



KOHBYO

Smart Feeder

Smart Screw Feeder

Operation Manual NJN-200



Thank you for purchasing KOFU SEIBYO's
Smart Feeder NJN-200.

This manual is intended to describe the operation of the product
and important safety precautions.

For safety and operating comfort of this machine,
be sure to read this Operation Manual and clearly understand the contents.

This manual is also of help for handling an uncertain situation
and malfunction in case it occurs.

Keep this warranty and manual available whenever necessary.

Table of Contents

Safety

1] Overview/Features of Smart Feeder (NJN-200)

2] Accessories

3] Names of Parts

4] Adjustment and Handling

1. Rail width adjustment

2. Alignment unit adjustment and screw feed rate

3. Adjustment

1) Feed speed adjustment

2) Screw feed rate adjustment

3) Vibration frequency adjustment I

4) Vibration frequency adjustment II

(Adjustment when feed speed varies depending on the amount
of screws in the hopper)

5] Precautions for Use

6] Troubleshooting

7] Main Specifications

8] After-sales Service

Safety The following safety precautions should always be observed to assure further safe operations.

Safety Precautions Read and understand "Safety" carefully before using the product for safety assurance. Observe the following precautions to protect workers, workers around, and property.

The following safety precautions should always be observed for safety.

1. Avoid the following conditions for machine installation.
Locations exposed to dust, oil, moisture and vibrations
2. Do not control and disassemble the AC adapter with wet hands.
3. Stop using the machine when abnormal smoke, odor or noise is detected, and unplug the cord from the wall outlet.
(Attachment plug, adapter, connecting cord, and socket included)



DANGER

"DANGER" denotes that there is an imminent hazard which will cause serious personal injury or death, if disregarded and mishandled.



Do not plug too many leads into a single socket.
Potential fire and overheating will occur if disregarded.



Do not modify, forcefully bend, and pull the AC adapter.
No heavy object must be placed on the adapter.
Potential fire and electric shock will occur if disregarded.



Be sure to use the specified power voltage (AC100V-240V) and supplied AC adapter only.
Potential fire, electric shock and damage will occur if disregarded.



Do not touch the AC adapter with wet hands.
Potential electric shock will occur if disregarded.



Do not touch the AC adapter during electrical storms.
Potential electric shock will occur if disregarded.



Make sure the blade of the AC adapter is free of dust before plugging it into the wall outlet.
Potential fire and electric shock will occur if disregarded.



WARNING

"WARNING" denotes that there is a hazard which may cause serious personal injury or death, if disregarded and mishandled.



Keep metal away from the opening of the machine.
* In case the metal object enters the AC adapter, remove the adapter from the wall outlet and contact the dealer.
Potential fire, electric shock and damage may occur if disregarded.



Keep from water. (Make sure that a water-filled container is kept clear of the machine.)
* This machine is not water-resistant. In case water enters the machine, remove the AC adapter from the wall outlet and contact the dealer.
Potential fire, electric shock and damage may occur if disregarded.



Do not disassemble and modify the machine. (Modification is prohibited by law.)
Potential fire, electric shock and damage may occur if disregarded.



Remove the AC adapter from the wall outlet if smoke or abnormal odor occurs.
Potential fire and accident may occur if disregarded.



CAUTION

"CAUTION" denotes that there is a hazard which may cause minor personal injury or property damage, if disregarded and mishandled.



Keep the AC adapter cord and the machine away from flame.
Potential fire, electric shock and damage may occur if the cord sheath or the machine melts.



Avoid unstable and vibration-prone areas.
Potential personal injury and damage may occur if the machine falls.



Do not leave the machine in an area exposed to direct sunlight.
Potential fire may occur due to rise in internal temperature.



Avoid areas subjected to abrupt changes in temperature
Potential damage may occur if disregarded.



Avoid dust, dirt, and moisture.
Potential fire, electric shock and damage may occur if disregarded.



Always hold the machine when removing the AC adapter.
Potential fire, electric shock and damage may occur if the cord is pulled.



Symbol of don'ts



Symbol of dos

1] Overview

Smart Feeder NJN-200 is excellent in feeding under head-short screws and thin collar-head screws while utilizing all of KOFU SEIBYO's accumulated technology. Be sure to be well-versed in machine adjustment, described later, to make proper adjustments attuned to screw characteristics and allow this machine to deliver its performance fully.

