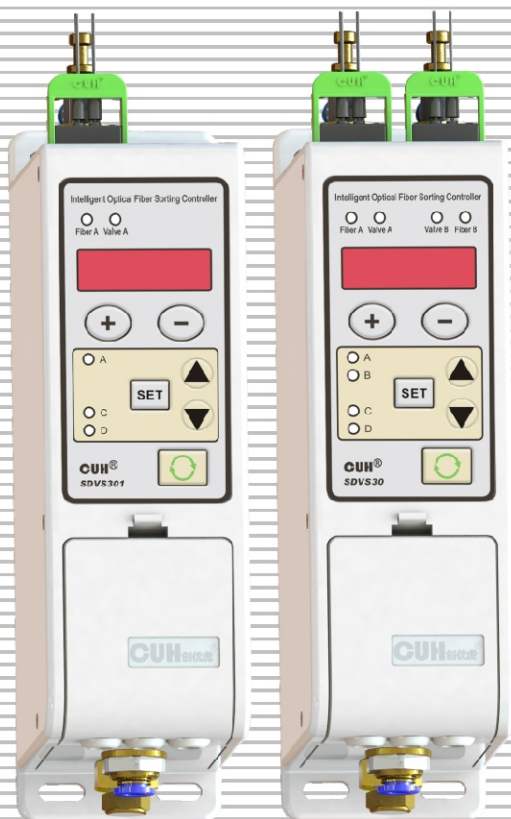


# CUH

## Intelligent Optical Feeding Parts Sorting Controller



### SDVS30 Series User Manual








# Preface

Thank you for choosing CUH SDVS30 Intelligent Optical Feeding Parts Sorting Controller.

This user manual includes operation approach, data sheets, specifications and typical application examples of the controller. Please read it carefully before further operation and preserve it properly.

The symbols below remind you of possible personal injuries or equipment damages. Please read them carefully.

|   |  |
|---|--|
|  <b>DANGER</b>     | Failure to comply with related notes may result in casualties.                                   |
|  <b>WARNING</b>    | Failure to comply with related notes may result in casualties.                                   |
|  <b>CAUTION</b>    | Failure to comply with related notes may result in moderate or minor injury.                     |
|  <b>ATTENTION</b>  | Failure to comply with related notes may result in damage to the controller or other equipments. |
|  <b>KEY POINTS</b> | Notes and restrictions need to be followed.  |

**This manual applies to the following controller models:**

- ◆ Intelligent Optical Feeding Parts Sorting Controller - SDVS30  
(Dual optical fibers)
- ◆ Intelligent Optical Feeding Parts Sorting Controller - SDVS301  
(Single optical fiber)

## Safety and precautionary measures

- 1、**DANGER** This controller is designed for feeding parts sorting only. Do not use it for human body protection.
- 2、**DANGER** This controller must not be used as an explosion-proof product. Do not use it in potentially explosive atmosphere.
- 3、**WARNING** The controller must be powered by DC. Never apply AC to it, otherwise the controller may explode or catch fire.
- 4、**WARNING** Never plug or unplug the wires nor touch the signal control ports in the case of electrification to prevent electric shock accident.
- 5、**CAUTION** Be sure to select a power source with appropriate power according to the load. It is recommended to use Class II power supply with 24V/1A specifications and IEC standards.
- 6、**ATTENTION** Do not lay the wires connected to the SDVS30 controller nearby AC power cables or vibrator power cables, otherwise the internal circuit may be damaged by destructions such as lightning strikes.
- 7、**ATTENTION** The controller is designed for being used in a cool, dry environment. Never leave it outdoors or expose it to direct sunlight or water. Do not work outside the temperature and humidity ranges required by the data sheet.
- 8、**ATTENTION** Please confirm that the air supply pressure does not exceed the maximum working pressure specified in the technical specification sheet of this controller. And the compressed air purification level meets the requirement specified in Section 3.1, otherwise the controller may be damaged or its service life may be greatly reduced.
- 9、**KEY POINTS** Be sure to install the controller to a solid platform that is reliably grounded.
- 10、**KEY POINTS** Never operate the controller under conditions that are beyond its design limits.
- 11、**KEY POINTS** Please strictly follow the instructions in this manual and the "Simplified user manual of SDVS30 ". CUH does not assume any civil or criminal liability for any equipment loss or personal injury caused by violation of these operating instructions.
- 12、The final interpretation of this user manual belongs to our company.

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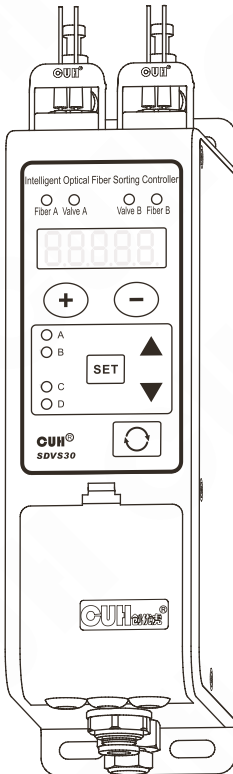
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# Chapter I Notice

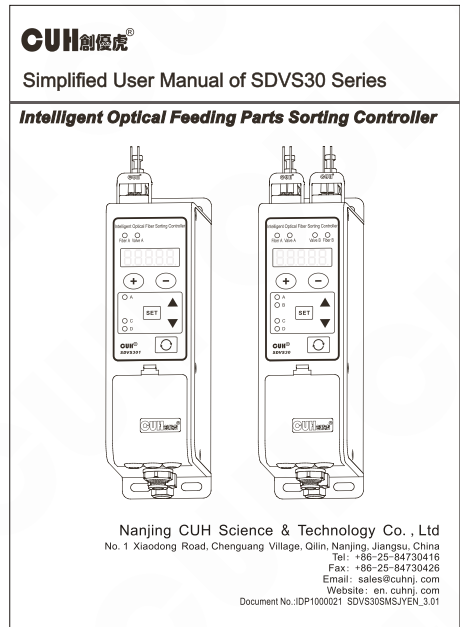
This chapter introduces packing list, names of controller components and part numbers of optional accessories.

## 1.1 Packing List

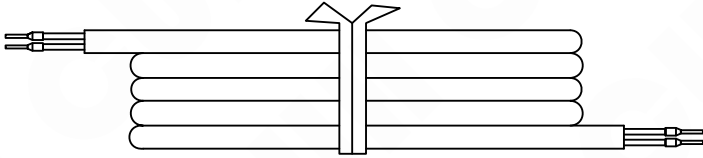
Please check the packed goods upon receiving. If anything wrong, please contact us.



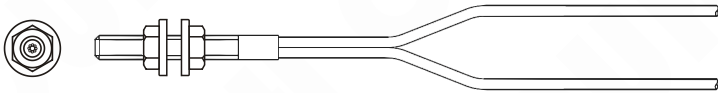
Controller×1  
(SDVS30 or SDVS301)



