MAINTENANCE TROUBLE SHOOTING

DH32 AND DH290 MODELS

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AL119	EEV alarm:Low suction temp.
AL120	EEV alarm:Motor error
AL121	EEV alarm:Self Tuning
AL122	EEV alarm:Emergency closing
AL123	EEV alarm:Temperature delta
AL124	EEV alarm:Pressure delta
AL125	EEV alarm:Param.range error
AL126	EEV alarm:ServicePosit% err

AL127	EEV alarm:ValveID pin error
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AL129	High press alarm
AL130	Disc.temp.probe error
AL131	Suct.temp.probe error
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AL133	Suct.press.probe error
AL134	Tank temp.probe error
AL135	EVI SuctT.probe error
AL136	EVI SuctP.probe error
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AL138	High temp. alarm
AL139	Low temp. alarm
AL140	Temp.delta alarm
AL141	EVI alarm:Param.range error
AL142	EVI alarm:Low superheat
AL143	EVI alarm:LOP
AL144	EVI alarm:MOP
AL145	EVI alarm:High condens.temp.
AL146	EVI alarm:Low suction temp.
AL147	EVI alarm:Motor error
AL148	EVI alarm:Self Tuning
AL149	EVI alarm:Emergency closing
AL150	EVI alarm:ServicePosit% err
AL151	EVI alarm:ValveID pin error
AL152	Supply power error
AL153	Fan1 fault
AL154	Fan2 fault
AL155	Fans Offline
AL165	Slave1 Offline
AL166	Master Offline
AL167	Slave2 Offline
AL168	Slave3 Offline
AL169	Slave4 Offline
AL170	Slave5 Offline
AL171	Slave6 Offline
AL172	Slave7 Offline
AL173	Slave8 Offline
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AL176	Low ambient temp alarm
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AL178	Heater overheat alarm
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AL180	Aux controller alarm: Retain mem write error
AL181	Aux controller alarm: Return temp. error
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AL184	Aux controller alarm: Solar temp. error
AL185	Aux controller alarm: Aux controller offline
AL186	Low evap temp alarm

2. AL001 Too Many Mem Writings, AL002 Retain Mem Write Error

Cause analysis:
Frequently modify parameters
Detection method：
Visual inspection
Solution：
Stop operating the controller for 3 minutes, or power it off for 3 minutes before restarting.

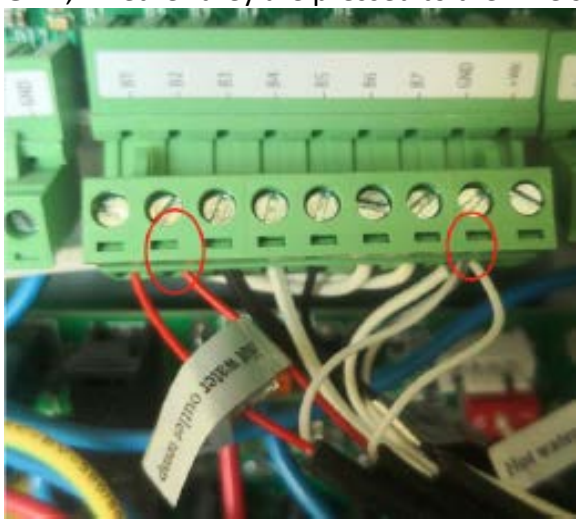
3. AL003 Inlet Probe Error

Cause analysis:
The inlet probe wires are loose or broken, or the probe itself is damaged.
Detection method:
Check whether the two wires of the water inlet probe are properly connected to **B1** and **GND**, whether they are pressed to the wire skin, and whether they are pressed tightly.

Solution:
After confirming that the wires are correctly connected, strip a small additional length of insulation from the inlet probe wire to expose more copper, then reconnect and secure it firmly. If the fault persists, replace the temperature probe.

4. AL004 Outlet Probe Error

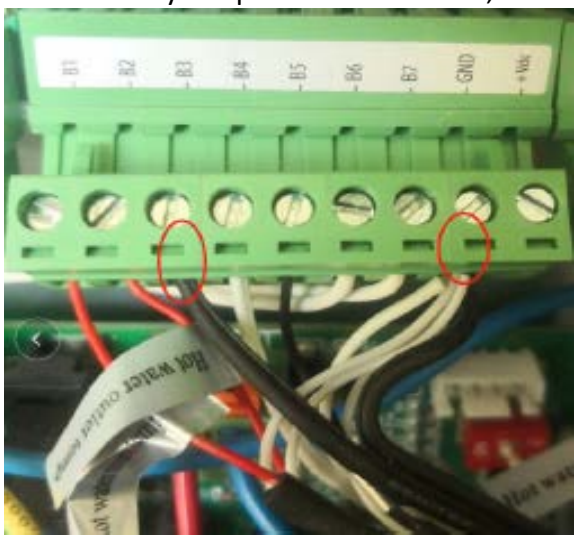
Cause analysis:
The outlet probe wires are loose or broken, or the probe itself is damaged.
Detection method:
Check whether the two wires of the water outlet probe are properly connected to **B2** and **GND**, whether they are pressed to the wire skin, and whether they are pressed tightly.



Solution:
After confirming that the wires are correctly connected, strip a small additional length of insulation from the inlet probe wire to expose more copper, then reconnect and secure it firmly. If the fault persists, replace the temperature probe.

5. AL005 Ambient Probe Error

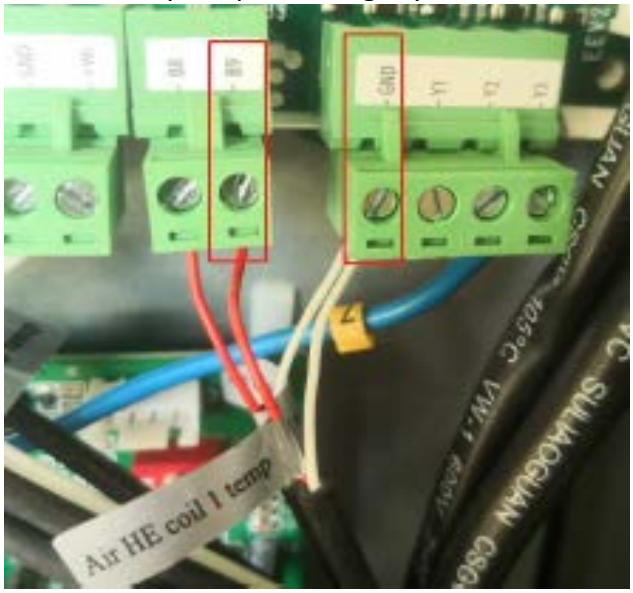
Cause analysis:
The ambient probe wires are loose or broken, or the probe itself is damaged.
Detection method:
Check whether the two wires of the ambient probe are correctly connected to **B3** and **GND**, whether they are pressed to the wire, and whether they are pressed tightly.