Features of Smart Feeder

1. Compact, slimmed-down, simple screw feeder superior in feeding short L-sized screws
2. Support for screws ranging from M1.0 to M3 through alignment unit replacement and rail width control
3. Low-friction and less-soil design attributed to low hopper internal circulation
4. Easy removal of remaining screws and easy detection of foreign objects for screw switching
5. Simple configuration of the machine with a built-in controller

2] Accessories

Accessories listed below are supplied in the product package
Be certain all the accessories are packed with your machine.

(1) Operation Manual (this manual)

Read this manual thoroughly and gain a thorough understanding of machine operating information.

This manual must be kept available to users whenever necessary.

(2) Hexagonal wrench (for M3 caps)

This hexagonal wrench is used to adjust the vibrating part (alignment unit and rail).

(3) Sensitivity adjustment slot screwdriver

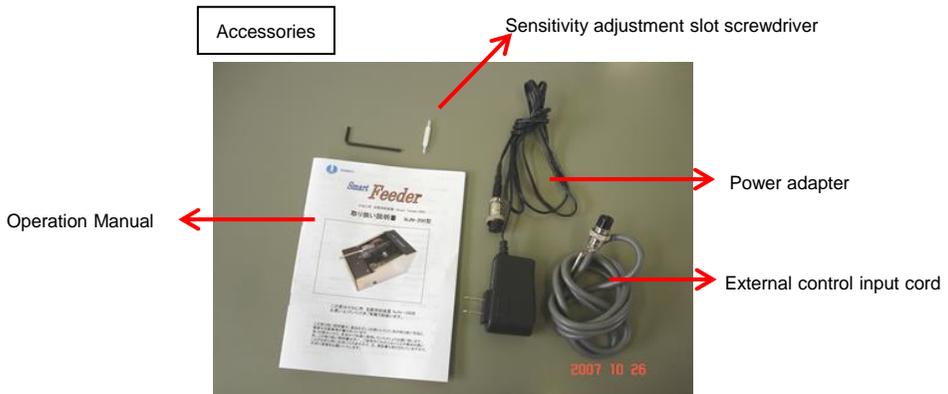
Always use the dedicated slot screwdriver to adjust the sensitivity. Do not use a precision screwdriver and others. Failure to use the dedicated screwdriver may cause the slot's flutes to be damaged and disable adjustment.

(4) Power adapter

Supplied adapter (standard): AC100V (AC100 to 240V/50Hz•60Hz)

(5) External control input cord

Always use this cord when controlling the machine externally.



3) Names of Parts

1. Drum
2. (Vibrating part) Pre-alignment part
3. (Vibrating part) Alignment unit
4. (Vibrating part) Rail
5. Power switch
6. Power connector
7. External control signal connector
8. Ground terminal
9. Feed speed adjustment slot
10. Drum rotation adjustment slot
11. Frequency adjustment slot
12. Reverse sensitivity adjustment slot

