

A1	
Description	INDOOR PCB ABNORMALITY
Possible Root cause	1. Faulty indoor PCB. 2. Faulty connector connection at indoor.
Troubleshooting	<pre>graph TD; A[Turn off unit.] --> B[Check indoor PCB connector conditions (including PCB to terminal block and all PCB wire connector).]; B --> C{Any sign of loose or abnormal.}; C -- Yes --> D[Connect correctly and operate again.]; C -- No --> E[Replace indoor PCB and operate again.];</pre> <p>The troubleshooting flowchart for indoor PCB abnormality starts with turning off the unit. The next step is to check the indoor PCB connector conditions, including the PCB to terminal block and all PCB wire connectors. A decision is made based on whether there is any sign of loose or abnormal connection. If the answer is 'Yes', the user is instructed to connect correctly and operate again. If the answer is 'No', the user is instructed to replace the indoor PCB and operate again.</p>

A5	
Description	ANTIFREEZE PROTECTION OR HIGH PRESSURE CONTROL
Possible Root cause	<ol style="list-style-type: none"> 1. Indoor air filter, heat exchanger block due to dust accumulation. 2. Indoor air short circuit. 3. Indoor coil thermistor faulty. 4. Indoor PCB faulty. 5. Fan blower dirty.
Troubleshooting	<pre> graph TD A[Check indoor air flow.] --> B{Any air short circuit?} B -- Yes --> C([Provide sufficient air passage.]) B -- No --> D[Check intake air filter.] D --> E{Is it very dirty?} E -- Yes --> F([Clean the air filter.]) E -- No --> G[Check the dust accumulate indoor coil.] G --> H{Is it very dirty?} H -- Yes --> I([Clean the indoor coil.]) H -- No --> J[Check fan blower condition.] J --> K{Is it very dirty?} K -- Yes --> L([Clean fan blower.]) K -- No --> M[Check indoor coil thermistor resistance.] M --> N{Does it conform to the thermistor resistance table?} N -- Yes --> O([Change indoor PCB.]) N -- No --> P([Change indoor thermistor.]) </pre> <p># Refer to thermistor resistance table.(Page 67, 6.1)</p>

A6	
Description	INDOOR FAN MOTOR ABNORMALITY
Possible Root cause	1. Indoor fan motor winding short, or the motor lead wire broken. 2. Indoor PCB faulty.
Troubleshooting	<pre> graph TD A[Turn off power supply and rotate fan by hand.] --> B{Does it rotate?} B -- No --> C[Change fan motor.] B -- Yes --> D[Check fan motor connector condition.] D --> E{Does it connect properly?} E -- No --> F[Connect correctly.] E -- Yes --> G[Change PCB and turn on power.] G -- No --> H[Change fan motor.] </pre> <p>The flowchart for Indoor Fan Motor Abnormality troubleshooting starts with the instruction to turn off the power supply and rotate the fan by hand. A decision diamond asks 'Does it rotate?'. If 'No', the action is to 'Change fan motor.'. If 'Yes', the next step is to 'Check fan motor connector condition.'. Another decision diamond asks 'Does it connect properly?'. If 'No', the action is to 'Connect correctly.'. If 'Yes', the next step is to 'Change PCB and turn on power.'. A final decision diamond (implied by the flow) leads to 'Change fan motor.' if the problem persists after changing the PCB.</p>

C4	
Description	INDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	<pre> graph TD A[Check the thermistor connector condition.] --> B{Normal?} B -- No --> C[Correct the connection] B -- Yes --> D[Check thermistor resistance value.] D --> E{Normal?} E -- No --> F[Replace thermistor] E -- Yes --> G[Replace PCB.] </pre> <p>The flowchart for Indoor Heat Exchanger Thermistor Abnormality troubleshooting starts with the instruction to 'Check the thermistor connector condition.'. A decision diamond asks 'Normal?'. If 'No', the action is to 'Correct the connection'. If 'Yes', the next step is to 'Check thermistor resistance value.'. A second decision diamond asks 'Normal?'. If 'No', the action is to 'Replace thermistor'. If 'Yes', the final action is to 'Replace PCB.'. A note indicates to refer to the thermistor resistance table (Page 67, item 6.1).</p> <p>*Remark: Refer Thermistor resistance check procedure in Appendix A.(Page 67, item 6.1)</p>

C9	
Description	INDOOR ROOM THERMISTOR ABNORMALITY
Possible Root cause	1. Thermistor, connector faulty. 2. Indoor PCB faulty.
Troubleshooting	<pre>graph TD; A[Check the thermistor connector condition.] --> B{Normal?}; B -- No --> C[Correct the connection]; B -- Yes --> D[Check thermistor resistance value.]; D --> E{Normal?}; E -- No --> F[Replace thermistor]; E -- Yes --> G[Replace PCB.];</pre> <p># Refer thermistor resistance table.(Page 67, item 6.1)</p>

