

ACIQ

R32 18K-60K TOP-DISCHARGE AC COOLING-ONLY CONDENSER

SERVICE MANUAL

Models Covered:

AC-I-18AC14

AC-I-24AC14

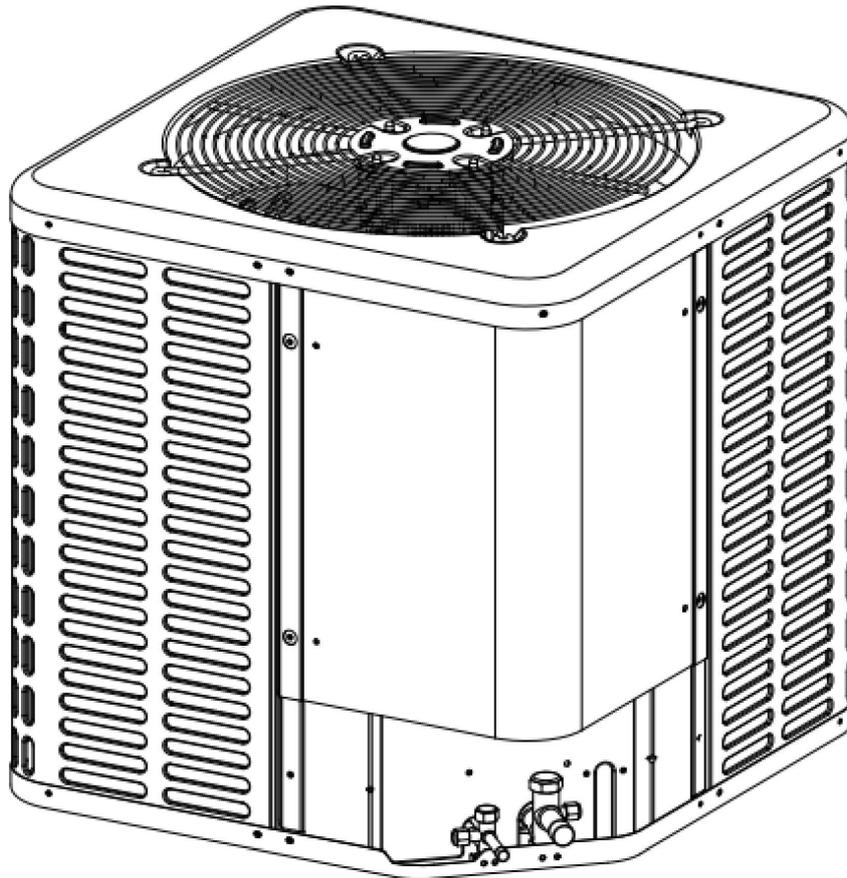
AC-I-30AC14

AC-I-36AC14

AC-I-42AC14

AC-I-48AC14

AC-I-60AC14



RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION

ATTENTION INSTALLING PERSONNEL

Prior to installation, thoroughly familiarize yourself with this Installation Manual. Observe all safety warnings.

During installation or repair, caution is to be observed

It is your responsibility to install the product safely and to educate the customer on its safe use

VERSION DATE: 01-30-26

Part 1

General Information

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1 Product lineup

Model	Cooling Capacity (Btu/h)	Heating Capacity (Btu/h)	Appearance
AC-I-18AC14	18000	/	
AC-I-24AC14	24000	/	
AC-I-30AC14	30000	/	
AC-I-36AC14	35000	/	
AC-I-42AC14	42000	/	
AC-I-48AC14	46000	/	
AC-I-60AC14	54000	/	

2 Specifications

ACIQ ODU Model Numbers		AC-118AC14	AC-124AC14	AC-130AC14	AC-136AC14	AC-142AC14	AC-148AC14	AC-150AC14
Power supply (Outdoor)		V, Ph-Hz	208/230V, 1Ph, 60Hz	208/230V, 1Ph, 60Hz	208/230V, 1Ph, 60Hz	208/230V, 1Ph, 60Hz	208/230V, 1Ph, 60Hz	208/230V, 1Ph, 60Hz
Cooling (Standard conditions)	Rated Capacity	Btu/hr	18000	24000	30000	35000	42000	48000
	Input	W	1475	2050	2550	3000	3580	4600
	Current	A	6.70	9.30	11.50	13.80	16.20	20.90
	EER2	Btu/hr/W	12.20	11.70	11.70	11.70	11.70	11.70
	SEER2	Btu/hr/W	14.3	14.3	14.3	14.3	14.3	13.8
Heating (Standard conditions)	Rated Capacity	Btu/hr	N/A	N/A	N/A	N/A	N/A	N/A
	Input	W	N/A	N/A	N/A	N/A	N/A	N/A
OUTDOOR MINIMUM CIRCUIT AMPACITY		A	11	13	17	24	25	33
OUTDOOR MAX. FUSE		A	15	20	25	30	35	50
Outdoor Airflow		CFM	2000	2000	2650	2650	2950	2950
Outdoor Noise Level		dB(A)	58.0	58.0	59.0	59.0	60.0	60.0
Connection Wiring		AWG	24V: AWG 14*3 Shielded	24V: AWG 12*3 Shielded	24V: AWG 12*3 Shielded	24V: AWG 10*3 Shielded	24V: AWG 8*3 Shielded	24V: AWG 8*3 Shielded
Communication Type		--	24V	24V	24V	24V	24V	24V
Throttle Type		--	Capillary	Capillary	Capillary	Capillary	Capillary	Capillary
Outdoor Unit Weight & Dimensions	Dimension (WxDxH)	inch	23-5/8" x 23-5/8" x 25"	23-5/8" x 23-5/8" x 25"	29-9/16" x 29-9/16" x 25"	29-9/16" x 29-9/16" x 25"	29-9/16" x 29-9/16" x 32-7/8"	29-9/16" x 29-9/16" x 32-7/8"
	Dimension (WxDxH)	mm	600 x 600 x 635	600 x 600 x 635	740 x 740 x 635	740 x 740 x 635	740 x 740 x 835	740 x 740 x 835
	Packing (WxDxH)	inch	25-63/64" x 25-63/64" x 26-3/16"	25-63/64" x 25-63/64" x 26-3/16"	30-5/16" x 30-5/16" x 26-3/16"	30-5/16" x 30-5/16" x 26-3/16"	30-5/16" x 30-5/16" x 34-1/16"	30-5/16" x 30-5/16" x 34-1/16"
	Packing (WxDxH)	mm	660 x 660 x 665	660 x 660 x 665	770 x 770 x 665	770 x 770 x 665	770 x 770 x 865	770 x 770 x 865
	Net/Gross Weight	lb	117 / 123	119 / 126	139 / 148	145 / 154	157 / 168	176 / 187
	Net/Gross Weight	kg	53 / 56	54 / 57	63.1 / 67	65.9 / 70	71 / 76	80 / 85
Refrigerant type		--	R32	R32	R32	R32	R32	R32
Refrigerant charge		oz	45.86	52.91	75.84	79.37	91.71	102.29
Additional charge for each ft		oz/ft	0.52	0.52	0.52	0.52	0.52	0.52
Design pressure		PSIG	609/174	609/174	609/174	609/174	609/174	609/174
Refrigerant Piping	Liquid side	inch	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	Gas side	inch	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
	Max. piping length	ft	98	131	131	164	213	213
	Max. piping length	m	30	40	40	50	64	64
	Max. level difference	ft	66	62	62	62	96	96
Operating Temperature	Outdoor (cooling)	°F	5°~131°	5°~131°	5°~131°	5°~131°	5°~131°	5°~131°
		°C	-4°~75°	-4°~75°	-4°~75°	-4°~75°	-4°~75°	-4°~75°

