

DEWIN MS500-2S-2.2G

DEWIN MS500-2S-2.2G Variable Frequency Drive (VFD) User Manual

2.2kW, 220V Single Phase Input, Three-Phase Output

1. INTRODUCTION

This manual provides essential information for the safe and efficient operation of your DEWIN MS500-2S-2.2G Variable Frequency Drive (VFD). Please read this manual thoroughly before installation, operation, or maintenance to ensure proper use and prevent potential hazards. This VFD is designed to control the speed of three-phase asynchronous motors from a single-phase 220V input.

2. SAFETY INFORMATION

WARNING: Risk of electrical shock. Read the user manual before operation. Wait at least 10 minutes after removing power before servicing. Do not connect AC power to output terminals U/T1, V/T2, and W/T3.

Always observe the following safety precautions:

- Installation and wiring must be performed by qualified personnel only.
- Ensure the power supply is disconnected before any wiring or maintenance.
- Verify correct voltage and current ratings before connecting the VFD.
- Do not operate the VFD with damaged cables or components.
- Ensure proper grounding to prevent electrical shock.
- Keep the VFD away from moisture, direct sunlight, and corrosive environments.
- Do not touch internal components immediately after power-off, as residual voltage may be present.

AVERTISSEMENT:

À utiliser sous la surveillance directe d'un adulte.

WARNING:

To be used under the direct supervision of an adult.

ADVERTENCIA:

Debe usarse bajo la supervisión directa de un adulto.

AVERTENZA:

Da utilizzare sotto la diretta supervisione di un adulto.

WARNUNG:

Nur unter unmittelbarer Aufsicht eines Erwachsenen zu verwenden.

Figure 2.1: Multi-language warning label indicating the need for adult supervision and caution with electrical components.

3. PRODUCT FEATURES

The DEWIN MS500-2S-2.2G VFD offers advanced features for precise motor control:

- **Multiple Control Algorithms:** Supports asynchronous motor VF control, current vector open-loop control, permanent magnet synchronous motor standard open-loop control, and open-loop vector control. Provides 150% starting torque at 0.5Hz (sensorless vector control) for high torque, precision, and wide speed adjustment.
- **Fast Current Limiting Function:** Prevents frequent overcurrent alarms by quickly limiting current within the protection point when it exceeds the set threshold, safeguarding equipment from sudden charging or interference.
- **High-Speed Cooling Fan:** Features an independent heat dissipation duct and high-speed fan for effective cooling, reduced heat, low noise, and long-term stable operation.
- **Torque Limit Protection:** Limits output torque to a preset maximum to protect machinery when the command exceeds its mechanical capacity, ensuring equipment safety while maximizing efficiency.
- **High-Quality Double-Layer Board:** Equipped with an intelligent double-layer board (power board + main board) for high-speed processing. Features a large button design for simple operation and real-time data display on a digital screen.
- **Compact Design:** Small size with a detachable panel for easy installation and convenient screw terminal wiring.

Variable Frequency Drive

Single-phase input 220V, three-phase output 220V inverter

220V 2.2KW

Protect The Motor

Energy Saving

Frequency

Strong Security



Figure 3.1: Overview of the Variable Frequency Drive highlighting key benefits such as motor protection, energy saving, frequency control, and strong security.

Equipped With Radiator

Independent cooling air duct further reduces heat, strong heat dissipation, low noise, ensuring long-term stable operation of the equipment



Figure 3.2: The VFD is equipped with an independent cooling air duct and fan for efficient heat dissipation, ensuring stable long-term operation.

