ACME JZ® 精震

JZ80-M系列
数字调频振动盘控制器用户手册

JZ80-M Series Digital Frequency Modulation Vibration Plate Controller User Manual

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Foreword

First of all, thank you for purchasing the JZ series digital vibration feeder controller※!

This manual provides users with guidance and instructions on model selection, installation and commissioning, parameter setting, fault diagnosis and elimination, as well as daily maintenance of the controller. To ensure the correct installation and operation of the controller, please read this user manual carefully before installation and keep it properly.

This user manual applies to the following models of controllers:

■ Digital frequency modulation vibration feeding controller, JZ80-M (4.0A output current)

Note: ※Hereinafter referred to as the controller in this manual

Special Precautions Requiring Attention:

1. **Never** unplug wiring or touch any controller terminals while power is applied, to prevent electric shock and accidents.

2. **Do NOT** connect the controller to a 380V AC power supply. This will cause permanent damage! (For 380V operation, select the dedicated 380V series product.)

3. **Avoid** using relays or similar devices to control output by interrupting the controller's power supply, as this will significantly shorten its service life. (Refer to later sections of this manual for proper operation methods.)

4. The controller is designed for cool, dry environments. Do not operate it outdoors, in areas prone to water exposure, under direct sunlight, or beyond its specified temperature/humidity ranges.

5. Under no circumstances operate the controller beyond its design limits.

6. Strictly follow this manual during operation. Our company assumes no civil or criminal liability for equipment damage or personal injury resulting from non-compliance.

7. Do not open the controller casing (risk of electric shock). For malfunctions, contact our company for immediate troubleshooting support or return for repair.

Version Change History

Version	Date	Changed Points	Remarks
V1.0	June 2024	New Document	
V2.0	June 2025	Unified parameters	

Working and Storage Environment

I. Pre-use Inspection

Each controller undergoes rigorous quality testing before leaving the factory and is packaged in reinforced anti-impact packaging. After unpacking the controller, please immediately conduct the following checks:

1.Check whether the controller's exterior has been damaged during transportation.

2.Verify that the controller model number matches the order registration details exactly.

II. Working Environment

To ensure optimal performance and extended service life of the controller, please observe the following during installation:

★ A well-ventilated environment for effective heat dissipation.

★ Keep away from water droplets, steam, dust (especially oily dust).

★ Free from corrosive or flammable gases and liquids.

★ Free from airborne dust and metal particles.

★ Stable and free from vibration.

★ Protected from electromagnetic noise interference.

III. Electrical Characteristics and Specifications (JZ80-M)

Exceeding electrical specifications will cause serious damage and must be strictly prevented!

Electrical Characteristics

Items	Numerical value			Unit	Instructions;
	Minimum	Typical	Maximum		
input voltage	85	220	260	VAC	Single-phase 50/60Hz
Working environment temperature	-10	20	40	℃	Derate at 40–50°C
Working environment humidity	10	60	90	%RH	No condensation

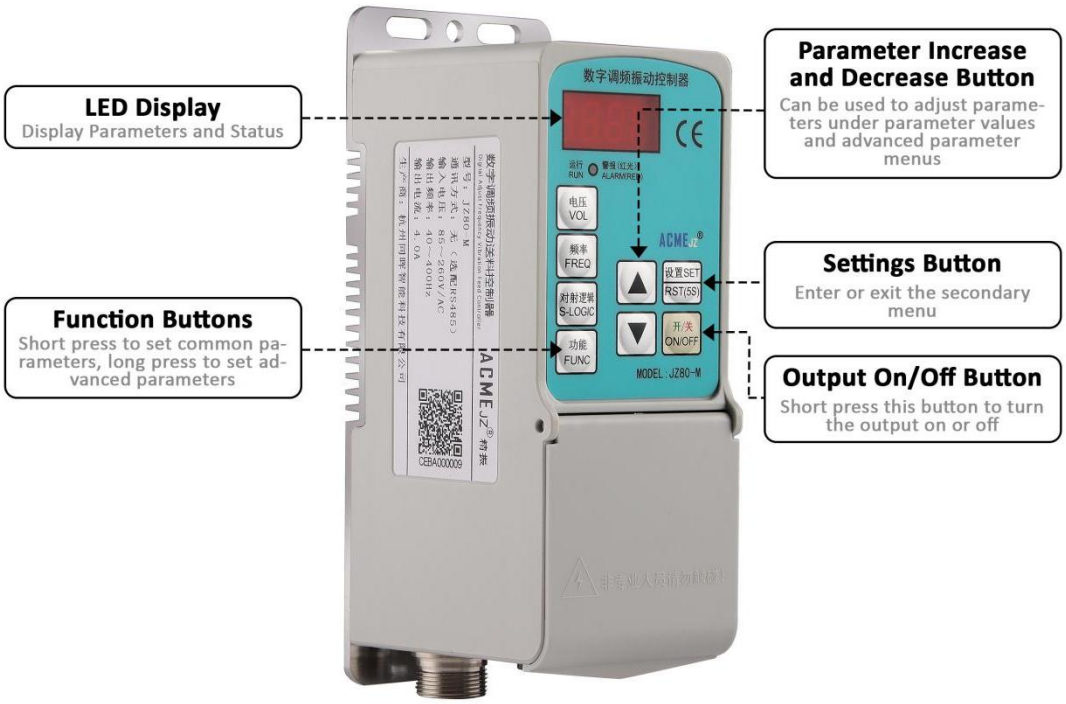
Specifications (Test condition: Input voltage 220VAC)

Items	Range		Unit	Instructions;
	Minimum	Maximum		
output voltage	0	260	V (Volts)	
Minimum adjustable voltage	1	-	V (Volts)	
Frequency range	40	400	Hz (Hertz)	
Minimum adjustable frequency	0.1	-	Hz (Hertz)	
output waveform	Sine			
Output current	-	4.0	A (Amperes)	
Output power	-	880	VA (Volt-Ampere)	
Delay time range	0	40	S (Seconds)	
Minimum adjustable delay time	0.1	-	S (Seconds)	
Startup time	0	20	S (Seconds)	
Auxiliary power supply voltage	22	26	V (Volts)	24V DC low voltage power supply
Auxiliary power supply current	-	200	mA	24V DC low voltage power supply
No-load power consumption	1.8	3.5	W (Watts)	
Display mode	-	4	bits	LED digital tube
Control mode	1.0~5.0		V (Volts)	Remote control voltage
	TTL standard level			Switch signal
	8 buttons + LED			Touch panel buttonboard

CONTENTS

Chapter 1 Controller Components

1.1 Buttonboard and Indicators



Status Indicator:

Run Indicator: Lights solid blue during normal operation; flashes when the power key is pressed.Glows red when the controller enters a fault condition.

Quick-Access Keys:

After pressing the *Voltage*, *Frequency*, or *Photoelectric Logic* keys, parameters can be directly adjusted using the increment/decrement keys.

1.2 External Components Description

Bottom View of Controller Components:


Power Switch
Output
Aviation Plug
Power Input
Aviation Plug

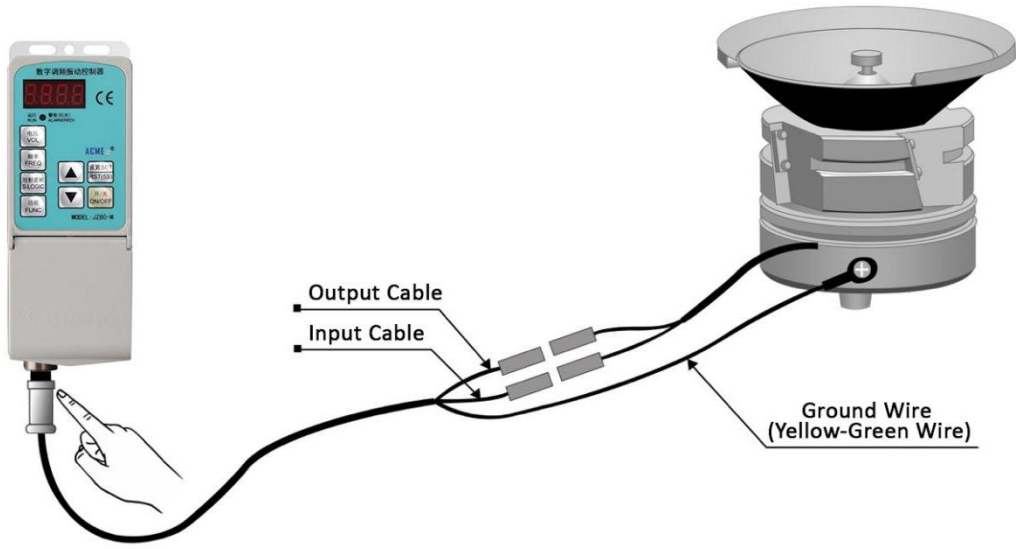
JZ80-M (4.0 A)

Chapter 2 Quick Installation and Trial Run

Follow these steps for initial setup:

Step 1: Unpack the controller and inspect both its exterior and the nameplate on the side to confirm the model matches your requirements.

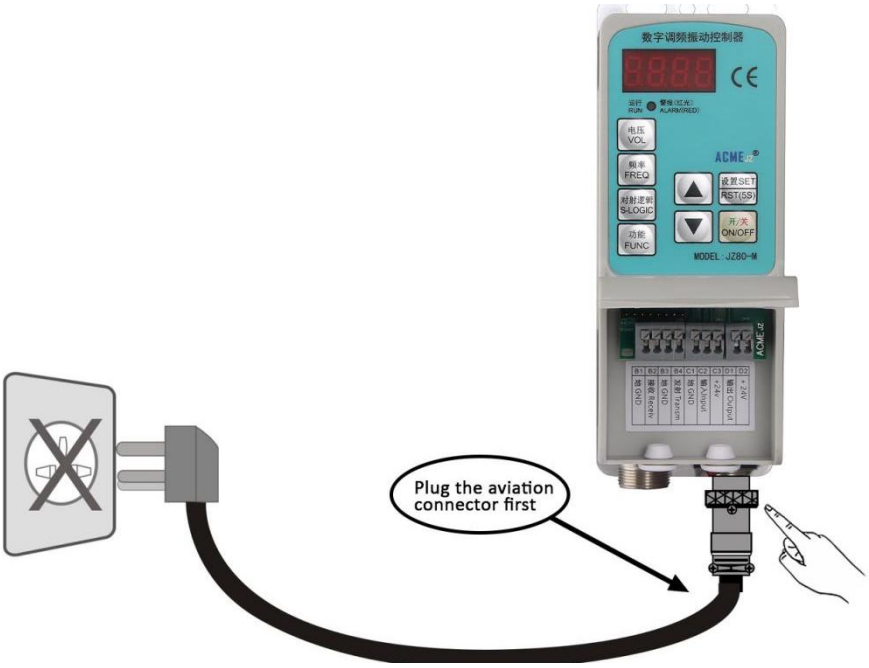
Step 2: Take the output cable from the accessory kit.First, connect the cable's terminals to the electromagnetic coil of the vibration plate※Then insert the cable's aviation connector into the controller,Finally, tighten the locknut.



