



OMEGA

VRF

TECHNOLOGY

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VRF

Trouble Shooting

VRF Error Table

Fault or protect definition

Code	Fault or protect definition	XH9	3 times P9 protection in 30 minutes
E0	Outdoor communication failures	P0	Reserve
E1	Sequence fault	P1	High pressure protection
E2	Indoor and host communication failures	P2	Low pressure protection
E3	Exhaust temperature sensor fault	XP3	INV over AC current protection
E4	Environmental temperature sensor T4 fault	P4	Exhaust temperature is too high to protect
E5	T6A Plate heat exchanger inlet sensor fault	P5	Condensate T3 high temperature protection
E6	T3 Condensate temperature sensor fault	XP6	IPM module protection
E7	T6B Plate heat exchanger outlet sensor fault	P7	The lack of the degree of superheat
E8	Outdoor address fault	XPA	Temperature sensor T8 is too high to protect
E9	AC voltage protection	XP9	DC fan module protection
EA	Refrigerant cooling copper tube temperature sensor fault	XL0	DC compressor module fault
XH0	Communication failures between module board and main control board	XL1	DC low voltage protection
H1	Communication failures between main chip and slave chip of the main control board	XL2	DC high voltage protection
H2	The decrease in the number of outdoor failures	XL4	MCE fault/synchronous/closed loop
H3	The increase in the number of outdoor failures	XL5	Zero speed protection
XH4	3 times P6 protection in 60 minutes	XL7	Phase sequence error protection
H5	3 times P2 protection in 60 minutes	XL8	A moment before and after the speed change > 15 Hz
H6	3 times P4 protection in 100 minutes	XL9	Set speed and the actual speed difference > 15 Hz
H7	The decrease in the number of indoor failures	PA----	Need to enter password prompt for password
H8	Pressure sensor fault	XP8	Drive type mismatch
XH9	3 times P9 protection in 30 minutes	XH9	3 times P9 protection in 30 minutes

