AC-DC Series Product Common Failure Analysis

Applicable Models: QM,QO and PVDP Series

Failure Description	Causes	Corrective Measures
Module fails to start normally	1. Excessive external capacitive load at output; 2. Insufficient input power; 3. Output load is too heavy, or the rear-end load has excessive inrush current during startup; 4. For QO series modules: External capacitor not added as required by the technical manual.	1. Ensure external output capacitance does not exceed the maximum capacitive load specified in the technical manual; 2. Increase the power capacity of the input source; 3. Use a higher-power module or reduce the output load; 4. Add external capacitor as per the technical manual parameters.
Module fails instantly during startup	1. Surge current exists during module startup; 2. Output load is too heavy, or the rear-end load has excessive inrush current during startup; 3. Input voltage is too high.	1. Add a surge suppression circuit at the module input as recommended in the technical manual; 2. Use a higher-power module or reduce the output load; 3. Reduce input voltage to meet the requirements in the technical manual.
Output voltage too low	1. Insufficient power from input source; 2. Output load (including capacitive/inductive loads) is too heavy; 3. Excessive wiring loss between the load and module output.	1. Increase the power capacity of the input source; 2. Use a higher-power module or reduce the output load (including capacitive/inductive loads); 3. Reduce wiring impedance between the load and module output.
No output after short-term use	1. Output terminal has an external short circuit; 2. Input fuse blown or PTC thermistor overheated causing excessive resistance; 3. Input voltage does not meet specification requirements; 4. For DM120/240 series: Over-temperature causing the product to enter thermal shutdown.	1. Check for soldering errors on output pins; 2. Check fuse and PTC thermistor values to confirm specifications are adequate; 3. Ensure input voltage is within the technical specifications; 4. Investigate cause of overheating and improve heat dissipation.

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Failure Description	Causes	Corrective Measures
Excessive output ripple/noise	1. Inadequate external filtering at output; 2. Oscilloscope ground connection unreliable; 3. Inconsistent oscilloscope bandwidth selection; 4. System interference.	1. Add filtering circuits/parameters per recommendations in the technical manual; 2. Ensure oscilloscope ground connection is secure; 3. Use 20MHz bandwidth for standard noise measurement; 4. Test module separately to confirm system interference; Contact our FAE.
Module damaged after operating for a period	1. Input voltage too high/too low during operation; 2. Reverse voltage (e.g., from inductive loads like relays) at module output; 3. Ambient temperature too high; 4. Output load too heavy; 5. Lightning/surge damage.	1. Strictly maintain input voltage within operating range; 2. Add diode and TVS at module output; 3. Derate power usage at high temps (use derating curve), improve heat dissipation, avoid enclosed spaces; 4. Use a higher-power module or reduce output load; 5. Implement protection circuit per technical manual; 6. Add surge suppression circuit at input per technical manual.
Triple-output module: Positive output accurate, but ± outputs severely low	1. Positive output terminal unloaded; 2. Positive output load too light while ± outputs overloaded.	1. Use a ± dual-output AC/DC, or add appropriate dummy load to positive output; 2. Add dummy load to positive output; or use a lower-power module; or use a single positive-output AC/DC plus a ± dual-output DC/DC.
Dual-output (±) module: Positive voltage low, negative voltage high	Imbalanced load between positive and negative outputs (heavier load on one side causes lower voltage).	1. Add dummy load to the lightly loaded output to balance loads (ratio ≤ 2:1); 2. Use a single-output AC/DC plus a ± dual-output DC/DC to provide balanced voltage.
Increased output ripple & inability to handle load after operating period	Ambient operating temperature too high.	1. Mount module away from high-power heat sources; 2. Implement heat dissipation measures to lower ambient temperature; 3. Strictly follow derating curve in technical manual at high temperatures.

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Failure Description	Causes	Corrective Measures
Module interferes with system / Fails EMC requirements	1. Module too close to system-sensitive components; 2. EMC circuit not added per technical manual.	1. Increase distance to sensitive components and add shielding; 2. Add recommended EMC protection circuit per technical manual.
Audible noise after power-on	1. Module in light-load skip-mode (frequency within audible range); 2. Impedance mismatch between module output and rear-end load.	1. Ensure rear-end load is ≥10% or within recommended range; Noise is normal if function is unaffected; 2. Add external capacitor at output for debugging per application needs.
No output/low voltage when near walkie-talkie	Walkie-talkie RF interference (exceeds product immunity rating).	Keep product >10cm away from walkie-talkies.
Module functional, but system fails	System program timing conflicts with module power-up/startup delay time.	Optimize system software program timing.

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