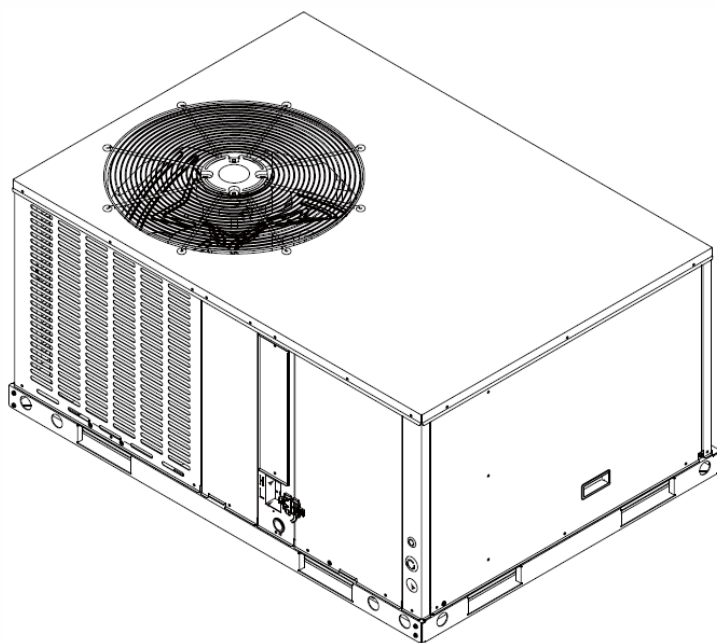


SPLIT AIR CONDITIONERS

Service Manual

ComfortStar®

CPH SERIES



IMPORTANT NOTE:



Read this manual carefully before operating your new air conditioning unit. Make sure to save this manual for future reference.

Please check the applicable models, technical data, F-GAS(if any) and manufacturer information from the "Owner's Manual - Product Fiche " in the packaging of the outdoor unit. (European Union products only)

Service Manual

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PART 2 System Instruction 3

2.1 Refrigerant Circuit 3

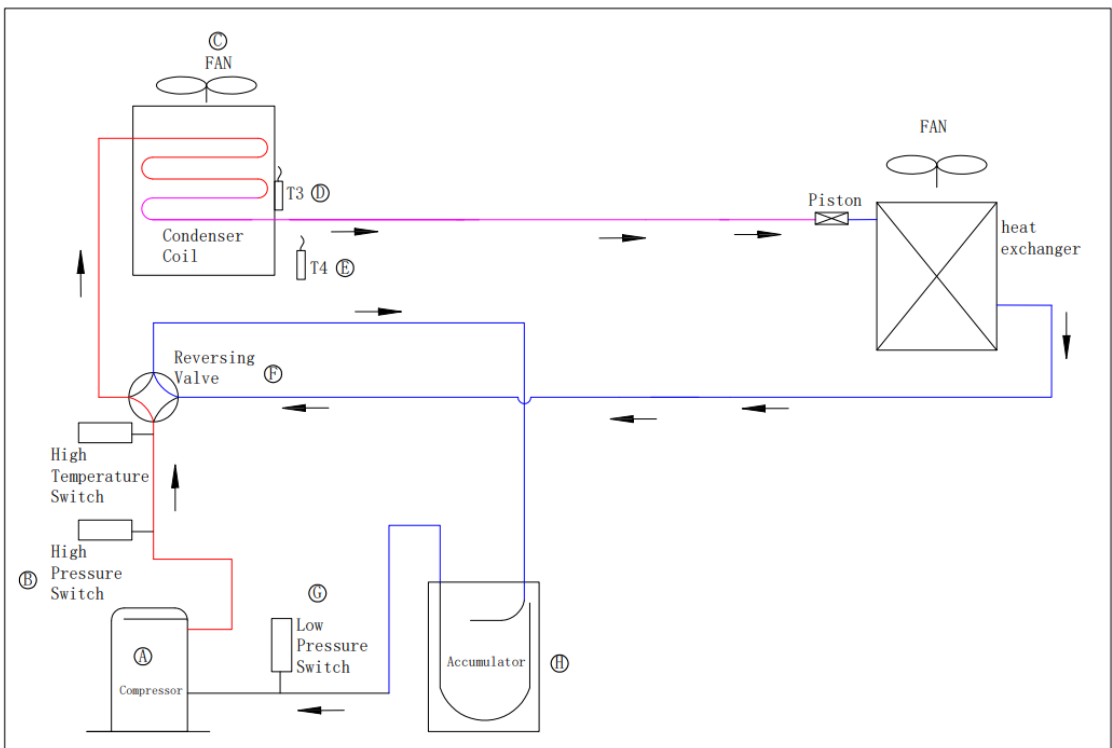
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2.3 Refrigerant Flow 7

2. System Instruction

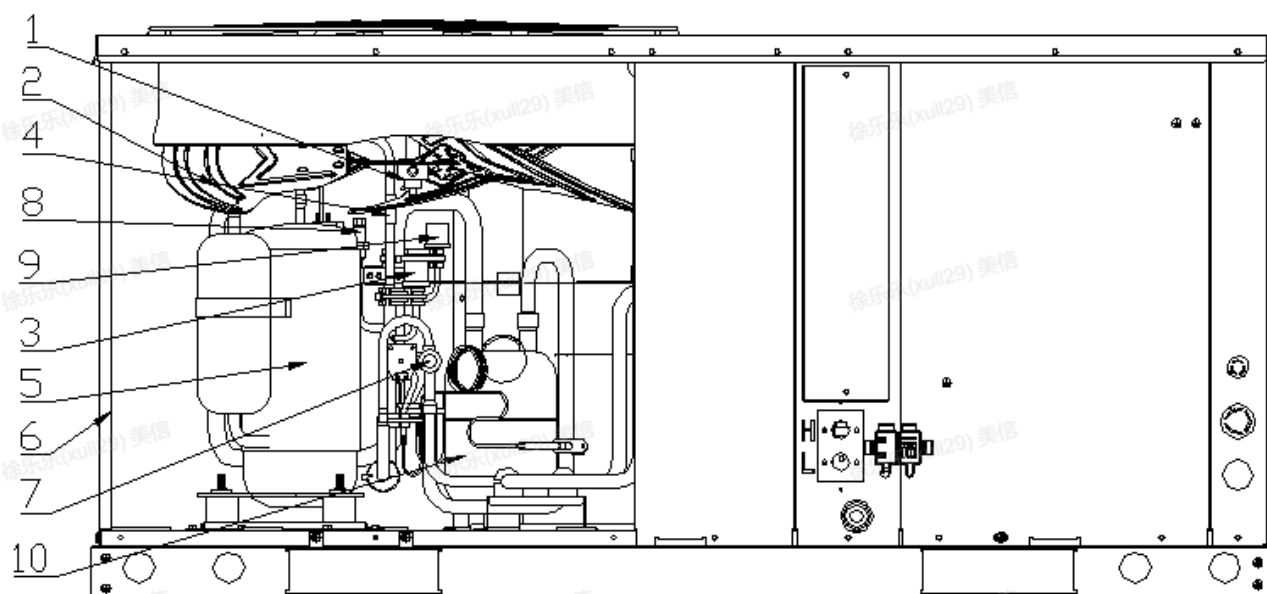
2.1 Refrigerant Circuit

No. in diagram	Symbol	Part Name	Major function
A	Comp.	Compressor	Compresses and drives the refrigerant.
B	HPS	High pressure switch	Used to high pressure protection when up to 609 PSIG and recovery when below to 464 PSIG.
C	Fan	Fan of outdoor	Used to help heat exchange by 10-speeds ECM motor.
D	T3	Condenser coil temperature sensor	Used to discharge temperature protection and Fan control in cooling mode, and defrost control.
E	T4	Ambient temperature sensor	Used to ambient protection and Fan control in cooling mode, and defrost control.
F	RV	The Reversing Valve	Used to switch mode between cooling and heating.
G	LPS	Low pressure switch	Used to low pressure protection when below to 20 PSIG and recovery when up to 44 PSIG.
H	Accumulator	Accumulator	Store the liquid component of the refrigerant and reduce the load of the condenser.

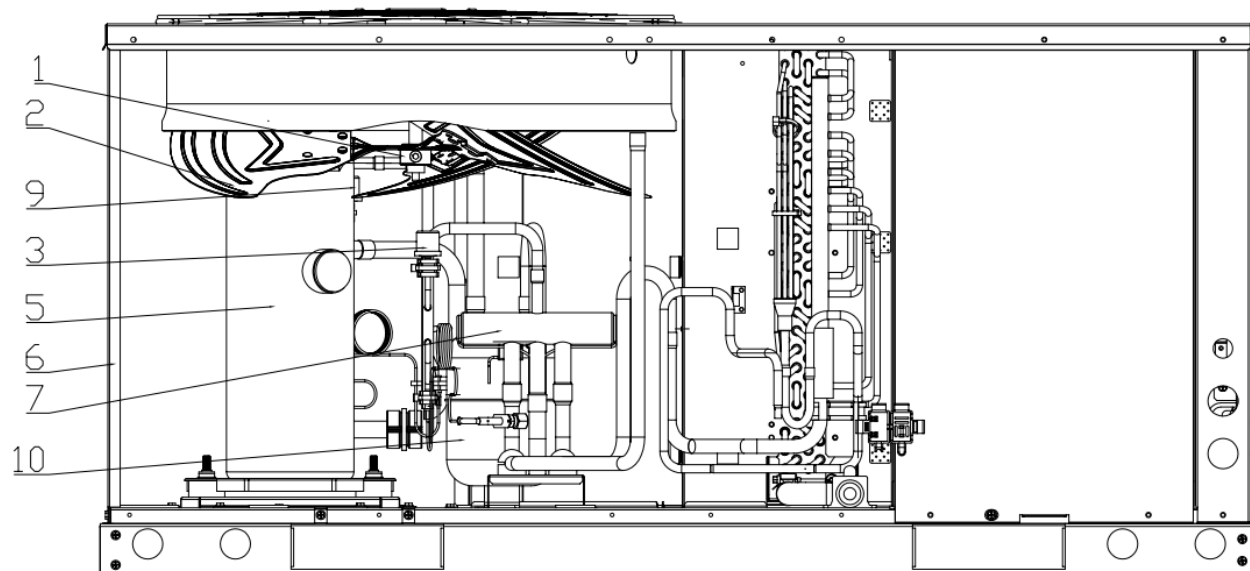


2.2 Functional Part

13.4H 71/90

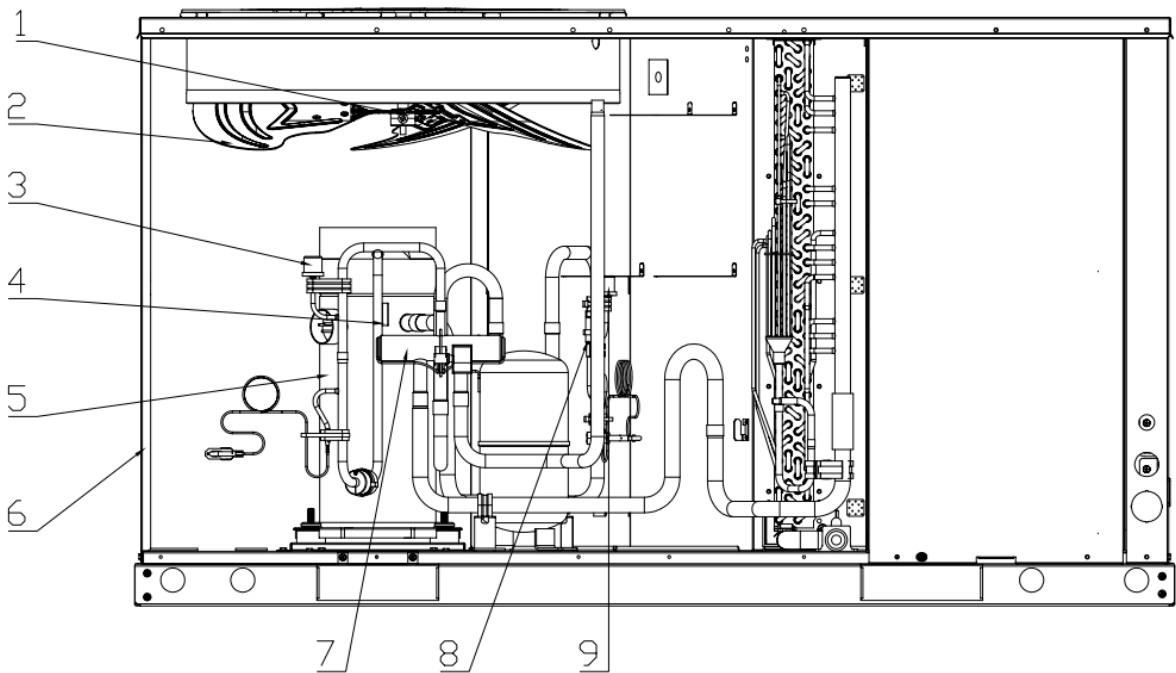


13.4 H 105

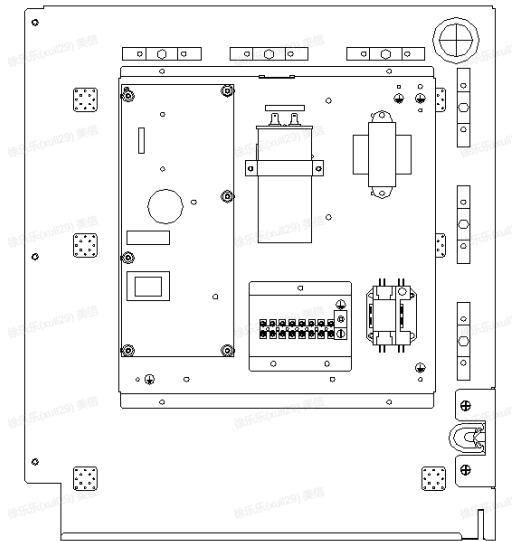


2.2 Functional Part

13.4 H 120/140/160



13.4 H Electric control box for 71/90/105/120/140/160



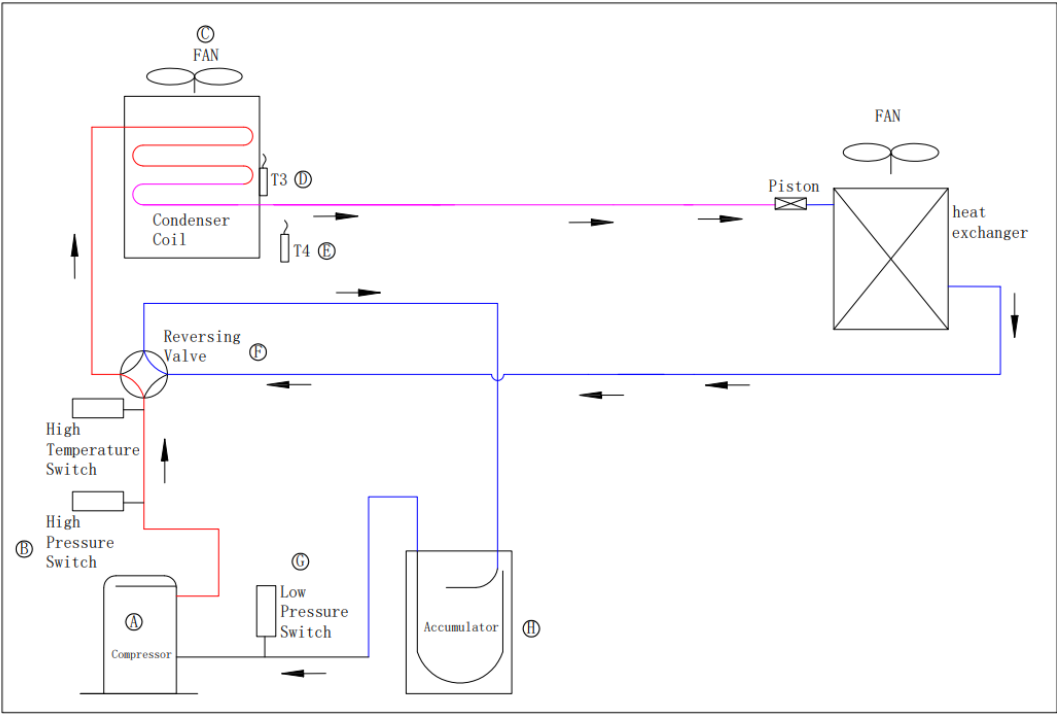
2.2 Functional Part

No. in diagram	Symbol	Part Name
1	Motor	Fan motor
2	Fan	Fan of outdoor
3	HPS	High pressure switch
4	DTS	Discharge Temperature switch
5	Comp.	Compressor
6	COIL	Condenser coil
7	RV	The Reversing Valve
8	FPA	Fusible plug assembly
9	PS	Pressure switch
10	Accumulator	Accumulator

2.3 Refrigerant Flow Chart

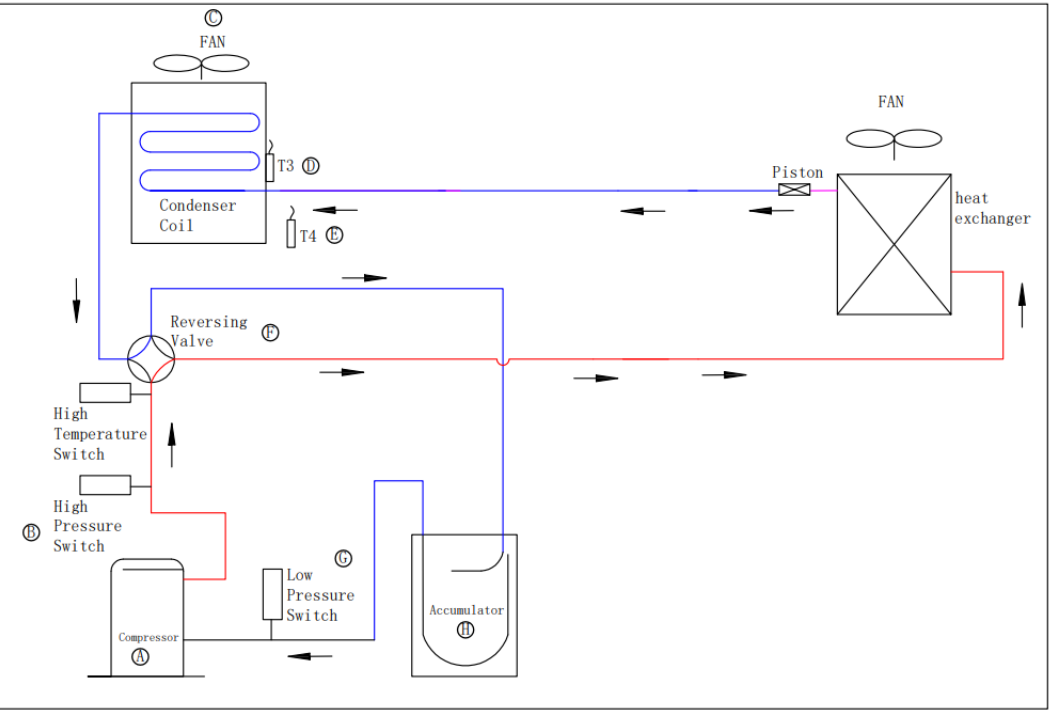
Cooling Operation/Cooling Oil Return Operation/Defrost Operation

- High pressure gas
- High pressure liquid
- Low pressure



Heating Operation/Heating Oil Return Operation

- High pressure gas
- High pressure liquid
- Low pressure



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3.1.4 Unit Special Control 12

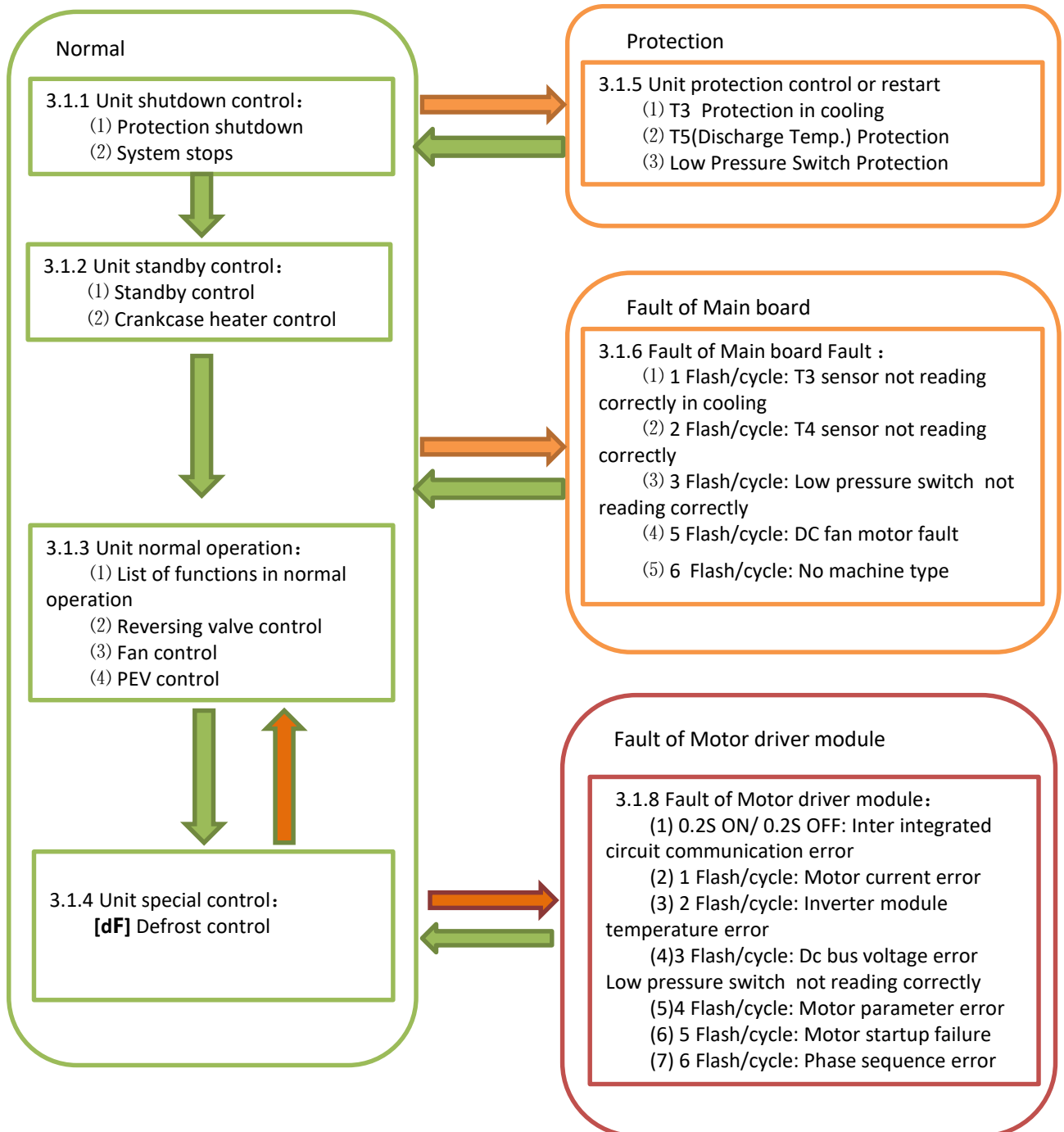
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3.1 Function General



3.1.1 Unit shutdown control

(1) Unit protection shutdown

To protect the outdoor unit, our system will shut down when there is something abnormal. Also the LED 1(Red) or LED 2(Green) would show the fault code when fault present.