VRF Operating Parameters Table

LED display in check procedures

No.	Display	Reference values	No.	Display	Reference values
	Current frequency (indoor unit quantity when unit in standby mode)				
1	This outdoor unit address	0, 1, 2, 3	35	Secondary side current of inverter compressor B	Actual value (A)
2	This outdoor unit capacity address	0-F: The corresponding number of outdoor units is shown in the table on the nameplate of the outdoor unit	36	AC voltage	Actual value (A)
3	Number of online outdoor units	Available for master unit only	37	DC bus line voltage of compressor A	Actual value = Display value * 4(V)
4	Total capacity of outdoor units	When paralleling, available for master unit only	38	DC bus line voltage of compressor B	Actual value = Display value * 4(V)
5	Number of outdoor units in operation	Master display only	39	Priority mode	0: Auto priority 1: Heating priority 2: Cooling priority 3: Heating only 4: Cooling only 5: VIP priority and auto priority
6	Total HP of outdoor units in operation	Master-slave display	40	Silence mode	0: Standard mode; 1: Silence mode 1 ; 2: Silence mode 2 ; 3: Silence mode 3 ; 4: Night silence mode
7	Maximum online indoor units quantities	The maximum total number of indoor units used to communicate with outdoor units	41	Static pressure mode	0: Standard mode; 1: Low pressure ; 2: Medium pressure; 3: High pressure; 4: Super high pressure
8	Current online indoor units quantities	Current total number of indoor units communicating with outdoor units	42	VIP indoor unit address	
9	Quantities of indoor units in operation	Current total number of indoor units with cooling or heating mode	43	Refrigerant status	0: Normal 1: Excessive refrigerant 2: Serious excessive refrigerant 11: Lack of refrigerant 12: Lack of much refrigerant 13: Lack of too much refrigerant
10	Running mode	0: Off or fan only 2: Cooling only 3: Heating only 4: Forced cooling 5: Forced heating	44	T2B condition A	Factory default 8, setting range: 5-15
11	Total capacity demand of indoor units	Available for master unit only	45	T2 condition B	Factory default 44, setting range: 40-50
12	Amended capacity demand for the master unit	Available for master unit only	46	Energy saving value	Factory default 100%, setting range: 100%-40%
13	Output capacity of outdoor unit	Actual output HP	47	Maximum defrost time	Factory default 10 minutes, setting range: 5-20 minutes
14	Low pressure value	Actual value= Display value * 0.01 (Mpa)	48	Defrosting T3 temperature exit condition	Factory default 15°C, setting range: 10-18°C
15	High pressure value	Actual value= Display value * 0.1 (Mpa)	49	Allowed offline time of indoor unit	Factory default 60 minutes, can be set as 60,120,180,240,480
16	Fan speed range	0-36	50	Number of allowed offline indoor units	Factory default 2, setting range: 0-6
17	Average temperature of evaporators T2/T2B	Actual value (°C)	51	Reserve	Reserve
18	Temperature of condenser outlet T3	Actual value (°C)	52	T2B correction plus or minus	0: No correction 4: Unit number correction (No T2B average correction) 5: Number of units+T2B average correction+3 6: Number of units+T2B
19	Ambient temperature T4	Actual value (°C)	53	Reserve	Reserve
20	Temperature sensor T5	Reserve	54	Reserve	Reserve
21	Inlet temperature(T6A) of plate heat exchanger	Actual value (°C)	55	Compressor A drive code	
22	Outlet temperature(T6B) of plate heat exchanger	Actual value (°C)	56	Compressor B drive code	
23	Discharge temperature of inverter compressor A	Actual value (°C)	57	Frequency limitation of inverter compressor A	0: Unlimited frequency 1: T4 frequency limiting 2: Pressure frequency limiting 3: Voltage frequency limiting 4: Exhaust frequency limiting 5: Current frequency limiting 6: P6 frequency limiting 7: Module temperature limiting
24	Discharge temperature of inverter compressor B	Actual value (°C)	58	Frequency limitation of inverter compressor B	0: Unlimited frequency 1: T4 frequency limiting 2: Pressure frequency limiting 3: Voltage frequency limiting 4: Exhaust frequency limiting 5: Current frequency limiting 6: P6 frequency limiting 7: Module temperature limiting
25	Temperature sensor T8	Refrigerant cooling copper tube temperature	59	Reserve	Reserve
26	Temperature of IPM A	Actual value (°C), Internal temperature of IPM	60	Last time error fault or protection code	No protection or fault display 00
27	Temperature of IPM B	Actual value (°C), Internal temperature of IPM			
28	Superheat degree of compressor	Actual value (°C)			
29	Opening degree of EXV A	8-24HP: Actual value = Display value * 8 26-32HP: Actual value = Display value * 8*6			
30	Opening degree of EXV C	Actual value = Display value * 8			
31	Auxiliary valve adjustment interval	0: OFF; 1: Minimum opening; 2: Automatic adjustment			
32	Current of inverter compressor A	Actual value (A)			
33	Current of inverter compressor B	Actual value (A)			
34	Secondary side current of inverter compressor A	Actual value (A)			

VRF Trouble Shooting

E0: Outdoor unit communication error

Reason: The communication between the slave unit and the master unit is lost, and the slave show error.

Solution:

1. Please ensure that the connection wire linking the main board of the master and slave units to the communication terminal is in good condition and securely attached.
2. Check whether the communication line H1H2E of the master and slave unit is connected correctly, connect the corresponding letters hand in hand, prohibit star connection, use a multimeter to measure whether the communication line is open current/short current
3. If there are no issues identified during the aforementioned steps, it is recommended to replace either the communication board or the main control board.

VRF Trouble Shooting

E1: Phase sequence malfunction

Reason: Faulty three-phase power supply phase sequence or inadequate phase, which is only noticeable when phase B is absent, phase A is absent, the main control board has no power, phase C is absent, or the fan module has no power.

Solution:

1. To ensure that there is no inadequate phase, employ a multimeter to gauge the phase voltage and confirm whether it is within the range of 220-240V.
2. Verify the status of the filter board's power supply and confirm that it is operating correctly, while also checking that the line voltage is 380V. If the power supply is deemed abnormal, it is recommended to replace the filter board.
3. If all of the above procedures yield no issues, it is recommended to replace the main control board.