4. SPECIFICATIONS

Technical specifications for the DEWIN MS500-2S-2.2G VFD:

Parameter	Value
Model Number	MS500-2S-2.2G
Material	Flame retardant ABS plastic
Nominal Input Voltage	Single phase 220V
Nominal Input Frequency	50/60Hz
Nominal Output Voltage	Three-phase 220V
Rated Output Current	10A
Applicable Motor Power	2.2KW

Parameter	Value
Output Frequency (Low Frequency Mode)	0-320Hz
Installation Method	Wall mounted
Protection Level	IP20
Cooling Method	Cooling fan
Dimensions (L x W x H)	Approx. 14.2 x 11.5 x 7.3 cm (5.6 x 4.5 x 2.9 inches)
Item Weight	840 g



Figure 4.1: Physical dimensions of the DEWIN VFD, indicating its compact size for installation.

5. SETUP AND INSTALLATION

5.1 Unpacking and Inspection

Upon receiving the VFD, carefully unpack it and inspect for any signs of damage during transit. Ensure all components listed in the packing list are present. If any damage or missing parts are found, contact your

supplier immediately.

5.2 Mounting

The VFD is designed for wall-mounted installation. Choose a location that is:

- Well-ventilated to allow for proper heat dissipation.
- Free from excessive dust, moisture, and corrosive gases.
- Away from direct sunlight and high temperatures.
- Stable and capable of supporting the VFD's weight.

Ensure adequate clearance around the VFD for airflow, especially around the cooling fan area.

5.3 Wiring

WARNING: All wiring must be performed by a qualified electrician. Ensure power is disconnected before making any connections.

Follow the wiring diagrams carefully. The VFD requires a single-phase 220V input and provides a three-phase 220V output for the motor.

