

SATAKE

INSTRUCTION MANUAL

GRAVITY SELECTOR

SGA5B-T, 10B-T, 15B-T



WARNING

- Do not carry out any operation, maintenance or inspection of the machine until you have read and well understood the contents of this instruction manual.
- Keep this manual at hand whenever any operation, maintenance or inspection of the machine is being carried out.

SATAKE (THAILAND) CO., LTD.

CONTENT

1. LIMITED WARRANTY	4
2. SAFETY.....	5
2.1 Warning / Caution Types and Meanings	6
2.2 General Instructions	7
2.3 Special Precautions	9
2.4 Warning Stickers	10
2.5 Location of Warning Stickers	11
3. SPECIFICATIONS.....	12
4. DIMENSIONS	14
5. CONSTRUCTION	20
5.1 How it works.....	22
6. INSTALLATION.....	23
6.1 Rigging Method of the Machine	23
6.2 Confirmation of Levelness.....	24
6.3 Position of Setting.....	24
6.4 Remove the Retaining Fittings	25
6.5 Selection of Floor	25
6.6 Maintenance Space	26
6.7 Static Vacuum Pressure	26
6.8 Power Line	27
6.9 Fault Signals from Downstream Processes.....	27
6.10 Rubber Springs.....	28
6.11 Installation Procedure	29
6.12 Design of the Processing Line	30
7. PREPARATION FOR OPERATION.....	31
7.1 Inspection	31
7.2 No-Load Operation	31
8. OPERATION	32
9. ADJUSTMENT OF AMPLITUDE	36

9.1	How to Adjust Amplitude.....	36
9.2	Standard Position of Balance Weight.....	37
10.	MAINTENANCE AND INSPECTION.....	38
11.	TROUBLESHOOTING.....	40
12.	LIST OF CONSUMABLE PARTS.....	42
	EMERGENCY ADDRESS AND TELEPHONE.....	43

1. LIMITED WARRANTY

The machine was produced under quality control and inspection. But, if there are any problems under normal use the limited warranty for the machine extends for the first year beginning on the date of purchase of the machine.

1. Please contact our agency or sales office to repair. If there is a problem within limited warranty period, We will repair for free (only under normal use condition). After the warranty period, repair fee would be billed.
2. It will be charged during limited warranty period following conditions.
 - (1) Damages & losses misuse of improper or operated installation with no care.
 - (2) Damages & losses unauthorized modification or unauthorized repair.
 - (3) Damages & losses because of disasters (fire, flood, storm and earthquake etc.), pollution, unusual voltage & damaged by sea air (rust).
 - (4) Damages & losses which you moved or dropped the machine after setting.
 - (5) Damages & losses which use of unauthorized spare parts or repair at unauthorized agency or factory.
3. We will supply parts of the machine for 7 years after stop of production. But within this period some special parts are exceptional.
4. Basically, We will stop to supply parts in 7 years after discontinued to produce. But if you have a request to order the parts, We will discuss about it. All warranty informations, machine features and specifications are subject to change without notice.

2. SAFETY



WARNING

Do not carry out any operation, maintenance or inspection until you have read and well understood the contents of this instruction manual.

- Keep this manual at hand for reference whenever any operation, maintenance or inspection of the machine is being carried out.
- When you operate, maintain or inspect the machine, you are requested to follow instructions and warnings as stipulated in this manual. If you have any questions or indistinct points, you should suspend operation of the machine or your work until you can clarify it with the Satake office listed at the end of this manual for inquiries about the machine.
- Satake shall not be responsible for any injury, loss or damage caused by failure to observe instructions stipulated in this manual, by misuse or modification without our permission.

This chapter describes the definition of hazard signal words as well as safety precautions to be observed at the time of operation, maintenance or inspection as detailed and classified in the “General Inspections” and “ Special Precautions.”

2.1 Warning / Caution Types and Meanings

Hazard warning in this instruction manual and warning stickers attached on the machine main body are classified into the following three kinds, depending on the degree of risk of accident.

Operator must recognize the importance of the warnings, and carefully follow the instructions given in this manual.



This shows potential hazard. If you do not follow this, there is some possibility of fatal or serious injury.



This shows potential hazard. If you do not follow this, there is some possibility of middle or minor class injury, damages of the equipment / machinery or misconduct in material or product.



This is used for calling special attention to or adding emphasis to a certain information required to be noticed.

**WARNING**

- The operator is supposed to pay attention to the following points to ensure safety in operating, inspecting and serving the machine.

- (1) Operator must contain long hair in a hair cover and neatly wear clothes and shoes that are suitable for work. When carrying out any inspection or maintenance, wear appropriate protective gear such as helmet and safety shoes.
- (2) Keep clean the surroundings and passages around the machine.
- (3) Do not pour water over the machine. Water in the machine shorts the electric circuits, consequently causing the machine to break down.
- (4) Do not fail to ground the machine in order to protect a person from being involved in electric accidents and to prevent fires from occurring due to current leaks.
- (5) Never touch the live parts inside the machine after turning on power.
- (6) Do not permit any person who has not been properly trained to operate or service the machine.
- (7) Keep out any person other than those permitted by the operator. Never let children come close to the machine.
- (8) Do not fail to inspect the machine before starting operation. When carrying out any inspection work, always power off and clearly indicate that the machine is under inspection or maintenance both in the control room and control panel at the work shop.

- (9) Always power off before inspection and maintenance and follow the appropriate lock out procedure. After the inspection, make sure that there are no tools left.
- (10) Check for any looseness or damage on bolts, nuts and belts. Make sure to restore the cover after the checking.
- (11) Check for any damages on power cords and wire cables. Also, check for any looseness or disconnection of connectors and plugs.
- (12) Operate the machine with all covers attached. Do not attempt to remove any cover during the machine operation.
- (13) Always stop the machine before greasing the driving part of the machine.
- (14) Operator should well understand the power off procedure for a case of emergency.
- (15) When working with two or more persons, each person must confirm communication with others before starting work.

2.3 Special Precautions

- (1) Install the machine in a level and stable place. Unleveled and unstable installation will cause vibration and poor performance of the machine.
- (2) Do not operate, inspect or maintain the machine with any part that is not specified in this instruction manual.
- (3) Keep sufficient working space around the machine.
- (4) Before turning the power on, confirm the safety of the surroundings and passages around the machine.
- (5) Handle the machine with care. Careless handling of the machine may lead to malfunction and failure of the machine.
- (6) Keep alert to the machine, If any abnormality is found, stop the operation and check the machine to ensure safe operation.
- (7) When using a ladder, it must be set in stable location.
- (8) In case the machine is used in a dusty place, wear a dust-proof mask and goggles.
- (9) If employees of a plant are unable to read or write, the owner of the plant must explicitly draw their attention to any existing hazards and must give them special instruction.

2.4 Warning Stickers



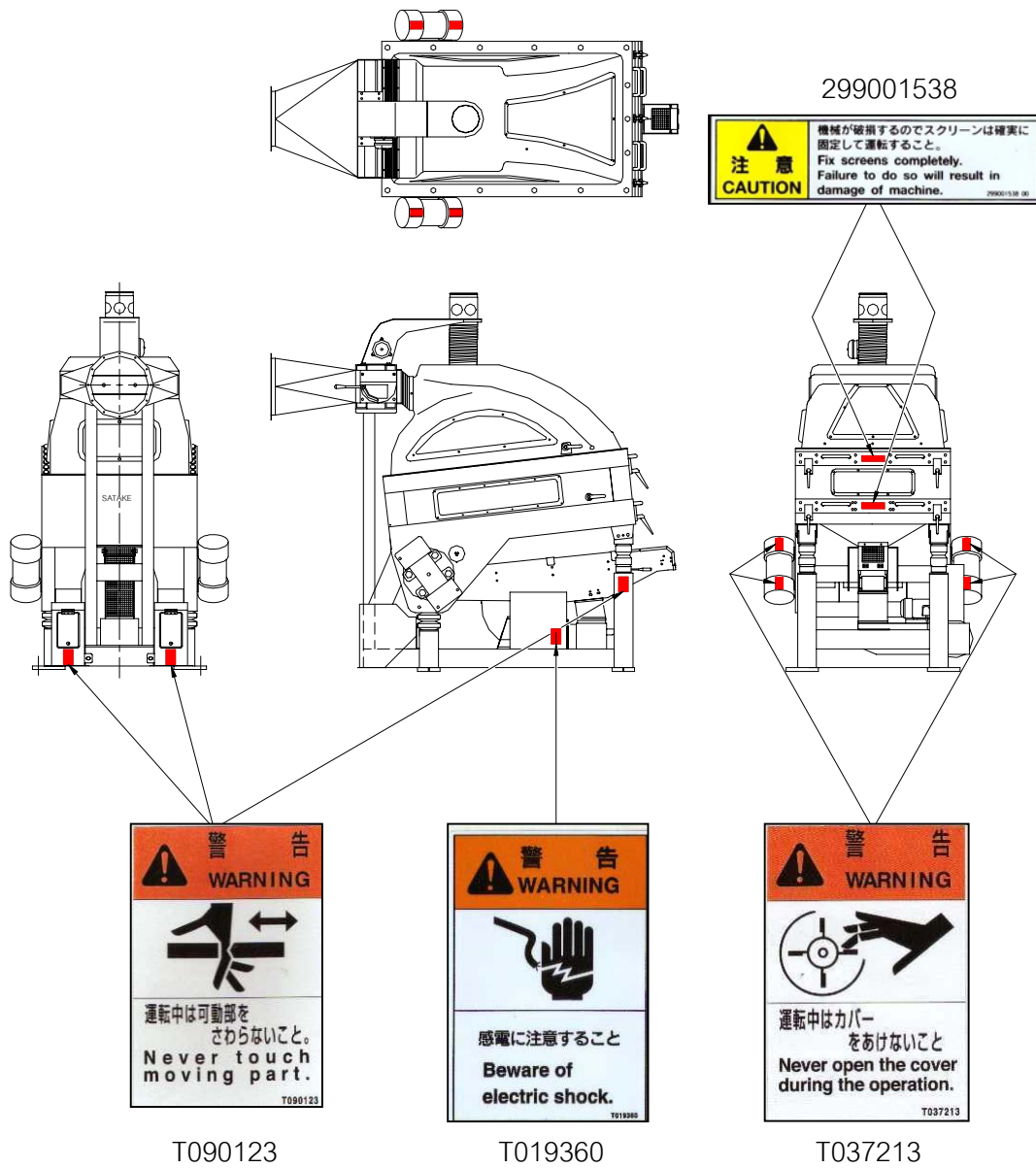
NOTE

How to handle Warning Stickers

- Check if letters and illustration on the sticker are legible and if not, remove dirt on the sticker or replace it.
- Use cloth, water or cleanser to remove dirt. Do not use organic solvent or gasoline.
- In case the sticker is damaged, lost, or illegible, replace it with a new one.

