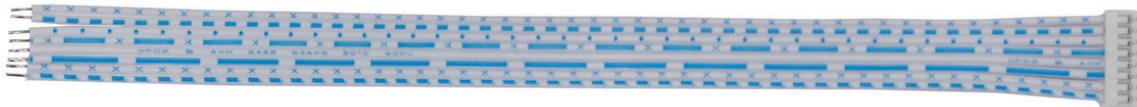


High-power Stepper Motor Drive Controller User Manual

ZK-SMC04



1.PRODUCT OVERVIEW

The ZK-SMC04 is an industrial-grade, high-power stepper motor drive control integrated module designed for single-axis, two-phase, four-wire stepper motors. It supports high- power 42, 57, and some 86 motors. This module features a liquid crystal display, large current output (2.4A-6.6A), TTL serial communication, a scalable control interface, and 15 automatic/manual control modes. It is suitable for various applications including small mechanical equipment, industrial automation control, and modular motor applications.

Interface function

Running interface

Used for displaying running information in work



Menu settings interface

In practical work, the parameters that need to be modified are all concentrated here.



2.SPECIFICATIONS

Feature	Specification
Product Model	SMC04
Product Name	Drive control integrated machine
Supply Voltage	10-30VDC >3A
Shell Size	79mm x 43mm x 41mm
Opening Size Output	75mm x 39mm
Current Adapted	2.4A-6.6A
Stepper Motors	42 / 57 / 86 series
Pulse Frequency Control	200KHz
Mode Selection	15 options (customizable)
Operating Environment	-10 ~ 60 °C (no condensation)

High power stepper motor drive control integrated machine **ZK-SMC04**

Industrial grade controller

liquid crystal display

large current
2.4A-6.6A

Supports high-power 57
and some 86 motors

TTL serial communication

Scalable control interface

15 automatic/manual control modes



Free: PH2.0mm-8P terminal wire

Disclaimers

Electronic module products require you to have a certain electronic foundation and carefully read the product instructions before use;

The product is not designed for medical, life-saving, or life sustaining purposes, and cannot be used in dangerous places such as coal mines and oil depots. We do not guarantee any such liability;

The profit margin of the product is low, and the user's operational ability and usage scenarios vary greatly. No electronic device can be fool-proof. The equipment owner should take corresponding protective measures and risk management plans. If any personal or property damage is directly or indirectly caused by this equipment, the company is not responsible for compensation.