(2) Thermostat satisfied shutdown

Anytime system is in unit standby, LED 1 (Red) will flash slowly (2s ON and 2s off).

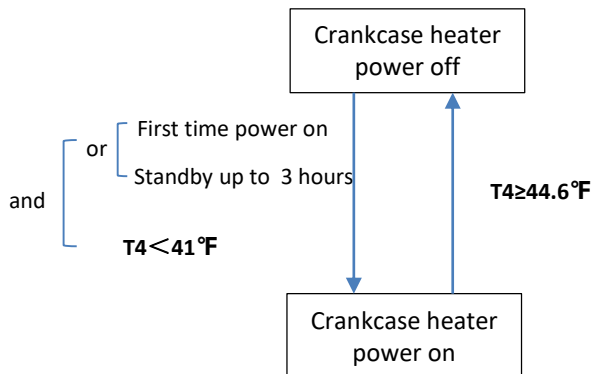
3.1.2 Unit standby control

(1) Standby control

When compressor stopped, the outdoor fan would stop immediately.
Before compressor start, the outdoor fan motor will run at least 15 seconds.

(2) Crankcase heater control

Here is the condition for crankcase heater control.



T4 is the Ambient temperature .

3.1.3 Unit normal operation

Anytime the compressor is operating, the digital tube will show the frequency of compressor.

(1) List of functions in normal

[Cooling]

Symbol	Part Name	Major function
RV	The Reversing Valve	OFF
Fan	Outdoor fan motor	10 speeds ECM motor. Controlled by T3.

[Heating]

Symbol	Part Name	Major function
RV	The Reversing Valve	ON
Fan	Outdoor fan motor	10 speeds ECM motor. Controlled by T4 and T3

(2) Reversing valve control

The heat pump need “B” signal of 24V wires.

● Cooling:

The reversing valve is off during cooling.

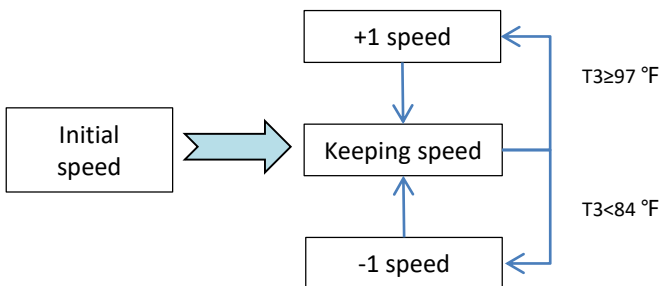
● Heating:

The reversing valve is on during heating and heating standby.

▲Special control: The reversing valve will delay about 1 minute when the first heating starting for reversing reliability.

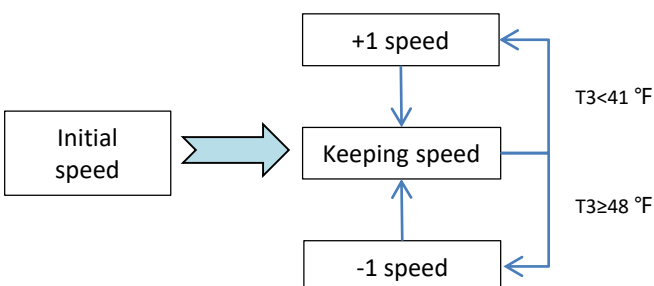
(3) Fan control

[Cooling]



Note: ± 1 speed/25 seconds, 10 speeds ECM motor.

[Heating]

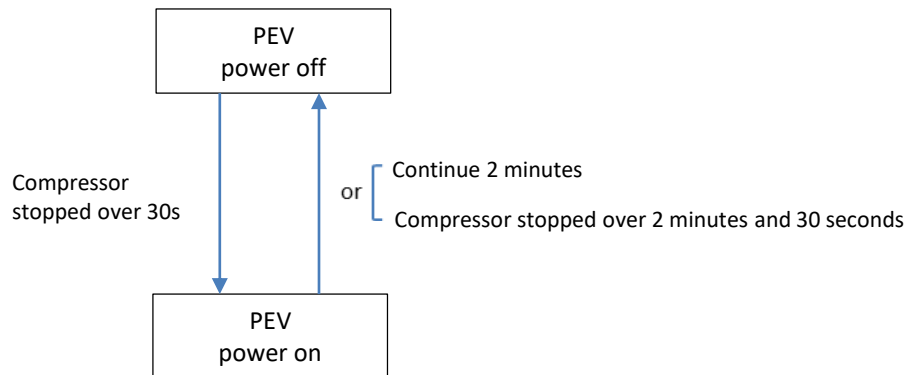


Note: ± 1 speed/25 seconds, 10 speeds ECM motor.

3.1.3 Unit Normal operation

(4) PEV control

The PEV's function is to help equalize the refrigerant pressures on the high and low sides prior to compressor operation. You will hear a "hissing" sound every time after the compressor stops, this is the PEV equalizing the pressure.



3.1.4 Unit special control

[dF] Defrost control

● The Demand Defrost Control (DDC) monitors the coil temperature using thermistor (T3). A second thermistor (T4) monitors outdoor ambient temperature. Based on these parameters, as well as accumulative running time and Standby time, the DDC calculates proper initiation of defrost.

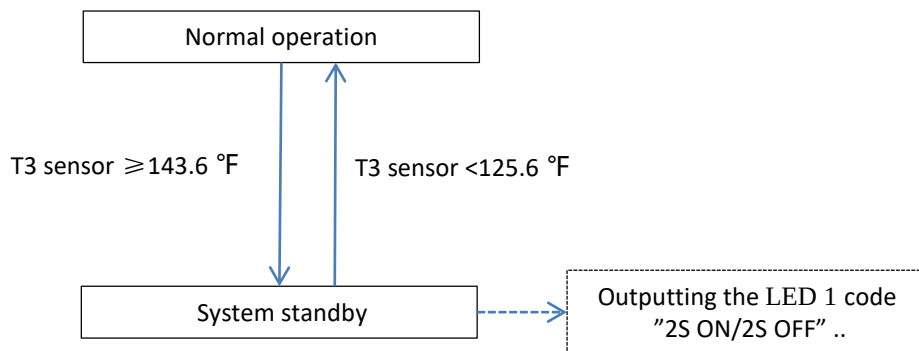
● Any of three conditions is required to enter defrost:

- T3 < 32 °F and lasted for 60 minutes
- T4 < 37 °F and lasted for 65 minutes
- "Standby time" is 2 hours, T3 < 28 °F when starting and lasted for 15 minutes

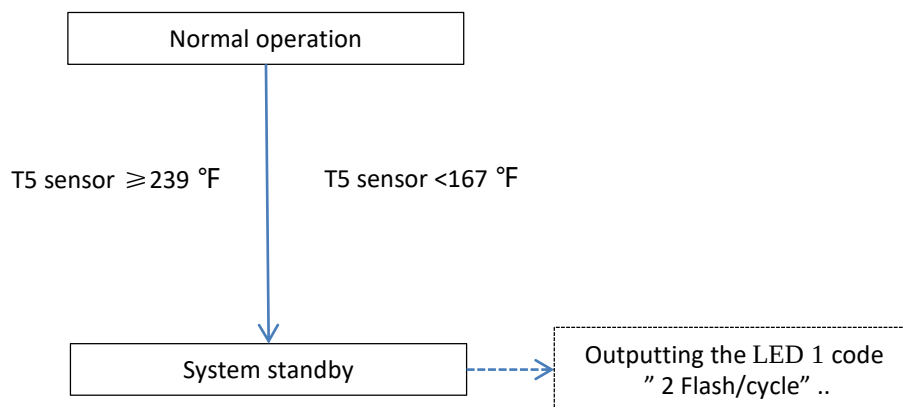
3. Function and Control

3.1.5 Unit protection control or restart:

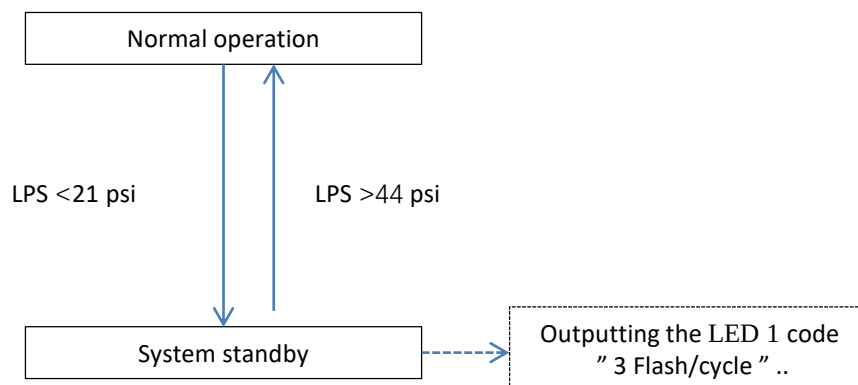
(1) T3 Protection in cooling



(2) T5(Discharge Temp.) Protection



(3) Low Pressure Switch Protection



3. Function and Control

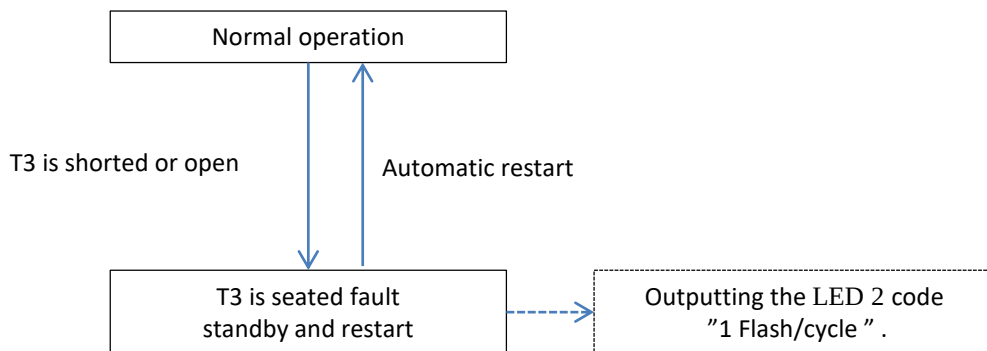
3.1.6 Fault of Main board:

No.	Operation LED	Protection code	Protection control description	Supposed cause
1	LED2	1 Flash/cycle	T3 sensor not reading correctly in cooling	T3 sensor is not properly placed/High pressure switch fault
2	LED2	2 Flash/cycle	T4 sensor not reading correctly	T4 sensor is not properly placed/High pressure switch fault/ Discharge temp. switch open
3	LED2	3 Flash/cycle	Low pressure switch not reading correctly	Low pressure switch is not properly connected.
4	LED2	5 Flash/cycle	DC fan motor fault	Motor fault/severe weather (fan rpm too low due to wind)
5	LED2	6 Flash/cycle	Phase sequence error	Speed message isn't wrote in main board

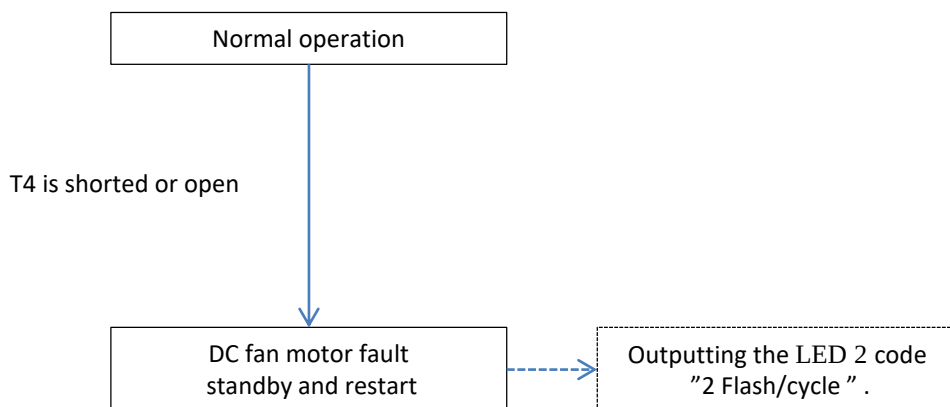
3. Function and Control

3.1.7 Unit protection control or restart:

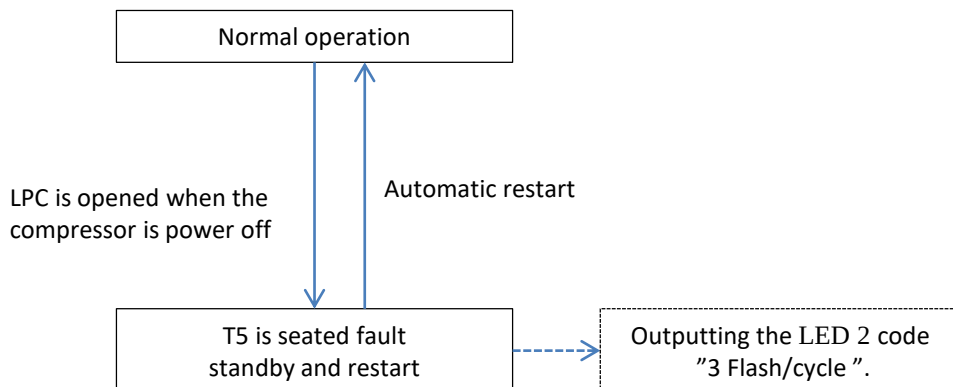
(1) T3 sensor not reading correctly in cooling



(2) T4 sensor not reading correctly



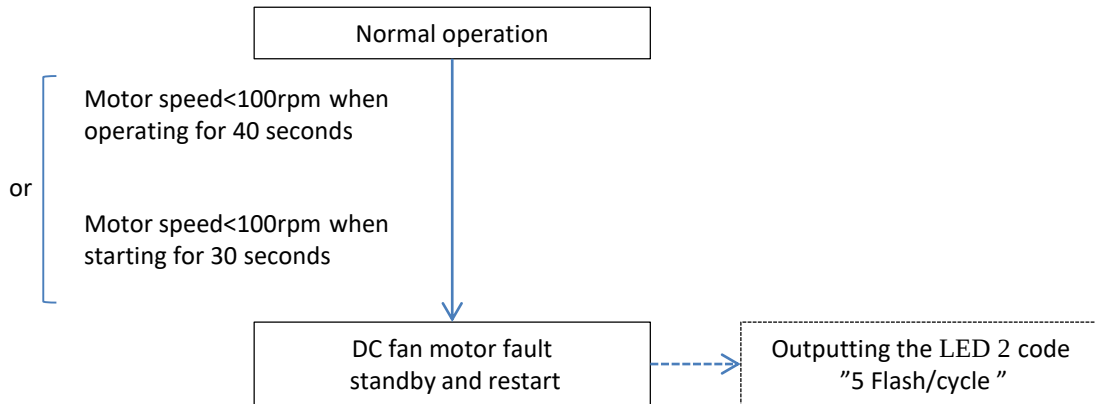
(3) LPC open



3. Function and Control

3.1.7 Unit protection control or restart :

(4) OFAN Failure



3. Function and Control

3.1.8 Fault of Motor driver module :

No.	Operation LED	Protection code	Protection control description	Supposed cause
1	LED1	0.2S ON/0.2S OFF	Inter integrated circuit communication error	Main board is broken
2	LED1	1 Flash/cycle	Motor current error	Motor shaft is stuck or Motor is broken
3	LED1	2 Flash/cycle	Inverter module temperature error	Motor is broken
4	LED1	3 Flash/cycle	Dc bus voltage error	Check out the power supply
5	LED1	4 Flash/cycle	Motor parameter error	Main board is broken or motor type is wrong
6	LED1	5 Flash/cycle	Motor startup failure	Check out the Motor
7	LED1	6 Flash/cycle	Phase sequence error	Check out the Motor supply wiring

PART 4 Field settings 1

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4.1.3 Manual Defrost 21

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4.4 Thermostat 24

4. Field settings

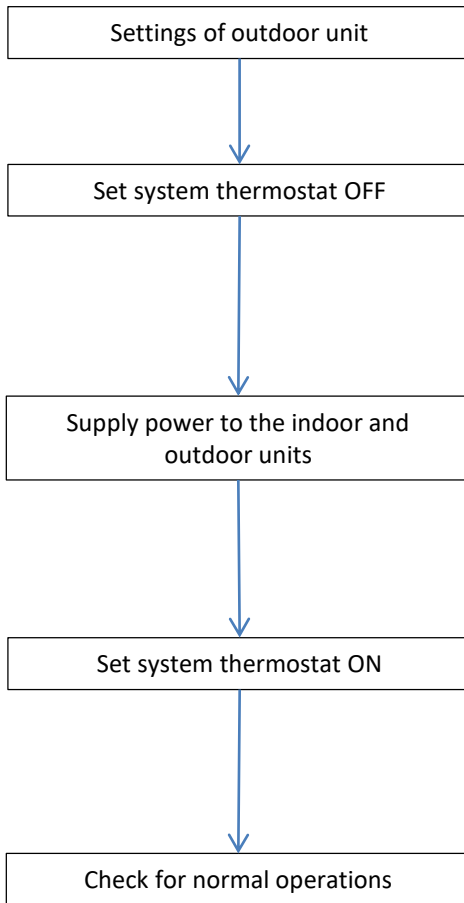
4.1 Test operation

4.1.1 Checks before test operation

No.	Checkpoints	Cautions or warnings
1	Are all units securely installed?	Dangerous for turning over during storm Possible damage to pipe connections
2	Is the earth wire installed according to the applicable local standard?	Dangerous if electric leakage occurs
3	Are the condenser unit installed according to location restrictions requirement?	Poor capacity abnormal operation
4	Are all air inlets and outlets of the indoor and outdoor units unobstructed?	Poor cooling Poor heating
5	Does the drain flow out smoothly?	Pipeline water leak
6	Is piping adequately heat-insulated?	Pipeline water leak Poor capacity
7	Do the supply power wirings connected Normally? Including the earth wiring.	Dangerous if electric leakage occurs
8	Does the earth leakage circuit breaker connected normally?	Dangerous if electric leakage occurs
9	Do the wirings of 24V signal connected according to wiring diagram? Including the thermostat wiring and setting.	abnormal operation
10	Is the supply voltage conform to the specifications on the name plate?	abnormal operation Damage unit
11	Are the cable sizes as specified and according to local regulations?	Damage of cables

4.1 Test operation

4.1.2 Turn power on



Note:

Make field setting if needed.
(For the setting procedure, refer to information in “4.2.2 Setting by DIP switches”)

Note:

In a normal condition, the LED1 flash slowly (2S ON/2S OFF) and LED2 steady on.

