VEICHI

# Manual

## VH100

# Preface

This Manual is a concise guide for the VH100 Series PLCs, covering design, installation, connection, and maintenance. It outlines hardware specs, features, usage, accessories, and FAQs for quick reference.

For more detailed product information, please refer to the *VH Series Programmable Controller Manual* and the *AutoStudio Programming Software Manual* issued by VEICHI. For technical resources or support, visit the official website at https://www.veichi.cn.

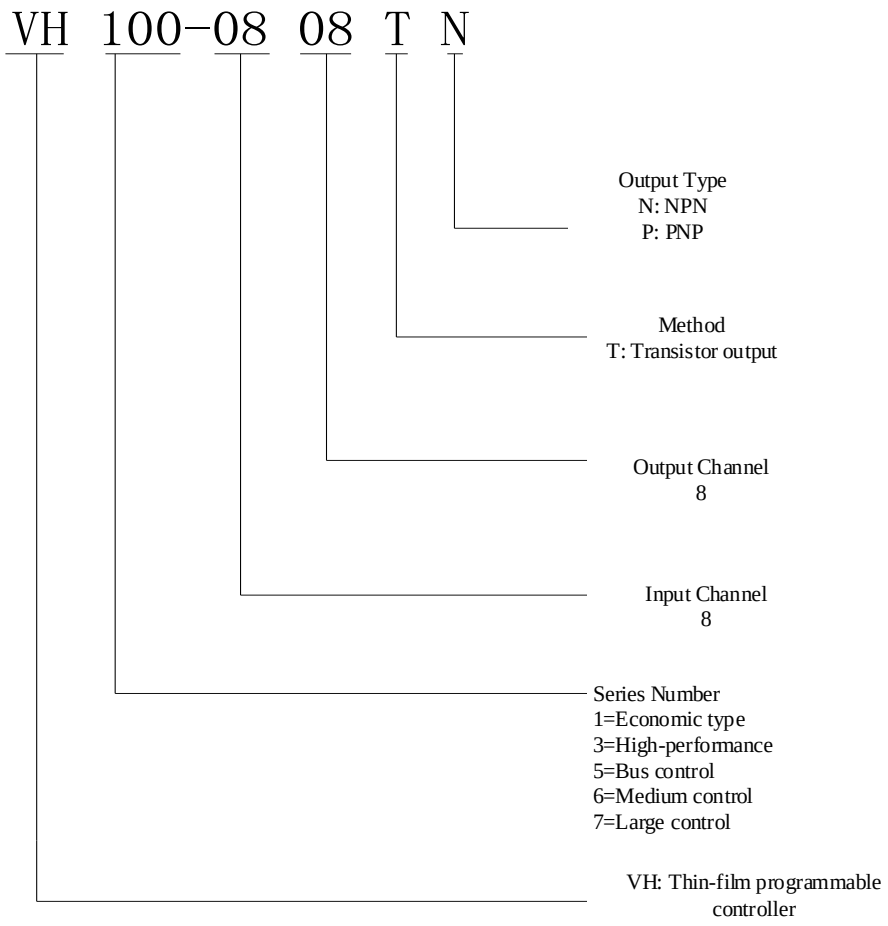
# Catalog

1 Product Introduction....1
1.1 Model....1
1.2 Outline Structure....1
1.3 Terminal....3
1.4 Power Specification....3
2 Switching Input/Output Characteristics....4
2.1 Input Characteristics and Signal Specification....4
2.2 Output Characteristics and Signal Specifications....5
3 Communication Port....7
4 Installation....8
4.1 Specification....8
4.2 Installation Method....8
4.2.1 Fixed by DIN Slot....8
4.2.2 Master Installation....9
4.2.3 Disassembly....10
4.3 Cable Connections and Specifications....10
5 Power-up Operation and Routine Maintenance....12
5.1 Power-up Operation....12
5.2 Routine Maintenance....12
Notice to Users....13
Version Change Log....14