Forward rotation indicator

Encoder setting knob

Forward rotation

Reverse rotation indicator



CW

CW

CCW

OUT

160.0
002.0

CCW

ZK-SMC04 Stepper motor controller

RUN/STOP

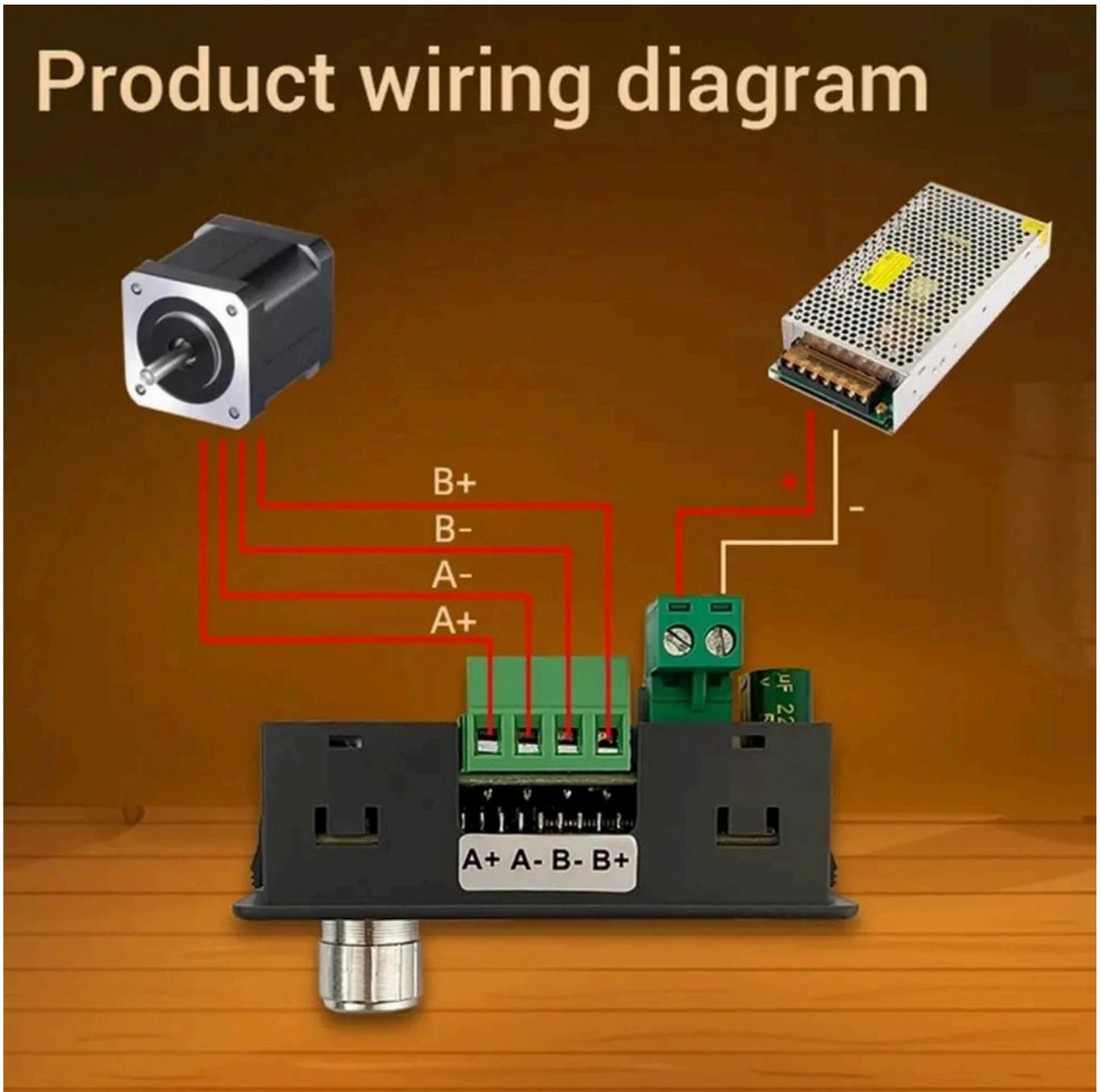
Reverse rotation

Run / pause

3.SETUP AND WIRING

WARNING: Disconnect power before making any wiring connections. Incorrect wiring can cause damage to the device and connected components.

3.1. Component Identification



CW Button: Initiates forward (clockwise) rotation.

CCWButton: Initiates reverse (counter-clockwise) rotation.