Solution:
After confirming that the wires are correctly connected, strip a small additional length of insulation from the inlet probe wire to expose more copper, then reconnect and secure it firmly. If the fault persists, replace the temperature probe.

6. AL006 Condenser Coil Temp

Cause analysis:
The wires of condenser coil tempt probe are loose / broken, or the probe is broken
Detection method: Check whether the two wires of the condenser coil temperature probe are properly connected to **B9** and **GND**, whether they are pressed to the wire skin, and whether they are pressed tightly.



Solution:
After confirming that the wires are correctly connected, strip a small additional length of insulation from the inlet probe wire to expose more copper, then reconnect and secure it firmly. If the fault persists, replace the temperature probe.

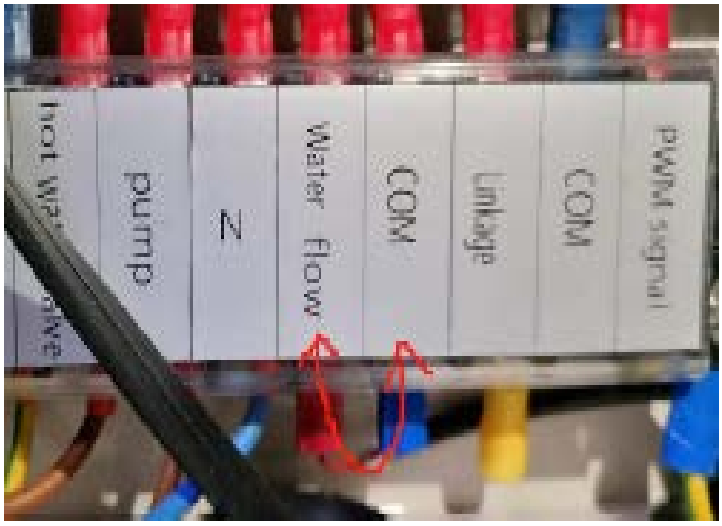
7. AL007 Water Flow Switch / AL137 Flow Switch Alarm

Cause analysis:

- The filter is clogged, resulting in reduced water flow.
- Air is trapped in the piping, causing unstable or insufficient flow.
- The pump is not emptied out, resulting in a small flow.
- A valve in the water system is fully or partially closed.
- The water pump capacity is too small, resulting in inadequate flow.
- The water flow switch is faulty.
- The water pump is damaged.

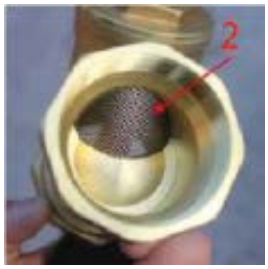
Judgement method:

- Release air through the exhaust valve and visually confirm whether the water flow is low.
- Check whether any valve in the water system is not fully open.
- Verify whether the water pump output on the main board is supplying power.
    - If power is present but the pump does not rotate, the water pump is faulty.
- If the above issues are ruled out, **temporarily short-circuit the water flow switch** (connect the *Water Flow* terminal to *COM*).
  Force the heat pump to start and observe temperature changes:
    - If the **outlet water temperature rises more than 10°C above the tank temperature**, the water flow is insufficient.
      → The system needs to be bled of air or a larger pump should be installed.
    - If the **temperature difference is within 10°C** and no fault occurs after startup, the water flow switch is defective.



Solution:

- If the filter is blocked, remove the filter cap (see Figure 1) and clean the filter (see Figure 2).



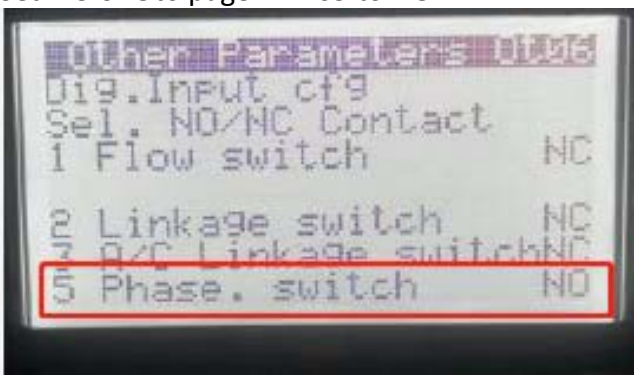
- If air is present in the pipeline, exhaust all air through the exhaust valve or union.

If the water pump has not been fully primed, release air from the pump's exhaust port.

- Check all valves and ensure they are full opened.
- If the system contains no air and the flow remains insufficient (temperature difference >10°C after the flow switch is short-circuited), replace the existing water pump with one that has a higher head and greater flow capacity.
- If the flow switch is determined to be faulty, replace the water flow switch.
- If the water pump is damaged, replace the water pump.

8. AL008 Phase sequ.prot.alarm

Cause analysis:
Abnormal parameter setting.
Solution:
Set DI5 of Ot6 page in M09 to NO.



9. AL013 Low Superheat – Viv.A

Cause analysis:

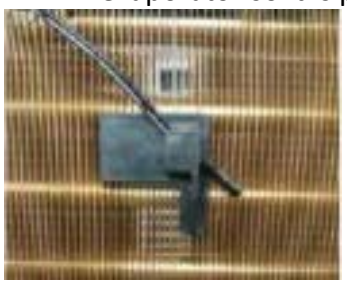
- The unit has developed heavy frost.
- The unit has been operating at **low frequency for an extended period**.

Judgement method:

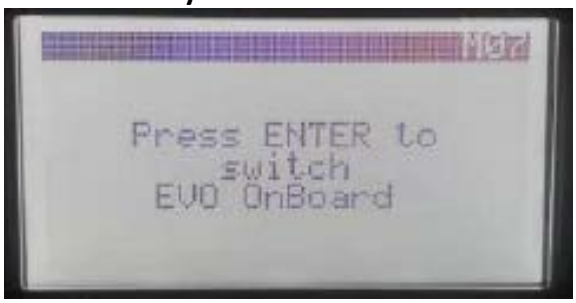
- Visually inspect the unit to determine whether **severe frosting** is present.
- Check the **operating frequency** in the user parameters to confirm whether the unit is running continuously at low frequency.

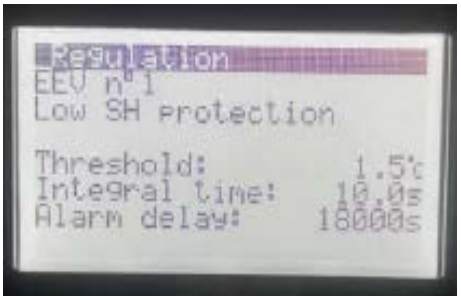
Solution:

- If the unit is severely frosted, **relocate the ambient temperature sensor** on the evaporator so it is positioned farther away from the evaporator surface.



- If there is **no frost**, adjust the **Alarm Delay** parameter on the **EEV n1** page under **Factory Parameter M07** and set it to **18,000 seconds**.





