CUH

Variable Frequency Vibratory Feeder Controller

SDVC35-Series

Instruction Book

Preface

Thank you for choosing **CUH** Intelligent Digital Vibratory Feeder Controllers.(The controller for short in the following text)

This instruction book includes notes for installing, debugging, parameter setting, maintaining and trouble shooting of the controller. Please read this instruction book carefully before operating the controller and keep it properly

Notice

➔Never hot swap nor touch the contacts in any case to avoid electric shock or other accidents.

➔Never connect the controller to 380V AC which may cause unrecoverable damage. (Choose products that are designed for 380V AC when needed)

➔Never switch the input of the controller by way of cutting off power supply through a relay, a PLC or other devices, otherwise service life of the controller may be reduced severely.

➔The controller is designed to work in a cool and dry environment. Never run outdoors to avoid soaking or sun exposure. Operat the controller within the temperature range that its electrical characteristics demand.

➔Never operate the controller under the condition that beyond its designed limits.

➔Operate the controller in accordance with this instruction book strictly. We will not assume any civil or criminal liability if the equipment damage or personal injury is caused by incorrect operation.

!

Never open the controller shell to avoid electric shock. Contact CUH if the controller breaks down.

Never try to revamp the controller since the solid state circuit boards inside the controller can not be repaired, and there's no adjustable part.

Operating Environment

Inspection Before Using

Every controller will go through rigorous quality inspection before delivery and is packed with crash-proof packaging.

Please Check the Following Items After Unpacking:

➔Whether the controller is damaged in appearance

➔Whether model of the controller is exactly what you ordered

Runtime Environment

Please follow the notes below to ensure better performance and longer lifetime of the controller

➔Well-ventilated environment

➔Keep away from water, steam, dust and especially oily dust

➔Keep away from corrosive or flammable gas and liquid

➔Keep away from flying dust and metal particles

➔Firmly fixed to avoid self vibration

➔Keep away form electromagnetic interference

➔Operate within the temperature range of -10 °C to 40 °C

Contents

Chapter I Features

The controller is specially designed for controlling vibratory feeder in the automation systems. Combined with the latest electronic technology and elaborate design, the controller provides the following convenient and practical features:

Frequency Tracking: Synchronize output frequency and phase of several controllers to avoid beat effect.

Auto FM: Automatic frequency adjusting in real time to ensure best feeding result.

Auto Speed Stabilization: Automatic feeding speed stabilizing in real time regardless of the quantities of the feeding parts.

Auto Frequency Searching: Find the best operating frequency of the vibratory feeder and adjusts parameters automatically.

Frequency Adjusting: Output Frequency ranges from 40.0Hz to 400.0Hz.

Voltage Adjusting: Output Voltage ranges from 0V to 260V.

Automatic Voltage Stabilizing: The controller can eliminate feeding speed variation caused by mains voltage fluctuation.

Soft Startup: In order to avoid sudden shock to the work pieces, the controller can gently increase output voltage from 0 to the pre-set value when startup.

Intelligent Photoelectric Sensing: Our adaptive Intelligent Photoelectric Sensor can help to stall the controller when work-pieces are full or work-piece is empty and to fulfill the functions of Soft Startup Time **S**etting, Startup Delay, Shutdown Delay, and Logical Relation Adjusting.

Halt when Work-pieces are full: A NPN switch sensor can help to halt the controller when work-pieces are full and to fulfill the functions of Soft Startup Time Setting, Startup Delay, Shutdown Delay, and Logical Relation **A**djusting.

Acceleration: Due to this function, maximum output voltage value of the controller can be increased up to 150% of the input voltage value.

Remote Speed Control: Output Voltage of the controller can be controlled by an external potentiometer, a PLC, or voltage control signal ranging form 1V to 5V.

Controlling Output: The Controlling Output signal outgoing from the transistor can coordinate a solenoid or other external devices with the controller.

Keypad Locking: Press the ON/OFF button and hold for 2 seconds to lock all buttons for fear of false operation.

Maximum Output Restriction: Maximum Output Voltage value can be preset to protect the equipment from damage caused by misuse.

Waveform Index Setting: Operators can weight efficiency and maximum capacity by adjusting this parameter.

Default Settings Restonation: This function allows the user to restore all default parameter settings and reset the controller.

CUH attaches great importance to the product quality management and safety performance. Apart form the high-quality components we use and rigorous quality control system, **CUH** has taken account of possible accidents users may encounter and provides the following protective functions to maximum the controller's practicability.

Short-Circuit Protection: If output of the controller is short-circuited, the controller will halt its output until restarted.

Current Overload Protection: The controller will halt its output to ensure equipments' operating safety when operation current exceeds its rated value.

Overheat Protection: The controller will halt its output to protect itself when operation temperature is too high.

CUH controllers are strictly compliant with CE certification.

Chapter II   Installation Guide

Step One:

Open the packing box and check the controller's outward appearance and make sure the controller model is exactly what you ordered.

Step Two:

Connect the Output Power Cable in the packing box to the vibrator's electromagnetic coils.

Output Pin

Output Pin

Ground Wire
(Yellow and Green Dual Color)
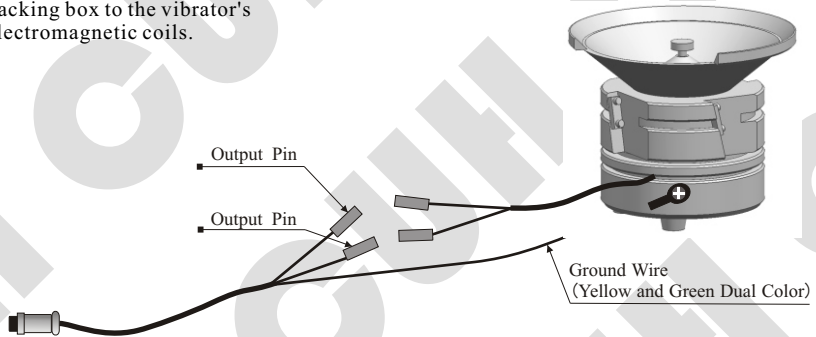
!   Notice

Make sure the vibrator's electromagnetic coils is connected to the two output pins of the Output Power Cable and the electromagnetic coils is reliably grounded otherwise series security incident may occur.

Step Three:

Connect the Input Power Cable to the controller and lock the power nut.

Connect here first

Step Four:

Connect the plug of the Input Power Cable to the mains jack.

Chapter III Components Description

3.1 Descriptions of the Indicators

Acceleration Indicator:
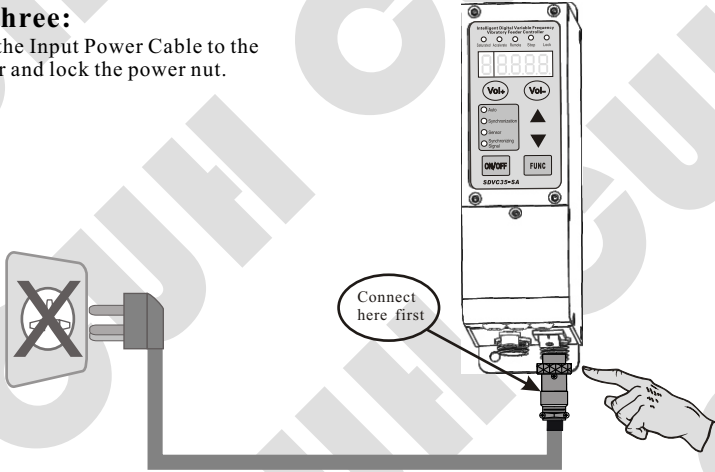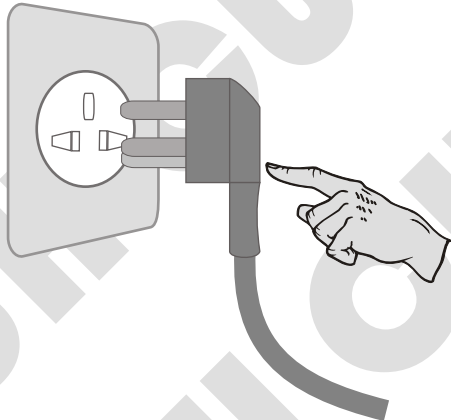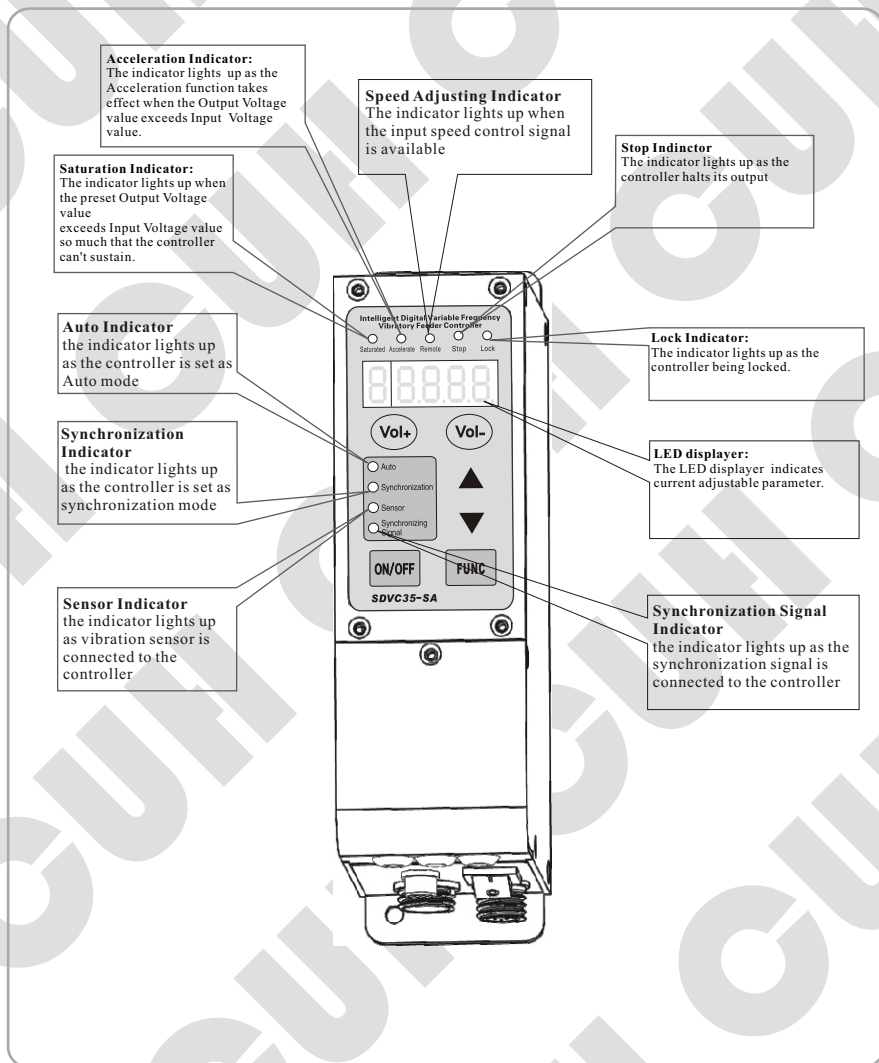The indicator lights up as the Acceleration function takes effect when the Output Voltage value exceeds Input Voltage value.

Speed Adjusting Indicator
The indicator lights up when the input speed control signal is available

Stop Indinctor
The indicator lights up as the controller halts its output

Saturation Indicator:
The indicator lights up when the preset Output Voltage value exceeds Input Voltage value so much that the controller can't sustain.

Auto Indicator
the indicator lights up as the controller is set as Auto mode

Lock Indicator:
The indicator lights up as the controller being locked.

Synchronization Indicator
the indicator lights up as the controller is set as synchronization mode

LED displayer:
The LED displayer indicates current adjustable parameter.

Sensor Indicator
the indicator lights up as vibration sensor is connected to the controller

Synchronization Signal Indicator
the indicator lights up as the synchronization signal is connected to the controller

Intelligent Digital Variable Frequency
Vibratory Feeder Controller

Saturated Accelerate Remote Stop Lock

Vol+   Vol-

○ Auto
○ Synchronization
○ Sensor
○ Synchronizing Signal
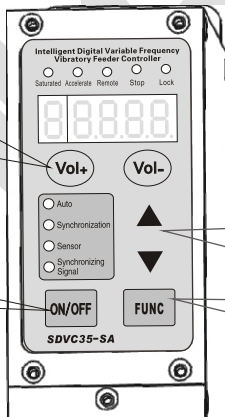
▲

▼

ON/OFF   FUNC

SDVC35-SA

3.2 Descriptions of the Control Panel

Vol+ & Vol- buttons/ Feeding Speed Adjusting Buttons
In the manual mode the buttons work as Vol+ and Vol- buttons.
In the Auto mode the buttons work as Feeding Speed Adjusting Buttons.
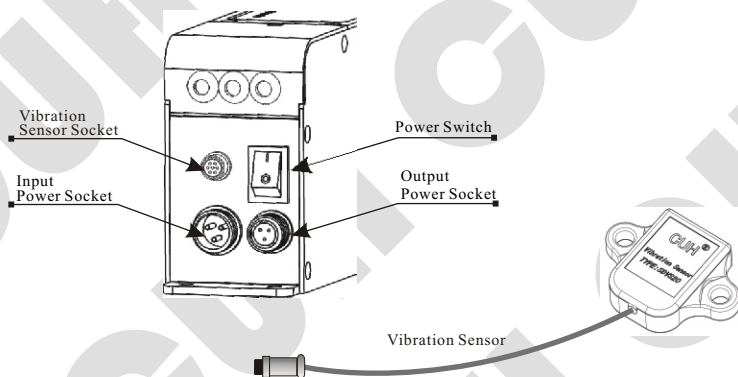
Parameter Value Increasing Button & Parameter Value Decreasing Button
In the Basic Parameters Adjusting Mode, Advanced Parameters Adjusting Mode and Automatic Synchronization Parameters Adjusting Mode these two buttons are used for adjusting the parameter values.

ON/OFF Button
Startup, shutdown output or lock the controller by pressing this button
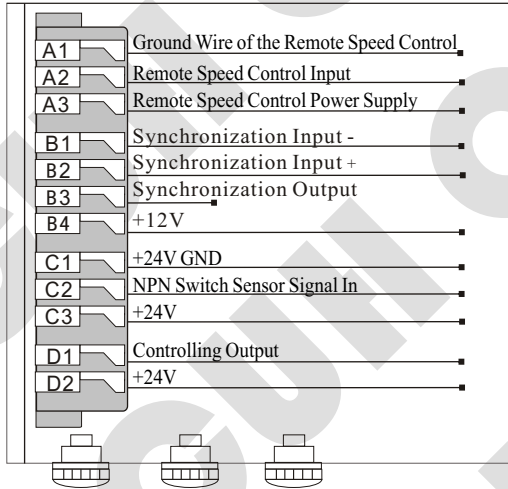
FUNC Button
Shift among the Basic Parameters Adjusting Mode, Advanced Parameters Adjusting Mode and Automatic Synchronization Parameters Adjusting Mode by pressing this button.

Intelligent Digital Variable Frequency Vibratory Feeder Controller

Saturated   Accelerate   Remote   Stop   Lock

Vol+   Vol-

Auto
Synchronization
Sensor
Synchronizing Signal

ON/OFF   FUNC

SDVC35-SA

3.3 I/O Interface Descriptions

Vibration Sensor Socket

Power Switch

Input Power Socket

Output Power Socket

Vibration Sensor

The Vibration Sensor is a optional accessory.
Choose it if you need the controller works at Auto Tracking status.

3.4 Signal Interface Definition

A1	Ground Wire of the Remote Speed Control
A2	Remote Speed Control Input
A3	Remote Speed Control Power Supply
B1	Synchronization Input -
B2	Synchronization Input +
B3	Synchronization Output
B4	+12V
C1	+24V GND
C2	NPN Switch Sensor Signal In
C3	+24V
D1	Controlling Output
D2	+24V

Chapter IV   Parameter Adjusting

For the user convenience, parameters of the controller are classified into the categories of Common Parameters, Basic Parameters, Advanced Parameters and Auto Tracking Parameters in this instruction book.

Common Parameters

● Press the (Vol+) or (Vol-) button to adjust the parameter

● In Auto Mode, these two buttons adjust feeding speed

● In Manual Mode, these two buttons adjust output voltage

● In Auto mode, press these two buttons to adjust basic parameters .
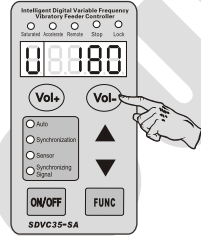
Parameter	Corresponding Sign	Adjustable Range	Adjustable Accuracy	Mode			
				Manual	Auto	Tracking	Auto Tracking
Output Voltage	∪	0~260V	1V	✔		✔	
Feeding speed	A				✔		✔

Basic Parameters

● Press the FUNC button and hole for 2 seconds to enter the Basic Parameter Adjusting Status.

● Press the FUNC button repeatedly to switch different parameters.

● Press the ▲ or ▼ button to adjust the parameter value.

● Press the FUNC button and hole for 2 seconds again to exit Basic Parameter Adjusting Status.
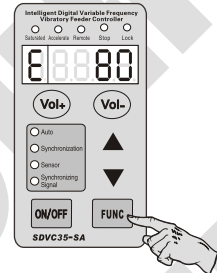
Parameter	Corresponding Sign	Adjustable Range	Adjustable Accuracy	Mode			
				Manual	Auto	Tracking	Auto Tracking
Frequency	E	40~400Hz	0.1Hz	✔			
Soft Startup Time	t	0.0~10.0s	0.1s	✔	✔	✔	✔
Startup Delay Time	⅃	0.0~20.0s	0.1s	✔	✔	✔	✔
Shutdown Delay Time	L	0.0~20.0s	0.1s	✔	✔	✔	✔

Advanced Parameters

● Press the FUNC and ▲ buttons and hold for 2 seconds to enter the Advanced Parameter Adjusting Status

● Press the FUNC button repeatedly to switch different parameters.

● Press the ▲ or ▼ button to adjust the parameter value

● Press the FUNC button and the ▲ button and hold for 2 seconds to exit Advanced Parameter Adjusting Status.
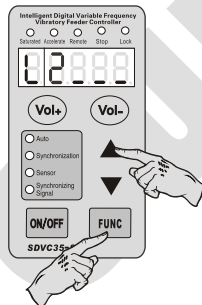
Parameter	Corresponding Sign	Adjustable Range	Adjustable Accuracy	Mode			
				Manual	Auto	Tracking	Auto Tracking
Logical Relation	⌐2	Normal Open Normal Close		✓	✓	✓	✓
Logical Relation Setting of the Controlling Output	⌐3	Normal Open Normal Close		✓	✓	✓	✓
In-line Controlling Output	⌐4	Normal Open Normal Close		✓	✓	✓	✓
Maximum Output Voltage Restriction	H	0~260V	1V	✓	✓	✓	✓
Acceleration Index Adjusting	Y	100%~150%	1%	✓	✓	✓	✓
Waveform Index Adjusting	⌐	0~100	1	✓	✓	✓	✓
Temperature Display	C	-10.0℃ ~80.0℃	0.1°	✓	✓	✓	✓
Default Settings Restoration	00000	-----		✓	✓	✓	✓

Auto Tracking Parameters

●Press the FUNC and ▼ buttons and hold for 2 seconds to enter the Auto Tracking Parameter Adjusting Status

● Press the FUNC button repeatedly to switch different parameters.

● Press the ▲ or ▼ button to adjust the parameter value

●Press the FUNC button and the ▼ button and hold for 2 seconds to exit Auto Tracking Parameter Adjusting Status.
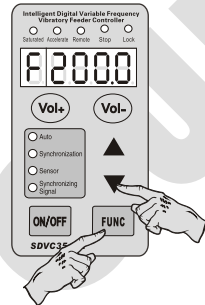
Parameter	Corresponding Sign	Adjustable Range	Adjustable Accuracy	Mode			
				Manual	Auto	Tracking	Auto Tracking
Reference Output Frequency Setting	F	0.0Hz~180.0Hz	0.1Hz		✓		
Output Frequency Range	A	Manual/Auto	0.1Hz		✓		
Manual/Auto	C5	Master/Slave		✓	✓	✓	✓
Master/Slave	C6	0~200		✓	✓	✓	✓
Frequency Adjusting Index I Setting	CE	0~200			✓		
Amplitude Adjusting Index P Setting	PA	0~200			✓		✓
Amplitude Adjusting Index I Setting	CA	0~260V			✓		✓
Current Output Voltage	C	0-16G	1V	✓	✓	✓	✓
Maximum Amplitude Restriction	P	0.0~360.0	0.1G		✓		✓
Phase Difference Setting	Y	0~260V	0.1	✓	✓	✓	
Auto Frequency Scanning / Output Voltage	b		1V			✓	

Chapter V Operating Mode

The controller can work in four different operating modes

● Manual Mode, Output Frequency and Output Current are adjusted manually

● Auto Mode, Output Frequency and Output Voltage are adjusted automatically according to the feedback of the sensor

● Tracking Mode, Output synchronous frequency according to the synchronizing signal and manually adjusted voltage

● Auto Tracking Mode, Output synchronous frequency according to the synchronizing signal

5.1 Manual Mode

The Output Voltage can be set directly and digitally through the control panel. Benefit from the unique Voltage Stabilizing Function, Output Voltage of the controller won't fluctuate as the Input Voltage does,and a vibrator can work stably in unstable input voltage environment.

5.1.1 Output Voltage Setting

➨ Turn on the power switch

➨ The Output Voltage Indicator lights up as the controller enters Output Voltage Adjusting status when the LED displays the voltage symbol U and the previously set voltage value.

➨ Adjust the Output Voltage value by pressing the (Vol+) or (Vol-) button.

U - represents Output Voltage
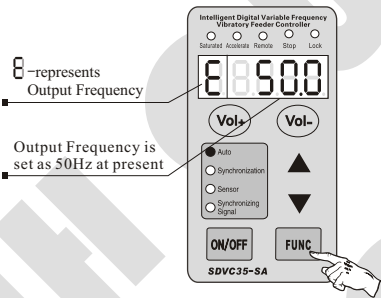
Output Voltage value is set as 180V at present
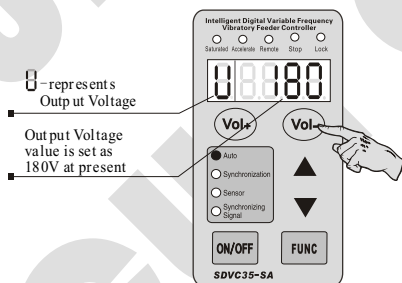
Output Voltage can be adjusted in any Basic Parameter Adjusting status or Advanced Parameter Adjusting status by pressing the (Vol+) or (Vol-) button. The controller returns to the previous parameter adjusting status after adjusting the Output Voltage.

5.1.2 Output Frequency Adjusting

The controller is produced with the DDS technology and its output has got high frequency accuracy and stability which doesn't change as the time or temperature does.

▸ Press the FUNC button and hold for 2 seconds to enter the Basic Parameters Adjusting status.

▸ The Frequency Indicator on the panel lights up and the LED displays the Output Frequency symbol E and the current Output Frequency value.

▸ Press the ▲ or ▼ button to adjust the parameter value.

8 –represents Output Frequency

Output Frequency is set as 50Hz at present

Intelligent Digital Variable Frequency Vibratory Feeder Controller

Saturated Accelerate Remote Stop Lock

E 50.0

Vol+   Vol-

Auto
Synchronization
Sensor
Synchronizing Signal

ON/OFF   FUNC

SDVC35-SA

5.2 Auto Mode

In this mode, the controller adjusts output voltage and output frequency automatically according to the data from the sensor to ensure preset feeding speed stable and best vibration frequency.

5.2.1 Vibration Sensor Installation
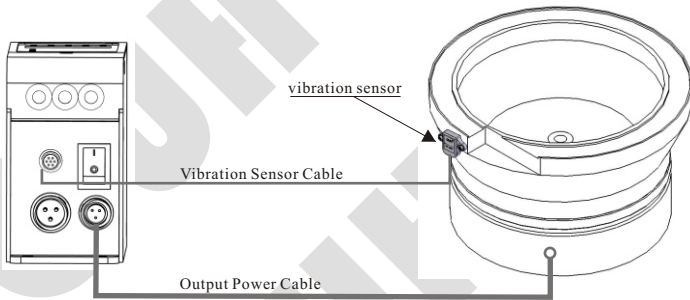
Install the vibration sensor on a secure, even surface, any direction, any angle.

➤ Turn on the power switch of the controller

➤ The Sensor Indicator lights up as the vibration sensor is properly connected.

➤ The controller works automatically in the default Auto Mode

A – represents feeding speed adjustment in the Auto Mode

indicates Auto Mode

Sensor Indicator

In Auto Mode, Output voltage and output frequency can not be adjustec manually.

If the sensor is not connected, output voltage and output frequency can only be adjusted manually.

5.2.2 Auto Frequency Searching

By Auto Frequency Searching, the controller finds the best operating frequency of the vibratory feeder and adjusts parameters automatically. The only thing users need to do is to set feeding speed and the controller will work in the best state.

▸ In the Auto Mode or Manual Mode, press the ▲ and ▼ buttons and hold for 3 seconds to start Auto Frequency Searching as the LED displays current output frequency.

▸ After searching, the controller will set all parameters such as reference frequency, frequency range, frequency adjusting parameter I, amplitude adjusting parameter P, amplitude adjusting parameter I, phase difference and auto mode.

E – represents output frequency in Auto Mode

Auto Indicator

Sensor Indicator
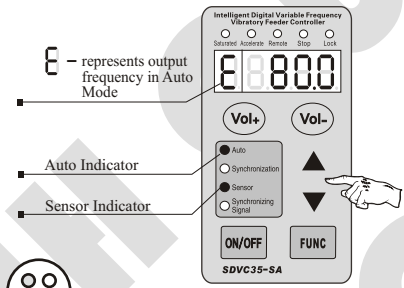
● If the LED displays Err02 right after frequency searching, this means maximum auto searching output voltage is set too high. But the controller can still work normally.
● Press the ON/OFF button if you want to cancel auto frequency searching in the searching process. The controller will go back to the status before auto frequency searching.

5.2.3 Auto Mode Feeding Speed Adjusting

▸ Press the (Vol+) or (Vol-) button to change feeding speed.

A – represents feeding speed adjustment in the Auto Mode

Indicates Auto Mode

Sensor Indicator
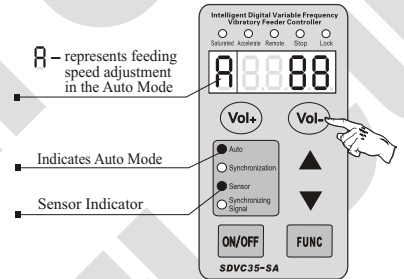
5.2.4 Parameter Adjusting in Auto Mode
Users can also adjust each parameter manually.

5.2.4.1 Reference Output Frequency Setting F
Adjustable frequency range is reference output frequency $\pm$ max deviation
Reference Output Frequency should be set around resonant frequency of the vibratory
feeder where the controller can find the best output frequency more quickly.

5.2.4.2 Adjustable Frequency Range Setting ∩
Adjustable frequency range is reference output frequency $\pm$ max deviation. Suggested
max deviation is around 30.0Hz. If the max deviation is set too large, the vibratory feeder
may work at improper frequency, and if the max deviation is set too small, flexibility of
the vibratory feeder may affected.

5.2.4.3 Frequency Adjusting Index I Setting IF
The controller adjusts output frequency automatically via PID algorithm. IF is a
frequency integration index. The larger the IF value is, the faster the controller adjusts
output frequency. But too large IF value may cause oscillation of the output frequency.

5.2.4.4 Amplitude Adjusting Index P Setting PA
The controller adjusts output voltage automatically via PID algorithm. PA is a speed ratio
index. The larger PA value is, the faster the controller adjusts output voltage. But too large
PA value may cause oscillation of the output voltage.

5.2.4.5 Amplitude Adjusting Index I Setting IA
The controller adjusts output voltage automatically via PID algorithm. IA is a speed
integration index. The larger PA value is, the faster the controller adjusts output voltage.
But too large PA value may cause oscillation of the output voltage.

5.2.4.6 Current Output Voltage U
The parameter is used for displaying current output voltage and it is nonadjustable.

5.2.4.7 Maximum Acceleration Restriction P
The parameter restricts maximum acceleration the vibratory feeder bears to protect the
feeding system.

5.2.4.8 Phase Difference Setting H
Adjust this parameter to change phase of the output voltage, default phase difference is 0°

5.2.4.9 Maximum Output Voltage When Auto Frequency Searching b
Output voltage won't exceed this value in the process of auto frequency searching to
protect the feeding system.

5.3 Tracking Mode/Tracking & Auto Mode

Sometimes there are more than one vibratory feeder in the feeding system. If output frequency values of the vibratory feeder controllers in the system are different, there may exits beat frequency effect among the vibratory feeders.
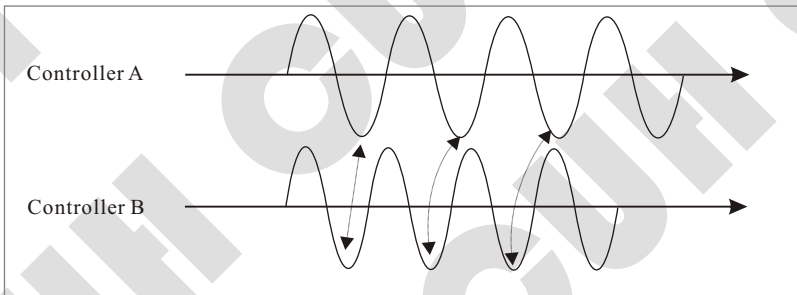
In the Tracking Mode, output frequency of the slave controller is controlled by the master controller or another controller and output voltage of the slave controller is set by itself.

In the Tracking & Auto Mode, output frequency of the slave controller is controlled by the master controller or another controller and output voltage of the slave controller is controlled by vibration sensor to ensure constant feeding speed.

The master controller should be set in the independent working mode. One master controller could drive several slave controllers.

The master controller could work in the manual mode or auto mode. In the manual mode, output voltage is set by itself while in the auto mode output voltage is adjusted automatically by itself to ensure constant feeding speed.

Waveforms two controllers output when they are not working in Tracking Mode or Tracking & Auto Mode. (Different output frequency)

Waveforms two controllers output when they are in the Tracking Mode or Tracking & Auto Mode. (Same output frequency)
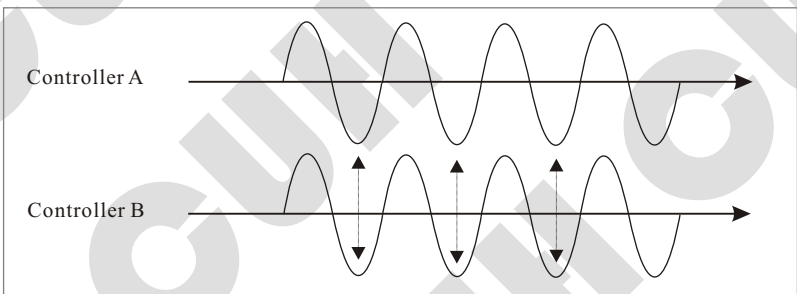
5.3.1 Connection Method of Two Controllers When They Working In the Tracking Mode or Tracking & Auto Mode.

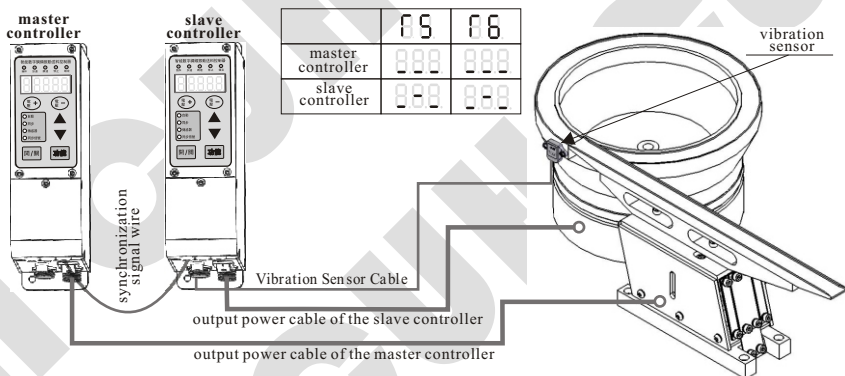●**Principle and Connection Method of the Master Controller in Manual Mode and the Slave Controller in Manual Mode:**
Output frequency of the slave controller is controlled by the master controller while output frequency of the master controller is set manually.
Output voltage of the master controller and slave controller are set manually.
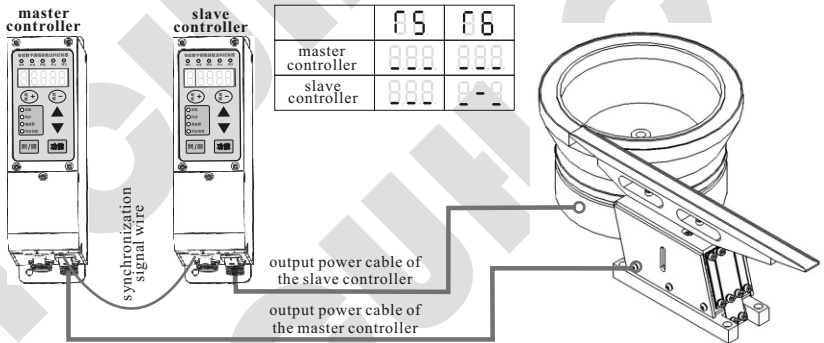
●**Principle and Connection Method of the Master Controller in Auto Mode and the Slave Controller in Manual Mode:**
Output frequency of the slave controller is controlled by the master controller while output frequency of the master controller is controlled by vibration sensor automatically.
Output voltage of the slave controller is controlled manually while output voltage of the master controller is controlled by vibration sensor automatically.
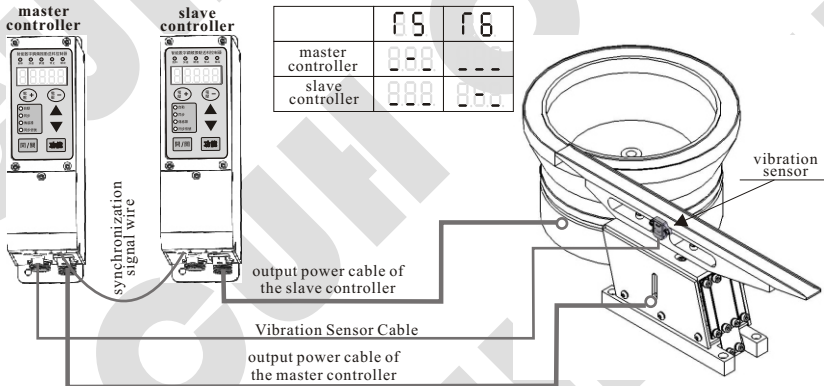
●**Principle and Connection Method of the Master Controller in Manual Mode and the Slave Controller in Auto Mode：**

Output frequency of the slave controller is controlled by the master controller while output frequency of the master controller is set manually.

Output voltage of the slave controller is controlled by vibration sensor automatically while output voltage of the master controller is set manually.

●**Principle and Connection Method of the Master Controller in Auto Mode and Slave Controller in Auto Mode：**

Output frequency of the slave controller is controlled by the master controller while output frequency of the master controller is controlled by vibration sensor automatically.

Output voltage of the master controller and slave controller are controlled by the vibration sensor automatically.
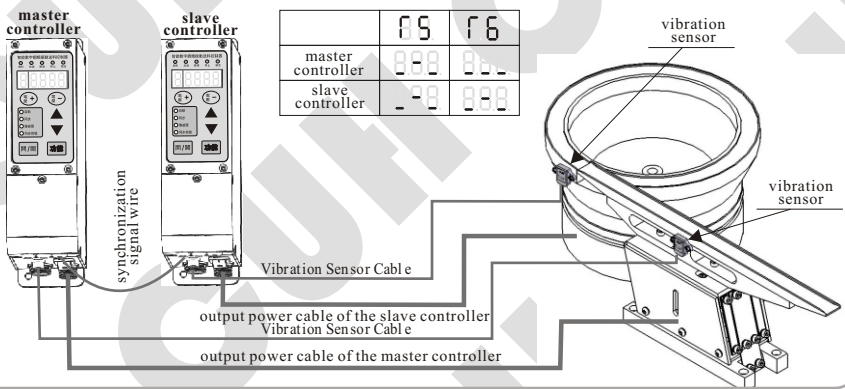
5.3.2 Connection Method of the Synchronization Signal Wire

Step 1
Open the door of the signal wire terminals bin.
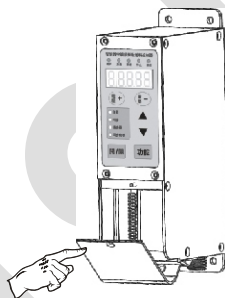
Step 2
Connect the master controller and the slave controller with the synchronization signal wire according to the schematic diagram
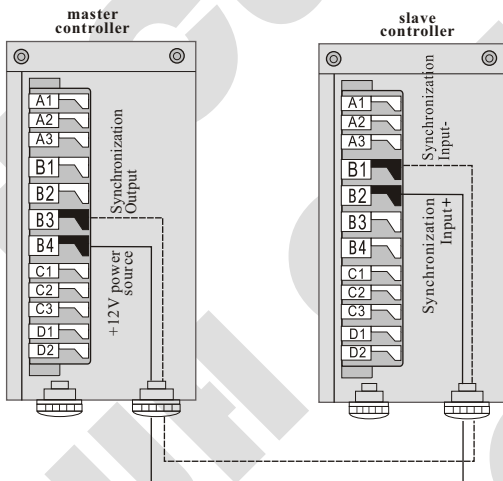
5.3.3   Tracking Mode Setup

Master Controller Setup

▶▶ Press the FUNC and ▼ buttons and hold for 2 seconds to enter the Auto Tracking Parameter Adjusting Status.

▶▶ Press the FUNC button repeatedly until shifting to the parameter of Γ6, set the parameter to Γ6_ _ _ by pressing the ▲ or ▼ button.
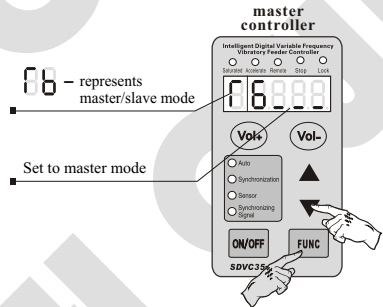
The master controller can work in Auto Mode (Γ5 set to _ _ _) or Manual Mode (Γ5 set to _ ⁻ _).

Slave Controller Setup

▶▶ Press the FUNC and ▼ buttons and hold for 2 seconds to enter the Auto Tracking Parameter Adjusting Status

▶▶ Press the FUNC button repeatedly until shifting to the parameter of Γ6, set the parameter to Γ6_ ⁻ _ by pressing the ▲ or ▼ button.

▶▶ Output frequency of the slave controller is synchronous with the synchronization signal from the master controller. Output voltage of the slave controller can be adjusted manually by setting Γ5 to _ _ _ or automatically by setting Γ5 to _ ⁻ _.
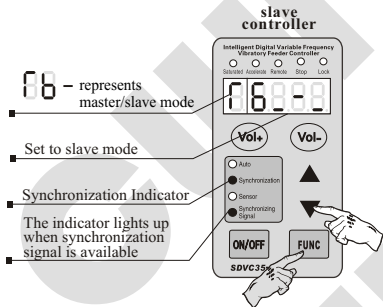
The controller will halt its output when synchronization signal is not inputted or unstable while output voltage can be adjusted manually and output frequency become nonadjustable. The Synchronization Signal Indicator goes out at the same time.

5. 4 Other Functions

5.4.1 Soft Startup

In order to avoid sudden shock to the work pieces, the controller can gently increase Output Voltage from 0 to the pre-set value when startup.

5.4.2 Output Switch Button

The soft-touch switch button on the panel can turn on/off the controller's output quickly and easily.

5.4.3 Maximum Output Voltage Restriction

Maximum Output Voltage of the controller can be set to prevent damage to the vibrator. Remote Speed Controller function is affected by this parameter.

5.4. 4 Acceleration Parameter Adjusting

This parameter means the maximum Output Voltage as percentage of the Input Voltage. The Acceleration function is affected by this parameter.

5.4.5 Waveform Index Adjusting

Operators can weight peak efficiency and maximum power (minimal noise) by adjusting this parameter.

5.4.6 Temperature Display Function

Display internal temperature of the controller in real time. Enter advanced parameter adjusting status and shift to the parameter of C by pressing the FUNC button to read the temperature.

5.4.7 Keypad Locking

The Keypad Locking Function can lock all buttons on the panel to avoid misoperation.

5.4.8 Default Settings Restoration

This function allows the operator to restore all default parameter settings.

Due to the abundant functions of the controller, many parameters can be adjusted. In order to avoid the circumstance that after too many times modification by a beginner, the controller can not work properly, this function allows the operator to restore default settings to the controller in an easy way.

Chapter VI External Signal Control

6.1   Using Method of the NPN Switch Sensor

The controller can operate with all kinds of sensors such as switch sensors, optical switch sensors and fiber optic sensors.
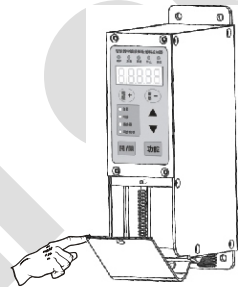
6.1.1 Connection method of the NPN Proximity Switch Sensor

Step 1:
Open the upper cover plate of the controller.

Step 2:
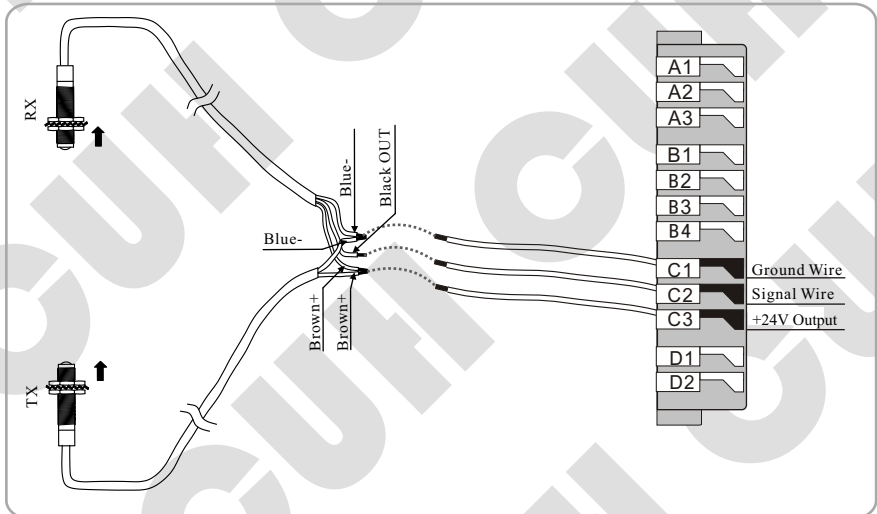Connect the NPN Proximity Switch Sensor to the terminals of the controller according to the diagram.

C1 — Ground Wire
C2 — Signal Wire
C3 — +24V Output

A1
A2
A3
B1
B2
B3
B4
C1
C2 — Signal Wire
C3 — +24V Output
Ground Wire
D1
D2

Convention

The blue wire represents ground wire
The black wire represents signal wire
The brown wire represents power wire

Proximity Switch
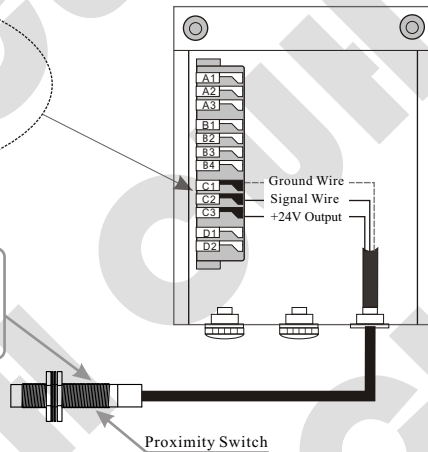
6.1.2 Connection method of the NPN Counter-radiation Switch Sensor
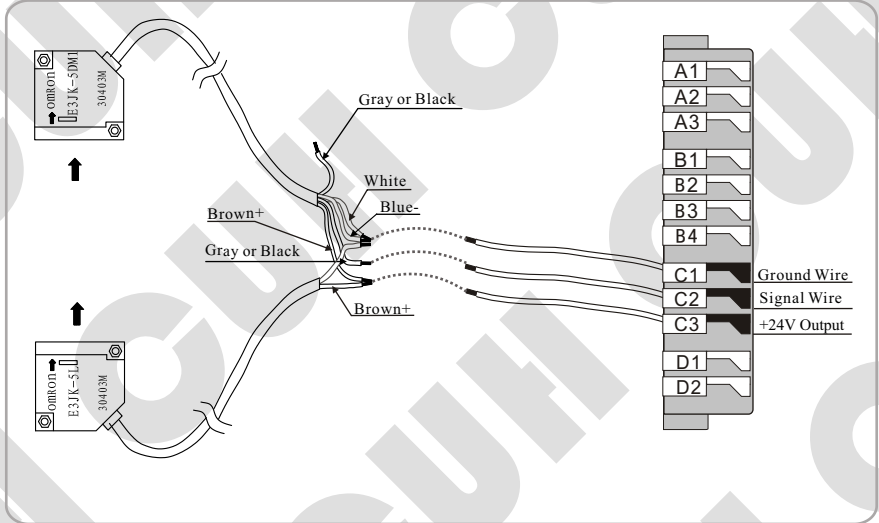
6.1.3 Connection method of the Photoelectric Counter-radiation Sensor