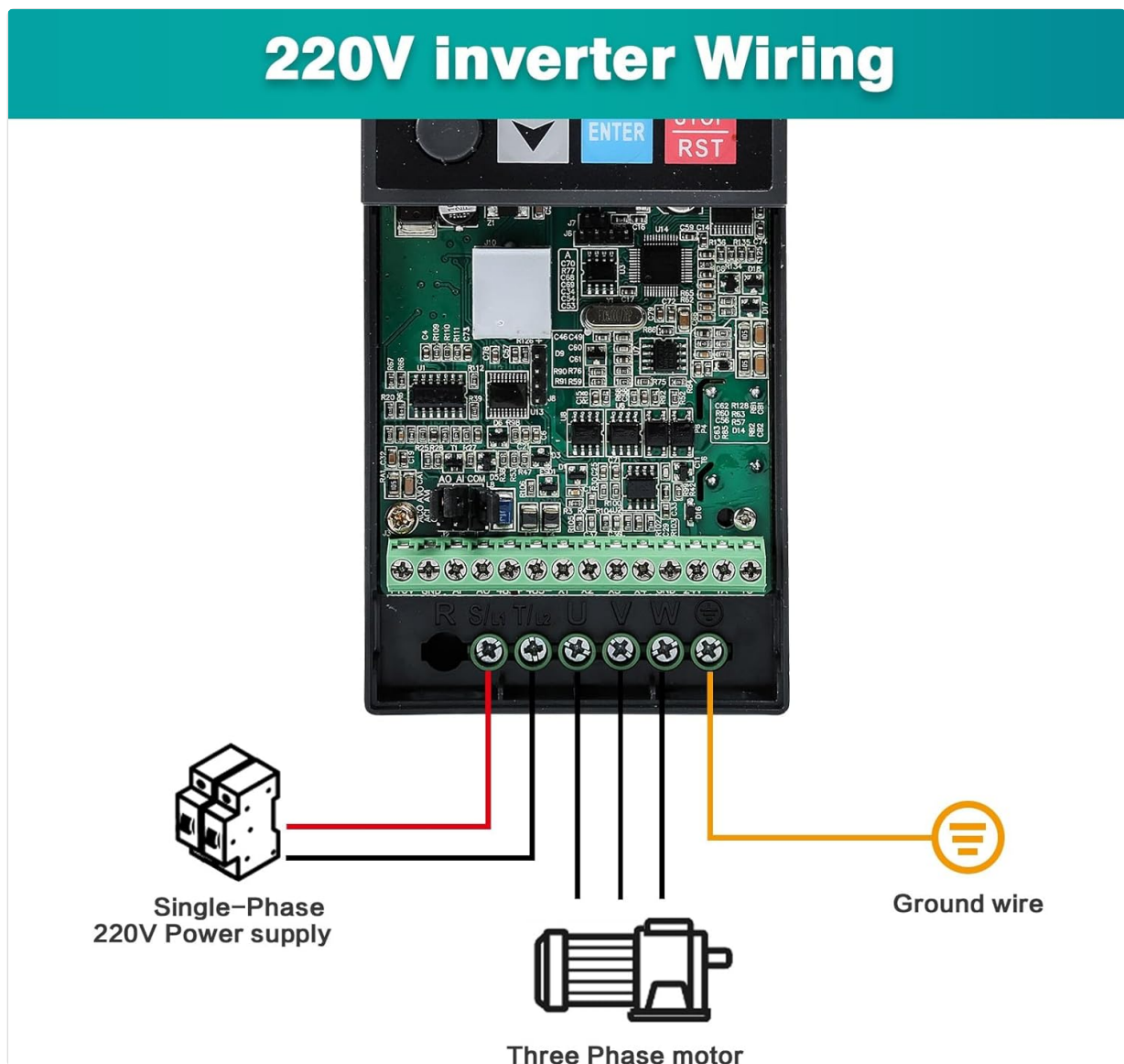


Figure 5.1: Detailed wiring connections for the 220V inverter, illustrating the single-phase 220V power supply, ground wire, and three-phase motor connections (U, V, W terminals).

