

# Automatic Screw Feeder

自動ネジ供給機

## BS-L Series Operation Manual(Maintenance)

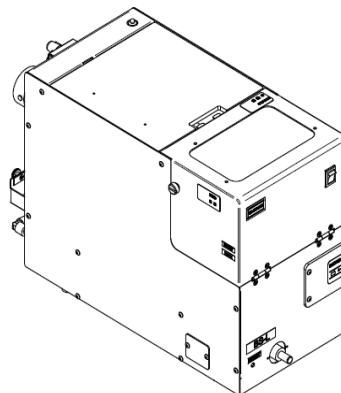
- Read these instructions for the proper use of this machine.
- After having read these instructions, keep them in a convenient place so you or the operator can refer to them whenever necessary.

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We do not have any branches in China.

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目前, 敝司在中国没有办事处与所谓的中国官网。」

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弊社の名を騙る偽サイトにご注意下さい。現在、当社は中国国内に支店はございません。



BSLMAE01

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## 1. Before use

Thank you very much for purchasing our Automatic Screw Feeder, 『BS-L series』 .

Please check up the escaperories supplied with it before using it.

Accessories      Operation manual x1    AC adapter x1    Allen wrench x1  
                     Screwdriver x1    Screw delivery tubex1

Before using your product, please read this manual carefully to get best results from the product.

## 2. Operating Precautions

This manual contains safety alert symbols and safety precaution messages to prevent injuries of the operator or damages to property.

◎ Indications



### WARNING

This indicates there is a chance of death, serious injury or fire if the instructions are not followed.



### CAUTION

This indicates there is a chance of personal injury or damage to property if the instructions are not followed.

◎ Symbols indicating type of danger and preventative measures



Prohibited operation. Never do this!



Do not disassemble, modify or repair.



Do not touch with wet hands.



This indicates to stop operations.

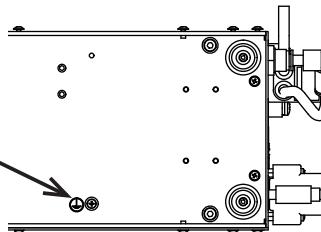


Unplug power supply from wall outlet.



General caution.

Attach the ground wire by loosening the screw near the mark  of the equipment.



the bottom of the main body

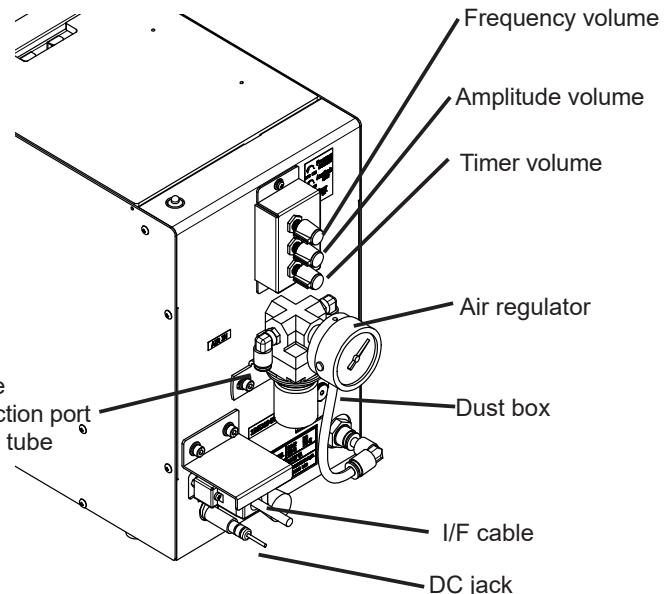
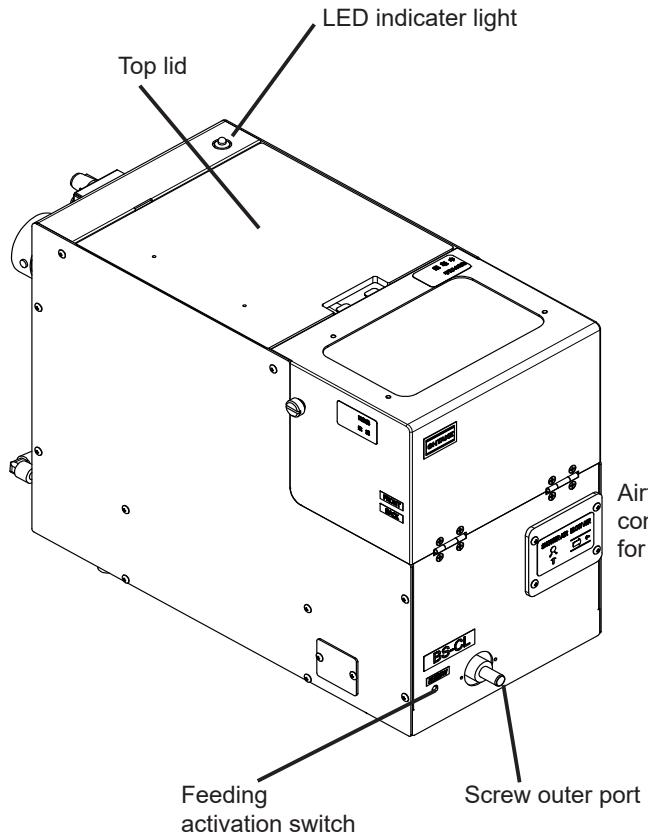
### WARNING

