ED300 Series Variable Frequency Drive Specification

Product ED300-T4F15-1.5

Model：

Version： V1.0

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2026-7-25	2026-8-1	2026-8-1

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Revision History			
Date	**Revision version**	**Revision Notes**	**Reviser**
2026-7-25	V1.0	New formulation	Jason

Catalog

1. Product Overview 6
2. Technical Specifications 7
2.1. Key Specifications 7
2.2. Terminal Definitions 8
2.3. DIP Switch Configuration 9
3. Product Features 10
4. Product Dimensions 11
5. Wiring Diagram 12
6. Communication Protocol 13
7. Fault Protection & Troubleshooting Guide 17

IMPORTANT SAFETY WARNINGS



★ Improper use may result in hazardous conditions, potentially causing personal injury or loss of life.

★ Improper use may result in hazardous conditions, potentially causing equipment damage or accelerated deterioration.

★Even precautionary instructions may lead to dangerous situations depending on changing conditions.

★ Install the unit on a non-combustible surface (e.g., metal panel) and ensure it is securely mounted to prevent falling due to vibration.

★ Do not install the controller if it is damaged or has missing components.

★ Do not install the unit in locations exposed to direct sunlight, strong airflow, or water mist.

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★ Ensure the power supply is turned OFF before wiring.

★ Wiring must be performed by qualified electrical personnel.

★ The input terminals are dry contact signals — do NOT connect to a power source.

★ Implement system-level protection mechanisms to prevent hazardous conditions caused by controller failure.

★ Follow the principle of separation between high-voltage and low-voltage wiring.

★ Use cables that comply with the specified technical requirements.

★ Use a parallel grounding method, and ensure the grounding conductor is as thick as possible.

★ Use an appropriate screwdriver when tightening screws; incorrect tools may cause screw head stripping.

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★ Set the appropriate jumpers / DIP switches according to the machine configuration.

★ Before operation, verify that all wiring is correct, then apply power.

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★ Do not inspect or probe signals during operation.

★ Do not arbitrarily modify parameter settings during operation.

★ Maintain a safe distance from the machine during operation. ★ For any repair requirements, contact the manufacturer. Do not attempt unauthorized repairs.

★ Do not pull, twist, or excessively bend power cables or communication cables, as this may cause serious faults.

★ Do not directly touch electronic components on the control board to avoid electrostatic discharge (ESD) damage.

★ The manufacturer reserves the right to correct defects caused by hardware limitations, but assumes no liability for resulting consequences.

★ The manufacturer shall not be held responsible for any consequences caused by improper use.

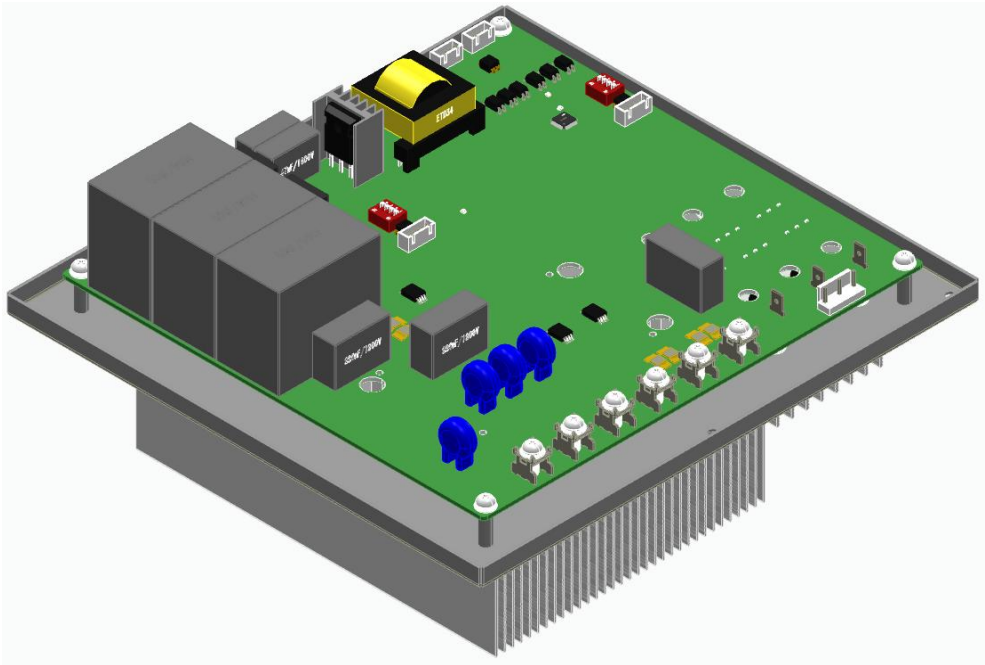
★ The manufacturer reserves the right to provide on-site service to end users, but is not obligated to do so.