# 1 Product Introduction

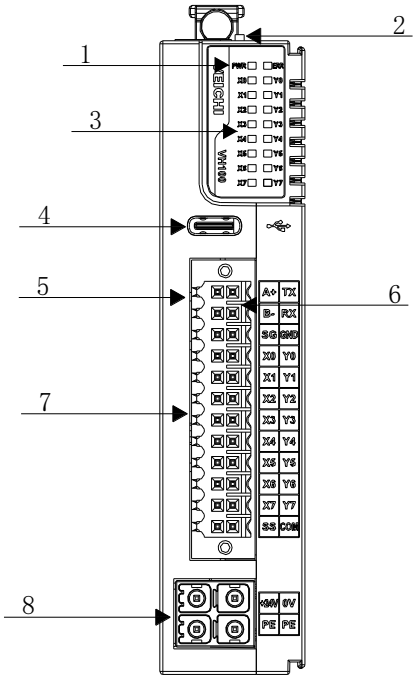
## 1.1 Model

Refer to the figure below:




## 1.2 Outline Structure

The outline structure of the VH100 series main module is illustrated below (VH100-0808TN for example).




| No. | Type | Mark | Definition | Description |
|---|---|---|---|---|
| 1 | Operation indicator | PWR | Normal operation | ON: Power supply is normal<br>Flash: Operation is in progress<br>OFF: No power or abnormal power supply |
| | | ERR | Operation error | OFF: No serious errors<br>Flash: A serious error has occurred |
| 2 | Dialing switch | RUN/STOP | To control master start/stop | - |
| 3 | IO indicator | X/Y | IO status display | ON: Input or output is valid<br>OFF: Input or output is invalid |
| 4 | Type-C interface | | Connect to PC | - |
| 5 | RS485 | A+/B- | 485 communication signal | Isolated |
| 6 | RS232 | TX/RX | 232 communication signal | Non-isolated |
| 7 | I/O port | X/Y | 8 channels of input, 8 channels of output | X0-X7, Y0-Y7 |
| 8 | Power interface | 24V/0V/PE | DC 24V power supply | - |

1 channel of RS-232 level, 1 channel of RS-485 level, Type-C USB interface, mode selector with ON and OFF positions, 1 RS-485 terminal resistor with a resistance of 120Ω. 8 channels of DC24V inputs, 8 channels of transistor outputs (including 3 channels with 100kHz high-speed pulses), DC 24V power supply.

## 1.3 Terminal

| Type | Mark | Definition |
|---|---|---|
| RS485 | A+ | 485 communication signal + |
| | B- | 485 communication signal - |
| | SG | 485 communication ground |
| RS232 | TX | RS232 transmit signal |
| | RX | RS232 receive signal |
| | GND | RS232 communication ground |
| IO terminal | X0-X7 | Input points |
| | SS | Common terminal for input points |
| | Y0-Y7 | Output points |
| | COM | Common terminal for output points |
| Power interface | +24V | DC 24V power supply + |
| | 0V | DC 24V power supply - |
| | ⏚ | PE |

## 1.4 Power Specification

- DC power:

| Item | Specification |
|---|---|
| Terminal input power rated voltage | 24V DC±10% (21.6V DC ~ 26.4V DC) |
| Terminal input power rated current | 0.2A (max. at 24V) |
| 24V input power protection | Short circuit protection and reverse connection protection |

# 2 Switching Input/Output Characteristics

## 2.1 Input

The input characteristics and signal specifications are shown as follows.

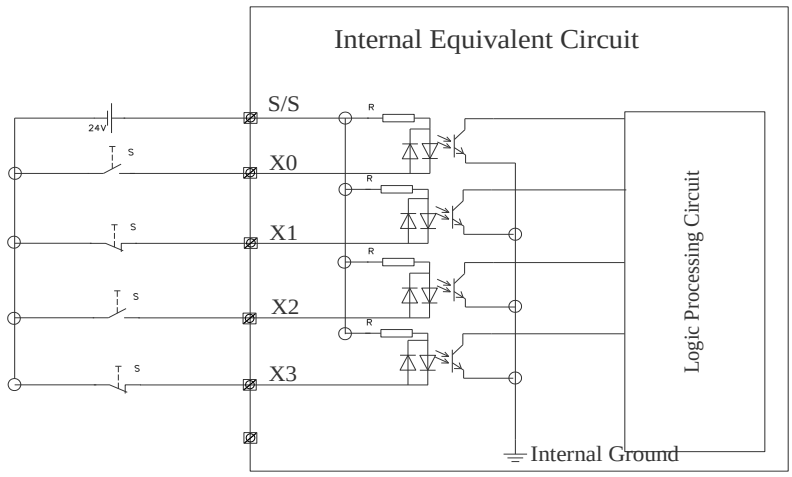
| Item | | Input Terminal |
|---|---|---|
| Input method | | Source/sink mode selectable via "S/S" terminal |
| Parameters | Detection voltage | 24V DC |
| | Input current | 4mA (typical at 24V) |
| | Input impedance | Reference value: 5.3k to 5.6k |
| | Input ON | ＞15V DC |
| | Input OFF | ＜5V DC |
| Filtering | Digital | X0-X7 is provided with digital filtering, with filter time programmable from 0ms to 60ms |
| | Hardware | All other ports are equipped with hardware filtering, with filter time of about 10ms |
| High speed | | X0-X7 support high-speed counting, interrupts, and pulse capture<br>X0, X1 support counting up to 50kHz<br>X2-X7 support counting up to 10kHz<br>Total input frequency must be less than 60kHz |
| Common terminal | | Single common terminal, labeled as S/S |

