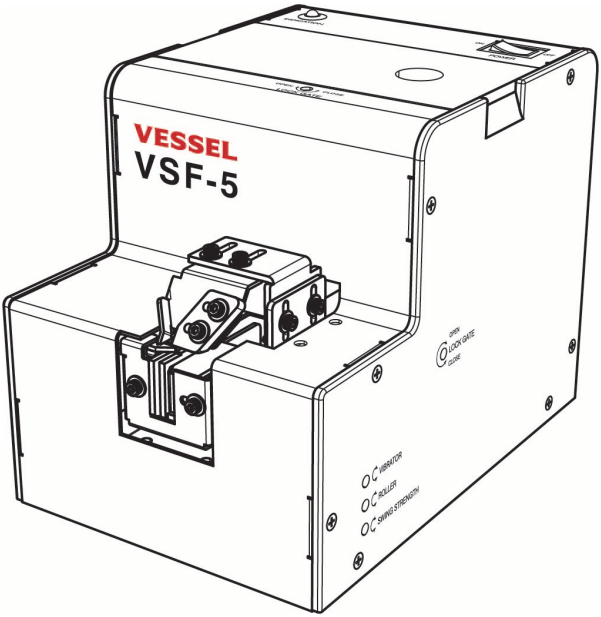
VESSEL

Screw Feeder

No.VSF-5

Instruction Manual



Read this instruction manual thoroughly before starting to use the product.
After reading, keep the instruction manual around so the operators can refer the content whenever necessary.

Table of Contents

■For Safe Use

Safety Precautions

- Read this section, “ Safety Precautions, ” thoroughly before starting to use the product, and handle the product correctly.
- Precautions are classified into following two categories according to the degrees of danger.

⚠ WARNING	Conditions where incorrect handling may lead to death or serious injury
⚠ CAUTION	Conditions where incorrect handling may lead to moderate injury or property damage

⚠	This symbol indicates “ Warning and Caution . ”
⃠	This symbol indicates “ Prohibition ” of actions.
●	This symbol indicates mandatory required actions.

⚠ WARNING	
⃠ PROHIBITED	Do not use the product in an environment with an abrupt temperature change or dew condensation. Risk of product breakdown.
⃠ DO NOT WET	Do not use the product where water, oil, or solvent may be poured or in a place with high humidity. Risk of electric shock or product breakdown.
⃠ PROHIBITED	Do not use the product with specifications other than those specified in the Specifications section. Risk of fire or electric shock.
⃠ PROHIBITED	Do not install, use, or conduct maintenance of the product unless the contents of this manual are fully understood.
● REMEMBER	Be sure to store this manual near the product so the operators can refer to the contents easily.

■Product Features / Specifications

This product scoops up screws with a drum, arranges them on a rail in order, horizontally feeds them with vibration, to eject them one by one with a screwdriver bit.

Features

●Compact size
This space-saving feeder can be installed in an area of just 126 x 182 mm (half of a B5 sheet).

●A variety of screw sizes from M1 to M5 is supported.

●The replacement parts required to change the screw size are enclosed.
The top cover of the feeder functions as a storage case to store the spacers and tools.
The storage case is securely fixed onto the feeder with magnets to prevent loss.

●Equipped with screw supply sensor
The drum rotates and vibrates only when required to supply the screws, so power consumption can be suppressed.

●The structure arranges the screws on a rail in order and then feeds them out, so that they continues to be supplied.
Countersunk screws, pan head screws, truss screws, and washer heads, etc., can be supplied.

* Note that this feeder cannot be used with screw and washer assemblies.
Left: Washer head screw　Right: Screw and washer assembly

Video Introduction A video showing the adjustment procedure is available at the following website. http://www.vessel.co.jp/html/info/movie-ve.html	