This machine is provided with warning stickers on certain locations where a special precaution is required. It is important for operators to know the location and contents of each stickers and follow the instruction on the sticker to prevent accidents.

2.5 Location of Warning Stickers



※ The machine shown in this Fig. is SGA5B-T

Fig. 2-1

3. SPECIFICATIONS

Model		SGA5B-T	SGA10B-T	SGA15B-T
Capacity	Paddy (Long&medium grain)	3	7	10
	Brown rice (Long & medium grain)	5	10	15
	Wheat (as gravity selector)	6 ~ 9	-	-
	Wheat (as destoner)	5 ~ 7	7 ~ 13	13 ~ 18
Required power		Vibrating motor 1 0.37 kW Vibrating motor 2 0.37 kW Fan motor 0.75 kW	Vibrating motor 1 0.3 kW Vibrating motor 2 0.3 kW Fan motor 0.75 kW	Vibrating motor 1 0.3 kW Vibrating motor 2 0.3 kW Fan motor 0.75 kW
Air Capacity (M ³ / min)	Paddy & Brown rice	80 ~ 90	120 ~ 140	180 ~ 210
	Wheat	80 ~ 90	120 ~ 140	180 ~ 210
Static pressure(KPa)		-0.7	-0.7	-0.7
Net Weight (kg)		620	750	1020
Vertical dynamic loads (kgf)		1550	1880	2550
Dimensions(mm)	W	1304	1814	2440
	L	2074	2074	2074
	H	1979	1946	2179

✘ Above dimensions are for the case of machine with secondary sorter attached there to.

✘✘ Vibrating motors (0.68 kW) are also available.

Remark.

1. Condition of material

Materiel	Moisture content	Bulk density (t/ m ³)
Paddy	Less than 15 %	0.5 ~ 0.6
Brown rice	Less than 15 %	0.75 ~ 0.8
Wheat	Less than 15 %	0.72 ~ 0.85

✘ Capacity may change depends on material condition.

2. Can not separate stone(s), which bigger than 600 mm³ (about size of M 6 Nut), need to install pre cleaner such as Fs and SFI.

3. Need periodically cleaning (once / week)

(May have poor separation with screen which stick bran and paddy shell.)

4. DIMENSIONS

SGA5B-T

With secondary sorter

Unit: mm

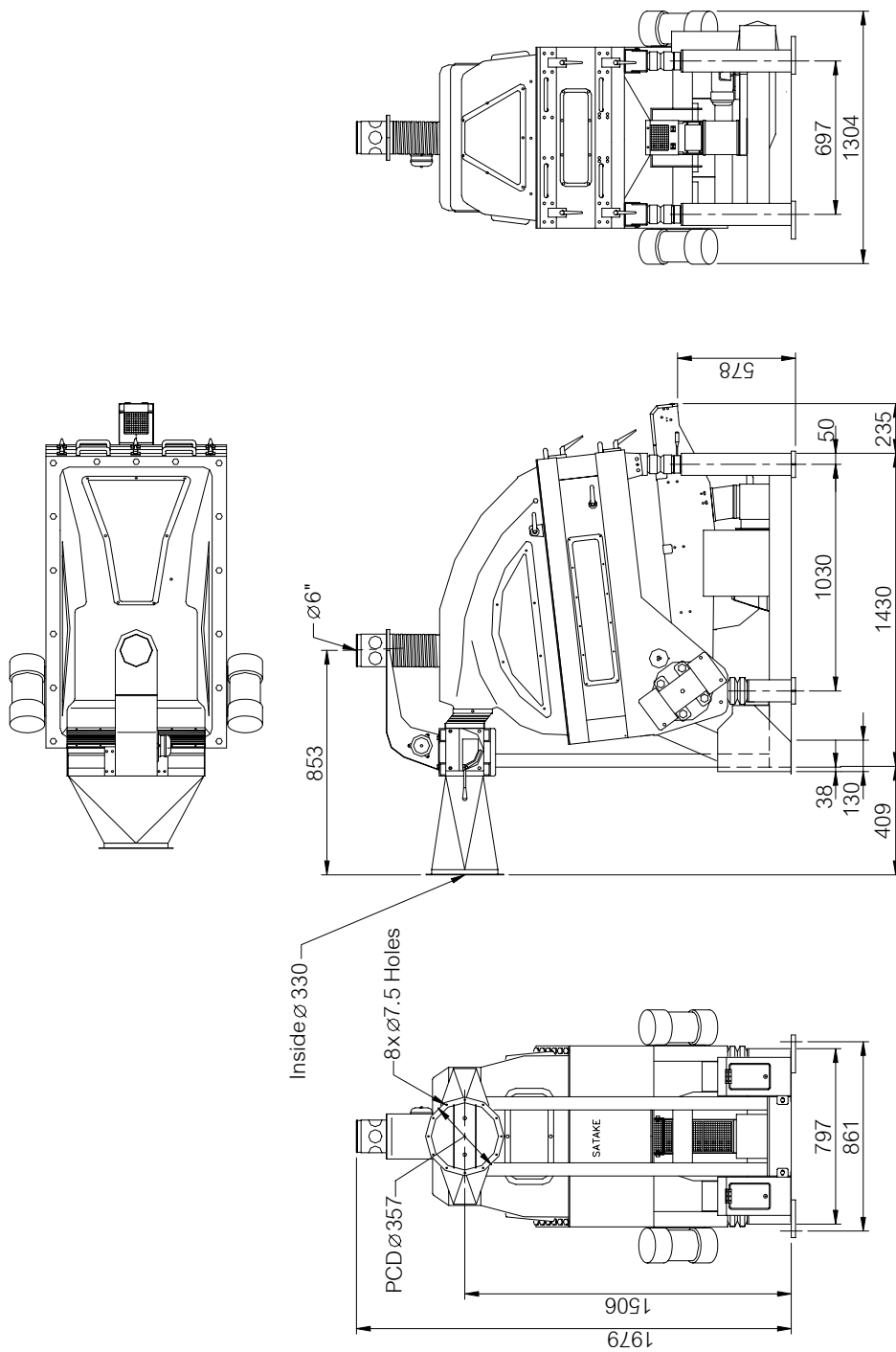
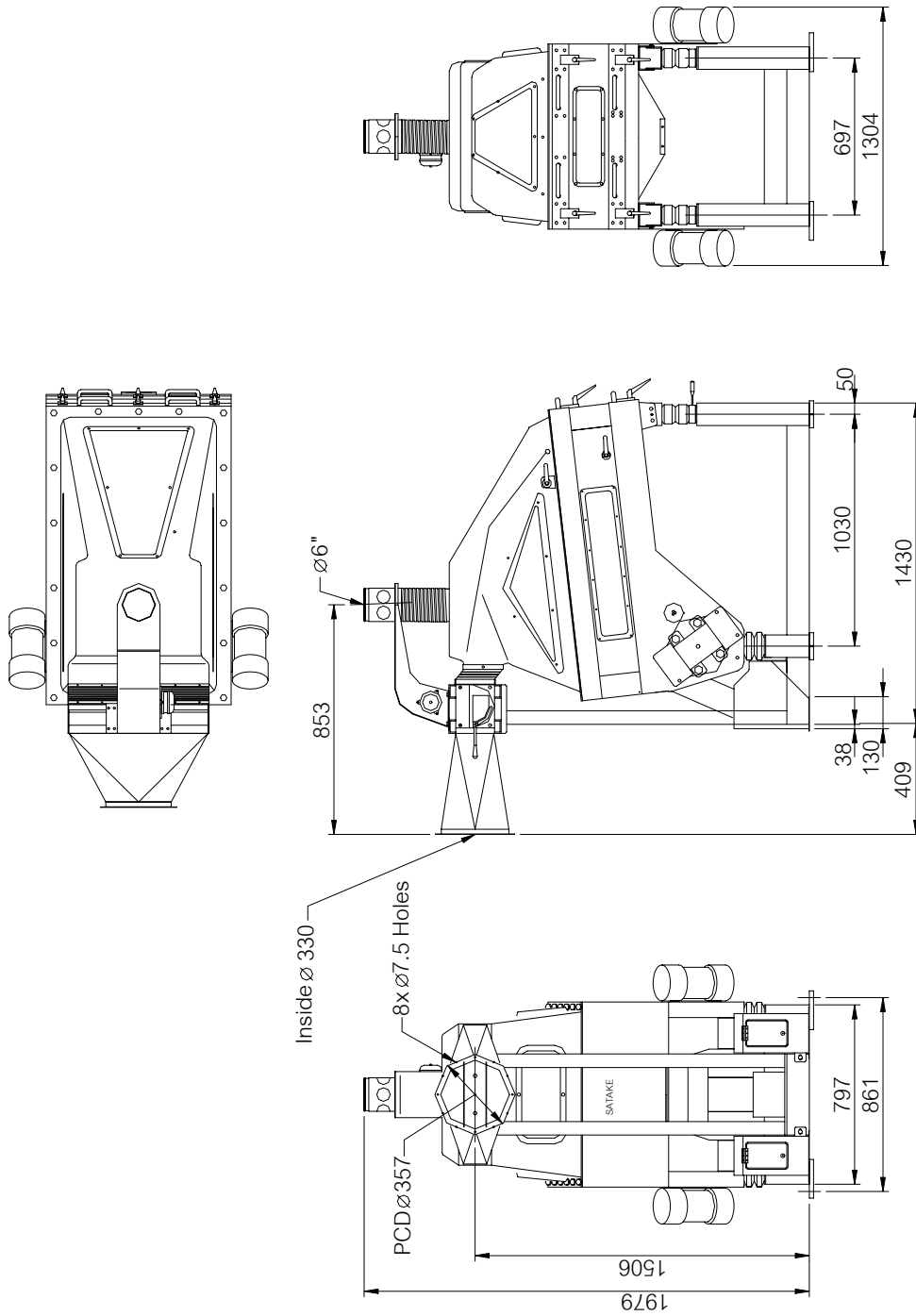


Fig. 4-1

SGA5B-T

Without secondary sorter (Optional)