Note: ※ Ensure the electromagnetic coil is connected to both output terminals, and the chassis must be properly safety-grounded. Failure to do so may energize the enclosure, posing a severe safety hazard!

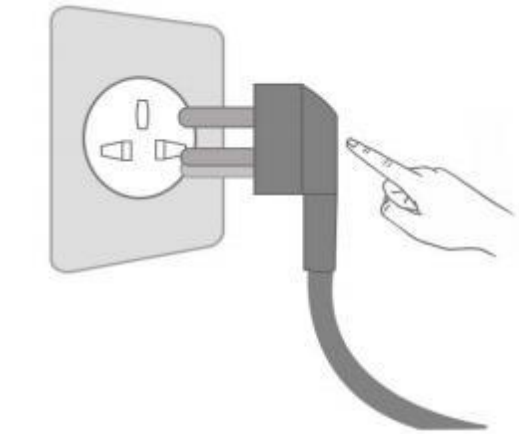
Step 3:

First, insert the aviation connector of the input power cable into the controller, then tighten the locknut.



Step 4:

Plug the power cable three-prong plug into the power supply socket.



Step 5:

Turn on the controller power switch.

Step 6:

Adjust the output voltage to between 30V~80V.

Step 7:

Press the "Frequency" button briefly to enter the frequency adjustment state, use "▲" and "▼" to find the natural frequency※ of the vibrating body, i.e., the resonance point.

Note: ※ The peak vibration occurs at the system's natural frequency. Since every vibrating body possesses a unique natural frequency, adjust this parameter to operate within the optimal working frequency range.

Step 8:

After finding the natural frequency of the vibrating body, press the voltage button briefly and use "▲" and "▼" to adjust the voltage to the desired output value.

After completing the above steps, the controller will be operational at a basic level. For additional functions, please refer to other sections of the manual..

Chapter 3 External Terminal Definitions

The controller supports multiple external signals or sensors as command sources for operation. It also features a DO (Digital Output) channel for driving external relays, switches, and other devices to coordinate with the vibratory feeder controller. This chapter details the wiring configurations for:

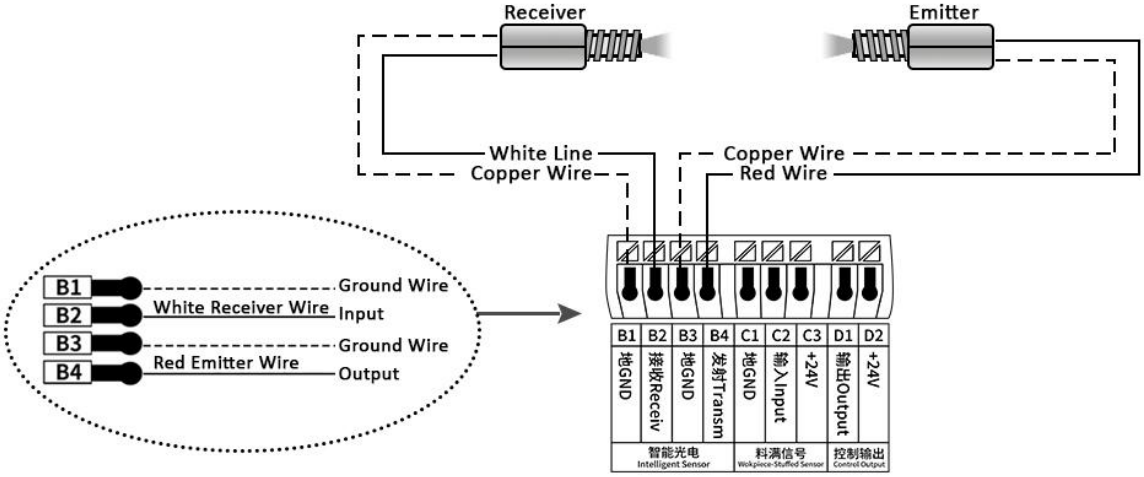
- Intelligent opposed-mode photoelectric sensors
- Proximity switch inputs (material full/empty stop control)
- Remote speed command inputs
- DO signals

3.1 Wiring Method for Intelligent Photoelectric Sensor

The controller, when paired with opposed-mode photoelectric sensors, enables reliable material full/empty detection. It automatically compensates for ambient light interference on sensor sensitivity, ensuring robust performance without manual sensitivity adjustments.

Step 1: Open the access door of the terminal compartment.

Step 2: Connect the photoelectric sensor according to the wiring diagram.



Note:Under factory default settings, the sensor's logic orientation is set for material-empty detection.

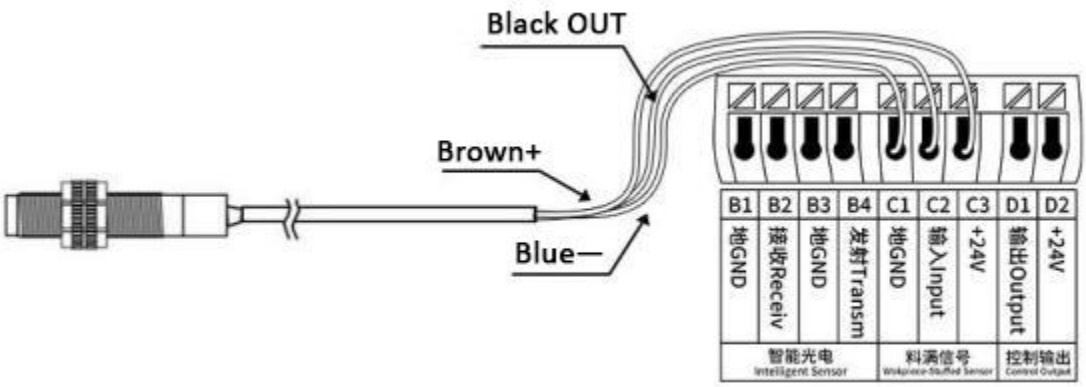
3.2 Wiring Method for Proximity Switch Input Port

The controller supports various switch-type sensors—including proximity switches, photoelectric sensors, fiber amplifiers, and I/O outputs from external PLCs—enabling automatic start/stop functions under their signal control.

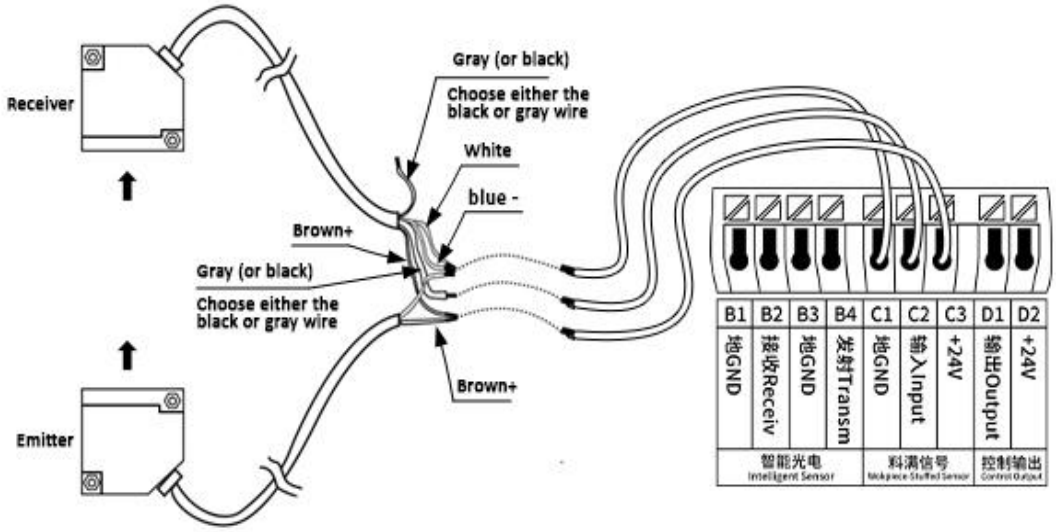
3.2.1 Wiring Method for Three-Wire NPN Proximity Switch

Step 1: Open the access door of the terminal compartment.

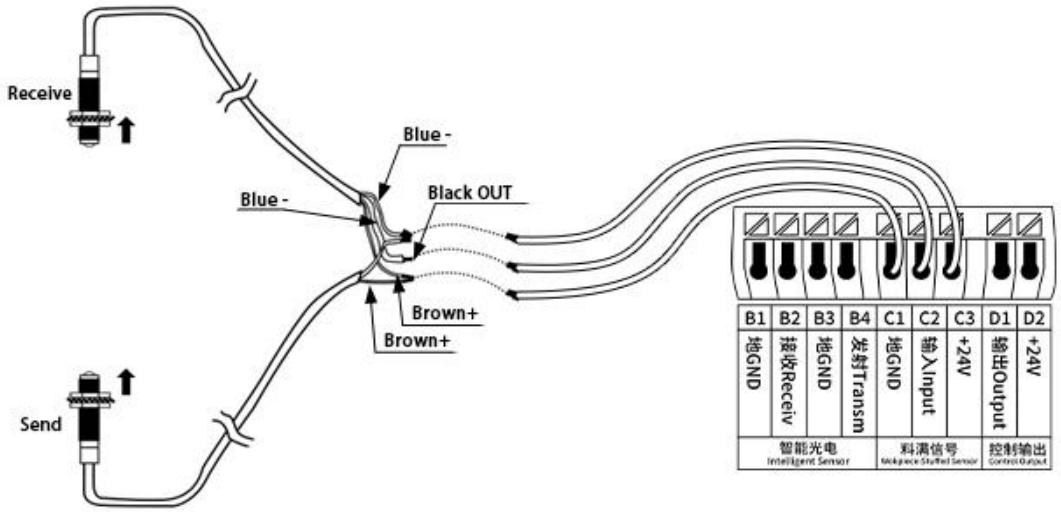
Step 2: Connect the sensor as shown in the diagram.