Part 2

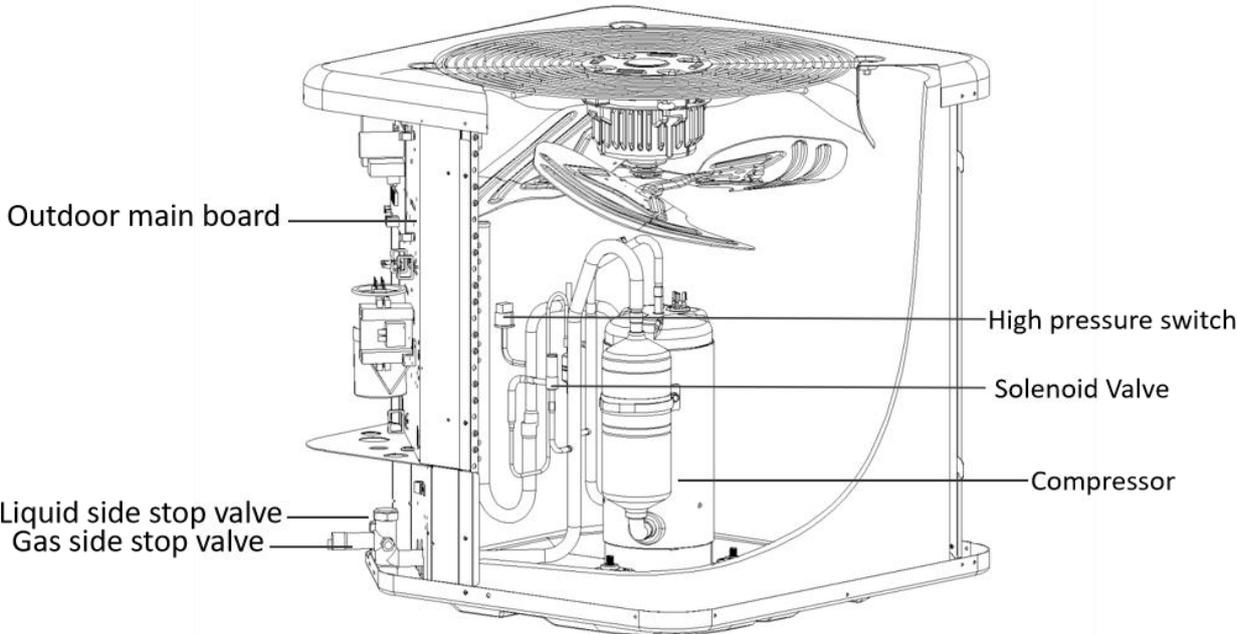
Component Layout and Refrigerant Circuit

