## MDCS33-16-14-A

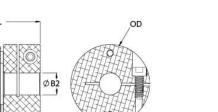
Ruland MDCS33-16-14-A, 16mm x 14mm Single Disc Coupling, Aluminum, Clamp Style, 33.3mm OD, 33.3mm Length

## Description

Ruland MDCS33-16-14-A is a clamp single disc coupling with 16mm x 14mm bores, 33.3mm OD, and 33.3mm length. It is zero-backlash and has a balanced design for reduced vibration at high speeds. The single disc design is comprised of two anodized aluminum hubs and two sets of thin stainless steel disc springs which can accommodate angular misalignment and axial motion, however does not allow for any parallel misalignment. MDCS33-16-14-A is lightweight and has low inertia making it well suited for applications with speeds up to 10,000 RPM. Hardware is metric and tests beyond DIN 912 12.9 standards for maximum torque capabilities. Ruland manufactures MDCS33-16-14-A to be torisionally rigid and an excellent fit for precise positioning stepper servo applications commonly found in semiconductor, solar, printing, machine tool, and test and measurement systems. It is machined from solid bar stock that is sourced exclusively from North American mills and RoHS3 and REACH compliant. MDCS33-16-14-A is manufactured in our Marlborough, MA factory under strict controls using proprietary processes.

Product	Specifications
Dama (D4)	

B1 Max Shaft Penetration   15.0 mm   B2 Max Shaft Penetration   16.1 mm     Outer Diameter (OD)   33.3 mm   Bore Tolerance   +0.03 mm / -0.00 mm     Length (L)   33.3 mm   Hub Width (LH)   15.00 mm     Recommended Shaft Tolerance   +0.000 mm / -0.013 mm   Forged Clamp Screw   M3     Screw Material   Alloy Steel   Hex Wrench Size   2.5 mm     Screw Finish   Black Oxide   Seating Torque   2.1 Nm     Number of Screws   2 ea   Dynamic Torque Reversing   2.83 Nm     Angular Misalignment   1.0°   Dynamic Torque Non-Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10° kg-m²   Maximum Speed   10,000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW:BT-1R-1/4-18.3     Recommended Hex Key   Metric Hex Keys   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Manufacturer   Ruland Manufacturing </th <th>Product Specifications</th> <th></th> <th></th> <th></th>	Product Specifications					
Outer Diameter (OD)   33.3 mm   Bore Tolerance   +0.03 mm / -0.00 mm     Length (L)   33.3 mm   Hub Width (LH)   15.00 mm     Recommended Shaft Tolerance   +0.000 mm / -0.013 mm   Forged Clamp Screw   M3     Screw Material   Alloy Steel   Hex Wrench Size   2.5 mm     Screw Marerial   Black Oxide   Seating Torque   2.1 Nm     Number of Screws   2 ea   Dynamic Torque Reversing   2.83 Nm     Angular Misalignment   1.0°   Dynamic Torque Non-Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup> Maximum Speed   10,000 RPM     Full Bearing Support Require?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW/BT-tR-t/4-18.3     Recommended Hex Key   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Statinless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type E Black Anodize	Bore (B1)	16 mm	Small Bore (B2)	14 mm		
Length (L)   33.3 mm   Hub Width (LH)   15.00 mm     Recommended Shaft Tolerance   +0.000 mm / -0.013 mm   Forged Clamp Screw   M3     Screw Material   Alloy Steel   Hex Wrench Size   2.5 mm     Screw Finish   Black Oxide   Seating Torque   2.1 Nm     Number of Screws   2 ea   Dynamic Torque Reversing   2.63 Nm     Angular Misalignment   1.0°   Dynamic Torque Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10 <sup>6</sup> kg-m <sup>2</sup> Maximum Speed   10.000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW:BT-1R-1/4-18.3     Recommended Hex Key   Matric Hex Keys   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type E Black Anodize     Manufacturer   Ruland Manufacturing   Country of Origin   USA <td>B1 Max Shaft Penetration</td> <td>15.0 mm</td> <td>B2 Max Shaft Penetration</td> <td>16.1 mm</td>	B1 Max Shaft Penetration	15.0 mm	B2 Max Shaft Penetration	16.1 mm		
Recommended Shaft Tolerance   +0.000 mm / -0.013 mm   Forged Clamp Screw   M3     Screw Material   Alloy Steel   Hex Wrench Size   2.5 mm     Screw Finish   Black Oxide   Seating Torque   2.1 Nm     Number of Screws   2 ea   Dynamic Torque Reversing   2.83 Nm     Angular Misalignment   1.0°   Dynamic Torque Non-Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10.6 kg-m²   Maximum Speed   10,000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW-BT-1R-1/4-18.3     Recommended Hex Key   Metric Hex Keys   Material Specification   Ubics: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type E Black Anodize     Manufacturer   Ruland Manufacturing   Country of Origin   USA     Weight (lbs)   0.124900   UPC   634529085158	Outer Diameter (OD)	33.3 mm	Bore Tolerance	+0.03 mm / -0.00 mm		
Screw Material   Alloy Steel   Hex Wrench Size   2.5 mm     Screw Finish   Black Oxide   Seating Torque   2.1 Nm     Number of Screws   2 ea   Dynamic Torque Reversing   2.83 Nm     Angular Misalignment   1.0°   Dynamic Torque Roon-Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10° kg-m²   Maximum Speed   10,000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW:BT-IR-1/4-18.3     Recommended Hex Key   Metric Hex Keys   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Type III, Class 2 and ASTM B580 Type Black Anodize     Manufacturer   Ruland Manufacturing   Country of Origin   USA     Weight (lbs)   0.124900   UPC   634529085158     Tariff Code   8483.60.8000   UNSPC   31163008     Note 3	Length (L)	33.3 mm	Hub Width (LH)	15.00 mm		
Screw Finish     Black Oxide     Seating Torque     2.1 Nm       Number of Screws     2 ea     Dynamic Torque Reversing     2.83 Nm       Angular Misalignment     1.0°     Dynamic Torque Non-Reversing     5.65 Nm       Parallel Misalignment     0.00 mm     Static Torque     11.3 Nm       Axial Motion     0.20 mm     Torsional Stiffness     35.4 Nm/Deg       Moment of Inertia     9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup> Maximum Speed     10,000 RPM       Full Bearing Support Required?     Yes     Zero-Backlash?     Yes       Balanced Design     Yes     Torque Wrench     TW:BT-tR-t1/4-18.3       Recommended Hex Key     Metric Hex Keys     Material Specification     Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel       Temperature     -40°F to 200°F (-40°C to 93°C)     Finish Specification     Sulfuric Anodized MIL-A-8625 Type II, Class 2 and ASTM B580 Type B Black Anodize       Maufacturer     Ruland Manufacturing     Country of Origin     USA       Weight (Ibs)     0.124900     UPC     634529085158       Tariff Code     8483.60.8000     UNSPC     31163008       Note 1     Stailess steel hub	Recommended Shaft Tolerance	+0.000 mm / -0.013 mm	Forged Clamp Screw	M3		
Number of Screws     2 ea     Dynamic Torque Reversing     2.83 Nm       Angular Misalignment     1.0°     Dynamic Torque Non-Reversing     5.65 Nm       Parallel Misalignment     0.00 mm     Static Torque     11.3 Nm       Axial Motion     0.20 mm     Torsional Stiffness     35.4 Nm/Deg       Moment of Inertia     9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup> Maximum Speed     10,000 RPM       Full Bearing Support Required?     Yes     Zero-Backlash?     Yes       Balanced Design     Yes     Torque Wrench     TW:BT-1R-1/4-18.3       Recommended Hex Key     Metric Hex Keys     Material Specification     Hubs: 2024-7351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel       Temperature     -40°F to 200°F (-40°C to 93°C)     Finish Specification     Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type B Black Anodize       Manufacturer     Ruland Manufacturing     Country of Origin     USA       Weight (Ibs)     0.124900     UPC     634529085158       Tariff Code     8483.60.8000     UNSPC     31163008       Note 1     Stainless are at maximum misalignment.     Note 3       Note 2     Torque ratings are at maximum	Screw Material	Alloy Steel	Hex Wrench Size	2.5 mm		
Angular Misalignment   1.0°   Dynamic Torque Non-Reversing   5.65 Nm     Parallel Misalignment   0.00 mm   Static Torque   11.3 Nm     Axial Motion   0.20 mm   Torsional Stiffness   35.4 Nm/Deg     Moment of Inertia   9.406 x 10° kg-m²   Maximum Speed   10,000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW:BT-1R-1/4-18.3     Recommended Hex Key   Metric Hex Keys   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type B Black Anodize     Manufacturer   Ruland Manufacturing   Country of Origin   USA     Weight (Ibs)   0.124900   UPC   634529085158     Tariff Code   8483.60.8000   UNSPC   31163008     Note 1   Stainless steel hubs are available upon request.   Note 3     Note 2   Torque ratings are tor guidance only. The user must determine suitability for a particular application.     Note 4   Torque ratings for the couplings are based on the physical limitations/failure point of the dis	Screw Finish	Black Oxide	Seating Torque	2.1 Nm		
Parallel Misalignment0.00 mmStatic Torque11.3 NmAxial Motion0.20 mmTorsional Stiffness35.4 Nm/DegMoment of Inertia9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup> Maximum Speed10,000 RPMFull Bearing Support Required?YesZero-Backlash?YesBalanced DesignYesTorque WrenchTW:BT-IR-1/4-18.3Recommended Hex KeyMetric Hex KeysMaterial SpecificationHubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Type II, class 2 and ASTM B580 Type B Black AnodizeMaufacturerRuland ManufacturingCountry of OriginUSAWeight (Ibs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Note 3Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. Under normal/typical conditional torque of the disc springs. Under normal/typical condition the smallest standard bores are eavailable to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Number of Screws	2 ea	Dynamic Torque Reversing	2.83 Nm		
Axial Motion0.20 mmTorsional Stiffness35.4 Nm/DegMoment of Inertia9.406 x 10 <sup>6</sup> kg-m²Maximum Speed10,000 RPMFull Bearing Support Required?YesZero-Backlash?YesBalanced DesignYesTorque WrenchTW:BT-1R-1/4-18.3Recommended Hex KeyMetric Hex KeysMaterial SpecificationHubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type BManufacturerRuland ManufacturingCountry of OriginUSAWeight (Ibs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Torque ratings are at maximum misalignment.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. Reyways are available to provide additional torque capacity in the shaft/hub co	Angular Misalignment	1.0°	Dynamic Torque Non-Reversing	5.65 Nm		
Moment of Inertia   9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup> Maximum Speed   10,000 RPM     Full Bearing Support Required?   Yes   Zero-Backlash?   Yes     Balanced Design   Yes   Torque Wrench   TW:BT-1R-1/4-18.3     Recommended Hex Key   Metric Hex Keys   Material Specification   Hubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless Steel     Temperature   -40°F to 200°F (-40°C to 93°C)   Finish Specification   Sulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type Black Anodize     Manufacturer   Ruland Manufacturing   Country of Origin   USA     Weight (lbs)   0.124900   UPC   634529085158     Tariff Code   8483.60.8000   UNSPC   31163008     Note 1   Stainless steel hubs are available upon request.   Note 3   Performance ratings are for guidance only. The user must determine suitability for a particular application.     Note 4   Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. It exprives and available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support f	Parallel Misalignment	0.00 mm	Static Torque	11.3 Nm		
Full Bearing Support Required?YesZero-Backlash?YesBalanced DesignYesTorque WrenchTW:BT-1R-1/4-18.3Recommended Hex KeyMetric Hex KeysMaterial SpecificationHubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Type II, Class 2 and ASTM B580 Type B Black AnodizeManufacturerRuland ManufacturingCountry of OriginUSAWeight (lbs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Torque ratings are at maximum misalignment.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Axial Motion		Torsional Stiffness	35.4 Nm/Deg		
Balanced DesignYesTorque WrenchTW:BT-1R-1/4-18.3Recommended Hex KeyMetric Hex KeysMaterial SpecificationHubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Type II, Class 2 and ASTM B580 Type B Black AnodizeManufacturerRuland ManufacturingCountry of OriginUSAWeight (lbs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Note 2Note 2Torque ratings are at maximum misalignment.Fin user must determine suitability for a particular application.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on th shaft is possible below the rated torque of the disc springs. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Moment of Inertia	9.406 x 10 <sup>-6</sup> kg-m <sup>2</sup>	Maximum Speed	10,000 RPM		
Recommended Hex KeyMetric Hex KeysMaterial SpecificationHubs: 2024-T351 Aluminum Bar, Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type B Black AnodizeManufacturerRuland ManufacturingCountry of OriginUSAWeight (Ibs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Torque ratings are at maximum misalignment.Note 2Torque ratings are for guidance only. The user must determine suitability for a particular application.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Full Bearing Support Required?	Yes	Zero-Backlash?	Yes		
Disc Springs: Type 302 Stainless SteelTemperature-40°F to 200°F (-40°C to 93°C)Finish SpecificationSulfuric Anodized MIL-A-8625 Typ II, Class 2 and ASTM B580 Type B Black AnodizeManufacturerRuland ManufacturingCountry of OriginUSAWeight (lbs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Note 2Torque ratings are at maximum misalignment.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Balanced Design	Yes	Torque Wrench	<u>TW:BT-1R-1/4-18.3</u>		
II, Class 2 and ASTM B580 Type B Black AnodizeManufacturerRuland ManufacturingCountry of OriginUSAWeight (lbs)0.124900UPC634529085158Tariff Code8483.60.8000UNSPC31163008Note 1Stainless steel hubs are available upon request.Note 2Torque ratings are at maximum misalignment.Note 3Performance ratings are for guidance only. The user must determine suitability for a particular application.Note 4Torque ratings for the couplings are based on the physical limitations/failure point of the disc springs. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the disc springs. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the disc springs. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more	Recommended Hex Key	Metric Hex Keys	Material Specification	Disc Springs: Type 302 Stainless		
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**WARNING** This product can expose you to chemicals including Ethylene Thiourea and Nickel (metallic), known to the State of California to cause cancer, and Ethylene Thiourea known to the State of California to cause birth defects or other reproductive harm. For more information go to <u>www.P65Warnings.ca.gov</u>.

Installation Instructions

- Align the bores of the MDCS33-16-14-A single disc coupling on the shafts that are to be joined and determine if the misalignment parameters are within the limits of the coupling. (*Angular Misialignment:* 1.0°, *Parallel Misalignment:* 0.00 mm, *Axial Motion:* 0.20 mm)
- 2. Fully tighten the M3 screw on the first hub to the recommended seating torque of 2.1 Nm using a 2.5 mm hex torque wrench.
- 3. Before tightening the screw on the second hub, rotate the coupling by hand to allow it to reach its free length.
- Tighten the screw on the second hub to the recommended seating torque. Make sure the coupling remains axially relaxed and the misalignment angle remains centered along the length of the coupling.
- 5. The shafts may extend into the relieved portion of the bore as long as it does not exceed the shaft penetration length of 15.0 mm for bore 1 and 16.1 mm for bore 2.