

SAL-U

Self-contained Hopper Loader

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Version: Ver.C



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1. General Description



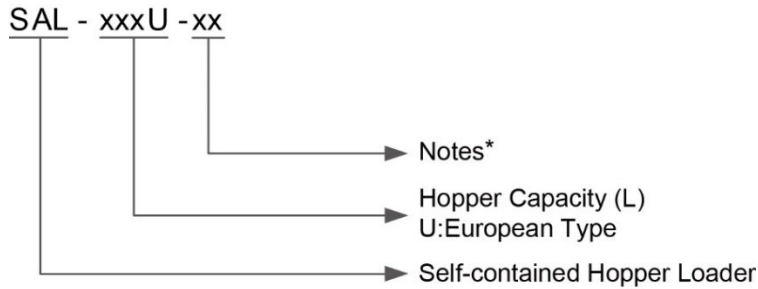
Read this manual carefully before operation to prevent personal injuries or damage of the machine.

SAL-U series self-contained hopper loader is suitable for conveying virgin material. It adopts Euro stainless steel hopper to avoid material contamination. It looks nice, since its surface has been polished. In addition, it has a sound-proof blower cover to reduce noise produced in the process of operation. What's more, the remote operation has been realized by using a wire-control controller, which is more convenient for clients to operate.



Picture 1-1: Self-contained Hopper Loader SAL-12U

1.1 Coding Principle



Notes:*

A = Add Air Accumulator

P = For Polished Hopper Inside

CE = CE Conformity

1.2 Feature

- I SAL-1U~SAL-12U (-E) adopts carbon brush, which brings fast rotating speed, large air quantity and compact appearance. It's easy for transportation and installation.
- I The controller has independent mixing and shut-off output function that can directly control the proportional valve SPV-U and shut-off valve SBU.
- I Hopper and base mount positions are adjustable.
- I It adopts LCD display + microcomputer controller to ensure intuitive display and easy operation.
- I Equipped with RS485 interface for central monitoring the production status.
- I Transparent glass pipe is optional for SAL-12U to observe the production status.
- I SAL-U has a reed switch, while SAL-U-E adopts photosensor switch with high sensitivity and stable quality.
- I All models equipped with hinged hopper lid that are connected by hinge for easy mesh cleaning.
- I SAL-U series are equipped with cloth mesh filter and auto-spraying dust cleaner that can reduce machine cleaning frequency.
- I Adopt on-line switch that is easy for machine operation when it is mounted on the high place.
- I Equipped with neon light belt for visual observing the equipment's working status; (red) is alarming, (green) is operating, (yellow) is standby.

All maintenance work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both operating and maintenance. Chapter 6 contains maintenance instructions 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 after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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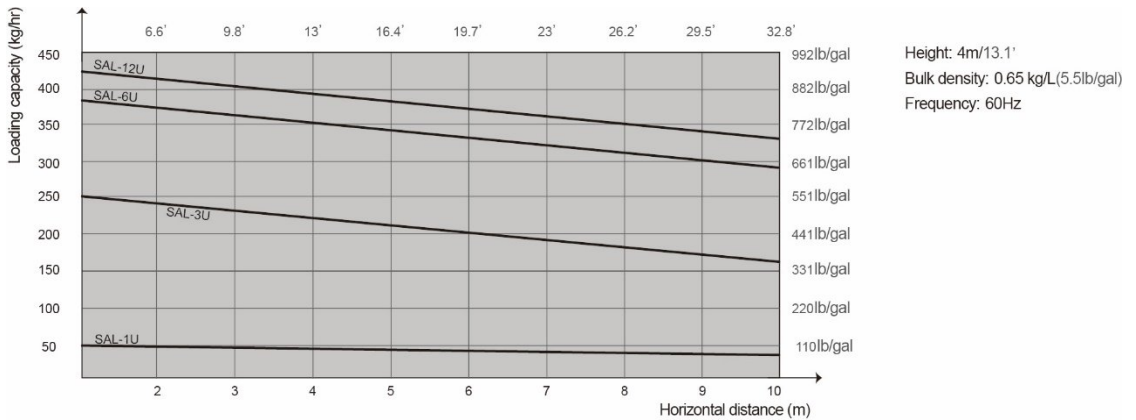
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1.3 Loading Capacity



Picture 1-2: Loading Capacity

1.4 Safety Regulations

Strictly abide by the following safety regulations to prevent personal injuries and damage of equipment.