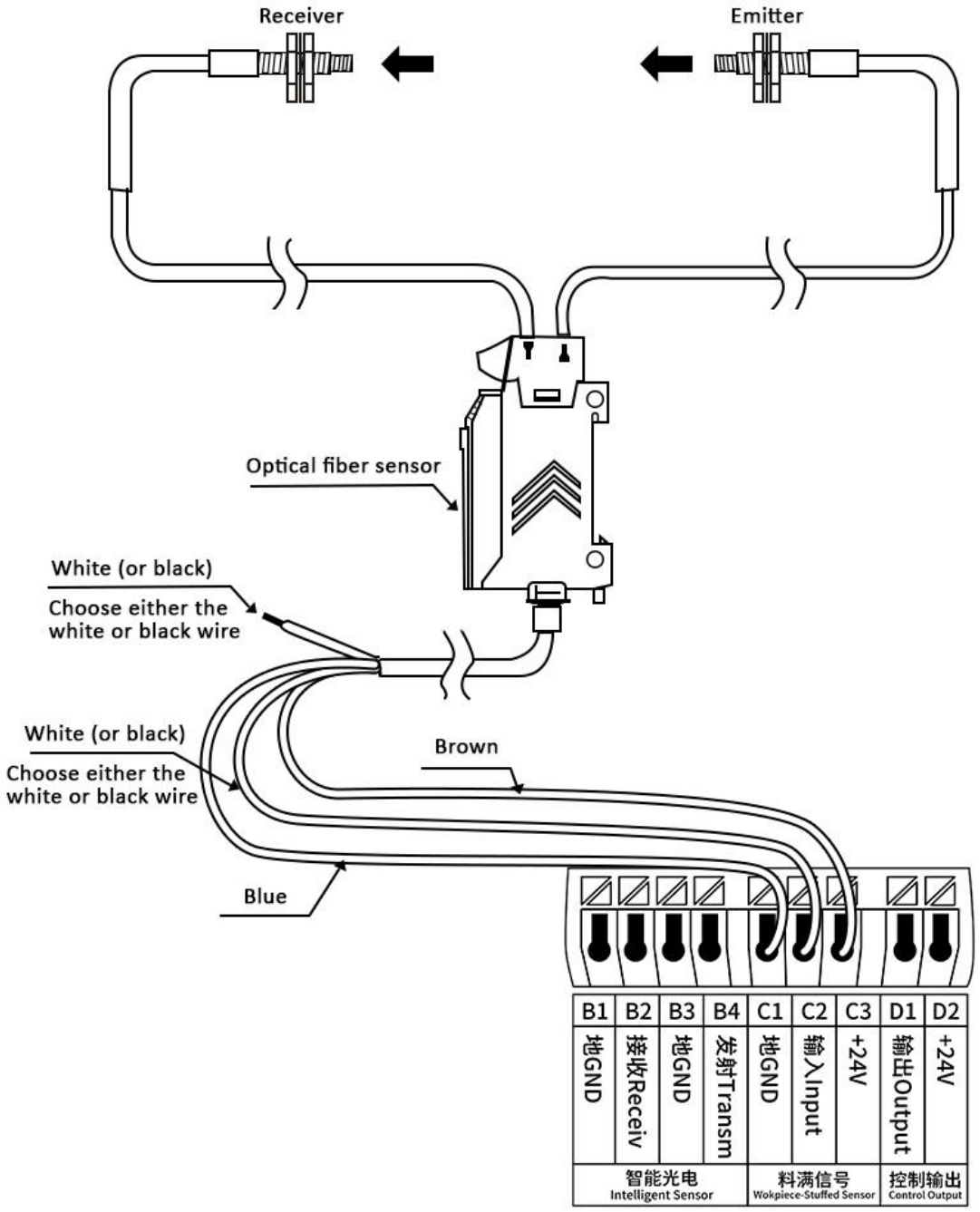
3.2.2 Retro-reflective NPN Sensor Wiring Guide



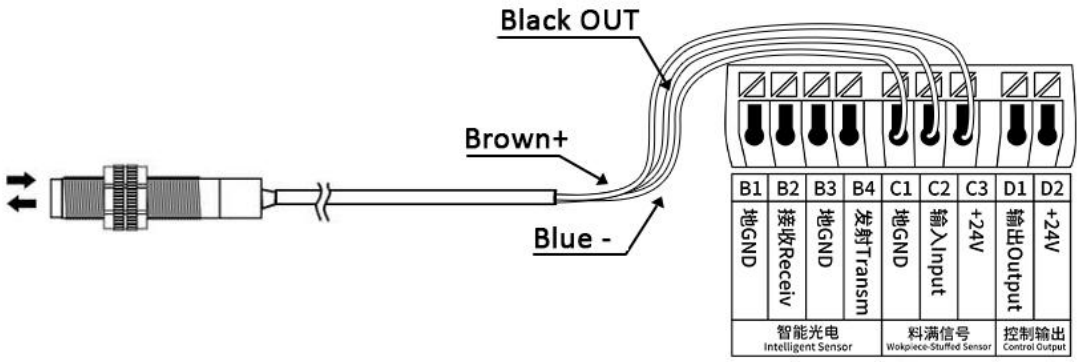
3.2.3 Through-beam Photoelectric Sensor Wiring Guide



3.2.4 Through-beam Fiber Optic Sensor Wiring Guide



3.2.5 Reflective Fiber Optic Sensor Wiring Guide

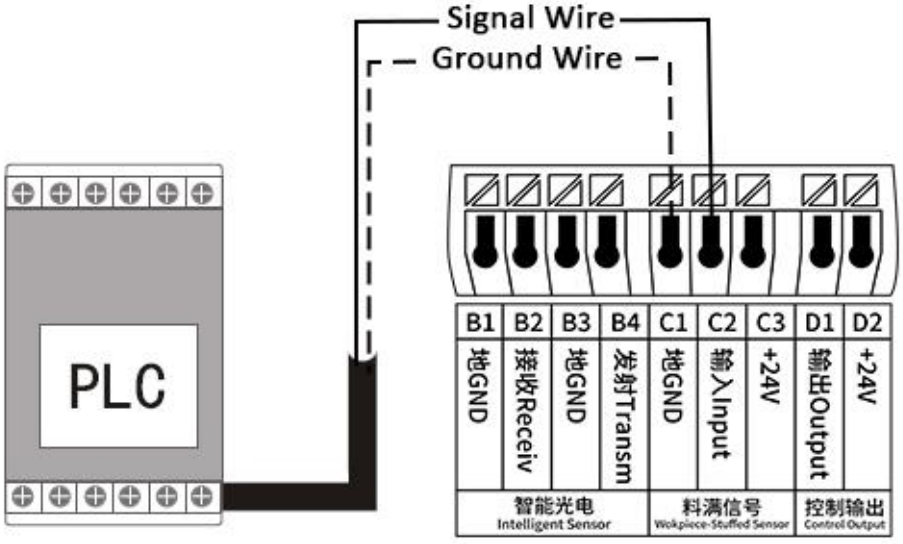


3.3 PLC Control Vibration Feeder Start/Stop Wiring Method

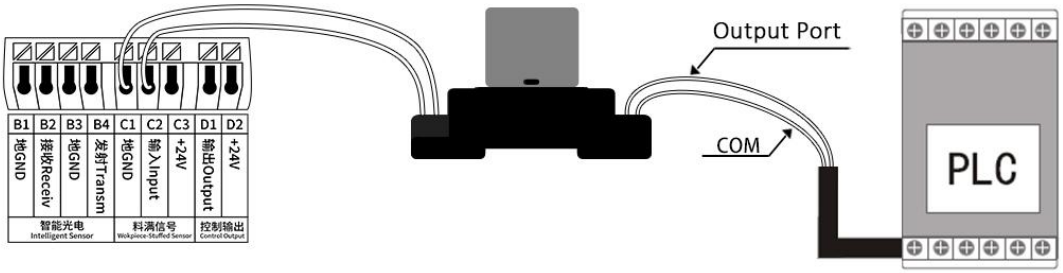
PLC Wiring Method:

Step 1: Open the access door of the terminal compartment.

Step 2: Connect the PLC signal wire according to the diagram



If the PLC is NPN output, it can directly control the controller. If the PLC is PNP output, it can control the controller through a relay. Of course, if the PLC is NPN output, a relay can also be used to control the controller, as shown below:

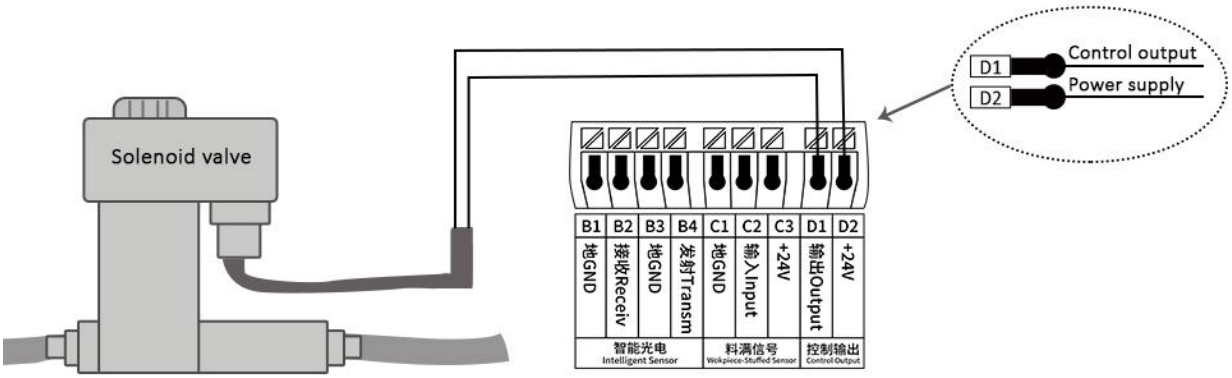


Short C1 and C2 to stop the controller, disconnect C1 and C2 to run the controller. If inverse logic is needed, set the proximity switch port logic direction Pr10.

