



Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.





WARNING


- 1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience.
 - 2** Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product. This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

 - ①** Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
 - ②** Use for applications where life or assets could be significantly affected, and special safety measures are required.
 - 3** Observe organization standards and regulations, etc., related to the safety of device design and control, etc. ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components) JFPS2008 (Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.
 - 4** Do not handle, pipe, or remove devices before confirming safety.
 - ①** Inspect and service the machine and devices after confirming safety of all systems related to this product.
 - ②** Note that there may be hot or charged sections even after operation is stopped.
 - ③** When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
 - ④** When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
 - 5** Observe warnings and cautions in the following pages to prevent accidents.
- The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

 **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

 **WARNING:** If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

 **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. Every item provides important information and must be observed.

Warranty

- 1** **Warranty period**

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.
- 2** **Warranty coverage**

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge. However, following failures are excluded from this warranty:

 - 1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
 - 2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
 - 3) Failure not caused by the product.
 - 4) Failure caused by use not intended for the product.
 - 5) Failure caused by modifications/alterations or repairs not carried out by CKD.
 - 6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
 - 7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.
- 3** **Compatibility check**

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Design/selection

1. PAW Series Standard / Mechanical lock specifications

WARNING

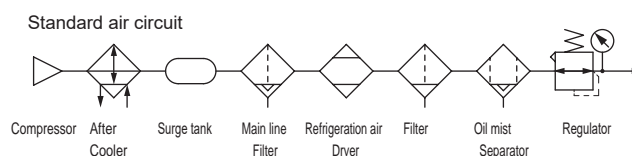
- This product is a pneumatic assistive device, intended for use as a machine with a jig, attachment, etc., mounted to the device's tip transport section. For use, be sure to implement a risk assessment for the machine overall, and confirm safety before use. In addition, the end user should perform a risk assessment on the user side, based on residual risk information for the machine overall, and stipulate a safe operating method for use.
- During attachment manufacture and control circuit design, be sure to install an interlock circuit for detecting whether a workpiece is present, and design equipment and circuits safely to prevent unexpected operation by the equipment.

CAUTION

- Each unit single item cannot be disassembled. Do not disassemble, as it could impair the original performance and accuracy. For an overhaul of single item units, contact a CKD representative.
- Rubber cushions are incorporated on the rising and lowering ends and the rotation end to regulate the vertical operating range and the rotation angle, but they are not structured to accept impact. Do not use the product so as to collide with the rising end, lowering end, or rotation end.
- The rotation lock mechanism (option) is a mechanism to hold the force in the rotation direction generated by the inclination of the mounting surface, deflection of the product, etc. It is not designed to stop the dynamic rotational force.

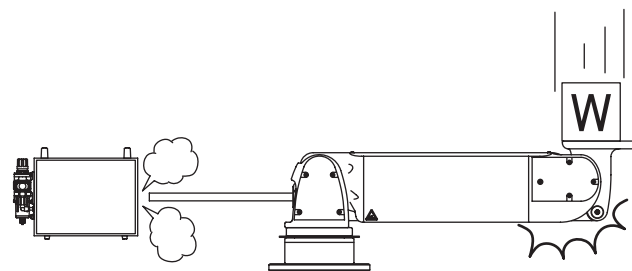
[Pneumatic source]

- Use the pneumatic pressure supplied to the PowerArm within the range of [0.05MPa] to [0.7MPa]. For the pressure required to load, refer to the graph of "Load capacity under pressure".
- Prepare clean air ([standard air circuit] compressed air quality class: 1.5.1 to 1.6.1 equivalent) for supplied air.



[Pneumatic piping]

- If the pneumatic piping slips during use, the arm may fall, creating a hazard. Securely connect the pneumatic piping so that it does not come out.



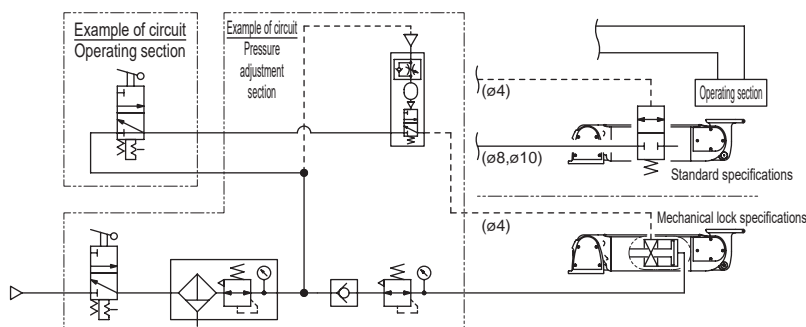
[Air circuit]

- When creating an air circuit, be sure to incorporate a safety mechanism and perform a risk assessment as an equipment to prevent jumping up due to the falling of the transported objects and a sudden drop due to a mistake in the switching operation.

