Service Manual

GE APPLIANCES

ENDURE™

Single Zone

Ductless Split Heat Pumps

Outdoor Models

ASH109URDEB

ASH112URDEB

ASH118URDEB

Highwall

ASYW09URDEB

ASYW12URDEB

ASYW18URDEB

Compact Cassette

AB09SC2VHA

AB12SC2VHA

AB18SC2VHA

MSP Ducted

USYM09UCDSA

USYM12UCDSA

USYM18UCDSA

Console

USYF09UCDWA

USYF12UCDWA

USYF18UCDWA

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.

GE APPLIANCES a Haier company

AIR&WATER SOLUTIONS

31-5001044 Rev. 0 05-24

GE APPLIANCES

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Revision History

05/24 - *Edition release.*

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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

ENDURE™

Compressor Type:
DC Inverter Driven Rotary

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

WIFI
Built-in WiFi

		09EHAW	12EHAW	18EHAW
	Outdoor	ASH109URDEB	ASH112URDEB	ASH118URDEB
	UPC	084691920472	084691920489	084691920496
	Indoor	ASYW09URDEB	ASYW12URDEB	ASYW18URDEB
	UPC	084691932703	084691932758	084691932741
Cooling	Rated Capacity Btu/hr	9,000	12,000	17,800
	Capacity Range Btu/hr	3,100~12,000	3,100~15,000	8,500~21,000
	SEER2	30.0	27.5	23.0
	EER2	16.0	15.0	13.0
	Moisture Removal Pt./hr	2.5	3.4	4.2
Heating	Heating Capacity Range Btu/hr	3,100~20,000	3,100~22,000	8,700-27,000
	Rated Heating Capacity 47°F Btu/hr	10,000	14,500	20,000
	Max. Heating Capacity 5°F Btu/hr	10,600	14,900	18,000
	COP @ 5°F	1.90	1.9	1.9
	HSPF2 (IV)/HSPF2 (V)	14.0/10.0	12.5/10.0	12.0/9.0
Operating Range	Cooling w/o Wind Baffle °F(°C)	-	-	-
	Cooling w/ Wind Baffle °F(°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)
	Heating °F (°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)
Outdoor Unit	Maximum Fuse Size A	15	20	30
	Minimum Circuit Amp A	13	14	20
	Outdoor Noise Level dB	56	56	56
	Dimension: Height in (mm)	27 1/2 (697)	27 1/2 (697)	30 (762)
	Dimension: Width in (mm)	35 (890)	35 (890)	36 1/4 (920)
	Dimension: Depth in (mm)	13 7/8 (353)	13 7/8 (353)	15 1/8 (385)
	Carton Dimension: Height in (mm)	30 3/4 (780)	30 3/4 (780)	33 3/16 (843)
	Carton Dimension: Width in (mm)	42 3/8 (1076)	42 3/8 (1076)	42 3/4 (1085)
	Carton Dimension: Depth in (mm)	18 1/8 (460)	18 1/8 (460)	19 1/8 (487)
	Weight Ship/Net - lbs (kg)	115.5/98.3 (52.4/44.6)	124.8/107.6 (56.6/48.8)	154.3/133.4 (70/60.5)
	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)	546/433/340/250/235	580/524/430/334/324	636/531/426/320/259
	Heating Airflow CFM (Turbo/High/Med/Low/Quiet)	546/443/352/264/240	597/524/430/344/324	636/541/436/330/259
	Cooling Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	1250/980/815/650/610	1200/1100/900/700/650	1250/1050/925/800/700
	Heating Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	1200/980/840/700/610	1240/1000/850/700/600	1150/1050/925/800/650
	Indoor Sound Level dB Cooling (Turbo/High/ Med/Low/Quiet)	45/39/36/31/25	46/42/37/31/27	47/41/38/35/29
	Indoor Sound Level dB Heating (Turbo/High/ Med/Low/Quiet)	48/46/39/36/28	48/45/39/32/28	51/47/44/38/32
	Dimension: Height in (mm)	12 7/8 (327)	12 7/8 (327)	13 1/4 (337)
	Dimension: Width in (mm)	39 3/4 (1009)	39 3/4 (1009)	44 3/8 (1126)
	Dimension: Depth in (mm)	8 3/4 (223)	8 3/4 (223)	9 1/16 (230)
	Carton Dimension: Height in (mm)	16 (405)	16 (405)	16 1/2 (418)
	Carton Dimension: Width in (mm)	42 3/4 (1085)	42 3/4 (1085)	47 1/2 (1206)
	Carton Dimension: Depth in (mm)	11 5/8 (296)	11 5/8 (296)	13 1/2 (342)
	Weight Ship/Net - lbs (kg)	35.7/27.8 (16.2/12.6)	35.7/27.8 (16.2/12.6)	45.2/36.6 (20.5/16.6)
	Drainpipe Size O.D. in	5/8	5/8	5/8
Refrigerant Lines	Line Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	IDU Flare Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	ODU Port Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	Lineset Adapter Required	None	None	None
	Refrigerant (Factory Charge Oz.)	R410A (56.8)	R410A (62.1)	R410A (82.9)
	Max. Line Length/Height Ft (mm)	50/33 (15/10)	50/33 (15/10)	83/50 (25/15)

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.

ENGLISH

NOTE

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Compact Cassette Indoor

Compressor Type:
DC Inverter Driven Rotary

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



		09EHAB	12EHAB	18EHAB
	Outdoor	ASH109URDEB	ASH112URDEB	ASH118URDEB
	UPC	084691920472	084691920489	084691920496
	Indoor	AB09SC2VHA	AB12SC2VHA	AB18SC2VHA
	UPC	688057405469	688057405476	688057405483
Cooling	Rated Capacity Btu/hr	9,000	12,000	17,000
	Capacity Range Btu/hr	3,100~12,000	3,100~13,600	6,500~20,000
	SEER2	20.0	20.5	16.0
	EER2	10.5	12.5	10.6
	Moisture Removal Pt./hr	2.5	3.2	3.8
Heating	Heating Capacity Range Btu/hr	3,100~18,000	3,100~21,000	5,100~22,000
	Rated Heating Capacity 47°F Btu/hr	10,000	12,400	18,000
	Max. Heating Capacity 5°F Btu/hr	7,200	8,700	13,600
	COP @ 5°F	1.50	1.80	1.45
	HSPF2 (IV)/HSPF2 (V)	8.2/6.3	8.5/6.5	8.0/6.3
Operating Range	Cooling °F (°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)
	Heating °F (°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)
Outdoor Unit	Maximum Fuse Size A	15	20	30
	Minimum Circuit Amp A	13	14	20
	Outdoor Noise Level dB	56	56	56
	Dimension: H x W x D in (mm)	27 1/2 x 35 x 13 7/8 (697 x 890 x 353)	27 1/2 x 35 x 13 7/8 (697 x 890 x 353)	30 x 36 1/4 x 15 1/8 (762 x 920 x 385)
	Carton Dimension: H x W x D in (mm)	30 3/4 x 42 3/8 x 18 1/8 (780 x 1076 x 460)	30 3/4 x 42 3/8 x 18 1/8 (780 x 1076 x 460)	33 3/16 x 42 3/4 x 19 1/8 (843 x 1085 x 487)
	Weight Ship/Net - lbs (kg)	115.5/98.3 (52.4/44.6)	124.8/107.6 (56.6/48.8)	154.3/133.4 (70/60.5)
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto
	Airflow CFM (Turbo/High/Med/Low/Quiet)	410/365/305/265/205	410/365/305/265/205	470/410/365/295/252
	Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	830/760/690/620/560	830/760/690/620/560	850/800/760/680/590
	Indoor Sound Level dB (Turbo/High/Med/Low/Quiet)	42/40/36/32/25	42/40/36/32/25	45/42/40/36/32
	Dimension: H x W x D in (mm)	10 1/4 x 22 7/16 x 22 7/16 (260 x 570 x 570)	10 1/4 x 22 7/16 x 22 7/16 (260 x 570 x 570)	10 1/4 x 22 7/16 x 22 7/16 (260 x 570 x 570)
	Carton Dimension: H x W x D in (mm)	15 x 28 1/4 x 26 3/4 (380 x 718 x 680)	15 x 28 1/4 x 26 3/4 (380 x 718 x 680)	15 x 28 1/4 x 26 3/4 (380 x 718 x 680)
	Weight Ship/Net - lbs (kg)	43.9/34 (19.9/15.4)	48.5/40.8 (22/18.5)	48.5/40.8 (22/18.5)
	Condensate Pump	Standard	Standard	Standard
	Drain Pipe Size O.D in	1 1/4**	1 1/4**	1 1/4**
	Max. Drain-Lift height in(mm)	47 1/4 (1200)	47 1/4 (1200)	47 1/4 (1200)
Grille (Sold Separately)	Model Number	PB-700KB	PB-700KB	PB-700KB
	Dimension: Height in (mm)	2 3/8 (60)	2 3/8 (60)	2 3/8 (60)
	Dimension: Width in (mm)	27 9/16 (700)	27 9/16 (700)	27 9/16 (700)
	Dimension: Depth in (mm)	27 9/16 (700)	27 9/16 (700)	27 9/16 (700)
	Weight Ship/Net - lbs (kg)	10.6/6.2 (4.8/2.8)	10.6/6.2 (4.8/2.8)	10.6/6.2 (4.8/2.8)
Refrigerant Lines	Line Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	IDU Flare Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	ODU Port Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	Lineset Adapter Required	1/2 to 3/8*	1/2 to 3/8*	None
	Refrigerant (Factory Charge Oz.)	R410A (56.8)	R410A (62.1)	R410A (82.9)
	Max. Line Length/Height Ft (mm)	50/33 (15/10)	50/33 (15/10)	83/50 (25/15)

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.

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MSP Ducted Indoor

Built-in WiFi

Compressor Type:
DC Inverter Driven Rotary

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

		09EHYM	12EHYM	18EHYM
	Outdoor	ASH109URDEB	ASH112URDEB	ASH118URDEB
	UPC	084691920472	084691920489	084691920496
	Indoor	USYM09UCDSA	USYM12UCDSA	USYM18UCDSA
	UPC	084691851554	084691851561	084691851578
Cooling	Rated Capacity Btu/hr	9,000	12,000	18,000
	Capacity Range Btu/hr	3,100~12,000	3,100~13,600	6,500~23,200
	SEER2	18.0	18.0	16.2
	EER2	11.5	11.7	10.5
	Moisture Removal Pt./hr	2.5	3.2	3.8
Heating	Heating Capacity Range Btu/hr	3,100~18,000	3,100~21,000	5,100~24,000
	Rated Heating Capacity 47°F Btu/hr	10,000	14,800	20,000
	Max. Heating Capacity 5°F Btu/hr	9,800	11,500	17,200
	COP @ 5°F	1.75	1.42	1.46
	HSPF2 (IV)/HSPF2 (V)	9.5/7.6	8.5/6.7	8.1/6.4
Operating Range	Cooling w/o Wind Baffle °F (°C)	-	-	-
	Cooling w/Wind Baffle °F (°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)
	Heating °F (°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)
Outdoor Unit	Maximum Fuse Size A	15	20	30
	Minimum Circuit Amp A	13	14	20
	Outdoor Noise Level dB	56	56	56
	Dimension: H x W x D in (mm)	27 1/2 x 35 x 13 7/8 (697 x 890 x 353)		30 x 36 1/4 x 15 1/8 (762 x 920 x 385)
	Carton Dimension: H x W x D in (mm)	30 3/4 x 42 3/8 x 18 1/8 (780 x 1076 x 460)		33 3/16 x 42 3/4 x 19 1/8 (843 x 1085 x 487)
	Weight Ship/Net - lbs (kg)	115.5/98.3 (52.4/44.6)	124.8/107.6 (56.6/48.8)	154.3/133.4 (70/60.5)
	Base Pan Heater	Built-in	Built-in	Built-in
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto
	Airflow CFM (Turbo/High/Med/Low/Quiet)	424/353/294/235/176	494/424/353/294/235	735/635/541/470/400
	Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	880/800/720/640/560	950/870/780/680/600	880/820/760/700/640
	Indoor Sound Level dB (Turbo/High/Med/Low/Quiet)	44/41/38/35/32	47/44/41/38/35	48/45/42/39/36
	Dimension: H x W x D in (mm)	9 3/4 x 27 1/2 x 27 1/2 (248 x 700 x 700)		9 3/4x43 1/4x27 1/2 (248 x 1100 x 700)
	Carton Dimension: H x W x D in (mm)	13 1/2 x 37 1/2 x 35 1/2 (340 x 950 x 900)		13 1/2 x 46 x 33 3/4 (340 x 1170 x 860)
	Weight Ship/Net - lbs (kg)	66/57 (30/26)	66/57 (30/26)	77/70 (35/32)
	Max. External Static Pressure in.W.G (Pa)	0.6 (150)	0.6 (150)	0.6 (150)
	Internal Condensate Pump	Standard	Standard	Standard
	Drain Pipe Size O.D in	1**	1**	1**
	Max. Drain-lift height in (mm)	27 9/16 (700)	27 9/16 (700)	27 9/16 (700)
Refrigerant Lines	Line Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	IDU Flare Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	ODU Port Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	Lineset Adapter Required	1/2 to 3/8*	1/2 to 3/8*	None
	Refrigerant (Factory Charge Oz.)	R410A (56.8)	R410A (62.1)	R410A (82.9)
	Max. Line Length/Height Ft (mm)	50/33 (15/10)	50/33 (15/10)	83/50 (25/15)

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.

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Console Indoor

ENDURE™

Compressor Type:
DC Inverter Driven Rotary

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

WIFI Built-in WiFi

WIFI Built-in WiFi

WIFI Built-in WiFi

		09EHYF	12EHYF	18EHYF
	Outdoor	ASH109URDEB	ASH112URDEB	ASH118URDEB
	UPC	084691920472	084691920489	084691920496
	Indoor	USYF09UCDWA	USYF12UCDWA	USYF18UCDWA
	UPC	084691851523	084691851530	084691851547
Cooling	Rated Capacity Btu/hr	9,000	11,600	14,800
	Capacity Range Btu/hr	3,100~12,000	3,100~13,600	6,500~18,000
	SEER2	20.0	20.0	17.0
	EER2	11.0	12.5	10.0
	Moisture Removal Pt./hr	2.5	3.2	3.8
Heating	Heating Capacity Range Btu/hr	3,100~18,000	3,100~21,000	5,100~20,000
	Rated Heating Capacity 47°F Btu/hr	10,000	12,800	17,800
	Max. Heating Capacity 5°F Btu/hr	7,700	9,000	13,300
	COP @ 5°F	1.50	1.45	1.40
	HSPF2 (IV)/HSPF2 (V)	8.5/6.4	8.5/6.4	8.5/6.6
Operating Range	Cooling °F (°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)	14~115°F (-10~46°C)
	Heating °F (°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)	-31~75°F (-35~24°C)
Outdoor Unit	Maximum Fuse Size A	15	20	30
	Minimum Circuit Amp A	13	14	20
	Outdoor Noise Level dB	56	56	56
	Dimension: H x W x D in (mm)	27 1/2 x 35 x 13 7/8 (697 x 890 x 353)	27 1/2 x 35 x 13 7/8 (697 x 890 x 353)	30 x 36 1/4 x 15 1/8 (762 x 920 x 385)
	Carton Dimension: H x W x D in (mm)	30 3/4 x 42 3/8 x 18 1/8 (780 x 1076 x 460)	30 3/4 x 42 3/8 x 18 1/8 (780 x 1076 x 460)	33 3/16 x 42 3/4 x 19 1/8 (843 x 1085 x 487)
	Weight Ship/Net - lbs (kg)	115.5/98.3 (52.4/44.6)	124.8/107.6 (56.6/48.8)	154.3/133.4 (70/60.5)
Indoor Unit	Fan Speed Stages	5 + Auto	5 + Auto	5 + Auto
	Airflow CFM (Turbo/High/Med/Low/Quiet)	264/235/205/176/147	294/264/235/205/176	341/311/282/252/223
	Indoor Motor Speed RPM (Turbo/High/Med/Low/Quiet)	650/560/480/410/360	700/590/510/440/390	800/710/630/560/510
	Indoor Sound Level dB (Turbo/High/Med/Low/Quiet)	43/40/37/34/31	45/42/39/36/33	49/46/43/40/37
	Dimension: H x W x D in (mm)	23 3/4 x 27 1/2 x 8 1/4 (600 x 700 x 210)	23 3/4 x 27 1/2 x 8 1/4 (600 x 700 x 210)	23 3/4 x 27 1/2 x 8 1/4 (600 x 700 x 210)
	Carton Dimension: H x W x D in (mm)	27 1/2 x 30 3/4 x 12 (695 x 783 x 303)	27 1/2 x 30 3/4 x 12 (695 x 783 x 303)	27 1/2 x 30 3/4 x 12 (695 x 783 x 303)
	Weight Ship/Net - lbs (kg)	35.7/27.8 (16.2/12.6)	35.7/27.8 (16.2/12.6)	45.2/36.6 (20.5/16.6)
	Drain Pipe Size O.D in	5/8	5/8	5/8
Refrigerant Lines	Line Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	IDU Flare Size: Liquid (Suction) in.	1/4 (3/8)	1/4 (3/8)	1/4 (1/2)
	ODU Port Size: Liquid (Suction) in.	1/4 (1/2)	1/4 (1/2)	1/4 (1/2)
	Lineset Adapter Required	1/2 to 3/8*	1/2 to 3/8*	None
	Refrigerant (Factory Charge Oz.)	R410A (56.8)	R410A (62.1)	R410A (82.9)
	Max. Line Length/Height Ft (mm)	50/33 (15/10)	50/33 (15/10)	83/50 (25/15)

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.

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, cassette, ducted and console. 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

The systems are designed to operate in temperature ranges of 60°F to 86°F in cooling mode and 60°F to 86°F in heat mode.

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 unit receives operating voltage and communication data signals on # 14 AWG (copper stranded without splicing) wire that connects between the indoor and outdoor unit. There should not be any splices in the field wiring that goes between terminals 1, 2, 3 and 4. A splice in these wires may cause the system to lose communication between the indoor and outdoor units. The system will then display an error code E7.

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).

The condensate system is a gravity type in the highwall and the console models. 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 unit is installed. The indoor fan will run continuously when placed in heating or cooling mode and will not cycle on and off with the outdoor unit. If it did,room temperature could not be sensed or maintained.

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. The compressor operating speed is determined by the difference between the conditioned space temperature and the set point.

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 VAC (+/- 10%) 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 needed. 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.

Indoor Unit

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.

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

Four 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 provides the temperature sensed at the output 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.

Tr = room temperature Ts = set temperature

If Tr ≤ Ts, the outdoor unit will operate and the indoor fan operates in cold air prevention function

If Tr > Ts+ 2°F, the outdoor unit turns off and the indoor fan operates to circulate the residual heat remaining in the coil.

If Tr < Ts+ 2°F, the outdoor unit will restart and the indoor fan operates in cold air proof mode.

The speed of the indoor fan can be controlled manually by the user or automatically by the system. The speed can be changed between HIGH, MEDIUM, and LOW. The predetermined conditions for automatic control are as follows:

- High Speed: Tr < Ts
- Medium Speed: Ts ≤ T ≤ Ts + 4°F
- Low Speed: Tr > Ts + 4°F

When the indoor fan is running in automatic mode and the speed switches from high to low, the indoor fan will maintain high speed for a period of 3 minutes before switching to low speed.

Cold Air Proof Operation

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.

Indoor coil Temperature:	Indoor Fan Speed:
Over 99°F	Auto or Set speed
99°F	Low speed
95°F	Light speed
77°F or lower	Fan OFF

4 minutes after the indoor fan starts, the light or low speed will switch to the set speed.

Residual heat sending: the indoor fan will operate on low speed until the coil temperature reaches 73 degrees.

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

When heating has been satisfied, the compressor will turn off first, followed by the outdoor fan. The 4-way valve will de-energize 2 minutes after compressor stops.

The indoor unit fan motor will continue to run at minimum speed, until the indoor coil reaches a minimum temperature of 73°F, when it will turn off. If the indoor coil temperature rises over 77°F, the indoor fan will start.

If the system detects a malfunction, it may shut down or show an error code on the indoor unit display board and/or outdoor unit main board LED.

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

Four 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.

Two defrost temperature sensors provide the temperature sensed at the output of the condenser coil. The lowest reading will be used in the defrost logic.

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.

As the room is cooled or heated, the system will automatically switch between cool mode, fan mode, and heat mode. There is a minimum 15 minute operating time between mode changes.

Dry Mode

Overview

The temperature control range is 60°F - 86°F. This mode is used for dehumidification.

Tr= room temperature Ts= set temperature

When Tr > Ts+ 4°F, the compressor will turn on and the indoor fan will operate at the set speed.

When Ts ≤ Tr ≤ Ts+ 4°F, the compressor will operate at the high dry frequency for 10 minutes, then at the low dry mode for 6 minutes. The indoor fan will operate at low speed.

When Tr< Ts, the outdoor unit will stop, and the indoor fan will stop for 3 minutes, then operate at the low speed option.

Automatic fan speed:

- When Tr > Ts+ 9°F, High speed
- When Ts+ 5.4°F ≤ Tr< Ts+ 9°F, Medium speed
- When Ts+ 3.6°F ≤ Tr< Ts+ 5.4°F, Low speed
- When Tr< Ts+ 3.6°F, Light speed

Note: TURBO and QUIET mode must be set using the remote controller.

If the outdoor fan is stopped, the indoor fan will pause for 3 minutes.

If the outdoor fan is stopped for more than 3 minutes, and the compressor is still operating, the system will change to light speed mode.

Indoor Unit

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

The indoor unit main board will illuminate the display, indicating the set temperature and current status of the unit.

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

As the louver opens, the indoor fan motor will operate at the speed last set. The fan motor has a feedback circuit which provides the 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 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 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 via the terminal 3 wire to perform the requested function.

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.

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

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.

Temperature Sensors

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

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

The defrost temperature sensor provides the temperature sensed at the output 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.

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

Defrost Operation

Defrost cycle will initiate if any of three conditions are met:

Te = Defrost temperature sensor
Tao = Outdoor ambient temperature sensor
Tes = Condensation point temperature

- Tes > 23°F, and Te ≤ 23°F
- 5°F Tes ≤ Tes < 23°F, and Te ≤ Tes
- Tes < 5°F and Te ≤ 5°F
- Tes = C X Tao-a
- Tao < 32°F, C = .08
- Tao > or = 32°F, C = .06
- a = 6

To enter the defrost mode, the compressor must have accumulated 10 minutes of run time, and 45 minutes of accumulated run time since the last defrost cycle.

When the defrost cycle begins, the following conditions take place:

1. Indoor fan motor stops.
2. Compressor stops for 40 seconds.
3. After 40 seconds, the 4-way valve shifts to cooling position and outdoor fan stops. The compressor starts again.
4. About 1 minute, the compressor accelerates to the defrost frequency: 88 Hz for 110 VAC models, 90 Hz for Caliber, 100 Hz for Endure next Generation.
5. The outdoor unit will now defrost. Defrost cycle runs continuously for 10 minutes approximately, unless the following conditions are met:
6. The condenser maintains a temperature above 48°F for 60 seconds, or
7. The condenser maintains a temperature above 59°F for 5 seconds.

Upon exiting the defrost cycle, the following sequence takes place:

1. The compressor will stop.
2. The outdoor fan will operate at high speed.
3. 25 seconds later the 4-way valve will shift to the heating mode.
4. 30 seconds later the compressor will start, and the system resumes normal operation.

Upon exiting the defrost cycle, the following conditions will take place:

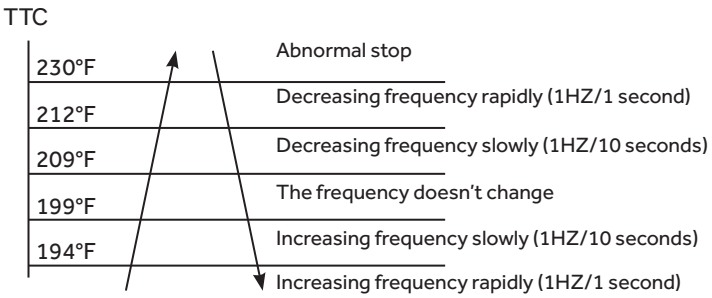
1. The compressor will stop.
2. The outdoor fan will operate at high speed.
3. 25 seconds later the 4-way valve will shift to the heat mode position.
4. 30 seconds later the compressor will start.

The system resumes normal operation.

Protection Functions

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 2 seconds, an exhaust overheating protection error code will be indicated at the outdoor unit.



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:

104°F (40°C): Increasing slowly
126°F (52°C): Holds value
135°F (57°C): Decreasing slowly
140°F (60°C): Decreasing rapidly
145°F (63°C): Compressor stops

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
09K	8A	9A	10A	12A
12K	13A	14A	15A	16A
18K	15A	16A	17A	18A

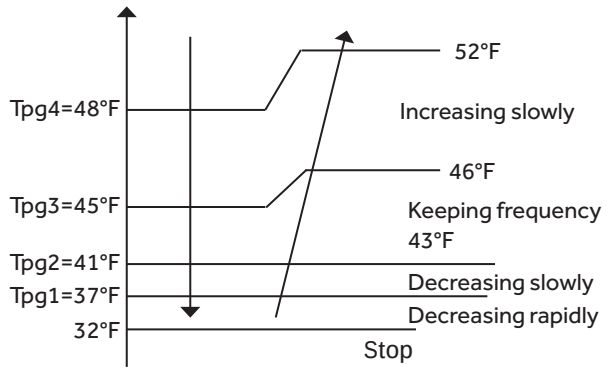
Anti-freeze Protection of the Indoor Coil

The temperature sensed by the coil sensor is used to determine at what speed the compressor is to run to avoid the coil temperature being too cold.

Tpg_Indoor: Indoor unit pipe sensor temperature
Ts: Outdoor unit Suction Line sensor temperature

- When Min(Tpg_indoor, Tpg_indoor + Ts)/2) < Tpg1, the frequency of the compressor decreases at the rate of 1HZ / 1 second.
- When Min(Tpg_indoor, Tpg_indoor + Ts)/2) < Tpg2, the frequency of the compressor decreases at the rate of 1HZ / 10 second.
- When Tpg_indoor begins to rise again, and Tpg2 ≤ Min(Tpg_indoor, Tpg_indoor + Ts)/2) ≤ Tpg3, the frequency of the compressor does not change.
- When Tpg3 < Min(Tpg_indoor, Tpg_indoor + Ts)/2) < Tpg4, the frequency of the compressor increases at the rate of 1HZ / 10 second.

Example: if Min(Tpg_indoor, Tpg_indoor + Ts)/2) ≤ 32°F sustains for 2 minutes, the outdoor unit will stop and indicate an underload malfunction code at the outdoor unit. The compressor stops for a minimum of 3 minutes. When Min(Tpg_indoor, Tpg_indoor + Ts)/2) > Tpg4, the compressor will restart.



Base Pan Heater

To keep condensate water from freezing inside the cabinet, a base pan heater is installed at the factory. Refer to the chart below for the operating parameters.

Outdoor Temperature	Pan Heater
> 37°F (3°C)	OFF
28°F (-2°C) to 34°F (1°C)	OFF 20min, ON 10min
10°F (-12°C) to 25°F (-4°C)	OFF 15min, ON 15min
< 10°F (-12°C)	ON

Special Functions

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.
- Any command from the remote control will be ignored for 30 seconds after power is restored.

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

Enhanced/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

Force defrost via Remote Controller (YR-HG):

Setting method:

1. Set to HEAT Mode
2. Set to 30°C/86°F
3. Set High Fan Speed
4. Press Health Button 10 times within 5 seconds
5. Hear Unit will Beep 4 times to Confirm. System will enter Force Defrost mode.

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.

Temperature Compensation

This function allows you the capability to adjust the temperature compensation offset of any indoor unit.

HIGHWALL/CONSOLE

A remote control with SLEEP button is needed to perform the FOLLOWING steps.

When the unit is in heating mode, a 4°C temperature compensation is added automatically to the Room Air Temperature reading. The display will show the Room Temperature compensated.

1. Apply power to the unit.
2. Set to Cooling Mode or Heating Mode
3. Set the temperature to 75°F (24°C).
4. Aim the controller at the infrared signal receiver and adjust the temperature to the desired value (see note below), then set the unit to OFF by pressing the controller's ON/OFF button. The remote signal receiver will beep 4 times. The beep indicates the set temperature compensation has been set successfully.

Note:

- If set to 24 (starting point), compensation is zero (0).
- If set to 25, compensation is + 1°C.
- If set to 26, compensation is + 2°C.
- If set to 23 compensation is -1°C.
- If set to 22, compensation is -2°C, and so on.
- Temperature Compensation can be adjusted from -8°C to +6°C
- To disable temperature compensation (compensation = zero), set to 24

5. Once the desired value has been selected, turn OFF the unit via the YR-HG controller to save the compensation settings.

DUCTED

(Control YR-HBS-01 required)

1. Remove power to the unit and unplug the wired controller from the indoor unit PCB.
2. Connect an Infrared Remote Signal Receiver - RE-02 - to the indoor unit PCB, connector CN29 (36K, 48K) or CN21 (24K).
3. Apply power to the unit.
4. Press the ON/OFF button on the remote control (YR-HBS-01).
5. Change the display temperature unit to °C. To do it, press the MENU/OFF button, then press CONFIRM button (Ignore this step if the display temperature is already °C).
6. Set the remote controller for HEAT mode operation and set the temperature to 24°C.
7. Aim the controller at the infrared signal receiver and press the SLEEP button 7 times within 5 seconds. The remote signal receiver will beep 2 times. The beeps indicate the set temperature compensation modification is available.
8. Aim the controller at the infrared signal receiver and adjust the temperature to the desired value (see note below), then set the unit to OFF by pressing the controller's ON/OFF button. The remote signal receiver will beep 4 times. The beep indicates the set temperature compensation has been set successfully.