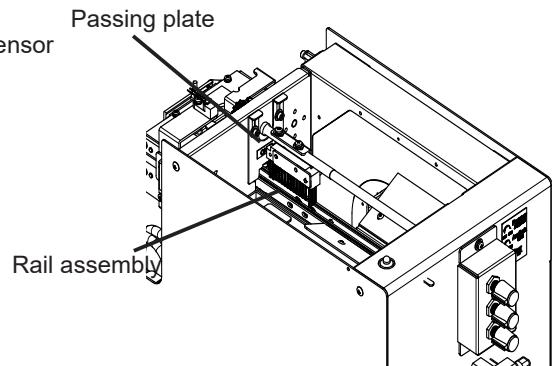
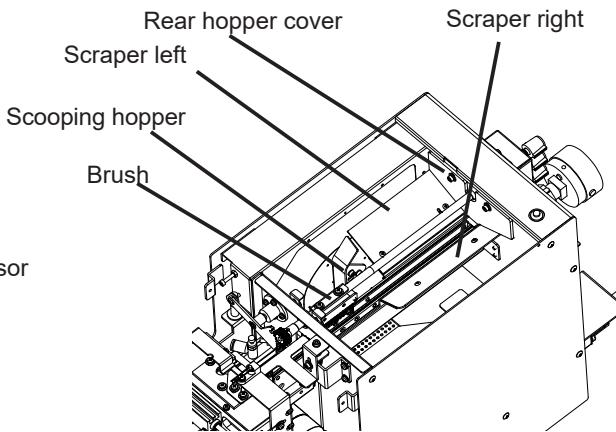
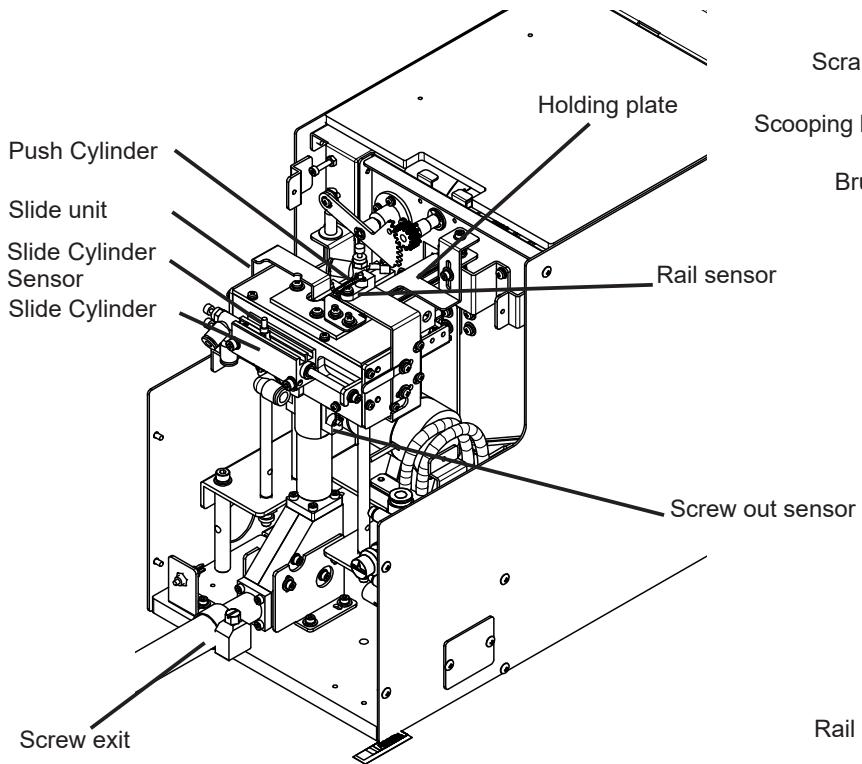
-  Do not disassemble the AC adapter as there is a risk of electric shock, fire or malfunction.
-  Do not damage, alter or change the power cord. Do not place heavy objects on the cord. Do not pull hard on the cord or twist the cord as it could be damaged, thereby causing a risk of fire or electric shock.
-  Do not handle the AC adapter with wet hands as it could cause an electric shock.
-  When using an outlet with AC100 ~ 240V, don't overload the electrical circuit.
-  Do not modify or remodel this machine as this may cause a fire or electric shock.
-  Do not operate this machine near flammable liquids, gasses or materials as there could be a risk of fire or explosion.
-  Stop operating the machine and unplug the AC adapter from the wall outlet when you detect overheating, smoke, a pungent odor or any other unusual condition, as there may be a risk of fire or electric shock.
-  In the case of a thunderstorm, stop operating the machine, turn off the power and unplug the AC adapter from the wall outlet. If there is lightning and thunder nearby, move away from the machine and do not touch it or the AC adapter. After the thunder stops, and when it is safe to do so, check the machine. If there is any abnormality, contact your dealer.
-  When performing maintenance, changing parts or when you sense an abnormality in the machine, turn the power off and pull the AC adapter from the wall outlet. In addition, there are parts that become hot in the circuit board. When performing maintenance around the circuit board, turn off the power for at least 5 minutes before performing work. There is a risk of burns.

 CAUTION

-  Use only the AC adapter supplied with this machine otherwise it may result in a fire or electric shock.
-  Do not install this machine in an unstable location otherwise it may fall causing damage or injury.
-  Always operate the machine with the upper cover in place, otherwise it may result in injury.
-  Do not allow any foreign material to enter the machine while in operation.
-  Do not put your fingers into the machine while in operation, otherwise an injury will result.
-  Do not operate this machine in overly humid or dusty conditions.
-  Keep the plug socket clean at all times otherwise it may cause a fire or electric shock.
-  When moving the machine, always disconnect the AC adapter from the wall outlet or it may result in damage to the cord, or cause a fire or electric shock.
-  Turn off the machine and unplug the AC adapter from the wall outlet during closing hours or if the machine will be unused for any extended period of time.
-  When moving the machine, be sure to hold it with both hands and be careful not to drop it.  
Dropping the machine at your feet may cause injury.
-  Do not operate the machine with tension on the AC adapter cord.  
Keep the cord loose and untangled.
-  Do not bend, alter or damage the rail. Do not apply any oil. It is recommended that the user clean the rail periodically.
-  Do not use any screw that is out of the specified range nor any screw that is oily or dirty.
-  When picking up screws, do not exert excessive force or shock to the screws.

### 3. Component name





## 4. Installation

### 4- 1. Connection utility sources

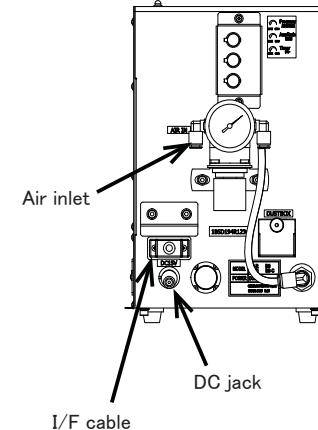
#### (1) Power connection

Please connect the adapter cable to the connector as shown on right.

#### (2) Air supply connection

Please use plastic tubes of outer diameter φ6mm to connect to the air regulator. Please set the pressure to 0.5MPa.

Lift the cap of the air regulator (upwards), and the lock will be released. After settings is done, fasten the cap down again to lock the regulator.

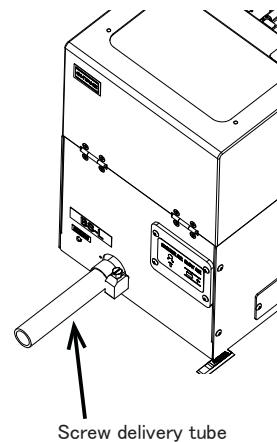
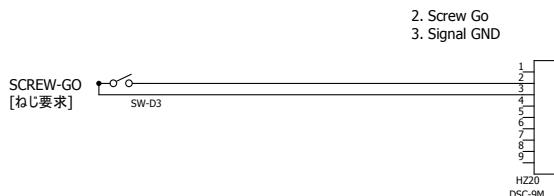


### 4- 2. Connecting signal cable and screw delivery tube

#### (1) Signal cable connection

Connect the external interface cable to the rear of the unit. Please prepare the signal cable by yourself.

Input a signal between the 2-3 pins of the D-SUB 9pin female connector.



#### (2) Screw delivery tube connection

Connect the attached screw delivery tube to the screw discharge port at the front of the main unit. After connecting, fix it with a cable band.

Be careful when routing the tube, as sharp bending or strong tightening with a cable tie can cause screw clogging.

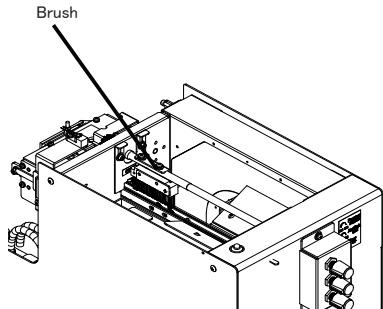
## 5. Basic Operations

### 5- 1. Loading the screws

- Take out the top cover, turn the power switch on and off so that the brush stops vertically right above the rail, as shown on right.
- At the first initialization of the machine, please place roughly equal amount of screws on both side of the rail. Level of screws inserted shall be below lower edge of the rail.
- Please adjust the amount of screws accordingly, depending on the actual operating rate and conditions of screw delivery flow.