10. AL028 Battery Discharge EVD

Cause analysis:

- The unit is experiencing **strong electrical interference** from nearby equipment.

Judgement method:

- Check whether there is **other electrical equipment** operating near the unit that may be generating **large electromagnetic interference**.

Solution:

- **Isolate** or move the interfering electrical equipment away from the unit.
- **Power off** the system for **3 minutes**, then restart it to clear the alarm.

11. AL037 BLDC-alarm: Out of Envelope

Cause analysis:

- The **water temperature is too high**, or the **ambient temperature is too low**, causing the operating conditions to fall outside the allowable range.

Judgement method:

- Check whether **User Parameter B3** (ambient temperature) **is below –25°C.**
- Check whether **User Parameter B1** (water temperature) **exceeds 61°C.**

Solution:

- Ensure the unit operates **within the specified allowable temperature range** to prevent the BLDC compressor from exceeding its safe operating envelope.

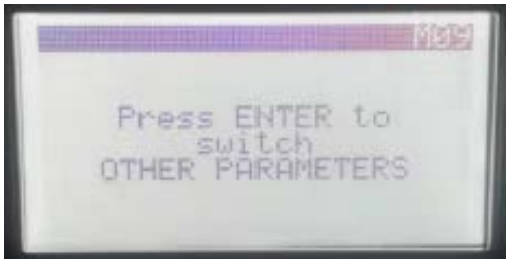
12. AL038 BLDC-alarm: Starting Fail Wait / AL039 BLDC-alarm: Starting Fail Exceeded

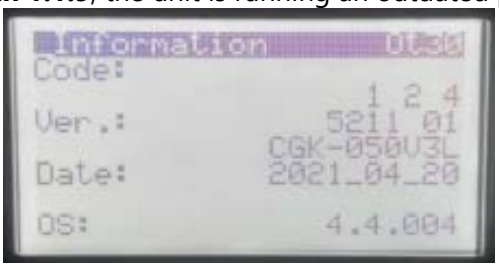
Cause Analysis:

- Incorrect program.
- Incorrect **inverter parameter selection**.
- The **inverter driver** is damaged or malfunctioning.

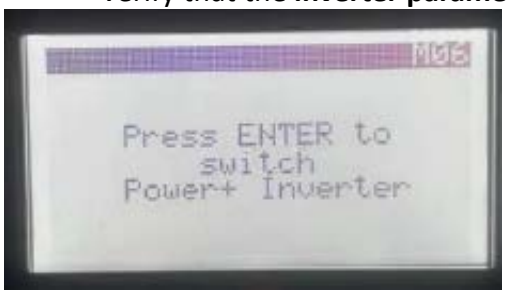
Judgement method:

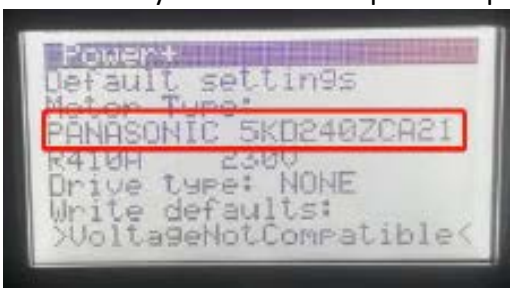
- Check the **program version**.
    - If the version is **lower than 1.1.9**, the unit is running an outdated program.





- Verify that the **inverter parameters** correctly match the compressor specifications.

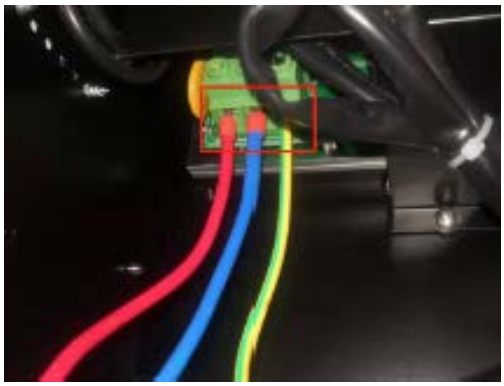


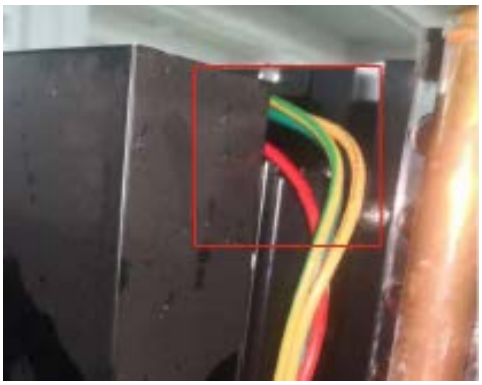


- Inspect the inverter wiring for **burnt marks** or signs of overheating.

- 380V Inverter driver.

- 220V Inverter Driver





Solution:

- If the unit is running an **old program**, refresh the program to the latest version.
- If the **inverter parameters are incorrect**, re-enter the correct inverter parameters or refresh the program.
    - Set **NO** → **YES** on the **Ot10 page** in **M08**.
    - If the Ot10 option is not available (must be confirmed), change **NO** → **YES** on the **Power+ page** in **M06**.
- If the **inverter driver wiring** shows burnt marks or damage, the inverter driver may need to be replaced.

13. AL041 BLDC-alarm: High Discharge Gas Temp

Cause Analysis:

- **Insufficient refrigerant** in the system.
- The exhaust probe is faulty.

Judgement method:

- If **low pressure is low**, and the temperature indicated on the low-pressure gauge is **more than 15°C below the current ambient temperature**, while the exhaust temperature **B4 exceeds 115°C**, this indicates a **lack of refrigerant**.

- If the exhaust probe temperature **B4 remains above 115°C even after shutdown**, the **probe is defective**.

Solution:

- If refrigerant is insufficient: locate the **leak point**, repair the leak, **re-evacuate** the system, and then **recharge refrigerant according to the weight specified on the nameplate**.
- If the exhaust temperature probe is faulty: **replace the probe**.

14. AL051 Power+ alarm: 01-Overcurrent

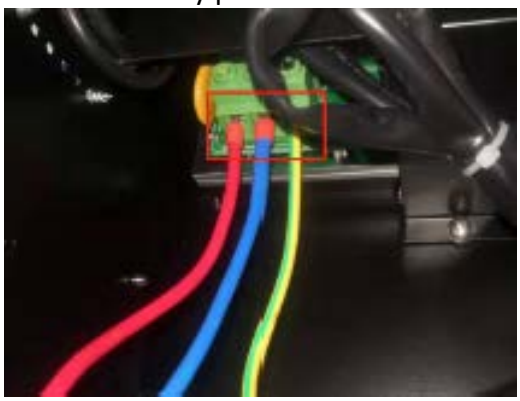
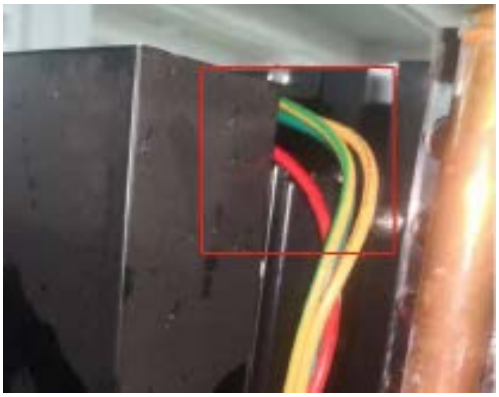
Cause analysis:

- Loose wiring between the compressor and inverter, causing excessive current.
- Undersized wire diameter leading to **low voltage drop** under load.
- Power supply voltage is inherently **too low**.
- Compressor coil **short circuit** or internal damage.

