BROCHURE

BSM B-series

Servo motors

The BSM B-Series offers all the performance and reliability our customers have come to expect from ABB servo motors. It has the performance of rare earth magnet motors but without the rare-earth magnets. The rotor is designed around ferrite magnets. This Non-Rare Earth (more environmentally friendly) material is less susceptible to sourcing and pricing pressure. For high precision applications, this motor offers exceptionally low cogging with minimal torque ripple. For machining applications in particular, this translates to a better finish on machined surfaces (increased quality).

Introduction to ABB's servo motor offering

9AKK107304_HDS high-performance AC PM servo motor catalog

9AKK106417_Servo motors BSM series catalog

HDS
The HDS series is based on a 10 pole segmented lamination design. The stator has a higher slot fill with less end turns than previous designs, which contributes to this motor being a very efficient torque-dense solution. It has a good torque to weight ratio which is important in robotic applications. The series offers ingress protection of IP65 with shaft seal.

HDS HY series explosion proof
The HY series is a high performance explosion-proof servo motor. This product adopts increased safety EC level and TC level explosion-proof design for applications requiring certification to ensure safe operation of the product in Zone 2 / Zone 22 explosion-proof areas.

HDS-264 water-cooled PM Servo
This water-cooled servo was designed with all the standard HDS features and options. Because of its water-cooled design, this motor can deliver a lot of torque in a small 264 frame. It has available power ratings ranging from 47.1 to 80.1kW.

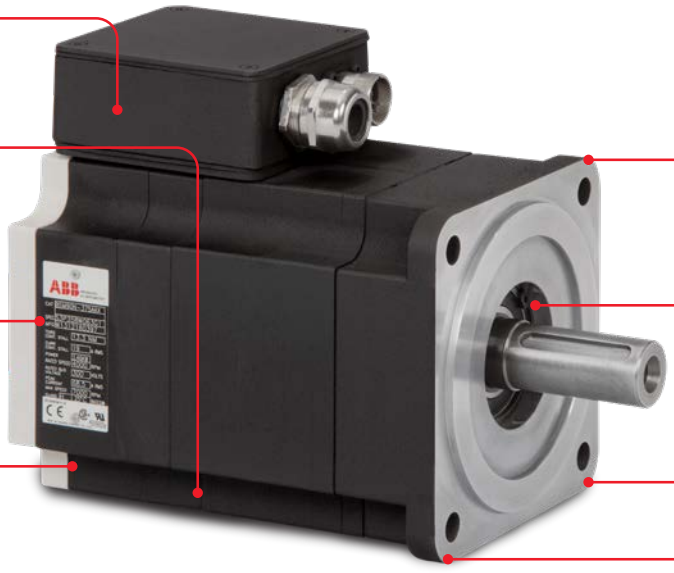
BSM
BSM servo motors are available in low and medium inertia designs; low inertia for applications that require very fast accel and decel resulting in more throughput (faster cycle times), and medium to high inertia for applications that require inertia matching of larger loads. All BSM series motors offer IEC and NEMA mounting dimensions standard, with the ability to offer custom mechanical dimensions and custom windings.

9AKK107627_Servo gearheads GBSM series brochure

GBSM
GBSM are precision gearheads designed specifically for BSM servo motors. These planetary gearheads are designed for servo applications requiring precision, durability, and long trouble free operation. These are high efficiency gearheads that maximize the power transmission capability. They are designed with low backlash to reduce shock loads in dynamic reversing applications. They mount directly to the BSM servo motor family to provide torque multiplication, speed reduction, and inertia matching.

Brushless servo motors
BSM B-series

BSM B-series servo motors provide higher inertia in a very economical package. These motors have a time-proven, reliable ferrite magnet design, which can be used in applications needing higher inertial matching. Ferrite is also more environmentally friendly and less susceptible to sourcing and pricing pressures when compared to rare-earth solutions.



- Torque range
  - BSM80 14.4 lb-in(1.63Nm) - 27 lb-in(3.1Nm)
  - BSM90 20 lb-in(2.3Nm) - 57 lb-in(6.5Nm)
  - BSM100 52.5 lb-in(5.9Nm) - 177 lb-in(20Nm)
- Inertia range
  - 0.0031 lb-in-s^2 - (3.51 kg-cm^2) to 0.0666 lb-in-s^2 - (75.2 kg-cm^2)
- Higher rotor inertia for matching heavier machine inertial loads.
- Optional forced air cooling to extend torque capability for additional motor performance.
- Windings potted for additional voltage protection, improved reliability and improved heat transfer.
- Design interchangeable with C and N series for machine design versatility.
- Rugged industrial construction and quality design.
- Time proven reliable ferrite magnetic design in an economical package.
- Popular mounting dimensions.
- cURus/CE – proven designs, proven quality.
- Optional holding brakes for design versatility.

BSM B-Series + ACS880

Matched solution for demanding applications ranging from simple standalone (single-axis) to complex networks (multi-axis).

Note: ACS880-01 drives can be ordered with +N5700 positioning control programs for simple positioning systems

ACS880 parameter number	Description	BSM80B-133	Example: BSM80B-133 value
99.03	Motor type	Asynchronous induction=0 Synchronous PM=1	1
99.04	Motor control mode	DTC=0 Scalar=1	0
99.06	Motor nom. current	amps	4.6 **(1)**
99.07	Motor nom. voltage	VAC	84 **(2)**
99.08	Motor nom. frequency	Hz	133.3 **(3)**
99.09	Motor nom. speed	RPM	4000 **(4)**
99.10	Motor nom. power	kW	0.57 **(5)**
99.13	ID run request	Yes=1 No-0	1

* ID run must be performed every time any of the motor parameters (99.04, 9906...99.12) have been changed.

Match performance selection guide

BSM B-series and ACS880 (wall-mounted single drives)

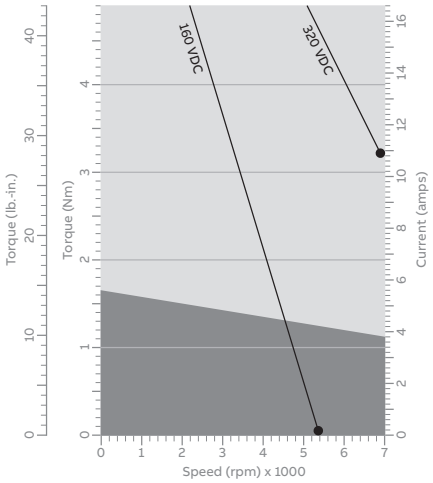
Drive catalog number example: ACS880-01-06A6-2

