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RATTMMOTOR YPMC-1000W

RATTMMOTOR YPMC-1000W 220V Servo Motor Kit Instruction Manual

Model: YPMC-1000W | Brand: RATTMMOTOR

1. INTRODUCTION

1.1 Product Overview

The RATTMMOTOR YPMC-1000W 220V Servo Motor Kit is a high-performance control solution designed for precision automation applications. This kit includes a powerful 1000W AC servo motor (Model: A2M-80SV03230) and a compatible servo motor driver (Model: S2SVD20), offering robust and accurate motion control. It is suitable for integration into CNC engravers, milling machines, robotic systems, and various other industrial automation equipment requiring precise positioning, speed, and torque control.

1.2 What's in the Box

Upon unpacking, verify that all components listed below are present and undamaged.



Image: Overview of the RATTMMOTOR YPMC-1000W Servo Motor Kit components, including the servo motor, servo driver, and various connection cables and accessories.

- 1 x RATTMMOTOR 1000W AC Servo Motor (Model: A2M-80SV03230)
- 1 x RATTMMOTOR Servo Motor Driver (Model: S2SVD20)
- 1 x Motor Power Cable
- 1 x Encoder Cable
- 1 x DB25 Connector (for control signals)
- 1 x Terminal Block Connector
- Mounting Screws and Accessories



Image: A closer view of the RATTMMOTOR YPMC-1000W Servo Motor Kit, showing the servo motor, driver, and the included power and encoder cables, along with the DB25 and terminal block connectors.

2. SAFETY INFORMATION

Read all safety instructions carefully before installation, operation, or maintenance of the servo motor kit. Failure to comply with these instructions may result in personal injury or equipment damage.

- **Electrical Safety:** Ensure the power supply is disconnected before making any electrical connections or performing maintenance. Only qualified personnel should perform electrical wiring.
- **Grounding:** Properly ground the motor and driver to prevent electrical shock.
- **Moving Parts:** Keep hands, clothing, and tools away from rotating parts of the motor during operation.
- **Overload Protection:** Do not exceed the rated specifications of the motor and driver. Use appropriate overcurrent protection.
- **Environment:** Operate the kit within the specified environmental conditions (temperature, humidity, altitude) to ensure optimal performance and longevity.
- **Emergency Stop:** Implement an accessible emergency stop mechanism in your system design.

3. PRODUCT SPECIFICATIONS

3.1 Motor Parameters (Model: A2M-80SV03230)

- **Power:** 1000W
- **Brake:** No
- **Number of Poles:** 5 pairs
- **Rated Power Supply:** 220V
- **Rated Speed:** 3000 r/min
- **Peak Speed:** 6000 r/min
- **Rated Torque:** 3.8 N.m
- **Max Torque:** 11.4 N.m
- **Rated Current:** 4.8A
- **Max Current:** 14.4A
- **Encoder Resolution:** 10000 ppr
- **Protection Structure:** IP65
- **Impact Strength:** 98 m/s²
- **Vibration Resistance:** 49 m/s²
- **Insulation Class:** F
- **Insulation Resistance:** > 20 MΩ DC500V
- **Insulation Withstand Voltage:** AC 1500V 1 minute