Note:

- If set to 24 (starting point), compensation is zero (0).
- If set to 25, compensation is + 1°C.
- If set to 26, compensation is + 2°C.
- If set to 23 compensation is -1°C.
- If set to 22, compensation is -2°C, and so on.
- Temperature Compensation can be adjusted from -8°C to +6°C
- To disable temperature compensation (compensation = zero), set to 24

9. Remove power and connect the wired controller.
10. Set the unit to OFF by pressing the button ON/OFF button. The setting will be in effect with the next ON time. This setting will be saved in the EEPROM.

LARGE CASSETTES

(Control YR-HBS-01 required)

1. Install the grille assembly and connect the power cable.
2. Unplug the wired controller.
3. Connect power to the unit.
4. Press the ON/OFF button on the remote control (YR-HBS-01).
5. Change the display temperature unit to °C. To do it, press the MENU/OFF button, then press confirm. (Ignore this step if the display temperature is already °C).
6. Open the front cover of the remote control and press the LIGHT button 12 times in 7 seconds.
7. The panel will beep 4 times and display an "A".
8. Press the LIGHT button once to confirm. The display will read "A0".
9. Press the button TEMP UP or DOWN until the display shows "A5".
10. Press the LIGHT button once to confirm. The display will read "0b".
11. Press the button TEMP UP or DOWN to scroll through the listed Codes. Each code is associated with a corresponding compensation value (see table below). For example, if you want to make the temperature invalid, scroll it to 0F. Values in the chart below are Negative Values or Negative Compensation.

Code	0	1	2	3	4	5	6	7	8	9	0A	0b	0C	0d	0E	0F
Compensation Value °C	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

12. Press the LIGHT button once to confirm. The display will read "A5".
13. Press the ON/OFF button on the remote control to save the changes

COMPACT CASSETTES

(Control YR-HBS-01 required)

1. Remove power to the unit and unplug the wired controller from the indoor unit PCB.
2. Apply power to the unit.
3. Press the ON/OFF button on the remote control (YR-HBS-01).
4. Change the display temperature unit to °C. To do it, press the MENU/OFF button, then press confirm. (Ignore this step if the display temperature is already °C).
5. Set the remote controller for HEAT mode operation and set the temperature to 24°C.
6. Aim the controller at the infrared signal receiver and press the SLEEP button 7 times within 5 seconds. The remote signal receiver will beep 2 times. The beeps indicate the set temperature compensation modification is available.
7. Aim the controller at the infrared signal receiver and adjust the temperature to the desired value (see note below), then set the unit to OFF by pressing the controller's ON/OFF button. The remote signal receiver will beep 4 times. The beep indicates the set temperature compensation has been set successfully.

Note:

- If set to 24 (starting point), compensation is zero (0).
- If set to 25, compensation is + 1°C.
- If set to 26, compensation is + 2°C.
- If set to 23 compensation is -1°C.
- If set to 22, compensation is -2°C, and so on.
- Temperature Compensation can be adjusted from -8°C to +6°C
- To disable temperature compensation (compensation = zero), set to 24

8. Remove power and connect the wired controller.
9. Set the unit to OFF by pressing the button ON/OFF button. The setting will be in effect with the next ON time. This setting will be saved in the EEPROM.

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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ASH109URDEB
ASH112URDEB
ASH118URDEB

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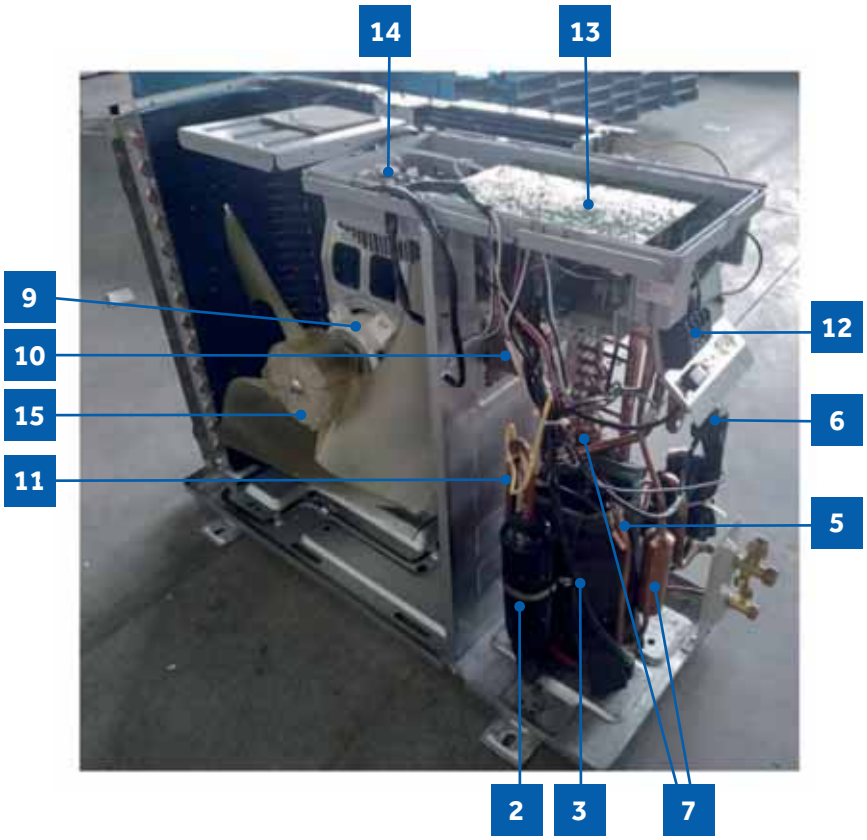
The outdoor unit has two circuit boards, an Inverter Power Module (IPM) that drives the compressor and main control board (PCB) that manages system functions and inverter calculations.

Sensors monitor key temperatures throughout the system to manage operational decisions.

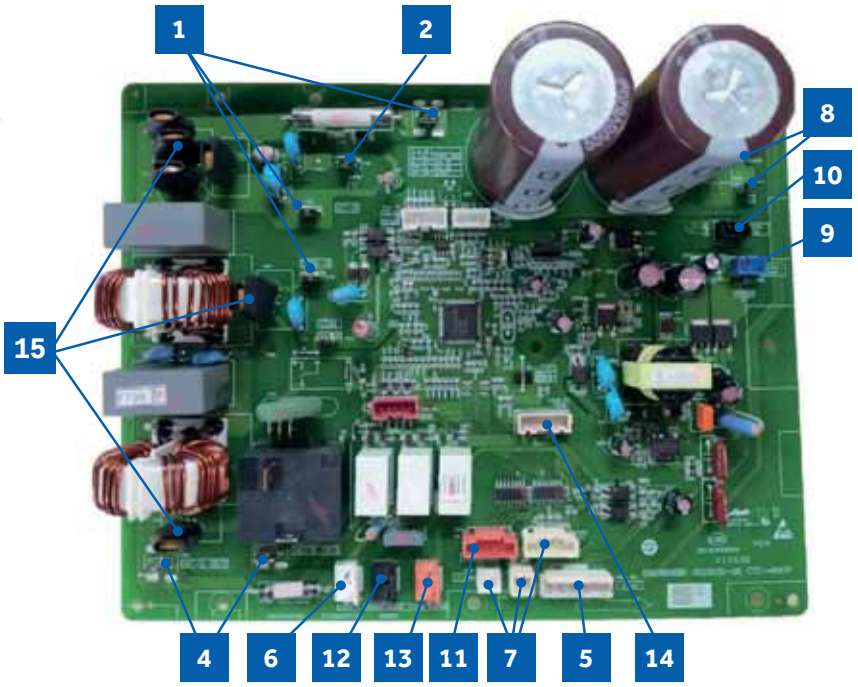
Outdoor Component Identification

1. 4-Way Valve
2. Accumulator
3. Compressor
4. Defrost Temperature Sensor
5. Discharge Temperature Sensor
6. Electronic Expansion Valve
7. Refrigerant Strainers
8. Ambient Temperature Sensor
9. Fan Motor
10. Power Factor Reactor
11. Suction Line Temperature Sensor
12. Terminal Block
13. Main Control Board (PCB)
14. Module Control Board (IPM)
15. Fan Blade



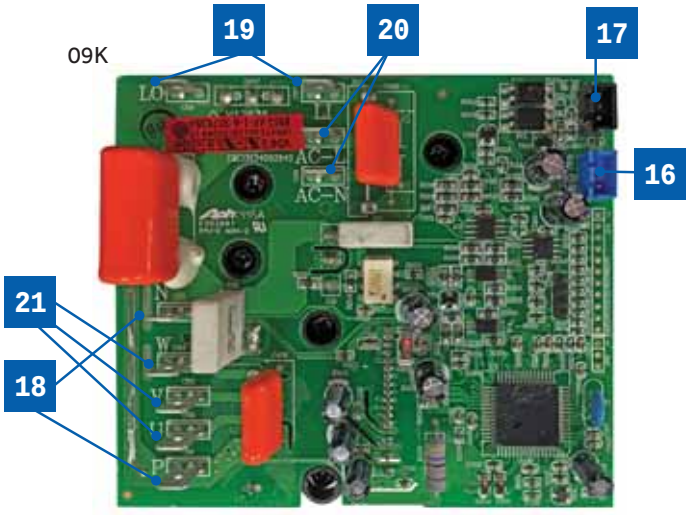
PCB (1): Outdoor Control PCB

1. CN1, CN2: 230VACpowerfromterminal block connections 1(N) and 2(L), CN6-connector for COM-N
2. CN5: Connector for ground
3. CN4: Communication connection between the indoor board and the outdoor board
4. CN8, CN9: 230VAC power to the IPM connections CN8 (or CN1) and CN9 (orCN2)
5. CN21: Connector for fan motor
6. CN10: Connector for four way valve coil
7. CN18, CN20, CN31: Connections for temperature sensors
8. CN26, CN24: 310 VDC power from the IPM connections CN1 (or CN8) and CN5 (or CN9)
9. CN22: Connector for DC POWER - 15V and 5V to the IPM
10. CN23: 5VDC and 15VDC pulsing communication connection between the PCB and the IPM
11. CN16: Connector for the electronic expansion valve
12. CN48: Connector for the base pan heater
13. CN49: Connector for COMP heater
14. CN38: Connector for diagnostic port
15. RV1, RV2, RV3 Varistor



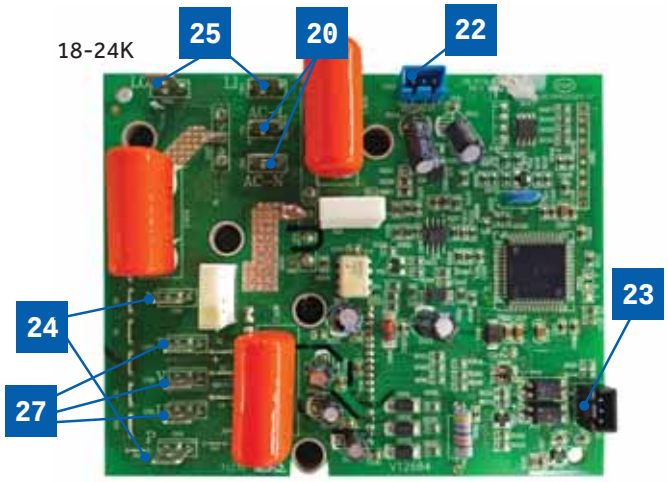
PCB (2): IPM for 09K

16. CN10: Connector for the DC power 5V and 15V form the control PCB
17. CN11: Pulsing communication connection between the IPM and the PCB
18. CN1,CN5: 310 VDC signal to the PCB connections CN26 and CN24
19. LI (CN7), LO (CN6): Connector for reactor
20. CN8, CN9: 230 VAC signal from the PCB
21. CN2, CN3, CN4: Compressor U, V, and W connections



PCB (3): IPM for 18-24K

22. CN10: 5 VDC and 15 VDC power signal from PCB connection CN22
23. CN11: Connector for communicate between the control board and the module board
24. CN8, CN9: 310VDC power to PCB connections CN26 and CN24
25. LI (CN3), LO (CN4): Connector for reactor
26. CN1, CN2: 230 VAC power from PCB connections CN8 and CN9
27. CN5, CN6, CN7: Compressor U, V, and W connections



Terminal Block

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

The compressor is a three phase DC inverter driven rotary type, capable of variable speed operation. The compressor operating frequency will be determined by the temperature difference between set point and room temperature.

The compressor of 09K is electrically connected to the IPM on terminal connections CN2, CN3 and CN4.

The compressor of12K&18K is electrically connected to the IPM on terminal connections CN5, CN6 and CN7.

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. It is unlikely to ever have an electrical failure of this component.

The Reactor of 09K is electrically connected to the IPM on terminal connections CN6 and CN7.

The Reactor of 12K& 18K is electrically connected to the IPM on terminal connections CN3 and CN4.

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 via PLUG CN-21.

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.

Discharge Temperature Sensor

The Discharge Temperature Sensor is a negative coefficient thermistor that senses the temperature 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.

This sensor connects to the Main Control Board at PLUG CN-20.

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 PCB monitors the temperature of the outdoor coil to determine when the system should perform a defrost cycle. The sensor also monitors coil temperature during defrost cycles to determine termination conditions.

This sensor connects to the Main Control Board at PLUG CN-20.

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.

This sensor connects to the Main Control Board at PLUG CN-31.

Suction Line Temperature Sensor

The Suction Line Temperature Sensor is a negative coefficient thermistor that senses the temperature of the suction line. The PCB monitors the temperature of the suction line and the EEV operation to maintain an acceptable superheat.

This sensor connects to the Main Control Board at PLUG CN-18.

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.

This sensor connects to the Main Control Board at PLUG CN-20

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.

The 4-Way Valve is electrically connected to the Main Control Board at PLUG CN-10.

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 metering device position is determined by input from a Suction Line Temperature Sensor. 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.

The electronic expansion valve is electrically connected to the Main Control Board at PLUG CN-16.

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.

Refrigerant Filters

The system has debris-catching strainers that protect internal system components from contaminants in the refrigerant. The strainer is a permanent part that is not typically replaced.

Base Pan Heater

The Base Pan Heater is electrically connected to the Main Control Board at PLUG CN-48 and energized with 230 VAC.

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). 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.

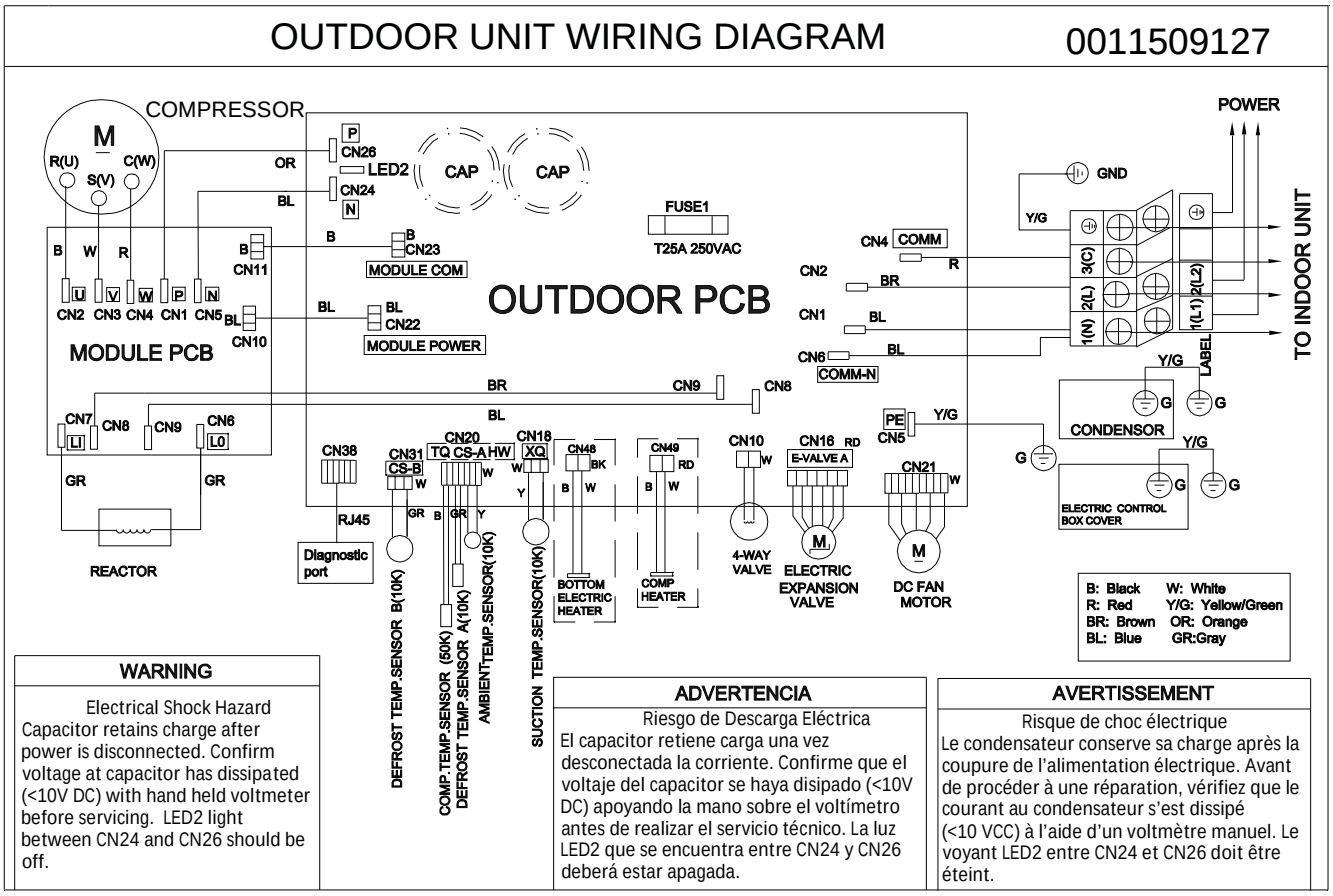
Step 3

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

Checking the Base Pan Heater

The resistance across the heater should be 140 to 170 ohms. Replace it if the value is significantly different, or if the heater reads open or shorted.

09K



WARNING

Electrical Shock Hazard
Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.

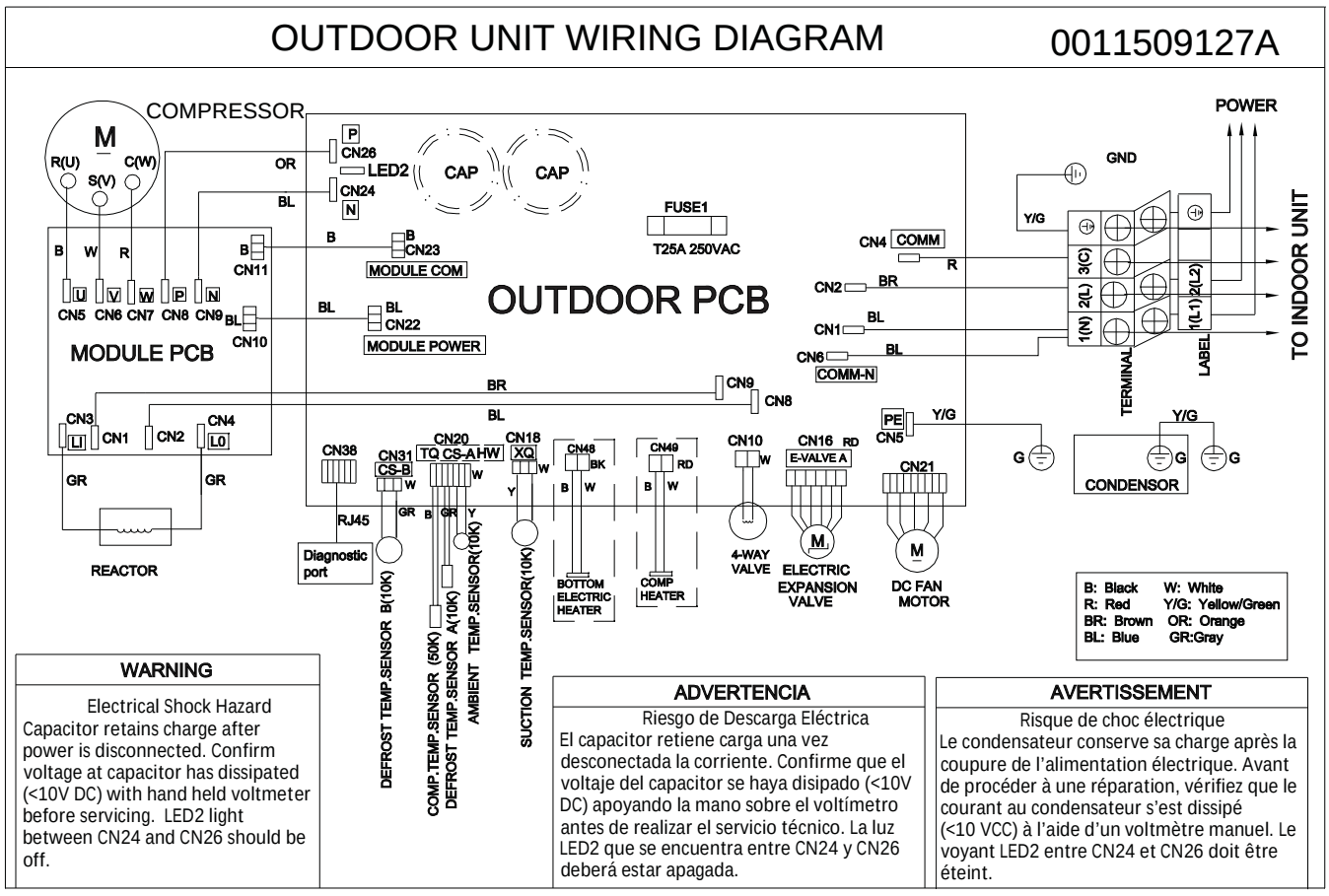
ADVERTENCIA

Riesgo de Descarga Eléctrica
El capacitor retiene carga una vez desconectada la corriente. Confirme que el voltaje del capacitor se haya disipado (<10V DC) apoyando la mano sobre el voltímetro antes de realizar el servicio técnico. La luz LED2 que se encuentra entre CN24 y CN26 deberá estar apagada.

AVERTISSEMENT

Risque de choc électrique
Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

12-18K



WARNING

Electrical Shock Hazard
Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.

ADVERTENCIA

Riesgo de Descarga Eléctrica
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AVERTISSEMENT

Risque de choc électrique
Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

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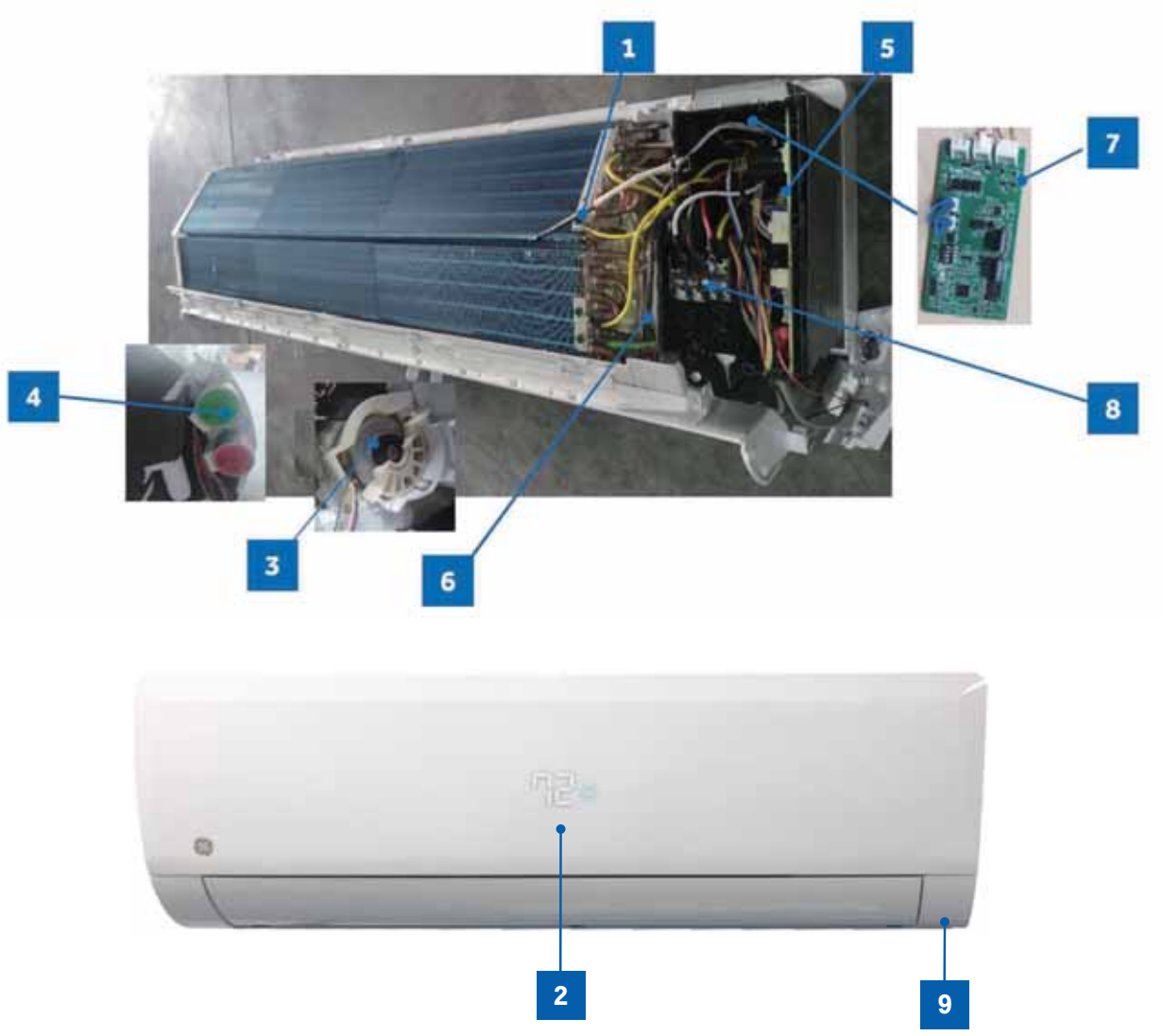
COMPONENTS

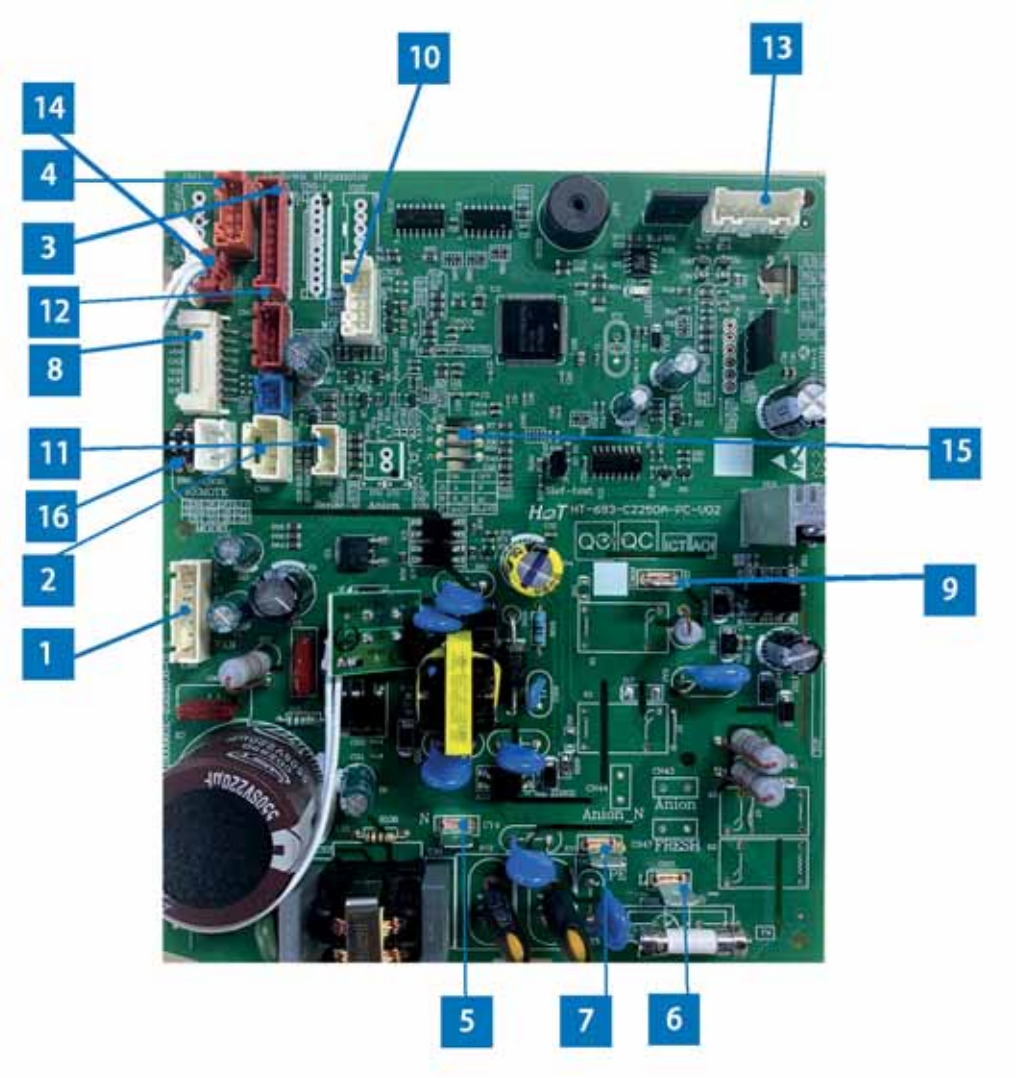
The indoor unit is mounted high on the wall to provide comfort and air movement within the conditioned space. Features of the system include: Variable speed blower operation that speeds up and slows down with changes in demand, moving louvers to direct air, indoor air temperature sensing, evaporator 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. Main Control Board
6. Piping Temperature Sensor
7. Power Supply Board
8. Terminal Block
9. Occupancy Sensor

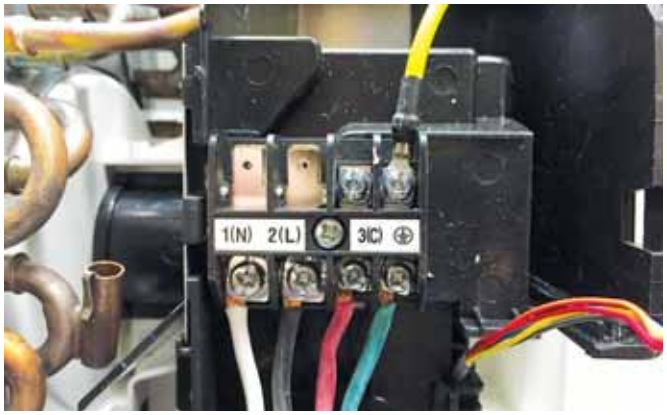


PCB



1	CN9: Connector for fan motor
2	Connector for coil temperature sensor and room temperature sensor
3	CN5: Connector for UP/DOWN STEP motor
4	CN11: Connector for LEFT/RIG HT STEP motor
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

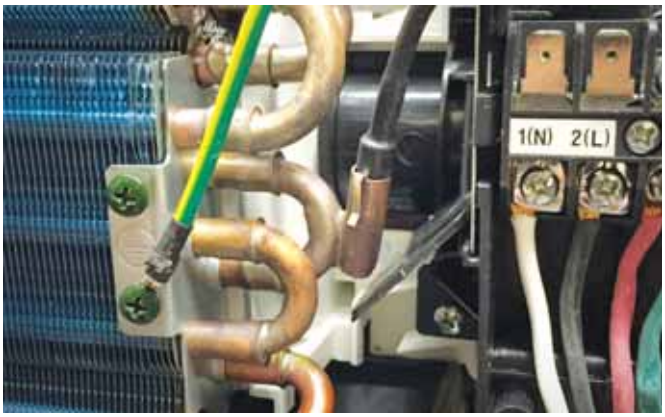
The Ambient (room) Temperature Sensor is a negative coefficient thermistor that will decrease in resistance with increases in room air temperature. The sensor is located on a clip mounted in the return air stream.