Cont. stall torque	Cont. stall current	Current (nom) (1)	Power (nom) (5)	BEMF @ speed (nom)	Speed (nom) (4)	FREQ (nom) (3)	Servo catalog number	Drive catalog number	Power cable*	Power cable*
Nm	amps	amps	kW	VAC (2)	RPM	Hz		ACS880-01-	w/J-box	w/connector
1.63	5.52	4.6	0.57	84.0	4000	133.33	BSM80B-133xx	06A6-2	N/A	CBLxxxSP-12
1.63	3.78	2.78	0.75	183.6	6000	200	BSM80B-150xx	04A6-2	N/A	CBLxxxSP-12
1.63	2.59	2.17	0.57	178.8	4000	133.33	BSM80B-175xx	04A6-2	N/A	CBLxxxSP-12
2.2	6.74	6.51	0.89	93.0	4000	133.33	BSM80B-233xx	07A5-2	N/A	CBLxxxSP-12
2.2	4.78	4.45	1.29	196.2	6000	200	BSM80B-250xx	06A6-2	N/A	CBLxxxSP-12
2.2	3.38	3.27	0.89	184.8	4000	133.33	BSM80B-275xx	04A6-2	N/A	CBLxxxSP-12
3.08	10.2	8.49	1.07	85.6	4000	133.33	BSM80B-333xx	10A6-2	N/A	CBLxxxSP-12
3.08	7	5.52	1.52	187.2	6000	200	BSM80B-350xx	07A5-2	N/A	CBLxxxSP-12
3.08	5.2	4.34	1.07	167.4	4000	133.33	BSM80B-375xx	06A6-2	N/A	CBLxxxSP-12
2.35	3.7	3.2	0.85	180.0	4000	266.67	BSM90B-175xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
2.35	1.9	1.7	0.44	168.0	2000	133.33	BSM90B-1150xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
2.35	1.4	1.38	0.29	139.6	1200	80	BSM90B-1250xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
4.8	8.46	7.2	1.71	171.5	4000	266.67	BSM90B-275xx	10A6-2	CBLxxxRP-12	CBLxxxSP-12
4.8	4.4	4.07	0.93	164.7	2000	133.33	BSM90B-2150xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
4.8	2.48	2.39	0.58	176.1	1200	80	BSM90B-2250xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
6.5	11.1	8.07	1.98	166.4	4000	266.67	BSM90B-375xx	16A8-2	CBLxxxRP-12	CBLxxxSP-12
6.5	5.3	4.59	1.18	174.2	2000	133.33	BSM90B-3150xx	06A6-2	CBLxxxRP-12	CBLxxxSP-12
6.5	3	2.76	0.75	183.1	1200	80	BSM90B-3250xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
5.93	9.8	9.23	2.34	172.16	4000	266.67	BSM100B-175xx	10A6-2	CBLxxxRP-12	CBLxxxSP-12
5.93	4.96	4.78	1.21	178.3	2000	133.33	BSM100B-1150xx	06A6-2	CBLxxxRP-12	CBLxxxSP-12
5.93	3.1	3.03	0.76	165.4	1200	80	BSM100B-1250xx	04A6-2	CBLxxxRP-12	CBLxxxSP-12
12	18.57	14.59	3.95	183.8	4000	266.67	BSM100B-275xx	24A3-2	CBLxxxRP-20	CBLxxxSP-20
12	9.16	8.46	2.32	186.4	2000	133.33	BSM100B-2150xx	10A6-2	CBLxxxRP-12	CBLxxxSP-12
12	6.08	5.32	1.32	168.5	1200	80	BSM100B-2250xx	06A6-2	CBLxxxRP-12	CBLxxxSP-12
17	26.48	17.74	4.77	182.6	4000	266.67	BSM100B-375xx	031A-2	CBLxxxRP-35	N/A
17	14.06	11.73	2.97	171.9	2000	133.33	BSM100B-3150xx	16A8-2	CBLxxxRP-20	CBLxxxSP-20
17	8.23	7.36	1.91	176.2	1200	80	BSM100B-3250xx	10A6-2	CBLxxxRP-12	CBLxxxSP-12
20	35.66	20.82	4.89	159.6	4000	266.67	BSM100B-475xx	046A-2	CBLxxxRP-35	N/A
20	15.8	12.52	3.32	180.0	2000	133.33	BSM100B-4150xx	16A8-2	CBLxxxRP-20	CBLxxxSP-20
20	9.64	8.17	2.13	177.1	1200	80	BSM100B-4250xx	10A6-2	CBLxxxRP-12	CBLxxxSP-12

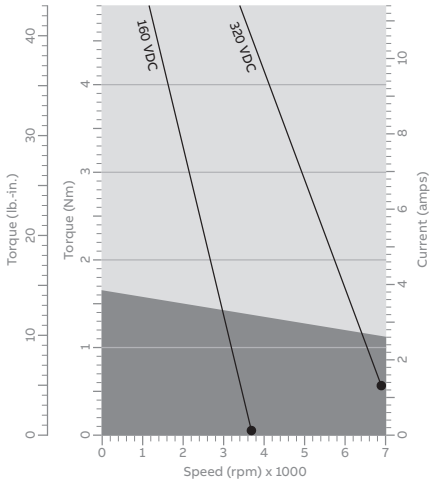
* Feedback cables will also be required and should be selected based on feedback type.

Performance curves
BSM B-series

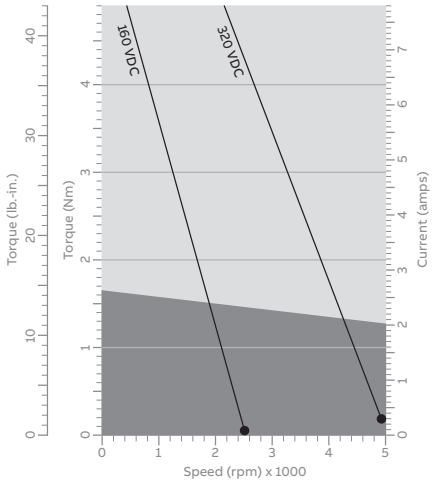
BSM80B-133



BSM80B-150



BSM80B-175

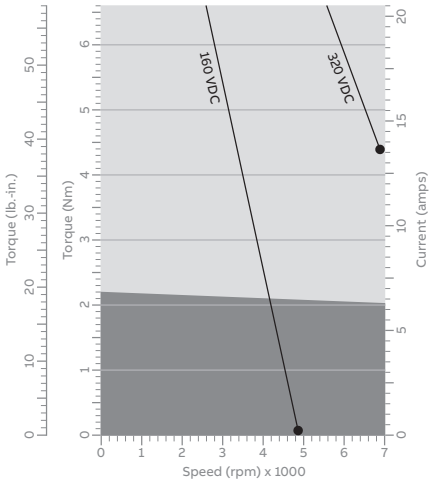


*Refer to page 24 on performance curve explanation

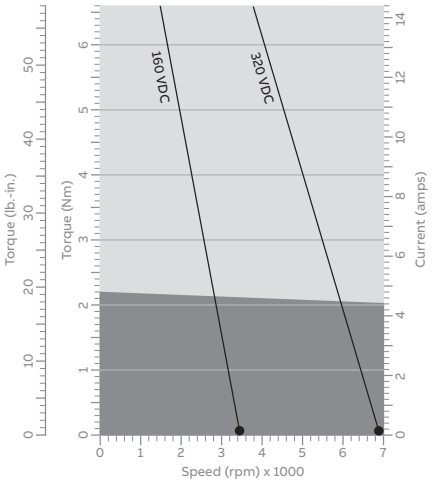
Catalog number		BSM80B-133	BSM80B-150	BSM80B-175
General				
Continuous stall torque	lb-in	14.4	14.4	14.4
	N-m	1.63	1.63	1.63
Continuous current	amps	5.52	3.78	2.59
Peak torque	lb-in	50.45	50.45	50.45
	N-m	4.9	4.9	4.9
Peak current	amps	16.56	11.34	7.77
Mechanical time constant	msec	6.6	6.6	6.1
Electrical time constant	msec	3.2	3.1	3.4
Rated voltage	volts	160	320	320
Rated power	kW	0.57	0.75	0.57
Rated speed	rpm	4000	6000	4000
Rated frequency	Hz	133.3	200	133.3
Electrical				
Torque constant	lb-in/amp	3.07	4.47	6.54
	N-m/amp	0.347	0.506	0.739
Voltage constant	V_{pk}/krpm	29.6	43.2	63.2
	V_{rms}/krpm	21.0	30.6	44.7
Resistance	ohms	1.9	4.0	7.8
Inductance	mH	6.24	12.73	26.77
Mechanical				
Inertia	lb-in-s²	0.0031	0.0031	0.0031
	Kg-cm²	3.502	3.502	3.502
Maximum speed	rpm	7000	7000	7000
Number of motor poles	-	4	4	4
Weight	lbs./Kg	9/4.1	9/4.1	9/4.1

