

MP-Series Food Grade Motors



MP-Series (Bulletin MPF) food-grade motors combine the characteristics of the MP-Series low-inertia servo motors with features specifically designed to meet the unique needs of many food and beverage applications. These high-performance servo motors address the challenges of food environments by incorporating food-grade paint and shaft seal, along with noncorrosive fasteners and stainless steel shaft. For meat and poultry applications, and for applications with high pressure wash and caustic chemicals, the MP-Series stainless-steel servo motors are recommended.

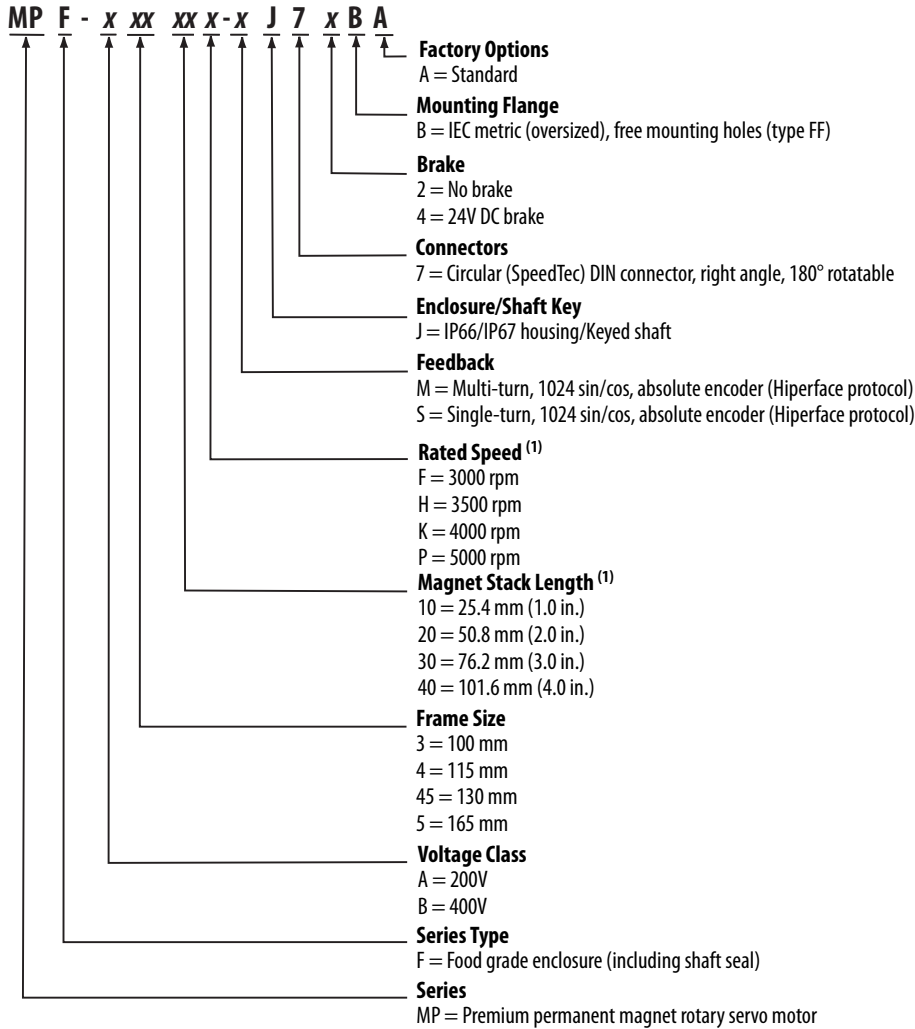
MP-Series Food Grade Motor Features

Attribute	Value
Main characteristics	<ul style="list-style-type: none"> Configurable winding options, brakes, and encoder feedback Low rotor inertia
Features	<ul style="list-style-type: none"> Food-grade epoxy coated 200V and 400V-class windings Shaft-end threaded hole SpeedTec-ready DIN connectors, rotates 180° Standard IEC 72-1 mounting dimensions
Motor type	Brushless AC synchronous servo motors
Environmental rating	<ul style="list-style-type: none"> IP66/IP67 with shaft seal (standard) and use of environmentally sealed cable connectors Food grade grease on shaft seal
Certifications	Bulletin MPF 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	1.6...19.4 N·m (14...172 lb·in)
Peak stall torque	3.61...48.6 N·m (32...430 lb·in)
Speed	Up to 5000 rpm
Motor rated output	0.73...4.1 kW
Compatible servo drives	<ul style="list-style-type: none"> Kinetix 5500⁽¹⁾ Kinetix 6200/6500 Kinetix 6000 Kinetix 300/350 Kinetix 2000 Ultra3000
Typical applications	<ul style="list-style-type: none"> Food packaging Volumetric filling Form, fill, seal Food handling For meat and poultry applications, the MP-Series Stainless Steel motors are recommended

(1) Requires the 2198-H2DCK Hiperface-to-DSL feedback converter kit. MP-Series (200V-class) food-grade motors require the 2198-H2DCK (series B or later) converter kit.

Catalog Numbers - MP-Series Food Grade 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.