E1	
Description	OUTDOOR PCB ABNORMALITY
Possible Root cause	<ol style="list-style-type: none">1. Micro Controller program run-away due to external factor such as Noise, Momentary voltage drop, Momentary power failure.2. Damage of EEPROM.3. Faulty outdoor unit PCB.4. Broken hardness between PCB.
Troubleshooting	<pre>graph TD; A([Turn on the power again.]) --> B{Error still occur?}; B -- No --> C([Replace outdoor PCB.]); B -- Yes --> D[Check if the outdoor unit is grounded.]; D --> E{Grounded?}; E -- No --> F([Ground the system.]); E -- Yes --> G{Is the harness broken?}; G -- No --> H([Replace outdoor PCB.]); G -- Yes --> I([Replace the harness.]);</pre> <p>The troubleshooting flowchart for Outdoor PCB Abnormality starts with the instruction 'Turn on the power again.' This leads to a decision diamond 'Error still occur?'. If the answer is 'No', the action is 'Replace outdoor PCB.'. If 'Yes', the next step is 'Check if the outdoor unit is grounded.'. This leads to another decision diamond 'Grounded?'. If 'No', the action is 'Ground the system.'. If 'Yes', the next step is 'Is the harness broken?'. If 'No', the action is 'Replace outdoor PCB.'. If 'Yes', the final action is 'Replace the harness.'.</p>

E5	
Description	COMPRESSOR OVERLOAD
Possible Root cause	<ol style="list-style-type: none"> 1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Stop valve malfunction. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant. 6. Electronic expansion valve defective. 7. Disconnection of discharge pipe thermistor. 8. Faulty discharge pipe thermistor. 9. Disconnection of connector S40. 10. Electronic expansion valve or coil malfunction. 11. Disconnection of 2 terminals of OL.
Troubleshooting	<pre> graph TD Q1{Discharge pipe thermistor disconnected?} -- Yes --> A1[Insert thermistor in position.] Q1 -- No --> Q2{Thermistor resistance normal?} Q2 -- No --> A2[Replace thermistor.] Q2 -- Yes --> Q3{Connectors properly connected?} Q3 -- No --> A3[Connect back the connectors.] Q3 -- Yes --> A4[Disconnect connector S40 from PCB.] A4 --> A5[Check resistance of 2 terminals connector S40.] A5 --> Q4{0Ω?} Q4 -- Yes --> A6[Check electronic expansion.] Q4 -- No --> A7[Disconnect 2 terminals of OL.] A6 --> Q5{Malfunction?} Q5 -- Yes --> A8[Replace electronic expansion or the coil.] Q5 -- No --> A9[Check four way valve.] A9 --> Q6{Malfunction?} Q6 -- Yes --> A10[Replace four way valve or the coil. Replace outdoor PCB.] Q6 -- No --> A11[Check refrigerant line.] A11 --> Q7{Malfunction?} Q7 -- Yes --> A12[Refer refrigerant line check procedures.] Q7 -- No --> A13[Replace outdoor PCB.] A7 --> Q8{Resistance between 2 terminals is 0Ω?} Q8 -- Yes --> A14[Disconnect 2 terminals of OL.] Q8 -- No --> A15[Disconnect 2 terminals of OL.] </pre> <p>*Remark: Please refer to Appendix A for Electronic expansion valve (page 69,item 6.2), four way valve (page 69,item 6.3) and refrigerant line checking procedures (page 70,item 6.4).</p>

E5	
Description	COMPRESSOR OVERLOAD
Possible Root cause	1. Refrigerant Shortage. 2. 4 way valve malfunction. 3. Electronic expansion valve defective. 4. Outdoor unit PCB defective. 5. Water mixed in refrigerant.
Troubleshooting	<pre> graph TD Start([Turn off unit. Disconnect compressor wire harness (U.V.W) and check winding.]) --> Spec{Resistance follow spec?} Spec -- No --> ChangeComp([Change compressor.]) Spec -- Yes --> Connect[Connect back wire and turn on unit.] Connect --> Stop{Compressor stop without running?} Stop -- Yes --> ChangePCB1([Change outdoor PCB.]) Stop -- No --> CheckExp[Check electronic expansion.] CheckExp --> MalExp{Malfunction?} MalExp -- Yes --> ReplaceExp([Replace electronic expansion or the coil.]) MalExp -- No --> CheckValve[Check four way valve.] CheckValve --> MalValve{Malfunction?} MalValve -- Yes --> ReplaceValve([Replace four way valve or the coil. Replace outdoor PCB.]) MalValve -- No --> CheckLine[Check refrigerant line.] CheckLine --> MalLine{Malfunction?} MalLine -- Yes --> ReferLine([Refer refrigerant line check procedures.]) MalLine -- No --> ReplacePCB2([Replace outdoor PCB.]) </pre> <p>#Compressor winding resistance 1.18Ω between all terminals at 20°C (68°F)</p> <p>#Refer page 69 item 6.2</p> <p>#Refer page 69 item 6.3</p> <p>#Refer page 70 item 6.4</p>

