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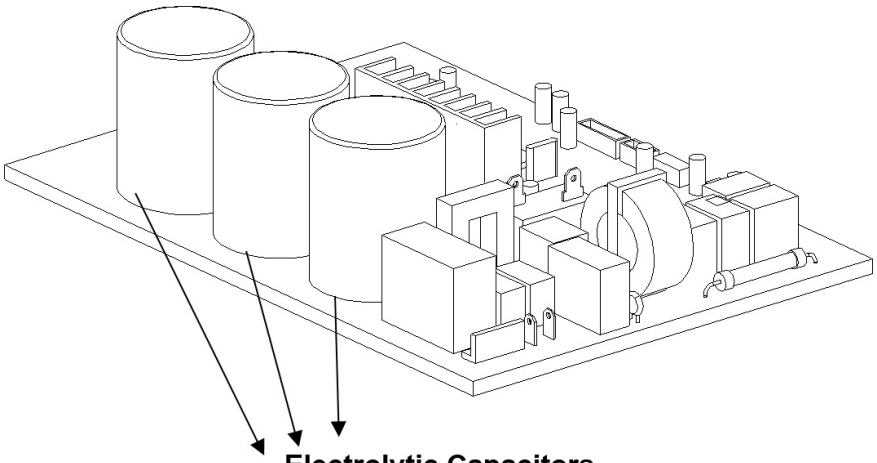
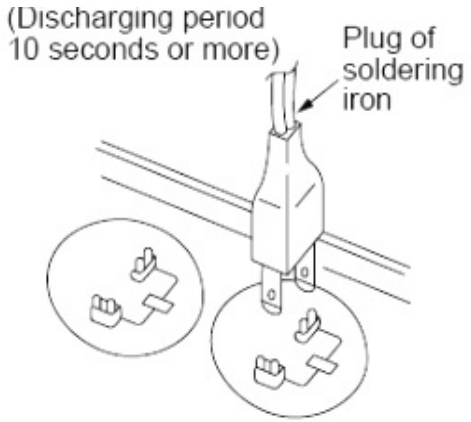
01. Safety

HIGH VOLTAGE! CAUTION!

Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



For other models, please connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.



Note: The picture above is only a reference. Model plugs may vary slightly between models.

02. Troubleshooting

02.01. Indoor Unit Error Display

Error Codes	Operation Lamp	Timer Lamp	Causes
E0	☆ 1 time	**X**	Indoor unit EEPROM parameter error
E1	☆ 2 times	**X**	Communication error between indoor and outdoor units
E3	☆ 4 times	**X**	Indoor fan speed has been out of control
E4	☆5 times	**X**	Indoor room temperature sensor (T1) open circuit or short circuit
E5	☆ 6 times	**X**	Evaporator coil temperature sensor (T2) open circuit or short circuit
EC	☆ 7 times	**X**	Refrigerant leakage detection
F0	☆ 1 time	**O**	Overload current protection
F1	☆ 2 times	**O**	Outdoor ambient temperature sensor (T4) open circuit or short circuit
F2	☆ 3 times	**O**	Condenser coil temperature sensor (T3) open circuit or short circuit
F3	☆ 4 times	**O**	Compressor discharge temperature sensor (T5) open circuit or short circuit
F4	☆ 5 time	**O**	Outdoor unit EEPROM parameter error
F5	☆ 6 times	**O**	Outdoor fan speed has been out of control
P0	☆ 1 time	☆	IPM malfunction or IGBT over-strong current protection
P1	☆ 2 times	☆	Over voltage or over low voltage protection
P2	☆ 3 times	☆	High temperature protection of compressor top diagnosis and solution (only WRC-050AS and WRC-071AS)
P4	☆ 5 times	☆	Inverter compressor drive error
CP	-	**-**	Remote On/Off terminal is open circuit
E7	-	**-**	Communication error between the display board and main indoor PCB

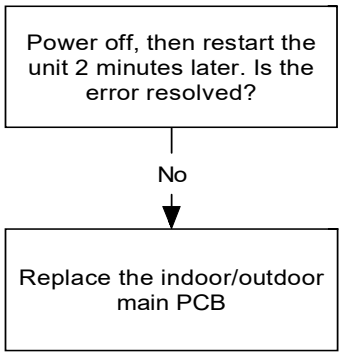
O – ON **; X –** OFF**;** ☆ **–** Flash

02.02. Troubleshooting Error Codes

02.02.01. EEPROM parameter error diagnosis and solution (E0/F4)

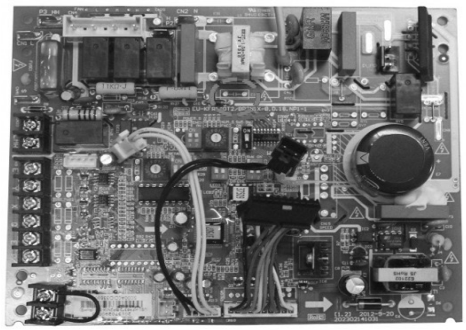
Error Code	E0 / F4
Malfunction decision conditions	Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.
Supposed causes	• Installation mistake • PCB faulty

Troubleshooting:

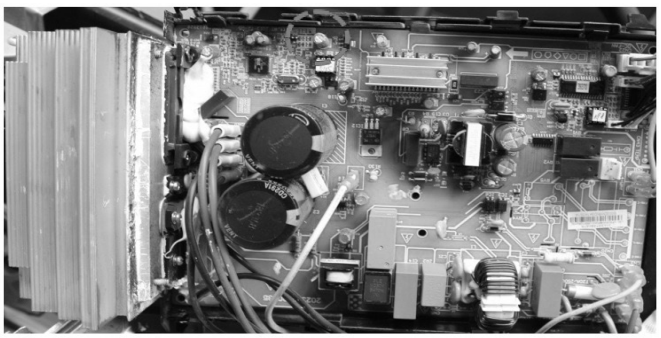


EEPROM:

A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.



