SPV-U Series

Proportional Valve

Date: July, 2013

Version: Ver.B (English)

SHINI

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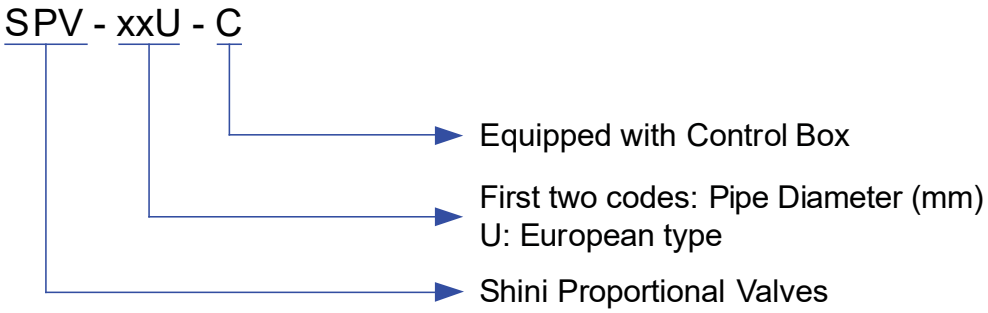
1. General Description

Read this manual carefully before operation to prevent damage of the machine or personal injuries.

SPV-U series proportional valve mix regrind and new materials in a proper proportion, and then send them back to the moulding machine to achieve a proportional mixing and loading effect. It features directly mounted on loaders or mounted on the pipeline. Besides, it is applicable to Euro loaders and has to equip control box to perform when in other situations.

Model: SPV-38U-C

1.1 Coding Principle



1.2 Feature

1) Standard configuration

- European type design, classy appearance, easy installation and operation.
- Unique design of valve body, make material conveying more smoothly.
- The performance of solenoid valve is so stable that the air cylinder acts accurately to ensure a proportional mixing of new and regrind materials.
- There is no need of ordering control box when working with SAL-U series hopper loaders.
- Instant recycling of regrind materials to reduce production cost.
- Equipped with 1~4 levels woking function selection, making material mixing more evenly.

2) Accessory option

- When applied in other conditions, control cabinet can be an option.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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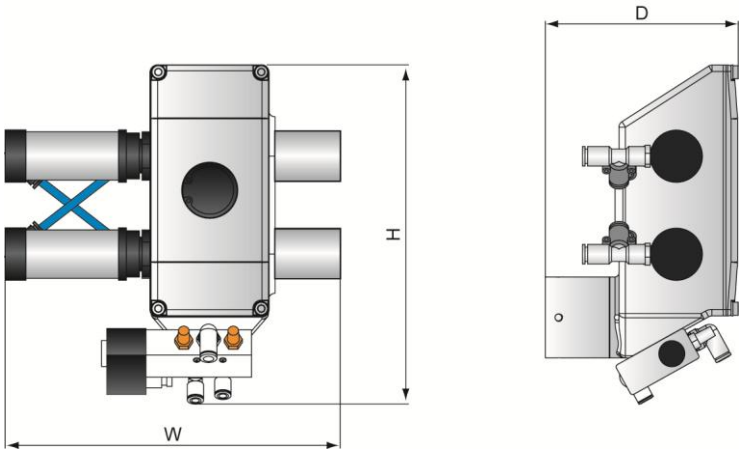
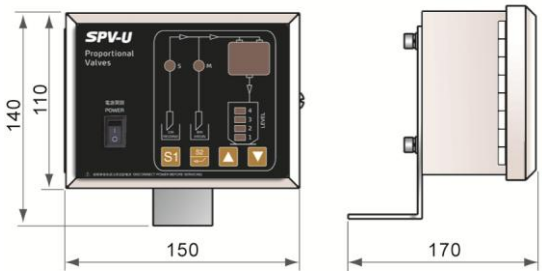
1.3 Technical Specifications

1.3.1 Technical Specifications



Picture 1-1：Proportional Valve



Picture 1-2：Control Box

1.3.2 Specifications

Table 1-1：Specifications

Model	Compressed Air Pressure	Driven Means	Maximum Material Flow	Pipe Size (inch)	Dimensions (mm) H×W×D	Weight (kg)
SPV-38U-(C)	3kgf/cm^2 Compressed Air	Cylinders	350kg/hr	1.5	270 × 260 × 150	3.5
SPV-50U-(C)	3kgf/cm^2 Compressed Air	Cylinders	550kg/hr	2	270 × 260 × 150	3.8

Note:1) "C" stands for control box, there is no need of control

box when working with SAL-U loaders. without prior notice.

2) Above maximum passing rate is based on pellet material of 0.65kg/L in bulk density and 3-5mm in diameter.