E6	
Description	COMPRESSOR LOCK/START-UP ABNORMALITY
Possible Root cause	1. Compressor locked. 2. Compressor harness disconnect.
Troubleshooting	<pre> graph TD A[Turn off power. Disconnect harnesses U, V and W.] --> B[Check with Inverter analyzer.] B --> C{Normal?} C -- No --> D[Correct power supply or replace outdoor unit PCB.] C -- Yes --> E[Turn off power and reconnect harnesses. Turn on power again and restart system.] E --> F{Emergency stop without compressor running?} F -- Yes --> G[Replace the compressor.] F -- No --> H{System shut down after errors repeated several times?} H -- No --> I[Check outdoor electronic expansion valve coil. Replace it as required.] H -- Yes --> J[Replace the compressor.] </pre> <p>The troubleshooting flowchart for E6 (Compressor Lock/Start-Up Abnormality) begins with turning off power and disconnecting harnesses U, V, and W. The next step is to check with an inverter analyzer. If the system is not normal, the power supply should be corrected or the outdoor unit PCB replaced. If normal, power is turned off and harnesses are reconnected, followed by a restart. A decision is then made on whether there was an emergency stop without the compressor running. If yes, the compressor is replaced. If no, another decision is made on whether the system shut down after repeated errors. If yes, the compressor is replaced; if no, the outdoor electronic expansion valve coil is checked and replaced as required.</p>

E7	
Description	OUTDOOR FAN MOTOR LOCK
Possible Root cause	<ol style="list-style-type: none"> 1. Fan motor breakdown. 2. Harness or connector disconnected between fan motor and PCB or in poor contact. 3. Foreign matter stuck in fan. 4. Defective outdoor unit PCB.
Troubleshooting	<pre> graph TD A{Fan motor connector disconnected?} -- Yes --> B(Turn off power and reconnect connector.) A -- No --> C{Foreign matters in or around fan?} C -- Yes --> D(Remove foreign matters.) C -- No --> E(Turn on the power.) E --> F(Rotate the fan.) F --> G{Fan rotates smoothly?} G -- No --> H(Replace outdoor fan motor.) G -- Yes --> I(Check rotation pulse input on outdoor unit PCB.) I --> J{Pulse signal generated?} J -- No --> H J -- Yes --> K(Replace outdoor PCB.) </pre> <p>*Remark: Refer Appendix A for rotation pulse check. (Page 71, item 6.5)</p>

E8	
Description	AC INPUT OVER CURRENT
Possible Root cause	<ol style="list-style-type: none"> 1. Over current due to compressor failure. 2. Over current due to defective outdoor unit PCB. 3. Over current due to defective power transistor. 4. Over current due to short-circuit.
Troubleshooting	<pre> graph TD A[Measure the input current.] --> B{Input current flowing above its stop level?} B -- No --> C[Replace the outdoor unit.] B -- Yes --> D[Check outdoor fan motor, outdoor ambient temperature, refrigerant charge level] D --> E{Any abnormal?} E -- Yes --> F[Refer to the type of abnormality and conduct proper service.] E -- No --> G[Turn off the power and disconnect the harness U, V and W.] G --> H[Check with the inverter checker.] H --> I{Compressor faulty?} I -- Yes --> J[Change Compressor.] I -- No --> K[Change outdoor Control Box.] </pre> <p>The troubleshooting flowchart for AC INPUT OVER CURRENT is as follows:</p> <ol style="list-style-type: none"> Measure the input current. Decision: Input current flowing above its stop level? <ul style="list-style-type: none"> If No, Replace the outdoor unit. If Yes, proceed to step 3. Check outdoor fan motor, outdoor ambient temperature, refrigerant charge level. Decision: Any abnormal? <ul style="list-style-type: none"> If Yes, Refer to the type of abnormality and conduct proper service. If No, proceed to step 5. Turn off the power and disconnect the harness U, V and W. Check with the inverter checker. Decision: Compressor faulty? <ul style="list-style-type: none"> If Yes, Change Compressor. If No, Change outdoor Control Box.