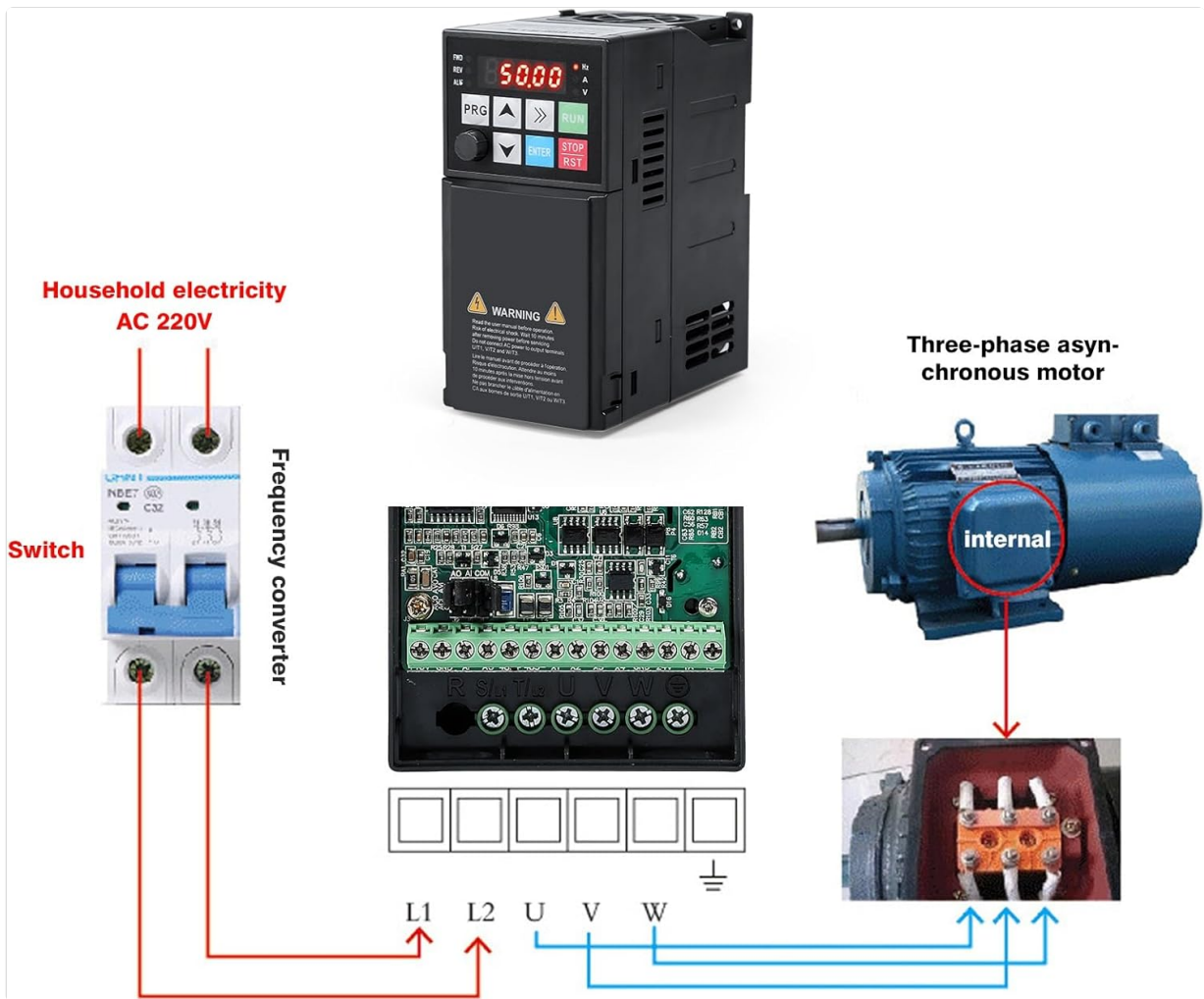


Figure 5.2: Conceptual wiring diagram showing the connection from household single-phase AC 220V electricity, through a switch and the frequency converter, to a three-phase asynchronous motor.