Performance curves
BSM B-series

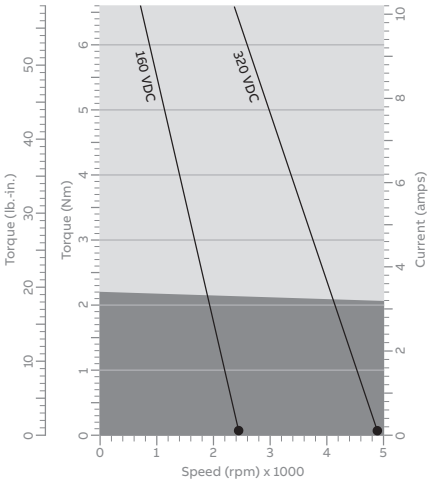
BSM80B-233



BSM80B-250



BSM80B-275

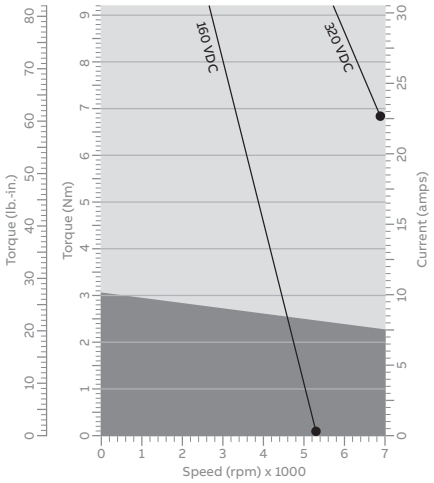


*Refer to page 24 on performance curve explanation

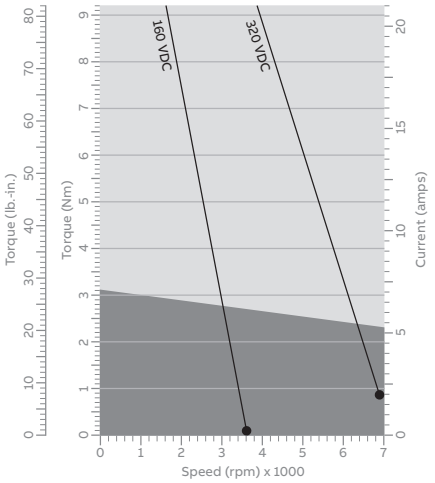
Catalog number		BSM80B-233	BSM80B-250	BSM80B-275
General				
Continuous stall torque	lb-in	19.4	19.4	19.4
	N-m	2.20	2.20	2.20
Continuous current	amps	6.74	4.78	3.38
Peak torque	lb-in	68.15	68.15	68.15
	N-m	6.6	6.6	6.6
Peak current	amps	20.22	14.34	10.14
Mechanical time constant	msec	4.4	5.4	5.2
Electrical time constant	msec	3.9	3.0	3.7
Rated voltage	volts	160	320	320
Rated power	kW	0.89	1.29	0.89
Rated speed	rpm	4000	6000	4000
Rated frequency	Hz	133.3	200	133.3
Electrical				
Torque constant	lb-in/amp	3.39	4.78	6.76
	N-m/amp	0.384	0.542	0.764
Voltage constant	V_{pk}/krpm	32.8	46.2	65.3
	V_{rms}/krpm	23.24	32.7	46.2
Resistance	ohms	1.0	2.5	4.88
Inductance	mH	3.91	7.66	17.93
Mechanical				
Inertia	lb-in-s^2	0.0050	0.0050	0.0050
	Kg-cm^2	5.649	5.649	5.649
Maximum speed	rpm	7000	7000	7000
Number of motor poles	-	4	4	4
Weight	lbs./Kg	14/6.4	14/6.4	14/6.4

Performance curves
BSM B-series

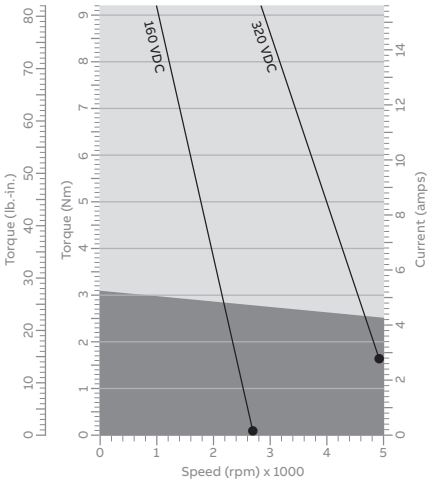
BSM80B-333



BSM80B-350



BSM80B-375

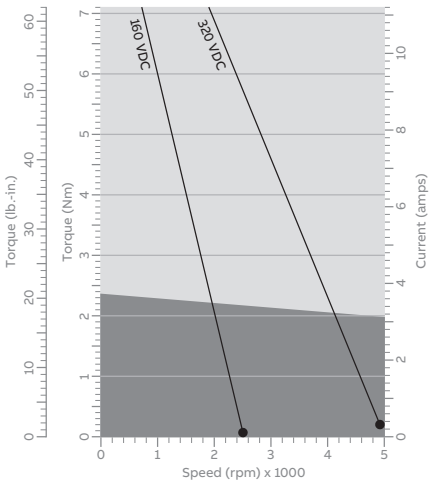


*Refer to page 24 on performance curve explanation

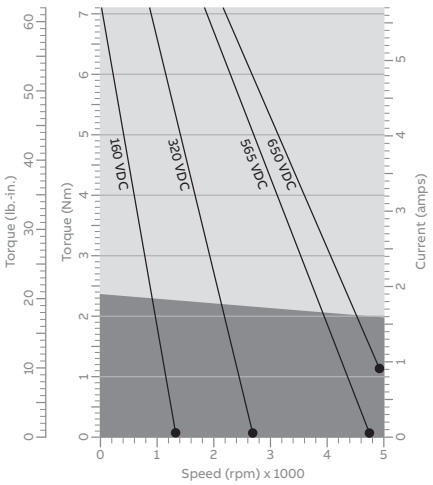
Catalog number		BSM80B-333	BSM80B-350	BSM80B-375
General				
Continuous stall torque	lb-in	27	27	27
	N-m	3.08	3.08	3.08
Continuous current	amps	10.2	7.0	5.2
Peak torque	lb-in	95.41	95.41	95.41
	N-m	9.24	9.24	9.24
Peak current	amps	30.6	21	15.6
Mechanical time constant	msec	4.6	4.7	4.6
Electrical time constant	msec	3.9	3.7	3.4
Rated voltage	volts	160	320	320
Rated power	kW	1.07	1.52	1.07
Rated speed	rpm	4000	6000	4000
Rated frequency	Hz	133.3	200	133.3
Electrical				
Torque constant	lb-in/amp	3.13	4.56	6.12
	N-m/amp	0.354	0.516	0.692
Voltage constant	V_{pk}/krpm	30.2	44.1	59.1
	V_{rms}/krpm	21.4	31.2	41.86
Resistance	ohms	0.7	1.5	2.7
Inductance	mH	2.73	5.57	9.41
Mechanical				
Inertia	lb-in-s²	0.0068	0.0068	0.0068
	Kg-cm²	7.682	7.682	7.682
Maximum speed	rpm	7000	7000	7000
Number of motor poles	-	4	4	4
Weight	lbs./Kg	19/8.6	19/8.6	19/8.6

