SONY

3-099-449-02

AUTOMATIC SCREW FEEDER

Operating Manual

FK-505 SERIES

FK-514 517 520 523 526 530 535 540 550 514F 517F 520F 523F 526F 530F 535F 540F 550F 514RS 517RS 520RS 523RS 526RS 530RS 535RS 540RS 550RS

mountz
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English

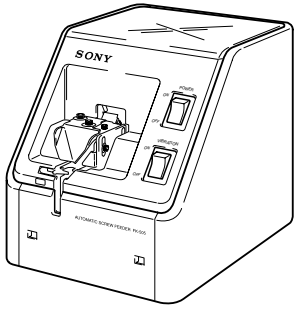
Operating Instructions

Table of Contents

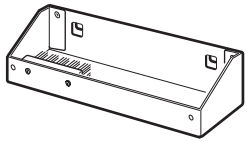
Checking the Package Contents

Before using this machine, check that you have all the items listed below.

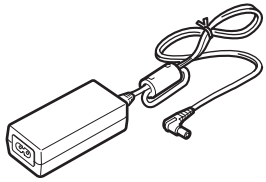
● **Main unit x 1**



● **Screw tray x 1**

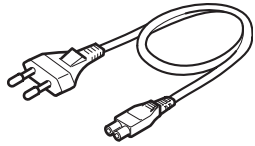


● **AC adapter x 1**



* Do not use any AC adapter other than the one supplied in the package.

● **Power cord x 1**



● **Operating Manual (this manual x 1)**

Note	When making adjustment, prepare a ballpoint type hexagonal screwdriver with the 2-mm width across flats (commercially available). 

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Features

○ Simple operation and high-speed screw pickup

This machine is the automatic screw feeding machine that lines up screws at the specified position so that the screws are ready to be picked up by the electric screwdriver swiftly This machine speeds up screw pickup and improves the efficiency of the screw fastening work.

- You just have to lower the tip of an electric screwdriver bit along the bit guide and pull it toward you without thinking about the location of the screw head.
- This machine enables you to pick up screws at about four times the normal speed.

○ Various types of screws supported

Various screw types, lengths and head shapes are widely supported. Adjustment for setup change for different screws is simple.

○ Compact configuration and space-saving

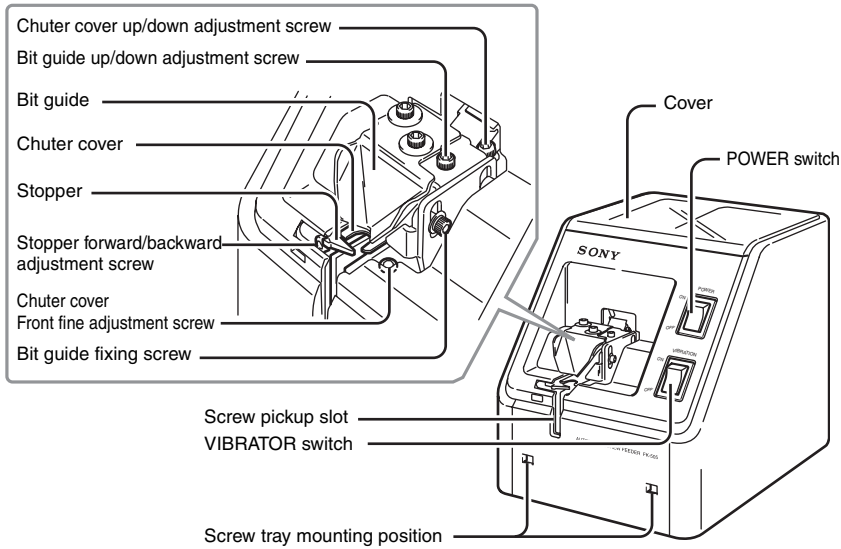
Thanks to the compact configuration, two or more units can be installed in parallel without taking up space.

○ Human-engineered design enabling smooth operations

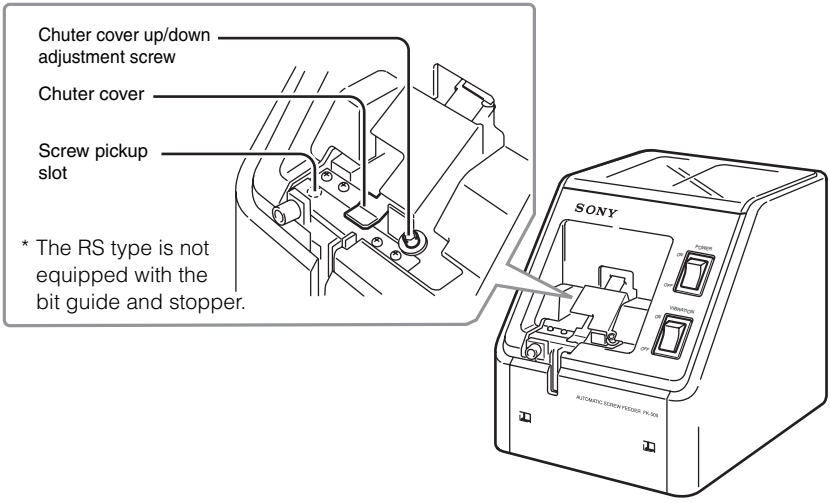
The built-in protection systems prevent the screw feeding operation from an excessive mechanical load. The power supply protection circuit prevents the system from short-circuit caused by the reverse-polarity connection of the power. In addition, the auto-vibration function realizes the smooth screw pickup operation.

