoor unit will vary the refrigerant flow and indoor air volume levels to match the comfort requirement inside the conditioned space. If an abnormal condition is detected by the system's sensors, the system has the ability to take reactive measures.

The amount of refrigerant flow and associated capacity generated by the system will be determined by how fast the system's variable speed rotary compressor is pumping.

If a large amount of capacity is needed, the compressor will operate at a high speed. As the need for capacity reduces and the temperature of the room nears set point, the compressor will slow down. When set point has been reached, the compressor will shut off while the fan continues to operate. When a difference in temperature is sensed between the set point and room, the compressor will restart at a new calculated speed.

If a system sensor determines there is a need to adjust the frequency signal to prevent a system malfunction, the compressor frequency may be over ridden and a new frequency established. It should be noted that the frequency signal level that is sent to the compressor cannot be determined by a servicing technician. In this manual, system components, operation, sensor functions, and diagnostic procedures will be explained in greater detail.

System Power

The 230 Volt AC power for the system connects to terminals 1(N), 2(L), and ground of the outdoor unit terminal block. This terminal block also has terminals to connect power to the indoor unit.

The voltage readings between terminals 1(N) and ground, and terminals 2(L) and ground should be 120 VAC. The voltage reading between terminals 1(N) and 2(L) should be 230 VAC.

One additional connection on the terminal block (3) is for the communication wire between the indoor and outdoor units.

NOTE: Mis-wiring of these connections may cause improper operation or damage to system components.

Cooling Operation Mode

Overview

The temperature control range in cooling mode is 60°F - 86°F. The temperature set by the remote control and the indoor unit ambient temperature sensor will determine if a call for cooling is justified. If a call for communicated from the indoor unit to the outdoor unit. The indoor unit louver will open using a stepper motor, and the indoor fan will operate at the speed last set. The outdoor unit will determine the position of the EEV and speed frequency of the compressor. There can be a delay of up to 3 minutes before the outdoor unit fan and compressor start.

The speed of the indoor fan can be controlled manually by the user or automatically by the system. The speed can be changed between LOW, MEDIUM, and HIGH.

The predetermined conditions for automatic control are follows:

Tr= room temperature Ts= set temperature

- High speed: Tr ≥ Ts+5.4F
- Medium Speed: Ts + 1.8°F ≤Tr < Ts + 5.4°F
- Low Speed: Tr ≤Ts + 1.8°F or when the sensor is off.

There will be a 2 second delay when manually controlling the speed.

The outdoor unit temperature sensors: outdoor ambient, defrost, suction line, and compressor discharge, used in conjunction with the indoor temperature sensors, indoor ambient and coil, provide information to the outdoor control board to monitor the system and regulate the frequency of the compressor, the EEV, and outdoor fan speed, to achieve the desired room temperature.

When the call for cooling has been satisfied, the compressor will turn off, followed by the outdoor fan. The indoor unit fan will continue to run.

If the system detects a malfunction, it may shut down or show an error code. This code will l be shown on the indoor display board or a flashing LED will appear on the outdoor PCB.

Indoor Unit

To enter the cool mode, point the infrared remote control at the indoor unit and press the power button, then press the COOL mode button if not already set to cool mode.

The signals received by the infrared receiver are relayed to the main board of the indoor unit to turn the system on and set it to cool mode. The indoor unit PCB will illuminate the display, indicating the set temperature and current status of the unit.

The PCB will signal the stepper motor to open the louver to either a stationary position, or one of several oscillating modes.

As the louver opens, the indoor unit main board will power up the indoor fan motor, operating the fan at the speed last set. The indoor fan motor has a feedback circuit which provides the indoor unit main board with information for controlling the speed of the fan motor.

Temperature Sensors

The indoor unit has two sensors that provide temperature information to the main board. The sensors: an indoor ambient temperature sensor, and pipe temperature sensor, are used for controlling the system during cool mode. The resistance values of the sensors will vary with temperature. The resistance to temperature values can be found using a temperature/ resistance chart specific to the sensor being checked.

Communication

The indoor and outdoor unit main boards communicate via a digital signal on the wire connected to terminal 3 of each unit. A splice or break in this wire will cause a communication error.

When a command is received from the remote control, the indoor unit main board communicates with the outdoor unit main board to perform the requested function.

Outdoor Unit

Upon a request for cooling, the outdoor unit main board applies power to the outdoor fan motor and compressor. Depending on system cycling, there may be up to a 3 minute wait period before the compressor and outdoor fan start.

WARNING: Do not measure compressor voltages as damage to the meter may result.

The temperature difference between the setting and the room temperature will affect the Compressor speed, and the larger the difference, the higher the Compressor speed.

Default Dead band is +/- 2 °F. Not adjustable.

The outdoor unit main board also controls the position of the EEV (Electronic Expansion Valve) to regulate the ow of refrigerant to the indoor unit evaporator coil.

Temperature Sensors

Five temperature sensors located in the outdoor unit provide temperature information to the outdoor unit main board for control of the system during cool mode.

The outdoor ambient temperature sensor provides the temperature of the air drawn into the condenser coil

The defrost temperature sensor A provides the temperature sensed at the output of the condenser coil.

The defrost temperature sensor B provides the temperature sensed at the middle of the condenser coil.

The suction line temperature sensor provides the temperature sensed at the incoming suction line pipe.

The compressor discharge sensor provides the temperature sensed at the discharge pipe of the compressor.

Call to Terminate Cooling

The system will terminate cooling when the indoor ambient temperature sensor is equal to or lower than 2°F of the room set temperature. The indoor control board will communicate to the outdoor control board to de-energize the compressor.

The outdoor fan will run for 60 seconds before stopping.

The indoor fan motor and louver will continue operating after cooling has been terminated.

To stop cool mode, press the power button to turn the system off, or change to another mode.

Freeze Protection Function

When the compressor operates continuously for 10 seconds and the temperature of the indoor coil has been below 32°F for 10 seconds, the compressor will stop. The indoor unit fan will continue to operate. When the temperature of the indoor coil rises to 45°F for more than 3 minutes the compressor will restart and the system will continue functioning.

Heating Operation Mode

Overview

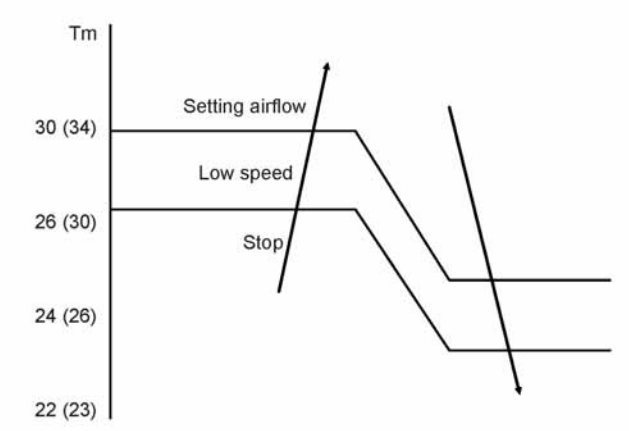
The temperature control range in heating mode is 60°F - 86°F. The temperature set by the remote control and the indoor unit ambient temperature sensor will determine if a call for heat is needed. If a call for heat is justified, a temperature compensation adjustment is automatically added to the operating parameter and the call is communicated from the indoor unit to the outdoor unit.

The indoor unit louver will open using a stepper motor. The indoor fan will not operate at this time.

The outdoor unit will shift the 4-way valve to the heat mode position and determine the position of the EEV and speed (frequency) of the compressor. There can be a delay of up to 3 minutes before the outdoor unit fan and compressor start.

Cold Air Prevention Control

At initial start of heat mode, indoor blower will not be turned on immediately until indoor coil temperature senses a minimum temperature. This period usually takes 30 seconds to 3 minutes depending on the outdoor temperature.



Note: The numbers in the brackets is the temperature control point when the outdoor temperature is more than 10 degrees.

Defrost

When the system initiates a call for defrost, the indoor fan motor stops. The indoor unit display will not change. Any indoor unit malfunctions will be ignored at this time. The system will cycle through the defrost operation. Any indoor unit malfunctions will be ignored until the compressor restarts and has been operating for 30 seconds. At the conclusion of the defrost cycle, the indoor fan will enter the cold air proof operation. Heat mode resumes.

Automatic Heating Temperature Compensation

When the system enters heating mode, a temperature compensation adjustment is added to the operating parameter. This adjustment is canceled when exiting heat mode.

Indoor Unit

To enter the heat mode, point the infrared remote controller at the indoor unit and press the power button, then press the HEAT mode button if not already set to heat mode.

The signals received by the infrared receiver are relayed to the main board of the indoor unit to turn the system on and set it to heat mode.

The indoor unit PCB will activate the display of the indoor unit, illuminating the display and indicating the set temperature and current status of the unit.

The indoor unit PCB will signal the stepper motor to open the louver to a stationary position.

The PCB will power up the indoor fan motor after the outdoor unit has started and heating of the indoor coil has taken place (see cold air proof operation). The motor has a feedback circuit which provides information for controlling the speed of the fan motor.

Temperature Sensors

The indoor unit has two sensors that provide temperature information to the indoor unit main board, a room temperature sensor, and pipe temperature sensor, are used for controlling the system during heat mode.

The resistance values of the sensors will vary with temperature. The resistance to temperature values can be found using a temperature/ resistance chart specific to the sensor being checked.

Communication

The indoor and outdoor unit main boards communicate via a digital signal on the wire connected to terminal 3 of each unit. A splice or break in this wire will cause a communication error.

When a command is received from the remote control, the indoor unit main board communicates with the outdoor unit to perform the requested function.

Outdoor Unit

Upon a request for heat, the outdoor unit PCB applies power to the 4-way valve, outdoor fan motor, and compressor. Depending on system cycling, there may be up to a 3 minute wait period before the compressor and outdoor fan start.

NOTE: Do not measure compressor voltages as damage to the meter may result.

If the room temperature is above the set temperature, yet lower than 2° F above the set temperature, the system will adjust the running frequency of the compressor automatically.

The outdoor unit main board also controls the position of the EEV (Electronic Expansion Valve) to regulate the flow of refrigerant to the outdoor unit evaporator coil.

Temperature Sensors

Five temperature sensors located in the outdoor unit provide temperature information to the PCB for control of the system during heat mode.

The ambient temperature sensor provides the temperature of the air drawn into the condenser coil.

The defrost temperature sensor A provides the temperature sensed at the output of the condenser coil.

The defrost temperature sensor B provides the temperature sensed at the middle of the condenser coil.

The suction line temperature sensor provides the temperature sensed at the incoming suction line pipe.

The compressor discharge sensor provides the temperature sensed at the discharge pipe of the compressor.

Call to Terminate Heating

The system will call to terminate heating when the indoor temperature is equal to or higher than 2°F above the room set temperature. The indoor control board will communicate to the outdoor control board to de-energize the compressor. The outdoor fan will run for 60 seconds before stopping. The 4-way valve will de-energize 2 minutes after the compressor stops.

To stop heat mode, press the power button to turn the system off, or change to another mode.

Auto Mode

With the system turned on, press the AUTO button on the remote control. The system will change to the auto mode of operation.

In Auto Mode the system will automatically switch to operate in heating or cooling mode if temperatures are outside setpoint (plus 1°F and the temperature compensation set in the indoor system).

There is a minimum 15 minute after the compressor stops before automatic changes in operating mode between heating or cooling or user changes from auto mode will take effect.

Dry Mode

Overview

To enter the dry mode, point the infrared remote control at the indoor unit and press the DRY mode button.

The louvers (if included) and the AUTO fan operation and speed will be determined by an algorithm using the indoor unit internal thermal sensors. The AUTO fan mode includes a 3 minute delay switching from high fan speed to low speed.

Temperature Sensors

The indoor unit has two sensors that provide temperature information to the PCB. An ambient temperature sensor and pipe temperature sensor are used for controlling the system during dry mode. The resistance values of the sensors will vary with temperature. The resistance to temperature values can be found using a temperature /resistance chart (See chapter TROUBLESHOOTING & REFERENCES)

Communication

The indoor and outdoor unit main boards communicate via a digital signal on the wire connected to terminal 3 of each unit.

Outdoor Unit

Upon a request for dry mode, the outdoor unit main board applies power to the fan motor and compressor. Depending on system cycling, there may be up to a 3 minute wait period before the compressor and outdoor fan start.

The outdoor unit PCB also controls the position of the EEV (Electronic Expansion Valve) to regulate the flow of refrigerant to the indoor unit evaporator coil.

The outdoor unit switch over valve will operate in the default cooling mode and supply the indoor unit with cold decompressed refrigerant by regulating the EEV flow rates.

Defrost Operation

During heating, a need for defrost is detected by the outdoor coil temperature sensor. Defrost is controlled by the ambient and coil temperature sensors.

Initiate Defrost:

After compressor running in heating for continuous 10 minutes and for accumulated 50 minutes, by testing Te (defrosting temp sensor) or TC (testing of outdoor exchanger frosting condition) and outdoor ambient temp sensor TA, when the following conditions are continuous for 5 minutes, the unit will enter defrosting operation. In case of no defrosting operation caused by imbalanced refrigerant flow (caused by refrigerant lack or other reason), the unit will enter defrost when any one of the two conditions are meet.

Entering condition:

$Te \leq C \times TA - \alpha$ OR $TC \leq C \times TA - \alpha$ and lasts for 5 minutes

Note:

C:

$TA < 0°C$, $C = 0.8$

$TA \geq 0°C$, $C = 0.6$

1. Entering temp. limit of defrosting 1: $-15°C \leq C \times TA - \alpha \leq -2°C$
2. Entering temp limit of defrosting 2: $C \times TA - \alpha < -15°C$ & $Te \leq -15°C$ for continuous 5 minutes & accumulated running time reaching 90 minutes.
3. Defrosting entering limit condition: indoor coil temp lower than 40°C
4. Heating mode compressor running accumulated time stop/pause condition: Detecting stop (end) : shifting from heating to cooling mode Detecting pause: thermostat OFF, unit off.

Defrost Termination

Defrost will last no more than 10 minutes. Using Te to test outdoor heat exchanger frosting condition, if it lasts over accumulative 60 seconds of 7°C or over accumulative 30 seconds of 12°C or over 15°C, defrosting will stop.

Forced Defrost:

In heating operation (including standby state), unit will start forced defrosting after receiving forced defrosting signal from the indoor unit. Indoor manual defrosting signal will keep until the outdoor unit enters the defrosting process.

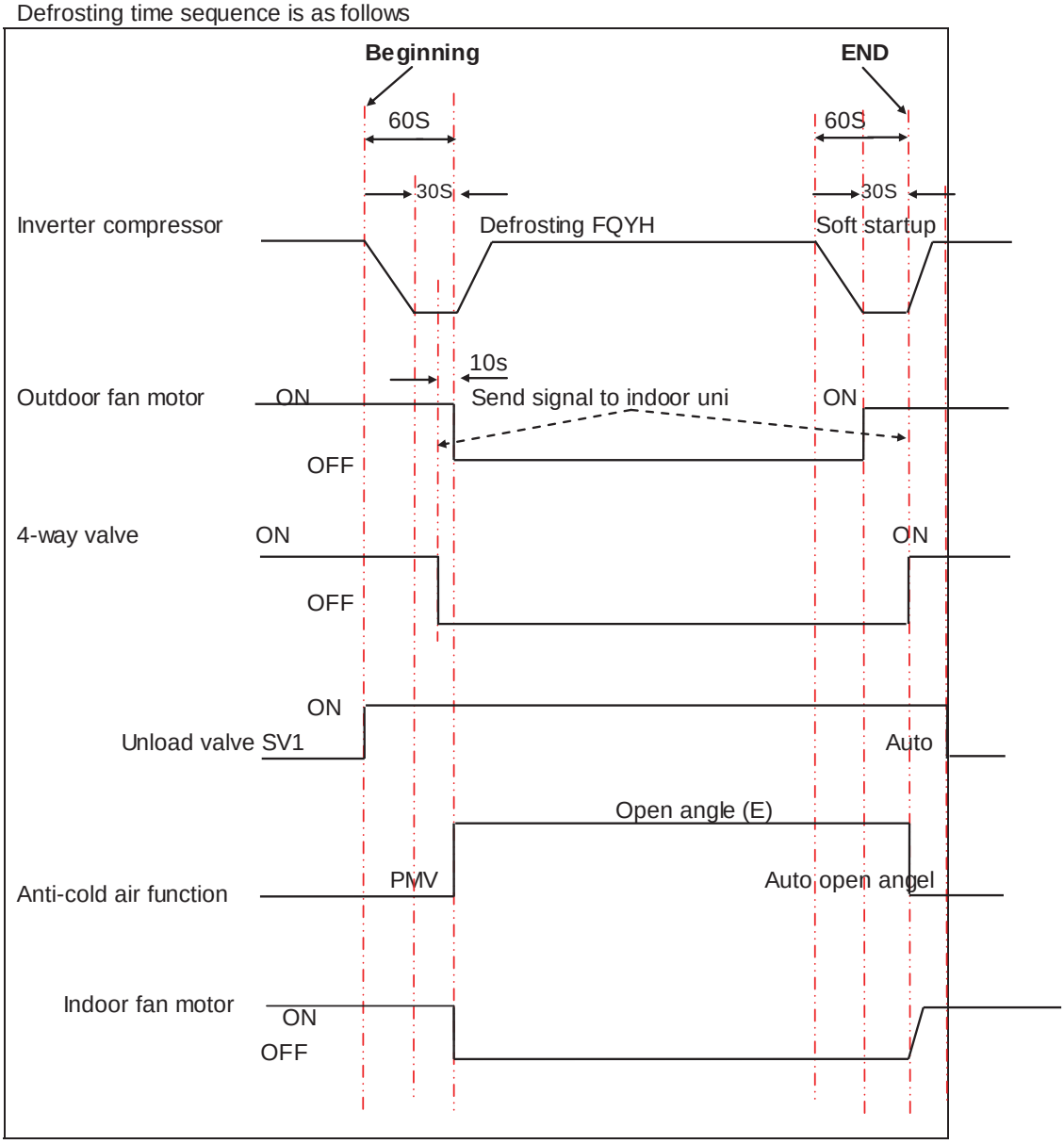
Note: It can enter manual defrosting when compressor is in OFF state, but it needs to follow 3-minute protection rule.

Timed Defrost Conditions:

Starting condition: after setting outdoor function dip switch, it will execute timing defrosting in heating mode.

1. If outdoor ambient temp is over 10 degrees, even if timing defrosting is set, it will follow the auto defrosting condition, meaning auto entering and auto quitting.
2. When outdoor ambient temp is lower than 10 degree (including 10 degree), it will follow the defrosting operation as below:
3. When compressor runs for continuous 10 minutes and runs for accumulative 50 minutes , it will enter defrosting operation.
4. Timing defrosting operation and quit condition is the same as auto defrosting.

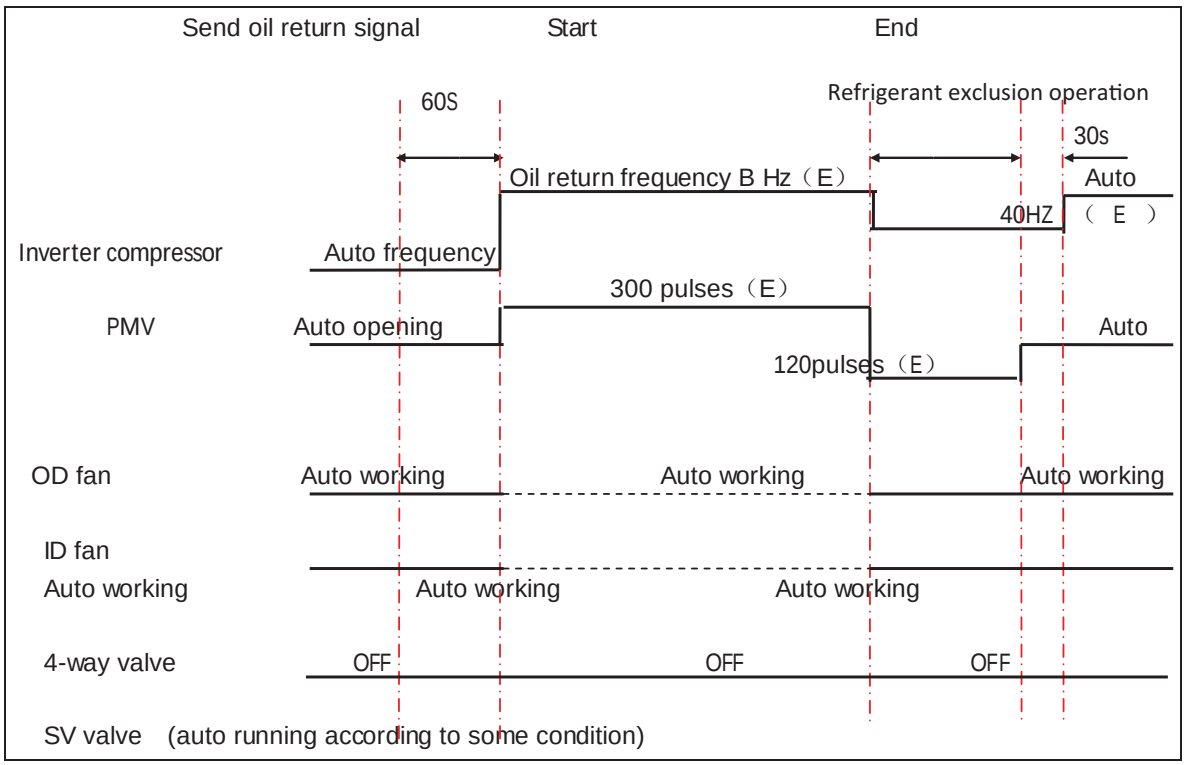
Defrosting time sequence is as follows



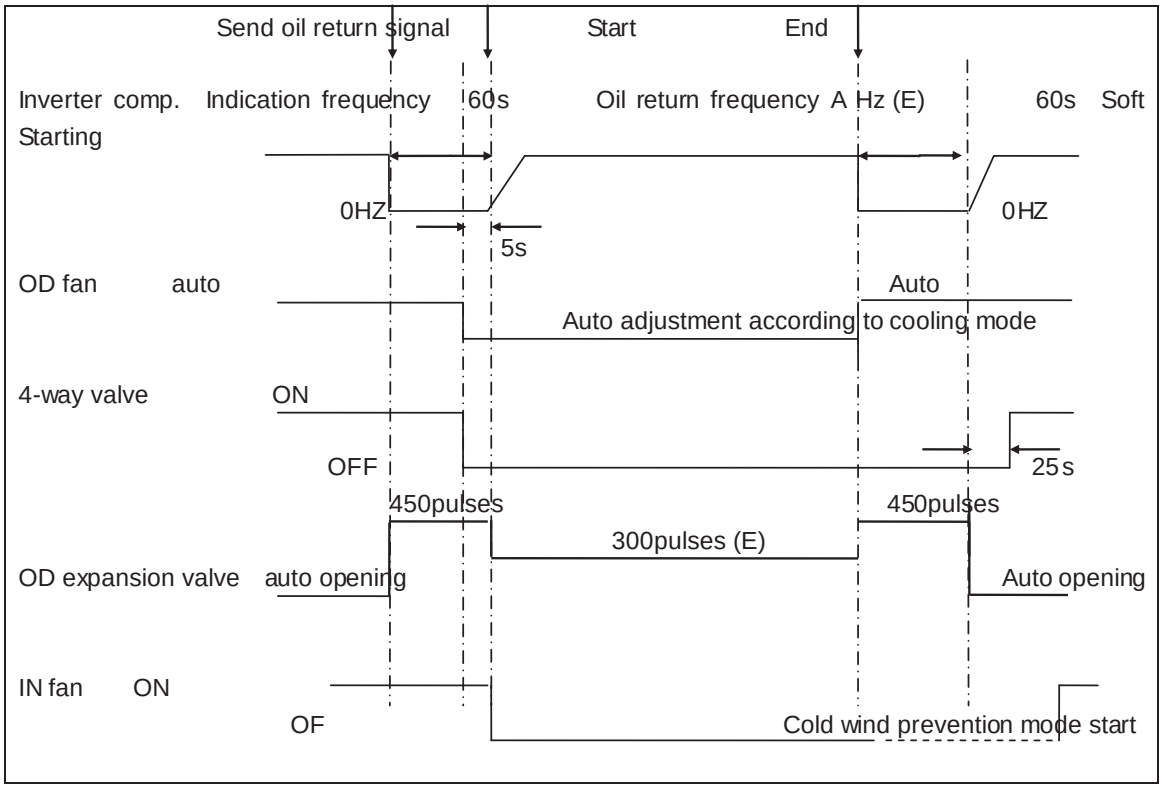
Oil Return Control

Oil return control ensures oil regularly returns to the compressor that has been operating for long periods of time at a low speed.

The oil return mode will be entered when the compressor has been operating for at least 5 hours at a speed lower than parameters C HZ (E) and the temperature TC is lower than 122° F. The 5 hour timing will pause if the unit is changing modes or stopped by an error code. Timing will resume when the compressor restarts. Timing will automatically reset when the compressor is operating at a speed higher than B HZ (E) for more than 10 minutes. Timing will reset following a defrost period during the heating mode. After oil return, the timer is reset.



Process control chart of oil return:



EEV Control

1. Set up one generate electronic expansion valve, and the regulating valve is controlled by the outdoor unit.

- Reset electronic valve: the valve plate of the outdoor unit is powered on for the first time to perform a full closing action.
- Power supply: switching power supply, outdoor unit 13.5V (electronic expansion valve input voltage) all the way.

2. The electronic property of the EEV:

- Largest opening: 500 pulse
- Driving speed: PPS
- Note: considering the application of MAXI function, the EEV of each model should be larger, when operating as one outdoor unit with one indoor unit, the opening of the EEV should be stable lower than 200 steps. Leave the system adjustment margin for MAXI function.

3. The initialization action of the EEV:

- Driving speed of the EEV: Open-way: 31.25 PPS (32 millisecond) , Closed-way: 31.25 PPS (32 millisecond) Full open action and full closed action of EEV: full open action: open as 470 pulse (E) , full closed action: after closing 540 pulse, repeat three times (close as 60 pulse and open as 5 pulse, it means stop at opening of 5) .

4. The limitation of the EEV opening:

Condition	Opening Requirement:	Lower Limit	Upper Limit
Shut down	Standard opening of the model, according to the opening of last time	/	/
Standby (temperature sensor off)	Standard opening of the model, according to the mode before the temperature sensor is off	/	/
Cooling startup process	Execute the standard cooling opening of the model	Standard opening	400
Heating startup process	Execute the standard heating opening of the model	150	400
Cooling, dehumidification	Adjust automatically	70	470
Heating	Adjust automatically	70	470
Defrosting	Fixed opening	200	400
Oil return	Fixed opening	150	400
Refrigerant discharge	Fixed opening	150	400

Four Way Valve Control

1. When powering on, four way valve is in OFF state.
2. In other modes except heating, the four way valve is powered off.
3. The 4-way valve is on in the heating mode, except under the following conditions:

- In heating mode, in initial starting time of compressor to ensure the pressure difference ;
- In defrosting operation if there is no compressor stopping, power four way valve off

4. When shifting from heating to other modes, four way valve will power off after a while.

Condensate Pump Control

1. In the cooling and the dehumidification modes the condensate pump will run when the compressor starts and will shut off 5 minutes after the compressor stops.
2. When in the cooling mode and there is a call for heating, the condensate pump will continue to run for 5 minutes.
3. If the unit detects a full water signal for more than 5 minutes, the compressor will shut off. The pump will continue to run for 5 minutes after the compressor stops. If the full water signal is still indicated, the unit will show a drainage system error. The pump will continue to run for 5 minutes after the error is cleared.

Shutdown Control

Initiative shutdown mode (shutdown normally without protection):

When the air conditioner is in cooling or heating mode, the compressor get the shutdown signal, the current frequency of the compressor is more than 55HZ (EE) , the compressor will decrease to 48HZ at the speed of 2HZ/s and shut down directly.

If the current frequency of the compressor is lower than 55HZ, it will shut down directly after it receives the signal. Avoid that the sudden shutdown will cause too strong stress when in high working frequency. After the compressor stops, the fan motor will perform the blowing remaining heat control before shutdown. Shutdown because of the anti-freeze protection, the compressor will stop as initiative shut down mode.

Passive shut down mode (Error protection shut down):

When the system come to the pressure protection, over-current protection, high module temperature protection, high condensation temperature protection and the unit shut down, no matter the frequency of the compressor come to 55HZ, the unit will shut down directly.

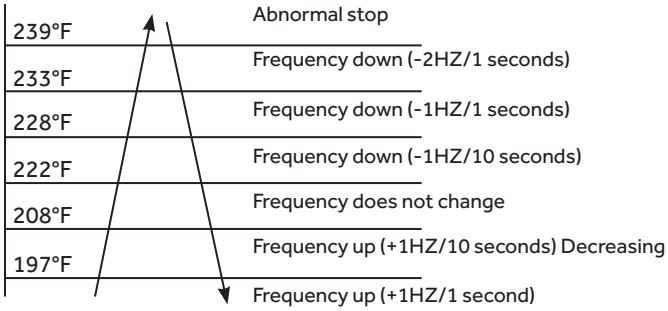
Protection Functions

The following details monitored parameters that may limit the operating frequency of the compressors 3-phase AC motor as the parameters approaches the limits of ideal operating range; therefore limiting the refrigerant pressure and operational capacity of the system as a whole.

Compressor High Temperature

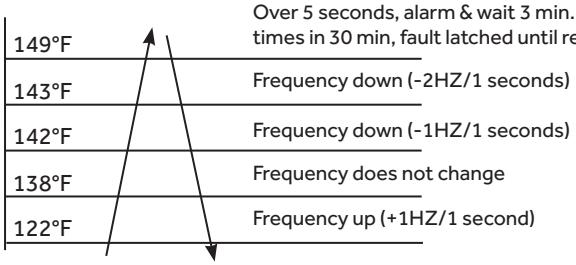
The compressor discharge pipe sensor (exhaust temp) senses the temperature of the refrigerant exiting the compressor The sensed temperature received from the sensor by the control circuitry will cause the compressor frequency to increase or decrease (see chart below) If a temperature of >= 230 °F is sensed for 3 seconds, the system will pause for 3 minutes and then restart. If this occurs 3 times in 60 minutes, an exhaust overheat protection error code will be indicated at the indoor unit. The fault code will be reset if power is cycled to the unit.

Discharge Temperature Sensor



Overheating Protection for Indoor Unit

A sensor monitors coil temperature in both heating and cooling modes, and causes the compressor to speed up, slow down, or stop



Compressor Over-Current Protection

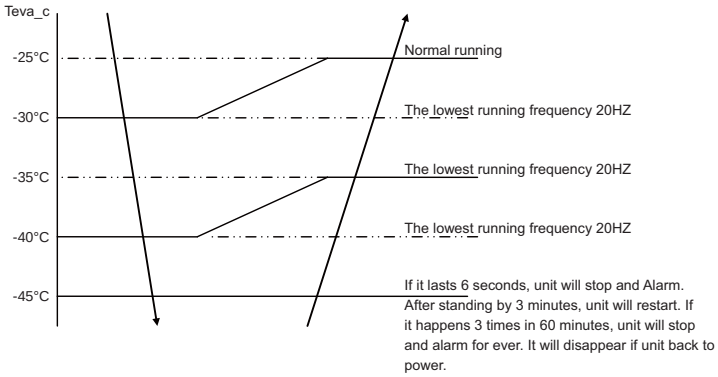
If the current draw of the compressor is greater than the values listed on the chart below for approximately 3 seconds, the compressor will stop. After 3 minutes the compressor will restart. If the over-current condition occurs 3 times in 20 minutes, the system will lock-out, and a code will be indicated at the outdoor unit. It will be necessary to remove power to the system to reset the lock-out condition.