EA	
Description	4 WAY VALVE ABNORMALITY
Possible Root cause	<ol style="list-style-type: none"> 1. Thermistor defective. 2. 4 way valve defective. 3. Outdoor PCB defective. 4. Insufficient gas. 5. Foreign substance mixed in refrigerant. 6. Stop valve defective. 7. Disconnect of 4 way valve coil.
Troubleshooting	<pre> graph TD D1{Four way valve coil disconnected (loose)?} -- Yes --> A1[Correct the four way valve coil.] D1 -- No --> D2{Harness disconnected?} D2 -- Yes --> A2[Reconnect the harness.] D2 -- No --> P1[Check the continuity of the four way valve coil and harness.] P1 --> P2[Disconnect the harness from the connector.] P2 --> D3{Resistance between harnesses. within spec?} D3 -- No --> A3["Replace the four way valve coil. Class 09/12: 1000 ~ 2000 Ω Class 18/24: 560 Ω +- 56 Ω"] D3 -- Yes --> D4{Check the four way valve switching output.} D4 -- Malfunction --> A4[Replace the outdoor unit PCB.] D4 -- Functioning --> D5{Any thermistor disconnected?} D5 -- Yes --> A5[Reconnect the thermistor(s).] D5 -- No --> D6{Check the thermistors.} D6 -- Malfunction --> A6[Replace the defective thermistor(s).] D6 -- Functioning --> D7{Check the refrigerant line.} D7 -- Malfunction --> A7[Refer to the refrigerant line check procedure.] D7 -- Functioning --> A8[Replace the four way valve (defective or dust-clogged).] </pre> <p>*Remark: Refer to Appendix A for thermistor resistance checking procedures.(Page 67, item 6.1) Refer to Appendix A for Four way valve performance checking procedures.(Page 69, item 6.2) Refer to Appendix A for Inverter unit refrigerant check procedures.(Page 70, item 6.4)</p>

F3	
Description	DISCHARGE PIPE OVERHEAT
Possible Root cause	<ol style="list-style-type: none"> 1. Refrigerant shortage. 2. Four way valve malfunctioning. 3. Discharge pipe thermistor defective. 4. Outdoor PCB defective. 5. Water mixed in the local piping. 6. EXV defective. 7. Stop Valve defective.
Troubleshooting	<pre> graph TD A{Check the thermistors.} -- Malfunction --> B(Replace the defective thermistor(s).) A -- Functioning --> C{Check the electronic expansion valve.} C -- Malfunction --> D(Replace the electronic expansion valve or the coil.) C -- Functioning --> E{Check the refrigerant line.} E -- Malfunction --> F(Refer to the refrigerant line check procedure.) E -- Functioning --> G(Replace the outdoor unit PCB.) </pre> <p>*Remark: Refer to Appendix A for thermistor resistance checking procedures. (Page 67, item 6.1) Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 69, item 6.2) Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 70, item 6.4)</p>

F6	
Description	HEAT EXCHANGER OVERHEAT
Possible Root cause	<ol style="list-style-type: none"> 1. The installation space is not large enough. 2. Faulty outdoor fan motor. 3. Faulty EXV. 4. Faulty outdoor heat exchanger thermistor. 5. Faulty stop valve. 6. Dirty heat exchanger. 7. Unit overcharge. 8. Defective outdoor unit PCB.
Troubleshooting	<pre> graph TD A([Check the installation space.]) --> B{Check the installation condition.} B -- Malfunction --> C([Change the installation location or direction. Clean the outdoor heat exchanger.]) B -- Functioning --> D{Check the outdoor fan.} D -- Malfunction --> E([Replace the outdoor fan motor. Reconnect the connector or fan motor lead wires.]) D -- Functioning --> F{Check the electronic expansion valve.} F -- Malfunction --> G([Replace the electronic expansion valve or the coil. Replace the outdoor unit PCB.]) F -- Functioning --> H{Check the outdoor heat exchanger thermistor.} H -- Malfunction --> I([Replace the outdoor heat exchanger thermistor.]) H -- Functioning --> J([Replace the outdoor unit PCB.]) </pre> <p>*Remark: Refer to Appendix A for thermistor resistance checking procedures. (Page 67, item 6.1) Refer to Appendix A for Electronic Expansion Valve (EXV) checking procedures. (Page 69, item 6.2) Refer to Appendix A for Inverter unit refrigerant check procedures. (Page 70, item 6.4) Refer to Appendix A for Installation condition check. (Page 71, item 6.6)</p>

H0 (Class 18/24)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective. 3. Defective compressor.
Troubleshooting	<pre>graph TD; A[Check reactor connection.] --> B{Any abnormal?}; B -- Yes --> C[Connect back reactor.]; B -- No --> D[Check reactor resistance.]; D --> E{<10 Ω?}; E -- No --> F[Change reactor.]; E -- Yes --> G[Check compressor resistance.]; G --> H{<10 Ω?}; H -- No --> I[Change Compressor.]; H -- Yes --> J[Change outdoor PCB.];</pre> <p># Disconnect the reactor wire and measure resistance between terminal.</p>

H0 (Class 09/12)	
Description	COMPRESSOR SENSOR SYSTEM ABNORMAL
Possible Root cause	1. Broken and disconnected harness. 2. Outdoor unit PCB defective.
Troubleshooting	<pre>graph TD; A[Check the harness S30.] --> B{Is the harness broken?}; B -- Yes --> C(Replace the harness.); B -- No --> D[Turn off the power and turn it on again.]; D --> E{Get restarted and error displayed again?}; E -- No --> F(No problem. Keep on running.); E -- Yes --> G(Replace the PCB.);</pre>