Counter input ports have a maximum frequency threshold. Exceeding this may result in inaccurate counting or system failure. Please properly arrange input ports and use appropriate external sensors.

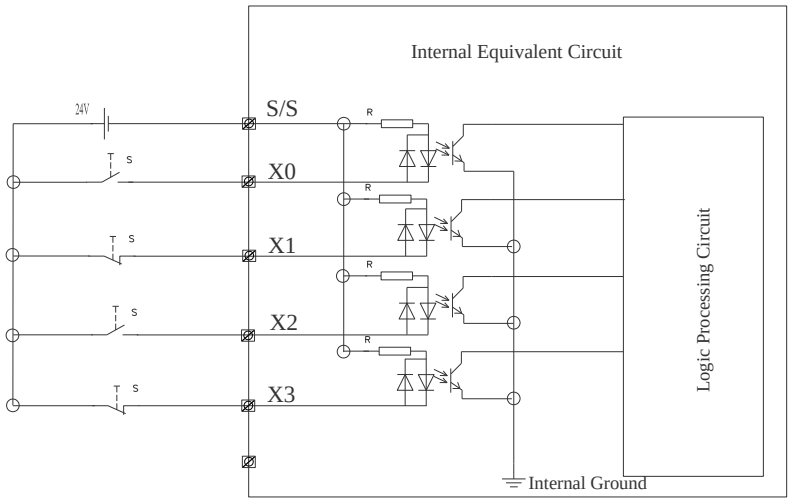
The PLC features an "S/S" port for selecting input modes: source input or sink input. Connecting "S/S" to "+24V" configures it for sink input mode, compatible with NPN sensors.

## Input Connection

- Sink Input Terminal Circuit Diagram




- Source Input Terminal Circuit Diagram



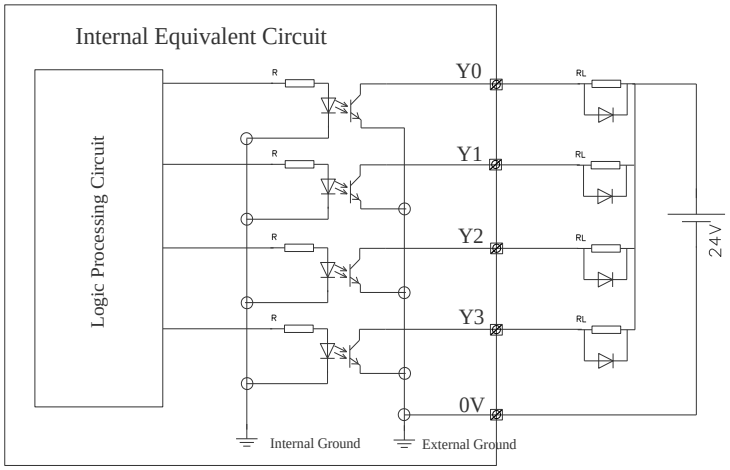

# 2.2 Output

The output characteristics and signal specifications are shown in the table below.