Model	Holds Value	Decrease 1Hz/10s	Decrease 1Hz/s	Over-current point
24K	16A	17A	18A	19A
30K	16A	17A	18A	19A
36K	16A	17A	18A	19A

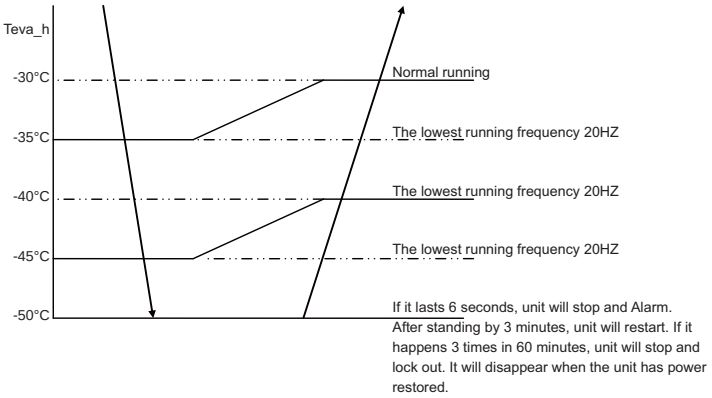
Low Pressure Protection

The low pressure is controlled by simulating evaporating temperature:

When cooling, compare the evaporating temp. with the compressor suction temp. and choose the lower one (Teva c) to compare.



In the heating mode, low pressure protection is realized by the lower temperature (Teva h) from a comparison of the defrost temperature (Te) and ambient (Tc) temperature.



4-Way Valve Protection

In heating mode, after continuous running of compressor for 10 minutes, if Tm (indoor sensor) < indoor ambient temp -2°C (E) and Te (outdoor sensor) >15°C (E) for continuously for 1 minute, four way valve will be powered off, reporting four way valve error. If the compressor starts after 3 minutes and the error is detected 3 times continuously in 1 hour, a 4-way valve error code will be displayed. The error will not be detected during defrost and within 10 minutes after termination of defrost, in the oil return mode, or within 10 minutes following an oil return cycle.

Only in initial starting of compressor in heating mode, outdoor fan motor and four way valve will powering on simultaneously.

If compressor frequency is higher than regulated frequency before off, it will lower to required frequency and then stop.

Compressor inverter frequency and outdoor fan speed will operate in accordance with other requirement.

Indoor Unit Anti-freeze Protection

To avoid the indoor coils frosting over, a lower limit for the indoor temperature sensor will limit the maximum output of the compressor in cooling mode.

The outdoor unit LED will display the anti-freeze protection mode. The indoor unit will not, as this function is not a fault. The unit will end this mode automatically.

Anti-freeze protection in cooling mode:

9°C	General control
8°C	Frequency rises slowly as 1HZ/10s.
6°C	Remain unchanged.
	Frequency decrease slowly as 1HZ/10s.

When TM<6°C, the compressor frequency will decrease at the speed of 1HZ/10s;

When TM start to rise again, and 6°C<=TM<=8°C, the compressor frequency will remain unchanged.

When 8°C<TM<=10°C, the compressor frequency will rise at the speed of 1HZ/10s.

When the state of TM<2°C lasts for 10s after 6 minutes of the startup of the compressor, or the state of T<-20°C (E) lasts for more than 2 hours in cooling mode, the compressor will stop. The unit will shut down for 5 minutes and the temperature of the coil rise to 10°C (E) , it will be back up and running.

Special Functions

Emergency Switch

Emergency switch operation

- If the emergency switch is pressed when shutting down the system, the set temperature is locked at 75°F. Pressing the switch again during start-up will return the system to normal.

Test run

- To enter the test mode, press the emergency button for 5 seconds until two beeps are heard then release. The unit will maintain the last mode it was in before the shutdown. If in cooling, the temperature will be locked at 61°F with high speed fan. Heating will be locked at 86°F with high speed fan. To disable the test mode, press the emergency button again or use the wired or remote controller.

Room Card Control

Room Card Invalid:

If room card is invalid, using room card to turn ON/OFF (ON when close and OFF when open) is valid, similar function to other controller.

Room Card Valid (Default):

If room card is valid, indoor will operate only when room card closes and then receives ON order from other controllers.

Timing Operation:

When using wired controller, unit will be controlled ON/OFF by wired controller

When using remote controller, unit will be ON/OFF according to set time by remote controller and current time.

Auto Restart

When this is enabled, the following functions will automatically resumes after a power loss:

- ON/OFF State, Mode of Operation, Fan Speed, Temperature Setpoint, Louver Swing settings.
- If there was a timer set or the system was in Sleep mode, they will be canceled upon restart

Wired Controller:

- Auto Restart is Enabled by Default

Wireless Controller:

- Enable: Press the Sleep button 10 times within 7 seconds. You will hear 4 beeps as confirmation
- Disable: Press the Sleep button 10 times within 7 seconds. You will hear 2 beeps as confirmation

Timed Defrost

Timed Defrost via Remote Controller (YR-HG): (Same as dip switch 1 and 2 OFF)

Setting method:

1. Set to HEAT Mode
2. Set to 30°C/86°F
3. Set High Fan Speed
4. Press Temperature+ Button 10 times within 7 seconds
5. Hear Unit will Beep 7 times to Confirm

Cancel method:

Same process as Setting Method. Hear Unit Beep 5 times to confirm of cancel function.

Forced Defrost

When using remote controller:

When outdoor in heating or off state, set high fan, 86 degrees F, press sleep key 6 times in 5 seconds, and indoor beeps 3 times to enter manual defrosting.

When using wired controller :

It will receive corresponding forced defrost signal and enter defrost.

Sleep Function

When using wired controller, unit will be controlled ON/OFF by wired controller.

When using remote controller, press sleep key to set sleep function including sleeping in heating and sleeping in cooling. After setting sleep function and upon changing the operating mode, the sleep function will deactivate.

Indoor Temperature Display

This function will allow you to set the display to show either the Ambient temperature or the setpoint:

Set temperature:

- Press the Light button 10 times within 5 second, Hear Unit will Beep 4 times to confirm.

Ambient temperature:

- Press the Light button 10 times within 5 second, Hear Unit will Beep 2 times to confirm.

Cassette Swing Control

24k Cassette:

When powering on and initializing, louvers will fully open for positioning, and then enter basic opening, the fan motors will actuate the louver blades as per the control algorithm.

36k/48k Cassette:

Swinging will be controlled by an infrared LED. Louvers will swing to their default position when first powered on and will then actuate the louver blades as per the control algorithm.

Temperature Compensation

This function allows you the capability to adjust the temperature compensation offset of any indoor unit. The adjusted value is programmed into the EEPROM.

Logic: The Actual Ambient Temperature = The Display Ambient Temperature+ Temperature Compensation

Guide:

1. Apply power to the unit.
2. Set to Cooling Mode or Heating Mode
3. Set the temperature to 24°C.
4. Press the SLEEP button 7 times within 5 seconds. Indoor PCB will Beep 2 times to confirm.
5. 24°C will be the starting/reference point for the Temperature Compensation. Temperature Compensation can be adjusted from -8°C to +6 °C. Example: if you want to set the Temperature Compensation value by 4°C, then set the temperature to 28°C.
6. Once the desired value has been selected, turn OFF the unit via the YR-HG controller to save the compensation settings.

Setting External Static Pressure

Using Wired Controller- QACT17A settings

1. After backlight is lit at the wired controller off, press and hold FAN and TEMP + button for 10 seconds.
2. The static pressure selection will appear in the upper right hand corner.
3. The parameter value of ESP grades can be adjusted by pressing TEMP+ or TEMP- buttons.
4. Press FAN button to confirm the change.

ESP Level (ESP grade)	USYM09/12/18UCDSA USYM24/30/36UCDDA	USYM42/48UCDDA
1	0.10 in W.C.	0.12 in W.C.
2	0.15 in W.C.	0.20 in W.C.
3	0.20 in W.C.	0.28 in W.C.
4	0.28 in W.C.	0.32 in W.C.
5	0.36 in W.C.	0.36 in W.C.
6	0.40 in W.C.	0.40 in W.C.
7	0.44 in W.C.	0.44 in W.C.
8	0.48 in W.C.	0.48 in W.C.
9	0.52 in W.C.	0.52 in W.C.
10	0.60 in W.C.	0.60 in W.C.

Use the Up and Down Arrow buttons to adjust the static pressure level numbers. Then press the Set button to confirm

SmartHQ™ SERVICE

SmartHQ Service

The Bluetooth module will connect to the unit physically via RJ45 service ports located in the indoor and outdoor units, and connect to a smartphone or tablet via Bluetooth. It may be used to achieve the following functions:

1. Software updates
2. Real time sensor readings/ load control
3. View alerts, fault data, cycle history, graphs
4. Automated diagnostic tests (upcoming)
5. Data collection (upcoming)

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ASH124UCDDA
ASH3036UCDDA
ASH4248UCDDA

TABLE OF CONTENTS

PCB

IPM

ODU	IPM Model #
ASH124UCDDA	0150401945CAA
ASH3036UCDDA	0150401945CAB
ASH4248UCDDA	0150401945CAC

Board appearance may vary by model.

Terminal Block

Terminal block appearance may vary by model.

The outdoor unit is powered by 208/230 volt single phase electricity connected at the terminal block. Terminals 1 and 2 connect this voltage to the system. The number 3 terminal is communication that connects wiring between the indoor and outdoor units. A ground terminal connects the outdoor unit to the line voltage power source.

Condensate safety switches should break the wire on terminal 2.

The indoor unit is also powered by the same electrical supply as the outdoor unit. #14 stranded copper wire is connected to the wiring terminal block at the outdoor unit and is run to the same terminals on the indoor terminal block.

When installing the field supplied wiring, make certain the wire gauge is correct. There should not be any electrical wiring splices between the indoor unit and outdoor unit wire connection 3. This wire is used to carry communication data between the indoor and outdoor units. A wiring splice where wires are twisted in a wire nut may cause deformation of the communication signal. If communication is lost between the indoor and outdoor units, an ERROR CODE E7 will occur.

Compressor

A DC inverter drives the three phase AC rotary compressor, capable of variable speed operation. The compressor operating frequency will be determined by the room temperature and protection functions of the system.

The compressor is electrically connected to the IPM .

Protection of the compressor will be provided by the discharge temperature sensor, the suction line temperature sensor, and the overcurrent protection parameter in the PCB.

Power Factor Reactor

The Reactor is a power filter.

The Reactor is electrically connected to the IPM on terminal connections

Defrost Temperature Sensor A

The Defrost Temperature Sensor A is a negative coefficient thermistor that will change resistance in response to outdoor coil temperature changes. The Main Control Board monitors the temperature sensor for the Outdoor Coil and applies a control algorithm to determine when to perform a defrost cycle. For pertinent information see the Defrost Cycle description on page A-9.

Defrost Temperature Sensor B

The Defrost Temperature Sensor B is same as the Defrost Temperature Sensor A. The system chooses the lowest of the two temperature values.

Fan Motor

The fan motor is a variable speed motor. The required speed is calculated by the PCB. The motor is electrically connected to the PCB.

Generally, in COOL MODE, the motor will slow down as outdoor air temperature falls. In HEAT MODE, the motor will increase speed as the outdoor air temperature falls.

Suction Line Temperature Sensor

The Suction Line Temperature Sensor is a negative coefficient thermistor that senses the temperature of the suction line. The Main Control Board monitors the temperature sensor to measure superheat and return pressure. A control algorithm is used to determine the desired frequency of the compressor.

Outdoor Ambient Temperature Sensor

The Ambient Temperature Sensor is a negative coefficient thermistor that will change resistance in response to outdoor air temperature changes. The PCB monitors the temperature of the outdoor air to determine fan speed requirements and inverter speed. The sensor also plays a role in calculation of required defrost conditions.

Discharge Temperature Sensor

The Discharge Temperature Sensor is a negative coefficient thermistor that senses the temperature and therefore pressure of the compressor hot gas. The PCB monitors the temperature of the compressor hot gas and will make inverter speed changes in response to input from this device.

4-Way Valve

The 4-Way Valve redirects the flow of refrigerant in the piping circuit to allow the system to reverse the functions of the indoor and outdoor coils. When de-energized in COOL MODE, the valve will direct the refrigerant hot gas to the outdoor coil. When energized in HEAT MODE, the valve will direct the hot gas to the indoor coil.

The valve flow direction capability is controlled by an electrical solenoid. When energized with 230 VAC, the solenoid will magnetically move an internal slide within the 4-Way Valve to change the direction of refrigerant flow.

Base Pan Heater

The Base Pan Heater is electrically connected to the Main Control Board and energized with 230 VAC. This will be activated for short pulses and eventually always on as ambient temperatures drop to ensure condensate is drained fully from the base pan and prevent ice impairment/damage.

Electronic Expansion Valve

The metering device is an electronic expansion valve. The valve consists of an electrical operator and a valve body with internal variable size orifice. When operating, the PCB will send pulses of voltage to the electrical operator. The operator will then magnetically move the position of the metering orifice pin to vary refrigerant flow.

The EEV will change the internal orifice size to maintain an acceptable level of superheat.

During COOL MODE the valve meters low pressure refrigerant to the indoor coil. During HEAT MODE the valve meters low pressure refrigerant to the outdoor coil.

Accumulator

The Accumulator is located in the suction line circuit at the entrance to the compressor. The accumulator helps prevent liquid refrigerant from entering the compressor during run operation and can store excess refrigerant.

Refrigerant Filters

The system has debris-catching strainers that protect internal system components from contaminants in the refrigerant.

NOTE: Component resistance readings shown in this section are for reference only. Actual resistance values may based on model being tested. Component readings shown below are based on the models of 1U*EH2VHD outdoor unit.

Testing of the following components requires the use of needle probes. Avoid testing the connector end of the plug, as damage to the internal sections of the plug can occur.

Checking the Outdoor Unit Sensors

NOTE: Use respective temperature / sensor chart for sensor type being tested.

- Compressor discharge sensor
- Suction sensor
- Defrost temperature sensor
- Ambient sensor

Step 1

Disconnect the sensor plug from the control board for this test. Failure to do so may provide inaccurate readings.

Step 2

Using k-type temperature probe, determine the temperature of the sensor being tested.

Step 3

Using an ohmmeter, check the resistance value of the sensor.

Step 4

Referring to the temperature / resistance table for the sensor being checked, verify the resistance value corresponds to the temperature checked in Step 2. Replace the sensor if the reading is open, shorted, or outside

Step 5

Re-seat the plug on the connector at the conclusion of the test.

Checking the Reversing Valve Coil

Step 1

Disconnect the reversing valve plug from the PCB for this test. Failure to do so may provide inaccurate readings.

Step 2

Using an ohmmeter, check the resistance value of the coil. The resistance value of the coil should be 1.2 kilo ohms to 1.8 kilo ohms. Replace the valve coil if the reading is significantly different, or if the coil shows open or shorted.

Step 3

Re-seat the plug on the connector at the conclusion of the test.

Checking the DC Fan Motor

Step 1

Using needle probes, check the DCV at the back of the fan plug on the PCB. The values are:

- Red to black: +310 VDC
- White to black: +15 VDC
- Yellow to black: 1-4 VDC when running; 0 VDC when there is no call for heating or cooling
- Blue to black: pulsing 0-8 VDC when running; 14 VDC when there is no call for heating or cooling

Checking the EEV Coil

Step 1

Disconnect the EEV coil from the PCB for this test. Failure to do so may provide inaccurate readings.

Step 2

The resistance values of plus pin combinations are 46 Ohm.

Step 3

Re-seat the plug on the connector at the conclusion of the test.

Checking the Compressor Windings

Step 1

Disconnect wiring from terminals U, V and W of the IPM.

Step 2

Using an Ohmmeter, check the resistance value of the compressor windings. Measure between wires U and V, U and W, and V, and W.

The resistance value of the windings should be balanced (equal +/-20%). If the resistance values are not equal, verify the wiring and connections to the compressor as well as the compressor itself. Repair or replace as needed.

Step 3

Reconnect the wiring to the IPM at the conclusion of the test.

Checking the Base Pan Heater

The resistance across the heater should be 100 to 500 ohms. Replace it if the value is significantly different, or if the heater reads open or shorted.

SW1 DIP Switch Settings

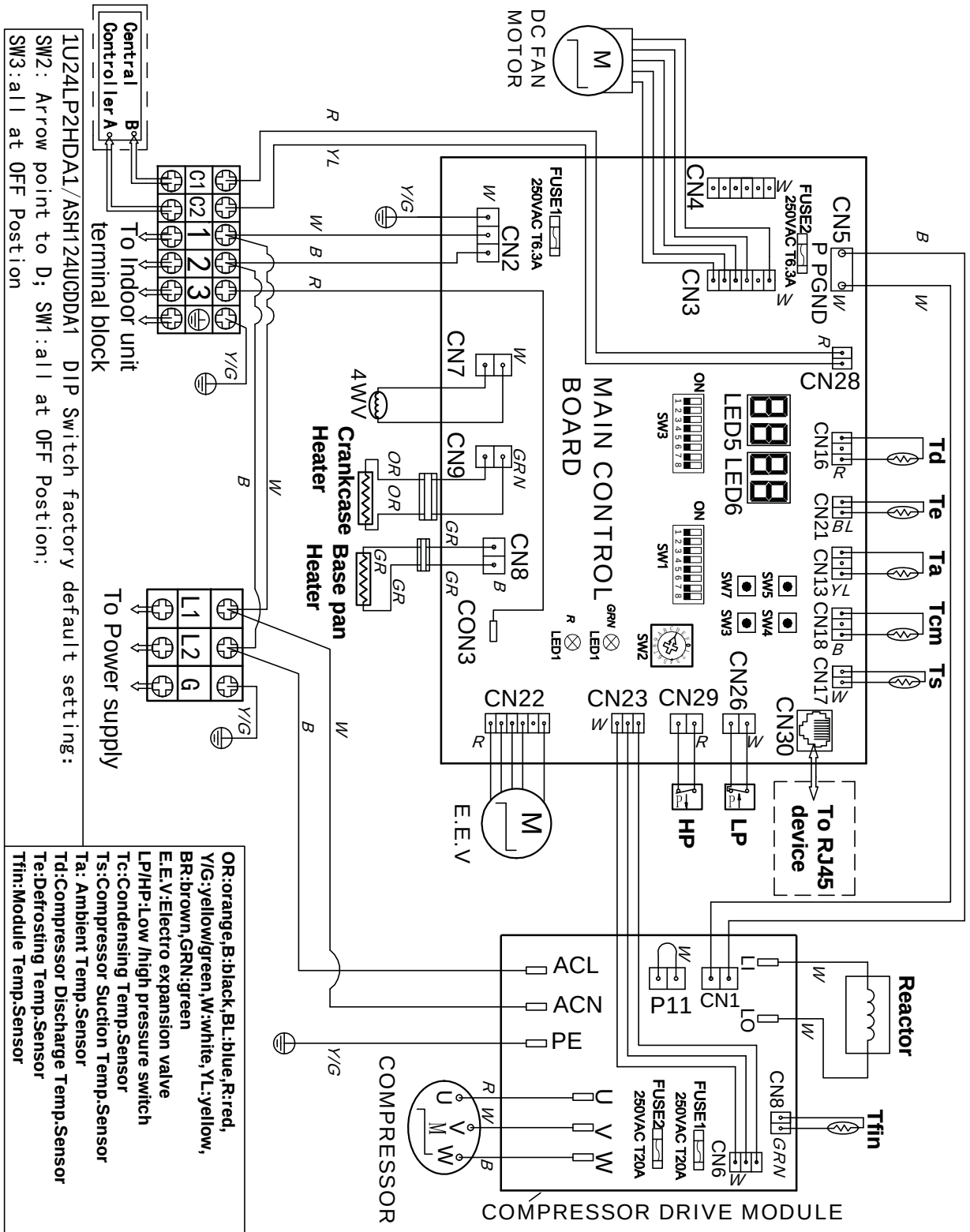
Description	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Manually forced operation invalid(default)	OFF	----	----	----	----	----	----	----
Manually forced operation valid	ON	----	----	----	----	----	----	----
Manually forced heating(default)	----	OFF	----	----	----	----	----	----
Manually forced cooling	----	ON	----	----	----	----	----	----
Normal standby cost(default)	----	----	OFF	----	----	----	----	----
Low stand by power cost	----	----	ON	----	----	----	----	----
Reversed	----	----	----	OFF	----	----	----	----
Reversed	----	----	----	ON	----	----	----	----
Central control(default)	----	----	----	----	OFF	----	----	----
Reversed	----	----	----	----	ON	----	----	----
Reversed	----	----	----	----	----	OFF	----	----
Reversed	----	----	----	----	----	ON	----	----
Defrost automatic(default)	----	----	----	----	----	----	OFF	----
Defrost by time	----	----	----	----	----	----	ON	----
Silent running invalid	----	----	----	----	----	----	----	OFF
Silent running valid	----	----	----	----	----	----	----	ON

SW3 DIP Switch Settings

	Indoor unit Address (Indoor unit address for one wired controller control more than one unit)						
Address	SW3-1	SW3-2	SW3-3	SW3-4	SW3-5	SW3-6	SW3-7
1	ON	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF
----	----	----	----	----	----	----	----
127	ON	ON	ON	ON	ON	ON	ON

ENGLISH

ASH124UCDDA



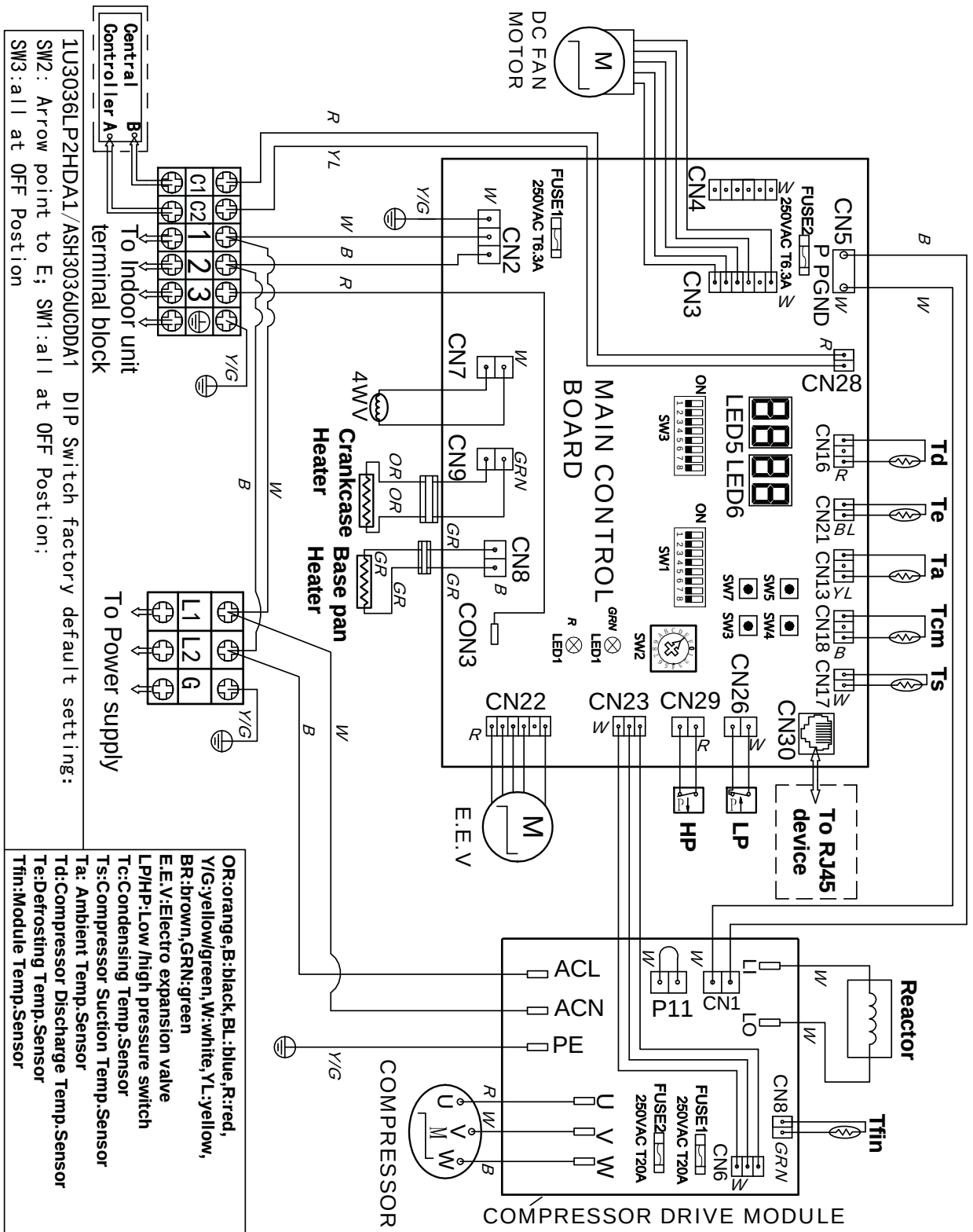
1U24LP2HDA1/ASH124UCDDA1 DIP Switch factory default setting:
SW2: Arrow point to D; SW1:all at OFF Postion;
SW3:all at OFF Postion

OR:orange,B:black,BL:blue,R:red,
Y/G:yellow/green,W:white,YL:yellow,
BR:brown,GRN:green
E.E.V:Electro expansion valve
LP/HP:Low /high pressure switch
Tc:Condensing Temp.Sensor
Ts:Compressor Suction Temp.Sensor
Ta: Ambient Temp.Sensor
Td:Compressor Discharge Temp.Sensor
Te:Defrosting Temp.Sensor
Tfin:Module Temp.Sensor

NOTE:
1.Dashed parts are optional.
2.SW3 is for central control adress selection.Refer to service manual to get more details about DIP switches settings.
3.Once out of factory do not change the switches of SW1,SW2,SW3 without technical guidence.
4.For maintenance safety,please operate after pow- ler supply cut off at least 3 minutes

015055720 1

ASH3036UCDDA



1U3036LP2HDA1/ASH3036UCDDA1 DIP Switch factory default setting:
SW2: Arrow point to E; SW1:all at OFF Postion;
SW3:all at OFF Postion

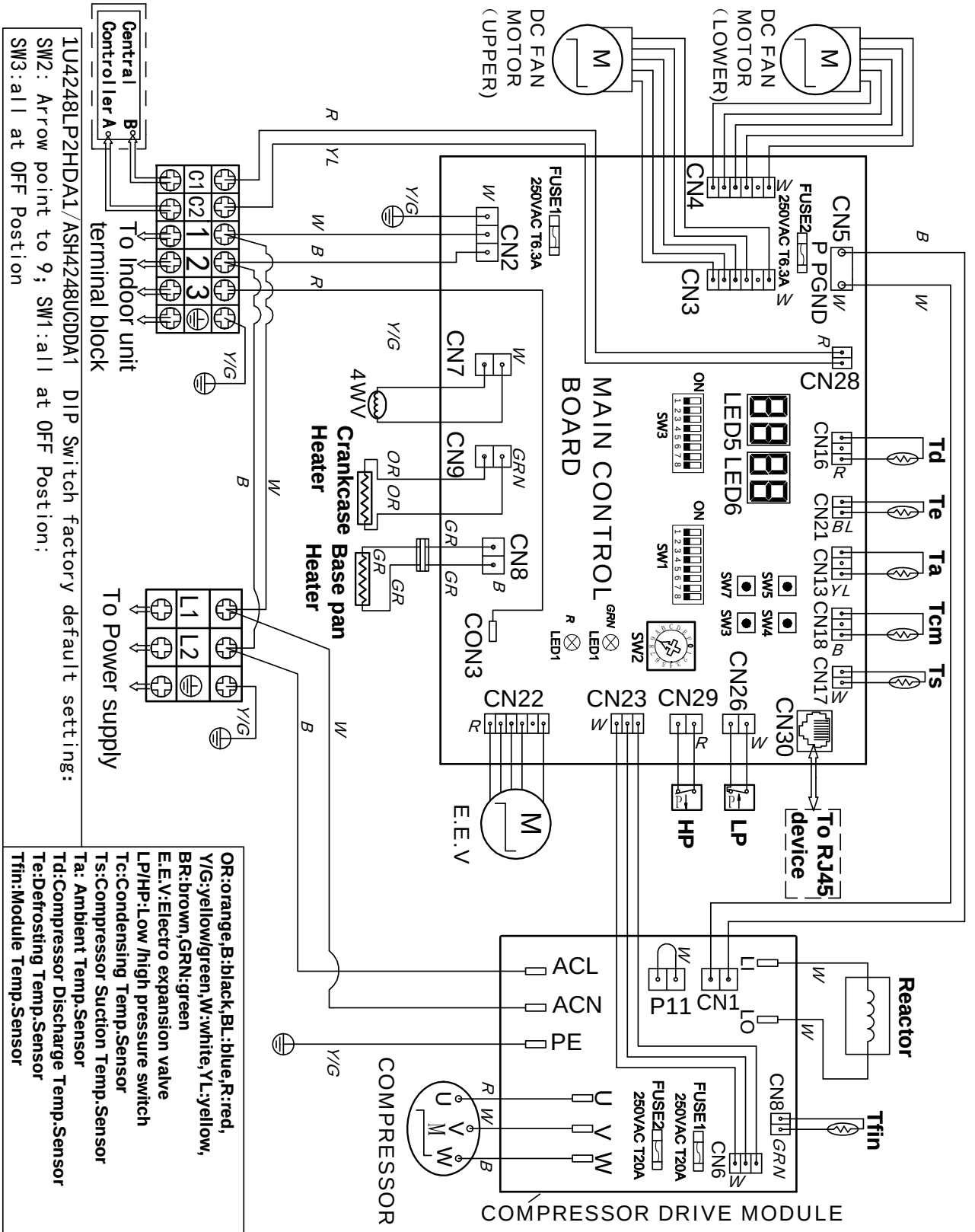
OR:orange,B:black,BL:blue,R:red,
Y/G:yellow/green,W:white,YL:yellow,
BR:brown,GRN:green
E.E.V:Electro expansion valve
LP/HP:Low /high pressure switch
Tc:Condensing Temp.Sensor
Ts:Compressor Suction Temp.Sensor
Ta: Ambient Temp.Sensor
Td:Compressor Discharge Temp.Sensor
Te:Defrosting Temp.Sensor
Tfin:Module Temp.Sensor

NOTE:

1.Dashed parts are optional.
2.SW3 is for central control adress selection.Refer to service manual to get more details about DIP switches settings.
3.Once out of factory do not change the switches of SW1,SW2,SW3 without technical guidence.
4.For maintenance safety,please operate after pow- ler supply cut off at least 3 minutes