VRF Trouble Shooting

E2: Communication failure between indoor unit and outdoor unit ;

Reason: : Communication failure between indoor unit and outdoor unit

Solution:

1. Verify that the communication wire between the communication board and the main control board is functioning correctly. Ensure that the wiring is securely fastened and that the wiring harness is free of any damages before proceeding to the next step.
2. Examine whether the communication wire PQE is utilizing a 2-core shielded wire and is correctly connected. Avoid using a star connection and ensure that the connection is P to P, Q to Q, and E to E.
3. Determine whether there is an open circuit or short circuit in the communication wire by using a multimeter. Measure the resistance between PQ to verify if there is a short circuit. If no short circuit is identified, short circuit PQ, and measure whether there is an open circuit from the PQ terminal of the outdoor unit.
4. After ensuring that there are no issues with the communication wire, check whether all of the indoor units are receiving power and have designated addresses. Verify that each indoor unit is powered on and has an address assigned. If any indoor unit lacks an address, please refer to the internal machine FE troubleshooting guidelines.
5. If none of the previously mentioned steps detect any issues, the problem could be due to communication interference. Attempt to resolve this problem by connecting a 100Ω resistance between the PQ of the last indoor unit within the system. If the issue persists, investigate the source of the interference and eliminate it. If the problem still cannot be resolved, consider replacing either the communication board or the main board.

VRF Trouble Shooting



E3/E4/E5/E6/E7/EA: Exhaust gas temperature sensor TP/ambient temperature sensor T4/plate exchange inlet T6A sensor/condenser temperature T3 sensor/plate exchange outlet T6B sensor failure/refrigerant heat dissipation copper pipe sensor T8

Reason: Sensor reading error or sensor is damaged

Solution:

1. Verify that the sensor is firmly connected to the main board. Reconnect it firmly if necessary. If the sensor is deemed faulty, proceed to the next step.
2. Unplug the sensor and measure the resistance of the sensor. Check whether it is open or short. If the sensor's resistance is open or short, replace the sensor group. If the resistance is normal, replace the main board instead.
3. The E3 exhaust sensor failure may be caused by inaccurate resistance readings. This issue often presents itself after the system has been operational for at least 10 minutes, with $P_c \geq 3.0 \text{MPa}$ and $TP < 15^\circ\text{C}$.

VRF Trouble Shooting

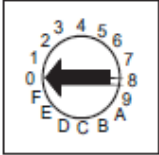
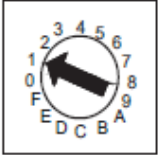
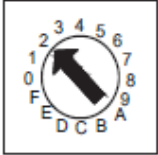
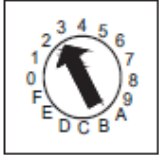
E8: Outdoor unit address error

Reason: Outdoor unit address dialing error

Solution:

1. Verify the dialing codes of both the master and slave unit. Follow the SW6 dialing instructions and perform the dialing process accordingly. Once the dialing is complete, turn the power back on.

SW6 Outdoor address setting

			
0	1	2	3
Master	Slave 1	Slave 2	Slave 3

VRF Trouble Shooting



E9: AC voltage protection

Reason: AC supply voltage problem

Solution:

1. Use a multimeter to measure the voltage of the power supply phase to confirm the supply voltage (below 165V or higher than 265V)
2. If the power supply voltage is confirmed to be within the normal range and there are no other identifiable issues, proceed with replacing the main board.

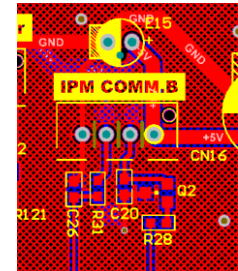
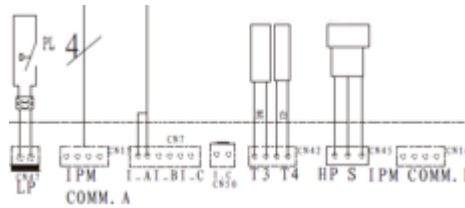
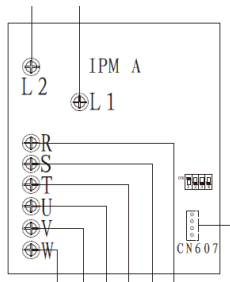
VRF Trouble Shooting

