

TS09-L: IPM malfunction or IGBT over-strong current protection or Inverter compressor drive error diagnosis and solution

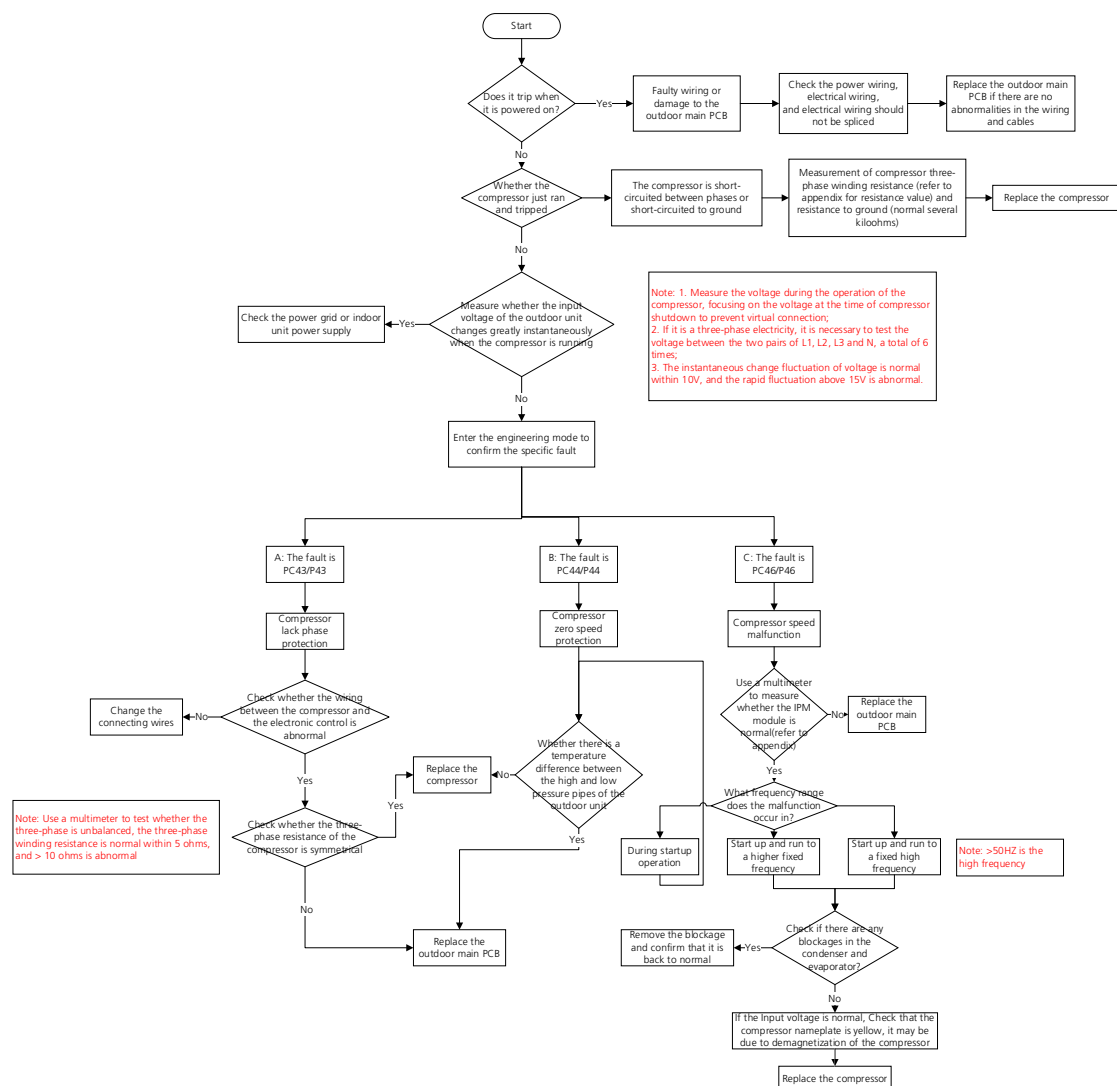
Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the LED displays the failure code and the AC turns off.