Names and Functions of Main Parts

● Front (Standard type and F type)



● Front (RS type)



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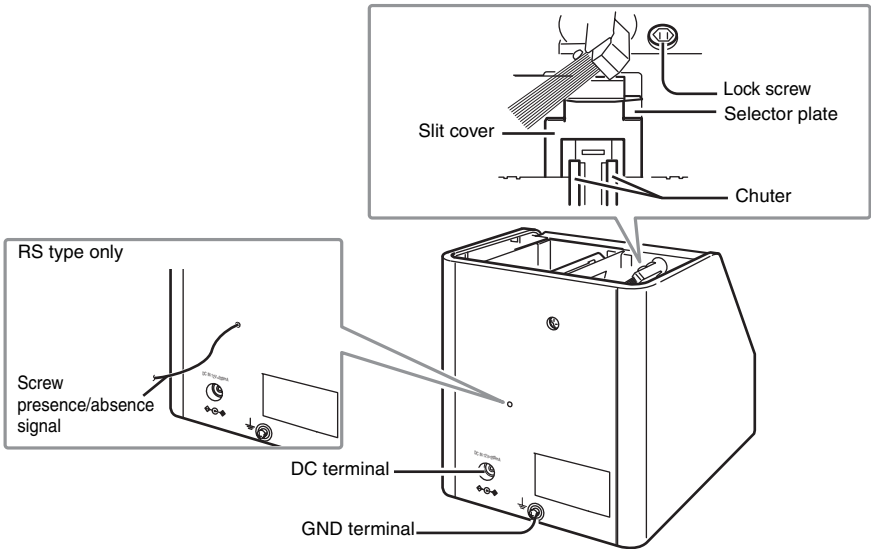
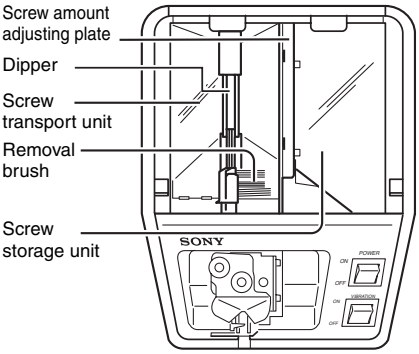
● Rear

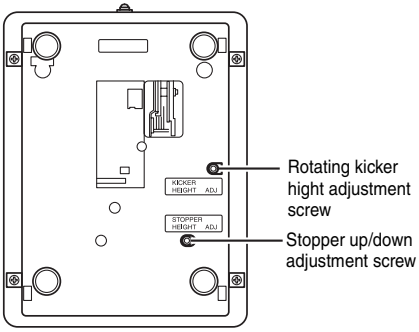


● Top

* View with the cover open



● Bottom



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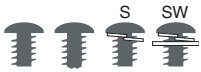
Correspondence Table between Screw Types, Bits and Models

● Screw types and corresponding models

Use the model that corresponds to the type of screw to be used.

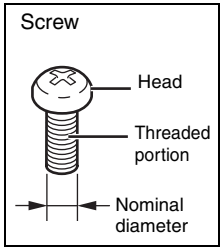
Screw specifications/ types		Screw shape	Corresponding model		
			Standard type	F type (Flat screw specification)	RS type (Automatic machine specification)
JCIS precision machine screw			Yes	No	Yes
JIS machine screw	Pan		Yes	No	Yes
	Bind		Yes	No	Yes
	Truss		Yes	No	Yes
	Round		Yes	No	Yes
	Flat Oval countersunk		No	Yes	No

* 1: Type 1, 2: Type 2, 3: Type 3, S: Spring washer, W: Flat washer

● Nominal diameters of screw and corresponding models

Use the model that corresponds to the nominal diameter of screws to be used.

Screw nominal diameter	Corresponding model		
	Standard type	F type (Flat screw specification)	RS type (Automatic machine specification)
M1.4	FK-514	FK-514F	FK-514RS
M1.7	FK-517	FK-517F	FK-517RS
M2.0	FK-520	FK-520F	FK-520RS
M2.3	FK-523	FK-523F	FK-523RS
M2.6	FK-526	FK-526F	FK-526RS
M3.0	FK-530	FK-530F	FK-530RS
M3.5	FK-535	FK-535F	FK-535RS
M4.0	FK-540	FK-540F	FK-540RS
M5.0	FK-550	FK-550F	FK-550RS



* M indicates diameter.

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● Supported lengths of screws

The usable minimum length of screw is different depending on the nominal diameter and type of screw. Check the minimum length on the table below.

	Screw		Minimum length of screw (ℓ)									Maximum length of screw (ℓ)
	Types \ Nominal diametes		M1.4	M1.7	M2.0	M2.3	M2.6	M3.0	M3.5	M4.0	M5.0	M1.4 to 5.0
Standard type RS type	Single Screw		1.4	1.6	1.8	2.5	2.8	3.0	3.5	4.0	5.0	18.0
	Screw with spring washer		–	–	3.0	4.0	4.0	4.0	6.0	6.0	8.0	
	Screw with spring + flat washer		–	–	5.0	5.0	6.0	6.0	8.0	8.0	10.0	
F type	Flat type screw, oval countersunk screw		1.8	2.2	2.5	2.8	3.5	4.0	4.5	5.0	6.0	

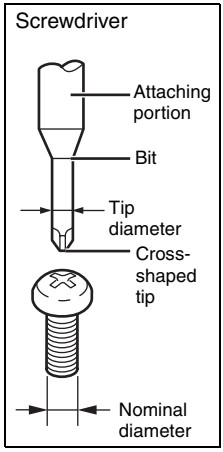
unit: mm

● Nominal diameters of screws and screwdriver bits

Use the screwdriver bit (tip diameter) that corresponds to the nominal diameter of screw.

Screw		Screwdriver bit	
Standard	Nominal diameter	Tip diameter	Bit tip No.
JCIS precision machine screw	M1.4	M1.4 or less	No.0
	M1.7	M1.7 or less	
	M2.0	M2.3 or less	
	M2.3	M2.3 or less	
	M2.6	M2.6 or less	
JIS machine screw	M2.0	M2.3 or less	No.1
	M2.3	M2.3 or less	
	M2.6	M2.6 or less	
	M3.0	M3.2 or less	No.2
	M3.5	M3.2 or less	
	M4.0	M4.0 or less	
	M5.0	M5.0 or less	

unit: mm



* Shapes and dimensions of the bit attaching portion vary depending on the screwdriver manufacturer.

Adjustment Method

Adjustment Procedures for Each Screw Type

Before using the machine or when screw types are to change, perform the adjustment as described below.