1.4.1 Safety Signs and Labels



All the electrical components should be installed by electrician.
Turn off the main switch and control switch during maintenance.



Warning! High voltage!
This sign should be attached on the cover of control box!



Warning! Caution!
Be careful when at the location or area where this sign appears!



Notice!
All screws of the electrical components in it are locked tight. No need to check it regularly.

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:

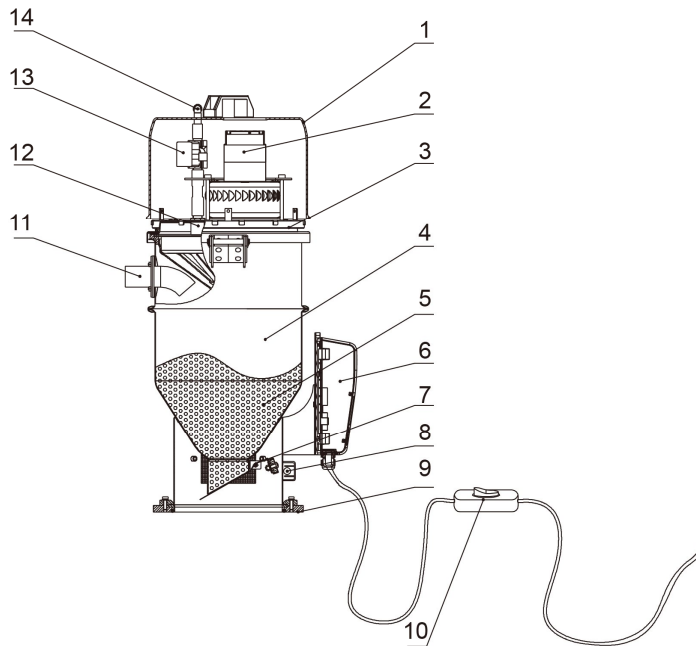
- 1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
- 2) Any incidents beyond human controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural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

SAL-U series of self-contained Hopper Loader is suitable for conveying plastic granules. It mainly conveys materials by running the blower to produce differential pressure inside the material hopper.

2.1.1 Working Principle Diagram of SAL-U-(CA)



Names of Parts:

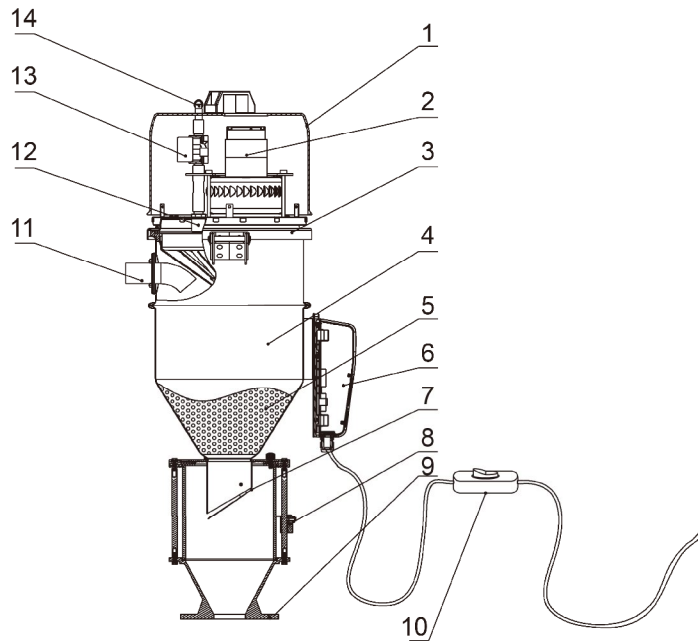
- | | | | |
|--------------------|------------------------|---------------------|------------------------------|
| 1. Blower cover | 2. Carbon brush blower | 3. Neon light belt | 4. Material hopper |
| 5. Raw material | 6. Control box | 7. Non-return piece | 8. Magnetic Proximity Switch |
| 9. Base | 10. On-line switch | 11. Inlet pipe | 12. Reverse cleaning kit |
| 13. Solenoid valve | 14. Air pipe connector | | |

