15.4. Self-diagnosis Method

15.4.1. H11 (Indoor/Outdoor Abnormal Communication)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the data received from outdoor unit in indoor unit signal transmission is checked whether it is normal.

Malfunction Caused

- Faulty indoor unit PCB.
- Faulty outdoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wrong wiring.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units.
- Indoor unit-outdoor unit signal transmission error due to disturbed power supply waveform.

When abnormality indication starts again		
Check the indoor-outdoor units' connection wires.	Caution	For safety reason and to prevent component breakdown, always switch off the power before remove and connect the component.
Is there any wiring error?	YES	Correct the indoor-outdoor units connection wires
NO	. –	
Disconnect terminal 3 wire and measure Vdc between terminal 2 & 3 from the outdoor unit.		
Is the Vdc fluctuate between 20-70Vdc?	NO	Replace outdoor PCB
YES] –	
Reconnect terminal 3 wire and measure Vdc between terminal 2 & 3 from the outdoor unit.		
		
Is the Vdc fluctuate between 20-50Vdc?	NO	Replace indoor unit PCB.

15.4.2. H14 (Indoor Intake Air Temperature Sensor Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the indoor intake air temperature sensor are used to determine sensor errors.

Malfunction Caused

• Faulty connector connection.

- Faulty sensor.
- · Faulty PCB.

Troubleshooting

0 -10 0 10 20 30 40 50

Temperature (°C)



15.4.3. H15 (Compressor Temperature Sensor Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the outdoor compressor temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- · Faulty sensor.
- Faulty PCB.



15.4.4. H16 (Outdoor Current Transformer Open Circuit)

Malfunction Decision Conditions

A current transformer (CT) is detected by checking the compressor running frequency (≥ rated frequency) and CT detected input current (less than 0.65A) for continuously 20 seconds.

Malfunction Caused

- CT defective
- Outdoor PCB defective
- Compressor defective (low compression)



15.4.5. H19 (Indoor Fan Motor - DC Motor Mechanism Locked)

Malfunction Decision Conditions

The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor (feedback of rotation > 2550rpm or < 50rpm)

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty indoor unit PCB.



15.4.6. H23 (Indoor Pipe Temperature Sensor 1 Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor 1 are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- · Faulty sensor.
- · Faulty PCB.





15.4.7. H24 (Indoor Pipe Temperature Sensor 2 Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor 2 are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





15.4.8. H25 (e-ion Air Purifying System Abnormal)

Malfunction Decision Conditions

During standby of cooling and heating operation, e-ion breakdown occurs and air conditioner stops operation.

Malfunction Caused

- Faulty indoor main PCB.
- Faulty indoor e-ion power module.



15.4.9. H27 (Outdoor Air Temperature Sensor Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the outdoor air temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- · Faulty sensor.
- Faulty PCB.

Troubleshooting

10

0 -10

10

0

20

Temperature (°C)

30

40

50



15.4.10. H28 (Outdoor Pipe Temperature Sensor Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the outdoor pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- · Faulty PCB.

Troubleshooting



Temperature (°C)

15.4.11. H30 (Compressor Discharge Temperature Sensor Abnormality)

Malfunction Decision Conditions

During startup and operation of cooling and heating, the temperatures detected by the outdoor discharge pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.



15.4.12. H33 (Unspecified Voltage between Indoor and Outdoor)

Malfunction Decision Conditions

The supply power is detected for its requirement by the indoor/outdoor transmission.

Malfunction Caused

- Wrong models interconnected.
- Wrong indoor unit and outdoor unit PCBs used.
- Indoor unit or outdoor unit PCB defective.



15.4.13. H58 (Patrol Sensor Abnormality)

- **Malfunction Decision Conditions**
- If Patrol sensor feedback is 0V or 5V continuous for 6 hours.
- Error will display only when the Patrol operation is ON.

Malfunction Caused

- Faulty connector connection.
- Faulty Patrol sensor.



15.4.14. H97 (Outdoor Fan Motor - DC Motor Mechanism Locked)

Malfunction Decision Conditions

The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor.

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty outdoor unit PCB.



15.4.15. H98 (Indoor High Pressure Protection)

Error Code will not display (no Timer LED blinking) but store in EEPROM

Malfunction Decision Conditions

During heating operation, the temperature detected by the indoor pipe temperature sensor is above 60°C.