Note:

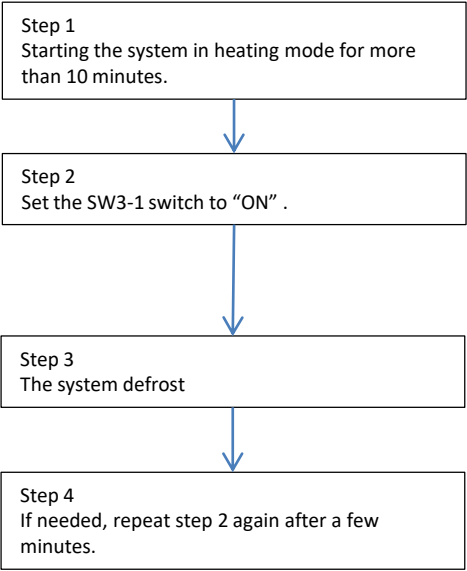
Be sure to turn the power on 1 hour before starting operation when the ambient temperature is below **70°F**

Note:

Check operations
Check for the 24V signal from thermostat
Check for operation mode
Check for the digital display shows the compressor frequency

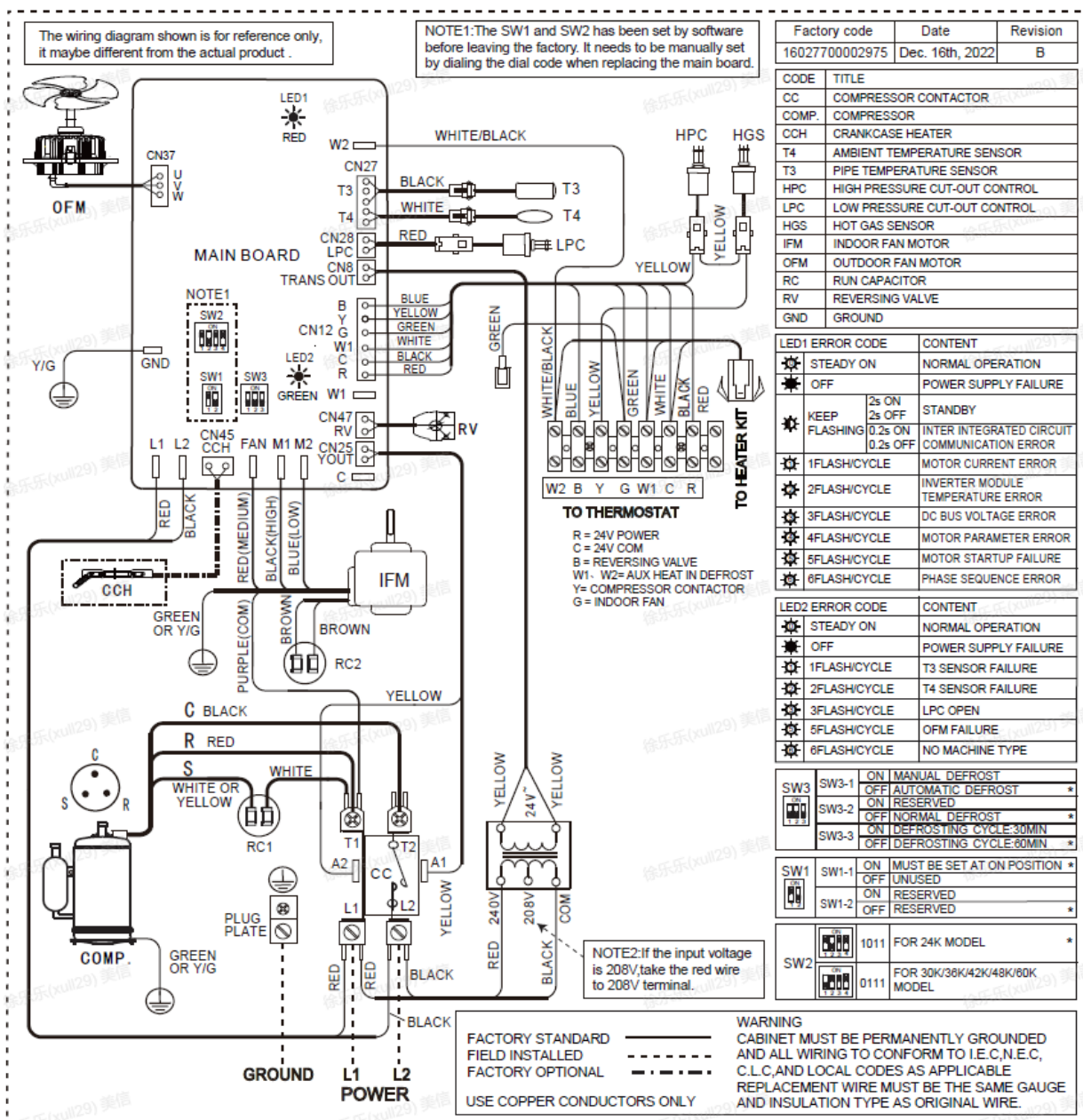
4.1 Test operation

4.1.3 Manual defrost



Note:
Defrost will exit automatically.

4.2 Setting by DIP switches

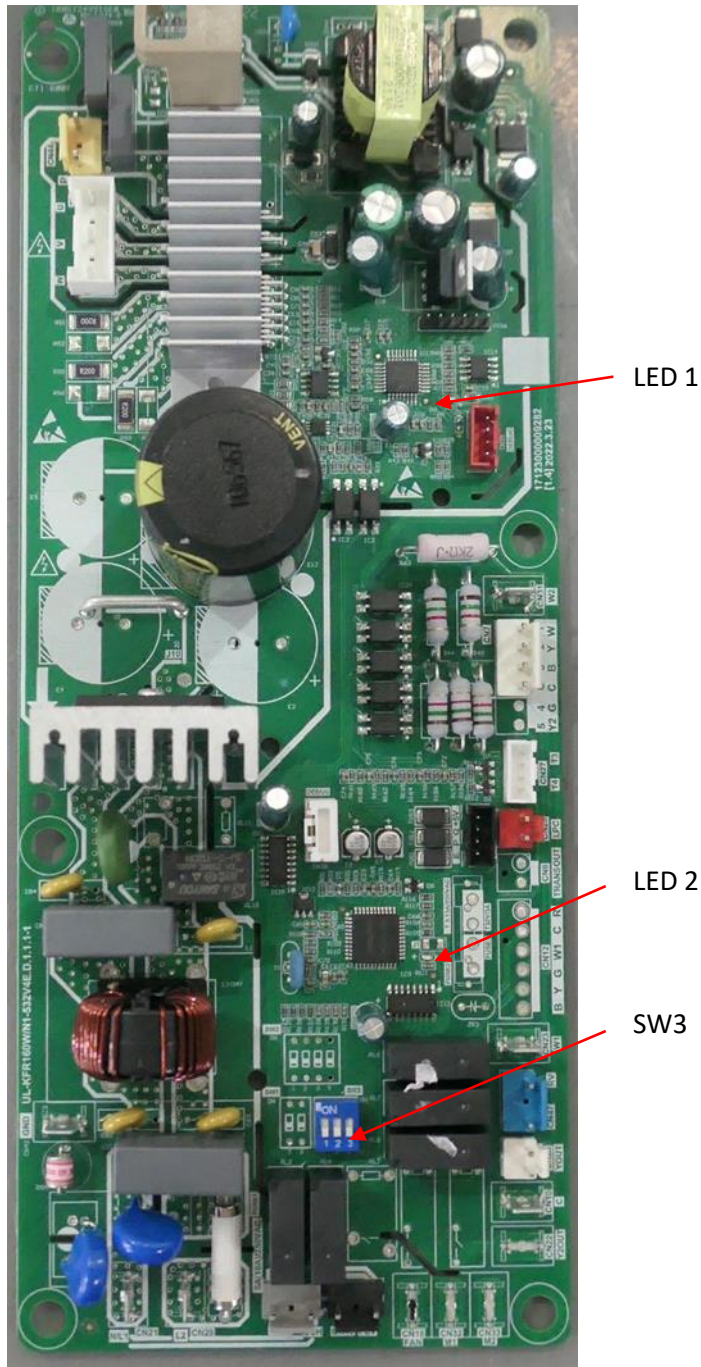


SW3	SW3-1	ON	MANUAL DEFROST	
		OFF	AUTOMATIC DEFROST	*
	SW3-2	ON	RESERVED	
		OFF	NORMAL DEFROST	*
	SW3-3	ON	DEFROSTING CYCLE:30MIN	
		OFF	DEFROSTING CYCLE:60MIN	*

SW1	SW1-1	ON	MUST BE SET AT ON POSITION	*
		OFF	UNUSED	
	SW1-2	ON	RESERVED	
		OFF	RESERVED	*

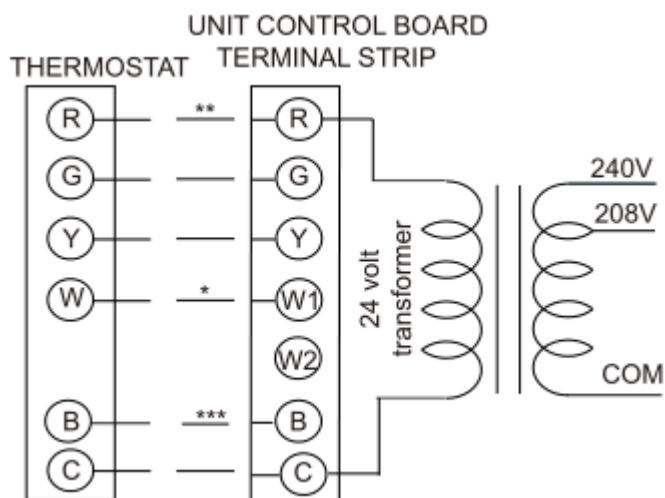
SW2	1011	FOR 24K MODEL	*
	0111	FOR 30K/36K/42K/48K/60K MODEL	

4.3 LED position indication



4.4 Thermostat

Thermostat should be mounted on an inside wall about 58" from floor and will not be affected by unconditioned air, sun and/or heat exposure. Follow the instruction carefully because there are many wiring requirements.



- *** B wire be used with heat pump system only, reversing valve energizes at the heating mode, and cut off at the cooling mode.
- ** Minimum wire size of 18 AWG wire should be used for all field installed 24 volt wire.
- * Only required on units with supplemental electric heat.

PART 5 Intelligent Troubleshooting 2

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5. Intelligent Troubleshooting

5.1 diagnosis system introduction

There are two types of auxiliary diagnosis code in system: Main board code and Motor driver module code

5.1.1 Fault of Main board

No.	Operation LED	Protection code	Protection control description	Supposed cause
1	LED2	1 Flash/cycle	T3 sensor not reading correctly in cooling	T3 sensor is not properly placed/High pressure switch fault
2	LED2	2 Flash/cycle	T4 sensor not reading correctly	T4 sensor is not properly placed/High pressure switch fault/ Discharge temp. switch open
3	LED2	3 Flash/cycle	Low pressure switch not reading correctly	Low pressure switch is not properly connected.
4	LED2	5 Flash/cycle	DC fan motor fault	Motor fault/severe weather (fan rpm too low due to wind)
5	LED2	6 Flash/cycle	No machine type	Speed message isn't wrote in main board

5.1.2 Fault of Motor driver module :

No.	Operation LED	Protection code	Protection control description	Supposed cause
1	LED1	0.2S ON/0.2S OFF	Inter integrated circuit communication error	Main board is broken
2	LED1	1 Flash/cycle	Motor current error	Motor shaft is stuck or Motor is broken
3	LED1	2 Flash/cycle	Inverter module temperature error	Motor is broken
4	LED1	3 Flash/cycle	Dc bus voltage error	Check out the power supply
5	LED1	4 Flash/cycle	Motor parameter error	Main board is broken or motor type is wrong
6	LED1	5 Flash/cycle	Motor startup failure	Check out the Motor
7	LED1	6 Flash/cycle	Phase sequence error	Check out the Motor supply wring

Note:

1. These fault codes will be displayed on the digital tube until the issue is resolved.

5.2 Symptom-based Troubleshooting

5.2.1 LED1/LED2 OFF

Issue	LED1/LED2 OFF
Model	All
Fault name	/
Classify	Power/electric issue
Possible cause	- Frequently power off and power on (within 3 minutes) - Abnormal power input - Abnormal wire connections
Notes:	

Troubleshooting



Check for the following 4 points:

- ① If frequently power off and power on (within 3 minutes)
- ② If the supply power is normal
- ③ If wiring diagram to insure all wire

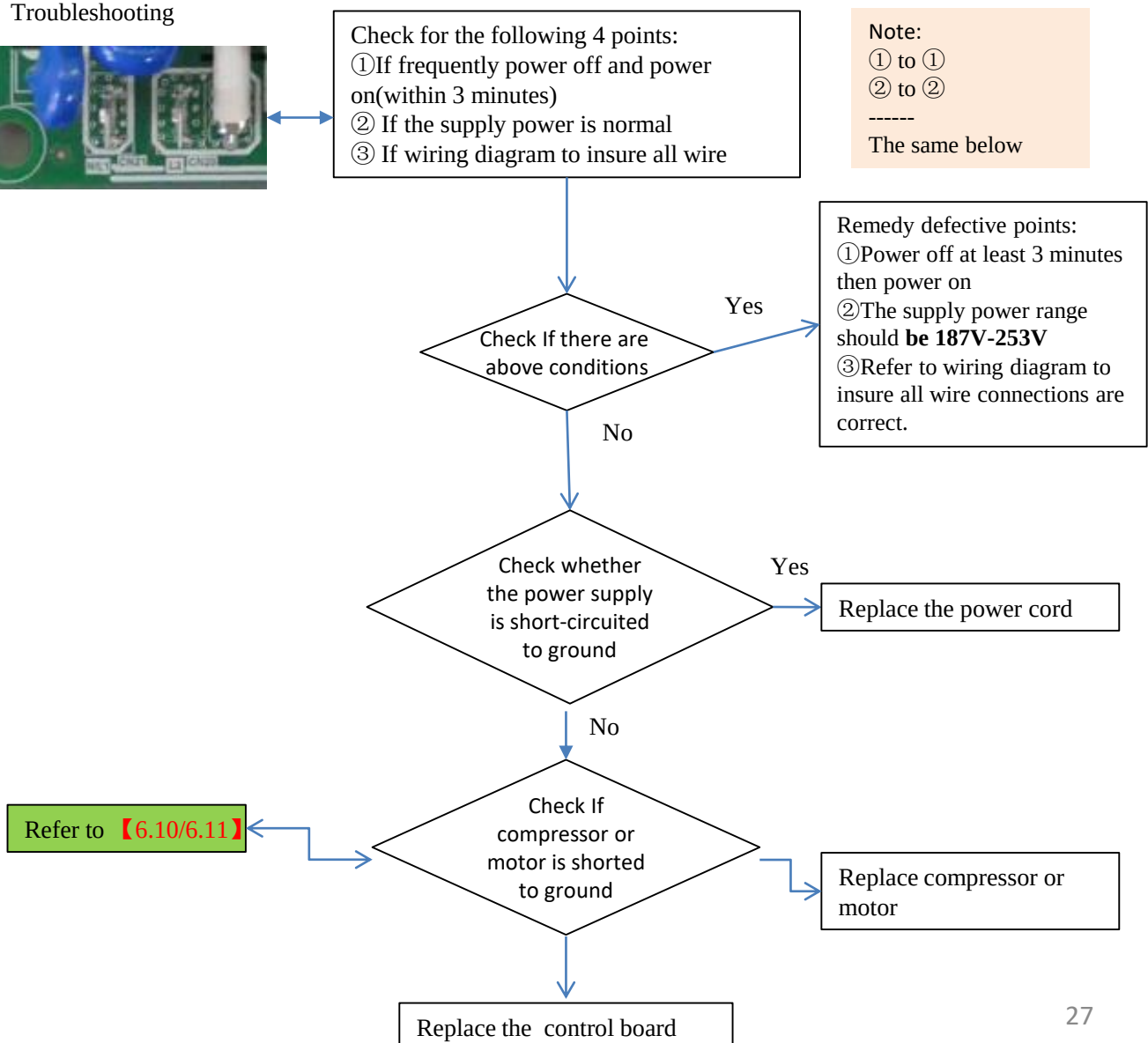
Note:

- ① to ①
- ② to ②

The same below

Remedy defective points:

- ① Power off at least 3 minutes then power on
- ② The supply power range should be **187V-253V**
- ③ Refer to wiring diagram to insure all wire connections are correct.

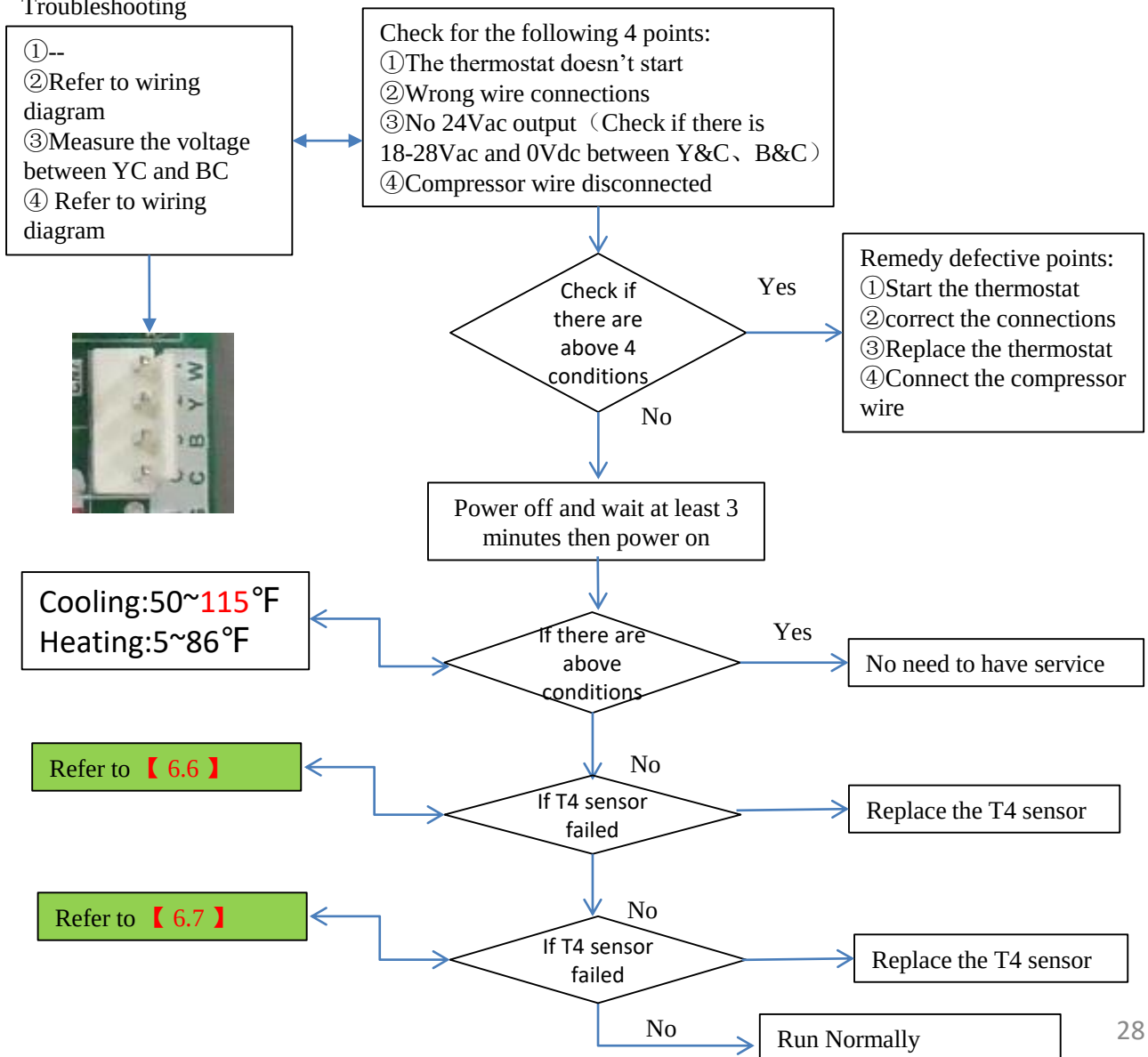


5.2 Symptom-based Troubleshooting

5.2.2 System does not start operation

Issue	System does not start operation
Model	All
Fault name	/
Classify	Thermostat fault
Possible cause	• The thermostat doesn't start • Wrong wire connections between thermostat and unit • Damaged thermostat • Disconnect the compressor wire (could be caused after service)
Notes:	