UNIT:mm

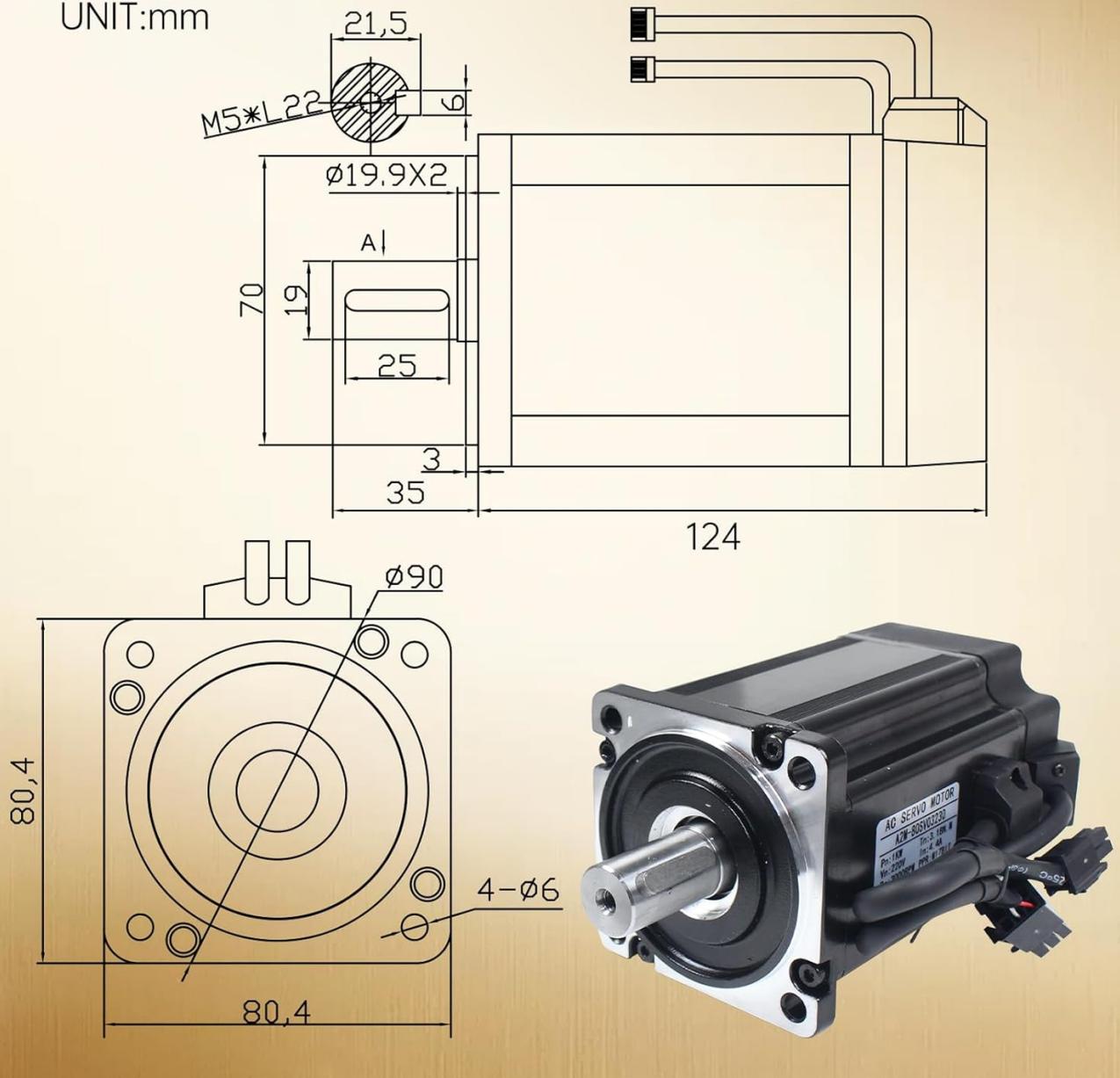


Image: Detailed technical drawing illustrating the dimensions of the servo motor in millimeters, including shaft diameter, mounting hole distances, and overall housing size.

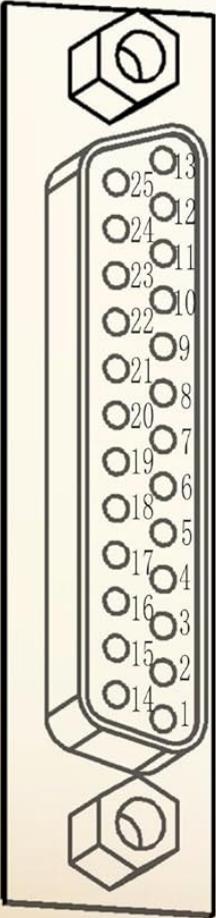
	Pin	Interface No	Name	Function
	DC12~24V COM	9 10	Power supply and ground of control signal	Input power and ground of input/output control signal
	SigIn1 SigIn2 SigIn3 SigIn4	6 7 21 8	Input command signal	Input command signal. Functions assigned to each input signal port at the factory: SigIn1: servo enable SigIn2: Alarm reset SigIn3: position deviation clearing SigIn4: pulse input disabled
	SigOUT1 SigOUT2 SigOUT3 SigOUT4	11 23 12 24	Output command signal	Output command signal. Functions assigned to each output signal port at the factory: SigOUT1: Servo ready SigOUT2: alarm detection SigOUT3: positioning completed SigOUT4: emergency stop detection
	PV PP+ PP- PD+ PD-	2 3 14 4 5	Command pulse input port	PV: open collector input power supply The command pulse can be input in three different ways: 1: Command direction and pulse input 2: Clockwise/counterclockwise pulse input 3: Quadrature pulse input with 90 degree phase difference
	empty empty empty empty empty empty OZ GND	20 19 18 17 15 16 22 1	Encoder signal output	Contact the manufacturer for encoder output function
	Vref AGND	25 13	Analog input	Analog voltage input port. When speed or torque is controlled, it is used to receive speed or torque commands. Voltage input range: -10V~+10V.