1. Product Overview

The ED300 Series Variable Frequency Drive (VFD) Controller is specifically designed for air conditioning and heat pump applications, featuring a three-phase 380V–480V AC input and a dual-inverter output drive architecture.The two output channels independently drive the compressor and the fan.The compressor side is compatible with induction motors,brushless DC motors and permanent magnet synchronous motors.The fan side supports brushless DC motors.

The core advantage of this product lies in its precise control of compressor speed and torque. By dynamically adjusting the input frequency and voltage, it achieves high energy efficiency,smooth operation,wide capacity modulation range and comprehensive protection mechanisms.

The controller integrates rectifier unit,inverter unit,DC bus capacitors, switching power supply and MCU based main control circuit.It incorporates real-time control algorithms responsible for signal processing,logical computation and communication scheduling.In addition, it provides multiple protection functions including over-current,over-voltage,under-voltage,over-temperature and overload.The controller features a standard Modbus interface, supporting data exchange with the host computer, remote monitoring, parameter configuration, and centralized management.

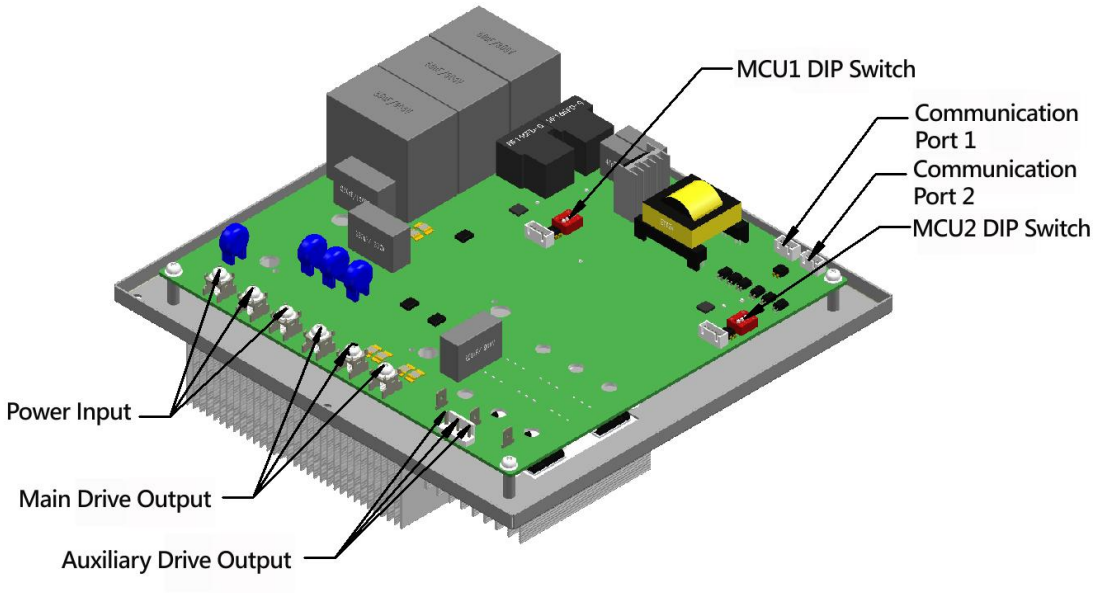


2. Technical Specifications

2.1. Key Specifications

Parameter	Specification	
Model	ED300-T4F15-1.5	ED300-T4F22-1.5
Operating Voltage Range	Three-phrase 380V AC～480V AC±15% 50/60Hz	
Maximum Output Power	Main drive: 23 kW; Auxiliary drive: 2 kW	Main drive: 32 kW; Auxiliary drive: 2 kW
Maximum Input RMS Current	Main drive: 35 A; Auxiliary drive: 6 A	Main drive: 48 A; Auxiliary drive: 6 A
Output Mechanical Frequency Range	10～130rps	
Efficiency	96%	
Communication Interface	RS485	
Cooling Method	Forced air cooling	
Operating Environment	Temperature: -30°C to +55°C Relative Humidity: 5%–95% RH	
Storage Environment	Temperature: -40°C to +70°C Relative Humidity: 5%–95% RH (non-condensing, dust-free)	
Altitude	≤1000 m (no derating); above 1000 m: derate 1% per 100 m; max. 3000 m	