■Product Features / Specifications

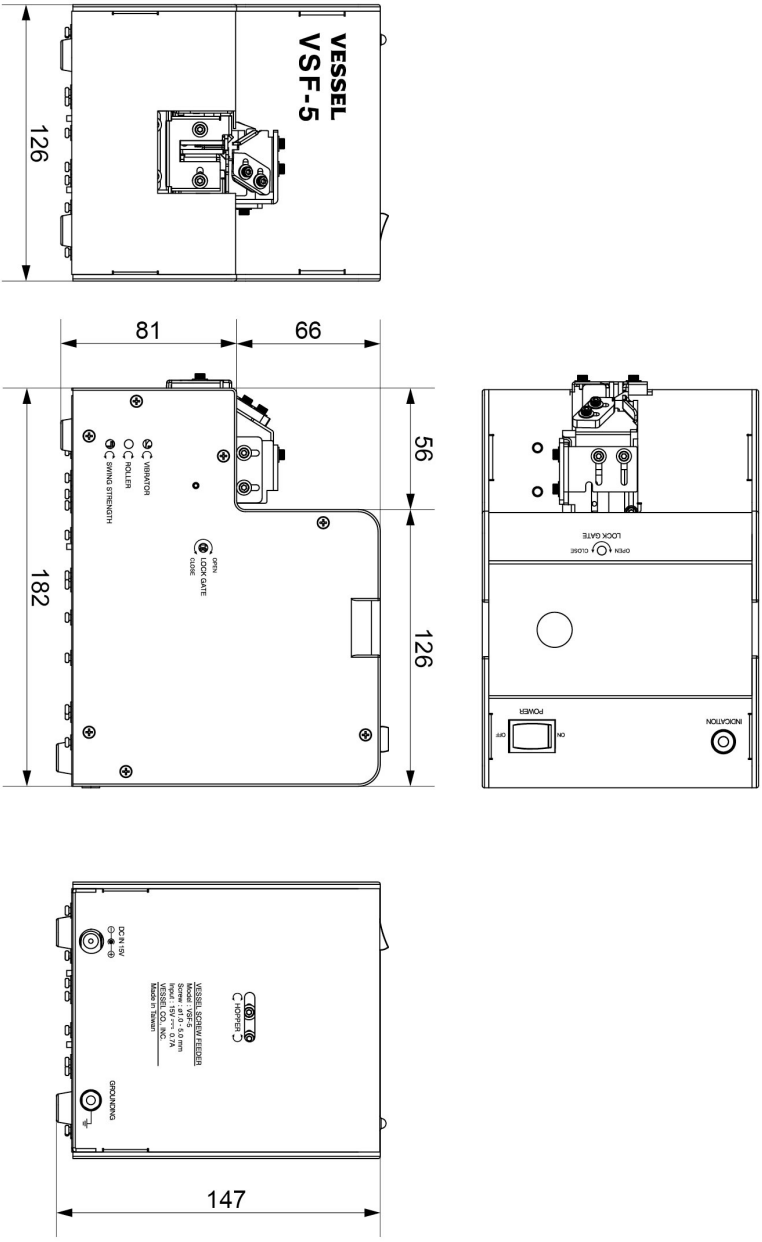
Specifications

Model	:	VSF-5
Input voltage/current	:	15V DC±5% 0.7A
Applicable screw size	:	Nominal diameter M1.0 to M5.0 Screw length L max. 20 mm
Screw capacity	:	Max. 200 cc
Width x Depth x Height	:	126 x 182 x 147 mm (excluding protrusions)
Weight	:	2.2 kg (excluding accessories)
Operating temperatue / humidity	:	0 to 40°C 10 to 95% RH (with no dew condensation)
Installation place	:	Indoors
Material	:	Metal, resin

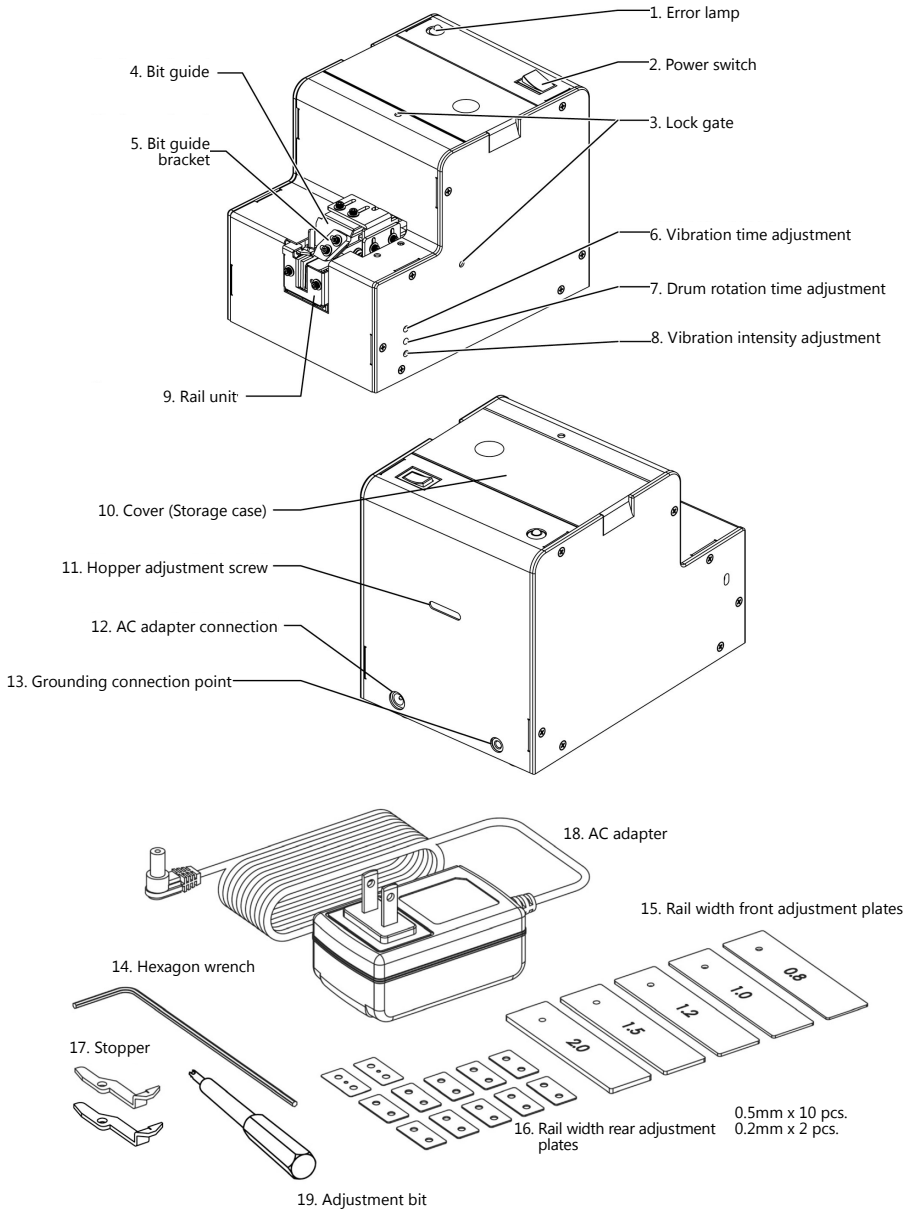
Accessories

AC adapter		
Model	:	AD15-VSF
Rated input voltage	:	100~240V AC (50/60Hz) 0.8A
Rated output voltage	:	15V DC 1.5A
Operating temperature / humidity	:	0 to 40°C 10 to 95% RH (with no dew condensation)
Cord length	:	Approx. 1.8 m
Weight	:	136 g
L-shaped hexagon wrench		H2.0 mm
Stopper		For M1.0 to 2.0 1 pc. For screws larger than M2.0 to M5.0 1 pc.
Rail width front adjustment plates		70 x 90 x t0.8 mm, t1.0 mm, t1.2 mm, t1.5 mm, t2.0 mm 1 pc. each
Rail width rear adjustment plates		20 x 10 x t0.2 mm 2 pcs., 20 x 10 x t0.5 mm 10 pcs.
Adjustment bit		
Grounding wire		
Instruction manual		

■External view



■Names and Functions of Each Part



* The stopper (small) and rail width rear adjustment plates (0.2mm x 2 pcs. 0.5mm x 3 pcs.) are assembled onto the rail unit when the product is shipped from the factory.