(1) Not all combinations are available. Only the configurations for rated speed and magnet stack length, as listed in MP-Series Food Grade (200V-class) Performance Specifications on [page 81](#) and MP-Series Food Grade Motor (400V-class) Performance Specifications on [page 81](#), are available. Use Motion Analyzer software to size and select motors for your application.

MP-Series Food Grade Motor High Resolution Encoders

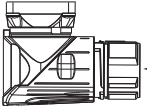
MP-Series Food Grade motors are available with high performance encoders with a choice of single-turn (-S) or multi-turn (-M) high resolution feedback:

- Up to 2 million counts per revolution 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.

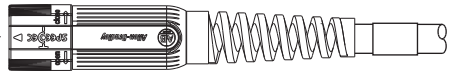
Motor Connector/Cable Compatibility

MP-Series (Bulletin MPF) motors are equipped with SpeedTec-ready DIN connectors.

**SpeedTec-ready
DIN Connectors**



SpeedTec DIN (M7) Cable Plug



- MPF-A/Bxxx motors
- Receives M4 and M7 cable plugs (O-ring required for M4)
- Attach M7 cable plug with one-quarter turn

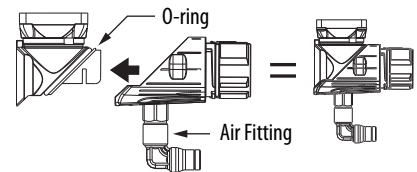
- 2090-CFBM7DF-CEAAxx (standard, non-flex) flying-lead, feedback cables
- 2090-CFBM7DD-CEAAxx (standard, non-flex) drive-end connector, feedback cables
- 2090-CFBM7DF-CEAFxx (continuous-flex) flying-lead, feedback cables
- 2090-CFBM7DD-CEAFxx (continuous-flex) drive-end connector, feedback cables
- 2090-CFBM7DF-CDAFxx (continuous-flex) flying-lead, feedback cables

- 2090-CPWM7DF-xxAAxx (standard, non-flex) power-only cables
- 2090-CPBM7DF-xxAAxx (standard, non-flex) power/brake cables
- 2090-CPWM7DF-xxAFxx (continuous-flex) power-only cables
- 2090-CPBM7DF-xxAFxx (continuous-flex) power/brake cables

MP-Series Food Grade Motor Options

MP-Series Food Grade motors are available with these options:

- 24V DC brake.
- The positive air-pressure kit (catalog number MPF-7-AIR-PURGE) is mounted on the feedback connector to provide positive air pressure to further reduce the chance of contamination inside the motor.



- Shaft seal kits are available for field replacement. Shaft seals are made of PTFE and the kit includes a lubricant to reduce wear.

IMPORTANT Shaft seals are subject to wear and require periodic inspection and replacement. Replacement is recommended every 3 months, not to exceed 12 months, depending on use.