Troubleshooting

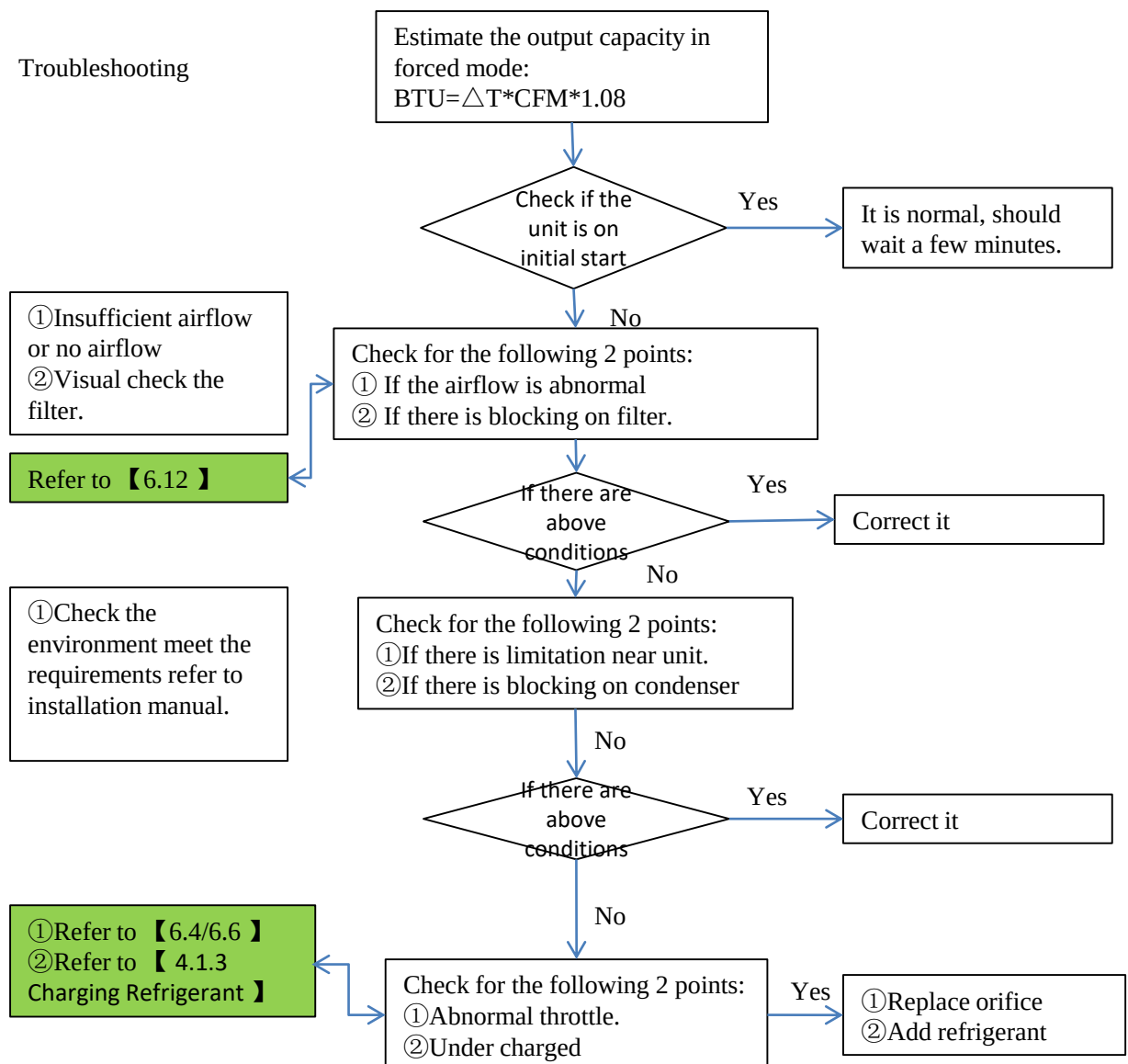


5.2 Symptom-based Troubleshooting

5.2.3 Capacity is low

Issue	Capacity is low
Model	All
Name	/
Classify	System fault
Possible cause	• Poor heat dissipation of the evaporator • Poor heat dissipation of the condenser • Under charged • First start

Troubleshooting

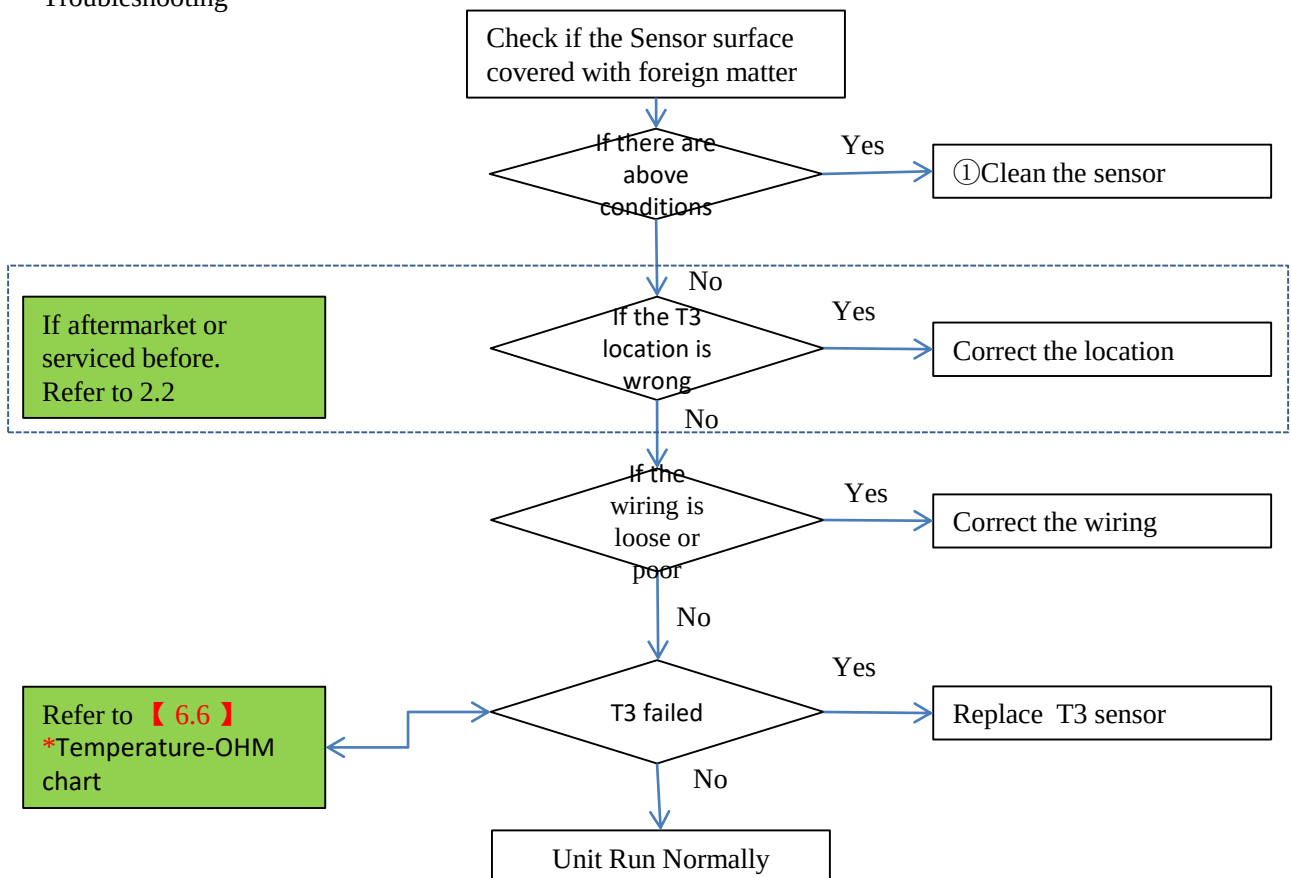


5.3 Troubleshooting by Main board Fault code

5.3.1 LED2-1 Flash/cycle

Faulty code	LED2-1 Flash/cycle
Model	All
Name	T3 sensor not reading correctly in cooling
Classify	System fault
Possible cause	• Wrong location of T3 sensor • Faulty T3 sensor • The wiring terminal is loose or poor • The Sensor surface covered with foreign matter

Troubleshooting

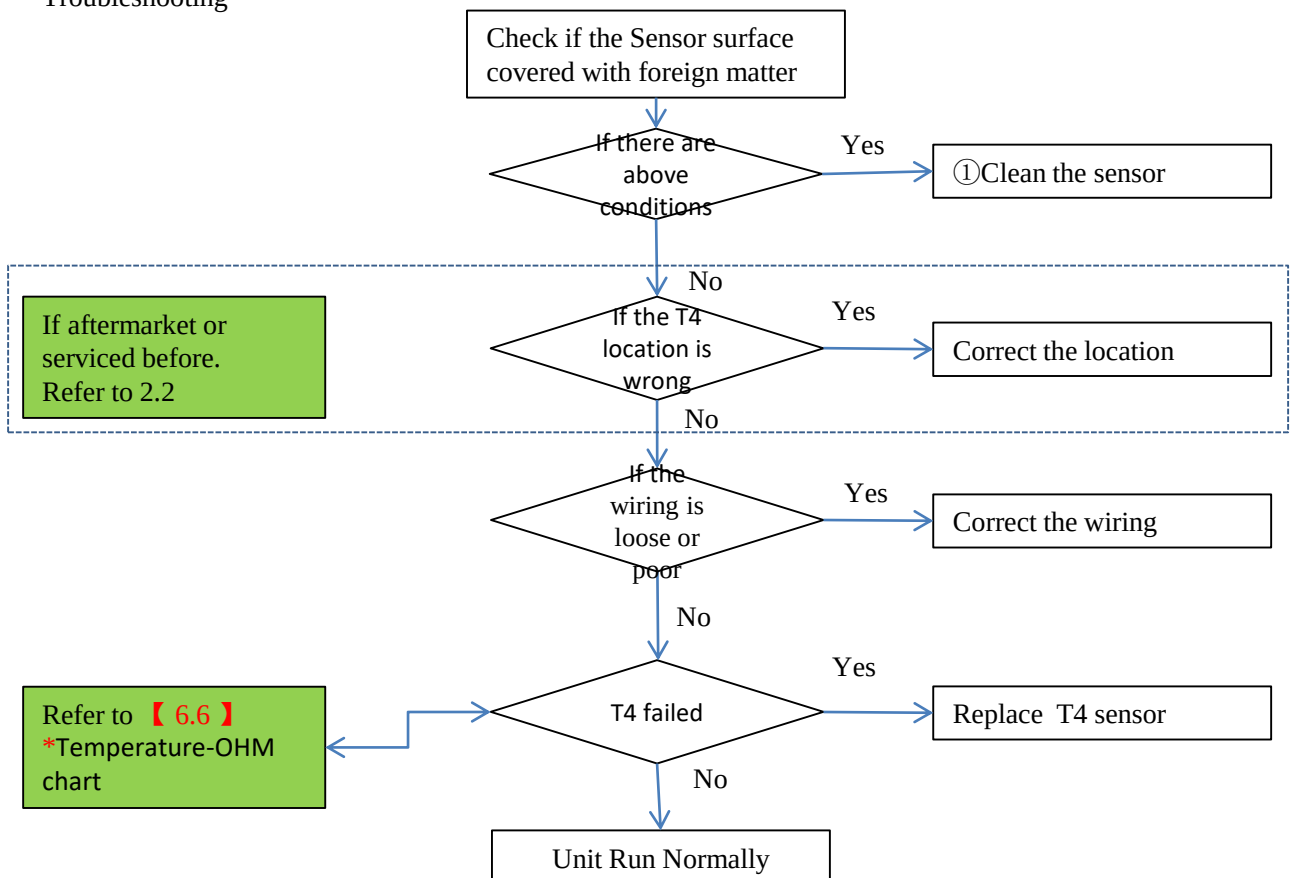


5.3 Troubleshooting by Main board Fault code

5.3.2 LED2-2 Flash/cycle

Faulty code	LED2-2 Flash/cycle
Model	All
Name	T4 sensor not reading correctly in cooling
Classify	System fault
Possible cause	• Wrong location of T4 sensor • Faulty T4 sensor • The wiring terminal is loose or poor • The Sensor surface covered with foreign matter

Troubleshooting

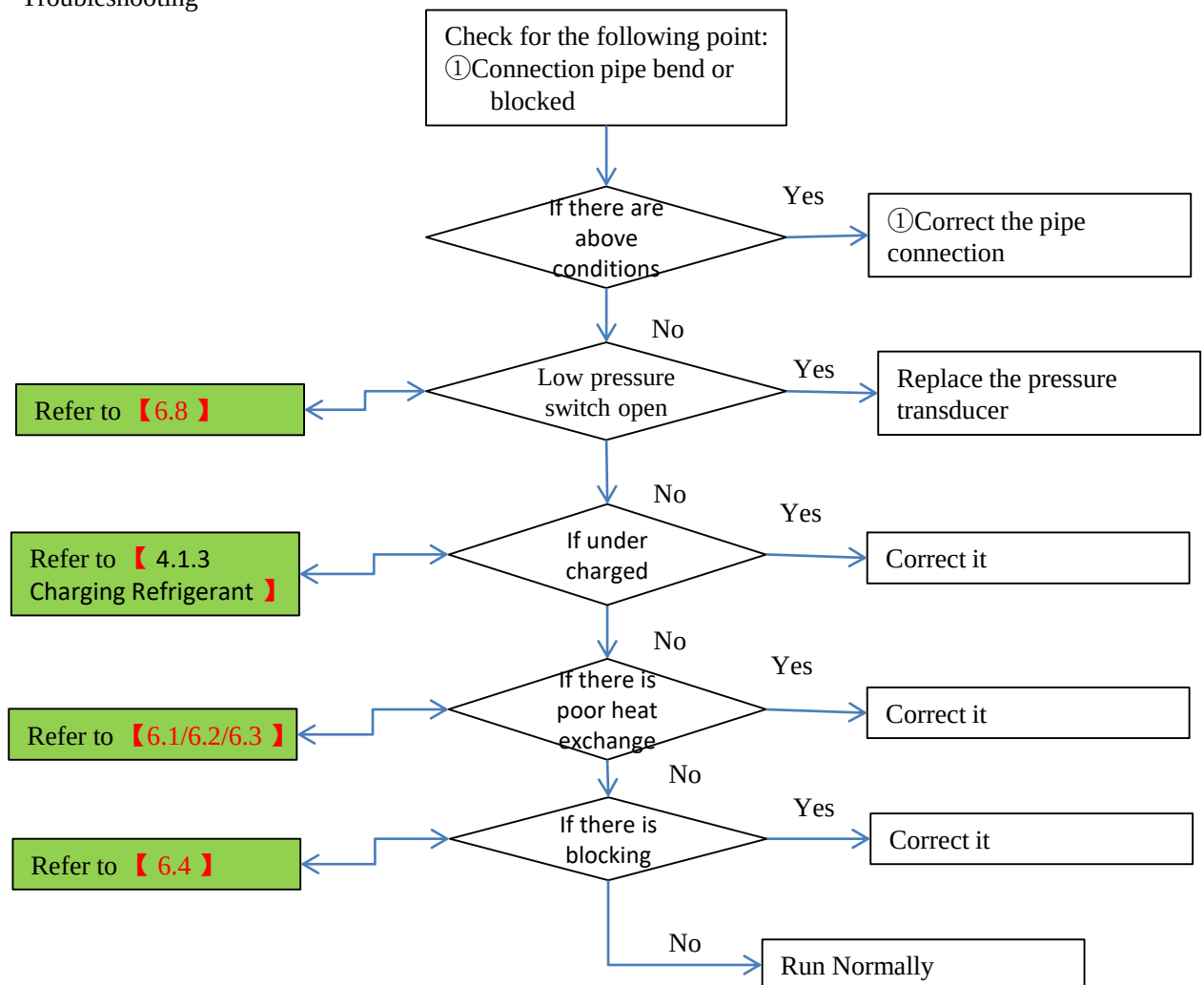


5.3 Troubleshooting by Main board Fault code

5.3.3 LED2-3 Flash/cycle

Faulty code	LED2-3 Flash/cycle
Mode	All
Name	Low pressure protection
Classify	System fault
Possible cause	- Indoor fan stopped abnormally / poor heat exchange orifice/filter drier/indoor coil blocked - Under charged

Troubleshooting

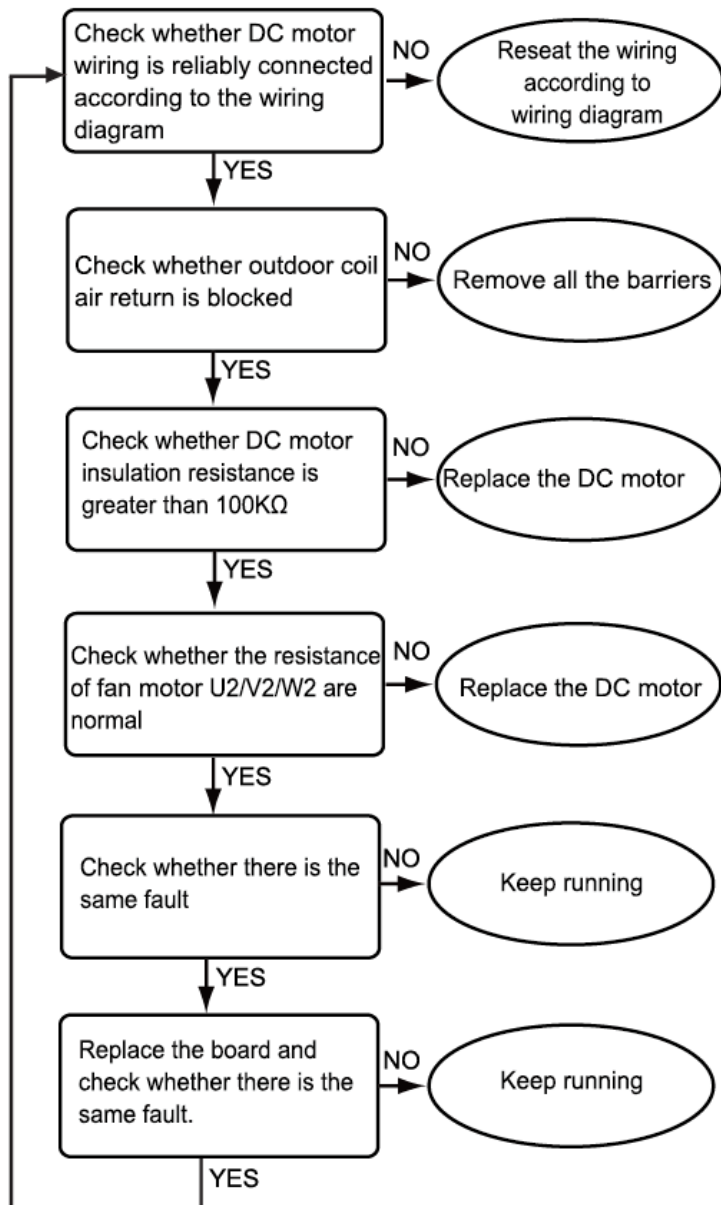
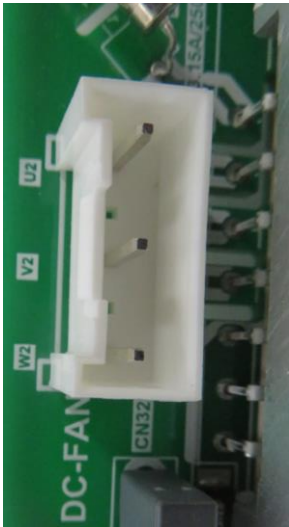


5.3 Troubleshooting by Main board Fault code

5.3.4 LED2-5 Flash/cycle

Faulty code	LED2-5 Flash/cycle
Model	All
Name	DC fan motor fault
Classify	Electric issue
Possible cause	• Start electromagnetic interference • Motor failed • Electric issue