3.4 DO Wiring Guide

The controller can output low-voltage signals to synchronize other devices, such as solenoid valves, PLCs, etc.

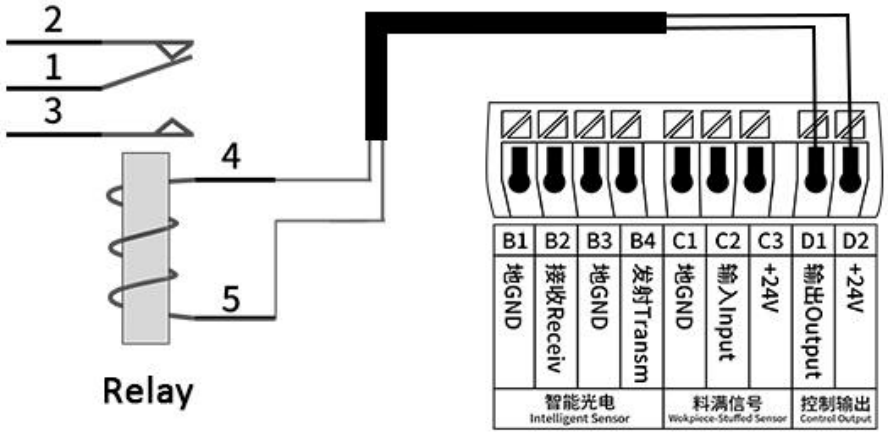
Wiring Configuration for Solenoid Valve Control:



◆The controller can directly drive solenoid valves with a rated voltage of 24V and power less than 4W.

◆If the solenoid valve power is too high, consider using an external power supply.

Wiring method for controlling relays:



◆The controller can directly drive relays with a rated voltage of 24V and power less than 4W.

To invert output logic, configure function code Pr07.

Chapter 4 Common Operations

4.1 Voltage Adjustment

Press the voltage button to enter the voltage adjustment interface

Use "▲" and "▼" to adjust the voltage.

The output voltage unit of the controller is V. Please find the resonant frequency of the vibration plate before modifying the default voltage value. Generally, a lower voltage setting results in smaller vibration amplitude, and a higher voltage setting results in larger vibration amplitude.

Function Code	Name	Symbol	Function Description	Factory Value
PC01	output voltage	U	0~260V, in 1V	100

4.2 Frequency Adjustment

Press the frequency button to enter the frequency adjustment interface

Use "▲" and "▼" to adjust the frequency.

The output frequency unit of the controller is HZ, and the minimum adjustable range is 0.1HZ. During the use of the controller, you can first set the output voltage to a smaller value or the default value, then adjust the output frequency, and find the mechanical resonance point of the vibration plate by listening to the sound of the vibration plate and the material operation, then exit the frequency interface and adjust other parameters.

Function Code	Name	Symbol	Function Description	Factory Value
PC02	Output frequency	F	5~400.0HZ, in 0.1HZ	80.0

Note: When the frequency value is greater than or equal to 100HZ, the letter F is not displayed, only the frequency value is displayed.

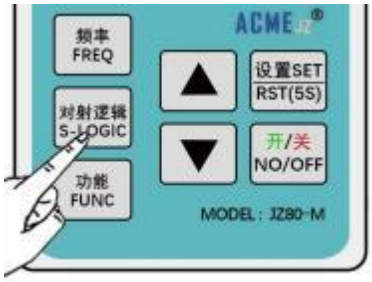
4.3 Intelligent Photoelectric Logic Adjustment

Under normal conditions, when the photoelectric sensor does not receive a light signal, the controller is in the "run" state under the factory default setting (normally open logic direction). However, for some applications, inverse logic is required, that is, the controller needs to be in the "stop" state when no photoelectric signal is received, and this function can be achieved via this parameter.

◆When the logic direction is set to normally open, the controller is in the run state when no light signal is received, and the controller is in the stop state when a light signal is received.

◆When the logic direction is set to normally closed, the controller is in the stop state when no light signal is received, and the controller is in the run state when a light signal is received.

Press the photoelectric logic button to enter the photoelectric logic adjustment interface

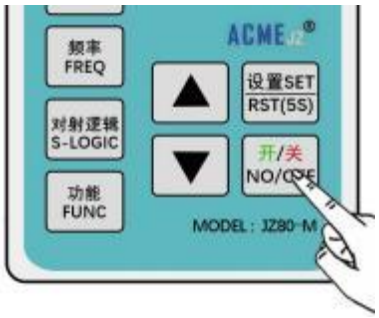


Use "▲" and "▼" to switch between positive logic and inverse logic. Press the photoelectric logic button to set the PC03 value.

Function Code	Name	Symbol	Function Description	Factory Value
PC03	Intelligent Photoelectric 1 Logic Direction	L	0: Normally Open Logic 1: Normally Closed Logic	0

4.4 Panel Switch Operation

The panel switch of the controller can be used to control the output. Short press the panel "On/Off" to switch the controller from the run state to the stop state, and short press the panel "On/Off" again to switch the controller from the stop state to the run state. After pressing the panel switch, the run indicator will flash.Since the control priority of the external intelligent photoelectric sensor and switch sensor input port is higher, the panel "On/Off" cannot switch the controller to the run state after the external signal gives a stop command.



Short press

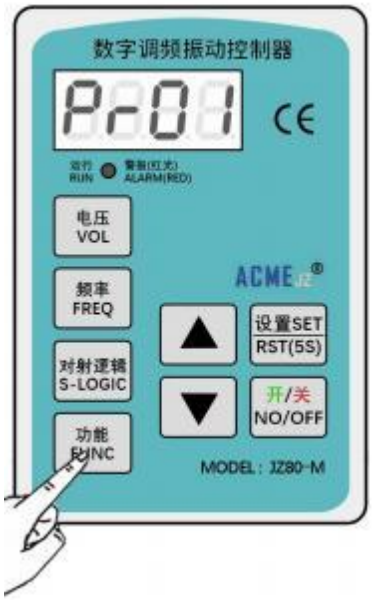
4.5 Parameter Reset

The controller features extensive parameters of user customization. However, for beginners may struggle to achieve operation despite repeated adjustments. In such cases, consider using reset function to quickly reset the controller parameters to their default values.

Press and hold the "Set" button for more than 5 seconds until "SAVE" is displayed, then release the button.The controller will reset its parameters to default Values.

Chapter 5 Parameter Description

Press the "Function" button to enter the common function parameter menu.



Use "▲" and "▼" to switch Function Codes. The Function Code length is 9, and you can use "▼" to scroll backward to find the Function Code.

5.1 Common Parameter Settings

To enhance user accessibility,the controller prioritizes frequently used parameter s at the forefront of the function code group, comprising 9 key parameters.

5.1.1 Turn-On Delay Time

By default, the turn-on delay time refers to the axis's turn-on delay: when the smart photoelectric sensor or proximity switch signal indicates activation, the controller starts powering the base after the set delay time.

Function Code	Name	Function Description	Unit	Factory Value
Pr01	Turn-On Delay Time	0.0~40.0	0.1S	0.2

Note: The default turn-on delay time for the proximity switch is pr11=0. If pr11 is not 0, pr01 is the turn-on delay time for the smart photoelectric sensor, and pr01 is the turn-on delay time for the proximity switch.

5.1.2 Turn-Off Delay Time

By default, the turn-off delay time refers to the axis's turn-off delay: when the smart photoelectric sensor or proximity switch signal indicates deactivation, the controller stops powering the base after the set delay time, and the base stops vibrating.

Function Code	Name	Function Description	Unit	Factory Value
Pr02	Turn-Off Delay Time	0.0~40.0	0.1S	0.2

Note: The default turn-off delay time for the proximity switch is pr12=0. If pr12 is not 0, pr02 is the turn-off delay time for the smart photoelectric sensor, and pr02 is the turn-off delay time for the proximity switch.

5.1.3 Maximum Output Voltage

The controller allows configuration of a “maximum output voltage” to limit output lev els. This parameter prevents damage to vibration equipment caused by inadvertent ope ration with excessive voltage.

Function Code	Name	Function Description	Unit	Factory Value
Pr03	Maximum output voltage	30~260	V	260

5.1.4 Control Signal Logic Operation

The controller allows configuration of the logical relationship between inputs from smart photoelectric sensors and switch sensors when activated simultaneously. This logic directly governs the operational status of the controlled system.

◆Logical relationship "AND": The controller operates only when both the smart photoelectric sensor and the switch sensor input signals require the controller to run.

◆Logical relationship "OR": The controller operates when either the smart photoelectric sensor or the switch sensor input signal requires the controller to run.

◆Logical relationship "XOR": The controller operates only when the smart photoelectric sensor and the switch sensor input signals require different states.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr04	Control signal logical Operation	0: Logical "OR" 1: Logical "AND" 2: Logical "XOR"	0~2	1

5.1.5 Photoelectric Sensitivity

This parameter can adjust the sensitivity of the intelligent photoelectric signal reception. The smaller value, the higher the sensitivity, and the signal can still be detected even when the distance between the transmitter and receiver is far, but the ability to resist light interference is worse. The larger value, the stronger the ability to

resist external light interference, but the supported distance between the transmitter and receiver becomes smaller.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr06	Photoelectric Sensitivity	Smaller data means higher sensitivity and poorer anti-interference ability.	0~1000	60

5.1.6 DO logic selection

Under factory default settings, the DO output port operates with NO (Normally Open) logic, where Terminal 1 and Terminal 2 output 24V DC when the drive is running. For applications requiring inverted logic (i.e., outputting 0V during drive operation), this function can be enabled by configuring the specified parameter.

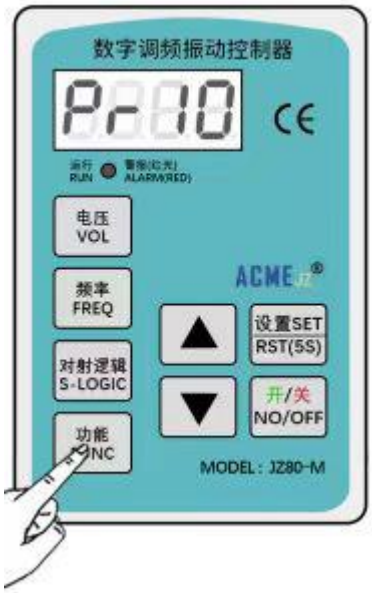
◆When the DO output port logic direction is set to normally open, the DO output port outputs 24V when the controller is running, and 0V when the controller is stopped.