| Item | Transistor Type |
|---|---|
| Output mode | Conducts when "ON"; disconnects when "OFF" |
| Voltage characteristics | 24V DC, polarity required |
| Current requirements | As per output electrical specifications |
| Features | Low drive current, high frequency, long lifespan |
| Description | Suitable for high-frequency, long-life applications such as controlling servo amplifiers and frequently actuated electromagnets |

| Item | | Specification |
|---|---|---|
| High-speed output (Y0~Y2) | Resistive load | 0.5A/terminal, 2A/8 terminals |
| | Inductive load | 7.2W/terminal, 24W/8 terminals |
| | Lamp load | 5 W/terminal, 18W/8 terminals |
| | Load current | For outputs above 10kHz, load current ≥ 12mA |
| | Max. frequency | Resistive load: 100kHz, inductive load: 0.5Hz, lamp load: 10Hz |
| Standard outputs (Y4~Y7) | Resistive load | 0.5A/terminal, 1A/common terminal |
| | Inductive load | 6W/24V DC (total) |
| | Lamp load | 1W/24V DC (total) |
| | Load current | ≥5mA |
| | Max. frequency | Resistive load: 100Hz, inductive load: 0.5Hz, lamp load: 10Hz |
| PWM output (Y0 to Y2) | | Max. frequency: 100 kHz |
| OFF leakage current | | < 30μA, <24V rated voltage |
| Max ON residual voltage | | < 0.5V DC |
| Isolation | | Opto-coupler isolated |
| Common terminal | | 8 channels/common terminal (output power supply -) |
| Short circuit protection | | Each circuit features short-circuit protection with recovery after power outage |
| External inductive load protection | | Install freewheel diodes [2] for external inductive load |
| Output display | | Output indicator is ON when in drive state |

## Output Connection



# 3 Communication Port

The VH100 series PLC main module offers 2 serial asynchronous communication ports, COM0 and COM1, with supported baud rates of 115200, 57600, 38400, 19200, 9600, 4800, 2400, and 1200 bps.

| Signal | Left | Right | Description |
|---|---|---|---|
| RS485 differential pair + | A+ | TX | RS232 transmit signal |
| RS485 differential pair - | B- | RX | RS232 receive signal |
| RS485 communication ground | SG | GND | RS232 communication ground |

RS485 communication specification

| Item | Description |
|---|---|
| Supported channels | 1 |
| Hardware interface | 2 × 12 PIN terminal (common terminal with DIDO) |
| Isolation | Capacitive isolation |
| Terminal resistor | 120Ω, act as master or slave |
| Slave qty | Up to 31 slaves (each slave line distance must be less than 3m) |
| Short circuit protection | 24V misinsertion protection |

RS232 communication specification

| Item | Description |
|---|---|
| Supported channels | 1 |
| Hardware interface | 2 × 12 PIN terminal (common terminal with DIDO) |
| Isolation | None |

COM1 connects with production equipment like drives, using MODBUS or RS485 protocols for networked control of multiple devices. It features screw terminals, and users can make their own communication cables, with twisted shielded wire recommended.

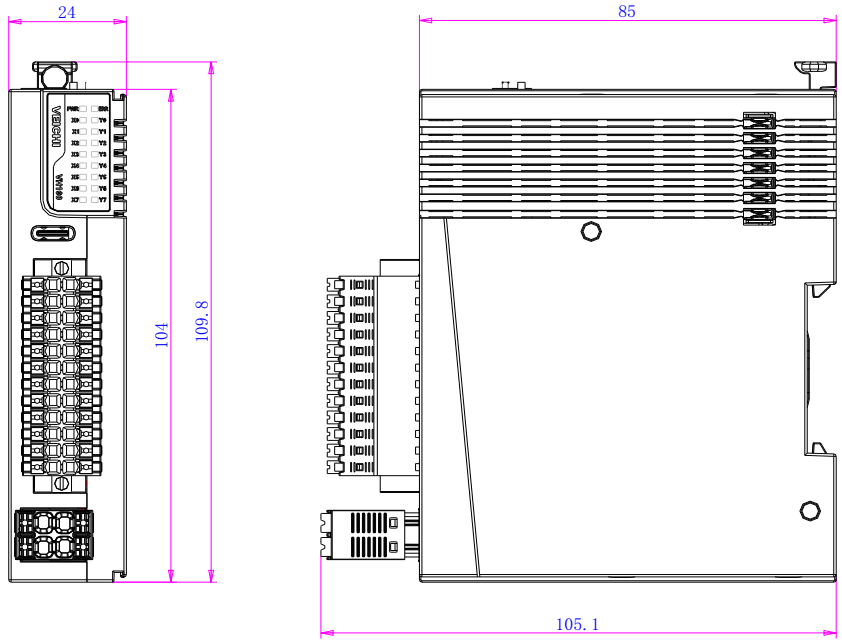
USB: Type-C interface for program transfer, online firmware updates, and monitoring.