2) Power supply: 1Φ, 115 / 230VAC, 50/60Hz.

1.4 Safety Regulations

To avoid any body injures and damages of the machine, please do to observe the regulations in this manual.

When operating this machine, please observe the regulations as follows.

1.4.1 Safety Signs and Labels

 Warning! Be careful!

This label means that this area should be taken care!

 Attention!

No need for regular inspection because all the electrical parts in the control unit are fixed tightly!

1.4.2 Transportation and Storage of the Machine

Transportation

1) SPV-U series are packed in crates or plywood cases with wooden pallet at the bottom, suitable for quick positioning by fork lift.
2) Do not rotate the machine and avoid collision with other objects during transportation to prevent improper functioning.
3) The structure of the machine is well-balanced, although it should also be handled with care when lifting the machine for fear of falling down.
4) The machine and its attached parts can be kept at a temperature from -25℃ to +55℃ for long distance transportation and for a short distance, it can be transported with temperature under +70℃.

Storage

1) SPV-U series should be stored indoors with temperature kept from 5℃ to 40℃ and humidity below 80%.
2) Keep the whole machine, especially the electrical components away from water to avoid potential troubles caused by the water.
3) Plastic film should be used to protect the machine from dust and rains.

Working environment

The machine should be operated:
Indoors in a dry environment with max. temperature +45℃ and humidity no more than 80%.

Do not use the machine:

1) If it is with a damaged cord.
2) On a wet floor or when it is exposed to rain to avoid electrical shock.
3) If it has been dropped or damaged until it is checked or fixed by a qualified serviceman.
4) This equipment works normally in the environment with altitude within 3000m.
5) At least a clearance of 1m surrounding the equipment is required during operation. Keep this equipment away from flammable sources at least two meters.
6) Avoid vibration, magnetic disturbance at the operation area.

Rejected parts disposal

When the equipment has run out its life time and can not be used any more, unplug the power supply and dispose of it properly according to local code. In the enent of loss or damage to a key of a trapped key interlocking device, the complete key lock unit shall be replaced.

Fire Hazard

 In case of fire, Co_2 dry powder fire extinguisher should be applied.

 Feeding strip materials can give rise to an entanglement hazard.

1.5 Exemption Clause

The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

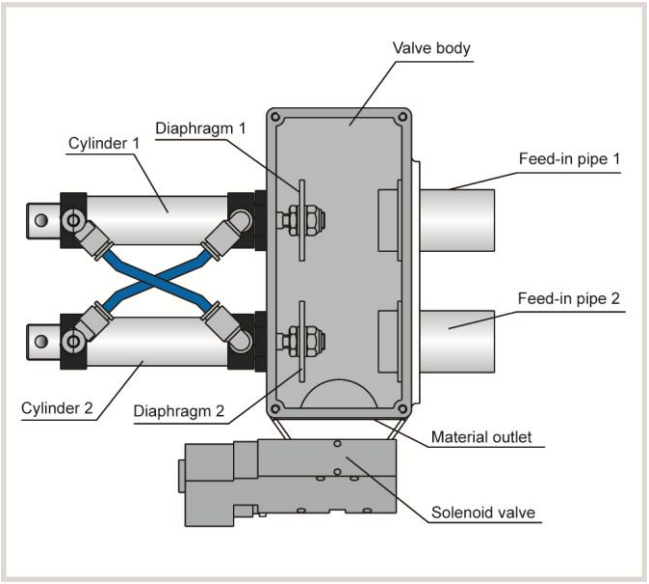
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3. Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.

