Swing Clamp

Smart Series
Swing Clamp

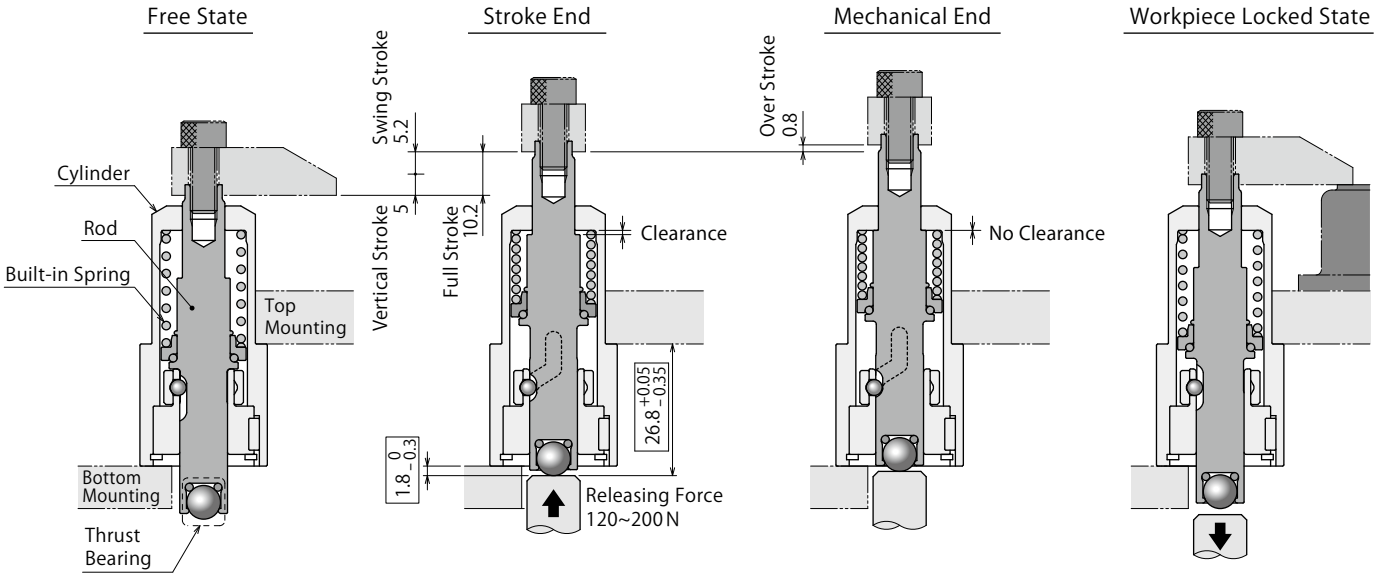
Model KSS

High Rigidity, Long Operational Life and High Accuracy with Powerful Swing Mechanism

Swing Angle Position Repeatability ± 1°

Using Low-dust Grease for Clean Environments

Action Description



- When releasing force is applied to the thrust bearing on the bottom, the built-in spring is compressed and the clamp is released.
- The stroke end is shown in ▭ in the drawing.

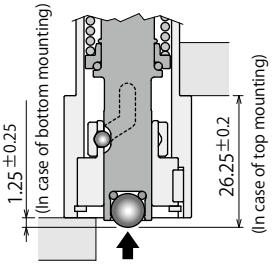
- When released 0.8mm further from the stroke end (over stroke), the rod cannot be stroked any further. (Mechanical End)

- When releasing force is released, the rod swings and descends with the built-in spring to clamp a workpiece.