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.

Stepper Motors

The stepper motors move 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

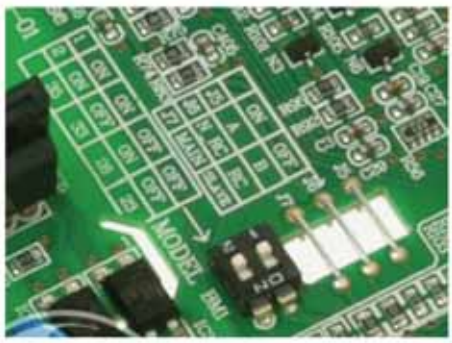
If the remote control is non-functional, the Emergency Button can be used. 73 -78^{O}F will be maintained, until commands are received via the remote control.

DIP Switch & Jumpers

The PCB DIP Switch and Jumper must be configured when replacing the PCB, according to the model of the unit, as following:

	CAPACITY SETTING		DISPLAY SETTING	
	BM1-1	BM1-2	J1	J2
9K	OFF	OFF	UNCUT	CUT
12K	OFF	ON	UNCUT	CUT
18K	ON	OFF	UNCUT	CUT

- J5 jumper: Uncut. Function not available in this model.
- 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.



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.

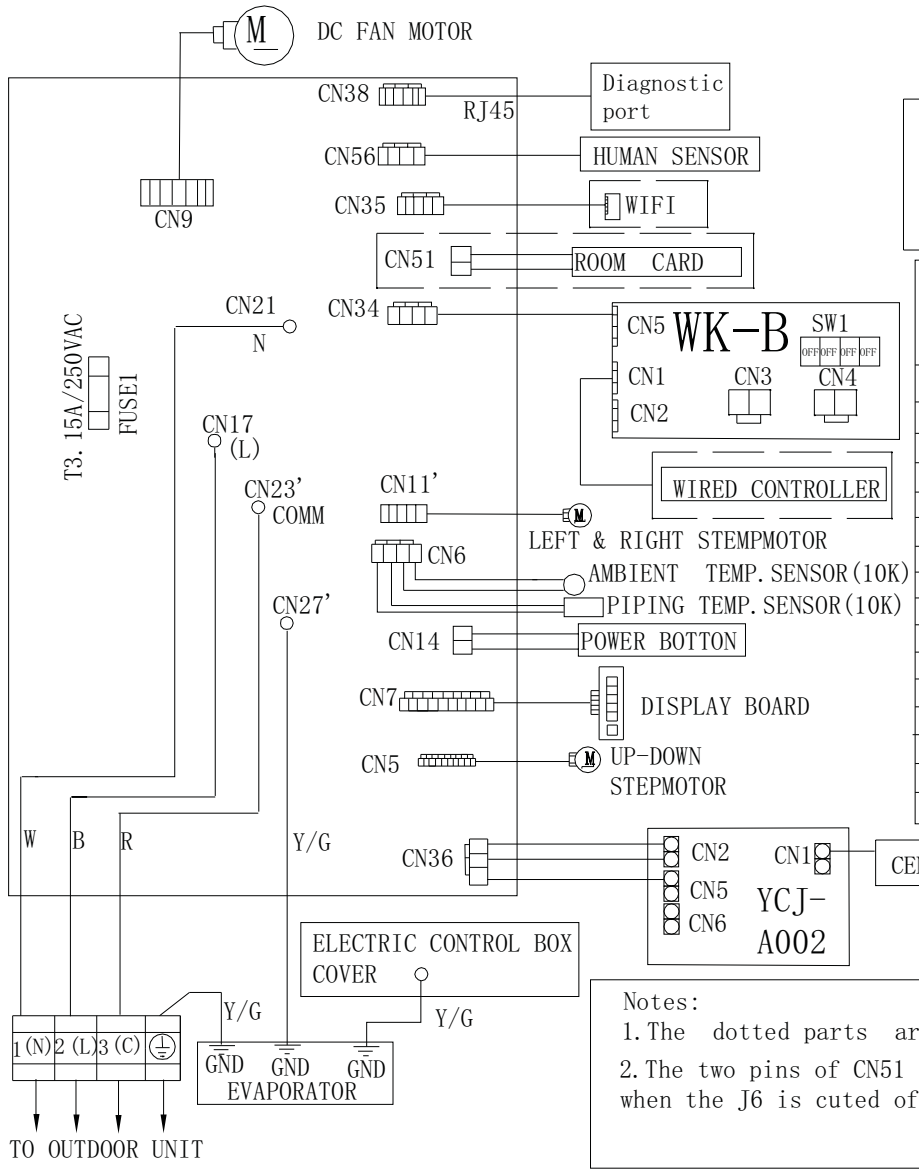
	Red	Orange	Yellow	Pink	Blue
Red	-	296.5 Ω	295.5 Ω	296.3 Ω	296.1 Ω
Orange	-	-	594.5 Ω	595.5 Ω	594.5 Ω
Yellow	-	-	-	594.3 Ω	594.5 Ω
Pink	-	-	-	-	594.3 Ω
Blue	-	-	-	-	-

Step 3

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

INDOOR UNIT DIAGRAM

0011509128



R:Red B:Black
W:White BL:Blue
Y:Yellow BR:Brown
Y/G:Yellow/Green

Unit No.	SW1 DIP Switch position (1 2 3 4)
0	off off off off
1	off off off on
2	off off on off
3	off off on on
4	off on off off
5	off on off on
6	off on on off
7	off on on on
8	on off off off
9	on off off on
10	on off on off
11	on off on on
12	on on off off
13	on on off on
14	on on on off
15	on on on on

Notes:
1. The dotted parts are optional.
2. The two pins of CN51 should be shorted, when the J6 is cuted off.

Model selection:

09K	model-23 code - BM1	- 1 off	2 off
12K	model-26 code - BM1	- 1 off	2 on
18K	model-33 code - BM1	- 1 on	2 off

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

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.

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USYM09UCDSA
USYM12UCDSA
USYM18UCDSA

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.

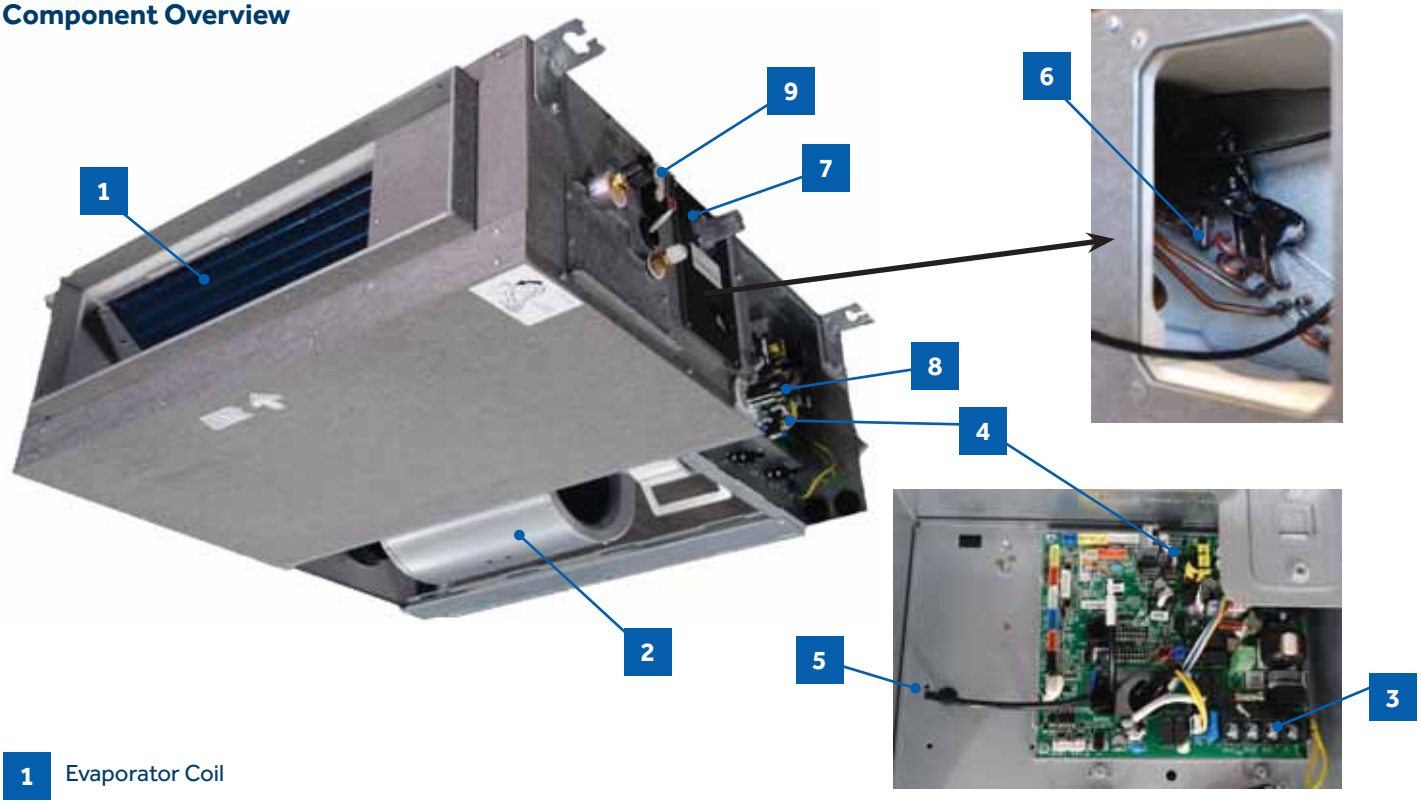
These units have a built in condensate pump with an associated condensate level switch. The condensate pump is capable of lifting water out of the indoor unit. If high water lift is needed, the water from the cassette pump should be pumped into a field supplied condensate pump with high lift power.

The layout of the system is very straightforward and components are easily accessed should service be required. 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 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 to the ECU for calculation of inverter capacity and temperature control.

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 for Anti Freezing and Anti Cold Blow cycles. The sensor also provides critical temperature information to the ECU that may be used in frequency adjustments.

7 Condensate Pump

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

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. The float switch requires no maintenance.

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.

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 ECU. The indoor board has some limited diagnostic capability which will be covered in this manual.

1 **CN17:** GEA3 WiFi module socket

2 **CN6:** DC fan motor socket

3 **CN10:** Fresh air link/E.A.O socket

4 **CN-4:** Relay for auxiliary heater link (Dry contact,rating-230VAC ,3A)

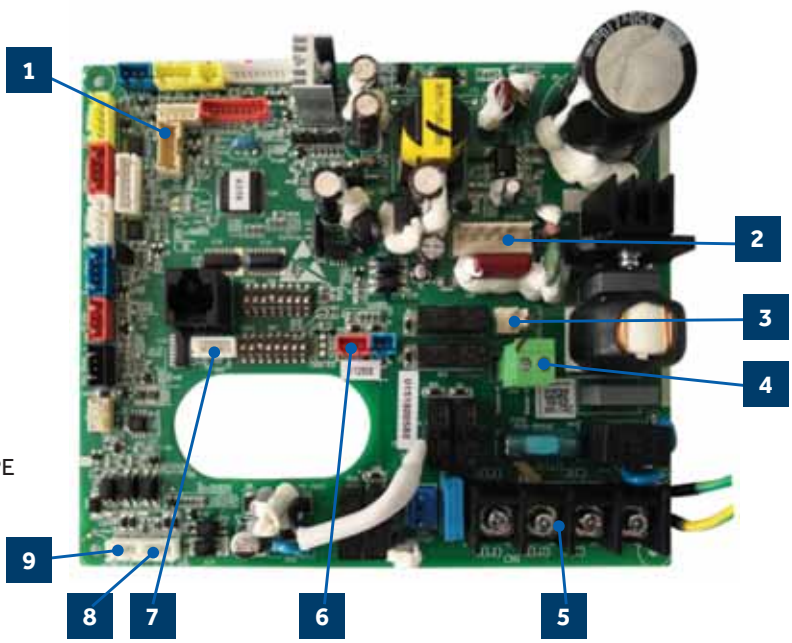
5 **CN1:** Power terminal block

6 **CN19:** Float switch socket

7 **CN3:** Temperature sensor socket (Tr:ROOM SENSOR, Tp:PIPE SENSOR)

8 **CN22-1:** Wired controller socket2

9 **CN22:** Wired controller socket1



The Indoor Unit Circuit Board communicates with the outdoor unit ECU 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 to CH- 1 and CH-2 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 wired controller will be energized. Check the wired remote controller connection is seated properly and then check line voltage.

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

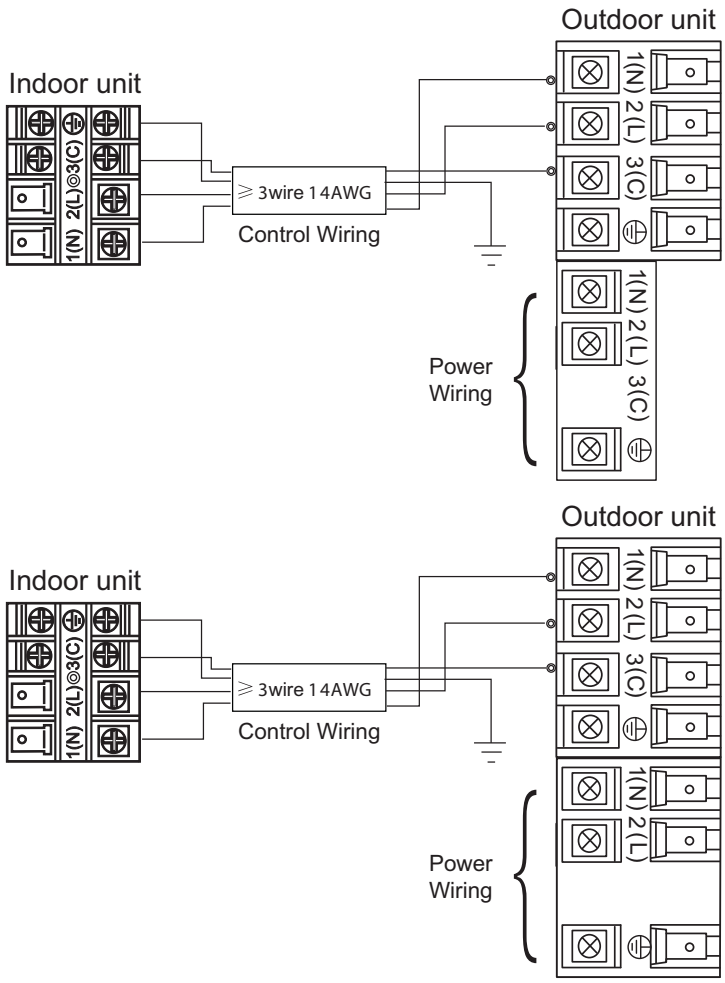
This control board has control over the fan louver movement, manual fan blower control, indoor coil temperature and indoor air temperature sensing functions. All operational decisions are controlled by the OUTDOOR UNIT ECU.

The control board has a replaceable 5A 250V fuse that protects against excessive current. If power is present at the board but the board does not work, check for continuity through the fuse. Replace if the fuse is open.

The indoor unit temperature sensors are connected at Plug CN-13. 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 motor connects to the circuit board at Plug CN-14, CN-15 and CN-16. The motors are located in the louver assembly.

The blower motor is connected to the circuit board at plug CN-6.



Condensate Pump Logic

The pump is connected to the circuit board on Plug CN-9. The pump is energized whenever the Float Switch opens, indicating that the water needs to be pumped out from the unit. The float switch connects onto the circuit board via Plug CN-19.

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 wireless or 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 controller (wired controller or wireless remote controller)
- Indoor unit has been via the 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 following occurs:

- Fresh air function is canceled via the controller (wired controller or wireless remote controller)
- Indoor unit has been 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 controller (wired controller or wireless remote controller)
- Indoor unit has been via the 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.

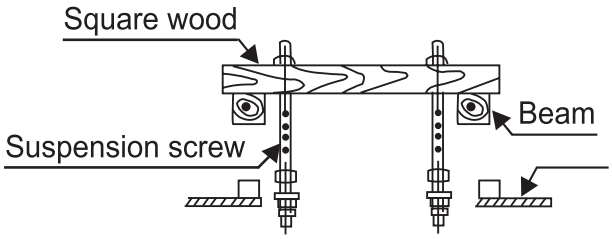
When this function is enabled and the Indoor Unit is ON, the unit will proceed Continuous Fresh Air, keeping the Indoor Fan Motor energized even if the compressor is stopped or the IDU reaches it's real setpoint temperature (real setpoint=customer set point + compensation point).

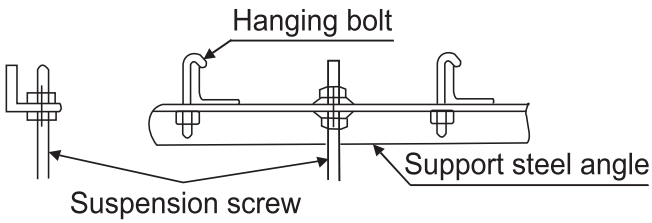
Notes:

- *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

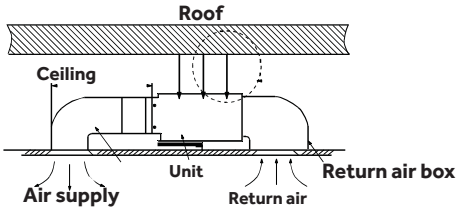
Here are the typical duct configurations that can be used with the unit. 3/8" thread suspension screws are recommended.

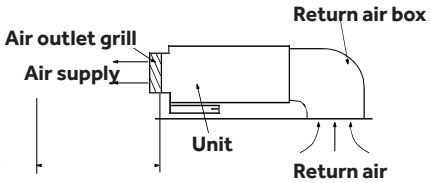




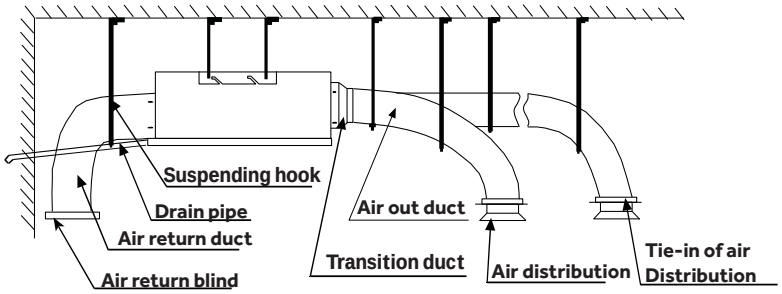
Ductwork Installation

Roof Installation

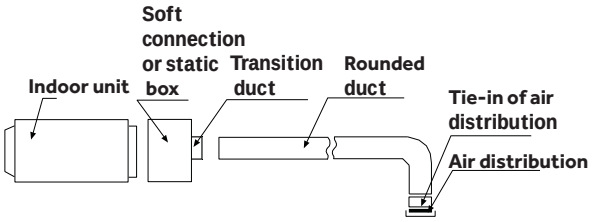


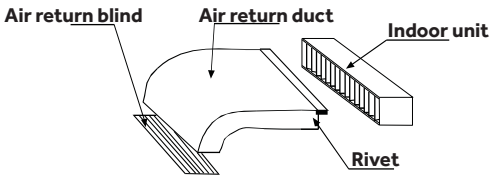


Long Duct



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

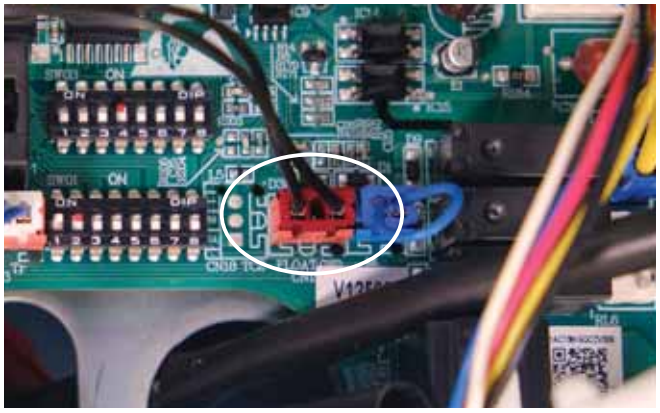




Test Condensate Pump and Associated Float Switch

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.)



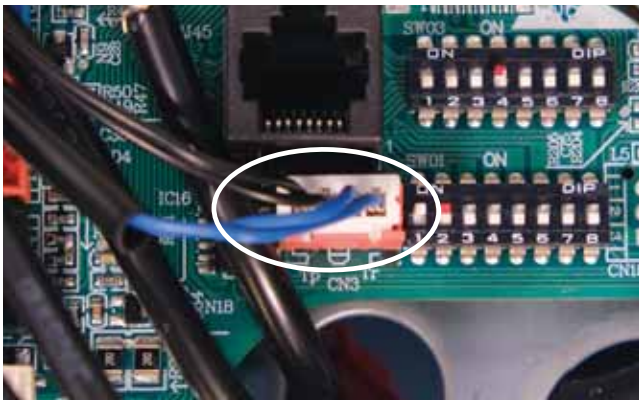
3. The pump should start.
4. If the pump does not start, check for voltage at the pump control board connection. There should be 230 Volts AC to the pump. If there is not, the circuit board is defective. If there is proper voltage to the pump, either the pump or associated pump wiring is defective.

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.)

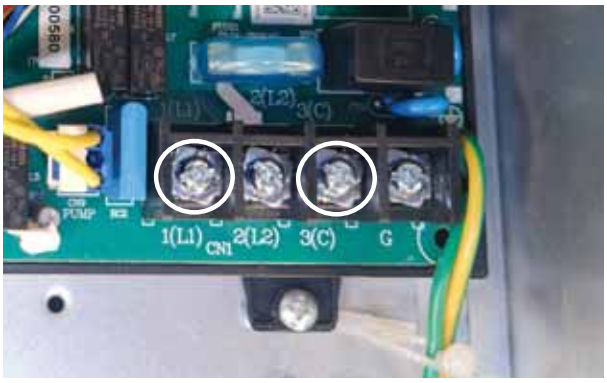
Testing Communication Circuit

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. 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.

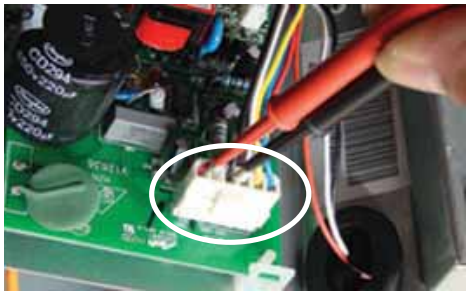
Indoor Fan Motor Voltage Check

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.

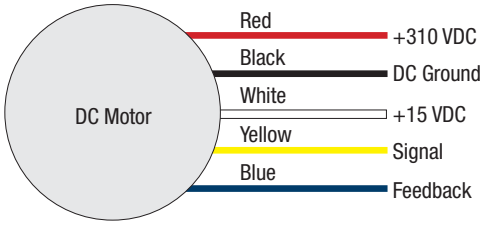
Motor Test:

1. If the motor doesn't run, check for 310VDC between Pins 1 and 3. If it is not present, the indoor board is bad. If voltage is present, continue on.



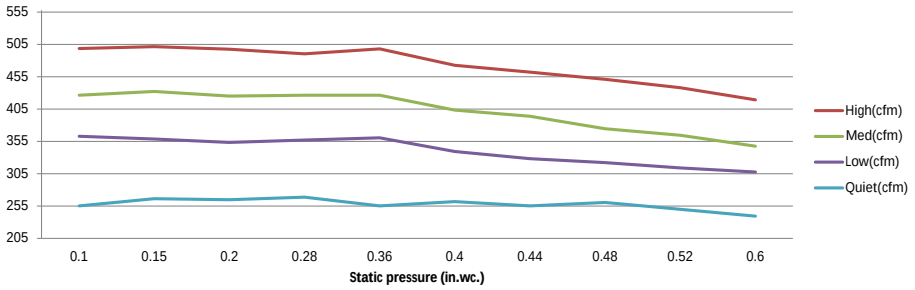
2. Check the voltage between Pins 3 and 4. The voltage should be +15VDC. If it is not present, the board is bad. If voltage is present, continue on.

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.