4. Employing consumables or oil media that are not appointed by Shini.

2. Structure Characteristics and Working Principle

2.1 Working Principle

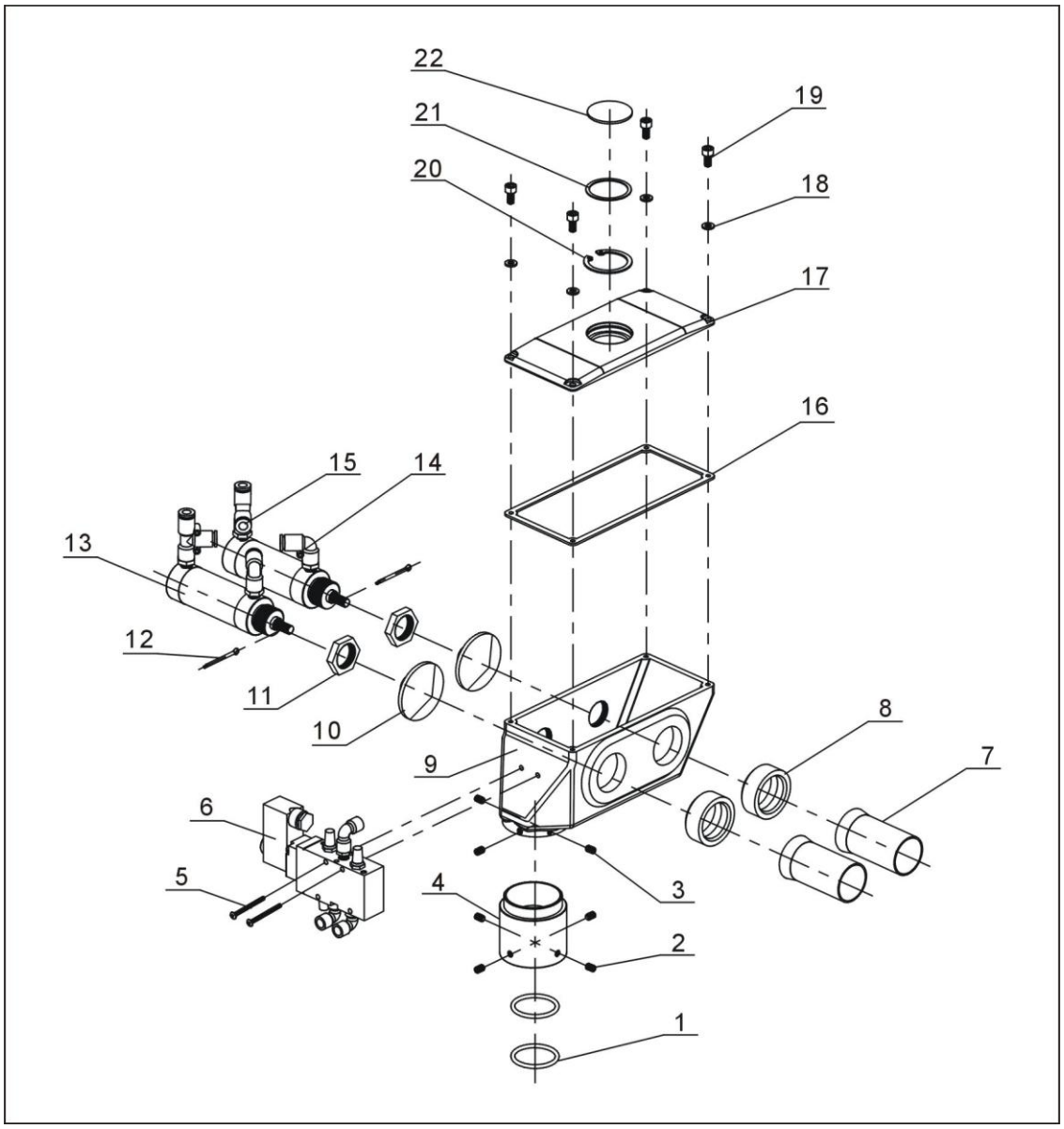
After material loading time and the proportion of secondary material have been set, the cylinder tank will control the feeding proportion of new materials and secondary materials in hopper by driving opening & closing and start time of diaphragm 1 and 2 so as to accomplish the proportioned mixing.



Picture 2-1： Working Principle Illustration

2.2 Drawing and Parts List

2.2.1 Assembly Drawing



Remarks: Please refer to material List 2.2.2 for specific explanation of the arabic numbers in parts drawing.