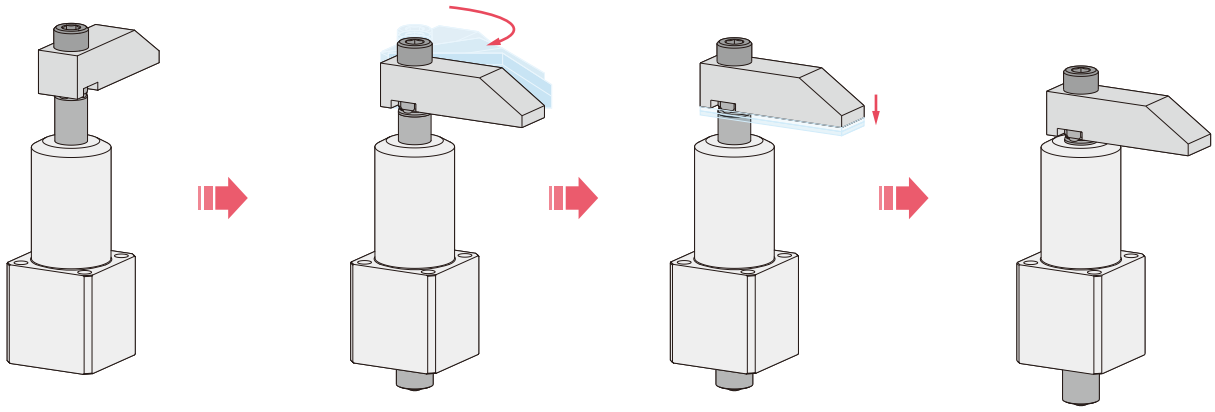
Applying a thrust force exceeding 200N at the mechanical end position may damage the inside of the clamp.

Especially in case of a driving device using as shown on P.16 "Application Examples", set the clamp to a position where it stops within the over stroke range before the mechanical end when released to avoid overloading.

Recommended Releasing Point



Action Description



Before Swing：Released
(Stroke End/Mechanical End)

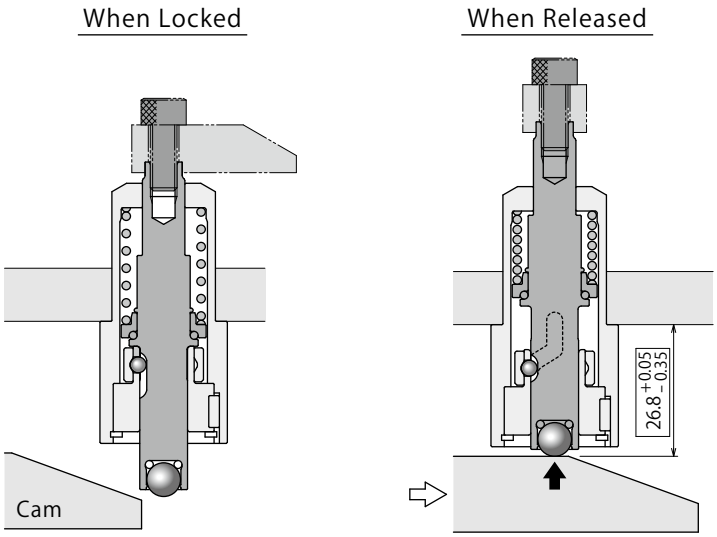
The lever descends
as it swings.

After swing completion,
it descends vertically.

Action Completed：Clamped
(Free State /
Workpiece Locked State)

Application Examples

Operation by sliding cam



Model No. Indication

KSS005 0 - R

1 2

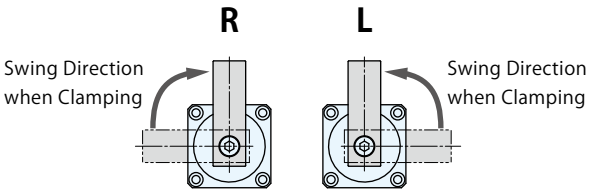
1 Design No.