Troubleshooting



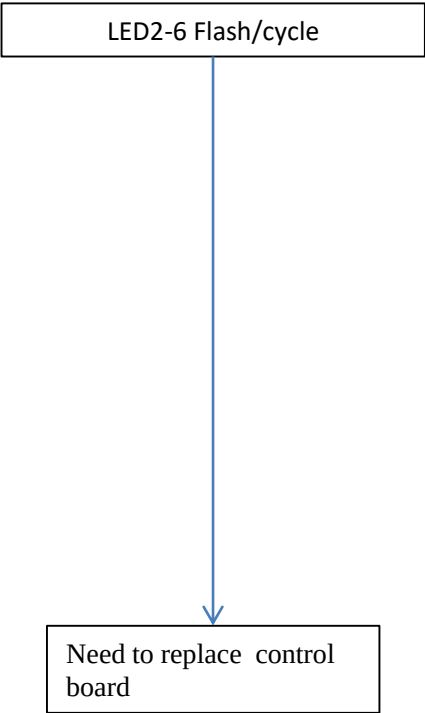
Refer to **【6.10】**

5.3 Troubleshooting by Main board Fault code

5.3.5 LED2-6 Flash/cycle

Faulty code	LED2-6 Flash/cycle
Model	All
Name	No machine type
Classify	Electric issue
Possible cause	• Speed message isn't wrote in main board • Control board broken

Troubleshooting

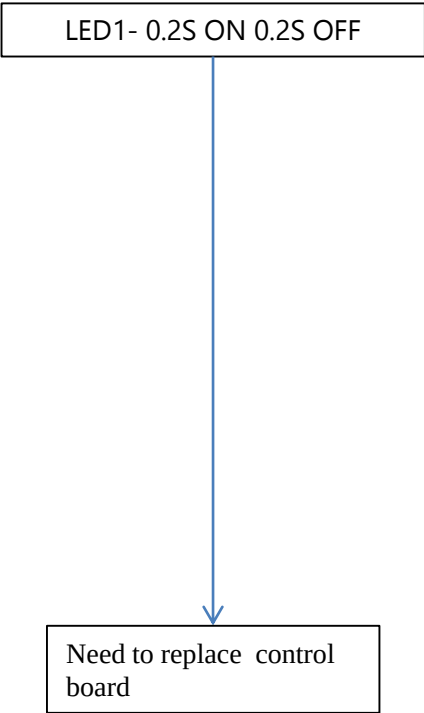


5.4 Troubleshooting by Motor driver module code

5.4.1 LED1- 0.2S ON 0.2S OFF

Faulty code	LED1- 0.2S ON 0.2S OFF
Model	all
Name	Inter integrated circuit communication error fault
Classify	Electric issue
Possible cause	• Motor driver module poor contact • Control board broken

Troubleshooting

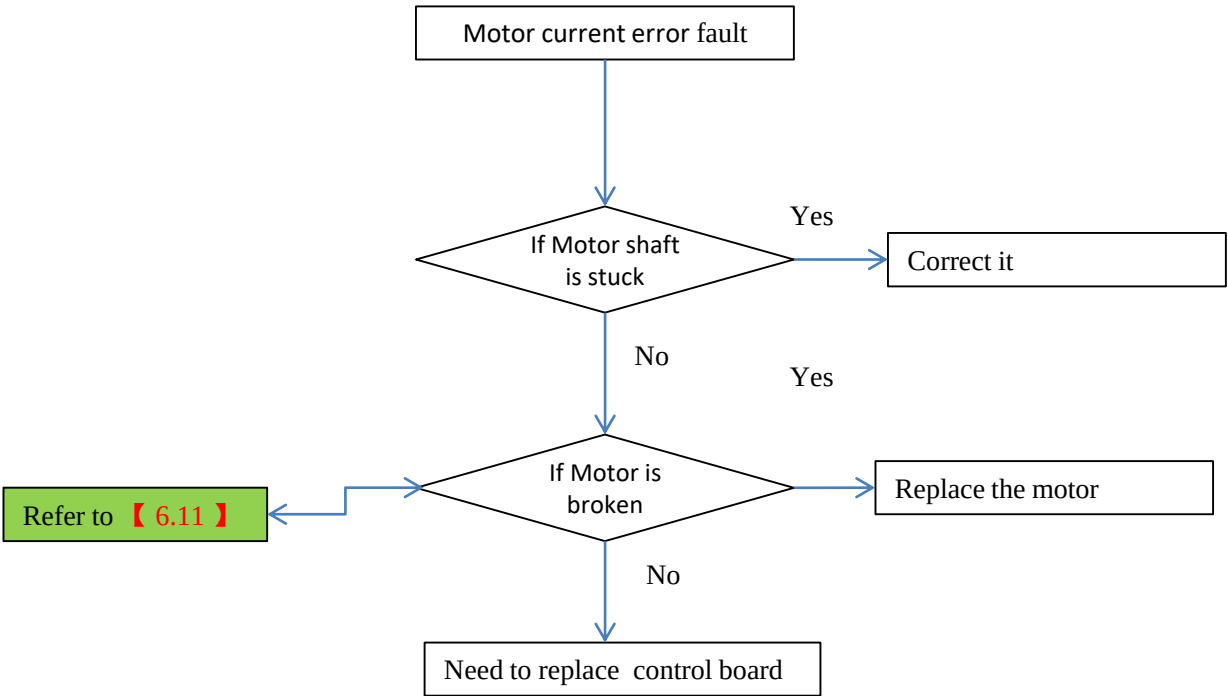


5.4 Troubleshooting by Motor driver module code

5.4.2 LED1--1 Flash/cycle

Faulty code	LED1--1 Flash/cycle
Model	all
Name	Motor current error fault
Classify	Electric issue
Possible cause	• Motor shaft stuck • Motor broken • Control board broken

Troubleshooting

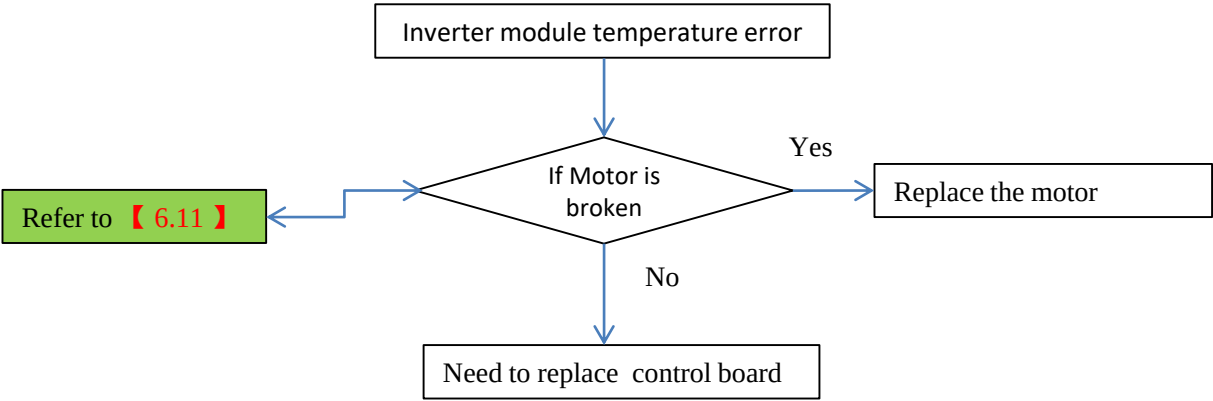


5.4 Troubleshooting by Motor driver module code

5.4.3 LED1--2 Flash/cycle

Faulty code	LED1—2 Flash/cycle
Model	all
Name	Inverter module temperature error
Classify	Electric issue
Possible cause	• Motor is broken • Control board broken

Troubleshooting

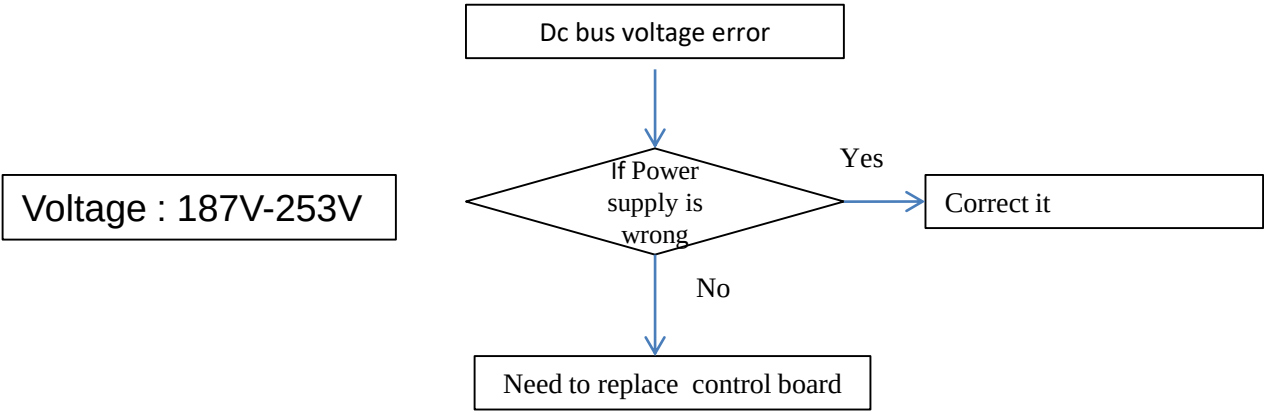


5.4 Troubleshooting by Motor driver module code

5.4.4 LED1--3 Flash/cycle

Faulty code	LED1—3 Flash/cycle
Model	all
Name	Dc bus voltage error
Classify	Electric issue
Possible cause	• Power supply wrong • Control board broken

Troubleshooting

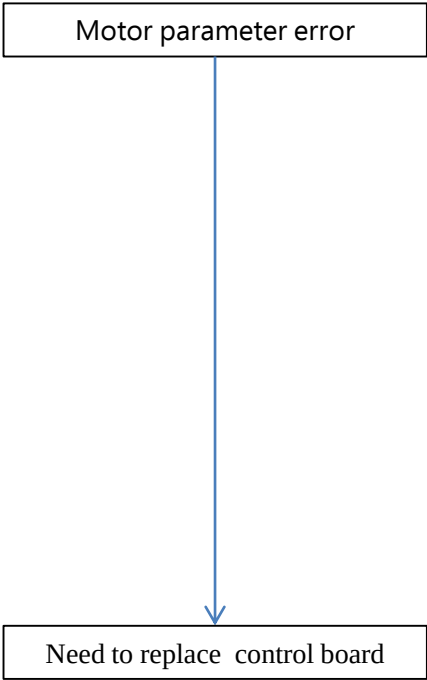


5.4 Troubleshooting by Motor driver module code

5.4.5 LED1--4 Flash/cycle

Faulty code	LED1—4 Flash/cycle
Model	all
Name	Motor parameter error
Classify	Electric issue
Possible cause	• Control board broken

Troubleshooting

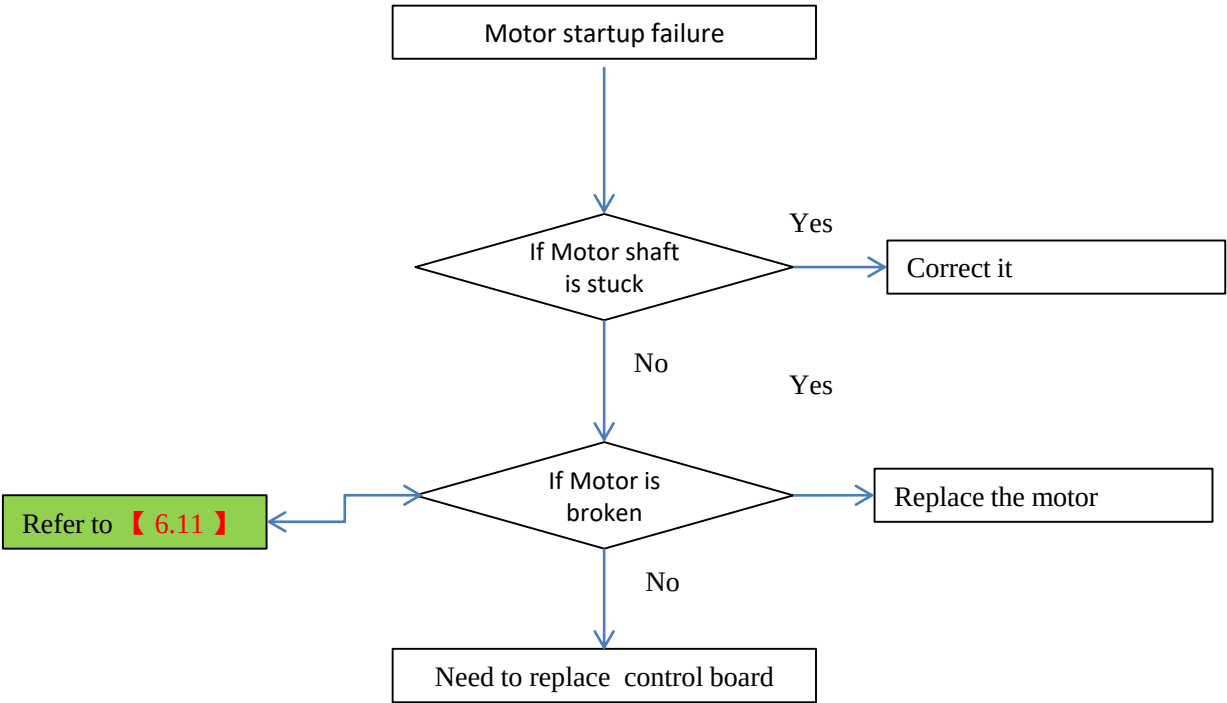


5.4 Troubleshooting by Motor driver module code

5.4.6 LED1--5 Flash/cycle

Faulty code	LED1—5 Flash/cycle
Model	all
Name	Motor startup failure
Classify	Electric issue
Possible cause	• Motor broken • Motor shaft stuck • Control board broken

Troubleshooting

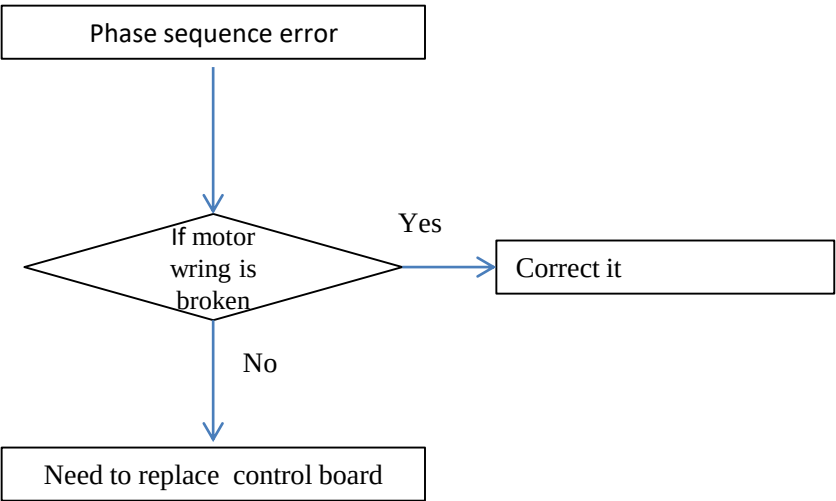


5.4 Troubleshooting by Motor driver module code

5.4.7 LED1--6 Flash/cycle

Faulty code	LED1—6 Flash/cycle
Model	all
Name	Phase sequence error
Classify	Electric issue
Possible cause	• Motor wring broken • Control board broken

Troubleshooting



PART 6 Check 43

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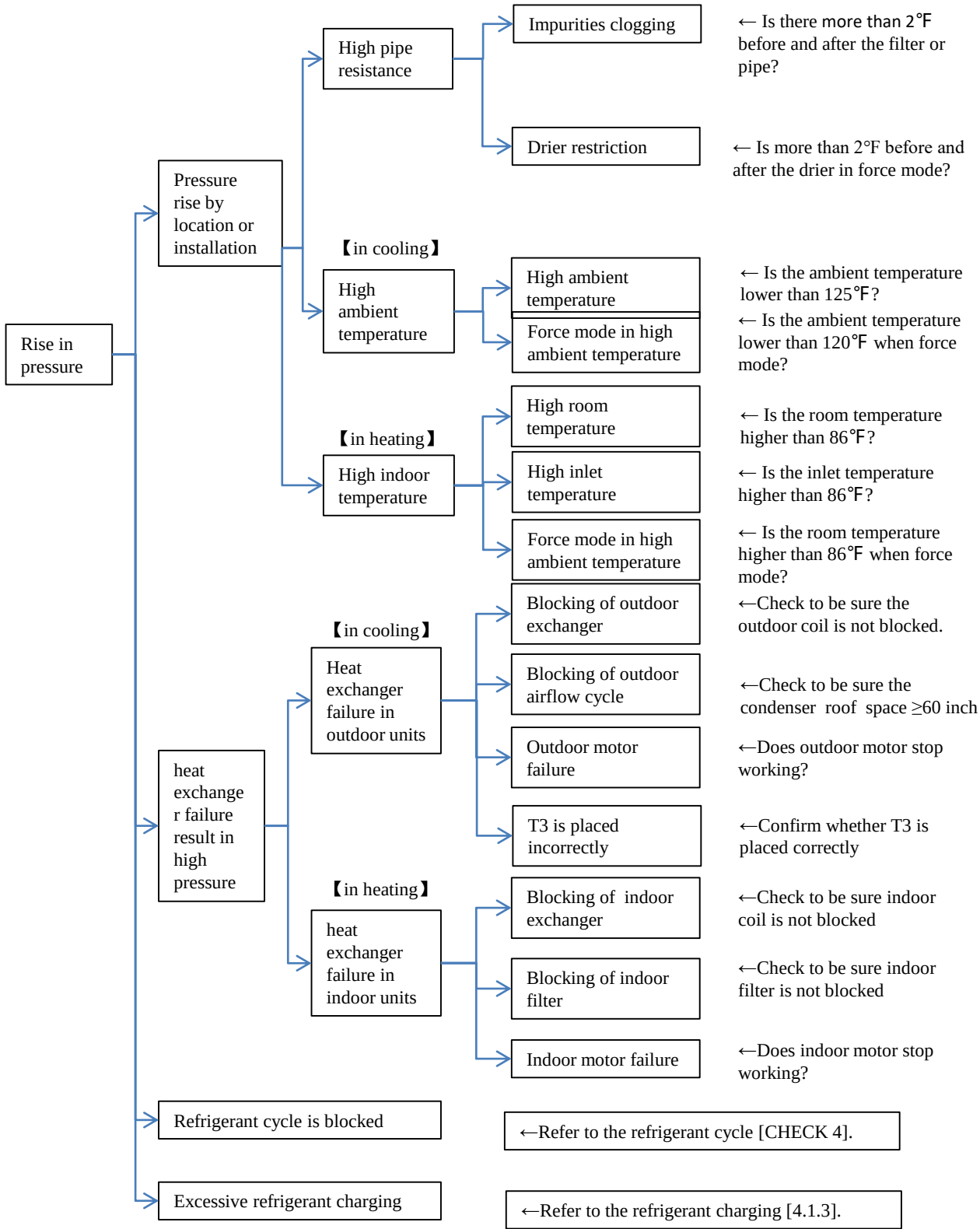
6.10 Check for Condenser Fan Motor 52

6.11 Check for Compressor Check 53

CHECK 1

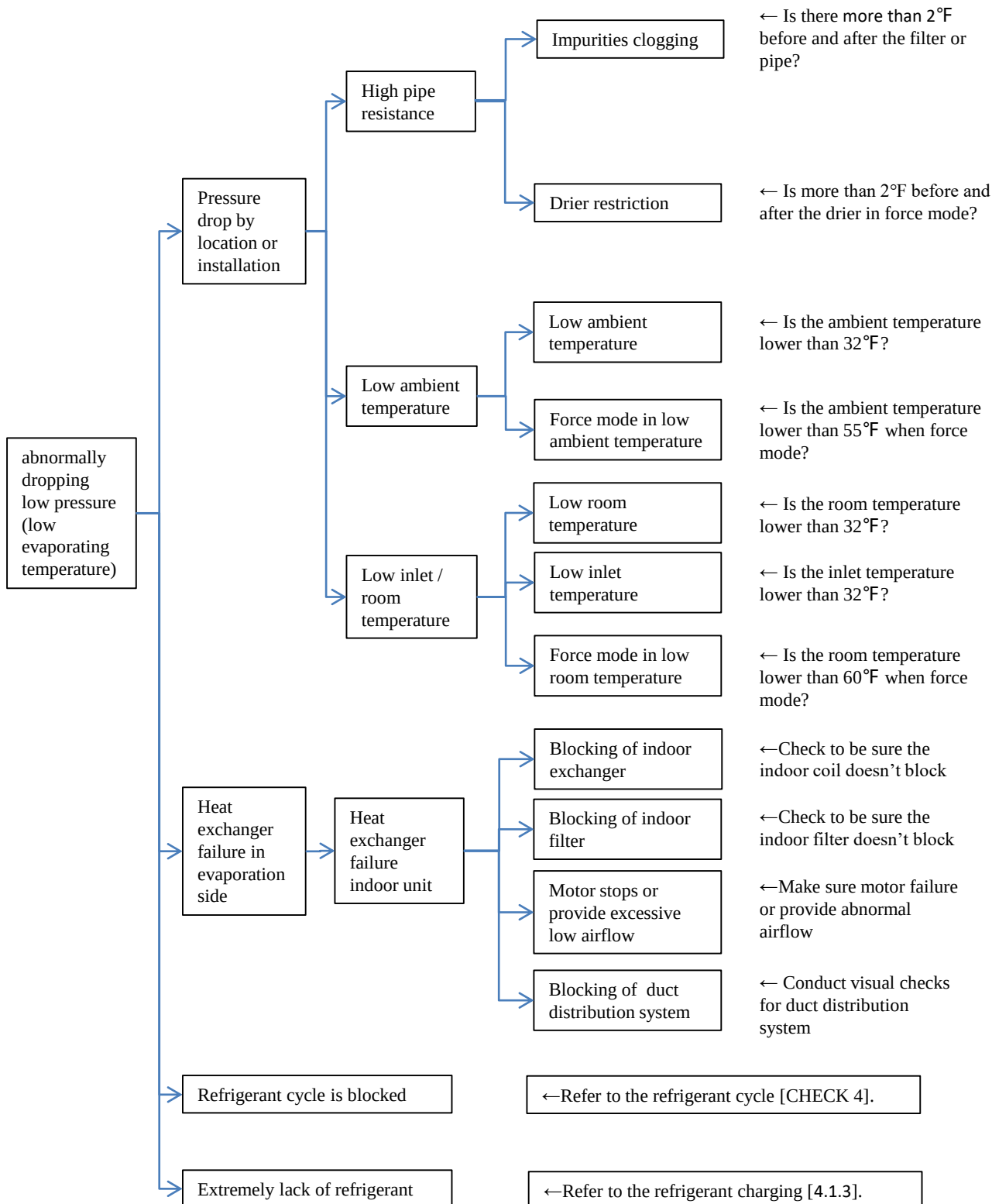
6.1 Check for Causes of Rise in High Pressure

Note: 310-380PSIG head pressure is normal for heating in normal conditions operation. The pressure may be as high as 440PSIG at 40°F outdoor temperature or higher. Start-up or return oil stages during heating.