1 Layout Functional Components 5

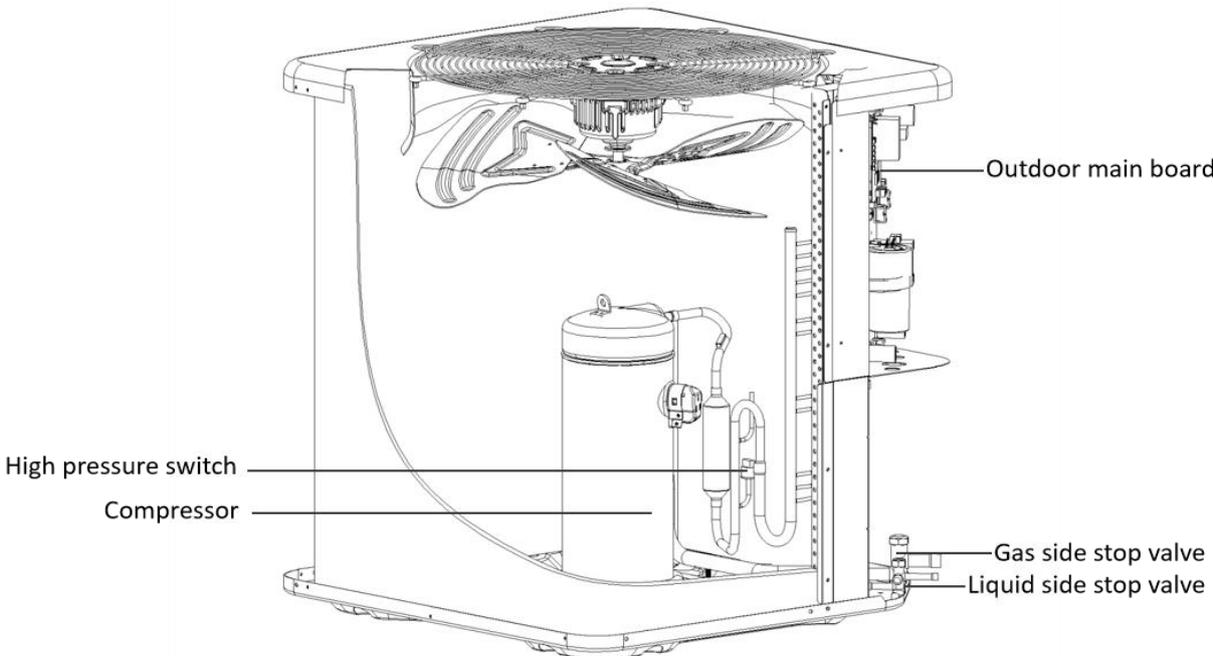
2 Piping diagrams 6

1 Layout Functional Components

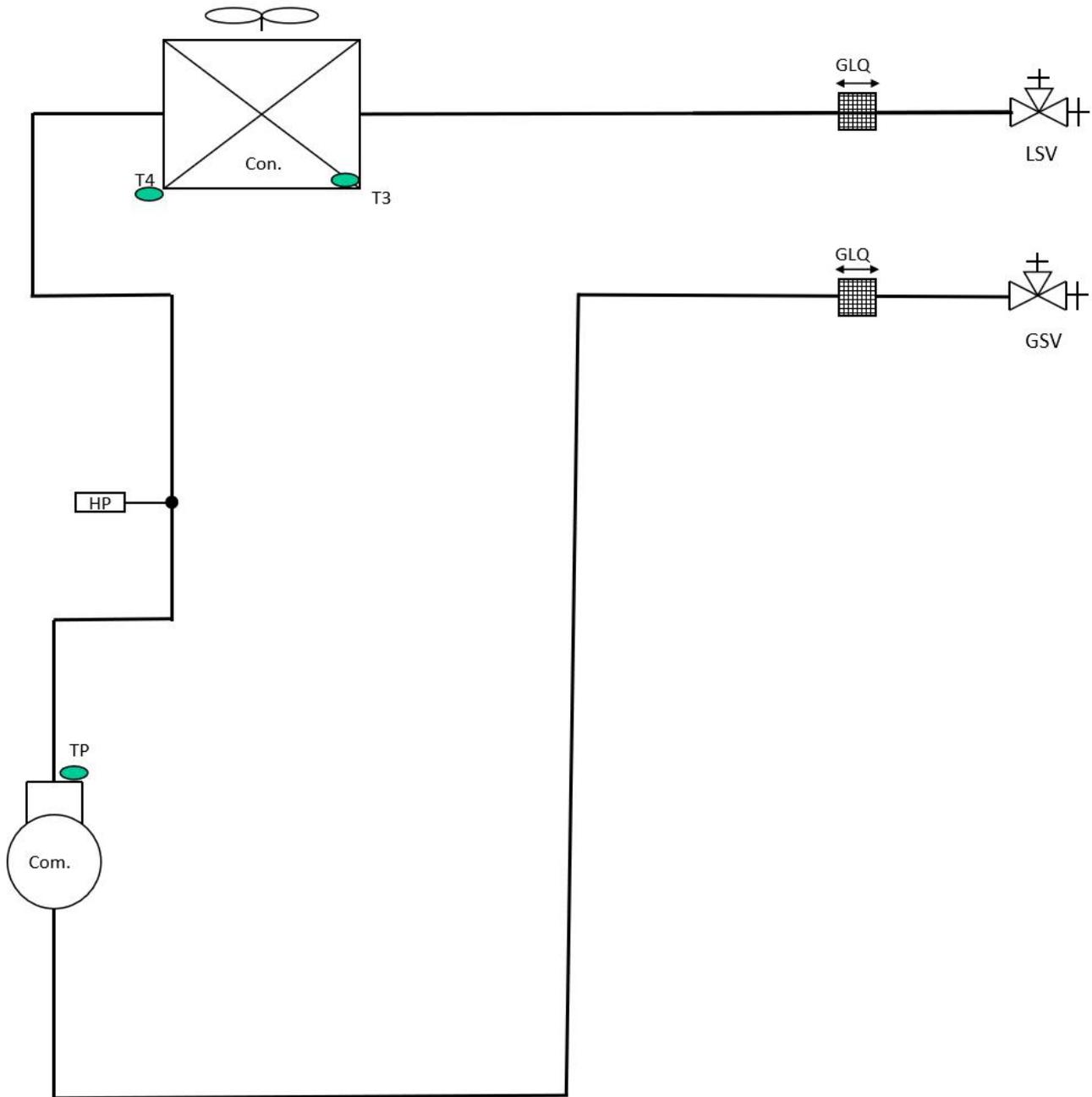
AC-I-18AC14, AC-I-24AC14, AC-I-30AC14, & AC-I-60AC14



AC-I-42AC14, AC-I-48AC14, & AC-I-60AC14



2 Piping diagrams



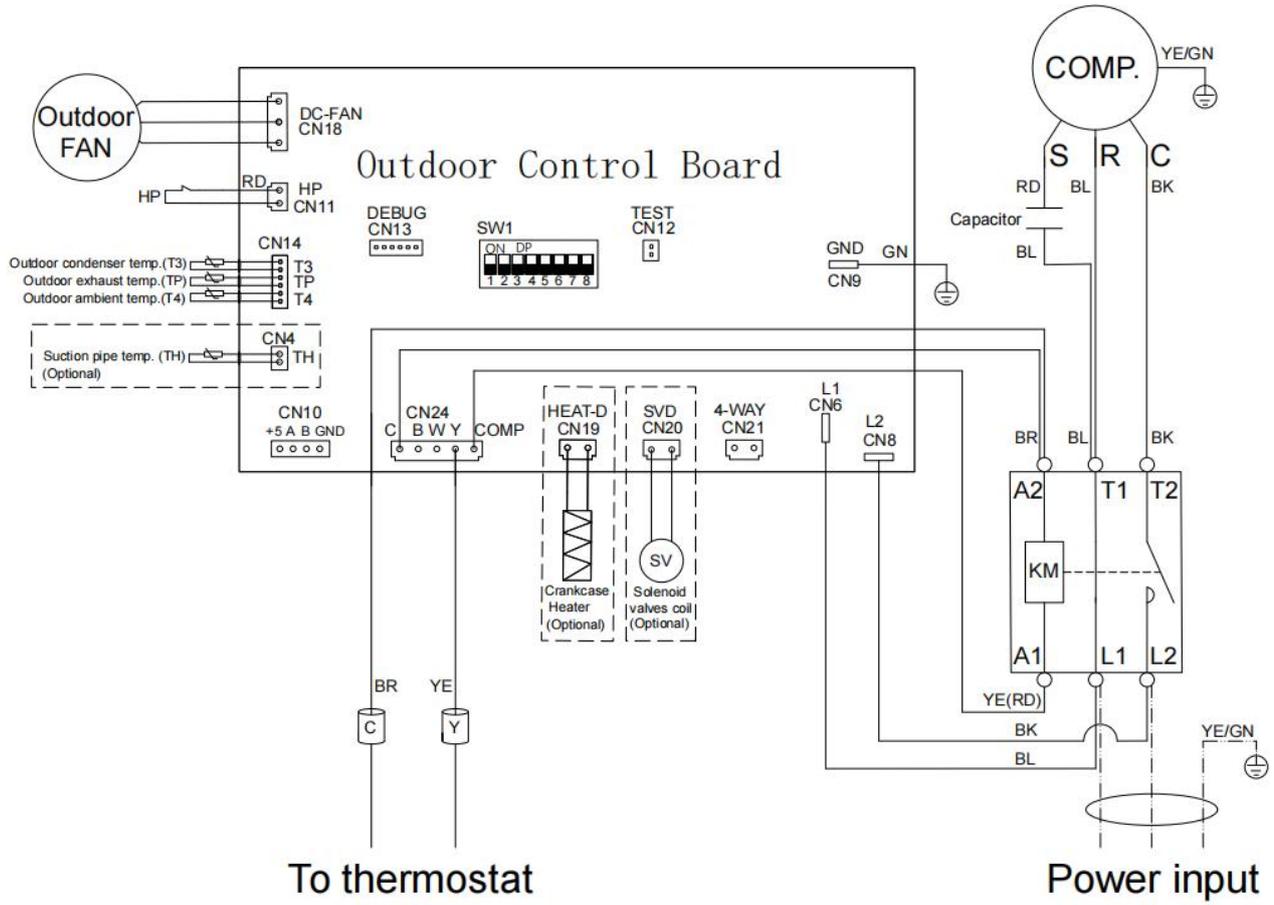
NO.	Component(Outdoor unit)	NO.	Component(Outdoor unit)
Com.	Compressor	LSV	Liquid Stop Valve
TP	Exhaust temperature sensor	GSV	Gas Stop Valve
HP	High pressure switch		
T4	Ambient temperature sensor		
T3	Condenser coil temperature sensor		
Con.	Condenser		
RCP	Refrigerant cooling pipe		
GLQ	Filter		