Aligning the Selector Plate and Chuter Cover with the Screw Shape (See page 119)

⇩

Adjusting the Bit Guide (See page 123)

* The RS type (automatic machine specification) is not equipped with the bit guide.

⇩

Adjusting the Stopper (See page 124)

* The RS type (automatic machine specification) is not equipped with the stopper.

⇩

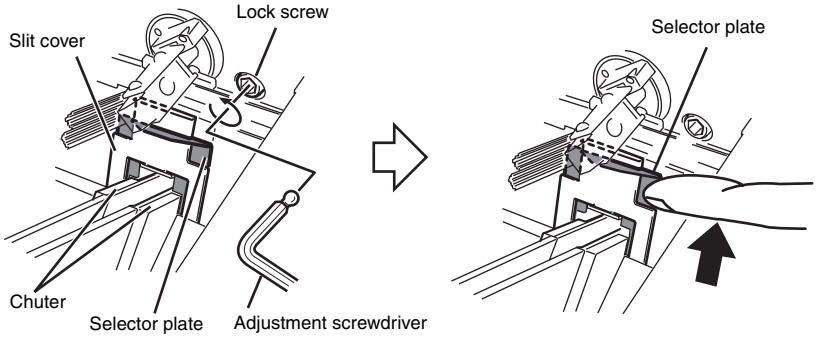
Adjusting the Rotating Kicker Height (See page 126)

Aligning the Selector Plate and Chuter Cover with the Screw Shape

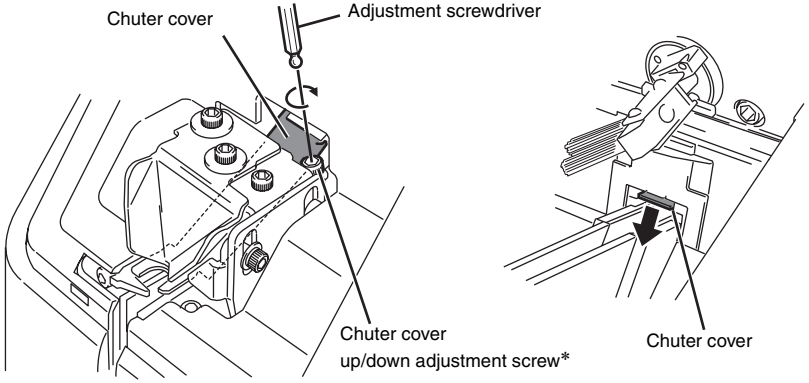
The selector plate and the chuter cover form a passage of screws in order to align the screws in order. Adjust the selector plate and the chuter cover to the optimal positions in accordance with the shape of screw.

1 Open the cover. Insert hand from the top of the machine and loosen the lock screw by turning it counter-clockwise.

2 Pull the selector plate upward with your fingertip.



3 Rotate the chuter cover up/down adjustment screw to move down the chuter cover lower than the head of screws to be handled.



* Rotating counter-clockwise: Moves up the chuter cover.
Rotating clockwise: Moves down the chuter cover.

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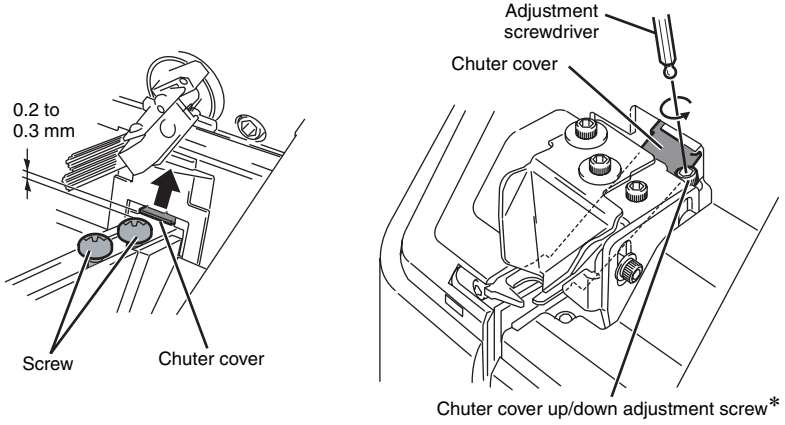
4 Place one or two screws to be handled at the entrance of the chuter.

5 Rotate the chuter cover up/down adjustment screw to move the chuter cover upward to the position where the screws flow in.



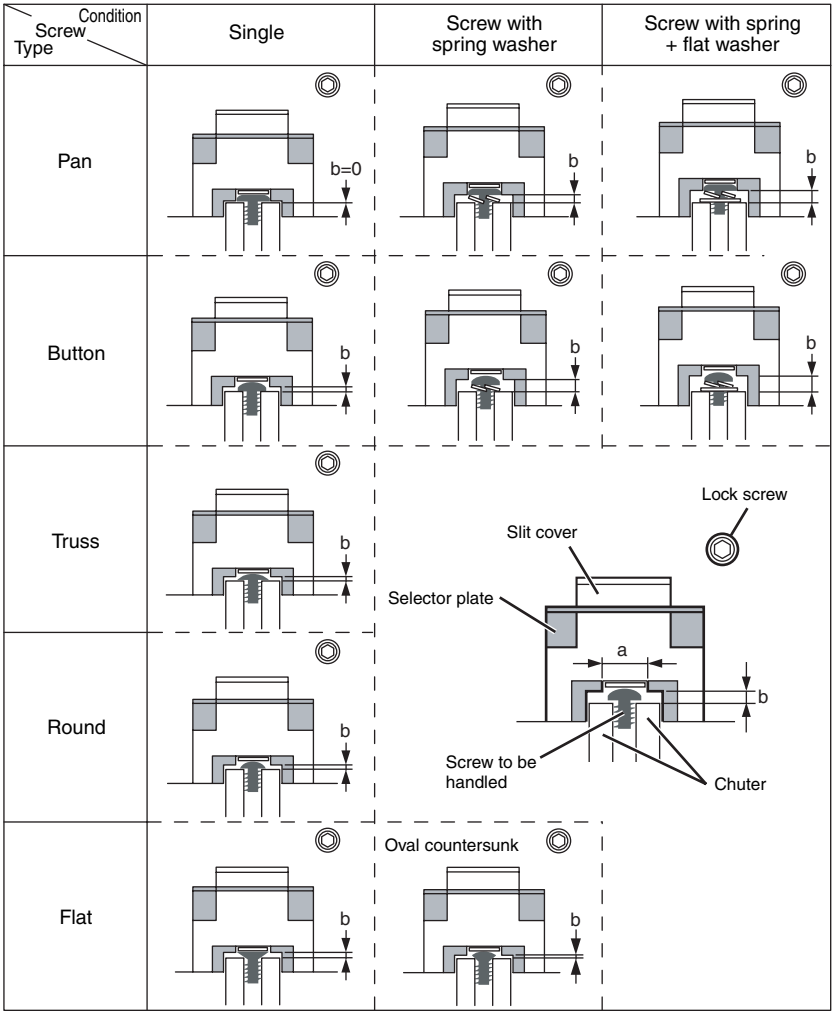
* Rotating counter-clockwise: Moves up the chuter cover.
Rotating clockwise: Moves down the chuter cover.