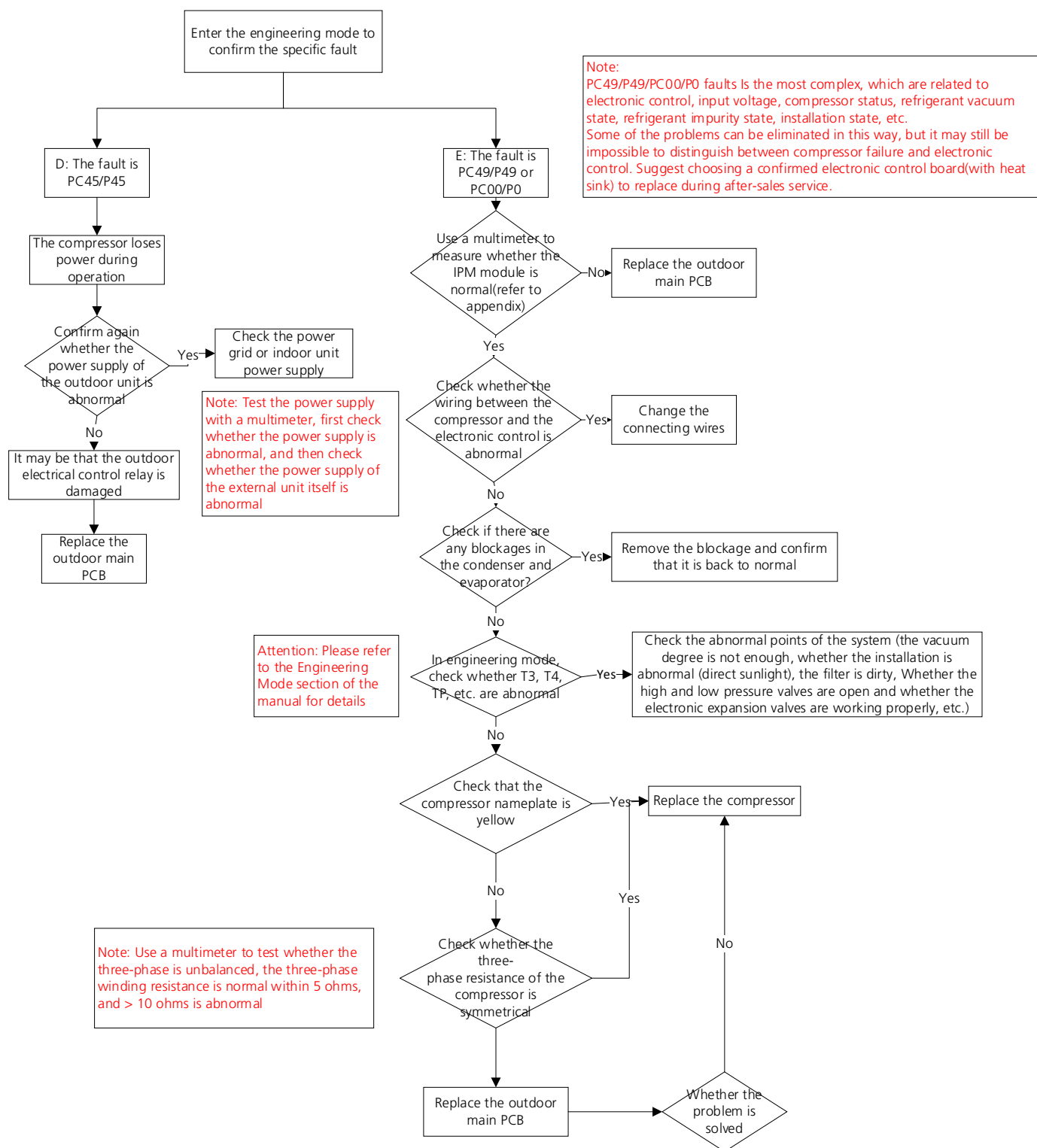
Or an abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB
- High-voltage components
- PFC circuit or reactor

Troubleshooting and repair:





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1. IPM Continuity Check

 **WARNING**

Electricity remains in capacitors even when the power supply is off.
Ensure the capacitors are fully discharged before troubleshooting.

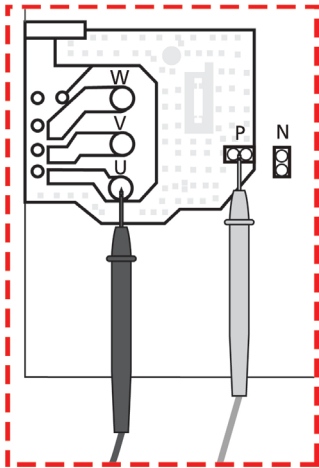
- 1. Turn off outdoor unit and disconnect power supply.
- 2. Discharge electrolytic capacitors and ensure all energy-storage unit has been discharged.
- 3. Disassemble outdoor PCB or disassemble IPM board.
- 4. Measure the resistance value between P and U(V, W, N); U(V, W) and N.