■Names and Functions of Each Part

Names and Functions of Each Part

Name	Display	Explanation of Functions
1. Error lamp	INDICATION	Lights when an error occurs.
2. Power switch	POWER	Use to turn the main power ON and OFF.
3. Lock gate	LOCK GATE	Prevents screws in the screw storage area from entering the main unit.
4. Bit guide		Guide for leading a bit to a screw head.
5. Bit guide bracket		Part used to adjust the bit diameter.
6. Vibration time adjustment	VIBRATOR	Sets the continuous time of the vibration that feeds screws.
7. Drum rotation time adjustment	ROLLER	Sets the continuous time of the drum that picks up the screws.
8. Vibration intensity adjustment	SWING STRENGTH	Adjusts the intensity of the vibration that feeds screws on the rails.
9. Rail unit		Rail assembly that feeds the screws with vibration.
10. Cover (Storage case)		Storage box for the rail width adjustment plates and wrenches.
11. Hopper adjustment screw	HOPPER	Adjusts the position of the hopper that supplies screws to the rail.
12. AC adapter connection	DC IN 15V	Connection terminal for the dedicated AC adapter.
13. Grounding connection point	GROUNDING	Terminal for grounding connection.
14. Hexagon wrench		2-mm across flat hexagon wrench
15. Rail width front adjustment plates		Metal plates that are stacked to adjust the rail width. (5 pcs.)
16. Rail width rear adjustment plates		Metal plates that are stacked to adjust the rail width. (12 pcs.)
17. Stopper		Guide that stops the screws at a set position. (2 pcs.)
18. AC adapter		AC adapter dedicated for this unit.
19. Adjustment bit		Dedicated bit for rotating adjustment section on right side of the main unit.

■Before Starting Use

⚠ CAUTION	
● REMEMBER	Always use the enclosed AC adapter.
⃠ PROHIBITED	Do not turn the power ON without the rail inserted.
● REMEMBER	Stop use immediately when a problem is found.
⃠ PROHIBITED	Do not modify or disassemble the product.

Installation place

Install the product on a flat stable place to ensure the correct performance.

The operation and actions will be affected if the product is installed on an incline (unstable place).

■Before Starting Use

Adjustment

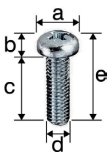
This product is adjusted to an M1.7 screw as the default.

1)	Confirm the screw size	⇒	Measure and confirm the size of each section of the selected screw.
2)	Remove the cover	⇒	Remove the outer cover to make adjustments easy.
3)	Remove the rail	⇒	Remove the rail unit to make adjustment appropriate to the screw.
4)	Replace the stopper	⇒	Replace the stopper that determines the position where the supplied screw stops.
5)	Adjust the rail width	⇒	Adjust the rail width according to the nominal diameter of the screw.
6)	Mount the rail	⇒	Mount the adjusted rail unit onto the main unit.
7)	Adjust the hopper	⇒	Adjust the position of the hopper that feeds the screws onto the rail.
8)	Adjust the brush	⇒	Adjust the height of the brush that drops down the screws improperly fed onto the rail.
9)	Adjust the screw head holding plate	⇒	Adjust the height of the plate so that screws are arranged in order without overlapping.
10)	Adjust the bit guide	⇒	Adjust so that the bit is correctly guided to the position of the screw.
11)	Adjust the sensor	⇒	Adjust the sensor so that the presence of a screw at the stopper position is detected.
12)	Adjust the F-type sensor	⇒	Adjust the sensor so that removal of a screw from the stopper position is detected.

1) Confirm the screw size

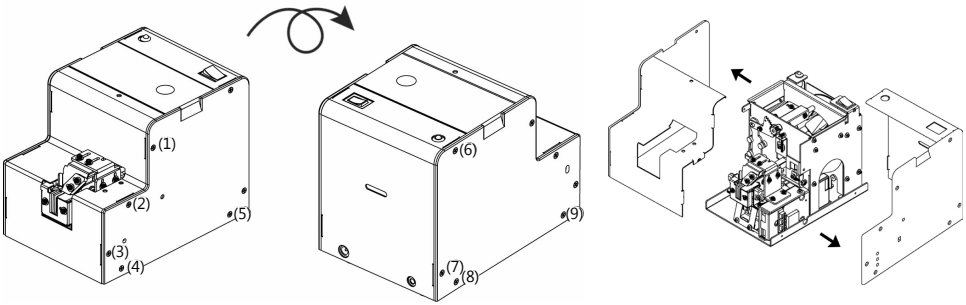
Using calipers, etc., measure the actual dimensions of the selected screw.

a Screw head diameter
b Screw head thickness
c Screw section length
d Screw nominal diameter
e Screw length



2) Remove the cover

There are a total of 16 screws. The cover can be removed by removing all of the screws, but the cover can also be easily mounted and removed by removing screws (1) to (9) shown below.

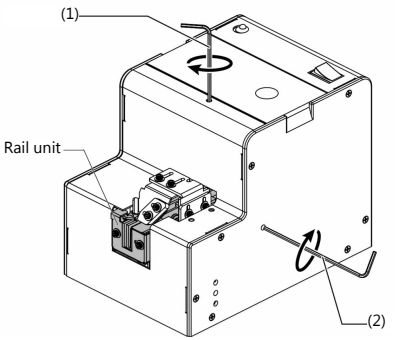


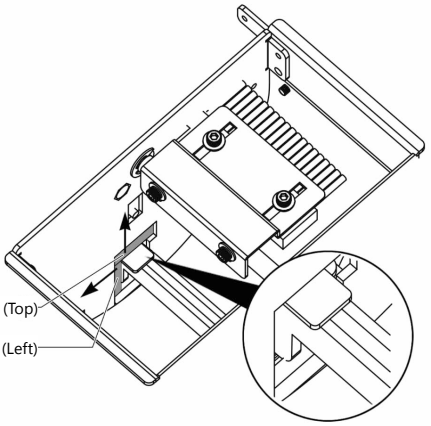
* The adjustment is performed by removing the main unit cover. However, in this manual the process is explained with the cover mounted.

3) Remove the rail

(1) Using the enclosed hexagon wrench, turn the "LOCK GATE" screw on the top of the main unit clockwise, and open the inner gate (Top).

(2) In the same manner, turn the "LOCK GATE" screw on the right of the main unit clockwise, and open the inner gate (Left).

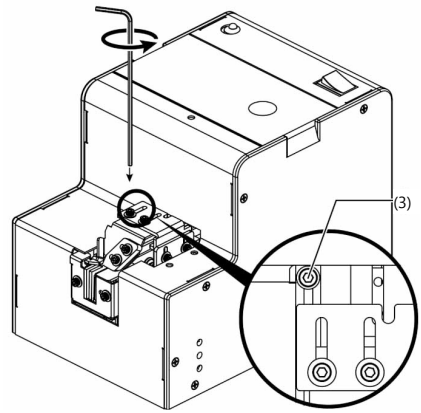


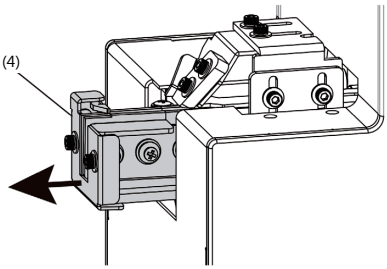


(3) Loosen the "rail fixing screw" at the left back of the rail.