- The Type and length of screw changes the load capacity so check and adjust the load accordingly.
- Do not overload the hopper with screws otherwise it may cause a malfunction or damage the machine.
- This machine accepts only steel screws. Plastic or stainless screws are not accepted.



### 5- 2. Turning ON the power

- Use only the adapter supplied with this machine to connect it to a wall outlet. When you turn the power on, the LED for the power lights up, the motor rotates and screws are scooped on to the rail.
- The rail vibrates to deliver screws to the pick up spot. When the screws come to the stopper, the motor and the rail vibration stops after 1-6 seconds



Use only the AC adapter supplied with this machine otherwise it may cause damage to the machine.

## 5- 3. Main Operations

When a screw request signal (shorting between 2-3 pins) is input from the signal cable, the screw feeder performs the following operations.

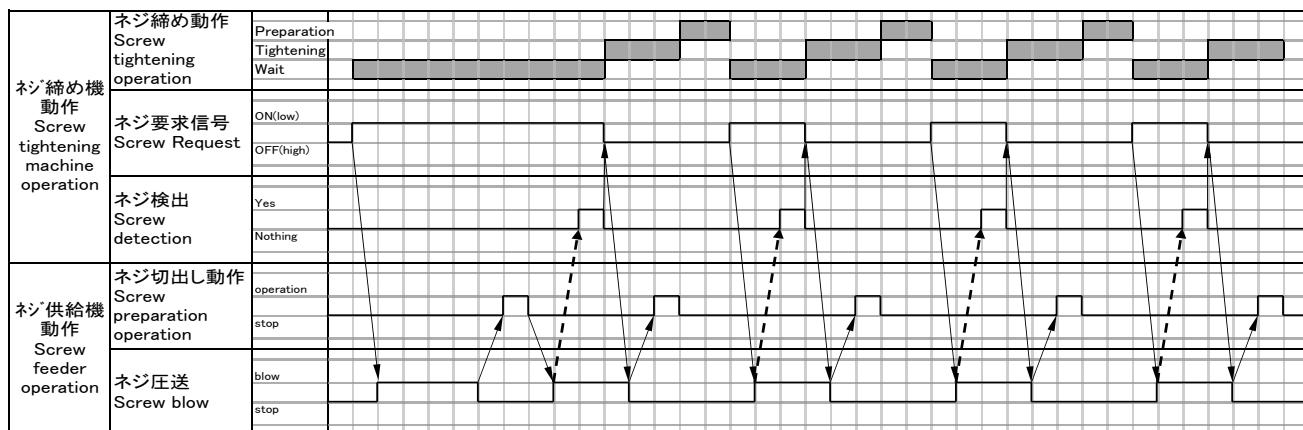
### (1) Operating sequence after power initialized(Sequence I)

- After a screw request signal is received from the robotic system (below referred to as "Robot"), air-pressureized delivery is activated.
- In case the screw request signal does not turn off within the specified time, perform the screw preparation operation (the operation of moving the screw to the screw exit port by sliding) and perform air-pressureized delivery again.  
(This re-activation of pressurization is only done as a part of the power-up initialization.)
- When the screw request signal turns off, air-pressureized delivery is stopped, the next screw preparation operation is performed, and the next screw request signal is waited for ON. If the screw request signal does not turn off, air-pressureized delivery continues. (2)

### Operation sequence following Sequence I

- When the screw request signal from the robot is turned on, air-pressureized delivery is started.
- When the screw request signal turns OFF, stop air-pressureized delivery, perform the next screw preparation operation, and wait for the next screw request signal to turn ON.
- After that, this operation is repeated.

## 5- 4. Timing chart



## **5-5. Forced vibration of rail**

If the screw is not supplied to the tip of the rail for a certain period of time, the vibration of the rail will increase. The vibration of the rail is increased regularly in order to eliminate the biting of the screws in the scooping chamber. The vibration noise becomes stronger, but this is not a malfunction.

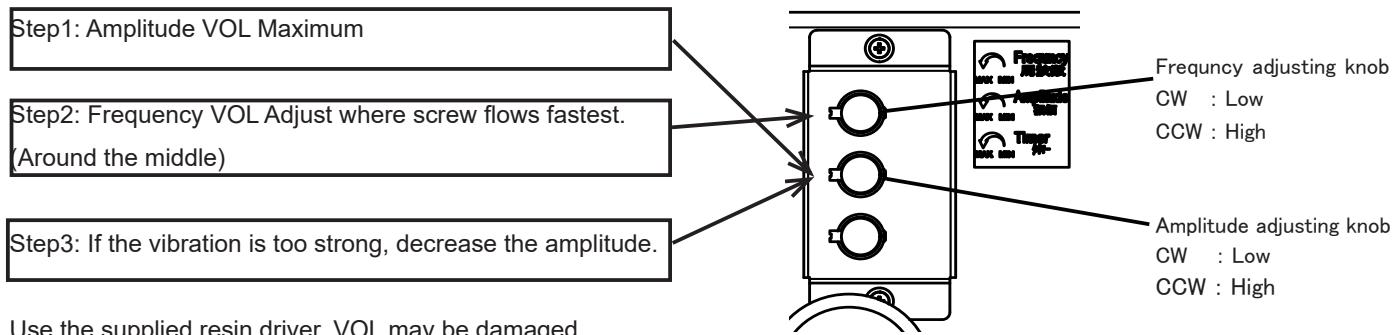
## **5-6. Instant motion of slide unit**

When the rail sensor detects the screw but the passage sensor cannot detect the screw after the escape operation, the slide block repeats a instant motion to eliminate the screw catching.

## 6.Adjustment

### 6-1. Checking and adjusting the rail vibration

The amplitude and frequency of the rail vibration can be adjusted. The vibration has been adjusted at the factory for screws that correspond with the rail. Put some screws into the rail and turn the power on. If they are delivered smoothly, there is no need for adjustment. The screw transport feed differs depending on screw type. For screws with a low transport speed, or screws that easily jump, perform the adjustment according to the following procedure.



Use the supplied resin driver. VOL may be damaged.

- If the vibration is adjusted to a too large a value to increase the transport speed, screws may jump from the rail and fall into the machine from the clearance, failing to unload screws normally. Adjust the vibration to a proper value that matches the loaded screws.
- With the accompanying screwdriver, turn the knob without using excessive force.
- When no screws are scooped onto the rail for a certain period of time, the rail vibration increases. If, still, no screws are scooped on to the rail, the machine stops operating.

## 6-2. Timer Adjustment

Depending on actual shape of screws, delivery speed may be varied. It is recommended to adjust the timer setting longer for screws with a slower delivery rate; and a shorter timer setting for smaller screws that move easily on the rail.

- The screw delivery and vibration of this machine is designed to continue until a screw is delivered, and the vibration shall stop after a certain time frame after a screw is present. This time frame before the vibration stop is set by this Timer volume. After the delivered screw is picked up, screw delivery operation resumes.
- Screw presence is detected by optical sensors.
- The timer volume is shown as picture below (Third from the top)
- Turning the volume clockwise will make the timer shorter, and counter-clockwise will make it longer.

