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: Free position locking large bore size cylinder USC Series

Design/selection

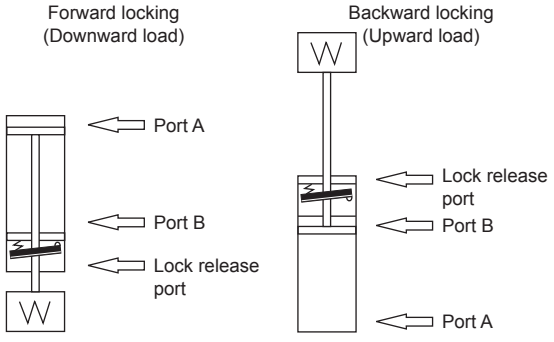
WARNING

- Cylinder with position locking mechanism (for holding cylinder stationary).
  Emergency stops (while the cylinder is in operation) can significantly decrease the service life.

- If back pressure is applied to the locking mechanism, the lock may be released. Use a discrete valve, or use an individual exhaust manifold.

- Do not apply torque to the rod when brakes are applied because the locking force may decrease, creating a dangerous condition. Also, use this product in mechanisms in which the rod does not rotate.

- To release the lock, when using forward locking, supply pressure to port B, and when using backward locking, supply pressure to port A. Check that load is not applied to the locking mechanism. When both ports A and B are exhausted and the piston is locked, if pressure is supplied to port A for forward locking or to port B for backward locking, the lock may not be released or, even if released, the piston rod may pop out, creating a hazard.



- Do not use multiple synchronized cylinders with position locking. If the synchronization deviates, an excess moment load or load concentration is applied to the cylinder locked first, risking lock release defects, shortened service life, or damage.

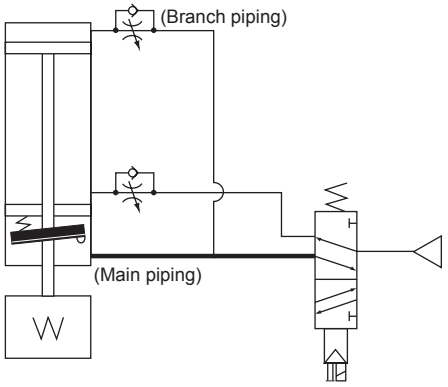
CAUTION

- Basic circuit diagram
  Arrange the air piping of this cylinder as shown in the figure below. Arranging the pipes differently from the figure below, such as piping the position locking part as a single unit, may cause problems such as delayed response.

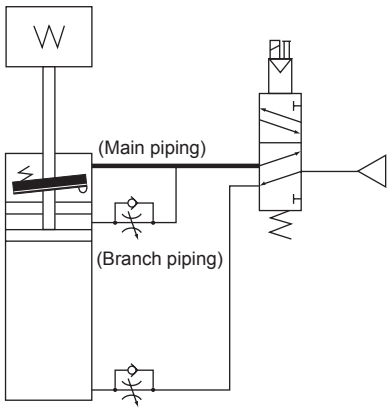
  1. Be sure to branch the piping of this cylinder after the valve into the position locking part (lock release port as main piping) and cylinder part (cylinder port as branch piping) as shown in the figure below.

  2. Be sure to design the piping so that the lock is released before the cylinder starts operating. Failure to do so may prevent unlocking or cause the piston rod to jump out.

Forward locking
(Downward load)



Backward locking
(Upward load)



Using the emergency stop with the air piping as shown in the figure above will move the cylinder backward in a forward locking and forward in a backward locking, returning it to the original position. (When there is no residual pressure, the cylinder stops at that point.)

Mounting, installation and adjustment

⚠WARNING

- Do not apply torque to the rod when brakes are applied because the locking force may decrease, creating a dangerous condition. Also, use this product in mechanisms in which the rod does not rotate.
- Do not apply grease to the piston rod during operation because the locking force may decrease, creating a dangerous condition.

⚠CAUTION

- Main piping in the basic circuit diagram on the previous page should be thicker and shorter than branch piping.
- Be sure to provide a guide separately when using multiple synchronized cylinders.
  Using only the cylinder may impair synchronicity and cause the rod to twist, leading to malfunctions.

Use/maintenance

⚠WARNING

- Do not apply additional grease to the piston rod or wipe off the grease that is already applied.
- Do not disassemble the lock, as doing so may be dangerous.
- Always use the product with the dust cover on, except for when performing manual release, in order to prevent failure or malfunction.
- For safety purposes, prevent the load from falling under its own weight during maintenance.

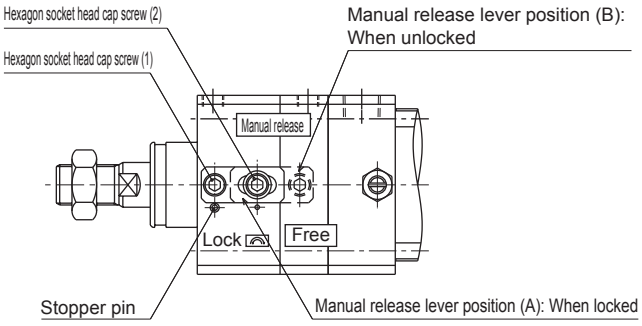
⚠CAUTION

- When locking the first time after leaving the lock released for a long time, a delayed response may occur in the lock.
  Do not leave the lock pressurized, and operate the lock at each cylinder operation.
  (Use the basic circuit diagram shown on page 924)
- Keeping the cylinder with pressure applied to the lock mechanism may cause the lock to release. Do not use 3-position closed center and 3-position P.A.B connection solenoid valves.
- Due to the structure, the piston rod drops by about 1 mm when the lock is applied.
- If no air pressure is supplied in vertical mounting, etc., locking force may not be sufficient when the lock is manually released. This may cause the rod to move (drop) with the load's weight.
  For safety, take the following measures before manually releasing the lock:

  ● Move the load to the bottom end.
  ● Provide a stopper to the load
  ● Apply air pressure to the cylinder to balance the load.

- Be sure to set the manual release bolt to the locking position in normal use.

■ How to unlock manually



● Unlocking
1) Loosen the hexagon socket head cap screw (1) 3 or 4 turns.
2) Loosen the hexagon socket head cap screw (2) 1 or 2 turns.
3) Rotate the release lever by 180° from the manual release lever position (A) to (B) in the direction of the arrow.
4) The piston rod is freed.

● Locking
1) Rotate the release lever by 180° from the manual release lever position (B) to (A) in the direction of the arrow.
2) Tighten the hexagon socket head cap screw (1) where the release lever comes in contact with the stopper pin.
3) Tighten the hexagon socket head cap screw (2).
4) The piston rod is locked.

Note: Be sure to rotate the release lever in the direction of the arrow when manually unlocking.
The release lever must not be removed.
The release lever can be turned by loosening the hexagon socket head cap screw (2) by 1 or 2 turns.
Excessive loosening may cause the release lever to come off.
Tighten the hexagon socket head cap screw at 8 to 11 N·m.

- The cylinder body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable absorbed energy range.