Digital tester		Resistance value	Digital tester		Resistance value
(+)Red	(-)Black	∞ (Several MΩ)	(+)Red	(-)Black	∞ (Several MΩ)
P	N		U	N	
	U		V		
	V		W		
	W		-		

Or test the conductivity of IPM with diode mode.

Needle-type Tester		Normal Value	Needle-type Tester		Normal Value
Red	Black		Red	Black	
P	U	Open-circuit	N	U	0.3-0.5V
	V			V	
	W			W	

Needle-type Tester		Normal Value	Needle-type Tester		Normal Value
Black	Red		Black	Red	
P	U	0.3-0.5V	N	U	Open-circuit
	V			V	
	W			W	

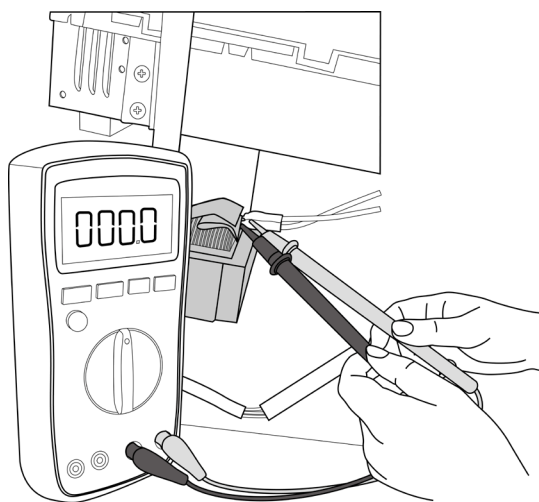


2. Normal voltage of P and N

208-240V(1-phase,3-phase)			380-415V(3-phase)
In standby			
around 310VDC			around 530VDC
In operation			
With passive PFC module	With partial active PFC module	With fully active PFC module	/
>200VDC	>310VDC	>370VDC	>450VDC

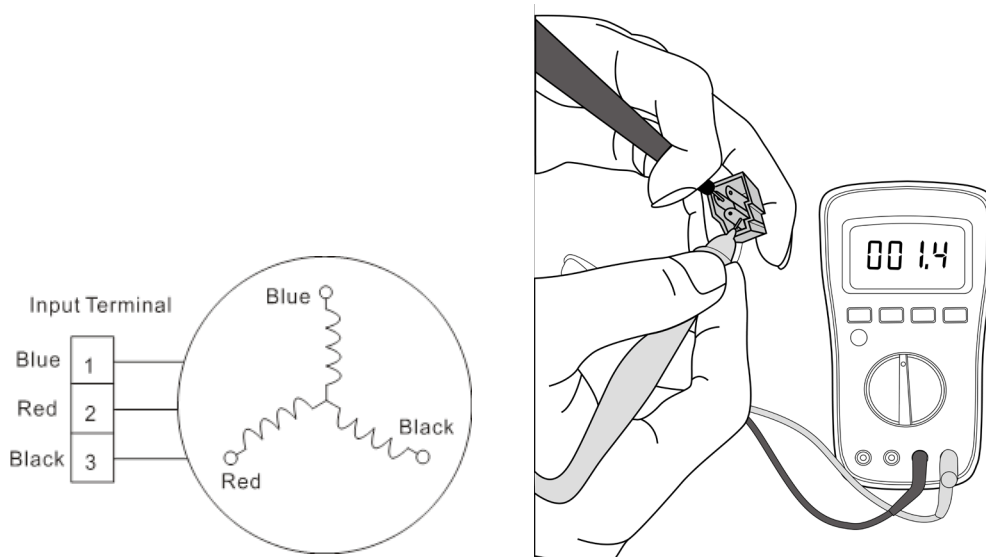
3. Reactor Check

Measure the resistance and voltage (to ground) of the reactor. The normal resistance should be around 0.1 ohm. Otherwise, the reactor must have malfunction.



4. Compressor check

Disconnect the compressor and check the resistance between U-V, V-W and U-W, and all 3 values should be equal. If not, the compressor is faulty and should be replaced.



Note: The picture and the value are only for reference, actual condition and specific value may vary.