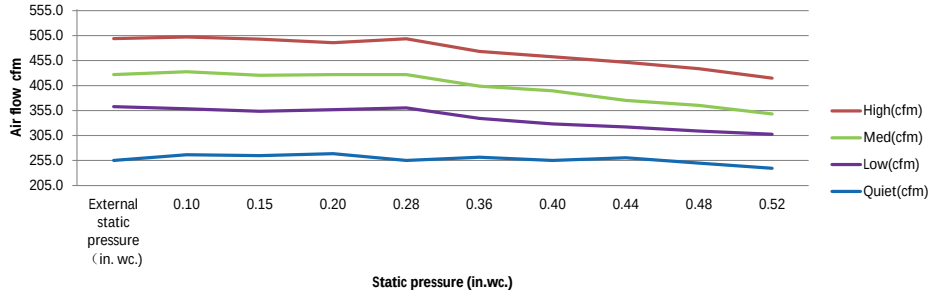


Static Pressure Charts

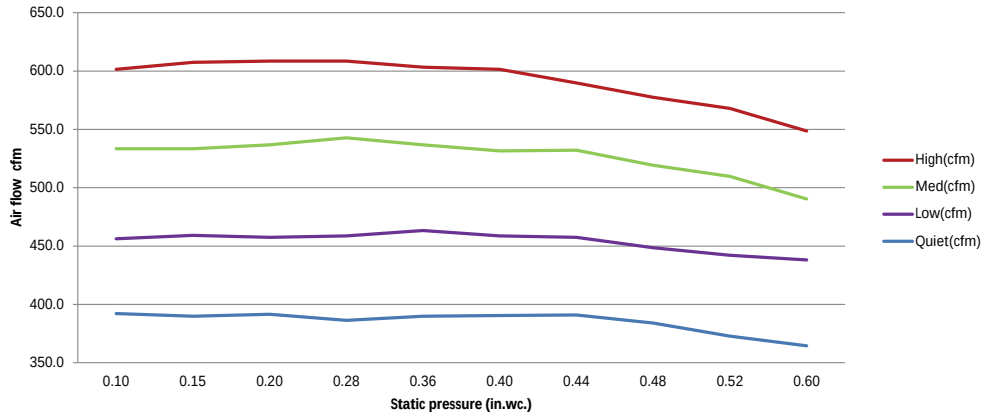
USYM09UCDSA



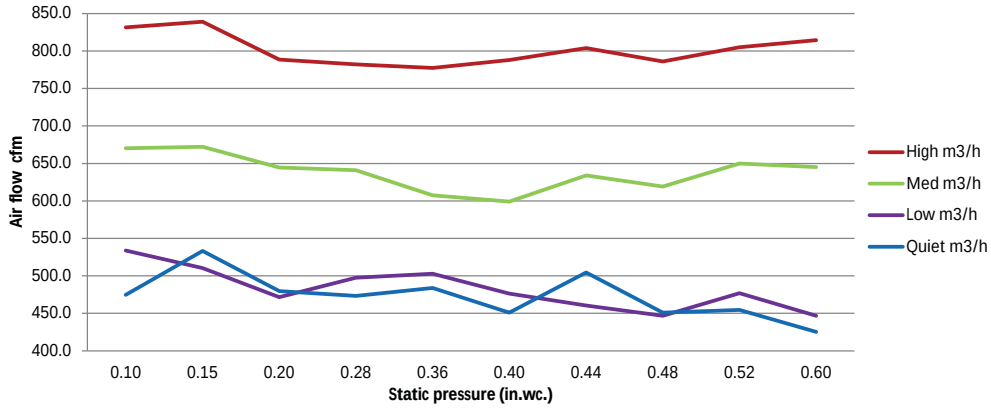
USYM12UCDSA



USYM18UCDSA



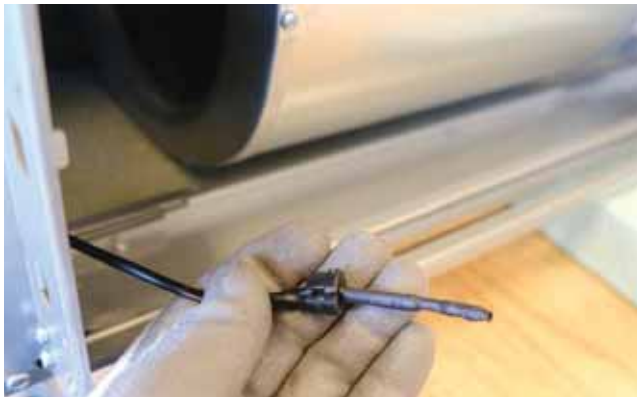
USYM24UCDSA



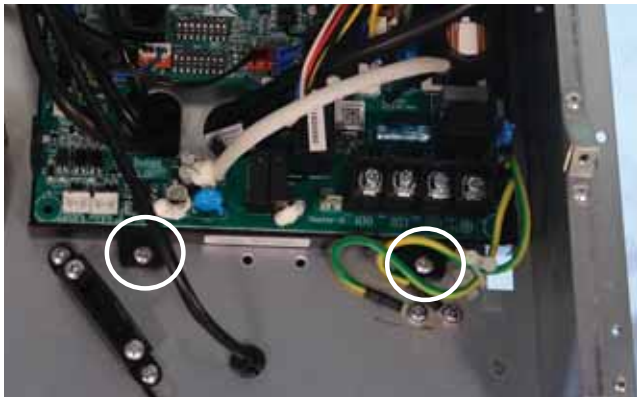
Board Replacement

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

1. Remove the ambient sensor.

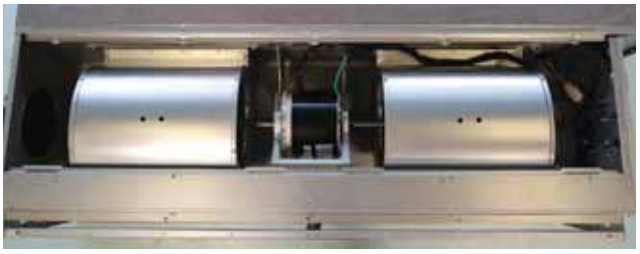


2. Unplug all connectors from the board.
3. Remove the 2 board mounting screws and remove the board.



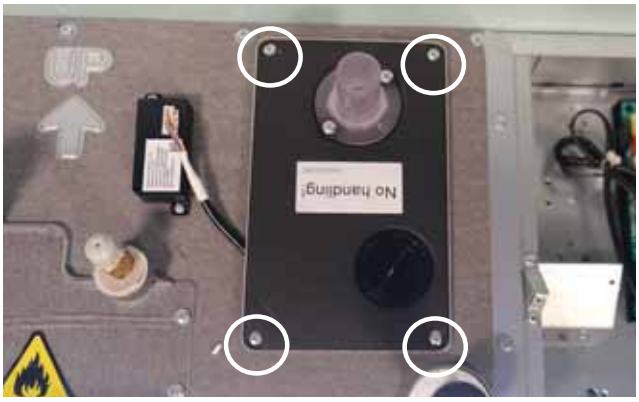
Removing the Condensate Pump

1. Remove the air inlet cover.

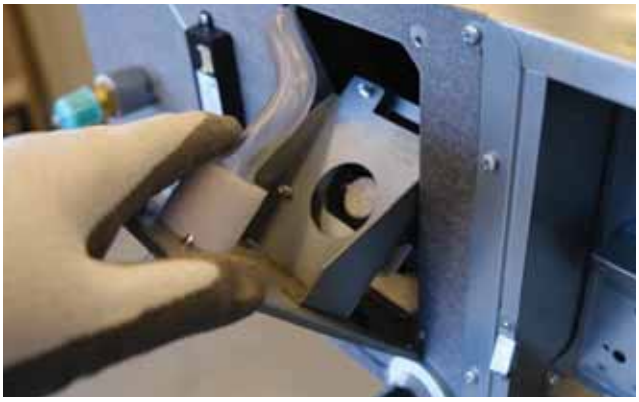


2. Unplug the pump motor and float switch wires from within the air inlet

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



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

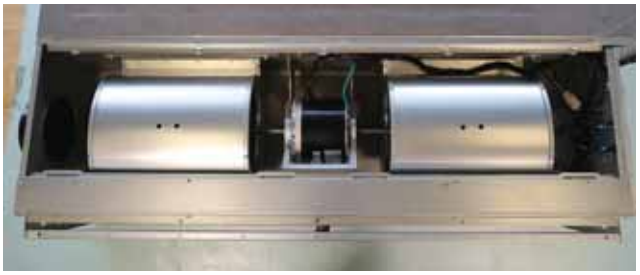


5. Pull wires through rubber grommets and remove pump assembly

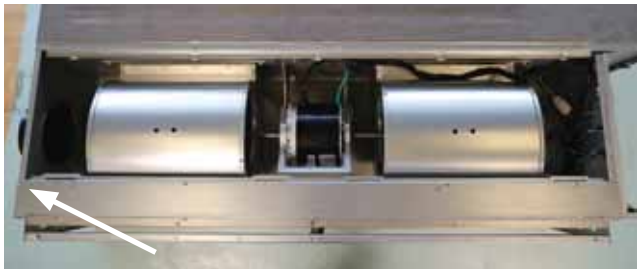
Removing Fan Motor

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

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

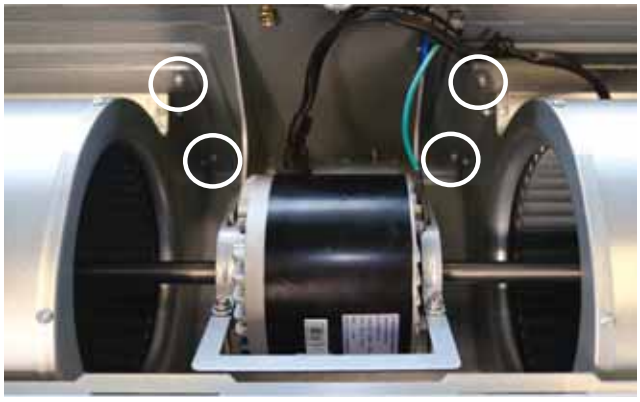


5. Remove the corner bracket.

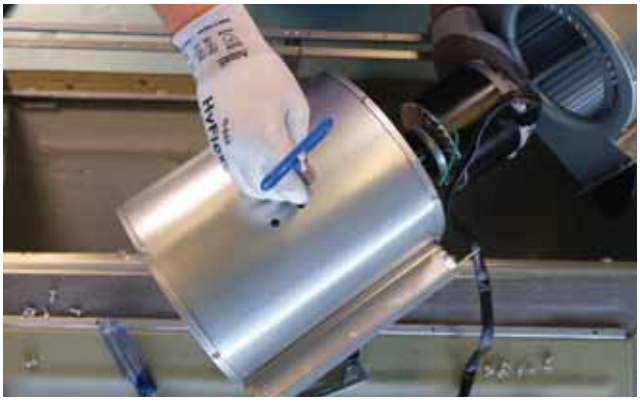


6. Remove the ground screw and free the motor wire harness.

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.

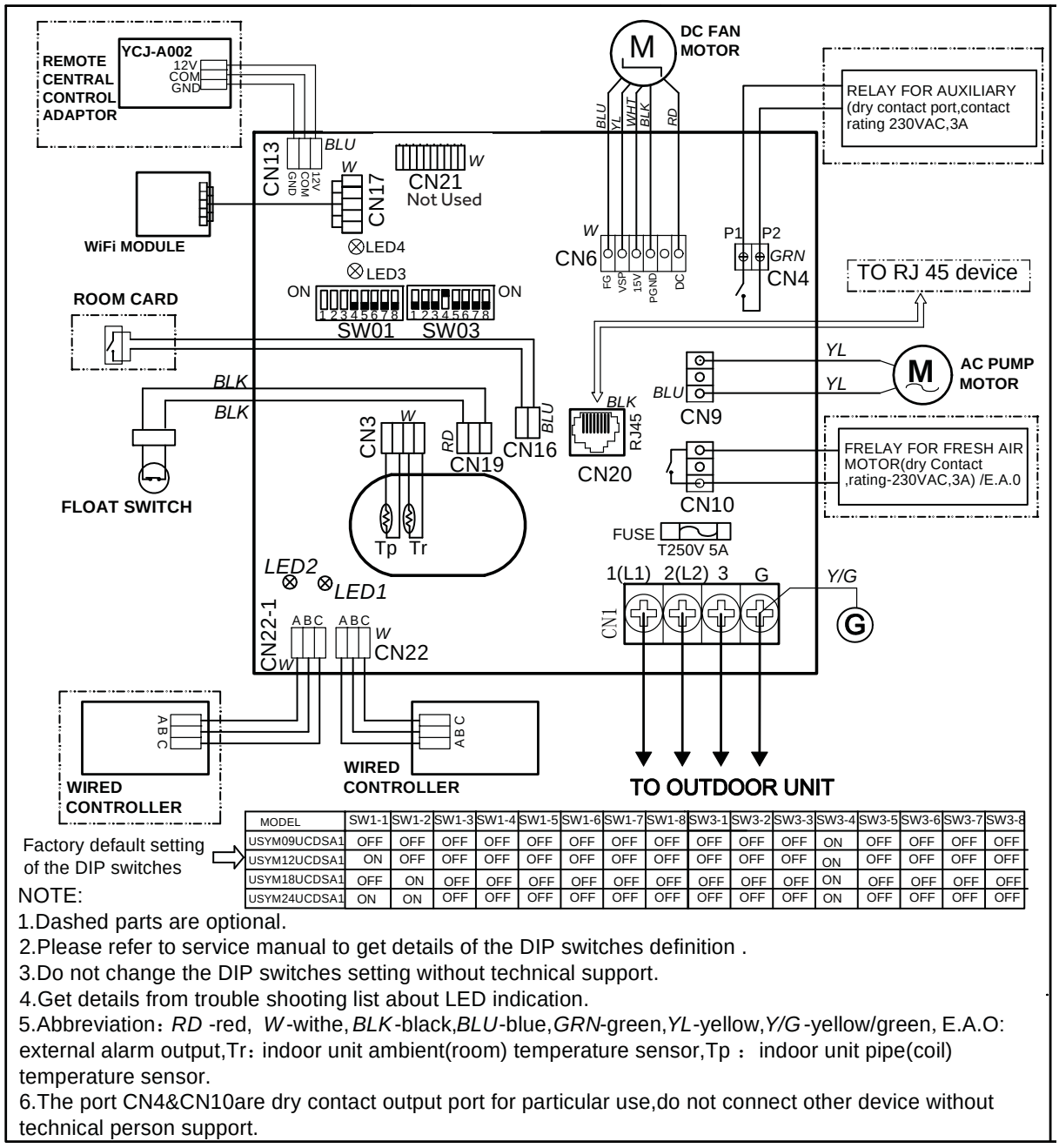


Replacing WiFi Module

1. Unplug existing WiFi module.

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

WIRING DIAGRAM



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
USYM09UCDSA1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM12UCDSA1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM18UCDSA1	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
USYM24UCDSA1	ON	ON	OFF	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.

0151539442

SW1 DIP Switch Settings

Description	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
Capacity: 9000btu/h	OFF	OFF	OFF	---	---	---	---	---
Capacity: 12000btu/h	ON	OFF	OFF	---	---	---	---	---
Capacity: 18000btu/h	OFF	ON	OFF	---	---	---	---	---
Capacity: 24000btu/h	ON	ON	OFF	---	---	---	---	---
Room card invalid	---	---	---	OFF*	---	---	---	---
Room card valid	---	---	---	ON	---	---	---	---
Heat pump	---	---	---	---	OFF*	---	---	---
Cooling only	---	---	---	---	ON	---	---	---
Fresh air valid	---	---	---	---	---	OFF*	---	---
External alarm output	---	---	---	---	---	ON	---	---
Without filter clean warning	---	---	---	---	---	---	OFF*	---
With filter clean warning	---	---	---	---	---	---	ON	---
North America area	---	---	---	---	---	---	---	OFF*
Non-North America area	---	---	---	---	---	---	---	ON

*Factory Default Setting

SW3 DIP Switch Settings

Description	SW3-1	SW3-2	SW3-3	SW3-4
Special fresh air (Canadian ventilation mode, Canada particular Area) invalid	OFF*	---	---	---
Special fresh air (Canadian ventilation mode, Canada particular Area) valid	ON	---	---	---
Console/MESP Duct	---	OFF*	---	---
Cassette (Reserved)	---	ON	---	---
Auxiliary heater invalid	---	---	OFF*	---
Auxiliary heater valid	---	---	ON	---
ESP grade 0-4 level	---	---	---	OFF
ESP grade 0-10 level	---	---	---	ON*

*Factory Default Setting

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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AB09SC2VHA
AB12SC2VHA
AB18SC2VHA

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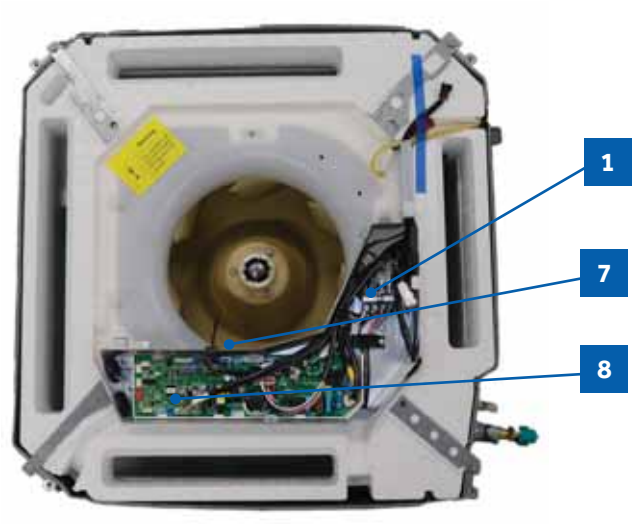
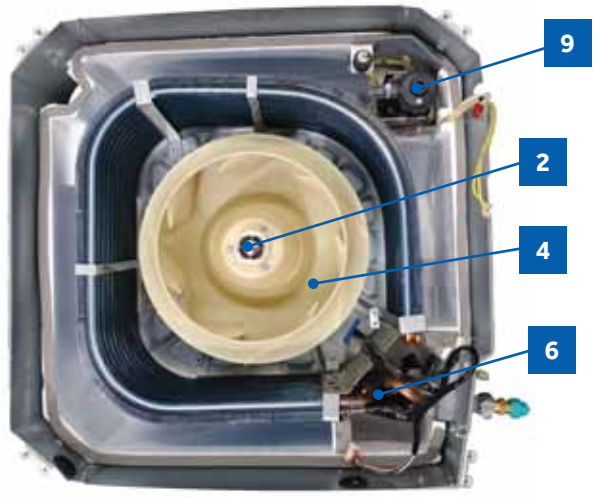
COMPONENTS

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.

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 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 ECU.

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 for Anti Freezing and Anti Cold Blow cycles. The sensor also provides critical temperature information to the ECU that may be used in frequency adjustments.

7 Ambient Temperature Sensor

The Ambient Temperature Sensor senses room temperature. This sensor provides room temperature information to the ECU for calculation of inverter capacity and temperature control.

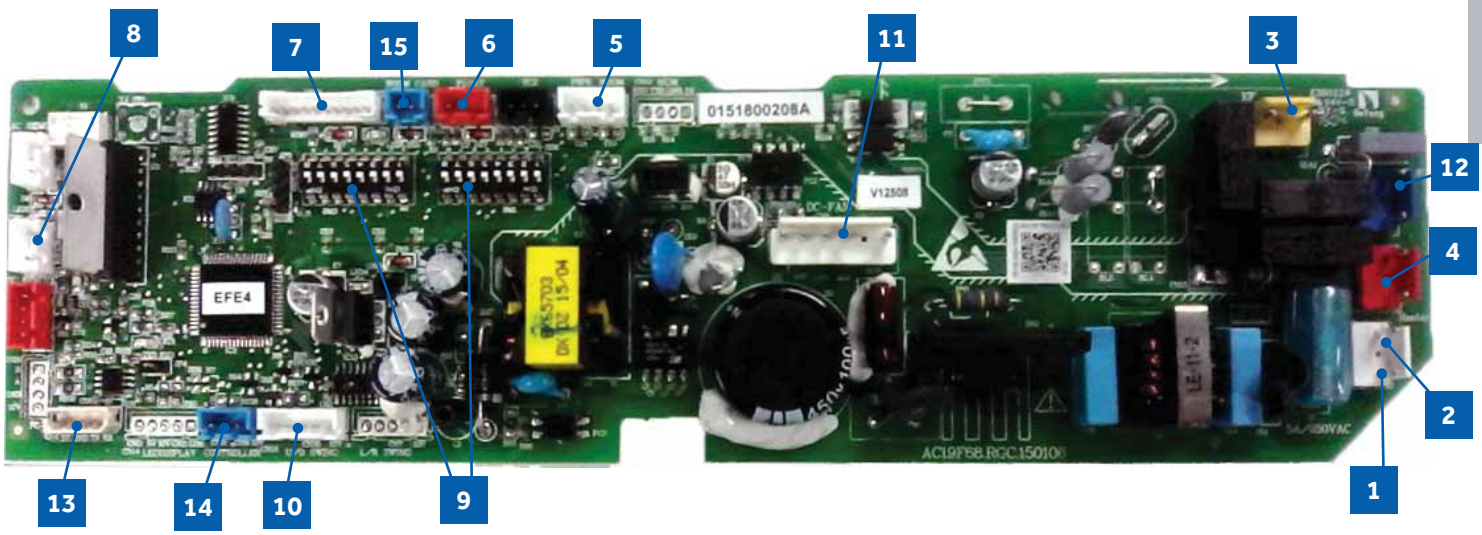
Both sensors are negative temperature coefficient type that reduce electrical resistance as temperature rises.

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 ECU. The indoor board has some limited diagnostic capability which will be covered in this manual.

9 Condensate Pump & Float Switch

Cassette Unit Indoor Circuit Board



1	N Terminal	**6**	**CN19:** Float Switch	**11**	**CN6:** Fan Motor
2	L Terminal	**7**	**CN21:** Louver Panel	**12**	**CN9:** Condensate Pump
3	Communication Terminal	**8**	**CN11:** Wired Remote	**13**	**CN4:** U-HOME
4	3.15A 250V Fuse	**9**	DIP Switches	**14**	**CN13:** Remote Central
5	**CN3:** Pipe/Room Temp Sensors	**10**	**CN35:** Stepper Motor	**15**	**CN1:** Room Card

The indoor unit circuit board controls the switching functions of the indoor unit. All control decisions are made by the outdoor unit ECU. The indoor board has some limited diagnostic capability which will be covered in this manual.

The Indoor Unit Circuit Board communicates with the outdoor unit ECU 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 ECU.

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 to CH- 3 and CH-4 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. If power is present at the board but the board does not work, check for continuity through the fuse. Replace if the fuse is open.

The indoor unit temperature sensors are connected at Plug CN-13. 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 via a connection at Plug CN-29.

There is one motor that controls the movement of the louvers. The motor connects to the circuit board at Plug CN-14. The motor is located in the over of the louver assembly.

The blower/fan motor is connected to the circuit board at plug CN-11.

The Cassette unit has a built in condensate pump. The pump is connected to the circuit board on Plug CN-9. The pump is energized whenever the Float Switch indicates that water needs to be pumped from the cassette. The float switch connects onto the circuit board via Plug CN-18.

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.

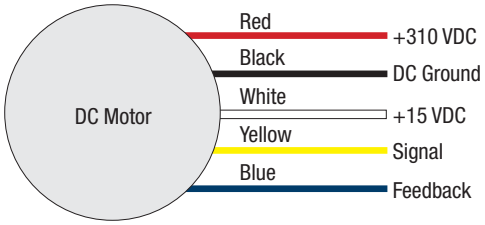
Indoor Fan Motor Test Procedure

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

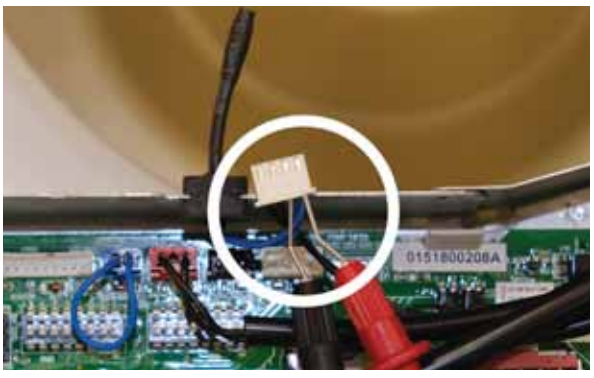
The easiest problems to solve will involve codes that are related to potential failure of temperature sensors. Common problems may include loose connections, open electrically, and out of calibration. Checking the condition of the sensors requires a temperature probe and an ohmmeter.

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.)

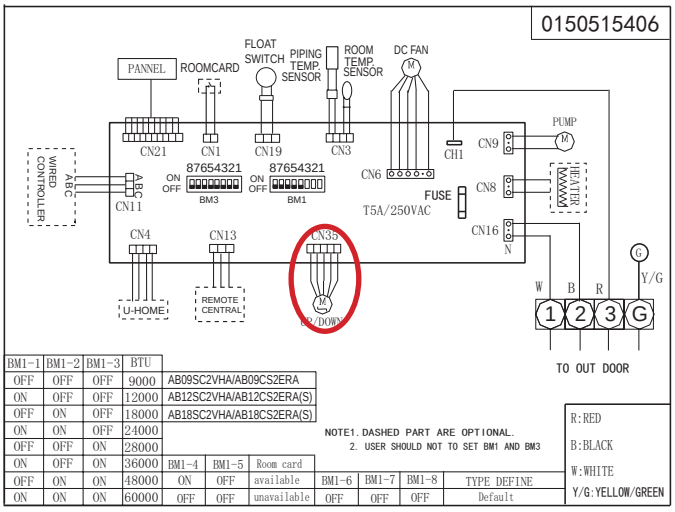


Testing Louver Motors

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.



BM1-1	BM1-2	BM1-3	BTU	
OFF	OFF	OFF	9000	AB09SC2VHA/AB09CS2ERA
ON	OFF	OFF	12000	AB12SC2VHA/AB12CS2ERA(S)
OFF	ON	OFF	18000	AB18SC2VHA/AB18CS2ERA(S)
ON	ON	OFF	24000	
OFF	OFF	ON	28000	
ON	OFF	ON	36000	
OFF	ON	ON	48000	
ON	ON	ON	60000	

BM1-4	BM1-5	Room card
ON	OFF	available
OFF	OFF	unavailable

BM1-6	BM1-7	BM1-8	TYPE DEFINE
OFF	OFF	OFF	Default

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.

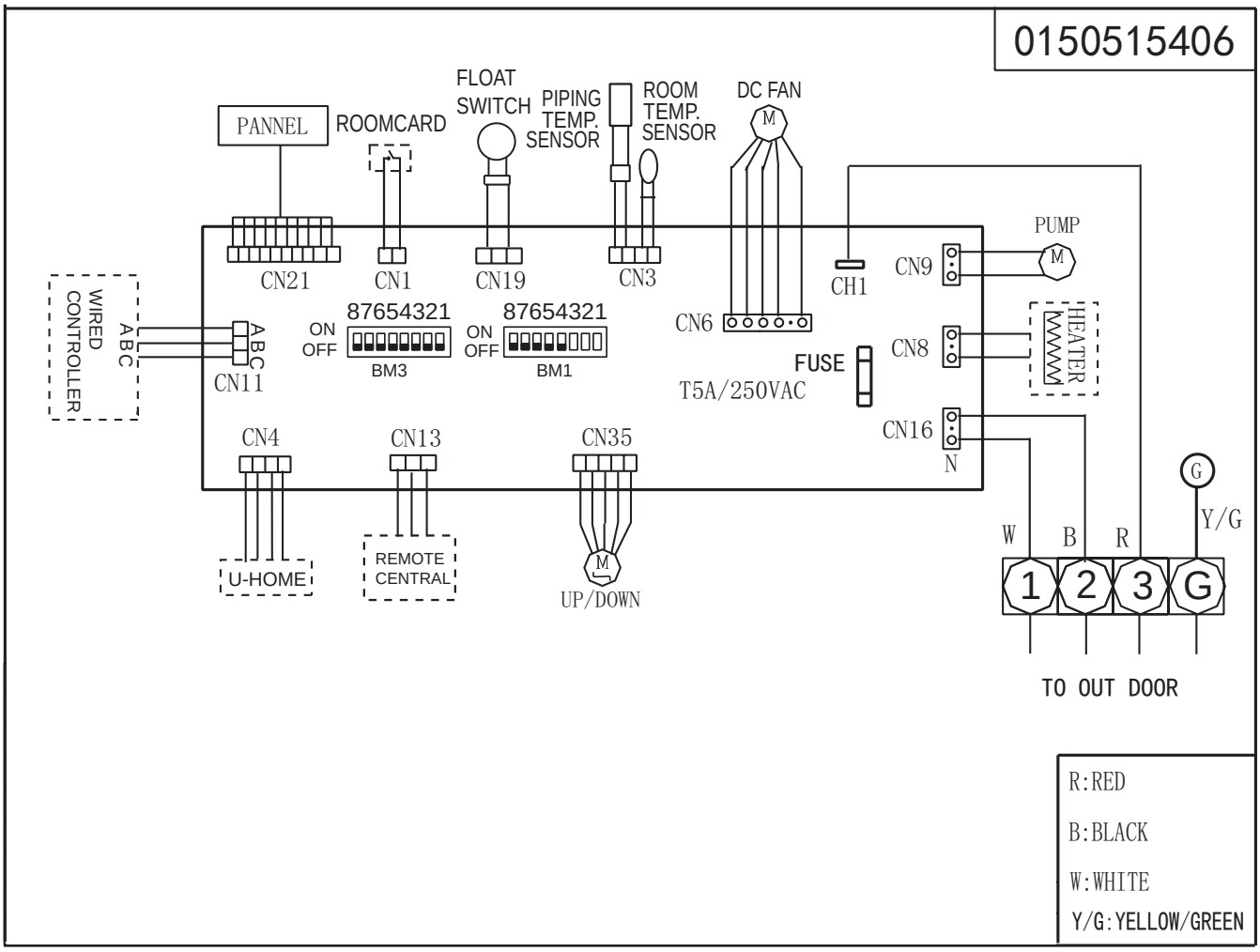
2. The voltage should fluctuate between 8VDC and 23VDC. The fluctuating signal indicates a good communication path.
3. If the voltage does not fluctuate, and the wiring is good, the indoor board is defective.

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.



BM1 DIP Switch Settings

BM1-1	BM1-2	BM1-3	BM1-4	BM1-5	BM1-6	BM1-7	BM1-8	Description
OFF	OFF	OFF	--	--	--	--	--	Unit capacity: 9000
ON	OFF	OFF	--	--	--	--	--	Unit capacity: 12000
OFF	ON	OFF	--	--	--	--	--	Unit capacity: 18000
--	--	--	OFF	--	--	--	--	Room card invalid(default)
--	--	--	ON	--	--	--	--	Room card valid
--	--	--	--	OFF	--	--	--	Heat pump(defult)
--	--	--	--	ON	--	--	--	Cooling only
--	--	--	--		OFF	OFF	OFF	Cassette(American)

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

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)
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	/	/

USYF09UCDWA
USYF12UCDWA
USYF18UCDWA

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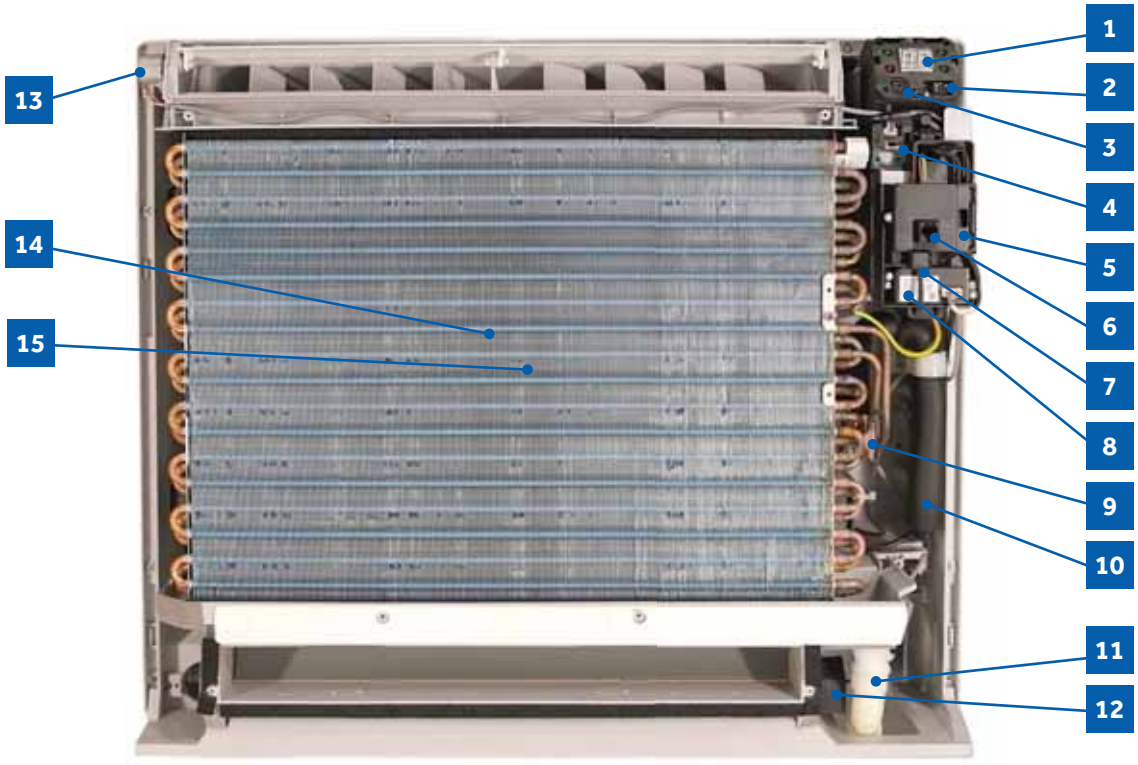
COMPONENTS

The indoor console unit functions as an evaporator coil during cooling mode, and as a condensing coil during heat mode. Condensate is collected by a drain pan below the coil and condensate is drained directly to the outdoor or to a secondary condensate pump via the provided condensate drain line

Console units may be operated with either a wired remote control or the wireless remote control provided with the unit.