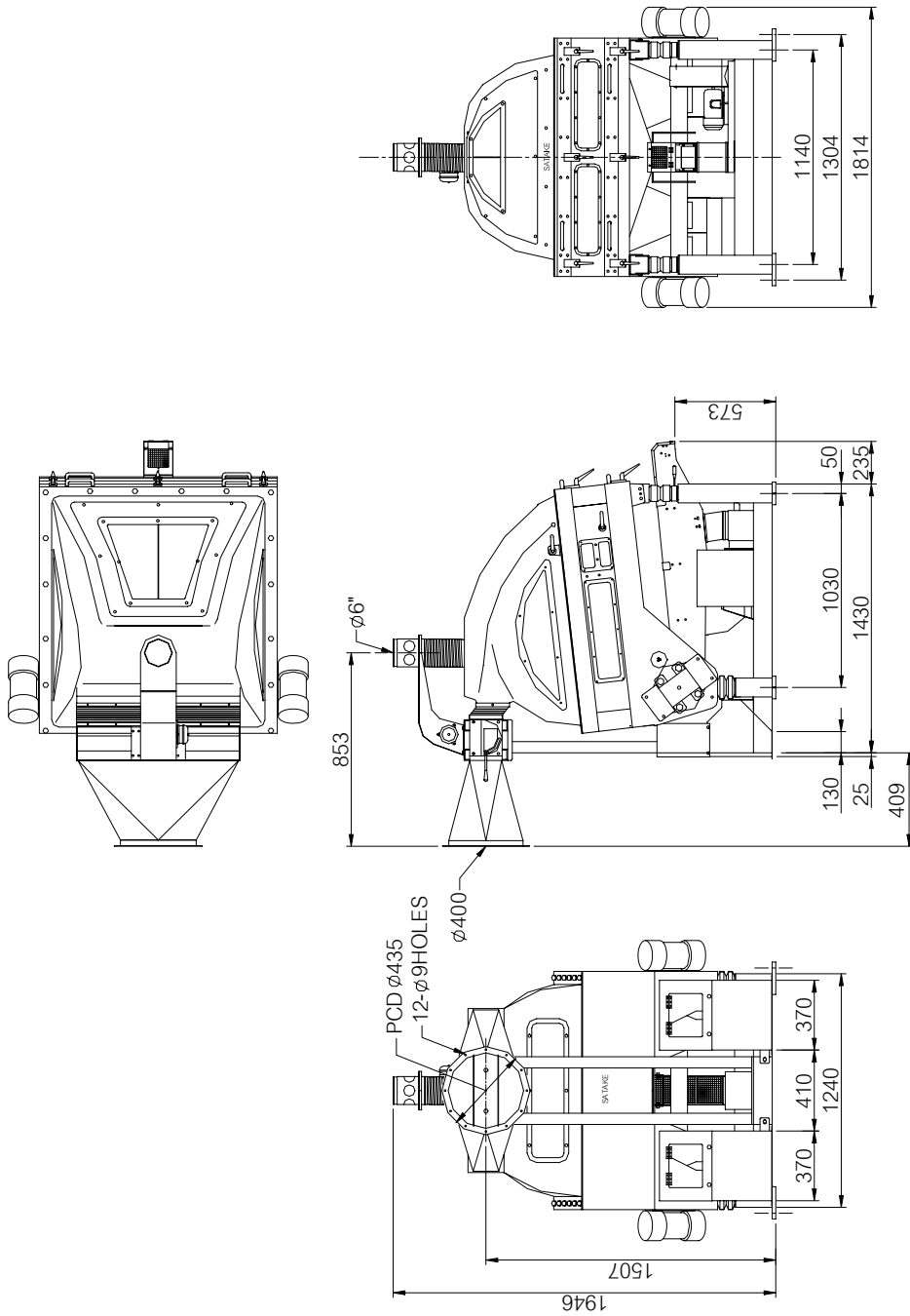


Unit: mm

Fig. 4-2

SGA10B-T

With secondary sorter

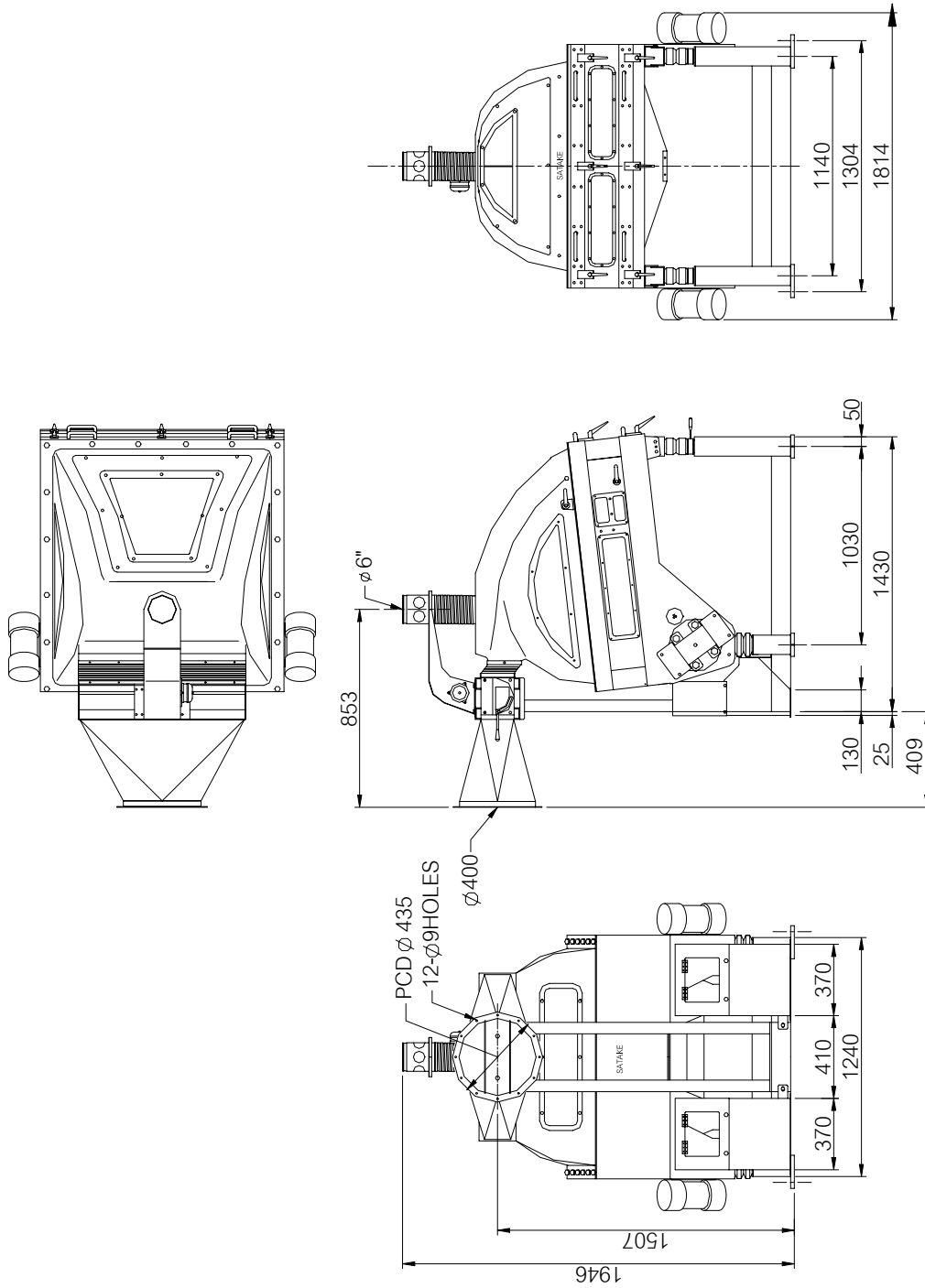


Unit: mm

Fig. 4-3

SGA10B-T

Without secondary sorter (Optional)