6.1.4 Connection method of the Optical Fiber Counter-radiation Sensor

RX   TX

Fiber optic sensor

White or Black

White or Black   Blue

Brown

A1	
A2	
A3	
B1	
B2	
B3	
B4	
C1	Ground Wire
C2	Signal Wire
C3	+24V Output
D1	
D2	
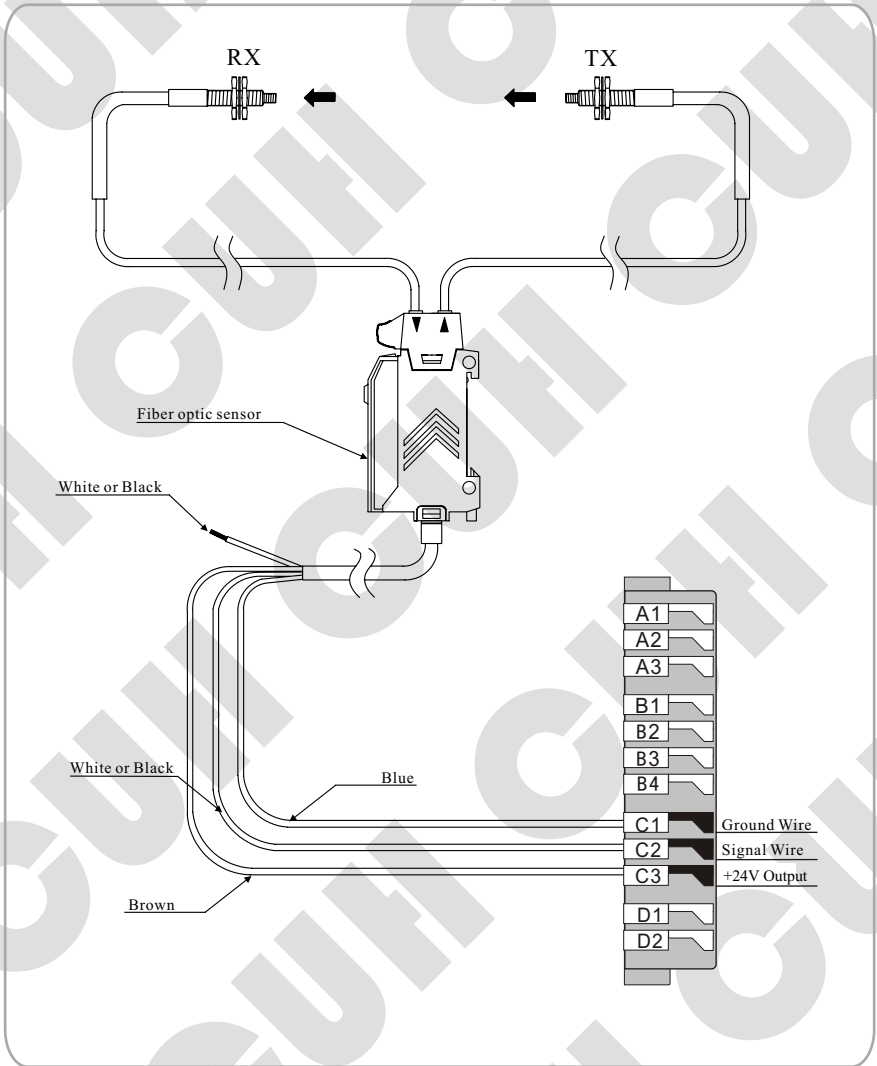
6.1.5 Connection method of the Photoelectric Reflection Sensor
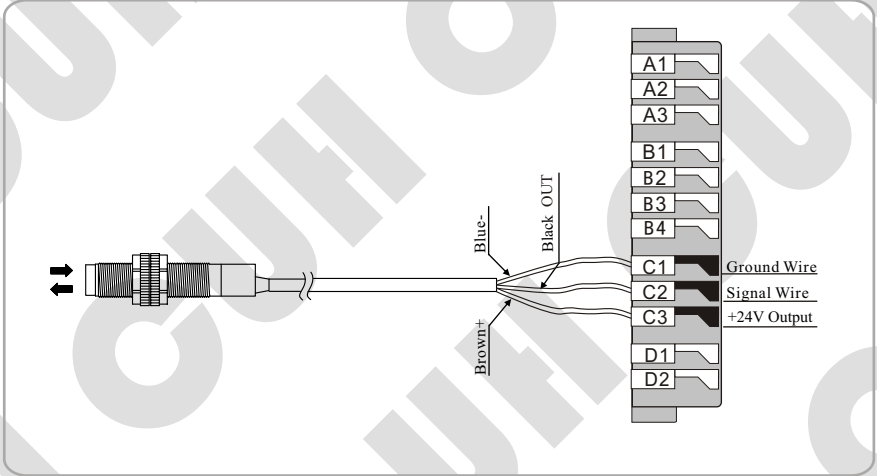
6.2 Startup Delay Time and Shutdown Delay Time Settings of the NPN Switch Sensor

By default, Intelligent Photoelectric Sensor and Switch Sensor share the same Startup Delay Time and Shutdown Delay Time. Operators can also set Startup Delay Time and Shutdown Delay Time independently for the Switch Sensor.

Startup Delay (⌐): The period of time the controller goes through from receiving a startup control signal to outputting.

▶ Press the FUNC and ▲ buttons simultaneously and hold for 2 seconds to enter the Advanced Parameters Adjusting status.

▶ Press the FUNC button repeatedly until shifting to the Startup Delay Time Adjusting status (⌐) as the Startup Delay Time Indicator on the panel lights up.

▶ Adjust the parameter by pressing the ▲ or ▼ button. The parameter unit is second, and the numerical precision is 0.1.

8 -represents Startup Delay Time of the NPN Switch sensor

Startup Delay Time is set as 2 seconds
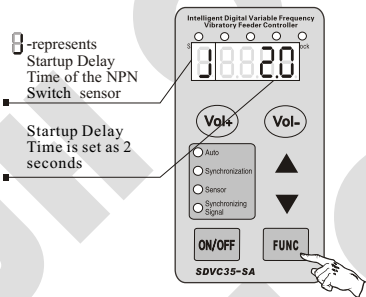
Shutdown Delay (L): The period of time the controller goes through from receiving a shutdown control signal to cutting off output.

▶ Press the FUNC and ▲ buttons simultaneously and hold for 2 seconds to enter the Advanced Parameters Adjusting status.

▶ Press the FUNC button repeatedly until shifting to the Shutdown Delay Time Adjusting status (L) as the Shutdown Delay Time Indicator on the panel lights up.

▶ Adjust the parameter by pressing the ▲ or ▼ button. The parameter unit is second, and the numerical precision is

8 -represent Shutdown Delay Time of the NPN Switch sensor

Startup Delay Time is set as 1.5 seconds
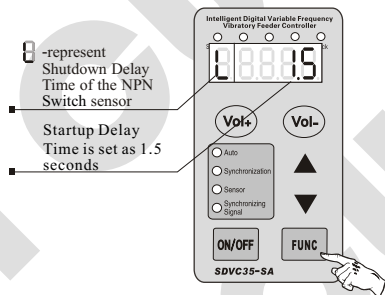
6.3 Logical Relation Setting of the NPN Switch Sensor (Halt when work-pieces are full)

Under normal circumstances，the controller receives no signal from the NPN Switch Sensor and runs by default. But in some special applications the controller needs to be stopped when receives no signal from the NPN Switch Sensor. Adjusting this parameter can fulfill this kind of application.

⇥ Press the [FUNC] and ▲ buttons simultaneously and hold for 2 seconds to enter the Advanced Parameters Adjusting status.

⇥ Press the [FUNC] button repeatedly until shifting to the Logical Relation Adjusting status of the NPN Switch Sensor (Γ 2).

⇥ Adjust the parameter by pressing the ▲ or ▼ button.

88 —represents Logical Relation of the NPN Switch Sensor

Normal Open

88 —represents Logical Relation of the NPN Switch Sensor
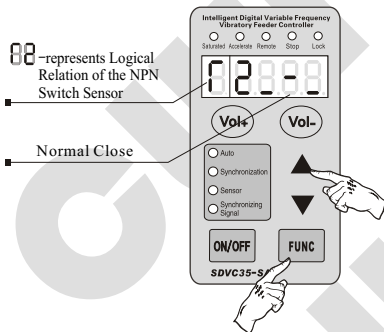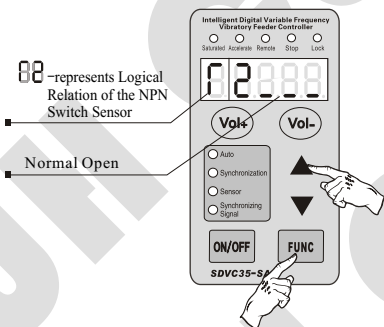
Normal Close

● When Logical Relation is set as Normal Open, namely no signal received, the controller runs.
● When Logical Relation is set as Normal Close, namely no signal received, the controller stops.