## 6-3. Adjustment of the air pressurizing speed

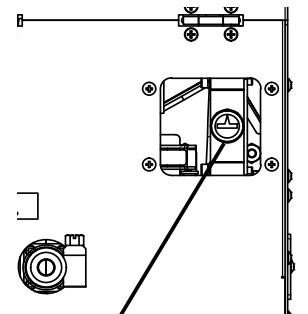
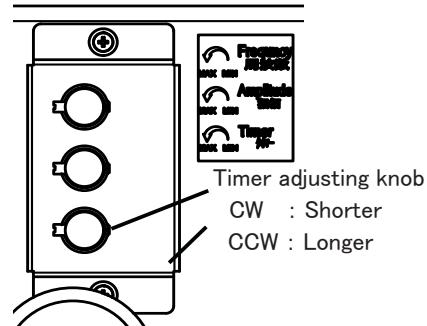
If the air pressure is set more than necessary amount, the screw may bounce out from the output port. Or, when the pressure is too low, the screw may not be delivered smoothly. Please make fine adjustment according to actual conditions accordingly.

Adjustment is made with the acrylic panel removed.

When the feeder is in operation, pressure setting can be adjusted by turning the actuator control as shown above. After the adjustment is done, please fasten the fixing nut firmly.

CW : Less airflow

CCW: More airflow



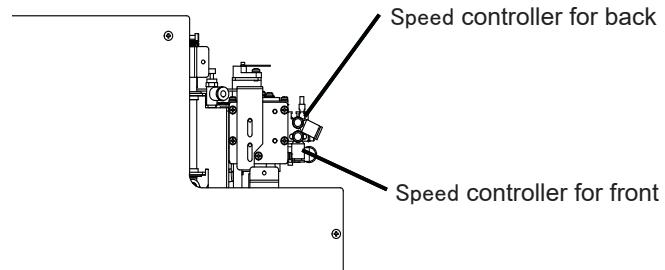
## 6-4. Speed adjustment of the slide unit

If you need to adjust the speed of the slide unit, adjust the speed with the speed controller of the cylinder on the left side. If the cylinder speed is set too fast, screw may jump out from the escaper unit.

After the adjustment is done, please fasten the fixing nut firmly and reinstall the acrylic cover.

CW : Less air/ slower

CCW : More air/ faster

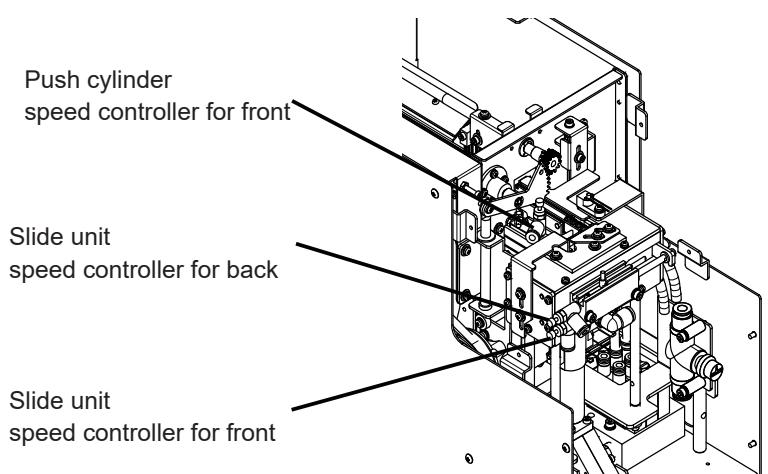


## 6-5. Speed adjustment of the push cylinder

If you need to adjust the speed of the push cylinder, open the front cover and adjust with the speed controller. After the adjustment is done, please fasten the fixing nut firmly and reinstall the acrylic cover.

CW : Less air/ slower

CCW : More air/ faster

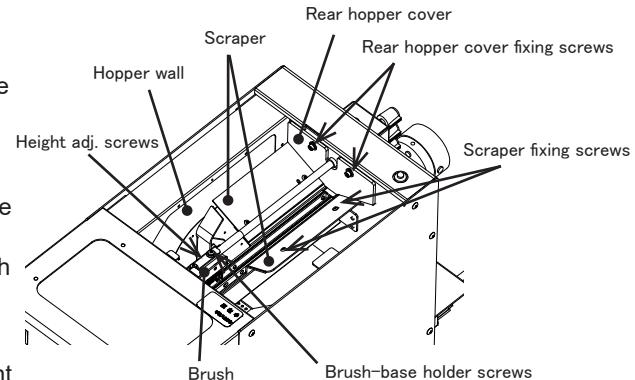


## 6-6. Adjustment of the brush height

! Please make certain that the power is OFF when making adjustment to avoid personal injuries.

Put in screws to the feeder unit. Turn on and off the power switch to active the unit so that screws fall into the rail.

- By operating the power switch, adjust it so that the brush stops at the horizontal position on the left side
- Swing the brush by hand, and check if tip of the brush can touch top of the screws on rail lightly.
- If the brush is too low or too high, it will affect the screws' supply speed.
- When adjustment is needed, loosen the height adj. screws.
- If plastic part of the brush touched the passing plate above the rail, please adjust horizontal position of the brush with the base holder screws.
- When adjustment is done, turn on the power and make sure that the brush is functioning effectively.



## 6-7. Adjustment of the rear hopper cover

! Please make certain that the power is OFF when making adjustment to avoid personal injuries.

- Please check that there's roughly a 0.5mm-wide clearance between the back-plate and the rail.
- Please adjust the plate so that it is not too low to affect vibration of the rail, or too high so that screws became stuck within the opening.
- When adjustment is necessary, please loosen the screws , and adjust the height of the cover.

## 6-8. Adjustment of the scrapers

! Please make certain that the power is OFF when making adjustment to avoid personal injuries.

- Check that the clearances, between the scraper right/left and hopper wall right/left, are around 0.5mm.
- When the scraper makes contact with the hopper wall, the rail vibration becomes weak and the screws are delivered slowly.  
When the clearance between the scraper and the hopper wall is too large, the screws may be caught easily.
- If any adjustment is required, loosen the scraper fixing screws and move the scraper up or down.
- After such adjustments, if deformation on the plate has occurred so that proper clearance and adjustment cannot be achieved, or scratches on the plates had caused trouble in screw movement, please purchase replacement parts for best results.

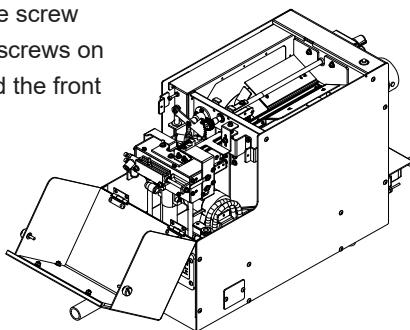
Left Scraper : TPO91201 Right Scraper: TPO91202

## 6-9. Adjustment of the screw flow from rail to slide unit

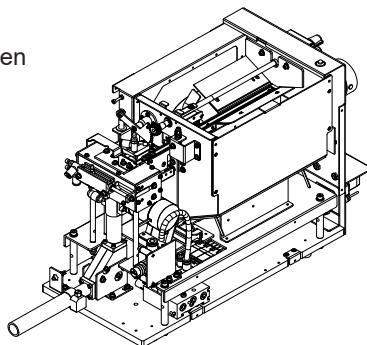
**!** Please make certain that the power is OFF when making adjustment to avoid personal injuries.