Picture 2-3：Assembly Drawing

2.2.2 Parts List

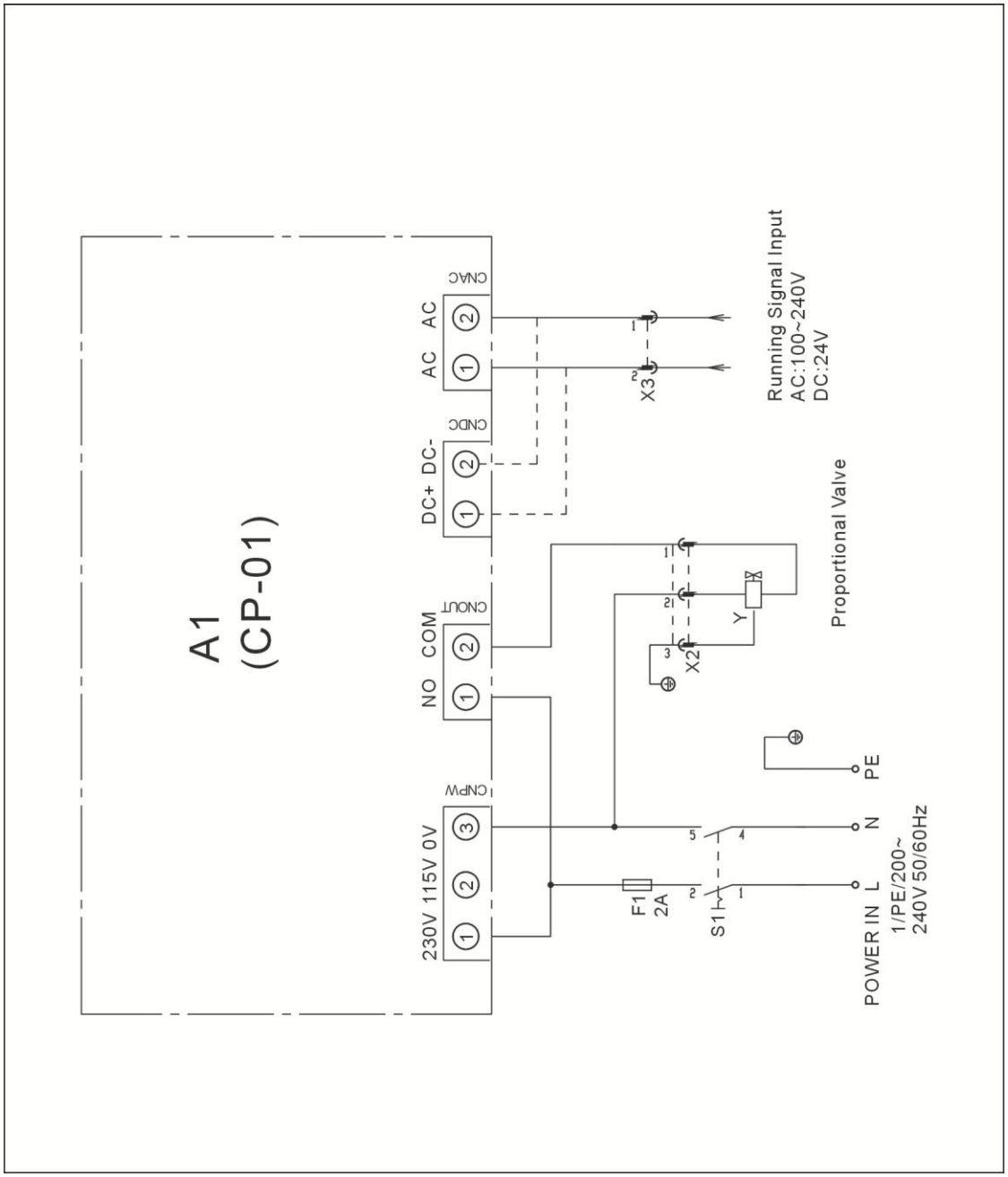
Table 2-1：Parts List

No.	Name	Part No.	
		SPV-38U-(C)	SPV-50U-(C)
1	O sealing ring*	YR20375300000	YR20375300000
2	Set screw M6×10	YW64000800100	YW64000800100
3	Set screw M5×5	YW68004500000	YW68004500000
4	Pipe sleeve for absorbing material	-	-
5	Cross socket head cap screw M4×25	YW63042500000	YW63042500000
6	Solenoid valve	YE32421000100	YE32421000100
7	Feed-in pipe	-	-
8	Feed-in pipe sleeve	-	-
9	Proportional valve	-	-
10	Line cone diaphragm	-	-
11	Nut M26×1.5	-	-
12	Cotter pin	YW09254000000	YW09254000000
13	Air tank	BH10380800010	BH10380800010
14	Air pipe connector	YW80061800200	YW80061800200
15	Air pipe connector	YW80601800000	YW80601800000
16	Valve cover fastener	YR10003000100	YR10003000100
17	Valve cover	BW20003800010	BW20003800010
18	Flat gasket	YW66051000000	YW66051000000
19	Socket screw M5×12	YW61051200000	YW61051200000
20	Circlip for shaft	YW69004200000	YW69004200000
21	Material observation window stringency	YR10423600000	YR10423600000
22	Glass lens	YW70415200000	YW70415200000

* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

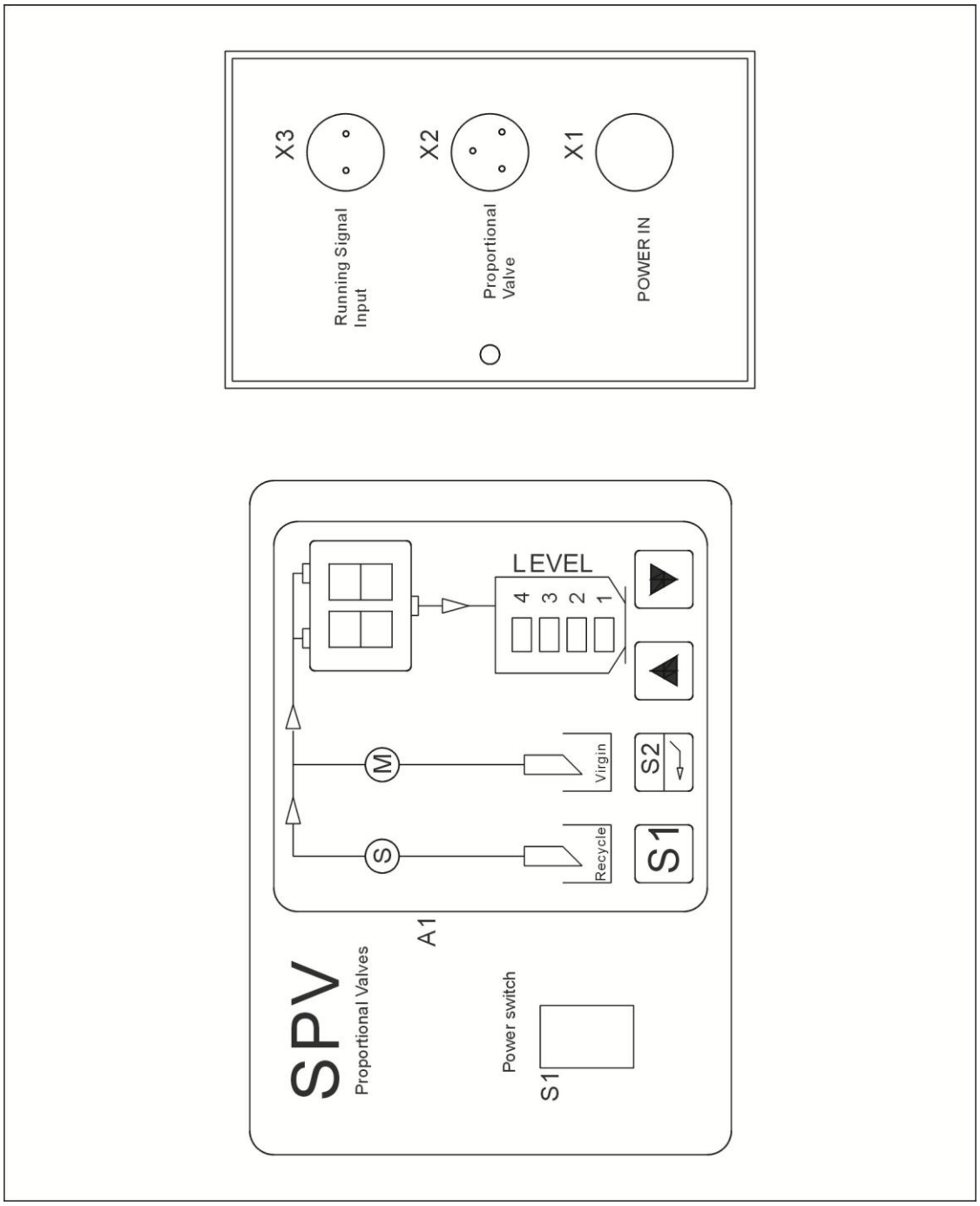
2.3 Electrical Diagram

2.3.1 Main Circuit



Picture 2-2：Main Circuit

2.3.2 Control Circuit



Picture 2-3：Control Circuit

2.3.3 Electrical Components List

Table 2-2：Electrical Components List

NO.	Symbol	Name	Specification	Part NO.
1	F1	Fuse Box**	250V 2A	YE46201500000
2	S1	Control Switch	12×19 5A	YE10121900000
3	Y	Solenoid Valve	230V 60Hz	YE32051800300
4	A1	Circuit Board*	115/230VAC 50/60Hz	YE80012200300
5	X1	Power line	250VAC 10A	YE51802300000
6	X2	Port	3P	YE62163000100
7	X3	Port	2P	YE68016200000 YE68016200100

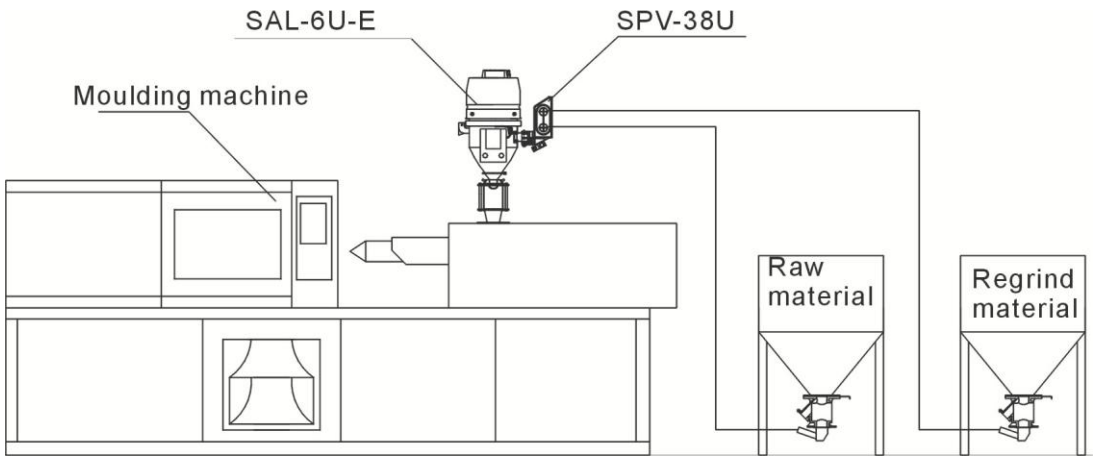
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