6.4   Connection Method of the Upper PLC which Controls the Vibratory Feeder Controller

6.4.1 Connection method of the controlling PLC

Step One:
Open the upper cover plate of the controller.

Step Two:
Connect the PLC to the terminals of the controller according to the diagram.

Relay output or NPN output of the PLC is compatible with the controller.
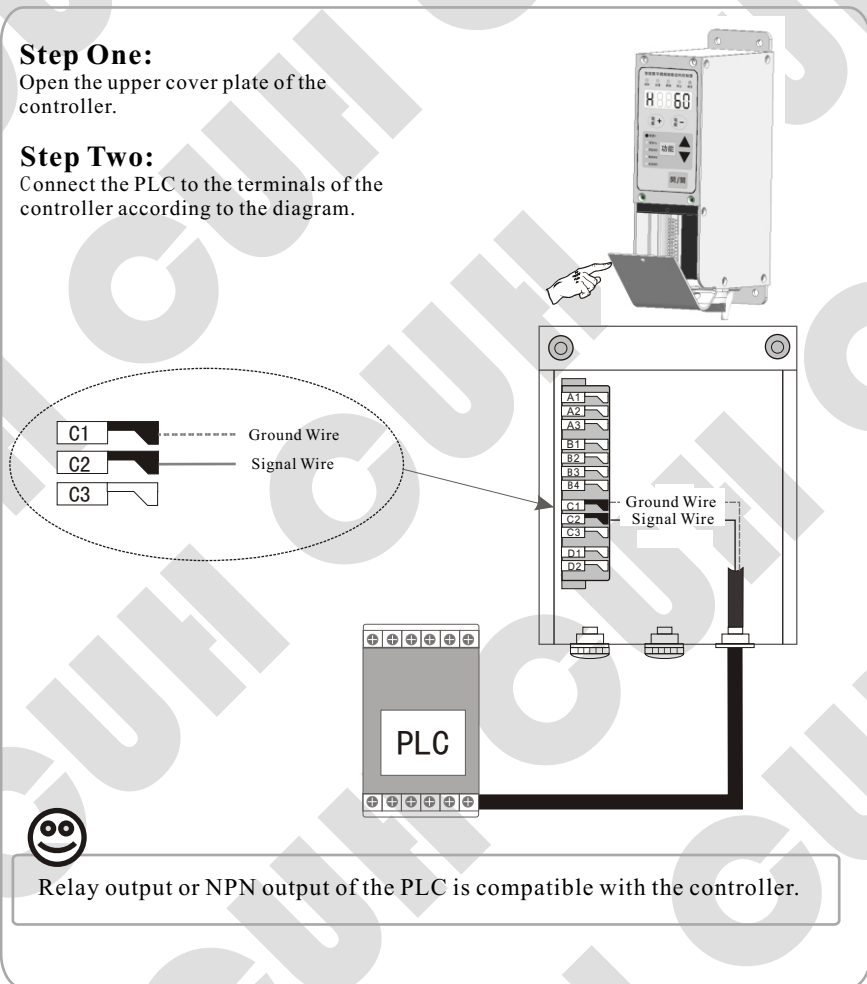
6.5   Controlling Output

The controller can output low-voltage controlling signal to cooperate with other devices such as a solenoid valve, a PLC or an electrical relay.

6.5.1 Connection method of the Controlling Output

Connection method of the solenoid valve
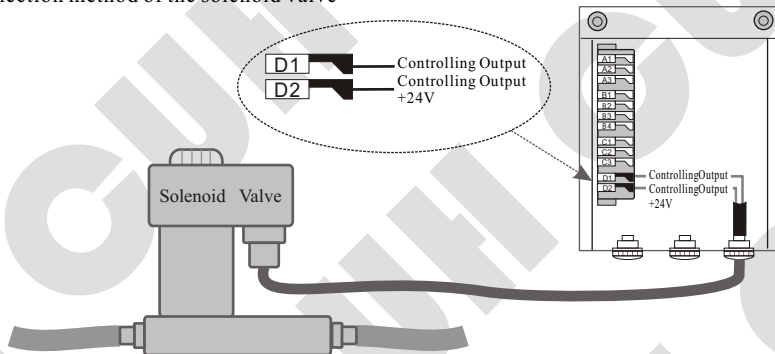
- The controller can directly drive a solenoid valve whose rated voltage is 24V and rated power lower than 4W.
- Use external power supply for high power solenoid valve.


Connection method of the electrical relay
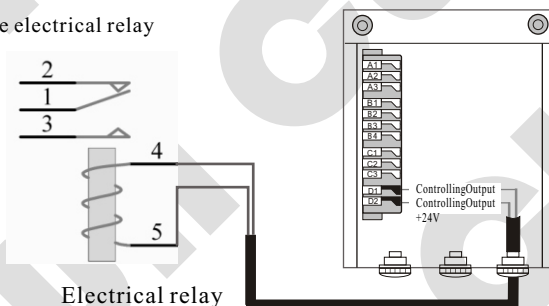
Electrical relay

- The controller can directly drive an electrical relay whose rated voltage is 24V and rated power lower than 4W.

6.5.2 Logical Relation Setting of the Controlling Output

▸ Press the FUNC and ▲ buttons simultaneously and hold for 2 seconds to enter the Advanced Parameters Adjusting status.

▸ Press the FUNC button repeatedly until shifting to the Logical Relation Adjusting status of the Controlling Output (Γ3).

▸ Adjust the parameter by pressing the ▲ or ▼ button.

represents Logical Relation of the Controlling Output

Normal Open

● When Logical Relation is set as Normal Open, the Controlling Output works as the controller runs.

● When Logical Relation is set as Normal Close, the Controlling Output doesn't work as the controller runs.

represents Logical Relation of the Controlling Output

Normal Close
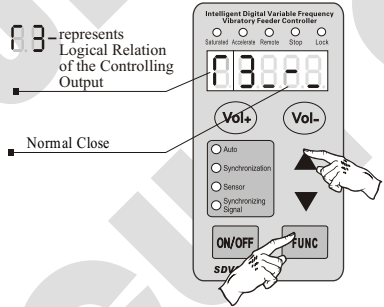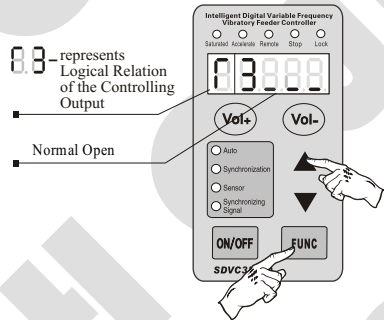
6.6   Remote Speed Control

The function of Remote Speed Control allows the operator to control the Output Voltage by an external potentiometer or a control signal ranging from 1V to 5V. Thus, external remote speed control can be easily achieved by a PLC, a DCS or some other means.
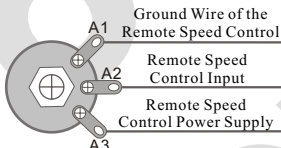
Remote Speed Control function becomes effective to the controller when the controlling signal exceeds 0.5V. Meanwhile, Remote Speed Control indicator on the panel lights up and the (Vol+) and (Vol-) buttons lose effectiveness. The LED displayer shows current Output Voltage if the controller is running in the Output Voltage Adjusting status.
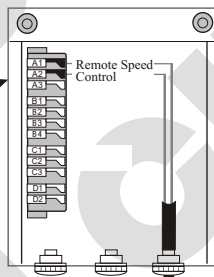
Connection method of the external potentiometer

A1 ———— Ground Wire of the Remote Speed Control
A2 ———— Remote Speed Control Input
A3 ———— Remote Speed Control Power Supply

Remote Speed Control
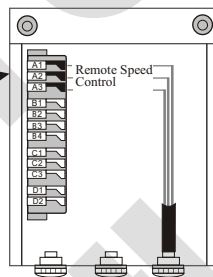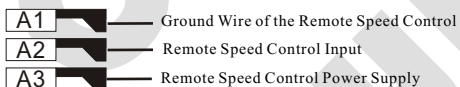
Note:

Please select linearity potentiometer with the resistance of 1k.

A1 — Ground Wire of the Remote Speed Control
A2 — Remote Speed Control Input
A3 — Remote Speed Control Power Supply

Connection method of the PLC

PLC

A1 ——— Ground Wire of the Remote Speed Control
A2 ——— Remote Speed Control Input
A3

Remote Speed Control

Chapter VII Security Functions

7.1 Automatic Voltage Stabilizing

The built-in Digital Voltage Stabilizing function can eliminate feeding speed variation caused by mains voltage fluctuation.