### 6-9-1. Detaching the cover plates

When checking the screw flow, loosen the 2 screws on both sides and fold the front cover.



Detach both sides and front cover when adjusting the slide unit .

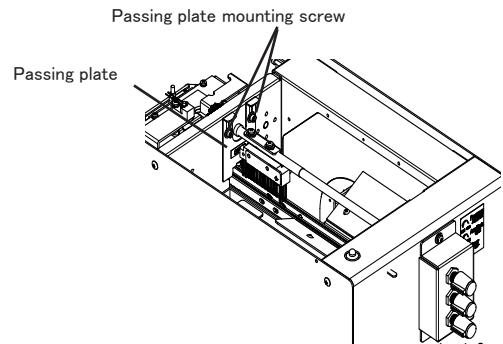


### 6-9-2. Passing plate adjustment

Make sure the passing plate is on the holding plate.

- If the passing plate is too low, the holding plate will be pushed down and the screw will not pass.
- If adjustment is required, loosen the passing plate and the holding plate mounting screws and adjust them together.

Refer to 6-9-3.



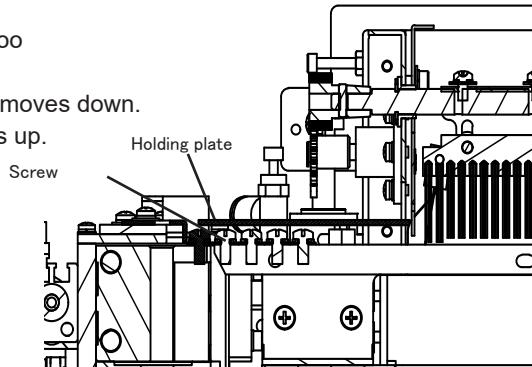
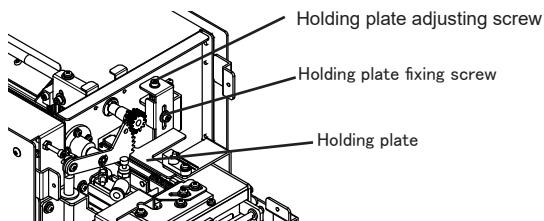
### 6-9-3. Holding plate adjustment

Space between holding plate and screw shall be roughly 0.5 ~ 1mm.

- If there is no clearance, a screw will be blocked. If the clearance is too large, screw piling or screw jump out will occur.

When the holding plate adjusting screw is turned clockwise, the plate moves down.

When the adjusting screw is turned counterclockwise, the plate moves up.

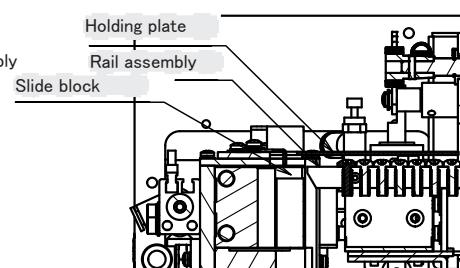
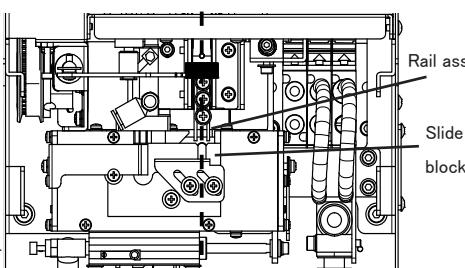
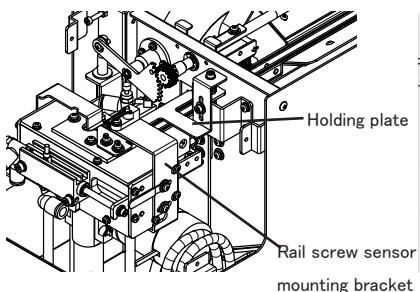


### 6-9-4. Slide unit adjustment

Remove both side covers, front cover, rail screw sensor mounting bracket and holding plate, and check the positions of the rail and slide block grooves from above the machine.

-Check the center position of the groove of the rail and slide block ⇒ Visually make it almost in the center.

-Check the height of the rail and slide block ⇒ Lower the upper surface of the rail and the screw receiving part of the slide block by about 0.2 mm on the slide block side.



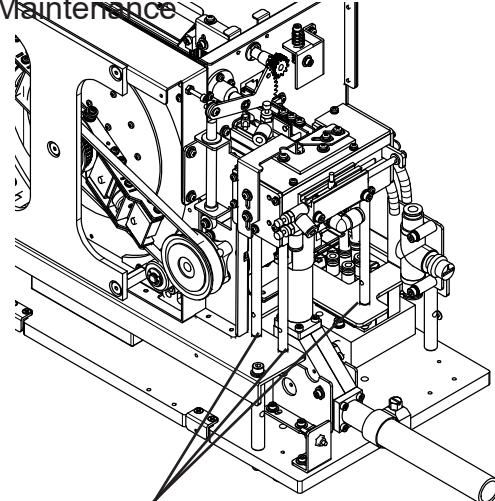
## Lateral adjustment

Loosen the three slide unit fixing screws on the underside of the height adjustment nut from the bottom of the machine. Move the slide unit body left and right so that the groove of the slide block and the position of the rail in the left-right direction are visually centered.

## Height adjustment

Loosen the three slide unit fixing screws on the underside of the height adjustment nut from the bottom of the machine. Visually check the height direction with the height adjustment nut so that the upper surface of the rail and the slide block screw receiving part are about 0.2 mm lower on the slide block side. After adjustment, fix it with the three slide unit fixing screws.

## 7. Maintenance



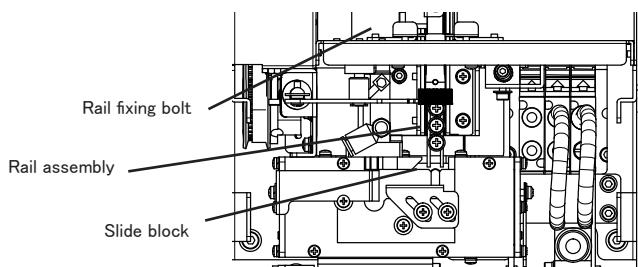
Height adjustment bolts

### 6-9-5. Rail and Slide block adjustment

Remove the holding plate temporary to check the clearance opening between rail and slide block.

\*Opening between rail and slide block  
⇒ Approx. 0.5mm

Please loosen the rail fixing bolt shown on right, adjust the position of rail assembly.



## 7. Maintenance

### 7-1. Rail groove cleaning

A dirty rail groove may interfere with the screw transport speed.

Clean the dirty rail with a soft, clean cloth dipped in alcohol.

If there is any dirt or a flaw in the rail groove that may cause an impediment in use, we recommend the user to replace the rail.