H6 (Class 09/12)	
Description	POSITION SENSOR ABNORMAL (COMPRESSOR)
Possible Root cause	1. Compressor relay cable disconnected. 2. Compressor itself defective. 3. Outdoor PCB defective. 4. Stop valve closed. 5. Input voltage out of specification.
Troubleshooting	<pre> graph TD A([Check for short circuit.]) --> B{Normal?} B -- No --> C([Replace the outdoor unit PCB, outdoor unit fan.]) B -- Yes --> D([Check the electrolytic capacitor voltage.]) D --> E{DC320 ± 30 V?} E -- No --> F([Replace the outdoor unit PCB.]) E -- Yes --> G{Electricals or compressor harnesses connected as specified?} G -- No --> H([Reconnect as specified.]) G -- Yes --> I([Turn off the power. Disconnect the harness U, V and W.]) I --> J([Check with inverter checker (*).]) J --> K{Any LED off?} K -- Yes --> L([Correct the power supply or replace the outdoor unit PCB.]) K -- No --> M([Replace the compressor.]) </pre> <p>* Inverter checker Part No.: 1225477</p>

H6 (Class 18/24)	
Description	POSITION SENSOR ABNORMAL (COMPRESSOR)
Possible Root cause	<ol style="list-style-type: none"> 1. Compressor relay cable disconnected. 2. Compressor itself defective. 3. Outdoor PCB defective. 4. Stop valve closed. 5. Input voltage out of specification
Troubleshooting	<pre> graph TD A[Turn off the power.] --> B[Check the power supply voltage.] B --> C{Voltage as rated?} C -- No --> D[Correct the power supply.] C -- Yes --> E[Check stop valve.] E --> F{OK?} F -- No --> G[Replace the stop valve.] F -- Yes --> H[Check the short circuit of the diode bridge.] H --> I{Normal?} I -- No --> J[Replace the outdoor unit PCB.] I -- Yes --> K[Check the connection.] K --> L{Electrical components or compressor harnesses connected as specified?} L -- No --> M[Reconnect the electrical components or compressor harnesses as specified.] L -- Yes --> N[Turn on the power. Check the electrolytic capacitor voltage.] N --> O{320 = 50 VDC?} O -- No --> P[Replace the outdoor unit PCB.] O -- Yes --> Q[Turn off the power. Disconnect the harnesses U, V and W.] Q --> R[Check with the inverter analyzer.] R --> S{Any LED off?} S -- No --> T[Replace the compressor.] S -- Yes --> U[Correct the power supply or replace the outdoor unit PCB.] </pre> <p>* Inverter analyzer: RSUK0917C</p> <p>Remark: Refer to Appendix A for Diode bridge short circuit check procedures. (Page 72, item 6.8)</p>

H8	
Description	AC CURRENT SENSOR ABNORMALITY
Possible Root cause	1. Internal wiring broken. 2. Outdoor unit PCB defective.
Troubleshooting	<pre> graph TD A[Check compressor harness connection.] --> B{Connection correct?} B -- No --> C(Reconnect it correctly.) B -- Yes --> D[Restart the system and check connector between main board and IPM board.] D --> E{Does it connect properly?} E -- No --> F(Reconnect it properly.) E -- Yes --> G(Change outdoor PCB.) </pre> <p>*Remark: This error is only applicable for model Class 18/24.</p>

H9, J3, J6, P4	
Description	Thermistor or related abnormality H9: OUTDOOR AIR THERMISTOR ABNORMALITY J3: COMPRESSOR DISCHARGE PIPE THERMISTOR ABNORMALITY J6: OUTDOOR HEAT EXCHANGER THERMISTOR ABNORMALITY P4: HEAT SINK THERMISTOR ABNORMALITY
Possible Root cause	1. Disconnection of the connector for the thermistor. 2. Thermistor corresponding to the error code is defective. 3. Defective heat exchanger thermistor in the case of J3 error (outdoor heat exchanger thermistor in cooling operation, or indoor heat exchanger thermistor in heating operation). 4. Defective outdoor unit PCB.
Troubleshooting	<pre> graph TD Start([Turn on the power again.]) --> Dec1{Error displayed again on remote controller?} Dec1 -- No --> Act1([Reconnect the connectors or thermistors.]) Dec1 -- Yes --> Act2[Check the thermistor resistance value.] Act2 --> Dec2{Normal?} Dec2 -- No --> Act3([Replace the defective thermistor(s) of the following thermistors. * Outdoor temperature thermistor. * Discharge pipe thermistor. * Outdoor heat exchanger thermistor.]) Dec2 -- Yes --> Note1["J3 error: the discharge pipe temperature is lower than the heat exchanger temperature. Cooling: Outdoor heat exchanger temperature. Heating: Indoor heat exchanger temperature."] Note1 --> Act4[Check the indoor heat exchanger thermistor resistance value in the heating operation.] Act4 --> Dec3{Indoor heat exchanger thermistor functioning?} Dec3 -- No --> Act5([Replace the indoor heat exchanger thermistor.]) Dec3 -- Yes --> Act6([Replace the outdoor unit PCB.]) </pre> <p>*Remark: Refer to Appendix A for thermistor resistance check procedures. (Page 67, item 6.1)</p>