Note	Be careful not to move the chuter cover too high. The distance between the screw head and the chuter cover should be approx. 0.2 to 0.3 mm.

6 Move the selector plate up and down in order to adjust the selector plate and that of the slit cover to the optimal positions in accordance with the types of screw to be handled.
(See page 121)

7 Tighten the lock screw by rotating it clockwise. (See page 119)

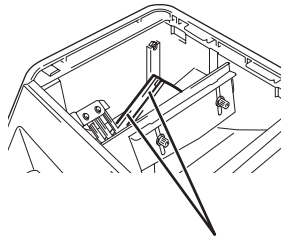
Adjustment of selector plate and slit cover



Note	• For the screw whose head can pass the dimension of a of the selector plate, move down the selector plate until b=0 is obtained. • For the pan head screw, the precision machine screws (single) of nominal diameters M2.3 and 2.6 are included.

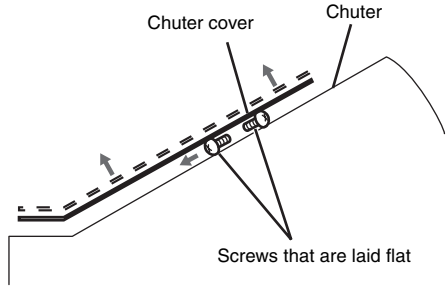
Note

- Be very careful not to damage the chuter or the dipper groove, especially their top surfaces. Do not damage the edges of the groove.

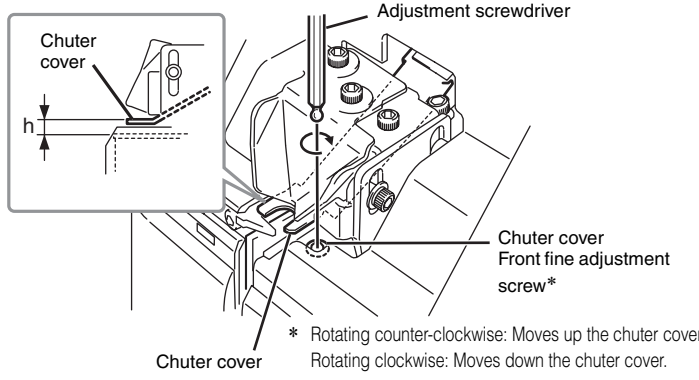


Edges of the chuter and the dipper groove

- If the screws that are laid flat and have entered underneath the chuter cover, rotate the chuter cover up/down adjustment screw (See page 119) to raise the chuter cover to flow them out.



- If you want to change only the height of the chuter cover (h shown in the illustration) of the screw pickup slot in accordance with the shape of the screw head, adjust the height by rotating the fine adjustment screw on the front of the chuter cover.



* Rotating counter-clockwise: Moves up the chuter cover.
Rotating clockwise: Moves down the chuter cover.

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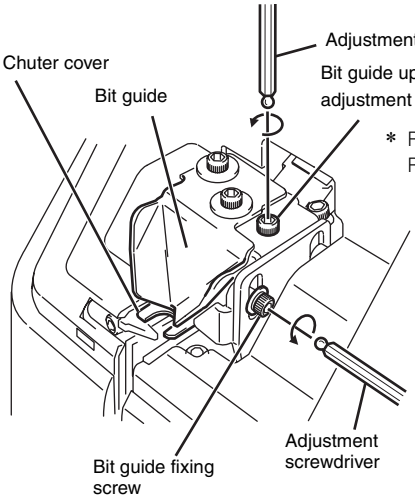
Adjusting the Bit Guide

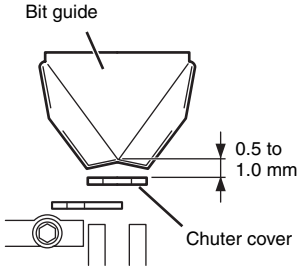
If the bottom end of the bit guide contacts the chuter cover, or if it is located too far, perform the following adjustment.

1 Loosen the bit guide fixing screw by rotating it counter-clockwise.

2 Adjust the position of the bit guide by rotating the bit guide up/down adjustment screw.



* Rotating counter-clockwise: Moves up the bit guide.
Rotating clockwise: Moves down the bit guide.



<When the bit guide is viewed from the front>

Note	The distance between the bit guide and the chuter cover should be approx. 0.5 to 1.0 mm.