### 7-2. Cleaning inside the machine

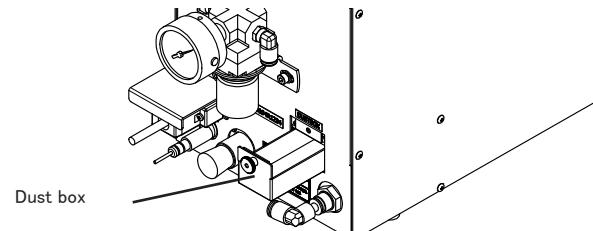
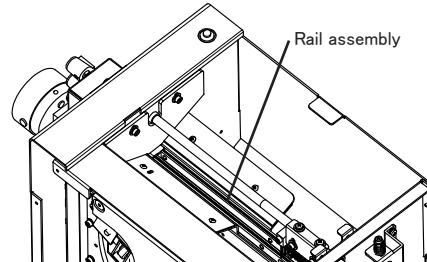
- If the inside of the machine is very dirty, remove the cover and blow the inside of the machine with air to remove iron powder and dust. Also, wipe the inside of the machine with a clean thin cloth soaked with alcohol.
- The dust box is installed under the scooping room. The dust box can be pulled out from the back, so please clean it regularly.

### 7-3. Grease up

Grease is applied to the following drive parts. Check once a month, and if there is a shortage of grease, add grease.

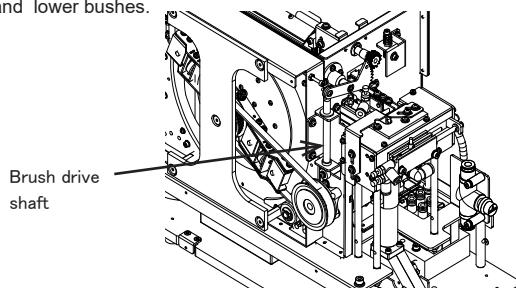
- ① Brush Drive Shaft
- ② Brush Drive Gear Large
- ③ Brush Shaft CP
- ④ Brush Gear
- ⑤ Magnet Shaft
- ⑥ Slide Block

Recommended grease  
Made by Toray Dou Coating  
MOLYKOTE BR-2PlussEquivalent



#### ① Brush Drive Shaft

- Grease application location : Sliding part of brush drive shaft and drive bush
- Grease application method : Apply grease to the vicinity of the upper and lower bushes.



## ② Brush Drive Gear Large

- Grease application location: Sliding part of brush drive gear large
- Grease application method: Remove the E-ring and the brush drive gear large, and apply grease to the shaft side.

## ③ Brush Shaft CP

- Grease application location: Sliding part between bush and the brush shaft
- Grease application method: Remove the front and rear E-rings, move the brush shaft slightly forward, and apply grease to the part that fits with the bush.

## ④ Brush Gear

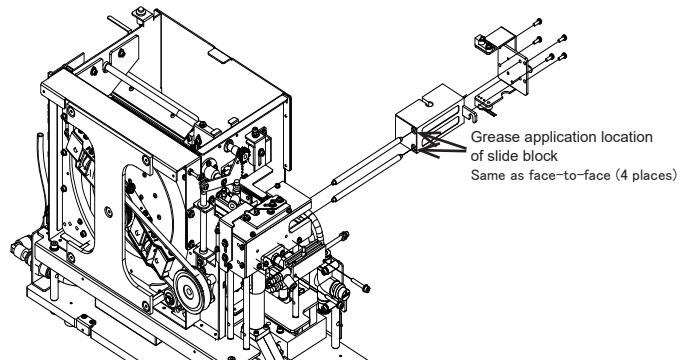
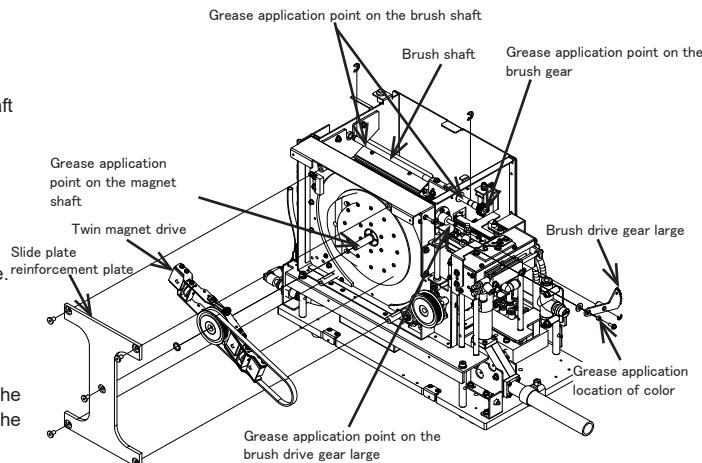
- Grease application location: The part where the brush gear and the brush drive gear are engaged

## ⑤ Magnet Shaft

- Grease application location: Sliding part between magnet shaft and twin magnet drive.
- Grease application method: Remove the C ring and magnet arm, and apply grease.

## ⑥ Slide Block

- Grease application location: Sliding part of slide block bush and slide shaft
- Grease application method: Remove the plate on the right side of the slide unit and the cylinder for the slide, pull out the slide block from the right side, and apply grease to the inside of the four bushes of the slide block.



## 7-4. Replacing the brush assembly

If the brush is too worn to sweep screws off of the rail, replace it. Remove the brush assembly fixing screws and remove the brush assembly. Assemble the new brush assembly in the reverse order.

- Adjustment See 6-6
- The part number of the brush assembly is TOKX0383

## 7-5. Replacing the rail assembly

To replace the rail assembly, first remove the slide unit fixing screw and then remove the slide unit. Next, loosen the rail assembly fixing screw and pull the rail assembly forward. Assemble the rail assembly and slide unit in the reverse procedure. Refer to 6-9-4 for adjusting the position of the slide unit and rail assembly.

## 7-6. Replacing the scraper

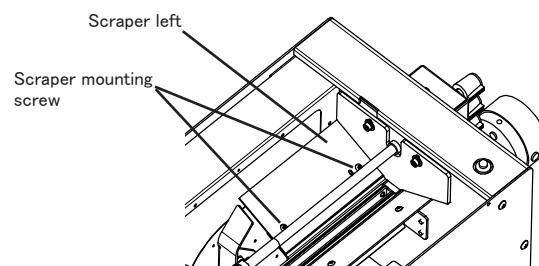
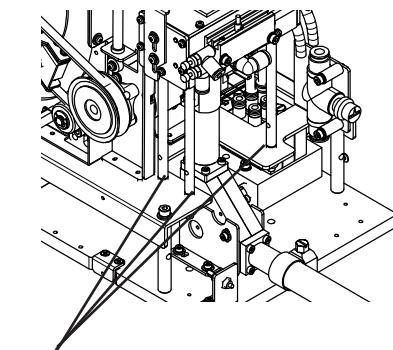
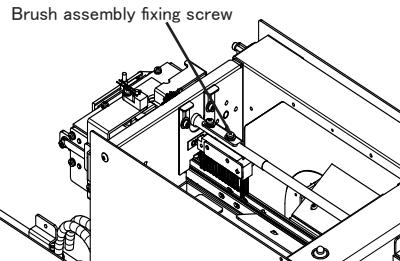
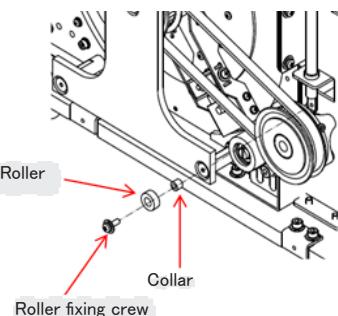
If the gap between the scraper and the wall cannot be adjusted properly, the scraper will need to be replaced. Remove the scraper mounting screws and replace the scraper.

