

Drive Couplings

Drive Couplings Overview

Rotating shaft-driven mechanical components are commonly used in all forms of machinery that perform the various processes and functions of modern industry. Perfect alignment of shafts and rotating components is desired, but it is nearly impossible to build a real-world machine in which adjacent shaft ends align perfectly.

Adjacent shafts can be misaligned in 3 orientations, angular, parallel and axial, see figure below. Misalignment will place stresses on shafts and related parts of the assembly such as bearings, which can result in early failure of both.

Drive couplings can be used to compensate for shaft misalignment, whether the misalignment is an intentional or an unintentional part of the design. When designing or modifying a system, there are essential factors to consider for choosing the correct couplings for the application.



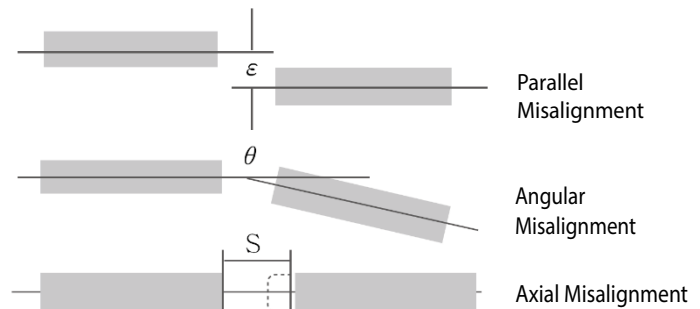
Design/Selection Factors:





(Refer to the specification tables herein for the particular specifications of each type of drive coupling.)

- **RPM:** For higher rpm applications, choose Jaw/Spider or Beam-Style Servo couplings. For lower rpm, consider Double-Loop or Oldham couplings.
- **Torque:** Consider the torque requirements of the application, and the torque specifications of the different drive coupling types. peak torque generally occurs at start-up, operating torque at steady-state operation, and reversing or braking torque during rapid acceleration or deceleration or direction changes.
- **Backlash:** Backlash is a measurement of the positional accuracy of the coupling, which is important for reversing and/or motion control applications. Zero backlash is ultimately desirable, but more expensive than necessary for low-precision applications.

For high-precision applications, choose Beam-Style Servo or Oldham couplings. For applications requiring less precision, consider Jaw/Spider or Double-Loop couplings.

- **Misalignment:** Some degree of angular, axial, or radial misalignment/displacement between shafts is almost unavoidable. Drive couplings can compensate for this misalignment.



| Coupling Type Comparisons | | | | |
|-----------------------------|---|---|--|---|
| Coupling Type | Jaw / Spider | Double Loop | Oldham | Beam-Style Servo |
| Representative Photo |  |  |  |  |
| Purpose | most common | light duty | general purpose | high performance & torque |
| Hub Material | aluminum | stainless steel | aluminum | 416 stainless steel |
| Center Material | polyurethane | Hytrel™ | Delrin™ | 420 stainless steel |
| Mounting Method | clamp | set screw | clamp | set screw |
| Electrical Isolation | yes | yes | yes | no |
| Backlash | varies | varies | zero | zero |
| Misalignment Capacity | ++ (axial) | +++ | ++ | + |
| Breakable "Mechanical Fuse" | no (fail safe) | no | yes | no |
| Relative Price | \$\$ | \$\$ | \$ | \$\$\$ |

Suremotion Drive Couplings

Beam-Style Servo Stainless Steel Set-Screw Couplings



Features

- Flexibility of bellows coupling plus torsional stiffness and strength of disc coupling
- Hubs made of 416 stainless steel
- Flex beams made of 420 stainless steel
- Zero backlash
- Corrosion-resistant
- Bore reducers available to fit a wide variety of bore combinations
- Very wide operating temperature range:
for 24/7 applications:
-73 to 191 °C (-100 to 375 °F)
for intermittent applications (<8hr):
-73 to 232 °C (-100 to 450 °F)