L3							
Description	ELECTRICAL BOX TEMPERATURE RISE (COMPRESSOR OFF)						
Possible Root cause	1. Fin temperature rise due to defective outdoor unit fan. 2. Fin temperature rise due to short circuit. 3. Fin thermistor defective. 4. Connector in poor contact. 5. Outdoor unit PCB defective.						
Troubleshooting	<pre> graph TD Start([Turn off the unit and turn on back after 20 mins.]) --> Error{Error again?} Error -- No --> Fan[Check outdoor fan.] Error -- Yes --> Thermistor[Check heat sink thermistor resistance.] Fan --> FanFunc{Outdoor fan functioning?} FanFunc -- No --> Motor[Change outdoor fan motor.] FanFunc -- Yes --> Dirty{Heat sink dirty?} Dirty -- No --> Install[Check installation condition.] Dirty -- Yes --> Clean[Clean the heat sink.] Thermistor --> ResNormal{Resistance normal?} ResNormal -- No --> ChangeThermistor[Change thermistor.] ResNormal -- Yes --> TempA{Heat sink temperature > A °C?} TempA -- No --> ChangePCB[Change outdoor PCB.] TempA -- Yes --> ChangeSink[Change heat sink or check outdoor fan condition.] </pre> <table border="1"> <thead> <tr> <th>Models</th><th>A °C (°F)</th></tr> </thead> <tbody> <tr> <td>Class 09/12</td><td>78 (172.4)</td></tr> <tr> <td>class 18/24</td><td>122 (251.6)</td></tr> </tbody> </table> <p>*Remark: Refer to Appendix A for thermistor resistance check procedures. (Page 67, item 6.1) Refer to Appendix A for outdoor fan system check. (Page 72, item 6.7) Refer to Appendix A for installation condition check. (Page 71, item 6.6)</p>	Models	A °C (°F)	Class 09/12	78 (172.4)	class 18/24	122 (251.6)
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Class 09/12	78 (172.4)						
class 18/24	122 (251.6)						

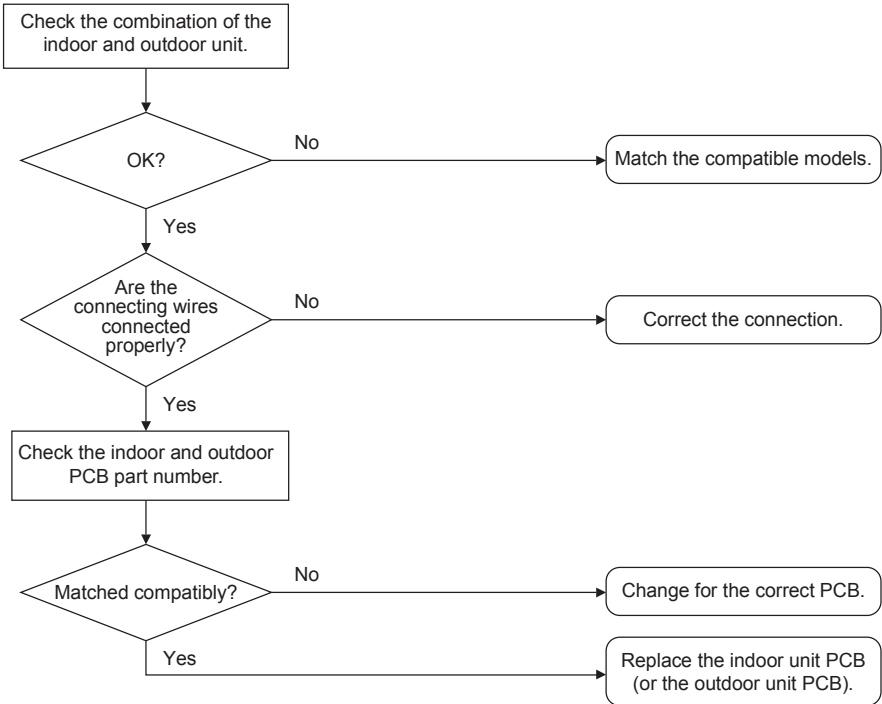
L4							
Description	Heat sink overheat						
Possible Root cause	<ol style="list-style-type: none"> 1. Fin temperature rise due to short circuit. 2. Fin temperature rise due to defective outdoor unit fan. 3. Fin thermistor defective. 4. Connector in poor contact. 5. Outdoor unit PCB defective. 6. Silicon grease is not applied properly on the radiation fin after replacing outdoor unit PCB. 						
Troubleshooting	<pre> graph TD Start([Turn off the power and turn it on again to start the system.]) --> Error{Error displayed again?} Error -- Yes --> PCB{Has the PCB been replaced?} PCB -- Yes --> Grease([Check if silicon grease is applied properly on the radiation fin. If not, apply the silicon grease.]) PCB -- No --> Temp[Check the radiation fin temperature.] Temp --> AboveA{Above A °C?} AboveA -- No --> ReplacePCB([Replace the outdoor unit PCB.]) AboveA -- Yes --> Error Error -- No --> Fan{Check the outdoor fan.} Fan -- Malfunction --> FanFix([Replace the outdoor fan motor. Correct the connectors and fan motor leads. Replace the outdoor unit PCB.]) Fan -- Functioning --> Dirty{Radiation fin dirty?} Dirty -- No --> Install([Check the installation condition.]) Dirty -- Yes --> Clean([Clean up the radiation fin.]) </pre> <table border="1"> <thead> <tr> <th>Models</th><th>A °C (°F)</th></tr> </thead> <tbody> <tr> <td>Class 09/12</td><td>93 (199.4)</td></tr> <tr> <td>class 18/24</td><td>85 (185)</td></tr> </tbody> </table> <p>*Remark: Refer to Appendix A for outdoor fan system check. (Page 72, item 6.7) Refer to Appendix A for installation condition check. (Page 71, item 6.6)</p>	Models	A °C (°F)	Class 09/12	93 (199.4)	class 18/24	85 (185)
Models	A °C (°F)						
Class 09/12	93 (199.4)						
class 18/24	85 (185)						