Image: A comprehensive table outlining the technical specifications for the 1000W servo motor, including power, torque, speed, current, and environmental ratings.

3.2 Driver Parameters (Model: S2SVD20)

- **Maximum Current:** 20A
- **Input Voltage:** AC220V (50/60Hz)
- **Cooling Method:** Heat dissipation air cooling
- **Encoder Type:** 17-bit magnetic encoder

- **Optional Interfaces (Customization Required):** RS-232, RS-485 interface, Modbus communication protocol for PC/PLC connection.

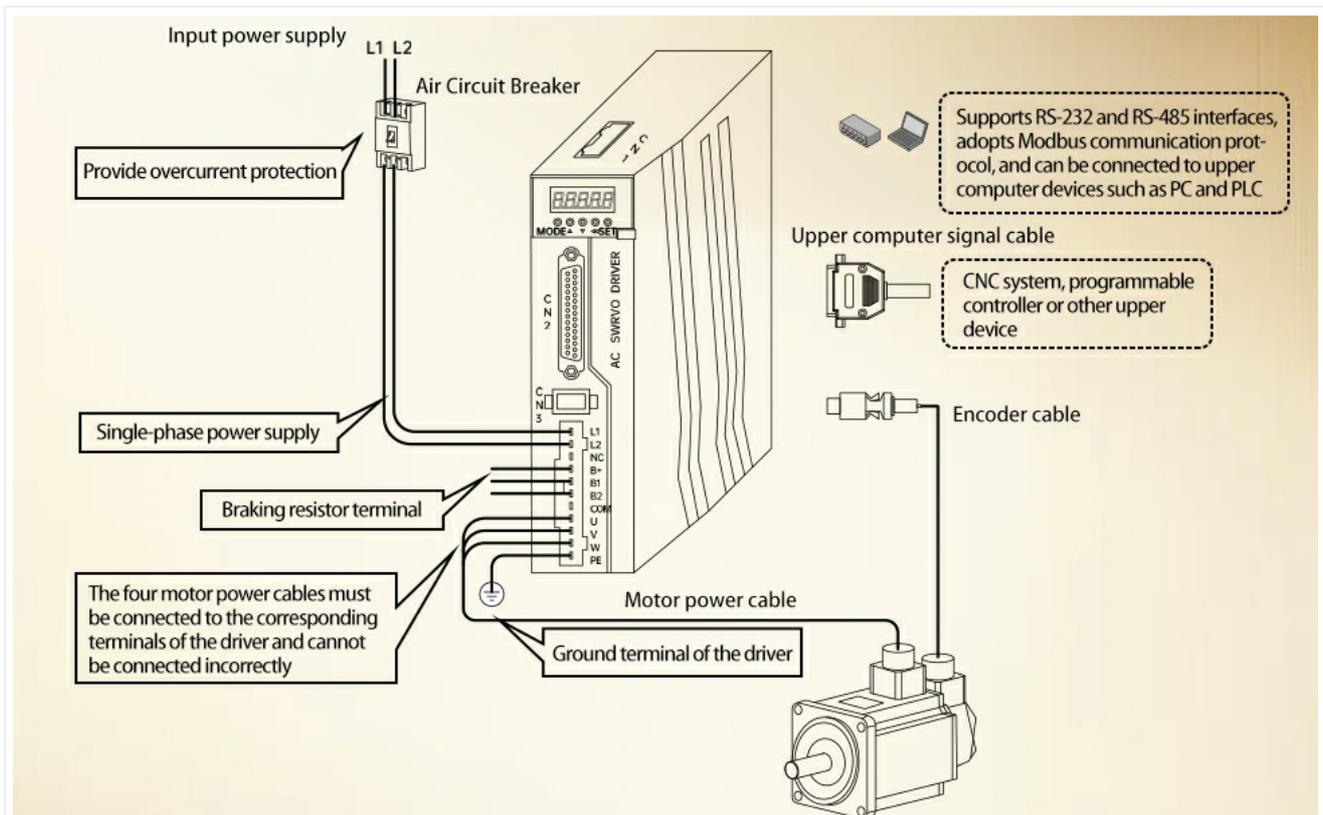


Image: The servo driver unit, showing its compact design and approximate dimensions of 159.5mm x 158.5mm x 41mm, highlighting its suitability for various installations.