Part 3

Wiring Diagram

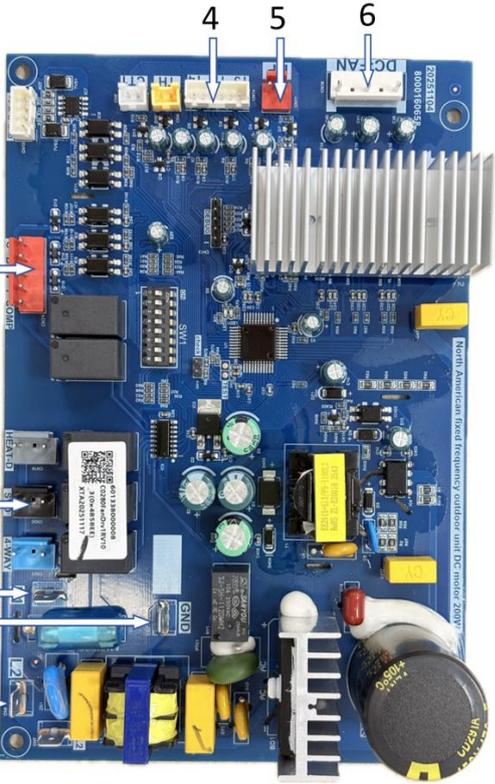
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1 Electric wiring diagram



Note: 18k 24k 30k 36k models should connect Solenoid valves coil

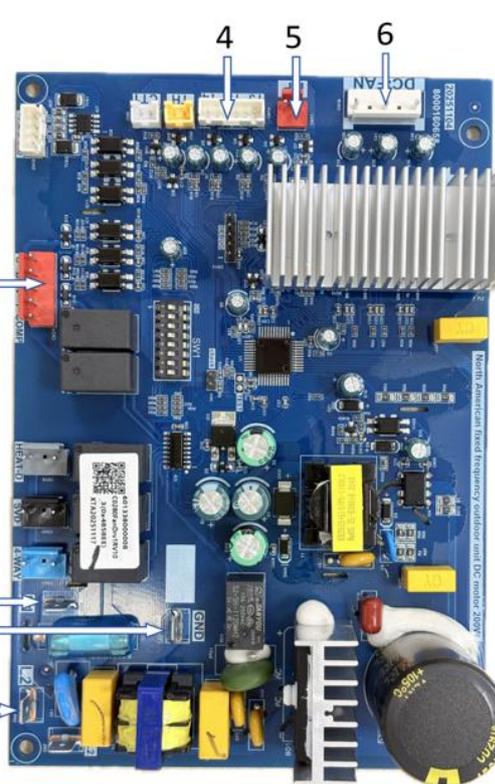
2 PCB



The image shows a blue printed circuit board (PCB) for an outdoor unit. It features a large silver heat sink in the center, a QR code on the left, and various electronic components. Eight numbered callouts point to specific terminals: 1 (L1), 2 (L2), 3 (GND), 4 (T3/T4/TP sensor), 5 (high pressure switch), 6 (DC motor), 7 (C/B/W/Y COMP), and 8 (solenoid valve).

No.	Functional description
1	Power supply input L(L1)
2	Power supply input N(L2)
3	Ground wire
4	T3 T4 TP sensor port
5	High pressure protection switch port
6	DC motor port
7	C B W Y COMP port(24V)
8	Solenoid valve port

18/24/30/36K Outdoor Main Control Board



The image shows a blue printed circuit board (PCB) for an outdoor unit, similar to the one above but with a different terminal configuration. It features a large silver heat sink, a QR code, and various electronic components. Seven numbered callouts point to specific terminals: 1 (L1), 2 (L2), 3 (GND), 4 (T3/T4/TP sensor), 5 (high pressure switch), 6 (DC motor), and 7 (C/B/W/Y COMP).

No.	Functional description
1	Power supply input L(L1)
2	Power supply input N(L2)
3	Ground wire
4	T3 T4 TP sensor port
5	High pressure protection switch port
6	DC motor port
7	C B W Y COMP port(24V)

42/48/60K Outdoor Main Control Board

Definition of SW1

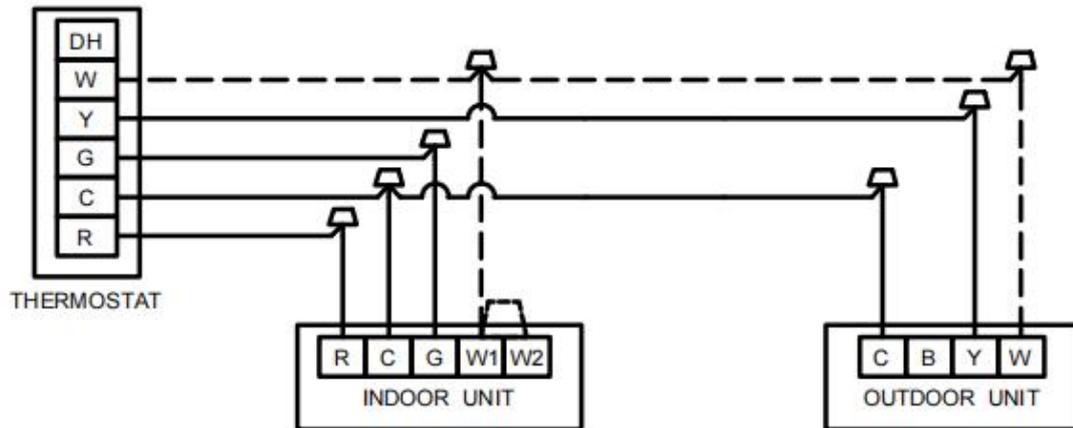
Wire Color Code	DIP switch status Indicate		Outdoor Display Board SW1 DIP switch selection				Outdoor Display Board SW1 DIP switch selection			
			SW1.1	SW1.2	SW1.3	SW1.4	SW1.5	SW1.6	SW1.7	SW1.8
RD RED OR ORANGE	ON <input type="checkbox"/>	This Indicate OFF (The DIP switch is dialed to the digital side)	OFF	24V Control (Default)			SW1.5	OFF	Reserved (Default)	
BL BLUE GN GREEN	OFF <input checked="" type="checkbox"/>		ON	RS485 Comm. Mode			ON	ON	Manual Defrosting	
BR BROWN GY GRAY	ON <input checked="" type="checkbox"/> OFF <input type="checkbox"/> 1	This Indicate ON (The DIP switch is dialed to the non-digital side)	OFF	Heating and cooling			SW1.6	OFF	Auto Defrosting (Default)	
BK BLACK YE YELLOW			ON	Single-cooled (Default)			ON	ON	Periodically Defrosting	
WH WHITE PR PURPLE			OFF	SW1.4	OFF	Model	18K	SW1.7	OFF	Defrost interval 60 minutes (Default)
			ON	ON	ON		24K 30K 36K 42K	ON	ON	Defrost interval 30 minutes
			ON	OFF	Reserved	SW1.8	OFF	General mode (Default)		
			ON	ON	48K 60K	ON	ON	High vertical mode		