Picture 2-1: Working Principle of SAL-U-(CA)

After the power and on-line switch are turned on, the neon light belt turns yellow and the reed switch (8) detects the shortage signal, the carbon brush blower (2) starts to work and the neon light belt (3) turns green to generate vacuum in the material hopper. Meanwhile, the non-return piece (7) is closed, and the materials in the storage hopper enter into the hopper (4) from the feed pipe (11) due to the air pressure difference. After the suction time is over, the carbon brush blower stops running, and the materials discharge due to the weight. When the reed

switch (8) detects no material, the carbon brush blower delays, the solenoid valve (13) opens, and the the external cleaning gas enters the reverse cleaning kit (12) from the air pipe connector (14). After cleaning the dust on the filter cloth and hopper inner wall, the carbon brush blower will start again. When the hopper is short of materials, the neon light belt (3) on the hopper cover turns red to alarm. The hopper loader optional with air accumulator helps to increase the air storage capacity and enhance the dust cleaning effect of the reverse cleaning kit.

2.1.2 Working Principle of SAL-U-E(EA)



Names of Parts:

- | | | | |
|--------------------|------------------------|---------------------|-----------------------------|
| 1. Blower cover | 2. Carbon brush blower | 3. Neon light belt | 4. Material hopper |
| 5. Raw material | 6. Control box | 7. Non-return piece | 8. Photosensor |
| 9. Base | 10. On-line switch | 11. Inlet pipe | 12. Reverse cleaning device |
| 13. Solenoid valve | 14. Air pipe connector | | |

Picture 2-2: Working Principle of SAL-U-E(EA)

After the power and on-line switch are turned on, the neon light belt (3) turns yellow and the photoelectric switch (8) detects the shortage signal, and the carbon brush blower (2) starts to work. The neon light belt (3) turns green, and the carbon brush blower (2) works to generate vacuum in the material hopper (4). Meanwhile, the non-return piece (7) is closed, and the materials in the storage

hopper enter into the hopper (4) from the feed pipe (11) due to the air pressure difference. After the suction time is over, the carbon brush blower stops running, and the materials discharge due to the weight. When the photoelectric switch (8) detects no materials, the carbon brush blower delays, the solenoid valve (13) opens, and the the external cleaning gas enters the reverse cleaning kit (12) from the air pipe connector (14). After cleaning the dust on the filter cloth and hopper inner wall, the carbon brush blower will start again. When the hopper is short of materials, the neon light belt (3) on the hopper cover turns red to alarm. The hopper loader optional with air accumulator helps to increase the air storage capacity and enhance the dust cleaning effect of the reverse cleaning kit.

2.2 Description of Electrical Components

2.2.1 Photoelectric Switch

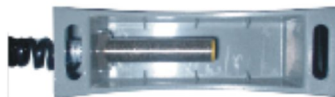
- 1) It is applied to material conveying control and material shortage alarm for SAL-U-E series.
- 2) Mounted on photosensor fixing plate.



Picture 2-3: Photoelectric Switch

2.2.2 Magnetic Proximity Switch

- 1) It is applied to material conveying control and material shortage alarm for SAL-U series.
- 5) Mounted on photosensor fixing plate.

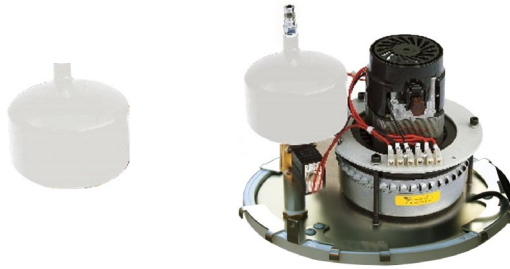


Picture 2-4: Magnetic Proximity Switch

2.3 Optional Accessories

2.3.1 Air Accumulator

Air accumulator is fixed on SAL-6U/12U-(A) which can reinforce the auto cleaning.



Picture 2-5: Air Accumulator

Specification of Air Accumulator: HxD=170x76mm

Note: Please fix the air supply correctly. The air pressure is 4~6kgf/cm².

3. Installation and Debugging

This series of models only could be applied in working environment with good ventilation.