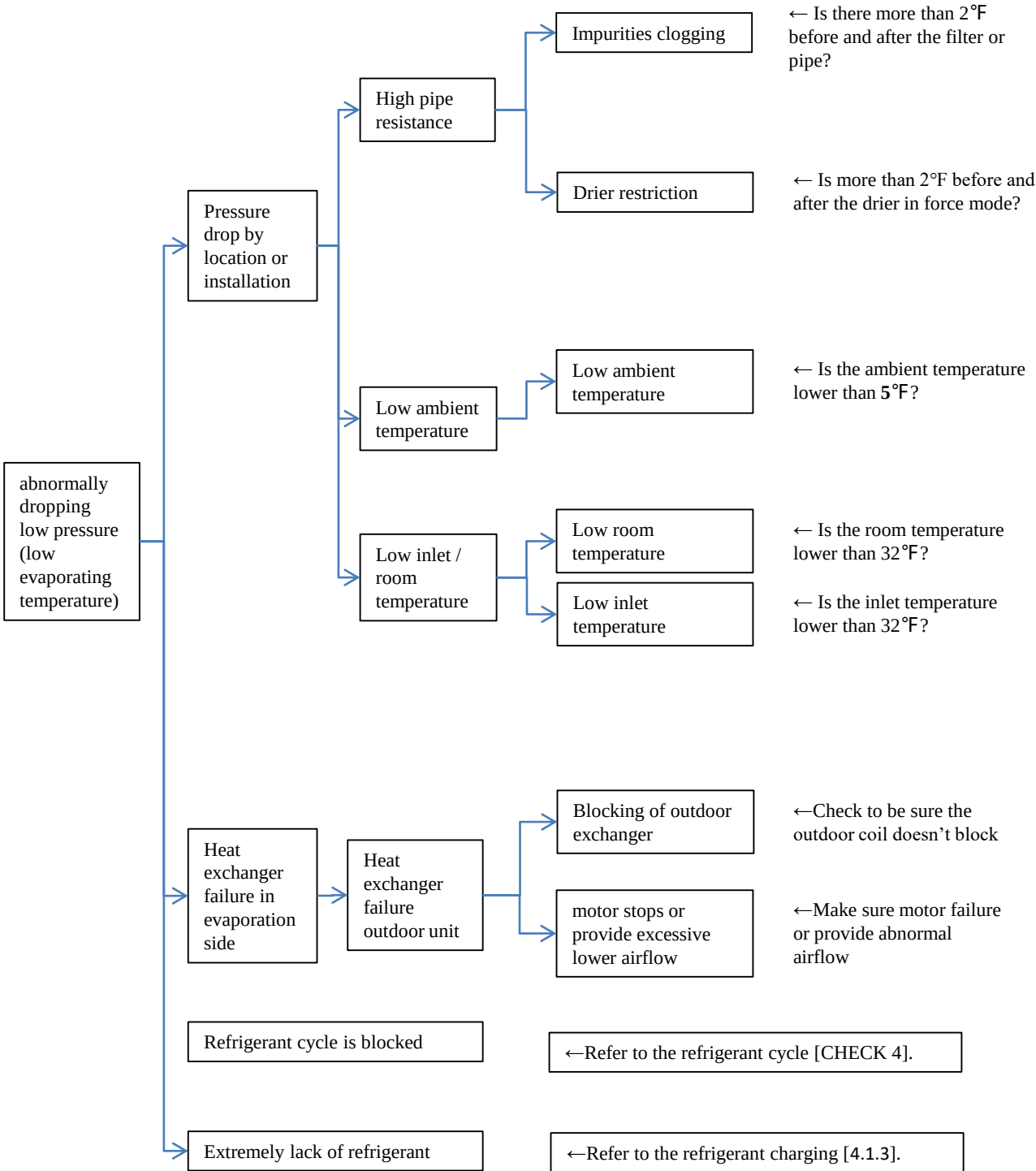
CHECK 2**6.2 Check for Causes of Dropping Low Pressure in cooling**

Note: 110-140PSIG head pressure is normal in cooling conditions. The value may be lower/higher at maximum/minimum/limited frequency of compressor operation . Start-up or return oil stages.



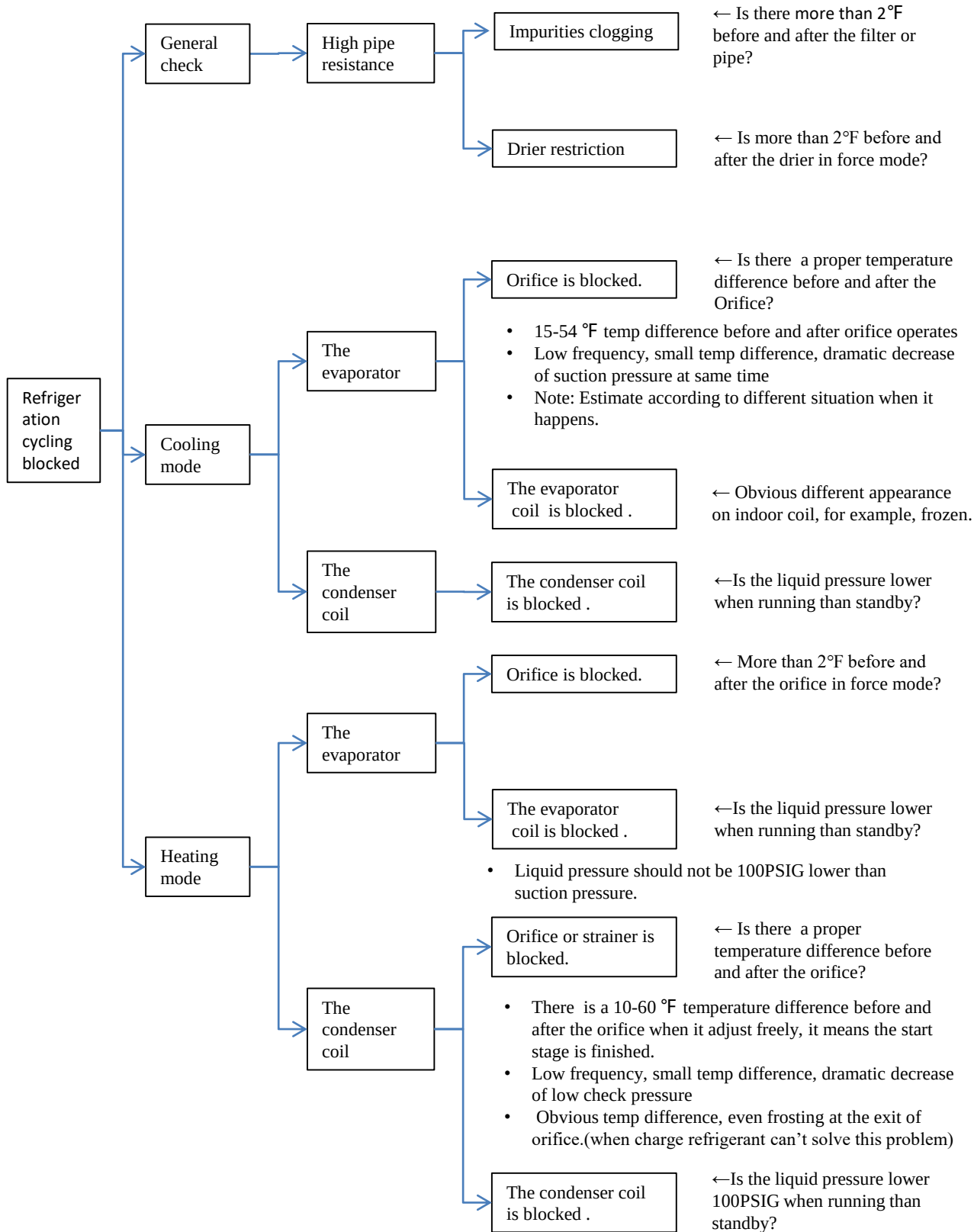
CHECK 3

6.3 Check for Causes of Dropping Low Pressure in heating



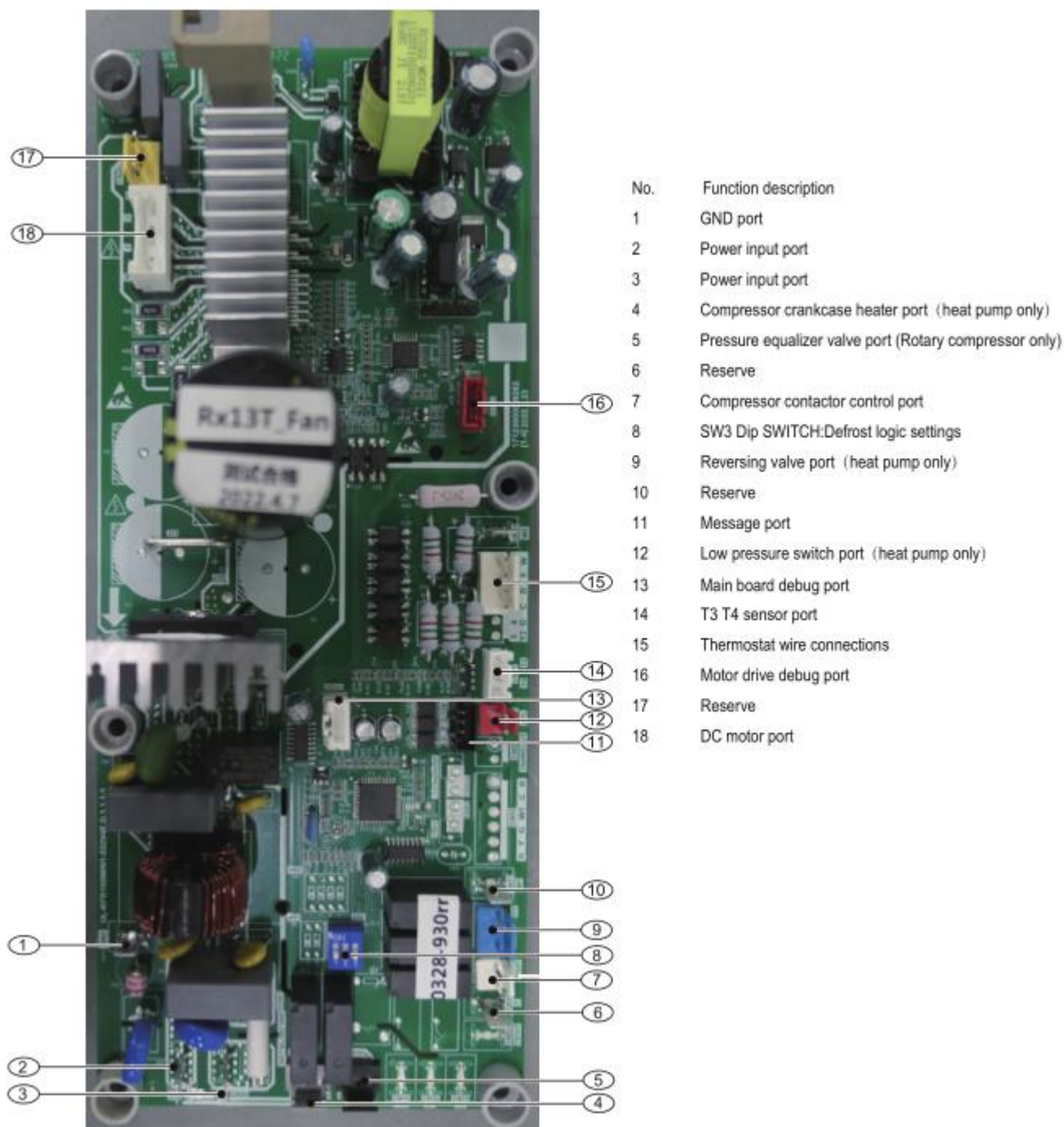
CHECK 4**6.4 Check for Causes of Refrigeration cycling blocked**

Note: Check at normal and force mode operation, some problems will be more obvious.



CHECK 5

6.5 Check for control board



*The photo is provided for reference purposes only, Layout and components will vary according to the unit specification.

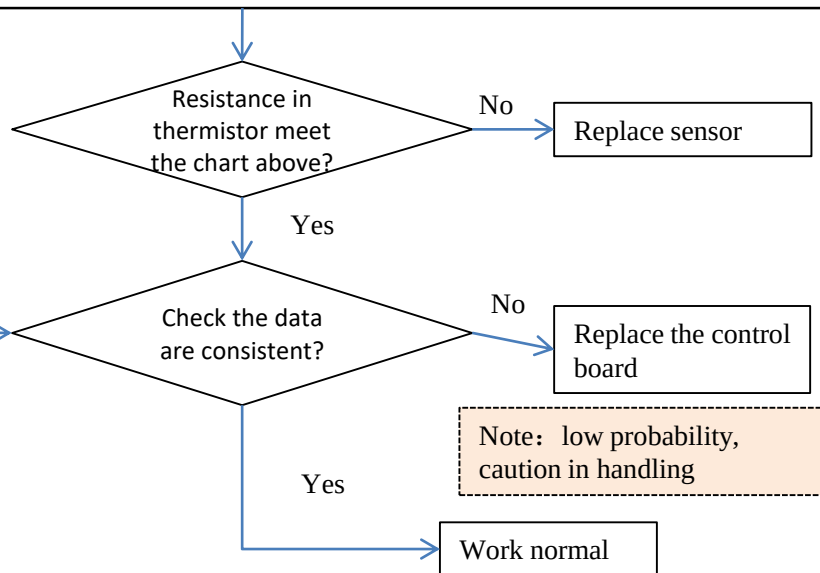
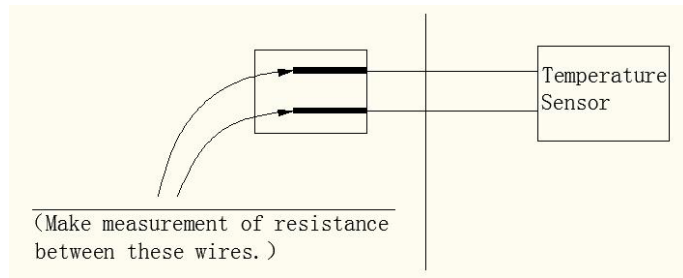
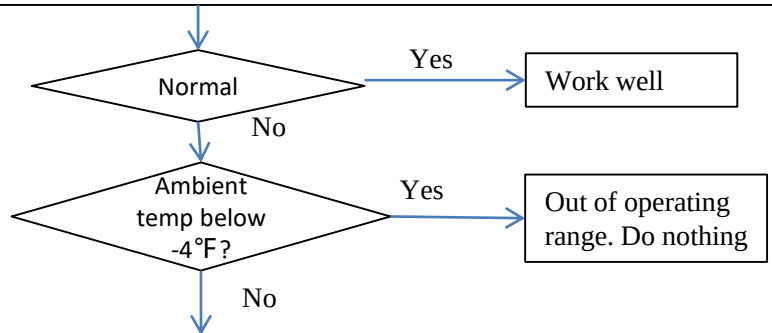
CHECK 6

6.6 Check for Temperature Sensor (T3/T4)

Check temp transducer (T3/T4) :

Compare the temperature checked (T3-3#/T4-4#/T5-5#, refer to 4.1.5), it's normal if the temperature difference was within 15°F when standby.(need to avoid the waste heat affect T5/Tf when standby mode)

T3/T4: 77 °F --10KΩ

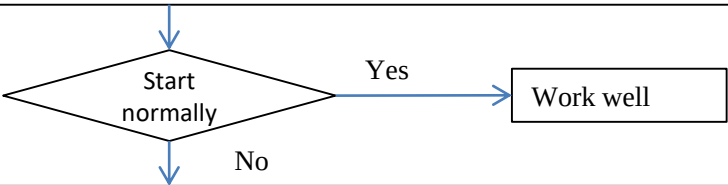


Refer to **Appendix 7**

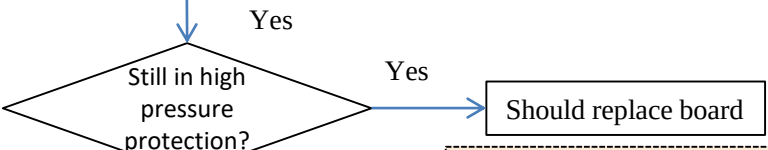
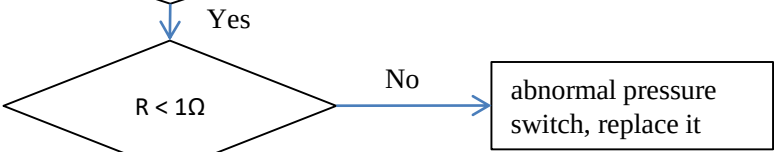
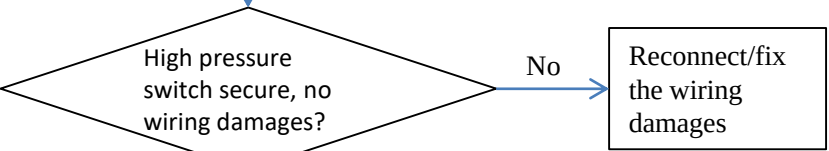
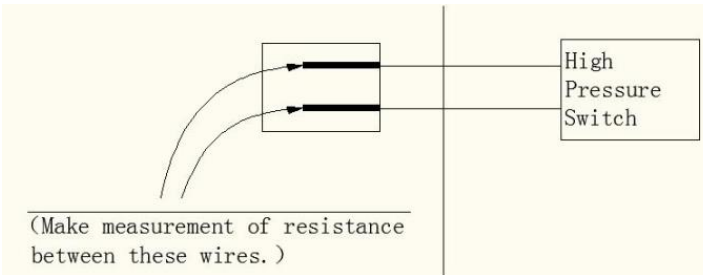
CHECK 7

6.7 Check for High Pressure Switch (HPS)

High Pressure Switch :
Whether the switch can start normally when start the machine



When power off and pull up



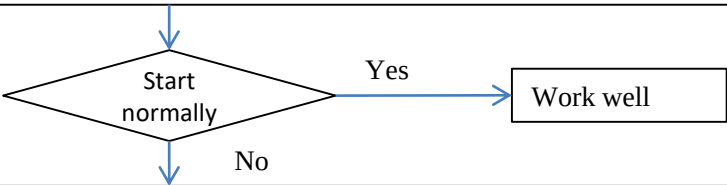
Note: low probability, caution in handling

Note:
Normal high pressure switch
opens above 600PSIG, resets
below 435PSIG.