Judgement method:

- Check whether the **power cable**, compressor wiring, and the inverter's input/output wires are **loose** or show **burnt marks**.
- Inspect the **380V inverter wiring** for burn marks and confirm all terminals are firmly tightened.

- Inspect the **220V inverter wiring** for burn marks and ensure all connections are securely pressed.

- Remove the compressor cover and check its wiring for burn marks or loose terminals.

- Use a **multimeter** to measure voltage drop when the compressor starts:
    - If voltage **gradually decreases** and drops **more than 10% below** the rated value, the issue is caused by **undersized wire diameter**.
- Use a multimeter to measure voltage during **standby**:
    - If voltage is **10% below** the rated value even with no load, the issue is **low supply voltage**.
- If all above conditions are excluded, measure the **resistance between the compressor's three coils**:
    - If any resistance is significantly **too small**, **too large**, or the difference between coils exceeds **20%**, the compressor is faulty.
    - If resistance between any terminal and **ground** is present, the compressor is also considered faulty.

Solution:

- If the cable is loose, re-tighten the connector of the cable.
- If the wire diameter is too small, replace the appropriate wire.
- If the voltage is too low, you can add a voltage stabilizer, or look for a power supply bureau to keep the voltage stable.
- If the compressor is confirmed defective, **replace the compressor**.

15. AL053 Power+ alarm:03-DCbus overvoltage

Cause analysis:

- The DC bus voltage is higher than the allowable range.

Judgement method:

- Use a multimeter to measure the actual voltage. If the voltage exceeds the rated value by more than 20%, the overvoltage condition is confirmed.

Solution:

- Install a voltage regulator to stabilise the supply, or contact the local power supply authority to address unstable incoming voltage.

16. AL054 Power+ alarm:04-DCbus undervoltage

Cause analysis:

- The DC bus voltage has dropped below the acceptable operating range.

Judgement method:

- Measure the supply voltage to confirm whether it is significantly lower than the rated value.

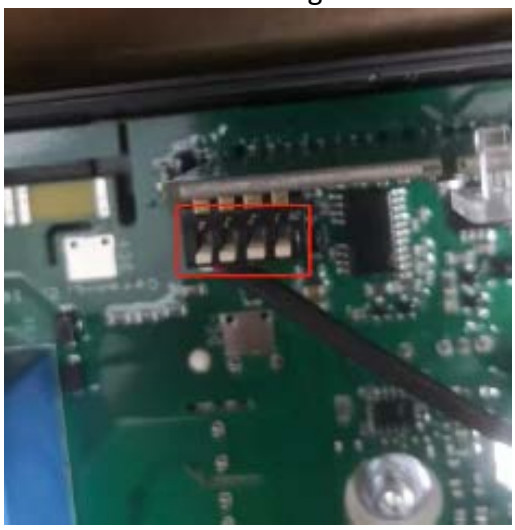
Solution:

- Install a voltage regulator to stabilise the input voltage, or contact the local power supply authority to resolve issues with inconsistent or insufficient voltage.

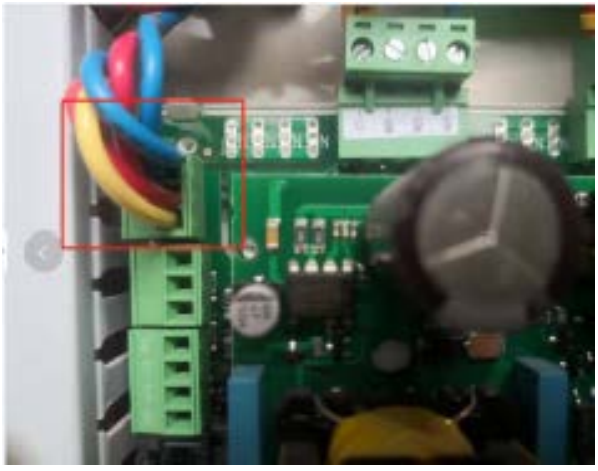
17. AL114 Power+ alarm:Power+ offline

Cause analysis:

- The interval between powering off and powering on the host is too short.
- The position of the inverter's dialling switch is wrong, and the direction of the inverter's dialling must be the same.



- The inverter communication or power cables are loose.
- Main control board connection line.



- 380V frequency converter communication line.

- 220V frequency converter communication line.

Solution:

- If the power-on interval is too short, power off the system again
    - Wait at least **3 minutes**, then power on.
    - If the issue persists, power off again and wait **10 minutes** before restarting.
- Adjust the DIP switches on all converters to ensure they are set to the same position.
- Re-tighten all converter connection cables to ensure secure and stable contact.

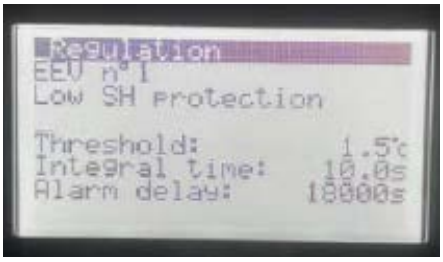
18. AL115 EEV alarm:Low superheat

Cause analysis:

- The unit has been operating at low frequency for an extended period, exceeding its normal operating range.

Solution:

- Adjust the **Alarm Delay** parameter for **EEV N1** in **menu M07** and set its value to **18000**.



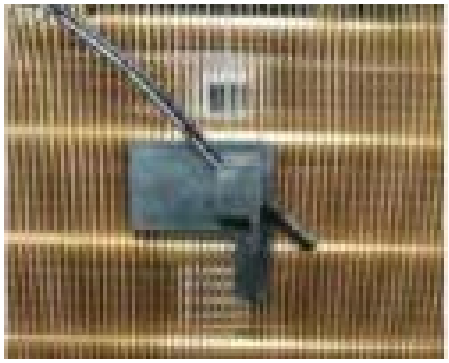
19. AL128 Low press alarm

Cause analysis:

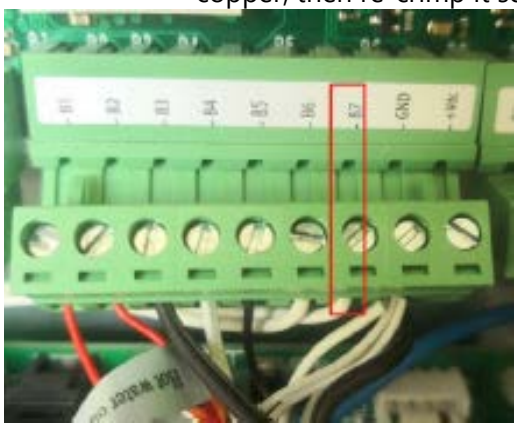
- The main unit's heat-exchange fins are heavily frosted.
- Damaged or deformed fan blades are causing insufficient airflow.
- The wiring to the low-pressure sensor is loose.
- Refrigerant is leaking from the system.
- The low-pressure sensor itself is faulty.