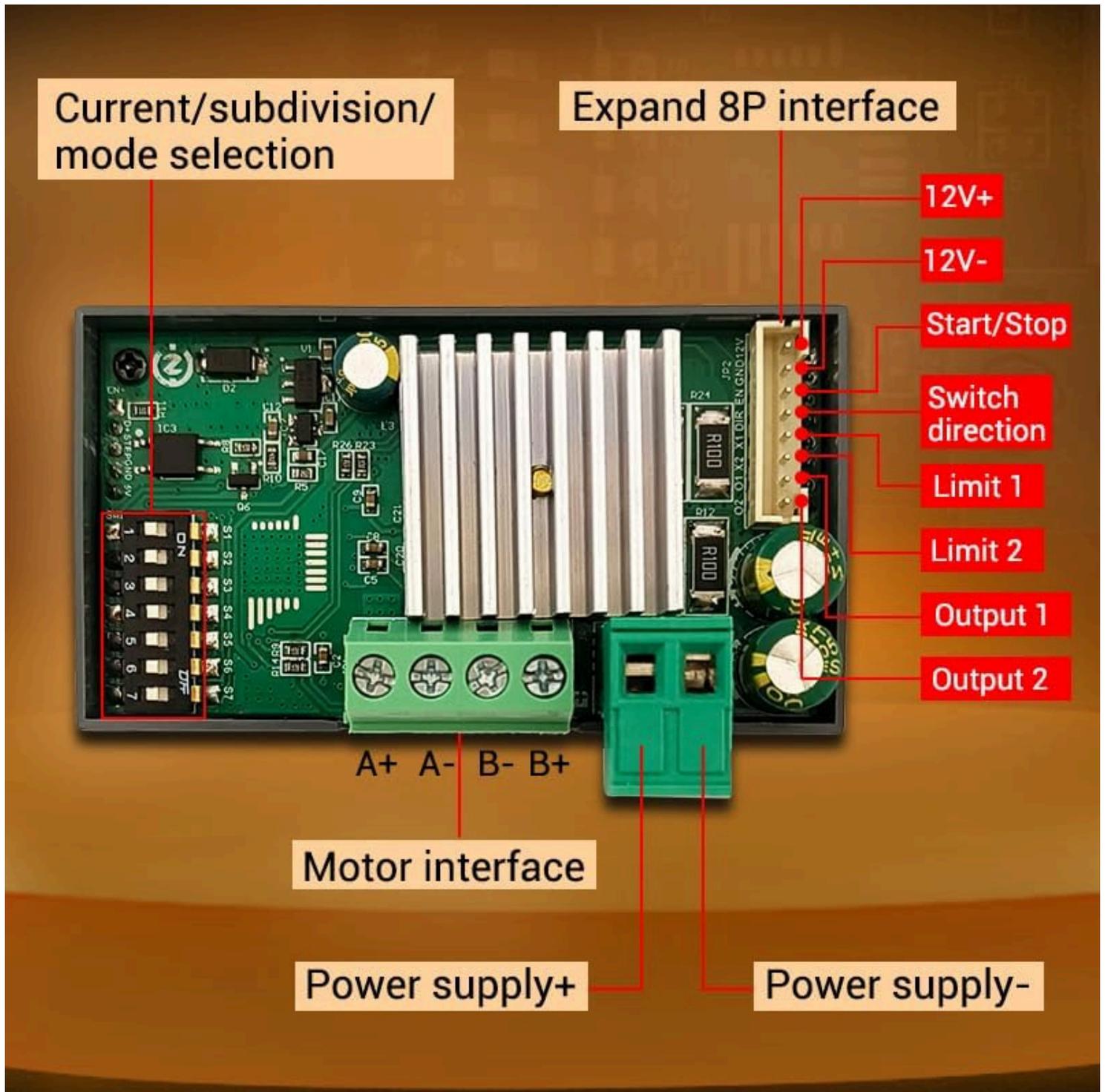
EncoderSettingKnob: Used to adjust speed and navigate menu options.

RUN/STOPButton: Toggles motor operation (start/pause).

CWIndicator: Illuminates when the motor is rotating clockwise.

CCWIndicator: Illuminates when the motor is rotating counter-clockwise.

Display: Liquid crystal display showing current speed, parameters, and operational status.



- **Current/Subdivision/Mode Selection (DIP Switches):** A set of DIP switches (labeled 1-7) on the board for configuring motor current, micro-stepping (subdivision), and control modes. Refer to the specific product documentation for detailed DIP switch configuration tables to match your stepper motor and application requirements. **Motor Interface (A+, A-, B+, B-):** Terminal block for connecting the two-phase, four-wire stepper motor windings. Ensure correct phase connection. **Power Supply (+, -):** Terminal block for connecting the 10-30VDC power supply. Observe correct polarity. **Expand 8P Interface:** A header for connecting external control signals and outputs:
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- o **12V+, 12V-:** Power output for external sensors or components.
- o **Start/Stop:** External input for motor start/stop control.
- o **Switch Direction:** External input for changing motor rotation direction.
- o **Limit1, Limit2:** Inputs for limit switches.
- o **Output1, Output2:** General purpose output signals.