Shaft Seal Kit Catalog Numbers

Motor Cat. No.	Shaft Seal Kit Cat. No.
MPF-A3xx and MPF-B3xx	MPF-SST-A3B3
MPF-A4xx and MPF-B4xx	MPF-SST-A4B4
MPF-A45xx and MPF-B45xx	MPF-SST-A45B45
MPF-A5xx and MPF-B5xx	MPF-SST-F165

Refer to the MP-Series Food Grade Servo Motor Installation Instructions, publication [MP-IN004](#), for motor accessory information.

Technical Specifications - MP-Series Food Grade Motors**MP-Series Food Grade (200V-class) Performance Specifications**

Motor Cat. No.	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 ⁽¹⁾ kg·m ² (lb·in·s ²)	Motor Weight, approx ⁽¹⁾ kg (lb)
MPF-A310P	5000	1.58 (14)	3.61 (32)	0.73	4750	0.000044 (0.00039)	2.8 (6.1)
MPF-A320P	5000	3.05 (27)	7.91 (70)	1.3	4750		
MPF-A320H	3500	3.05 (27)	7.91 (70)	1.0	3350	0.000078 (0.00069)	3.8 (8.3)
MPF-A330P	5000	4.18 (37)	11.1 (98)	1.6	5000	0.00012 (0.0010)	4.7 (10)
MPF-A430P	5000	5.99 (53)	19.8 (175)	1.9	5000	0.00038 (0.0033)	5.6 (12)
MPF-A430H	3500	6.21 (55)	19.8 (175)	1.8	3500		
MPF-A4530K	4000	8.13 (72)	20.3 (180)	2.3	4000	0.00040 (0.0036)	7.4 (16)
MPF-A4540F	3000	10.2 (90)	27.1 (240)	2.5	3000	0.00052 (0.0046)	8.7 (19)
MPF-A540K	4000	19.4 (172)	48.6 (430)	4.1	4000	0.00147 (0.013)	16 (35)

(1) Refer to MP-Series Low Inertia Motor (200V-class) Performance Specifications on [page 54](#) for brake rotor inertia and brake motor weight.

MP-Series Food Grade Motor (400V-class) Performance Specifications

Motor Cat. No.	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 ⁽¹⁾ kg·m ² (lb·in·s ²)	Motor Weight, approx ⁽¹⁾ kg (lb)
MPF-B310P	5000	1.58 (14)	3.61 (32)	0.77	5000	0.000044 (0.00039)	2.8 (6.1)
MPF-B320P	5000	3.05 (27)	7.91 (70)	1.5	5000	0.000078 (0.00069)	3.8 (8.3)
MPF-B330P	5000	4.18 (37)	11.1 (98)	1.6	5000	0.00012 (0.0010)	4.7 (10)
MPF-B430P	5000	6.55 (58)	19.8 (175)	2.0	5000	0.00038 (0.0033)	5.6 (12)
MPF-B4530K	4000	8.25 (73)	20.3 (180)	2.4	4000	0.00040 (0.0036)	7.4 (16)
MPF-B4540F	3000	10.2 (90)	27.1 (240)	2.5	3000	0.00052 (0.0046)	8.7 (19)
MPF-B540K	4000	19.4 (172)	48.6 (430)	4.1	4000	0.00147 (0.013)	16 (35)

(1) Refer to MP-Series Low Inertia Motor (200V-class) Performance Specifications on [page 54](#) for brake rotor inertia and brake motor weight.

MP-Series Food Grade Motor Brake Specifications

Motor Cat. No.	Backlash, max (brake engaged) arc minutes	Holding Torque N·m (lb·in)	Coil Current at 24V DC A	Brake Response Time			Brake Rotor Inertia kg·m ² (lb·in·s ²)	Brake Motor Weight, approx kg (lb)
				Release ms	Engage (by using external arc suppression device)			
					MOV ms	Diode ms		
MPF-A/B310	45	4.18 (37)	0.45...0.55	50	20	110	0.000057 (0.00050)	3.8 (8.3)
MPF-A/B320							0.000092 (0.00081)	4.7 (10)
MPF-A/B330							0.00013 (0.0011)	5.7 (13)
MPF-A/B430	37	10.2 (90)	0.576...0.704	110	25	160	0.00042 (0.0038)	7.4 (16)
MPF-A/B4530							0.00044 (0.0039)	9.2 (20)
MPF-A/B4540							0.00056 (0.0050)	11 (24)
MPF-A/B540	25	28.3 (250)	1.05...1.28	70	50	250	0.00157 (0.0139)	19 (41)