Solutions:

- **Severe fin frosting:**
    - Perform a forced defrost. Ensure the ambient (environmental) probe is positioned away from the fins to prevent it being covered by frost. Check whether the defrost parameters have been altered; if so, restore them to the original factory settings.



- **Damaged blades:**
  - Replace the faulty fan blades to restore proper airflow.
- **Loose low-pressure sensor wiring:**
  - Inspect the wiring for the low-pressure sensor on terminal **B7**. Strip a small additional section of insulation on the inlet water probe wire to expose more copper, then re-crimp it securely.



- **System refrigerant leakage:**
  - Identify and repair the leakage point. After repairs, evacuate (vacuum) the system, then recharge it with the correct refrigerant amount as specified on the equipment nameplate.
- **Faulty low-pressure sensor:**
- If all other causes have been ruled out, replace the low-pressure sensor directly.

20. AL129 High press alarm

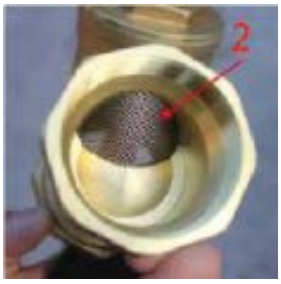
Cause analysis:

- The filter is clogged, reducing water flow.
- Air trapped in the piping system causes uneven or restricted flow.
- The water pump has not been properly vented, resulting in reduced flow.
- One or more valves in the water system are closed or not fully opened.
- The hot-water probe or underfloor-heating probe is not installed in the correct return pipe or tank blind pipe.
- The pump head or flow capacity is insufficient, causing inadequate circulation.
- Scaling inside the water-side heat exchanger increases pressure.
- Air present in the refrigerant (fluorine) circuit increases system pressure.

- The high-pressure sensor switch is faulty.
- A damaged electronic expansion valve results in abnormally high pressure.

Solution:

- **Clogged filter:**
  - Remove the filter cap (Figure 1) and clean the filter mesh (Figure 2).

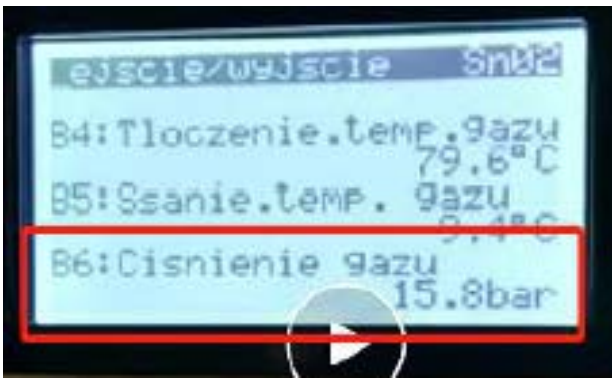


- **Air in the pipeline:**
  - Release trapped air through the exhaust valve or using the union fitting.

- **Water pump not vented:**
  - Exhaust the air through the pump's dedicated exhaust port.

- **Closed or partially opened valves:**
  - Inspect all valves in the water system and fully open them.
- **Probe sensor displaced:**
  - Re-install the sensor in the correct position according to the wiring diagram or system schematic.
- **Insufficient pump head/flow:**
  - If no air is present in the pipeline and the temperature difference still exceeds 10°C after short-circuiting the flow switch, replace the pump with one that provides higher head and flow capacity.
- **Scaling in the water-side heat exchanger:**
  - Inspect for scale buildup. If heavily scaled, clean the heat exchanger and refill the system with treated water.

- **Air in the refrigerant circuit:**
  - If the system was not vacuumed for at least one hour or not fully evacuated during repair, pressure gauge readings may fluctuate. Re-vacuum the system thoroughly and recharge it with the correct refrigerant quantity.
- **Faulty high-pressure sensor:**
  - If the mechanical gauge shows normal pressure while the Carel controller indicates high pressure, the high-pressure sensor may be defective. Replace the high-pressure sensor.



- **Damaged electronic expansion valve:**
  - If the temperature difference between the inlet and outlet of the electronic expansion valve is unusually small, the valve may be faulty. Replace the electronic expansion valve.

21. AL130 Disc.temp.probe error – Exhaust probe failure

Cause analysis:

- The exhaust temperature probe is malfunctioning due to one of the following:
  - Loose wiring
  - Broken wiring
  - A defective probe

Judgement method:

- Inspect the exhaust probe wiring to verify:
  - The two probe wires are correctly connected to **B4** and **GND.**
  - The wire insulation has not been clamped instead of the copper conductor.
  - The connection is firmly and securely fastened.

Solution:

After ensuring proper wiring, strip a small additional section of insulation from the exhaust probe cable to expose more copper conductor, then re-crimp or re-fasten the connection securely. If the alarm persists after correcting the wiring, replace the exhaust temperature probe with a new one.

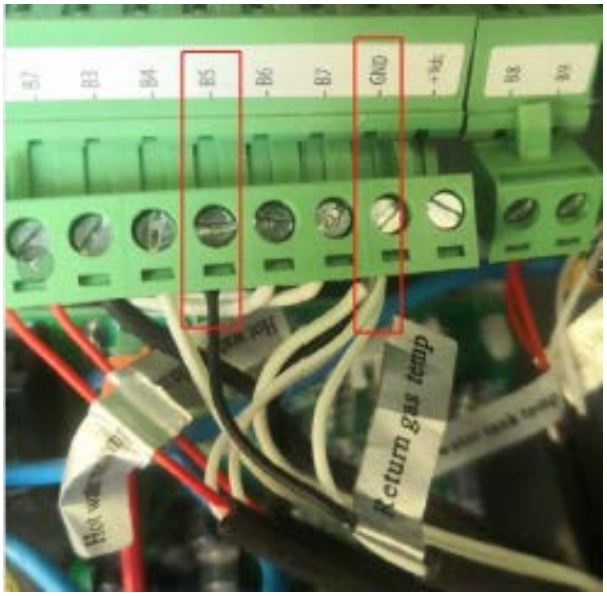
22. AL131 Suct.temp.probe error – return gas probe failure

Cause analysis:

- The return-gas temperature probe is malfunctioning due to one of the following issues:
    - Loose probe wiring
    - Broken or damaged cable
    - A faulty temperature probe

Judgement method:

- Inspect the return-gas probe wiring to confirm:
    - The two wires are correctly connected to **B5** and **GND**
    - The copper conductor is properly clamped (not just the insulation)
    - The terminals are firmly and securely fastened



Solution:

After verifying correct wiring, strip a small additional section of insulation from the return-gas probe cable to expose more copper conductor and re-fasten the connection securely. If the alarm continues after proper rewiring, replace the return-gas temperature probe with a new one.