◆When the DO output port logic direction is set to normally closed, the DO output port outputs a low level when the controller is running, and 24V when the controller is stopped.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr07	DO Logic Selection	0: Normally Open 1: Normally Closed	0~1	0

5.2 Advanced Parameter Settings

By long pressing the "Function" button, enter the auxiliary function parameter setting menu.



Use "▲" and "▼" to switch Function Codes. The Function Code length is 17, and you can use "▼" to page backward to find the Function Code.

5.2.1 Proximity switch logic direction

Normally, when the proximity switch input port is not connected to any signal, it is equivalent to a high-level input due to the internal pull-up resistor. Under the factory default settings, the controller is in the running state. When the switch sensor input port is connected to a low level, under the factory default settings, the controller is in the stop state. However, for some applications, inverse logic is needed, meaning the controller should be in the stop state when the switch sensor input port is not connected to any signal. This function can be achieved by setting this parameter.

◆When the logic direction is set to normally open, the controller is in the running state when the switch sensor input port is connected to a high level, and in the stop state when connected to a low level.

◆When the logic direction is set to normally closed, the controller is in the stop state when the switch sensor input port is connected to a high level, and in the running state when connected to a low level.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr10	Proximity switch	0: Normally Open Logic	0~1	0

	logic direction	1: Normally Closed Logic		

5.2.2 Proximity Switch On Delay

The proximity switch can separately set the on and off delays. By default, it is 0, and setting the switch delay is sufficient. If you need to separately set the on and off delays for the photoelectric and proximity switches, use this parameter to set the proximity switch on delay.

Function Code	Name	Parameter Range	Unit	Factory Value
Pr11	Proximity Switch On Delay	0.0~40.0	0.1S	0.0

5.2.3 Proximity Switch Off Delay

The proximity switch can separately set the on and off delays. By default, it is 0, and setting the switch delay is sufficient. If you need to separately set the on and off delays for the photoelectric and proximity switches, use this parameter to set the proximity switch off delay.

Function Code	Name	Parameter Range	Unit	Factory Value
Pr12	Proximity Switch Off Delay	0.0~40.0	0.1S	0.0

5.2.4 Soft Start Time

When the controller starts from a stopped state (including power-on startups), the output voltage can smoothly ramp up to the set value to prevent the vibrating equipment and controller from being subject to shock. This parameter (in seconds) is minimally adjustable in increments of 0.1 seconds.

Soft Start Time: The time required for the output voltage to increase from 0V to the maximum voltage. The controller increases from 0V to the set voltage.

The time to reach the set voltage is calculated by the following formula: (Output Voltage / Maximum Voltage) × Soft Start Time.

Function Code	Name	Function Description	Unit	Factory Value
Pr13	Soft Start Time	0.0~20.0	0.1S	1.5

5.2.5 Run Control Selection

In general, the operating state of the controller depends on external signals, such as the logical relationship between the status of smart photoelectric sensors, switch sensor input ports, panel switches, and internal parameter settings. In some applications, it is necessary to remove the control of external signals on the controller, which can be achieved through this parameter.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr14	Run Control Selection	0: External switch controls the controller, DO indicates whether the controller is running. 1: Panel switch controls the controller, DO indicates the proximity switch signal. 2: Proximity switch port controls the controller, DO indicates the photoelectric signal. 3: Photoelectric port controls the controller, DO indicates the proximity switch signal.	0~3	150

Note: Regardless of the value of Pr14, the DO level logic inversion is always effective.

5.2.6 Acceleration Index

Acceleration Index: Indicates the maximum percentage of the output voltage relative to the input voltage. Users can control the effect of the acceleration function through this parameter.

Function Code	Name	Function Description	Unit	Factory Value
Pr15	Acceleration Index	100~150	1%	100

5.2.7 Communication Enable

When the master device communicates with the controller via RS485, the master device needs to control start and stop through the bus, which can be achieved by writing this parameter.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr16	Communication Enable	Bit0: Enable setting bit Bit1: Communication enable selection bit. Bit2: Force enable selection bit	1~255	1

If the controller does not require external sensors (photoelectric or proximity switches) to participate in controlling start and stop, use communication to force axis enable by enabling BIT2 and make the following settings:
If communication is enabled, set to 5 (0B101)
If communication is disabled, set to 4 (0B100)

If the controller requires external sensors to participate in controlling start and stop, communication and external sensors work together, meaning both communication enable and external sensors are effective, the controller starts. If either communication enable or external sensors are invalid, the controller stops.
If communication is enabled, whether the controller starts depends on the sensors, set to 3 (0B11)
If communication is disabled, set to 2 (0B10)

5.2.8 Controller's Status

When the master device communicates with the controller, it sometimes needs the current status of the controller, this Function Code is read-only.

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr17	Controller Status	0: Initialization 1: Not Enabled 2: Enabled 3: Alarm	0~65535	0

When the units digit is 3, indicating an alarm state, the tens digit represents the alarm code.

5.2.9 Port Diagnostic Function: Port Status

The current port status is shown as a two-digit value. Default status at power-on:

Photoelectric sensor: No signal (LSB=1)
Proximity switch: Normally open (MSB=1)

Status Interpretation:

Digit	**Component**	**Status 0**	**Status 1**
LSB	Photoelectric sensor	Beam aligned (transmitter/receiver paired)	No signal (default)
MSB	Proximity switch	Detecting material (activated)	Normally open (default)

Normal power-on status value: 11

Field Debugging Guide:
Photoelectric sensor diagnosis:

Verify beam alignment by checking LSB status change
Failure indication: No LSB change when blocking/unblocking beam

Proximity switch diagnosis:

Monitor LED status vs MSB value change
Failure indication: MSB remains static when LED toggles

Extended Functionality:
Real-time port status readable via RS485 communication
Enables remote monitoring and system integration

5.3 Counting Function

Function Code	Name	Function Description	Parameter Range	Factory Value
Pr39	Quantity of final paragraphs	Quantity of end-stage workpieces before shutdown.	0~9999	0
Pr40	Voltage of final paragraphs	End-stage output voltage before shutdown	0~260V	100
Pr41	Count Value	Quantity of workpieces	0~9999	0
Pr42	Counting Threshold	Counting Set Value	0~9999	0
Pr43	Delay time	Delay and Start New Cycle After Counting Completion	900.0S	3.0s

Considering the continuity of counting operation, the delayed turn-off Pr02 is set to 2.0 seconds.

This controller supports counting function. When the sensor connected to port C detects a workpiece passing through, the count value increases by 1. When the counted quantity reaches the end stage (counting threshold minus end-stage quantity), the controller's output voltage decreases to the end-stage voltage, and the bowl feeder continues to operate. When the counted quantity reaches the Pr42 counting threshold, the controller shuts down.

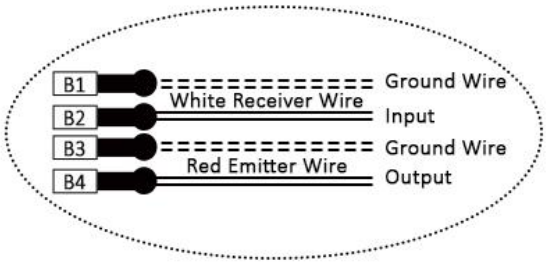
The controller supports two counting reset functions:
1.Timed reset: When Pr43 is greater than zero, after the workpiece count value reaches the Pr42 counting threshold, the timer starts counting. When the timing duration reaches the delay time set by Pr43, the count value resets to zero, the bowl feeder voltage recovers, and vibration starts.

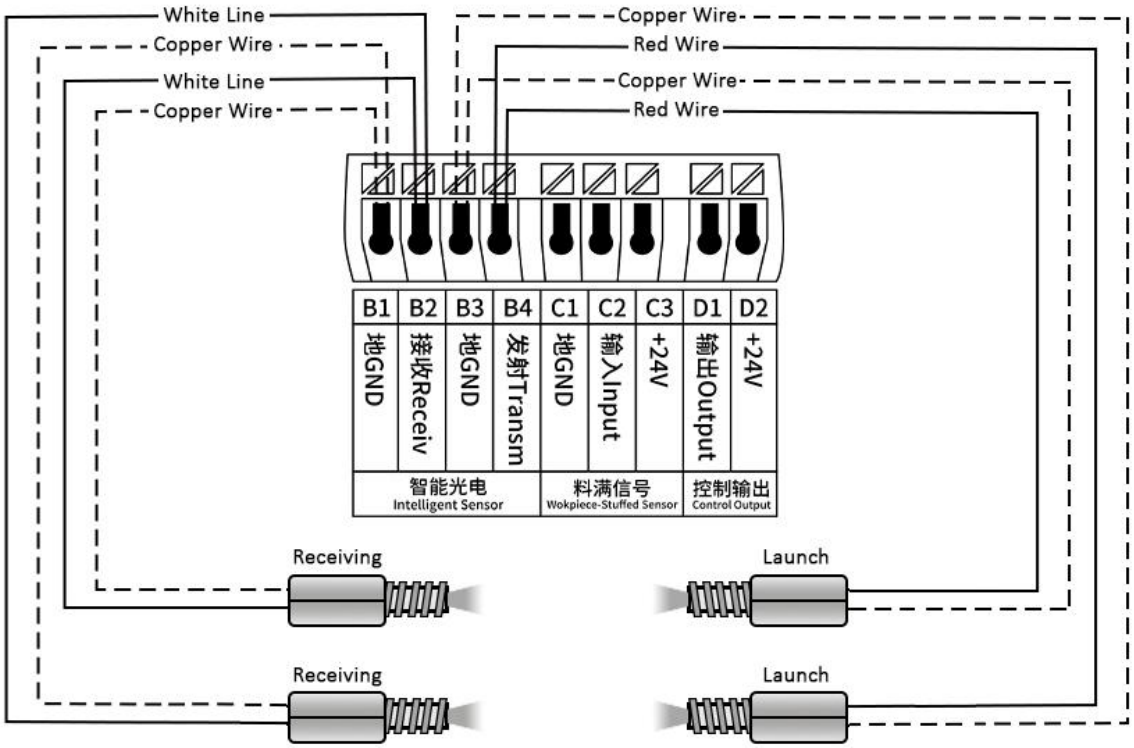
2.Switch reset: Connect a switch between port B1 and B2.Set Pr07 to 0, and use port B as I/O.When the count value reaches the value set by Pr42, the controller shuts down.When the switch is pressed, the count value resets to zero, the bowl feeder voltage recovers, and vibration starts.Additionally, the PLC output port can be connected to B1 and B2 to control the counter reset.