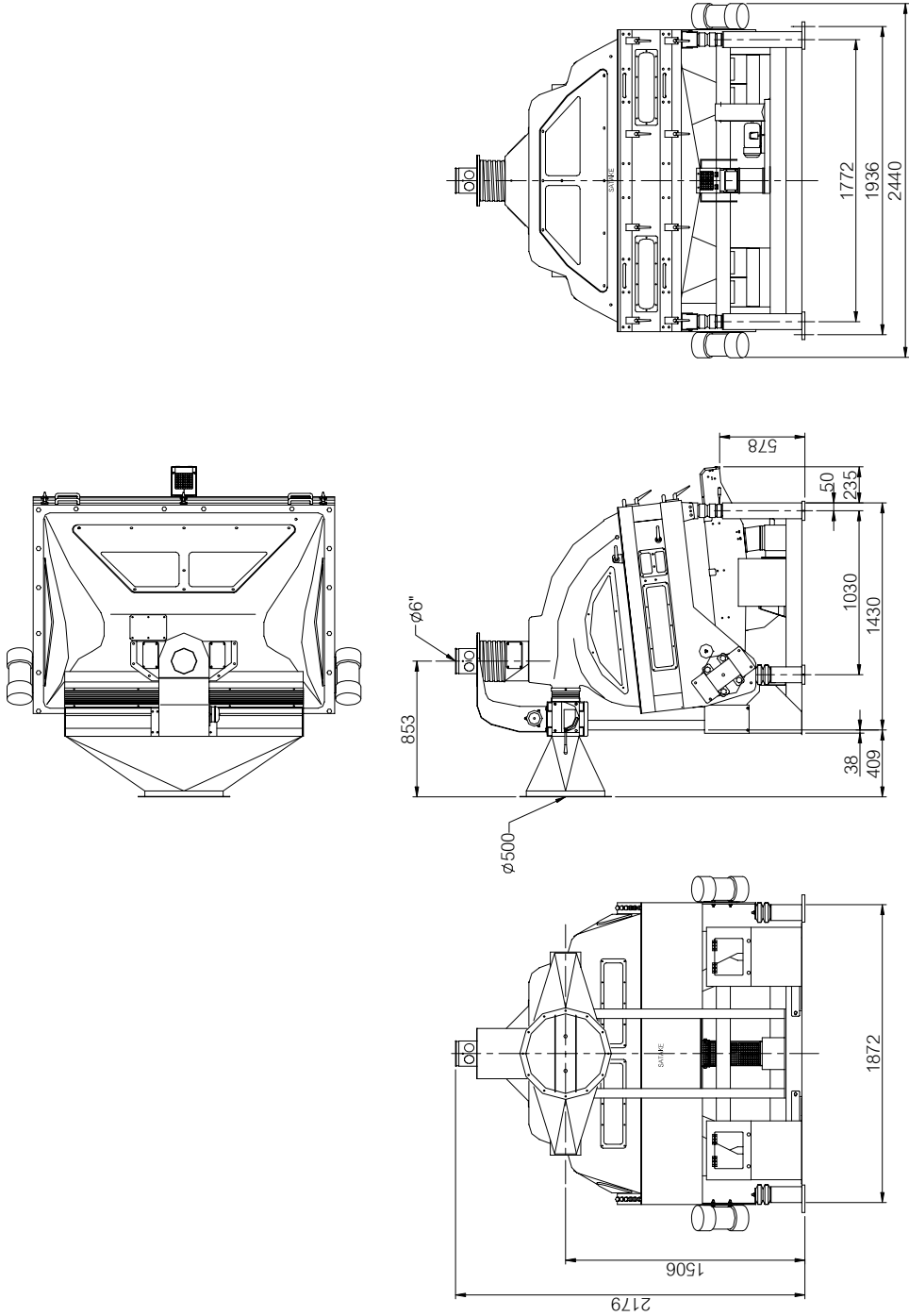


Unit: mm

Fig. 4-4

SGA15B-T

With secondary sorter

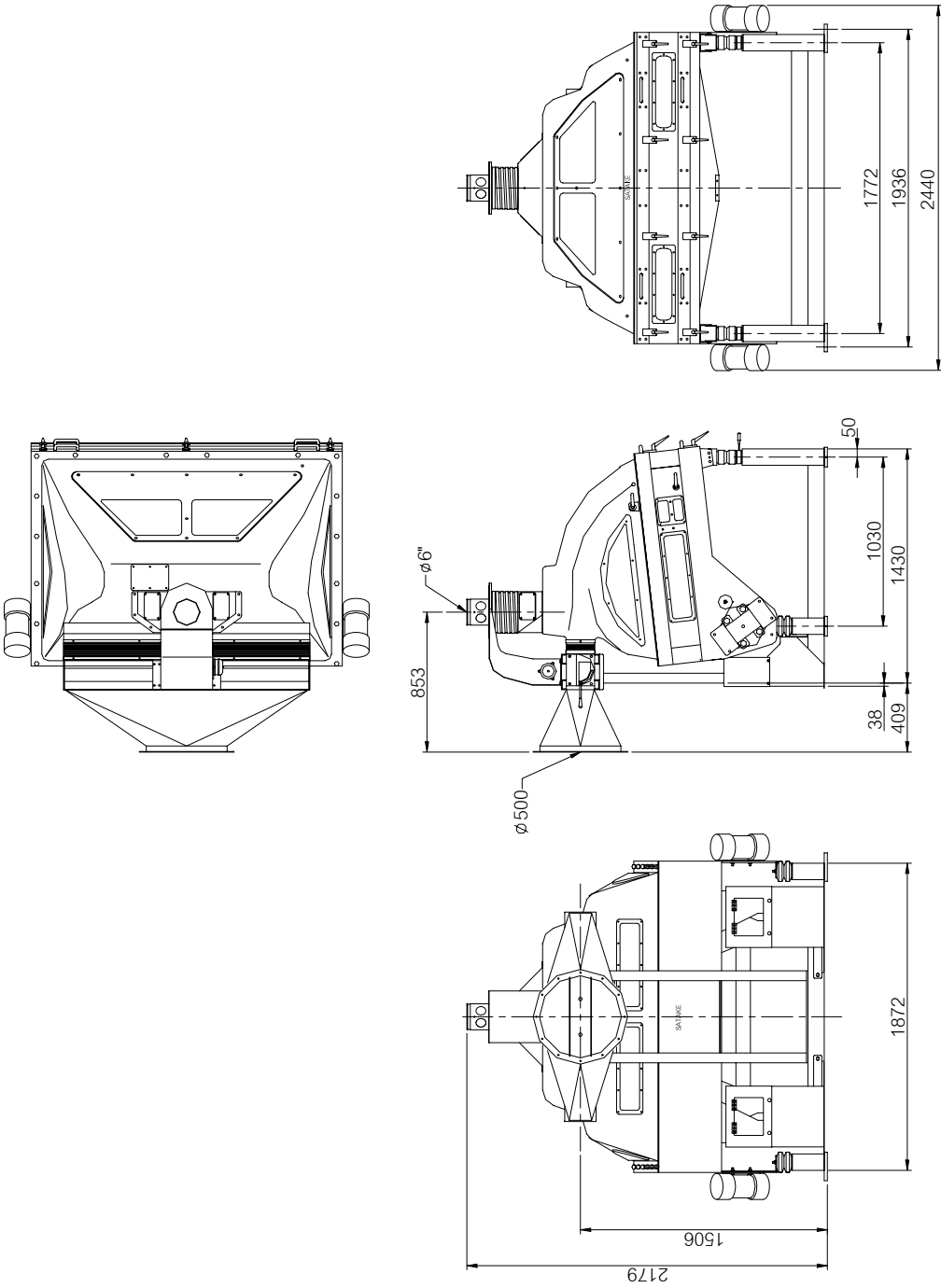


Unit: mm

Fig. 4-5

SGA15B-T

Without secondary sorter (Option)



Unit: mm

Fig. 4-6

5. CONSTRUCTION

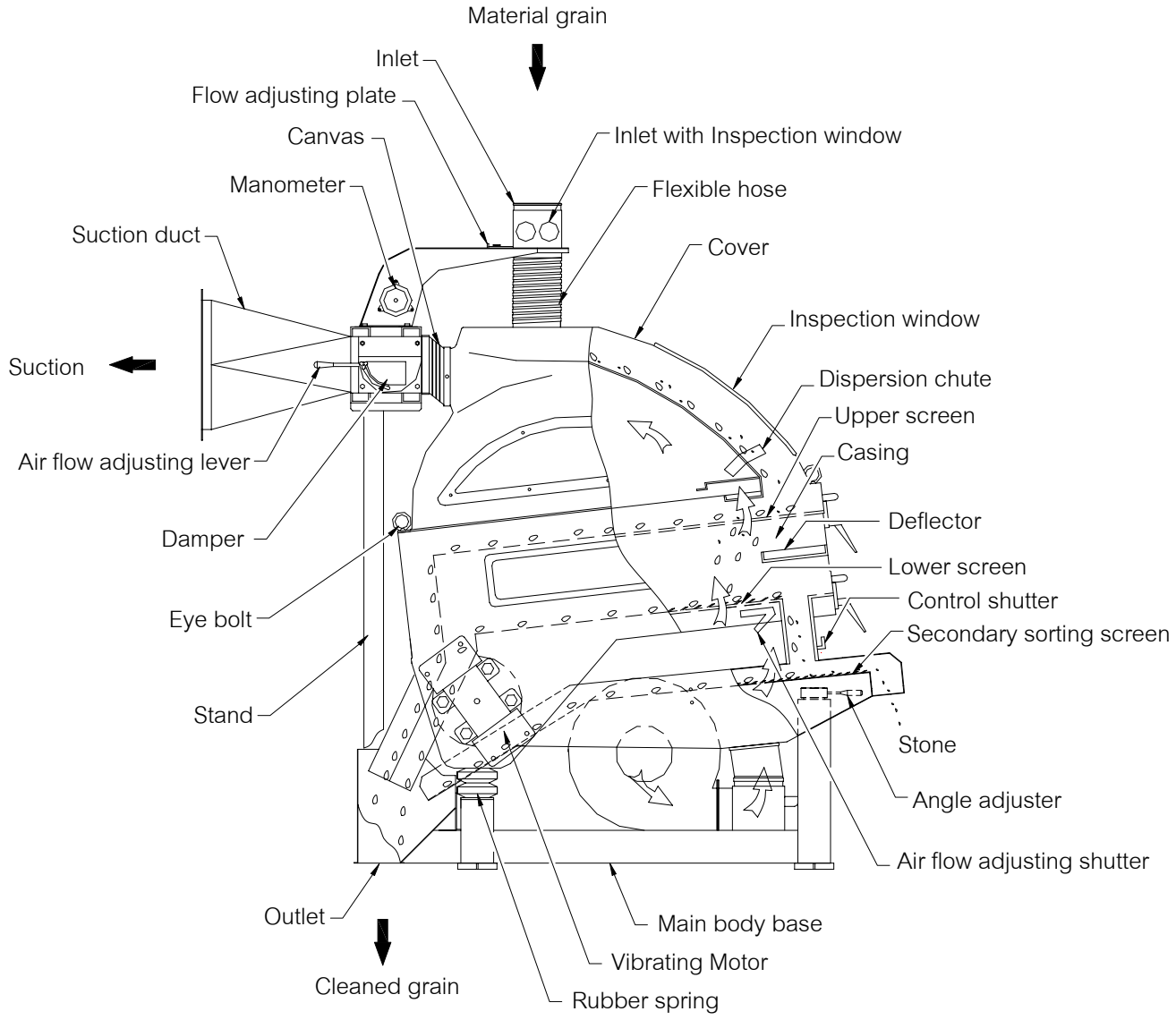


Fig. 5-1

The vibrating body is supported by four rubber springs.

The top end of the inlet shall be connected with chute pipe at the site, and the bottom end of the inlet is connected to the vibrating body with a flexible hose.

Flow rate adjusting plate is provided at the bottom of the inlet. Inspection windows are provided on the inlet for observing grain feeding in. The cover of the vibrating body is provided with large inspection windows and connected to the suction duct with a canvas. The suction duct is equipped with an air volume damper to adjust air volume by the airflow adjusting lever.

The vibrating body is equipped with two vibrating motors on the both sides that run in opposite direction each other and give vibration to the vibrating body. The outlets are located between two vibrating motors.

The stone discharge gate is positioned at the top end of the secondary sorting unit mounted in the middle of and underneath the vibrating body.

The upper and lower screens are made of a single fine-meshed gauze.

The destoning adjusting plate (or deflector) is located at the upper end of the lower screen.

The screen can be removed from the material feeding side. Pulling the screen off the machine requires a space allowance of 1500 mm.

5.1 How it works

- (1) Grain supplied through the inlet is moved forward and further transferred spreading over stainless plate by vibrations ,then the grain drop down.
- (2) The dropped grain is divided in two by the dispersing chute and supplied to each of the upper and lower screens.
- (3) The grain spreads evenly over the mesh screen and gets stratified and separated by the difference in specific weight through the screen vibrations and rising airflow.
- (4) Dust and other light foreign materials are carried to the dust collecting unit with the air flow.
- (5) Sorted grain/stone mixture that passed through the upper and lower screen drop down to the secondary sorting section.
- (6) Stone and other foreign materials of heavy specific weights are removed by the secondary sorting screen. The refined grain after the secondary sorting return to the feeding gate.
- (7) The sorting conditions may be visually observed through the inspection window at the top cover, or checked by the discharge at the stone discharge gate of the secondary sorting section in order to adjust it through three air flow adjusting valves.
- (8) Discharge gates include four clean grain discharge gates and a stone discharge gate.