015055720 2

ASH4248UCDDA

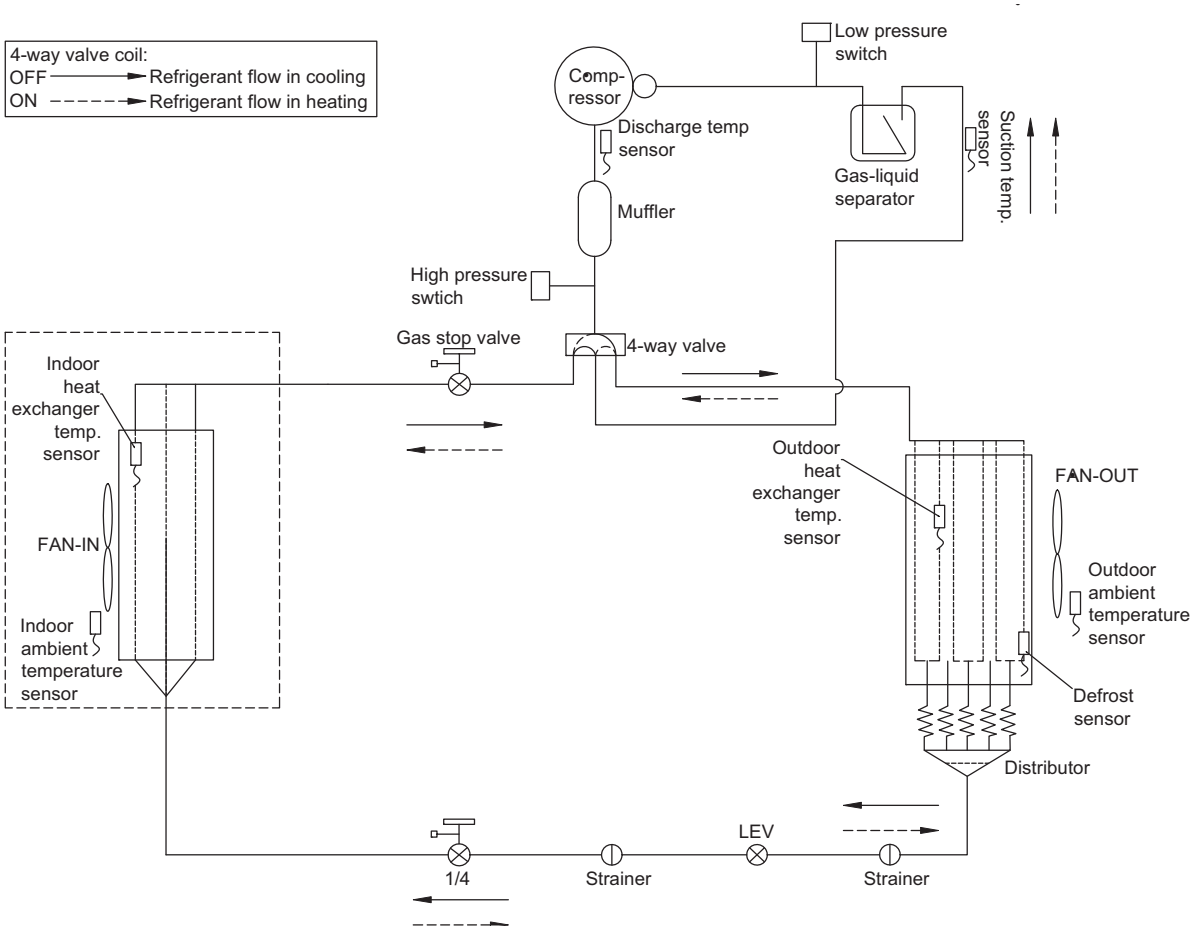


OR:orange,B:black,BL:blue,R:red,
Y/G:yellow/green,W:white,YL:yellow,
BR:brown,GRN:green
E.E.V:Electro expansion valve
LP/HP:Low /high pressure switch
Tc:Condensing Temp.Sensor
Ts:Compressor Suction Temp.Sensor
Ta: Ambient Temp.Sensor
Td:Compressor Discharge Temp.Sensor
Te:Defrosting Temp.Sensor
Tfin:Module Temp.Sensor

NOTE:

1.Dashed parts are optional.
2.SW3 is for central control adress selection.Refer to service manual to get more details about DIP switches settings.
3.Once out of factory do not change the switches of SW1,SW2,SW3 without technical guidence.
4.For maintenance safety,please operate after pow- ler supply cut off at least 3 minutes

0150557203


4-way valve coil:
OFF Refrigerant flow in cooling
ON Refrigerant flow in heating
Comp-ressor
Low pressure switch
Discharge temp sensor
Muffler
Gas-liquid separator
Suction temp. sensor
High pressure swtich
Gas stop valve
4-way valve
Indoor heat exchanger temp. sensor
FAN-IN
Indoor ambient temperature sensor
Outdoor heat exchanger temp. sensor
FAN-OUT
Outdoor ambient temperature sensor
Defrost sensor
Distributor
LEV
1/4
Strainer
Strainer

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA

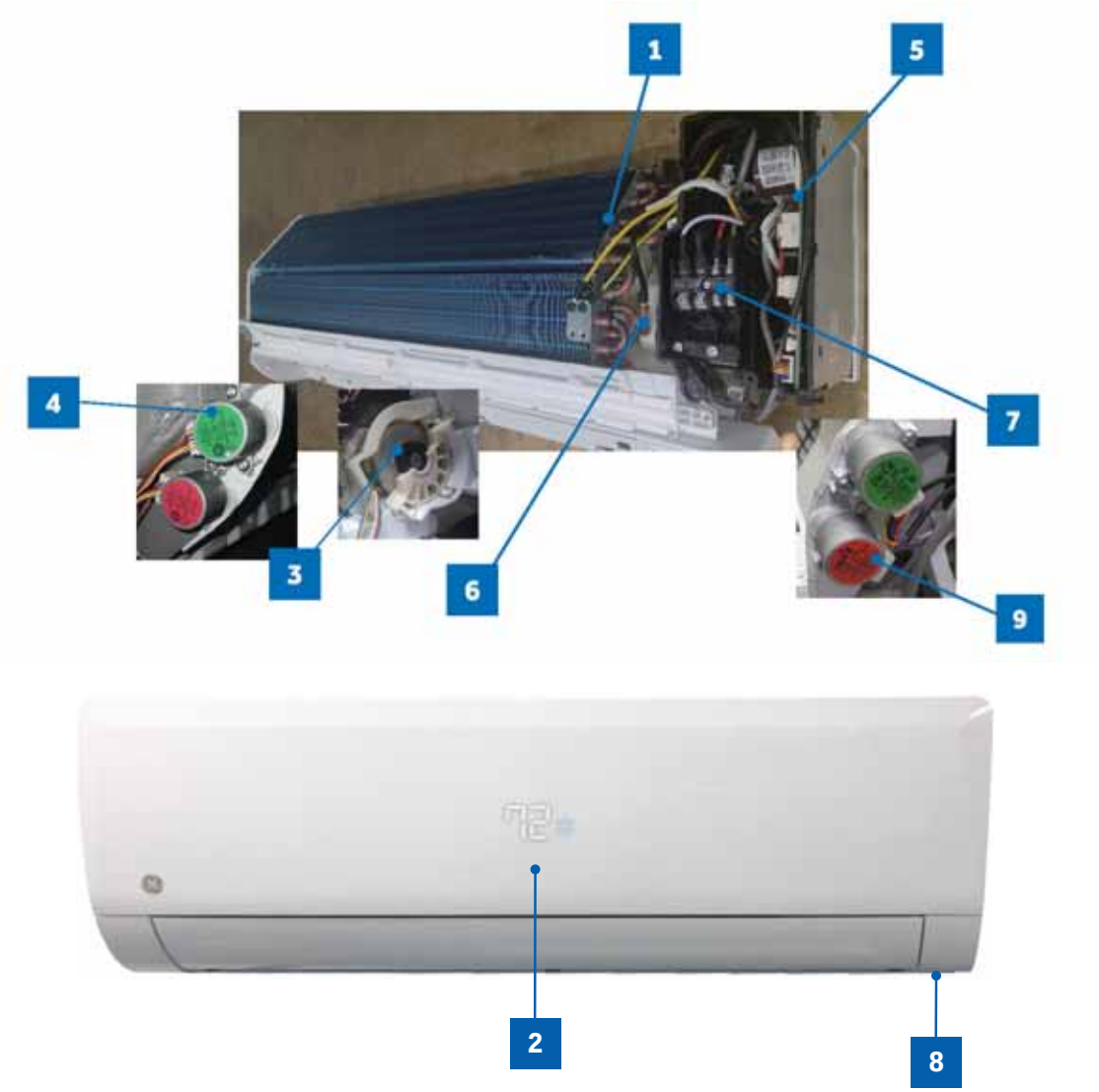
TABLE OF CONTENTS

COMPONENTS

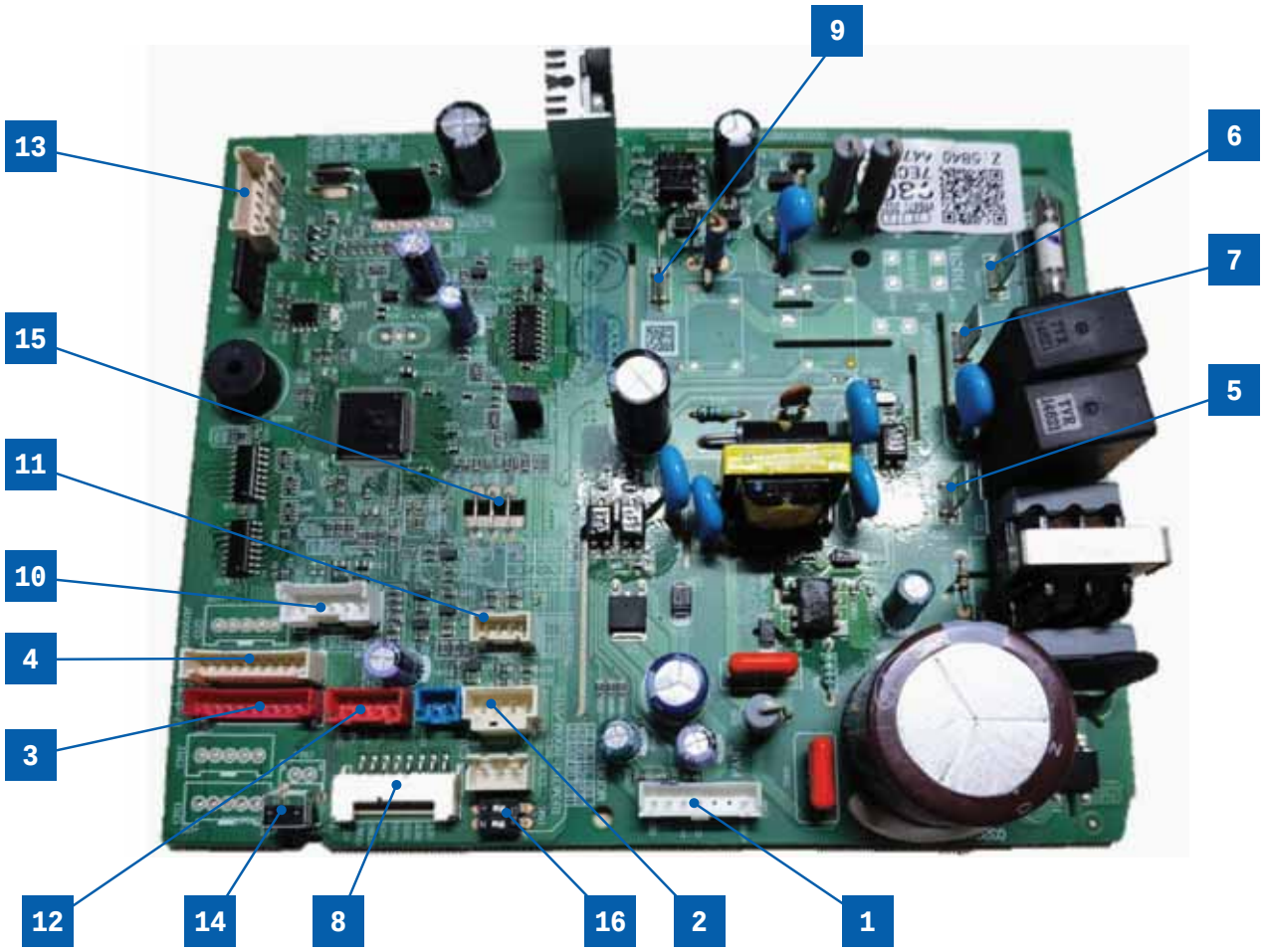
The indoor unit is mounted high on the wall to provide comfort and air movement within the conditioned space. Features of the system include: Variable speed blower operation that speeds up and slows down with changes in demand, moving louvers to direct air, indoor air temperature sensing, evaporator coil temperature sensing, a status display, evaporator coil with metering device located in outdoor unit, and an emergency operation button.

Indoor Component Identification

1. Indoor Ambient Temperature Sensor
2. Display
3. Fan Motor
4. Louver Motor
5. PCB
6. Piping Temperature Sensor
7. Terminal Block
8. Emergency Button
9. Louver Motor

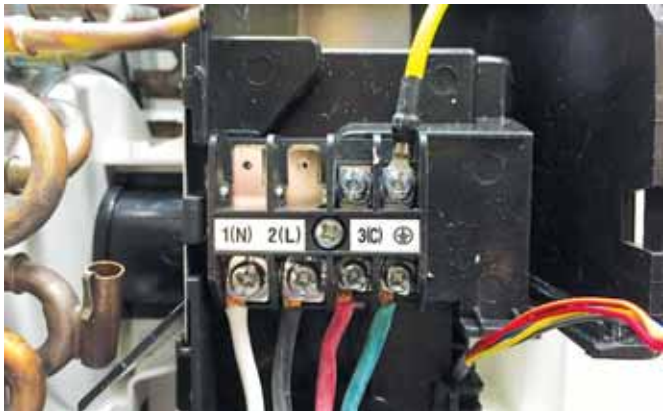


PCB



1	CN9: Connector for fan motor
2	CN6: Connector for pipe temperature sensor and room temperature sensor
3	CN5-1: Connector for UP/DOWN STEP motor 1
4	CN5: Connector for UP/DOWN STEP motor 2
5	CN21: Connector for power N
6	CN17: Connector for power L
7	CN27: Connector for GND
8	CN7: Connector for display board
9	CN23: Communication connection between the PCB and the outdoor unit
10	CN35: Connector for WiFi module
11	CN56: Connector for occupancy sensor
12	CN34: Connector for wired controller interface
13	CN38: Connector for diagnostic port
14	CN14: Connector for forced operation ON/ OFF switch
15	J5: Select remote code A or B J6: Select room card enable or disable
16	BM1: 1-2 Select 23,26,33 or 35

Terminal Block



The unit terminal block receives electrical power from the outdoor unit. There are 4 connections for electrical wires. Terminals 1 and 2 are connected to terminals 1 and 2 of the outdoor unit. This wiring supplies power to the indoor unit.

Terminal 3 is a communication wire. The indoor unit sends indoor air temperature, coil temperature and temperature setpoint information to the outdoor unit on this wire. If a splice or break in this wire is present, the indoor unit will not be able to communicate with the outdoor unit. The ERROR CODE will be an E7.

Ambient Temperature Sensor

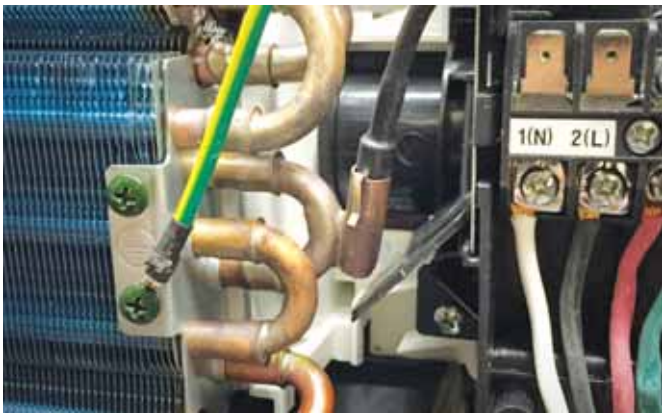
The Ambient (room) Temperature Sensor is a negative coefficient thermistor that will decrease in resistance with increases in room air temperature. The sensor is located on a clip mounted in the return air stream.

The sensor connects to the control board at Plug CN-6.

Display

The indoor display has an infrared communication circuit that receives operating commands from the remote control. This display will indicate operating modes, error codes, indoor air temperature, timer status, and power status.

Piping Temperature Sensor



The Piping Temperature Sensor is a negative coefficient thermistor that will decrease in resistance with increases in coil temperature. The sensor is located in a socket soldered to the surface of the indoor coil.

This sensor will monitor the temperature of the indoor coil in both cooling and heating modes of operation. Should abnormally cold or hot coil temperature be detected by this sensor, the system will take steps to correct the condition or report an ERROR CODE.

The sensor connects to the control board at Plug CN-6.

Louver Stepper Motors

The STEPPER MOTOR moves the louver up and down, or right and left, depending upon selections made at the remote control.

These motors are connected at CN5 and CN11.

Fan Motor

The Fan Motor is a variable speed motor. The air volume will vary with the speed of the compressor, or it can be set at the remote control to maintain a single speed.

The Fan Motor is connected to the indoor control board via PLUG CN-9.

Emergency Button

If the remote control is non-functional, the Emergency Button can be used. 73 -78^{O}F will be maintained, until commands are received via the remote control.

DIP Switch & Jumpers

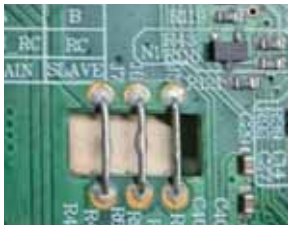
DIP switches BM1-1 and BM1-2 selects EEPROM codes 23, 26, 33 or 35 to identify the tonnage of the unit. These switches must be set when replacing the PCB.

The replacement PCB is shipped with all switches set to the OFF position. Switch configuration is as follows:

	TONNAGE	
	BM1-1	BM1-2
23	OFF	OFF
26	OFF	ON
33	ON	OFF
35	ON	ON

- J5 Selects remote code A or B. If two indoor units are used in the same area and the user wishes to control them separately, J5 of the second unit is cut for code B operation. The wireless remote for the second unit must also set to code B. Factory Default is Uncut.
- J6 Jumper: Cut off when use a Room Card Interface. Factory default is Uncut.
- J7 Jumper: Cut off when the unit is Sub in a Daisy Chain Controller set up. Factory Default is Uncut.

	CAPACITY SETTING	
	UNCUT	CUT
J5	REMOTE A	REMOTE B
J6	NO ROOM CARD	ROOM CARD
J7	MAIN	SUB



Testing of the following components requires the use of an ohmmeter and k-type temperature probe.

NOTE: When using the test probes, probe the back or side contacts of the plug to obtain the reading. Do not try to probe the connector end of the plug, as this may damage the contacts.

Checking the Indoor Unit Sensors

NOTE: Use respective temperature / sensor chart for sensor type being tested.

- Coil sensor
- Ambient sensor

Step 1

Disconnect the sensor from the PCB for this test. Failure to do so may provide inaccurate readings.

Step 2

Determine the temperature of the sensor being tested.

Step 3

Check the resistance value of the sensor.

Step 4

Referring to the temperature / resistance table for the sensor being checked, verify the resistance value corresponds to the temperature checked in step 2.

Replace the sensor if the reading is open, shorted, or outside

Step 5

Re-seat the plug on the PCB at the conclusion of the test.

Checking the Stepper Motors

Step 1

Disconnect the Stepper Motor plug PCB for the test. Failure to do so may provide inaccurate readings.

Step 2

Refer to the chart shown below for plug pin combinations and resistance values.

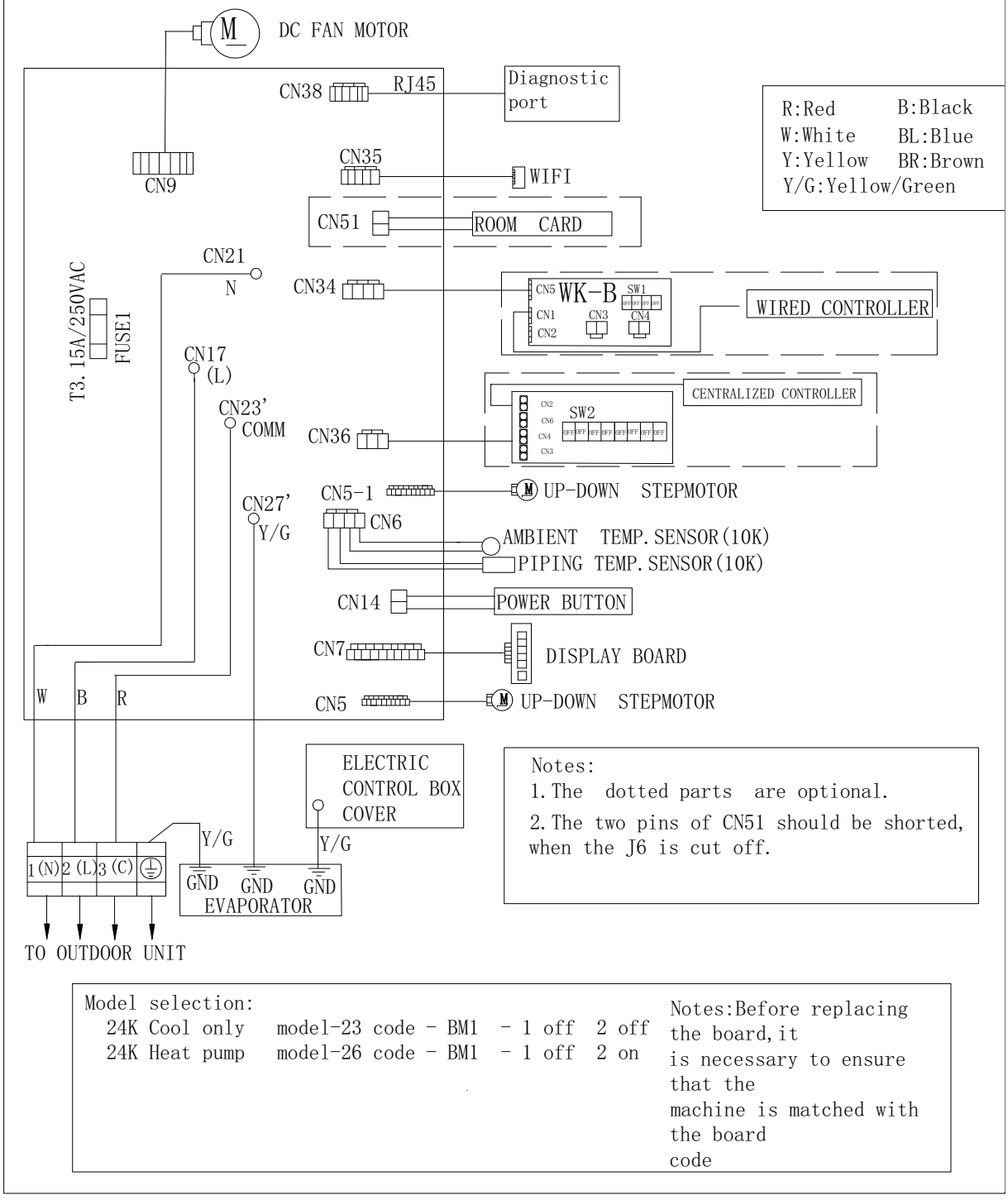
	Red	Orange	Yellow	Pink	Blue
Red	-	296.5 Ω	295.5 Ω	296.3 Ω	296.1 Ω
Orange	-	-	594.5 Ω	595.5 Ω	594.5 Ω
Yellow	-	-	-	594.3 Ω	594.5 Ω
Pink	-	-	-	-	594.3 Ω
Blue	-	-	-	-	-

Step 3

Re-seat the plug on the connector at the conclusion of the test.

INDOOR UNIT DIAGRAM

0011520511A



Model selection:

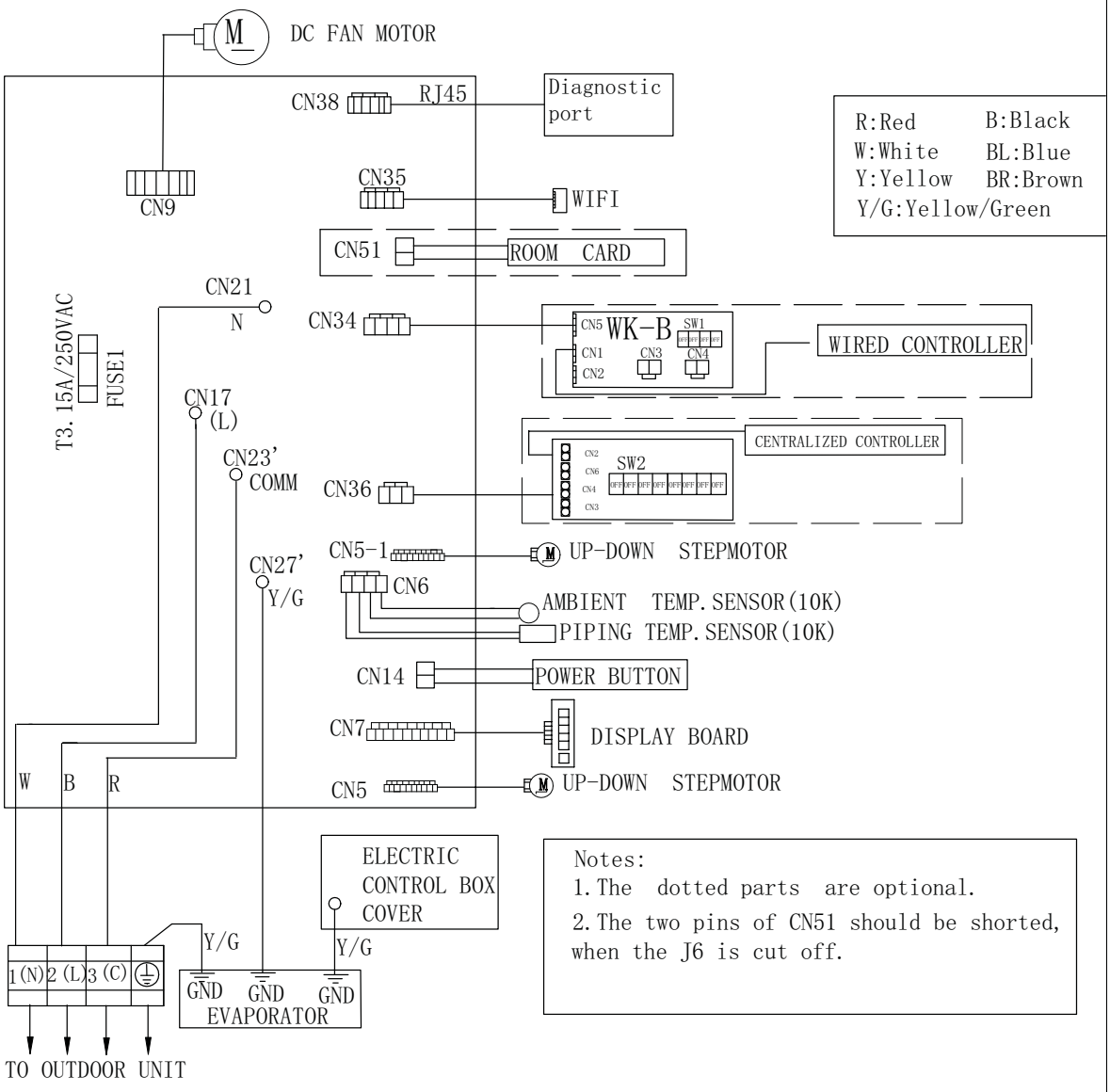
24K Cool only	model-23 code - BM1	- 1 off	2 off
24K Heat pump	model-26 code - BM1	- 1 off	2 on

Notes:Before replacing the board, it is necessary to ensure that the machine is matched with the board code

30-36K

INDOOR UNIT DIAGRAM

0011520511



Model selection:

30K Cool only	model-23 code - BM1	- 1 off	2 off
30K Heat pump	model-26 code - BM1	- 1 off	2 on
36K Cool only	model-33 code - BM1	- 1 on	2 off
36K Heat pump	model-35 code - BM1	- 1 on	2 on

Notes:Before replacing the board,it is necessary to ensure that the machine is matched with the board code

ERROR CODES

OUTDOOR		INDOOR
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	DIGITAL DISPLAY
1	OUTDOOR EEPROM FAILURE	F12
2	IPM OVERCURRENT OR SHORT CIRCUIT	F1
/	OUTDOOR ALTERNATING CURRENT, OVER CURRENT PROTECTION	F22
/	COMPRESSOR OVER CURRENT DURING DECELERATION	/
4	COMMUNICATION FAILURE BETWEEN THE IPM AND OUTDOOR PCB	F3
5	MODULE OPERATED OVERLOAD (COMPRESSOR OVERLOAD PROTECTION)	F20*
6	MODULE LOW OR HIGH VOLTAGE	F19*
/	COMPRESSOR CURRENT SAMPLING CIRCUIT FAULT	F27
8	OVERHEAT PROTECTION FOR DISCHARGE TEMPERATURE	F4
9	MALFUNCTION OF THE DC FAN MOTOR	F8*
10	MALFUNCTION OF DEFROST TEMPERATURE SENSOR	F21
11	SUCTION TEMPERATURE SENSOR FAILURE	F7
12	AMBIENT TEMPERATURE SENSOR FAILURE	F6
13	DISCHARGE TEMPERATURE SENSOR FAILURE	F25
/	HIGH OUTDOOR SUCTION TEMPERATURE	F30*
/	PFC CIRCUIT LOOP VOLTAGE	/
15	COMMUNICATION FAILURE BETWEEN THE INDOOR & OUTDOOR UNIT	E7
16	LACK OF REFRIGERANT OR DISCHARGING	F13*
17	4-WAY VALVE SWITCHING FAILURE	F14*
18	LOSS OF SYNCHRONISM DETECTION	F11
/	POSITION DETECTION CIRCUIT FAULT OF COMPRESSOR	F28
/	LOW DC OR AC VOLTAGE	/
/	TERMINAL BLOCK TEMP TOO HIGH	F15*
20	INDOOR THERMAL OVERLOAD	E9
21	INDOOR UNIT OVERLOAD PROTECTION, HEATING MODE ONLY.	E9*
21	INDOOR COIL FROSTED	E5
/	INDOOR ANTI-FROSTING PROTECTION	E5*
/	PFC CIRCUIT LOOP OVERCURRENT	/
/	INDOOR COIL TEMPERATURE (ABNORMAL READING)	/
23	MODULE THERMAL OVERLOAD	F5*
24	COMPRESSOR START FAILURE, OVER-CURRENT	F2*
25	PHASE CURRENT PROTECTION (IPM)	F23*
26	MCU RESET	F9
/	IPM POWER SUPPLY PHASE LOSS (3-PHASE)	/
27	MODULE CURRENT DETECT CIRCUIT MALFUNCTION	F24
/	WIRING ERROR: COMPRESSOR TO IPM	/
/	LOW REFRIGERANT FLOW. LOCKOUT.	/
28	LIQUID PIPE SENSOR FAILURE: CIRCUIT A	F10
29	LIQUID PIPE SENSOR FAILURE: CIRCUIT B	F16
30	LIQUID PIPE SENSOR FAILURE: CIRCUIT C	F17
31	LIQUID PIPE SENSOR FAILURE: CIRCUIT D	F18
32	GAS PIPE SENSOR FAILURE: CIRCUIT A	F29
33	GAS PIPE SENSOR FAILURE: CIRCUIT B	F30
34	GAS PIPE SENSOR FAILURE: CIRCUIT C	F31
35	GAS PIPE SENSOR FAILURE: CIRCUIT D	F32
36	GAS PIPE SENSOR FAILURE: CIRCUIT E	F26
/	OUTDOOR PIPE TEMPERATURE PROTECTION IN COOLING MODE	F34
/	COMPRESSOR OVERCURRENT DETECTED BY IPM	/
38	MALFUNCTION OF MODULE TEMPERATURE SENSOR MOMENTARY POWER FAILURE DETECTION	F35
39	MALFUNCTION OF CONDENSING TEMPERATURE SENSOR	F36
40	LIQUID PIPE SENSOR FAILURE: CIRCUIT E	F33
41	TOCI TEMPERATURE SENSOR FAILURE	F38
42	HIGH PRESSURE SWITCH OPEN	F39
43	LOW PRESSURE SWITCH OPEN	F40

* Hidden indoor error code. LED1 will flash outdoors, but no error will appear on indoor unit display. To view error code on indoor display, press and hold the Emergency button for 15 seconds.