3 Low voltage wiring diagram

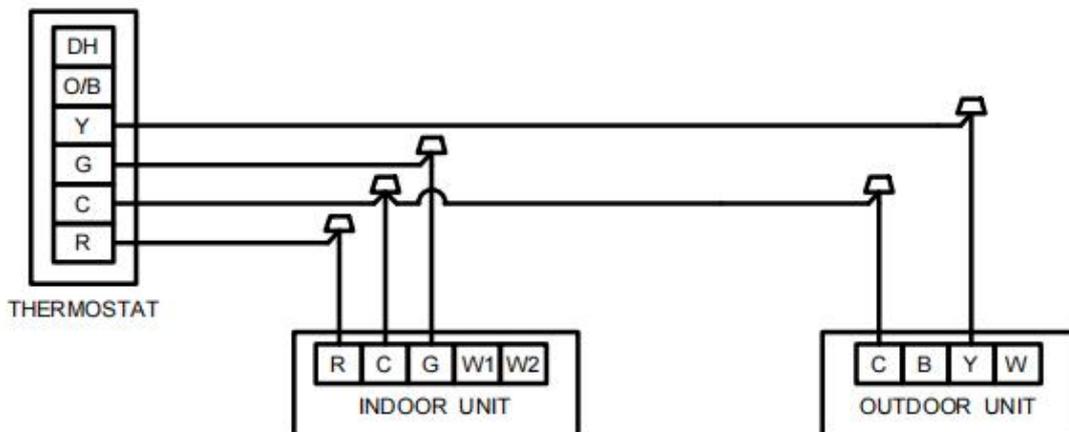
The following wiring diagram are suitable for the Indoor Unit and Outdoor Unit with 24V thermostat.

Cooling-Only Model

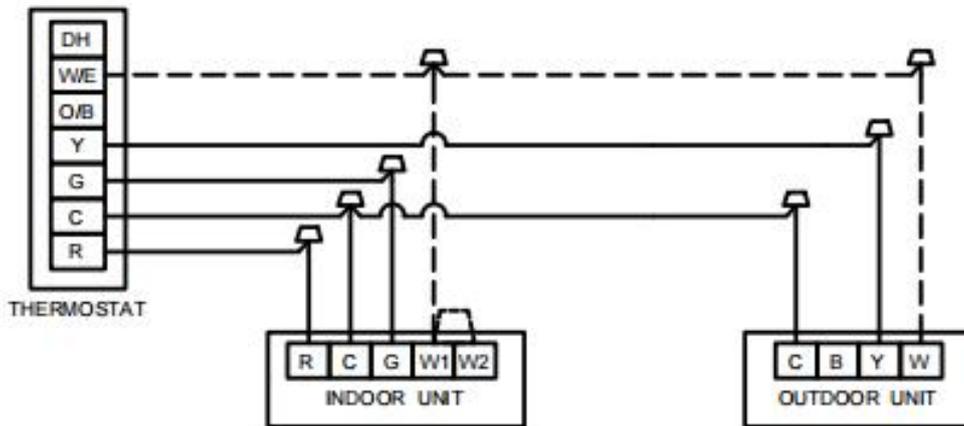
Wiring for 1H and 1C thermostat (no heat pump system model)



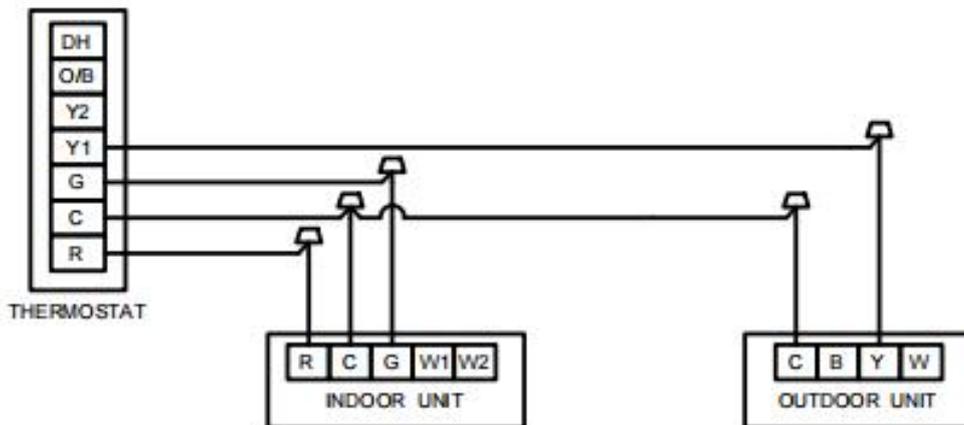
Wiring for 1H and 1C thermostat (no heat pump system model)



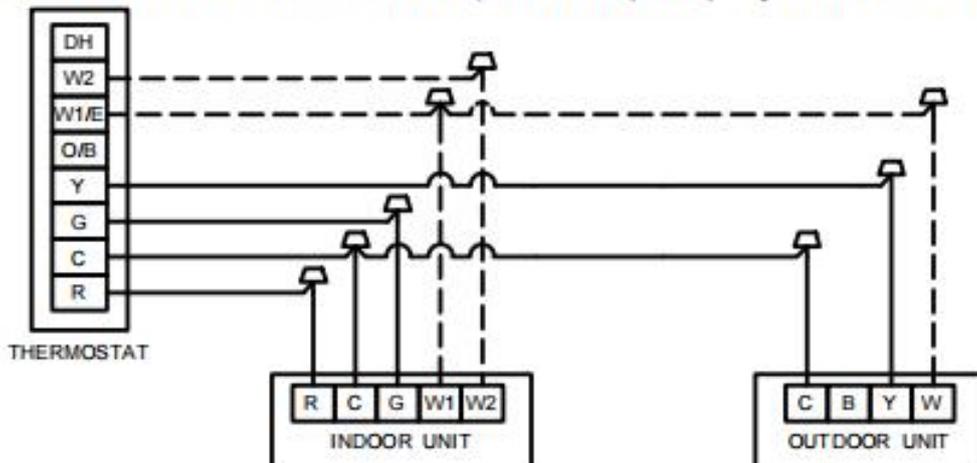
Wiring for 2H and 1C thermostat (no heat pump system model)