Component Overview



1 Display

The indoor unit display communicates system mode, but does not display temperatures or diagnostic codes. This information is indicated on the wired or wireless control.

When servicing a diagnostic error always refer to the outdoor unit code.

2 IR Receiver

3 Power Switch

4 Lower Damper Control

5 Control Board Box

6 Diagnostic Port

7 Ambient Sensor

The Ambient Temperature Sensor senses room temperature. This sensor provides room temperature information to the ECU for calculation of inverter capacity and temperature control.

8 WiFi Module

9 Coil Sensor

The Coil Temperature Sensor senses indoor coil temperature in the cooling mode and in the heating mode. This sensor is used for Anti Freezing and Anti Cold Blow cycles. The sensor also provides critical temperature information to the ECU that may be used in frequency adjustments.

10 Flare Connections

11 Condensate Drain

12 Lower Damper Motor

13 Upper Louver Motor

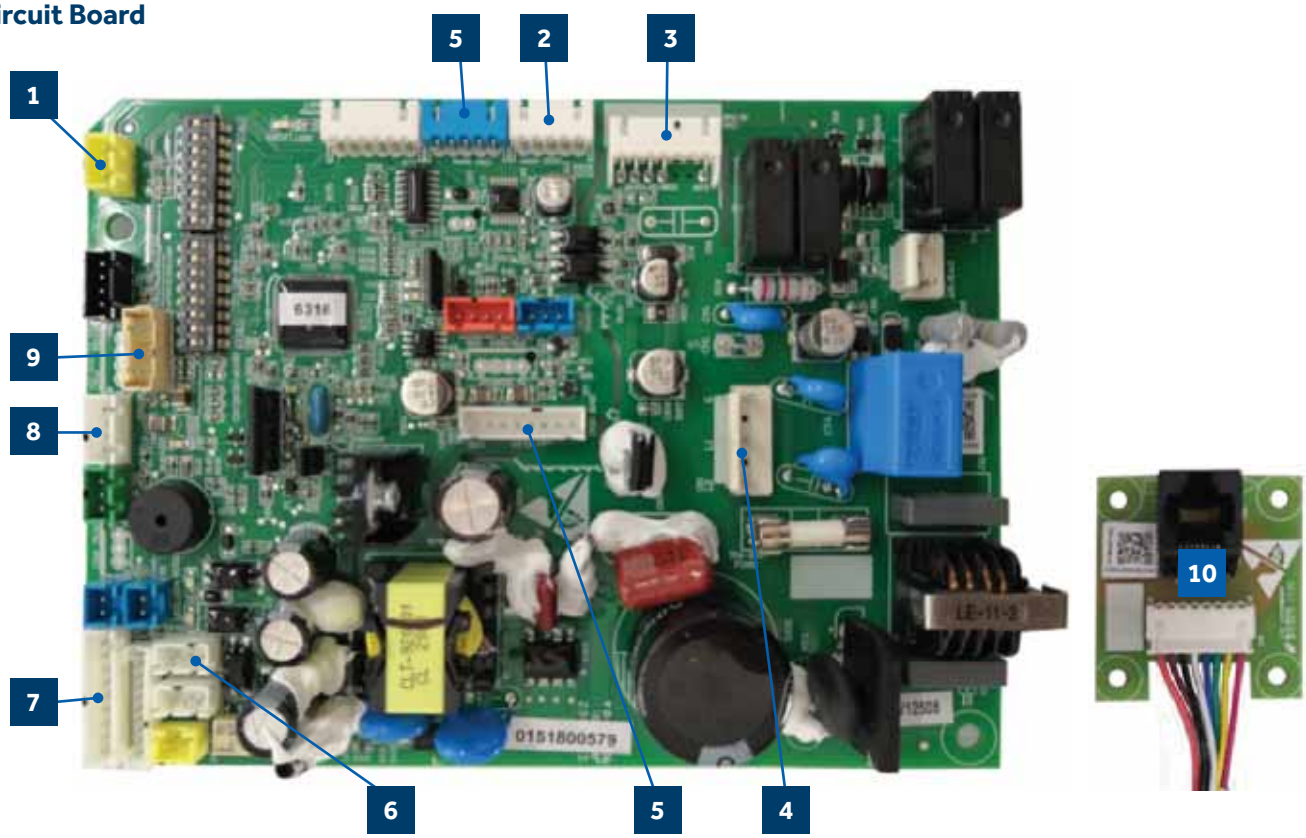
The louver motor is a stepper type motor that moves the louver left/right. The motor is controlled by a pulsed voltage that cannot be measured. If the louver does not move when it should, check for a bind in the louvers.

14 Blower Fan (behind coil)

15 Blower Motor (behind coil)

The indoor unit features a multi-speed blower motor that will change speed to match the capacity demand from the outdoor unit. The blower motor is controlled by both the remote control and by commands from the outdoor unit ECU

Indoor Circuit Board



1. **SW2:** Damper switch
2. **CN35:** Lower damper motor
3. **CN6:** DC fan motor
4. Power supply
5. **CN20:** Diagnostic port
6. **CN22:** Optional wired controller
7. **CN31:** Display
8. **CN3:** Temperature sensor socket (Tr: ROOM SENSOR, Tp:PIPE SENSOR)
9. **CN17:** WiFi module
10. RJ45 Smart HQ adapter board

The indoor unit circuit board controls the switching functions of the indoor unit. All control decisions are made by the outdoor unit ECU. The indoor board has some limited diagnostic capability which will be covered in this manual.

The indoor unit Circuit Board communicates with the outdoor unit ECU via a connection at terminal block screw 3. The data pulse that sends the communication information can be measured with a voltmeter set to DC voltage range. From the ground connection at the terminal block to the number 3 screw, voltage should pulse up and down when data is transmitted.

Line voltage to power the indoor unit is made on terminal block connections 1 and 2. Power connects from these terminal connections to CH-3 and CH-4 on the circuit board. If the board does not respond to command 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. If power is present at the board but the board does not work, check for continuity through the fuse. Replace if the fuse is open.

The indoor unit sensors are connected at plug CN-13. When testing the calibration of these sensors the wires can be released from the plug by pressing the tension tab on the side of the plug.

The receiver/display unit, mounted on the front cover of the indoor unit plugs connects to the circuit board at location CN-29.

The blower/fan motor connection is located at plug CN-11.

Removing the Filter Cover & Filter

1. Slide the side latches up to unlock the cover and pull forward about an inch then lift up.

2. The filter is very flexible and can be grabbed at any location and removed.

Front Cover Removal

1. Remove the 4 screws that are at the corners of the air intake opening. Gently open the horizontal louver. Lift up the top edge of the front cover and then pull forward.

Control Box Removal

1. Remove the screw from the right side of the box cover.

2. Lift up the panel that contains the diagnostic port, WiFi module and ambient sensor. And remove the box cover.

3. Unplug the three connectors for the fan motor, upper louver and bottom damper.

4. Remove the ground screw.

5. Remove the mounting screw for the box.

6. The box can now be removed.

Board Replacement

1. Follow the instructions for removing the control box.
2. Remove the cover screw from the bottom of the box, then remove cover.

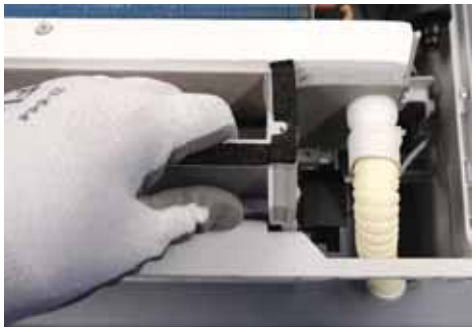
3. Take note of connection location and carefully remove each connector.
4. Remove the 2 screws mounting the board in the box. They in diagonal corners from each other.

Upper Louver Removal

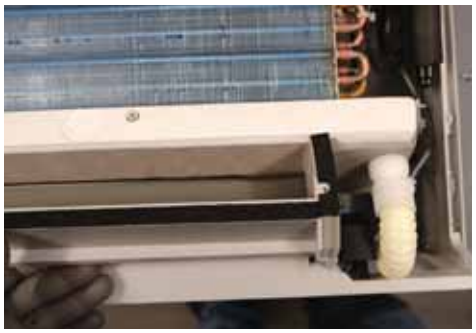
1. Remove the filter cover and front cover.
2. Locate and remove the two screws mounting the upper louver assembly to the case. They are on either end of the assembly.

Lower Damper Assembly Removal

1. Remove the filter cover and front cover.
2. Disconnect the condensate drain.
3. Locate and remove the two screws mounting the damper assembly to the case.
4. Pull on the right end of the assembly and rotate the bottom of the assembly outward.



Note: When re-installing the damper assembly, first place the front edge of the condensate drain pan into place then rotate the bottom of the assembly into position.



Replace Fan Motor

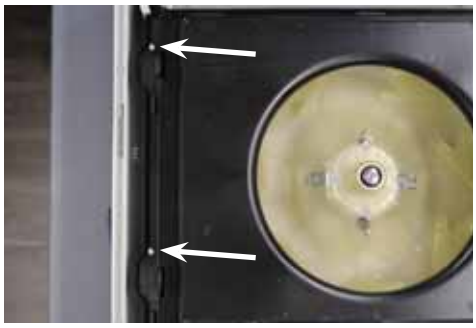
1. Remove filter cover, front panel, control box, upper louver and bottom damper.
2. Remove the white plastic strap that hold the line set in place on the right side of the unit.

3. Locate the locking tabs on the left side of the evaporator and press them inward and pull the coil forward to remove.

IMPORTANT: Great care should be taken to when performing this step. Excessively moving the lineset that connects to the flare can cause a refrigerant leak.

4. Slide the coil to the right to. The coil can now be gently pulled away from the case. Only move the coil far enough to access the four screws holding on the fan inlet faring.

5. Remove the four screws holding on the fan inlet faring.



6. Remove the wire cover from the back of the case.

7. Remove the motor bracket.

NOTE: when replacing the motor, the wires must exit from the bottom of the motor to prevent water from entering the motor.

Indoor Fan Motor Test Procedure

If the indoor fan motor does not run:

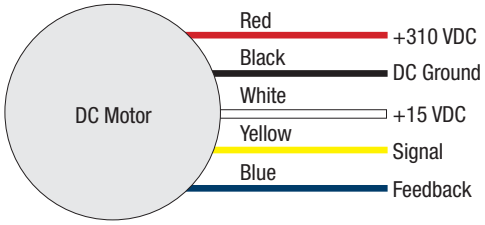
1. Disconnect power to the system.
2. Remove the return air cover and access the fan motor circuit board connection.
3. Reset power and turn the remote control fan command to Fan On mode.

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:

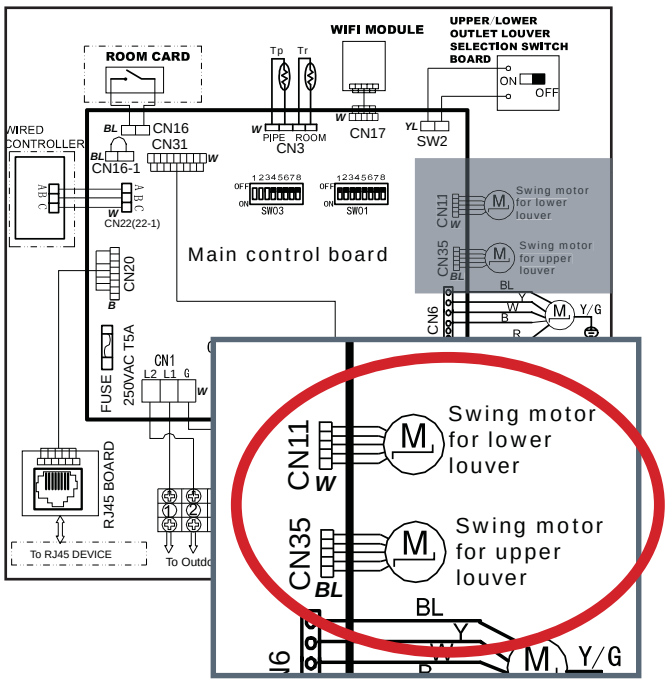
1. Confirm the sensor is firmly attached to the circuit board connection plug.
2. Remove the sensor wires form the connection plug by releasing holding tension on the plugs tension tab.

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.)

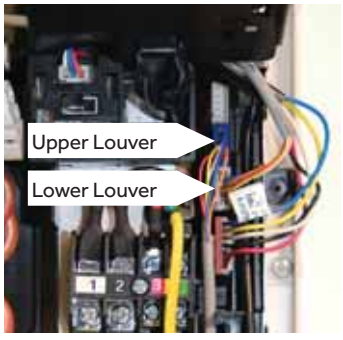
Testing Louver Motors

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 should be 292Ω from red wire (common) to any other wire.. 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.

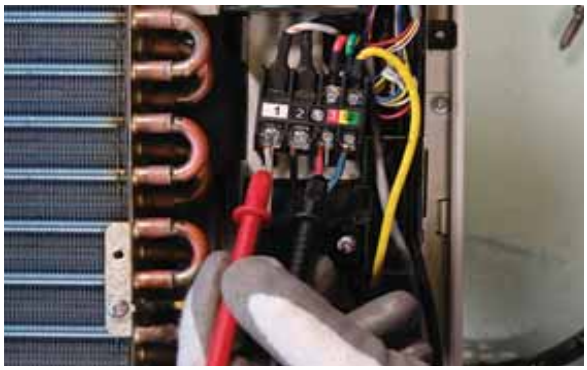
Testing Communication Circuit

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.

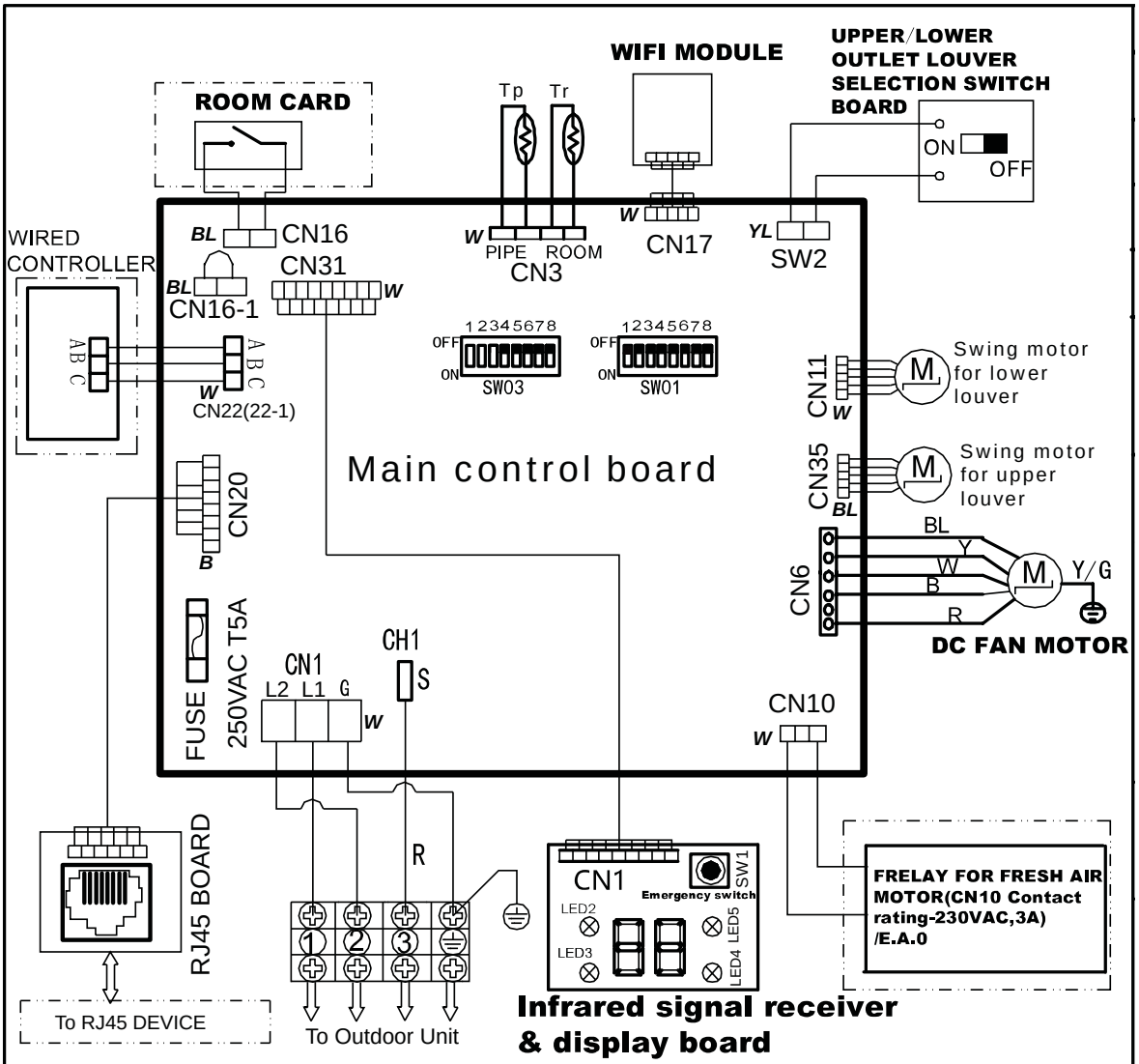
1. Measure the DC voltage between terminals 1 and 3 on the indoor terminal block.



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.

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 switches factory default setting

SW3-1	SW3-2	SW3-3	SW3-4	SW3-5	SW3-6	SW3-7	SW3-8	All Console default
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	MODEL
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	USYF09UCDWA1
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	USYF12UCDWA1
OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	USYF18UCDWA1

0150539441

Note:

1.Dashed parts are optional.

2.Please refer to the technical service manual for detailed explanations of DIP switches.

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

4.Abbreviation: R-red ,B-black,BL-blue,W-white,Y/G-yellow/green, TEMP.-temperature, E.A.O-exrernal alarm output,Tr-indoor unit room temperature sensor ,Tp-indoor unit pipe temperature sensor (coil temperature sensor)

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

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*
/	INDOOR FAN MOTOR OVERCURRENT	/

* 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.

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TABLE OF CONTENTS

ENGLISH

Check This First

Outdoor Unit

Models:

ASH109URDEB
ASH112URDEB
ASH118URDEB

Conditions Needed for Basic Operation

3-minutes of time delay from the call for heating or cooling

↓

Line voltage available at:
1. TERMINAL STRIP - 1(N) & 2 (L)
2. AC-L & AC-N at the PCB - CN2 & CN1
3. AC-L OUT & AC-N OUT at the PCB - CN8 & CN9
4. AC-L & AC-N at the IPM -CN8 & CN9 (9K) / CN1 & CN2 (12K/18K)

- 1 (N) and 3 (C): 0-80 **VAC fluctuating**
- 2 (L) and 3 (C): 0-140 VAC **fluctuating**

↓

310+ VDC available at:
1. P & N at the IPM - CN1 & CN5 (9K) / CN8 & CN9 (12K/18K)
2. P & N at the PCB - CN24 & CN26

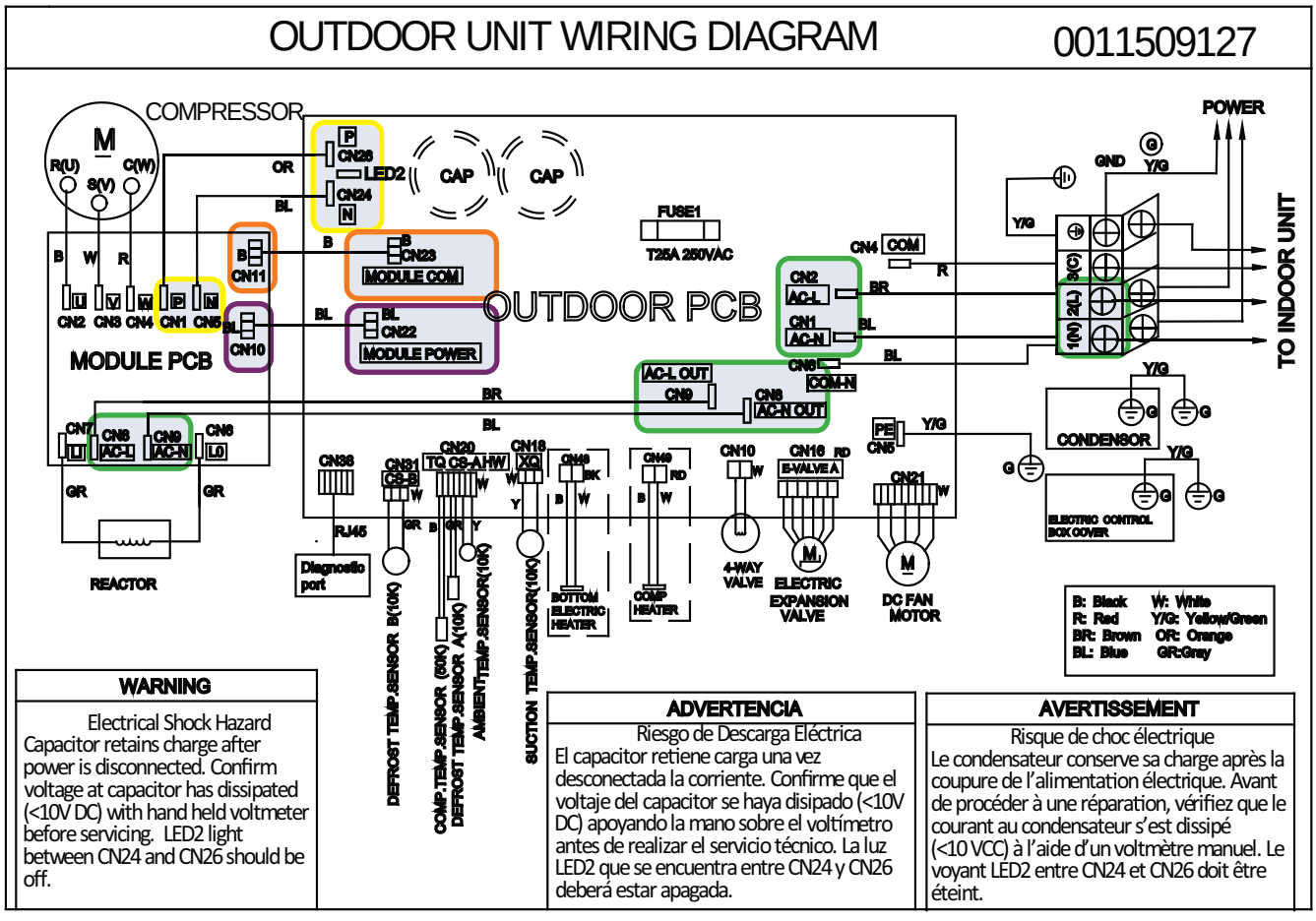
↓

Module COM 5-G-15 VDC available at:
1. CN23 at the PCB
2. CN11 at the IPM

↓

Module power 5-G-15 VDC available at:
1. CN22 AT THE PCB
2. CN10 AT THE IPM

Wiring Diagram Reference

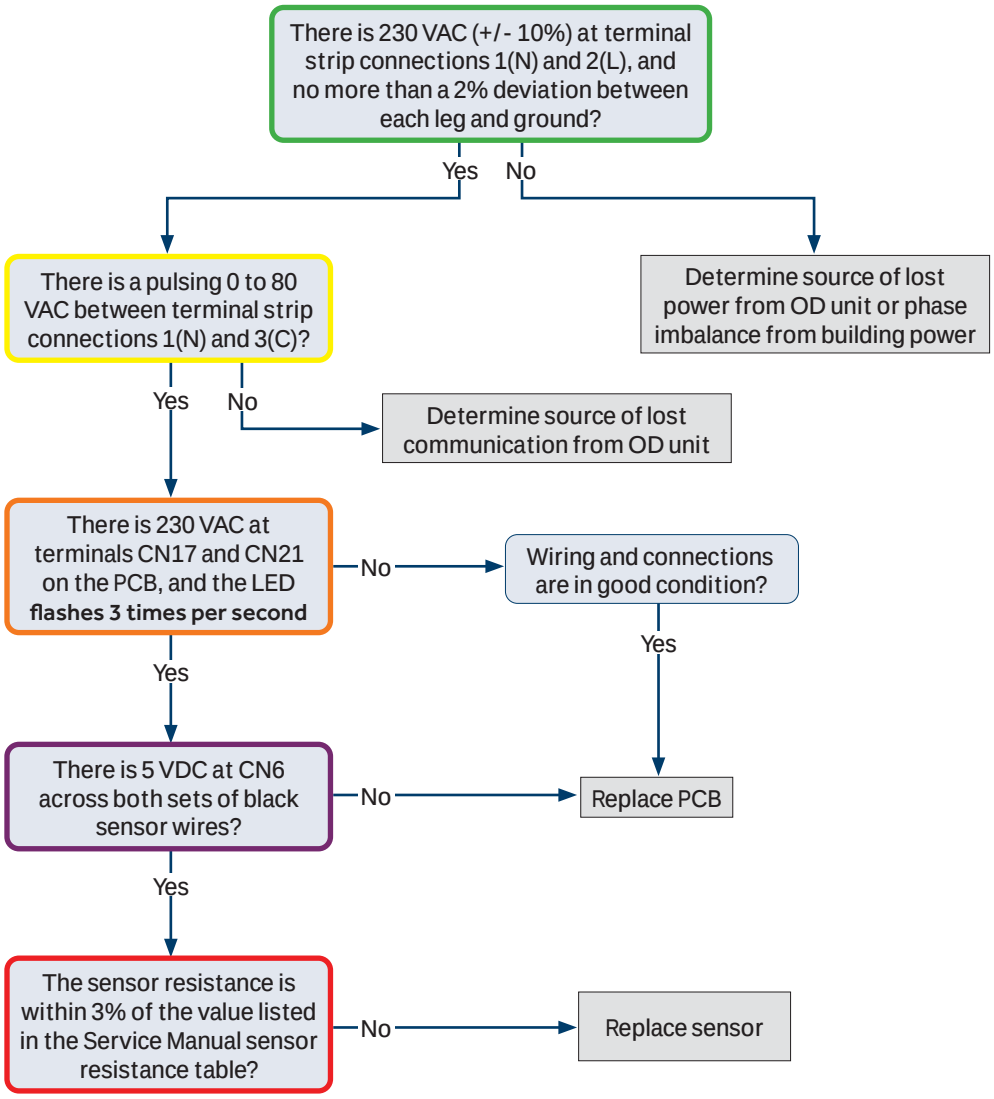


Check This First

Indoor Unit

Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

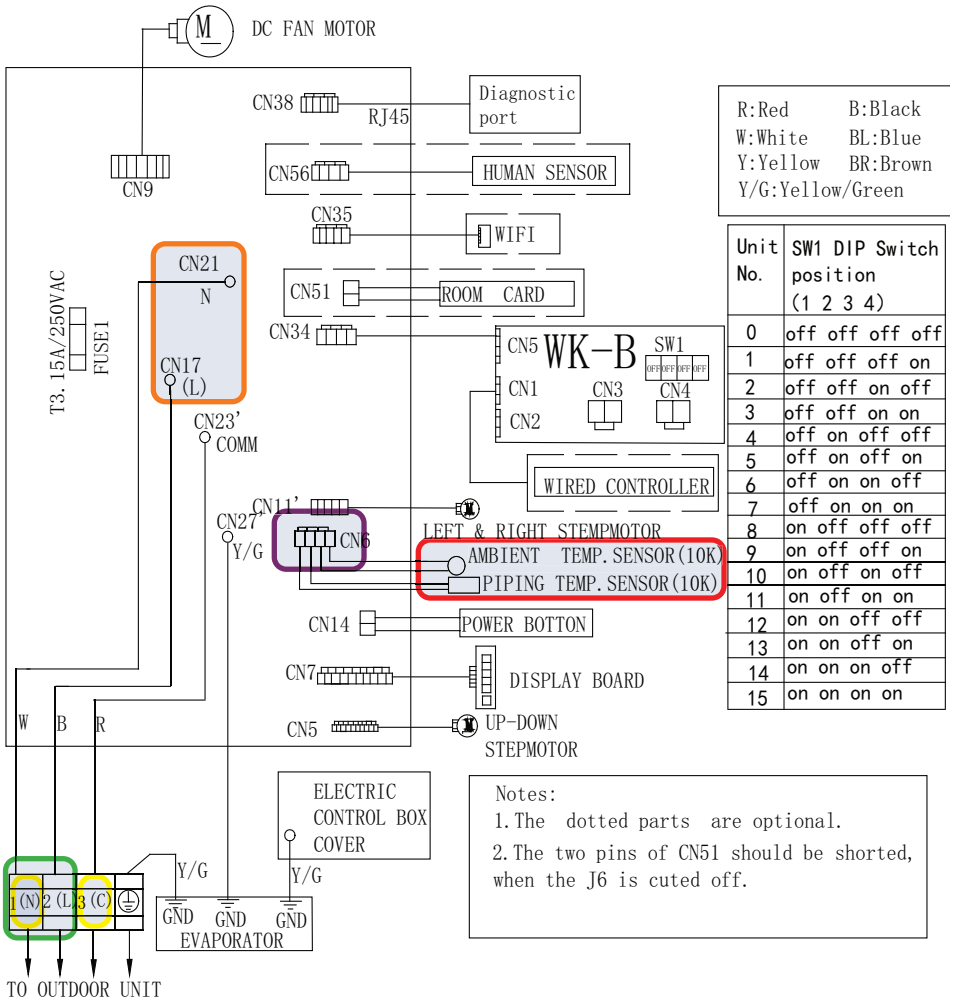


Check This First - Indoor Unit

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)