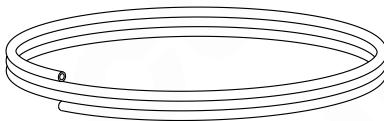
Simplified Manual ×1



24V Power Cable×1



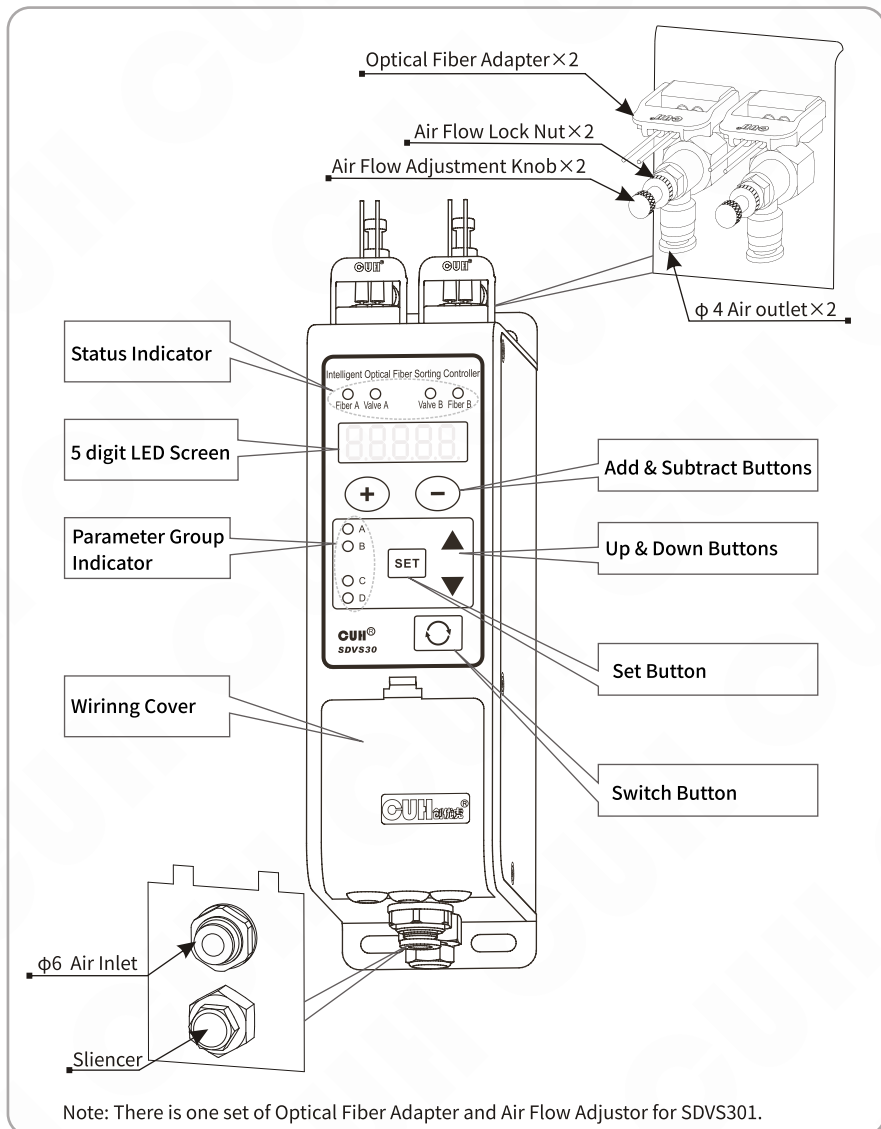
Reflective optical Fiber Sensor × 2 for SDVS30  
Reflective optical Fiber Sensor × 1 for SDVS301



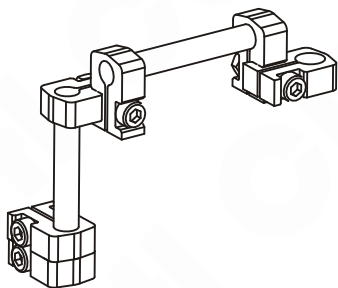
PU Tube  $\phi$  4mm × 2m for SDVS30  
PU Tube  $\phi$  4mm × 1m for SDVS301



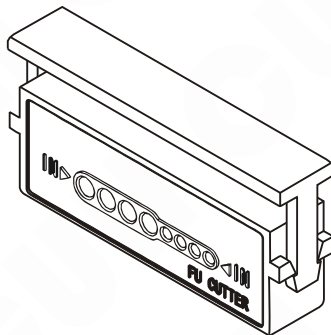
## 1.2 Components Descriptions



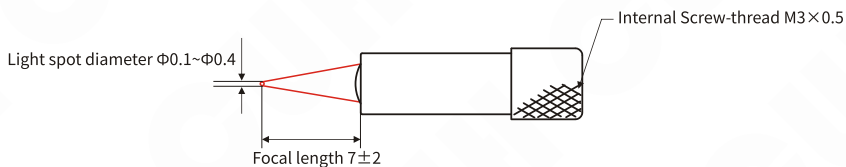
### 1.3 Part numbers of Optional accessories



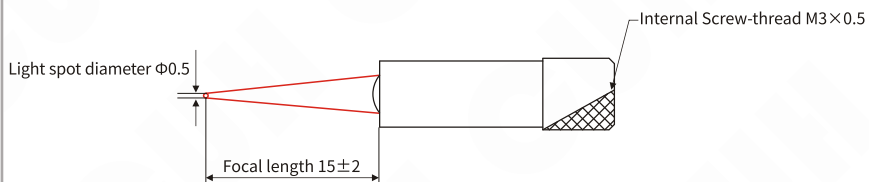
Optical Fiber Holder F-1T



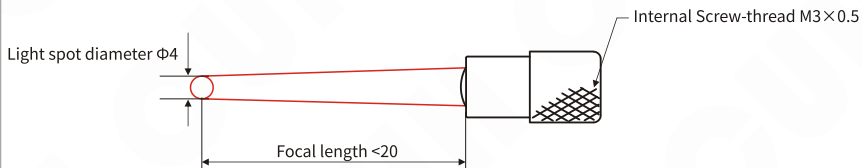
Optical Fiber Cutter F-1C



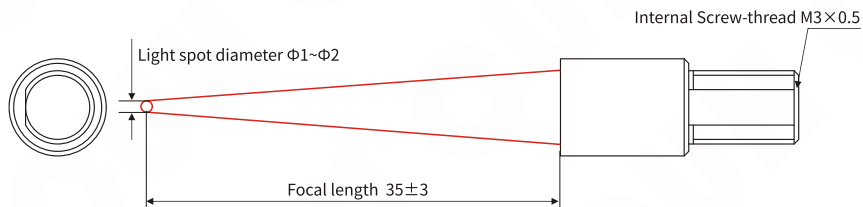
Lens for Reflective Optical Fiber Sensor F-1M



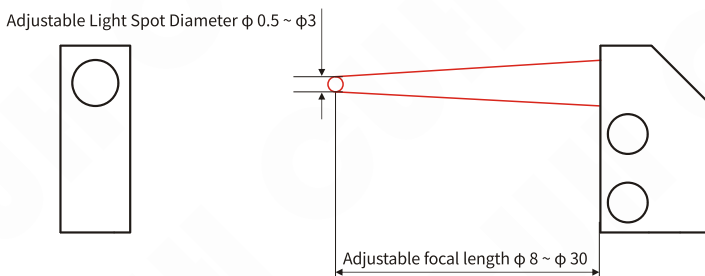
Lens for Reflective Optical Fiber Sensor F-2M



Lens for Reflective Optical Fiber Sensor F-3M



Lens for Reflective Optical Fiber Sensor F-4M



Lens for Reflective Optical Fiber Sensor F-5M

If you need other types of optical Fiber Sensor such as Through-Beam, Regional, High temperature resistance and so on, please contact us.

## Chapter II Controller Descriptions

This chapter introduces the main functions and application scope of the controller.

### 2.1 Product Introduction

SDVC30 Intelligent Optical Feeding Parts Sorting Controller is a universal product designed for automatic material sorting application. It integrates two sets of optical fiber amplifiers, air valves, air flow regulators and I/O sensor ports (only one set for SDVS301). The controller uses the air outlets controlled by the magnetic valves to blow away the abnormal materials based on the luminance differences among different feeding parts obtained by the optical fiber sensors to achieve material sorting.

This controller can meet the requirements of most two-stage sorting systems (SDVS301 is a one-stage sorting controller), and it is more cost-effective than other separate optical fiber amplifier plus magnetic valve solutions. This controller can work with other CUH SDVC series controller, to provide overall solution of automatic feeding and material sorting.

### 2.2 Application Scope

This controller can not sort materials that do not have obvious different grayscale between passing and rejecting states, since the material is sorted according to the reflected and transmitted light intensity of itself. In selecting the character of materials through fiber optical, you can determine the light spot diameter and detection position through the shape, transparency, surface brightness of the material. Based on above information, you can determine whether the material can be sorted with our product.

This controller is not suitable for quality inspection, e.g. rejecting cracked or defect chip capacitors, rice color sorting, fine fruit selection and so on.