3.2. Basic Motor and Power Supply Wiring

Connect your stepper motor and DC power supply to the ZK-SMC04 as illustrated below. Double-check all connections before applying power.

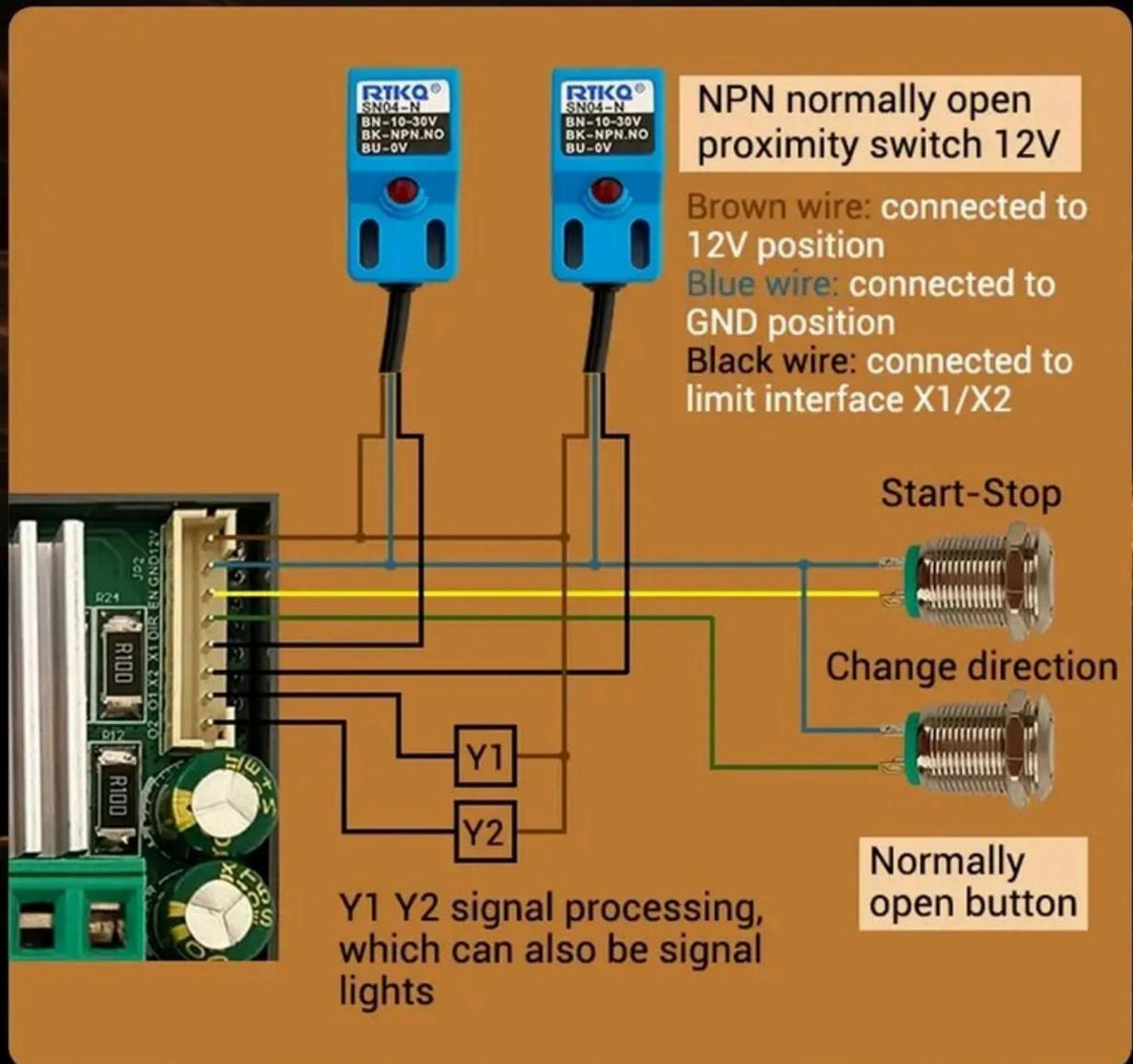


- Connect the stepper motor's A+, A-, B+, B- wires to the corresponding terminals on the ZK-SMC04.
- Connect the positive (+) terminal of your 10-30VDC power supply to the '+' terminal on the ZK-SMC04, and the negative (-) terminal to the '-' terminal.

3.3. External Signal, Limit, and Output Connections

The ZK-SMC04 can be integrated with external NPN normally open proximity switches and push buttons for enhanced control. Follow the diagram for proper connection.

Signal+limit+output connection



- **NPN Normally Open Proximity Switch (12V):**
 - o Brownwire:Connectto12V+onthe8Pinterface.
 - o Bluewire:ConnecttoGND(12V-)onthe8Pinterface.
 - o Blackwire:ConnecttoLimit1(X1)orLimit2(X2)onthe8Pinterface.
- **Start-Stop Button:** Connect a normally open push button between the "Start/Stop" terminal and GND on the 8P interface.
- **Change Direction Button:** Connect a normally open push button between the "Switch direction" terminal and GND on the 8P interface.
- **Y1, Y2 (Output 1, Output 2):** These terminals can be used for signal processing or to drive indicator lights.

4.0 PERATING INSTRUCTIONS

The ZK-SMC04 provides a user-friendly interface for both real-time operation monitoring and parameter configuration.

4.1. Interface Overview

Operating instructions



Stop running and exit

On the running interface, adjust the speed of the rotary encoder, press the CW button - forward rotation, CCW button - reverse, RUN/STOP button - stop running and exit. Long press the encoder to enter the menu settings.



In the menu settings interface, adjust the rotary encoder to change the parameter codes F-01~F-14. Long press the encoder, save the parameters and exit to enter the running interface.