2.2. Terminal Definitions



Terminal	Specification	Function	Remarks
R、S、T	M5 screw terminals	AC power input	
U、V、W	M5 screw terminals	Compressor connection	
U1、V1、W1	XH3.96-5(2/4-pin)	Fan connection	
CN1 CN2	XH2.54-4	485communication interfaces (2 channels)	V：NC A：485 signal A+ B：485 signal B- G：48 Signal ground

2.3. DIP Switch Configuration

SW3： Main Compressor Address Setting				
S/N	Communication ID	DIP switch position		Remarks
		2	1	
1	1	OFF	OFF	
2	2	OFF	ON	
3	3	ON	OFF	
4	4	ON	ON	

SW5:Auxiliary Compressor Address Setting				
S/N	Communication ID	DIP switch position		Remarks
		2	1	
1	21	OFF	OFF	
2	22	OFF	ON	
3	23	ON	OFF	
4	24	ON	ON	

3. Product Features

1、 The controller adopts sensorless SVPWM (Space Vector PWM) sinusoidal control, effectively reducing harmonics,motor vibration, torque ripple and noise

2、 The compressor uses a closed-loop starting control strategy, ensuring smooth startup,reduced starting current and minimal impact on the power grid.

3、 Field weakening control and MTPA (Maximum Torque Per Ampere) control improve the compressor's operating frequency range

4、 A dual closed-loop control strategy is implemented.Outer loop (speed loop) ensures stable frequency operation.Inner loop (current loop) ensures precise torque output.

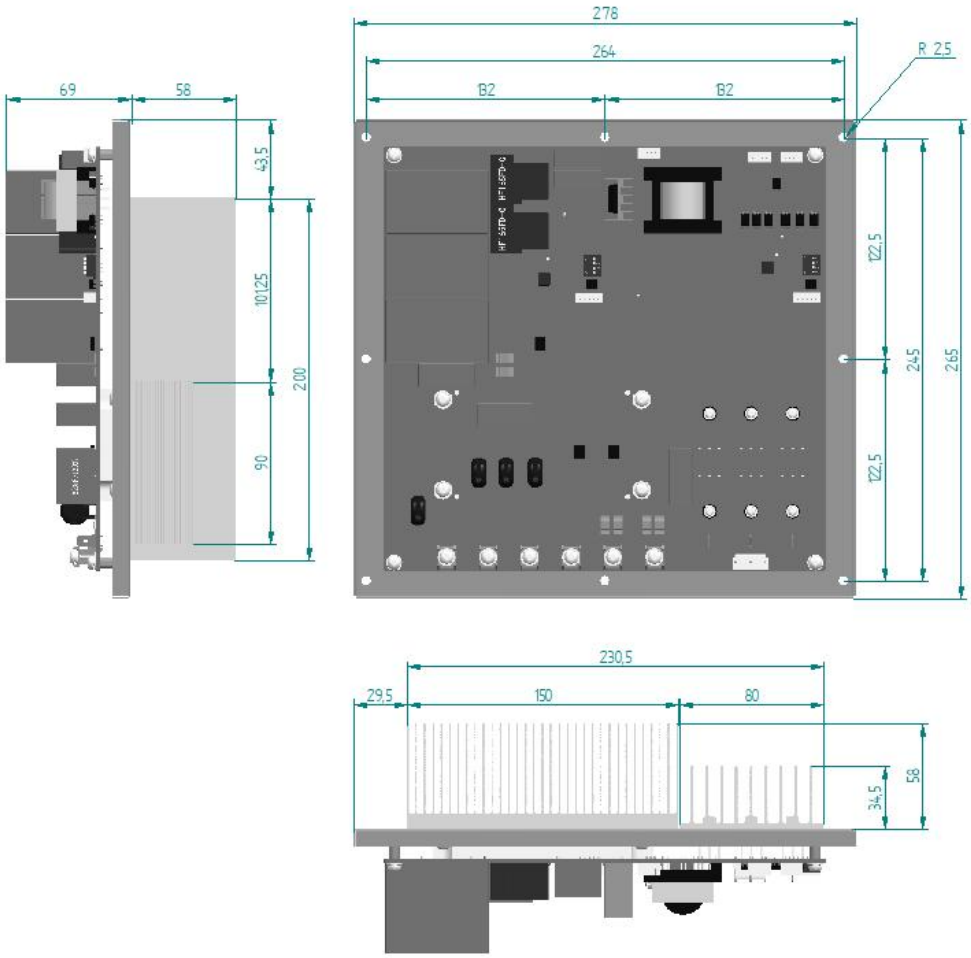
5、Ultra-Wide Operating Voltage Range: Capable of stable operation within a three-phase AC voltage range of 380V–480V ±15%.