23. AL134 Tank temp.probe error water tank probe failure

Cause analysis:

- The water-tank temperature probe is malfunctioning due to one of the following:
  - Loose probe wiring
  - Damaged or broken probe cable
  - A faulty temperature probe

Judgement method:

- Inspect the probe wiring to verify:
  - The two probe wires are correctly connected to **B8** and **GND**
  - The terminals are gripping the *copper conductor* rather than just the insulation
  - The wiring is securely and firmly fastened

Solution:

Once correct wiring is confirmed, strip a small additional section of insulation from the water-tank probe cable to expose more copper conductor, then re-crimp or re-fasten it securely. If the error continues after proper rewiring, replace the water-tank temperature probe directly.

24. AL138 High temp. (Alarm Outlet water temperature is too high protection)

Cause analysis:

- The filter is clogged, reducing water flow
- Air is trapped in the piping, causing unstable or restricted flow.
- The water pump has not been properly vented, resulting in reduced flow.
- One or more valves in the water system are not fully opened.
- The set temperature is too high relative to the available flow.
- The water pump capacity (head/flow) is too small, causing insufficient circulation.

Solution:

- Clean the filter thoroughly.
- Drain the pipeline and install an automatic air-vent valve at the highest point of the system to remove trapped air.
- Vent the water pump to discharge internal air.
- Ensure all valves in the system are fully opened.
- Lower the set temperature to a suitable level.
- Replace the existing pump with one that provides a larger head and higher flow rate.

25. AL139 Low temp. Alarm (Cooling subcooling protection)

Cause analysis:

- The filter is clogged, resulting in reduced water flow.
- Air is trapped in the piping, causing unstable or restricted circulation.
- The water pump has not been fully vented, leading to inadequate flow.
- One or more valves in the water system are not fully open.
- The set temperature is too low relative to the available flow.
- The water pump capacity (head/flow) is insufficient, resulting in low circulation.

Solution:

- Clean the filter thoroughly.
- Drain the pipeline and install an automatic exhaust (air-vent) valve at the highest point of the system to release trapped air.
- Vent the water pump to discharge internal air.
- Ensure all valves in the system are fully opened.
- Reduce the set temperature to an appropriate level.
- Replace the existing pump with one that provides a larger head and higher flow rate.

26. AL153 Fan ½ fault speed control fan ½ fault, AL155 Fans Offline speed control fan communication offline

Cause analysis:

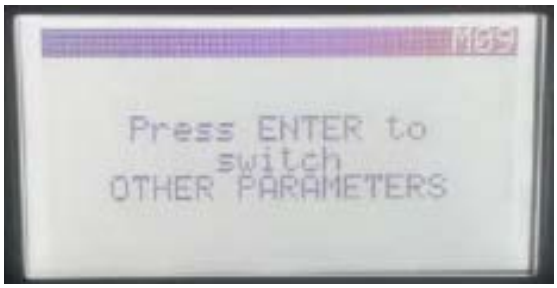
- The fan-drive dial switch is set incorrectly.
- The fan wiring is loose.
- The program version is outdated.
- The fan drive module is faulty.
- The fan motor itself is damaged.

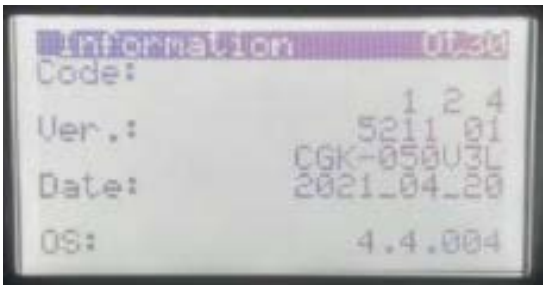
Solution:

- Reset the fan-drive dial switch:
    - Set **1** to the **Digital** position and **2** to the **ON** position.

- Ensure the **fan wiring socket is fully inserted** and securely connected.

- If the **program version is earlier than 1.1.9**, update (refresh) the program to the latest version.





- Replace the fan drive.
- Replace the motor if it confirmed to be faulty.

27. Compressor Failure

Cause analysis:

- Compressor damage due to voltage issues:
  - Voltage fluctuations—either too high, too low, or caused by undersized power wiring—can damage the compressor.
- Compressor damage due to poor connections:
  - Loose connections on the main power supply wiring or compressor wiring can cause excessive current, leading to overheating and failure.
- Compressor damage due to poor lubrication:
  - Liquid refrigerant returning to the compressor (liquid return) can dilute the oil and cause inadequate lubrication, resulting in internal damage.

Fault phenomenon:

- **Starting current is abnormally high** or triggers current-protection alarms.
- **Operating current remains too high** or triggers current-protection alarms during use.

- **Compressor runs but does not heat or cool**, and the high-/low-pressure gauge readings show **no change or very little change** (less than 0.2 MPa under normal operation).

Judgement method:

- Check compressor coil resistance.
    - Power off the unit.
    - Remove the compressor terminal cover.
    - Set a multimeter to 200 Ω.
    - Measure the resistance between each pair of the three compressor terminals:
        - Between terminal **1 and 2**
        - Between terminal **2 and 3**
        - Between terminal **3 and 1**
    - Compare the three measured resistances
        - If the difference between any measured resistance and the expected resistance exceeds **10% (at 20°C)**, the compressor coil is likely **short-circuited or damaged**.
- Check for grounding faults.
    - With the power off and multimeter still set to **200 Ω**, measure the resistance between:
        - Each of the **three compressor terminals**
        - And the **grounding wire**
    - If any reading shows:
        - **0 Ω**, or
        - **Less than 100 Ω**, then the compressor is **internally damaged** and must be replaced.

Steps to replace the compressor:

- **Recover the refrigerant:**
  - Ensure the pressure gauge reads **0** before disassembly.
- **Disconnect wiring:**
  - Remove the compressor electrical connections.
- **Remove piping:**
  - Cut/weld off the **exhaust pipe**.
  - Cut/weld off the **return (suction) pipe**.
- **Remove the old compressor:**
  - Unscrew the mounting bolts and lift out the compressor.
- **Install the new compressor:**
  - Position it properly.
  - Tighten all mounting screws.
- **Reconnect piping:**
  - Weld the exhaust pipe.
  - Weld the return (suction) pipe. Ensure clean welds to avoid leaks.
- **Reconnect the wiring:**
  - Attach compressor cables securely.
- **Vacuum the system:**
  - Use a vacuum pump for at least 1 hour.
  - Confirm that the gauge reaches –1 bar (full vacuum).
- **Recharge refrigerant:**
  - Charge according to the exact weight specified on the nameplate.
  - Use an electronic scale to ensure accuracy.
- **Leak test:**
  - Apply a small amount of detergent/water solution to all weld points and joints to check for bubbles (leaks).