Tune parameter

Exit parameter settings

In the menu settings interface, short press the encoder to enter the F-XX corresponding menu parameter setting state, and the parameters will flash. Then short press the shift button to rotate the encoder and adjust the parameters. Short press the RUN/STOP button to exit parameter settings and return to the main menu number adjustment interface.

- **Running Interface:** Displays real-time operational data such as motor speed (OUT) and other relevant information during active motor control.
- **Menu Settings Interface:** Used for configuring various operational parameters (F-01 to F-14). All modifiable parameters are accessed through this interface.

4.2. Basic Motor Control

Follow these steps for basic motor operation:

1. **Start/Pause:** Press the **RUN/STOP** button to initiate motor movement or pause it.
2. **Forward Rotation (CW):** Press the **CW** button. The motor will rotate clockwise, and the CW indicator LED will light up.
3. **Reverse Rotation (CCW):** Press the **CCW** button. The motor will rotate counter-clockwise, and the CCW indicator LED will light up.
4. **Adjust Speed:** While the motor is running, rotate the encoder knob to increase or decrease the motor's speed.

4.3. Menu Navigation and Parameter Setting

To configure advanced settings and operational modes:

Product introduction



This is an operation control module specifically designed for single axis two-phase four wire stepper motors.

The module has multiple fixed operating modes built-in, allowing users to quickly choose the appropriate motion trajectory. You can save and set the distance/speed/delay/number of cycles in case of power failure. It can run independently as a module or be used in conjunction with other systems.

Can be used in general industrial control applications, but cannot be used in special industries such as medical, firefighting, or life critical fields.