Continued on following page

ERROR CODES

OUTDOOR		INDOOR
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	DIGITAL DISPLAY
44	SYSTEM HIGH PRESSURE PROTECTION: OVERCHARGED, HIGH CONDENSING TEMPERATURE OR MALFUNCTION OF FAN MOTOR.	F41
45	SYSTEM LOW PRESSURE PROTECTION: UNDERCHARGED, LOW DEFROSTING TEMPERATURE, OR MALFUNCTION OF FAN MOTOR.	F42
/	INCORRECT MATCH BETWEEN INDOOR & OUTDOOR	F43
L0	OAT LESS THAN -22°F (-30°C)	/
/	INDOOR AMBIENT TEMPERATURE SENSOR FAILURE	E1
/	INDOOR COIL TEMPERATURE SENSOR FAILURE	E2
/	INDOOR PCB EEPROM FAILURE	E4
/	COMMUNICATION FAULT BETWEEN THE INDOOR AND OUTDOOR UNIT	/
/	COMMUNICATION FAULT BETWEEN THE CONTROLLER AND INDOOR UNIT	/
/	DC VOLTAGE OF THE FAN MOTOR DRIVER TOO HIGH OR TOO LOW	/
/	FAN MOTOR DRIVER OVER 95°F (35°C)	/
/	INDOOR FAN MOTOR OUT OF STEP	/
/	DRAIN SYSTEM MALFUNCTION	/
/	ZERO CROSS SIGNAL DETECTED WRONG	/
/	INDOOR FAN MOTOR MALFUNCTION	E14*
/	OUTDOOR PCB FAIL	D1, D2, D3

* Hidden indoor error code. LED1 will flash outdoors, but no error will appear on indoor unit display. To view error code on indoor display, press and hold the Emergency button for 15 seconds.

USYM24UCDDA
USYM30UCDDA
USYM36UCDDA
USYM42UCDDA
USYM48UCDDA

TABLE OF CONTENTS

COMPONENTS

The Mid-Static Ducted Indoor Unit will act as evaporator coils during cooling mode and condenser coils during heating mode. This unit can operate with a motorized supply air louver or it can have a LIMITED amount of ducting added to the unit's return and supply air duct connection flanges. The return air ducting can be connected to the end of the cabinet or the bottom blank off plate can be removed for bottom return configuration.

DIP Switches on the unit's circuit board configure the fan power to match the ducting configuration.

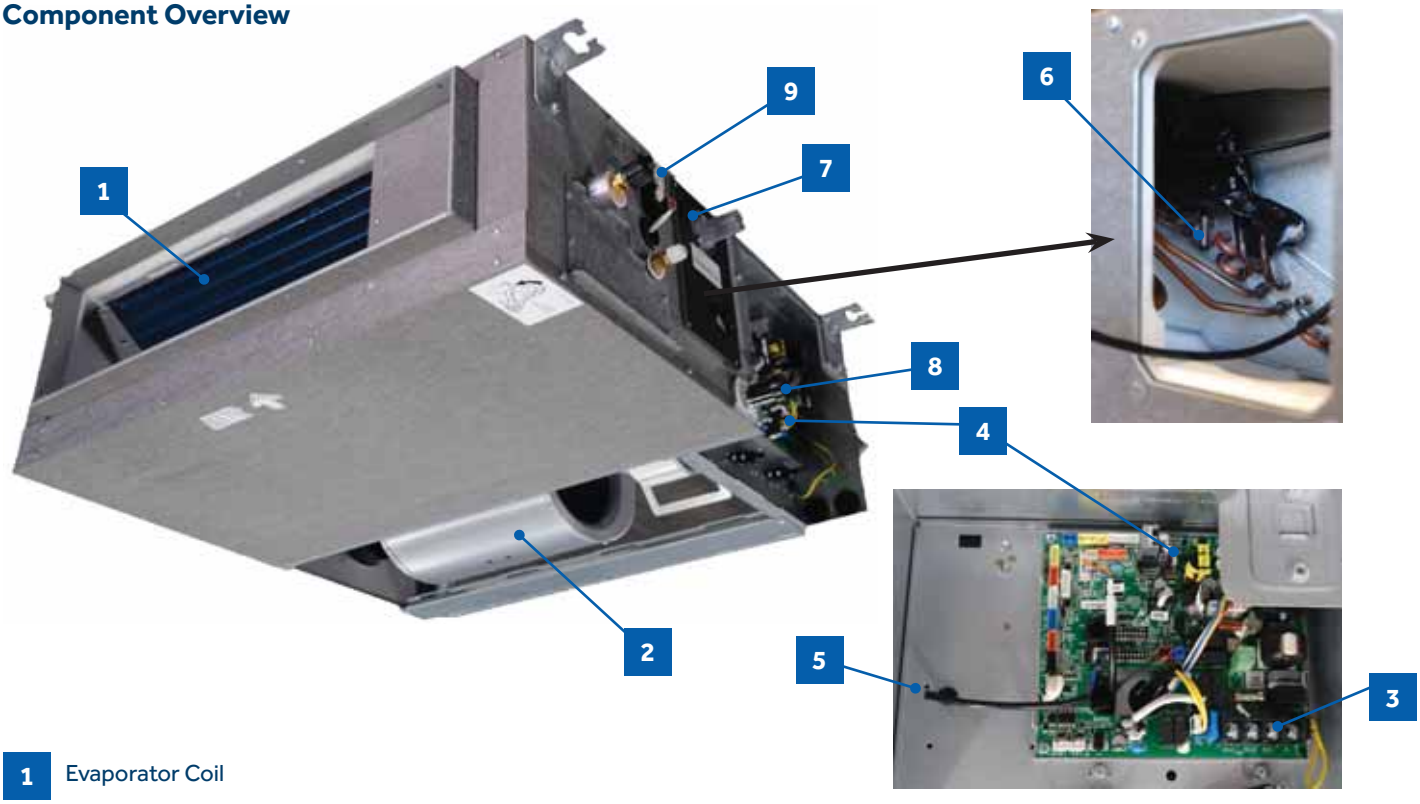
These units have a built in condensate pump with an associated condensate level switch. The condensate pump is capable of lifting water out of the indoor unit. If high water lift is needed, the water from the cassette pump should be pumped into a field supplied condensate pump with high lift power.

The blower assembly and room air temperature sensor is accessed at the rear of the evaporator coil, and the piping temperature sensor is located under the top cover. The condensate pump and float switch are accessed under the removable panel next to the electrical control box.

The wired controller can be configured to sense room air temperature. There is no option for use with wireless remote control.

All operating status and information is displayed on the wired controller. The Mid-Static Ducted unit does not have a display.

Component Overview



1 Evaporator Coil

2 Blower Assembly

The indoor unit features a DC variable speed dual shaft blower motor that will change speed to match the capacity demand from the outdoor unit. The motor is a dual shaft type that powers two individual blower assemblies.

The blower assembly consists of 2 plastic blowers. A set screw holds each blower wheel to the blower motor.

The indoor blower motor is connected to the indoor unit control board. The wiring from the motor to indoor board consists of 5 wires connected to pins that deliver line voltage, speed, and feedback information.

During normal operation, the indoor control board will energize the indoor blower motor and request proper speed. Fan power should be set using the DIP Switches SW1 settings.

3 Terminal Block

Power to operate the indoor unit comes from the electrical line voltage terminal block at the outdoor unit. The wiring includes 4 wires, 1, 2, 3 and ground. Wires 1 and 3 complete the data path. These wires should always be 14 gauge AWG Stranded type wire. Splices in wires 1 or 3 may cause communication errors.

4 Control Board

Located under the electrical control box cover.

5 Ambient Temperature Sensor

The Ambient Temperature Sensor senses room temperature. This sensor provides room temperature information used in a control algorithm for compressor frequency adjustments.

6 Piping Temperature Sensor

The Piping Temperature Sensor senses indoor coil. This sensor is used for Anti Freezing and Anti Cold Blow cycles. The sensor also provides critical temperature information used in a control algorithm for compressor frequency adjustments.

7 Condensate Pump

The Mid-Static Ducted unit has a built in condensate pump. The pump is energized whenever the Float Switch indicates that water needs to be pumped from the cassette.

The float switch and pump are located behind the removable insulated cover next to the electrical control box. The pump is hermetically sealed and requires no maintenance. The float switch is a normally closed switch, that opens as water rises.

8 Gravity Drain Ports

The indoor unit has the option for either gravity drain systems or the use of an internal condensate pump with float switch. The pump is capable of minimal lift. If high lift is required, the water from the Mid-Static Ducted unit should be pumped to a field supplied condensate pump that is capable of high lift. The system should not be allowed to retain any water for hygienic health and safety concerns.

WiFi

The unit comes shipped with a WiFi module that provides control via a smartphone app.

Indoor Unit Circuit Board

The indoor unit circuit board controls the switching functions of the indoor unit. All control decisions are made by the outdoor unit. The indoor board has some limited diagnostic capability.

USYM24UCDDA

USYM30UCDDA, USYM36UCDDA, USYM42UCDDA, USYM48UCDDA

The Indoor Unit Circuit Board communicates with the outdoor unit via a connection at Terminal Block screw 3. The data pulse that sends the communication information can be measured with a voltmeter placed to DCV range. From the ground connection at the Terminal Block to the Number 3 screw connection, the voltage should pulse up and down when data is being transmitted.

Line voltage to power the indoor unit comes in on Terminal Block connections 1 and 2. Power connects from these terminal connections on the circuit board.

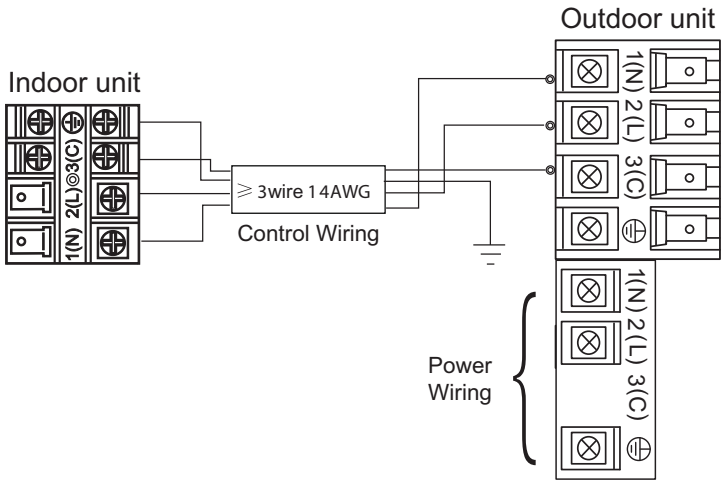
The connections on the indoor board are shown here in the schematic drawing.

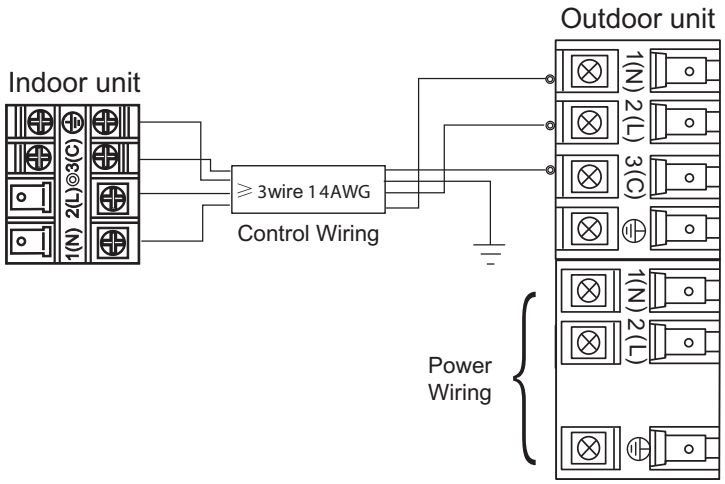
This control board has control over the fan louver movement, manual fan blower control, indoor coil temperature and indoor air temperature sensing functions. All operational decisions are controlled by the OUTDOOR UNIT.

The control board has a replaceable 5A 250V fuse that protects against excessive current.

When testing the calibration of these sensors, the wires can be released from the plug by pressing on the tension tab on the side of the plug.

There 3 motors that control the directional movement of the accessory louver. The motors are located in the louver assembly.





Condensate Pump Logic

The pump is energized whenever the Float Switch opens, indicating that the water needs to be pumped out from the unit.

In Cooling or Dry mode:

- If the compressor is running, the condensate pump is energized and will respond to the Float Switch.
- When the compressor stops, the condensate pump is energized for an additional 5 minutes and will continue to respond to the float switch.
- If the float switch remains opened (water detected) for more than 5 minutes when the compressor is running, the compressor will stop, and the pump will continue to run, until the float switch closes.
- If the float switch does not close, an error code will display, and the pump will continue to run.
- If the float switch closes, the pump will continue to run for 5 additional minutes.

In Heating or Fan Only mode:

- If the float switch opens (water detected) for 2 seconds, the condensate pump is energized.
- If the float switch closes, the pump will continue to run for 5 additional minutes.

Fresh Air Function

When there is fresh air signal received by the Indoor Unit PCB (the fresh air signal can be sent by infrared remote controller or wired controller), the Normal fresh air function is valid.

When a call for Fresh Air is received, via the wired controller, the unit will enable the standard fresh air function.

This function can be activated at any mode except defrost mode. When the IDU been turned off by controller, the fresh air function is invalid. This function can be activated in any mode, except for defrost mode. When the Indoor Unit has been turned off via the controller, the fresh air function will be disabled.

Call for Fresh Air is Received:

In Cooling / Dehumidification mode:

The fresh air output will maintain a 20 minutes ON, 20 minutes OFF cycle after the compressor starts.

This cycle will be active until one of the following occurs:

- Fresh air function is canceled via the wired controller
- The compressor stops.

In Fan Only mode:

The fresh air output will maintain a 20 minutes ON, 20 minutes OFF cycle.

This cycle will be active until one of the Fresh air function is canceled via the controller

In Heating mode

The fresh air output will maintain a 20 minutes ON, 20 minutes OFF cycle after the compressor starts.

This cycle will be active until one of the following occurs:

- Fresh air function is canceled via the wired controller
- The compressor stops.
- The system enters into Defrost Cycle.

Special Fresh Air Function (Canadian Ventilation Mode - Mid Static Ducted Only)

Special fresh air function (Canadian ventilation mode) is valid when DIP switch SW3_1 is set to the ON position, and invalid when DIP switch SW3_1 is set to OFF position.

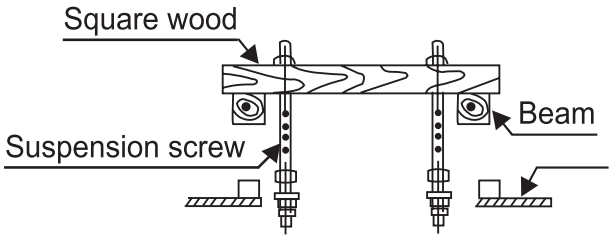
When this function is enabled and the Indoor Unit is ON, the unit will proceed Continuous Fresh Air, keeping the Indoor Fan Motor energized even if the compressor is stopped or the IDU reaches it's real setpoint temperature (real setpoint=customer set point + compensation point).

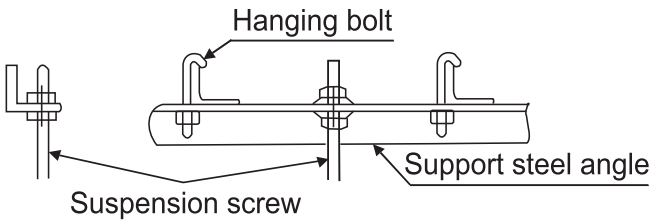
Notes:

- *During an active Call, the fan motor speed will be whatever setting the customer has set it to. Once the Call is satisfied, the fan motor speed will be set to a special Low setting that corresponds to the ESP setting.*
- *During a Defrost Cycle, the indoor fan is disabled, along with the Fresh Air Function*

Basic Duct Configurations

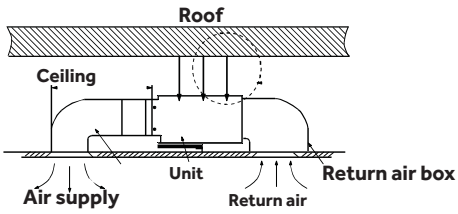
Here are the typical duct configurations that can be used with the unit. 3/8" thread suspension screws are recommended.

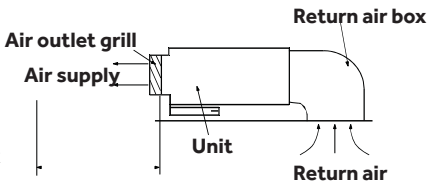




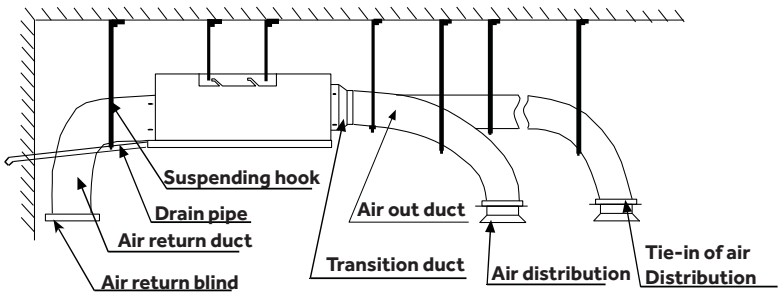
Ductwork Installation

Roof Installation

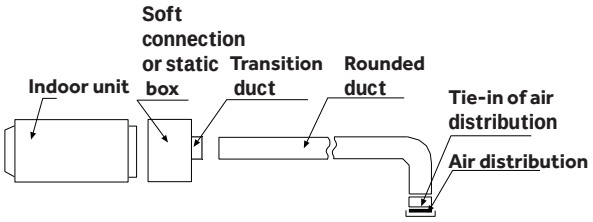


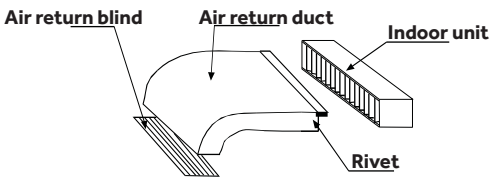


Long Duct



Use rivet to connect the air return duct on the air return inlet of the indoor unit, then connect the other end with the air return

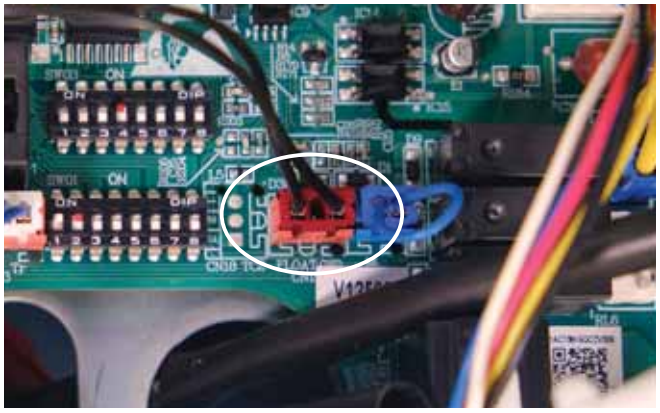




Test Condensate Pump and Associated Float Switch

If the internal condensate pump does not operate, the pump may be bad or the float switch may be defective. Perform the following test:

1. Access the electrical control box.
2. Unplug the float switch from the circuit board. (The float switch is a normally closed switch. Disconnecting from the board will simulate an open switch, thus activating the pump motor.)



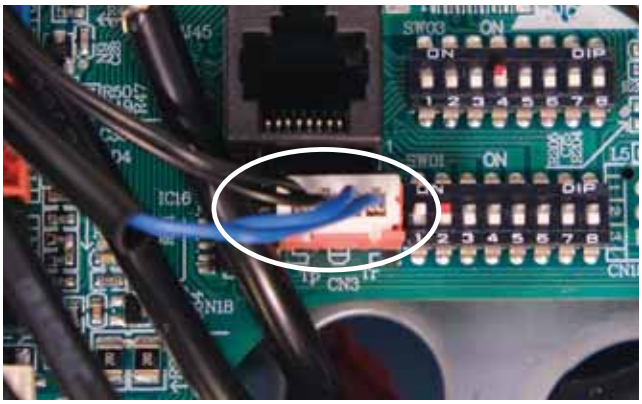
3. The pump should start.
4. If the pump does not start, check for voltage at the pump control board connection. There should be 230 Volts AC to the pump. If there is not, the circuit board is defective. If there is proper voltage to the pump, either the pump or associated pump wiring is defective.

Testing Temperature Sensors

The easiest problems to solve will involve codes that are related to potential failure of temperature sensors. Common problems may include loose connections, open electrically, and out of calibration. Checking the condition of the sensors requires a temperature probe and an ohmmeter.

The Reference Section of this manual contains temperature resistance tables that can be used to check the calibration of the sensors. The measured resistance must be within the tolerances printed on the top of the tables.

1. Confirm the sensor is firmly attached to the circuit board connection plug.
2. Remove the sensor wires from the connection plug by releasing holding tension on the plugs tension tab.



3. Use an ohmmeter to test the electrical resistance of the sensor.

4. Measure the air temperature near the sensor and compare the required resistance against measured resistance (refer to charts in reference section). If the sensor is within calibration, the sensor is good. If the sensor is out of calibration, replace the sensor (tube Sensors should be removed from socket and exposed to air temperature during test).

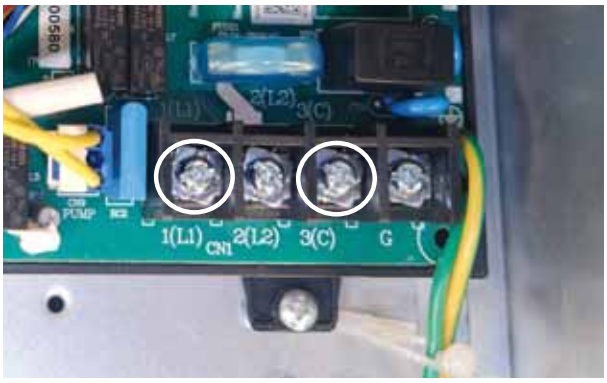
Testing Communication Circuit

If an Error E7 occurs, perform the following test to determine if the indoor control board is functioning properly to send data to the outdoor unit.

Perform this test with the unit powered and all wiring connected between indoor and outdoor unit.

Make sure all wiring between the indoor and outdoor unit are correct. There should no splices between the indoor and outdoor unit wiring connecting terminals 1 or 3. Make sure wiring is correct, before performing this test.

1. Measure the DC voltage between terminals 1 and 3 on the indoor terminal block.



2. The voltage should fluctuate between 8VDC and 23VDC (results will vary based upon meter calculations). The fluctuating signal indicates a good communication path.
3. If the voltage does not fluctuate, and the wiring is good, the indoor board may be defective.

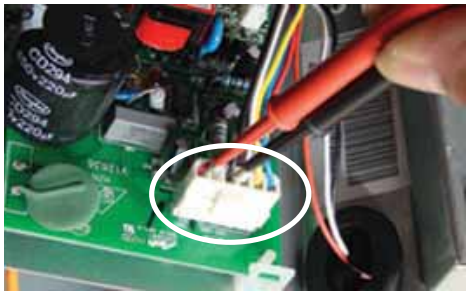
Indoor Fan Motor Voltage Check

If The Indoor Fan Motor Does Not Run:

1. Remove the front cover and access the fan motor circuit board connection.
2. Reset power and turn the remote control fan command to Fan On mode.

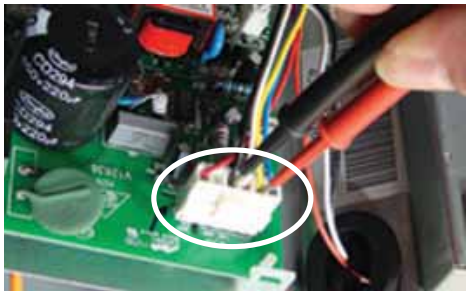
Motor Test:

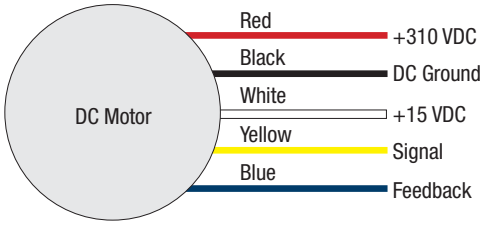
1. If the motor doesn't run, check for 310VDC between Pins 1 and 3. If it is not present, the indoor board or power supply may be damaged. If voltage is present, continue on.



2. Check the voltage between Pins 3 and 4. The voltage should be +15VDC. If it is not present, the board may be damaged. If voltage is present, continue on.

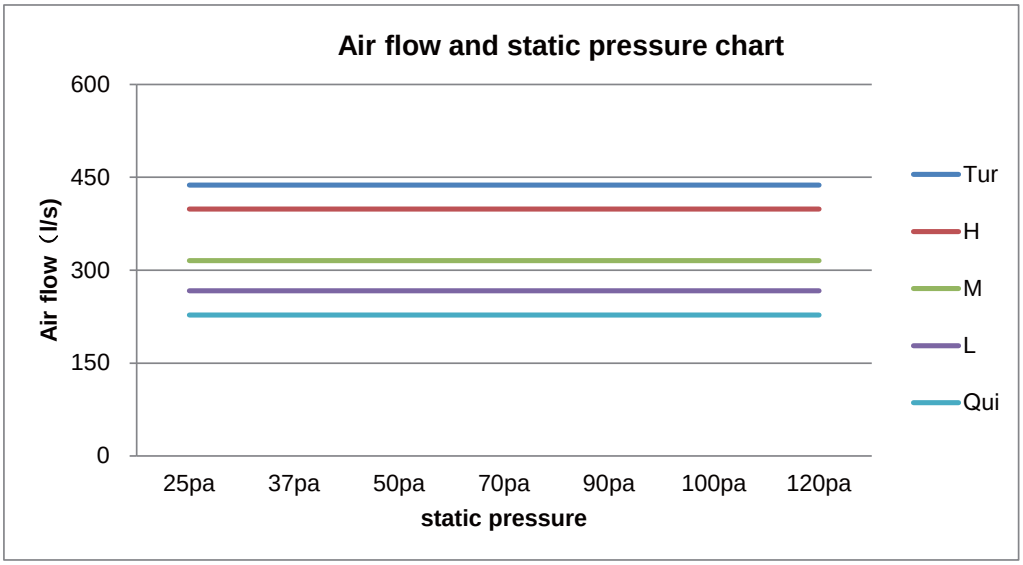
3. Check for voltage between Pins 3 and 6. If no DC voltage is present, the board may be damaged. If voltage is present, change the motor.



