Pneumatic components

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 73 for general information of the cylinder, and to Intro Page 80 for general information of the cylinder switch.

Product-specific cautions: Rotary actuator rack and pinion mechanism RRC Series

Design/selection

⚠ CAUTION

■ Do not apply torque exceeding rated output externally to the product.
If force exceeding rated output is applied, the product could be damaged.

■ If oscillating angle repeatability is required, directly stop external load.
The initial oscillating angle may change even with products provided with adjustable angles.

■ If the axial load (thrust load) on the shaft exceeds the allowable value, faulty operation could occur. Therefore, do not apply a load in excess of the allowable value. If this is unavoidable, use a structure with a thrust bearing as shown in Fig.1.

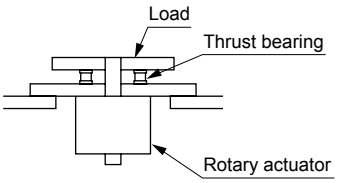

Fig. 1

■ Avoid applying bending (radial) load exceeding the allowable value onto the shaft end, or faulty operation could occur.
When unavoidable, use a mechanism transmitting only rotation as shown in Fig. 2.
When connecting the shaft end and load at any position in the oscillation range, use flexible couplings, etc., that will not twist off to prevent the shaft from breaking and bearings from wearing or seizing.

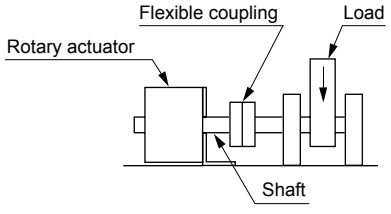

Fig. 2 Radial load

■ Install the external stopper in a position far from the rotary shaft.
If the stopper is installed near the rotary shaft, torque generated by the product could be applied to the rotary shaft. This reaction on the stopper may damage the rotary shaft or bearings, possibly resulting in injury to the operator or damage to equipment or devices.

■ If the load weight is large and oscillation speed is high, large inertia could be generated and allowable absorbed energy exceeded, possibly damaging the rotary actuator.
Install a shock absorber to absorb inertia.

■ When installing a load or jig, etc., on the rotary actuator shaft, check that load is not applied to the body as shown in Fig.3.

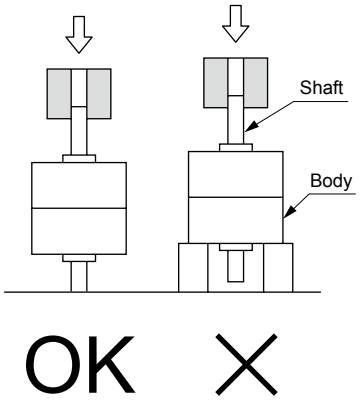

Fig. 3

■ Prevent seizing at rotating sections.
Apply grease to rotating sections (pins, etc.) to prevent seizing.

■ The retention torque of the oscillating end is about half that of the effective torque, so a load factor of 50% or less should be used.

■ Generally, select the model so that the output torque is twice or more than that required by load.
The RRC Series uses a double piston, so if the oscillating angle is adjusted by the stopper bolt, torque at the oscillation end will be half the effective torque.

■ Even if the required torque load is low during oscillation motion, the load inertia may lead to actuator damage. Upon consideration of moment of inertia, kinetic energy and oscillating time, be sure to use with the allowable energy or less.

Mounting, installation and adjustment

⚠CAUTION

■ When adjusting the angle by supplying pressure, do not rotate the device too much in advance.
When adjusting while supplying pressure, the device could rotate and drop during adjustment, depending on how it is oriented, possibly resulting in operator, component, or device injury or damage.

■ Do not loosen the angle adjustment hexagon bolt beyond the adjusting range.
Loosening more than the adjusting range may cause the angle adjustment bolt to fall out, potentially causing bodily injury or damage to the workpiece/device/equipment.
The cylinder's oscillating angle will decrease when the angle adjustment hexagon bolt is rotated clockwise.

■ Observe steps (1) to (5) when adjusting the angle. If adjustments are not made this way, the seal washer will be damaged after one or two adjustments.

[Angle adjustment procedure]

(1) First loosen the hexagon nut as shown in Fig.1.

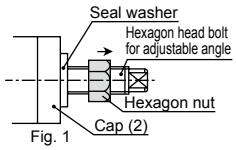

Fig. 1

(2) Second, remove the seal washer cap (2) by hand to reach the state shown in Fig. 2.

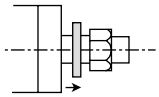
Fig. 2

(3) Turn the angle adjustment hexagon bolt, hexagon nut, and seal washer together as shown in Fig.3, and adjust the angle. Check that the rubber section of the seal washer does not bite into the thread part.

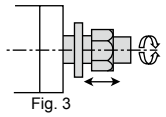
Fig. 3

(4) After adjusting the angle, move the seal washer near to the cap (2) by hand as shown in Fig. 4.

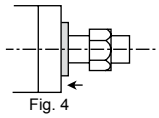
Fig. 4

(5) Tighten securely with the hexagon nut as shown in Fig. 5. Check that the rubber section of the seal washer does not bite into the thread part.

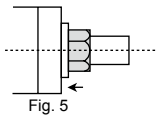
Fig. 5

■ Securely tighten the hexagon nut after adjusting the angle. If not adequately tightened, the hex nut could loosen in the course of usage, resulting in external leakage.