Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Intro 39, and for cylinder switches, see P. 628.

Individual Precautions: Check Valve

During Design / Selection

Warning

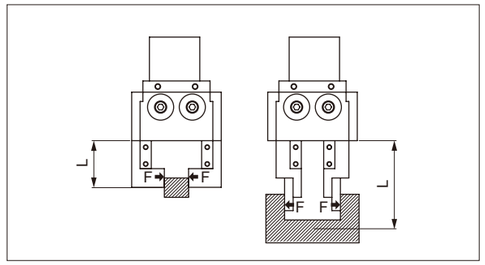
■ If there is a risk that the moving workpiece may pose a danger to the human body, or a risk of fingers being pinched in the finger part, please implement safety measures such as installing a protective cover.

■ If circuit pressure drops due to a service interruption or problems in the air source, gripping force drops and the workpiece could drop. Provide position locking measures, etc., so that personnel are not injured or machines damaged.

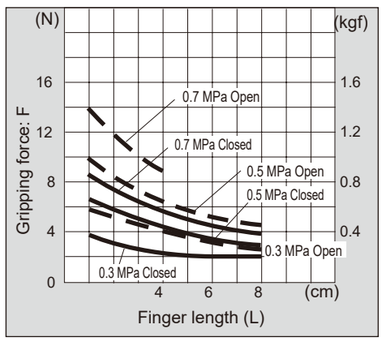
Caution

■ Precautions Regarding Gripping Force

● Gripping force represents the force when gripping a workpiece as shown in the figure below.



● Performance data indicates the gripping force at hand finger length L at a supply pressure of 0.15 to 0.7 MPa.



● When determining the gripping force from performance data, if L is the distance to the workpiece's center of gravity when the attachments are manufactured, the gripping force F is as follows

When = 1, then F = F1

When = 2, then F = F2 Refer to the drawing below.

Expressed as.

● For the length when L-shaped attachments are included, select as follows.

Example: For an L-shape, 30 mm in the finger direction and 30 mm bent at 90 degrees, the attachment length is considered to be 60 mm.

● Use attachments with a length wilow profile the values in the gripping force performance data table for each model.

● The maximum length of the attachments should be wilow profile the performance data.

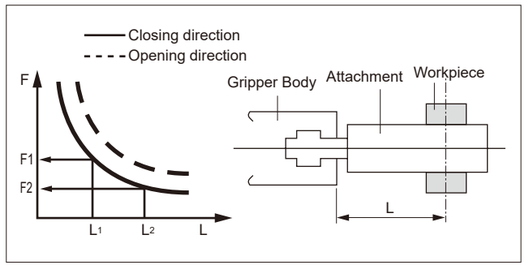
● When transporting a workpiece (weight W_L), use the following as a reference.

W_L x 9.8 x 5 < (F x N) [Holding only]

W_L x 9.8 x 10 < (F x N) [Normal transport]

W_L x 9.8 x 20 < (F x N) [Rapid acceleration transport]

W_L : Workpiece Weight [kg]
F : Gripping Force (N)
N : Number of fingers [Qty.]

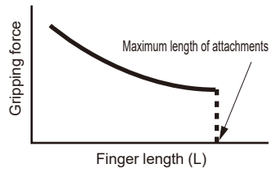


■ Use as short and light an attachment as possible. If they are long and heavy, the inertial force during opening and closing will be large, which may cause play in the fingers or accelerate wear on the finger sliding parts, adversely affecting the service life.

● Keep the length of the attachments wilow profile the values in the performance data.

● The weight of the attachments affects the service life. Please keep it at or below the following.

W < 1/4H (1 piece) W : Weight of finger
H : Gripper Product Weight



■ Avoid using only the spring force of the single-acting type to grip workpieces as much as possible.The gripping force will become unstable and may cause malfunction.

■ For the single-acting type, the spring force is weakest near the stroke end (open end for NO type, closed end for NC type). Due to the structure that operates with spring force, it may not return if operated with a short stroke, so consider the attachment shape to grip the workpiece with sufficient stroke allowance.

■ Usage Environment

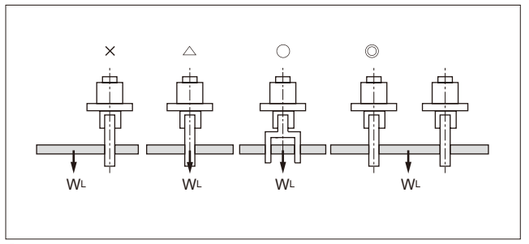
In cutting, casting, and welding factories, foreign matter such as cutting fluid, chips, and dust may enter. Prevent these as much as possible with covers, etc. Also, do not use in the following environments.