28. Leaking Refrigerant

Cause analysis:

- Refrigerant leakage caused by loose or insufficiently tightened connections (e.g., pressure gauge joints, pressure sensors, or connections between indoor and outdoor units in split systems).
- Pipe cracking due to vibration or impact during transportation, resulting in refrigerant leakage.
- Long-term operation causing weak or poor welding points on copper tubes to fracture and leak.
- Freezing and cracking of the heat exchanger due to a power outage that prevents the unit from entering antifreeze mode.
- Refrigerant leakage caused by defects or poor quality of accessories or components.

Fault phenomenon:

- The unit displays a **low-voltage fault**.
- The unit displays an **exhaust temperature too high** fault.

Judgement method:

- **Full refrigerant loss:**
  - After shutdown, if **both high- and low-pressure gauge readings fall below 0.1 MPa**, complete refrigerant leakage is likely.
- **Partial refrigerant leakage:**
  - When water temperature is **below 50°C** but the **exhaust temperature exceeds 105°C**, partial leakage is suspected.
  - Apply a **detergent solution** to all welds and connection points; **bubbling indicates the leak location**.
- **Internal leakage inside the heat exchanger:**

  If no leaks are found at welds, fins, or connection ports:
  - Remove the inlet and outlet water pipes.
  - Reconnect them using a **90-degree upward-facing elbow**, ensuring both inlet and outlet are at the same height.
  - Fill the heat exchanger fully with water.
  - Pressurize the refrigerant circuit with **high-pressure nitrogen**.
  - If bubbles appear from the elbow on the water side, the heat exchanger has an **internal leak**.

Solution:

- **Leakage at Welding Points:**
    - Release refrigerant (ensure pressure gauge reads **0**; skip this step if already empty).
    - Charge the system with **nitrogen pressure**.
    - Apply **detergent solution** to all welds and fin areas.
        - Bubbles indicate the leaking location.
    - Repair the leak (reweld).
    - Vacuum the system for **at least 1 hour**, ensuring the gauge reaches **–1 bar**.
    - Recharge refrigerant according to the **exact weight on the nameplate**, using an electronic scale.
    - Apply detergent solution to solder joints again to confirm **no leaks** remain.
- **Leakage at Connection Ports:**
    - Re-tighten all connection ports.
    - Vacuum the system for **at least 1 hour**, ensuring the gauge reaches **–1 bar**.
    - Recharge refrigerant to the **nameplate-specified weight**, using an electronic scale.
    - Apply detergent solution to all joints again for leak testing.
- **Internal Heat Exchanger Leakage (Plate Heat Exchanger Replacement)**
    - Release refrigerant (ensure gauge reads **0**; skip if empty).
    - Remove the temperature probe from the heat exchanger.
    - Cut/weld off the **inlet and outlet refrigerant pipes**.
    - Cut/weld off the **inlet and outlet water pipes**.
    - Remove all mounting screws and take out the defective heat exchanger.
    - Install the new heat exchanger and secure all screws.
    - Weld the refrigerant inlet/outlet pipes.
    - Weld the water inlet/outlet pipes.
    - Reconnect the probe wiring.
    - Vacuum the system for **more than 1 hour**, confirming **–1 bar**.
    - Recharge refrigerant according to the **rated weight**, using an electronic scale.
    - Apply detergent solution to all weld points to verify there are **no leaks**.

29. Water Leakage

Cause analysis:

- Water leakage caused by improperly tightened connection joints.
- Water leakage due to pipe cracking from vibration or impact during transportation.
- Long-term operation causing weak welds on copper pipes to fracture and leak.
- Heat exchanger cracking and leaking due to power outage preventing the unit from entering antifreeze mode.
- Water leakage resulting from defective or low-quality accessories.

Fault phenomenon:

- No fault code is displayed, but **visible water leakage** is present.

Judgement method:

- Visually inspect the unit and surrounding area to confirm **water flowing out** from a pipe, fitting, or component.

Solution:

- **Leakage at Threaded Connection Ports:**
  - Remove and re-seal the threaded joint using **PTFE (raw material) tape**, then tighten the connection securely.
- **Leakage at Welding Points:**
  - Drain the water from the heat exchanger.
  - Re-weld or repair the faulty weld directly.
- **Leakage from Accessories (Valves, fittings, components):**
  - Replace the defective accessory with a new, properly functioning part.

30. Four-Way Valve Failure

Cause analysis:

- The four-way valve body becomes stuck due to **insufficient system cleanliness**, causing internal contamination.
- The four-way valve body cannot shift because the **four-way valve coil is damaged**.

Fault phenomenon:

- After switching the unit to **cooling mode**, the system continues to heat.
- During defrost, **frost is not removed**, indicating the reversing cycle did not occur.

Judgement method:

- During the fault, touch the **four pipes** of the four-way valve:
  - There is **no significant temperature difference** between them.
  - System pressures are abnormal:
    - High pressure becomes low
    - Low pressure becomes high
- Test the four-way valve coil with a piece of **iron**:
  - If the coil shows **no magnetic attraction,** the coil is faulty.

Solution:

- **Replace the Four-way valve coil:**
  - Power off the unit.
  - Disconnect the four-way valve coil connector on the main board.
  - Remove the coil-mounting screw and take off the old coil.
  - Install the new four-way valve coil and tighten the coil screw.
  - Reconnect the valve coil output line and neutral wire.
- **Replace the Four-Way Valve Body:**
  - Release refrigerant (ensure the pressure gauge reads **0**).
  - Remove the four-way valve coil.
  - Cut/weld off the **four copper pipes** connected to the four-way valve.
  - Remove the old valve body.
  - Install the new four-way valve.
  - Weld the four copper pipes back into place

        - **Important:** Wrap the valve body with a **wet cloth** while welding to prevent its temperature from exceeding **120°C**.
    - Reinstall the coil.
    - Vacuum the system for **at least 1 hour**, confirming the pressure gauge reaches **–1 bar**.
    - Recharge refrigerant according to the **exact weight on the nameplate** using an electronic scale.
    - Apply detergent solution to all weld points and check for leaks again.

31. Electronic Expansion Valve Failure

Cause analysis:

- The electronic expansion valve becomes **stuck** due to **insufficient cleanliness** inside the refrigerant system, causing debris to obstruct movement.
- The electronic expansion valve **cannot operate** because the **valve coil is damaged** and unable to drive the valve.