Malfunction Caused

- Clogged air filter of the indoor unit
- · Dust accumulation on the indoor unit heat exchanger
- Air short circuit
- · Detection error due to faulty indoor pipe temperature sensor
- Detection error due to faulty indoor unit PCB



15.4.16. H99 (Indoor Freeze Prevention Protection: Cooling or Soft Dry)

Error code will not display (no TIMER LED blinking) but store in EEPROM

Malfunction Decision Conditions

Freeze prevention control takes place (when indoor pipe temperature is lower than 2°C)

Malfunction Caused

- Clogged air filter of the indoor unit
- Dust accumulation on the indoor unit heat exchanger
- Air short circuit
- Detection error due to faulty indoor pipe temperature sensor
- Detection error due to faulty indoor unit PCB



15.4.17. F11 (4-way valve Abnormality)

- **Malfunction Decision Conditions**
- \bullet When heating operation, when indoor pipe temperature is below 10°C
- \bullet When cooling operation, when indoor pipe temperature is above 45°C

Malfunction Caused

- Connector in poor contact
- Faulty sensor
- Faulty outdoor unit PCB
- · 4-way valve defective



15.4.18. F90 (Power Factor Correction Protection)

Malfunction Decision Conditions

During startup and operation of cooling and heating, when Power Factor Correction (PFC) protection circuitry at the outdoor unit main PCB senses abnormal high DC voltage level.

Malfunction Caused

- DC voltage peak due to power supply surge.
- DC voltage peak due to compressor windings not uniform.
- Faulty outdoor PCB.



15.4.19. F91 (Refrigeration Cycle Abnormality)

Malfunction Decision Conditions

- During cooling, compressor frequency = Fcmax.
- During heating, compressor frequency > Fhrated.
- During cooling and heating operation, running current: 0.65A < I < 1.65A.
- During cooling, indoor intake indoor pipe < 4°C
- During heating, indoor pipe indoor intake < 5°C

Multi Models Only

- Gas shortage detection 1: A gas shortage is detected by checking the CT-detected input current value and the compressor running frequency. During startup and operating of cooling and heating, input current < 8.78/256 (A/Hz) x compressor running frequency + 0.25.
- Gas shortage detection 2: A gas shortage is detected by checking the difference between indoor pipe temperature and indoor intake air temperature during cooling and heating.

Malfunction Caused

- Refrigerant shortage (refrigerant leakage)
- Poor compression performance of compressor.
- 2/3 way valve closed.
- Detection error due to faulty indoor intake air or indoor pipe temperature sensors.



15.4.20. F93 (Compressor Rotation Failure)

Malfunction Decision Conditions

A compressor rotation failure is detected by checking the compressor running condition through the position detection circuit.

Malfunction Caused

- Compressor terminal disconnect
- Outdoor PCB malfunction



15.4.21. F95 (Cooling High Pressure Abnormality)

Malfunction Decision Conditions

During operation of cooling, when outdoor unit heat exchanger high temperature data (61°C) is detected by the outdoor pipe temperature sensor.

Malfunction Caused

- Outdoor pipe temperature rise due to short circuit of hot discharge air flow.
- Outdoor pipe temperature rise due to defective of outdoor fan motor.
- Outdoor pipe temperature rise due to defective outdoor pipe temperature sensor.
- Outdoor pipe temperature rise due to defective outdoor unit PCB.



15.4.22. F96 (IPM Overheating)

Malfunction Decision Conditions

During operating of cooling and heating, when IPM temperature data (100°C) is detected by the IPM temperature sensor. *Multi Models Only*

- Compressor Overheating: During operation of cooling and heating, when the compressor OL is activated.
- Heat Sink Overheating: During operation of cooling and heating, when heat sink temperature data (90°C) is detected by the heat sink temperature sensor.

Malfunction Caused

- IPM overheats due to short circuit of hot discharge air flow.
- IPM overheats due to defective of outdoor fan motor.
- IPM overheats due to defective of internal circuitry of IPM.
- IPM overheats due to defective IPM temperature sensor.
 - Multi Models Only
 - Compressor OL connector poor contact.
 - Compressor OL faulty.



15.4.23. F97 (Compressor Overheating)

Malfunction Decision Conditions

During operation of cooling and heating, when compressor tank temperature data (112°C) is detected by the compressor tank temperature sensor.

Malfunction Caused

- Refrigerant shortage (refrigerant leakage).
- 2/3 way valve closed.
- Detection error due to faulty compressor tank temperature sensor.



15.4.24. F98 (Input Over Current Detection)

Malfunction Decision Conditions

During operation of cooling and heating, when an input over-current (14.98A) is detected by checking the input current value being detected by current transformer (CT) with the compressor running.

Malfunction Caused

- Over-current due to compressor failure.
- Over-current due to defective outdoor unit PCB.
- Over-current due to defective inverter main circuit electrolytic capacitor.
- Over-current due to excessive refrigerant.