4. SETUP AND INSTALLATION

4.1 Wiring Diagram

Follow the wiring diagram carefully to ensure correct and safe connection of the servo motor and driver to your system. Incorrect wiring can lead to malfunction or damage.

THE 220V SERVO UNIT

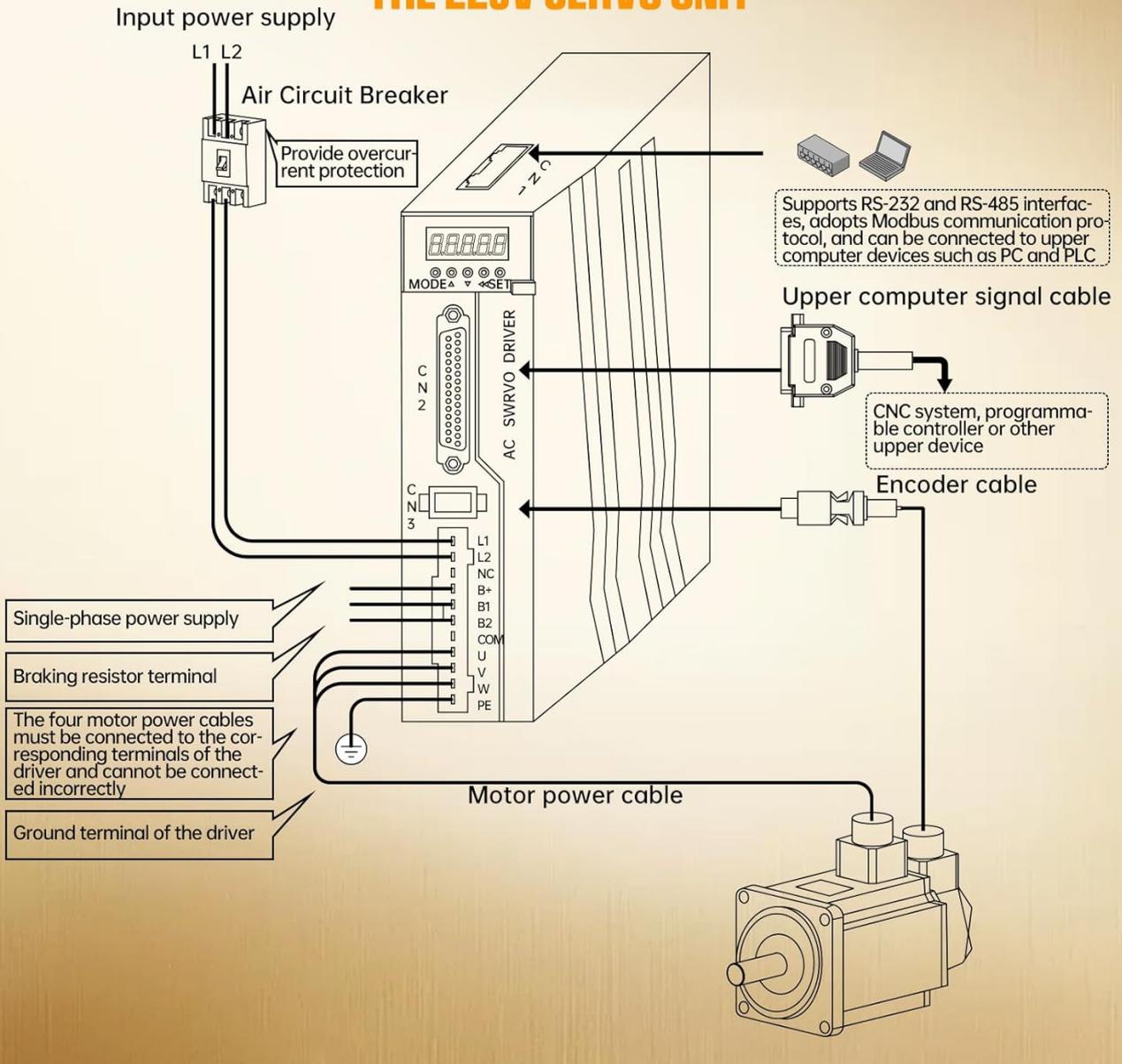


Image: A detailed wiring diagram for the 220V servo unit, illustrating connections for input power supply (L1, L2), air circuit breaker, braking resistor terminal, motor power cable (U, V, W), ground terminal, encoder cable, and upper computer signal cable to the CNC system.