6. INSTALLATION



CAUTION

- Use a wire having sufficient strength for rigging.

6.1 Rigging Method of the Machine

- Use the four eyebolts attached to the machine when transferring or installing the machine.
- Use the great care not to damage the side cover etc. when carrying out rigging work.

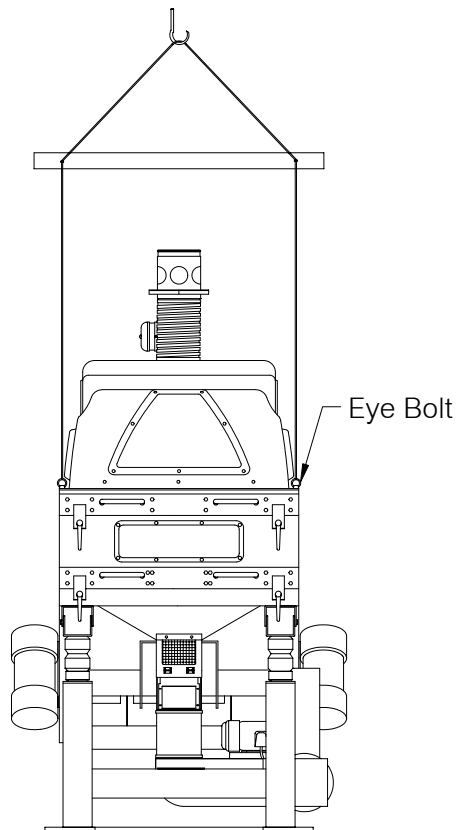



Fig. 6-1

6.2 Confirmation of Levelness

 WARNING
<ul style="list-style-type: none">● Remove the retaining fitting A and B before commencement of operation without fail.● When the machine is not installed at a horizontal place, the machine may not function satisfactory.● Ensure the levelness of the machine and bolt it securely to the floor with bolts M20.

Set the machine at the specified position and make sure that it is placed horizontally. If not, insert a liner at the position of anchor bolt to adjust the levelness of the machine. Then bolt the machine securely to the floor with bolts.

6.3 Position of Setting

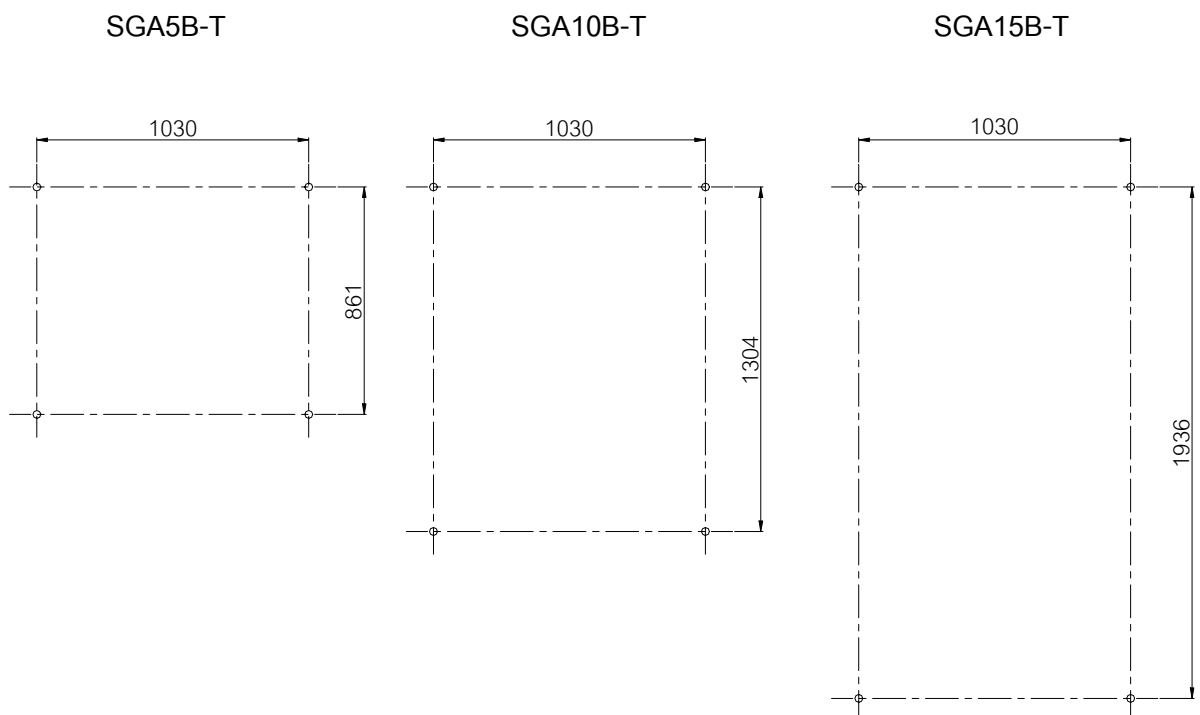


Fig. 6-2

6.4 Remove the Retaining Fittings

The vibration body is retained by the retaining fittings A and B to protect it against damage during transportation. After installation, remove retaining fittings before commencing without fail.

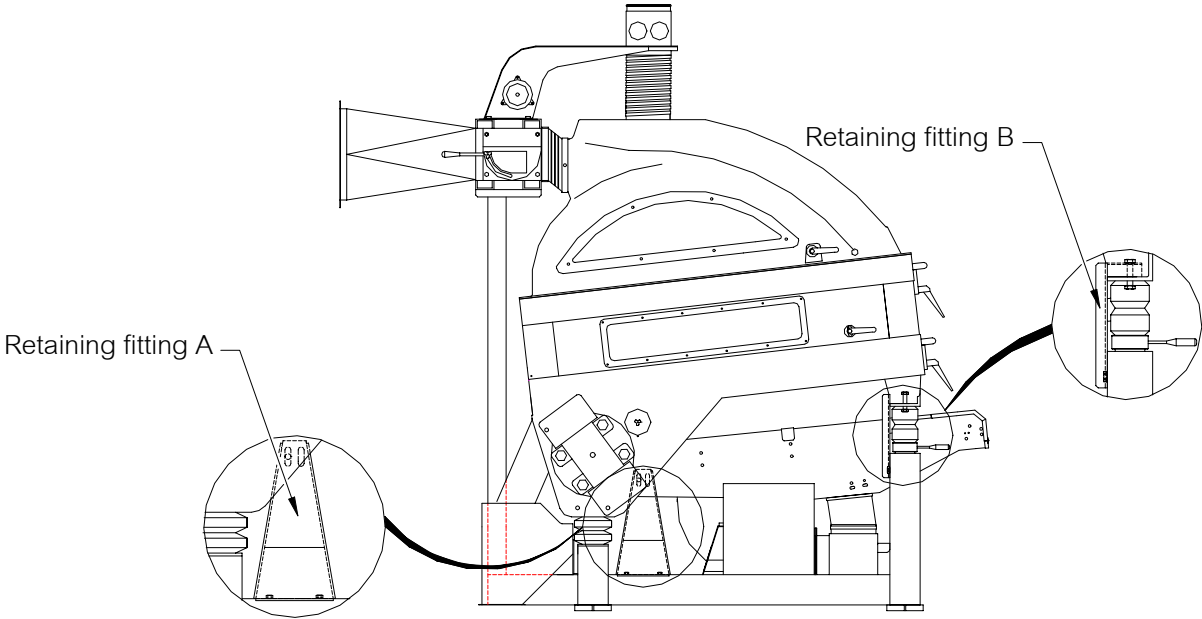


Fig. 6-3

6.5 Selection of Floor

The floor to be selected for installation must have enough strength.

6.6 Maintenance Space

When installing the machine, allow enough space around the machine for maintenance and inspection job or passages as shown in Fig. 6-4 (The dimensions indicated are minimum).

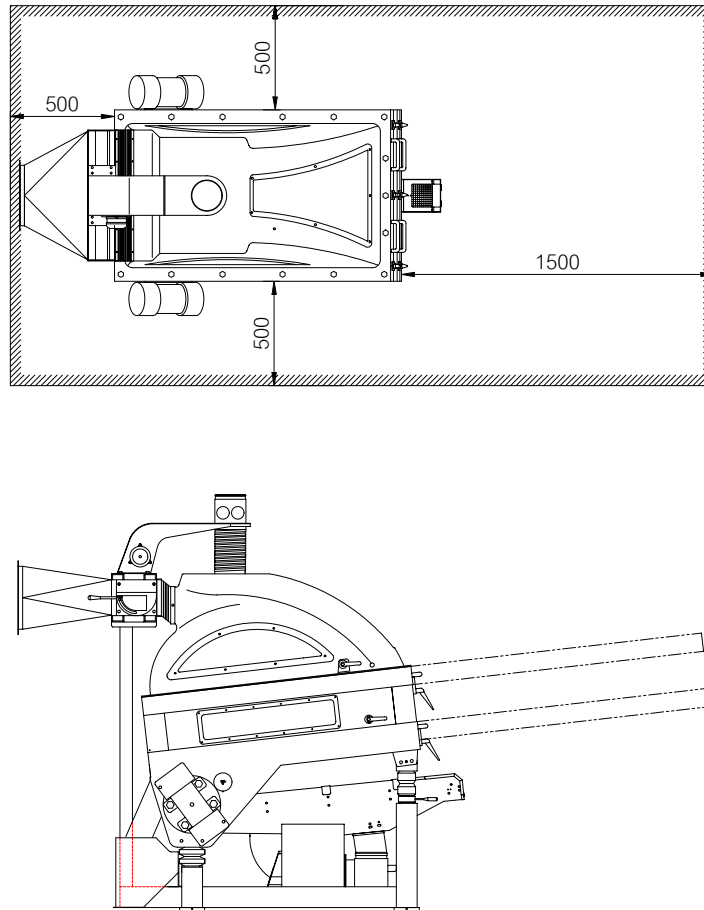


Fig. 6-4

6.7 Static Vacuum Pressure

The machine requires a separate vacuum dust collecting unit which must be of the design to maintain a static vacuum pressure of $-60 \sim -70$ kPa. The air capacity is $80 \sim 90$ M³/min (SGA5B-T), $120 \sim 140$ M³/min (SGA10B-T) and $180 \sim 210$ M³/min (SGA15B-T) per unit and static pressure $-60 \sim -70$ kPa. The duct diameter is 330 mm (SGA5B-T), 400 mm (SGA10B-T) and 500 mm (SGA15B-T).