● Splashing of cutting fluid (because sliding parts are abraded by abrasives or abrasive in the fluid)

● When organic solvents, chemicals, acids, alkalis, kerosene, etc. are contained in the atmosphere

● Exposure to water

■ When gripping long or large workpieces, gripping the center of gravity is a prerequisite for stable gripping, but consider increasing the size or using multiple units to ensure stability.



◎: Excellent, ○: Good, △: Conditiona, ×: Not Applicable

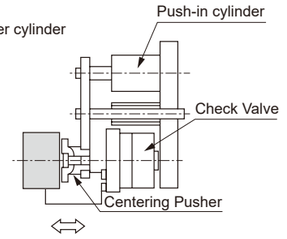
■ Select a model with sufficient gripping force for the workpiece weight.

■ Select a model with sufficient opening/closing width relative to the workpiece size.

■ If directly inserting the workpiece into the jig with the hand, consider clearance during design to avoid damaging the hand. The hand may be damaged.

Check Valve

When using a pusher cylinder



Note) The workpiece is slid along the top of the attachment, so chuck life could drop markedly. Sufficient consideration must be given to the shape of the attachments.

■ If the attachment rigidity is insufficient, deflection may cause the finger to jam and adversely affect operation.

■ Adjust the hand opening/closing speed with a speed controller (optional). If used at high speed, play may occur sooner. Also, the shock during opening and closing may cause the workpiece to vibrate, leading to chucking errors, workpiece insertion errors, or poor repeatability.

■ When using small bore/short stroke actuators at high frequency, condensation (water droplets) may form in piping depending on conditions. Take measures to prevent condensation by using a quick exhaust valve, etc.

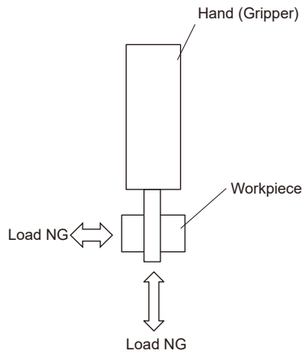
■ The rubber cover does not guarantee hermeticity. Since gaps may form between the rubber cover, body and finger, contact CKD if this is a problem.cv

During Use

1. Common

Caution

■ Do not apply excessive load to the fingers or attachments during workpiece attachment/detachment or transfer. Scratches or dents on the finger may cause malfunction.



■ If a lateral or impact load is applied to the finger, it may cause play in the finger or damage. Adjust and check that no external force is applied to the finger.

■ Clamping operations become more accurate when performed as softly and slowly as possible. Also, repeatability becomes stable.

■ Periodically replenish grease to the sliding parts of the finger. Periodic replenishment can further extend the service life.

■ When attaching the attachment, be careful not to apply a lateral load to the finger.

■ Tighten with the following torques when mounting.

Nominal screw size	M3	M4	M5	M6	M8
Recommended tightening torque (N·m)	0.59	1.4	2.8	4.8	12.0

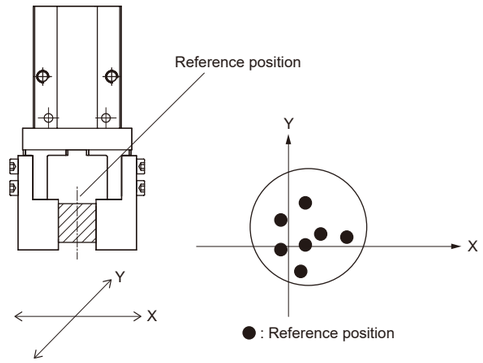
■ Do not disassemble or modify the body.

■ The rubber cover is a consumable part. Replace as necessary.

■ Repeatability

Repeatability refers to the deviation in the finger stop position when clamping/unclamping is repeated under the same conditions (hand fixed, same attachment used, etc. – see below). Shock during opening/closing may lead to workpiece positional deviation and deterioration of repeatability. Also, be aware that wear or insufficient rigidity of the attachments can also lead to deterioration of accuracy.

Condition
· Attachment dimensions, shape, weight
· Workpiece gripping position of attachments
· Clamping method, length
· Resistance at the contact area between attachments and workpieceShockless opening/closing with a speed controller
· Fluctuation of gripping force (air pressure), etc.



For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual .

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