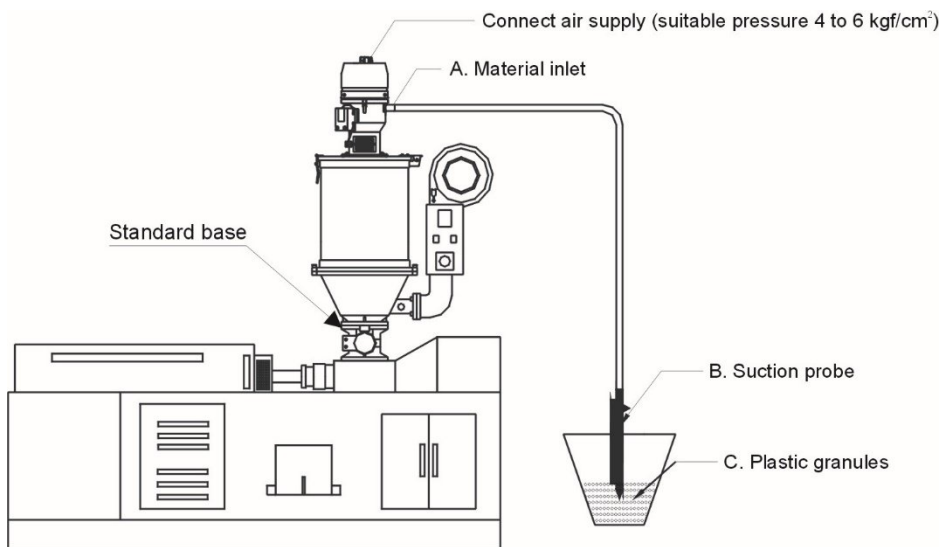
Notice!

Read this chapter carefully before installation of the machine. Install the machine by the following steps.

Power supply should be fixed by qualified technicians!

3.1 Install the equipment on dryers or molding machines.

3.1.1 Installation of SAL-U (-A)



Picture 3-1: Installation of SAL-U (-A)

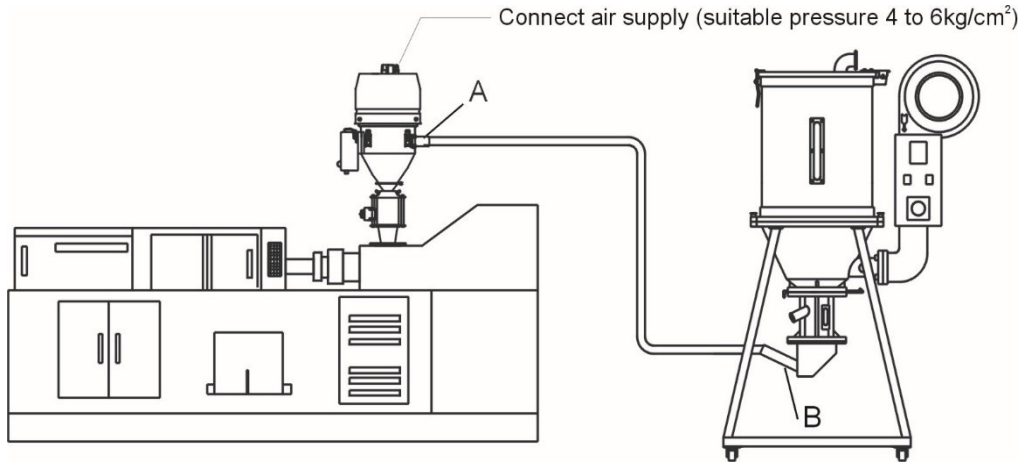
Install the Hopper Loader (SAL-U) on a hopper dryer (refer to the above drawing) by fastening the screws on the hopper base. Connect one end of the conveying pipe with material inlet (A) and the other end with suction pipe (B). Then insert the end with suction pipe B into the storage tank.

3.1.2 Power Supply of SAL-U (-A)

Connect SAL-1.5U / 3U / 6U / 12U(-A) with AC 1Φ 230V, 50 Hz power supply and earth wire.

Note: Make sure that power supply is turned off before you connect the electrical wires.

3.1.3 Installation of SAL-U-E (A)



Picture 3-2: Installation of SAL-U-E (A)

Install the hopper loader (SAL-3U / 6U / 12U-E (A)) on the molding machine (refer to the above drawing) by fastening the 4 screws on the hopper base. Connect material inlet (A) with suction box (B) of the dryer. If equipped with optional air accumulator or cleaning function, please connect with air supply.