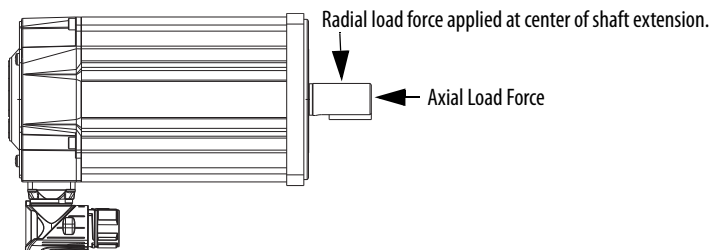
MP-Series Food Grade Motor Load Force Ratings

Bulletin MPF motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables below represent an L₁₀ bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that can occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	78 (172)	62 (137)	49 (108)	–	40 (88)	–	36 (79)
MPF-A/B320	87 (192)	69 (152)	55 (121)	–	45 (99)	–	40 (88)
MPF-A/B330	–	74 (163)	59 (130)	–	49 (108)	–	43 (95)
MPF-A/B430	106 (234)	84 (185)	67 (148)	–	55 (121)	–	49 (108)
MPF-A/B4530	133 (293)	105 (232)	84 (185)	73 (161)	–	66 (146)	–
MPF-A/B4540	140 (309)	111 (245)	89 (196)	77 (170)	–	–	–
MPF-A/B540	–	143 (316)	114 (251)	99 (219)	–	90 (199)	–

MPF-xxxx-xJ7xAB Load Forces



Axial Load Force Ratings (maximum radial load)