Performance curves
BSM B-series

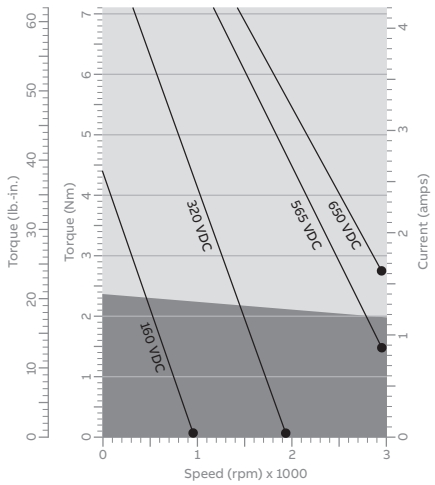
BSM90B-175



BSM90B-1150



BSM90B-1250

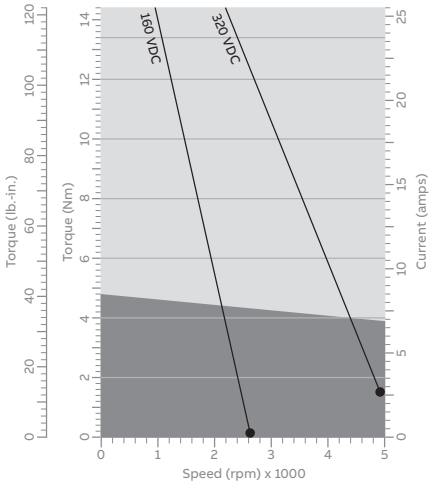


*Refer to page 24 on performance curve explanation

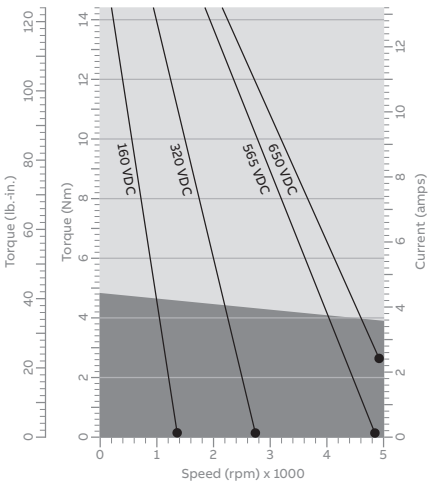
Catalog number		BSM90B-175	BSM90B-1150	BSM90B-1250
General				
Continuous stall torque	lb-in	20	20	20
	N-m	2.35	2.35	2.35
Continuous current	amps	3.7	1.9	1.4
Peak torque	lb-in	62.4	62.4	62.4
	N-m	7.05	7.05	7.05
Peak current	amps	11.1	5.7	4.2
Mechanical time constant	msec	3.1	2.9	2.6
Electrical time constant	msec	3.7	3.8	4.3
Rated voltage	volts	320	320	320
Rated power	kW	0.85	0.44	0.29
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.58	12.29	17.02
	N-m/amp	0.744	1.389	1.92
Voltage constant	V_{pk}/krpm	63.6	118.7	164.4
	V_{rms}/krpm	45.0	84	116.3
Resistance	ohms	3.81	12.79	28.58
Inductance	mH	14.19	49.45	92.56
Mechanical				
Inertia	lb-in-s^2	0.0040	0.0040	0.0040
	Kg-cm^2	4.519	4.519	4.519
Maximum speed	rpm	6000	6000	4600
Number of motor poles	-	8	8	8
Weight	lbs./Kg	19/8.6	19/8.6	19/8.6

Performance curves
BSM B-series

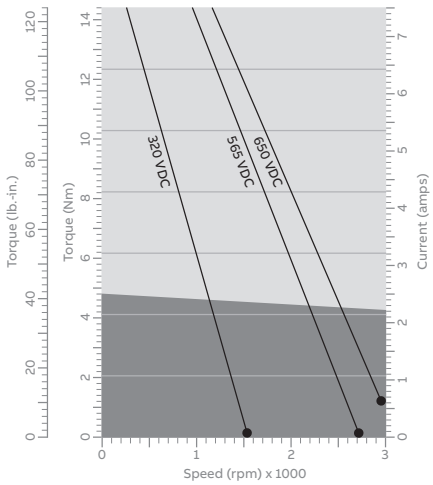
BSM90B-275



BSM90B-2150



BSM90B-2250



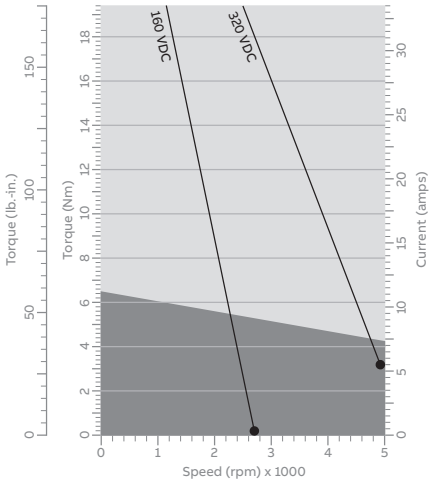
*Refer to page 24 on performance curve explanation

Catalog number		BSM90B-275	BSM90B-2150	BSM90B-2250
General				
Continuous stall torque	lb-in	38	38	38
	N-m	4.8	4.8	4.8
Continuous current	amps	8.46	4.4	2.48
Peak torque	lb-in	114.6	114.2	114.2
	N-m	14.4	14.4	14.4
Peak current	amps	25.38	13.2	7.44
Mechanical time constant	msec	2.2	2.2	2.4
Electrical time constant	msec	4.4	4.8	3.8
Rated voltage	volts	320	320	320
Rated power	kW	1.71	0.93	0.58
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.27	12.05	21.47
	N-m/amp	0.709	1.362	2.427
Voltage constant	V_{pk}/krpm	60.5	116.3	207.4
	V_{rms}/krpm	42.87	82.34	146.76
Resistance	ohms	1.26	4.6	16.1
Inductance	mH	5.28	22.36	62.06
Mechanical				
Inertia	lb-in-s^2	0.0079	0.0079	0.0079
	Kg-cm^2	8.925	8.925	8.925
Maximum speed	rpm	6000	6000	3600
Number of motor poles	-	8	8	8
Weight	lbs./Kg	30/13.6	30/13.6	30/13.6z

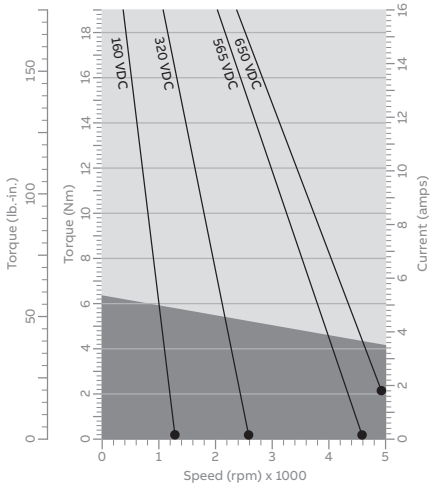
NOTE: A blower cooling option is available which will increase the motor's continuous stall torque by another 50%. Peak torque remains unchanged.