3.1.4 Power Supply of SAL-U-E(A)

Connect SAL-U-E (A) series of machines with AC1Φ, 230V, 50Hz power supply and earth wire.

Note: Make sure that power supply is turned off before you connect the electrical wires.

4. Application and Operation






4.1 Control Panel



Picture 4-1: Control Panel

Table 4-1: Control Panel



NO.	Symbol	Name	Description
1		ON/OFF	Start/stop the machine
2		MENU	Enter or exit parameter setting
3		SET	Modify or confirm machine parameters
4		DOWN	Move the menus down, and reduce the value
5		UP	Move the menbus up, and increase the value
6		FULL MAT.LIGHT	It means full materials in the hopper
7		BLENDING	It means the machine is mixing the materials in the hopper
8		MAT.SHUT-OFF	It means the machine is shutting off the materials






9		SHORTAGE ALARM	It means machine alarm for no materials during suction
10		COMMUNICATION	It means the communication is connecting through
11		FILTER MESH CLEAN	It means filter auto cleaning function
12		OVERLOAD ALARM	It means motor overload error
13		SCREEN BLOCKING	Prompt to clean or replace the filter screen

4.2 Start /Stop the Machine

The start and stop of SAL-U series is controlled by start / stop switch on the control panel.

4.3 Keypad on the Control Panel

After the machine is powered on, press the  key to start the machine, and the loader starts to work. Then, press the  key again to stop the machine; Modify the parameter settings.

For example: Set the suction time to 15S. In OFF status, press the  key to select the "F.01". Press the  key to enter, press the  or  key to adjust the value to 15S, and press the  key to confirm.

Notice: The machine will restart if connecting the power supply again.

4.3.1 Code Interpretation

Code Name	Function	Code	Description
R01	Clean the filter	R12	Wait for motor stop
R02	Wait for motor stop	N02	Wait for materials are all discharged to the hopper
D	Sucking the masterbatches (Action	N03	Wait for suction cycling

	ended, and the vacuum breaking valve is closed)		
N01	Waiting time	P	Wait for suction confirmation
R11	Clean the filter screen, and materials start to discharge to the hopper		

4.3.2 Parameter List of Basic Settings

Code	Function Description	Parameters	
		Preset value	Range
F.01	Suction action time Motor suction time when there's a shortage of materials, which is also the vacuum breaking valve's working time. Corresponding action: D	15 secs.	5-127 secs.
F.02	Shut-off action time Start with the suction action at the same time, and set the shut-off time. Set 0 as not start.	0	0-100 secs.
F.03	Mixing proportion Start at the same time with the suction action, and set the mixing proportion. Time calculation method: suction time * [F.03]% Set 0 as not start.	0% Not start	0-100%
F.04	Mixing mode The number of layers of mixing action when it starts mixing. For example: the suction time is 20sec, the mixing proportion is 10%, the number of layers is 2, and then the mixing action is 9s—1s ----9s---1s Set single layer's working, and the suction time range is 5-99 secs. Set double layers' working, and the suction time range is 17-99 secs. Set three layers' working, and the suction time range is 32-99 secs. Set four layers' working, and the suction time range is 46-99 secs. If the suction time changes, the min. action time is less than 1 sec. after calculation, and the program will force to change the action time to 1 sec.	1	1-4 times
F.05	Mixing action count cycle start setting Count from the first start-up, and start once mixing action after several times of repeated suction starts. Set 1 as mixing materials every time. Set [F.03] to 0 without mixing.	once	1-9 times