[Recommended air circuit]

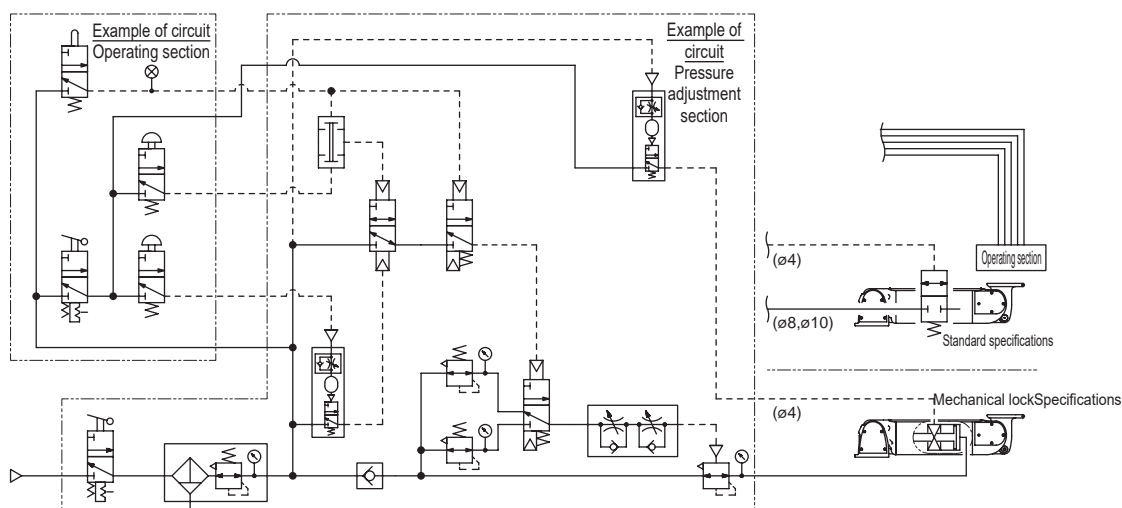
■ Operating pressure fixing control (air 1 pressure circuit)

Control that maintains balance at a constant weight by setting one precision regulator. They are suitable for assisting jigs and tools that do not cause weight fluctuations.



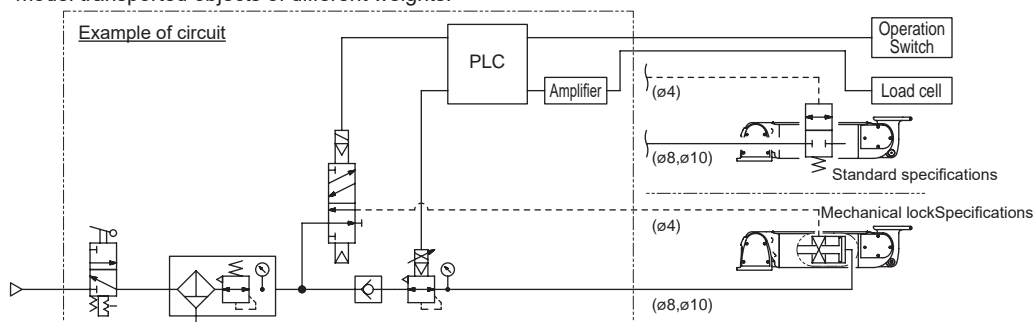
■ Operating pressure fixing control (air 2-pressure circuit)

With two precision regulators, when there is a transported object and when there is no transported object, two balance states are preset and then switched by switch operation. This series is suitable for use in batch production, etc., where identical products are transported continuously.



■ Automatic operating pressure adjustment control

Control which detects the weight of the transported object by a load cell installed at the arm tip, and adjusts the pressure according to the weight with an electro pneumatic regulator. It is suitable for handling multi-model transported objects of different weights.