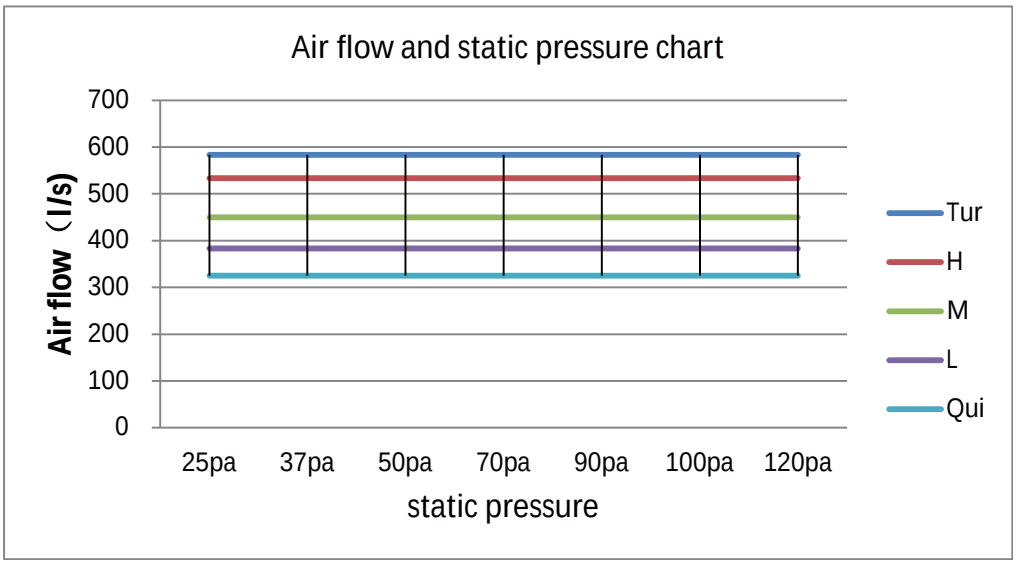


Static Pressure Charts

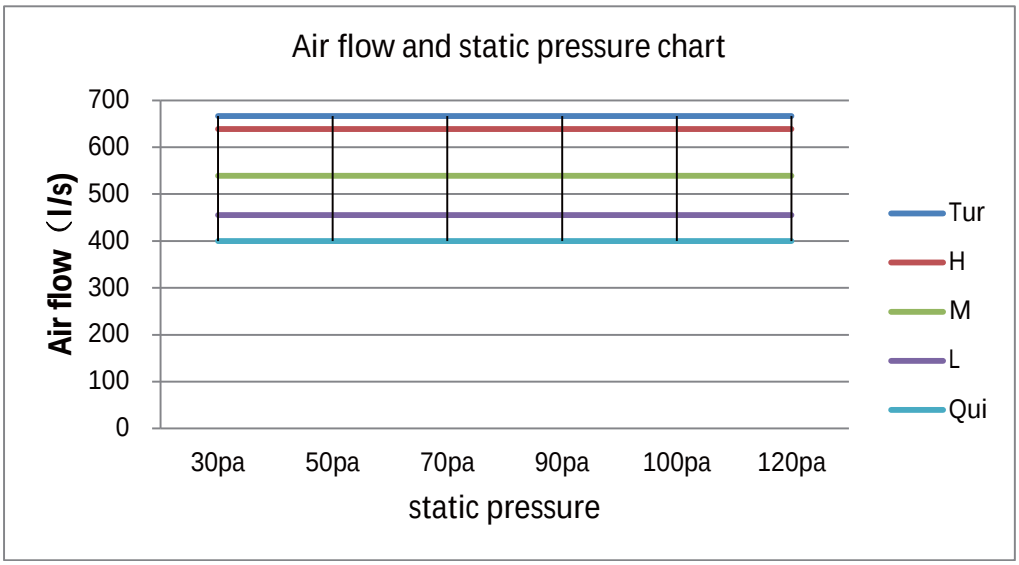
USYM24UCDDA



USYM30UCDDA, USYM36UCDDA



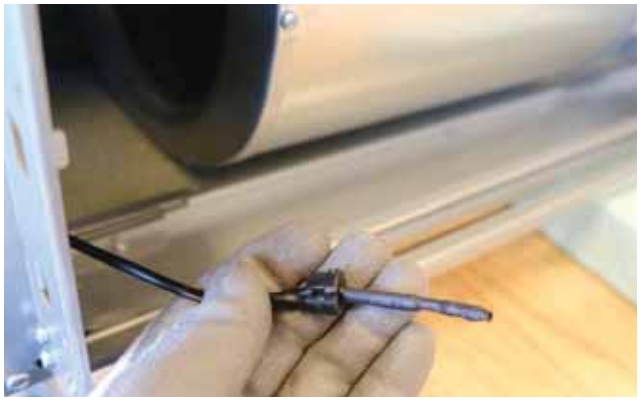
USYM42UCDDA, USYM48UCDDA



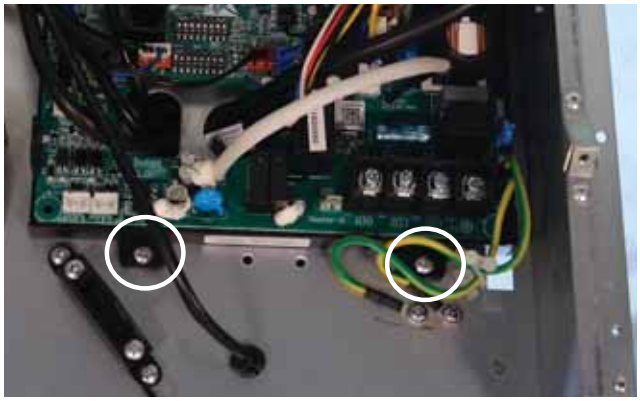
Board Replacement

(Access to the bottom of unit is required for this procedure)

1. Remove the ambient sensor.

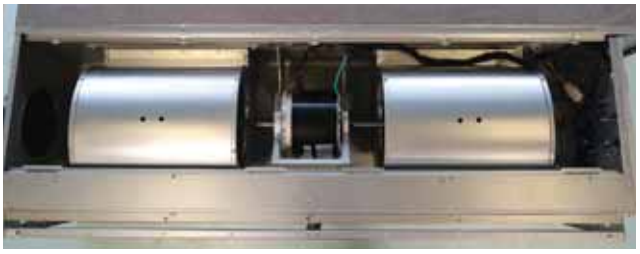


2. Unplug all connectors from the board.
3. Remove the 2 board mounting screws and remove the board.



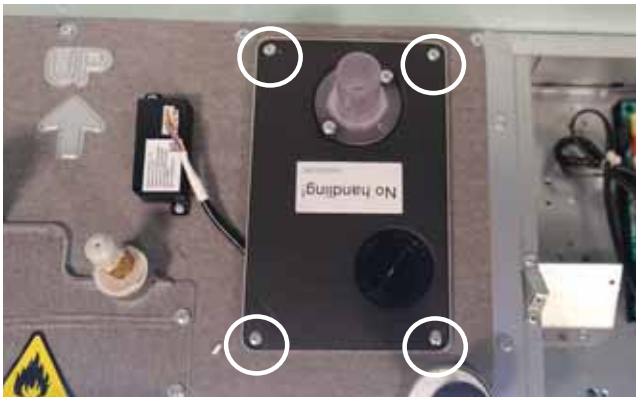
Removing the Condensate Pump

1. Remove the air inlet cover.

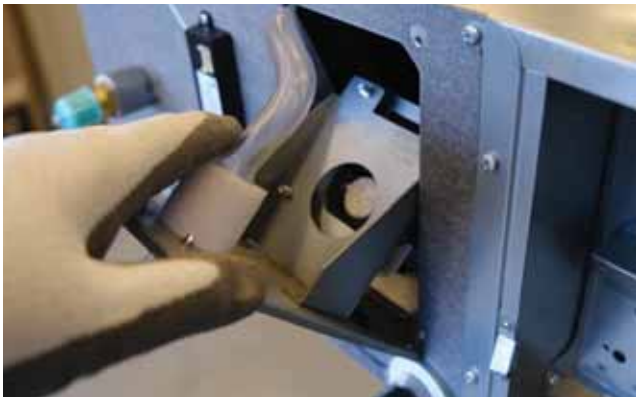


2. Unplug the pump motor and float switch wires from within the air inlet

3. Remove the 4 screws holding the pump in place.



4. Tilt the pump out from the top and pull out

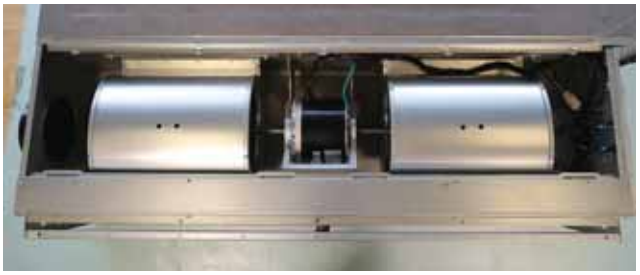


5. Pull wires through rubber grommets and remove pump assembly

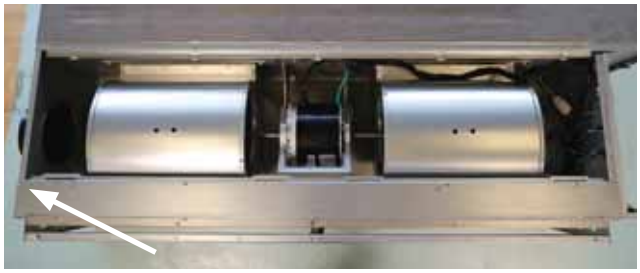
Removing Fan Motor

1. Remove control board cover.
2. Unplug motor wires.

3. Feed motor wires into the air inlet box
4. Remove the air box cover.

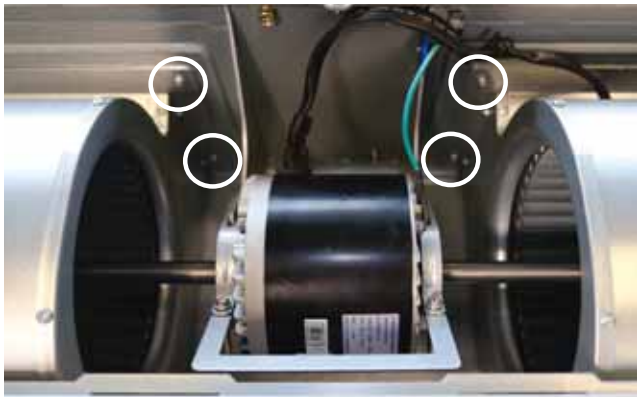


5. Remove the corner bracket.

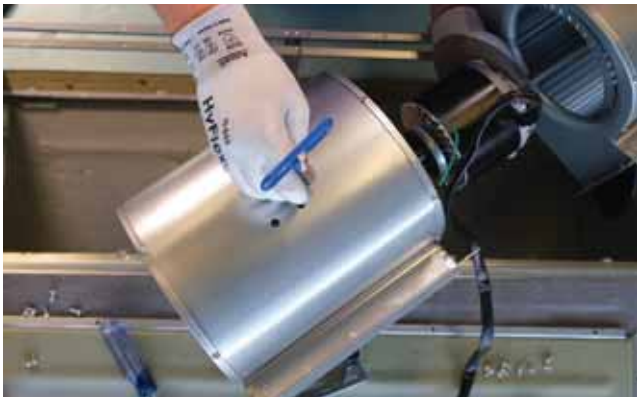


6. Remove the ground screw and free the motor wire harness.

7. Remove the screws holding the blower housing to the unit, 4 on each housing.



8. Support the motor (2 people may be required at this time). Loosen the 2 screws of the motor mount bracket and remove full assembly
9. Using a long 4mm hex wrench, loosen the set screws from the blower wheel and remove from motor shaft.



Replacing WiFi Module

1. Unplug existing WiFi module.

2. Insert new WiFi module.
3. Replace the WiFi passcode sticker.
4. Pair the unit to account.

DIP SWITCH SETTINGS

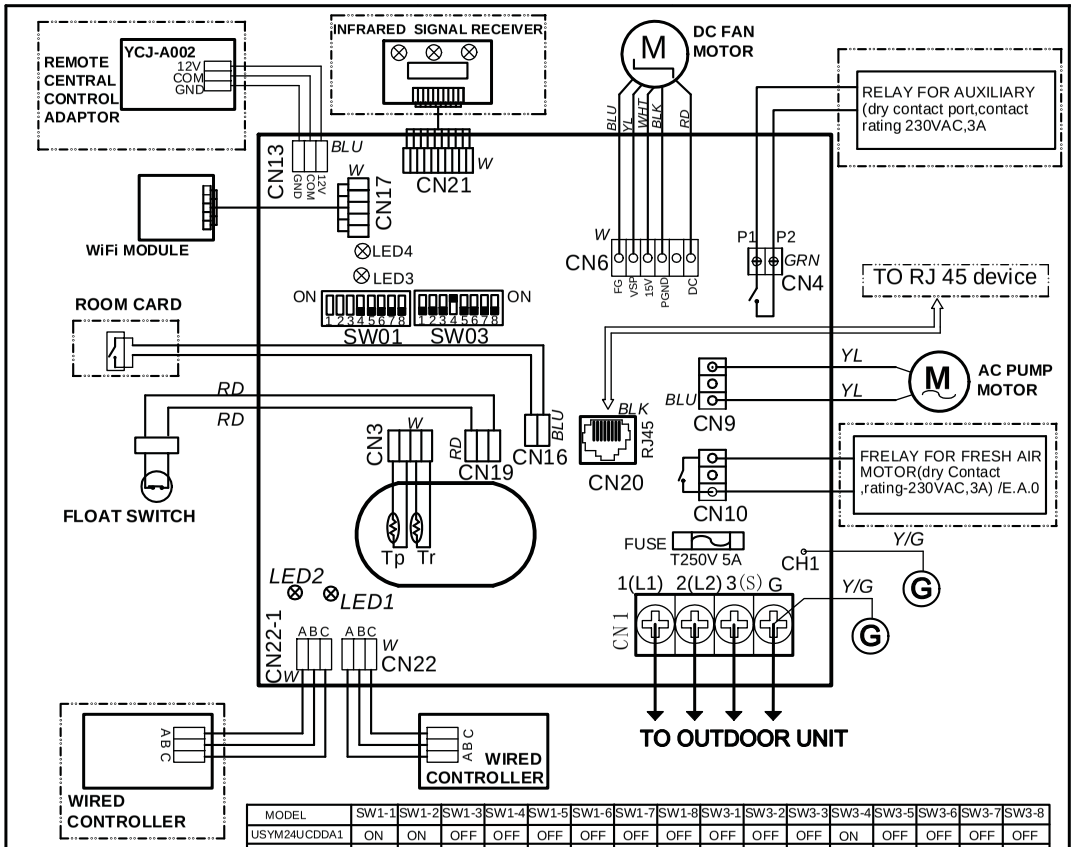
SW1 DIP Switch Settings

	Capacity			Room Card	Running Mode	Fresh Air	Filter Change Notice	Region
Description	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Capacity: 24kBTU (7.1kW)	ON	ON	OFF	---	---	---	---	---
Capacity: 30kBTU (9.0kW)	OFF	OFF	ON	---	---	---	---	---
Capacity: 36kBTU (10.5kW)	ON	OFF	ON	---	---	---	---	---
Capacity: 42kBTU(12.5kW)	OFF	ON	ON	---	---	---	---	---
Capacity: 48kBTU (14.0kW)	ON	ON	ON	---	---	---	---	---
Room card invalid (default)	---	---	---	OFF	---	---	---	---
Room card valid	---	---	---	ON	---	---	---	---
Heat pump (default)	---	---	---	---	OFF	---	---	---
Cooling only	---	---	---	---	ON	---	---	---
Fresh air valid (default)	---	---	---	---	---	OFF	---	---
External alarm output valid	---	---	---	---	---	ON	---	---
Disable filter change notice (default)	---	---	---	---	---	---	OFF	---
Enable filter change notice	---	---	---	---	---	---	ON	---
North America area (USA & Canada) (default)	---	---	---	---	---	---	---	OFF
Non-North America	---	---	---	---	---	---	---	ON

SW3 DIP Switch Settings

Description	SW3-1	SW3-2	SW3-3	SW3-4
Special Fresh Air function valid	ON	---	---	---
Special fresh Air funtion invalid (default)	OFF	---	---	---
Reserved	---	ON	---	---
Reserved (default)	---	OFF	---	---
Auxiliary heater Function valid	---	---	ON	---
Auxiliary heater Function invalid (default)	---	---	OFF	---
MESP DUCT (10 ESP level)	---	---	---	ON
Slim DUCT (10 ESP level)	---	---	---	OFF

Indoor Unit Address (Indoor unit address for one wired controller control more than one unit)				
Address	SW3-5	SW3-6	SW3-7	SW3-8
0 (main)	OFF	OFF	OFF	OFF
1 (sub)	OFF	OFF	OFF	ON
2 (sub)	OFF	OFF	ON	OFF
3 (sub)	OFF	OFF	ON	ON
4 (sub)	OFF	ON	OFF	OFF
5 (sub)	OFF	ON	OFF	ON
6 (sub)	OFF	ON	ON	OFF
7 (sub)	OFF	ON	ON	ON
8 (sub)	ON	OFF	OFF	OFF
9 (sub)	ON	OFF	OFF	ON
10 (sub)	ON	OFF	ON	OFF
11 (sub)	ON	OFF	ON	ON
12 (sub)	ON	ON	OFF	OFF
13 (sub)	ON	ON	OFF	ON
14 (sub)	ON	ON	ON	OFF
15 (sub)	ON	ON	ON	ON



Factory default setting of the DIP switches

MODEL	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	SW3-1	SW3-2	SW3-3	SW3-4	SW3-5	SW3-6	SW3-7	SW3-8
USYM24UCDDA1	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM30UCDDA1	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM36UCDDA1	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM42UCDDA1	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM48UCDDA1	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF

NOTE:

1.Dashed parts are optional.

2.Please refer to service manual to get details of the DIP switches definition .

3.Do not change the DIP switches setting without technical support.

4.Get details from trouble shooting list about LED indication.

5.Abbreviation：*RD* -red, *W*-withe, *BLK*-black,*BLU*-blue,*GRN*-green,*YL*-yellow,*Y/G*-yellow/green, E.A.O: external alarm output,Tr：indoor unit ambient(room) temperature sensor,Tp ： indoor unit pipe(coil) temperature sensor.

6.The port CN4&CN10are dry contact output port for particular use,do not connect other device without technical person support.

Indoor unit trouble shooting

Flash times of the indoor unit PCBA		Wired controller error code	Contents of malfunction	Possible reason
LED3	LED4			
0	1	01	Malfunction of indoor unit ambient temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	2	02	Malfunction of indoorunit pipe(coil) temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	4	04	EEPROM wrong of indoor PCB	EEPROM chip disconected or broken or wrong programmed,or PCB broken
0	7	07	Abnormal communication between indoor and outdoor units	connection wires disconected or wrong adress setting of indoor unit or faulty power supply or faulty PCB
0	8	/	Abnormal communication between wired controlleer and indoor unit	Wrong connection or wired controller broken,or PCB faulty
0	12	0C	Malfunction of drain system	Pump motor disconnected or atwrong position,or the float switch disconnected or at wrong position,or the PCB float port short connector disconnected
0	13	0D	Zero cross sigal wrong	Zero cross sigal detected wrong
0	14	0E	Indoor unit DC fan motor abnormal	DC Fan motor disconnected or DC Fan broken or circuit broken
M(≥2)	N(≥0)	HEX code correspond to decimal (M*10+N)	Error of the outdoor unit	See note 1,2

Note:

1.The outdoor failure can also be indicated by the indoor unit,the checking method as follows:outdoor unit error code=(M*10+N)-20.LED3 flash M times and LED4 flash N times .The wired controller error display the HEX CODE which correspond to DEC code (M*10+N).

2.To get much more details about the out door unit failure,please refer to the outdoor unit trouble shooting list.

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ERROR CODES

OUTDOOR		INDOOR	
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	LED 4	LED 3
1	OUTDOOR EEPROM FAILURE	2	1
2	IPM OVERCURRENT OR SHORT CIRCUIT	2	2
/	OUTDOOR ALTERNATING CURRENT, OVER CURRENT PROTECTION	/	/
/	COMPRESSOR OVER CURRENT DURING DECELERATION	2	3
4	COMMUNICATION FAILURE BETWEEN THE IPM AND OUTDOOR PCB	2	4
5	MODULE OPERATED OVERLOAD (COMPRESSOR OVERLOAD PROTECTION)	2	5
6	MODULE LOW OR HIGH VOLTAGE	2	6
/	COMPRESSOR CURRENT SAMPLING CIRCUIT FAULT	2	7
8	OVERHEAT PROTECTION FOR DISCHARGE TEMPERATURE	2	8
9	MALFUNCTION OF THE DC FAN MOTOR	2	9
10	MALFUNCTION OF DEFROST TEMPERATURE SENSOR	3	0
11	SUCTION TEMPERATURE SENSOR FAILURE	3	1
12	AMBIENT TEMPERATURE SENSOR FAILURE	3	2
13	DISCHARGE TEMPERATURE SENSOR FAILURE	3	3
/	HIGH OUTDOOR SUCTION TEMPERATURE	/	/
/	PFC CIRCUIT LOOP VOLTAGE	3	4
15	COMMUNICATION FAILURE BETWEEN THE INDOOR & OUTDOOR UNIT	3	5
16	LACK OF REFRIGERANT OR DISCHARGING	3	6
17	4-WAY VALVE SWITCHING FAILURE	3	7
18	LOSS OF SYNCHRONISM DETECTION	3	8
/	POSITION DETECTION CIRCUIT FAULT OF COMPRESSOR	/	/
/	LOW DC OR AC VOLTAGE	3	9
/	TERMINAL BLOCK TEMP TOO HIGH	/	/
20	INDOOR THERMAL OVERLOAD	4	0
21	INDOOR UNIT OVERLOAD PROTECTION, HEATING MODE ONLY.	/	/
21	INDOOR COIL FROSTED	4	1
/	INDOOR ANTI-FROSTING PROTECTION	/	/
/	PFC CIRCUIT LOOP OVERCURRENT	4	2
/	INDOOR COIL TEMPERATURE (ABNORMAL READING)	/	/
23	MODULE THERMAL OVERLOAD	4	3
24	COMPRESSOR START FAILURE, OVER-CURRENT	4	4
25	PHASE CURRENT PROTECTION (IPM)	4	5
26	MCU RESET	4	6
/	IPM POWER SUPPLY PHASE LOSS (3-PHASE)		
27	MODULE CURRENT DETECT CIRCUIT MALFUNCTION	4	7
/	WIRING ERROR: COMPRESSOR TO IPM	/	/
/	LOW REFRIGERANT FLOW. LOCKOUT.	/	/
28	LIQUID PIPE SENSOR FAILURE: CIRCUIT A	4	8
29	LIQUID PIPE SENSOR FAILURE: CIRCUIT B	4	9
30	LIQUID PIPE SENSOR FAILURE: CIRCUIT C	5	0
31	LIQUID PIPE SENSOR FAILURE: CIRCUIT D	5	1
32	GAS PIPE SENSOR FAILURE: CIRCUIT A	5	2
33	GAS PIPE SENSOR FAILURE: CIRCUIT B	5	3
34	GAS PIPE SENSOR FAILURE: CIRCUIT C	5	4
35	GAS PIPE SENSOR FAILURE: CIRCUIT D	5	5
36	GAS PIPE SENSOR FAILURE: CIRCUIT E	5	6
/	OUTDOOR PIPE TEMPERATURE PROTECTION IN COOLING MODE	/	/
/	COMPRESSOR OVERCURRENT DETECTED BY IPM	5	7
38	MALFUNCTION OF MODULE TEMPERATURE SENSOR MOMENTARY POWER FAILURE DETECTION	5	8
39	MALFUNCTION OF CONDENSING TEMPERATURE SENSOR	5	9
40	LIQUID PIPE SENSOR FAILURE: CIRCUIT E	6	0
41	TOCI TEMPERATURE SENSOR FAILURE	6	1
42	HIGH PRESSURE SWITCH OPEN	6	2
43	LOW PRESSURE SWITCH OPEN	6	3

Continued on following page

OUTDOOR		INDOOR	
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	LED 4	LED 3
44	SYSTEM HIGH PRESSURE PROTECTION: OVERCHARGED, HIGH CONDENSING TEMPERATURE OR MALFUNCTION OF FAN MOTOR.	6	4
45	SYSTEM LOW PRESSURE PROTECTION: UNDERCHARGED, LOW DEFROSTING TEMPERATURE, OR MALFUNCTION OF FAN MOTOR.	6	5
/	INCORRECT MATCH BETWEEN INDOOR & OUTDOOR	/	/
L0	OAT LESS THAN -22°F (-30°C)	/	/
/	INDOOR AMBIENT TEMPERATURE SENSOR FAILURE	0	1
/	INDOOR COIL TEMPERATURE SENSOR FAILURE	0	2
/	INDOOR PCB EEPROM FAILURE	0	4
/	COMMUNICATION FAULT BETWEEN THE INDOOR AND OUTDOOR UNIT	0	7
/	COMMUNICATION FAULT BETWEEN THE CONTROLLER AND INDOOR UNIT	0	8
/	DC VOLTAGE OF THE FAN MOTOR DRIVER TOO HIGH OR TOO LOW	/	/
/	FAN MOTOR DRIVER OVER 95°F (35°C)	/	/
/	INDOOR FAN MOTOR OUT OF STEP	/	/
/	DRAIN SYSTEM MALFUNCTION	0	12
/	ZERO CROSS SIGNAL DETECTED WRONG	0	13
/	INDOOR FAN MOTOR MALFUNCTION	0	14
/	INDOOR FAN MOTOR OVERCURRENT	/	/

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USYL24UCDDA
USYL30UCDDA
USYL36UCDDA
USYL42UCDDA
USYL48UCDDA

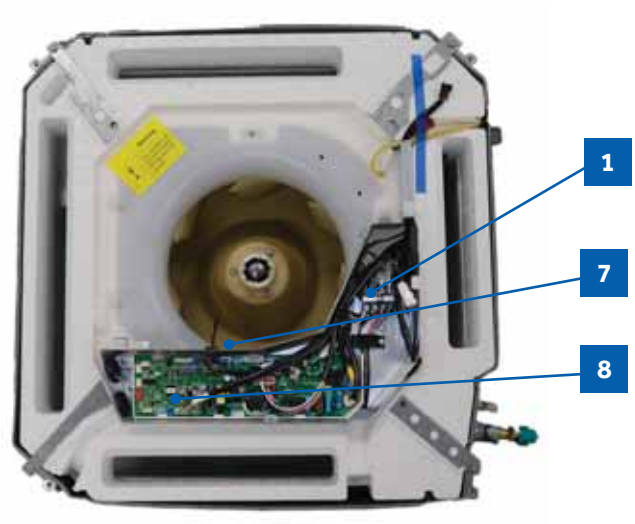
TABLE OF CONTENTS

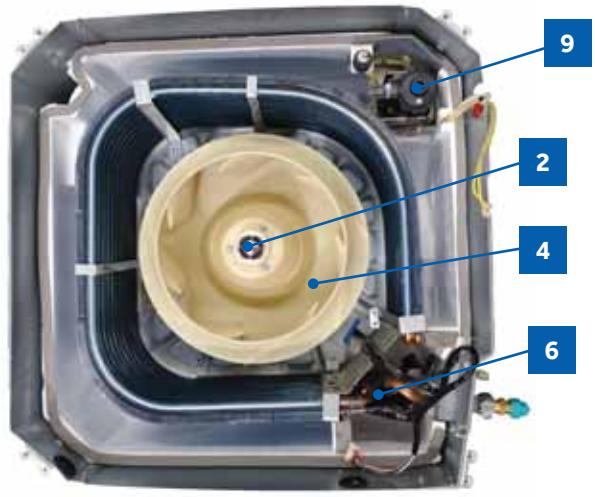
COMPONENTS

The indoor cassette type units act as evaporator coils during cooling mode and condenser coils during heating mode. These units have a built in condensate pump with an associated condensate level switch. The condensate pump is capable of lifting water out of the indoor unit. If high water lift is needed, the water from the cassette pump should be pumped into a field supplied condensate pump with high lift power. Water must not be retained in the unit for hygienic health and safety concerns.

Cassette type indoor units can be operated with a wired controller or a remote control.

Component Overview





1 Terminal Block

Power to operate the indoor unit comes from the electrical line voltage terminal block at the outdoor unit. The wiring includes 4 wires, 1, 2, 3 and ground. Wires 1 and 3 complete the data path. These wires should always be 14 gauge AWG unshielded stranded type wire. Splices in wires 1 or 3 may cause communication errors.

2 Motor Blower

The indoor unit features a multi speed blower motor that will change speed to match the capacity demand from the outdoor unit. Separate motors located in the indoor unit control the operation of the motorized louvers. All of the louver motors are controlled via commands received from the remote control. The blower motor is controlled by both the remote control and by commands from the outdoor unit control algorithm.

3 Display

The indoor unit has a display that communicates system mode. The indoor unit does not display temperatures or diagnostic codes. When a wired controller is used, this information is displayed on the wired controller. It is recommended to use a wired controller with the cassette unit.

When servicing a diagnostic error, ALWAYS refer to the outdoor unit code to make diagnostic decisions.

4 The Blower Assembly

The blower assembly consists of a plastic blower wheel that is connected to a PSC indoor blower motor. A set screw holds the blower wheel to the blower motor.

The indoor blower motor is a Multi Speed Fan Motor that is connected to the indoor unit control board. The wiring from the motor to indoor board consists of 4 wires connected to pins common, low , medium and high speeds.

During normal operation, the indoor control board will energize the indoor blower motor and request proper speed. The motor has a run capacitor that is located in the Cassette unit's control box. The run capacitor connects to the motor via two orange wires. This capacitor is field replaceable.

5 Louver Motors

The louver motors are stepper type motors that move the louvers up/down. The motors are controlled by pulsed voltage that cannot be measured. If the louver does not move when it should, check for a bind in the louvers.

6 Piping Temperature Sensor

The Piping Temperature Sensor senses indoor coil temperature in the cooling mode and in the heating mode. This sensor is used in the control algorithm for operations such as the Anti-Freezing and Anti-Cold Blow cycles.

7 Ambient Temperature Sensor

The Ambient Temperature Sensor senses room temperature. This sensor provides room temperature information for the control algorithm to calculate the inverter and compressor frequency.

Both sensors are negative temperature coefficient type that reduce electrical resistance as temperature rises.

8 Control Board

The indoor unit circuit board controls the switching functions of the indoor unit. All control decisions are made by the outdoor unit Outdoor unit control algorithm. The indoor board has some limited diagnostic capability.

9 Condensate Pump & Float Switch

Cassette Unit Indoor Circuit Board

The indoor unit circuit board controls the switching functions of the indoor unit. All control decisions are made by the outdoor unit control algorithm. The indoor board has some limited diagnostic capability.

The Indoor Unit Circuit Board communicates with the outdoor unit via a connection at Terminal Block screw 3. The data pulse that sends the communication information can be measured with a voltmeter placed to DCV range. From the ground connection at the Terminal Block to the Number 3 screw connection, the voltage should pulse up and down when data is being transmitted.

This control board has control over the fan louver movement, manual fan blower control, indoor coil temperature and indoor air temperature sensing functions. All operational decisions are controlled by the OUTDOOR UNIT.

The connections on the indoor board are shown here in the schematic drawing.

Line voltage to power the indoor unit comes in on Terminal Block connections 1 and 2. Power connects from these terminal connections on the circuit board. If the board does not respond to commands and has no display, check for line voltage at these connections. When power is present at the indoor board, the Display Power Indicator will be lit.

The control board has a replaceable 3.15A 250V fuse that protects against excessive current.

When testing the calibration of these sensors, the wires can be released from the plug by pressing on the tension tab on the side of the plug.

The receiver/display unit that is mounted to the front cover of the indoor unit plugs into the circuit board

There is one motor that controls the movement of the louvers. The motor is located in the over of the louver assembly.

The Cassette unit has a built in condensate pump. The pump is energized whenever the Float Switch indicates that water needs to be pumped from the cassette.

Accessing the Blower Motor and Condensate Pump

1. Disconnect power to the outdoor unit.
2. Remove the louver assembly.
3. Disconnect the main power wire to the indoor unit.
4. Unplug the condensate pump and float switch from wiring harness.
5. Unplug fan motor from wiring harness.
6. Remove ground wire from ground screw on electrical box. Remove electrical box.
7. Remove 5 screws holding foam condensate pan bottom in place.

8. Slide condensate pan from cassette.

Removing Fan Motor

1. Remove holding nut from fan blade.

2. Fan blade will slide off motor shaft.
3. Remove Phillips head screw holding cover plate over motor wiring leads.
4. Remove 3 nuts that hold fan motor in place.

5. Fan motor will come loose.

Removing Condensate Pump

1. Remove screws holding condensate pump and float switch in position.
2. Disconnect condensate hose from condensate pump.
3. Remove assembly.

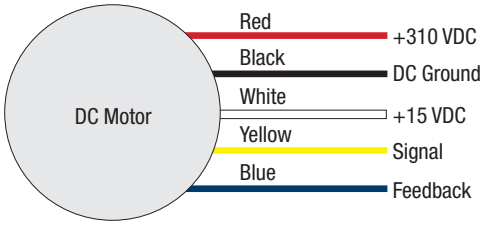
Indoor Fan Motor Test Procedure

If the indoor fan motor does not run:

1. Disconnect power to the system.
2. Remove the return air cover and access the circuit board connection.
3. Reset power and turn the remote control fan command to Fan On mode.

Motor Test:

1. If the motor doesn't run, check for 310VDC between Pins 1 and 3. If it is not present, the indoor board is bad. If voltage is present, continue on.
2. Check the voltage between Pins 3 and 4. The voltage should be +15VDC. If it is not present, the board is bad. If voltage is present, continue on.
3. Check for voltage between Pins 3 and 6. If no DC voltage is present, the board is bad. If voltage is present, change the motor.



Testing Temperature Sensors

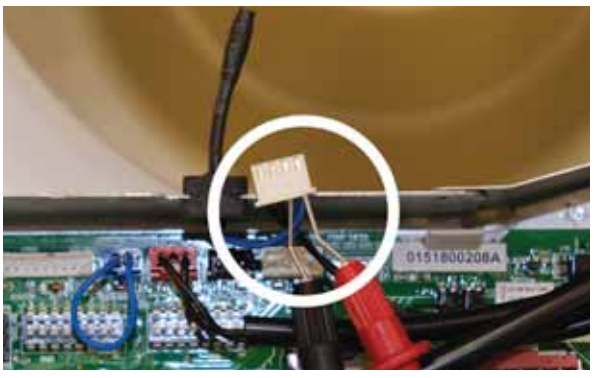
The easiest problems to solve will involve codes that are related to potential failure of temperature sensors. Common problems may include loose connections, open electrically, and out of calibration. Checking the condition of the sensors requires a temperature probe and an ohmmeter.

The Reference Section of this manual contains temperature resistance tables that can be used to check the calibration of the sensors. The measured resistance must be within the tolerances printed on the top of the tables.

To test the electrical condition of a temperature sensor perform the following:

1. Confirm the sensor is firmly attached to the circuit board connection plug.
2. Remove the sensor wires form the connection plug by releasing holding tension on the plugs tension tab.