- Refer to 6-8 for adjusting the position of the scraper.

## 7-7. Replacing the roller for the brush drive shaft

If the brush shaft is malfunctioning due to worn rollers, replace the rollers. Remove the roller fixing screw and replace it with a new roller.

-Roller part number: TPO90982



## 7- 8. Replacing the twin magnet drive

If the rotation of the twin magnet drive interferes with the wall, the twin magnet drive needs to be replaced. Follow the procedure below for replacement.

1) Remove the side plate reinforcement plate. (Washer is inserted.)

2) Loosen the idler.

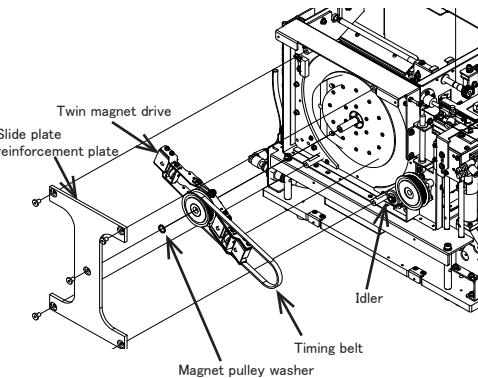
3) Remove the twin magnet drive together with the timing belt.

4) Install in the reverse procedure.

5) Apply tension to the idler so that the timing belt does not loosen.

Make sure that the twin magnet drive does not interfere with the idler when it rotates.

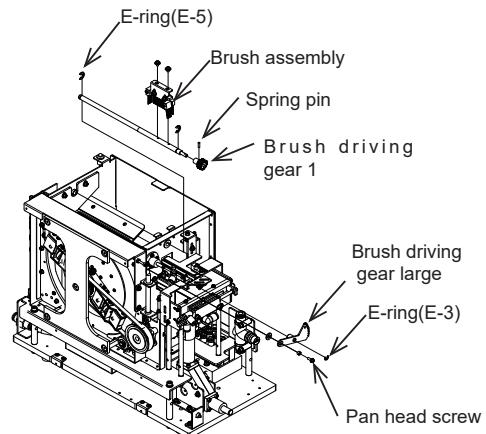
- The part number of the twin magnet drive is PLMB0039



## 7- 9. Replacing the brush driving gear1

If the brush driving gear wears out and malfunctions begin to appear, replace it. Remove the E-ring (E-3) and pan head screw, and remove the brush driving gear large. Remove the brush assembly and E-ring (E-5) and pull the brush shaft forward. Remove the spring pin and replace the brush drive gear.

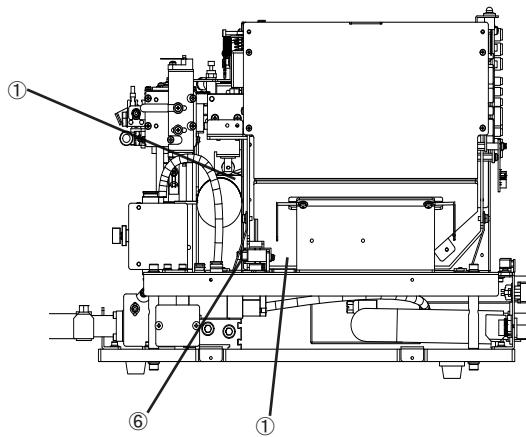
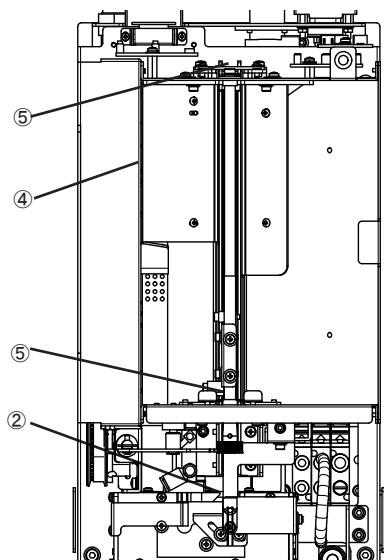
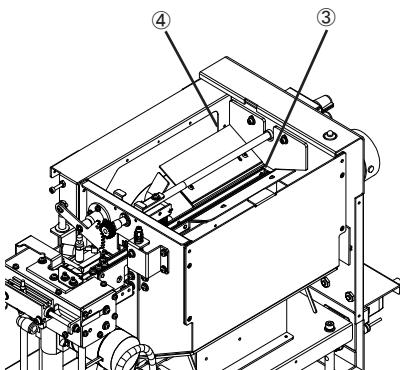
Engage the brush driving gear large with the brush driving gear 1 so that the brush assembly faces directly downward when the lower surface of the brush driving gear large is in the horizontal position.



## 7-10. Confirmation of component interference in the event of abnormal vibration

If you cannot adjust the vibration to the proper level, check the following.

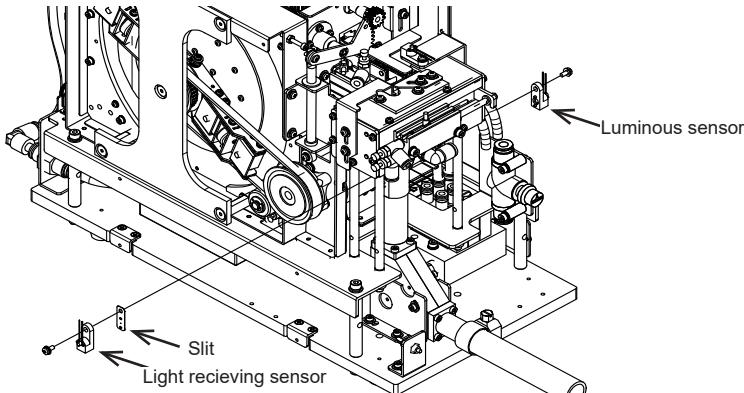
- ① Interference due to screws mixed
- ② Interference between rail and slide block
- ③ Interference between the rear hopper cover and rail
- ④ Interference between scraper and hopper wall
- ⑤ Interference between hopper wall and rail
- ⑥ Solenoid gap abnormality