Basic operation Wiring Diagram

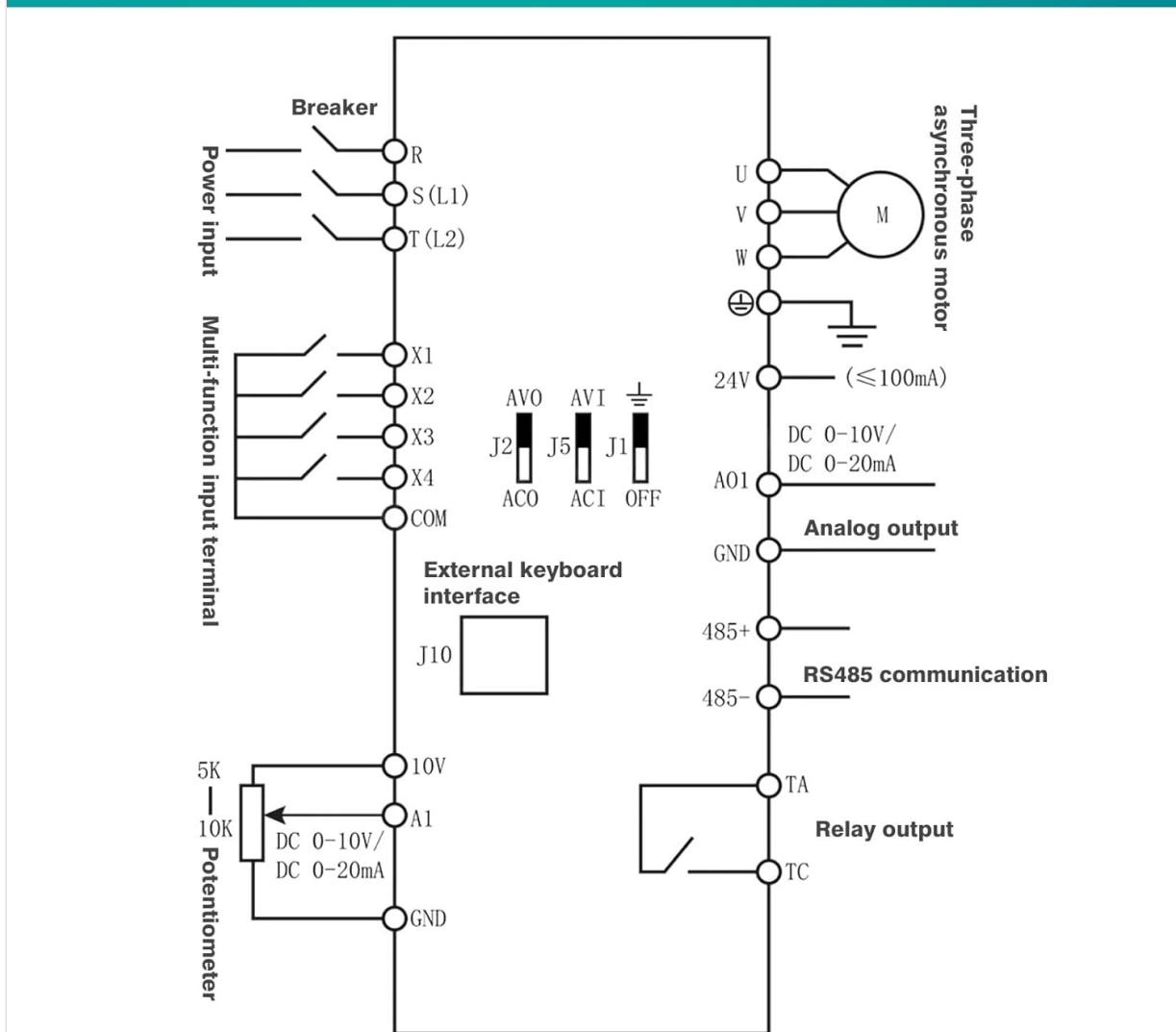


Figure 5.3: Comprehensive basic operation wiring diagram, detailing connections for power input (R, S, T), multi-function input terminals (X1-X4, COM), external keyboard interface, analog output (AO1, GND), RS485 communication (485+, 485-), relay output (TA, TC), and potentiometer (5K, 10K, A1, GND) for external control.

Terminal Connections:

- **Input (L1, L2):** Connect single-phase 220V AC power.
- **Output (U, V, W):** Connect to the three-phase motor terminals.
- **Ground (GND):** Connect to a reliable earth ground.
- **Control Terminals (X1-X4, COM, A1, etc.):** These are for external control signals such as start/stop, forward/reverse, analog speed reference (potentiometer), and communication. Refer to the detailed wiring diagram for specific functions.

6. OPERATING INSTRUCTIONS

6.1 Control Panel Overview

The VFD features a user-friendly control panel for monitoring and setting parameters.

Keyboard operation instructions



Figure 6.1: The VFD's keyboard operation instructions, showing the layout of the status display area, numeric up/down keys, frequency setting knob, parameter data setting button (PRG), Run key, and Stop/Reset button (RST).

- **Status Display Area:** Shows current frequency, voltage, current, and operational status (FWD/REV, ALM).
- **PRG (Program) Button:** Enters/exits parameter setting mode.
- **Up/Down Arrows:** Used to navigate parameters or adjust values.
- **ENTER Button:** Confirms parameter selection or value changes.
- **RUN Button:** Starts motor operation.
- **STOP/RST Button:** Stops motor operation or resets alarms.
- **Frequency Setting Knob:** Adjusts the output frequency (and thus motor speed) in real-time.

6.2 Basic Operation

1. **Power On:** After ensuring all wiring is correct and secure, apply single-phase 220V power to the VFD. The display will light up.
2. **Set Frequency:** Use the frequency setting knob to set the desired output frequency. The display will show the set frequency.
3. **Start Motor:** Press the **RUN** button. The motor will start accelerating to the set frequency.
4. **Stop Motor:** Press the **STOP/RST** button. The motor will decelerate and stop.

5. **Reverse Direction:** (If configured via control terminals X1-X4) Activate the appropriate control terminal to change motor direction. Refer to the detailed parameter manual for specific settings.