- Speeds up to 10,000rpm
- Torque up to 300 lb-in

Applications

- High performance applications
- High-speed applications
- High-torque applications

| Beam-Style Servo Stainless Steel* Set-Screw Drive Coupling Hubs | | | | | | | | | | | |
|---|----------|------|----------|---------|-------------------------------|--------------------------|------------------|-----------------|-------------|--|--------------|
| Part Number | Price | Size | Bore** | Max rpm | Torsional Stiffness (lb-in/°) | Max Torque (lb-in [N·m]) | Max Misalignment | | | Moment of Inertia (lb-in-s²x10 ⁻⁵) | Weight (oz) |
| | | | | | | | Radial (in [mm]) | Axial (in [mm]) | Angular (°) | | |
| DC-SBS19-0404 | \$99.00 | 19 | 1/4 in | 10,000 | 11 | 12 [1.4] | 0.010 [0.25] | 0.020 [0.51] | 7 | 0.86 | 0.84 |
| DC-SBS25-0808 | \$122.00 | 25 | 1/2 in | 7,500 | 27 | 24 [2.7] | 0.015 [0.38] | 0.025 [0.64] | | 3.75 | 1.60 |
| DC-SBS32-1010 | \$134.00 | 32 | 5/8 in | | 5,000 | 51 | | 48 [5.4] | | 0.020 [0.51] | 0.030 [0.76] |
| DC-SBS38-1212 | \$154.00 | 38 | 3/4 in | 3,750 | | 89 | 75 [8.5] | 0.025 [0.64] | | | 0.040 [1.02] |
| DC-SBS44-1414 | \$264.00 | 44 | 7/8 in | | 3,750 | 135 | 135 [15.3] | | | 0.025 [0.64] | 0.050 [1.27] |
| DC-SBS51-1616 | \$308.00 | 51 | 1in | 205 | | 180 [20.3] | 0.060 [1.52] | 115 | | | 11.26 |
| DC-SBS63-2020 | \$354.00 | 63 | 1-1/4 in | 395 | | 300 [33.9] | | 349 | | | 18.67 |

* Hubs are 416 stainless; flex beams are 420 stainless.

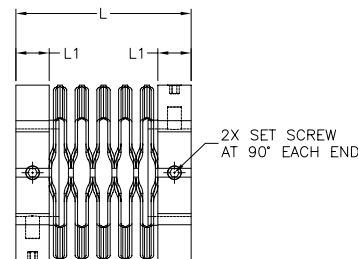
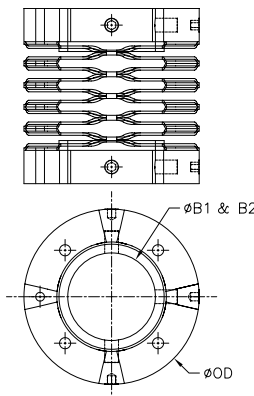
** Bore Reducers can be purchased separately from AutomationDirect and installed in DC-SBSxx-xxxx hubs if different bore sizes are needed.
(See page tROT-26 for Bore Reducers.)

Dimensions (in [mm])

| Beam-Style Servo Stainless Steel Drive Coupling Dimensions | | | | | |
|--|-----------|-------------|---------------|---------------|-------------|
| Size | Set Screw | L | L1 | ØB1* | ØB2* |
| (in [mm]) | | | | | |
| 19 | M3x0.5 | 0.75 [19.1] | 0.240 [6.10] | 0.250 [6.35] | 0.75 [19.1] |
| 25 | | 1.00 [25.4] | 0.345 [8.76] | 0.500 [12.70] | 1.00 [25.4] |
| 32 | M5x0.8 | 1.25 [31.6] | 0.386 [9.80] | 0.625 [15.88] | 1.25 [31.6] |
| 38 | | 1.50 [38.1] | 0.505 [12.83] | 0.750 [19.05] | 1.50 [38.1] |
| 44 | | 1.75 [44.5] | 0.550 [13.97] | 0.875 [22.23] | 1.75 [44.5] |
| 51 | | 2.00 [50.8] | 0.555 [14.10] | 1.000 [25.40] | 2.00 [50.8] |
| 63 | M6x1.0 | 2.50 [63.5] | 0.615 [15.62] | 1.250 [31.75] | 2.50 [63.5] |

* Use bore reducers for additional bore sizes and bore combinations.

See our website: www.AutomationDirect.com for complete Engineering drawings.