L5	
Description	IPM ABNORMALITY
Possible Root cause	<ol style="list-style-type: none"> 1. Over current due to defective power transistor. 2. Over current due to wrong internal wiring. 3. Over current due to abnormal supply voltage. 4. Over current due to defective PCB. 5. Error detection due to defective PCB. 6. Over- current due to closed stop valve. 7. Over current due to compressor failure. 8. Over current due to poor installation condition. 9. Connection between main board and IPM board is not properly connect.
Troubleshooting	<pre> graph TD Start([Check the installation condition.]) --> D1{Stop valve fully open?} D1 -- No --> A1([Fully open the stop valve.]) D1 -- Yes --> B1[Turn off the power and turn it on again to start the system. See if the same error occurs.] B1 --> D2{Error again?} D2 -- No --> A2([Monitor the power supply voltage and suction pressures, and other factors for a long term.]) D2 -- Yes --> B2[Turn off power and disconnect the harnesses U, V and W.] B2 --> C1[Check with the inverter analyzer.] C1 --> D3{Any LED off?} D3 -- Yes --> A3([Correct the power supply or replace the outdoor unit PCB.]) D3 -- No --> B3[Turn off the power and reconnect the harnesses. Turn on the power again and start operation.] B3 --> C2[Check the power supply voltage.] C2 --> D4{Voltage as rated?} D4 -- No --> A4([Correct the power supply.]) D4 -- Yes --> A5([Replace the compressor.]) </pre> <p>*Remark: Refer to Appendix A for installation condition check. (Page 71, item 6.6)</p>

U0	
Description	INSUFFICIENT GAS
Possible Root cause	<ol style="list-style-type: none"> 1. Disconnection of the discharge pipe thermistor, indoor or outdoor heat exchanger, room or outdoor temperature thermistor. 2. Closed stop valve. 3. Refrigerant shortage (refrigerant leakage). 4. Poor compression performance of compressor. 5. Defective electronic expansion valve.
Troubleshooting	<pre> graph TD A[Check stop valve.] --> B{Stop valve closed?} B -- Yes --> C[Fully open stop valve.] B -- No --> D[Check indoor and outdoor coil thermistor.] D --> E{Thermistor in actual position?} E -- No --> F[Put the thermistor back to actual position.] E -- Yes --> G[Check the indoor coil, outdoor coil and discharge pipe thermistor resistance.] G --> H{Resistance normal?} H -- No --> I[Change thermistor.] H -- Yes --> J[Check EXV.] J --> K{EXV functioning?} K -- No --> L[Change EXV.] K -- Yes --> M[Check refrigerant charge level.] M --> N{Refrigerant charge sufficient?} N -- Yes --> O[Change outdoor PCB.] N -- No --> P[Check for leakage.] P --> Q{Any leakage?} Q -- Yes --> R[Repair the leak point.] Q -- No --> S[Add in refrigerant charge.] </pre> <p>*Remark: Refer to Appendix A for thermistor resistance checking procedures. (Page 67, item 6.1) Refer to Appendix A for electronic expansion device checking procedures. (Page 69, item 6.2)</p>