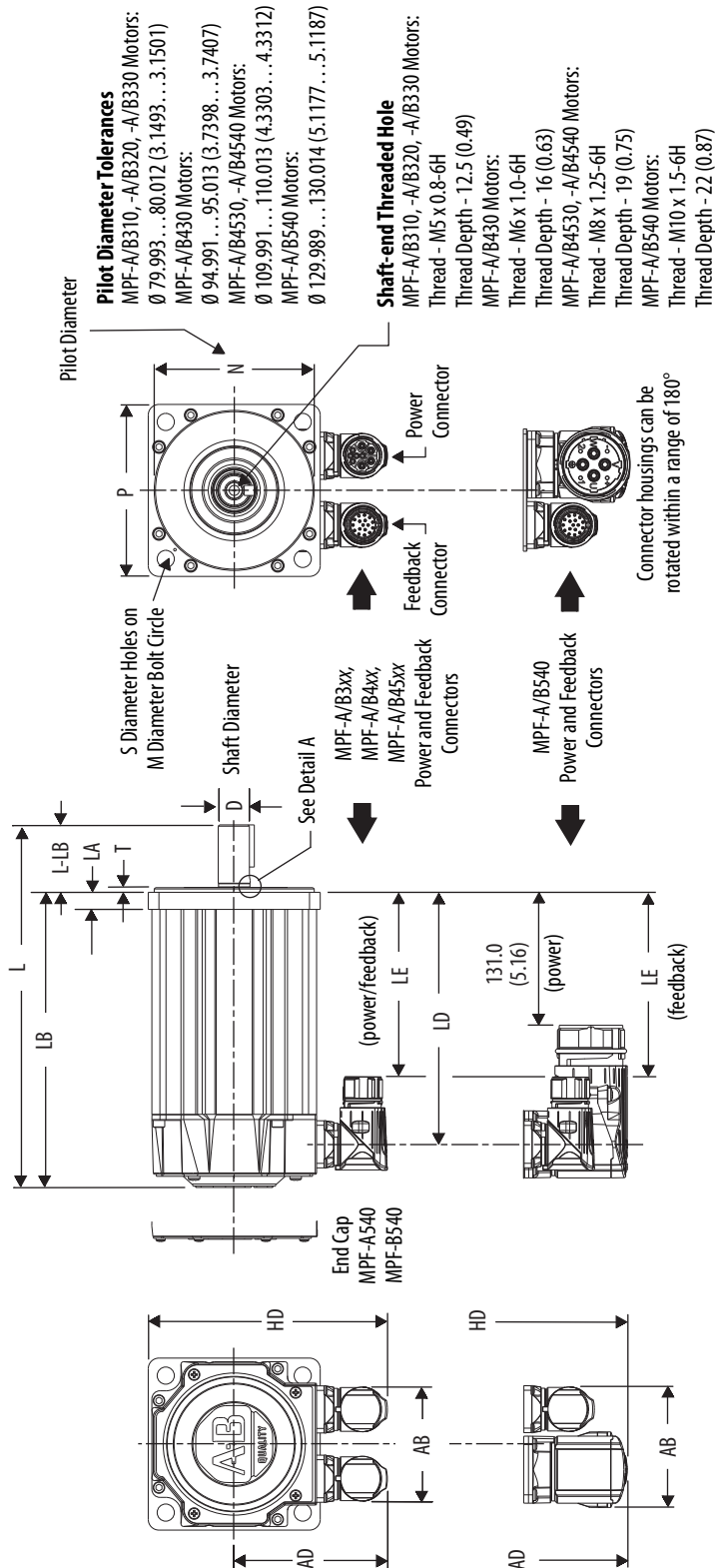
Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	30 (66)	23 (51)	16 (35)	–	13 (29)	–	11 (24)
MPF-A/B320	34 (75)	25 (55)	19 (42)	–	15 (33)	–	13 (29)
MPF-A/B330	–	27 (60)	20 (44)	–	16 (35)	–	13 (29)
MPF-A/B430	52 (115)	39 (86)	29 (64)	–	22 (49)	–	19 (42)
MPF-A/B4530	45 (99)	34 (75)	25 (55)	21 (46)	–	19 (42)	–
MPF-A/B4540	49 (108)	36 (79)	27 (60)	22 (49)	–	–	–
MPF-A/B540	–	48 (107)	35 (79)	30 (66)	–	26 (58)	–

Axial Load Force Ratings (zero radial load)

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	49 (108)	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B320	49 (108)	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B330	–	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B430	69 (152)	51 (112)	38 (84)	–	30 (66)	–	25 (55)
MPF-A/B4530	69 (152)	51 (112)	38 (84)	31 (68)	–	28 (62)	–
MPF-A/B4540	69 (152)	51 (112)	38 (84)	31 (68)	–	–	–
MPF-A/B540	–	67 (149)	49 (109)	41 (92)	–	36 (81)	–

Dimensions - MP-Series Food Grade Motors

MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx Motor Dimensions



Shaft Seal
 Refer to [page 80](#)
 for MP-Series
 Food Grade motors
 shaft seal kit information.

Shaft Diameter Tolerances
 MPF-A/B310, -A/B320, -A/B330 Motors: $\varnothing 15.989 \dots 16.013$ (0.6295...0.6305)
 MPF-A/B430 Motors: $\varnothing 18.996 \dots 19.009$ (0.7479...0.7483)
 MPF-A/B540 Motors: $\varnothing 27.996 \dots 28.009$ (1.1022...1.1027)

Shaft Detail with Key
 MPF-A/B310, -A/B320, -A/B330 = 5 x 5 x 25 Key
 MPF-A/B430 = 6 x 6 x 25 Key
 MPF-A/B4530, -A/B4540 = 8 x 7 x 32 Key
 MPF-A/B540 = 8 x 7 x 40 Key