3. Use an ohmmeter to test the electrical resistance of the sensor.
4. Measure the air temperature near the sensor and compare the required resistance against measured resistance. (See chart in reference section) If the sensor is within calibration, the sensor is good. If the sensor is out of calibration, replace the sensor. (Tube Sensors should be removed from socket and exposed to air temperature during test.)

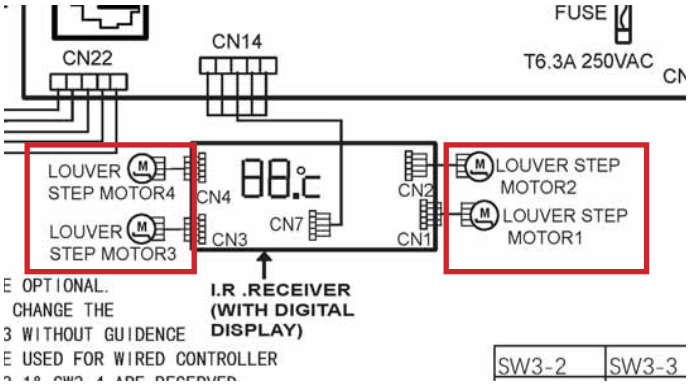


Testing Louver Motors

If the louver does not operate with command from the remote control, either the indoor board is bad, or the louver motor is defective. It is more likely the motor is defective than the board. (Make sure the louver assembly is not binding and keeping the vanes from moving.)

1. Remove power from the unit and remove the indoor unit cover.
2. Access the circuit board.

3. Identify the inoperable louver motor on the schematic drawing below and disconnect the plug from the circuit board.



4. Use an Ohmmeter to test the electrical continuity of the louver motor windings. The proper resistance for each winding can be found in this table. If the motor winding resistance is erratic or shows open, the motor is defective. Replace the motor.

5. If the motor checks out good, replace the indoor control board.

Testing Communication Circuit

If an Error E7 occurs, perform the following test to determine if the indoor control board is functioning properly to send data to the outdoor unit.

Perform this test with the unit powered and all wiring connected between indoor and outdoor unit.

Make sure all wiring between the indoor and outdoor unit are correct. There should no splices between the indoor and outdoor unit wiring connecting terminals 1 or 3. Make sure wiring is correct, before performing this test.

1. Measure the DC voltage between terminals 1 and 3 on the indoor terminal block.

2. The voltage should fluctuate between 8VDC and 23VDC. The fluctuating signal indicates a good communication path.
3. If the voltage does not fluctuate, and the wiring is good, the indoor board is defective.

Test Condensate Pump and Associated Float Switch

If the internal condensate pump does not operate, the pump may be bad or the float switch may be defective. Perform the following test:

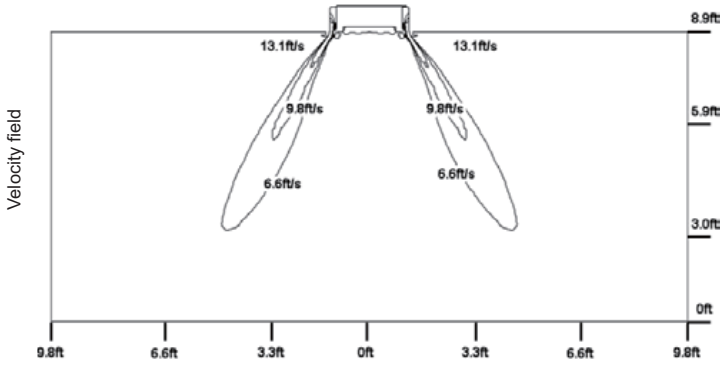
1. Access the electrical control box.
2. Assure the condensate pump molex connection is seated properly.
3. Unplug the float switch from the circuit board.

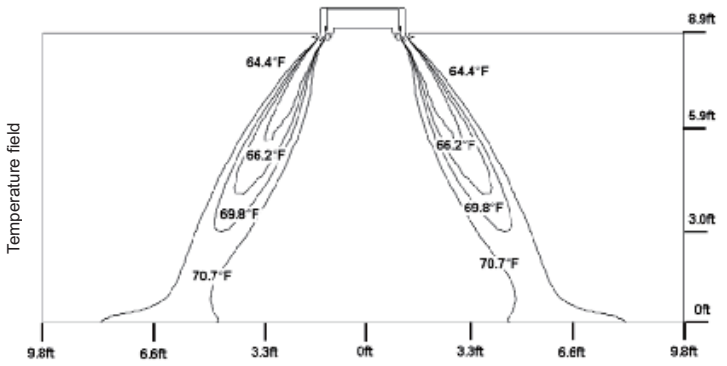
4. The pump should start.
5. If the pump does not start, check for voltage at the pump connector on the board. There should be 230 Volts AC to the pump. If there is not, the circuit board is defective. If there is proper voltage to the pump, either the pump or associated pump wiring is defective.

Air Velocity And Temperature Distribution Charts

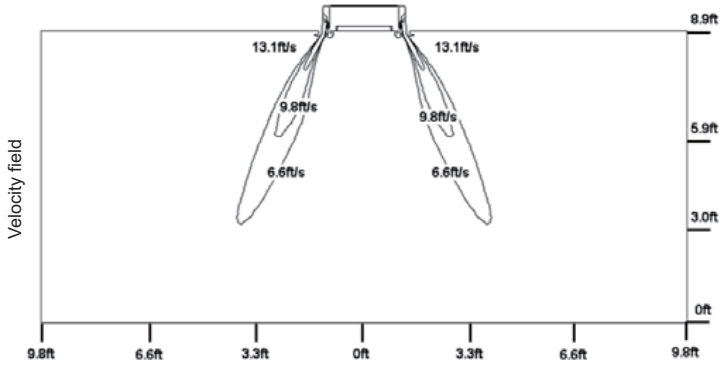
USYL24UCDDA

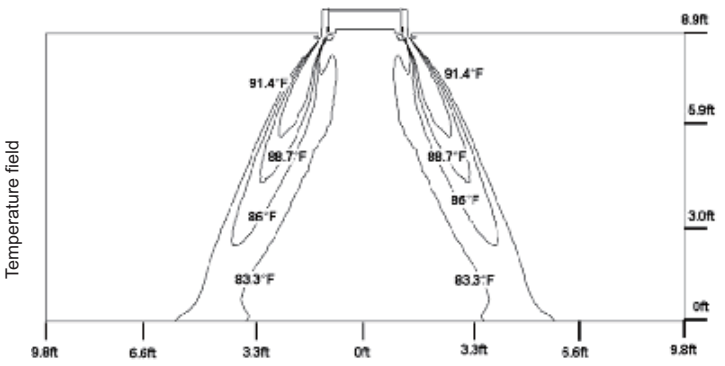
Cooling





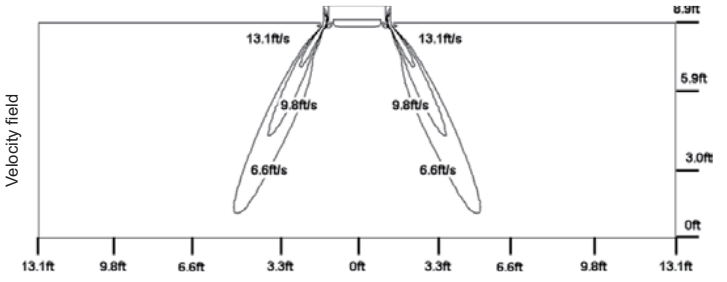
Heating

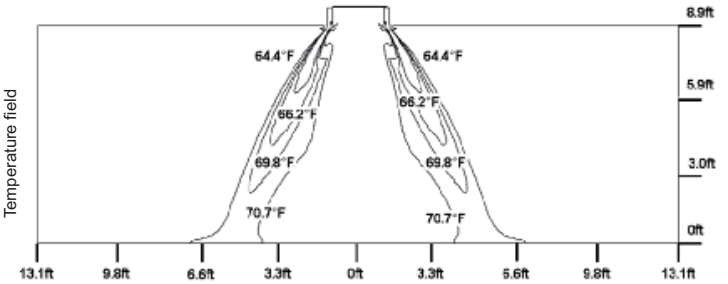




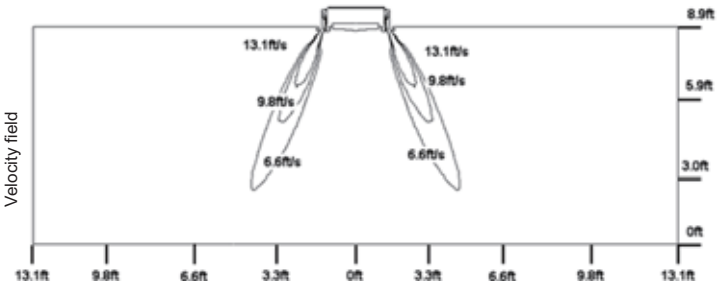
USYL30UCDDA, USYL36UCDDA

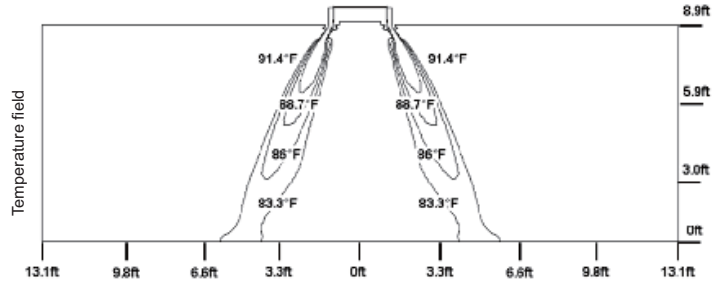
Cooling





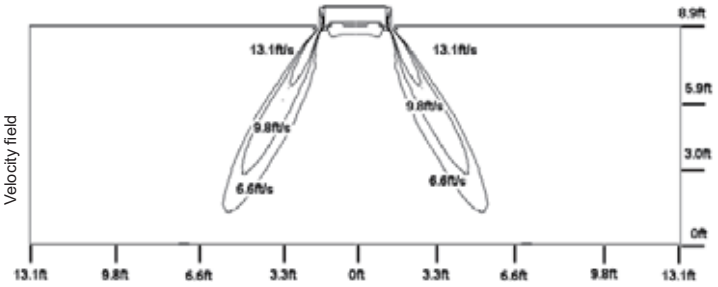
Heating

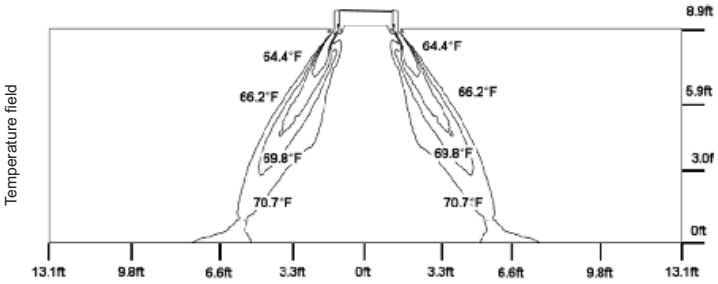




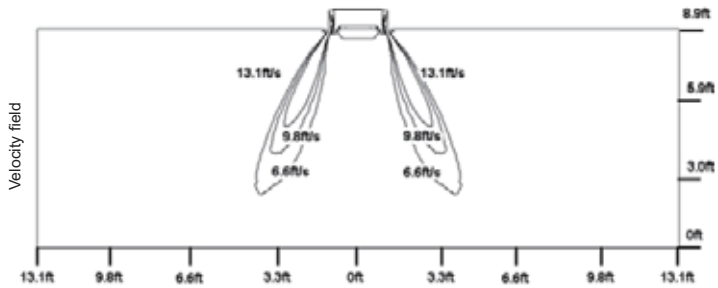
USYL42UCDDA, USYL48UCDDA

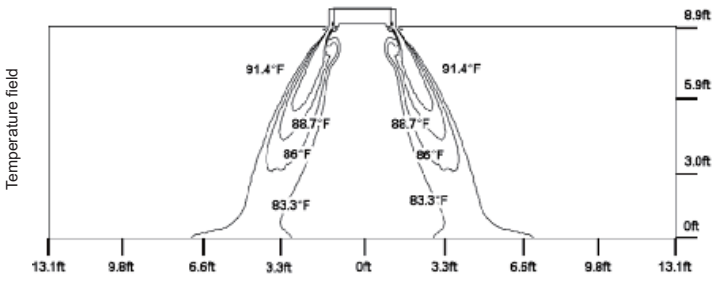
Cooling





Heating





DIP SWITCH SETTINGS

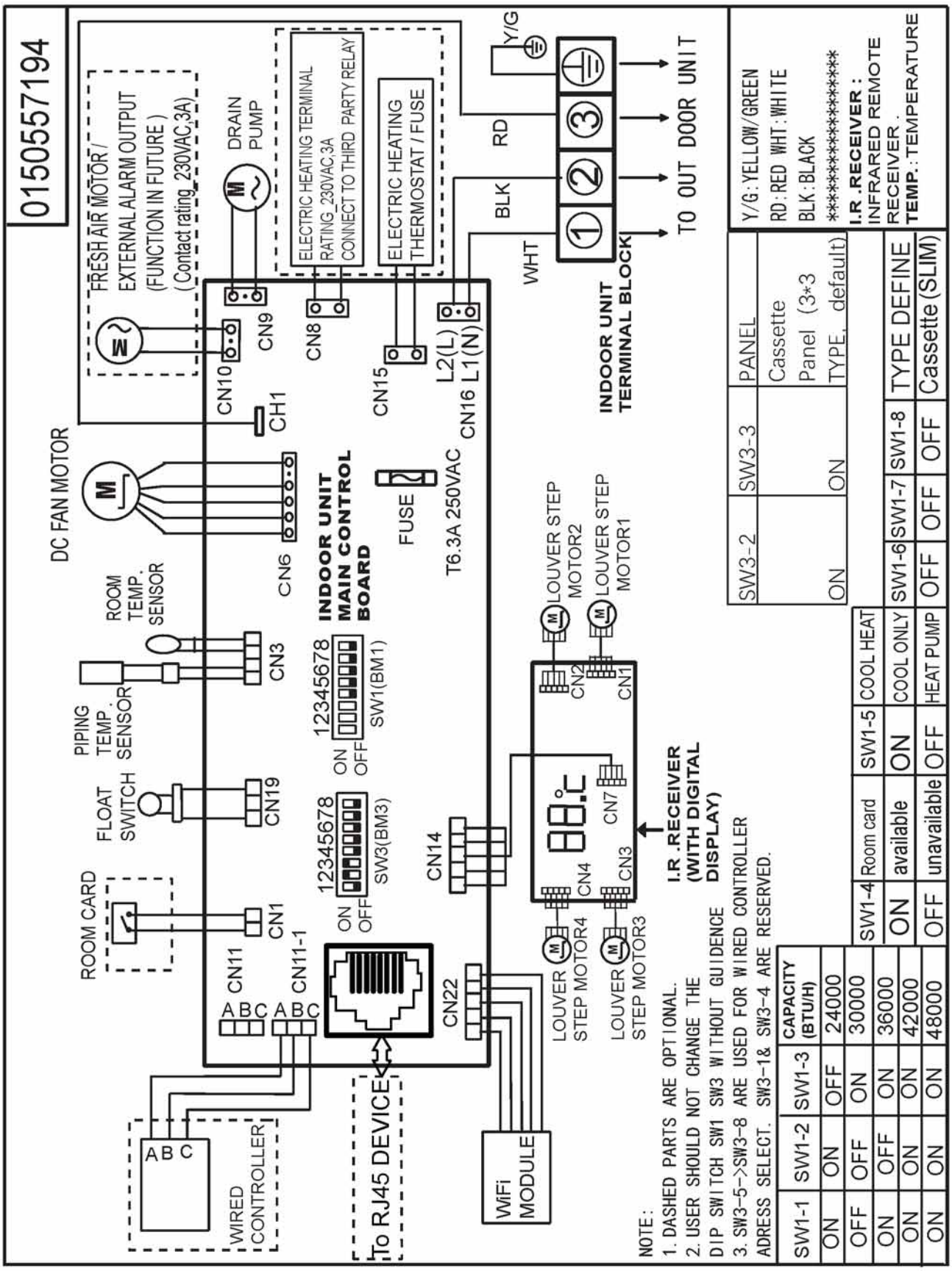
SW1 DIP Switch Settings

Description	Capacity			Room Card	Running Mode	Unit Type		
	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Capacity: 24kBTU (7.1kW)	ON	ON	OFF	---	---	---	---	---
Capacity: 30kBTU (9.0kW)	OFF	OFF	ON	---	---	---	---	---
Capacity: 36kBTU (10.5kW)	ON	OFF	ON	---	---	---	---	---
Capacity: 42kBTU (12.5kW)	ON	ON	ON	---	---	---	---	---
Capacity: 48kBTU (14.0kW)	ON	ON	ON	---	---	---	---	---
Room card invalid(default)	---	---	---	OFF	---	---	---	---
Room card valid	---	---	---	ON	---	---	---	---
Heat pump (default)	---	---	---	---	OFF	---	---	---
Cooling only	---	---	---	---	ON	---	---	---
Cassette (Slim)	---	---	---	---	---	OFF	OFF	OFF

SW3 DIP Switch Settings

Description	Panel	
	SW3-2	SW3-3
Cassette Panel (3*3 TYPE, default)	ON	ON

Indoor Unit Address (Indoor unit address for one wired controller control more than one unit)				
Address	SW3-5	SW3-6	SW3-7	SW3-8
0 (main)	OFF	OFF	OFF	OFF
1 (sub)	OFF	OFF	OFF	ON
2 (sub)	OFF	OFF	ON	OFF
3 (sub)	OFF	OFF	ON	ON
4 (sub)	OFF	ON	OFF	OFF
5 (sub)	OFF	ON	OFF	ON
6 (sub)	OFF	ON	ON	OFF
7 (sub)	OFF	ON	ON	ON
8 (sub)	ON	OFF	OFF	OFF
9 (sub)	ON	OFF	OFF	ON
10 (sub)	ON	OFF	ON	OFF
11 (sub)	ON	OFF	ON	ON
12 (sub)	ON	ON	OFF	OFF
13 (sub)	ON	ON	OFF	ON
14 (sub)	ON	ON	ON	OFF
15 (sub)	ON	ON	ON	ON


0150557194
FRESH AIR MOTOR / EXTERNAL ALARM OUTPUT (FUNCTION IN FUTURE) (Contact rating_230VAC,3A)
DRAIN PUMP
ELECTRIC HEATING TERMINAL RATING_230VAC,3A CONNECT TO THIRD PARTY RELAY
ELECTRIC HEATING THERMOSTAT / FUSE
Y/G
RD
BLK
WHT
TO OUT DOOR UNIT
INDOOR UNIT TERMINAL BLOCK
DC FAN MOTOR
ROOM TEMP. SENSOR
PIPING TEMP. SENSOR
FLOAT SWITCH
ROOM CARD
WIRED CONTROLLER
To RJ45 DEVICE
WiFi MODULE
INDOOR UNIT MAIN CONTROL BOARD
FUSE
T6.3A 250VAC
L2(L) L1(N)
LOUVER STEP MOTOR2
LOUVER STEP MOTOR1
LOUVER STEP MOTOR4
LOUVER STEP MOTOR3
I.R .RECEIVER (WITH DIGITAL DISPLAY)
CN1 CN2 CN3 CN4 CN6 CN7 CN8 CN9 CN10 CN11 CN11-1 CN14 CN15 CN16 CN19 CN22 CH1
SW1(BM1) SW3(BM3)
12345678
ON OFF
ABC ABC
Y/G:YELLOW/GREEN
RD:RED WHT:WHITE
BLK:BLACK
****
I.R .RECEIVER : INFRARED REMOTE RECEIVER .
TEMP.: TEMPERATURE
SW3-2 SW3-3 PANEL
ON ON Cassette Panel (3*3 TYPE, default)
SW1-6 SW1-7 SW1-8 TYPE DEFINE
OFF OFF OFF Cassette (SLIM)
NOTE:
1. DASHED PARTS ARE OPTIONAL.
2. USER SHOULD NOT CHANGE THE DIP SWITCH SW1 SW3 WITHOUT GUIDENCE
3. SW3-5->SW3-8 ARE USED FOR WIRED CONTROLLER ADRESS SELECT. SW3-1& SW3-4 ARE RESERVED.
SW1-4 Room card SW1-5 COOL HEAT
ON available ON COOL ONLY
OFF unavailable OFF HEAT PUMP
SW1-1 SW1-2 SW1-3 CAPACITY (BTU/H)
ON ON OFF 24000
OFF OFF ON 30000
ON OFF ON 36000
ON ON ON 42000
ON ON ON 48000

ERROR CODES

OUTDOOR		INDOOR	
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	PANEL LED FLASH OR ID PCB LED FLASH	
		YELLOW TIMER LED (PCB LED5)	GREEN RUN LED (PCB LED1)
1	OUTDOOR EEPROM FAILURE	2	1
2	IPM OVERCURRENT OR SHORT CIRCUIT	2	2
/	OUTDOOR ALTERNATING CURRENT, OVER CURRENT PROTECTION	2	3
/	COMPRESSOR OVER CURRENT DURING DECELERATION	/	/
4	COMMUNICATION FAILURE BETWEEN THE IPM AND OUTDOOR PCB	2	4
5	MODULE OPERATED OVERLOAD (COMPRESSOR OVERLOAD PROTECTION)	2	5
6	MODULE LOW OR HIGH VOLTAGE	2	6
/	COMPRESSOR CURRENT SAMPLING CIRCUIT FAULT	2	7
8	OVERHEAT PROTECTION FOR DISCHARGE TEMPERATURE	2	8
9	MALFUNCTION OF THE DC FAN MOTOR	2	9
10	MALFUNCTION OF DEFROST TEMPERATURE SENSOR	3	0
11	SUCTION TEMPERATURE SENSOR FAILURE	3	1
12	AMBIENT TEMPERATURE SENSOR FAILURE	3	2
13	DISCHARGE TEMPERATURE SENSOR FAILURE	3	3
/	HIGH OUTDOOR SUCTION TEMPERATURE	3	4
/	PFC CIRCUIT LOOP VOLTAGE	/	/
15	COMMUNICATION FAILURE BETWEEN THE INDOOR & OUTDOOR UNIT	3	5
16	LACK OF REFRIGERANT OR DISCHARGING	3	6
17	4-WAY VALVE SWITCHING FAILURE	3	7
18	LOSS OF SYNCHRONISM DETECTION	3	8
/	POSITION DETECTION CIRCUIT FAULT OF COMPRESSOR	3	9
/	LOW DC OR AC VOLTAGE	/	/
/	TERMINAL BLOCK TEMP TOO HIGH	4	0
20	INDOOR THERMAL OVERLOAD	4	0
21	INDOOR UNIT OVERLOAD PROTECTION, HEATING MODE ONLY.	4	1
21	INDOOR COIL FROSTED	4	1
/	INDOOR ANTI-FROSTING PROTECTION	4	2
/	PFC CIRCUIT LOOP OVERCURRENT	/	/
/	INDOOR COIL TEMPERATURE (ABNORMAL READING)	/	/
23	MODULE THERMAL OVERLOAD	4	3
24	COMPRESSOR START FAILURE, OVER-CURRENT	4	4
25	PHASE CURRENT PROTECTION (IPM)	4	5
26	MCU RESET	4	6
/	IPM POWER SUPPLY PHASE LOSS (3-PHASE)		
27	MODULE CURRENT DETECT CIRCUIT MALFUNCTION	4	7
/	WIRING ERROR: COMPRESSOR TO IPM	/	/
/	LOW REFRIGERANT FLOW. LOCKOUT.	/	/
28	LIQUID PIPE SENSOR FAILURE: CIRCUIT A	4	8
29	LIQUID PIPE SENSOR FAILURE: CIRCUIT B	4	9
30	LIQUID PIPE SENSOR FAILURE: CIRCUIT C	5	0
31	LIQUID PIPE SENSOR FAILURE: CIRCUIT D	5	1
32	GAS PIPE SENSOR FAILURE: CIRCUIT A	5	2
33	GAS PIPE SENSOR FAILURE: CIRCUIT B	5	3
34	GAS PIPE SENSOR FAILURE: CIRCUIT C	5	4
35	GAS PIPE SENSOR FAILURE: CIRCUIT D	5	5
36	GAS PIPE SENSOR FAILURE: CIRCUIT E	5	6
/	OUTDOOR PIPE TEMPERATURE PROTECTION IN COOLING MODE	5	7
/	COMPRESSOR OVERCURRENT DETECTED BY IPM	/	/
38	MALFUNCTION OF MODULE TEMPERATURE SENSOR MOMENTARY POWER FAILURE DETECTION	5	8
39	MALFUNCTION OF CONDENSING TEMPERATURE SENSOR	5	9
40	LIQUID PIPE SENSOR FAILURE: CIRCUIT E	6	0
41	TOCI TEMPERATURE SENSOR FAILURE	6	1
42	HIGH PRESSURE SWITCH OPEN	6	2
43	LOW PRESSURE SWITCH OPEN	6	3

Continued on following page

OUTDOOR		INDOOR	
MULTI-ZONE LED DISPLAY (CAC)	FAULT DESCRIPTION	PANEL LED FLASH OR ID PCB LED FLASH	
		YELLOW TIMER LED (PCB LED5)	GREEN RUN LED (PCB LED1)
44	SYSTEM HIGH PRESSURE PROTECTION: OVERCHARGED, HIGH CONDENSING TEMPERATURE OR MALFUNCTION OF FAN MOTOR.	6	4
45	SYSTEM LOW PRESSURE PROTECTION: UNDERCHARGED, LOW DEFROSTING TEMPERATURE, OR MALFUNCTION OF FAN MOTOR.	6	5
/	INCORRECT MATCH BETWEEN INDOOR & OUTDOOR	6	6
L0	OAT LESS THAN -22°F (-30°C)	/	/
/	INDOOR AMBIENT TEMPERATURE SENSOR FAILURE	0	1
/	INDOOR COIL TEMPERATURE SENSOR FAILURE	0	2
/	INDOOR PCB EEPROM FAILURE	0	4
/	COMMUNICATION FAULT BETWEEN THE INDOOR AND OUTDOOR UNIT	0	7
/	COMMUNICATION FAULT BETWEEN THE CONTROLLER AND INDOOR UNIT	0	8
/	DC VOLTAGE OF THE FAN MOTOR DRIVER TOO HIGH OR TOO LOW	/	/
/	FAN MOTOR DRIVER OVER 95°F (35°C)	/	/
/	INDOOR FAN MOTOR OUT OF STEP	/	/
/	DRAIN SYSTEM MALFUNCTION	0	12
/	ZERO CROSS SIGNAL DETECTED WRONG	0	13
/	INDOOR FAN MOTOR MALFUNCTION	0	14
/	INDOOR FAN MOTOR OVERCURRENT	/	/

TABLE OF CONTENTS

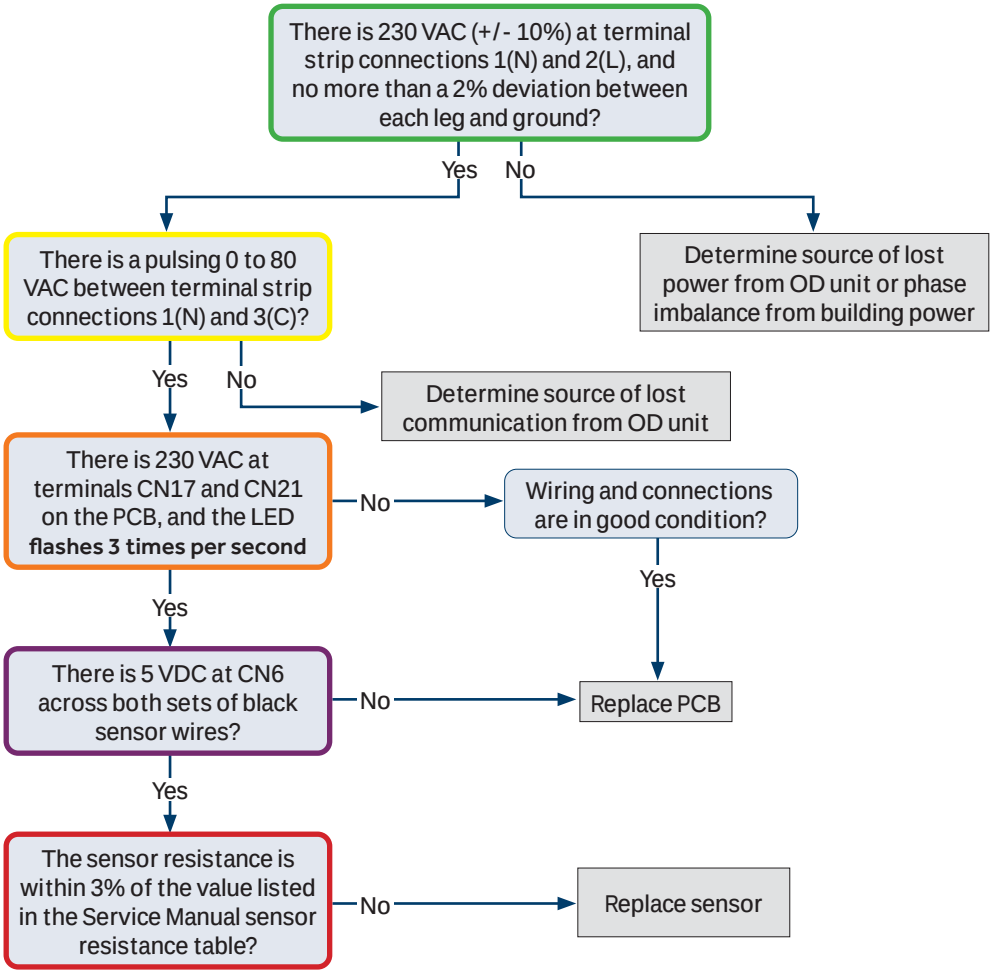
ENGLISH

Check This First

Indoor Unit

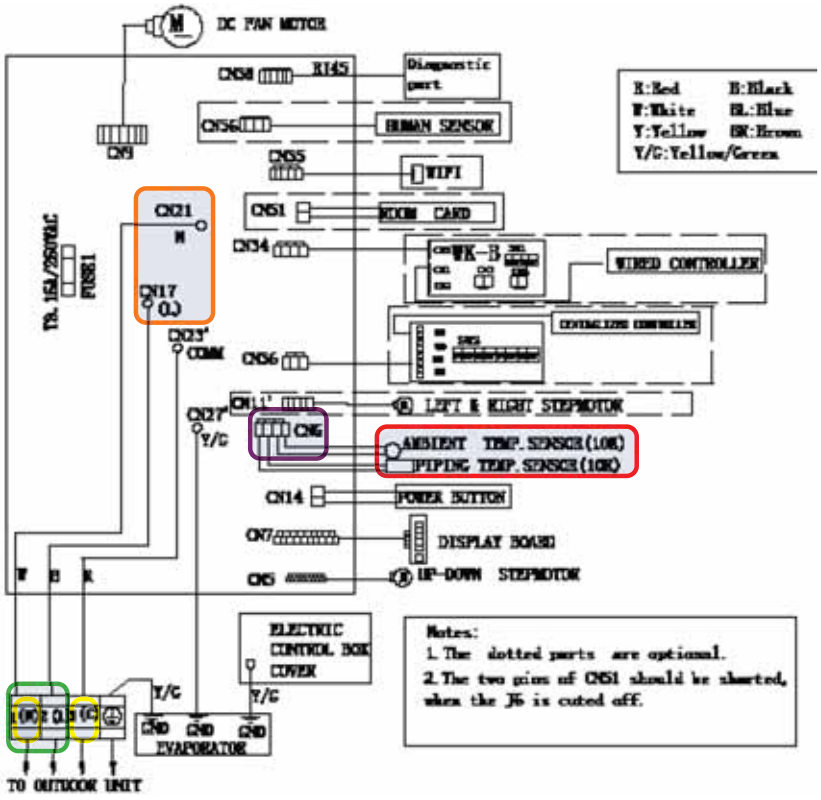
Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Sensor Resistance Table