U2	
Description	DC VOLTAGE OUT OF RANGE
Possible Root cause	<ol style="list-style-type: none"> 1. Power supply voltage is not as specified. 2. Defective DC voltage detection circuit. 3. Defective over-voltage detection circuit. 4. Defective PAM control part. 5. Disconnection of compressor harness 6. Short circuit inside the fan motor winding. 7. Noise. 8. Momentary drop of voltage. 9. Momentary power failure. 10. Defective outdoor unit PCB.
Troubleshooting	<pre> graph TD A[Check the power supply voltage.] --> B{Is the voltage fluctuation within ±10% from the rated value?} B -- No --> C[Correct the power supply.] B -- Yes --> D[Check the connection of the compressor harness.] D --> E{Loose or disconnected?} E -- Yes --> F[Reconnect the harness.] E -- No --> G{Does the outdoor fan rotate smoothly?} G -- No --> H[Replace the outdoor fan motor and the outdoor unit PCB.] G -- Yes --> I[Turn on the power.] I --> J{System restarted? (Repeat a few times.)} J -- No --> K[Replace the outdoor unit PCB.] J -- Yes --> L[Disturbance factors * Noise * Power supply distortion] L --> M[Check for such factors for a long term.] </pre> <p>Check the power supply voltage.</p> <p>Is the voltage fluctuation within $\pm 10\%$ from the rated value?</p> <p>No → Correct the power supply.</p> <p>Yes → Check the connection of the compressor harness.</p> <p>Loose or disconnected?</p> <p>Yes → Reconnect the harness.</p> <p>No → Does the outdoor fan rotate smoothly?</p> <p>No → Replace the outdoor fan motor and the outdoor unit PCB.</p> <p>Yes → Turn on the power.</p> <p>(Precaution before turning on the power again.) Make sure the power has been off for at least 30 seconds.</p> <p>System restarted? (Repeat a few times.)</p> <p>No → Replace the outdoor unit PCB.</p> <p>Yes → Disturbance factors * Noise * Power supply distortion</p> <p>Check for such factors for a long term.</p>

U4	
Description	COMMUNICATION ABNORMALITY
Possible Root cause	<ol style="list-style-type: none"> 1. Faulty outdoor unit PCB. 2. Faulty indoor unit PCB. 3. Indoor unit – outdoor unit signal transmission error due to wiring error. 4. Indoor unit – outdoor unit signal transmission error due to disturbed power supply waveform. 5. Indoor unit – Outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units
Troubleshooting	<pre> graph TD A[Check the power supply voltage.] --> B{Is the voltage fluctuation within ±10% from the rated value?} B -- No --> C[Correct the power supply.] B -- Yes --> D[Check the indoor unit - outdoor unit connection wires.] D --> E{Is there any wiring error?} E -- Yes --> F[Correct the indoor unit - outdoor unit connection wires.] E -- No --> G[Check the voltage of the connection wires on the indoor terminal board between No. 1(L) and SIG, and between No. 2 (N) and SIG.] G --> H{Properly connected?} H -- Yes --> I[Replace the connection wires between the indoor unit and outdoor unit.] H -- No --> J[Check the LED A on the outdoor unit PCB.] J --> K{Is LED A blinking?} K -- No --> L[Diagnose the outdoor unit PCB.] K -- Yes --> M{Rotate the outdoor fan by hand. Does the outdoor fan rotate smoothly?} M -- No --> N[Replace the outdoor fan motor and the outdoor unit PCB.] M -- Yes --> O[Check the power supply waveform.] O --> P{Is there any disturbance?} P -- No --> Q[Replace the indoor unit PCB.] P -- Yes --> R[Locate the cause of the disturbance of the power supply waveform, and correct it.] </pre> <p>#Refer section 4.0 Wiring Connection Diagram</p> <p>*Remark: Refer to Appendix A for power supply waveform check procedures. (Page 73, item 6.9)</p>

UA	
Description	INSTALLATION ABNORMALITY
Possible Root cause	1. Wrong models interconnected. 2. Wrong indoor unit PCB mounted. 3. Indoor unit PCB defective. 4. Wrong outdoor unit PCB mounted or defective.
Troubleshooting	 <pre> graph TD A[Check the combination of the indoor and outdoor unit.] --> B{OK?} B -- No --> C[Match the compatible models.] B -- Yes --> D{Are the connecting wires connected properly?} D -- No --> E[Correct the connection.] D -- Yes --> F[Check the indoor and outdoor PCB part number.] F --> G{Matched compatibly?} G -- No --> H[Change for the correct PCB.] G -- Yes --> I[Replace the indoor unit PCB (or the outdoor unit PCB).] </pre>