6.8 Power Line

 WARNING
<ul style="list-style-type: none">• Provide the grounding connection without fail by the use of earth cable for ensuring the safety.

The connection of power line to the machine is completed when the line is connected to the breaker inside the operation panel. The power is to be of three-phased 380V. Also connect earth cable to the grounding terminal inside the operation panel.

6.9 Fault Signals from Downstream Processes

By externally feeding B contact point signal across 6 and 7 on the terminal block inside the operation panel, the machine may be suspended automatically on failures. The terminals are short-circuited with a jump wire on shipment from factory.

6.10 Rubber Springs

When adjust body angle make sure four springs are in perfect alignment.

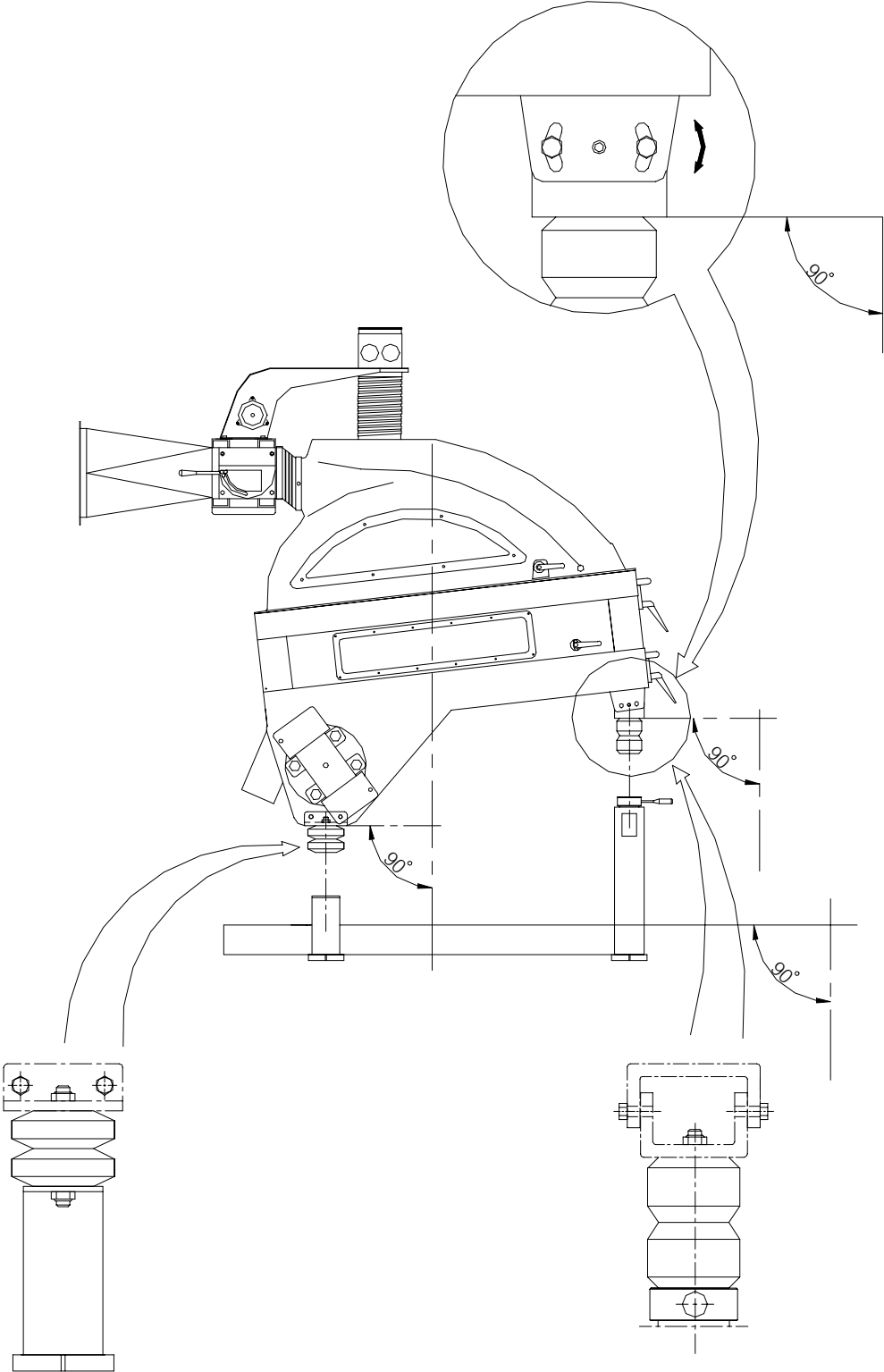


Fig. 6-5

6.11 Installation Procedure



WARNING

- Replace the eyebolts (4 PCs) for the use of transfer and installation of the machine with the hex. Coupling bolt (M16x20) supplied as an accessory after the completion of installation.

- (1) Use four eye bolts for transferring installation the machine.
- (2) Remove shipment retaining fittings A and B. (see Fig. 6-3)
- (3) Confirm the machine horizontally.
- (4) Retain the machine on the frame (or floor).
- (5) Fit the suction ducts on the feeding gate and discharge gate, and route the piping.
- (6) Fabricate the stone collecting box to suit the installed conditions.
- (7) Connect the wiring. Ensure that the machine is properly grounded.
- (8) Check for any tools or materials remaining inside the machine.
- (9) Power on the machine, and check the rotational directions of motors.
- (10) Confirm that the tightening torque of the motor retaining bolts is $90 \text{ N} \cdot \text{m}$ ($9 \text{ kgf} \cdot \text{m}$) for SGA5B-T and $170 \text{ N} \cdot \text{m}$ ($17 \text{ kgf} \cdot \text{m}$) for SGA10B-T / SGA15B-T.
- (11) Confirm once again that the machine is horizontally installed.

6.12 Design of the Processing Line

To maintain the best sorting performance, design the processing line to keep grain flowing on the screens while the machine is being operated. It takes some time for the grain flow to become consistent in the machine from the moment the material is supplied. In case the material supply is frequently interrupted as in a rice-whitening line, refer to the following example in designing the line.

- An example of recommended sequential control of rice whitening line installation.

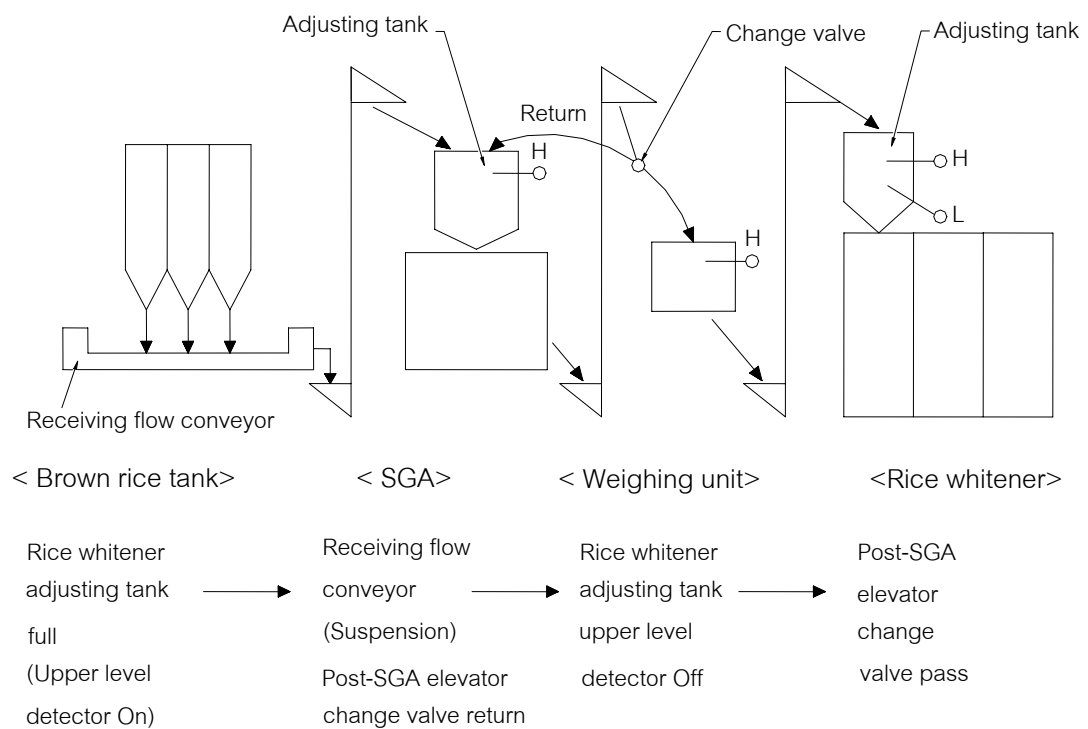


Fig. 6-6

- ✘ Fabricate the machine stand proper to match the conveyor unit at the subsequent process. The machine stand needs to be designed to have an adequate strength.
- ✘ Where an adjusting tank is installed preceding the SGA, determine the tank capacity in consideration of the volume remaining in the conveyor unit before the SGA.

7. PREPARATION FOR OPERATION



CAUTION

- Ensure to examine the items to be inspected before commencement of operation. Do not remove the vibrating motor cover during operation for safety.

7.1 Inspection

The vibrating body is retained for protection against damage during shipment. Once the installation is completed, remove retaining fittings A and B before operation.

Check for any tools, bolts, nuts, iron chips, or other foreign materials inside the machine, and clean it.

Make sure that the screens and the vibrating body are mutually retained firmly.

Make sure that the vibrating body is secured to the rubber spring.

Ensure that the vibrating motor is securely retained on the vibrating body.

7.2 No-Load Operation

Once the preparatory inspections are over, start the motors to ensure that the directions of rotation conform to those stated on the rotation seals.

Continue the operation for a while without load to check for any unusual vibrations on any part of the machine.

Since this is a vibrating machine, give additional tightening after the no-load operation to bolts and nuts on the vibrating body and to retaining bolts on vibrating motor.

Especially, make sure that the retaining bolts on the vibrating motor is tightened to a torque of 90 N•m (9 kgf•m) for SGA5B-T and 170 N • m (17kgf • m) for SGA10B-T / 15B-T.

8. OPERATION



CAUTION

- Do not start the machine before the manometer valve reaches into the set point.
Otherwise, the return pipe may cause a clogging.

