

PD375 Cylinders & Knobs

Model PD375 Quick-Change Cylinders & Knobs — Installation, Use & Maintenance

Quick-Change Cylinders and Knobs are used across a wide range of applications, including thermoforming, injection molding, robotics, automation, stamping, plastics and metal forming, racing, aerospace, defense, and more. More than 350,000 PD375-style cylinders are currently in service, operating in regular production across five continents — some in continuous use for fifteen years or longer without incident. This guide outlines the key factors governing proper installation, operation, and maintenance of the devices.

1. Alignment

Although infrequent, the majority of reported issues with quick-change devices have been resolved by addressing proper alignment. Correct installation of the quick-change system is critical to device performance; misalignment between the knobs and their corresponding cylinders can result in malfunction.

Installation guidelines for the cylinder locks are available for download on the Segen website: toolingtechgroup.com/segen-quick-change.

Alignment Tolerance

Cylinder locks must be mounted flush with the mounting plate and aligned with their respective knobs within 0.002". Exceeding this tolerance can cause the knobs to bend, bind, or fatigue prematurely.

2. Excessive Installation Torque

Over-torquing during initial installation can bend or weaken the knobs. Knobs are designed to be tightened with the Segen Socket Set to a snug fit, using thread-locking compound (Loc-Tite) to prevent loosening. No supplemental leverage or extension tools are required.

More information on the Socket Set is available at: toolingtechgroup.com/product/skt-segen-sockets.

3. Air Pressure

Although air pressure is not required to hold the cylinders in the locked position, sufficient air pressure is essential for complete cylinder actuation.

Recommended Air Supply

Minimum supply pressure: 50 PSI • Recommended operating pressure: 80–90 PSI

If a cylinder is not permitted to cycle fully, the knob may fail to release, subjecting it to additional stress. If cylinders do not receive air simultaneously, one cylinder may engage its mating knob differently than the others, producing uneven stress across the knob set. Use of a manifold to regulate air delivery to the cylinder locks is recommended, ensuring the first cylinder in line receives the same air volume as the last.

When locking the cylinders, confirm that all air pressure has been removed from the air lines; residual pressure can allow the locking balls to remain in the unlocked position until it bleeds off. A manifold or the Segen Safety Box helps ensure pressure is released uniformly and on command.

4. Air Fittings

Use of the Segen safety lock-out box (part number PD438BX) is strongly recommended to help prevent inadvertent energization of the cylinders with air.

On the PD375 cylinder, the pneumatic port is positioned very close to the interior piston. Segen air fittings, elbows, and tees are recommended for plumbing the cylinders for air supply.

Fitting Engagement Limit

Do not thread an air fitting into the port more than 4 turns (two full revolutions). Excessive fitting engagement can obstruct the piston and prevent it from traveling fully into the locking position.

5. Temperature

Thermal expansion can contribute to metal fatigue. Metals subjected to excessive stress will mechanically fail or fracture; this can also occur over time as a result of repeated, smaller stresses. The most common cause of metal failure, accounting for roughly 80% of cases, is fatigue. Thermal expansion can weaken Segen knobs when they are repeatedly forced to flex as the associated tool expands and contracts, a process analogous to a paper clip that fractures after being bent back and forth.

To mitigate this, Segen offers a sliding expansion knob designed to accommodate thermal expansion. Where extreme heat is a factor in an application, refer to the Segen website for sliding knob specifications.

Sliding Knob Usage

Sliding knobs are designed for plastics thermoforming molds, accommodating thermal expansion of the tooling so a mold can be changed out while still hot rather than waiting for it to return to ambient temperature and size. Sliding knobs move in one direction only; the recommended layout allows warm tooling to expand thermally in all directions. Use of sliding knobs for other purposes, such as accommodating mechanical play or clearance, is not guaranteed to perform reliably. Thorough testing is recommended for any non-standard application.

6. Proximity Sensors

Proximity sensors are installed and calibrated exclusively at the Segen facility and should not be adjusted after receipt. Prior to shipment, each sensor cylinder is tested multiple times against a variety of knobs. The position of the sensor barrel and mechanical bolt-stop should not be altered following receipt. If a product falls out of adjustment, return it to Segen for inspection and re-installation or re-calibration.

7. Maintenance

Maintenance frequency for quick-change cylinders depends on the operating environment. Cylinders operating in wet, dirty, or high-temperature conditions require more frequent maintenance or replacement.

Lubrication & Cleaning

Segen cylinders are engineered to operate without lubricant. A properly functioning cylinder will produce an audible rattle from the internal steel balls when shaken. Grease attracts dust and debris, which can cause the balls to seize within the ball track and result in a failure to lock instantly.

For routine maintenance, clean the cylinders with a fine wire brush and several short bursts of compressed air. An occasional light application of low-viscosity spray lubricant is acceptable but not required. Particular care should be taken to clear the conical area of the cylinder before each tool engagement, as residual particles inside the cone can prevent the knob from seating fully.

Unlock Before Engaging

The cylinder locks must be unlocked (energized with air) before engaging the male knobs. Forcing the knobs into the cylinders before unlocking them will damage the cylinders and knobs.

Segen knobs are engineered for durability but can be damaged through improper use. Knobs should be replaced if they become bent, dented, cracked, or twisted as a result of machine or operator error. When a machine operator or maintenance specialist is uncertain whether a knob remains serviceable, replace it as a precaution; replacement knobs represent the lowest-cost component in the system and are considerably less expensive than replacing a cylinder or repairing a damaged tool or machine.

In Summary

Adherence to these guidelines will help ensure a reliable, trouble-free transition to the Segen Quick-Change system.