## 2.3 Main Features

- Dual independent optical fiber amplifiers and air valves sets sorting system (Single set for SDVS301).
- Sunlight and incandescent light unaffected optical fiber amplifier.
- Auto generated dual threshold values can eliminate the influence of material gap.
- Alarm signal output upon blow off failure.
- Dual independent adjustable air flow outlets (Single outlet for SDVS301).
- Dual self-adapting NPN/PNP switch sensor interfaces.
- Dual push-pull type 24V/400mA power supply.
- Comprehensive protection functions including undervoltage, overvoltage, reverse wiring, overcurrent, short-circuit protections and so on.
- Parameter group switching function enables quick parameter setting.
- Input-output matrix and logical relations combination enable flexible function settings.
- Input-output sequential relationship self definition by output mode setting.
- Independent parameter group reset function helps you avoid unnecessary all parameters reset.
- In-built air valve actions counting function helps you evaluate the lifetime of the air valve .
- Dual anti-interference optical fiber amplifiers allow two optical fibers work together in proximity (SDVS301 do not have this function).
- Inherent material characteristic distribution study function greatly improves sorting reliability.

## Chapter III Installation and Connection

This chapter introduces necessary conditions for product usage, and ways of installation and connection.

### 3.1 Usage Conditions

This controller is powered by 24V DC. In order to ensure user's safety, please choose the CLASS II power supply that complies with IEC standards which ensures reinforced insulation between AC power grid and DC power line.

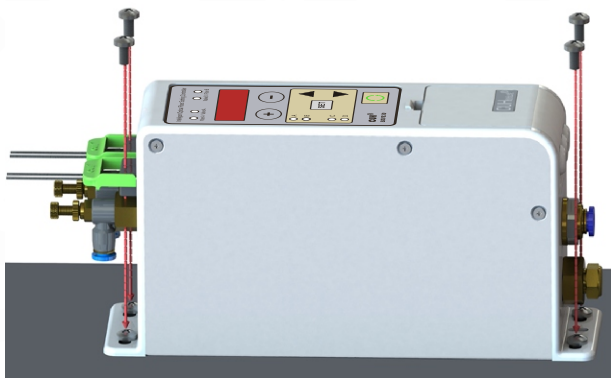
The total power consumption of this SDVS30 controller is about 4.4W (2.8W for SDVS301) which consist of 1.2W built-in circuit power consumption and 1.6W\*2 air valves (only one air valve for SDVS301). So it can be powered by one of our SDVC31 series or SDVC34 series controller. If you want to connect an external magnetic valve, please refer to chapter 5.4.

This controller requires compressed air to work, and there are strict requirement on the pressure and purification level of the compressed air. Operation air pressure of the air valve inside the product must not exceed 7 Bar. It is recommend to adjust the pressure of the compressed air supply to 5 bar with a pressure regulator. The minimum purification level of the compressed air should be level 2 for the solid partical, level 3 for humidity and level 2 for oil content, which is defined in the "GB/T13277.1-2008 compressed air quality standards".

Please refer to the technical specifications for operational ambient temperature and humidity requirements.

### 3.2 Installation and Fixing

Use M4 screws to fix this controller on a metal platform that is reliably grounded.

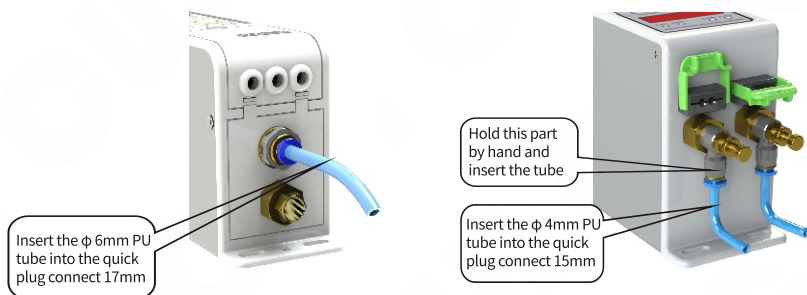


### 3.3 Input and Output Air Tubes Installation

The diameter of the equipped quick plug air inlet connector is 6mm while the outer and inner diameters of the PU air tube are 6mm and 4mm. Insertion depth is around 17mm.

The diameter of the equipped quick plug air outlet connectors is 4mm while the outer and inner diameters of the PU air tubes are 4mm and 2.5mm. Insertion depth is around 15mm. The quick plug air outlet connectors can be rotated to any angle for easy connection.

**ATTENTION** In order to prevent the air flow regulator from being damaged, the quick plug connector should be gripped when inserting the PU tube.



### 3.4 Output Air Flow Regulation

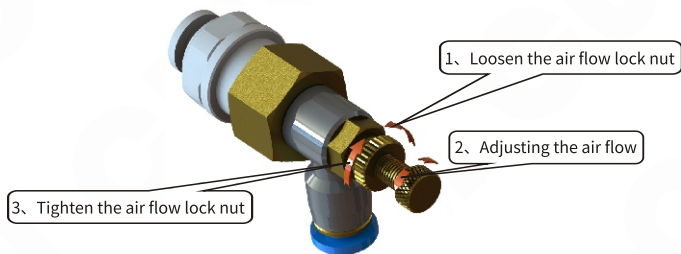
In order to prevent feeding materials from being blown out of feeding bowl, each air outlet connector is equipped with a flow regulator which can control the force of blowing .

Each air flow regulator consists of an adjustment knob and a lock nut. To adjust air flow, there are three steps to follow:

Step1: Rotate the air flow lock nut anticlockwise to unlock the air flow adjustment knob.

Step2: Rotate the air flow adjustment knob clockwise to decrease the air flow or anticlockwise to increase the air flow.

Step3: Rotate the air flow lock nut clockwise to lock the air flow adjustment knob.





### 3.5 Optical Fiber Sensor Installation

The built-in optical fiber adapters are designed for various types of optical fiber sensors. Two sets of reflective optical fiber sensors (one set for SDVS301) are provided as standard accessories.

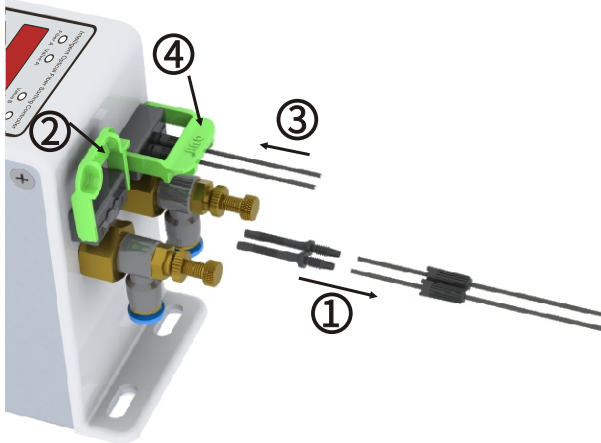
Installation steps of the optical fiber sensors are shown below:

Step1: Connect the optical fiber adapter abreast of the end of the optical fiber sensor.

Step2: Pull up the lock lever of the optical fiber adapter.

Step3: Insert the single core optical fiber sensor connected to the adapter to the T hole 15 mm or the multi-core optical fiber sensor connected to the adapter to the R hole 15 mm.

Step4: Pull down the lock lever of the optical fiber adapter to horizontal position and check whether the optical fiber is firmly locked. Installation diagram of the optical fiber sensor is shown below:



The optical fiber adapter can match 2.1 mm to 2.3 mm diameter optical fiber sensors.

**KEY POINTS** The thicker the optical fiber is, the greater luminous power will be coupled into the optical fiber which is helpful for checking dark materials.

### 3.6 Power Wire Connection

This controller can be powered by an external independent power supply or SDVC series vibratory feeder controllers.

**ATTENTION** If a SDVC series vibratory feeder controller is chosen as power supply, please check whether it meets the power requirement of this controller.

This controller is equipped with a power cable for connecting it to the 24V DC output port of the SDVC series controller. Wiring method:

Connect the I2 terminal of this controller and the +24V terminal of another SDVC series controller with the red wire.

Connect the I1 terminal of this controller and the GND terminal of another SDVC series controller with the black wire.