Shaft, Pilot, and Keyway Tolerances	MPF-A/B3xx	MPF-A/B4xx	MPF-A/B45xx	MPF-A/B540
Shaft Runout (T.I.R.)	0.035 (0.0014)	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0016)
Pilot Eccentricity (T.I.R.)	0.08 (0.0031)	0.08 (0.0031)	0.10 (0.0039)	0.10 (0.0039)
Max Face Runout (T.I.R.)	0.08 (0.0031)	0.08 (0.0031)	0.10 (0.0039)	0.10 (0.0039)
Keyway Depth (GE)	3.00...3.10 (0.118...0.122)	3.50...3.60 (0.138...0.142)	4.00...4.20 (0.158...0.165)	4.00...4.20 (0.158...0.165)
Keyway Width (F)	4.97...5.00 (0.196...0.197)	5.97...6.00 (0.235...0.236)	7.96...8.00 (0.314...0.315)	7.96...8.00 (0.3135...0.3150)

MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx Motor Dimensions

Motor Cat. No.	AB mm (in.)	AD mm (in.)	HD mm (in.)	T mm (in.)	LA mm (in.)	LD ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	L ⁽¹⁾ mm (in.)	LB ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	D ⁽³⁾ mm (in.)	M mm (in.)	S ⁽⁴⁾ mm (in.)	N ⁽³⁾ mm (in.)	P mm (in.)	GE ⁽³⁾ mm (in.)	F ⁽³⁾ mm (in.)
MPF-A/B310						102.0 (4.03)	62.0 (2.45)	168.0 (6.62)	128.0 (5.04)								
MPF-A/B320	66.0 (2.60)	87.25 (3.43)	133.4 (5.25)	2.74 (0.11)	9.91 (0.39)	128.0 (5.03)	88.0 (3.45)	193.0 (7.62)	153.0 (6.04)	40.0 (1.57)	16.0 (0.629)	100.0 (3.94)	7.0 (0.283)	80.0 (3.15)	92.39 (3.64)	3.0 (0.118)	5.0 (0.197)
MPF-A/B330						153.0 (6.03)	113.0 (4.45)	219.0 (8.62)	179.0 (7.04)								
MPF-A/B430	67.7 (2.66)	90.9 (3.58)	142.0 (5.59)	2.74 (0.11)	10.16 (0.40)	150.0 (5.89)	110.0 (4.31)	215.0 (8.48)	175.0 (6.90)	40.0 (1.57)	19.0 (0.748)	115.0 (4.53)	10.0 (0.401)	95.0 (3.74)	102.1 (4.02)	3.5 (0.138)	6.0 (0.236)
MPF-A/B4530	67.7 (2.66)	98.6 (3.88)	157.6 (6.20)	2.74 (0.11)	12.19 (0.48)	153.0 (6.02)	113.0 (4.44)	229.0 (9.0)	179.0 (7.03)	50.0 (1.97)	24.0 (0.945)	130.0 (5.12)	10.0 (0.401)	110.0 (4.33)	118.1 (4.65)	4.0 (0.158)	8.0 (0.315)
MPF-A/B540	71.2 (2.80)	136.4 (5.37)	209.0 (8.23)	3.12 (0.12)	13.97 (0.55)	202.0 (7.95)	162.0 (6.38)	287.0 (11.30)	227.0 (8.92)	60.0 (2.36)	28.0 (1.102)	165.0 (6.50)	12.0 (0.481)	130.0 (5.12)	145.3 (5.72)	4.0 (0.158)	8.0 (0.315)

(1) If ordering an MPF-A/B310, MPF-A/B320, or MPF-A/B330 motor with brake, add 35 mm (1.38 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B430 motor with brake, add 48 mm (1.89 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B4530 or MPF-A/B4540 motor with brake, add 23 mm (0.90 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B540 motor with brake, add 51 mm (2.0 in.) to dimensions L, LB, LD, and LE.

(2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

(3) For keyway, shaft diameter, and pilot diameter tolerances, refer to [page 84](#).

(4) Tolerance for this dimension is: MPF-A/B3xx, MPF-A/B4xx, or MPF-A/B45xx ± 0.36 mm (± 0.007 in.) and MPF-A/B5xx ± 0.43 mm (± 0.008 in.).

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