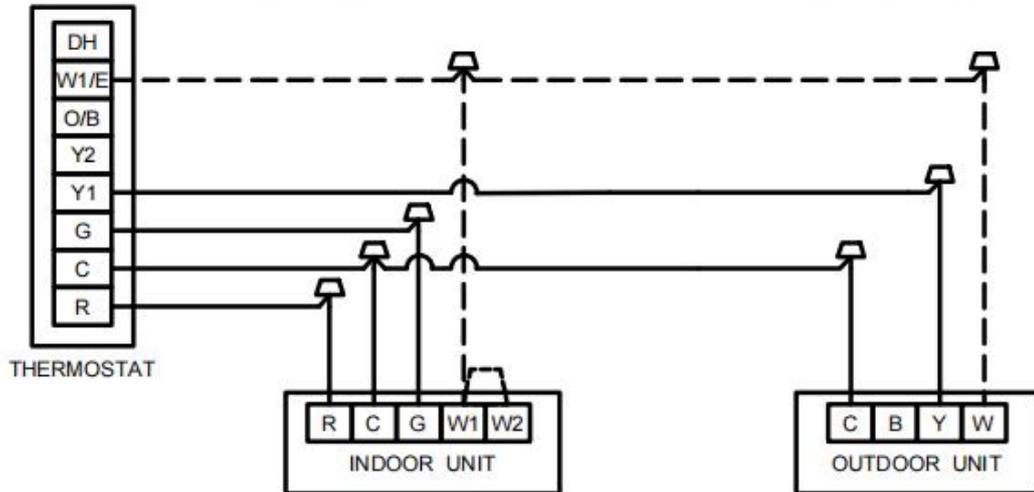
Wiring for 2H and 2C thermostat (no heat pump system model)



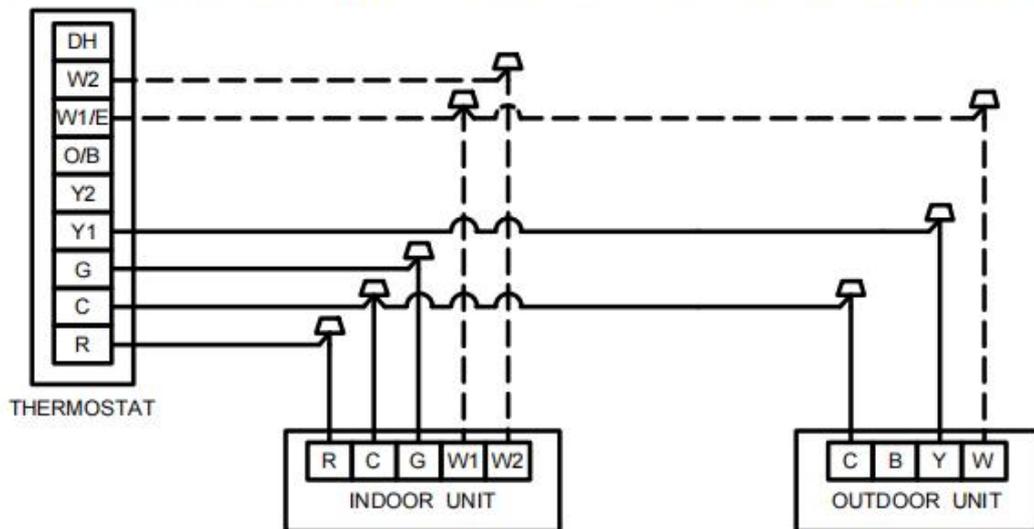
Wiring for 3H and 1C thermostat (no heat pump system model)



Wiring for 3H and 2C thermostat (no heat pump system model)



Wiring for 4H and 2C thermostat (no heat pump system model)



Control Logic:

Indoor unit connector

Connector	Purpose
R	24V Power Connection
C	Common
G	Fan Control
W1	Stage 1 Electric Heating
W2	Stage 2 Electric Heating

Outdoor unit connector

Connector	Purpose
C	Common
Y	Cooling

Note:

- 1) DH wiring is optional and requires a thermostat with a humidistat. DH functions as Passive Dehumidification and will downstage the indoor fan to first stage. System will operate according to normal sequence of operations if DH wiring is absent.
- 2) Dashed lines in the above thermostat wiring diagrams refer to optional wiring (wiring for Passive Dehumidification Function and/OR Electric Heat). For thermostat wiring please refer to the Owner's Manual of the thermostat.

Part 4

Diagnosis and Troubleshooting

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1 Error code table

	LED Display	System Status
Operating Mode	Green Light: Steadily On Red Light: Off	Standby
		Cooling
		Heating
System Alert	Green Light: Flashes 1 Time Red Light: Off	Low Pressure Alert(Reserved)
	Green Light: Flashes 2 Times Red Light: Off	High Pressure Alert
	Green Light: Flashes 3 Times Red Light: Off	Tp Exhaust Over-temperature Protection
	Green Light: Flashes 4 Times Red Light: Off	TH Anti-freeze Protection Fault(Reserved)
	Green Light: Flashes 5 Times Red Light: Off	T4 Ambient Temperature Protection
	Green Light: Flashes 6 Times Red Light: Off	T3 Over-temperature Protection
	Green Light: Off Red Light: Flashes 1 Time	T3 Sensor Error
	Green Light: Off Red Light: Flashes 2 Times	T4 Sensor Error
	Green Light: Off Red Light: Flashes 3 Times	Tp Sensor Error
System Lockout	Green Light: Off Red Light: Flashes 5 Times	6 Low Pressure Faults within 60 Mins(Reserved)
	Green Light: Off Red Light: Flashes 6 Times	3 Exhaust Over-temperature Faults within 60 Mins
	Green Light: Off Red Light: Flashes 7 Times	8 TH Anti-freeze Faults within 200 Mins(Reserved)

2 Troubleshooting

2.1 Safety Precautions

The following precautions here are quite important, so be sure to follow them carefully. Read these instructions carefully before installation. Keep this manual in a handy for future reference.

Failure to adhere to all precautionary measures listed in this section may result in personal injury, damage to the unit or to property, or in extreme cases, death.



WARNING

- Indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.



CAUTION

- Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury.
- It is also used to alert against unsafe practices.