- (1) Start the dust collecting unit, and set the manometer valve to -60 ~ -70 kPa.
- (2) Feed the material.
- (3) Set the flow rate of material from the previous process to a valve within the specified flow range.
- (4) Where an adjusting tank is installed preceding the material supply to this machine, reset the flow rate within the specified range using the shutter on the feeding gate.
- (5) Regulate the air volume by the air flow adjusting lever so that grains on the sorting plate ripple by a cluster of 20 ~ 30 mm wide and 20 ~ 30 mm long. Turning to the left will increase the airflow. In case the rice grains still move inadequately after the air flow adjustment, turn the angle adjusting lever to the left to increase the screen inclination angle.

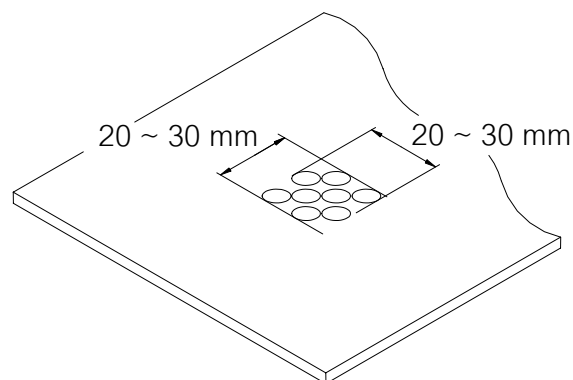


Fig. 8-1

- (6) Set the feeding amount into the secondary sorting section at 50 ~ 150 kg/H by adjusting the plate (or deflector), on the upper end of the lower screen, that separates rice-stone mixture from rice grains. (Basically adjust the gap to the screen to 10 ~ 15mm).

For the purpose of measuring the feeding amount, fully open the air flow adjusting shutter in the secondary sorting section while feeding the rice grains, and measure the weight of rice coming out into the stone discharge gate during a certain period of time, then calculate the feeding amount.

When stones and grains splash conspicuously, move the airflow adjusting shutter underneath the lower screen for adjustment. In case a high proportion of stone is included, open the gap wide. If the gap is insufficient, stones will not be discharged. Basically adjust the gap "A" to 20 mm for SGA5B-T and 30mm for SGA10B-T / 15B-T.

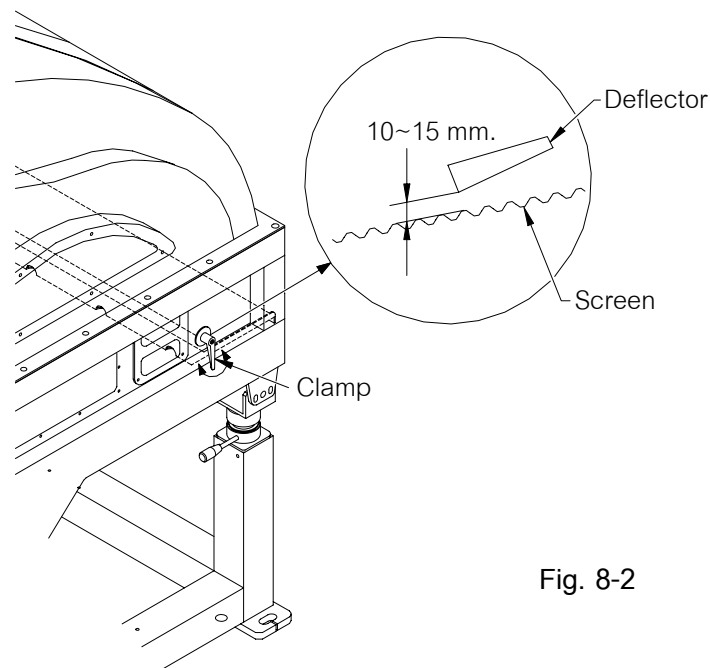


Fig. 8-2

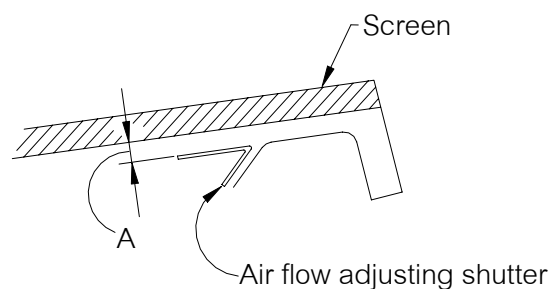


Fig. 8-3

- (7) To discharge stones alone from the rice-stone mixture transferred to the secondary sorting section, adjust and lock the secondary sorting air flow shutter at the fan suction gate.

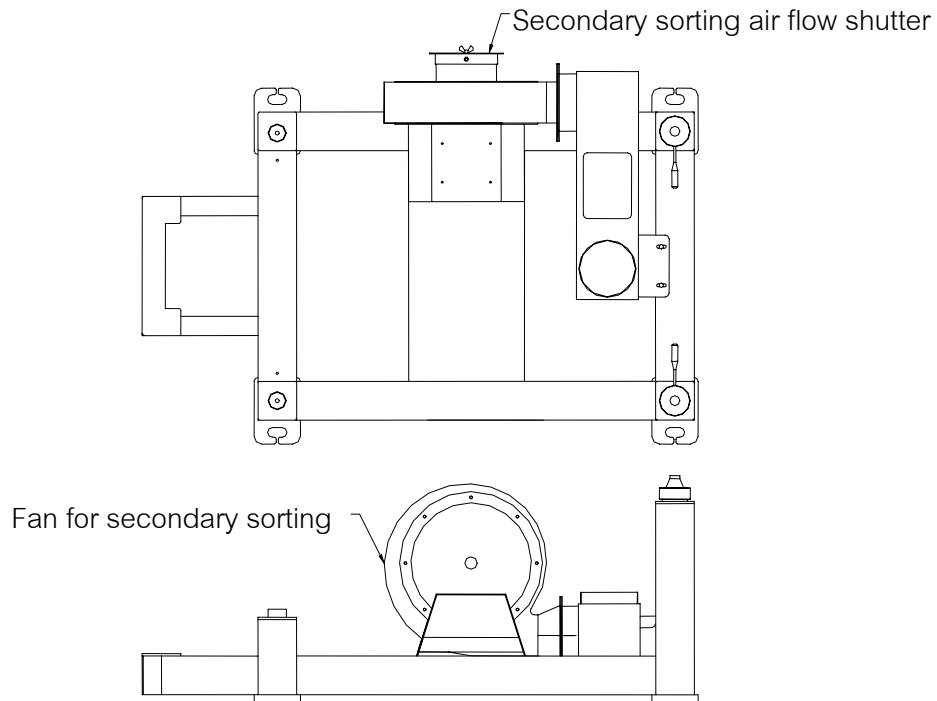


Fig. 8-4

- (8) When switching material types as non-glutinous to glutinous rice or glutinous to non-glutinous, replace the stone receiving box with another one and close the damper at the suction duct after the batch is finished. Close the secondary sorting airflow shutter. Thus, rice grains remaining inside the machine will be discharged completely in 1-2 minutes.

- (9) A large quantity of material grain may flow into the secondary section in such occasion that air quantity is small, a certain lot is ending, or no-load operation is taking a longer time, which may cause a blockage in the flow of air transport. In such case, set the volume of inflowing into the secondary sorting section and control the inflowing volume within such an extent that does not obstruct existing flow volume by the use of a control shutter located in midway of the feeding chute for the secondary sorting section.

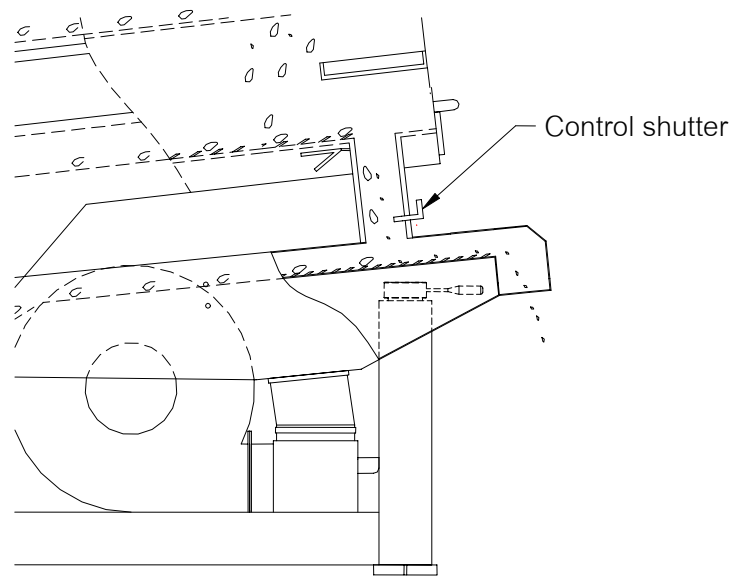


Fig. 8-5

9. ADJUSTMENT OF AMPLITUDE



WARNING

- Power off at first whenever you make an adjustment of the balancing weight.

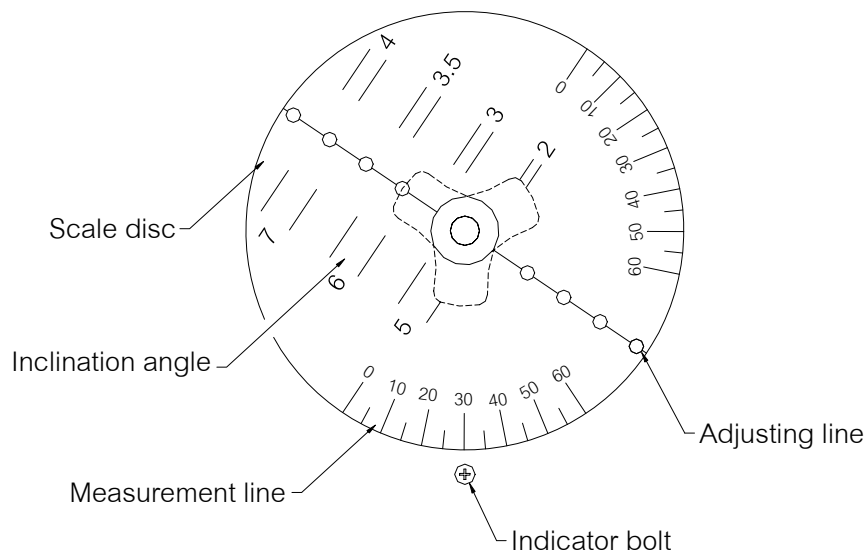
9.1 How to Adjust Amplitude

Start the machine at first, and adjust to make the “adjustment line” on the vibration scale panel appear to be a single straight line. Loosen the center knob, and turn the plate until the “adjustment line” looks a straight line, and then lock it back again.

Check the machine amplitude by observing the measurement line on the scale panel.