Performance curves
BSM B-series

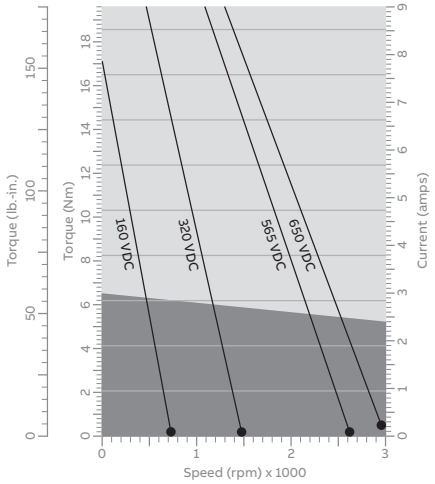
BSM90B-375



BSM90B-3150



BSM90B-3250



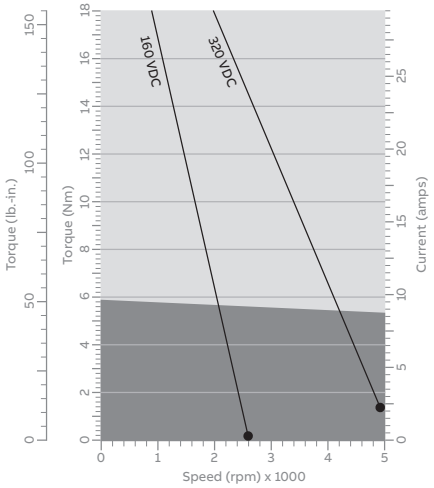
*Refer to page 24 on performance curve explanation

Catalog number		BSM90B-375	BSM90B-3150	BSM90B-3250
General				
Continuous stall torque	lb-in	57	57	57
	N-m	6.5	6.5	6.5
Continuous current	amps	11.1	5.3	3.0
Peak torque	lb-in	172.6	172.6	172.6
	N-m	19.5	19.5	19.5
Peak current	amps	33.3	15.9	9
Mechanical time constant	msec	1.7	1.8	2.0
Electrical time constant	msec	5.6	5.5	4.9
Rated voltage	volts	320	320	320
Rated power	kW	1.98	1.18	0.75
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.08	12.74	22.3
	N-m/amp	0.688	1.44	2.525
Voltage constant	V_{pk}/krpm	58.8	123	215.7
	V_{rms}/krpm	41.61	87.08	152.6
Resistance	ohms	0.682	2.87	9.4
Inductance	mH	3.38	15.5	46.7
Mechanical				
Inertia	lb-in-s^2	0.0117	0.0117	0.0117
	Kg-cm^2	13.219	13.219	13.219
Maximum speed	rpm	6000	6000	3600
Number of motor poles	-	8	8	8
Weight	lbs./Kg	30/13.6	30/13.6	30/13.6

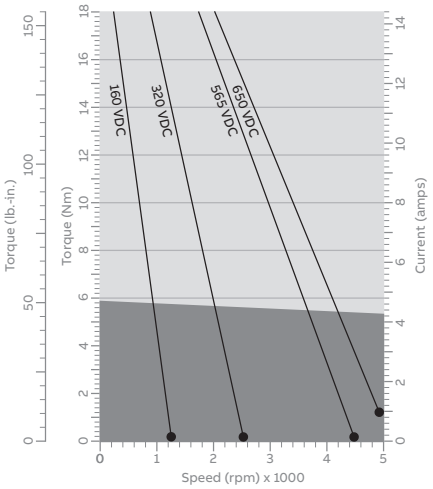
NOTE: A blower cooling option is available which will increase the motor's continuous stall torque by another 50%. Peak torque remains unchanged.

Performance curves
BSM B-series

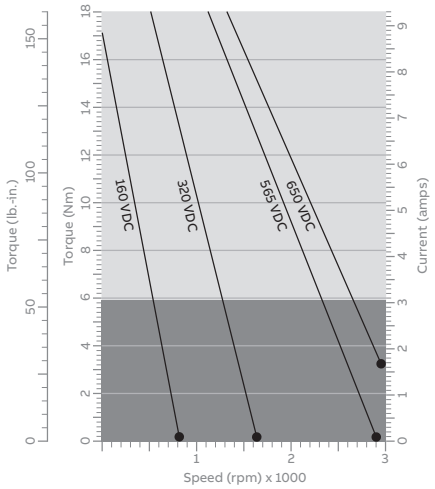
BSM100B-175



BSM100B-1150



BSM100B-1250

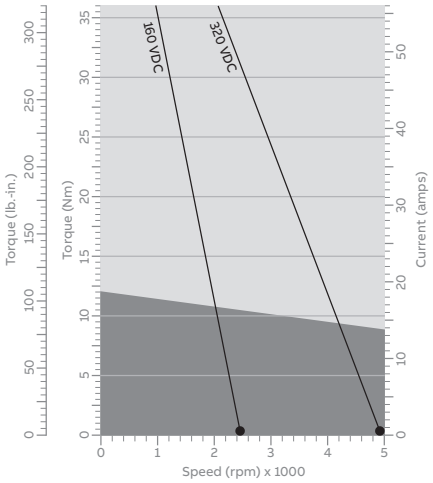


*Refer to page 24 on performance curve explanation

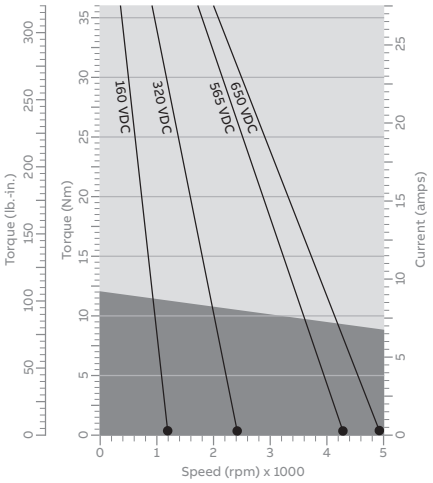
Catalog number		BSM100B-175	BSM100B-1150	BSM100B-1250
General				
Continuous stall torque	lb-in	52.5	52.5	52.5
	N-m	5.93	5.93	5.93
Continuous current	amps	9.8	4.96	3.1
Peak torque	lb-in	159.3	159.3	159.3
	N-m	18	18	18
Peak current	amps	29.4	14.34	9.3
Mechanical time constant	msec	5.6	5.5	5.2
Electrical time constant	msec	6	5.8	5.8
Rated voltage	volts	320	320	320
Rated power	kW	2.34	1.21	0.76
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.37	13.05	20.16
	N-m/amp	0.72	1.475	2.279
Voltage constant	V_{pk}/krpm	61.5	125.9	194.8
	V_{rms}/krpm	43.04	89.15	137.81
Resistance	ohms	0.99	3.93	8.45
Inductance	mH	5.44	21.77	48.99
Mechanical				
Inertia	lb-in-s^2	0.0188	0.0188	0.0188
	Kg-cm^2	21.241	21.241	21.241
Maximum speed	rpm	6000	6000	3850
Number of motor poles	-	8	8	8
Weight	lbs./Kg	33/15	33/15	33/15