1. **EnterMenu:** From the running interface, long press the encoder knob. The display will switch to the menu settings interface, showing a parameter code (e.g., F-01 P03).
 2. **SelectParameter:** Rotate the encoder knob to scroll through the available parameter codes (F-01 to F-14).
3. **EnterParameterEditMode:** Short press the encoder knob when the desired parameter code is displayed. The parameter value will start flashing, indicating it's ready for adjustment.
4. **AdjustParameterValue:**
 - o Short press the **RUN/STOP** button to shift the cursor to the digit you wish to change.
 - o Rotate the encoder knob to adjust the value of the selected digit.
5. **ExitParameterEditMode:** Short press the **RUN/STOP** button again to exit the parameter setting mode. The value will stop flashing, and you will return to the main menu interface (e.g., F-01 P03).
6. **Save and Exit Menu:** From the main menu interface, long press the encoder knob to save all changes and return to the running interface.

For a comprehensive description of each parameter (F-01 to F-14) and their functions, please consult the detailed product manual or manufacturer's documentation.

5. MAINTENANCE

- **Cleaning:** Keep the device clean and free from dust, debris, and moisture. Use a soft, dry cloth for cleaning.
- **Ventilation:** Ensure adequate airflow around the module to prevent overheating, especially during prolonged high-power operation.
- **Connections:** Periodically inspect all wiring connections for tightness and signs of wear or damage. Loose connections can lead to erratic behavior or component failure.
- **Environment:** Avoid exposing the module to extreme temperatures, high humidity, or corrosive chemicals.
- **Power Cycle:** If the device exhibits unexpected behavior, try power cycling it (disconnecting and reconnecting power) after ensuring all connections are secure.

6.T ROUBLESHOOTING

- **Motor not moving:**
 - Verify the power supply is connected correctly and providing 10-30VDC with sufficient current (>3A).
 - Check all motor wiring (A+, A-, B+, B-) for correct connections and continuity.
 - Ensure the **RUN/STOP** button has been pressed to initiate operation.
 - Review the DIP switch settings for motor current and control mode to ensure they are appropriate for your motor.
 - Check if any limit switches are activated, preventing movement.
- **Motor rotating erratically or making unusual noise:**
 - Inspect motor wiring for loose connections, incorrect phase sequence, or short circuits.
 - Adjust micro-stepping (subdivision) settings via the DIP switches. Incorrect settings can cause vibration or noise.
 - Ensure the motor's rated current is within the ZK-SMC04's output range (2.4A-6.6A).
 - Check for mechanical obstructions or issues with the motor itself.
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- **Display not working or showing incorrect information:**
 - Confirm the power supply is connected and functioning. If the display is dim or flickering, check the power supply voltage.
- **External controls (limit switches, buttons) not responding:**
 - Verify the wiring of external components to the 8P interface, ensuring correct polarity and connection points.
 - For NPN switches, confirm the brown wire is to 12V+, blue to GND, and black to the limit input.
 - Check the parameter settings in the menu to ensure external input functions are enabled and configured correctly.

7.W ARRANTY AND SUPPORT

7.1. Warranty Information

- This product is covered by a 90-day warranty from the date of receipt.
- A free repair service is provided within one year of purchase.
- The warranty does not cover any products that are physically damaged or operating under abnormal conditions as a result of misuse or improper installation.

7.2. Technical Support

For technical assistance, troubleshooting guidance beyond this manual, or any product-related inquiries, please contact the seller or refer to the official product page for additional resources and contact information.

8. USER TIPS

No specific user tips were available from provided reviews or Q&A. However, for optimal performance and longevity of your stepper motor system, consider the following general tips:

Motor Matching: Always ensure your stepper motor's current and micro-stepping settings are correctly configured via the DIP switches to precisely match the motor's specifications and your application's requirements. Mismatched settings can lead to overheating, reduced torque, or missed steps.

Power Supply Quality: Use a stable and clean DC power supply within the specified voltage range (10-30VDC) and with sufficient current capacity (>3A) to avoid performance issues.

Cable Management: Keep motor and signal cables as short as possible and properly shielded to minimize electrical noise interference.

Heat Dissipation: While the module has a heatsink, ensure it's installed in an environment with good airflow, especially if operating at higher currents or for extended periods.

9. DISCLAIMERS

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