3. Installation and Debugging

Read the instructions carefully before installation, Must observe the installation steps as follows!

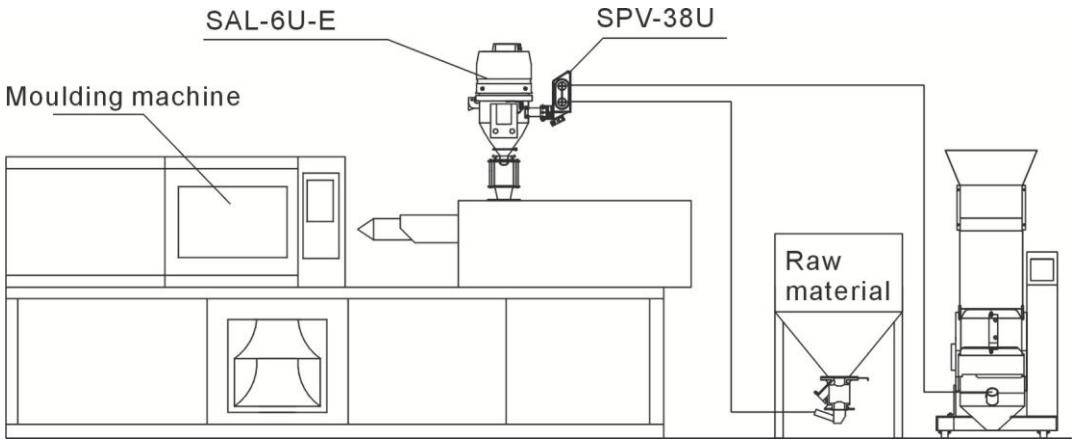
When installation SPV, Please connecting the pressure-air tube a-cording to the requirements.

3.1 Working with SAL-U



Picture 3-1: Working With SAL-U

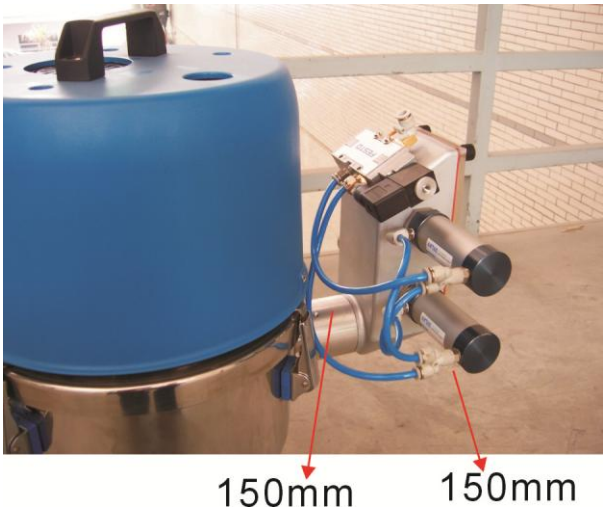
3.2 Working with Crusher



Picture 3-2：Working with Crusher

3.3 Installation Space

During installation of the machine, keep at least 150mm installation space around the machine as shown by the picture. Do not install the machine in a position crowded with other objects. This would cause inconvenience to operation, maintenance and repair. Do not sit on the machine. Keep away flammable and explosive goods.



Picture 3-3：Installation Space

4. Application and Operation

When SPV-U works with SAL-U, loading time should be set on SAL-U, please refer to SAL-U manual.