# 4 Installation

This PLC is designed for applications where the installation follows Environment II standard and pollution class 2.

## 4.1 Specification

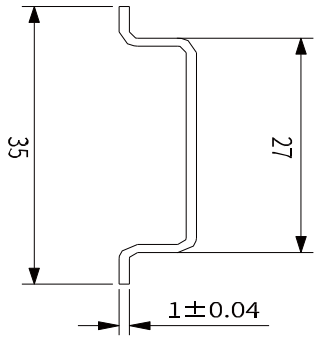
Ensure at least 10mm of clearance above the product to accommodate the latch's movement.




## 4.2 Installation Method

### 4.2.1 Fixed by DIN Slot

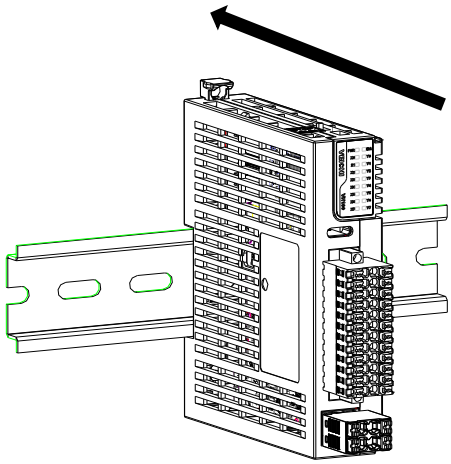
The master shall be installed to the DIN lead rail, which shall conform to IEC 60715 standard (35mm wide and 1mm thick). The dimensional information is shown in the following figure, and the unit is millimeter (mm).

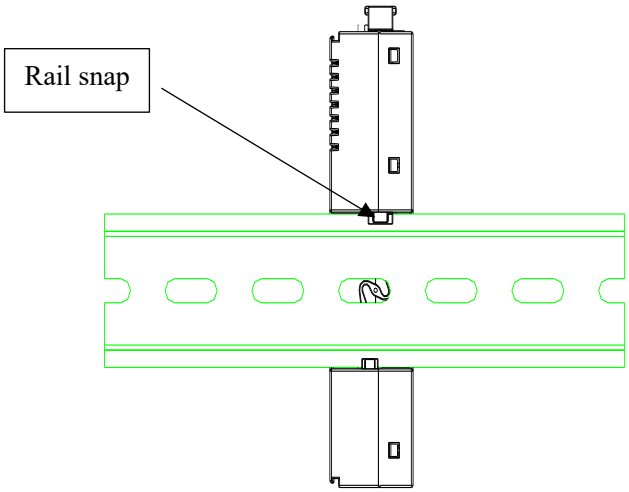



Installation of the product to a non-recommended DIN lead rail (especially if the thickness is not 1.0 mm) will cause snap failure and the product cannot be installed in place, leading to further misoperation.

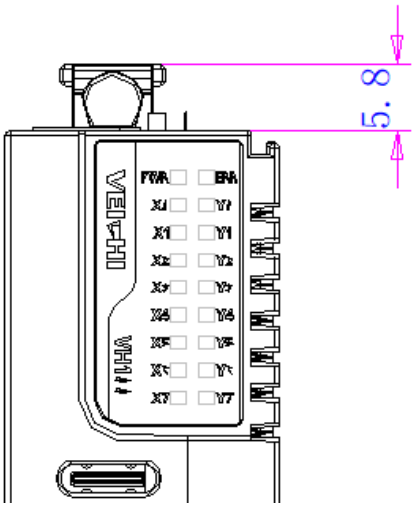
## 4.2.2 Master Installation

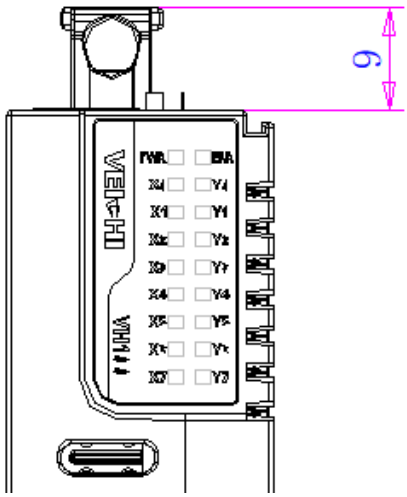
1. When installing, align the master to the DIN lead rail, press the module in the direction indicated by the arrow, and there will be an obvious clipping sound if it is in place, as shown in the following figure.