* Take care so that the fixing screw does not come off.

(4) Pull the "rail unit" out of the main unit.

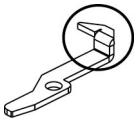


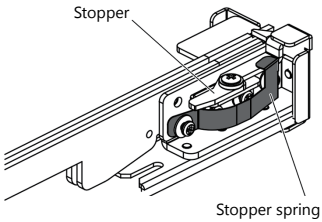


4) Replace the stopper

The stopper must be replaced to match the nominal diameter of the screw.

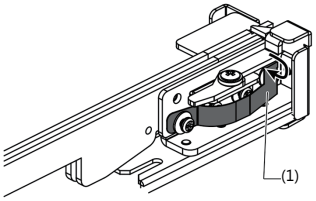
There are two types of stoppers:
For M1.0 to M2.0 (with small claws), and
For screws M2.0 to M5.0 (with large claws)

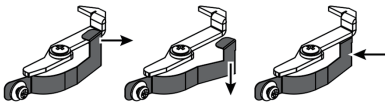


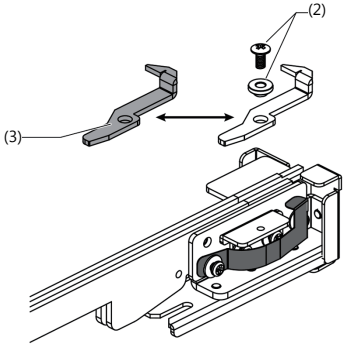


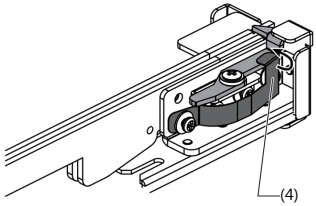
When the unit is shipped from the factory, the M1.0 to M2.0 stopper is mounted to match the M1.7 screw.

(1) Open the "stopper spring", and insert the spring under the stopper.
(2) Remove the "stopper fixing screw" together with the "spacer (black)".
(3) Mount the "stopper" that matches the nominal diameter of the screw at the original position.
(4) Return the spring to the top of the stopper.





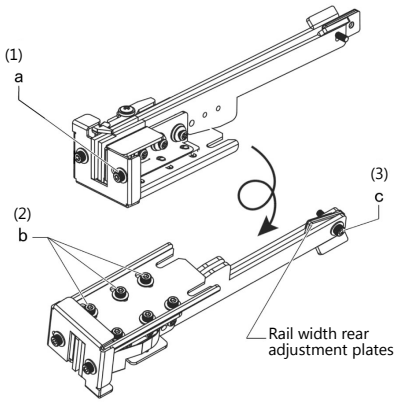


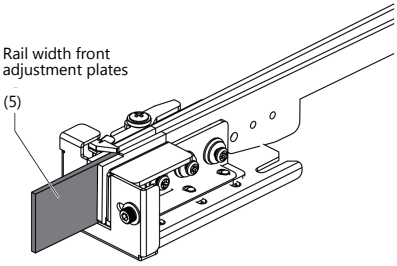


5) Adjust the rail width

The rail width must be adjusted according to the nominal diameter of the screw.

(1) Loosen the (a) screw (right side looking from front).
(2) Reverse the rail as shown below, and loosen the three (b) screws on the right side.
(3) Remove the (c) screw, and pull out the "rail width rear adjustment plate".
(4) Refer to the [Adjustment plate combination table 1] below, and prepare the required number of "rail width front adjustment plates" according to the nominal diameter of the screw in use.
(5) Sandwich the prepared adjusting plate, and tighten the screws in the order of (a) and (b). After tightening the screws, pull out the adjusting plate.



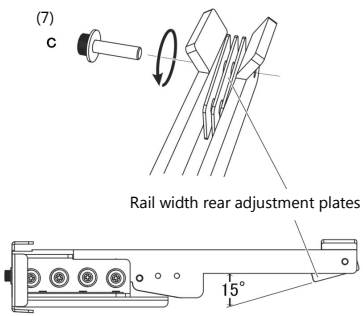


[Adjustment plate combination table 1]		Screw nominal diameter d	Rail width front adjustment plates (mm)
Screw nominal diameter d	Rail width front adjustment plates (mm)	M2.3	1.0 + 1.5
M1.0	1.2	M2.6	1.2 + 1.5
M1.2	1.5	M3.0	1.2 + 2.0
M1.4	1.5	M3.5	1.0 + 1.2 + 1.5
M1.7	0.8 + 1.0	M4.0	1.0 + 1.2 + 2.0
M2.0	1.0 + 1.2	M5.0	0.8 + 1.0 + 1.5 + 2.0

(6) Refer to the [Adjustment plate combination table 2] below, and prepare the required number of "rail width rear adjustment plates" according to the nominal diameter of the screw in use.

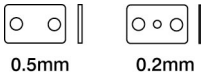
(7) As shown on the right, slant the prepared adjustment plate by approx. 15° and sandwich it in. Then, tighten screw (c).

* After adjusting, confirm that selected screws slide smoothly over the rail.



[Adjustment plate combination table 2]		Screw nominal diameter d	Rail width rear adjustment plates (mm)
Screw nominal diameter d	Rail width rear adjustment plates (mm)	M2.3	0.2 × 2 + 0.5 × 4 = 2.4
M1.0	0.2 + 0.5 × 2 = 1.2	M2.6	0.2 + 0.5 × 5 = 2.7
M1.2	0.2 × 2 + 0.5 × 2 = 1.4	M3.0	0.2 + 0.5 × 6 = 3.2
M1.4	0.5 × 3 = 1.5	M3.5	0.2 + 0.5 × 7 = 3.7
M1.7	0.2 × 2 + 0.5 × 3 = 1.9	M4.0	0.2 + 0.5 × 8 = 4.2
M2.0	0.2 + 0.5 × 4 = 2.2	M5.0	0.2 + 0.5 × 10 = 5.2

* The rail width rear adjustment plate with two holes is the 0.5 mm adjustment plate, and the plate with three holes is the 0.2 mm adjustment plate.