0 : Revision Number

2 Swing Direction when Clamping

R : Clockwise

L : Counter-Clockwise



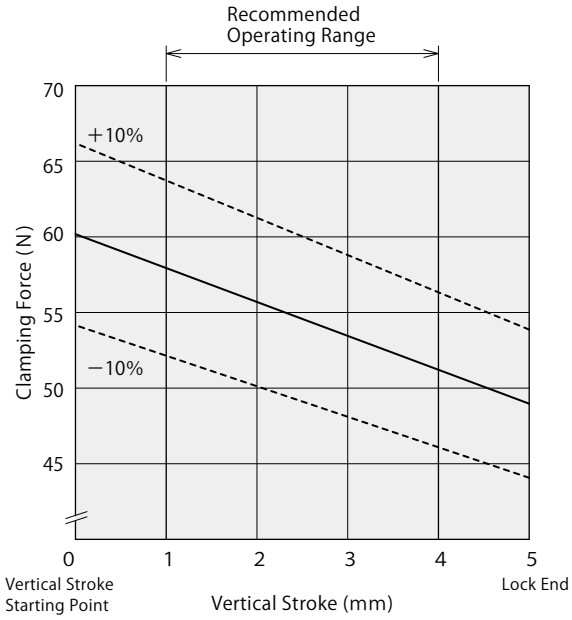
Specifications

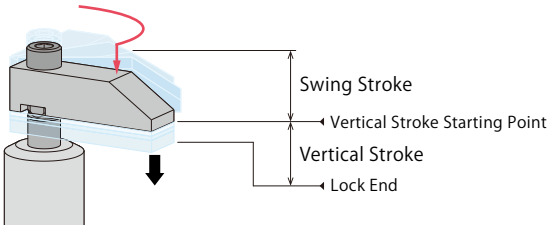
Model No.			KSS0050-□
Over Stroke ※1		mm	0.8
Full Stroke		mm	10.2
Swing Stroke (90°)		mm	5.2
Vertical Stroke		mm	5
90° Swing Angle Accuracy			90° ±3°
Swing Completion Position Repeatability			±1°
Spring Force	at Release (Max.)	N	85.9
	at Start of Vertical Stroke	N	68.7
	at the Middle of Vertical Stroke	N	61.6
	at Completion of Vertical Stroke	N	54.4
Releasing Force	Minimum	N	120
	Maximum ※1	N	200
Operating Temperature		℃	0 ~ 120
Grease			Low-dust Grease for Clean Environments : AFF manufactured by THK
Weight		g	About 95

Note :

※1. Applying releasing force exceeding the maximum specification value at the mechanical end may damage the inside of the clamp. When stopping at the mechanical end, make sure that releasing force does not exceed the maximum specification value. If releasing force exceeds the maximum specification value, stop the clamp within the over stroke range.

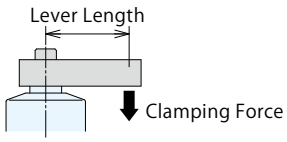
Clamping Force Curve



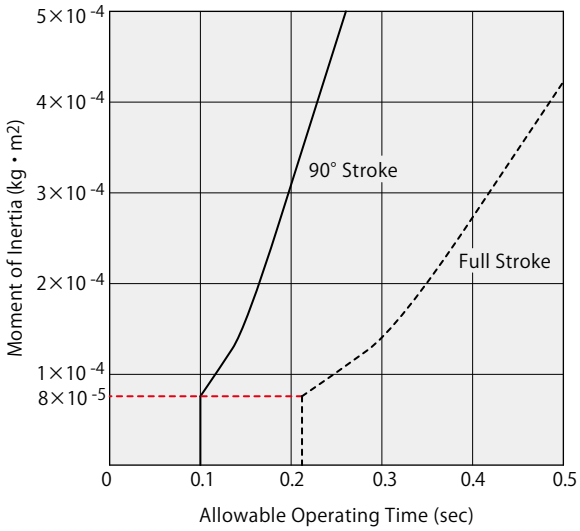


Note :

1. This graph is applicable to lever length below 60 mm. Please contact us for use with lever length over 60mm.



Allowable Swing Time Graph



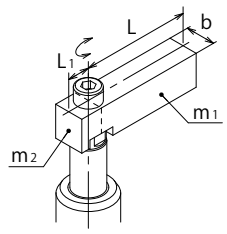
Notes :

1. The graph shows allowable swing time against the moment of inertia of a lever.
2. Lever with a large inertia sometimes does not work depending on lever mounting position.
3. For any lever inertia moment, minimum 90° swing time should be 0.1 sec. Excessive swing speed can reduce stopping accuracy and damage internal components.