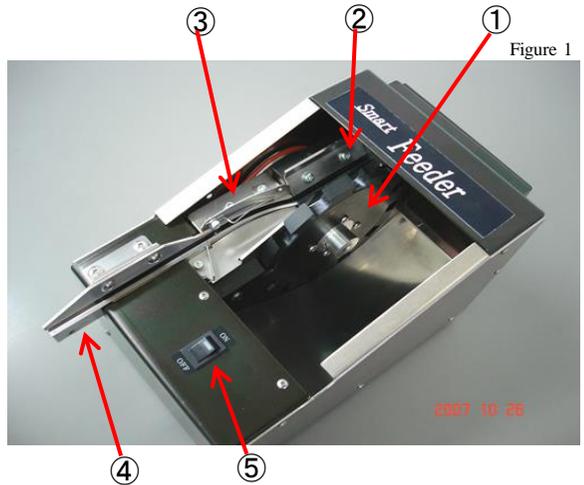


Figure 1

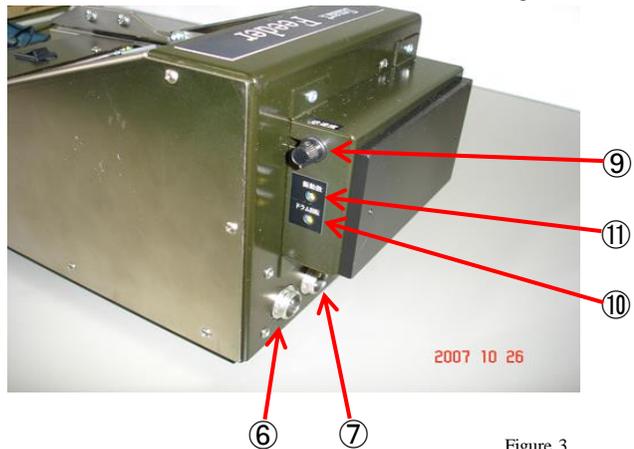


Figure 2

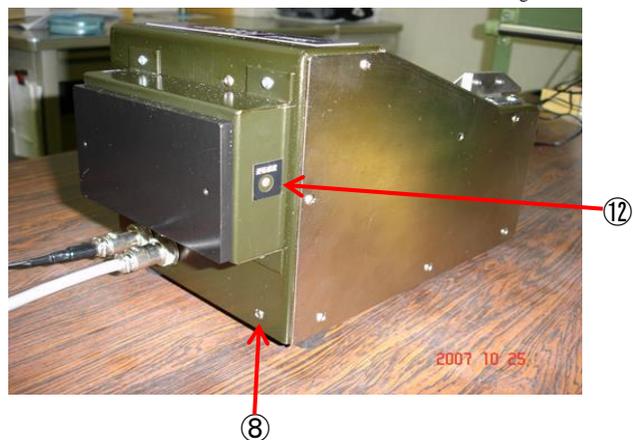


Figure 3

4] Adjustment and Handling

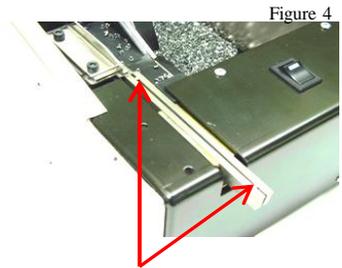
1. Rail width adjustment (see Fig. 4)

With the M3 L-shaped wrench, loosen the rail setscrew on the left side through the adjustment hole.

Place screws at the anterior and posterior ends of the rail for adjustment. Adjust the rail setscrew to allow distance between the rail and respective adjusting screws to be 0.1 to 0.2 mm, and then tighten the setscrew temporarily.

Turn on the power switch and check the adjusting screws for the proper flow of feeding after tightening the setscrew temporarily.

**** Repeat steps described above 2 to 3 times for proper adjustment. ****



Adjusting screw

2. Alignment unit adjustment (see Fig. 5)

1) Adjustment of standby alignment part groove width (see Fig. 5) Adjust the groove width adjustment plate of the standby alignment part to allow screws to go through smoothly. The width of the groove is roughly equal-sized to that of the rail. For some screw types, smooth screw feeding is delivered when the groove is widened depending on the shape of a screw head.

2) Adjustment of alignment unit screw feeding width (see Fig. 5)

Turn on the power and make coarse adjustments to the adjustment slots until screw feeding is observed. Adjust the alignment unit in Fine increments (optimization). Adjustment includes the checking of the head of screws as they go through the groove of the alignment unit. Adjust the adjustment plate of the alignment unit (a groove width and mounting angle) to allow only properly-aligned screws to go through the groove while screening out defective screws.

See 4] 4. Adjustment slots for adjusting the slots.

Groove width adjustment plate of standby alignment part

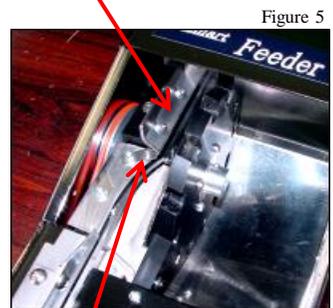


Figure 5

Screw feeding width adjustment plate of alignment unit

3. Alignment unit height adjustment

Not necessary

4. Adjustment slots

(Slot 9: Feed speed adjustment, Slot 10: Drum rotation adjustment Slot 11: Frequency adjustment)

*** Be sure to use the supplied sensitivity adjustment screwdrivers for slot adjustments.**

1) 9. Feed speed adjustment slot (amplitude adjustment)

This is used to control forward oscillations of the screw feeding part (vibrating part). The screw feed speed varies with oscillations. Adjustment is made to keep screw feeding optimum depending on the diameter and length of screws, allowing aligned screws to go the diameter and length of screws, allowing aligned screws to go maintaining a proper screw feed rate.

2) 10. Drum rotation adjustment slot

This is used to adjust the drum rotation speed for adjusting a rate of screw feeding to the alignment unit.
[Rotational speed increases when the screwdriver is turned clockwise.]
Recommended screw feeding is that a screw is replenished with a new one immediately after it is removed based on the amount of reflux screws from the feeding part and that of screws fed to the alignment unit.
Prolonged screw overfeeding, when the drum develops fast rotation, causes friction and soiling of screws.