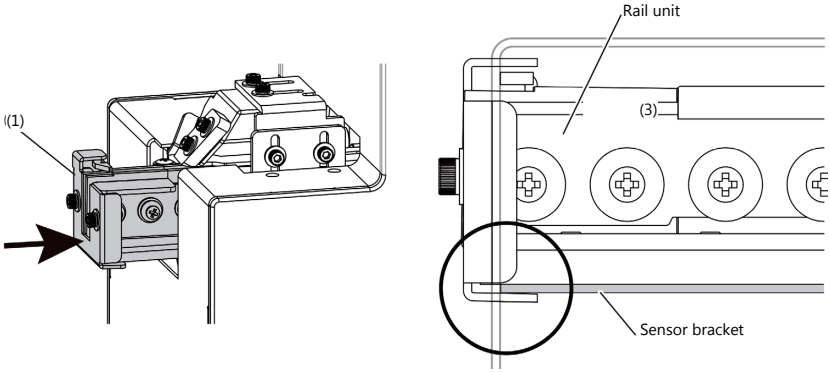
6) Mount the rail

(1) Return the "rail unit" to the main unit.

* Confirm that all screws are properly tightened before inserting.

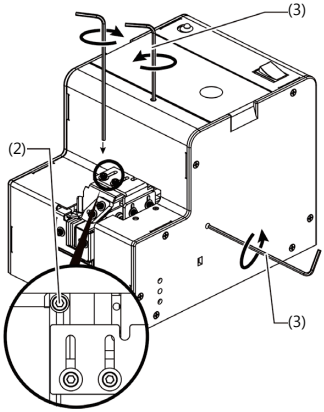
* Make sure that the rail unit does not rise up onto the sensor bracket when inserting it.

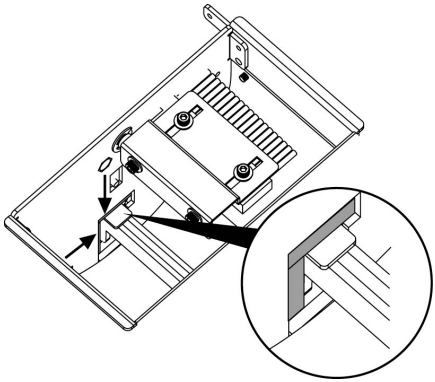
* If the rail unit does not fit into the back, it may be contacting the hopper.



(2) Tighten the "rail fixing screw" and fix the rail unit.
* Mount so that the clearance between the rail unit and main unit is the same on the left and right.

(3) Turn the "LOCK GATE" on the top and right sides of the unit counterclockwise to close the inner gates.
* To prevent contact because of vibration, do not close the inner gates completely. Leave them open by approx. 0.2 to 0.3mm.





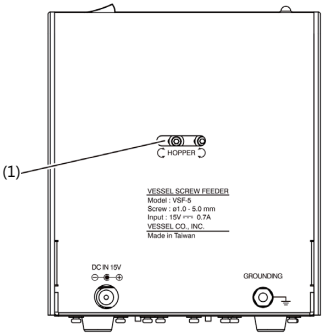
7) Adjust the hopper

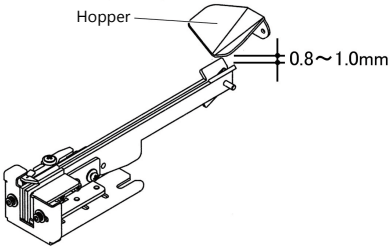
The hopper must be adjusted according to the nominal diameter of the screw.

(1) Using the enclosed hexagon wrench, loosen the two screws on the left and right of the "HOPPER" located on the back of the main unit. With a finger, adjust the hopper so it comes to the center of the rail.

(2) Confirm that there is a clearance of 0.8 to 1.0 mm between the hopper and rear section of the rail.
* If the hopper contacts the rear section of the rail, the vibration will increase and could cause the main unit to fail.

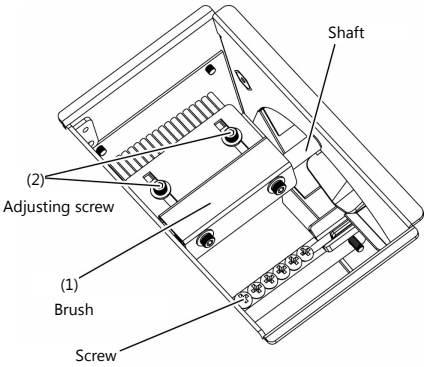
(3) After adjusting, tighten the two screws on the left and right of the HOPPER.





8) Adjust the brush

The brush must be adjusted according to the thickness of the screw head.



(1) Turn the power ON, and allow the brush to swing once. Turn the power OFF when the "adjusting screw" is facing up.

(2) With approx. 5 to 10 screws set on the rail travel face, loosen the two adjusting screws and adjust the brush position.

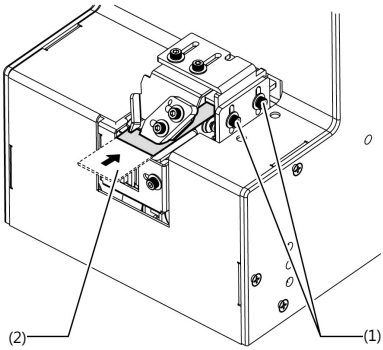
* Swing the brush by hand, and adjust to the height where the bristles slightly sweep over the head of the screw.
* When swinging by hand, do not rotate the brush over the range that it normally swings.
* Adjust so that the brush does not contact the screw head with force.
* The bruch is flocked according to the incline of the rail. Always mount the bruch so that the bristles and the rail are parallel.

(3) After adjusting, swing the brush by hand again, and confirm that the brush rotates smoothly.

(4) Tighten the two adjustment screws.

9) Adjust the screw head holding plate

The screw head holding plate must be adjusted according to the thickness of the screw head.



(1) As shown on the right, loosen the two screws and adjust the height of the "screw head holding plate".

(2) As shown on the right, insert the rail width front section adjustment plate into the opening to secure a clearance, and then tighten the screws. Pull out the adjustment plate after tightening the screws.

* Prepare an adjustment plate equal to the screw head thickness plus 0.1 to 0.5 mm thick.
  Example of adjustment: For 1.5 mm thickness at screw head.
  Use the rail width front section adjustment plate (1.0 + 0.8) mm, and confirm the clearance.
* Confirm that the rail and the screw head holding plate are parallel.
* Check that the stopper is not nipped by the adjustment plate.

10) Adjust the bit guide

The position of the bit guide must be adjusted according to the screw head.