°F	°C	Normal (KΩ		
		10K SENSORS	23K SENSORS	50K SENSORS
-0.4	-18	75.44	235.90	5494.21
5.0	-15	64.30	196.61	4558.19
10.4	-12	54.99	164.40	3795.39
14.0	-10	49.62	146.15	3365.73
21.2	-6	40.58	115.95	2658.81
24.8	-4	36.77	103.46	2368.32
32.0	0	30.30	82.69	1887.00
35.6	2	27.55	74.07	1687.81
41.0	5	23.95	62.94	1431.28
44.6	7	21.84	56.57	1284.36
50.0	10	19.06	48.31	1094.32
55.4	13	16.68	41.40	934.94
59.0	15	15.28	37.41	843.05
64.4	18	13.42	32.22	723.41
69.8	21	11.81	27.83	622.32
75.2	24	10.42	24.11	536.65
77.0	25	10.00	23.00	511.08
80.6	27	9.21	20.95	464.05
86.0	30	8.16	18.25	402.24
89.6	32	7.54	16.67	366.13
95.0	35	6.70	14.59	318.52
100.4	38	5.97	12.79	277.70



Error Code (Indoor/Outdoor)

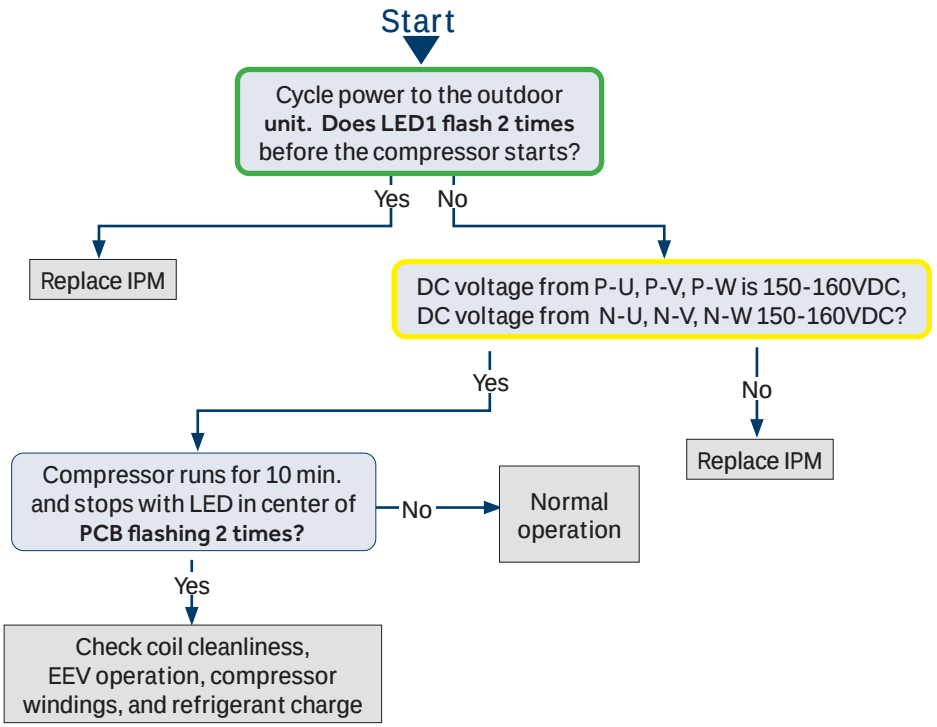
F1/LED1: 2 Flash

IPM Power Module Fail
(IPM power module protection)

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

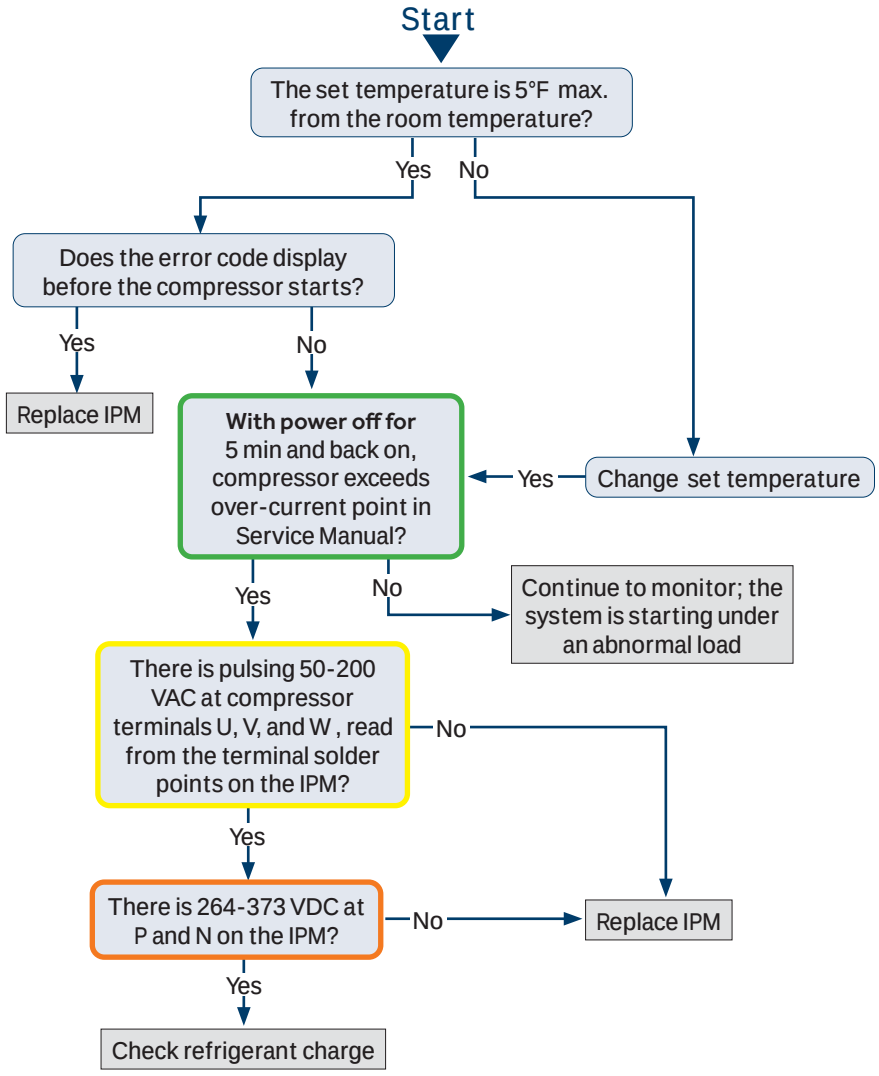
F2/LED1: 24 Flash

Overcurrent of the Compressor

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

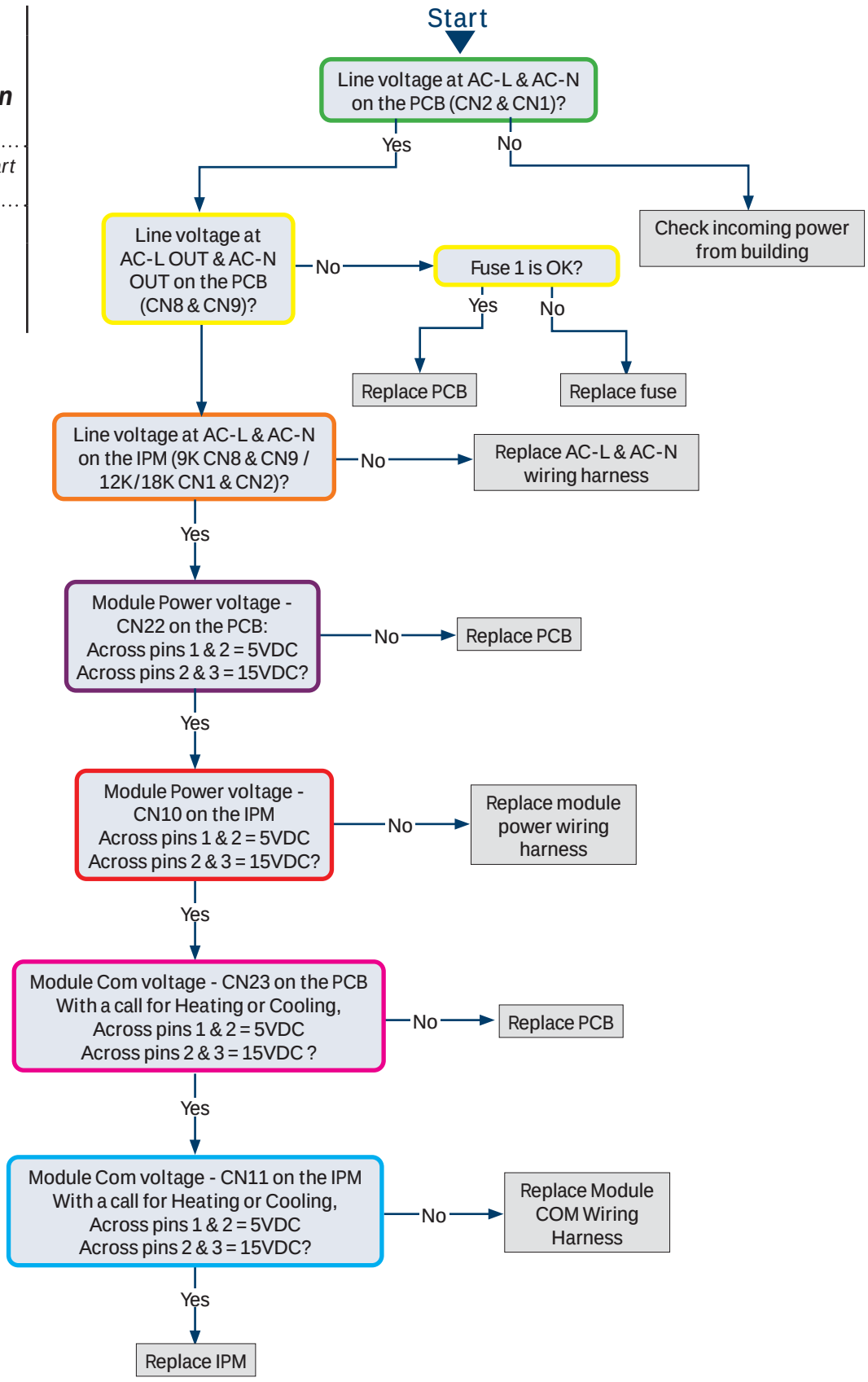
F3/LED1: 4 Flash

Communication Fault Between IPM and Outdoor PCB

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

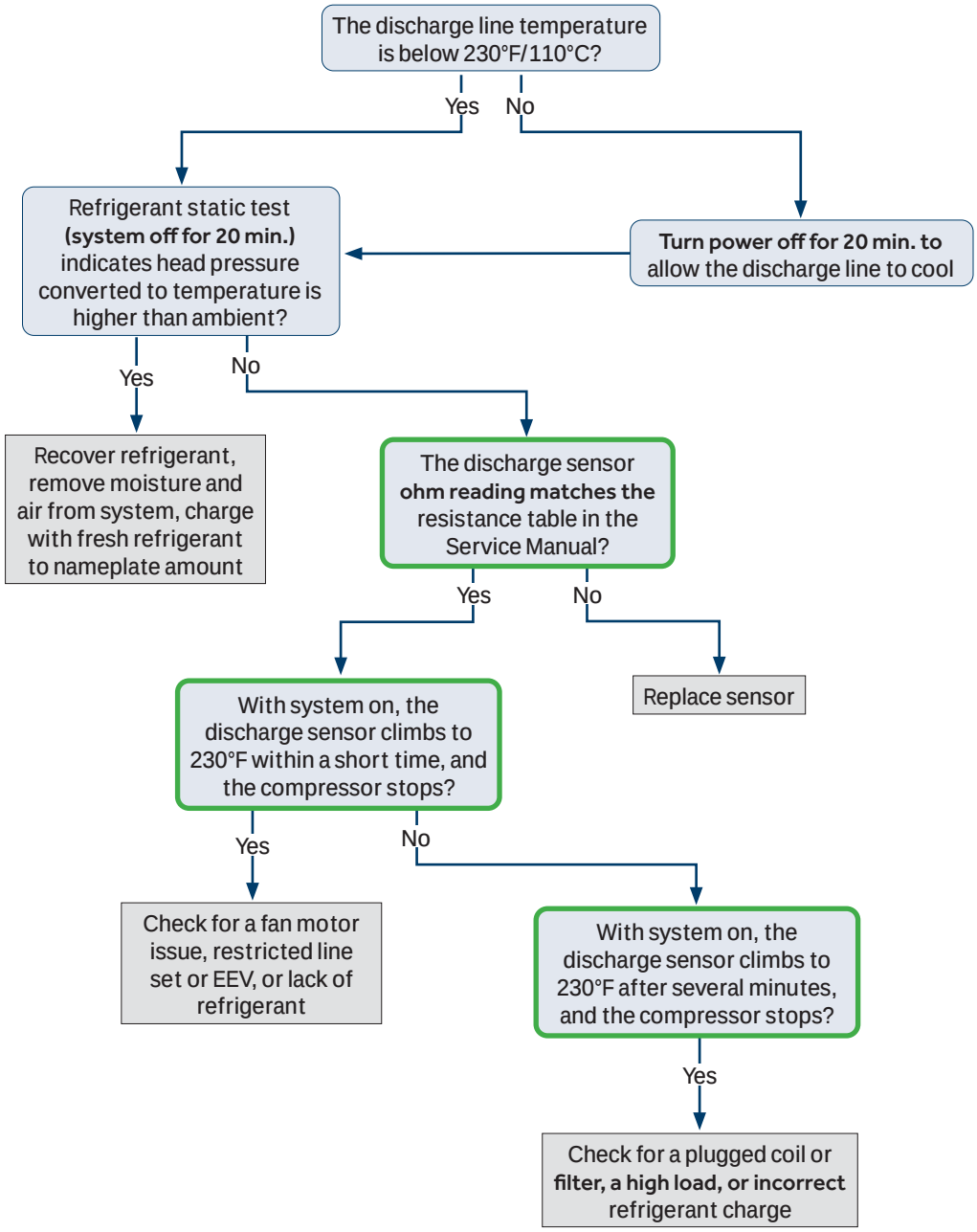
F4/LED1: 8 Flash

Overheat Protection for Discharge Temperature

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Codes (Indoor/Outdoor)

F6/LED1: 12 Flash
Ambient Temperature Sensor Failure

F7/LED1: 11 Flash
Suction Temperature Sensor Failure

F21/LED1: 10 Flash
Defrost Temperature Sensor Failure

F25/LED1: 13 Flash
Discharge Temperature Sensor Failure

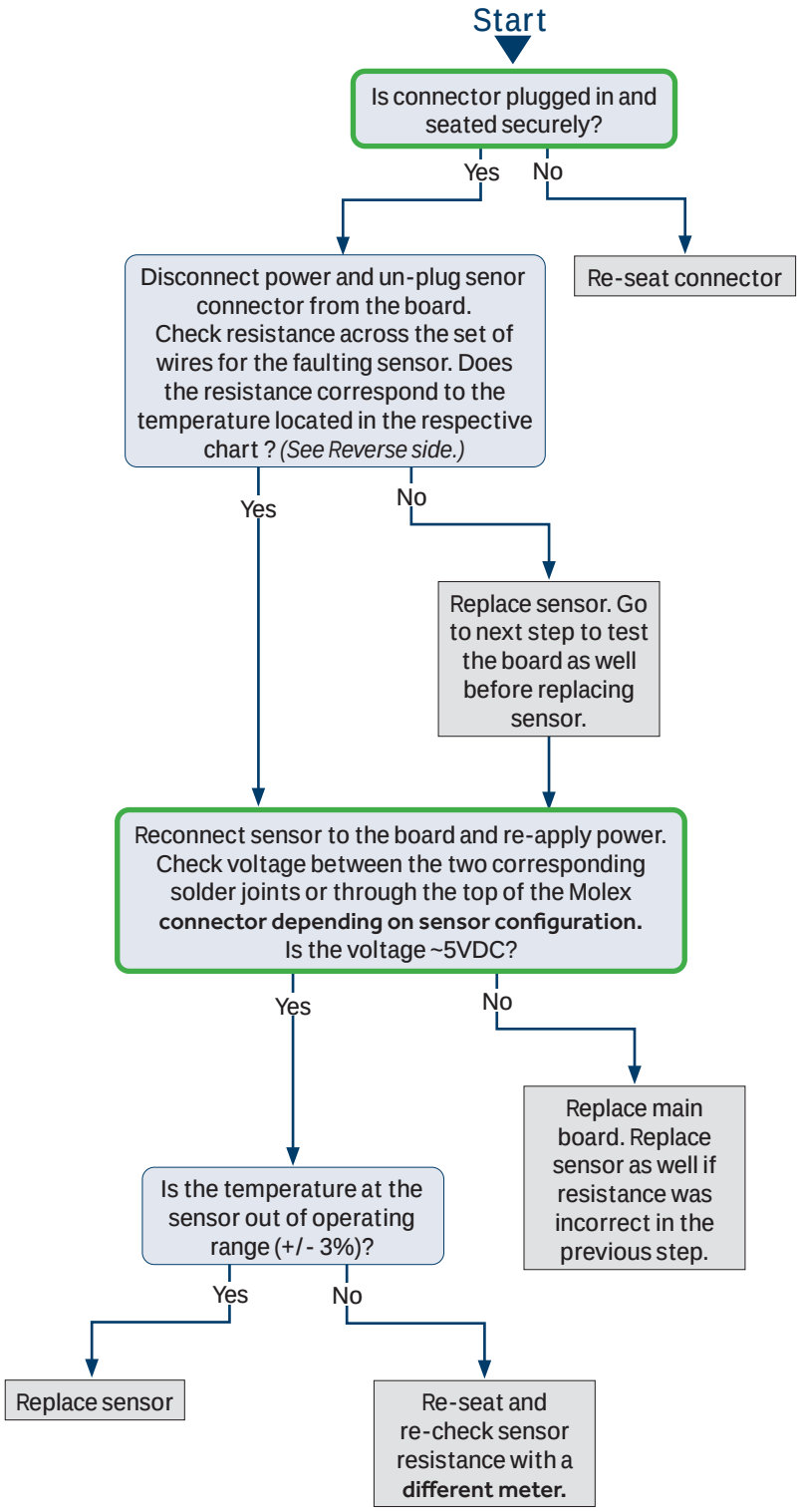
E1/LED1: No Flash
Room Temperature Sensor Failure

E2/LED1: No Flash
Indoor Coil Temperature Sensor Failure

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA

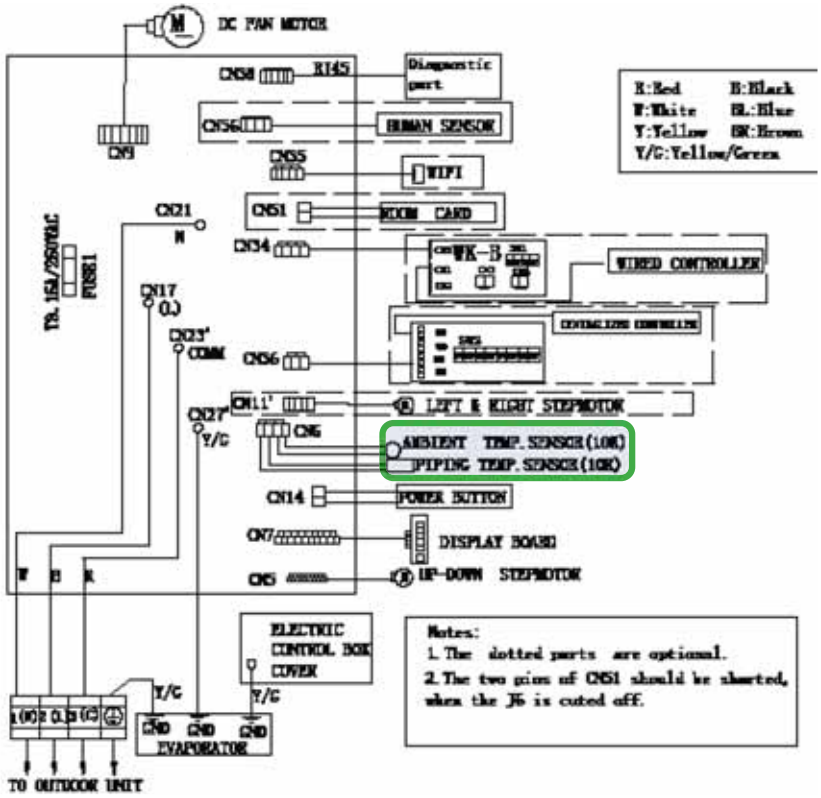


Error Code: F6/LED1: 12 Flash, F7/LED1: 11 Flash, F21/LED1: 10 Flash, F25/LED1: 13 Flash, E1/LED1: No Flash, E2/LED1: No Flash

Wiring Diagram Reference

Sensor Resistance Table

°F	°C	Normal (KΩ		
		10K SENSORS	23K SENSORS	50K SENSORS
-0.4	-18	75.44	235.90	5494.21
5.0	-15	64.30	196.61	4558.19
10.4	-12	54.99	164.40	3795.39
14.0	-10	49.62	146.15	3365.73
21.2	-6	40.58	115.95	2658.81
24.8	-4	36.77	103.46	2368.32
32.0	0	30.30	82.69	1887.00
35.6	2	27.55	74.07	1687.81
41.0	5	23.95	62.94	1431.28
44.6	7	21.84	56.57	1284.36
50.0	10	19.06	48.31	1094.32
55.4	13	16.68	41.40	934.94
59.0	15	15.28	37.41	843.05
64.4	18	13.42	32.22	723.41
69.8	21	11.81	27.83	622.32
75.2	24	10.42	24.11	536.65
77.0	25	10.00	23.00	511.08
80.6	27	9.21	20.95	464.05
86.0	30	8.16	18.25	402.24
89.6	32	7.54	16.67	366.13
95.0	35	6.70	14.59	318.52
100.4	38	5.97	12.79	277.70



Error Code (Indoor/Outdoor)

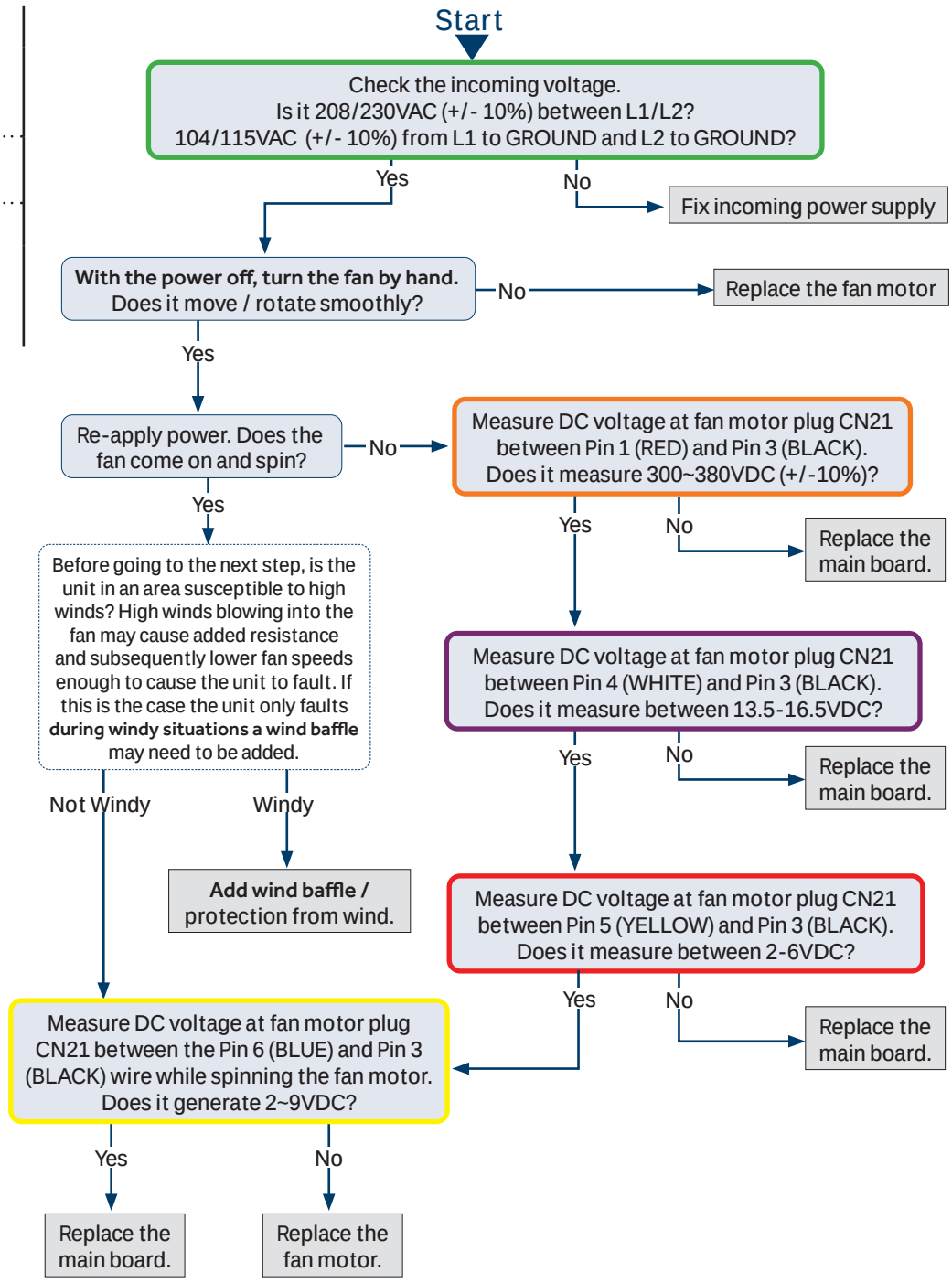
F8/LED1: 9 Flash

Outdoor DC Fan Motor Fault

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

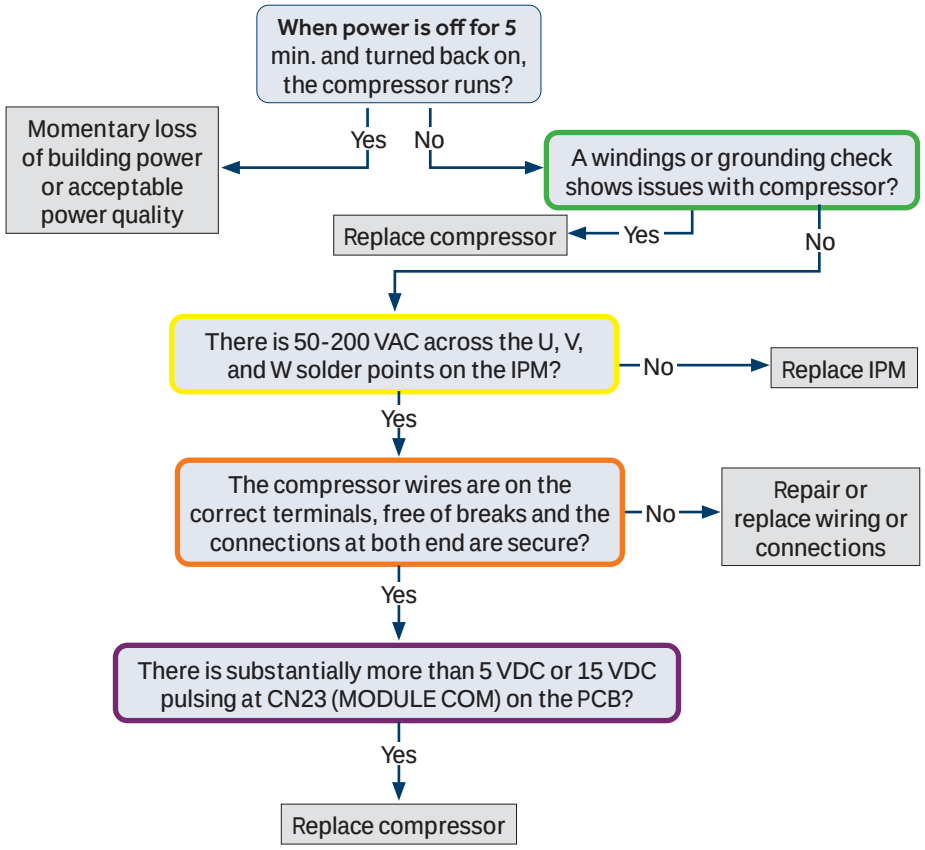
F11/LED1: 18 Flash

Loss of Compressor Synchronization

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

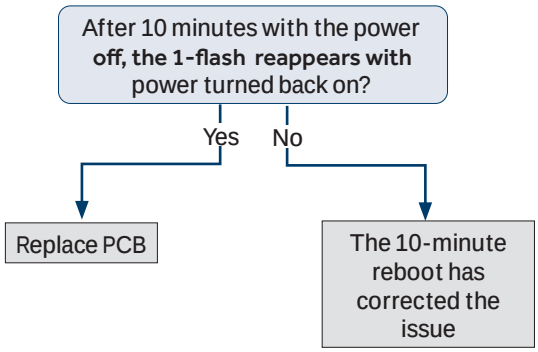
F12/LED1: 1 Flash

EEPROM Error

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code (Indoor/Outdoor)

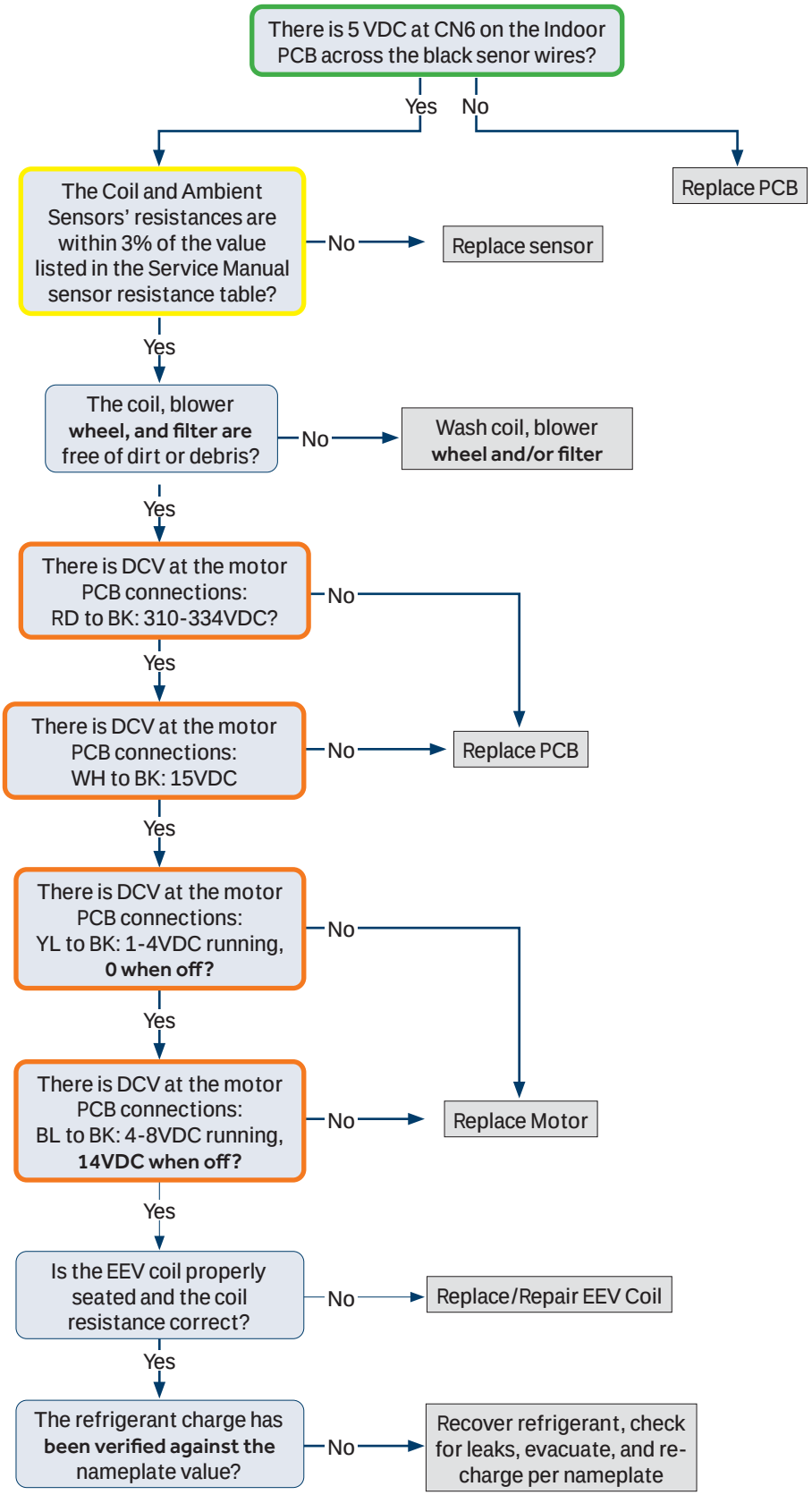
E5/LED1: 22 Flash

Coil Frost Protection

Complete the "Check This First" Flow Chart before continuing.

Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA

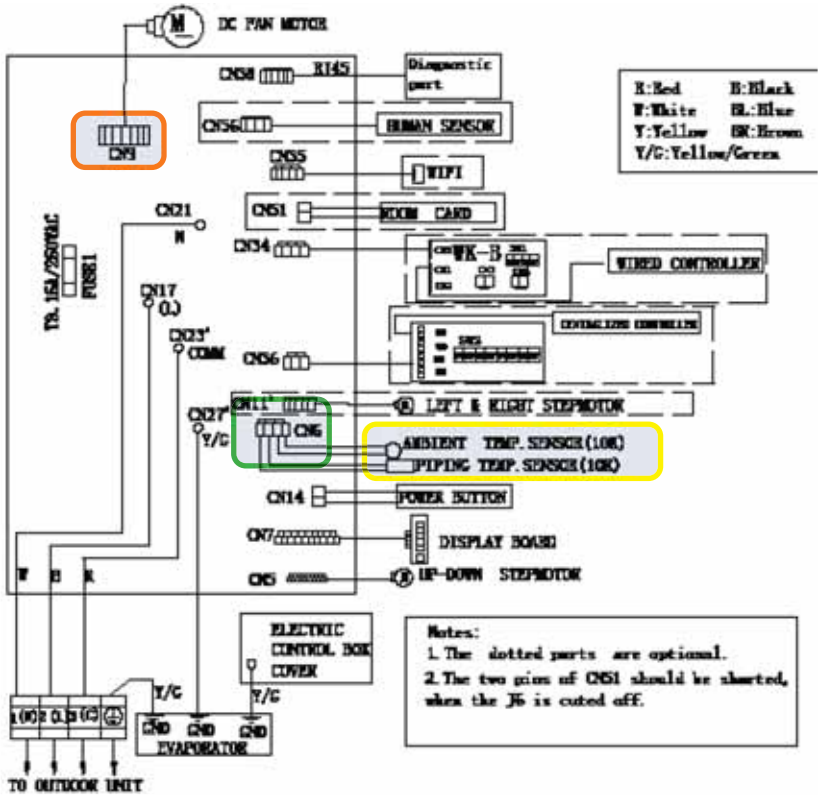


Error Code: E5/LED1: 22 Flash

Wiring Diagram Reference

Sensor Resistance Table

°F	°C	Normal (KΩ 10K SENSORS	23K SENSORS	50K SENSORS
-0.4	-18	75.44	235.90	5494.21
5.0	-15	64.30	196.61	4558.19
10.4	-12	54.99	164.40	3795.39
14.0	-10	49.62	146.15	3365.73
21.2	-6	40.58	115.95	2658.81
24.8	-4	36.77	103.46	2368.32
32.0	0	30.30	82.69	1887.00
35.6	2	27.55	74.07	1687.81
41.0	5	23.95	62.94	1431.28
44.6	7	21.84	56.57	1284.36
50.0	10	19.06	48.31	1094.32
55.4	13	16.68	41.40	934.94
59.0	15	15.28	37.41	843.05
64.4	18	13.42	32.22	723.41
69.8	21	11.81	27.83	622.32
75.2	24	10.42	24.11	536.65
77.0	25	10.00	23.00	511.08
80.6	27	9.21	20.95	464.05
86.0	30	8.16	18.25	402.24
89.6	32	7.54	16.67	366.13
95.0	35	6.70	14.59	318.52
100.4	38	5.97	12.79	277.70



EEV Resistance Values

EEV (6-pin, 5 wire)

	Yellow	Blue	White	Black	X	Red
Yellow	-	92 Ω	92 Ω	92 Ω	-	46 Ω
Blue	-	-	92 Ω	92 Ω	-	46 Ω
White	-	-	-	92 Ω	-	46 Ω
Black	-	-	-	-	-	46 Ω
X	-	-	-	-	-	-
Red	-	-	-	-	-	-

EEV (6-pin, 6 wire)

	Yellow	Blue	White	Black	X	Red
Yellow	-	0L	92 Ω	0L	46 Ω	0L
Blue	-	-	0L	92 Ω	0L	46 Ω
White	-	-	-	0L	46 Ω	0L
Black	-	-	-	-	0L	46 Ω
X	-	-	-	-	-	0L
Red	-	-	-	-	-	-

Error Code (Indoor/Outdoor)

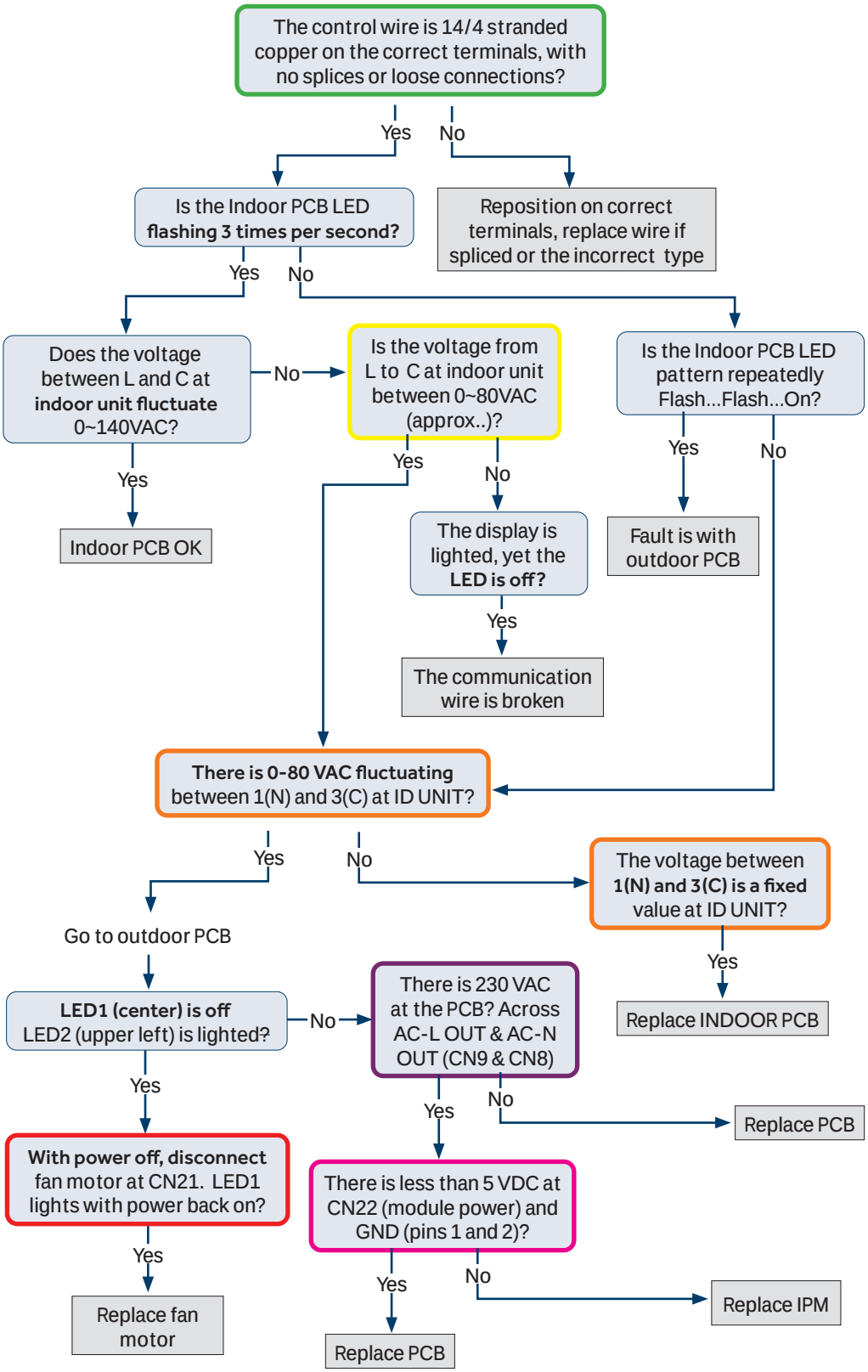
E7/LED1: 15 Flash

ID and OD Loss of Communication

Complete the "Check This First" Flow Chart for both ID and OD units before continuing.

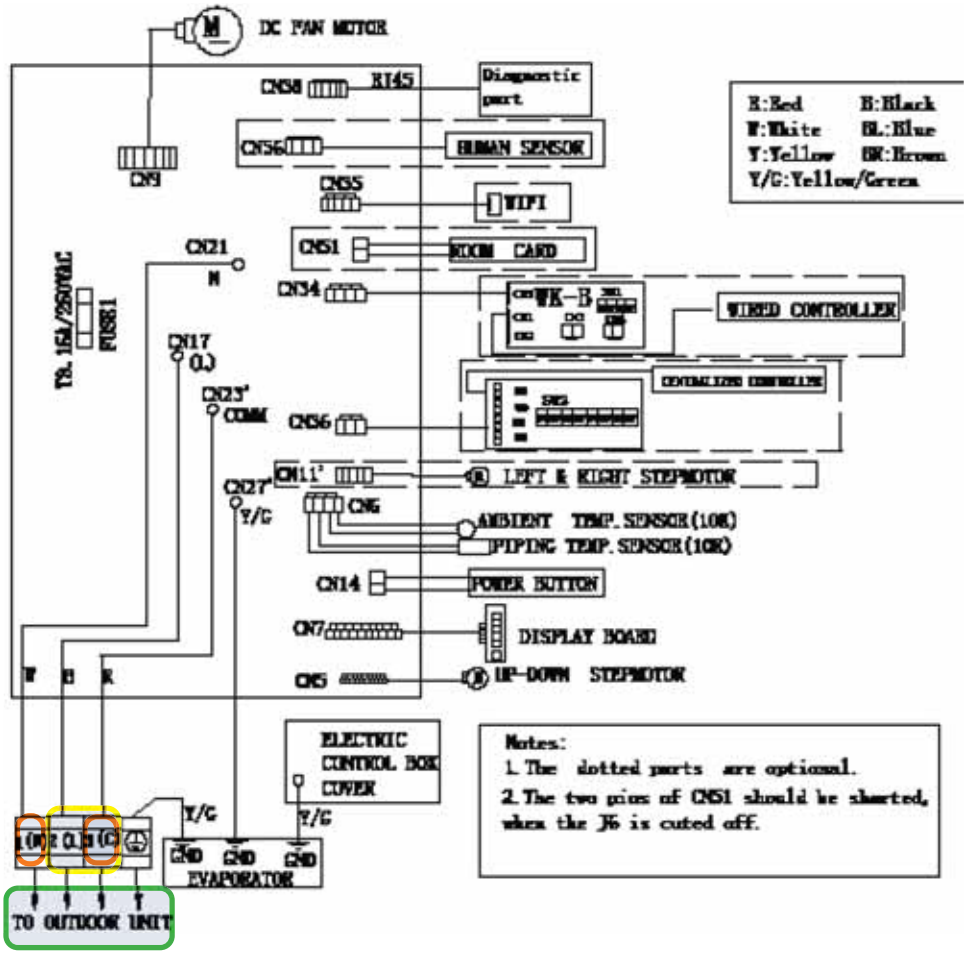
Models:

ASYW24TRDFA
ASYW30TRDFA
ASYW36TRDFA



Error Code: E7/LED1: 15 Flash

Wiring Diagram Reference



Error Code (Indoor)

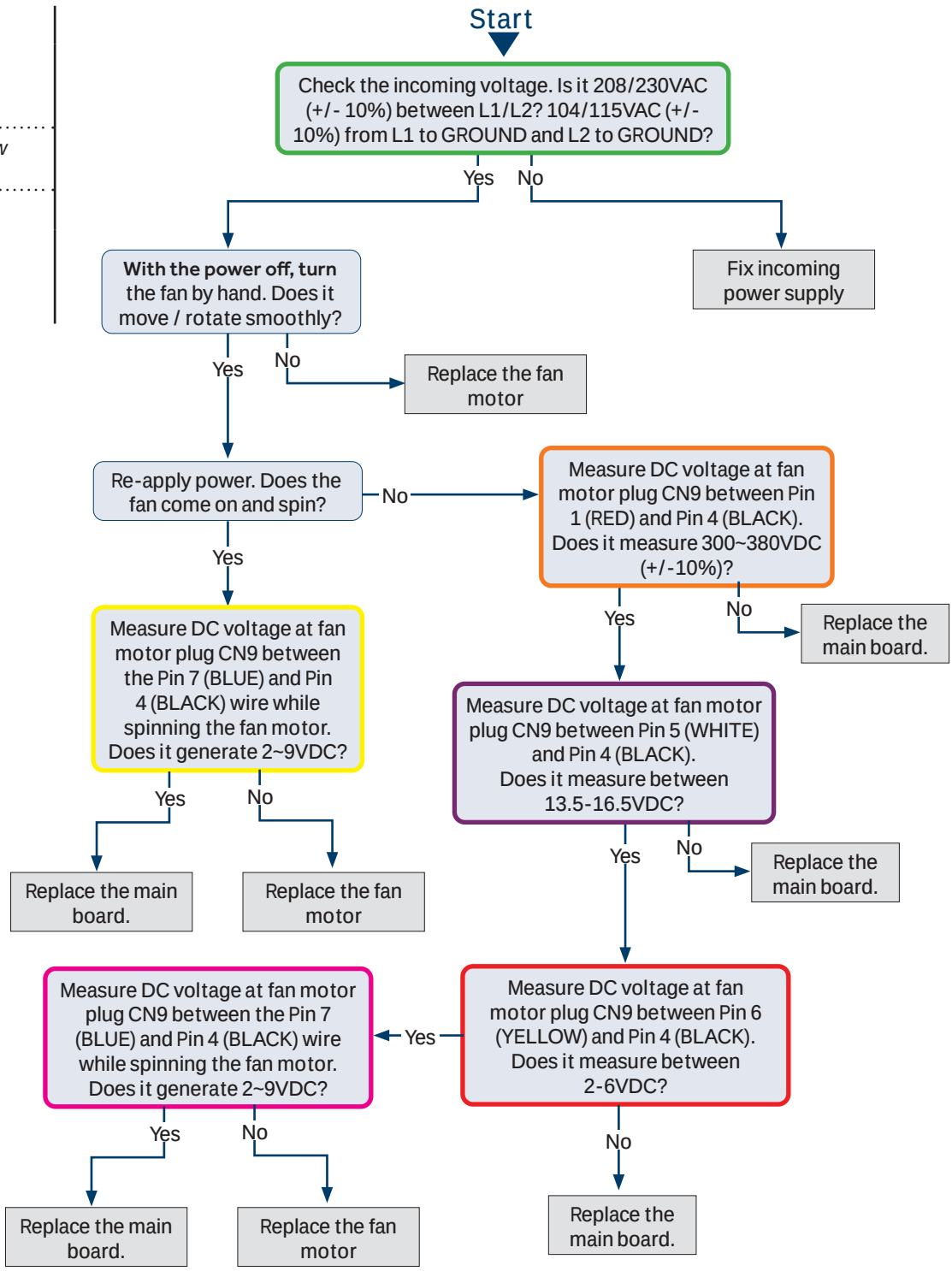
E14

Indoor Fan Motor Failure

Complete the "Check This First" Flow Chart before continuing.

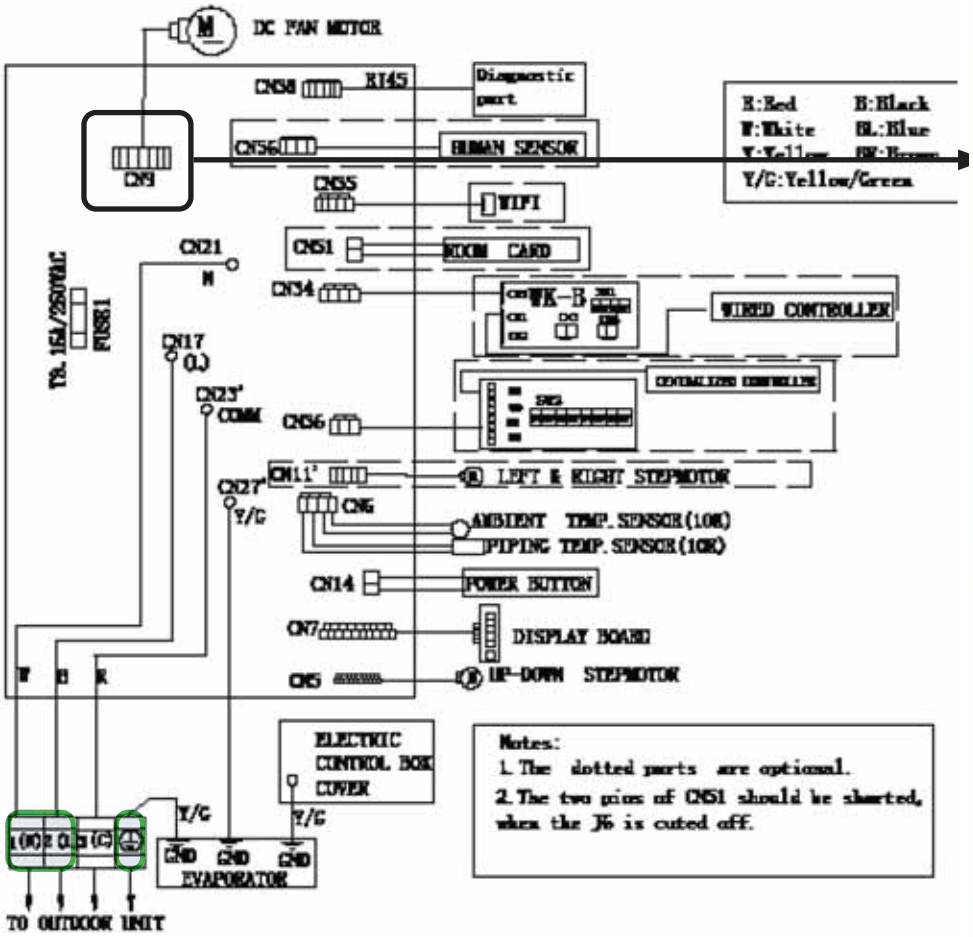
Models:

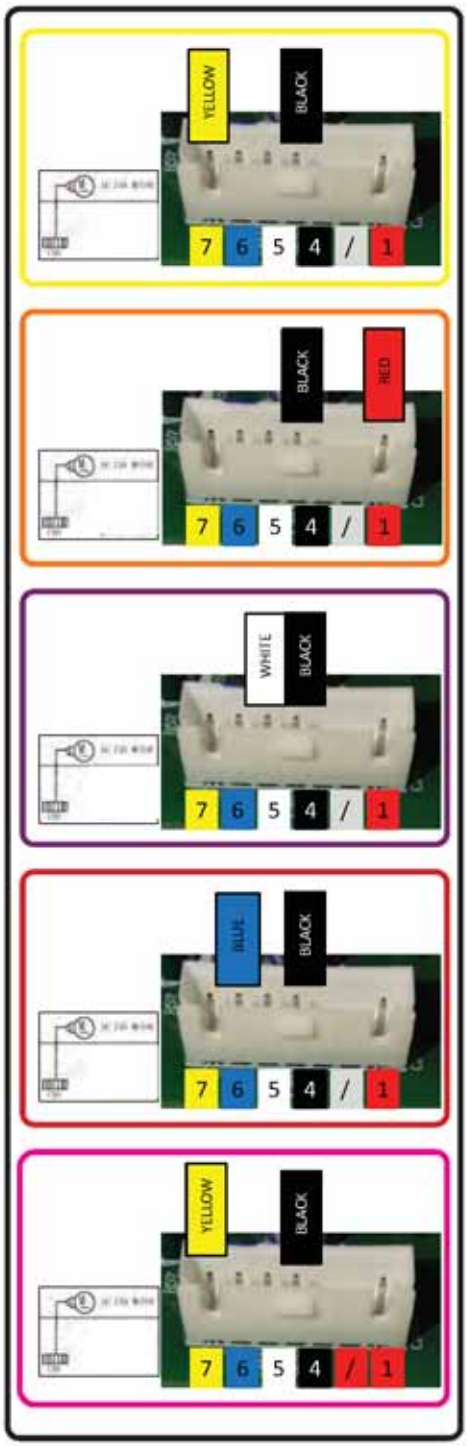
AW09EH2HEB
AW12EH2HEB
AW18EH2HEB



Error Code: E14

Wiring Diagram Reference





Temperature Sensor Resistance

1. Unplug the temperature sensor terminal from the PCB prior to making a resistance measurement.
2. For comparison, measure the resistance on two different sensors exposed to the same temperature.

Abbr.	Definition	Type
tAo	Temperature of outdoor ambient	10K
tc	Temperature of outdoor condenser	10K
td	Temperature of outdoor discharge	50K
tE	Temperature of outdoor defrost	10K
tS	Temperature of outdoor suction	10K
tdr	Temperature of compressor driver module	10K
Idr	Current of the compressor	10K

Abbr.	Definition	Type
tAI	Temperature of indoor ambient	10K
TCI	Temperature of indoor condenser	10K
Toci	Hot Gas Leaving the 4-Way Valve	10K
Tc2	EEV Liquid Sensor	10K
Tc1	EEV Gas Sensor	10K
Tm	Module Temp Sensor	10K
TAI	Temperature of indoor ambient (9K/12K Caliber & All CAC)	23K

		Normal (KΩ		
°F	°C	10K SENSORS	23K SENSORS	50K SENSORS
-22.0	-30.0	147.95	513.12	12061.74
-20.2	-29.0	139.56	478.89	11267.87
-18.4	-28.0	131.70	447.41	10531.37
-16.6	-27.0	124.34	418.38	9847.72
-14.8	-26.0	117.44	391.56	9212.81
-13.0	-25.0	110.96	366.75	8622.85
-11.2	-24.0	104.89	343.75	8074.38
-9.4	-23.0	99.19	322.41	7564.22
-7.6	-22.0	93.83	302.57	7089.47
-5.8	-21.0	88.80	284.11	6647.45
-4.0	-20.0	84.07	266.91	6235.71
-2.2	-19.0	79.62	250.87	5851.99
-0.4	-18.0	75.44	235.90	5494.21
1.4	-17.0	71.50	221.91	5160.46
3.2	-16.0	67.79	208.84	4849.00
5.0	-15.0	64.30	196.61	4558.19
6.8	-14.0	61.01	185.16	4286.55
8.6	-13.0	57.91	174.44	4032.71
10.4	-12.0	54.99	164.40	3795.39
12.2	-11.0	52.23	154.98	3573.43
14.0	-10.0	49.62	146.15	3365.73
15.8	-9.0	47.17	137.87	3171.31
17.6	-8.0	44.85	130.10	2989.25
19.4	-7.0	42.65	122.80	2818.67
21.2	-6.0	40.58	115.95	2658.81
23.0	-5.0	38.62	109.51	2508.91
24.8	-4.0	36.77	103.46	2368.32
26.6	-3.0	35.01	97.78	2236.39
28.4	-2.0	33.36	92.44	2112.55
30.2	-1.0	31.78	87.42	1996.25
32.0	0.0	30.30	82.69	1887.00
33.8	1.0	28.89	78.25	1784.33
35.6	2.0	27.55	74.07	1687.81
37.4	3.0	26.29	70.13	1597.04
39.2	4.0	25.09	66.43	1511.65
41.0	5.0	23.95	62.94	1431.28

		Normal (KΩ		
°F	°C	10K SENSORS	23K SENSORS	50K SENSORS
42.8	6.0	22.87	59.66	1355.62
44.6	7.0	21.84	56.57	1284.36
46.4	8.0	20.87	53.65	1217.23
48.2	9.0	19.94	50.90	1153.96
50.0	10.0	19.06	48.31	1094.32
51.8	11.0	18.23	45.87	1038.07
53.6	12.0	17.43	43.57	985.01
55.4	13.0	16.68	41.40	934.94
57.2	14.0	15.96	39.34	887.68
59.0	15.0	15.28	37.41	843.05
60.8	16.0	14.63	35.58	800.89
62.6	17.0	14.01	33.85	761.06
64.4	18.0	13.42	32.22	723.41
66.2	19.0	12.86	30.67	687.82
68.0	20.0	12.32	29.21	654.16
69.8	21.0	11.81	27.83	622.32
71.6	22.0	11.33	26.52	592.18
73.4	23.0	10.86	25.28	563.66
75.2	24.0	10.42	24.11	536.65
77.0	25.0	10.00	23.00	511.08
78.8	26.0	9.60	21.95	486.94
80.6	27.0	9.21	20.95	464.05
82.4	28.0	8.85	20.00	442.35
84.2	29.0	8.50	19.10	421.77
86.0	30.0	8.16	18.25	402.24
87.8	31.0	7.84	17.44	383.72
89.6	32.0	7.54	16.67	366.13
91.4	33.0	7.25	15.94	349.43
93.2	34.0	6.97	15.25	333.58
95.0	35.0	6.70	14.59	318.52
96.8	36.0	6.45	13.96	304.22
98.6	37.0	6.20	13.36	290.62
100.4	38.0	5.97	12.79	277.70
102.2	39.0	5.75	12.25	265.41
104.0	40.0	5.53	11.74	253.73

Continued on following page

Continued

°F	°C	Normal (KΩ 10K SENSORS	Normal (KΩ 23K SENSORS	Normal (KΩ 50K SENSORS
105.8	41.0	5.33	11.24	242.62
107.6	42.0	5.13	10.78	232.04
109.4	43.0	4.94	10.33	221.98
111.2	44.0	4.76	9.90	212.41
113.0	45.0	4.59	9.50	203.29
114.8	46.0	4.43	9.11	194.61
116.6	47.0	4.27	8.74	186.34
118.4	48.0	4.11	8.39	178.46
120.2	49.0	3.97	8.05	170.95
122.0	50.0	3.83	7.73	163.80
123.8	51.0	3.69	7.42	156.97
125.6	52.0	3.57	7.13	150.47
127.4	53.0	3.44	6.85	144.26
129.2	54.0	3.32		138.35
131.0	55.0	3.21		132.70
132.8	56.0	3.10		127.31
134.6	57.0	2.99		122.16
136.4	58.0	2.89		117.25
138.2	59.0	2.79		112.56
140.0	60.0	2.70		108.08
141.8	61.0	2.61		103.80
143.6	62.0	2.52		99.70
145.4	63.0	2.44		95.79
147.2	64.0	2.36		92.06
149.0	65.0	2.28		88.48
150.8	66.0	2.21		85.06
152.6	67.0	2.14		81.79
154.4	68.0	2.07		78.66
156.2	69.0	2.00		75.67
158.0	70.0	1.94		72.80
159.8	71.0	1.88		70.06
161.6	72.0	1.82		67.43
163.4	73.0	1.76		64.91
165.2	74.0	1.71		62.50
167.0	75.0	1.65		60.19
168.8	76.0	1.60		57.98
170.6	77.0	1.55		55.86
172.4	78.0	1.51		53.82
174.2	79.0	1.46		51.87
176.0	80.0	1.41		50.00
177.8	81.0	1.37		48.21
179.6	82.0	1.33		46.48
181.4	83.0	1.29		44.83
183.2	84.0	1.25		43.25
185.0	85.0	1.22		41.72
186.8	86.0	1.18		40.26
188.6	87.0	1.14		38.85
190.4	88.0	1.11		37.50
192.2	89.0	1.08		36.21
194.0	90.0	1.05		34.96

°F	°C	Normal (KΩ 10K SENSORS	Normal (KΩ 23K SENSORS	Normal (KΩ 50K SENSORS
195.8	91.0	1.02		33.77
197.6	92.0	0.99		32.62
199.4	93.0	0.96		31.51
201.2	94.0	0.93		30.45
203.0	95.0	0.91		29.42
204.8	96.0	0.88		28.44
206.6	97.0	0.86		27.50
208.4	98.0	0.83		26.59
210.2	99.0	0.81		25.71
212.0	100.0	0.79		24.87
213.8	101.0	0.76		24.06
215.6	102.0	0.74		23.28
217.4	103.0	0.72		22.52
219.2	104.0	0.70		21.80
221.0	105.0	0.68		21.10
222.8	106.0	0.67		20.43
224.6	107.0	0.65		19.78
226.4	108.0	0.63		19.16
228.2	109.0	0.61		18.56
230.0	110.0	0.60		17.98
231.8	111.0	0.58		17.42
233.6	112.0	0.57		16.88
235.4	113.0	0.55		16.36
237.2	114.0	0.54		15.85
239.0	115.0	0.52		15.37
240.8	116.0	0.51		14.90
242.6	117.0	0.50		14.45
244.4	118.0	0.48		14.01
246.2	119.0	0.47		13.59
248.0	120.0	0.46		13.19
249.8	121.0			12.80
251.6	122.0			12.42
253.4	123.0			12.05
255.2	124.0			11.70
257.0	125.0			11.35
258.8	126.0			11.02
260.6	127.0			10.70
262.4	128.0			10.40
264.2	129.0			10.10
266.0	130.0			9.81
267.8	131.0			9.53
269.6	132.0			9.26
271.4	133.0			9.00
273.2	134.0			8.74
275.0	135.0			8.50
276.8	136.0			8.26
278.6	137.0			8.03
280.4	138.0			7.81
282.2	139.0			7.60
284.0	140.0			7.39

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