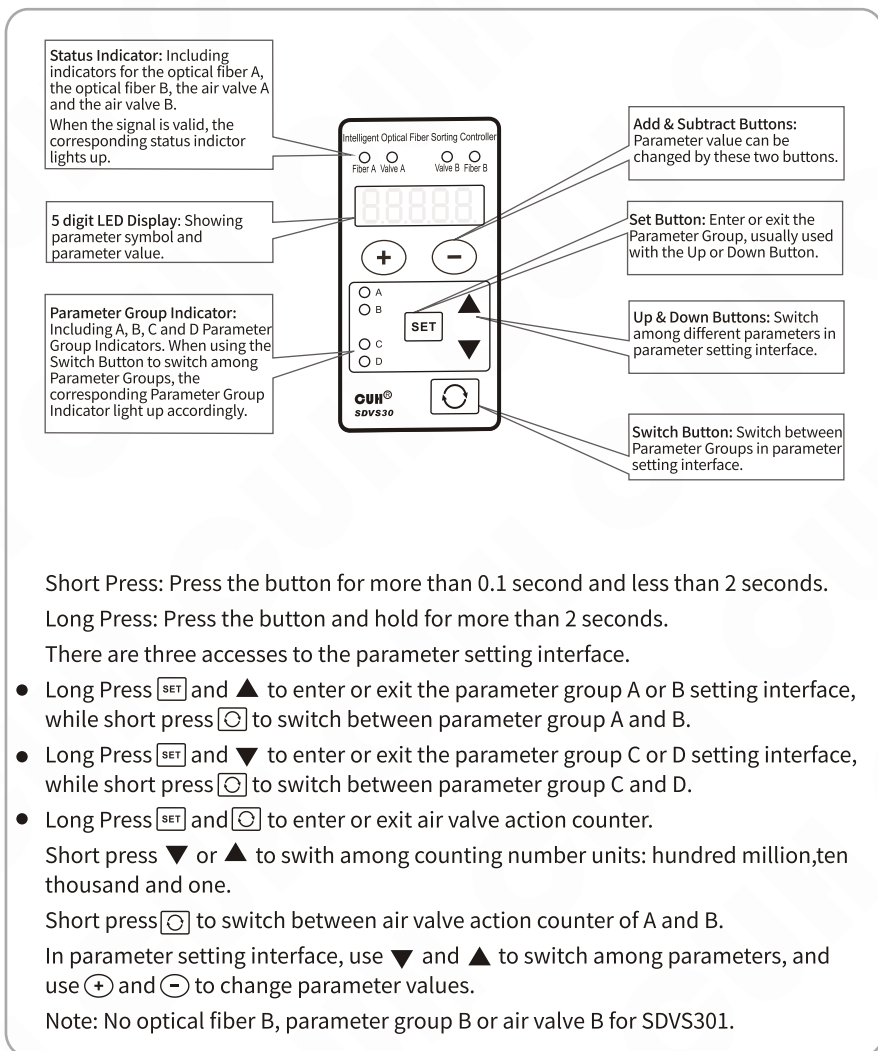
Using the SDVC34-M controller as power supply, please refer to the diagram below:



## Chapter IV Basic Operation Method

This chapter introduces the control panel, functional buttons and basic operation methods.

### 4.1 Basic Operation



**Short Press:** Press the button for more than 0.1 second and less than 2 seconds.

**Long Press:** Press the button and hold for more than 2 seconds.

There are three accesses to the parameter setting interface.

- Long Press **SET** and **▲** to enter or exit the parameter group A or B setting interface, while short press **☐** to switch between parameter group A and B.
- Long Press **SET** and **▼** to enter or exit the parameter group C or D setting interface, while short press **☐** to switch between parameter group C and D.
- Long Press **SET** and **☐** to enter or exit air valve action counter.

Short press **▼** or **▲** to switch among counting number units: hundred million, ten thousand and one.

Short press **☐** to switch between air valve action counter of A and B.

In parameter setting interface, use **▼** and **▲** to switch among parameters, and use **+** and **-** to change parameter values.

Note: No optical fiber B, parameter group B or air valve B for SDVS301.

## 4.2 Method of Application

Follow the five steps below to sort feeding material:

Step 1: Find out luminance feature of the material

Find out the most appropriate optical sensor focus point position on the feeder track that detected passing material luminance range and rejecting material luminance range are of great discrepancy.

Step 2: The optical fiber sensor installation

Fix the detector of the optical fiber sensor in an appropriate position, and choose a lens if necessary depending on the optical feature of the material.

Connect the optical fibers to the controller according to chapter 3.5. Adjust the optical sensor detector to the most appropriate position.

Step 3: Material luminance recording

Long press **SET** and **▲** to enter the real time luminance display status **R.0000** ;

Short press **□** to switch between parameter group A and B ;

- Place the material to be passed under the light spot of the optical fiber sensor focus and press **+** .The controller will display **R-P.0000** to record the **passing material luminance**.

- Place the material to be rejected under the light spot of the optical fiber sensor focus and press **-** .The controller will display **R-R.0000** to record the **rejecting material luminance**.

- Remove the feeding material from the light spot and then press **+** and **-** .The controller will display **R.0000** to record **background luminance**.

Afterwards, the controller will automatically generate high and low sorting threshold values **P.0000** and **P.0000** .

**KEY POINTS** Note: During feeding parts luminance recording, the air valves will stop working. After recording, long press **SET** and **▲** or wait for 2 minutes to return to standby interface and the air valves' action will return to normal.

**KEY POINTS** The installation position and angle of the optical fiber sensor should be adjusted so that the **passing brightness, rejecting brightness** and **background brightness** are recorded significantly different. Otherwise, the material to be rejected may be missed or the material to be passed may be too sensitively removed.

#### Step 4: Check the Blowing Logic

Place the passing material under the optical sensor light spot to check whether the air valve stops and place the rejecting material under the light spot to check whether the air valve blows. If not, do the luminance recording process again.



#### Step 5: Adjust the Output Air Flow

Adjust output air flow with the air flow adjustment knob to make sure the rejecting materials can be blown off the feeder track but not be blown out of the feed bowl. Please refer to chapter 3.4 for adjusting instructions. The air flow starting time of the air valve is affected by Delay Mode and Hold Mode. Please refer to chapter 5.3 for the timing diagram of Delay Mode and Hold Mode.

After operating the five steps above with success, the controller is ready for material sorting.

## 4.3 Default Setting Restoration

Each parameter group of A,B,C and D has its own reset function. You need to reset them one by one if you want to reset all. Steps to reset one parameter group:

1. Enter the setting interface of the parameter group to be reset.
2. Switch to reset parameter by short press ▼ button repeatedly until twinkling  is displayed on the screen. All indicators are also twinkling at the same time.
3. Press ⊕ and hold it until  is displayed on the screen. The controller returns to homepage.

Note: There is not parameter group B for SDVS301.

## Chapter V Advanced parameters Descriptions

This chapter introduces the definitions of all the parameters; the logical diagram of input and output ports; the installation instructions for the external optical fiber sensor, air valve and optical sensor holder.

### 5.1 Parameter Table

| Parameter Symbol | Definition                                     | Value Range   | Default Setting  |
|------------------|--|---|--|
|                  | Real time luminance in standby interface       | 0~1023  | —<br>(Only parameter group A and B)  |
|                  | Real time luminance in setting interface       | 0~1023  | —<br>(Only parameter group A and B)  |
|                  | Upper limit value of rejecting luminance range | 0~1023  | 479<br>(Only parameter group A and B)  |
|                  | Lower limit value of rejecting luminance range | 0~1023  | 179<br>(Only parameter group A and B)  |
|                  | Time to distinguish *                          | 0.01~0.1 seconds  | 0.01<br>(Only parameter group A and B)   |
|                  | Anti-interference ability *                    | 0~8   | 0<br>(Only parameter group A and B)  |
|                  | Switch sensor type selection                   | Auto<br>NPN<br>PNP  | Auto<br>(Only parameter group C and D)   |
|                  | Input signal rising edge delay                 | 0.00~10.00 seconds  | 0.05<br>(Only parameter group C and D)   |
|                  | Input signal falling edge delay                | 0.00~10.00 seconds  | 0.05<br>(Only parameter group C and D)   |
|                  | First signal source selection                  | 0、1、A、b、C、E、<br>-A、-b、-C、-E、<br>OA、Ob、Od、OP、<br>-OA、-Ob、-Od、-OP | 0<br>(-X means reversed X)   |
|                  | Second signal source selection                 | 0、1、A、b、C、E、<br>-A、-b、-C、-E、<br>OA、Ob、Od、OP、<br>-OA、-Ob、-Od、-OP | A for parameter group A<br>b for parameter group B<br>C for parameter group C<br>E for parameter group D |