The bit guide bracket must be adjusted according to the bit shaft diameter.

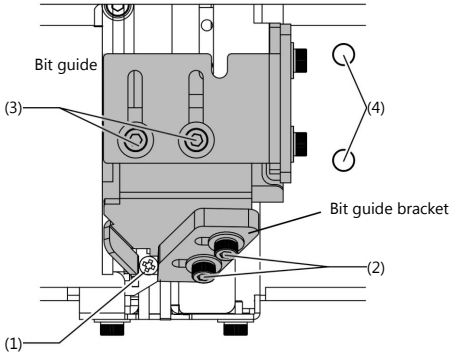
(1) Turn the power ON, move the selected screw to the "stopper" position, and then turn the power OFF.

(2) Loosen the two screws fixing the bit guide bracket, and adjust the bit width according to the shaft diameter of the selected bit.

* Approx. bit shaft diameter + 0.2 mm

(3) Loosen the two fixing screws on the top of the bit guide, and adjust the front/rear position of the bit guide according to the screw head.

* Adjust the bit guide so that the screw head comes to the center of the stopper and the bit guide.



(4) Loosen the two fixing screws in the hole on the left side of the bit guide, and adjust the left/right position of the bit guide according to the screw recess.

* Adjust so that the center of the bit guide's bit width comes to the center of the rail.

(5) After adjusting, confirm that the screws can be removed smoothly with the selected bit.

* The screw ejection will be affected even if the bit guide position is too wide or too narrow.
* Adjust so that the bottom edge of the bit guide is level with the rail travel face.
* If the screws are not ejected smoothly, check whether the screw head is at the correct position.

11) Adjust the sensor

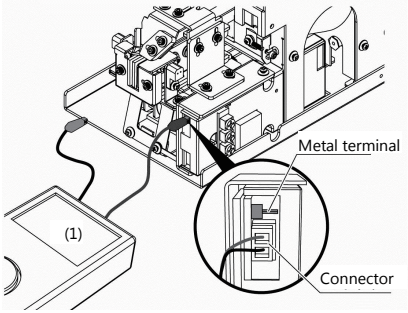
The sensor may be adjusted when the shape or size of the screw head is different.

Start operation once. The sensor must be adjusted if there are any problems such as below:

- "the drum rotation or the rail vibration does not stop even when a screw is at the stopper position";
- "the drum does not rotate, or the rail does not vibrate even when a screw is not at the stopper position".

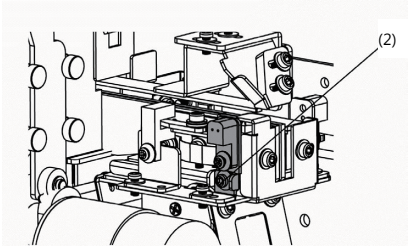
■Before Starting Use

(1) Prepare a tester to adjust the sensor. Connect the tester to the sensor output side (peel off tape to expose metal terminal) and the ground (plate under the unit), and set the tester to read the voltage value. After connecting, turn the power ON.
 * When the black/brown connector is disconnected, the vibration will stop and it will be easier to adjust the senor.



(2) Adjust only the sensor on the front left side. Loosen the fixing screw at the sensor adjustment section.
 * The adjustment section is fixed with a hexagon socket bolt.

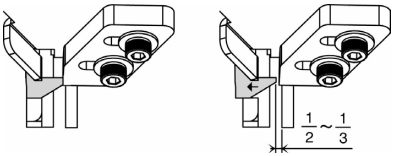
(3) Finely adjust the position while reading the tester value. Adjust so that the value is 3 V or more when there is a screw at the "stopper" position, and 0.4 V or less when there is no screw.
 * The sensor will operate normally even if the setting varies slightly, but it will malfunction if the setting varies greatly.



(4) After adjusting, tighten the fixing screw so that the sensor does not move.

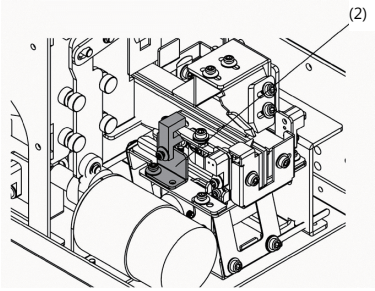
12) Adjust the F-type sensor

In the same manner as "11) the sensor adjustment", it may be necessary to adjust the F-type sensor if the screw head shape or size is different.



(1) Adjust the sensor so that it does not react when the "stopper" claws have not moved, and makes detection and advances to the next step when the claws move 1/2 to 1/3.

(2) The sensor is adjusted by adjusting the bending angle of the base on which the sensor is fixed with a tool (radio pliers, etc.).
 * Note that the base could break if it is bent too far.



⚠ CAUTION	
● REMEMBER	When the product is not used for a long time, turn off the power supply and unplug the product from the outlet.
● REMEMBER	Always use the enclosed AC adapter.
⃠ PROHIBITED	Do not allow dust or oil, etc., to stick onto the rail travel face.
⃠ PROHIBITED	Do not use non-applicable sized screws, or screws to which oil or dirt adheres, etc.
⃠ PROHIBITED	Do not apply excessive force on the rails or bit guide when removing the screw. There is a risk of damage, and the normal operation and movements of the main unit could be adversely affected.
⃠ PROHIBITED	Do not place fingers or foreign objects in screw storage section while this product is operating or moving.
⃠ PROHIBITED	Do not turn the power ON without the rail inserted.
● REMEMBER	If an abnormality occurs during operation, turn the power OFF immediately, and unplug the product form the outlet. Continuing use in an abnormal state could lead to unforeseen injuries, electric shock, or fires, etc.

Re-check before starting use

Re-check the following items before starting use.

(1) Is the enclosed AC adapter connected?

(2) Are the two "LOCK GATES" closed to the correct position?

(3) Is the bottom edge of the rail unit properly fit into the sensor bracket?

When finished with all adjustments and confirmations, use the product with the following steps.

■Operation

Operation

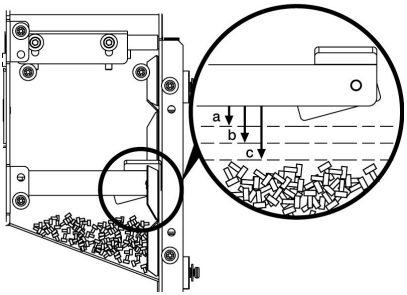
1) Load the screws

(1) First, confirm that the power is OFF.