Performance curves
BSM B-series

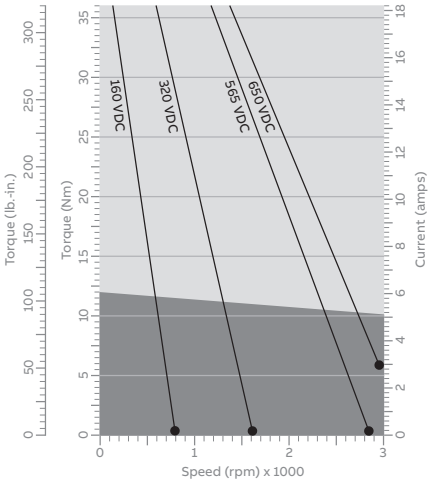
BSM100B-275



BSM100B-2150



BSM100B-2250

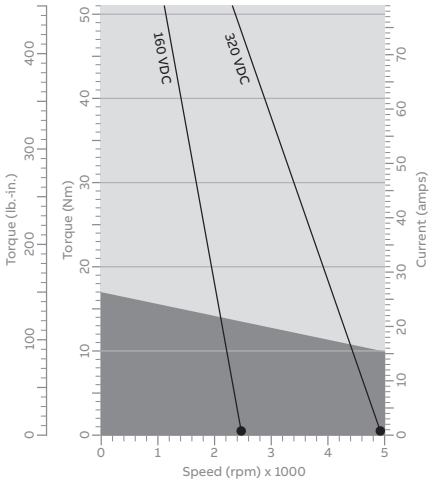


*Refer to page 24 on performance curve explanation

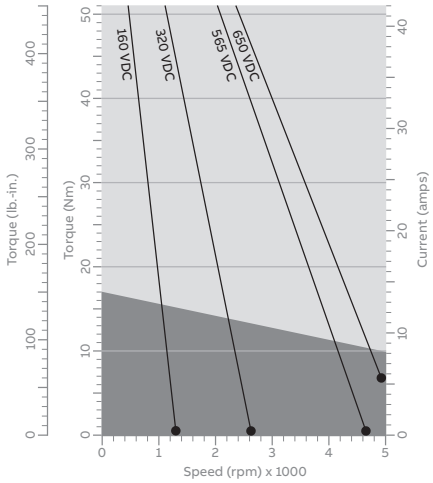
Catalog number		BSM100B-275	BSM100B-2150	BSM100B-2250
General				
Continuous stall torque	lb-in	106	106	106
	N-m	12	12	12
Continuous current	amps	18.57	9.16	6.08
Peak torque	lb-in	318.6	318.6	318.6
	N-m	36	36	36
Peak current	amps	55.71	27.48	18.24
Mechanical time constant	msec	3.4	3.8	3.8
Electrical time constant	msec	8.7	8.2	7.5
Rated voltage	volts	320	320	320
Rated power	kW	3.95	2.32	1.32
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.72	13.64	20.54
	N-m/amp	0.76	1.542	2.322
Voltage constant	V_{pk}/krpm	54.4	131.7	198.5
	V_{rms}/krpm	45.94	93.22	140.41
Resistance	ohms	0.38	1.459	3.242
Inductance	mH	2.61	11.57	24.10
Mechanical				
Inertia	lb-in-s^2	0.0386	0.0386	0.0386
	Kg-cm^2	43.612	43.612	43.612
Maximum speed	rpm	6000	5700	3800
Number of motor poles	-	8	8	8
Weight	lbs./Kg	52/23.6	52/23.6	52/23.6

Performance curves
BSM B-series

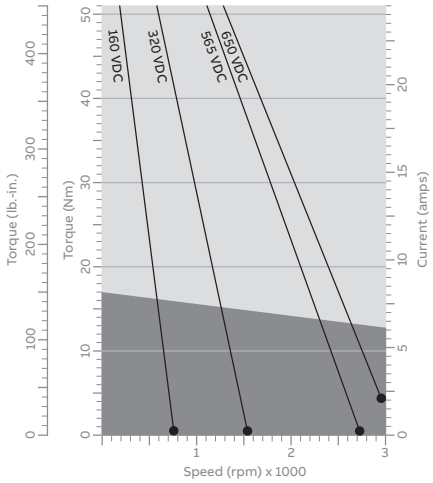
BSM100B-375



BSM100B-3150



BSM100B-3250



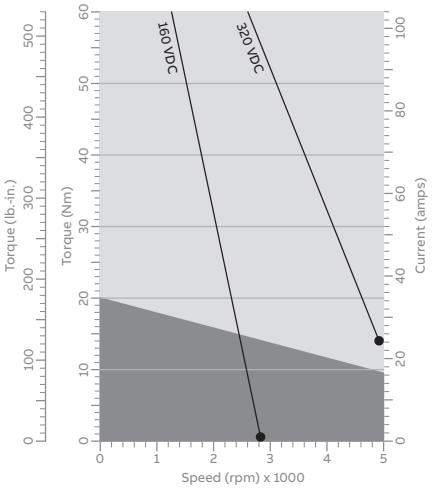
*Refer to page 24 on performance curve explanation

Catalog number		BSM100B-375	BSM100B-3150	BSM100B-3250
General				
Continuous stall torque	lb-in	150	150	150
	N-m	17	17	17
Continuous current	amps	26.48	14.06	8.23
Peak torque	lb-in	451	451	451
	N-m	51	51	51
Peak current	amps	79.4	42.18	24.69
Mechanical time constant	msec	3.6	3.6	3.3
Electrical time constant	msec	7.6	7.5	9.7
Rated voltage	volts	320	320	320
Rated power	kW	4.77	2.97	1.91
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	6.68	12.58	21.49
	N-m/amp	0.7552	1.421	2.429
Voltage constant	V_{pk}/krpm	62.6	121.8	207.5
	V_{rms}/krpm	45.66	85.96	146.85
Resistance	ohms	0.2	0.8	2.0
Inductance	mH	1.53	6.04	16.13
Mechanical				
Inertia	lb-in-s^2	0.0584	0.0584	0.0584
	Kg-cm^2	65.983	65.983	65.983
Maximum speed	rpm	6000	5700	3800
Number of motor poles	-	8	8	8
Weight	lbs./Kg	71/32.3	71/32.3	71/32.3

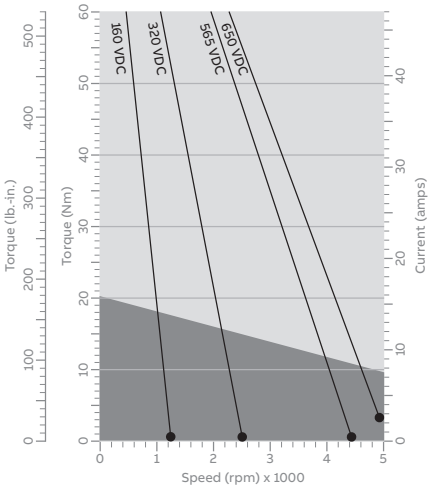
NOTE: A blower cooling option is available which will increase the motor's continuous stall torque by another 50%. Peak torque remains unchanged.

Performance curves
BSM B-series

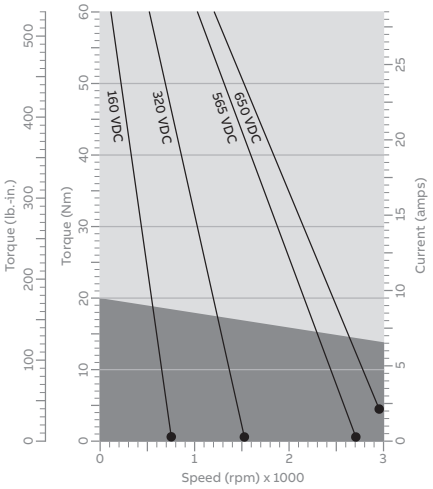
BSM100B-475



BSM100B-4150



BSM100B-4250



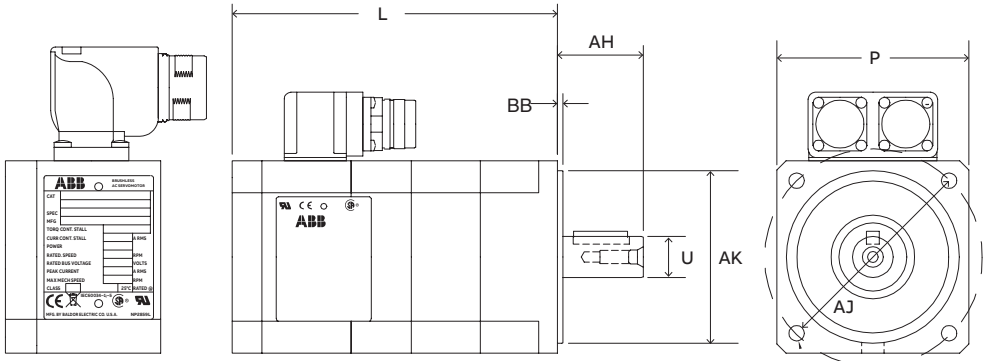
*Refer to page 24 on performance curve explanation