3 Tighten the bit guide lock screw by rotating it clockwise.

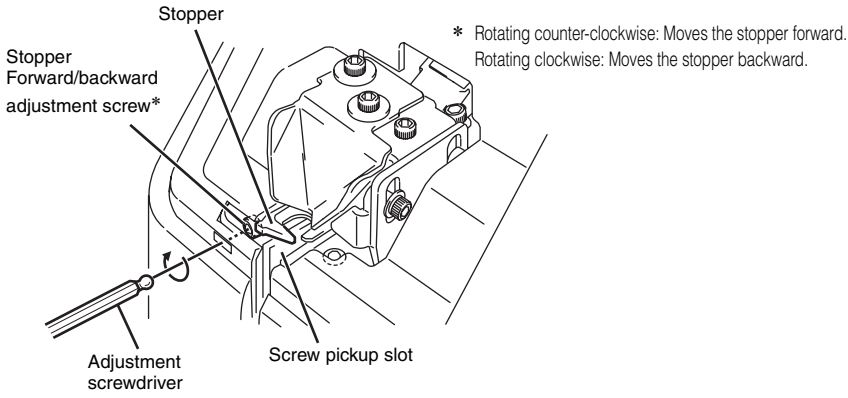
Adjusting the Stopper

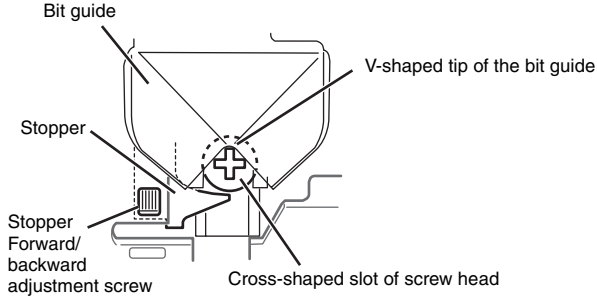
The stopper serves to line up screws at the screw pickup slot. Adjust it to the optimal position in accordance with the screw head shape.

Forward/backward adjustment (Adjustment of the bit guide position in accordance with the screw head shape)

1 Feed five to six screws to be handled so that they are accumulated on the chuter.

2 Adjust the bit guide position by rotating the stopper forward/backward adjustment screw so that the rear of the cross-shaped slot on the screw heads are aligned with the V-shaped tip of the bit guide (when viewed from the top).





<When the bit guide is viewed from the top>

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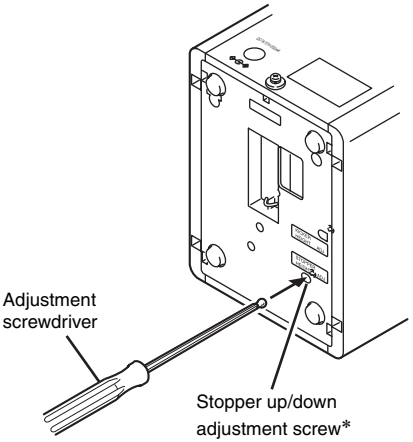
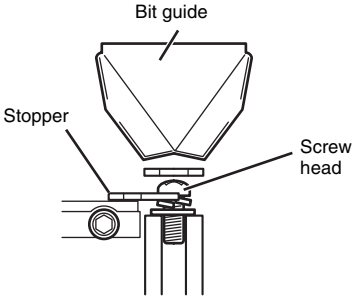
Up/down adjustment (height adjustment in accordance with the screw shape)

1 Adjust the height so that the stopper contacts the screw head by rotating the stopper up/down adjustment screw on the bottom of the machine.



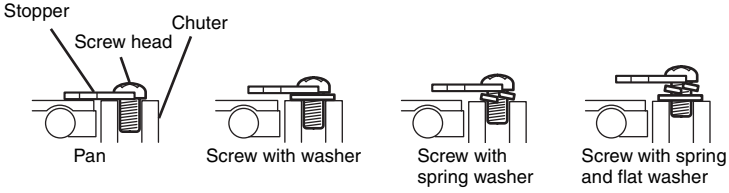


When the bit guide and the stopper are viewed from the front

* Rotating counter-clockwise:
Moves down the stopper.
Rotating clockwise:
Moves up the stopper.

* When the stopper up/down adjustment screw is turned counter-clockwise, the stopper contacts the top of the chuter. Do not turn it counter-clockwise from that point.
The stopper may be damaged.

* For the F type (flat head specification), the chuter has the different shape from that of the standard type.



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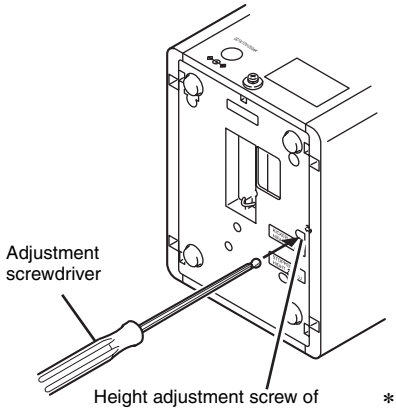
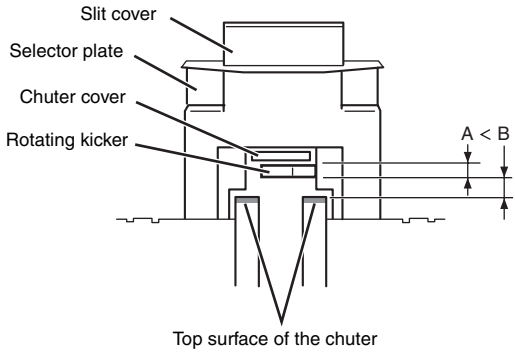
Adjusting the Rotating Kicker Height

When the screw with spring + flat washer is to be handled, and if the screws that are laid sideway at the chuter entrance cannot be taken away, increase the height of the rotating kicker.

1 Adjust the height of the rotating kicker so that the rotating kicker is positioned slightly higher than the midpoint between the chuter's top surface and the chuter cover, by rotating the height adjustment screw on the rotating kicker on the bottom of the machine.



* Rotating counter-clockwise: Moves up the rotating kicker.
Rotating clockwise: Moves down the rotating kicker.



<Chuter when viewed from the top>

Note	When adjusting height of the rotation kicker, visually confirm that the rotation kicker does not contact with the bottom of the slit cover and the top surface of the chuter. Be careful not to rotate the rotation kicker excessively. Doing so may damage the rotation kicker.