Chapter 6 Application Cases

6.1 Dual-Channel Application with Photoelectric Sensors

In some bowl feeder application sites, dual-track or multi-track systems are required to improve vibration conveying efficiency. Simultaneously, photoelectric beams need to be installed to detect the full-load status of each track. Based on detection results, the bowl feeder's start/stop is controlled: if the photoelectric beam of any track is unobstructed, the bowl feeder vibrates; if beams of both tracks are obstructed, the bowl feeder stops. The wiring method is as follows:



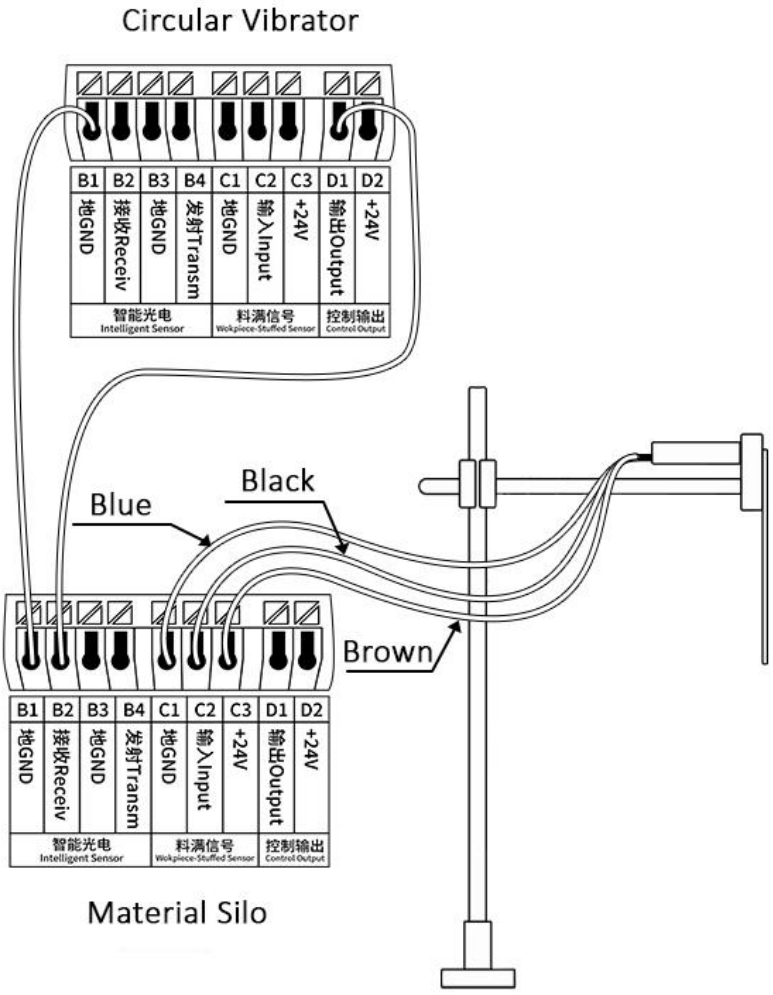


1.Twist the two smart photoelectric beam wires together: red with red, white with white, and bare copper wires with bare copper wires. The wiring is identical to that of a single beam.

2.Short press the beam logic key on the hopper controller and set it to 1.

6.2 Hopper Control

In some bowl feeder application sites where hoppers are used, hopper control must be completed based on the actions of the circular vibrator and the hopper's pendulum rod. The hopper must stop when the circular vibrator stops. When the circular vibrator vibrates, if the pendulum rod signal is on, the hopper runs; if the pendulum rod signal light is off, the hopper stops. The wiring for this solution is as follows:



Connect the ground wire of the circular vibrator and hopper (vibrator B1 to hopper B1). Connect the D1 terminal of the circular vibrator to the B2 terminal of the hopper.

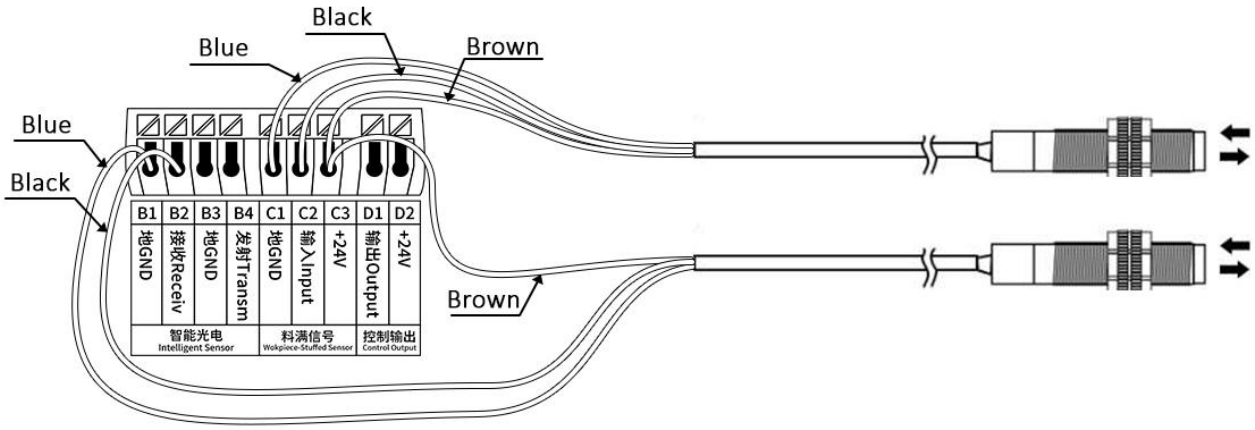
Connect the proximity switch to port C of the hopper. Additionally, configure the hopper controller as follows:

1. Short press the function key and set Pr06 (beam sensitivity) to 0.
2. 2.Short press the hopper beam logic key and set it to 1.
3. 3.Long press the function key and set hopper Pr10 (proximity switch input port logic direction) to 1.

If elevator linkage control is required, connect a relay between ports D1 and D2 of the hopper to control the elevator start/stop. Determine whether to modify Pr07 (DO output port logic direction) based on needs. If not controlling the elevator, neither relay connection nor corresponding parameter settings are required.

6.3 Two Proximity Switches

Some vibratory bowl applications require the use of two proximity switches to control the start and stop of the vibratory bowl, such as in dual-channel scenarios. The single-axis controller needs to modify parameters to support direct control of the vibratory bowl start and stop by two proximity switches. The wiring diagram is as follows:



Connect the first proximity switch to port C. Connect the brown wire of the second proximity switch to C3, the blue wire to B1, and the black wire to B2.

In this case, using proximity switches for dual channels, the following settings need to be made:

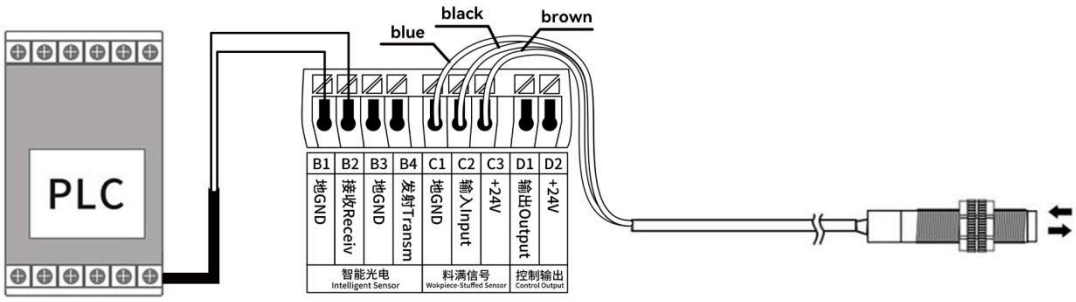
1. Press the function button briefly and set Pr06 (sensitivity of the photoelectric sensor) to 0.

2. Press the function button briefly and set Pr04 (control signal logic relationship) to 0 ("OR" operation, the controller stops when both channels detect an object, otherwise it runs).

Other applications of two proximity switches can be completed by setting the corresponding parameters.

6.4 Full-Load Shutdown and PLC Control

In some bowl feeder application sites, full-load shutdown functionality is required, while start/stop control via PLC is also needed. In such cases, **two-channel digital input** is necessary. Through parameter settings, the beam port can be repurposed as a switch port. The wiring is as follows:



Wiring and parameter settings are as follows:

1.Connect the PLC's COM port to terminal B1/ GND, and the Y port to B2. For the full-load shutdown proximity switch: brown wire to C3, blue wire to C1, black wire to C2.