How to Calculate the Moment of Inertia (Estimated)

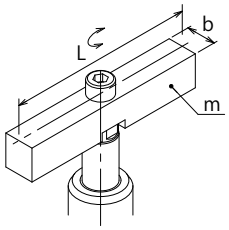
I : Moment of Inertia (kg・m²) L, L_1, L_2, K, b : Length (m) m, m_1, m_2, m_3 : Weight (kg)

① For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.



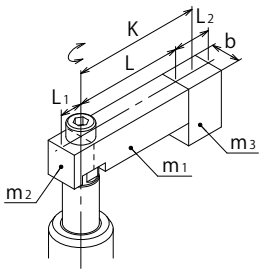
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

② For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.



$$I = m \frac{L^2+b^2}{12}$$

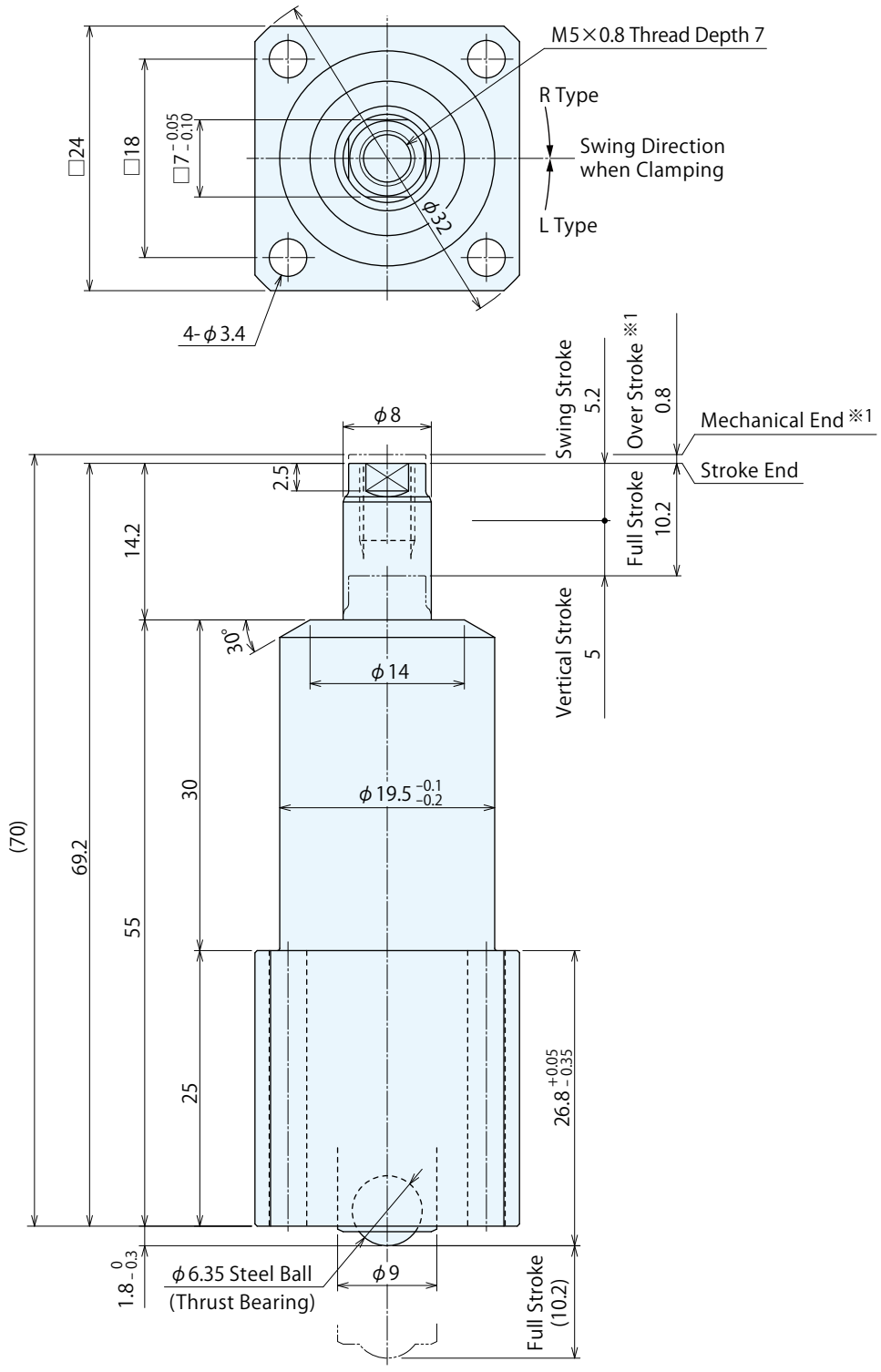
③ Load is applied on the lever front end.