XH0: Communication failure between main control chip and DSP module board

Reason: Communication failure between main control board chip and module

Solution:

1. Measure the RST voltage using a multimeter to confirm if the voltage is 380V. If the voltage is not 380V, check the power supply and the voltage of the filter board. If the voltage is 380V, proceed to the next step.
2. Confirm that the connection wire between the module board and the main control board is not experiencing open current or short current issues. Make sure that the connection is firmly established.
3. To determine the reference voltage, first connect the multimeter to the middle port and GND or 5V on both sides. Then, observe the readings on both ends of the multimeter's DC gear. If there are fluctuations on both ends of the multimeter or there is no fluctuation at both ends, it indicates that the motherboard is faulty. On the other hand, if one end has fluctuations and the other end has no fluctuations, it suggests that the module board is faulty.



VRF Trouble Shooting





H2: Outdoor units decrease

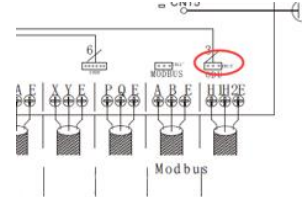
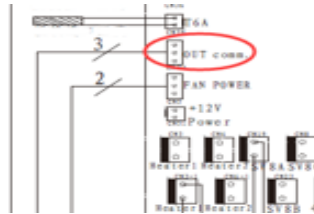
Reason: Slave unit communication lost on parallel system

Solution:

1. Check whether any slave unit is not receiving power by confirming that all circuit breakers are turned on, the power supply is stable, and there are no loose connections. Additionally, check that all indoor units are receiving power and are turned on. Finally, confirm that all outdoor units are powered on and receiving power.
2. Check whether the dialing code of any slave unit is incorrect, refer to the SW6 dialing code guide to correct the dialing code, and then power on again.
3. Verify if the connection cable linking the primary board to the communication terminal is functioning properly and securely fastened.
4. Ensure that the slave communication line H1H2E is properly connected in a daisy-chain configuration and avoid using a star configuration. Use a multimeter to test for continuity and shorts in the communication line.
5. If the previous steps do not identify any issues, consider replacing either the communication board or the main control board.

SW6 Outdoor address setting

			
0	1	2	3
Master	Slave 1	Slave 2	Slave 3



VRF Trouble Shooting



H3: Outdoor units increase

Reason: Master unit read slave unit quantity increase

Solution:

1. Please verify if the number of master and slave units is accurate and ensure that the communication between the other slave units and this system is not improperly linked.
2. Verify that the system contains the correct number of outdoor units and proceed to power it on again.

XH4: There are 3 times P6 protection in 60 minutes

Solution: Refer to P6

H5: There are 3 times P2 protection in 60 minutes

Solution: Refer to P2

H6: There are 3 times P4 protection in 100 minutes

Solution: Refer to P4

H7: Indoor unit quantities decreasing malfunction over 3 minutes

Reason: Part of the indoor unit communication is lost

Solution:

1. Refer to the indoor unit error code FE&E1;

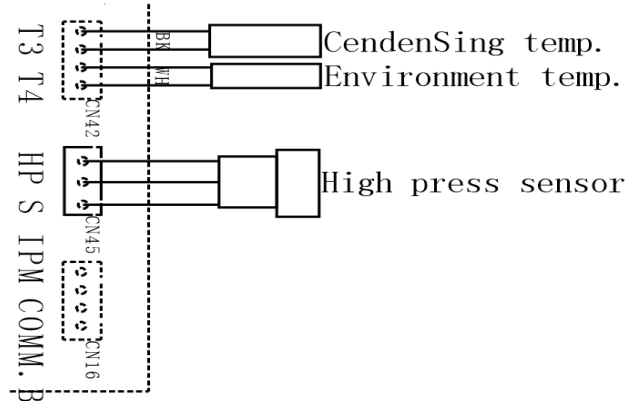
VRF Trouble Shooting

H8: Pressure sensor error

Reason: The main control board detects exhaust pressure < 0.3MPa

Solution:

1. Please examine if the pressure sensor is tightly attached and ensure that the connection is stable.
2. If the aforementioned steps do not identify any issues, it is recommended to replace the pressure sensor or main control board.



VRF Trouble Shooting



XH9: There are 3 times P9 protection in 30 minutes

Solution: Refer to P9

P0: Reserved

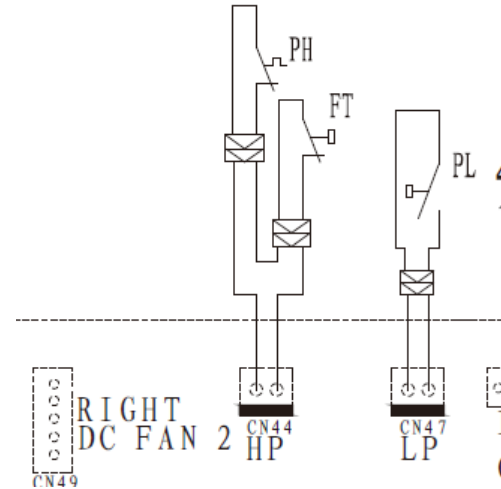
VRF Trouble Shooting

P1: High pressure protection

Reason: The open circuit state is detected at the high pressure switch detection port

Solution:

1. Please inspect the wiring of the high pressure switch to ensure that it is securely connected, and verify that the wiring is functioning correctly.
2. Please examine if the condenser is experiencing inadequate heat dissipation, and confirm that there are no issues with the heat dissipation.
3. Please check parameter item 23/24 for the exhaust temperature and confirm if it is below 120°C. If it is below 120°C, proceed to short-circuit the exhaust thermostat, and if the fault disappears, replace the exhaust thermostat. If the exhaust temperature is greater than or equal to 120°C, refer to the P4 fault. If the exhaust temperature is neither below 120°C nor above 120°C, proceed to the next step.
4. Please connect a pressure gauge, run the unit, and verify the high and low pressure readings. If the pressure readings are within the normal range, remove the pressure switch and measure its resistance. If the resistance is infinite, replace the pressure switch. However, if the pressure switch resistance is 0, replace the main board.
5. When connecting the pressure gauge for testing, if the pressure reading is too high, it indicates a system issue. To resolve this problem, you will need to troubleshoot potential issues such as blockages within the system, vacuum problems, and excessive refrigerant.



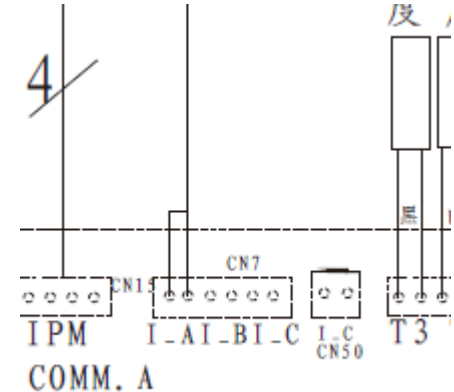
VRF Trouble Shooting

XP3: Inverter compressor over current protection

Reason: The main board detects that the operating current is too large

Solution:

1. Please inspect the wiring connections of the motor and compressor to ensure they are tightly secured, and confirm that the wiring is functioning correctly.
2. Please verify if the current transformer is securely connected
3. Please use a clamp meter to check the primary side AC current and the secondary side compressor DC current and inspect items 32/33/34/35. Compare the difference between the measured value and the clamp meter reading. If the difference is significant, it indicates a problem with the current transformer or the main control board. Attempt to use a normal transformer to resolve the issue. If the issue is not resolved, then it is necessary to replace the main control board.
4. If the difference between the clamp meter reading and the checked value is not significant, then it is possible that the issue lies with the compressor or the system. Further inspection and troubleshooting may be necessary to identify and resolve the problem.



VRF Trouble Shooting

P4: Discharge temperature sensor protection

Reason: Exhaust temperature sensor reads that the temperature is too high

Solution:

1. To determine if the low pressure is below the normal range of 0.7-0.9MPa, attach a pressure gauge. If the pressure is below the range, refrigerant should be added. Additionally, examine the main control board's SV5 spray cooling valve to verify if it produced 220V before the malfunction occurred. If there was no output, the main board should be replaced. If the output valve does not function, replace the SV5 coil.
2. To determine if the temperature sensor is accurate, measure its resistance. If the resistance reading is incorrect, the sensor should be replaced.
3. If the temperature sensor reading is correct, proceed to examine the exhaust temperature of item 11 and compare it. If the temperature of the main control board is not within a reasonable range, the main control board should be replaced.
4. If the previous steps do not identify any issues, inspect the refrigerant system to ensure that it is functioning correctly. Check for potential issues such as blockages in the air return pipe, poor evaporation, or compressor wear.

VRF Trouble Shooting

P5: Heat exchanger high temperature protection

Reason: The condenser temperature sensor reads that the temperature is too high

Solution:

1. Examine the heat dissipation of the condenser to verify that it is functioning correctly. Check for potential issues such as blockages caused by dirt or poor return air.
2. To determine if the temperature sensor is accurate, measure its resistance. If the resistance reading is incorrect, the sensor should be replaced.
3. If the temperature sensor reading is correct, proceed to check the middle and outlet temperature of the condenser for items 8 & 9 and compare it. If the temperature of the main control board is not within a reasonable range, the main control board should be replaced.
4. If the previous steps have not identified any issues, examine the system to ensure that it is functioning correctly. Check for potential issues such as the indoor unit load being too large or a vacuum problem.

VRF Trouble Shooting

XP6: IPM module protection

Reason: Compressor drive module abnormal

Solution:

1. Examine the power supply to verify that it is functioning correctly. Check for potential issues such as abnormal power supply phase voltage, which should typically be within the range of 220-240V. Confirm that the power supply is normal.
2. Examine the heat dissipation of the condenser to verify that it is functioning correctly. Check for potential issues such as blockages caused by dirt or poor return air.
3. Measure the resistance between compressor UWV, which is normally within 20Ω , and UVW resistance to ground, which is normally infinite at the $M\Omega$ level. If the compressor resistance is abnormal, replace the compressor. If the resistance is within normal limits, proceed to the next step.
4. Examine whether the module heat dissipation silicone grease is applied evenly and correctly. If the application is abnormal, apply the silicone grease again. If the application is normal, proceed to the next step.
5. If the previous steps have not identified any issues, run the unit and observe the compressor for any abnormalities, such as abnormal noise, excessive current, or other irregularities. If there are any abnormalities, the compressor should be replaced.
6. Observe the system for poor heat dissipation or module overheating and overcurrent, which can be caused by the mixing of difficult-to-compress gas. If this is the case, replace the main control board.

VRF Trouble Shooting

P7: Insufficient exhaust gas overheat protection

Reason: Too much refrigerant in the system, liquid back in the compressor, problems with the refrigerant system

Solution:

1. Examine whether the exhaust temperature sensor is accurate. If it is inaccurate, replace it. If the sensor is accurate, the problem may lie within the refrigerant system.
2. Attach a pressure gauge to examine the high and low pressures. Verify items 15/23/24 to determine if there is an excessive amount of refrigerant. If there is too much refrigerant, release the excess refrigerant.
3. Inspect the indoor unit to identify potential issues with poor evaporation or other problems. This could include blockages in the air return or supply, dirty or clogged filters, or other factors that may affect the unit's evaporative capabilities.

VRF Trouble Shooting

XP8: The outdoor unit capacity dial code does not match the compressor drive model protection

Reason: Dial code problem, fan module detection is abnormal

Solution:

1. Examine whether the SW11 capability dialing code of the main control board is correct. If it is incorrect, correct the dialing code to the appropriate setting.
2. Verify whether the dialing code of the IPM module board is correct. If it is incorrect, correct the dialing code to the appropriate setting.
3. After correcting the dialing code, power on the system again. If the problem persists, replace the main control board.

DIP switch on IPM:

ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8-18HP
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20-22HP
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24-32HP (IPM. A&B)

Sw11 setting for outdoor unit capacity:

	Set	0	1	2	3	4	5	6	7	8	9
	Capacity	8HP	10HP	12HP	14HP	16HP	18HP	20HP	22HP	24HP	26HP
	Set	A	B	C	D	E	F				
	Capacity	28HP	30HP	32HP	Reserved	Reserved	Reserved				

XP9: DC fan module protection

Reason: Fan drive module abnormal

Solution:

1. Examine the power supply to verify that it is functioning correctly. Check for potential issues such as abnormal power supply phase voltage, which should typically be within the range of 220-240V. Confirm that the power supply is normal.
2. Examine the input voltage of the rectifier bridge to verify that it is 220V. If it is not 220V, the filter board should be replaced.
3. Examine the output of the rectifier bridge to verify that it is 310V. If it is not 310V, the rectifier bridge should be replaced. If the output is correct, proceed to the next step.
4. Verify that the DC+/DC- of the fan module board is 310V. If it is not 310V, the filter board should be replaced. If the voltage is correct, proceed to the next step.
5. Examine whether the FAN POWER interface of the main control board is DC12V. If it is not DC12V, the main control board should be replaced. If the voltage is correct, proceed to the next step.
6. Inspect the communication line between the main control board and the fan module to verify that it is firmly connected and not open or shorted. If there is an issue with the communication line, replace it and proceed to the next step.
7. Utilize a multimeter to measure the resistance between the UVW of the motor to verify that it is not open or shorted and is within 20Ω. Measure the resistance of UVW to ground, which should be a normal infinity at the MΩ level. If the resistance is not within normal limits, the motor may be damaged and should be replaced.

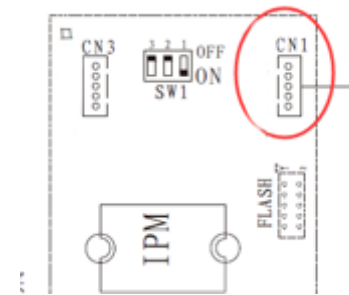
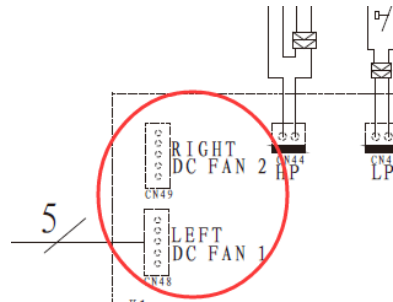
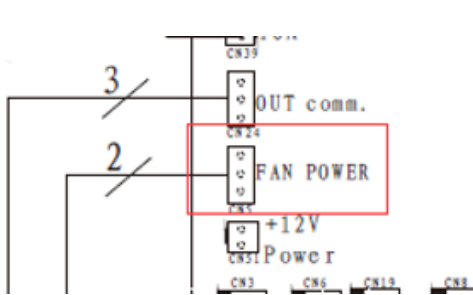
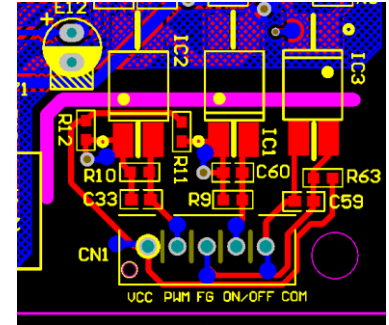
VRF Trouble Shooting

XP9: DC fan module protection

Reason: Fan drive module abnormal

Solution:

8. Measure the voltage between VCC and COM to verify that it is normally DC5V. If the voltage is not DC5V, the main control board should be replaced.
9. Measure PWM-COM and verify that DC0V is off and that normal DC2.5V voltage fluctuates. If the voltage is not within normal limits, the main control board should be replaced.
10. If the voltages of VCC-COM and PWM-COM are normal and the issue persists, the module board should be replaced. If the problem still cannot be resolved, replace the motor.



The communication port connects with the main board.
The power ground is connected to COM.
The fan start signal is controlled by Ctrl.
The signal for starting the fan is 0V, and for closing it is 5V.
The fan speed feedback is indicated by FG.

VRF Trouble Shooting

XPA: Module temperature sensor over-temperature protection

Reason: IPM module board temperature is too high

Solution:

1. Examine the heat dissipation of the condenser to verify that it is functioning correctly. Check for potential issues such as blockages caused by dirt or short circuiting of the return air.
2. Verify whether the module heat dissipation silicone grease is applied evenly and correctly. If the application is abnormal, apply the silicone grease again. If the application is normal, proceed to the next step.
3. Examine the system for poor heat dissipation or module overheating and overcurrent, which can be caused by the mixing of difficult-to-compress gas. If this is the case, replace the IPM module board.



OMEGA

VRF

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