2. Confirm that the DIN rail snaps are in place, and the locked and unlocked states are shown in the following figure.



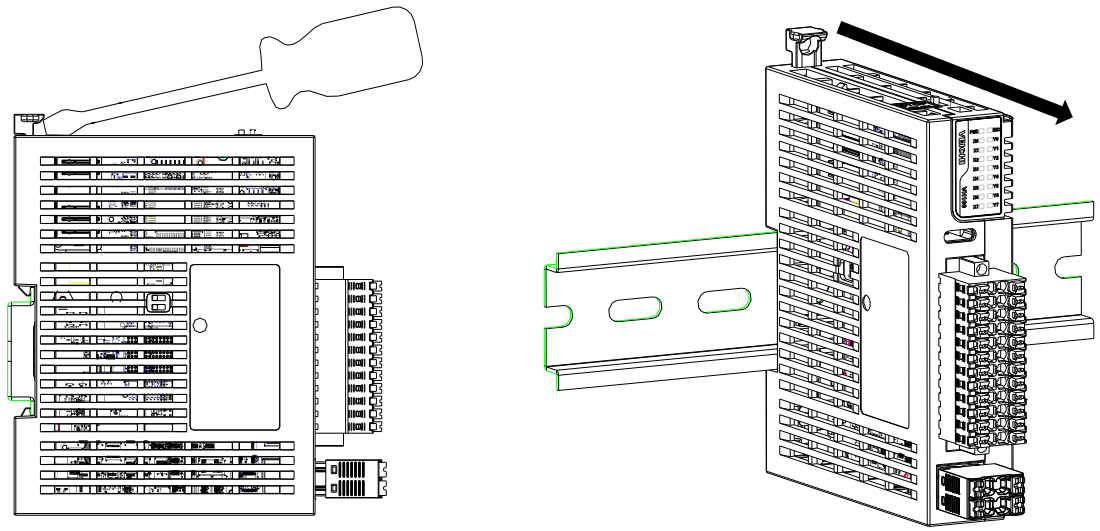




- If the snap is lower, it is locked.
- If the snap is higher, it is unlocked. When unlocked, press the snap down to make it locked.

When the master is not installed on the lead rail, please still keep the snap locked or it may fail if it remains unlocked for a long time.

### 4.2.3 Disassembly

Use a straight screwdriver or similar tool to pry the rail lock up, pull the module output, and press the snap down when finished.

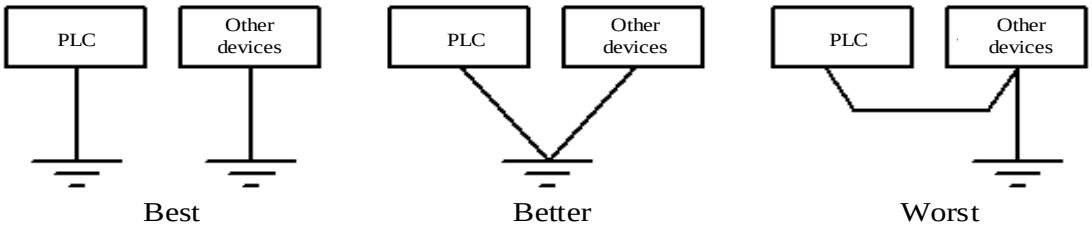


## 4.3 Cable Connections and Specifications

Connect the power and ground cables. For enhanced safety, users should incorporate circuit breakers and fuses in the PLC power input. See the figure for an example of AC and auxiliary power connections.

Ensure a reliable ground connection to boost equipment safety and PLC electromagnetic immunity. When installing, connect the PLC's power terminal⏚ to the ground using AWG16 to AWG22 wires, minimizing wire length.

It is advisable to set up an independent grounding system to prevent shared paths with other devices' grounds, particularly those with high interference, as illustrated in the figure.