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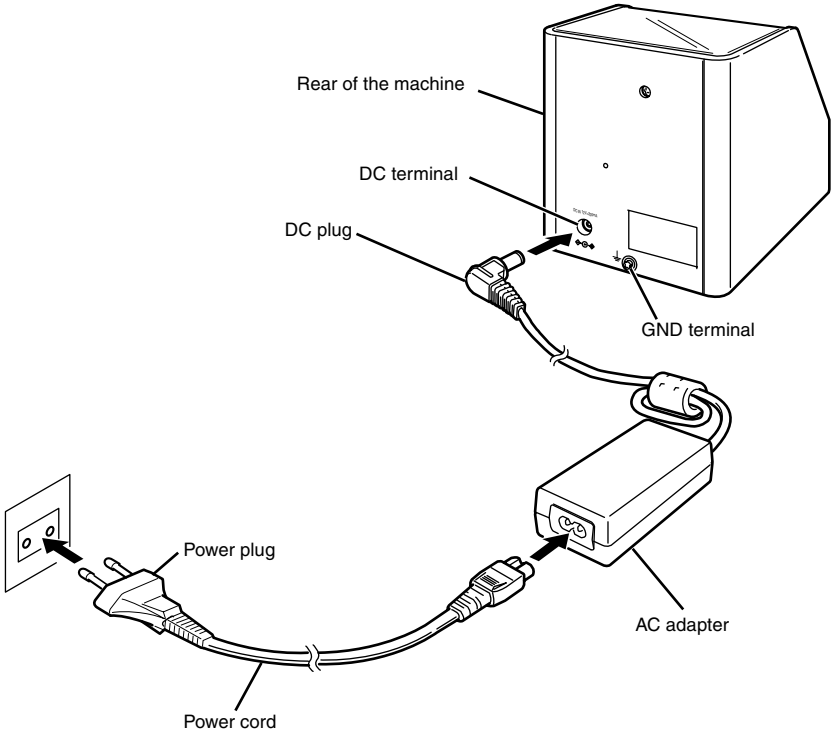
Connection Method

1 Connect the DC plug of the AC adapter to the DC terminal on the rear of the machine.

2 Connect the AC adapter and the power cord.

3 Connect the power plug of the power cord to the power source outlet securely.

4 Connect the GND terminal on the rear of the main unit to the earth.

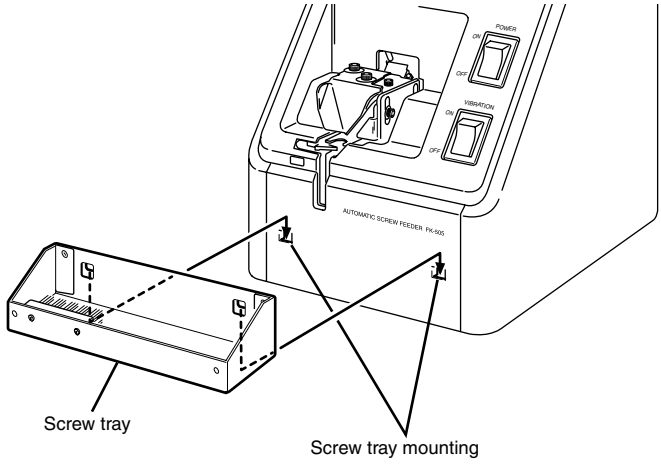


Note	If this machine will not be used for an extended period of time, disconnect the power plug of the power cord from the power source outlet.

Method to Install the Screw Tray

Install the screw tray to the front of the machine so that the screws should not be scattered when screws drop from the electric screwdriver during its screw pickup operation.

1 Hook the screw tray to the mounting holes (two holes) where the screw tray should be installed, on the front of the machine.

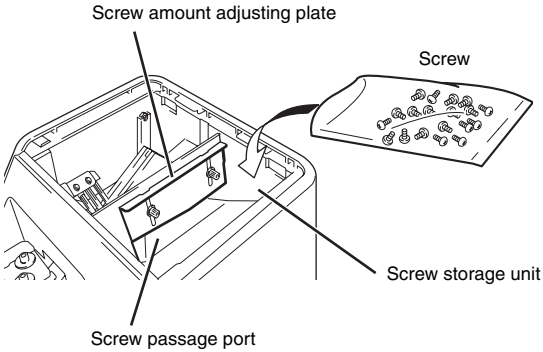


Operating Method

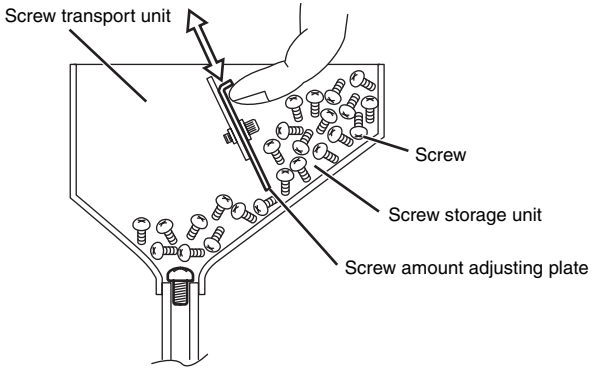
When the required adjustments in accordance with the screw type are complete, operate the machine in the following order.

Inserting Screws

1 Open the cover and insert screws in the screw storage unit.



2 Adjust the screw amount adjusting plate up/down with your finger tip so that the screws are supplied to the screw transport unit one screw after another.

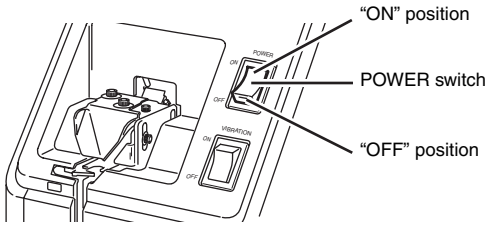


3 Close the cover.

Turning the Power On

When turning the power on, be sure to turn the power on while the main unit cover is being closed.

1 Press the ON position of the POWER switch.



The dipper moves up and down so that the screws are supplied to the chuter. When a specified amount of screws is supplied, the dipper stops.