Catalog number		BSM100B-475	BSM100B-4150	BSM100B-4250
General				
Continuous stall torque	lb-in	177	177	177
	N-m	20	20	20
Continuous current	amps	35.66	15.80	9.64
Peak torque	lb-in	531	531	531
	N-m	60	60	60
Peak current	amps	107	47	29
Mechanical time constant	msec	3.2	3.5	3.9
Electrical time constant	msec	7.9	8.5	9.1
Rated voltage	volts	320	320	320
Rated power	kW	4.89	3.32	2.13
Rated speed	rpm	4000	2000	1200
Rated frequency	Hz	266.7	133.3	80
Electrical				
Torque constant	lb-in/amp	5.84	13.17	21.6
	N-m/amp	0.66	1.488	2.41
Voltage constant	V_{pk}/krpm	57.2	123.1	205.3
	V_{rms}/krpm	39.89	90.01	147.60
Resistance	ohms	0.1412	0.67	2.07
Inductance	mH	1.03	5.58	18.27
Mechanical				
Inertia	lb-in-s^2	0.0666	0.0666	0.0666
	Kg-cm^2	75.248	75.248	75.248
Maximum speed	rpm	6000	5900	3700
Number of motor poles	-	8	8	8
Weight	lbs./Kg	79/36	79/36	79/36

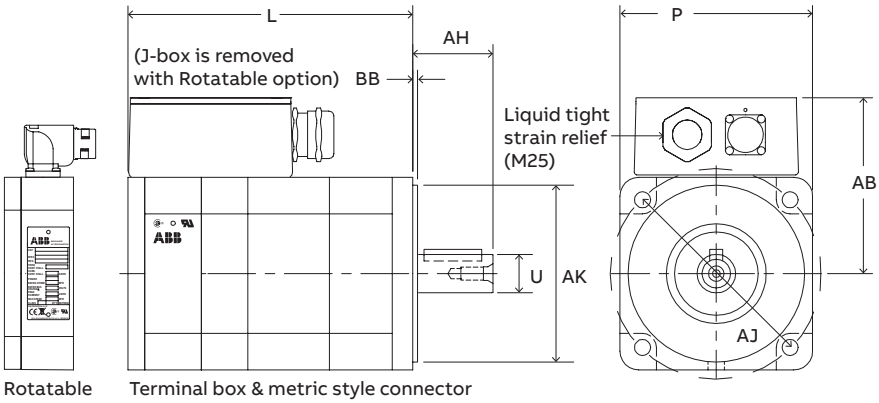
NOTE: A blower cooling option is available which will increase the motor's continuous stall torque by another 50%. Peak torque remains unchanged.

Brushless servo motors
Dimensions - IEC mounting

BSM 80 series



BSM 90/100 series



Motor code	P	L	AB	U	AH	KEY	AJ	AK	BB
80B-1	3.5 (89)	7.18 (183)	2.9 (75)	0.74 (19j6)	1.5 (40)	6x6x24	0.28 (7.0) thru hole 3.9 (100) B.C.	3.1 (80j6)	0.118 (3.0)
80B-2	3.5 (89)	8.68 (220)	2.9 (75)	0.74 (19j6)	1.5 (40)	6x6x24		3.1 (80j6)	0.118 (3.0)
80B-3	3.5 (89)	10.18 (258)	2.9 (75)	0.74 (19j6)	1.5 (40)	6x6x24		3.1 (80j6)	0.118 (3.0)
90B-1	4.7 (120)	7.11 (181)	4.3 (109)	0.94 (24j6)	1.9 (50)	8x7x36	0.39 (10) thru hole 5.1 (130) B.C.	4.3 (110j6)	0.138 (3.5)
90B-2	4.7 (120)	9.36 (238)	4.3 (109)	0.94 (24j6)	1.9 (50)	8x7x36		4.3 (110j6)	0.138 (3.5)
90B-3	4.7 (120)	11.61 (295)	4.3 (109)	0.94 (24j6)	1.9 (50)	8x7x36		4.3 (110j6)	0.138 (3.5)
100B-1	5.7 (146)	7.75 (197)	4.9 (124)	1.1 (28j6)	2.3 (60)	8x7x50	0.47 (12) thru hole 6.5 (165) B.C.	5.1 (130j6)	0.138 (3.5)
100B-2	5.7 (146)	10.75 (273)	4.9 (124)	1.1 (28j6)	2.3 (60)	8x7x50		5.1 (130j6)	0.138 (3.5)
100B-3	5.7 (146)	13.75 (349)	4.9 (124)	1.1 (28j6)	2.3 (60)	8x7x50		5.1 (130j6)	0.138 (3.5)
100B-4	5.7 (146)	15 (381)	4.9 (124)	1.1 (28j6)	2.3 (60)	8x7x50		5.1 (130j6)	0.138 (3.5)

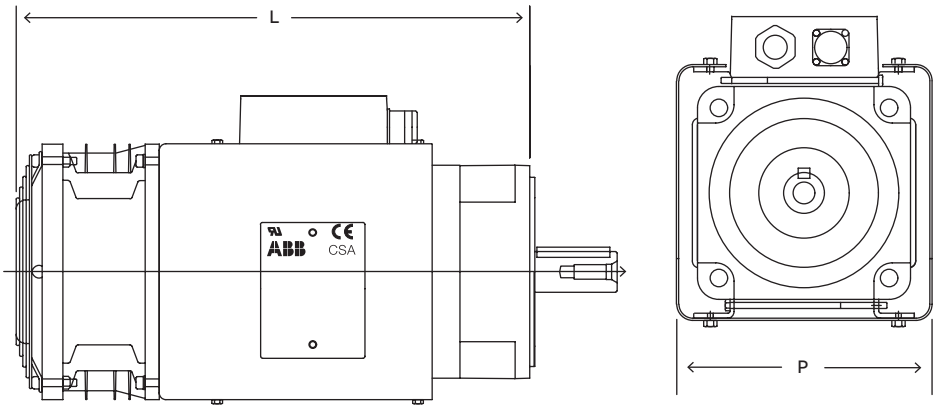
Motor code	Brake motor length - adder		Brake motor weight - adder
	Resolver	Encoder	
BSM80B	1.07 (27.2)	1.64 (41.66)	2.18 lbs.
BSM90B	2.39 (60.71)	2.39 (60.71)	5.74 lbs.
BSM100B	1.60 (40.64)	2.64 (67.06)	8.77 lbs.

Dimensions in inch (mm)
(1) BSM 50/63/80 has two (2) threaded connectors (metric style) for feedback and motor terminations.
(2) BSM 90/100 has one (1) threaded connector (metric style) for termination of feedback and power lead wires terminate to a terminal block.
(3) Order mating connectors as separate items.
(4) The motors have a threaded hole on the shaft end.
The BSM80 series is M6 x 1.0 threads (17 mm deep)
The BSM 90 series is M6 x 1.0 threads (17mm deep)
The BSM100 series is M10 x 1.5 threads (23 mm deep)
(5) Dimensions above are for reference only.
Detailed engineering drawings available upon request.

Brushless servo motors

BSM series with blower cooling option

BSM 90/100 series



Blower volt/amp

Motor	Voltage	Amps	CFM
BSM90/100	115 VAC 1ø 50/60 Hz	0.60	430
	230 VAC 1ø 50/60 Hz	0.30	430
	24 Vdc	2.10	470

Dimensions: Blower kits for use with BSM90/100 motors

Motor code		P dimension	L dimension
BSM90B-2	Motor	6.91 (175.5)	14.38 (365.2)
	Motor-brake	6.91 (175.5)	16.75 (425.5)
BSM90B-3	Motor	6.91 (175.5)	16.63 (422.3)
	Motor-brake	6.91 (175.5)	19.00 (482.7)
BSM100B-3	Motor	6.91 (175.5)	18.63 (473.0)
	Motor-brake	6.91 (175.5)	19.44 (493.6)
BSM100B-4	Motor	6.91 (175.5)	19.88 (504.8)
	Motor-brake	6.91 (175.5)	20.69 (525.4)

Dimensions in inch (mm)
All blowers are single phase.