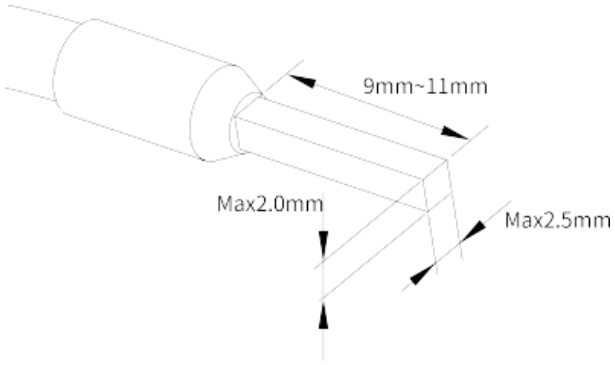



### Cable

Power cable: In the following table, the lug diameter is for reference only, which can be calculated reasonably according to actual use and adjusted separately.

| Accessory | Diameter | |
|---|---|---|
| | GB/mm2 | ANSI/AWG |
| Tubular lug | 0.3 | 22 |
| | 0.5 | 20 |
| | 0.75 | 18 |
| | 1.0 | 18 |
| | 1.5 | 16 |

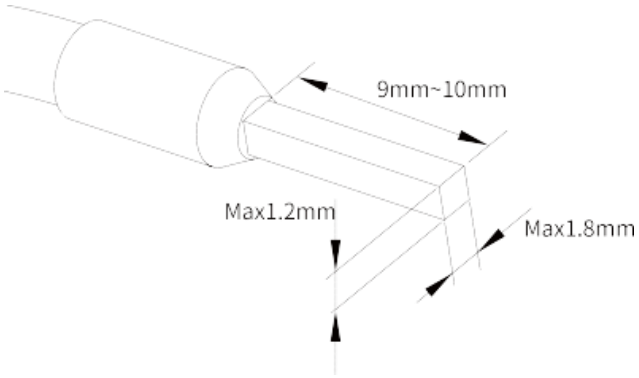
If other tubular lugs are used, press them to the twisted cables. The shape and size requirements are shown in the following figure.




Communication cable: In the following table, the lug diameter is for reference only, which can be calculated reasonably according to actual use and adjusted separately

| Accessory | Diameter | |
|---|---|---|
| | GB/mm2 | ANSI/AWG |
| Tubular lug | 0.3 | 22 |
| | 0.5 | 20 |

If other tubular lugs are used, press them to the twisted cables. The shape and size requirements are shown in the following figure.



# 5 Power-up Operation and Routine Maintenance

## 5.1 Power-up Operation

After wiring, check each connection to ensure no foreign objects have fallen into the casing and that heat dissipation is unobstructed.

1. Connect the PLC power supply; the PWR light on the PLC should illuminate.
2. Launch the AutoStudio software on the PC and download the compiled user program to the PLC.
3. After verifying the program, set the mode selector to the ON position; the RUN light should illuminate. If the ERR light is on, it indicates an error in the user program or system. Refer to the VH Series Small Programmable Controller Programming Manual to troubleshoot until the issue is resolved.
4. Then power up the external PLC system for system debugging.

## 5.2 Routine Maintenance

Routine maintenance checks should include:

1. Ensure a clean working environment for the PLC controller to prevent debris and dust from entering the unit;
2. Maintain good ventilation and heat dissipation for the programmable controller;
3. Ensure all wiring connections and terminal blocks are secure and in good condition.

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Warning

- Transistor outputs must not be connected to AC circuits, such as 220V AC. Design output circuits strictly according to electrical specifications to avoid overvoltage or overcurrent.
- Frequent operation of relay contacts may significantly reduce their lifespan; use them judiciously.
- Relay contacts should only be connected to loads less than 2A. For higher loads, use external contactors or intermediate relays.
- When the current through relay contacts is too low, reliable conduction cannot be guaranteed. It is recommended to design with a contact current greater than 5mA.

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# Notice to Users

1. Warranty covers the programmable controller unit only.

2. The warranty lasts for 18 months, during which we will repair any malfunctions or damages at no charge under normal use.

3. The warranty period begins from the product's manufacturing date. The machine code is the sole basis for determining the warranty period. Equipment without a machine code is considered out of warranty.

4. Even within the warranty period, a service fee will apply for:

Malfunctions from improper operation per the user manual;

Damages from fire, flood, voltage spikes, etc.;

Damages from using the controller for non-standard purposes.

5. Service fees are based on actual costs, but contracts take precedence.

6. Retain this card and present it for warranty service.

7. For inquiries, contact the agent or our company directly.

# Version Change Log

| Date | Version | Content |
| --- | --- | --- |
| 2024.08 | V1.0 | First version issued |

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