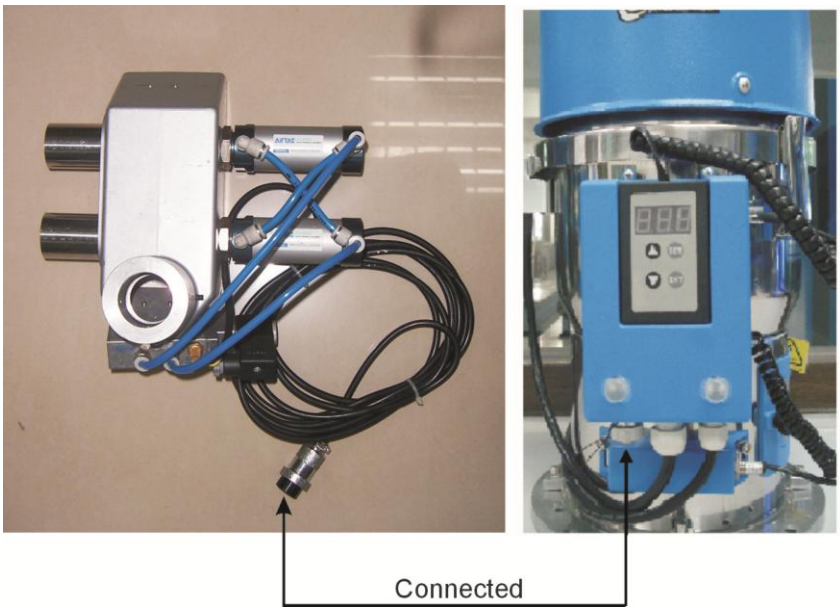
4.1 SAL-U Function Instruction

4.1.1 Parameter Settings on SAL-U

Table 4-1：Parameter Settings on SAL-U

Function symbol	Function instruction	Parameter value	
		Setting before delivery	Range
F. 02	Mixing time Starting at the same time with suction, setting the time before suction time [F.02]sec. Action time calculate style: suction time×[F.02]% setting "0"means stop.	No staring	0~100%

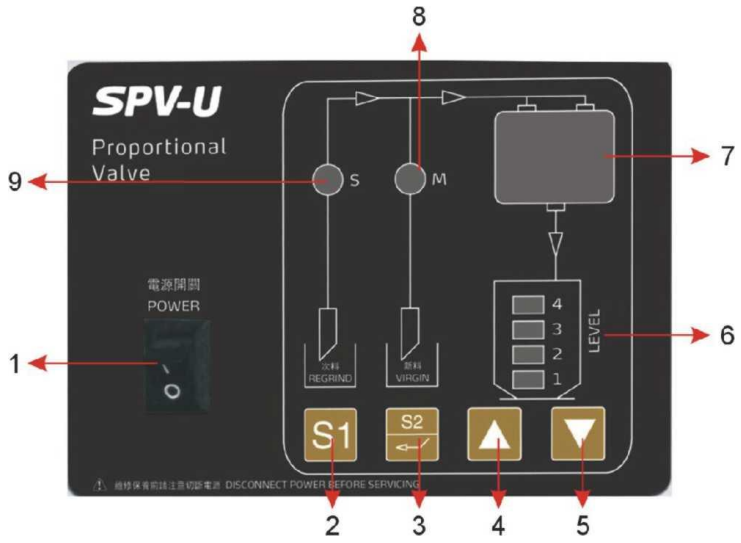
4.1.2 Instruction Diagram About Connecting with "SAL-U"



Picture 4-1：Instruction Diagram about Connecting with "SAL-U"

4.2 SPV-U with Independent Control Box

4.2.1 About the Control Panel



Picture 4-2：About the Control Panel

No	Name	Function description
1	Power	Power on to start the machine
2	Loading time set	Press this key to set loading time
3	Regrind percentage set	Press this key to set the percentage
4	Up key	Press this key to increase set value
5	Down key	Press this key to decrease set value
6	Working mode indicator	Indicating working mode
7	Display setup value or working status	Display setup value or working status
8	Indicator for setting regrind percentage	Blinks during regrind percentage setup
9	Loading indicator	Blinks during loading process

4.2.2 Start / Stop

1. Power on to start the machine, it will display software version "XX" (about 1second).
2. Turn off the power to stop the machine.
3. Shut off the loading signal to stop mixing.

4.2.3 Settings

Time setup

1. Displaying value will blink right after press S1 key, new material indicator M will blink,【F01】loading time (5~99 secs) is available for setting. Press ▲ or ▼ key to adjust loading time, and to press S1 or S2 after setup to confirm and save the value, but it will bounce out automatically without save if there is no input for 5 seconds.
2. Displaying value will blink right after press S2 key, regrind material indicator S will blink,【F02】 regrind percentage (1~99%) is adjustable. Press ▲ or ▼ key to adjust loading time, and to press S2 after setup to confirm and save the value, but it will bounce out automatically without save if there is no input for 5 seconds.
3. Displaying value will blink right after press ▲ + ▼ for 3 seconds, working mode indicators 

will blink,【F03】(use 1, 2, 3, 4 to stand for different working modes). Press ▲ or ▼ key to adjust working mode, and to press S1 or S2 after setup to confirm and save the value, but it will bounce out automatically without save if there is no input for 5 seconds.