2.1.1 In case of Accidents or Emergency



WARNING

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.



CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

2.1.2 Information servicing(For flammable materials)



WARNING

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized service center.



CAUTION

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

2.1.3 Operation and Maintenance



WARNING

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.

- Do not drink water drained from the unit.
- Avoid direct skin contact with water drained from the unit.
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.



CAUTION

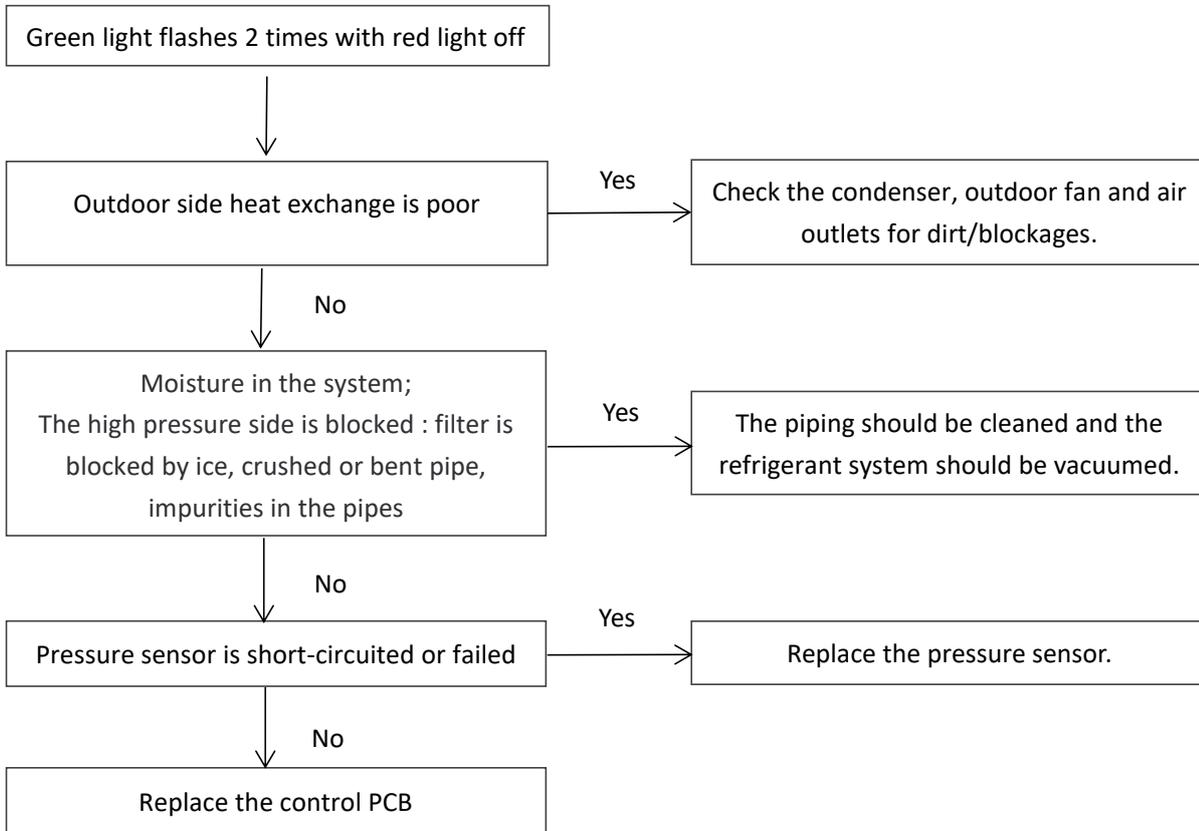
- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecured location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge
- Created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas waterOr other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

2.2 ATL Troubleshooting

- ATL indicates ambient temperature out of bounds protection.
- The unit stops running and will not start operating until the ambient temperature returns to the allowable temperature range, error code is displayed on the communication board.
- The allowable ambient temperature range is 5~125°F (-15~52°C).

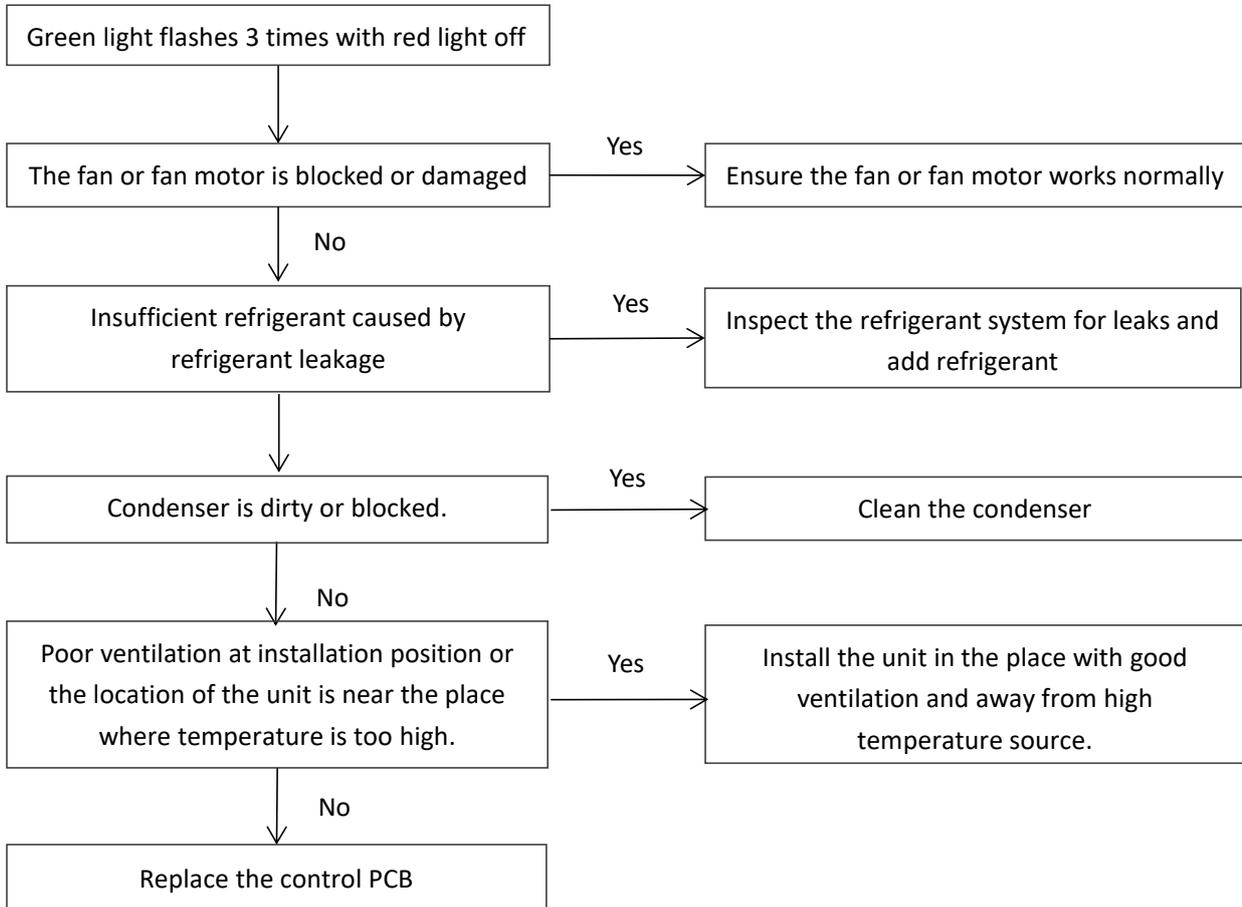
2.3 High Pressure Alert

- Green light flashes 2 times with red light off indicates High Pressure Alert.