(2) As shown on the right, open the top cover of the main unit, and load a suitable amount of selected screws.

* Load enough screws so that the bottom edge of the rail on the screw storage section is not contacted. The maximum screw capacity is 200 cc.
* Do not load different types of screws.

Thread length 1 to 10 mm ... a (10 mm)
Thread length 10 to 15 mm ... b (15 mm)
Thread length 15 to 20 mm ... c (20 mm)

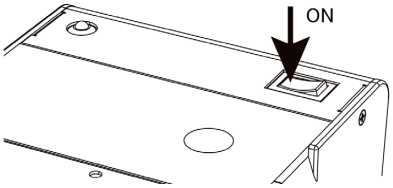


2) Turn the power ON.

(1) Connect the enclosed AC adapter to the outlet and the "DC IN 15 V" power on the back of the main unit.

(2) Turn ON the power switch at the top of the main unit.

A "beep" will sound to indicate starting, the drum will start rotating, and the rail will start vibrating. The screws will advance along the rail, and stop once when they reach the stopper.



3) Remove the screw with the electric screwdriver.

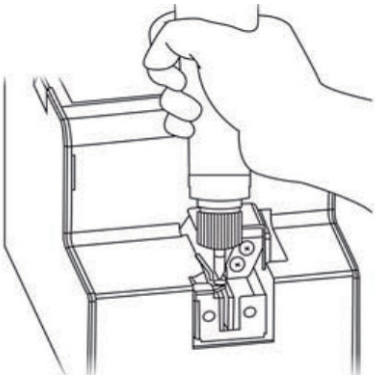
(1) Mount a bit that matches the selected screw onto the electric screwdriver.

* Select and use a magnetized bit.
* The screw cannot be picked easily unless the bit is magnetized.

(2) Align the bit to the bit guide.

(3) Lower the screwdriver vertically while rotating, and when it contacts the screw head, pull it forward and out levelly.

* Do not apply excessive force when lowering the electric screwdriver.

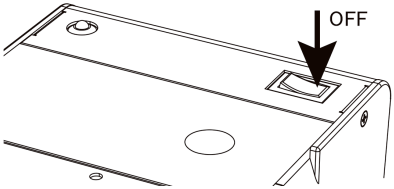


* Take care so that the bit does not contact places other than the bit guide.

Stopping operation

1) Turn the power OFF.

(1) Turn OFF the power switch at the top of the main unit.



Other adjustments

1) Vibration time adjuster "VIBRATOR"

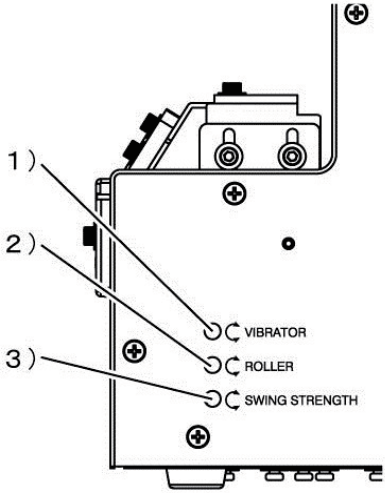
The time to when the vibration stops after the screw moves to the bit guide can be set.

2) Drum rotation time adjuster "ROLLER"

The time to when the roller drum stops after the screw moves to the bit guide can be set.

3) Rail vibration strength adjuster "SWING STRENGTH"

The strength can be set so that the screws on the rail move at a speed suitable for screw feed.



Other functions

1) Blocking prevention function

If foreign matters or screws get caught in the drum section and the operation stops, this unit can rotate in reverse temporarily to remove such items. If the blockage cannot be resolved by such reverse rotation, the operation will stop automatically, and the operator will be alerted with an error lamp and buzzer.

■Maintenance and Inspection

⚠ CAUTION	
● REMEMBER	Unplug the power plug before starting inspections. Risk of electric shock or product breakdown.
⃠ PROHIBITED	Do not wipe the product by using detergent or solvent. Risk of cracking, electric shock, or product breakdown.
⃠ PROHIBITED	Do not pour water on the product. Risk of electric shock or product breakdown.
● REMEMBER	Periodically inspect the product. Failure to perform inspections could result in early faults.

Before starting maintenance, always turn the main unit power OFF and unplug the AC adapter.
Before starting maintenance, remove all screws in the screw storage section and on the rail.

Cleaning the rail

The screws will not travel well, or operation faults will occur if dust or oil adheres on the rail.
Periodically remove the rail unit from the main unit, and wipe the rail groove, in which the screws travel, with a cotton swab soaked in alcohol.

Removing the rail unit

(1) Using the enclosed L-shaped hexagon wrench, turn the "LOCK GATE" screw on the top of the main unit clockwise, and open the inner gate.
(2) In the same manner, turn the "LOCK GATE" screw on the right side of the main unit clockwise, and open the inner gate.
(3) Loosen the "rail fixing screw" at the left back of the rail, and pull the rail unit out of the main unit.
(4) Adjust the rail width, and then return the rail unit to the main unit.
 * Refer to "5) Adjust the rail width (Before starting use)", and adjust the width of the rail.
 * Confirm that all screws are properly tightened before inserting the rail unit.
 * After inserting, check that the rail unit is fitted over the "sensor bracket".
(5) Tighten the "rail fixing screw" to fix the rail unit.
 * Do not forget to assemble the spacer (black) for the stopper part.
 * Mount so that the clearance between the rail unit and main unit is the same on the left and right.
(6) Turn the "LOCK GATE" on the top and right sides of the unit counterclockwise to close the inner gates.
 * To prevent contact because of vibration, do not close the inner gates completely. Leave them open by approx. 0.2 to 0.3mm.

Replacing the brush

If screws at an abnormal posture cannot be removed even after adjusting the brush, it may be worn. The brush must be replaced in this case.

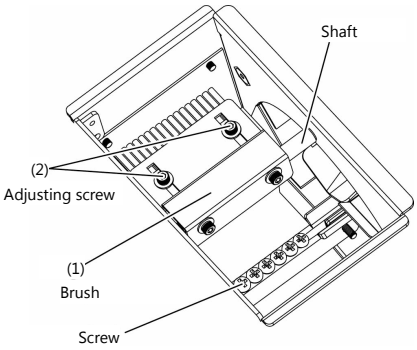
Removing the brush

(1) Turn the power ON, and allow the brush to swing once. Turn the power OFF when the "adjusting screw" is facing up.

(2) Remove the two "adjusting screws", and remove the brush from the shaft.