Working mode selection

1. Working mode 1: (1-percentage)×loading time is for new material + percentage × loading time is for regrind material.
   For example: Total loading time is 10 second.

   Regrind percentage is 10%. 9→1
2. Working mode 2: (1-percentage)×half of the loading time is for new material + percentage × half of the loading time is for regrind material + (1-percentage) × half of the loading time is for new material + percentage × half of the loading time is for regrind material.
   For example: Total loading time is 20 second. Regrind percentage is 10%.

9→1→ 9→1

3. Working mode 3: (1-percentage) × one third of the loading time is for new material + percentage × one third loading time is for regrind material + (1-percentage)×one third of the Loading time is for new material + percentage ×one third loading time is for regrind material + (1-percentage) × one third of the loading time is for new material + percentage × one third loading time is for regrind material.
   For example: Total loading time is 30 second. Regrind percentage is 10%.

   9→1 → 9→1 → 9→1

4. Working mode 4: (1-percentage) × one fourth of the Loading time is for new material + percentage × one fourth loading time is for regrind material + (1-percentage) × one fourth of the Loading time is for new material + percentage × one fourth loading time is for regrind material + (1-percentage) × one fourth of the Loading time is for new material + percentage × one fourth loading time is for regrind material +(1-percentage)×one fourth of the Loading time is for new material + percentage × one fourth loading time is for regrind material.

   For example： Total loading time is 40 second.

   Regrind percentage is 20%.

   8→2→8→2→8→2→ 8→2

   For example：working mode 2：Loading time 20sec. Regrind percentage 10%

Settings

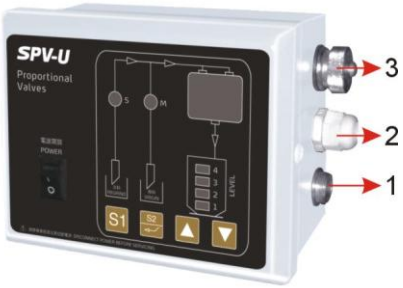
1. Working mode 1: Applicable range 5~99sec
2. Working mode 2: Applicable range 16~99sec
3. Working mode 3: Applicable range 31~99sec

4. Working mode 4: Applicable range 45~99sec

※Minimal regrind loading time is 1sec

※At setting mode，if to adjust【F01~F03】, the software will automatically ensure regrind loading time be no less than 1sec

4.2.4 Connections



Picture 4-3：Connections

No.	Name	Function description
1	Input loading signal	SPV-U will be receiving an activation signal When hopper loader starts
2	Power cable	SPV-U will be receiving an activation signal When hopper loader starts
3	Output signal for Proportioning solenoid valve	Proportioning solenoid valve will open when hopper loader is working

5. Trouble-shooting

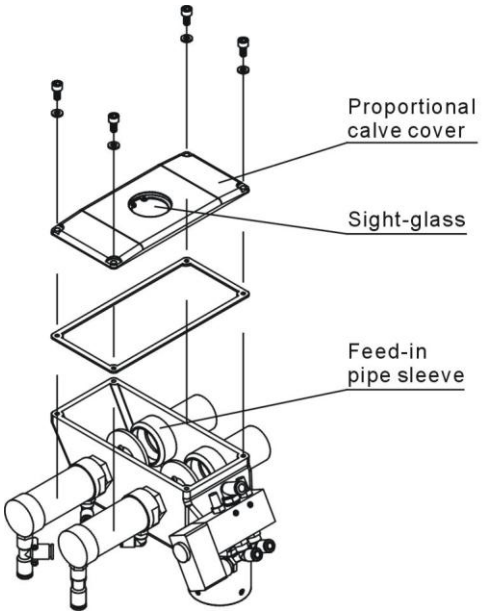
Failures	Possible reasons	Solutions
Cylinder does not work	1. Solenoid valve broken	1. Replace
	2. Did not connect the pressure-air tube	2. Connect
	3. Did not connect signal wire or broken	3. Connect or changed

6. Maintenance and Repair

6.1 Maintenance

All the repair work should be done by professionals in order to prevent personal injuries and damage of the machine.

Keep the external valve body clean, attention the Solenoid valve's service.



1. Open the proportional valve cap and check whether the material inlet pipe sleeve is seriously weared and teared, replace it when there is air leakage.
2. Check the wear condition of the material inlet pipe sleeve from the sight window. Period: Daily.

6.2 Maintenance Schedule

6.2.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.2.2 Check After Installation

☐Make sure the pipe connecting is correct

☐Make sure the connecting pipe is lock and tighten

☐Make sure the mounting base is lock and tighten

Electrical installation

☐Voltage check: _____ V _____ Hz

☐Signal wire connecting

☐Pressure air connecting