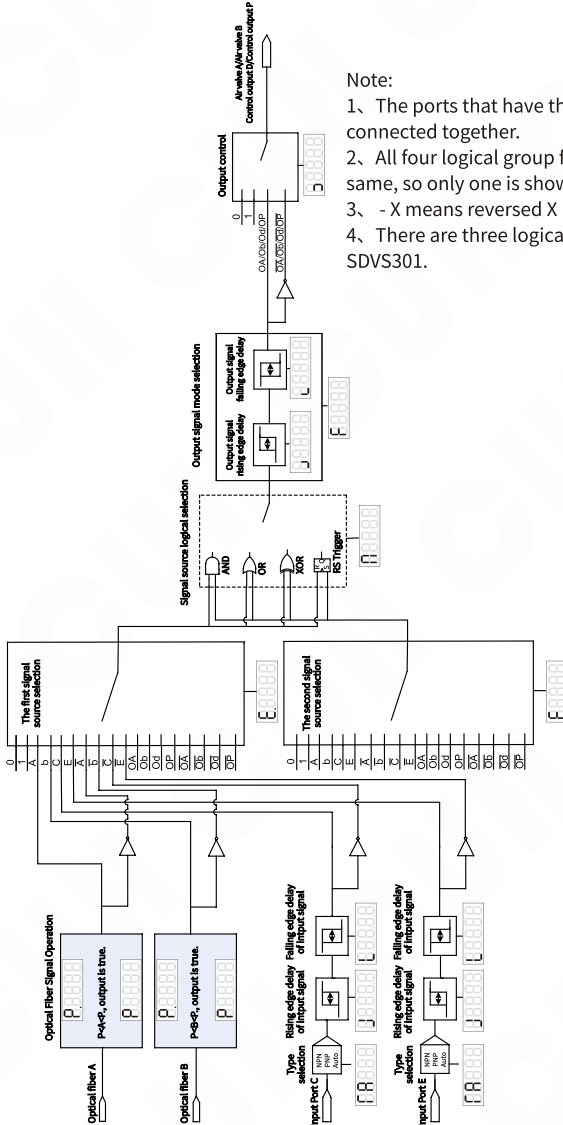
| Parameter Symbol | Definition                                     | Value Range   | Default Setting  |
|------------------|--|---|--|
|                  | Signal source logic selection                  | AND<br>OR<br>XOR<br>rs trigger                                    | OR   |
|                  | Output signal rising edge delay                | 0.00~10.00 seconds  | 0  |
|                  | Output signal falling edge delay               | 0.00~10.00 seconds  | 0 (parameter group A and B)<br>0.1 (parameter group C and D) |
|                  | Output signal mode selection                   | Hold Mode<br>Delay Mode   | Delay Mode   |
|                  | Output logic selection                         | Same<br>Reversed<br>Output normally open<br>Output normally close | Same   |
|                  | Reset to factory default setting               | ---   | ---  |
|                  | Number of air valve actions in hundred million | 0~9999 hundred million  | 0  |
|                  | Number of air valve actions in ten thousand    | 0~9999 ten thousand   | 0  |
|                  | Number of air valve actions                    | 0~9999  | 0  |

Note: SDVS301 has no parameter group B.

Please consult the professional engineer, if you need to adjust the parameters which accompanied with "\*\*".



## 5.2 Logical Diagram of Input and Output Ports



Note:

- 1、 The ports that have the same name are connected together.
- 2、 All four logical group figures are the same, so only one is showed.
- 3、 - X means reversed X
- 4、 There are three logical groups for SDVS301.

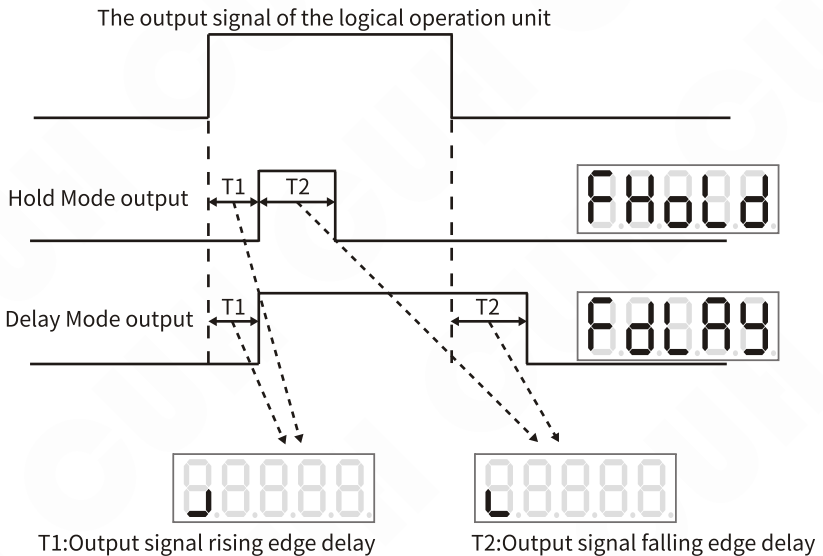
### 5.3 Output Mode Descriptions

This controller includes four output ports: Air Valve A, Air Valve B, Control Output D and Control Output P (there is not air valve B for SDVS301). The parameters of Control Output D are set in the Parameter Group C, and the parameters of Control Output P are set in the Parameter Group D.

Each output can be set to one of the two output modes respectively: hold mode and delay mode. Their definitions are interpreted below:

- Hold Mode:** when the Drive Output Signal of the Logical Operation Unit change from invalid to valid, the Output Signal will keep high for hold time. In this mode, the Output Signal Rising Edge Delay is used to set delay time for Output Signal, and the Output Signal Falling Edge Delay is used to set hold time for Output Signal.
- Delay mode:** when the Drive Output Signal of the logical operation unit changes from valid to invalid, the Output Signal is decided by the duration and off time of the Drive Output Signal. In this mode, the Output Signal rising delay is used to set on delay for Output Signal, and the Output Signal falling delay is used to set off time for Output Signal.

The timing diagram of the Hold Mode and Delay Mode as follows:

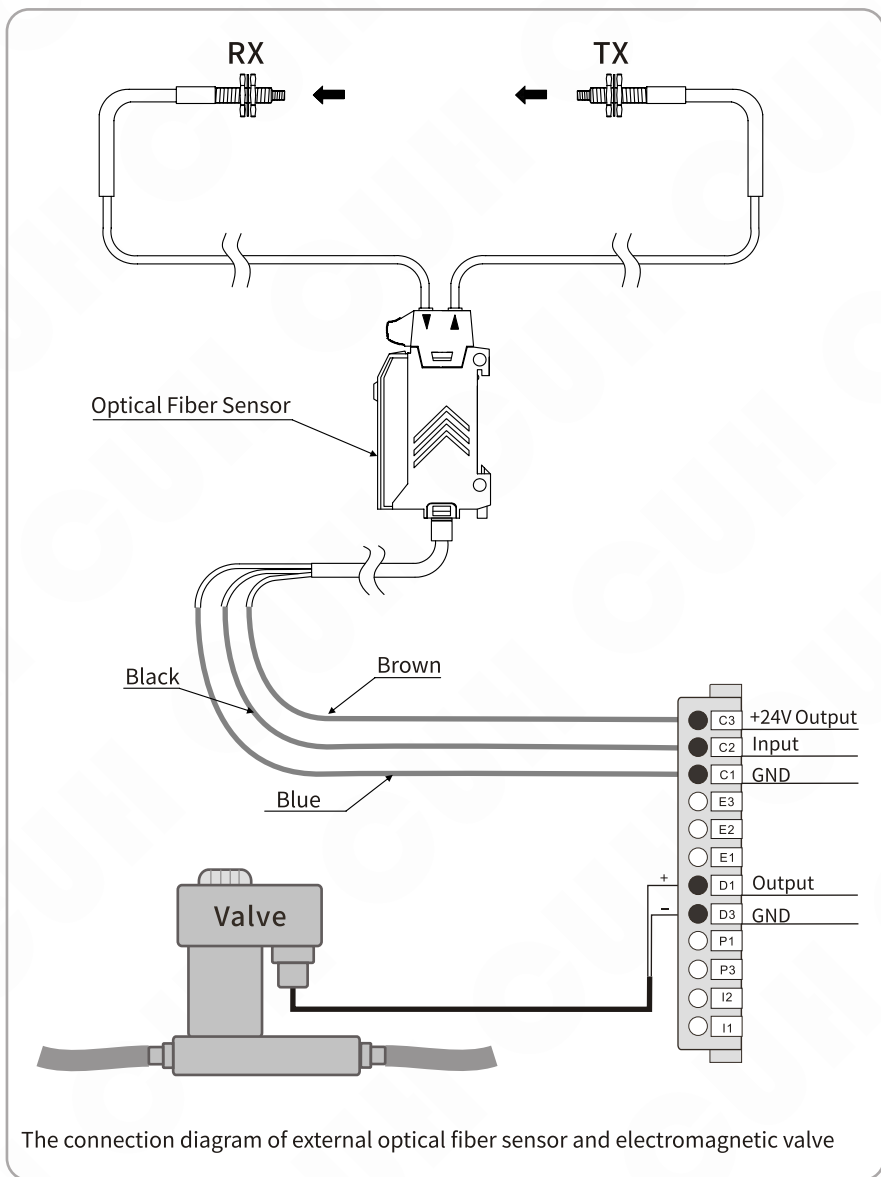


## 5.4 Optical Fiber Sensor and Air Valve

There are two digital input ports C and E, two control output ports D and P in the controller. The digital input ports can be set to the type of NPN, PNP or automation, and each of the digital input ports can support maximum power of sensor up to 1.2 W. Each of the control output ports can support the resistance load or inductor load, and the maximum power of the load supported can be up to 9.6 W, such as electromagnetic valve and electric relay.

**KEY POINTS** According to the total power of external optical fiber sensor and external electromagnetic valve, the user should select the power supply whose output power is not less than the total power for the controller. E.g: There are two 0.8 W external optical fiber sensor and two 4 W external electromagnetic valve to be used, so the total power of controller is  $2 \times 0.8W + 2 \times 4W + 4.4W = 14W$ ; The total power exceeds the power that the SDVC series can provide, so the user should equip with separate power supply.

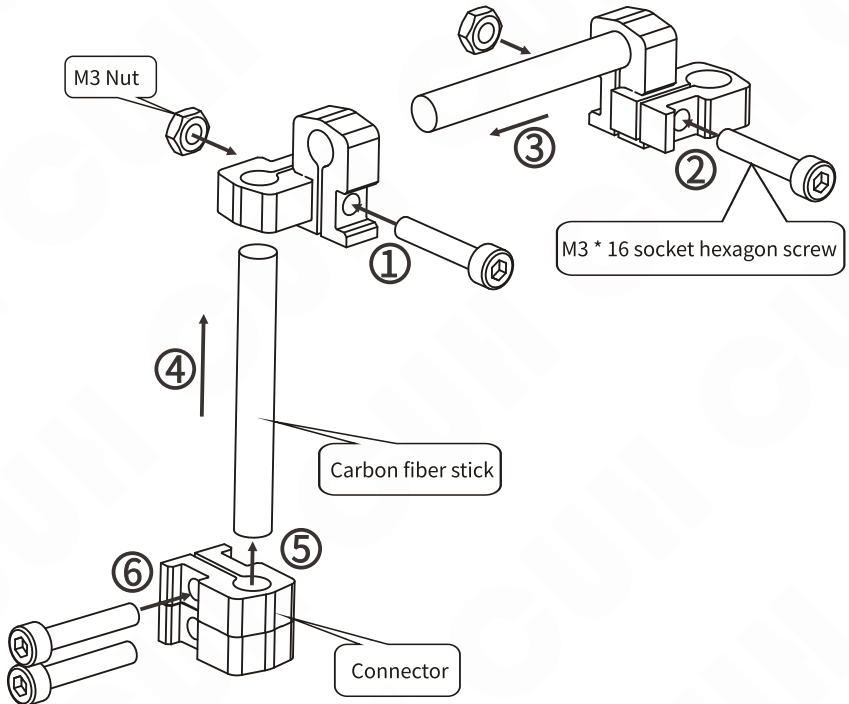
The external optical fiber sensor and external electromagnetic valve are respectively connected to the input port C and output port D, the diagram of which as follows. If another set of external optical fiber sensor and external electromagnetic valve are respectively connected to the input port E and output port P, this controller can constitute a system with four optical fiber sensor and electromagnetic valves.



## 5.5 The Installation of Optical Fiber Holder

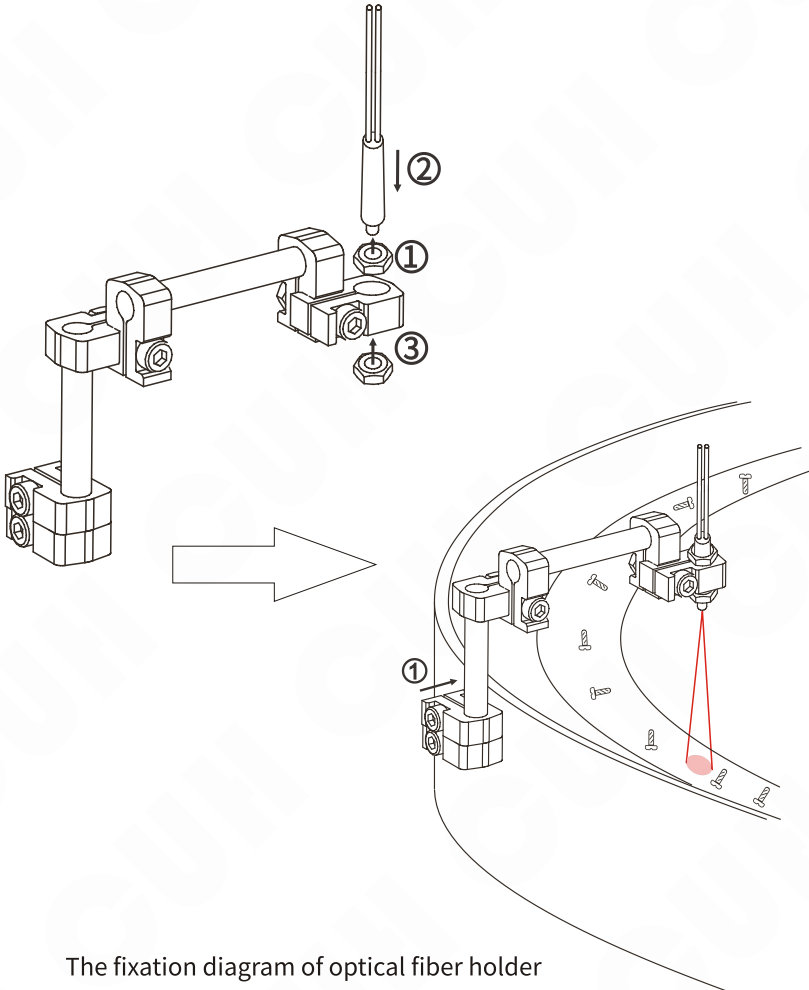
For the convenience to install the optical fiber sensor, you could purchase the optional optical fiber holder to fix the head of optical fiber sensor, and the optical fiber holder can be adjusted multi-angle.

Step 1: Install in order shown as below:



The diagram of optical fiber holder connection

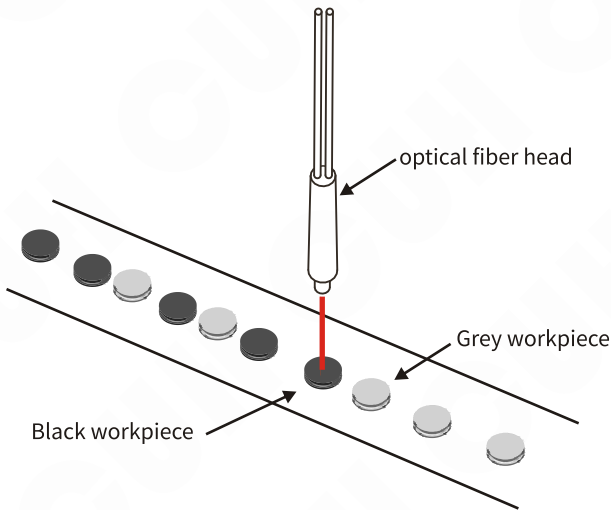
Step 2: Fix the head of optical fiber sensor to the optical fiber holder with nut, and install the assembled holder to the outwall of the feeder bowl. After installation, adjust the connector of the optical fiber holder to get better detection results, according to the position of the materials.