2 To turn off the power, press the OFF position of the POWER switch.

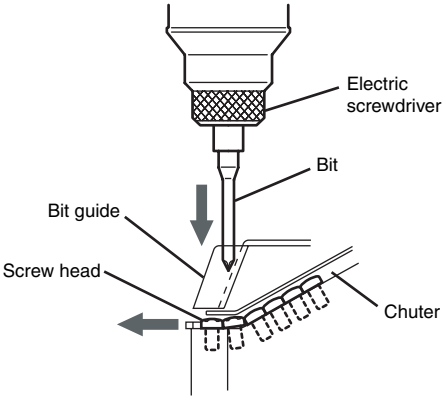
Note	• After the power is turned on, do not open the cover. Screws may jump out. To open the cover, turn the power off before turning it off. • The dipper and the eject brush move while the machine is operating. Do not touch them with hand. Doing so may cause physical damage. • Do not operate inside of the machine with any sharp-pointed tool and the like.

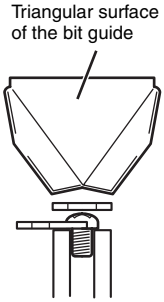
Picking up the Screws with Electric Screwdriver

1 Install the bit that fits the nominal diameter of the screw to be handled to the electric screwdriver.

2 Bring the bit of the electric screwdriver to the triangular surface (any position on the triangular surface is OK) of the bit guide.

3 Turn on the power of the electric screwdriver momentarily to move down the rotating bit in the vertical direction (↓) and pull it to the front (←) of the machine when the bit contacts the screw head.





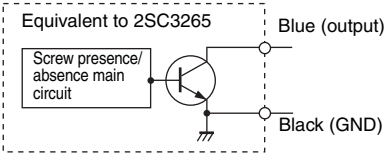
Note	• When moving the electric screwdriver, do not exert any force but the electric screwdriver must move down by its own weight. • When picking up screws, do not look at the screw head, but simply contact the tip of the bit with the bit guide. If the location of the screw head is taken into consideration excessively, the bit will not meet the screw head well so the bit may fail to pick up the screws. • If the bit contacts the screw head, pull it to the front along the horizontal surface of the screw pickup slot.

Screw presence/absence signal of the RS type (RS type only)

The "Screw presence/absence signal" (See page 115) on the rear of the machine has the NPN open-collector output signal. When screw exists at the screw pickup slot (See page 114), the output transistor turns on. If screw does not exist, the output transistor is turned off.

Screw presence/absence signal on the rear of the machine

Blue line	Output
Black line	GND (0 V)
Control output	Load current: 50 mA or less. Voltage DC 12 V to 24 V

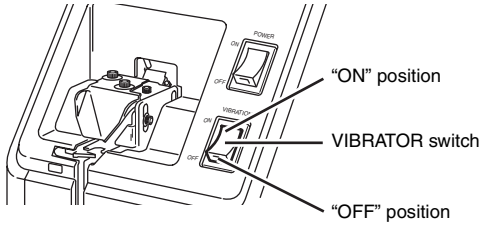


E

Setting the Vibrator

If the screws are not supplied to the specified position of the screw pickup slot because of the screw shape or size, turn on the vibrator. Whenever a screw is picked up, the vibrator works for a short time so that screws can be picked up easily.

1 Press the ON position of the VIBRATOR switch.



2 To turn off the power, press the OFF position of the VIBRATOR switch.

Ejecting Screws

To eject the screws remaining inside the machine, perform the procedure shown below.

1 Turn off the power. (See page 130)

2 Open the cover and move the screw amount adjusting plate of the screw storage unit upward.

3 Raise the front of the machine to return the screws on the chuter to the rear of the machine once.

4 Tilt the machine to the right and left to eject the remaining screws.

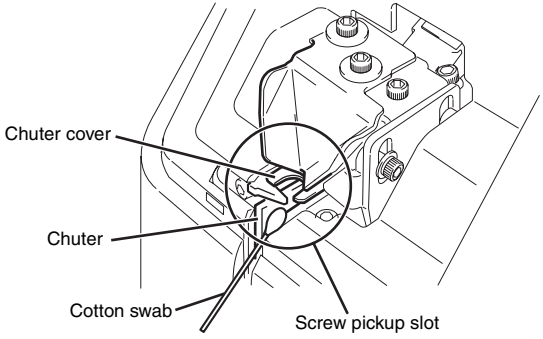
Maintenance Procedure

Cleaning the Chuter

1 Raise the chuter cover by rotating the chuter cover up/down adjustment screw. (See page 119)

2 Fully soak a cotton swab with alcohol.

3 Insert the cotton swab along the slope of the chuter from the groove of the screw pickup slot. Clean the chuter by moving the cotton swab forward and backward while pressing it against the upper chuter cover.

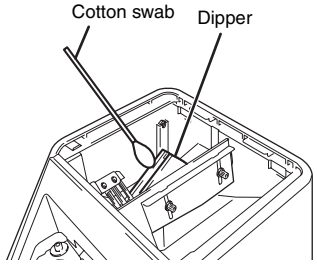


Cleaning the Dipper

1 Open the cover.

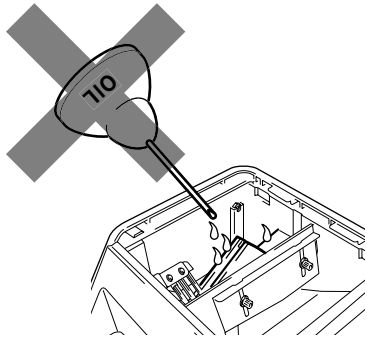
2 Fully soak a cotton swab with alcohol.

3 Insert the cotton swab into the groove of the dipper from the top of the machine to clean inside of the groove.

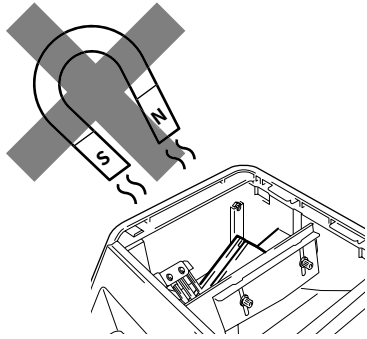


Note

- Be careful that cotton fiber of the cotton swab must not be left inside the machine as debris.
- Be very careful not to damage the chuter or the dipper groove, especially their top surfaces. Do not damage the edges of the groove.
- Be careful not to apply oil to the chuter or the dipper groove.