$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12} + m_3K^2 + m_3 \frac{L_2^2+b^2}{12}$$

External Dimensions

※ The drawing shows the released state (stroke end position).



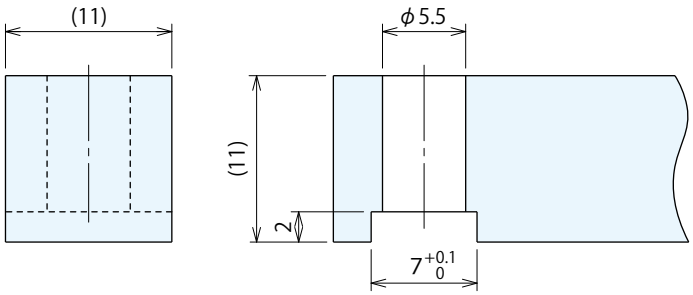
Notes :

※1. Applying releasing force exceeding the maximum specification value at the mechanical end may damage the inside of the clamp. When stopping at the mechanical end, make sure that releasing force does not exceed the maximum specification value. If releasing force exceeds the maximum specification value, stop the clamp within the over stroke range.

1. Mounting bolts are not provided. Please prepare them according to the mounting position.

Lever Design Dimensions

※ Reference for designing swing lever.



Note :

1. Swing lever should be designed with its length according to the allowable swing time graph and the clamping force curve.

Cautions

Notes for Design

1) Check Specifications

- This product is locked by the built-in spring and released by applying external force. Apply force within the range shown in specifications sections (refer to P.17 Releasing Force) to release. Applying excessive load on the cylinder leads to deformation and galling.
- Please use each product according to the specifications.

2) Swing lever should be designed to make the moment of inertia small.

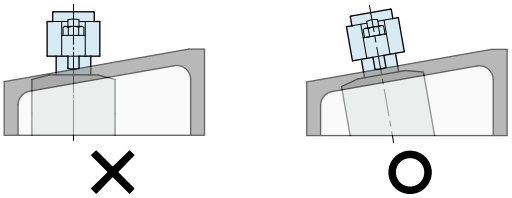
- Large moment of inertia will degrade the lever's stopping accuracy and cause damage to the clamp. Additionally, the clamp may not function, depending on lever mounting position.
- Set the swing time according to the moment of inertia. Refer to "Allowable Swing Time Graph" and make sure to operate clamps within the allowable operation time.

3) Protect the exposed area of the piston rod when using on a welding fixture.

- If spatter attaches to the sliding surface it could lead to malfunction.

4) When clamping on a sloped surface of the workpiece.

- Make sure the clamping surface and the mounting surface of the clamp are parallel.



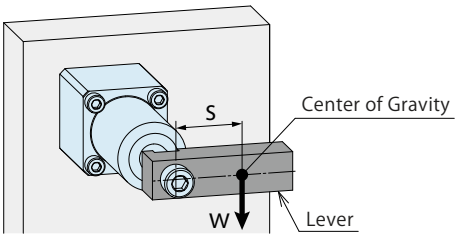
5) Installation of the Protection Cover

- If the moving parts of the clamp may endanger operator, please install the protection cover.

6) Notes for Lever Design

- Please design a lever as light as possible, and it should be no larger than necessary.
  The clamp may not function depending on mounting position and shape of the lever. If using a large lever in the mounting position as shown below, it may stop in the middle of swing action.
  Please design a lever with :

W : Lever Weight (N) × S : Distance to the Center of Gravity (m) ≦ 0.035 (N•m)



7) Operating Environment

This product has no function that prevents foreign substances. Do not use under environment with coolant and chips.