6.3 Parameter Setting

To access and modify advanced parameters:

1. Press the **PRG** button to enter parameter setting mode. The display will show a parameter code (e.g., P00).
2. Use the **Up/Down** arrow buttons to navigate through parameter groups and individual parameters.
3. Press **ENTER** to select a parameter. The current value will be displayed.
4. Use the **Up/Down** arrow buttons or the frequency setting knob to modify the value.
5. Press **ENTER** again to save the new value.
6. Press **PRG** to exit parameter setting mode.

Refer to the complete parameter list in the separate detailed manual for specific parameter functions and ranges.

7. MAINTENANCE

Regular maintenance ensures the longevity and reliable operation of your VFD.

- **Cleaning:** Periodically clean the VFD's exterior and ventilation openings to prevent dust accumulation. Use a soft, dry cloth. Do not use liquid cleaners.
- **Fan Inspection:** Check the cooling fan for proper operation and ensure it is free from obstructions. Replace if noisy or not functioning correctly.
- **Terminal Check:** Periodically inspect all wiring terminals for tightness. Loose connections can cause overheating and malfunction.
- **Environmental Conditions:** Ensure the operating environment remains within specified temperature and humidity ranges.

WARNING: Always disconnect power and wait for at least 10 minutes before performing any maintenance to allow capacitors to discharge.

8. TROUBLESHOOTING

This section provides solutions to common issues. For problems not listed here, contact technical support.

Problem	Possible Cause	Solution
VFD does not power on	No input power; Blown fuse; Incorrect wiring	Check power supply; Inspect fuses; Verify input wiring.
Motor does not start	RUN command not issued; Emergency stop active; Motor wiring error; Overload	Press RUN; Check emergency stop circuit; Verify motor wiring (U, V, W); Reduce load or check motor.
Motor runs in wrong direction	Incorrect phase sequence; Parameter setting for direction	Swap any two motor output phases (U, V, W); Adjust direction parameter (if applicable).

Problem	Possible Cause	Solution
Overcurrent alarm (OC)	Motor overload; Short circuit in motor wiring; Rapid acceleration/deceleration	Reduce load; Check motor and wiring for shorts; Increase acceleration/deceleration time parameters.
Overvoltage alarm (OV)	Input voltage too high; Rapid deceleration with high inertia load	Check input voltage; Increase deceleration time; Consider adding a braking resistor if issue persists.
Undervoltage alarm (UV)	Input voltage too low; Power supply instability	Check input voltage; Ensure stable power supply.
Overheat alarm (OH)	Insufficient cooling; Ambient temperature too high; Fan malfunction	Ensure proper ventilation; Check ambient temperature; Inspect cooling fan.

9. APPLICATIONS

The DEWIN MS500-2S-2.2G VFD is versatile and suitable for a wide range of industrial and commercial applications requiring precise motor speed control. Examples include:

WIDELY APPLICABLE

Suitable for fans, water pumps, oil pumping presses, compressors, conveyor belts, injection molding machines, crushers, mixers, ball mills and other equipment
 Suitable for fans, water pumps, oil pumping presses, compressors, conveyor belts, injection molding machines, crushers, mixers, ball mills and other equipment



Motor



Water Pump



Fan



Blender



Air compressor



Conveyor

Figure 9.1: Examples of equipment where the VFD can be widely applied, including motors, water pumps, fans, blenders, air compressors, and conveyors.

- Fans and ventilation systems
- Water pumps and fluid transfer systems
- Oil pumping presses
- Compressors
- Conveyor belts
- Injection molding machines
- Crushers and mixers
- Ball mills and other general industrial equipment

10. WARRANTY AND SUPPORT

For warranty information, please refer to the terms and conditions provided at the time of purchase or contact your vendor. For technical support, troubleshooting assistance beyond this manual, or spare parts inquiries, please contact DEWIN customer service or your authorized distributor.