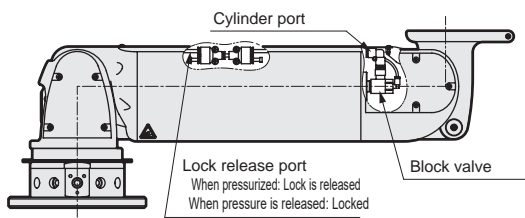
[Consider the layout when assembling and using unit products]

- Although rubber cushion is built into the stopper bolt and rotation prevention bolt of the rotation unit, the structure does not receive impact. When considering a layout, make sure that the layout has enough margin so that the arm does not hit the rotation end during operation.

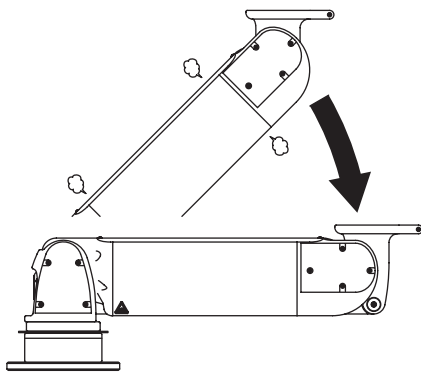
2 . PAW Series Standard specifications

⚠ WARNING

- Each PowerArm unit in the standard version has a built-in block valve. The block valve works as a vertical lock, which is unlocked by applying pressure. If the block valve is activated due to a sudden decrease in primary pressure (source pressure) due to trouble, etc., after primary pressure is restored, supply the balance pressure to the cylinder port, and then apply pressure to the unlock port to release the lock. If the lock is unlocked when the balance pressure is not supplied, the arm may drop, which is very dangerous.



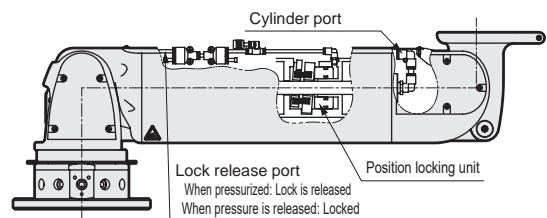
In addition, since it is an air block system that seals the internal cylinder, if left for long periods, the arm will drop due to minute leakage from the cylinder. When leaving it for long periods, lower all the arms to the bottom end. If you need to leave it at a state other than the fully descended one, please contact us.



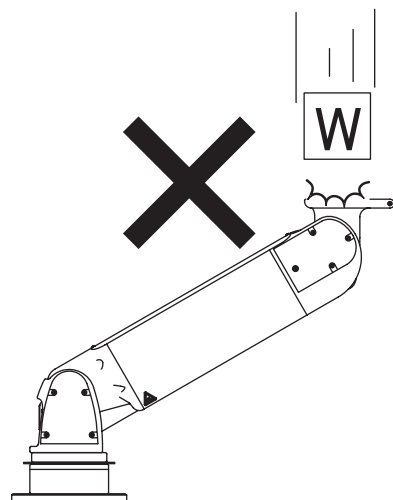
3 . PAW-*B Series mechanical lock specifications

⚠ WARNING

- Each PowerArm unit with Mecha-Lock specifications has a built-in lock unit. The lock unit works as a vertical lock and is unlocked by applying pressure. If the Mecha-Lock is activated due to a sudden decrease in primary pressure (source pressure) due to trouble, etc., supply the balance pressure to the cylinder port after the primary pressure is restored, and then pressurize the unlock port to release the lock. If the lock is released without supplying the balance pressure, the arm may fall and it may be very dangerous.