F1/LED1: 2 Flash

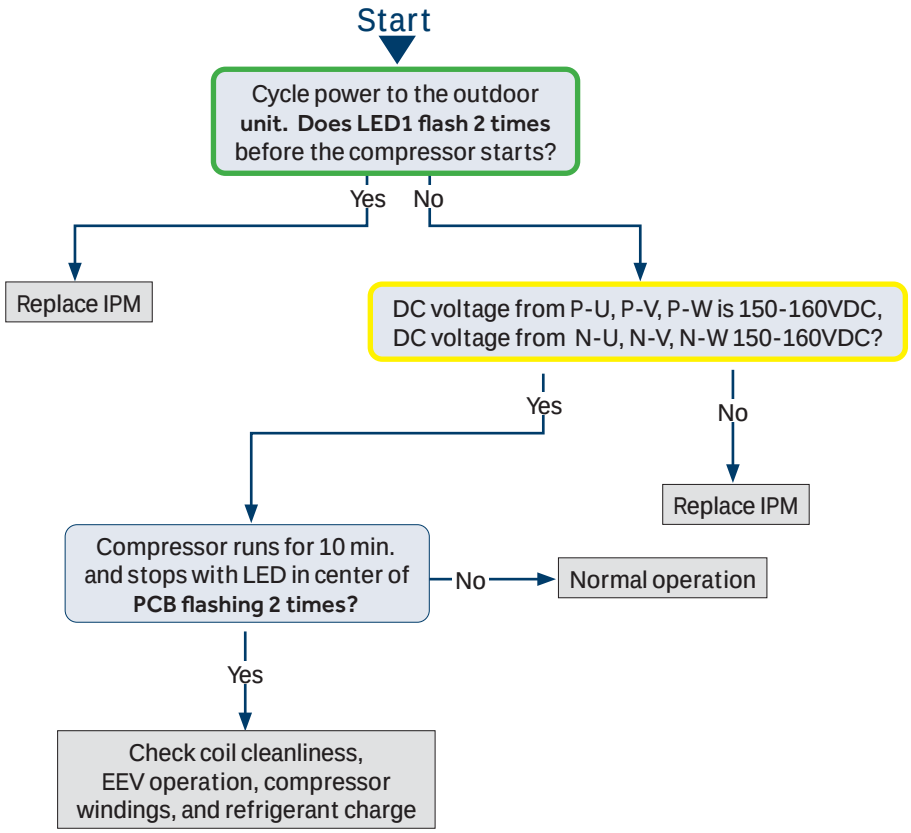
IPM Power Module Fail (IPM power module protection)

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

Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



EEV Resistance Values

EEV (6-pin, 5 wire)

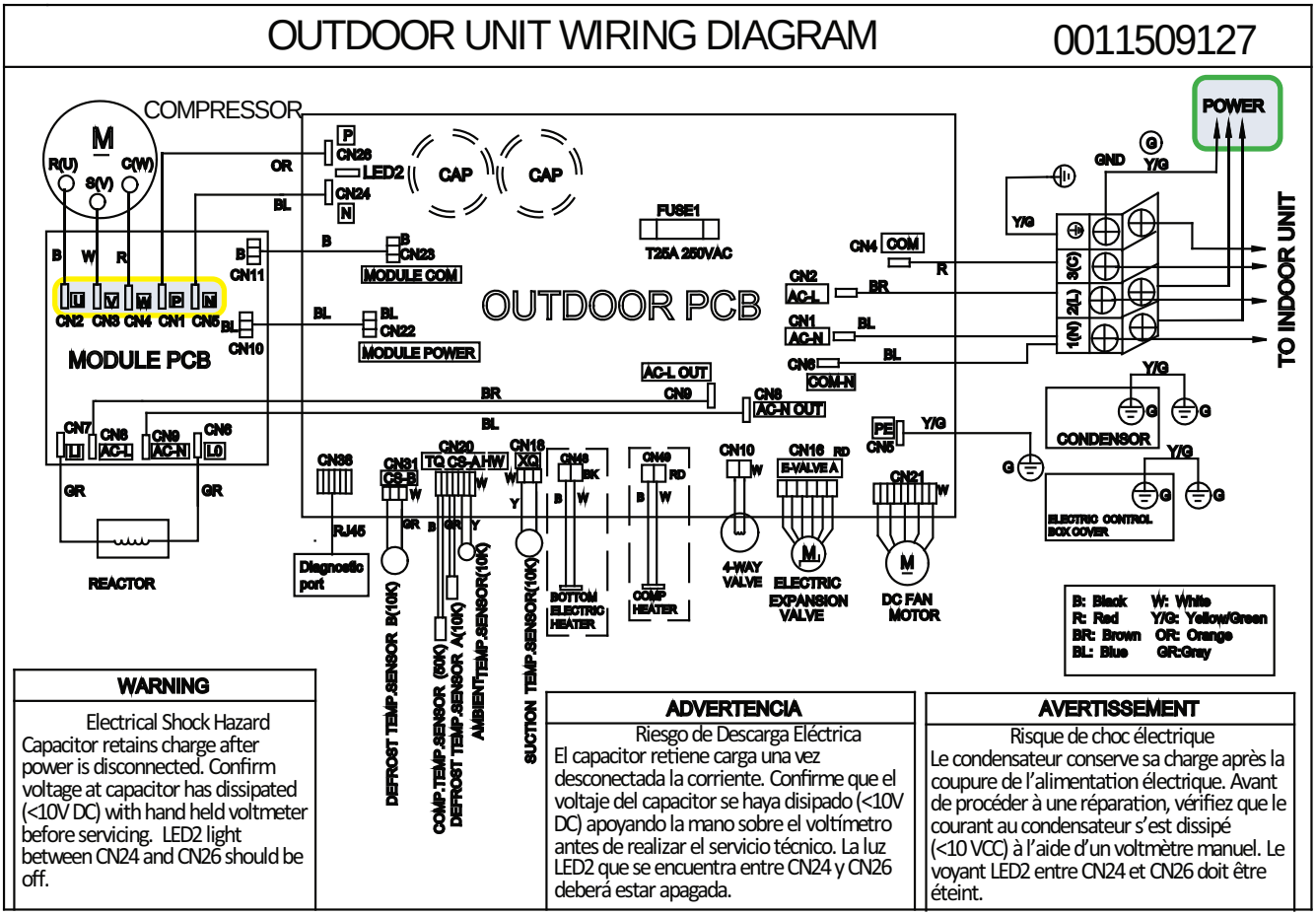
	White	Yellow	Orange	Blue	X	Red
White	-	92 Ω	92 Ω	92 Ω	-	46 Ω
Yellow	-	-	92 Ω	92 Ω	-	46 Ω
Orange	-	-	-	92 Ω	-	46 Ω
Blue	-	-	-	-	-	46 Ω
X	-	-	-	-	-	-
Red	-	-	-	-	-	-

EEV (6-pin, 6 wire)

	White	Yellow	Orange	Blue	Brown	Red
White	-	0L	92 Ω	0L	46 Ω	0L
Yellow	-	-	0L	92 Ω	0L	46 Ω
Orange	-	-	-	0L	46 Ω	0L
Blue	-	-	-	-	0L	46 Ω
Brown	-	-	-	-	-	0L
Red	-	-	-	-	-	-

Error Code: F1/LED1: 2 Flash

Wiring Diagram Reference



WARNING

Electrical Shock Hazard
Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.

ADVERTENCIA

Riesgo de Descarga Eléctrica
El capacitor retiene carga una vez desconectada la corriente. Confirme que el voltaje del capacitor se haya disipado (<10V DC) apoyando la mano sobre el voltímetro antes de realizar el servicio técnico. La luz LED2 que se encuentra entre CN24 y CN26 deberá estar apagada.

AVERTISSEMENT

Risque de choc électrique
Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

Error Code (Indoor/Outdoor)

F2/LED1: 24 Flash

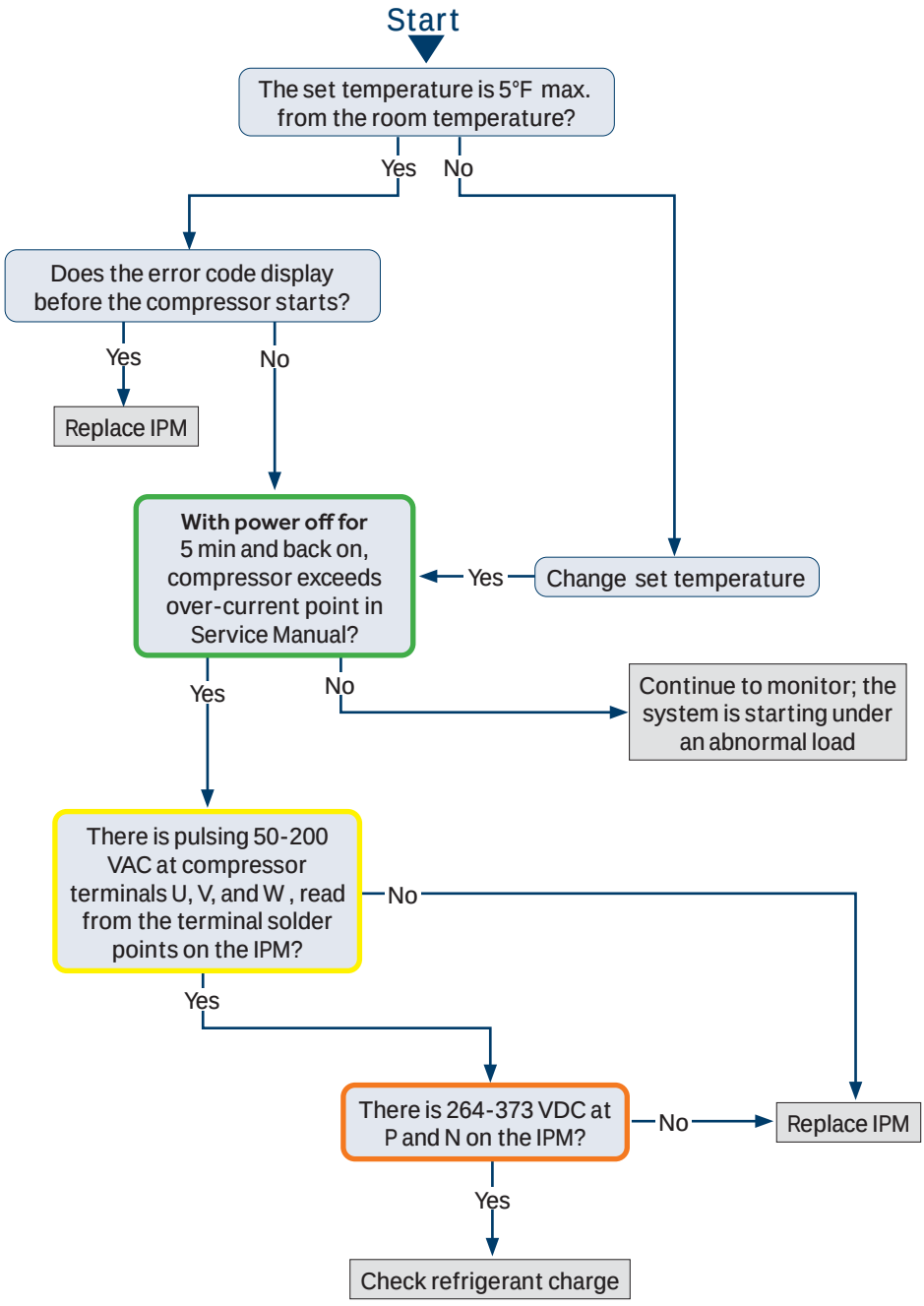
Overcurrent of the Compressor

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

Models:

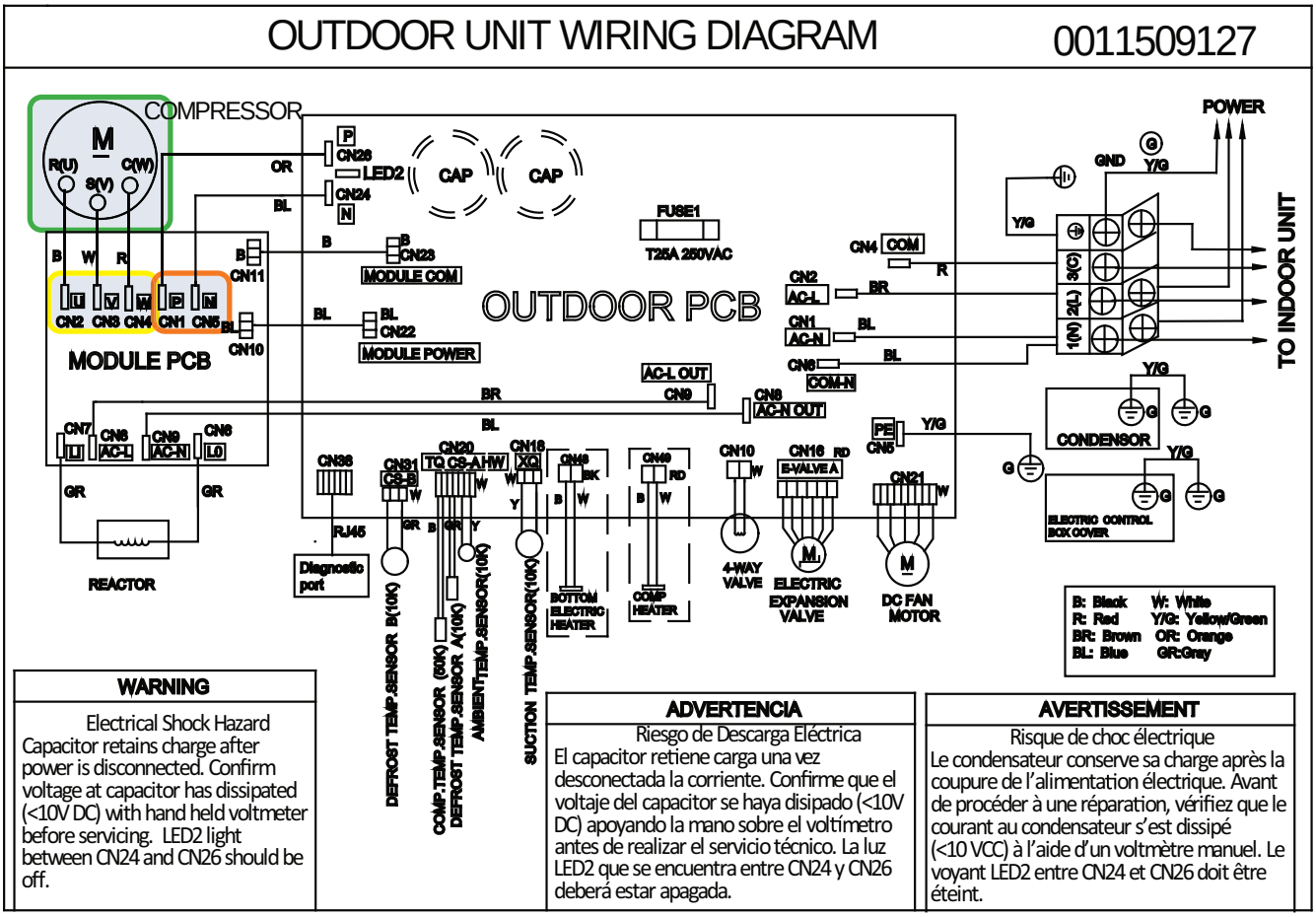
ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



Error Code: F2/LED1: 24 Flash

Wiring Diagram Reference



WARNING	ADVERTENCIA	AVERTISSEMENT
Electrical Shock Hazard Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.	Riesgo de Descarga Eléctrica El capacitor retiene carga una vez desconectada la corriente. Confirme que el voltaje del capacitor se haya disipado (<10V DC) apoyando la mano sobre el voltímetro antes de realizar el servicio técnico. La luz LED2 que se encuentra entre CN24 y CN26 deberá estar apagada.	Risque de choc électrique Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

Error Code (Indoor/Outdoor)

F3/LED1: 4 Flash

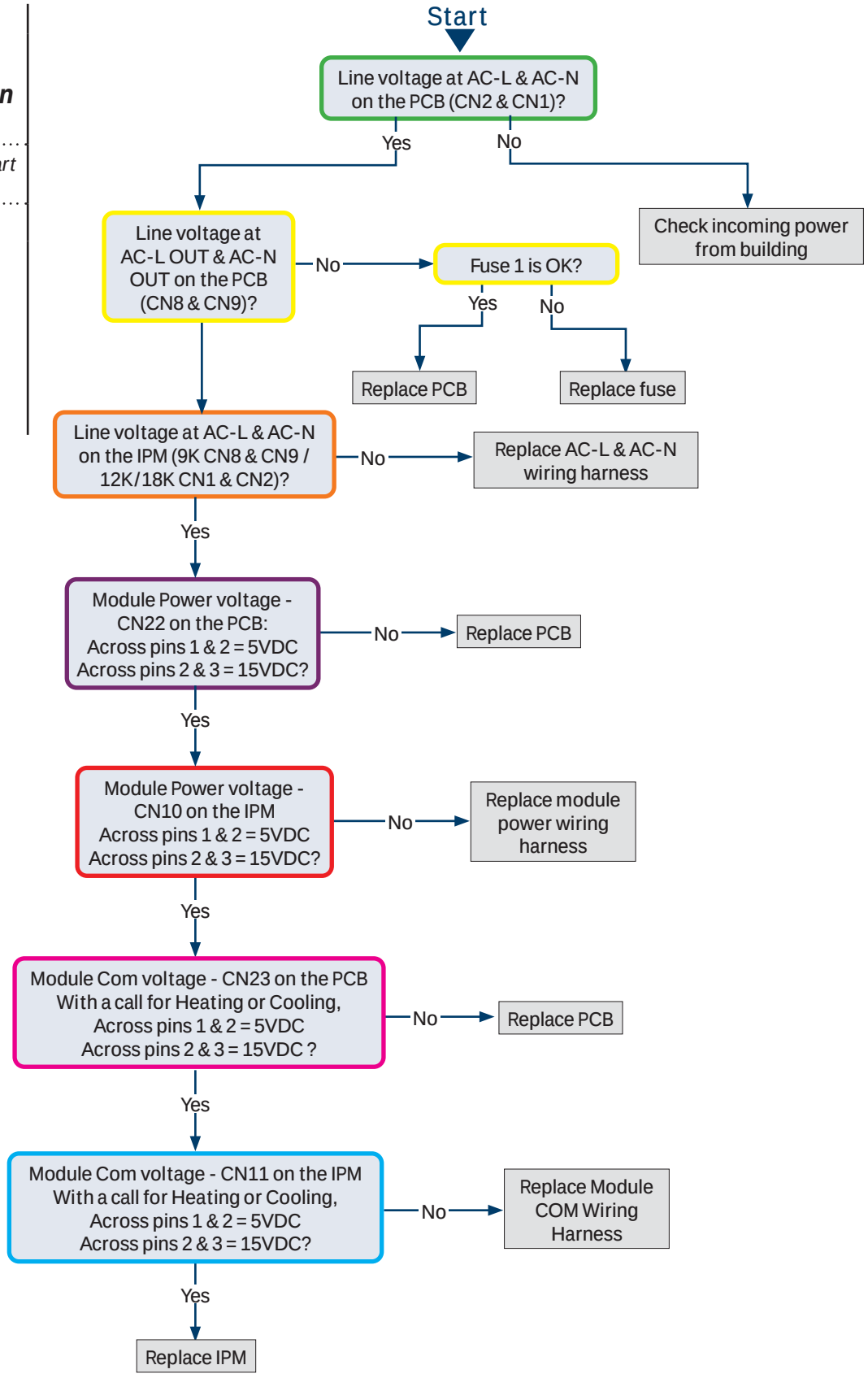
Communication Fault Between IPM and Outdoor PCB

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

Models:

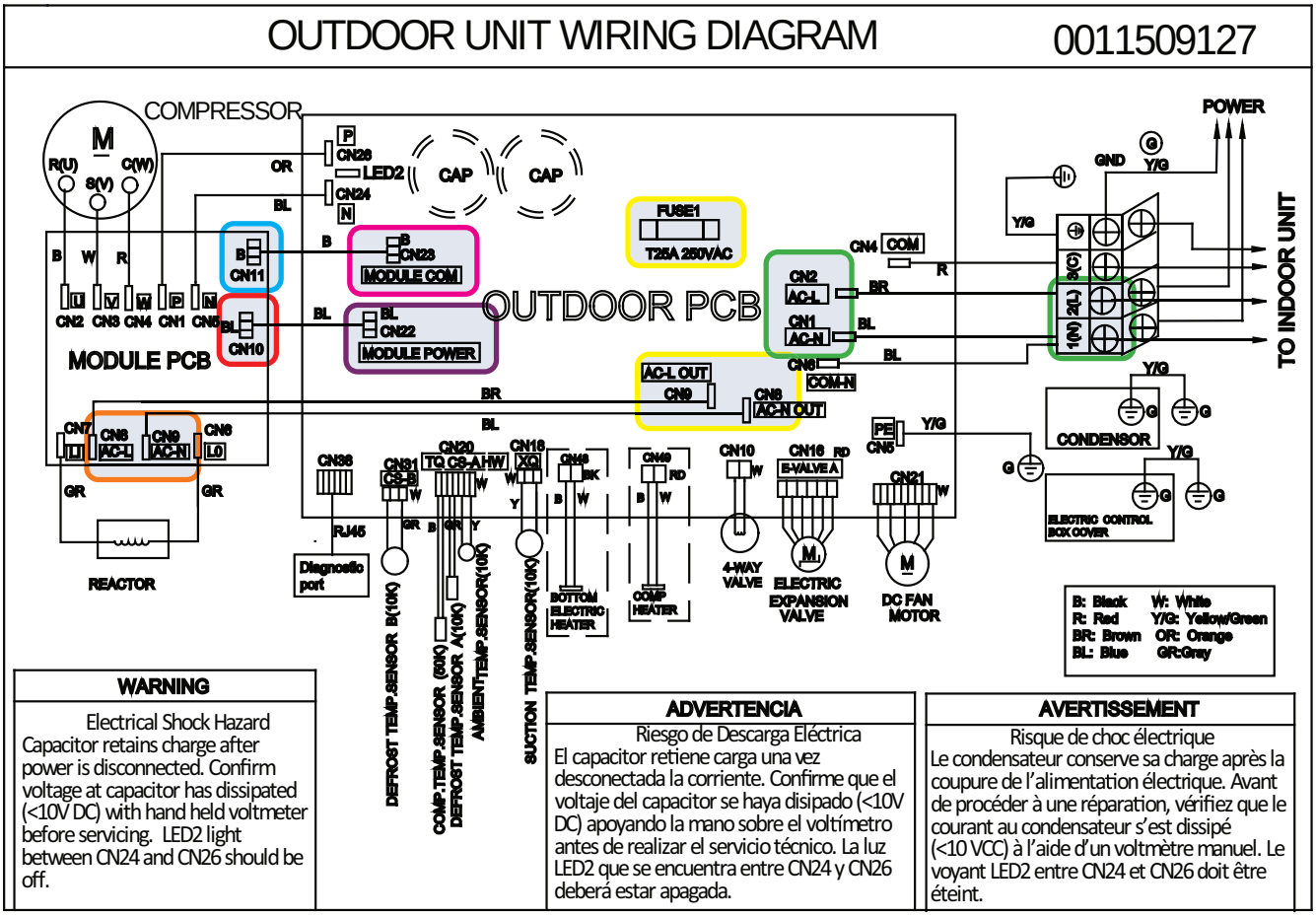
ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



Error Code: F3/LED1: 4 Flash

Wiring Diagram Reference



WARNING	ADVERTENCIA	AVERTISSEMENT
Electrical Shock Hazard Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.	Riesgo de Descarga Eléctrica El capacitor retiene carga una vez desconectada la corriente. Confirme que el voltaje del capacitor se haya disipado (<10V DC) apoyando la mano sobre el voltímetro antes de realizar el servicio técnico. La luz LED2 que se encuentra entre CN24 y CN26 deberá estar apagada.	Risque de choc électrique Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

Error Code (Indoor/Outdoor)

F4/LED1: 8 Flash

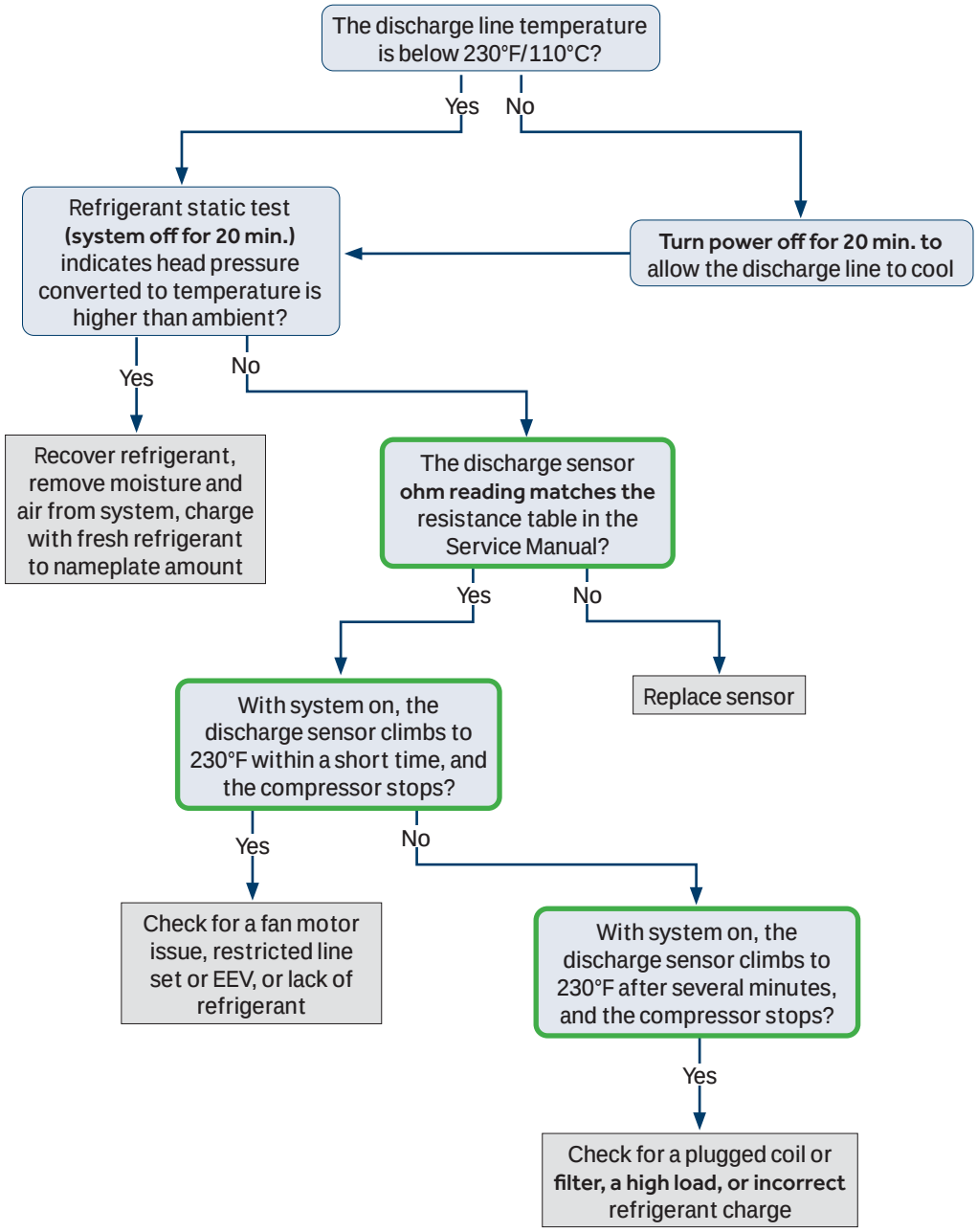
Overheat Protection for Discharge Temperature

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

Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



EEV Resistance Values

EEV (6-pin, 5 wire)

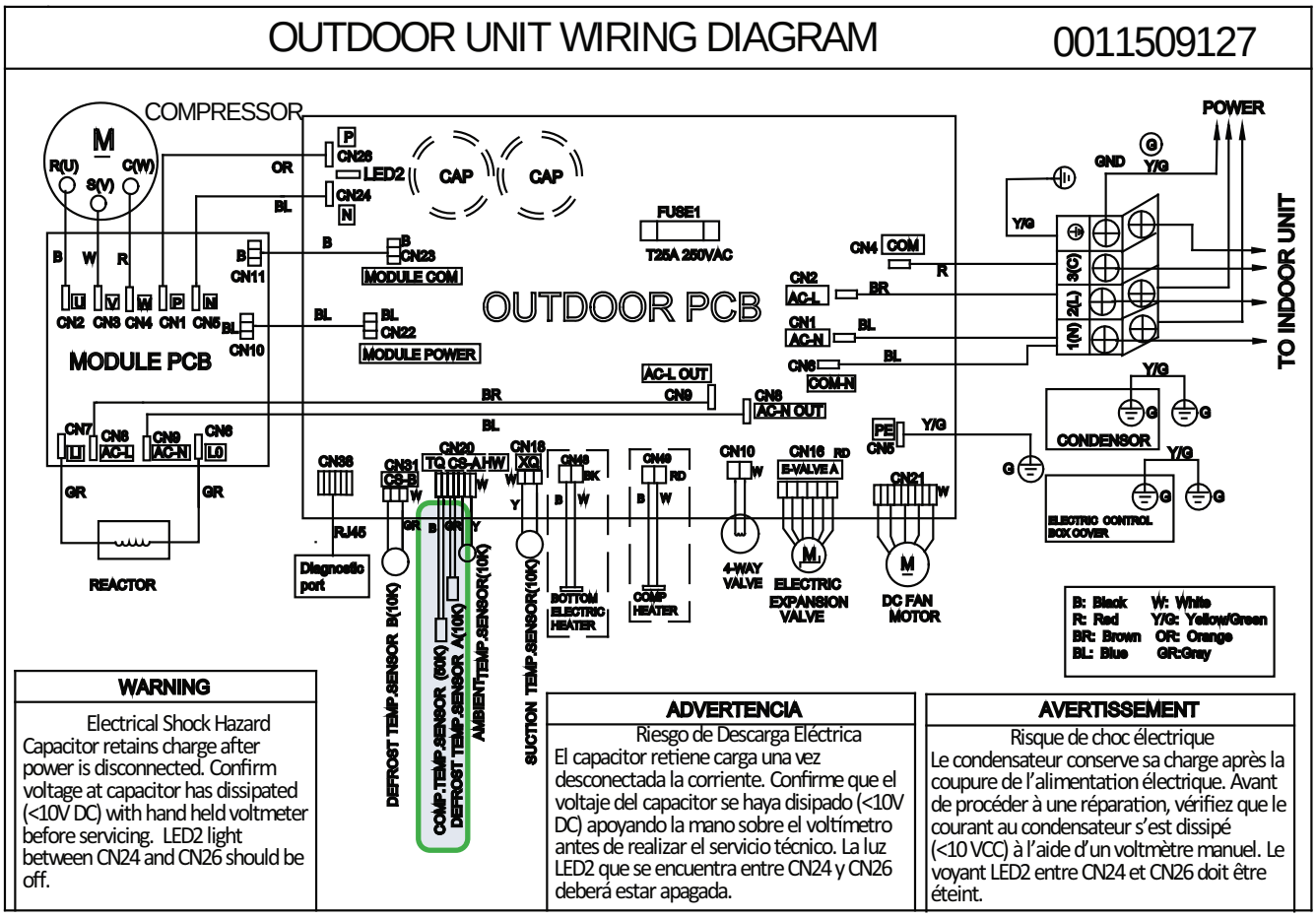
	White	Yellow	Orange	Blue	X	Red
White	-	92 Ω	92 Ω	92 Ω	-	46 Ω
Yellow	-	-	92 Ω	92 Ω	-	46 Ω
Orange	-	-	-	92 Ω	-	46 Ω
Blue	-	-	-	-	-	46 Ω
X	-	-	-	-	-	-
Red	-	-	-	-	-	-

EEV (6-pin, 6 wire)

	White	Yellow	Orange	Blue	Brown	Red
White	-	0L	92 Ω	0L	46 Ω	0L
Yellow	-	-	0L	92 Ω	0L	46 Ω
Orange	-	-	-	0L	46 Ω	0L
Blue	-	-	-	-	0L	46 Ω
Brown	-	-	-	-	-	0L
Red	-	-	-	-	-	-

Error Code: F4/LED1: 8 Flash

Wiring Diagram Reference



WARNING

Electrical Shock Hazard
Capacitor retains charge after power is disconnected. Confirm voltage at capacitor has dissipated (<10V DC) with hand held voltmeter before servicing. LED2 light between CN24 and CN26 should be off.