3) 11. Frequency adjustment slot

This is used to optimize frequencies that vibrate the vibrating part including the pre-alignment part, alignment unit and rail.
[Frequency increases when the screwdriver is turned clockwise.]
Turn on the power switch, and turn the feed speed adjustment slot to the center.
Turn the frequency adjustment slot slowly to make rough adjustment allowing the amplitude of the vibrating part to increase.
(Adjust the slot while lightly touching the end of the rail with a finger if frequency check is difficult.)

4) 11-1. Adjustment when the feed speed of the vibrating part fluctuates with the amount of screws in the hopper The most desirable frequency of the vibrating part can be found when the frequency adjustment slot (Slot 11) is turned with the screwdriver slightly counterclockwise with respect to the maximum frequency point (resonance point). Adjust Slot 11 until the feed speed becomes insusceptible to the varying amount of screws in the hopper. (See Fig. 5 and Fig. 11)

Procedure for adjustment

1. Fill the hopper with the minimum amount of screws to be scooped up with the rotating drum.
Make coarse adjustments to respective adjustment slots until screws go through the vibrating part.
2. Turn the screwdriver in the feed speed adjustment slot 20% counterclockwise from the maximum point
3. Find a maximum peak of frequency while checking the vibrating part by turning the frequency adjustment slot.
(It is important to find a peak where screws develop little oscillations.)
4. Adjustments following Steps 1 to 3 accelerate the feed speed remarkably. Re-adjust the feed speed adjustment slot while checking the condition of screws. (See Fig. 10)



5. Have the maximum amount of screws in the hopper, which is the amount of screws reaching the center of the drum, ready in a plastic bag. Place the plastic bag containing the screws in the hopper. Find a desirable position of the frequency adjustment slot where the speed of screws going through the vibrating part is least susceptible to the presence of the bag. (It is important to find frequency where screws develop little oscillations.) A relationship between the amount of screws in the hopper and feed speed varies with an adjusted position of the frequency adjustment slot. The feed speed decreases with increase in the amount of screws in the hopper when the screwdriver is turned clockwise after reaching a peak. A desirable adjustment is that screw feed speed increases gradually with decrease in the amount of screws in the hopper.

6. Feed speed adjustment (Slot 9) will be fundamental for further adjustments once the frequency adjustment slot (Slot 11) has been adjusted to an optimum position.

Figure 9



5] Precautions for Use

1. Power supply connector (dual pin connector)

Make sure to insert the power adapter output plug (input: AC100v, output: DC12v 1A) into the power connector securely, as shown in Fig. 9. Improper plug insertion could cause potential malfunction. For long-term storage of the machine, make sure to remove the power adapter from the wall outlet.

2. External control signal connector (3-pin connector)

This is used to control (start/ stop) Screw Feeder NJN-200 under external signals. The machine comes to a stop when pins 2 and 3 of the connector are short-circuited under external signals. (The external control input cord is supplied as an accessory.)

3. Ground connection

Make sure the machine is well grounded by using a panel setscrew to prevent electric shock hazards or eliminate internal static buildup.

4. Maximum screw feed rate

Make sure the rotating drum is to be filled with screws in the hopper up to its center. Feeding screws must be free of contamination, foreign particles, foreign objects, and magnetization.

The machine is designed for use with precision screws and becomes incapable of exerting its performance if a small gap is clogged with dirt or chippings.

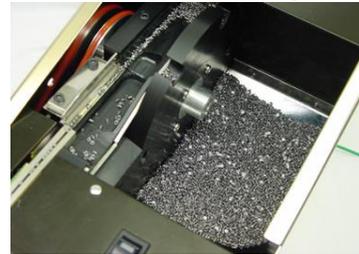
5. Make sure all screws fallen onto the chassis are removed through the notches at four corners before performing screw changeovers.

6. Failure to use the dedicated slot screwdriver to make slot adjustments* may cause the slot's flutes to be damaged.

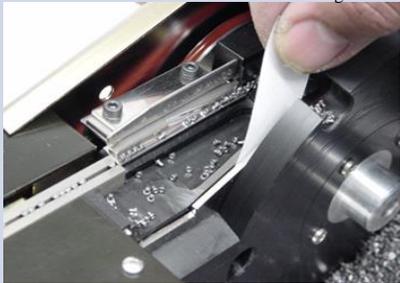
7. When removing the cover for inspection and maintenance of the feeder, always use a screwdriver mated to screws.

8. A damper sponge is inserted into between the rear panel and the spring of the vibrating part on the back of the machine. Do not remove it when performing internal inspection.