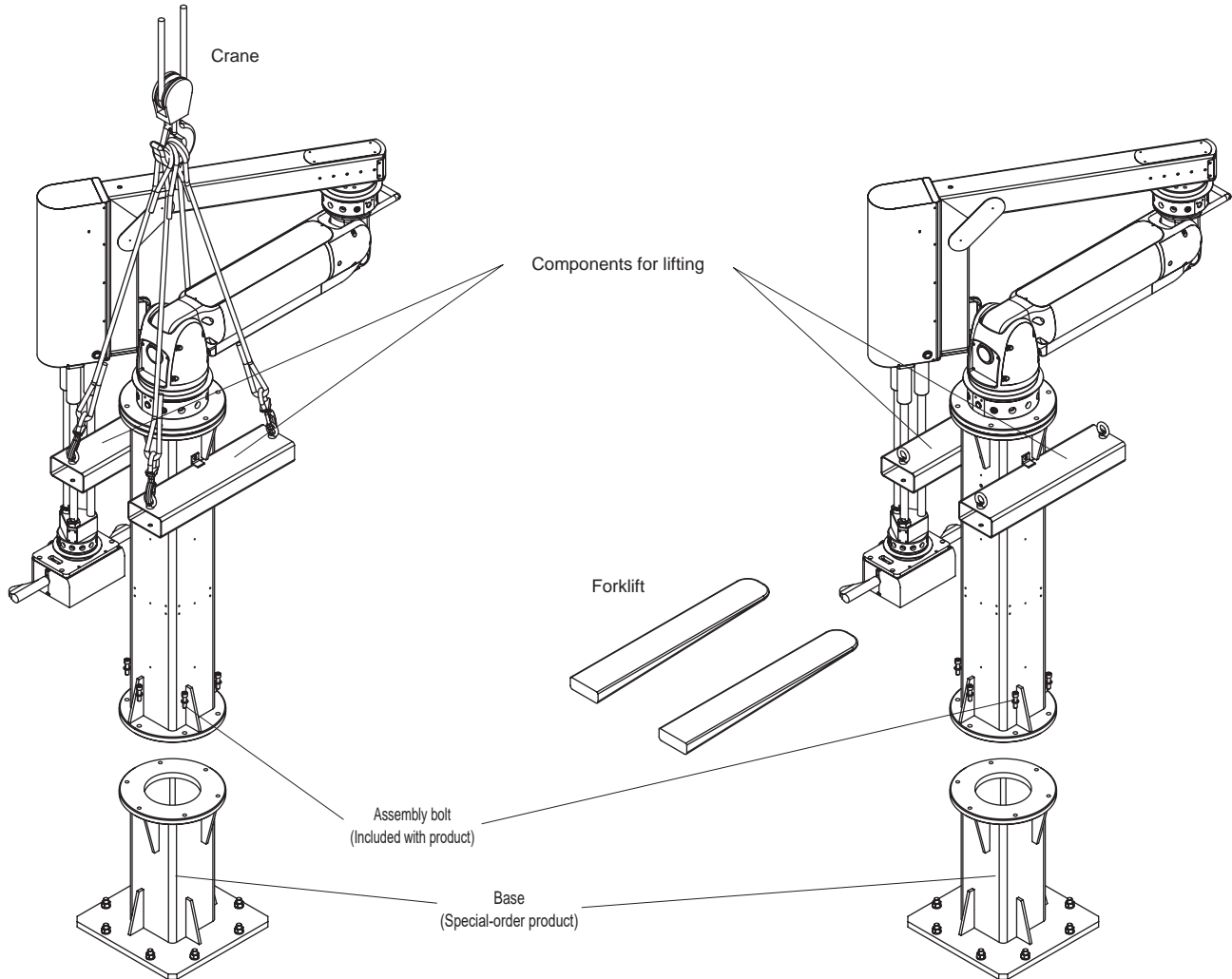
- When placing transported items on the device tip part (including mounted attachments and jigs, etc.) with the vertical lock engaged, do not drop the transported items for loading. The lock may not be able to be released.



4. PAW-A palletizing specifications

CAUTION

- This product is shipped in a wooden crate packaging form.
- For transportation, installation and assembly, cranes, forklifts, etc., which are appropriate for the product weight are required.
- Materials to be suspended (lifted) are assembled before shipment. Install and assemble them on the base by suspending or lifting them with a crane or a forklift.



5. Controller PAW-B

DANGER

- Use a tightening fitting to connect the piping between the controller and this product.

WARNING

- When connecting the air piping (electric wiring) protruding from the piping outlet of the body to the air circuit (electric circuit), check that the air piping or electric wiring is not crushed, or that tensile stress is not applied.

Use / Maintenance

1 . PAW Series Standard/mechanical lock specifications

WARNING

- If vibrations, noise, or other abnormalities occur, first assure your own safety, and then, if possible in safety, apply vertical and rotation locks. A fatal accident or total damage to the device may occur.
- Do not modify the product or device without the manufacturer's approval.
- Do not put hands or fingers into product or device gaps.
- When placing (hoisting) transported items on the device tip part (including mounted attachments and jigs, etc.), do not stack (hoist) lopsidedly or so as to tip the load over.
- During work or transport operation, never move away from the product or device. When releasing contact, always be sure to apply the lock, even if it is in a balanced state.

[Tip hazards]

- Do not use in excess of the maximum load capacity.

- Do not use in excess of the moment load.

2. PAW-A palletizing specifications

WARNING

- Do not hang the product from the arm section.
- Do not climb the product.

CAUTION

- During relocation or maintenance, do not suspend up the arm section.