Drive Couplings

Accessories – Bore Reducers



Features

- For use in all SureMotion drive coupling hubs to reduce bore size
- Split-collar design with 2 set screw flats will not mark shaft
- 25% greater holding power than standard split collar
- Hardened stainless steel

| Bore Reducers – Stainless Steel Clamping Type | | | | | | |
|---|---------|------------------|----------|-----------------|-----------|----------|
| Part Number | Price | Outside Diameter | | Inside Diameter | | Length |
| | | Nominal | Actual | Nominal | Actual | |
| DC-BRS04-02 | \$16.50 | 1/4 in | 0.250 in | 1/8 in | 0.125 in | 0.221 in |
| DC-BRS04-04M | \$16.50 | | | 4mm | 4mm | |
| DC-BRS04-03 | \$16.50 | | | 3/16 in | 0.1875 in | |
| DC-BRS04-05M | \$16.50 | | | 5mm | 5mm | |
| DC-BRS08-06M | \$21.75 | 1/2 in | 0.500 in | 6mm | 6mm | 0.449 in |
| DC-BRS08-04 | \$21.75 | | | 1/4 in | 0.25 in | |
| DC-BRS08-05 | \$22.00 | | | 5/16 in | 0.3125 in | |
| DC-BRS08-08M | \$21.75 | | | 8mm | 8mm | |
| DC-BRS08-06 | \$22.00 | | | 3/8 in | 0.375 in | |
| DC-BRS08-10M | \$22.00 | 5/8 in | 0.625 in | 10mm | 10mm | 0.460 in |
| DC-BRS10-10M | \$25.00 | | | 10mm | 10mm | |
| DC-BRS10-07 | \$25.00 | | | 7/16 in | 0.4375 in | |
| DC-BRS10-12M | \$25.00 | | | 12mm | 12mm | |
| DC-BRS10-08 | \$25.00 | | | 1/2 in | 0.5 in | |
| DC-BRS10-14M | \$25.00 | | | 14mm | 14mm | |
| DC-BRS10-09 | \$25.00 | 3/4 in | 0.750 in | 9/16 in | 0.5625 in | 0.646 in |
| DC-BRS12-06 | \$30.00 | | | 3/8 in | 0.375 in | |
| DC-BRS12-12M | \$30.00 | | | 12mm | 12mm | |
| DC-BRS12-08 | \$30.00 | | | 1/2 in | 0.5 in | |
| DC-BRS12-10 | \$30.00 | | | 5/8 in | 0.625 in | |
| DC-BRS12-16M | \$30.00 | | | 16mm | 16mm | |
| DC-BRS12-11 | \$30.00 | 7/8 in | 0.875 in | 11/16 in | 0.6875 in | 0.755 in |
| DC-BRS14-14M | \$32.00 | | | 14mm | 14mm | |
| DC-BRS14-10 | \$32.00 | | | 5/8 in | 0.625 in | |
| DC-BRS14-16M | \$32.00 | | | 16mm | 16mm | |
| DC-BRS14-11 | \$32.00 | | | 11/16 in | 0.6875 in | |
| DC-BRS14-18M | \$32.00 | | | 18mm | 18mm | |
| DC-BRS14-12 | \$32.00 | 1 in | 1.000 in | 3/4 in | 0.75 in | 0.773 in |
| DC-BRS16-10 | \$32.00 | | | 5/8 in | 0.625 in | |
| DC-BRS16-18M | \$33.00 | | | 18mm | 18mm | |
| DC-BRS16-12 | \$33.00 | | | 3/4 in | 0.75 in | |
| DC-BRS16-20M | \$33.00 | | | 20mm | 20mm | |
| DC-BRS16-13 | \$33.00 | | | 13/16 in | 0.8125 in | |
| DC-BRS16-14 | \$33.00 | 1-1/4 in | 1.250 in | 7/8 in | 0.875 in | 0.793 in |
| DC-BRS20-22M | \$34.00 | | | 22mm | 22mm | |
| DC-BRS20-24M | \$34.00 | | | 24mm | 24mm | |
| DC-BRS20-25M | \$34.00 | | | 25mm | 25mm | |
| DC-BRS20-16 | \$34.00 | | | 1 in | 1.0 in | |
| DC-BRS20-17 | \$34.00 | | | 1-1/16 in | 1.0625 in | |
| DC-BRS20-18 | \$34.00 | | | 1-1/8 in | 1.125 in | |