F.06	Setting time of cleaning before suction Set 0 as the no screen cleaning before suction. Corresponding action: R01	3 secs.	0-99 secs.
F.07	Setting time of screen cleaning after suction Set 0 as no screen cleaning after suction. Corresponding action: R11	0 secs.	0-99 secs.
F.08	Screen cleaning cycle It starts once [F.06] or [F.07] cleaning action only after several times of repeated suction actions. Set 1 as cleaning the screen cleaning at every suction.	3secs.	1~99 times
F.09	Circulating suction waiting time Waiting time before a new suction action starts after each suction action. Set 0 as not waiting. Waiting time before a new suction action starts Corresponding action: S.06	0 (Unit 10 secs.)	0-9990
F.10	Shortage metering alarm Set the number of times that the material doesn't fall into the hopper, and it should alarm after several times of this error occurs. Set 9 as cancelling this function. Corresponding action: A.01	3	1~9 times
F.11	Shutdown alarm for the times of material shortage Set the number of times that no material falling into the hopper. The times of material shortage that it should alarm. Set 99 as canceling this function. Corresponding action: A.04	99	[F.10]-99
F.12	The time waiting for motor stoppage Set 0 as not waiting after screen cleaning	0 secs.	0~99 secs.
F.13	Buzzer alarm type 0: Lasting alarm 1: Slow and interrupted alarm 2:Fast and interrupted alarm	1	0-2
F.14	Motor delay stop time After [F.01] suction time is ended, the delay time before motor stop. When the [F.19] is 1, this time is effective.	0 secs.	0~999 secs.
F.15	Carbon brush time record Check motor working time and clear the time. The method to clear the motor working time: Set the setting value as 0, and press ENT key to cancel.	0 (unit: 10 hrs.)	0-999 Only 0 means clearing the time.

F.16	The first carbon brush alarm The alarm will sound when the carbon brush reaches the set time. Set 0 as canceling this function. Corresponding action: A.05	80 (unit: 10 hrs.)	0-999
F.17	The second carbon brush alarm Set 0 as canceling this function. Corresponding action: A.06	100 (unit: 10 hrs.)	[F.16]-999
F.18	The third carbon brush alarm The alarm will sound when the carbon brush reaches the set time. The alarm won't stop until the carbon brush time is reset to 0. Set 0 as canceling this function. Corresponding action :A.07	110 (unit: 10 hrs.)	[F.17]-999
F.19	Motor start protective switch 0: The motor start protection function is enabled, and the suction motor has slow speed protection during start up. 1: The motor start protection function is disabled, and the suction motor runs at full speed during start up.	0	0: Soft start on 1:Soft start off

Notice: The password hasn't been set when the machine is shipped, and it can be set by the customer. In case of losses, please contact Shini company.

4.3.3 Communication Parameter Setting



Press <  > key and <  > key together for 3 secs. to enter parameter setting screen.

Table 4-2: Communication Parameter Table

Code	Function Description	Parameters	
		Preset value	Range
F.30	Comm. address	1	1-99
F.31	Baud rate 0---19200 1---9600 2---4800	1	0~2
F.32	Odd-even check 0---no check 1---odd check 2---even check	0	0~2

F.33	Communication mode selection	0	0~1
	0---Shini SLINK		
	1---China standard communication GB/T38687-2020		

4.4 Communication Address (Protocol: Modbus-RTU)

Address	Reading R/ Writing W	Parameter Content	Default Parameters	Minimum	Maximum	Unit
0	R	Current action				
		bit 0 shutdown		0	1	
		bit 1 standby		0	1	
		bit 2 suction		0	1	
		bit 3 waiting time		0	1	
		bit 4 in filter cleaning		0	1	
		bit 5 waiting for motor stop		0	1	
		bit 6 screen blockage alarm		0	1	
		bit 7 shortage alarm		0	1	
1	R	Real-time information				
3	R/W	Suction time	15	5	127	S
4	R/W	Screen cleaning cycle	3	1	99	times
6	R/W	Screen cleaning set time before suction	3	0	99	s
7	R/W	Discharge check time	10	5	99	s
8	R/W	Wait for motor stop time	0	0	99	s
9	R/W	Screen cleaning set time after suction	0	0	99	s
10	R/W	Waiting time of suction cycling	0	0	9990	10s
13	R	Input output status				
		bit 0 Shortage input signal		0 full material	1 material shortage	
		bit 1 Filter screen blocked input signal		0 no blockage	1 blocked	
		bit 4 Suction output		0 no output	1 output	

