



# SD Series Manual Overrides

## Sizing & Ordering

**NOTICE:** DYNATORQUE™ manual overrides are engineered devices for intended use with industrial automated valves, dampers, and other related types of equipment. Accordingly, when quoting or ordering a manual override several pieces of information are required to correctly size and select the product. This information is only available from the specifying entity and in all cases, final sizing and selection is the responsibility of the specifying entity. DYNATORQUE is not responsible for obtaining technical or dimensional information from third parties such as actuator or valve manufacturers, etc.

## Ordering Manual Override Operators

When ordering manual override operators, please carefully review the information in this document. Each section raises issues that are essential to specifying a manual override that will interface correctly with the automated package and provide years of dependable service.

In all cases, supplying certified valve technical information such as, top works drawings, and actuator mounting dimensions, is essential to DYNATORQUE correctly sizing the override. DYNATORQUE will be pleased to verify sizing that has been done by the specifying entity.

### Sizing 'SD' Type Overrides

#### Required Information

##### 1. What is the torque requirement to override?

Torque is normally expressed in Inch Pounds (in. lbs.), Foot Pounds (ft. lbs.), or Newton Meters (NM). This is a measurement of how much rotational force the application requires to actuate the driven device.

- **Double Acting Applications:** SD type override operators are normally associated with double acting pneumatic or hydraulic actuators, or back driveable electric actuators. For applications involving pneumatic or hydraulic actuators, provisions must be made in the actuator air/fluid supply to bleed the actuator cylinders prior to overriding. Assuming that the primary actuator has been correctly sized, using one of the following formulas will afford override torque and a comfortable safety factor: (Use either Valve Break Torque or Valve Seating Torque, whichever is greater).

$$\begin{aligned} \text{Valve Break Torque} \times \text{Safety Factor}^* &= \text{Override Sizing Torque} \\ \text{or} \\ \text{Valve Seating Torque} \times \text{Safety Factor}^* &= \text{Override Sizing Torque} \end{aligned}$$

\*Safety factor should be at least 1.25

- **Spring Return Applications:** When an SD type override is used with a spring return actuator, the override must generate enough torque to operate the valve *and* compress the actuator spring. As indicated above, for pneumatic or hydraulic applications, provision must be made in the actuator air/fluid supply to bleed the actuator cylinder prior to engaging the override. Assuming that the primary actuator has been correctly sized, using the following formula will afford override torque and a comfortable safety factor:

$$\text{Actuator Spring End Torque} \times 2.7 = \text{Override Sizing Torque}$$

## 2. What are the override-to-actuator and override-to-valve mounting and drive requirements?

Sandwich mounted override operators have two mounting surfaces and drive connections that have to be considered. Establishing dimensional compatibility is essential to correctly sizing the override and establishing the proper mounting and drive interface.

### Bolting patterns:

- **Top Flange Pattern:** The top flange side of the override is normally associated with mounting to the pneumatic, hydraulic, or back driveable electric actuator. In applications where the actuator is to be close-coupled (mounted directly ) to the override, this mounting pattern must be dimensionally compatible with that of the actuator.
  1. Measure the actuator's bolt circle or bolt pattern square dimensions. When ordering, indicate whether the pattern is circle or square.
  2. Determine the mounting bolt size and number of bolts as well as their relative position to centerline (on centerline, straddle 45 degrees off centerline, etc.).
  3. **Caution:** Many actuators are supplied with metric dimensions and metric bolt sizes. Additionally, some actuators are supplied to DIN standards that include a locating feature (spigot) that assists in centering this component. To insure correct fit, DYNATORQUE must be advised of these issues.
  
- **Bottom Pattern:** The bottom pattern is normally associated with the valve topworks connection. There are two ways to approach this pattern.
  1. Override bottom patterns are typically the same as the actuator bottom mounting pattern. Valve mounting patterns and/or specific valve features are not always directly compatible with actuator mounting patterns. Assuming the actuator will be mounted to the valve using a mounting plate or bracket, the override can be mounted to the existing mounting hardware.
  2. The other approach is direct mounting. If the valve does not have a packing gland, it may be possible to direct mount the override to the valve bonnet and eliminate the mounting hardware. Direct mounting to the valve requires specific valve dimensions. When submitting an RFQ or purchase order, be sure to include certified valve dimensional topworks drawings as part of the information package.

### Drive Coupling Connections:

Depending on the manufacturer of the valve and actuator, these connections can be very different configurations. It is important that connection type and dimensions be clearly specified to DYNATORQUE to insure a proper connection.

- **Actuator-to-Override:** Assuming that an actuator-to-override adapter kit is not being used, the top or “actuator end” of the drive coupling is required to couple to the output drive of the actuator.
  1. There are a wide variety of connection types used. A few examples are double-D, squares, stars, bores with keyways, etc. Determining the connection type and accurate dimensional information is essential to assuring a proper fit of the SD to the automated valve package.
- **Override-to-Valve:** The override-to-valve (bottom) connection must be compatible with the valve stem and can be supplied three ways:
  1. DYNATORQUE **normally** supplies a drive coupling connection that is dimensionally the same as the actuator torque output drive. This assumes use of mounting hardware with a driver compatible with the actuator.
  2. DYNATORQUE can provide a drive coupling with the bottom side blank. This allows the end user or valve automation center to modify the drive coupling for direct adaptation to the valve stem.
  3. DYNATORQUE can also provide the drive coupling machined to directly fit the valve stem. Since valve stems come in many different configurations, this option requires specific valve topworks dimensions. When submitting an RFQ or purchase order, be sure to include certified valve topworks dimensional drawings as part of the information package.

### 3. Other Sizing and Environmental Considerations

- **What is the Handwheel Rim Effort Requirement?** Overrides differ from standard gear operators in that a handwheel is normally supplied as part of the complete package and is included in the package price. Handwheels are sized to require approximately 80 pounds of rim effort to operate the override at rated torque. However, rim effort is not the only consideration when sizing a handwheel—many applications have space constraints and handwheels are available in a variety of sizes to satisfy envelope dimension requirements. If different handwheel rim efforts or dimensions are required, please consult a factory representative.
- **What is the application’s environment?** DYNATORQUE offers many options to reduce or eliminate damage caused by corrosive environments. Stainless steel component bolting and mounting hardware, stainless steel input shafts, bronze output gears and epoxy coating are all available as options. For extremely aggressive environments, DYNATORQUE offers a product line of manual overrides that have all external components constructed of stainless steel including the housing, flanged cover, handwheel and drive coupling. Contact the factory or your representative for more information.

- **Required Torque vs. Mounting Dimensions** When sizing any override, both torque and mounting requirements must be considered. A direct-mounted “larger override” may be more cost-effective than a “smaller override” that requires custom mounting and driver design. When sizing and pricing, first assure adequate torque output, then consider selecting an override based on mounting dimensions as a cost effective alternative. Consult factory as necessary.

**Please Note:**

When assembling DYNATORQUE products to a valve or to an automated valve package, standard engineering practices must be utilized to assure proper mounting orientation, configuration, and distribution of weights and forces. Failure to do so could cause product damage and/or malfunction, **and void warranty consideration**. If there are any questions please contact the factory.

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