Figure 10



6] Troubleshooting

Problem	Probable Cause/ Remedy
<p>The machine remains off after the power switch is turned on.</p>	<ol style="list-style-type: none"> 1. Make sure the power adapter is inserted into a wall outlet properly. 2. Make sure the power adapter output plug is inserted into the jack at the back. 3. Check machine condition with the external control connector disconnected when the feeder operates (ON/OFF) under control of external control signals. (The feeder turns on when the external control connector is disconnected.) 4. Power adapter error (Replacement required) 5. Make sure of power-supply voltage for feeder use overseas.
<p>No drum rotation despite normal movement of the vibrating part</p>	<ol style="list-style-type: none"> 1. Breakage of the round belt for drum rotation (Replacement required) 2. Breakdown of the motor (Replacement required) 3. The drum may not rotate if the drum rotation adjustment knob is turned to the lowest setting. (Turn the adjustment knob clockwise.)
<p>Low oscillation at the vibrating part</p>	<p>Re-adjust the adjustment slots, as shown in Fig. 2, respectively. If the problem persists, foreign objects may be present in the gap between the drum guide base plate and vibrating part (pre-alignment part, alignment unit, and rail). Check the gap by inserting a 0.1- to 0.25-mm thickness gauge or a strip of copy paper into it for foreign objects and size. (See Fig. 11)</p> <p style="text-align: right;">Figure 11</p> 

<p>Variations in drum rotation</p>	<ul style="list-style-type: none"> (1) Contamination, wearing down and looseness of the round belt (Belt replacement required) (2) Contamination of the grooves of the rotating pulley (Cleaning) (3) The gap between the drum guide base (see Fig. 1) and the drum is clogged with dirt or is narrow if the drum fails to rotate smoothly, with the round belt removed, when it is turned with a finger. (Cleaning and gap adjustment) (4) The hopper base plate is in contact with the drum. (Cleaning and gap adjustment) (5) The power switch must be turned off when a screw is engaged in the rotating drum. The drum is designed to recover from failures by manual inversion. Turn the reverse sensitivity adjustment slot (see Fig. 2) counterclockwise for adjustments because drum inversion may be disabled. (6) Screws are magnetized. Replace all screws in Smart Feeder with new ones. Defective screws may be magnetized if normal screw feeding is observed after screw replacement. Demagnetize it with the demagnetizer.
<p>Disrupted screw feeding despite normal movement of the vibrating part</p>	<p>Check the vibrating part and the screw surface for contamination. Check the surfaces of the vibrating part (pre-alignment part, alignment unit, and rails), hopper, and rotating drum for contamination, oil, and metal impalpable powder. Always keep all surfaces that screws come into contact, especially the inside of the rail, clean. Screw feeding may be disrupted if disregarded. Wipe them with a clean dry cloth. Wipe them with a swab wetted with alcohol if considerably contaminated.</p>

7] Main Specifications

Model: NJN-200

Input voltage: DC12V ($\pm 5\%$)

Feeding type: Electromagnetic, drum rotating and pumping type (drum inversion available)

Applicable screws: M2.0 to M4 \times 6 pan head screws

Hopper capacity: Approx. 2,500 M3.0 \times 5 pan head screws

Outer dimensions: W155 \times D290 \times H168

Weight: Approx. 7.0kg (machine only)

Power adapter: AC100 to AC240V

Rail length: Max. 15mm (overhang)

(The specifications are subject to change without notice due to continual improvements.)

*** Provisions of This Warranty ***

KOFU SEIBYO CO., LTD.'s repair services shall be supplied on any problems caused if the machine is used under proper conditions according to the operation manual, with no charge, at the dealer you purchased from. The repair service shall be available upon presentation of the warranty card. KOFU SEIBYO's liability under this warranty shall not be available for the following troubles and damages.

- (1) Troubles or damages caused by mishandling or unauthorized modification
- (2) Troubles or damages caused by post-purchase transport and drop
- (3) Troubles or damages caused by natural disaster such as fire, earthquake, lightning strike, wind and flood, or pollution, salt damage and abnormal voltage
- (4) No presentation of the warranty card
- (5) Omission of the purchase date, dealer name and customer name on the warranty card, or tampering of entries

Product Warranty Model: NJN-200		
Serial #		
Dealer		
	Purchase date (Y/M/D)	
Customer	Name	
	Division	Contact
	Address	
	ZIP:	
Phone:	Fax:	

KOFUSEIBYO Co., Ltd.
 1641-3 Tsuijiarai, Showa-cho, Nakakoma, Yamanashi
 JAPAN 409-3853
 Phone: +81-55-275-5333 Fax: +81-55-275-5332