		bit 5 Spraying valve output		0 no output	1 output	
		bit 6 Alarm output		0 no output	1 output	
14	R	Current action				
		bit 0 Shutdown		0	1	
		bit 1 Standby		0	1	
		bit 2 Sucking the materials		0	1	
		bit 3 Wait for material discharge		0	1	
		bit 4 Clean the filter screen		0	1	
		bit 5 Wait for motor stop		0	1	
		bit 6 Filter screen blocked alarm		0	1	
		bit 7 Shortage alarm		0	1	
15	W	Start/stop control		0 start up	1 shut down	
16	R/W	Suction time	15	5	127	S
17	R/W	Mixing time	0	0	100	%
18	R/W	Cycling start setting of mixing times count	1	1	9	times
19	R/W	Screen cleaning cycle	3	1	99	times
20	R/W	Cycling suction waiting time	0	0	9990	10s
21	R/W	Screen cleaning set time before suction	3	0	99	s
22	R/W	Screen cleaning set time after suction	0	0	99	s
23	R/W	Discharge check time	10	5	99	s
24	R/W	Shortage times count alarm	3	1	9	times
25	R/W	Shortage times count stop alarm	99	shortage times count alarm	99	times
26	R/W	Wait for motor stop time	0	0	99	s
27	R/W	Buzzer buzzing type	1	0	2	
29	R/W	Carbon brush work time record	0	0	999	10h
30	R/W	Full material detection time	2	1	9	S
31	R/W	Shortage detection time	3	1	9	S
32	R/W	Material shut-off time	0	0	100	s

33	R/W	Motor start protective switch	0	0	1	
34	R/W	Motor delay stop time	0	0	999	s
35	R	Total number of times to perform mixing actions	0	0	0x03 set value	times
36	R	Total number of times to perform screen cleaning actions	0	0	0x04 set value	times
37	R	Total number of shortage alarms	0	0	99	times
38	W	Start/stop control		0 start up	1 shut down	
39	R	Current action				
		bit 0 Shutdown		0	1	
		bit 1 Standby		0	1	
		bit 2 Clean the filter screen		0	1	
		bit 3 Wait for motor stop		0	1	
		bit 4 Sucking the materials		0	1	
		bit 5 Sucking the masterbatches (mixed)		0	1	
		bit 6 Wait for material discharge		0	1	
		bit 7 Wait for cycling suction		0	1	
40	R	Real-time information				
41	R	Input output status				
		bit 0 Shortage input signal		0 full material	1 material shortage	
		bit 1 Filter screen blocked input signal		0 no blockage	1 blocked	
		bit 2 Suction output		0 no output	1 output	
		bit 3 Load output		0 no output	1 output	
		bit 4 Mixing output		0 no output	1 output	
		bit 5 Spraying valve output		0 no output	1 output	
		bit 6 Alarm output		0 no output	1 output	
42	R	Alarm status				
		bit 0 Shortage alarm		0	1	
		bit 1 Shortage shutdown alarm		0	1	

		bit 2 Filter screen blocked alarm		0	1	
		bit 3 First carbon brush alarm		0	1	
		bit 4 Second carbon brush alarm		0	1	
		bit 5 Third carbon brush alarm		0	1	
43	R/W	The first carbon brush alarm	80	0	999	10h
44	R/W	The second carbon brush alarm	100	The first carbon brush alarm	999	10h
45	R/W	The third carbon brush alarm	110	The second carbon brush alarm	999	10h
46	R/W	Mixing times	1	1	4	times

Notes: R means only reading

W means only writing

R/W means writing and reading

Note: The password is not set in factory, which can be set by users. In case of loss, please contact us.

5. Trouble-shooting

Failures	Possible reasons	Solutions
Motor does not work	1. Motor fault	1. Repair or replace
	2. Circuit board fault.	2. Check whether the circuit is loose, and the circuit board runs normally.
	3. Poor contact or damage of magnetic reed switch / photosensor switch	3. Adjust or replace
	4. Power wire and signal wire disconnected.	4. Reconnect
Shortage alarm occurs (Panel display : [A.01],[A.03],[A.04])	1. The material is used up.	1. Refill the materials.
	2. The air pipe leakage.	2. Lock up or replace the air pipe.
	3.The filter cloth bag blocked.	3. Clean or replace the filter cloth bag.
	5. Insufficient or too much airflow refilled.	4. Adjust the position of the Euro suction box air inlet to avoid slight bending angle of the material pipe.
	5. The discharge plate cracked or deformed.	5. Replace the discharge plate.
	6. Suction time is set inappropriately.	6. Adjust the appropriate suction time as per the site conditions.
The fuse keeps burning after start up	Short circuit	Check the circuit.
The motor is still working after the material is full.	1. Circuit board fault	1. Check whether the circuit is loose, and the circuit board runs normally.
	2. Poor sensor induction	2. Replace the sensor.
Carbon brush alarm (Panel display : [A.05],[A.06],[A.07])	Insufficient carbon brushes	Buy a new carbon brush for replacement