7.2 Short-Circuit Protection

If output of the controller is short-circuited, the controller will halt its output until restarted.
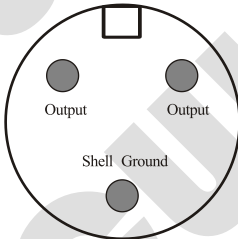
7.3 Current Overload Protection

The controller will halt its output to ensure equipments' operating safety when operation current exceeds its rated value.

7.4 Overheat Protection

The controller will halt its output to protect itself when operation temperature is too high.

Appendix

Appendix A: Output Interface Definition
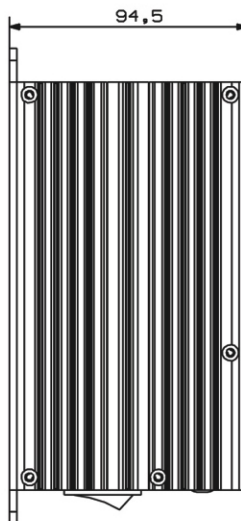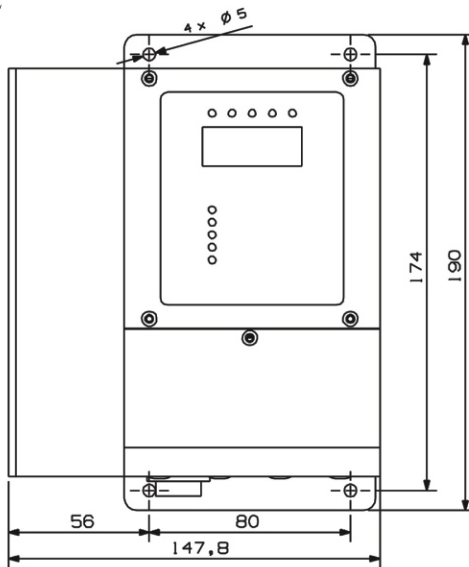

Output   Output

Shell Ground

😊 **Notice:**

A: Make sure the electromagnetic coils of the vibrator is connected to the two output pins of the Output Power Cable socket and the shell of the vibrator is reliably earthed, otherwise series security incident may occur.

B: After welding, make sure the blank area is enswathed by insulating tape or heat-shrinkable tube before insert it into the Output Power Cable socket to avoid electrical leakage or short-circuit.
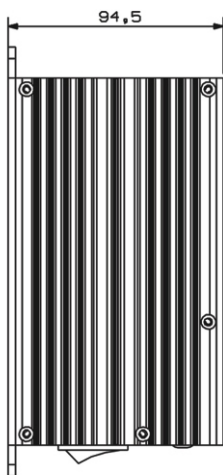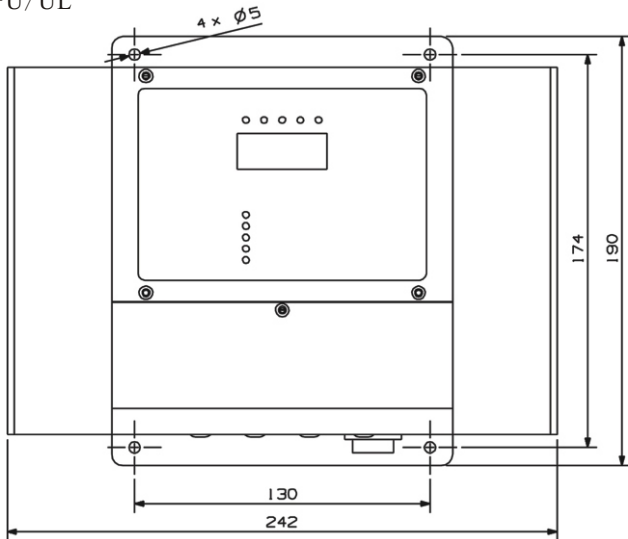
Appendix B**:** Dimensions

SDVC35‑S/M
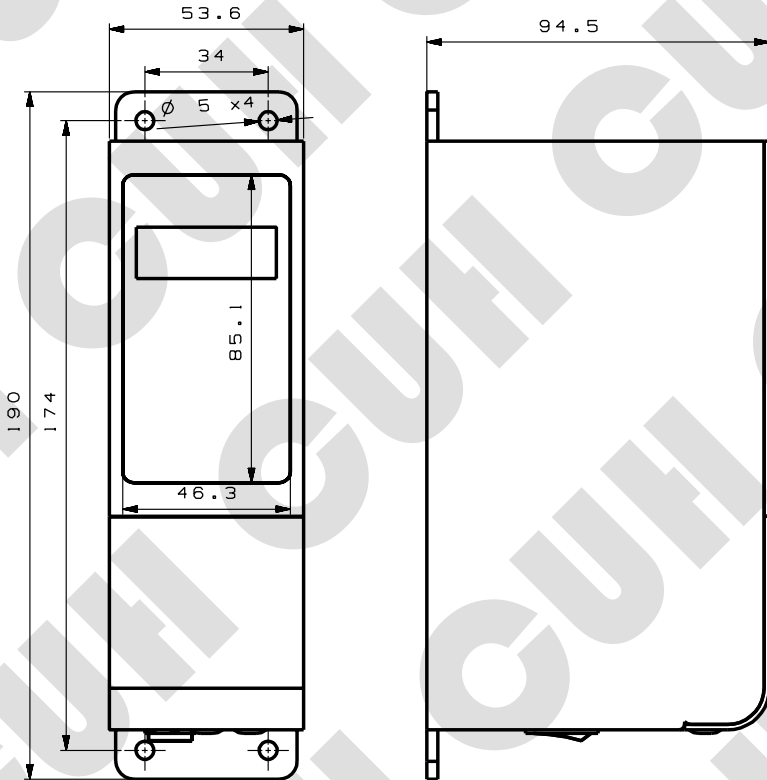
SDVC35-L/XL

SDVC35-U/UL

Appendix C: Electrical Specification

Item	Value		Unit	Description
	MIN	MAX		
Output Voltage	0	260	V	
Voltage Adjusting Accuracy	1		V	
Frequency Range	40	400	HZ	
Frequency Adjusting Accuracy	0. 1		HZ	
Output Waveform				
Output Current		1. 5	A	SDVC35--S
		3. 0		SDVC35--M
		4. 5		SDVC35--L
		6. 0		SDVC35--XL
		10		SDVC35--XXL
		20		SDVC35--XXXL
Output Power		330	VA	SDVC35--S
		660		SDVC35--M
		990		SDVC35--L
		1320		SDVC35--XL
		2200		SDVC35--XXL
		4400		SDVC35--XXXL
Time Delay Range	0	20	S	
Time Delay Accuracy	0. 1		S	
Soft Startup Time	0	9. 9	S	
Auxiliary Power Supply Voltage	22	26	V	24V
Auxiliary Power Supply Current		200	mA	24V
Stand-by Power Consumption	1. 5	3. 0	W	
Display Method		5. 0		LED Digital Tube
Control Method	1. 0-5. 0		V	Remote Controlled Voltage
	Standard TTL Electric Level			Switching Signal
	6 Buttons plus LED			Touch Button Keyboard

Appendix D: Trouble Shooting Tips and Error Explanations

The following tips can help to solve the problems you may encounter

1	No display after power on	◆ Make sure the power outlet is live ◆ Make sure the Input Power Cable is reliably connected to the power outlet
2	Displays normally but no output	◆ Make sure the Input Power Cable and Output Power Cable are firmly connected ◆ Make sure the Output Voltage parameter value is not too small ◆ Make sure the controller is not stopped by the control signal ◆ Make sure the controller is not stopped by the parameters that are set as normal off
3	Control signal loses effectiveness	◆ Make sure the control signal is correctly inputted ◆ Make sure the ground wire of the control signal is correctly connected to the controller ◆ Make sure the Logical Relation of the control signal is set correctly as you expectation
4	Beat phenomena	◆ Avoid vibration coupling among the vibrators ◆ Heighten the resonant frequency of the vibrators
5	Displays normally, no output, but sound can be heard	◆ Adjust all parameters as this book instructed
6	Err01	◆ Output in short-circuit, Make sure the Output Power Cable and the coil are not shorted out
7	Err02	◆ Output Over current, Reduce the Output Voltage value and make sure the armature gap is not too big
8	Err03	◆ Overheat, Place the controller in well ventilated environment
9	Err04	◆ Reserved, please contact us
10	Err05	◆ Reserved, please contact us

数字调压振动送料控制器

品名规格	特 点	
SDVC11 数字稳压振动送料控制器系列 	输入电压范围：150V～260V	输出电压范围：35V～250V
	输出电流：0～5A	输出功率：1100VA
	电源频率范围：40～70Hz	
	·自动稳压　　　　　　·缓启动 ·最大输出比例调节　·线性调节规律 ·短路保护功能　　　·过热保护功能	
SDVC20、22 智能数字稳压振动送料控制器系列 	输入电压范围：85V～420V	输出电压范围：35V～380V
	输出电流：0～10A	输出功率：3800VA
	电源频率范围：40～70Hz	
	·自动稳压　　　　　·缓启动 ·缓启动时间设置　·信号控制开关 ·双控制信号输入　·输出电压预置功能 ·料满停机　　　　·智能光电传感 ·线控调速　　　　·控制输出 ·过热保护功能　　·过流保护功能	