- **Power Supply:** Connect the AC220V single-phase power supply to L1 and L2 terminals. Ensure an air circuit breaker is installed for overcurrent protection.
- **Motor Connection:** Connect the four motor power cables (U, V, W, and ground) to the corresponding terminals on the driver. Verify correct phase sequence.
- **Braking Resistor:** If applicable, connect the braking resistor to its designated terminals.
- **Encoder Cable:** Connect the encoder cable from the motor to the CN3 port on the driver.
- **Control Signal Cable:** Connect the upper computer signal cable (e.g., to a CNC system or PLC) to the CN2 port on the driver.

4.2 CN2 Port Pinout (Control Interface)

The CN2 port is the primary interface for control signals. Refer to the pinout diagram for proper connection to your control system.



Servo Motor With Magnetic 17bit Absolute Encoder						
Servo Motor Mode	Motor Flange	Power	RS485 (Modbus)	Customized cable length	Brake	Motor Shaft Diameter
60AST-A1C01330	Nema24 60mmx60mm (mounting hole distance 49.5mm)	400w	Support	Support (3-15meter)	Optional	14mm With 5mm Key
60AST-A1C01930		600w				
80AST-A1C02430	Nema32 80mmx80mm (mounting hole distance 63.6mm)	750w				
80AST-A1C04025		1000w				19mm With 6mm Key

Image: A diagram detailing the pin assignments and functions of the CN2 port on the servo driver. It includes pins for power supply, input command signals (SigIn1-4), output command signals (SigOut1-4), command pulse input (PV+, PV-, PP+, PP-, PD+, PD-), encoder signal output, and analog input (Vref, AGND).

Pin No.	Interface No.	Name	Function
9	10	DC12-24V COM	Power supply and ground of input/output control signal
6	7	SigIn1	Input command signal. Functions assigned at factory: SigIn1: servo enable
	21	SigIn2	SigIn2: alarm reset
	8	SigIn3	SigIn3: position deviation clearing
	24	SigIn4	SigIn4: pulse input disabled
11	23	SigOut1	Output command signal. Functions assigned at factory: SigOut1: servo ready
	12	SigOut2	SigOut2: alarm detection

Pin No.	Interface No.	Name	Function
	24	SigOut3	SigOut3: positioning completed
		SigOut4	SigOut4: emergency stop detection
2	3	PV+	Command pulse input port. PV: open collector input power supply. The command pulse can be input in three ways: 1. Command direction and pulse input, 2. Clockwise/counterclockwise pulse input, 3. Quadrature pulse input with 90 degree phase difference.
	14	PP+	
	4	PD+	
	5	PD-	
20	19	empty	Encoder signal output (Contact manufacturer for function)
	18	empty	
	17	empty	
	16	empty	
	15	empty	
	22	OZ	
	1	GND	
25	13	Vref	Analog input. When speed or torque is controlled, it is used to receive speed or torque commands. Voltage input range: -10V to +10V.
		AGND	

5. OPERATING INSTRUCTIONS

5.1 Driver Display and Mode Selection

The servo driver features a digital display and control buttons for monitoring and parameter adjustment. The display mode can be switched between Monitor Mode, Auxiliary Mode, and User Parameter Mode.

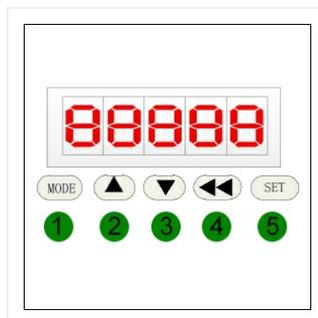


Image: Close-up of the servo driver's digital display and five control buttons (MODE, Up, Down, Left, SET) used for navigation and parameter input.



Image: A flowchart demonstrating how to switch between Monitor Mode (dn000), Auxiliary Mode (Fn000), and Parameter Mode (Pn000) by pressing the MODE key on the servo driver.

- **Monitor Mode (dn000):** Displays real-time operational data such as current speed, position, or error codes.
- **Auxiliary Mode (Fn000):** Provides access to auxiliary functions and diagnostic information.
- **Parameter Mode (Pn000):** Allows adjustment of various motor and driver parameters. Use the Up/Down buttons to navigate and SET to confirm.

5.2 Control Modes

The AC servo system supports multiple control modes, which can be configured via Modbus communication or through the driver's interface.