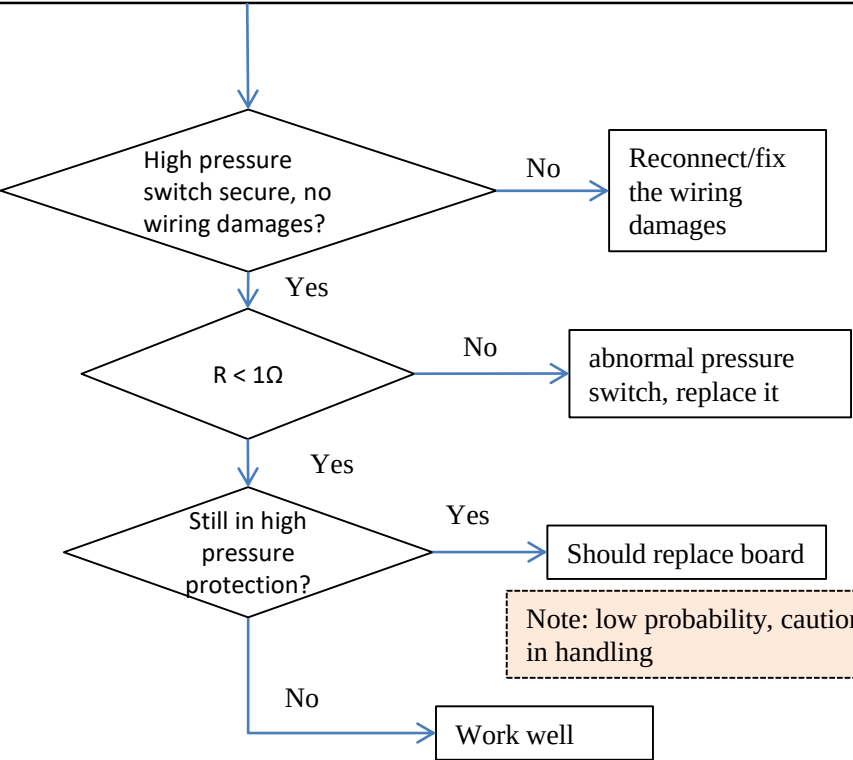
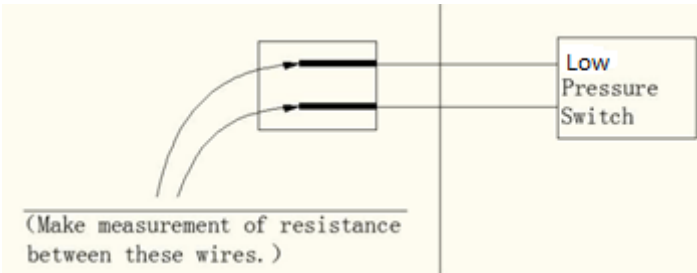
CHECK 8

6.8 Check for Low Pressure Switch (LPS)

High Pressure Switch :
Whether the switch can start normally when start the machine



When power off and pull up



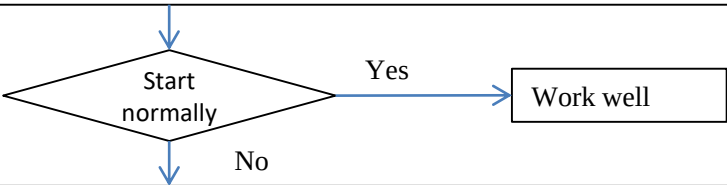
Note:
Normal high pressure switch
opens below 21PSIG, resets
above 44PSIG.

Note: low probability, caution
in handling

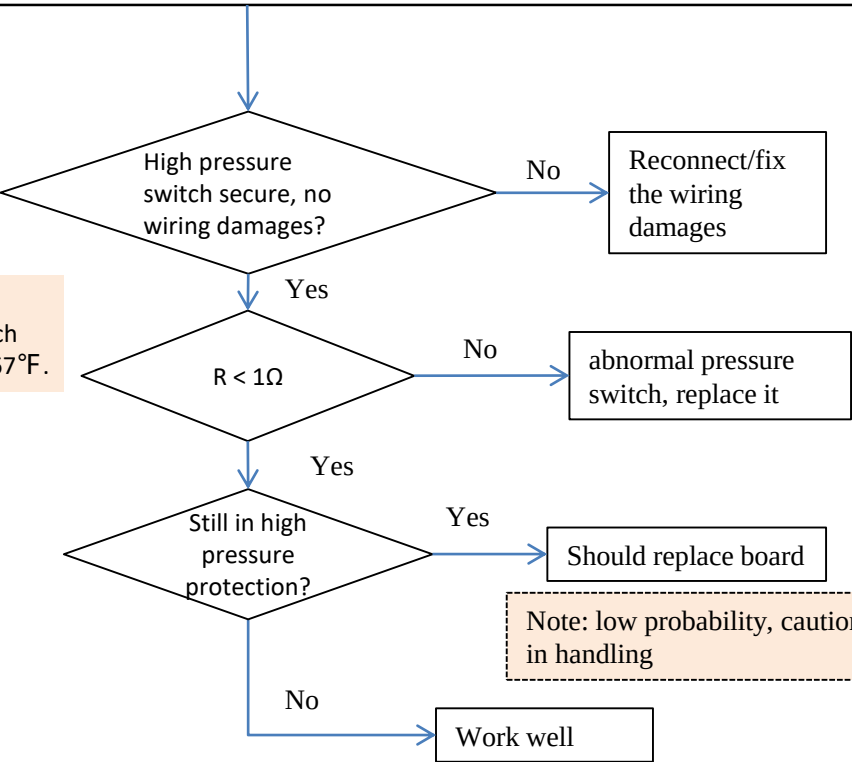
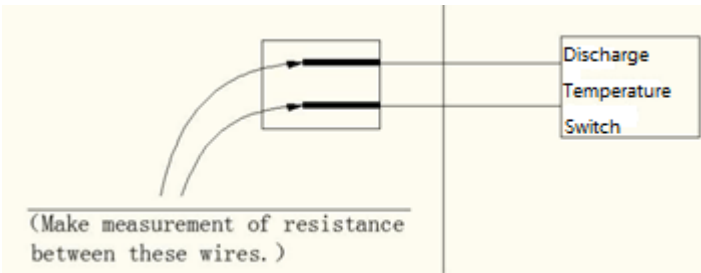
CHECK 9

6.8 Check for Discharge Temperature Switch (T5)

Discharge Temperature Switch :
Whether the switch can start normally when start the machine



When power off and pull up



Note:

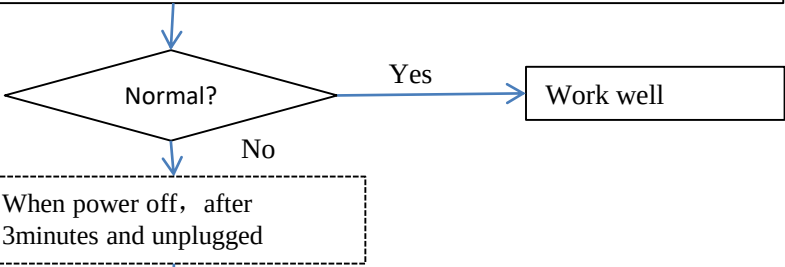
Normal discharge temperature switch opens above 239°F, resets below 167°F.

Note: low probability, caution in handling

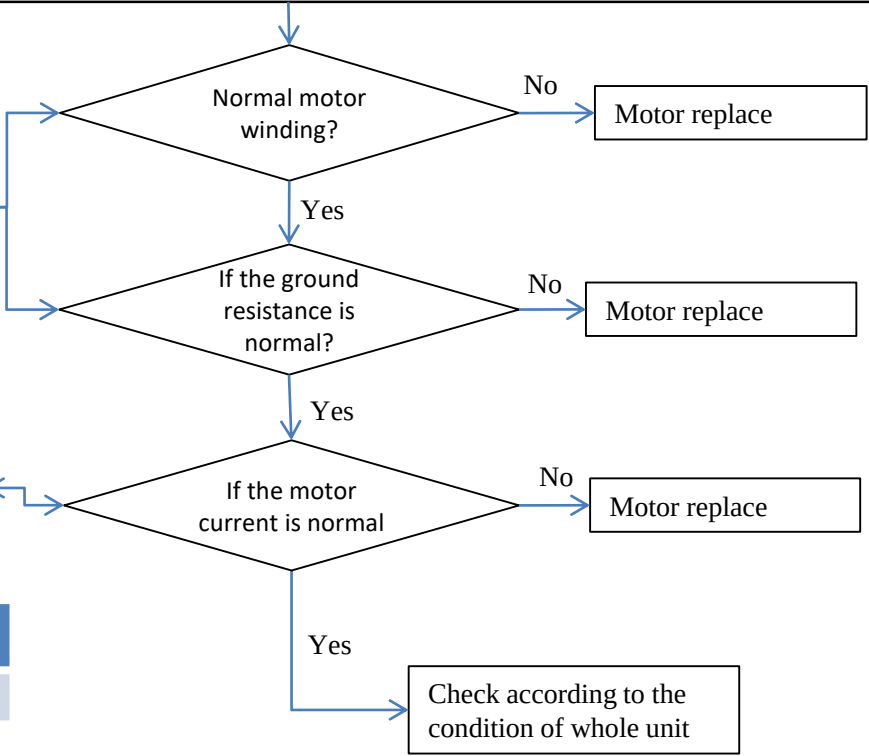
CHECK 10

6.10 Check for Condenser fan motor

Condenser fan motor:
Whether fan can start normally



Resistance (Ω)	200W
Between U and V	<36
Between V and W	<36
Between W and U	<36
Between U/V/W and ground	>10M



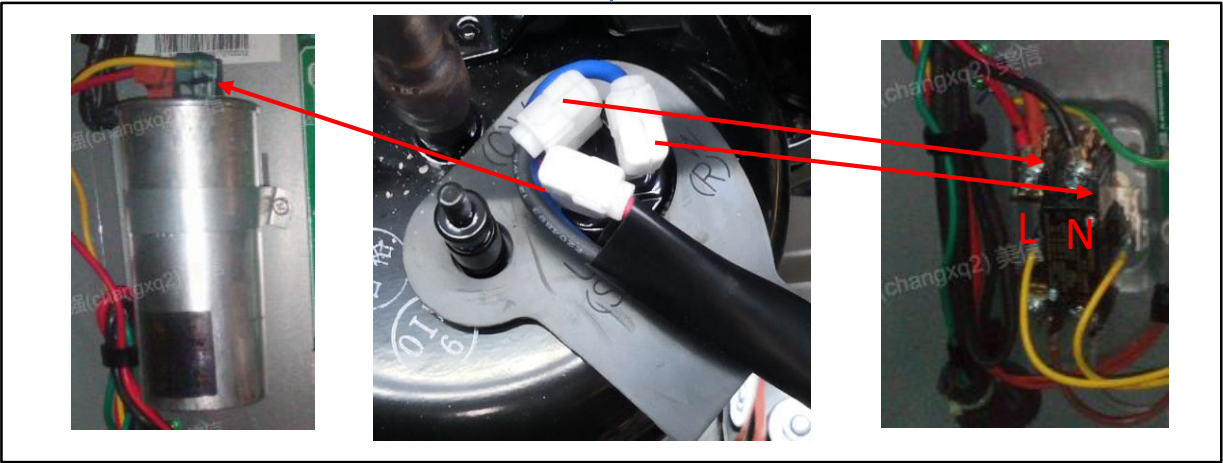
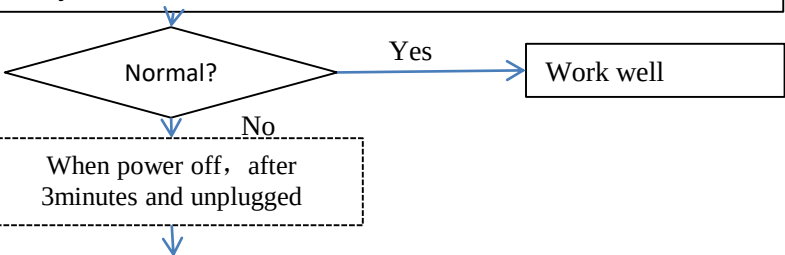
If the current is pulsating violently or abnormally beyond the “B” value

Motor output (W)	B(A)
200	2.2

CHECK 11

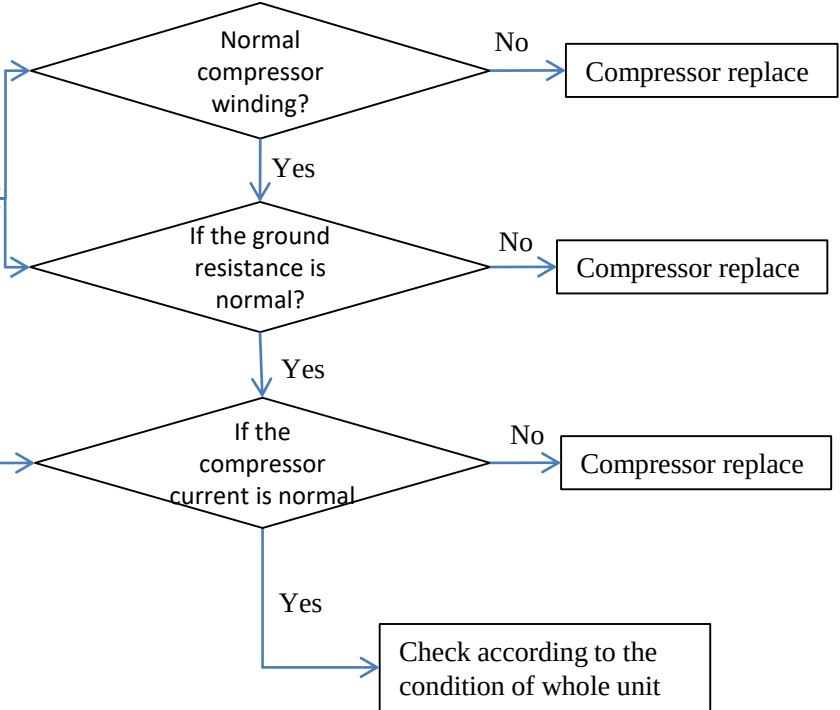
6.11 Check for Compressor

Compressor:
Whether compressor can start normally



For Scroll compressor, supply wiring is unitary, you can check it with colour (Red for L1, Black for L2, White for S)

Resistance (Ω)	Rotary	Scroll
Between R and C (L1 and L2)	<2	<2
Between C and S (L1 and S)	<2	<1
Between R and S (L2 and S)	<4	<1
Between U/V/W and ground	>10M	>10M



If the current is pulsating violently or abnormally beyond the "B" value

Model	2Ton	2.5Ton	3Ton	3.5Ton	4Ton	5Ton
B(A)	12	13	18	20	24	30

PART 7 Appendix

7.1 Wiring Diagrams 55

7.2 Control Board Replacement Procedure 59

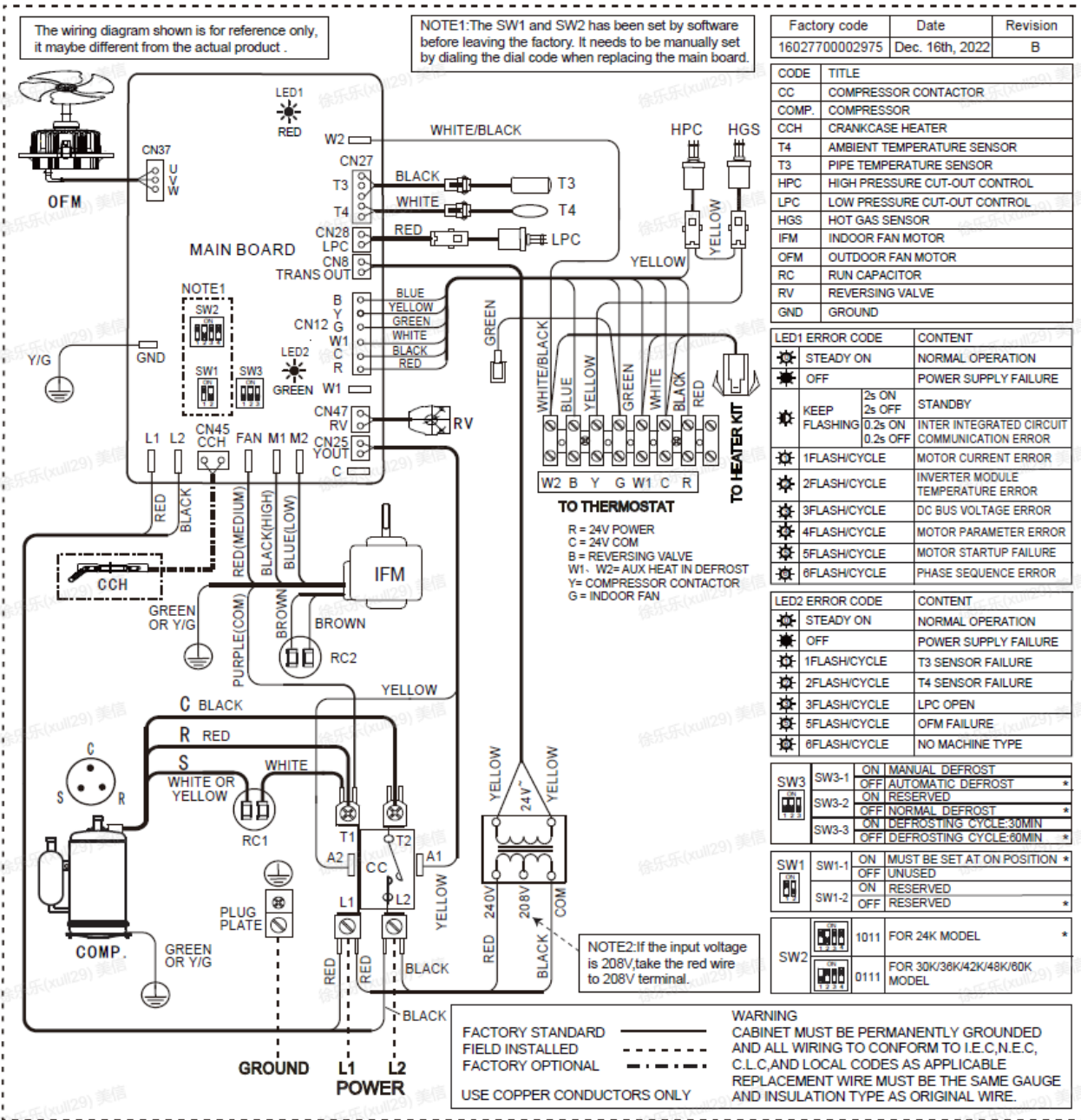
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7.5 Temperature and Resistance Relationship Tables 62