## Chapter VI Typical Application Cases

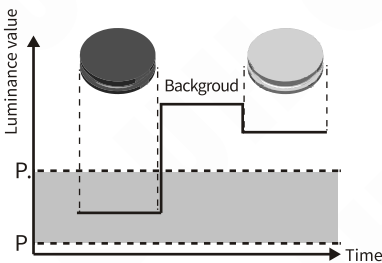
This chapter introduces the typical application case including sorting different pure color materials, sorting obvious grayscale feature materials and sorting complex shape materials.

### 6.1 The Sorting of Pure Color Materials

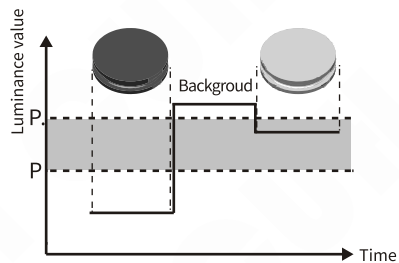


The diagram of sorting pure color materials

For this class of pure color materials, any color of material can be selected to reject. The detail operation for sorting materials refer to the basic operation in chapter IV.

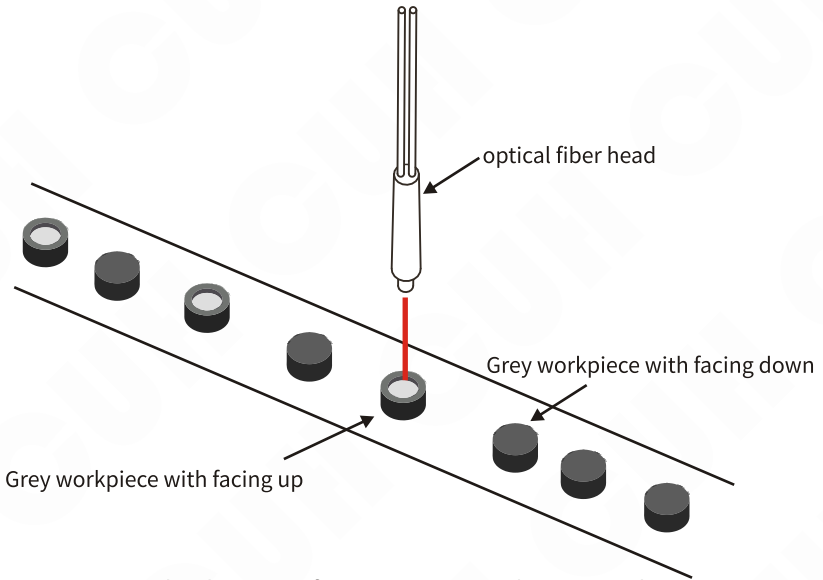


The result of rejecting the black materials

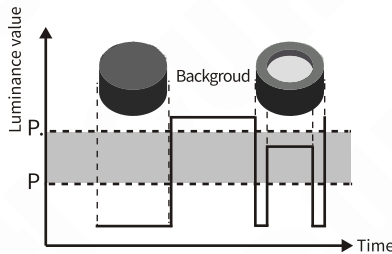


The result of rejecting the grey materials

## 6.2 The Sorting of Mixed Color materials



The diagram of sorting mixing color materials

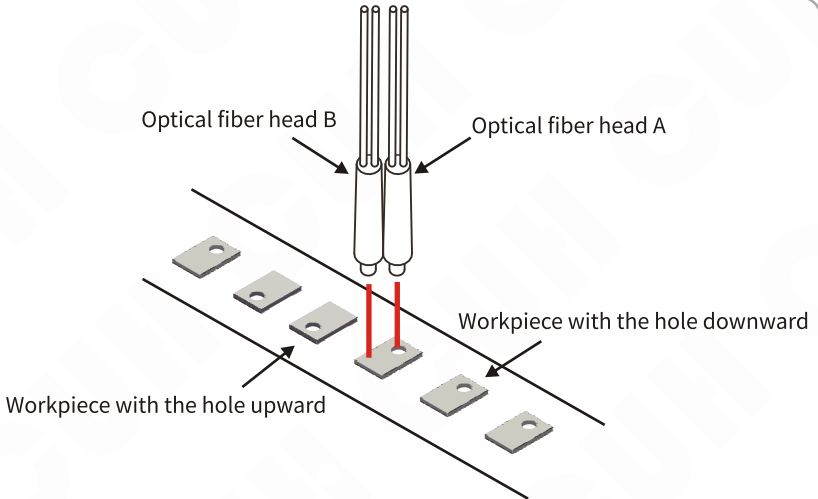


The diagram of grayscale distribution

The luminance value of the face down side of this material is same as its face up side's marginal part value. So the optical sensor should focus on its center position.



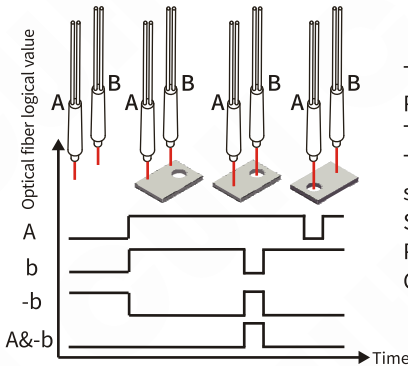
### 6.3 Two Optical Fiber Sensors Cooperative Sorting



The diagram of two optical fiber sensor cooperative sorting

There are two steps to sort the workpiece with two optical fiber sensors as follows:

1. Operate respectively material luminance recording process for two optical fiber sensor. make the hole of workpiece as the reserved feature and make the no hole parts of workpiece as the rejected feature.
2. Set signal source logical of two input signals, and reject the workpiece with the hole upward. The logical diagram as follows:



The setting steps are as follows:

Parameter group A:

The first signal source selects the signal A

The second signal source selects the reverse signal -b

Set signal source logical to be AND

Parameter group B:

Close the electromagnetic valve B

The logical digram of two optical fiber sensor cooperative sorting

# Chapter VII Technical Specifications

## 7.1 Technical Specification Table

| Item                             | Min | Typica            | Max   | Unit    | Remark                     |
|----------------------------------|-----|-------------------|-------|---------|----------------------------|
| Input DC Voltage                 | 22  | 24                | 26    | V       | Note 1                     |
| Output DC Current                | --- | ---               | 400   | mA      | Note 2                     |
| NPN Output Residual Voltage      | --- | ---               | 1.0   | V       | 400mA                      |
| PNP Output Residual Voltage      | --- | ---               | 1.5   | V       | 400mA                      |
| Response Time                    | 20  | 100               | ---   | ms      | When air pressure is 5 bar |
| Air Valve Blowing Time Unit      | 10  | ---               | ---   | ms      |                            |
| Flow Regulation Range            | 0   | ---               | 20    | L/min   |                            |
| Digital Photoelectric Gain       | --- | $7.8 \times 10^5$ | ---   | No Unit | Note 3                     |
| Digital Photoelectric Resolution | --- | 1024:1            | ---   | No Unit |                            |
| Standby Power                    | --- | ---               | 1.2   | W       | Note 4                     |
| Applicable Fiber Diameter        | 2.1 | 2.2               | 2.3   | mm      |                            |
| Input Air Pressure Range         | --- | 5                 | 7     | Bar     | Note 5                     |
| Input Air Pipe Outer Diameter    | --- | 6                 | ---   | mm      |                            |
| Output Air Pipe Outer Diameter   | --- | 4                 | ---   | mm      |                            |
| Anti-sunlight Interference       | --- | ---               | 50000 | Lux     |                            |
| Anti-incandescent Interference   | --- | ---               | 30000 | Lux     | Note 6                     |
| Ambient Temperature              | 0   | 25                | 45    | °C      | No condensation            |
| Ambient Humidity                 | 10  | 60                | 85    | %       |                            |
| Storage Temperature              | -40 | 25                | 85    | °C      |                            |

**CAUTION** Note 1: If input power exceeds 30 V, display screen will go out to protect the controller. Max input voltage must not exceed 36 V.