(3) Replace with a new brush, and mount at the original position.

* Refer to "8) Adjust the brush (Before starting use)"), adjust the position, and confirm the operation.



Cleaning the main unit

After cleaning the rails, clean the main unit while taking care to the circuit board inside.

Clean around the main unit to ensure normal operation of the unit.

* There are some sections that use grease. Take care not to wipe off this grease.

Parts

Always use genuine parts to ensure the product quality and normal operation of the machine.

Miscellaneous

Please consult with your dealer or Vessel when using special screws.

The specifications, appearance, and standards, etc., are subject to change without notice for product improvement.

⚠ CAUTION	
⃠ PROHIBITED	Do not use the product in the following conditions. Risk of fire or electric shock. ・ The product is broken due to dropping or shock. ・ The cord is damaged or heated up. ・ When the plug to the outlet is loose.
● Turn the power OFF.	If any abnormality occurs, turn the power switch OFF and disconnect the AC adapter.
⃠ PROHIBITION OF DISASSEMBLY	Never disassemble the product.

Continuing use with faults or abnormalities could result in product failure or accidents.
Consult a dealer where the product is purchased for repairs.

■Measures at Abnormal Conditions

Troubleshooting

Problem	Causes	Measures
Feeder does not operate even when power switch is turned ON.	AC adapter is not connected.	Connect the AC adapter.
	Screws exceeding the suitable amount have been loaded in the screw storage section.	Adjust the quantity of screws in the screw storage section to the suitable amount.
	Screws or foreigh matters have entered the main unit.	Remove the screws or foreign matters.
	AC adapter, switch, motor, or circuit board fault	Consult with your dealer.
Drum inside screw storage section does not rotate.	Screws exceeding the suitable amount have been loaded in the screw storage section.	Adjust the quantity of screws in the screw storage section to the suitable amount.
	Motor fault	Consult with your dealer.
The screws do not move.	Rail width adjustment fault	Adjust the rail width.
	Brush cannot remove screws at an abnormal posture.	Adjust the brush height. Adjust the screw head holding plate height.
	A screw at an abnormal position is caught on the screw head holding plate.	Remove the screw at the abnormal posture. Adjust the screw head holding plate height.
	Screw at abnormal position stops in the middle of the rail groove.	Remove the screw at the abnormal posture. Adjust the screw head holding plate height.
	Rail vibration is improperly adjusted.	Adjust the rail vibration strength. Adjust the "SWING STRENGTH".
The rail does not vibrate.	A screw or foreign matter is caught between the rail and main unit.	Remove the caught screw or foreign matter.
		Contact your dealer if no screw or foreign matter is caught, and the unit does not vibrate.
	Rail vibration is improperly adjusted.	Adjust the rail vibration strength. Adjust the "SWING STRENGTH".
	Vibration motor trouble or fault	Consult with your dealer.
The screw feed does not keep up.	The rail vibration time or drum rotation time is improperly adjusted.	Adjust the vibration time adjuster "VIBRATOR" or rotation time adjuster "ROLLER".

■Measures at Abnormal Conditions

Troubleshooting

Problem	Causes	Measures
Abnormal vibration or movement fault of screws on rail	Screw head holding plate is improperly adjusted.	Adjust the screw head holding plate height.
	Screw travel face is dirty or dusty.	Clean the screw travel face.
	Rail vibration is improperly adjusted.	Adjust the vibration time adjuster "VIBRATOR" or rotation time adjuster "ROLLER".
	Screw or foreign matter is caught in rail or vibration motor.	Remove the caught screw or foreign matter.
	Vibration motor is faulty.	Consult with your dealer.
Screws with abnormal posture are caught in rear section of rail.	Screws with abnormal posture are not removed by brush.	Adjust the brush. Replace the brush.
	Screw head holding plate is improperly adjusted.	Adjust the screw head holding plate height.
Screw stops without moving to stopper.	Screw head holding plate is improperly adjusted.	Adjust the screw head holding plate height.
	Rail width adjustment fault	Adjust the rail width.
	Screw is magnetized.	Demagnetize the selected screw.
Screw cannot be removed because it does not align with the bit properly.	Bit guide is improperly adjusted.	Adjust the bit guide and bit guide bracket.
Abnormal noise is heard from drum or rail.	Screw is caught in or contacting the fixed section.	Turn the power OFF and remove the screw. Adjust the hopper.
Screw dropped into the main unit.	The lock gate is not closed.	Shake the main unit and remove the screw.
		Open the main unit cover and remove the screw.

■Storage

⚠ CAUTION	
⃠ PROHIBITED	Do not store the product in the following locations. Risk of product breakdown. ・ Where a marked vibration or shock is applied to the main body ・ A place that is hot and highly humid beyond the range of the specifications ・ Where dew condensation occurs ・ Where the risk of ignition or explosion exists such as near flammable solvent or dust powder ・ Where a considerable amount of dust, dust powder, or smoke exists ・ Where water, oil, or chemicals may be poured on the product ・ Where an intensive electric field or ferromagnetic field is generated

■Warranty Certificate

Thank you very much for choosing our product.
VESSEL offers warranty service as per this manual in the case that the product gets out of order during the warranty period, in spite of the correct use according to the remarks described in this manual.
When the product gets broken, request a repair from a dealer where the product is purchased. Proof and date of purchase must accompany any request.

Even during the warranty period, a repair will be considered payable in the following cases.

1) Damage and/or breakage occurred due to an incorrect usage method or negligence during operation
2) Damage and/or breakage occurred due to an unauthorized repair or modification
3) Damage and/or breakage occurred due to fire, earthquake, flood, thunder, other natural disasters, gas damage, salt damage, pollution, abnormal voltage, etc.
4) Damage and/or breakage occurred due to transfer or transportation after purchase
5) Loss of this warranty certificate, not filling out the specified section, or when the words of this warranty certificate are tampered with.

This warranty certificate cannot be re-issued. Keep it safely and do not lose it.

- This warranty certificate only warrants a free repair or replacement of the breakdown of this product. It does not imply that the Vessel incurs damages that occurred due to a use or a usage failure of this product.
- This warranty certificate promises a free repair under the specified period and conditions. Therefore, it does not limit any legal rights of the customer.

Model	VSF-5	
Warranty Period	One year	The vessel is controlling the shipping date by using the product S/N.
Customer	Name	
	Address	Postal Code
	Phone Number	
Dealer	Store Name/Address/Phone Number	

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