3 . Controller PAW-B

WARNING

- Do not touch the live parts.
- Establish a ground connection before use.
- Do not use as a step.
- Do not climb the product.
- When using the wall mounting T-bracket, do not push up the product from below.
- Do not place yourself under this product when it is mounted on a wall.
- When installing on the floor (floor), install on a firmly paved, flat surface.

CAUTION

- If the PowerArm is not used when the day's work is completed, turn OFF the power supply and close the residual pressure exhaust valve to release air.
- Movement should be done by two people, while holding the handles.
- Do not remove the hexagon bolts of the cover except for installation or maintenance.
- Do not use this product with the cover removed.

4 . Dolly PAW-C

- Do not use this product at levels exceeding the allowable moment.
- Use on a firmly paved, flat surface.
- For a dolly with outriggers, use it with the outriggers fully extended.
- For a dolly with or without outriggers, be sure to use the product with four adjusters in contact with the ground.
- Move the dolly when the arm tip is completely lowered; for multiple axes, move only with the product folded into its most compact state.
- Do not move the dolly when the arm tip part (including mounted attachments and jigs, etc.) is carrying items to be transported.

How to unlock manually

When trouble occurs (electricity, air supply stop, etc.), the lock can be manually released. For details of how to unlock manually, refer to the instruction manual.

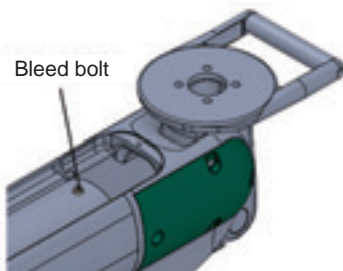
⚠ CAUTION

- The lock must be manually released by a service man with sufficient knowledge of the machine and air circuit.
- Lower transported objects and workpieces as far as possible before starting work.

[Vertical direction]

1 . PAW Series Standard specifications

- 1 . Stops air supplied to systems and devices. When performing electrical control, turn the power OFF.
- 2 . Remove the top cover.
- 3 . By loosening the bleed bolt 2 or 3 turns, internal air is gradually exhausted and drops slowly.

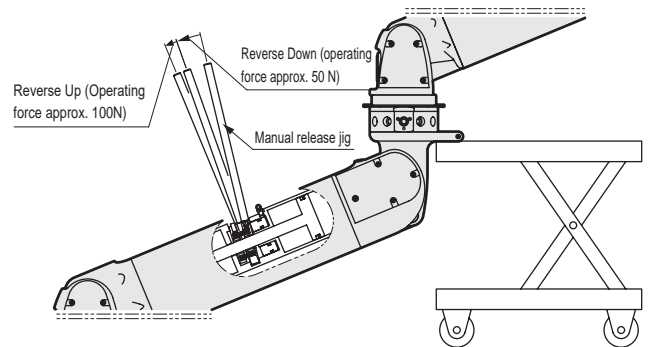


2 . PAW Series mechanical lock specifications

⚠ WARNING

- Manually release the handle while supporting it with a movable lifter, jack, etc. If manually released without support, the product could fall suddenly and cause a fatal accident on the body, product or device.
- 1 . Stops air supplied to systems and devices. When performing electrical control, turn the power OFF.
 - 2 . To prevent falling during manual release, the handle of the PowerArm unit is supported by a movable lifter, jack, etc.

- 3 . Remove the top cover.
- 4 . Remove the manual release cover.
- 5 . Loosen the bleed bolt 2 or 3 turns.
- 6 . Screw the manual release jig included with the product fully into the screw hole in the manual release cover.
- 7 . As shown below, the lock is released when the manual release jig is operated.

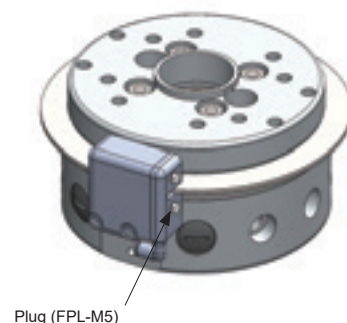


- 8 . Gently lower the movable lifter, jack, etc.

[Rotation direction]

1 . PAW Series Standard / Mechanical lock specifications

- 1 . Stops air supplied to systems and devices. When performing electrical control, turn the power OFF.
- 2 . The lock is released when two plugs (FPL-M5) are removed and two hexagon socket head cap screws are screwed into the removed screw hole.



Precautions for export

- Contact the nearest CKD Sales Office for information on the EAR assessment.