6、 Wide Operating Envelope & Fast Dynamic Response: Supports continuous compressor motor speed regulation from 10 to 130 rps, fully accommodating all-operating-condition demands of HVAC and heat pump systems from low to high loads.

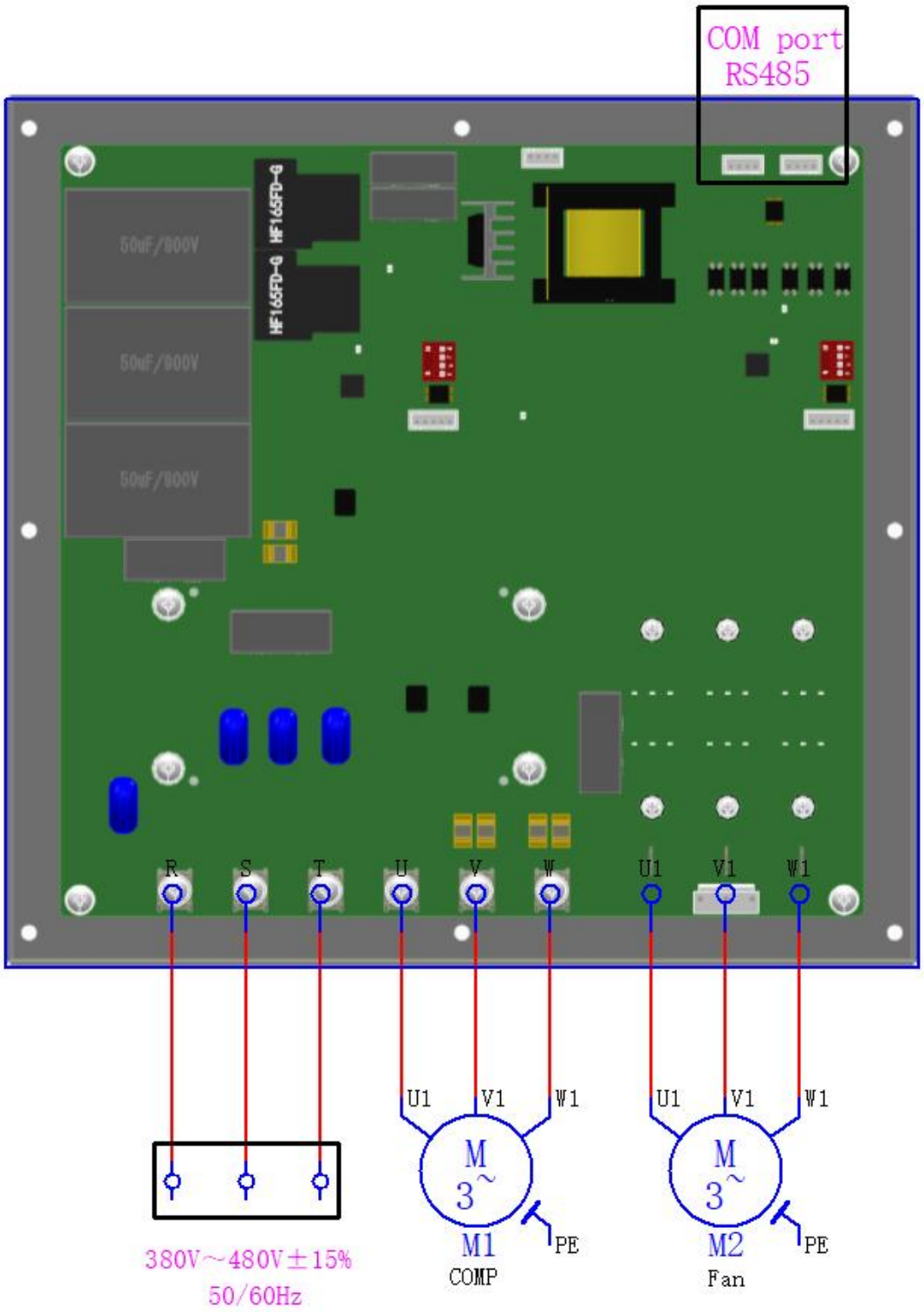
7、 High Efficiency, Compact Footprint, and High Integration: Designed for optimized manufacturability, streamlined testing, and ease of maintenance.