- **Position Control:** For precise positioning applications, typically using pulse and direction signals.
- **Speed Control:** For maintaining a constant rotational speed, often controlled by an analog voltage input.
- **Torque Control:** For applications requiring constant torque output, also typically controlled by an analog voltage input.
- **Extension Control:** Specific control mode for advanced applications.

6. DRIVER MULTIPLE FUNCTIONS

The S2SVD20 driver incorporates advanced algorithms for stable low-speed operation and high-performance encoder feedback for motor accuracy. It offers versatile functionality through its configurable I/O interfaces.

- **Advanced Algorithm:** Ensures stable and smooth operation, especially at low speeds.
- **High-Performance Encoder:** The 17-bit magnetic encoder provides precise feedback for accurate motor control.
- **Reserved I/O Function Interface:** Multiple input/output interfaces are available, allowing for flexible configuration to meet diverse application requirements. These can be combined arbitrarily to achieve desired functionalities.

7. AC SERVO FEATURES

The AC servo system is designed with features that enhance its adaptability and performance in various industrial settings.

- **Command Pulse Input:** Supports three types of command pulse input:
 1. Command direction and pulse input
 2. Clockwise/counterclockwise pulse input
 3. Quadrature pulse input with 90-degree phase difference
- **Control Mode Conversion:** Position control, speed control, torque control, and extension control can be seamlessly converted via Modbus communication to suit common application needs.
- **Display Modes:** The driver's display can switch between monitor mode, auxiliary mode, and user parameter mode for comprehensive system oversight and configuration.

8. APPLICATION AREAS

This servo motor kit is versatile and suitable for a wide range of automation equipment and instruments requiring high precision and

dynamic response.



Image: Visual examples of typical application areas for the servo motor kit, such as 3D printers, CNC machines, textile machinery, and cutting machines, demonstrating its broad utility in industrial automation.

- Screw Machines
- Automatic Equipment
- Medical Equipment
- Semiconductor Equipment
- Engraving Equipment
- Measuring Equipment
- AGV Carts (Automated Guided Vehicles)
- CNC Engravers and Milling Machines
- Robotic Systems

9. MAINTENANCE

Regular maintenance ensures the longevity and reliable operation of your servo motor kit.

- **Cleaning:** Keep the motor and driver free from dust, debris, and moisture. Use a soft, dry cloth for cleaning. Do not use solvents.
- **Connections:** Periodically check all electrical connections for tightness and signs of wear or corrosion.
- **Cooling:** Ensure adequate airflow around the servo driver for proper heat dissipation. Keep cooling vents clear.
- **Environmental Conditions:** Monitor the operating environment to ensure it remains within the specified temperature and humidity ranges.
- **Inspection:** Visually inspect the motor and cables for any physical damage.

10. TROUBLESHOOTING

This section provides general guidance for common issues. For complex problems, consult a qualified technician or refer to advanced documentation.

Problem	Possible Cause	Solution
Motor does not move	No power supply; Incorrect wiring; Servo enable signal not active; Emergency stop engaged.	Check power connections; Verify wiring against diagram; Activate servo enable signal; Release emergency stop.
Motor vibrates or makes unusual noise	Incorrect parameter settings (e.g., PID gains); Mechanical resonance; Loose connections.	Adjust PID parameters; Check for mechanical issues in the system; Secure all connections.

Problem	Possible Cause	Solution
Driver displays an error code	Overcurrent, overvoltage, undervoltage, encoder error, motor overload.	Refer to the driver's specific error code manual (if available) for detailed diagnostics and solutions. Check power supply, motor load, and encoder connections.
Inaccurate positioning	Encoder issue; Mechanical backlash; Incorrect pulse settings.	Inspect encoder cable and connection; Check mechanical system for play; Verify pulse input settings.

Note: For detailed parameter tuning and advanced troubleshooting, it is recommended to consult the full technical manual or seek assistance from experienced professionals. Online resources and community forums for similar servo systems may also provide valuable insights.

11. OFFICIAL PRODUCT VIDEO

Watch this short video demonstrating the RATTMMOTOR Servo Motor Driver Kit in operation. This video provides a visual overview of the kit's functionality and performance.



Video: A brief demonstration of the 400-1000W Servo Motor Driver Kit, showcasing its operational aspects and integration within a system. This video is provided by the seller.

12. WARRANTY AND SUPPORT

For warranty information, technical support, or service inquiries, please contact your point of purchase or the manufacturer directly. Keep your purchase receipt and product model number handy for faster service.

Manufacturer: RTM