Fault phenomenon:

- Water flow is normal, but the unit reports a **high-pressure fault** or **low-pressure fault**, indicating improper refrigerant regulation despite normal circulation.

Judgement method:

- With both refrigerant level and water flow confirmed as normal, manually touch **both ends** of the electronic expansion valve:
    - If **there is no noticeable temperature difference**, the valve is not functioning correctly and may be stuck or its coil may be faulty.

Solution:

- **Replace the Electronic Expansion Valve Coil:**
    - Power off the host unit.
    - Unplug the electronic expansion valve connector on the main board.
    - Remove the existing electronic expansion valve coil.
    - Install the new coil, **ensuring it is properly clamped in place**.
    - Reconnect the valve-coil wiring.
- **Replace the Electronic Expansion Valve Body:**
    - Release the refrigerant (ensure the pressure gauge reads **0**; skip this step if already empty).
    - Remove the electronic expansion valve coil.
    - Cut/weld off the **two copper pipes** connected to the electronic expansion valve.
    - Remove the old expansion valve body.
    - Install the new expansion valve body.
    - Weld the two copper pipes back onto the new valve.
    - **Important:** Wrap the valve body with a **damp cloth** during welding to ensure its temperature does **not exceed 120°C**.
    - Reinstall and clamp the electronic expansion valve coil securely.

- Vacuum the system for **more than 1 hour**, ensuring the pressure gauge reaches **–1 bar**.
- Recharge refrigerant according to the **exact weight specified on the nameplate**, using an electronic scale for accuracy.
- Apply a detergent solution to all welds and joints to **check for leaks** (bubbles indicate leakage).

32. Motor Failure

Cause analysis:

- The motor is damaged due to **motor quality issues**.

Fault phenomenon:

- **Low-pressure fault during heating**.
- **High-pressure fault during cooling**.
-

Judgement method:

- After confirming that all wiring is secure and not loose, check motor operation:
  - The **controller outputs a motor signal**, but
  - The **motor does not rotate**, indicating internal motor failure.

Solution:

- Disconnect power to ensure safety.
- Remove the fan wiring:
- For variable-frequency fans: disconnect the five-core socket.
- For fixed-frequency fans: disconnect the live wire, neutral wire, two capacitor wires, and ground wire.
- Remove the fan guard/net cover.
- Remove the damaged motor.
- Install the new motor.
- Reconnect all wiring exactly as before, matching each wire to its original position.

33. Motorboard Burnout

Cause analysis:

- The main board burns out due to **unstable or fluctuating voltage**.
- The motherboard is damaged because of **incorrect wiring**.
- The controller (motherboard or driver) fails due to **internal quality defects**.

Fault phenomenon:

- The control panel does not display anything.
- The unit does not operate according to the set parameters, indicating improper control output.

Judgement method：

- Perform a **visual inspection** of the motherboard fuse, driver, and surrounding components to check for **burn marks, discoloration, or melted areas**.

- The panel may show normal output while the motherboard has **no actual output**, or the panel may show **no output while the board still outputs**—both conditions indicate a board fault.

Solution:

- **Disconnect the power supply** to ensure safe handling.
- **Photograph and record** all wiring connections on the motherboard or driver before removal to ensure correct re-installation.
- Remove the **fixing screws or mounting brackets** securing the motherboard or driver.
- Remove the **damaged motherboard or driver** from the unit.
- Install the **new motherboard or driver** in the same location.
- Reinstall and tighten the **fixing screws or brackets**.
- Reconnect all wiring **exactly as originally recorded**.

34. Water Flow Switch Failure

Cause analysis:

- Failure caused by **poor quality or internal malfunction** of the water flow switch.

Fault phenomenon:

- The unit reports a **water flow fault**.

Judgement method：

- When the system contains **air in the piping** or the **filter is blocked**, a water-flow fault may appear. If the **water-flow switch is temporarily short-circuited** and the unit operates normally (with an **inlet-outlet water temperature difference within 8°C**), this indicates the **water-flow switch itself is defective**.

Solution:

- **Disconnect the power supply** to ensure safety.
- Remove the **wiring connections** from the water-flow switch.
- Remove the **faulty water-flow switch** from the system.
- Install the **new water-flow switch** in its place.
- Reconnect the water-flow switch wiring exactly as before.

35. Linkage Does Not Turn On

Cause analysis:

- The unit reports a **linkage failure** or **air-conditioning linkage failure**, preventing the system from activating correctly.

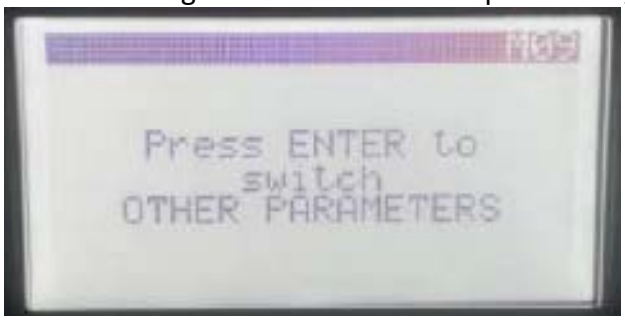
Solution:

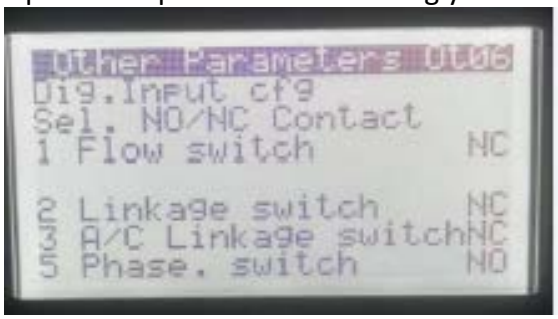
- **Adjust DI Input Wiring:**
  - Move the linkage signal wiring on the main board **from DI2 to DI3**.
- **Check the Linkage Switch**
  - Inspect whether the linkage switch is **short-circuited**
  - If it is **not** short-circuited, temporarily **short-circuit the linkage switch** to test whether the system responds.
- **Verify Factory Parameter Settings**
  - Check internal factory parameters to ensure correct DI logic:
    - **DI2** should be set to **Normally Closed (NC).**
    - **DI3** should also be **Normally Closed (NC).**

Change from DI2 to DI3

Short Linkage

If these settings do **not** match the requirements, update the parameters accordingly.





36. Three-Way Valve Reversed

Fault phenomenon:

- When set to **hot water mode**, the unit **cannot produce hot water** or instead produces heating water.
- When set to **heating or cooling mode**, the **hot water temperature rises or falls**, indicating that the system is actually operating in hot-water or cooling-water mode instead of the selected mode.
- Overall, the system behaves as though the **three-way valve is directing flow to the wrong circuit**.

Solution:

- **Swap the wiring connections** between the **floor-heating valve** and the **hot-water valve** on the three-way valve assembly to ensure correct valve actuation and mode switching.

[i]

[i] Version 1.2 Feb 2026