Indoor PCB Board



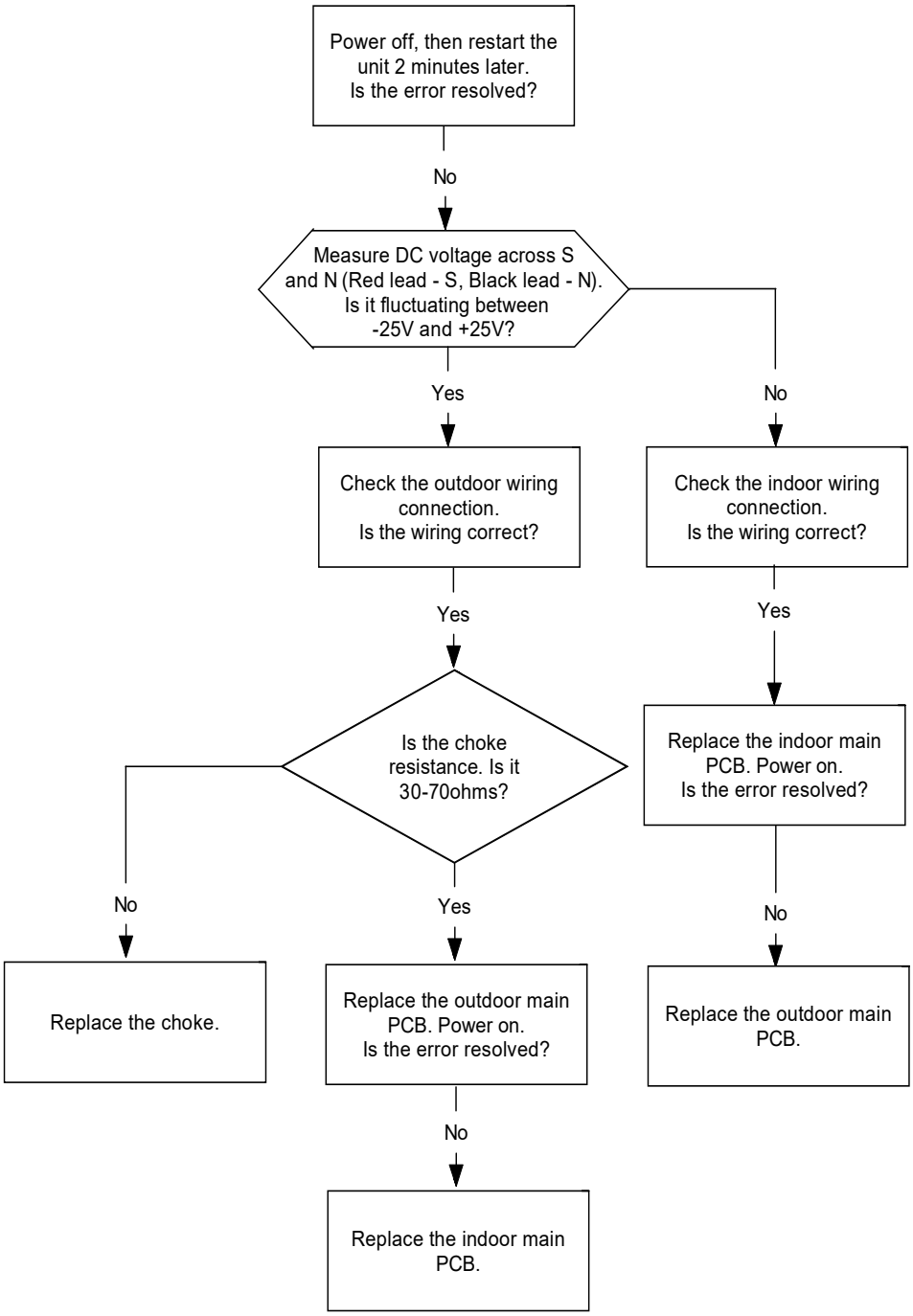
Outdoor PCB Board

Note: The two photos above are only a reference, unit models may vary slightly from what is shown.

02.02.02. Indoor / outdoor unit's communication diagnosis and solution (E1)

Error Code	E1
Malfunction decision conditions	Indoor unit does not receive the feedback from outdoor unit during 110 seconds and this condition happens four times continuously.
Supposed causes	• Wiring mistake • Indoor or outdoor PCB faulty

Troubleshooting:

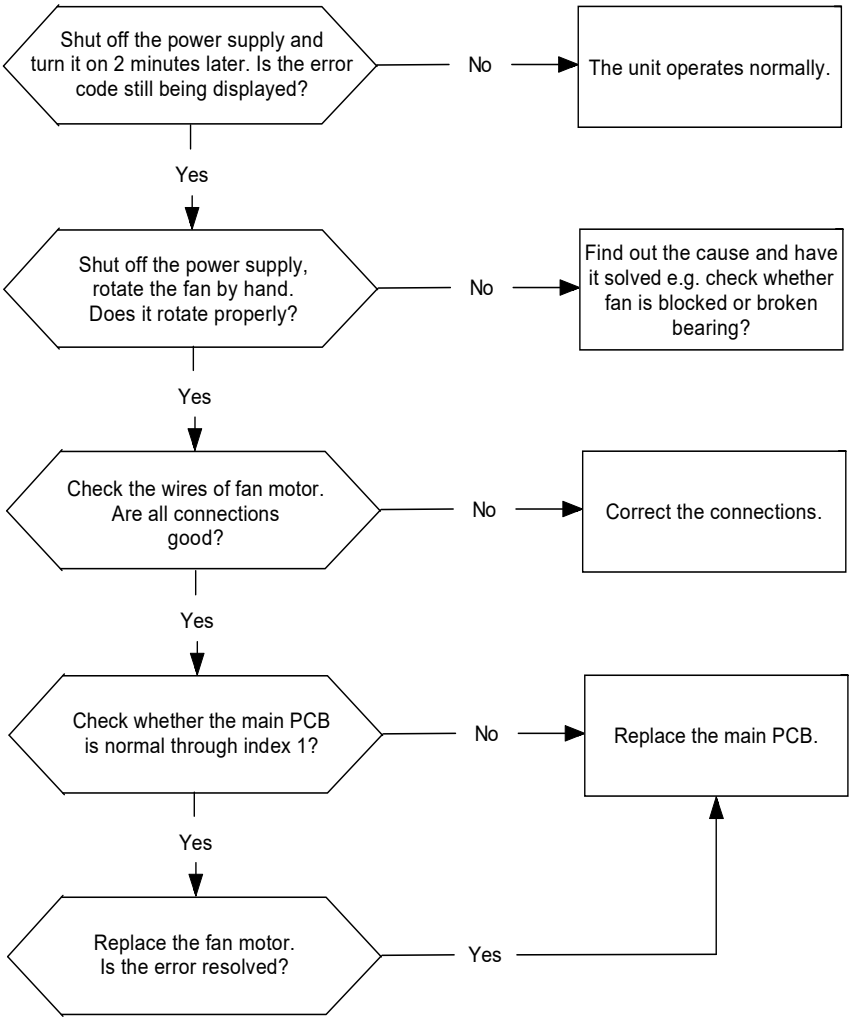


NOTE: The average resistance of the reactor should range from 30-70Ω. If the resistance lies outside of that range or there are traces of black points, please replace reactor.

02.02.03. Fan speed has been out of control diagnosis and solution (E3)

Error Code	E3/F5
Malfunction decision conditions	When indoor fan speed remains too low (300RPM) for certain time, the unit will stop and the LED will display the failure.
Supposed causes	• Wiring mistake • Fan assembly faulty • Fan motor faulty • PCB faulty

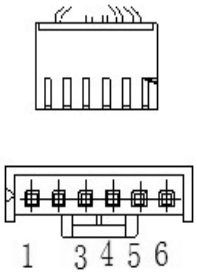
Troubleshooting:



Index 1:

1: Indoor or Outdoor DC Fan Motor (control chip is in fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.



DC motor voltage input and output:

No.	Colour	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

2: Outdoor DC Fan Motor (Control Chip is in Outdoor PCB)

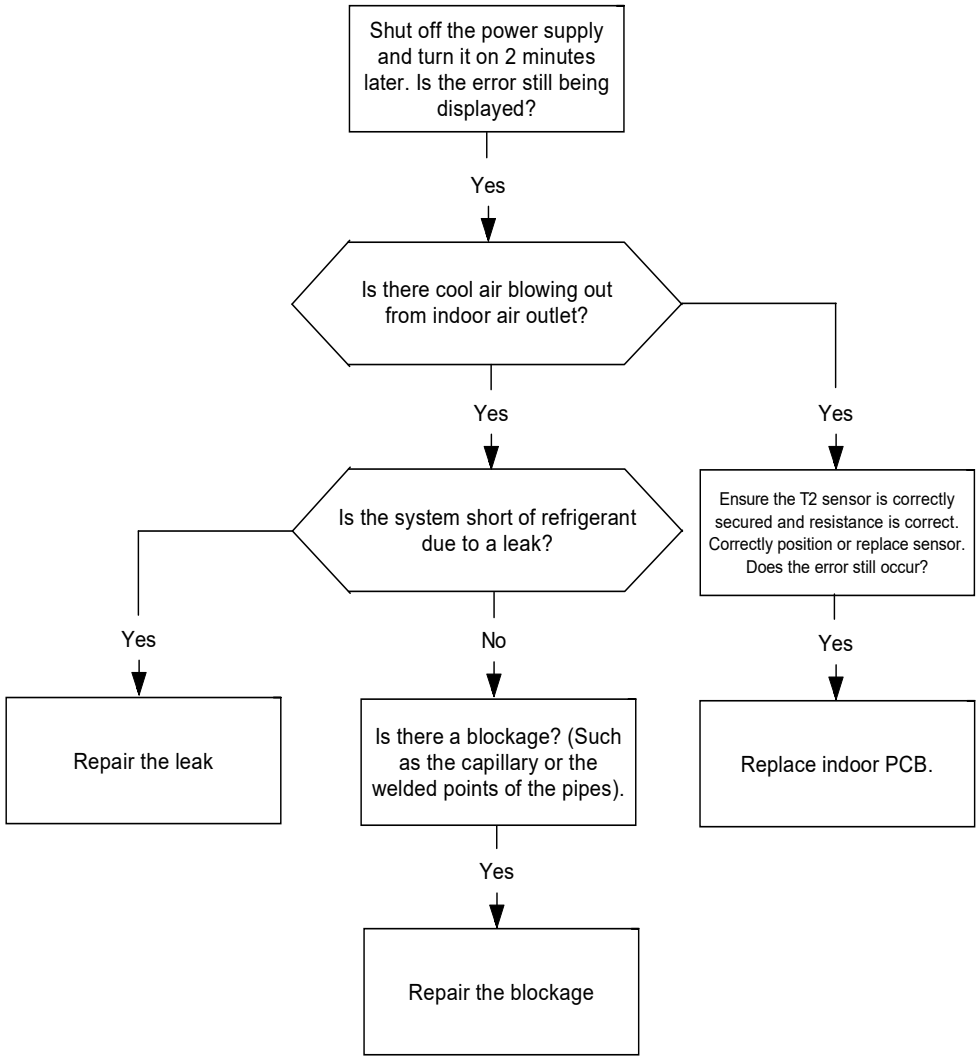
Power on ,and check if the fan can run normally, if the fan can run normally, the PCB must has problems and need to be replaced, If the fan can’t run normally, measure the resistance of each two pins. If the resistance is not equal to each other, the fan motor must have problems and need to be replaced, otherwise the PCB must has problems and need to be replaced.