8、 Comprehensive Protection Suite: Integrates multiple protection features (including under-voltage, over-voltage, over-current, and over-temperature). Powered by a high-performance MCU optimized for rapid digital signal processing (DSP) algorithms, enabling ultra-fast protection response times to ensure high system efficiency and operational reliability.

4. Product Dimensions



5. Wiring Diagram



6. Communication Protocol

Interface & Protocol: RS485, Asynchronous, Half-Duplex Baud Rate: 9600 bps Data Bits: 8 Stop Bits: 1 Parity: None （Main and auxiliary compressors share identical parameter register addresses, distinguished by their respective Modbus Slave IDs.）

Address	Parameter/name	Range	Default	Unit	Remarks
2001	Run/Stop Control	0～1	0	--	Cleared on power loss
2002	Target Speed Command	Main：10～160 Aux：100～1500	0	Main：rps Aux：rpm	Cleared on power loss
2003	Compressor Model	0～1000	0	--	Refer to Configuration list
2004	Acceleration Rate 1	0～5	3	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 0～60rps range
2005	Deceleration Rate 1	0～5	2	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 0～60rps range
2006	Acceleration Rate2	0～5	2	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 61～75rps range
2007	Deceleration Rate2	0～5	2	Hz/S	0=0.5Hz/S

Address	Parameter/name	Range	Default	Unit	Remarks
					1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 61～75rps range
2008	Acceleration Rate3	0～5	1	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 76～120rps range
2009	Deceleration Rate3	0～5	2	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S 3=3Hz/S 4=4Hz/S 5=5Hz/S 76～120rps range
2010	Emergency Stop Deceleration Rate	0～20	6	Hz/S	0=0.5Hz/S 1=1Hz/S 2=2Hz/S ..... 20=20Hz/S
2011	Max. Speed Limit	10～160	140	rps	
2012	Min. Speed Limit	10～160	15	rps	
2013	Fault Recovery Setting	0～1	0	- -	Cleared on power-off
3001	Drive Status	- -	read-only	- -	Bit0：0=OFF,1=ON Bit1～2： 00=Stable

Address	Parameter/name	Range	Default	Unit	Remarks
					01=Accelerating 10=Decelerating Others：Reserved
3002	Operating Status	- -	Read-only	- -	0 = Standby 1 = Initial Position Detection 2 = Startup 3 = Running 4 = Braking 5 = Stop 6 = Fault
3003	Fault Code	- -	Read-only	- -	Bit 0: Hardware Over-current Bit 1: Software Over-current Bit 2: Phase Current Sensing Abnormality Bit 3: Pre-charge Circuit Fault Bit 4: DC Bus Over-voltage Bit 5: DC Bus Under-voltage Bit 6: IPM Over-Temperature Protection Bit 7: Reserved (N/A) Bit 8: Compressor Over-speed Bit 9: Reserved (N/A) Bit 10: Compressor Phase Loss Bit 11: Compressor Startup Failure Bit 12: NTC Sensor Fault Bit 13: Reserved (N/A) Bit 14: Compressor/Fan Mismatch Error Bit 15: AC Grid Input Phase Loss
3004	Module Temperature	-55～200	Read-only	℃	0～255=-55～200℃
3005	Ambient	-55～200	Read-onl	℃	0～255=-55～200℃