Spray- wash valve abnormality	1. Circuit board fault	1. Check whether the circuit is loose, and the circuit board runs normally.
	2. Solenoid valve fault	2. Replace the solenoid valve.
Pressure difference alarm	1. Filter cloth bag blocked	1. Clean or replace the filter cloth bag.
	2. Solenoid valve fault	2. Replace the solenoid valve.

6. Maintenance and Repair

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

6.1 Cloth Filter



Cloth Filter SAL-U

- 1) Loosen the snap hooks on the loader, uplift the hopper cover and externally rotate it along the axis, take out the filter bag and clear away the dust on it.
- 2) Filter bag cleaning period: Daily.

6.2 Material Hopper

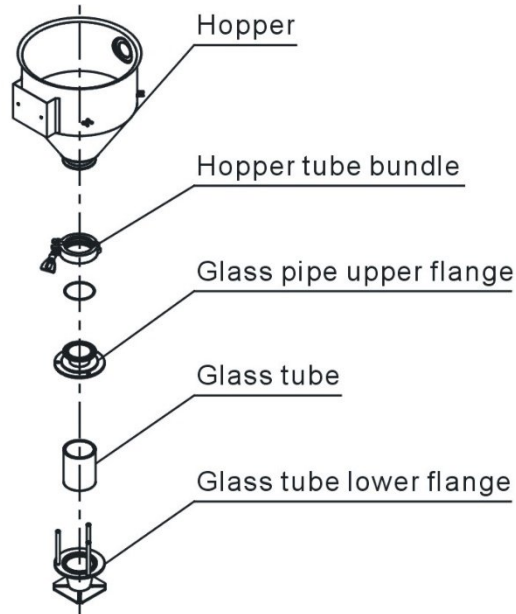
After a period time of operation, materials will adhere to the inner surface of material hopper. Please clean material hopper in time to ensure the optimal performance of equipment.

- 1) Loosen the snap hooks on the loader and open the hopper cover to take out the filter bag.
- 2) Put it back.

6.3 Glass Pipe

Glass Tube

Loosen the pipe clamp and take down the hopper; unscrew the screws of upper flange on the glass pipe. Then take out and clean the glass pipe.



Note: Be careful not to break the glass pipe when cleaning.

6.4 Magentic Proximity Switch, Photoelectric Switch

Magentic proximity switch

When the indicator of the proximity switch doesn't work, check the switch and replace with a new one if it doesn't work well.

- 1) Loosen the set screws of the outer box of the sensor.
- 2) Adjust the depth of the sensor going into the sensor shell or move it up and down until the indicator lights up. It means magnet is detected. By then, just tighten all screws.
- 3) If put a magnet close to the sensor, the indicator still doesn't light up, please check the connection.

Photoelectric Switch

When the indicator of the photoelectric switch doesn't work, check the switch contact. If it's in poor contact, please adjust or replace it.

- 1) Check if it's in poor contact
- 2) Please replace a new switch if it's damaged.

6.5 Maintenance Schedule

6.5.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage _____ Φ _____ V Frequency _____ Hz Power _____ kW

6.5.2 Installation & Inspection

- Check if the suction pipe has been correctly connected.
- Check if that pipe clips is secured.
- Check if mounting base is secured.

Electrical Installation

- Voltage: _____ V _____ Hz
- Fuse: One-phase: _____ A Three-phase: _____ A
- Check power phase.

6.5.3 Daily Checking

- Check main power switch.
- Check filter
- Check working status of the blower.

6.5.4 Weekly Checking

- Check all the electrical cables.
- Check if there are loose connections of electrical components.
- Check the screw of the base is secured.
- Check the air filter.

6.5.5 Monthly Checking

- Check the spring lock on the hopper cover is loosed or not.
- Check the hopper flap is deformed or not.
- Check the performance of magnetic proximity switch/photoelectrical sensor.