02.02.04. Refrigerant Leakage Detection diagnosis and solution (EC)

Error Code	EC
Malfunction decision conditions	Define the evaporator coil temp. T2 of the compressor just starts running as T cool. In the beginning 8 minutes after the compressor starts up, if T2 < Tcool - 1°C does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep continuous 3 minutes, and this situation happens 3 times, the display area will show “EC” and AC will turn off.
Supposed causes	• T2 sensor faulty • Indoor PCB faulty • System problem such as gas leak or blockage.

NOTE: this error occurs on cooling only

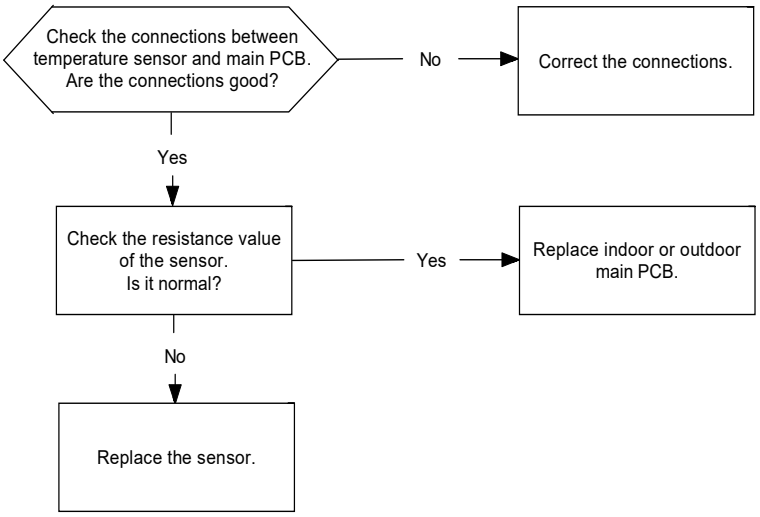
Troubleshooting:



02.02.05. Open circuit or short circuit of temperature sensor diagnosis and solution (E5)

Error Code	E4/E5/F1/F2/F3
Malfunction decision conditions	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.
Supposed causes	• Wiring mistake • Sensor faulty • PCB faulty

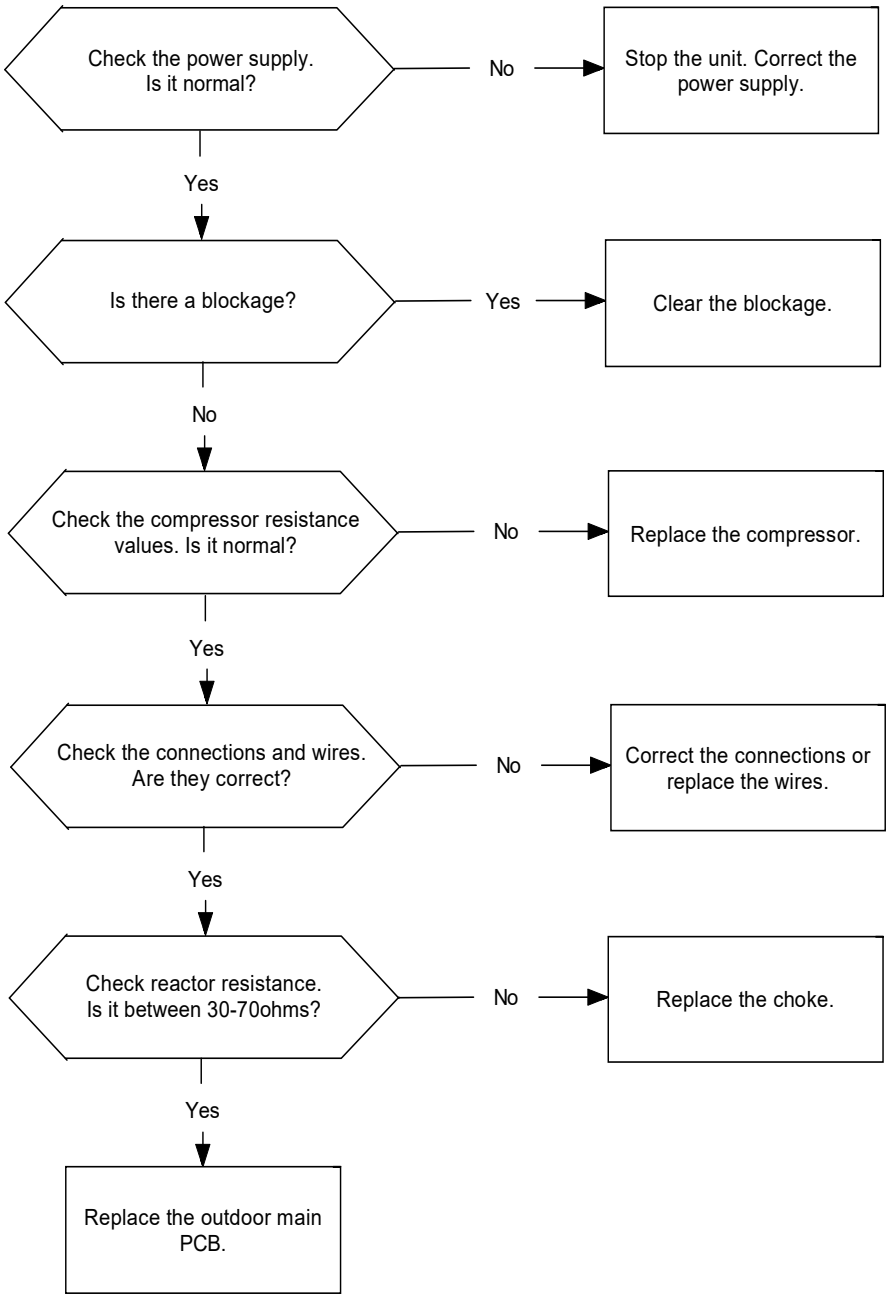
Troubleshooting:



02.02.06. Overload current protection diagnosis and solution (F0)

Error Code	F0
Malfunction decision conditions	An abnormal current rise is detected by checking the specified current detection circuit.
Supposed causes	• Power supply problems. • System blockage • PCB faulty • Wiring mistake • Compressor malfunction

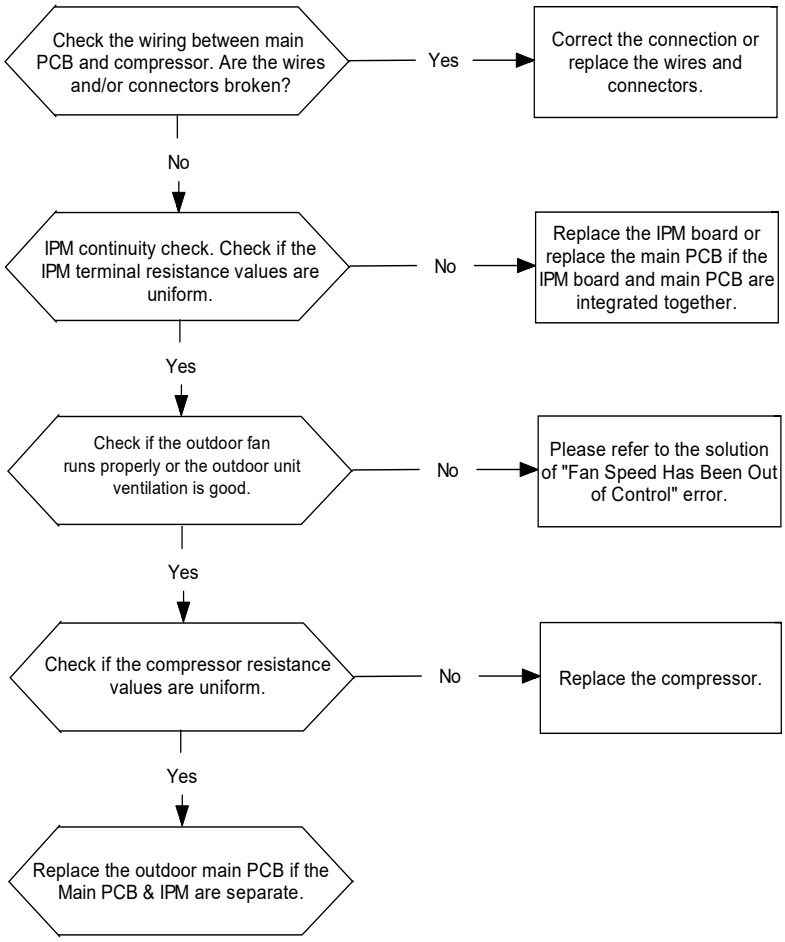
Troubleshooting:



02.02.07. IPM malfunction or IGBT over-strong current protection diagnosis and solution (P0)

Error Code	P0
Malfunction decision conditions	When the voltage signal that the IPM sends to the compressor drive chip is abnormal, the display LED will show “P0” and AC will turn off.
Supposed causes	• Wiring mistake • IPM malfunction • Outdoor fan ass’y faulty • Compressor malfunction • Outdoor PCB faulty

Troubleshooting:



IPM continuity check

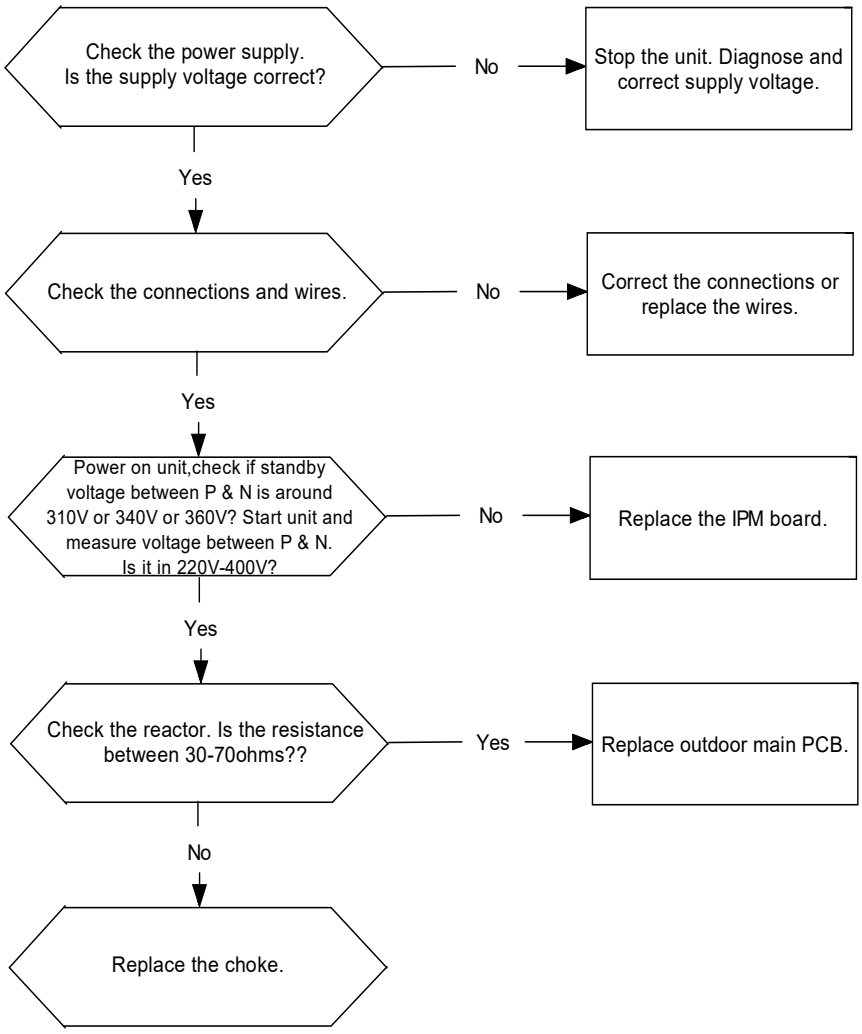
Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digital Tester		Normal Resistance Value	Digital Tester		Normal Resistance Value
(+) Red	(-) Black	∞ (Several MΩ)	(+) Red	(-) Black	∞ (Several MΩ)
P	N		U	N	
	U		V		
	V		W		
	W		(+) Red		

02.02.08. Over voltage or too low voltage protection diagnosis and solution (P1)

Error Code	P1
Malfunction decision conditions	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.
Supposed causes	• Power supply problems. • System leakage or block • PCB faulty

Troubleshooting:

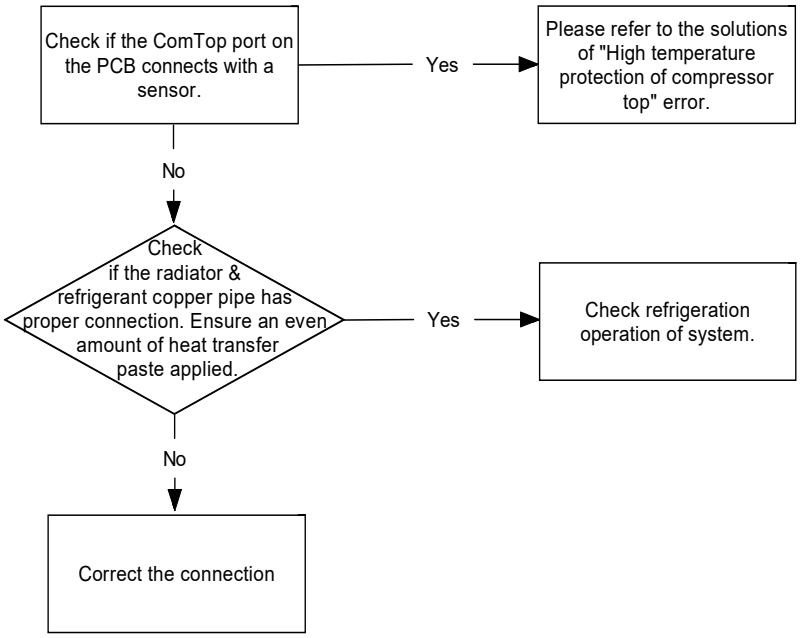


NOTE: The average resistance of the reactor should range from 30-70Ω. If the resistance lies outside of that range or there are traces of black points, please replace reactor.