Address	Parameter/name	Range	Default	Unit	Remarks
	Temperature		y		
3006	Motor RMS Current	1～100	Read-only	A	512=1A;51200=100A
3011	Compressor Speed Feedback	10～160	Read-only	rps	
3012	DC Bus Voltage	1～800	Read-only	V	64=1V;51200=800V
3013	Output Voltage	0～400	Read-only	Vrms	0～400=0～400Vrms
3018	Compressor Runtime	0～65000	Read-only	H	0～65000=0～65000H
3019	Firmware Version	- -	Read-only	- -	Actual value prevails

7. Fault Protection & Troubleshooting Guide

Fault Name	Description	Cause Analysis	Cause Analysis
Hardware Over-current	The drive output current exceeds the hardware preset threshold. After 3 minutes of alarm, the system evaluates recovery and performs automatic reset. If the fault occurs 3 times within 1 hour, the system locks and requires module reset or power cycling. Fault counter is cleared afterward.	1. Ground fault or short circuit in inverter output circuit 2. Incorrect motor parameter configuration or mismatch with actual motor	1. Check whether the motor input circuit is shorted or grounded 2. Verify software version and motor model; update drive parameters if inconsistent
Software Over-current	Phase current exceeds the software preset threshold for more than 2 carrier cycles (222 μs). After 3 minutes of alarm, the system evaluates recovery and performs automatic reset. If the fault occurs 3 times within 1 hour, the system locks and requires module reset or power cycling. Fault counter is cleared afterward.	1. Output current exceeds configured threshold 2. Motor parameters mismatch	1. Ensure current limit does not exceed motor rated current 2. If fault persists, investigate root cause of motor overload 3. Verify motor model and update parameters if necessary
Phase Current Detection Fault	The offset voltage of phase current detection is higher than 3V or lower than 2V. After 3 minutes of alarm, the system evaluates recovery and performs automatic reset. If the fault occurs 3 times within 1 hour, the system locks and requires module reset or power cycling. Fault counter is cleared afterward.	1. Main power circuit not energized 2. Current sensing circuit failure	1. Measure input voltage after power-on using a multimeter 2. If current sensing circuit is faulty, contact manufacturer
Pre-charge Fault	Upon power-on, DC bus voltage remains below 400V for more than 500 ms.	1. Abnormal input voltage 2. Pre-charge circuit	1. Measure input voltage after power-on 2. If precharge circuit is faulty,

Fault Name	Description	Cause Analysis	Cause Analysis
		failure	contact manufacturer
DC Bus Over-voltage	Triggered when DC bus voltage exceeds preset threshold.	Input voltage too high	Verify input voltage is within 380–480V AC ±15%
DC Bus Under-voltage	Triggered when DC bus voltage falls below preset threshold	Input voltage too low	Verify input voltage is within 380–480V AC ±15%
Module Over-temperature Protection	Triggered when module temperature exceeds 105°C	1.High ambient temperature 2. Blocked airflow 3. Cooling fan failure 4. Temperature sensor failure	1. Ensure ambient temperature is below 55°C 2. Clean air ducts 3. Replace cooling fan 4. Contact manufacturer
Compressor Over-speed Fault	Triggered when motor speed exceeds 9000 rpm (150 Hz) for more than 2 seconds.	Large deviation between feedback speed and set speed	Contact manufacturer
Compressor Phase Loss Fault	Triggered when: any phase current >5A AND less than 1/6 of total three-phase current, lasting >1s.	1. Loose motor wiring 2. Motor damage	1. Check wiring and ensure proper terminal contact 2. Replace compressor or fan
Module Temperature Sensor Fault	Triggered when sensor value exceeds detection range (-50°C to 150°C).	Temperature sensor failure	Contact manufacturer
Compressor/Fan Mismatch Faul	Triggered when stored compressor model does not match the model received from main controller	--	--
Grid Phase Loss Fault	Detected by hardware pulse signal and evaluated by software.	1、Missing input phase 2. Loose input wiring	1. Ensure input power is three-phase 380–480V 2. Tighten input terminals

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