ADVERTENCIA

Riesgo de Descarga Eléctrica
El capacitor retiene carga una vez desconectada la corriente. Confirme que el voltaje del capacitor se haya disipado (<10V DC) apoyando la mano sobre el voltímetro antes de realizar el servicio técnico. La luz LED2 que se encuentra entre CN24 y CN26 deberá estar apagada.

AVERTISSEMENT

Risque de choc électrique
Le condensateur conserve sa charge après la coupure de l'alimentation électrique. Avant de procéder à une réparation, vérifiez que le courant au condensateur s'est dissipé (<10 VCC) à l'aide d'un voltmètre manuel. Le voyant LED2 entre CN24 et CN26 doit être éteint.

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

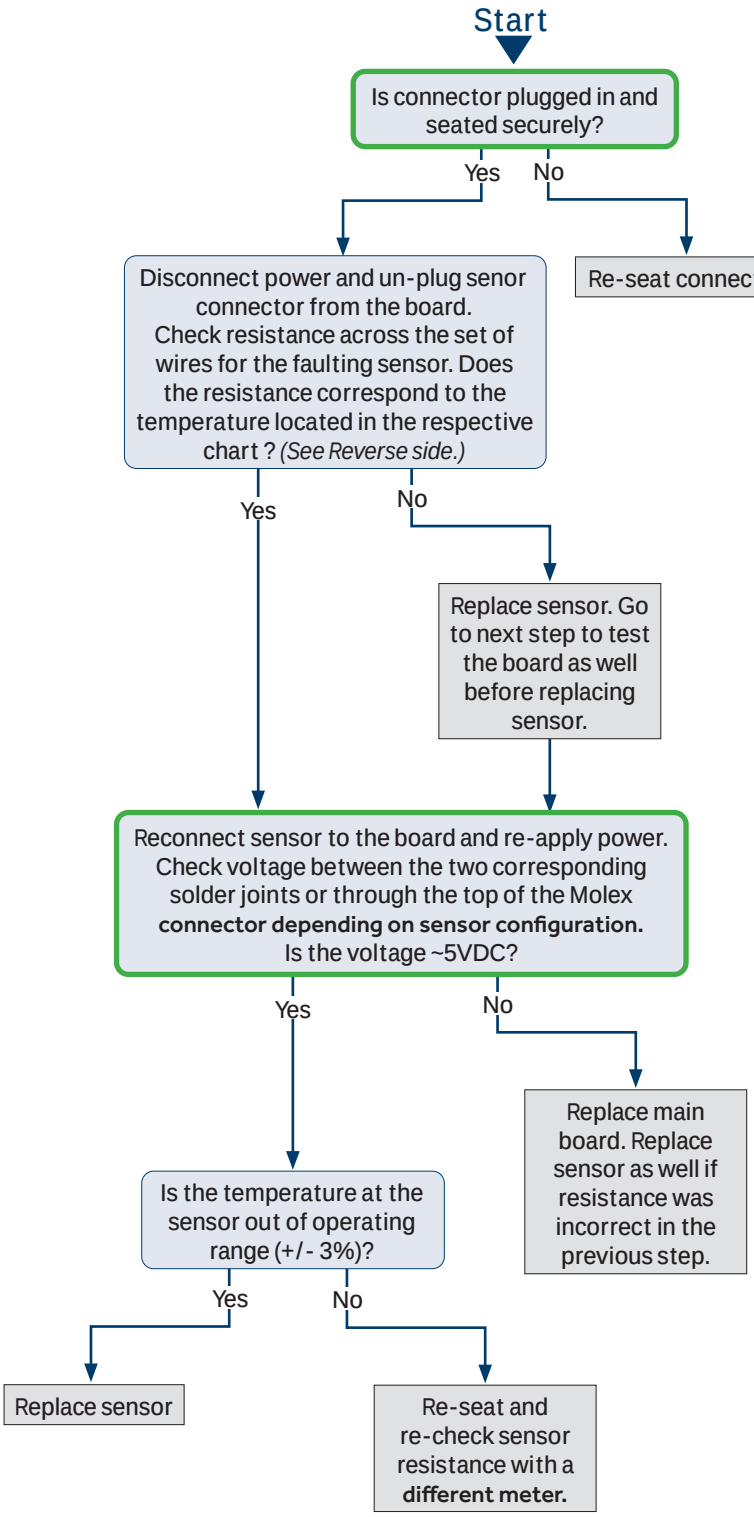
E2/LED1: No Flash
Indoor Coil Temperature Sensor Failure

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

Models:

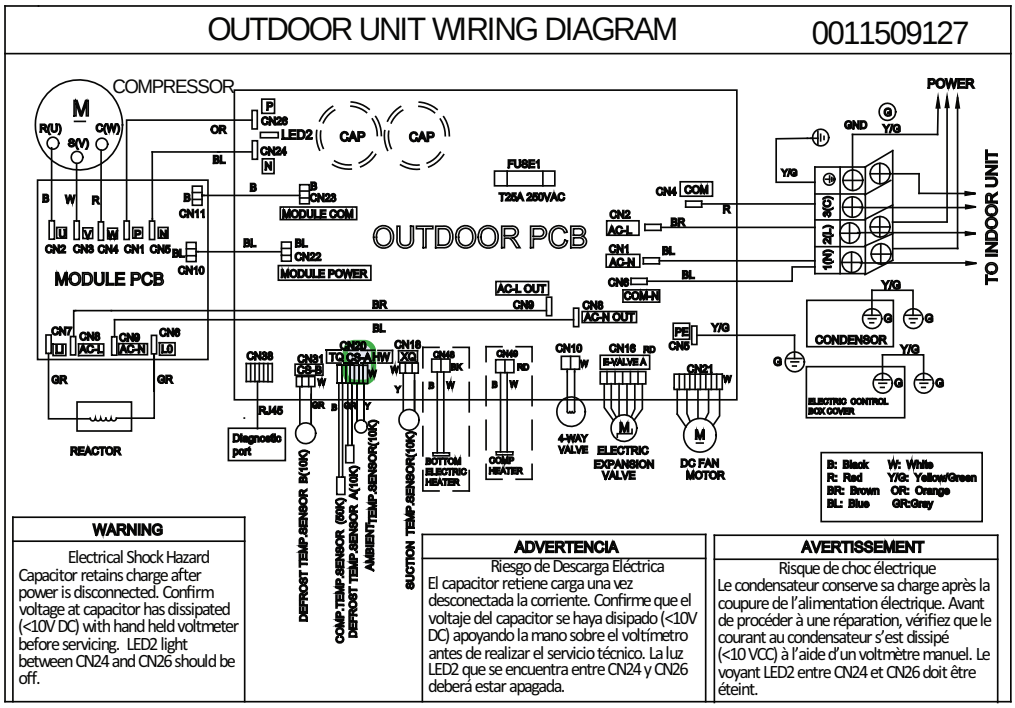
ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



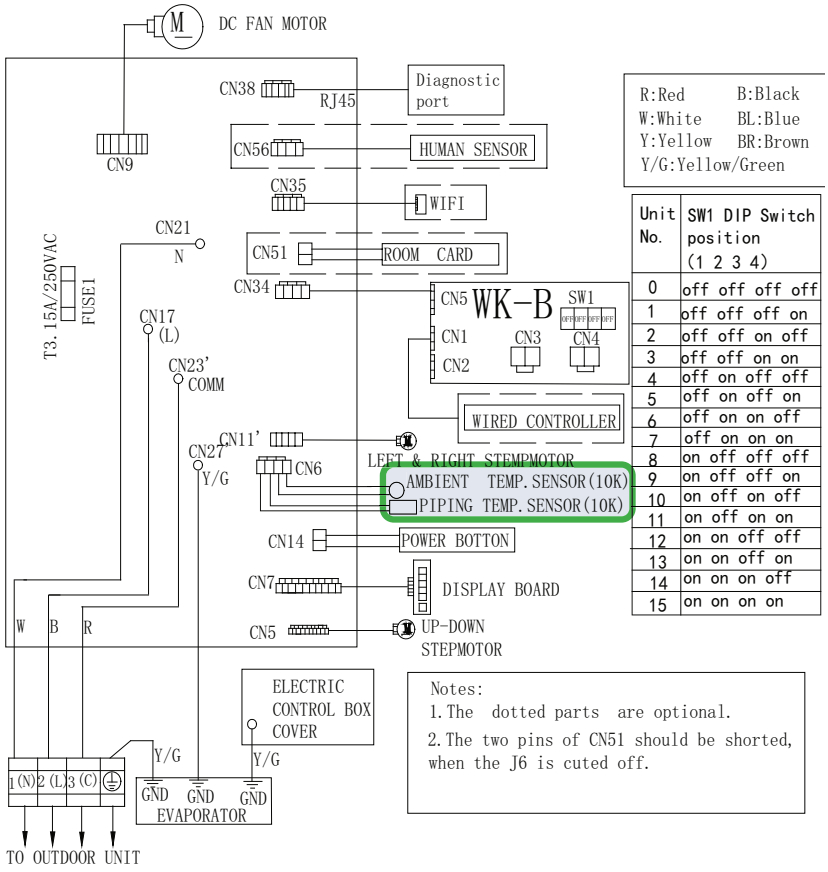
Error Code: F6/LED1: 12 Flash, F7/LED1: 11 Flash, F21/LED1: 10 Flash, F25/LED1: 13 Flash, E1/LED1: No Flash, E2/LED1: No Flash

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

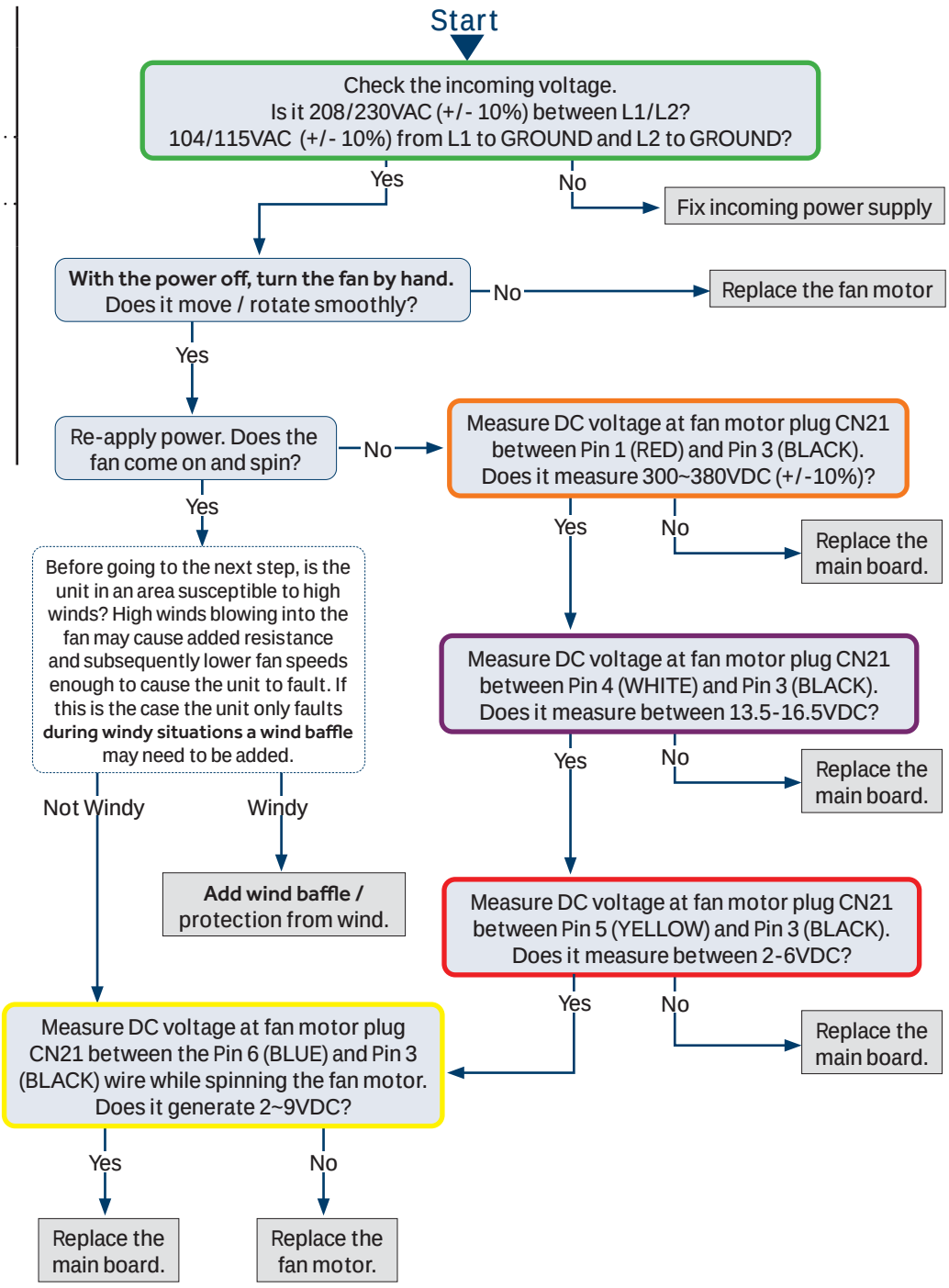
Outdoor DC Fan Motor Fault

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

Models:

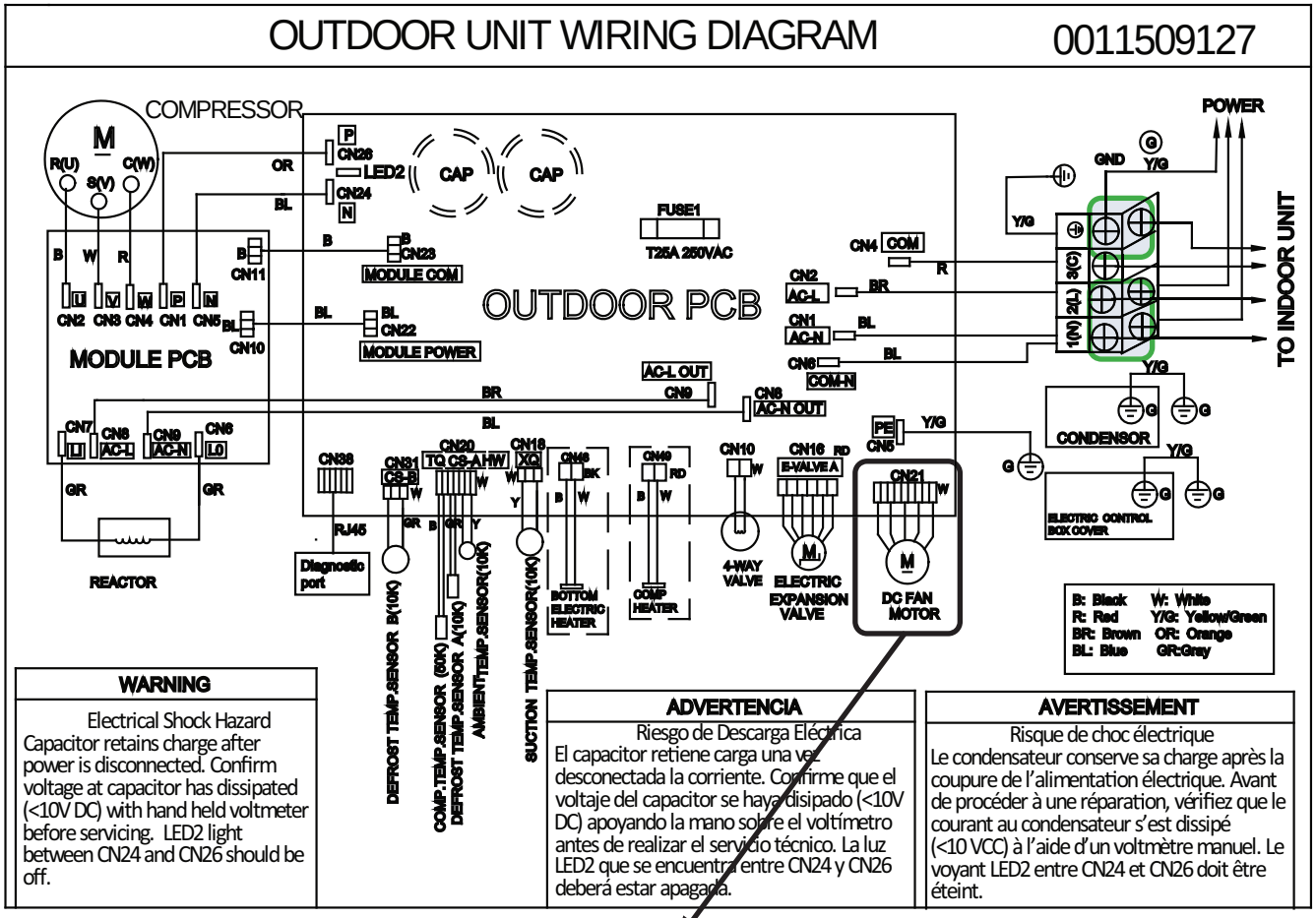
ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

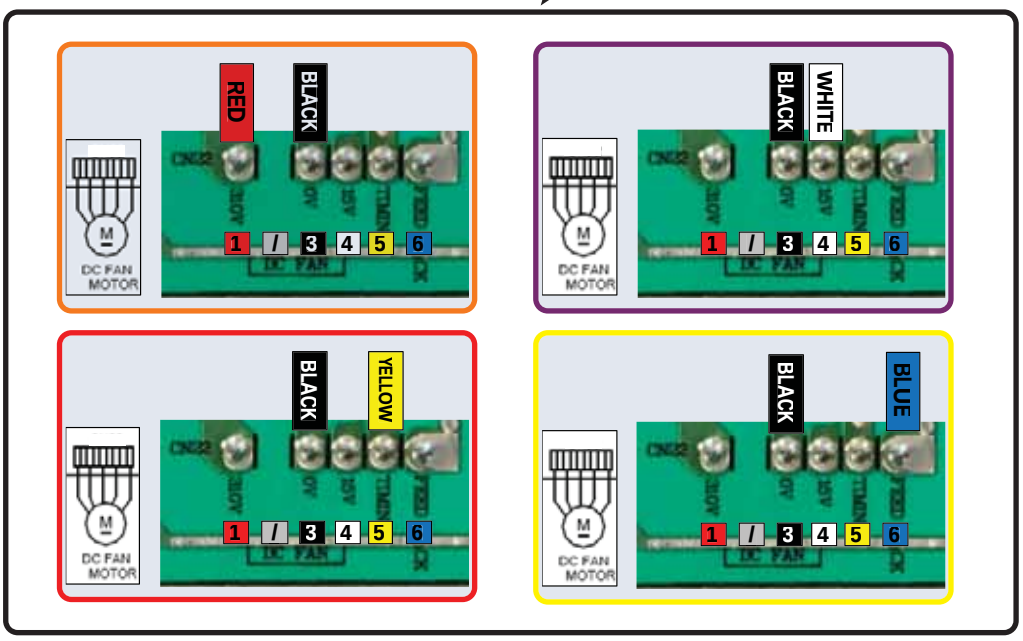
ASH109URDEB
ASH112URDEB
ASH118URDEB



Error Code: F8/LED1: 9 Flash

Wiring Diagram Reference





Error Code (Indoor/Outdoor)

F11/LED1: 18 Flash

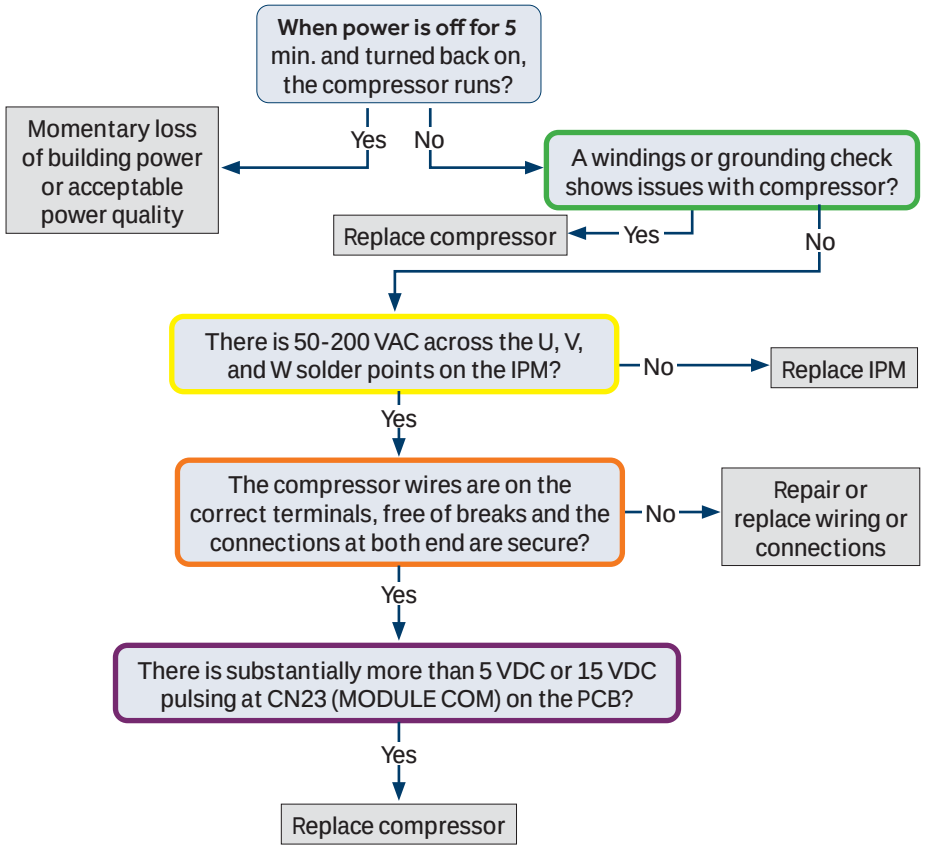
Loss of Compressor Synchronization

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

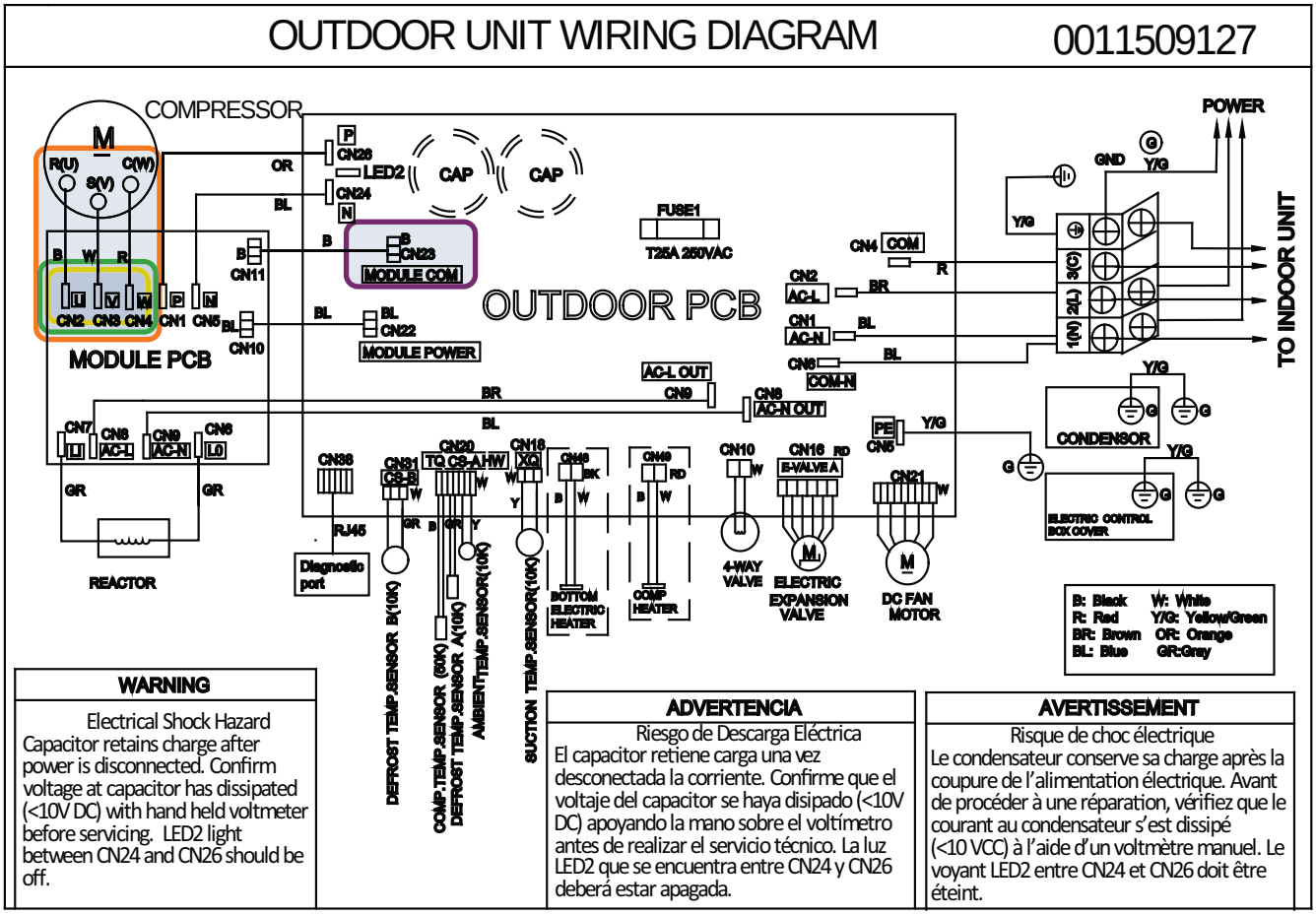
Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



Wiring Diagram Reference



Error Code (Indoor/Outdoor)