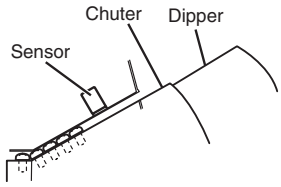


- Do not bring magnet close to the chuter or the dipper groove.



Troubleshooting

If any abnormality is found, take an appropriate measure by referring to the following items. If the abnormality does not disappear, contact your sales representative where you purchased the machine, or your nearest sales representative.

Problem	Check item	Countermeasures	Reference page
The power does not turn on.	Is the specified power voltage supplied to the AC power inlet? Is the circuit breaker turned off?	Check it with circuit tester (VOM).	–
	Is the power plug of the power cord connected to the power source outlet?	Connect the power plug of the power cord to the power source outlet securely.	Page 127
	Is the DC plug of the AC adapter connected to the DC terminal on the rear of the machine?	Connect the DC plug of the AC adapter to the DC terminal on the rear of the machine.	
	Is the POWER switch set to ON?	Press the ON position of the POWER switch.	Page 130
Machine does not operate.	Are the screws have lined up and the machine is in the standby state?	Remove the screws from the screw pickup slot. If the screws are removed, the machine will restart.	–
	Is the chuter or dipper clogged with screws or foreign materials?	Eject all of the screws or foreign materials.	Page 132
	Does the dipper not start working even when the screws are removed from the sensor block on top of the chuter while the power is ON? 	Turn OFF the POWER switch once and then back ON. If the dipper starts working when the POWER switch is turned OFF and back ON, the machine has no abnormality. If an excessive load is applied to the machine, the protection system works to stop the machine automatically.	Page 130
	Does the dipper stops working frequently during use?	Turn OFF the POWER switch and investigate the cause of the abnormality. An excessive load may be applied to the dipper or to the eject brush.	

Problem	Check item	Countermeasures	Reference page
Machine does not stop working.	Is chuter clogged with screws in the middle of the chuter unit?	Ejecting the screws.	Page 132
	Are the screws supplied to the chuter unit?	Insert screws.	Page 129
Abnormal sound is generated.	Is the chuter or dipper clogged with the screws or foreign materials?	Eject all of the screws or foreign materials.	–
Adjustment is impossible.	Is the clearance between the chuter cover and chuter clogged with the screws or foreign materials?	Eject all of the screws or foreign materials, and perform the adjustment again.	–
Screws drop when the screws are taken out.	Is the screw pickup slot magnetized?	Demagnetize the screw pickup slot by a demagnetizer.	–
The AC adapter heats up abnormally.	Are you using the AC adapter supplied with the machine?	Use the AC adapter supplied with the machine.	Page 112
	The AC adapter in use may be defective.	Contact your sales representative where you purchased the machine, or your nearest sales representative.	–

Note	Repair services will be carried out by the sales representative.

Warranty and Repair Service

● Warranty period

Warranty period is 6 months from the date of purchase.

● Repair service during the warranty period

The machine will be repaired free of change in accordance with the terms and conditions of free repair service.

Free Repair Policy

1. Sony Manufacturing Systems Corporation will repair the defective product at no charge at the shop where it was purchased if the product requiring repair service has been used properly (used according to the Instruction Manual).
2. The purchaser must pay the labor and parts charges in the following cases even during the warranty period:
   (1) Damage caused by misuse, damage caused by other devices, failure and damage caused by inappropriate repair work or modification
   (2) Failure and damage caused by transportation or falling of the product after purchase
   (3) Failure and damage caused by fire, earthquake, wind or flood, lightning strike, and other acts of God, pollution, seawater, or abnormal voltage

● Repair service after the warranty period

Machine will be repaired on the charged basis as far as the functions can be maintained by repair.

● Parts supply period

Sony Manufacturing Systems Corporation will supply the functional repair parts (parts required for maintaining the functions of the machine) of the manufacturing machines for the period of 5 years after discontinuation of manufacturing of the machine. The repair service will be supplied during the parts supply period as described above. Even after elapse of the repair parts supply period, machine can be repaired depending on the abnormality. Contact your sales representative from which you purchased the machine, or your nearest sales representative.

● When you ask for repair service

Read through the "Troubleshooting" (See page 135) and investigate the machine again. If the abnormality still does not disappear, contact your sales representative from which you purchased the machine, or your nearest sales representative.

● Contents to be informed when requesting repair service

- Serial number
- Abnormality detail
- Year, month and date of purchase

Main Specifications

● Main unit

Input voltage		12V DC, 200 mA
Input voltage *When the AC adapter (MPA-AC1) is used.		100 to 240 V AC, 15 VA, 50/60 Hz
DC plug		EIAJ Type
Outside dimensions		120 x 138 x 155 (W x H x D) mm
Mass	FK-505	1.1 kg (main unit only)
	FK-505F	1.1 kg (main unit only)
	FK-505RS	1.15 kg (main unit only)
Continuous supply speed		Approx. 1.5 seconds/screw (+P M3.0 x 8)
Operating environment		Ambient temperature:+10 to +30 °C (no condensation), less than 1000 m above sea level
Storage temperature		-10 to +50 °C (no condensation)
Noise level		66 dB
Pollution level		Pollution level 2
Operating environment		Indoor use only

● Screws that can be handled by this machine

Nominal diameter of screws	M 1.4 to M5.0 mm
Shape of threaded portion	M-series (machine) screws and tapping screws
Screw head shape (cross-recessed slot)	JCIS : Types 1, 2 and 3. Pan JIS : Pan, Button, Truss, Brazier, Flat head, Pan head machine screw (WH), with spring washer, with spring + flat washer * Only F type is dedicated to the flat-type screw.
Acceptable screw ,materials	Iron or materials attractable by magnet

* Use the model that corresponds to the nominal diameter and the screw head shape of screws to be used. (See page 116)

● Accessories

Screw tray (1 piece)	Power cord (1 piece)
AC adapter (1 piece)	Operating Manual (this manual: 1 piece)

MEMO

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FK-505 SERIES　2008.2
3-099-449-02　Printed in Japan
このマニュアルは再生紙を使用しています。