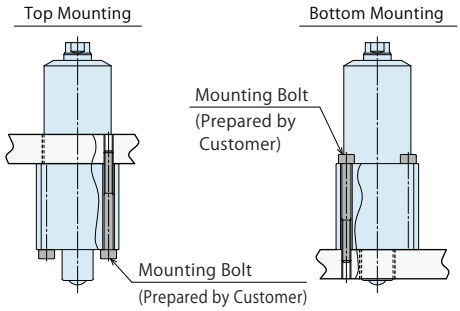
※ Please refer to P.45 for common cautions.
• Notes on Handling • Maintenance and Inspection • Warranty

Installation Notes

1) Installation of the Product

- When installing the product, use 4 hexagonal socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the list below. Tightening with greater torque than recommended can damage the thread, dent the seating surface or break the bolt.

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
KSS0050	M3×0.5	1.3



2) Installation and Removal of the Swing Lever

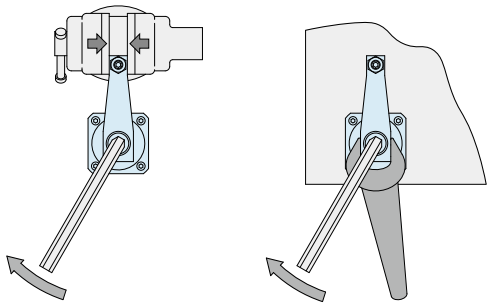
- Oil or debris adhered on the tightened parts of the lever and piston rod may cause the lever to loosen. Please clean them thoroughly before installation.
- Tighten the swing lever with the torque shown below. Tightening with greater torque than recommended can damage the bolts and lever tightening function.

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
KSS0050	M5×0.8	8

- If the piston rod is subjected to excessive torque or shock, the internal rotation mechanism may be damaged. Observe the following points to prevent these kinds of shocks.

At Installation

① Fix the swing lever with a vise or spanner, etc. and tighten the lever fixing bolt.



At Removal

① Fix the swing lever with a vise or spanner, etc. and loosen the lever fixing bolt 2 or 3 turns.

3) Checking Looseness and Retightening

- At the beginning of the product installation, the lever fixing bolt may be tightened lightly. Check the looseness and re-tighten as required.

4) Adjustment of Swing Speed

- Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast, the components will be worn out leading to damage.

MEMO

Common Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- Machines and devices should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① Machines and devices can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no external force is applied to the product.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no trouble/issue in the bolts and respective parts before restarting a machine or device.

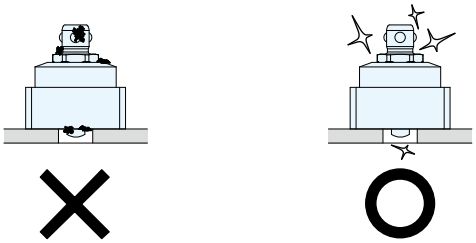
3) Do not touch a cylinder or workpiece while it is working.
- Otherwise, your hands may be injured.

4) Do not disassemble or modify.
- Contains a powerful spring which is dangerous.
  If the product is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before the product is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no external force is applied to the product.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly clean the moving parts and reference surfaces.
- Using the product contaminated with dirt may lead to malfunctioning.



If there is malfunction even after cleaning the product from outside, there may be contaminants or damage within internal parts. In this case, overhaul is required. Please call us for overhaul. If overhauled by unauthorized personnel, the warranty will be void even the period is still active.

3) Regularly tighten mounting bolts to ensure proper use.

4) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

5) The product should be stored in the cool and dark place without direct sunshine or moisture.

6) Please contact us for overhaul and repair.
- Contains a powerful spring which is dangerous.

Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

① If the stipulated maintenance and inspection are not carried out.
② Failure caused by the use of the non-confirming state at the user's discretion.
③ If it is used or operated in an inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty