RDD-Series Direct Drive Motors

RDD-Series™ (Bulletin RDB) direct-drive servo motor design provides direct-coupling to the load, thus improving system performance and efficiency by eliminating the need for inefficient mechanical power transmission devices, such as gearboxes, timing belts and pulleys. The initial RDD-Series offering incorporates a bearingless housed configuration designed for applications where the load is already supported by its own bearings.

RDD-Series Direct Drive Motor Features

Attribute	Value
Main characteristics	• Smart Motor Technology • Direct coupling to the load • Bearingless housed configuration
Features	• 400V-class windings • Multiple winding speed options • SpeedTec-ready DIN connectors, rotates 180° • Standard IEC 72-1 mounting dimensions
Motor type	Direct-drive rotary servo motor
Environmental rating	IP65 with use of environmentally sealed cable connectors
Certifications	Bulletin RDB rotary motors are UL Recognized components to applicable UL and CSA standards. CE marked for all applicable directives. Refer to http://www.ab.com for more information.
Continuous stall torque	32.7…426 N•m (289…3770 lb•in)
Peak stall torque	86.5…1050 N•m (766…9293 lb•in)
Speed	Base speeds between 177…1836 rpm
Motor rated output	1.97…8.69 kW
Compatible servo drives	• Kinetix 6200/6500 • Kinetix 6000 • Kinetix 7000
Typical applications	• Use to replace mechanical gear reduction (gear boxes, belts, pulleys) • Tight space constraints • Axes with high-power and high-performance requirements

Catalog Numbers - RDD-Series Direct Drive Motors

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.

RD B - B *xxx* *x* *x* - *x* B 7 2 AA

Factory Options
AA = Standard

Brake
2 = No brake

Connectors
7 = Circular (SpeedTec) DIN connector, right angle, 180° rotatable

Enclosure/Shaft
B = IP65 housing/Blind bore

Feedback
7 = Multi-turn, 2048 sin/cos, absolute encoder (EnDat protocol)
3 = Single-turn, 2048 sin/cos, absolute encoder (EnDat protocol)

Base Speed @ 440V (1)
4 = 200 rpm
5 = 250 rpm
6 = 375 rpm
8 = 625 rpm
9 = 750 rpm
C = 1500 rpm

Magnet Stacks (1)
1 = 1 stack
2 = 2 stacks
3 = 3 stacks
4 = 4 stacks

Frame Size - Bolt Circle Diameter (BCD)
215 = 215 mm
290 = 290 mm
410 = 410 mm

Voltage Class
B = 400V

Housing Type
B = Bearingless housing

Series
RD = Rotary direct drive servo motor

(1) Not all combinations are available. Only the configurations for rated speed and magnet stacks, as listed in RDD-Series Direct Drive Motor Performance Specifications on page 107, are available. Use Motion Analyzer software to size and select motors for your application.

RDD-Series Direct Drive Motor High-resolution Encoders

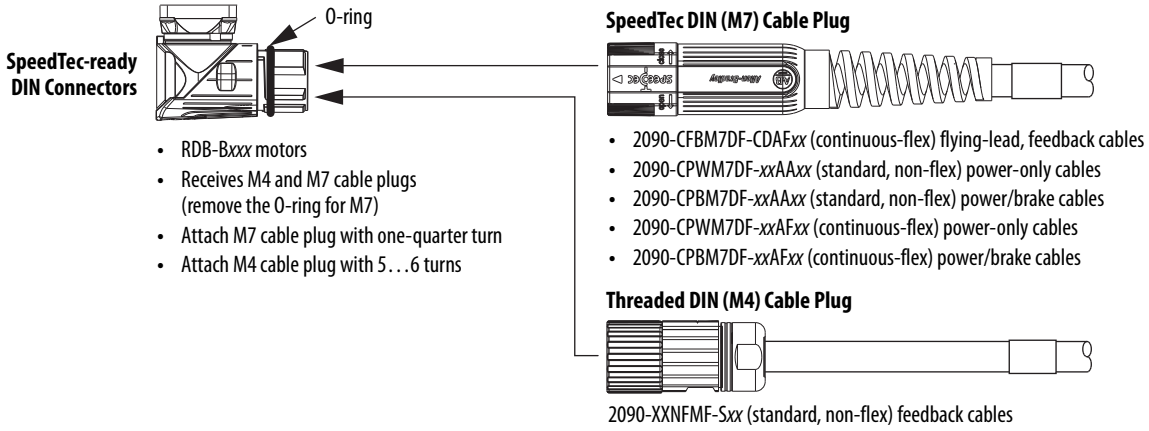
RDD-Series direct drive motors are available with high performance encoders with a choice of single-turn (-3) or multi-turn (-7) high-resolution feedback:

- Up to 4 million counts per revolution (-3 and -7) for smooth performance.
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns. The electromechanical design does not require a battery.

Use the 2090-K6CK-KENDAT feedback module (Kinetix 6000 drives) and the 2090-K7CK-KENDAT feedback module (Kinetix 7000 drives) for wiring the Bulletin RDB motor feedback connections. For Kinetix 6200 and Kinetix 6500 drives, use the 2090-K6CK-D15M motor feedback connector kit.

Motor Connector/Cable Compatibility

RDD-Series motors are equipped with SpeedTec-ready DIN connectors, however, EnDat encoder feedback requires the additional conductors included in the cables listed.



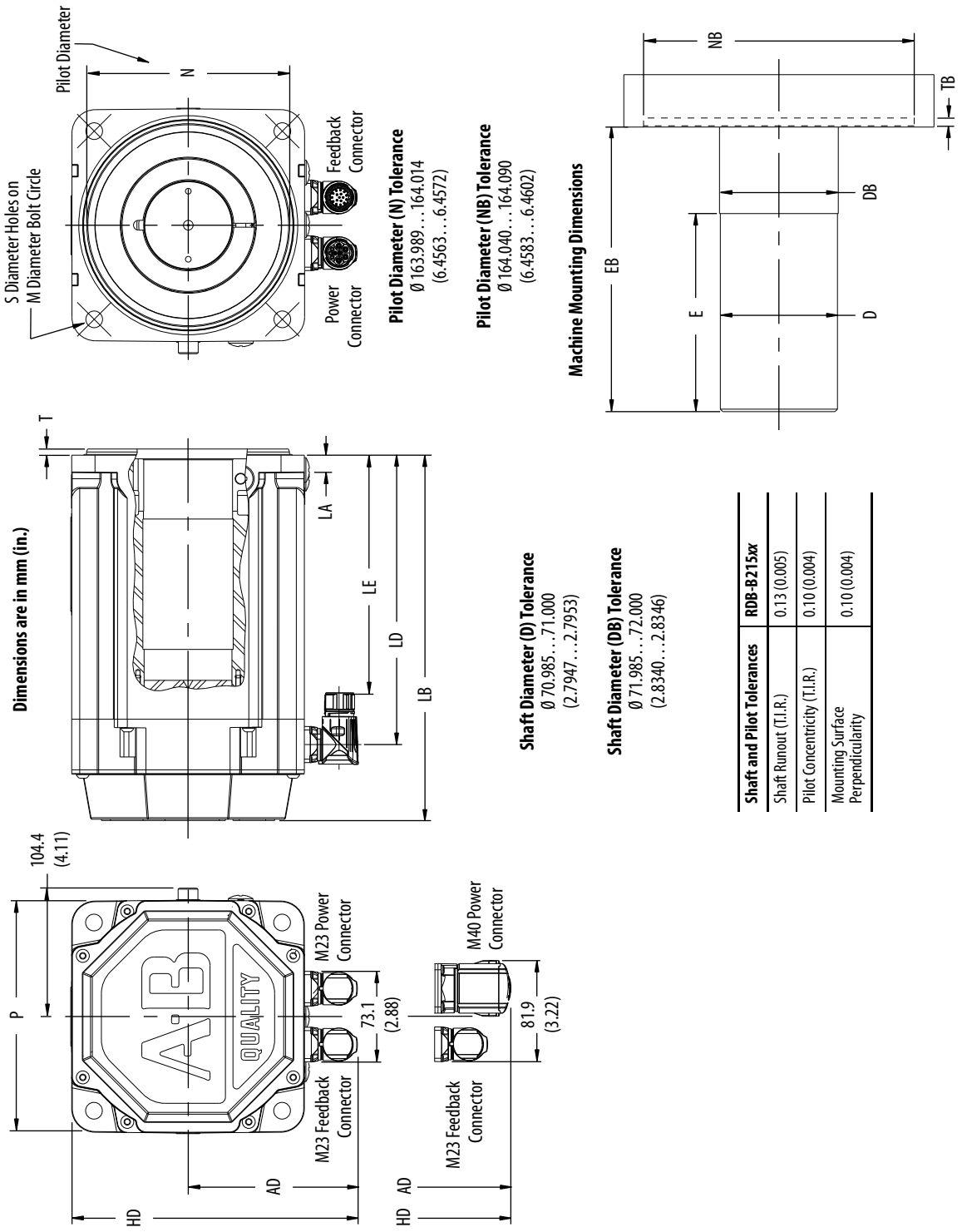
Technical Specifications - RDD-Series Direct Drive Motors

RDD-Series Direct Drive Motor Performance Specifications

Motor Cat. No.	Base Speed rpm	Speed, max rpm	Continuous Stall Torque N•m (lb•in)	Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia kg-m^2 (lb•in•s^2)	Motor Weight, approx kg (lb)
RDB-B21519	750	1235	32.7 (289)	86.5 (766)	3.64	1235	0.0094 (0.083)	19.1 (42)
RDB-B2151C	1500	2125			5.23	2125		
RDB-B21529	750	1035	45.4 (402)	116 (1027)	4.33	1035	0.0126 (0.112)	24.5 (54)
RDB-B2152C	1500	2125			6.41	2125		
RDB-B21539	750	1250	53.7 (475)	143 (1266)	5.34	1250	0.0157 (0.139)	29.5 (65)
RDB-B2153C	1500	2250			5.87	1772		
RDB-B29014	200	450	49.2 (435)	110 (974)	1.97	391	0.028 (0.25)	28.6 (63)
RDB-B29016	375	785			3.18	729		
RDB-B29019	750	1500			3.63	1128		
RDB-B29024	200	435	98.0 (867)	214 (1894)	3.33	413	0.047 (0.42)	42.7 (94)
RDB-B29026	375	885			4.05	632		
RDB-B29029	750	1200						
RDB-B29034	200	500	140 (1239)	318 (2815)	5.16	493	0.066 (0.58)	55.4 (122)
RDB-B29036	375	750			5.49	646		
RDB-B29039	750	1000	122 (1080)	318 (2815)	4.41	578		
RDB-B41014	200	385	183 (1620)	340 (3009)	5.20	360	0.123 (1.09)	67.6 (149)
RDB-B41016	375	700			4.83	440		
RDB-B41018	625	700						
RDB-B41024	200	365	332 (2938)	690 (6107)	7.29	350	0.225 (1.99)	108 (238)
RDB-B41026	375	600	308 (2726)					
RDB-B41035	250	490	426 (3770)	1050 (9293)	8.69	361	0.302 (2.67)	136 (300)

Dimensions - RDD-Series Direct Drive Motors

Bulletin RDB-B215*xx* Motor Dimensions

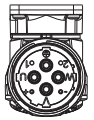


Shaft and Pilot Tolerances	RDB-B215*xx*
Shaft Runout (T.I.R.)	0.13 (0.005)
Pilot Concentricity (T.I.R.)	0.10 (0.004)
Mounting Surface Perpendicularity	0.10 (0.004)

Bulletin RDB-B215*xx* Motor Dimensions

Motor Cat. No.	AD [1] mm (in.)	HD [1] mm (in.)	T mm (in.)	LA mm (in.)	LD mm (in.)	LE mm (in.)	LB [2] mm (in.)	D mm (in.)	DB mm (in.)	E [3] mm (in.)	EB [4] mm (in.)	TB mm (in.)	M mm (in.)	S [5] mm (in.)	N mm (in.)	NB mm (in.)	P mm (in.)
RDB-B2151	136.7 (5.38)	230.9 (9.09)	5.0 (0.197)	14.0 (0.55)	166 (6.52)	124 (4.90)	226 (8.90)	71.0 (2.795)	72.0 (2.834)	49.0 (1.93)	104 (4.09)	5.5 (0.22)	215 (8.465)	13.50 (0.5315)	164 (6.456)	164 (6.459)	189 (7.44)
RDB-B2152					200 (7.86)	158 (6.24)	260 (10.24)			83.0 (3.27)	138 (5.43)						
RDB-B2153					234 (9.20)	192 (7.58)	294 (11.58)			117 (4.61)	172 (6.77)						

(1) Dimension is for motor with M23 power connector. For motor with M40 power connector, add 18.6 (0.73 in.).
(2) Tolerance for this dimension is ±0.52 mm (±0.02 in.).
(3) Tolerance for this dimension is ±0.40 mm (±0.015 in.).
(4) Tolerance for this dimension is ±1.50 mm (±0.06 in.) static, ±0.13 mm (±0.005 in.) dynamic.
(5) Tolerance for this dimension is +0.430, -0.000 mm (+0.0169, -0.0000 in.).

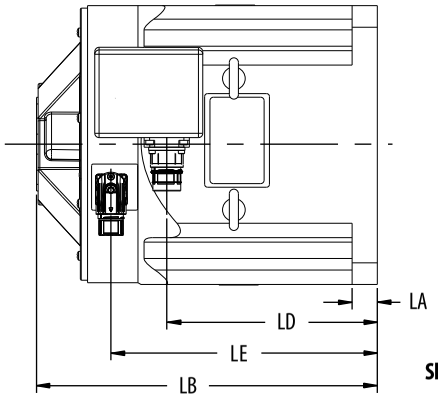
Power Connectors on RDD-Series Motors		Motor Cat. No.
M23 Power Connector		RDB-B21519, RDB-B21529, RDB-B2151C, RDB-B21539, RDB-B2152C
M40 Power Connector		RDB-B2153C

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

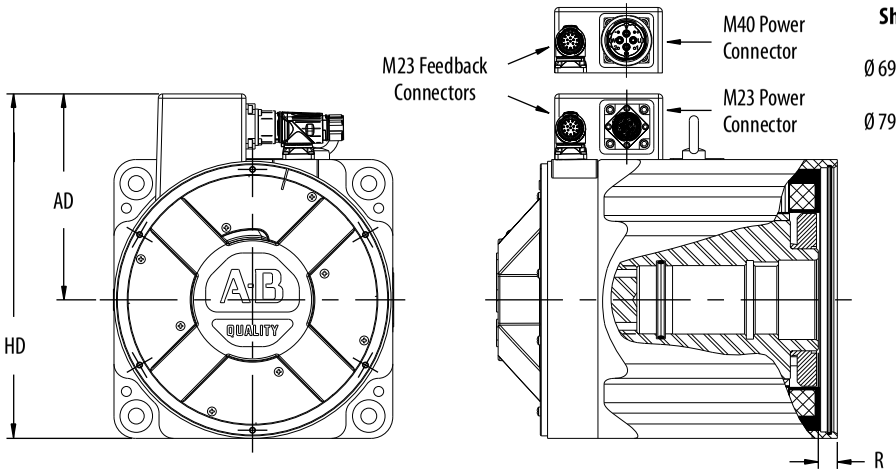
Bulletin RDB-B290*xx* and RDB-B410*xx* Motor Dimensions

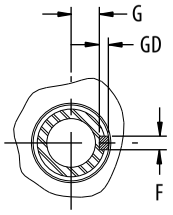
Shaft, Pilot, and Keyway Tolerances	RDB-B290*xx*	RDB-B410*xx*
Shaft Runout (T.I.R.)	0.038 (0.0015)	
Pilot Concentricity (T.I.R.)	0.05 (0.002)	
Mounting Surface Perpendicularity	0.05 (0.002)	
Keyway Depth (G)	24.80…24.99 (0.976…0.984)	29.80…29.99 (1.173…1.181)
Keyway Depth (GD)	7.90…8.00 (0.311…0.315)	
Keyway Width (F)	11.957…12.000 (0.4707…0.4724)	

Dimensions are in mm (in.)



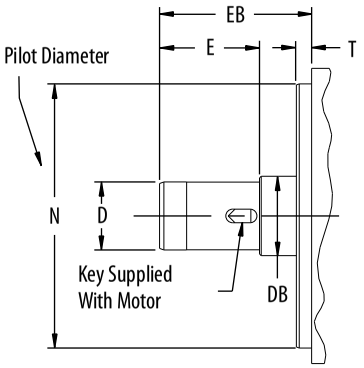
RDB-B290*xx* and RDB-B410*xx* motors have either M23 or M40 power connectors, with no significant difference in dimensions.





Shaft Key Detail

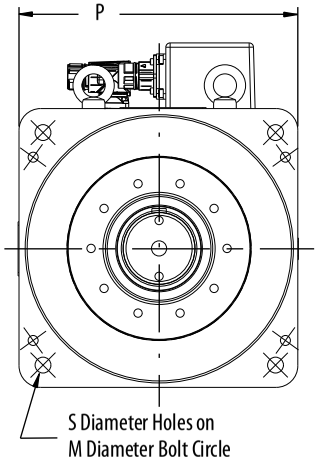
Machine Mounting Dimensions



Shaft Diameter (D) Tolerance
RDB-B290*xx* Motors:
Ø 59.988…59.999 (2.3617…2.3622)
RDB-B410*xx* Motors:
Ø 69.988…69.999 (2.7554…2.7559)

Pilot Diameter Tolerance
RDB-B290*xx* Motors:
Ø 232.92…232.96 (9.170…9.172)
RDB-B410*xx* Motors:
Ø 333.94…333.98 (13.147…13.149)

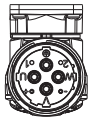
Shaft Diameter (DB) Tolerance
RDB-B290*xx* Motors:
Ø 69.988…69.999 (2.7554…2.7559)
RDB-B410*xx* Motors:
Ø 79.988…79.999 (3.1491…3.1496)



Bulletin RDB-B290*xx* and RDB-B410*xx* Motor Dimensions

Motor Cat. No.	AD mm (in.)	HD mm (in.)	T mm (in.)	LA (1) mm (in.)	LD mm (in.)	LE mm (in.)	LB (2) mm (in.)	D mm (in.)	DB mm (in.)	E (3) mm (in.)	EB (4) mm (in.)	M mm (in.)	S mm (in.)	N mm (in.)	P (5) mm (in.)	G mm (in.)	GD mm (in.)	F mm (in.)
RDB-B2901	182.3 (7.18)	305.9 (12.05)	13.5 (0.53)	22.2 (0.88)	86.5 (3.40)	136 (5.34)	201 (7.92)	59.9 (2.362)	69.9 (2.755)	43.94 (1.730)	88.92 (3.540)	290 (11.417)	14.0 (0.551)	232.9 (9.17)	245.9 (9.68)	24.99 (0.984)	8.00 (0.315)	12.0 (0.472)
RDB-B2902					136 (5.36)	185 (7.30)	251 (9.90)			88.14 (3.470)	134.11 (5.280)							
RDB-B2903					186 (7.31)	235 (9.25)	301 (11.83)			124.7 (4.910)	170.69 (6.720)							
RDB-B4101	256.3 (10.09)	432.1 (17.01)	17.8 (0.70)	25.4 (1.00)	105 (4.14)	164 (6.46)	230 (9.05)	69.9 (2.755)	79.9 (3.149)	40.39 (1.590)	114.05 (4.490)	410 (16.142)	17.5 (0.689)	333.9 (13.14)	350.0 (13.78)	29.99 (1.181)	8.00 (0.315)	12.0 (0.472)
RDB-B4102					174 (6.86)	233 (9.18)	300 (11.77)			83.82 (3.300)	167.89 (6.610)							
RDB-B4103					243 (9.58)	302 (11.90)	368 (14.49)			118.62 (4.670)	253.49 (9.980)							

(1) Tolerance for this dimension is ±2.15 mm (±0.085 in.).
(2) Tolerance for this dimension is ±2.30 mm (±0.09 in.).
(3) Tolerance for this dimension is ±0.13 mm (±0.005 in.).
(4) Tolerance for this dimension is ±1.50 mm (±0.060 in.) static, ±0.05 mm (±0.002 in.) dynamic.
(5) Tolerance for this dimension is ±1.52 mm (±0.06 in.).

Power Connectors on RDD-Series Motors		RDB-B290*xx* Cat. No.	RDB-B410*xx* Cat. No.
M23 Power Connector		RDB-B29014, RDB-B29016, RDB-B29024, RDB-B29019, RDB-B29034, RDB-B29026	N/A
M40 Power Connector		RDB-B29036, RDB-B29029, RDB-B29039	RDB-B410*xx*

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.