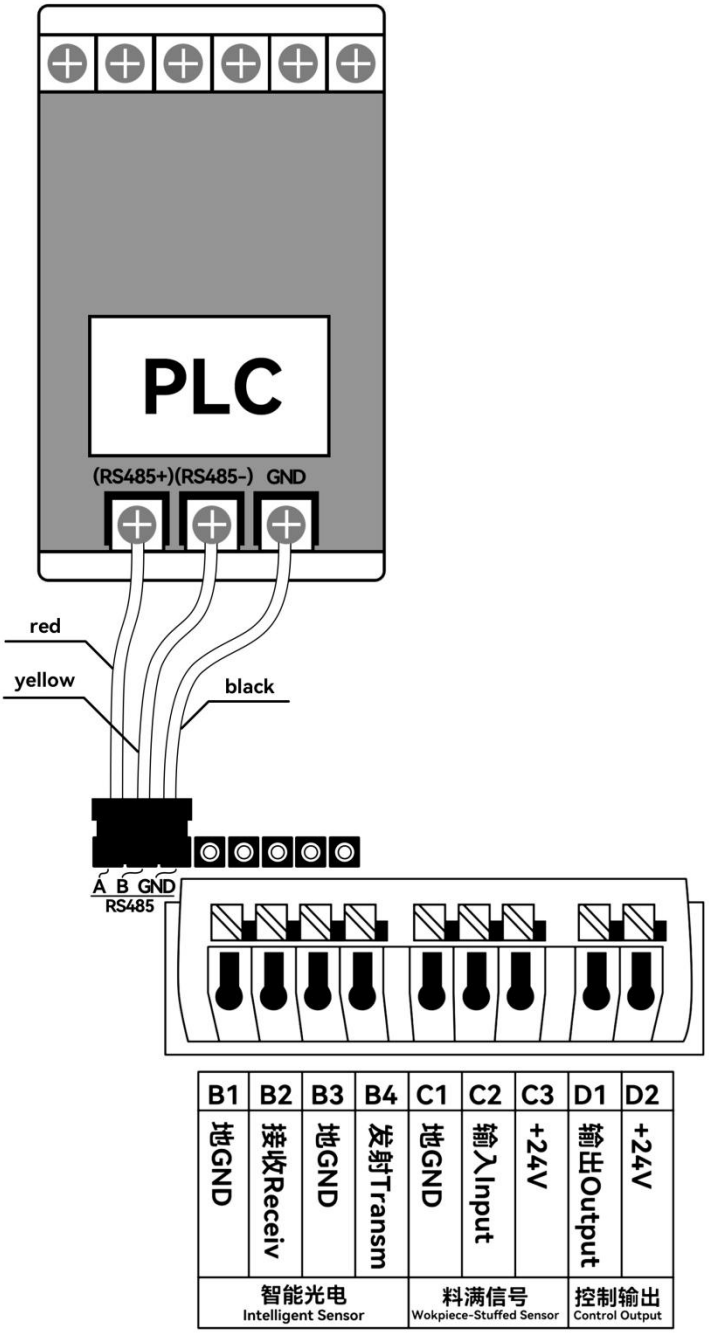
2.Short press the function key and set Pr06 beam sensitivity to 0.

3.Press the beam logic key and set it to 1.

After power-on, the controller does not vibrate. It starts vibrating when the PLC sends a signal and stops vibrating upon detecting full-load. If the PLC has a PNP output, a relay adapter is required for the PLC to control the on/off state between B1 and B2 via the relay.

Chapter 7 Modbus Communication

7.1 RS485 Communication Wiring



7.2 Set RS485 Communication Address (Pr35)

When multiple RS485 devices participate in networking, each device's address must be unique; otherwise, communication abnormalities will occur, making communication impossible. Wherein:

Function Code	Name	Option Description	Parameter Range	Defaults
Pr35	RS485 Communication Address	0: Broadcast Address 1~247: Slave Address.	0~247	1

The master device can perform write operations on slave devices via broadcast frames. Upon receiving a broadcast frame, the slave device executes the corresponding operation but does not respond.

7.3 RS485 Baud Rate Setting (Pr36)

The controller's communication baud rate must match the master device's baud rate ,otherwise, communication will fail.

Function Code	Name	Option Description	Parameter Range	Defaults
Pr36	RS485 Baud Rate Selection	0 : 2400bps 1:4800bps 2 : 9600pbs 3:19200bps 4: 38400pbs 5:57600pbs 6:115200bps	0~6	2

When multiple devices participate in networking, if a device's baud rate does not match the host's, it will cause communication errors for that device or affect other devices' communication.

7.4 Confirm RS485 Write EEPROM Enable (Pr37)

The controller provides real-time saving of Function Codes (Pr37=1). After modifying Function Codes through communication, they are saved in EEPROM in real-time, ensuring data retention after power loss.

Function Code	Symbol	Option Description	Parameter Range	Defaults
Pr37	RS485 Write EEPROM Enable	0: Do not save written parameters 1: Save written parameters	0~1	0

This function should be used with caution:

1. If the Function Code only needs to be modified once and then used continuously, the real-time saving function can be enabled (Pr37=1);

2. If the Function Code value needs to be changed frequently, it is recommended to disable the real-time saving function (Pr37=0). Otherwise, frequent EEPROM writes will reduce its lifespan.

3. Default Pr37=0.

7.5 Communication Protocol

The controller's data length is 16-bit, and the Function Code can be read and written through RS485 RTU. The command codes are as follows:

Operation	Command Code
Read 16-bit Function Code	0x03
Write 16-bit Function Code	0x06

Offset address is queried according to the address table

7.5.1 Read Function Code 0x03

Request Frame Format:

Start	A frame starts when the idle time is greater than or equal to 3.5 characters.
ADDR	Communication Address 1~247
CMD	0x03
DATA[0]	Starting Function Code Group Number
DATA[1]	Starting Function Code Group Offset, e.g., the offset within Pr01 group is 1
DATA[2]	High 8-bit of the number of Function Codes to read (Hexadecimal)
DATA[3]	Low 8-bit of the number of Function Codes to read (Hexadecimal)
CRCL	Low 8-bit of CRC check valid bytes
CRCH	High 8-bit of CRC check valid bytes
END	A frame ends when the idle time is greater than or equal to 3.5 characters.

Response Frame Format:

Start	A frame starts when the idle time is greater than or equal to 3.5 characters.
ADDR	Communication Address 1~247
CMD	0x03
DATALENGTH	The number of Function Code bytes, equal to twice the

	number of Function Codes (16-bit).
DATA[0]	Function Code value, high 8 bits.
DATA[1]	Function Code value, low 8 bits.
CRCL	Low 8-bit of CRC check valid bytes
CRCH	High 8-bit of CRC check valid bytes
END	A frame ends when the idle time is greater than or equal to 3.5 characters.

7.5.2 Write Function Code 0x06

In the MODBUS RTU protocol, writing a 16-bit Function Code uses 0x06. Request Frame Format:

Start	A frame starts when the idle time is greater than or equal to 3.5 characters.
ADDR	Communication Address 1~247
CMD	0x06
DATA[0]	Starting Function Code Group Number
DATA[1]	Starting Function Code Group Offset, e.g., the offset within Pr01 group is 1
DATA[2]	Write data high 8 bits (hexadecimal).
DATA[3]	Write data low 8 bits (hexadecimal).
CRCL	Low 8-bit of CRC check valid bytes
CRCH	High 8-bit of CRC check valid bytes
END	A frame ends when the idle time is greater than or equal to 3.5 characters.

Response Frame Format:

Start	A frame starts when the idle time is greater than or equal to 3.5 characters.
ADDR	Communication Address 1~247
CMD	0x06
DATA[0]	Written Function Code group number
DATA[1]	Offset within the written Function Code group, for example, the offset within Pr01 group is 1
DATA[2]	High byte of the written data, in hexadecimal
DATA[3]	Low byte of the written data, in hexadecimal
CRCL	Low 8-bit of CRC check valid bytes
CRCH	High 8-bit of CRC check valid bytes
END	A frame ends when the idle time is greater than or equal to 3.5 characters.

7.5.3 Communication error frame

Error frame response format:

Start	A frame starts when the idle time is greater than or equal to 3.5 characters.
ADDR	Communication Address 1~247
CMD	Command code + 0x80

DATA[0]~DATA[3]	DATA|ERRORCODE
CRCL	Low 8-bit of CRC check valid bytes
CRCH	High 8-bit of CRC check valid bytes
END	A frame ends when the idle time is greater than or equal to 3.5 characters.

Error Frame Code:

Error Code	Encoder Description
0x0001	Illegal Command Code
0x0002	Illegal Data Address
0x0003	Illegal Data
0x0004	Slave Device Failure

7.5.4 Communication Example

1. Master Sends Read Request

01	03	01	01	00	01	d4	36

This request frame indicates: the master reads 1 piece of 16-bit data starting from address PC01 of the slave with address 1. Slave Return Frame:

01	03	02	00	64	b9	af

This return frame indicates: the slave returns 2 bytes of data, with the content being 0x64.

Combined with the previous frame, the master reads PC01, which is the output voltage, and the slave returns 100 (V).

If 01 8x is returned, it indicates a read failure.

2. Master Sends Write Request

01	06	01	01	00	63	99	df

This request frame indicates: the master writes 0x63 (99) to the slave with address 1, Function Code PC01.

01 06 01 01 00 63 99 df

Slave Return Frame:

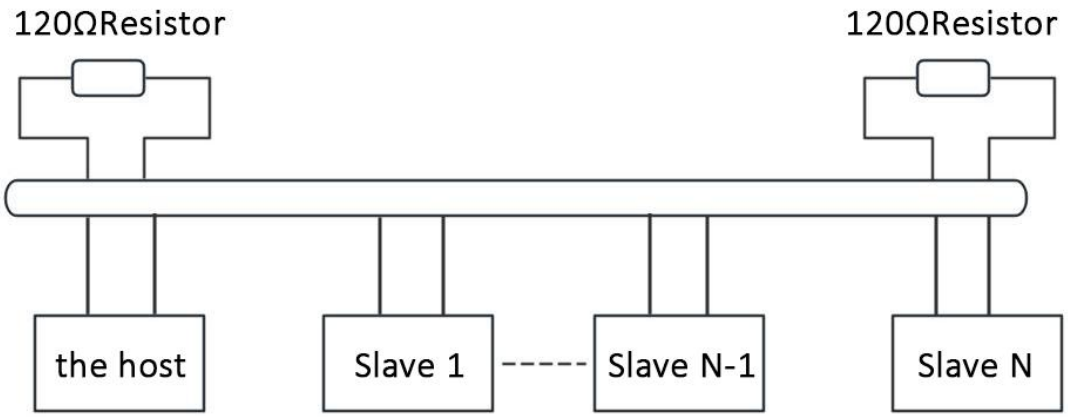
01	06	01	01	00	63	99	df

This return frame indicates: the slave has successfully written.

Combined with the previous frame, the master writes 99V to PC01.