## 8. Trouble shooting

Trouble	Cause	Corrective measures
The feeder continues to be inoperable.	<p><b>Motor overload</b>  When excessive current flows through the motor, the feeder continue to stop.  ① Screw hooking on the brush  ② Adhesion of screws, etc. on the magnet drive unit</p>	<p>Perform the following processing and turn on the power again.  ① Remove the screw on the brush.  ② Remove the screw, etc. on the magnet drive unit.  ③ Recovery of mechanical abnormality ⇒Please contact us.</p>
Forced vibration continues and stops.	<p><b>Screw supply error</b>  It occurs when the screw cannot be detected by the rail sensor. The probable causes are as follows.  ① There are no screws  ② Rail vibration is inappropriate and screw flow is poor.  ③ A screw is caught on the passing plate</p>	<p>Perform the following processing and turn on the power again.  ① Replenish the screws.  ② Adjust the vibration of the rail.  ③ Remove the screw and  When pushed by a subsequent screw and caught on a passing plate  - Weaken the vibration.  - Shorten the timer to reduce the amount of screws that ride on the scraper.  - Raise the passing plate.  When the misaligned screws are caught on the passing plate  - Lower the passing plate.  - Lower the brush.</p>
Air-pressurized delivery continues	<p><b>Air-pressurized delivery of screw abnormality</b>  It occurs when the external input signal "SCREW REQUEST" does not turn off in the air-pressurized delivery.</p>	Check that the screws are jammed between the main unit and the robot, and then remove the screws. For recovery, turn on the power again.
The push cylinder do not push out screws	<p><b>Slide cylinder sensor position error</b>  When the slide cylinder operates, the cylinder sensor may not be ON.</p>	Adjust the sensor position of the slide cylinder. For recovery, turn on the power again.
The slide unit repeats instantaneous operation.	<p><b>Abnormality of the slide unit</b>  It occurs when the rail sensor detects a screw and slides, but the feeder the screw outer sensor cannot detect it.</p>	Check the slide unit for clogging of screws, and if there is any clogging, remove the screws. After restoration, turn on the power again.

Trouble	Cause	Corrective measures
Weak screw feed on rail	<p><b>Rail vibration abnormality</b>            The rail vibration may be weakened and the screw feed may be weakened.</p>	<p>Perform the following processing and turn on the power again.</p> <ol style="list-style-type: none"> <li>① Vibration adjustment            Refer to 6-1 Checking and adjusting rail vibration, and adjust the vibration.</li> <li>② Foreign matter mixed            There is a possibility that foreign matter has entered the gaps between the vibrating parts and the vibration has weakened. Blow the solenoid, rail cover, etc. with air.</li> <li>③ Solenoid gap abnormality: Adjust the gap with a 0.5 mm shim.</li> <li>④ Interference of parts : Check for interference with the following parts.               <ul style="list-style-type: none"> <li>• Interference caused by screws mixed in the rail vibrating part                  : Removal of screws</li> <li>• Interference between rail and slide block : Adj. See 6-9-5</li> <li>• Interference between the rear hopper cover and the rail : Adj. See 6-7</li> <li>• Interference between the scraper and the hopper wall : Adj. See 6-8</li> <li>• Interference between the hopper wall before and after and the rail                  : Adjustment or parts replacement is required. Please contact us.</li> </ul> </li> </ol>
Slide unit does not move	<p><b>Abnormal screw outer sensor</b>            The screw outer sensor may be detecting the screw at all times.</p>	A dust may have adhered to the surface or slit of the screw output sensor. Remove the sensor and remove a dust adhering to the sensor surface and slits. When assembling, insert the slit on the light receiving side (the sensor surface is black).



## 9. Specifications

Power AC adapter (switching type)	Input:AC100~240V 50/60 Hz Output:DC15V
Dimensions	Feeder:169W x 436D x 269H (mm)
Weight	Feeder:Approx. 15kgf
Screw capacity	Approx.1300cc
Accessories	Operation Manual : 1copy AC adapter: 1unit Hexagon Wrench:1piece Screwdriver : 1piece
Installation location	Level stable place
Installation and storage condition	<ul style="list-style-type: none"> <li>• Temperature:0~40°C</li> <li>• Humidity:10~85%(Without condensation)</li> </ul>
Compliance standard	EMC:2014/30/EU MD:2006/42/EC RoHS2:2011/65/EU

### [CAUTION]

- This machine is a dedicated machine for the specified screw. Please contact us when changing the screw type.
- For improvement, the design, performance and specifications are subject to change without prior notice.
- The noise of this unit is less than LAeq 70 dB at a distance of 1 m.
- This product complies with EC directive. Please check the EC Declaration of Conformity for compliance standards.

## 10. Warranty

For users within Japan, the product is covered by warranty for a period of six months after the date of delivery. Such warranty will not be applicable to purchase or users outside of Japan. If it should become faulty, however, please contact your local dealer.

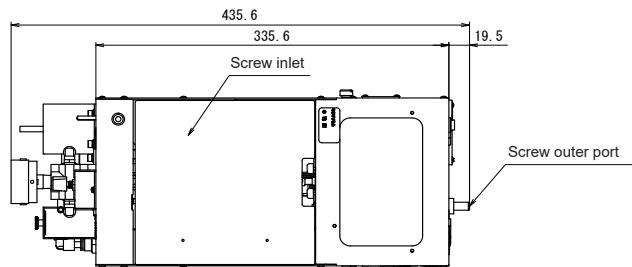
Solutions to the following situations may be implemented at a reasonable charge without regard to the warranty period.

1. Failure due to improper handling.
2. Failure due to product modification or improper processing.
3. Failure due to causes beyond control (for example earthquake or fire).
4. Failure attributable to any cause other than this product.
5. Consumables (brushes, main motor, stopper, bit guide) and replaceable parts and replacement work expenses.

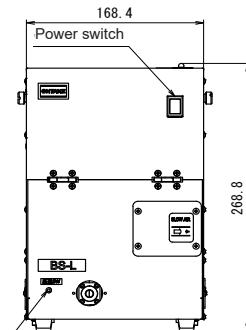
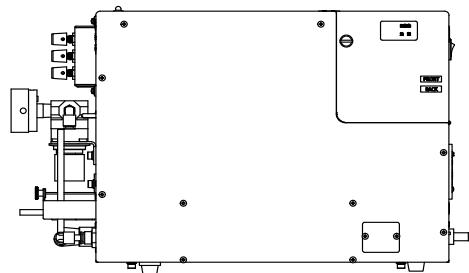
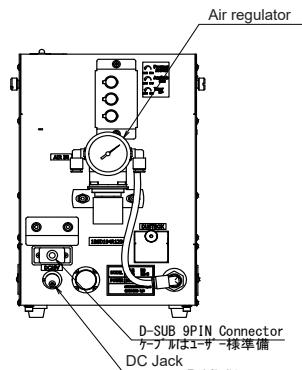
The repair parts shall be available within 5 years after purchase.

## 11. External dimensions

Screw feeder



[Unit] mm





Please note that on disposal, this product may be safely recycled in accordance with the relevant national legislation relating to electrical/ electronic products. If in doubt please contact your retailer for guidance.

部件名称	有毒有害物質或元素				
	鉛(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr(VI))	多溴联苯(PBB)
驱动齿轮,轴心部件	×	○	○	○	○
铆钉	×	○	○	○	○
六角铜柱	×	○	○	○	○
电路板元件	×	○	○	○	○
连接器	×	○	○	○	○

○: 表示該有害物質在該部件中的含量均在GB/T 26572-2011規定的限量要求以下。  
 ×: 表示該有害物質至少在該部件中的某一均質材料中的含量超出GB/T 26572-2011標準規定的限量要求。

<http://www.ohtake-root.co.jp>

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(as of Dec, 2020)  
 (2020年 12月現在)