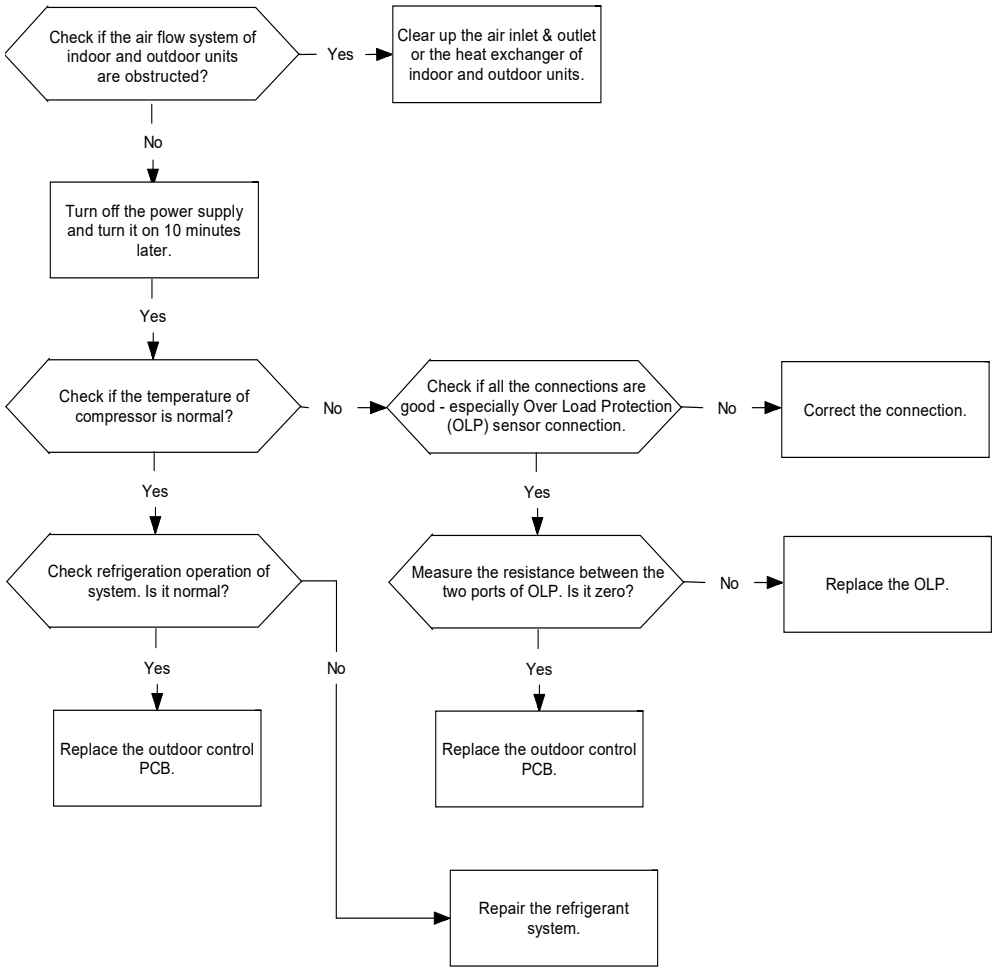
02.02.09. High temperature protection of IPM or Compressor Top diagnosis and solution (only WRC-050AS and WRC-071AS)

Error Code	P2
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	• Power supply problems. • System leakage or block • PCB faulty • Connection problems

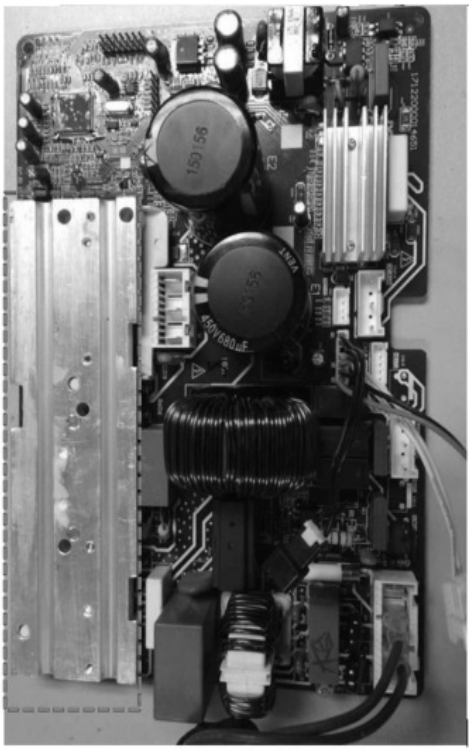
Troubleshooting:



High Temperature Protection of Compressor Top:



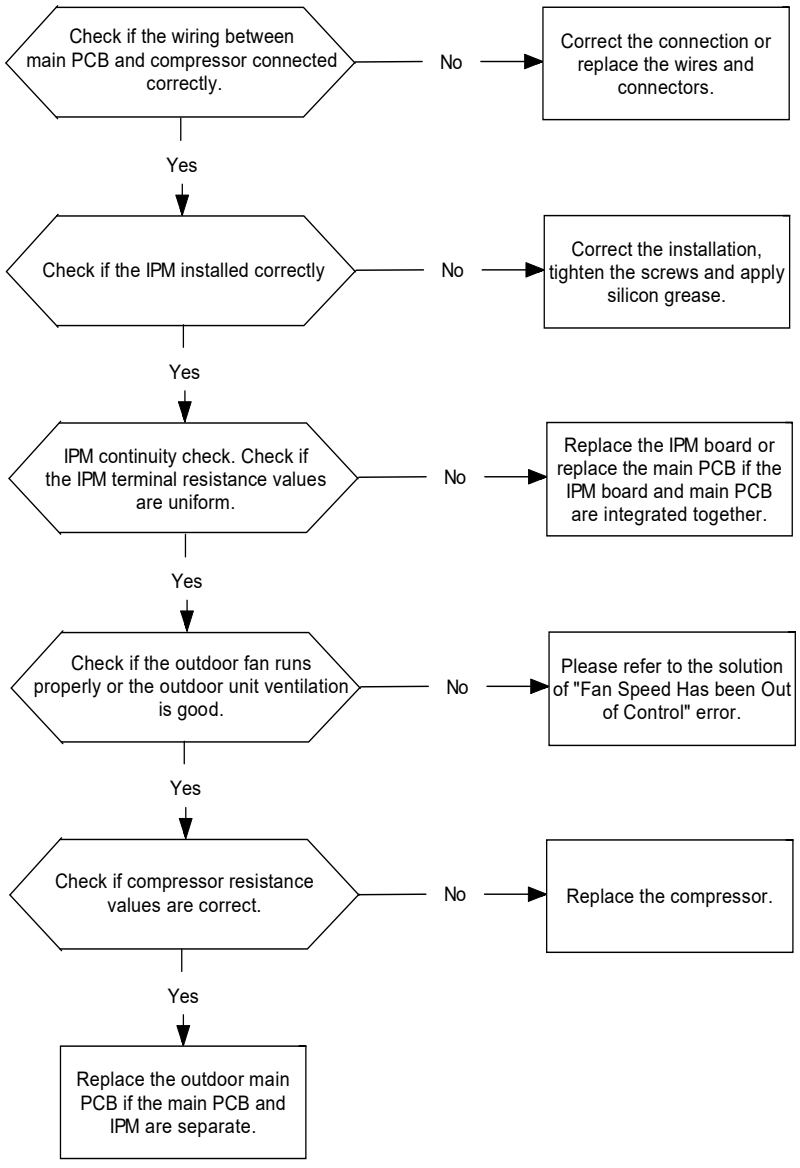
Radiator and Refrigerant Copper Pipe:



02.02.10. Inverter compressor drive error diagnosis and solution (P4)

Error Code	P4
Malfunction decision conditions	An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.
Supposed causes	• Wiring mistake • IPM malfunction • Outdoor fan assembly faulty • Compressor malfunction • Outdoor PCB faulty

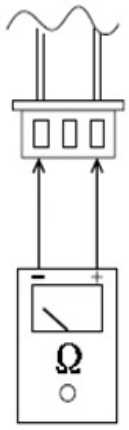
Troubleshooting:



02.03. Main Parts Check

02.02.01. Temperature Sensor Checking

Disconnect the temperature sensor from PCB, measure the resistance value by using a multimeter.



Temperature Sensors:

- Room temperature (T1) sensor
- Indoor coil temperature (T2) sensor
- Outdoor coil temperature(T3) sensor
- Outdoor ambient temperature (T4) sensor
- Compressor discharge temperature (T5) sensor

03. Appendix 1

Temperature Sensor Resistance Value Table for: T1, T2, T3, T4 (°C--K)

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5	62	2.19073	102	0.59386
-17	96.3423	23	9.9731	63	2.11241	103	0.57683
-16	88.5865	24	9.4736	64	2.03732	104	0.56038
-15	84.219	25	10	65	1.96532	105	0.54448
-14	78.311	26	8.55074	66	1.89627	106	0.52912
-13	74.536	27	8.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.486
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	48.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44	36	6.13059	76	1.34105	116	0.4006
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	38.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.2133	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	28.9058	43	4.5705	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.3239
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.8795	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.2777
11	18.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.918	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

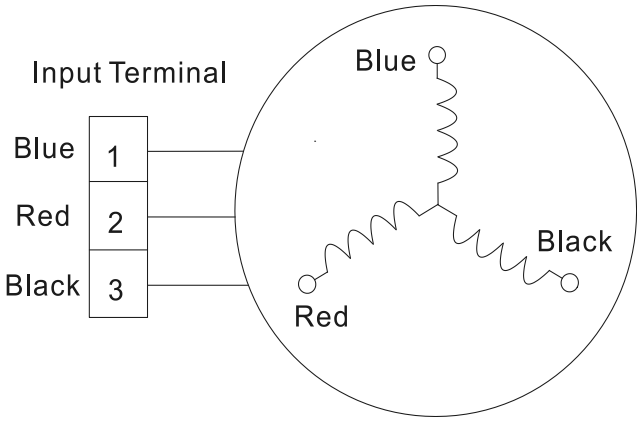
04. Appendix 2

Temperature Sensor Resistance Value Table for: Discharge Sensor (T5)

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-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	58.98	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	9.99	106	3.113
-13	363.3	27	50.28	67	9.61	107	3.025
-12	343.6	28	48.14	68	9.25	108	2.941
-11	325.1	29	46.11	69	8.902	109	2.86
-10	307.7	30	44.17	70	8.569	110	2.781
-9	291.3	31	42.33	71	8.248	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	28.15	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	108.8	50	18.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	98.69	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		

05. Appendix 3 - Compressor Checking

Measure the resistance value of each winding by using the tester.



Resistance Value			
Compressor Model No.	**ASN98D22UFZ**	**ASM135D23UFZ**	**ATF235D22UMT**
ActronAir Part No.	**WRC2619**	**WRC5011**	**WRC7126**
Blue - Red	1.57Ω (20°C)	1.75Ω (20°C)	0.75Ω (20°C)
Blue - Black			
Red - Blue			

06. Appendix 4 - Condenser Fan Checking

Measure the resistance value of each winding by using the tester.

Model	Part Number	Ω U - V - W
WRC-026AS	WRC2611	99.8
WRC-035AS		
WRC-050AS	WRC5008	38.1
WRC-071AS	WRC7113	42.3
WRC-080AS		

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ActronAir®

1800 119 229
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Actron Engineering Pty Ltd
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HEAD OFFICE SYDNEY AUSTRALIA

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