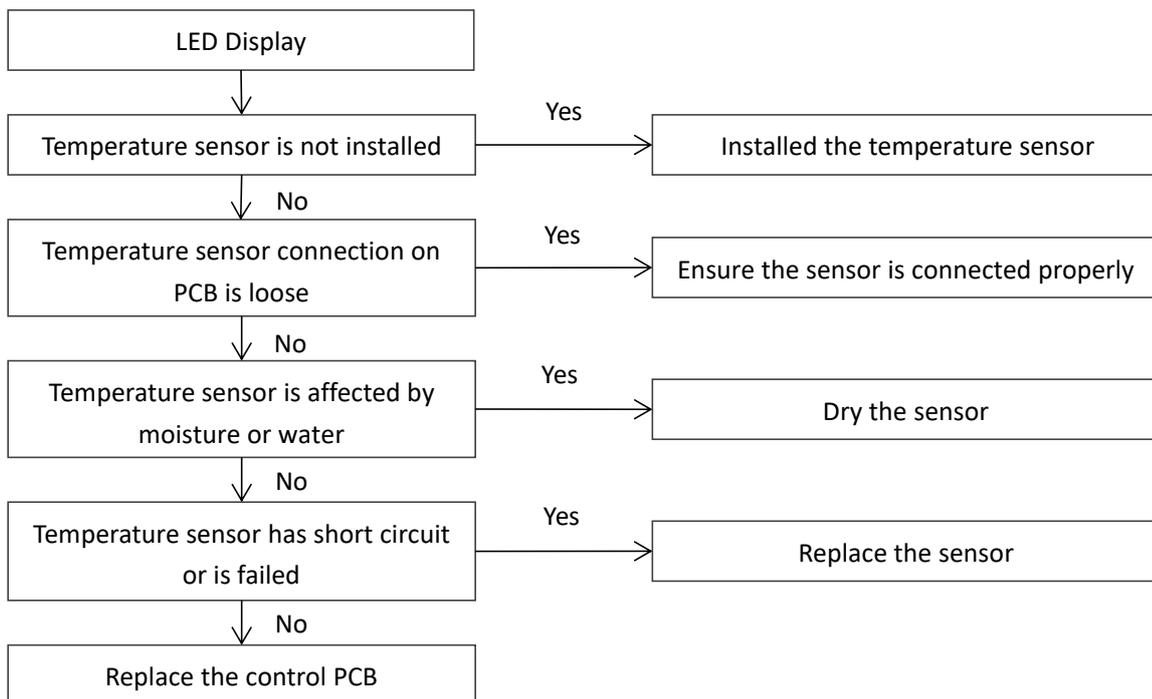
2.4 TP Exhaust Over-temperature Protection Troubleshooting

- Green light flashes 3 times with red light off indicates discharge temperature protection.
- The unit stops running and error code is displayed on the communication board.



2.5 T3/T4/TP Troubleshooting

- Green light flashes 5 times with red light off indicates Ambient Temperature Protection.
- Green light flashes 5 times with red light off indicates T3 Over-temperature Protection.
- Green light off with red light flashes 1 times indicates T3 Sensor Error.
- Green light off with red light flashes 2 times indicates T4 Sensor Error.
- Green light off with red light flashes 3 times indicates TP Sensor Error.
- Green light off with red light flashes 6 times indicates Exhaust Over-temperature Faults within 60 mins.



Note:

- 1) Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor's resistance characteristics table, the sensor has failed.

3. Temperature Sensor Resistance Characteristics

Outdoor ambient temperature sensor(T4) and condenser coil temperature sensor(T3) resistance characteristics.

Temperature (°C)	Resistance (kΩ)						
-25	144.266	15	16.079	55	2.841	95	0.708
-24	135.601	16	15.313	56	2.734	96	0.686
-23	127.507	17	14.588	57	2.632	97	0.666
-22	119.941	18	13.902	58	2.534	98	0.646
-21	112.867	19	13.251	59	2.44	99	0.627
-20	106.732	20	12.635	60	2.35	100	0.609
-19	100.552	21	12.05	61	2.264	101	0.591
-18	94.769	22	11.496	62	2.181	102	0.574
-17	89.353	23	10.971	63	2.102	103	0.558
-16	84.278	24	10.473	64	2.026	104	0.542
-15	79.521	25	10	65	1.953	105	0.527
-14	75.059	26	9.551	66	1.883		
-13	70.873	27	9.125	67	1.816		
-12	66.943	28	8.721	68	1.752		
-11	63.252	29	8.337	69	1.69		
-10	59.784	30	7.972	70	1.631		
-9	56.524	31	7.625	71	1.574		
-8	53.458	32	7.296	72	1.519		
-7	50.575	33	6.982	73	1.466		
-6	47.862	34	6.684	74	1.416		
-5	45.308	35	6.401	75	1.367		
-4	42.903	36	6.131	76	1.321		
-3	40.638	37	5.874	77	1.276		
-2	38.504	38	5.63	78	1.233		
-1	36.492	39	5.397	79	1.191		
0	34.596	40	5.175	80	1.151		
1	32.807	41	4.964	81	1.113		
2	31.12	42	4.763	82	1.076		
3	29.528	43	4.571	83	1.041		
4	28.026	44	4.387	84	1.007		
5	26.608	45	4.213	85	0.974		
6	25.268	46	4.046	86	0.942		
7	24.003	47	3.887	87	0.912		
8	22.808	48	3.735	88	0.883		
9	21.678	49	3.59	89	0.855		
10	20.61	50	3.451	90	0.828		
11	19.601	51	3.318	91	0.802		
12	18.646	52	3.191	92	0.777		
13	17.743	53	3.069	93	0.753		
14	16.888	54	2.952	94	0.73		

Compressor exhaust temperature sensor (TP) resistance characteristics.

Temperature (°C)	Resistance (kΩ)						
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294		
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045		
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

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The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details. Any updates to the manual will be uploaded to the service website, please check for the latest version.