7.6 RS485 Common Issues Handling

7.6.1 Terminal Resistor Connection Method

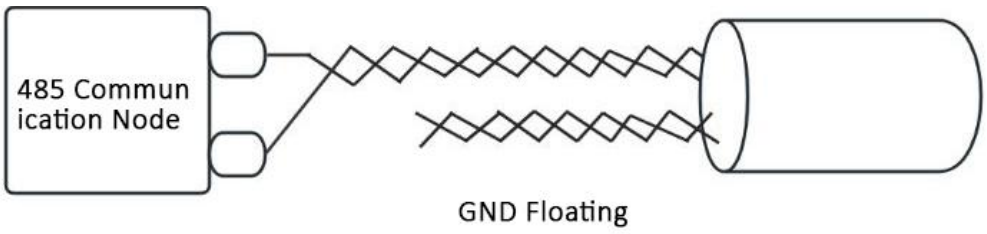


◆ Only 120Ω resistors can be connected at the RS485 terminals.

◆ It is recommended to place the master station on one side of the bus.

◆ Measure the resistance of the RS485 bus when the device is powered off; the resistance should be around 60Ω. If the resistance is less than 50Ω, check if terminal resistors are connected at nodes other than the two ends of the bus and disconnect them. If the resistance is 0, check if the node is short-circuited or damaged.

7.6.2 Correct Wiring Method (For nodes without GND connection points)



◆ Look for a reference ground shared with RS485 on this node; if there is a GND, connect it to this reference ground. Pay special attention that the shield layer should not be connected to the reference ground, as it may cause port damage.

◆ Look for a reference ground shared with RS485 on the node's board; if there is a GND, connect it to this reference ground. Pay special attention that the shield layer should not be connected to the reference ground, as it may cause port damage.

◆ If no RS485 reference ground is found, as shown in the figure, leave the RS485 GND floating while ensuring the PE ground wire is reliably connected.

Chapter 8 Safety Protection Functions

8.1 Short Circuit Protection Function

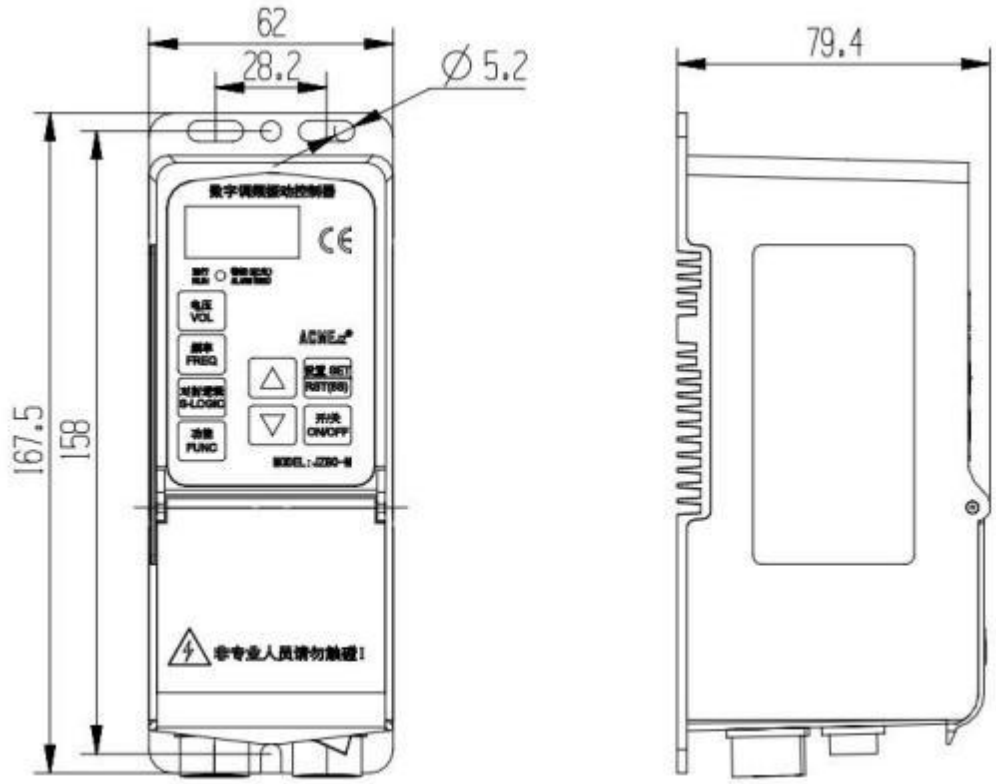
When an output short circuit occurs, the controller immediately stops output and displays Err.01. Pressing the "Voltage" key briefly enables access to voltage display and adjustment, though the controller remains in alarm state with no output.Short circuit alarms typically result from shorts in the base coil or cables, where the controller detects excessive current flow. Conduct an exchange test to pinpoint the fault location.

8.2 Error Messages and Troubleshooting Table

1	**Turn on the switch, no display**	(1) Verify mains power presence at the electrical outlet (2) Ensure the power plug is securely plugged into the outlet
2	**There is a display, but the vibration plate is not moving, and there is no sound**	(1) Please check if the output cable between the controller and the vibration plate is correctly and securely connected. (2) Please verify the controller parameters to determine if the output voltage is insufficient. (3) Please check if the controller's operation light is showing blue light. If the operation light is not on, please check the switch, input signal, and logic are set correctly. If the operation light is showing red light, please check and troubleshoot the issue according to the alarm code.
3	**Control signal does not work**	(1) Please check if the control signal is correctly connected; (2) Please check if the control signal ground is correctly connected to the controller ground; (3) Please check if the control signal logic relationship is set as expected;
4	**There is a display, the vibration plate does not move but sound can be heard**	(1) Please adjust the relevant parameters step by step according to the method introduced in this manual;
5	**Periodically fluctuating**	(1) Please check the vibration coupling issue between multiple vibration bodies; (2) Please adjust the working frequency of the coupled vibration equipment to make the frequency difference larger;
6		(1) Output short circuit; check wiring connections, vibratory bowl coil, etc. for possible short circuits. (2) The parameter settings are improper, resulting in excessive current.

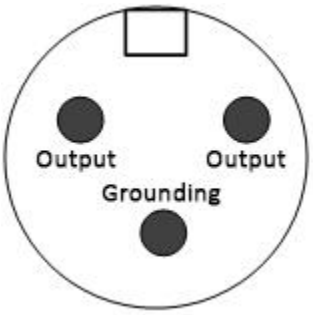
Appendix A Dimensions

JZ80-M Vibration Feeding Controller Dimensions: (mm)



Appendix B Port Definitions

Output Port Definitions



Please note:

1. Please confirm that the electromagnetic coil is connected to the two output pins, and the mechanical shell of the vibration body needs to be reliably grounded, otherwise it will cause the shell to be electrified, which may lead to serious safety accidents.
2. When soldering an aviation plug, be sure to tightly wrap the joint part with heat shrink tubing or insulating tape, and then insert it into the metal sleeve of the aviation plug to avoid electric leakage or short circuit accidents.

Appendix C Controller Parameter List

Address Table Query

Function Code	Name	Function Description	Factory Value	RS485 Address	Read/Write Attribute
PC01	output voltage	0~260V, in 1V	100	0x101 (257)	RW
PC02	output frequency	20~400.0HZ, in 0.1HZ	80	0x102 (258)	RW
PC03	Through-beam Photoelectric Sensor Logic Direction	0: Normally Open Logic 1: Normally Closed Logic	0	0x103 (259)	RW
Pr01	Turn-On Delay Time	0.0~10.0S, in 0.1S	0.2	0x201 (513)	RW
Pr02	Turn-Off Delay Time	0.0~10.0S, in 0.1S	0.2	0x202 (514)	RW
Pr03	Maximum output voltage	0~260V, in 1V	100	0x203 (515)	RW
Pr04	Control signal logical operation	0: Logical "OR" 1: Logical "AND" 2: Logical "XOR"	1	0x204 (516)	RW
Pr06	Photoelectric Sensitivity	0~1000	60	0x206 (518)	RW
Pr07	DO logic selection	0: Normally Open 1: Normally Closed	0	0x207 (519)	RW
Pr10	Proximity switch logic direction	0: Normally Open Logic 1: Normally Closed Logic	0	0x20A (522)	RW
Pr11	Proximity Switch On Delay	0.0~10.0S, in 0.1S	0	0x20B (523)	RW
Pr12	Proximity Switch Off Delay	0.0~10.0S, in 0.1S	0	0x20C (524)	RW
Pr13	Soft Start Time	0.0~20.0S, in 0.1S	1.5	0x20D (525)	RW
Pr14	Run Control Selection	0: External switch controls the controller, DO indicates whether the controller is running. 1: Panel switch controls the controller, DO indicates the proximity switch signal. 2: Proximity switch port controls the controller, DO indicates the photoelectric signal. 3: Photoelectric port controls the controller, DO indicates the proximity switch signal.	0	0x20E (526)	RW
Pr15	Acceleration Index	100~150, in %	100	0x20F (527)	RW
Pr16	Communication Enable	Bit0: Axis enable setting bit Bit1: Axis communication enable selection bit. Bit2: Axis communication force enable	0	0x210 (528)	RW
Pr17	Controller’s Status	Unit digit 0: Initialization unit digit is	2	0x211 (529)	RO

		1: Not enabled unit digit is 2: Enabled unit digit is 3: Alarm tens digit, hundreds digit is alarm code			
Pr35	RS485 Communication Address	1~255	1	0x223 (547)	RW
Pr36	RS485 baud rate	0 : 2400bps 1:4800bps 2 : 9600pbs 3:19200bps 4:38400bps 5:57600pbs 6:115200bps	2	0x224 (548)	RW
Pr37	RS485 Write EEPROM Enable	0: Do not save written parameters 1: Save written parameters	1	0x225 (549)	RW
Pr38	Parity Check	0: No parity, 2 stop bits 1: Even parity, 1 stop bit 2: Odd parity, 1 stop bit 3: No parity, 1 stop bit	0	0x226 (550)	RW
Pr39	Quantity of final paragraphs	0~9999	0	0x227 (551)	RW
Pr40	Voltage of final paragraphs	0~260	100	0x228 (552)	RW
Pr41	Count Value	Quantity of workpieces	0	0x229 (553)	RO
Pr42	Counting Threshold	Counting Set Value	0	0x22A (554)	RW
Pr43	Delay time	Delay and Start New Cycle After Counting Completion	0	0x22B (555)	RW
Pr44	Bus voltage	0~1000V	310	0x22C (556)	RO
Pr45	Version number		80	0x22D (557)	RO

Quality builds the foundation, innovation drives the future

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