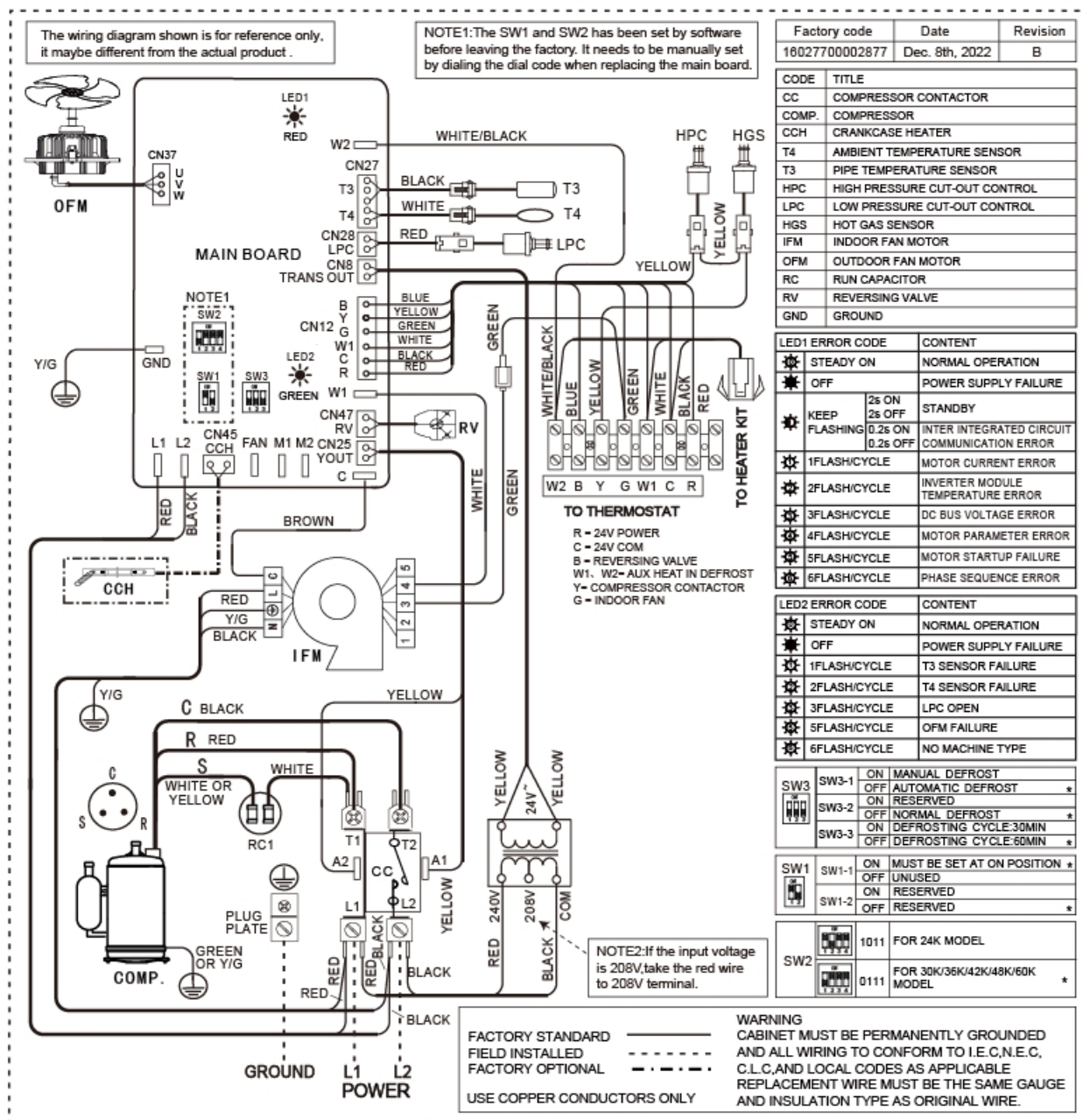
Appendix 1

7.1 Wiring diagrams for 24K



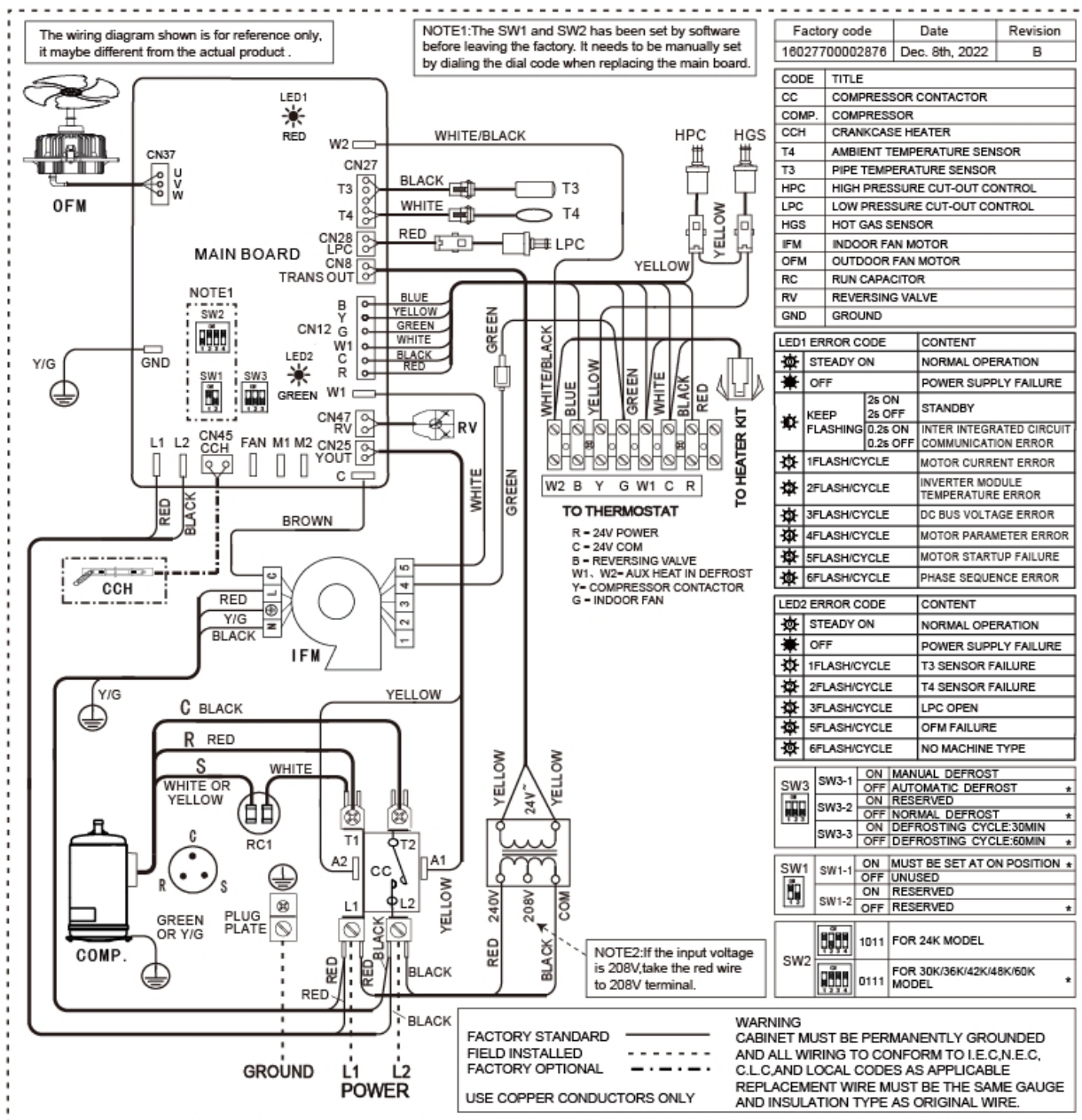
Appendix 1

7.1 Wiring diagrams for 30K



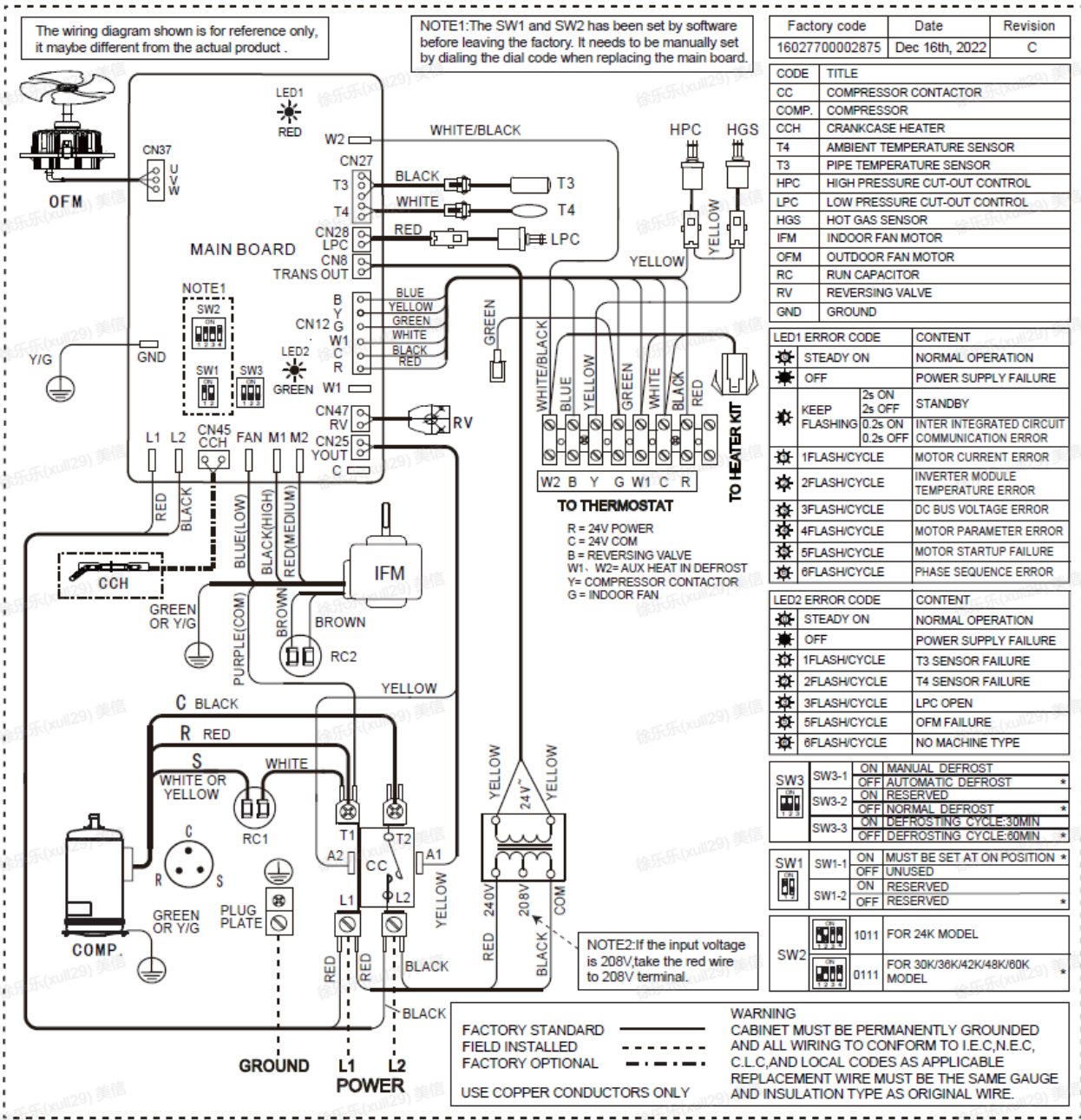
Appendix 1

7.1 Wiring diagrams for 36/60K

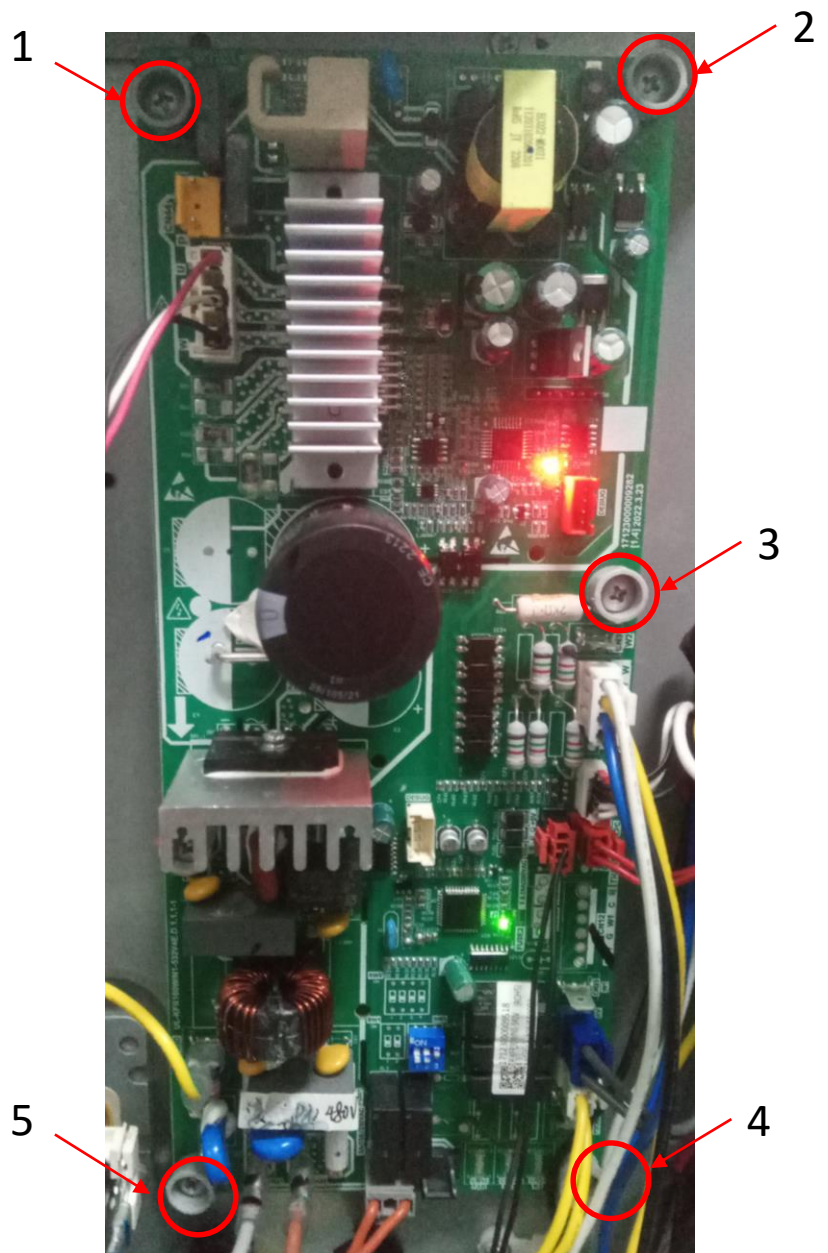


Appendix 1

7.1 Wiring diagrams for 42/48K



1. Power off and wait at least 3 minutes before opening the electric control box.
2. Remove the wirings carefully.
3. Remove the 5 screws on the board (as shown by the red circle and the serial number).
4. Install the new board on the unit.
5. Fasten the 5 screws (as shown by the red circle and the serial number).
6. Set up the SW1、SW2 and SW3 switches refer to the wire diagram.
7. Reconnect the wires according to the wire diagram.
8. Double check the wire connection, screws, thermal paste etc.



Fault Code of Motor Driver Module

LED1 ERROR CODE		CONTENT
	STEADY ON	NORMAL OPERATION
	OFF	POWER SUPPLY FAILURE
	KEEP FLASHING	2s ON 2s OFF
		STANDBY
		0.2s ON 0.2s OFF
	1FLASH/CYCLE	INTER INTEGRATED CIRCUIT COMMUNICATION ERROR
	2FLASH/CYCLE	MOTOR CURRENT ERROR
	3FLASH/CYCLE	INVERTER MODULE TEMPERATURE ERROR
	4FLASH/CYCLE	DC BUS VOLTAGE ERROR
	5FLASH/CYCLE	MOTOR PARAMETER ERROR
	6FLASH/CYCLE	MOTOR STARTUP FAILURE
	6FLASH/CYCLE	PHASE SEQUENCE ERROR

Fault Code of Main Control Module

LED2 ERROR CODE		CONTENT
	STEADY ON	NORMAL OPERATION
	OFF	POWER SUPPLY FAILURE
	1FLASH/CYCLE	T3 SENSOR FAILURE
	2FLASH/CYCLE	T4 SENSOR FAILURE
	3FLASH/CYCLE	LPC OPEN
	5FLASH/CYCLE	OFM FAILURE
	6FLASH/CYCLE	NO MACHINE TYPE

SYSTEM FAULTS	WHAT TO CHECK																															
	POWER SUPPLY	HIGH VOLTAGE WIRING	I.D. CONTROL DEF.	COMPRESSOR CAPACITOR	O.D. FAN CAPACITOR	I.D. BLOWER CAPACITOR	CONTACTOR COIL	CONTACTOR COIL	LOW VOLTAGE FUSE	STUCK COMPRESSOR	INEFFICIENT COMP.	REF. UNDERCHARGE	EXCESSIVE EVAP. LOAD	NONCONDENSABLES	RES. O.D. AIRFLOW	O.D. AIR RECIRCULATION	TXV STUCK OPEN	SUPERHEAT	REF. CIR. RESTRICTION	RES. I.D. AIRFLOW	SOV LEAKING	SOV COIL DEFECTIVE	CHECK VALVE LEAKING	LPC SENSOR DEF.	DEFROST CONTROL DEF.	T4 TEMP. SENSOR DEF.	T3 TEMP. SENSOR DEF.	HP/IGSS SENSOR DEF.				
REFRIGERANT CIRCUIT																																
Head Pressure Too High	C												P	P	S	P	S				S											
	H												P	P	S					P	S											
Head Pressure Too Low	C										S	P						S	S		S	S		P								
	H										S	P						S	S		S	S	S	P								
Suction Pressure Too High	C										S		P	P					S			P		P								
	H										S								S			P										
Suction Pressure Too Low	C											P							S	P	S											
	H											P				S	S		S		S		S									
Liquid Refrig. Floodback (TXV)	C																	P						P								
	H																	P						P								
I.D. Coil Frosting	C											P				S	S															
	H																															
Compressor Runs Inadequate or No Cooling/Heating	C										S	P		S	S				S	P	S	S		S								
	H										S	P		S					S	P	S	S	S	S								
ELECTRICAL																																
Compressor & O.D. Fan Won't Start	C	P	P				S	S	P	S	P	P																				
	H	P	P				S	P	S		P															S	S	S	S	S		
Compressor Will Not Start But O.D. Fan Runs	C	P	P								P																					
	H	P	P			S				P	P															S		S				
O.D. Fan Won't Start	C	P		P																												
	H	P		P																							S					
Compressor Hums But Won't Start	C			P		S					P																					
	H			P		S					P																					
I.D. Blower Won't Start	C	P	P	S		P	S	P	S		S																					
	H	P	P	S		P	S	P	S		S																					
DEFROST																																
Unit Won't Initiate Defrost	C																															
	H																							P		P		S				
Defrost Terminates on Time	C																															
	H											P														P		S				
Unit Icing Up	C																															
	H												P			S	S		S		P				P		P					

C- Cooling H - Heating P - Primary Causes S - Secondary Causes

C-cooling H-Heating P-Primary Causes S-Secondary Causes

Comp.-compressor RES.-Restrictions REF.-Refrigeration DEF.-Defective CIR.-Circuit EEV-Electronic expansion valve REV.-Reversing Valve PT-Pressure Transducer T3-Outdoor coil temp. sensor T4-Ambient temp. sensor T5-Comp. discharge temp. sensor Tf-Module radiator fin temp. sensor HPS-High pressure switch

RES I.D. AIRFLOW -Perhaps failure of fan motor or fan capacitor or filter

RES O.D. AIRFLOW -Perhaps failure of fan motor or fan capacitor or recirculation or blocking coil

RES O.D. RADIATOR-Perhaps failure of blocking radiator

Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ
-4	106.73	37	29.87	78	10	119	3.69
-3	103.25	38	29.22	79	9.5	120	3.61
-2	99.89	39	28.19	80	9.26	121	3.53
-1	96.65	40	27.39	81	9.03	122	3.45
0	93.53	41	26.61	82	8.81	123	3.38
1	90.53	42	25.85	83	8.59	124	3.3
2	87.62	43	25.12	84	8.38	125	3.23
3	84.83	44	24.42	85	8.17	126	3.16
4	82.13	45	23.73	86	7.97	127	3.1
5	79.52	46	23.07	87	7.78	128	3.03
6	77.01	47	22.42	88	7.59	129	2.96
7	74.58	48	21.8	89	7.4	130	2.9
8	72.24	49	21.2	90	7.22	131	2.84
9	69.98	50	20.61	91	7.05	132	2.78
10	67.8	51	20.04	92	6.88	133	2.72
11	65.69	52	19.49	93	6.72	134	2.67
12	63.65	53	18.96	94	6.56	135	2.61
13	61.68	54	18.44	95	6.4	136	2.56
14	59.78	55	17.94	96	6.25	137	2.5
15	57.95	56	17.45	97	6.1	138	2.45
16	56.17	57	16.98	98	5.96	139	2.4
17	54.46	58	16.52	99	5.82	140	2.35
18	52.8	59	16.08	100	5.68	141	2.3
19	51.2	60	15.65	101	5.55	142	2.25
20	49.65	61	15.23	102	5.42	143	2.21
21	48.16	62	14.83	103	5.3	144	2.16
22	46.71	63	14.43	104	5.18	145	2.12
23	45.31	64	14.05	105	5.06	146	2.08
24	43.95	65	13.68	106	4.94	147	2.03
25	42.64	66	13.32	107	4.83	148	1.99
26	41.38	67	12.97	108	4.72	149	1.95
27	40.15	68	12.64	109	4.61	150	1.91
28	38.97	69	12.31	110	4.51	151	1.88
29	37.82	70	11.99	111	4.41	152	1.84
30	36.71	71	11.68	112	4.31	153	1.8
31	35.64	72	11.38	113	4.21	154	1.77
32	34.6	73	11.09	114	4.12	155	1.73
33	33.59	74	10.8	115	4.03	156	1.7
34	32.61	75	10.53	116	3.94	157	1.66
35	31.67	76	10	117	3.85	158	1.63
36	30.76	77	10	118	3.77	159	1.6

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.