When the machine is vibrating, this pair of lines may look three or four lines, or may look obscured. Normally, a pair of lines of amplitude 5 with 50 Hz, and 3.5 with 60 Hz look three lines. (See Fig. 9-1) (This condition indicates the amplitude matches the scale.)

Fig. 9-1 Vibration scale disc



To change the amplitude, use four balancing weights inside the motors for adjustment. Loosen the tightening bolts of the adjusting imbalance weights, and adjust the drill points to match the desired amplitude.

9.2 Standard Position of Balance Weight

- Viewed from the refined material discharge gate.

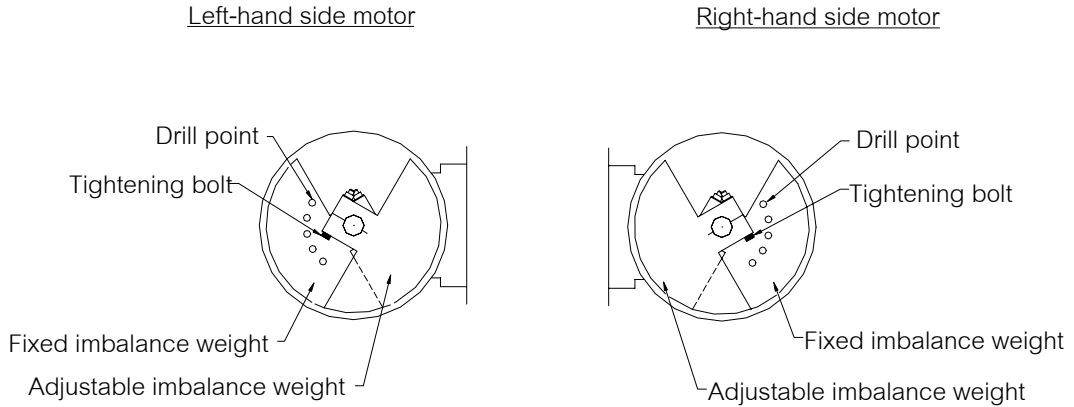


Fig. 9-2 For SGA5B-T (50Hz)

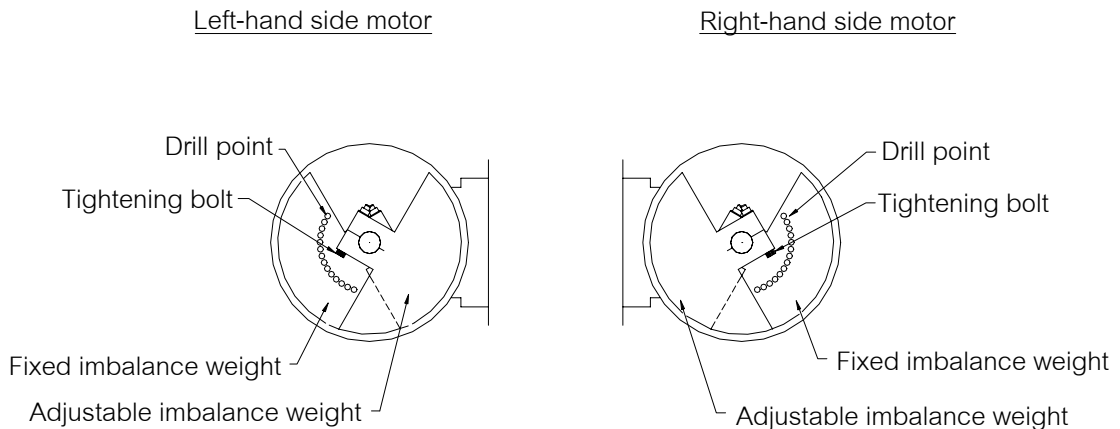


Fig. 9-3 For SGA10B-T (50Hz)

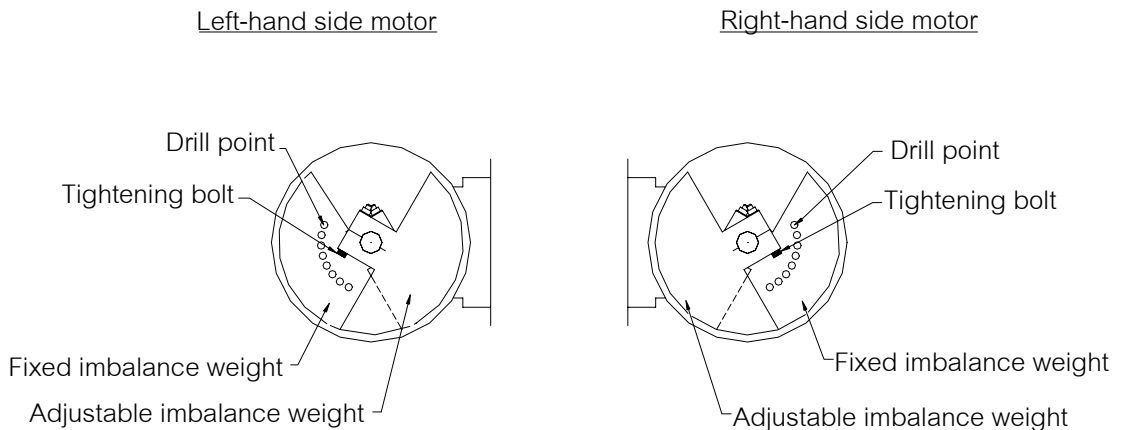


Fig. 9-4 For SGA15B-T (50Hz)

10. MAINTENANCE AND INSPECTION



WARNING

- Prior to cleaning or inspecting parts, turn off the power switch and the breaker, and display an “UNDER INSPECTION” notice.



CAUTION

- Do not use wire brushes or other hard tools for cleaning. Screen maybe damaged.

- (1) Remove and carefully clean the upper and lower screens once a week. If brown rice sludge and bran stick to the upper and lower screens, their sorting capability will diminish. To protect the screen surfaces that are specially treated, use soft rags or compressed air to clean them.

When using this machine under a dusty environment, carefully clean beneath of the lower screen with compressed air every day after operation. (Cleaning of the suction fan is to be made while in operation.)

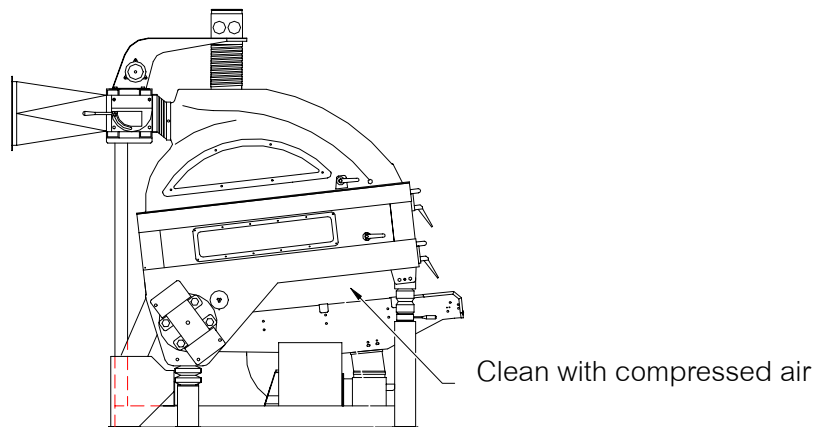



Fig. 10-1

- (2) If brown rice sludge, bran or other substance stick to the secondary sorting screen, the separation capability will deteriorate resulting in rice grains mixed in rejected stones. Since the screen surface is specially treated, use soft rags to clean it.

- (3) Inspection of vibrating motor fixing bolts:

 CAUTION
<ul style="list-style-type: none">• Conduct an additional tightening of the vibrating motor fixing bolts periodically.

Since the fixing bolts may loosen by the decreased tightening force resulting from the conformance of the attachment base surfaces, additional tightening is required. Immediately after starting operations, in particular, retighten them once a week or around. To ensure safety, inspect the tightening torque of vibrating motor retaining bolts for any departure from the standard value of 90 N • m (9 kgf • m) for SGA5B-T and 170 N • m (170kgf • m) for SGA10B-T / 15B-T every day for the first week of starting operations, once a week for a subsequent month, and once every three months thereafter.

Loosening of any one bolt may cause an accident. Tighten them firmly. In case bolts are removed, follow the same procedure as immediately after the operation start. The tightening torque for the fixing bolts is 90 N•m (9 kgf•m) for SGA5B-T and 170 N • m (170kgf • m) for SGA10B-T / 15B-T.

- (4) Take out the upper screen once a week and clean off stones and the like collected and gathered on the woven mesh located at the top end of the upper screen.

11. TROUBLESHOOTING



WARNING

- Before maintaining the machine, isolate the machine from the power supply.
- Refit the safety cover after maintenance.
- If the troubles are not remedied even after taking measures following the below instructions, contact your nearby distributor. See the contact address of Satake group companies at the end of this manual.

Conditions of Failure	Cause	Action to Take
1. Improper sorting	<ul style="list-style-type: none"> • Excessive flow rate. • Reduction in suction air capacity and static pressure. • Blockage of upper, lower and secondary sorting screens. • Blockage of rear surfaces of lower and secondary sorting screens. 	<ul style="list-style-type: none"> → Reduce the flow from the preceding process. → Clean the bag filter to remove the blockage. → Wipe the mesh surface once a week with soft rags or compressed air. → Clean the lower screen with compressed air from the lower part of the vibrating body. → With the secondary sorting screen, open the maintenance/inspection cover of the secondary sorter to clean it.

Conditions of Failure	Cause	Action to Take
	<ul style="list-style-type: none"> ● Machine vibrations. ● Blockage at end of the secondary sorting screen. 	<ul style="list-style-type: none"> → Retighten the bolts and nuts of the vibrating body. → Retighten the vibrating motor fixing bolts. → Retighten bolts of the machine stand. → Large foreign matters may stay in the vicinity of the stone discharge gate blocking the discharge of stones. Clean the area once a day.

12. LIST OF CONSUMABLE PARTS

Part No.			Part Name
SGA5B-T	SGA10B-T	SGA15B-T	
244800210	244800210	244800210	Rubber
-	-	-	Screen (Lower)
-	-	-	Screen (Upper)
244803070	244803070	244803070	Screen (Secondary sorting)
T090084	T090084	T090084	Canvas
T090550	244801820	244801820	Canvas
T090600	T090117	244811830	Duct B
244801840	244801840	244801840	Pipe
-	-	-	Nylon Tube \varnothing 8
FR004610118	FR004610118	FR004610118	Manometer
FZ018034001	FZ018034001	FZ018034001	Rubber spring
FZ018034003	FZ018034003	FZ018034003	Rubber spring

EMERGENCY ADDRESS AND TELEPHONE

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