**CAUTION** Note 2: Do not connect to capacitive load.

**KEYPOINTS** Note 3: The digital photoelectric gain is defined as the product of the average power of the emitted light and the receiving sensitivity. Diameter of the optical sensor core is 0.5mm.

**KEYPOINTS** Note 4: Standby Power is the power consumption when the internal solenoid valves are not operating.

**ATTENTION** Note 5: The maximum air supply pressure must not exceed 10 Bar when the controller is not powered.

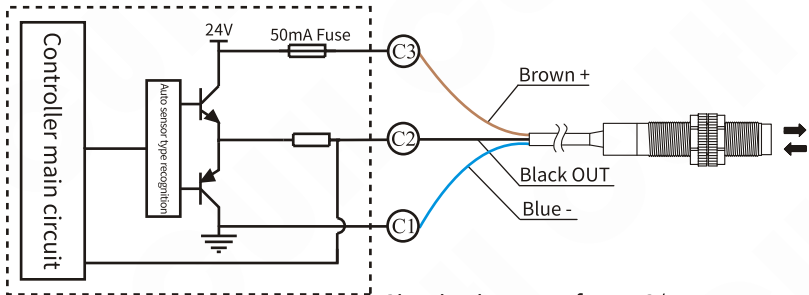
**KEYPOINTS** Note 6: Do not work under glare LED lighting.

## 7.2 The Circuit Diagrams of Input and Output Ports

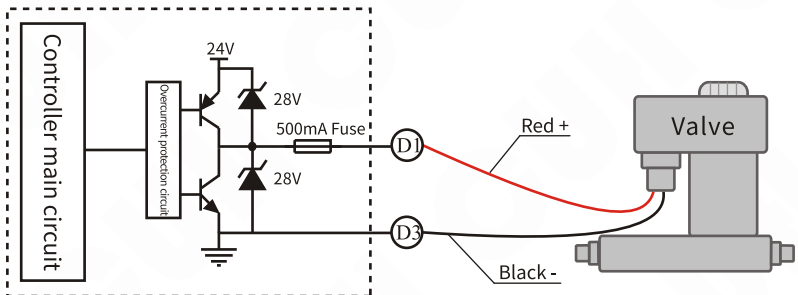
Because the input port C is the same as the input port E, and the output port D is the same as the output port P, only the circuit diagram of the input port C and the output port D are shown as follows:

The input ports C and E support multiple types of switch sensor e.g. proximity switch, photoelectric switch, optical fiber amplifier, ultrasonic sensor, pressure sensor, touch sensor, PLC digital output port.

The output ports D and P support multiple types load e.g. electromagnetic valve, relay, alarm, DC Fan, PLC digital input port and so on.



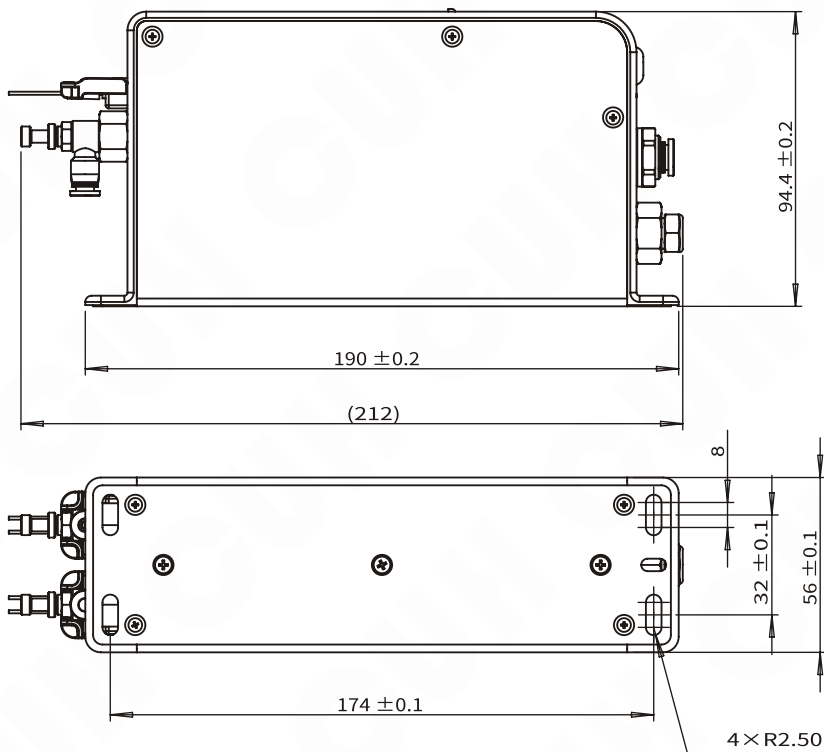
Circuit Diagram of Port C/E



Circuit Diagram of Port D/P

## Chapter VIII Appendix

### 8.1 Outline Dimension



Outline dimension diagram (Unit: mm)

## 8.2 Fault Diagnosis

| Error Code | Definition                             | Trouble Shooting Methods  |
|------------|--|---|
| EPP01      | Input Overvoltage                      | Make sure input voltage value ranges between 22V and 26V  |
| EPP02      | Input Undervoltage                     |   |
| EPP03      | Port D high level output overcurrent   | Make sure load current value does not exceed 400mA  |
| EPP04      | Port P high level output overcurrent   |   |
| EPP05      | Port D low level output overcurrent    |   |
| EPP06      | Port P low level output overcurrent    | Make sure the load is not shorted   |
| EPP07      | Port D high level output short-circuit |   |
| EPP08      | Port D low level output short-circuit  |   |
| EPP09      | Port P high level output short-circuit |   |
| EPP10      | Port P low level output short-circuit  | Make sure the rs trigger inputs are not valid at the same time (Note: SDVS301 has no air valve B) |
| EPP20      | Valve A input signal logical error     |   |
| EPP21      | Valve B input signal logical error     |   |
| EPP22      | Port D input signal logical error      |   |
| EPP23      | Port P input signal logical error      |   |

## 8.3 Reference Standards

| Absolute parameters: exceeding this parameters will cause serious damage to the product, and must be strictly observed. |                    |                     |       |                      |                   |
|---|--------------------|---------------------|-------|----------------------|-------------------|
| Item  | GB Standard        | IEC Standard        | Class | Standard requirement | Note              |
| electrostatic discharge   | GB/T 17626.2-2006  | IEC 61000-4-2:2001  | 4     | ±8 kV                | Contact discharge |
|   |                    |                     | 4     | ±15 kV               | Air discharge     |
| electrical fast transient pulse group   | GB/T 17626.4-2008  | IEC 61000-4-4:2004  | 4     | ±4 kV                |                   |
| DC Power supply ripple anti-interference  | GB/T 17626.17-2005 | IEC 61000-4-17:2002 | 4     | 15%                  | Evaluation A      |

# Chapter IX Product Warranty Informations

## 9.1 Warranty Period

The warranty period for this controller is one year from the date of purchase.

## 9.2 Warranty Scope

1. If the controller is damaged due to quality defects, we will free repair. But the following conditions are not covered by the warranty.

- a. Damage caused by incorrect operation or violation of the user manual.
  - b. The fault caused by other devices that connect to the product.
  - c. The fault caused by modification and repair of non-company personnel.
  - d. The fault caused by replacing consumable parts or repairing exactly according to instruction manual.
  - e. The fault caused by factors that changes in science and technology. After the product is shipped.
  - f. The fault caused by external factors such as fire, earthquake, flood and so on.
2. The warranty is limited to the conditions specified in the above. we do not assume any responsibility for the property loss caused indirectly by the product, such as device damaged, opportunity cost loss, benefit loss and so on.

## 9.3 Product Adaptation

The product is designed as the universal product for automated material sorting market, and it can not be used in following situation.

1. The facilities that have serious impact on life and property, such as nuclear power plant, airport, railroad, ship, mechanical device, medical equipment and so on.
2. Public service include electric power, gas and water supply and so on.
3. Outdoor environment or the environment similar to outdoor.



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