F12/LED1: 1 Flash

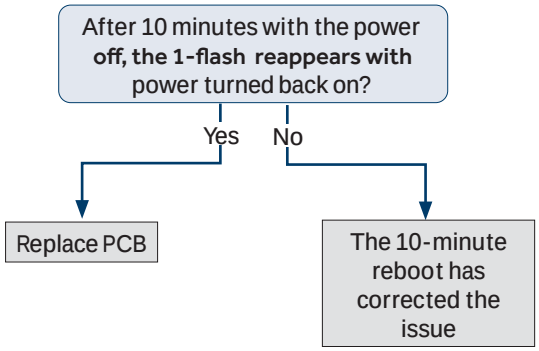
EEPROM Error

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

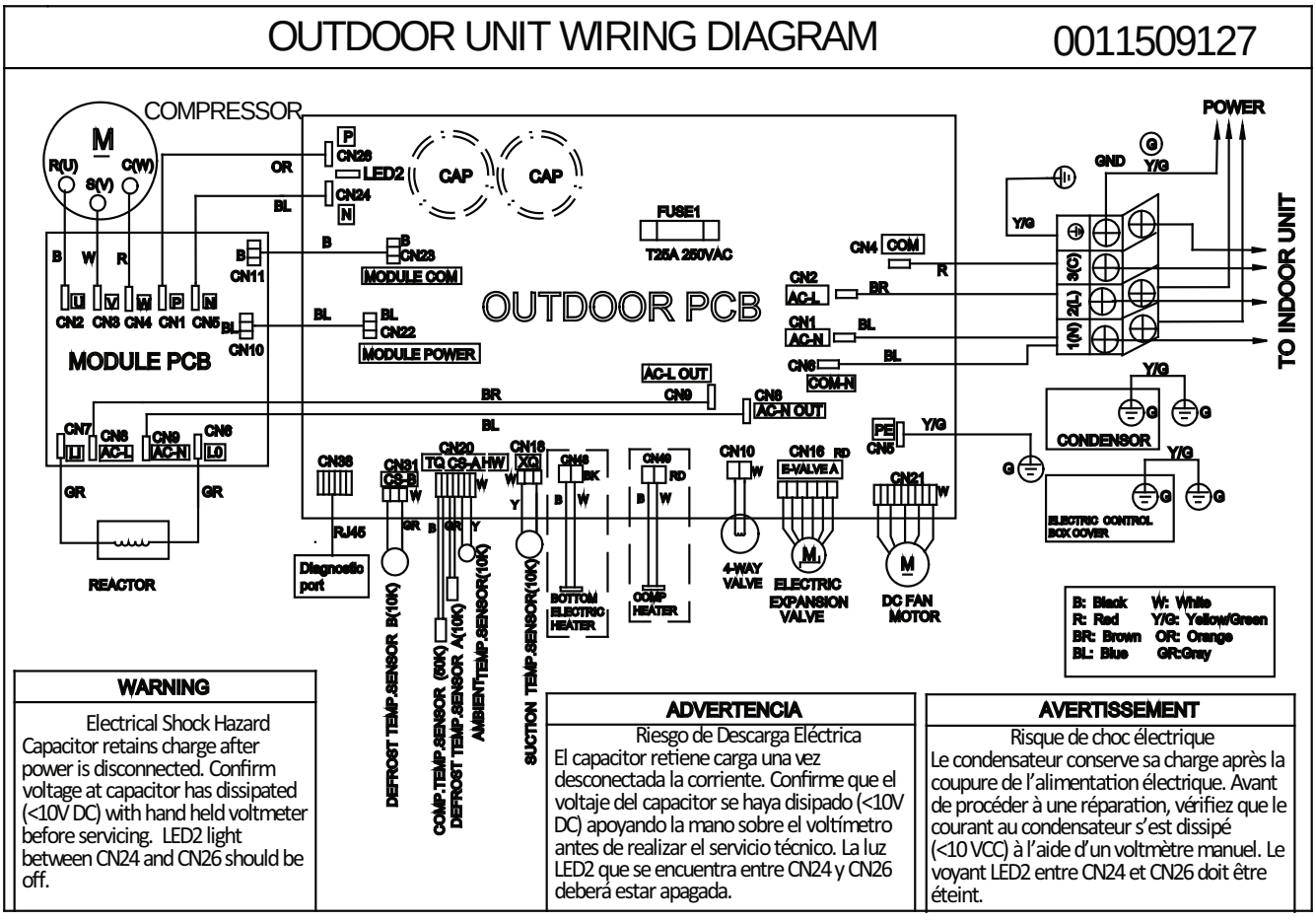
Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB



Wiring Diagram Reference



Error Code (Indoor/Outdoor)

E5/LED1: 22 Flash

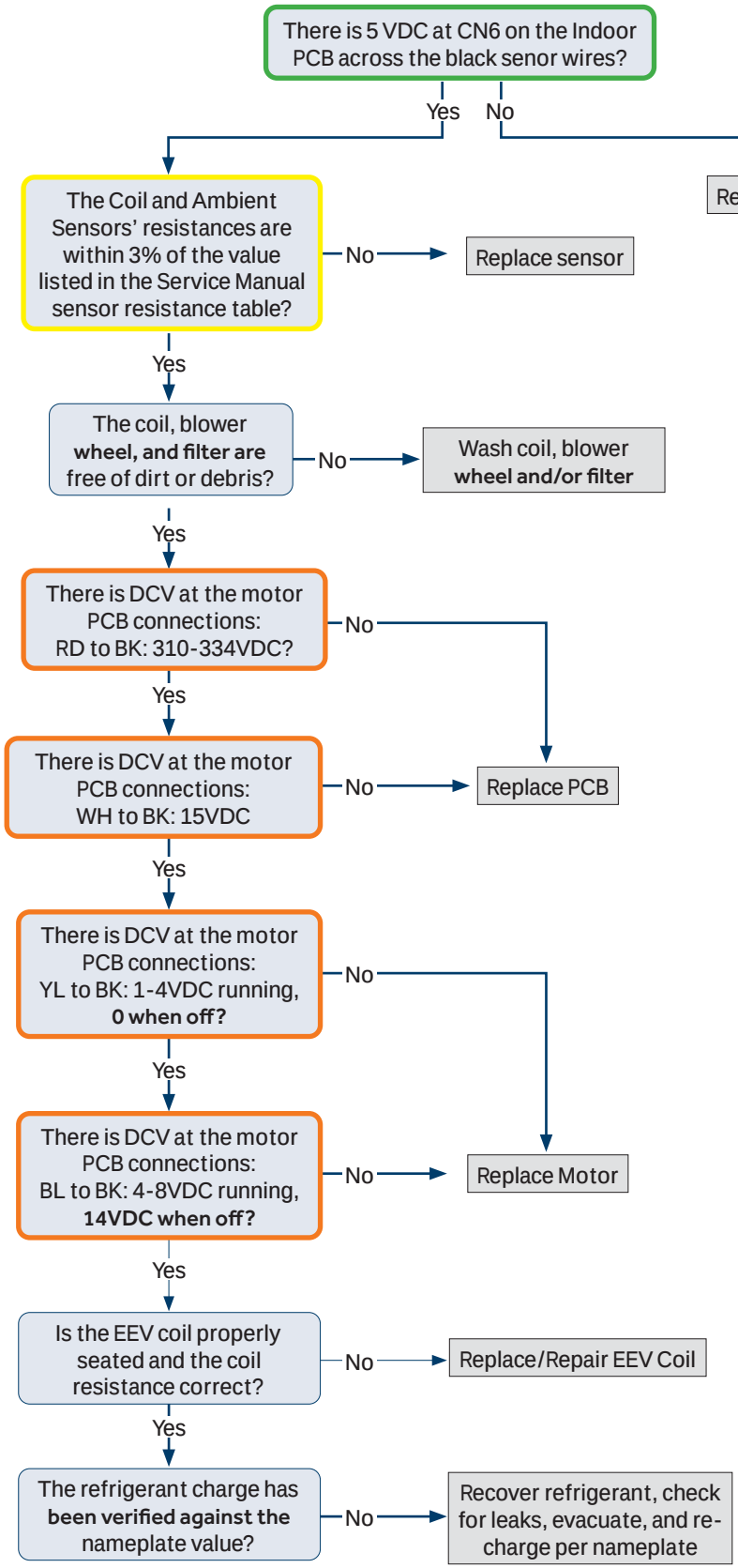
Coil Frost Protection

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

Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

ASH109URDEB
ASH112URDEB
ASH118URDEB

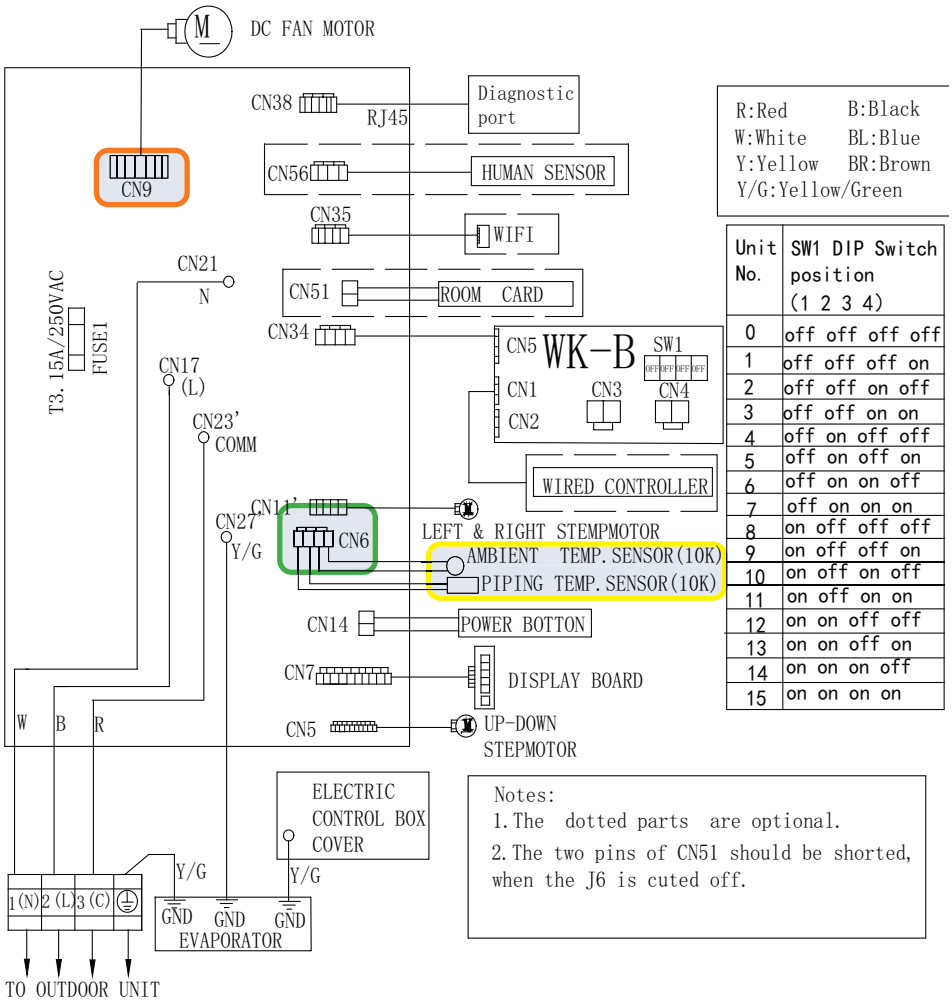


Error Code: E5/LED1: 22 Flash

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)

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

EEV (6-pin, 6 wire)

	White	Yellow	Orange	Blue	Brown	Red
White	-	OL	92 Ω	OL	46 Ω	OL
Yellow	-	-	OL	92 Ω	OL	46 Ω
Orange	-	-	-	OL	46 Ω	OL
Blue	-	-	-	-	OL	46 Ω
Brown	-	-	-	-	-	OL
Red	-	-	-	-	-	-

Error Code (Indoor/Outdoor)

E7/LED1: 15 Flash

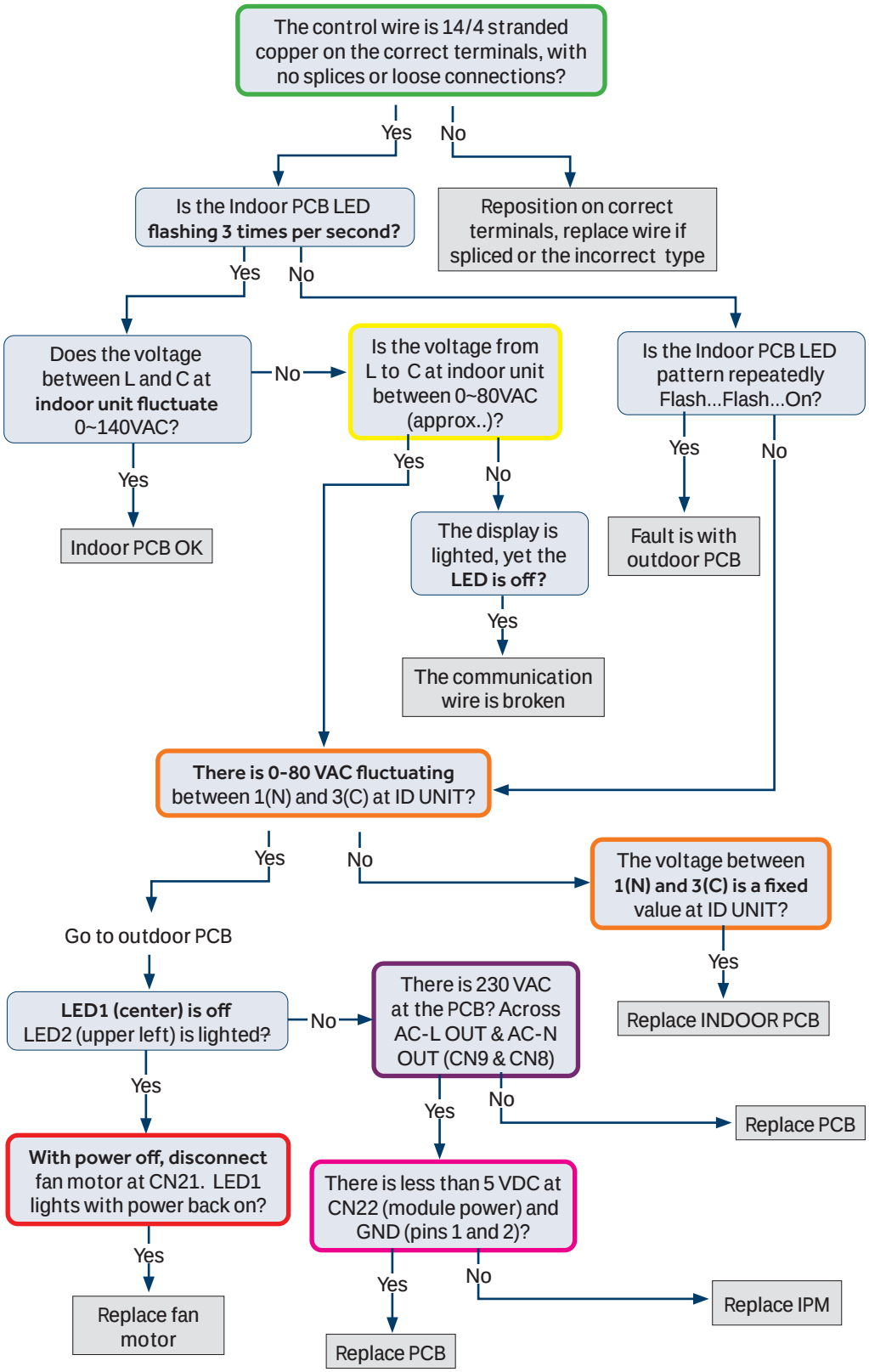
ID and OD Loss of Communication

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

Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB

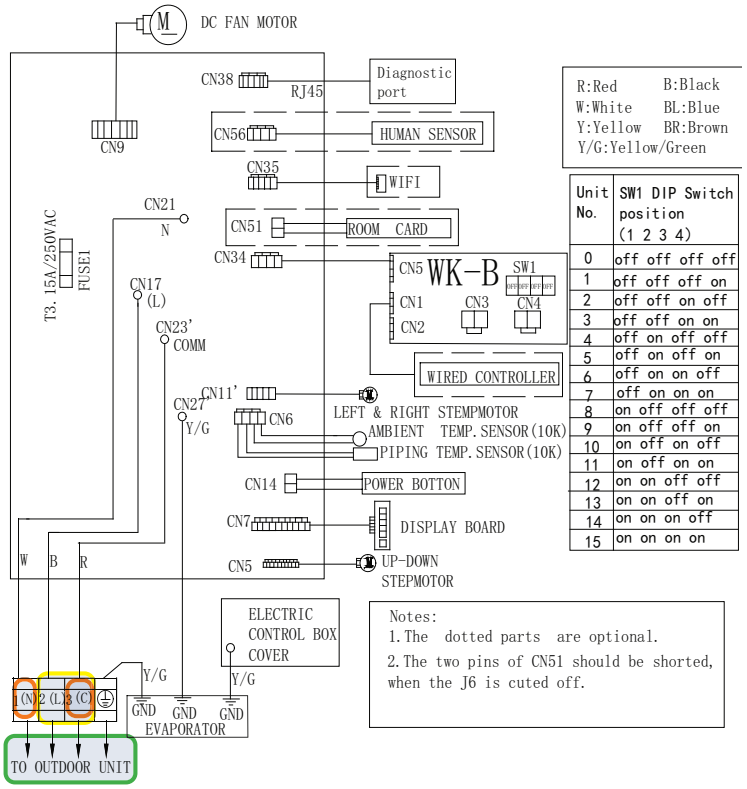
ASH109URDEB
ASH112URDEB
ASH118URDEB

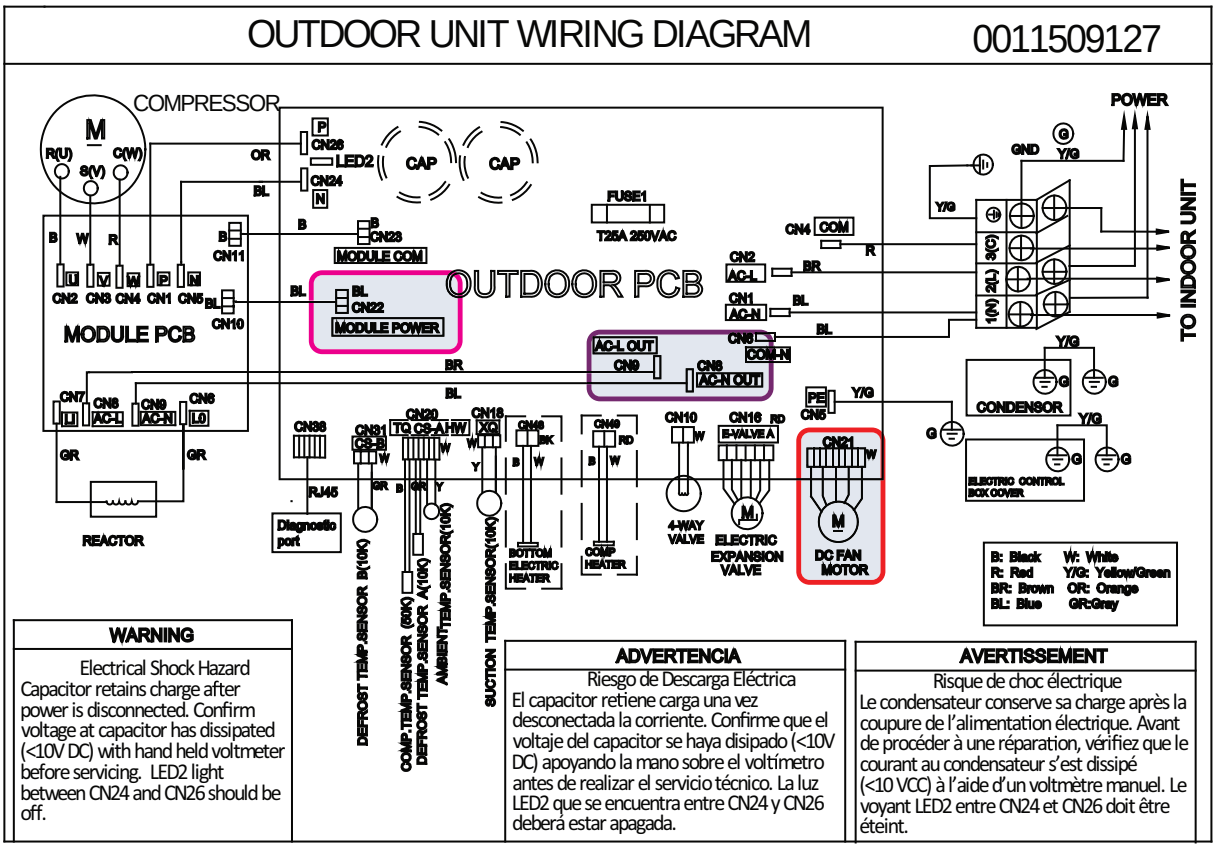


ENGLISH

Error Code: E7/LED1: 15 Flash

Wiring Diagram Reference





Error Code (Indoor)

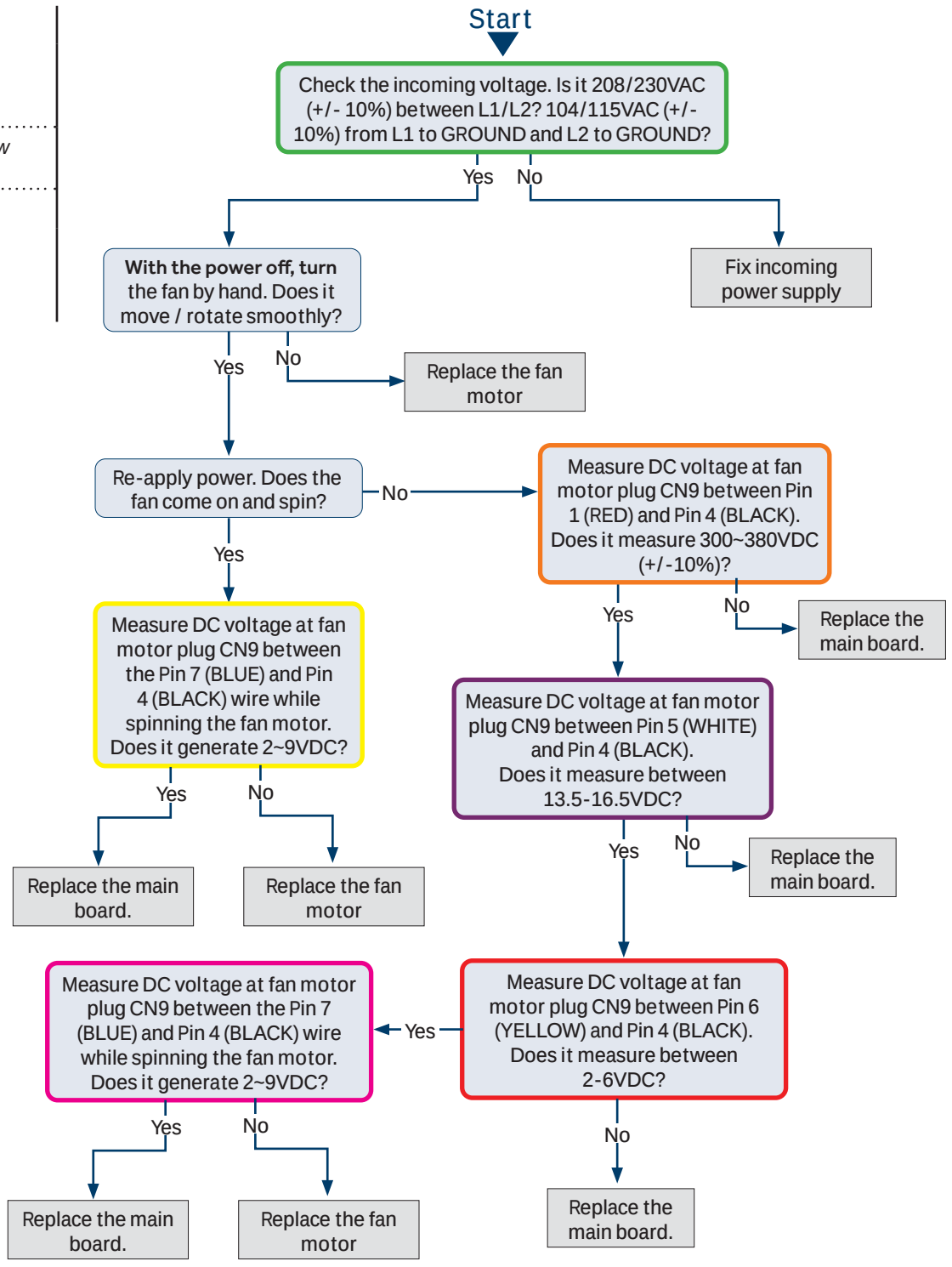
E14

Indoor Fan Motor Failure

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

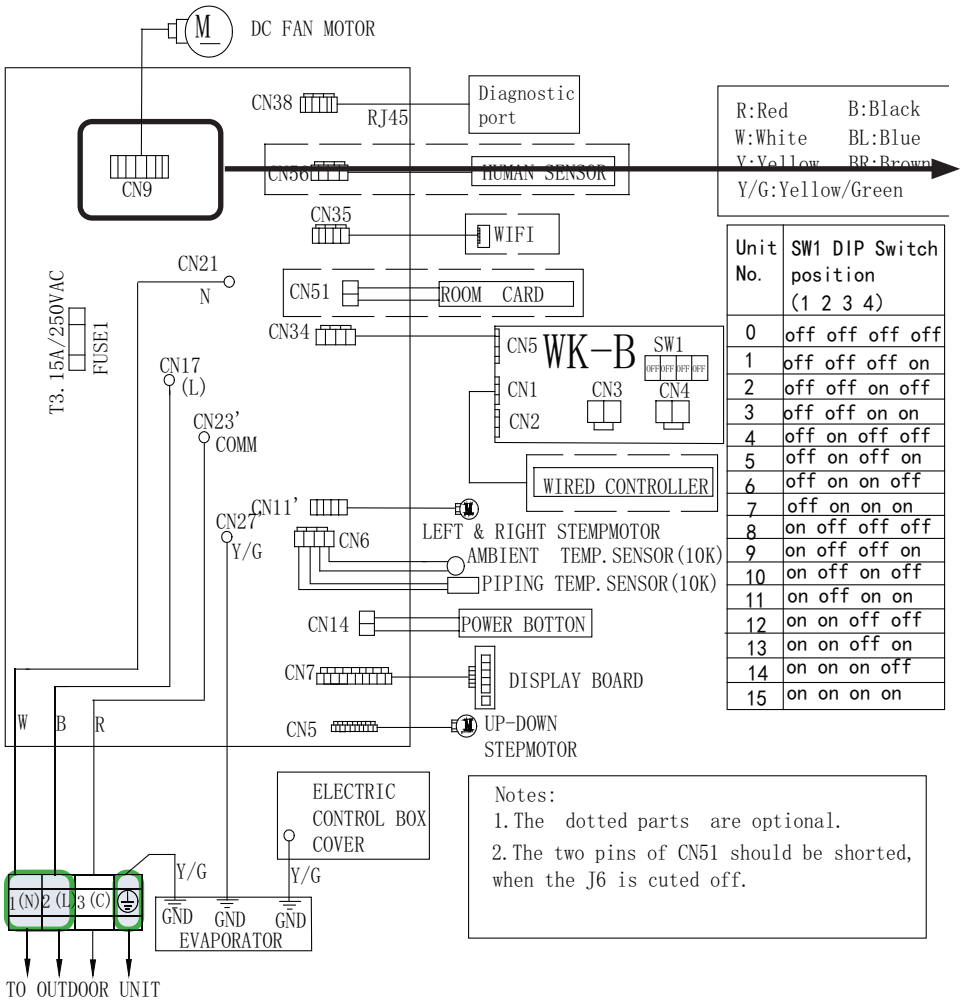
Models:

ASYW09URDEB
ASYW12URDEB
ASYW18URDEB



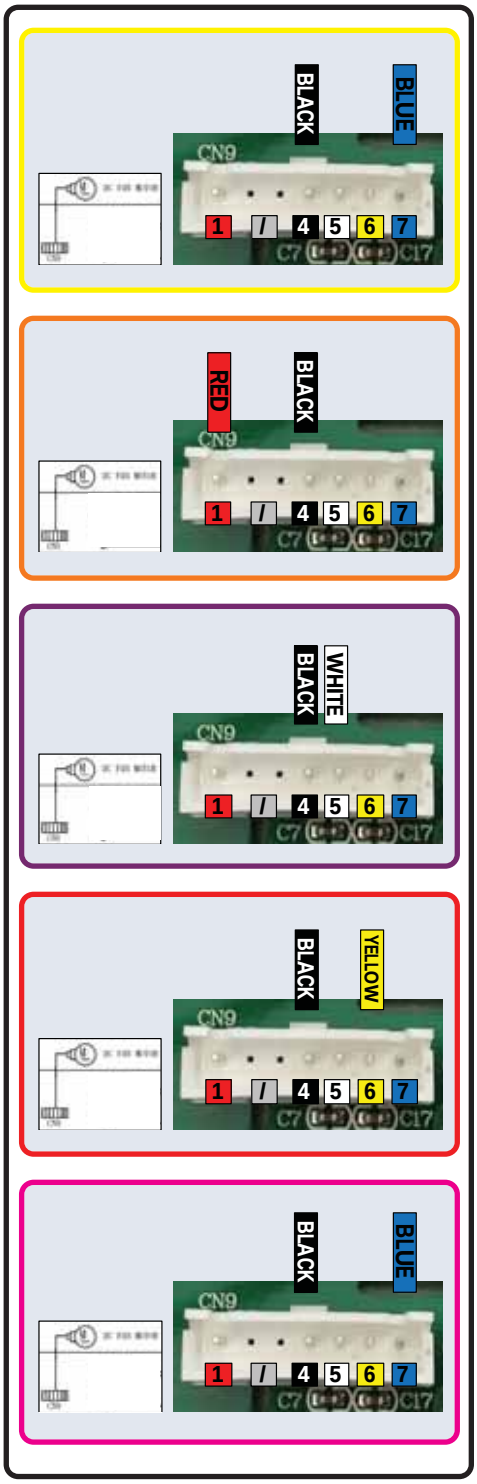
Error Code: E14

Wiring Diagram Reference



Unit No.	SW1 DIP Switch position (1 2 3 4)
0	off off off off
1	off off off on
2	off off on off
3	off off on on
4	off on off off
5	off on off on
6	off on on off
7	off on on on
8	on off off off
9	on off off on
10	on off on off
11	on off on on
12	on on off off
13	on on off on
14	on on on off
15	on on on on

Notes:
1. The dotted parts are optional.
2. The two pins of CN51 should be shorted, when the J6 is cuted off.



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

°F	°C	Normal (KΩ 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

°F	°C	Normal (KΩ 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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