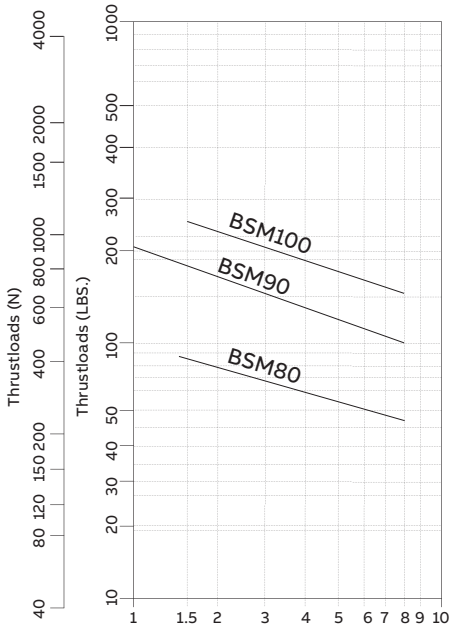
Brake date for BSM and SSBSM

Motor code	Brake holding torque lb-in (Nm)	Watts	Brake voltage (Vdc)	Brake current (amps)	Brake times (msec)		Brake inertia	
					Set	Release	(lb-in-s^2)	(kg-cm^2)
BSM80	40 (4.5)	19.7	24	0.7	9	48	0.000111	0.125
BSM90	140 (15.8)	22.5	24	0.9	14	110	0.00016	0.181
BSM100	350 (39.5)	33.7	24	1.4	22	195	0.00064	0.723

NOTE: All standard brakes used on Baldor BSM motors are 24VDC. The application needs to provide this voltage to release the brake. The brake is a holding brake only, and not intended to be used to decelerate loads. Contact ABB for details. Detailed engineering drawings are available upon request.

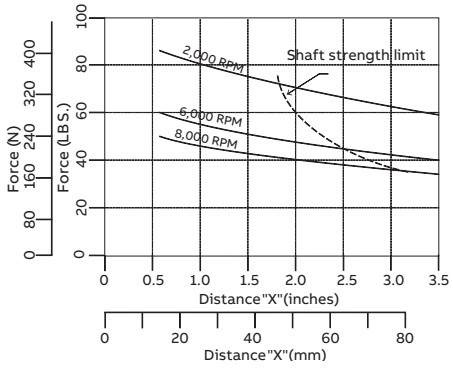
Brushless servo motors

Thrust load capacity

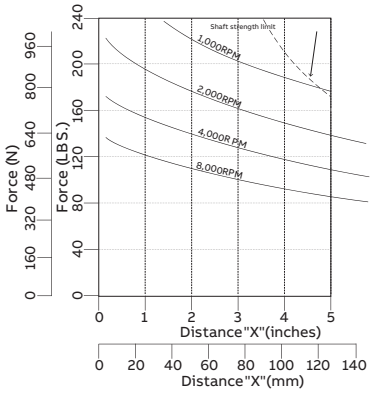


Radial load capacity

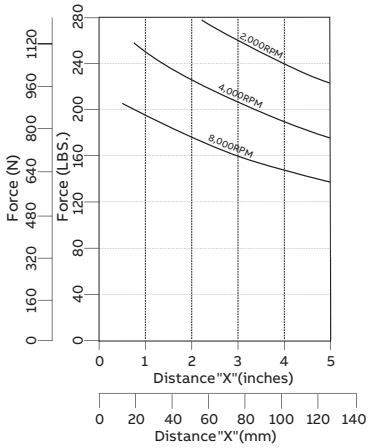
BSM80



BSM90



BSM100



Brushless servo motors
Cables

Motor power cable

Current rating	Length		Cable assemblies*	Raw cable
	Feet	Meters	Threaded CE connector	No connector
12	5	1.5	CBL015SP-12	CBL015RP-12
	10	3	CBL030SP-12	CBL030RP-12
	20	6.1	CBL061SP-12	CBL061RP-12
	30	9.1	CBL091SP-12	CBL091RP-12
	50	15.2	CBL152SP-12	CBL152RP-12
	75	22.9	CBL229SP-12	CBL229RP-12
	100	30.5	CBL305SP-12	CBL305RP-12
	250	76	-	CBL760RP-12
	500	152.5	-	CBL1525RP-12
20	5	1.5	CBL015SP-20	CBL015RP-20
	10	3	CBL030SP-20	CBL030RP-20
	20	6.1	CBL061SP-20	CBL061RP-20
	30	9.1	CBL091SP-20	CBL091RP-20
	50	15.2	CBL152SP-20	CBL152RP-20
	75	22.9	CBL229SP-20	CBL229RP-20
	100	30.5	CBL305SP-20	CBL305RP-20
35	5	1.5	CBL015SP-35	CBL015RP-35
	10	3	CBL030SP-35	CBL030RP-35
	20	6.1	CBL061SP-35	CBL061RP-35
	30	9.1	CBL091SP-35	CBL091RP-35
	50	15.2	CBL152SP-35	CBL152RP-35
	75	22.9	CBL229SP-35	CBL229RP-35
	100	30.5	CBL305SP-35	CBL305RP-35

(1) BSM series require both power and feedback cables
(2) CE style has shield tied to connector housing.
(3) Consult appropriate drive installation manual for cable length limitations.
* Cable assemblies include a connector on motor end, flying leads on drive end

Brushless servo motors
Cables

Feedback cable

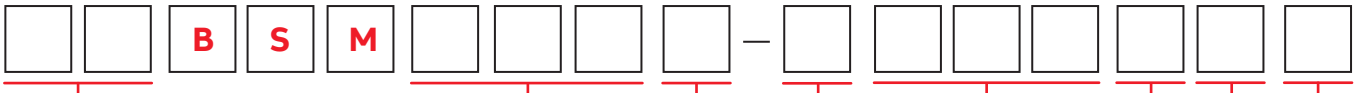
Type	Length Feet	Length Meters	Resolver*	Encoder*
For use with any drive: Threaded CE connector (motor side) Flying leads (drive side)	5	1.5	CBL015SF-R	CBL015SF-E
	10	3	CBL030SF-R	CBL030SF-E
	20	6.1	CBL061SF-R	CBL061SF-E
	30	9.1	CBL091SF-R	CBL091SF-E
	50	15.2	CBL152SF-R	CBL152SF-E
	75	22.9	CBL229SF-R	CBL229SF-E
	100	30.5	CBL305SF-R	CBL305SF-E

Type	Length		Encoder **	Resolver **	EnDat 2.2 & Hiperface **	SSI **
Drive module db connector	Feet	Meters	(FEN-01) HD 15 pin	(FEN-21) HD 15 pin	(FEN-11) HD 15 pin	(FEN-11) HD 15 pin
For use with ACS880: Threaded CE connector (motor side) and DB connector (Drive side)	5	1.5	CBL015SF-E5	CBL015SF-R5	CBL015SF-D5	CBL015SF-S5
	10	3	CBL030SF-E5	CBL030SF-R5	CBL030SF-D5	CBL030SF-S5
	20	6.1	CBL061SF-E5	CBL061SF-R5	CBL061SF-D5	CBL061SF-S5
	30	9.1	CBL091SF-E5	CBL091SF-R5	CBL091SF-D5	CBL091SF-S5
	50	15.2	CBL152SF-E5	CBL152SF-R5	CBL152SF-D5	CBL152SF-S5
	75	22.9	CBL229SF-E5	CBL229SF-R5	CBL229SF-D5	CBL229SF-S5
	100	30.5	CBL305SF-E5	CBL305SF-R5	CBL305SF-D5	CBL305SF-S5

(1) BSM series require both power and feedback cables
(2) CE style has shield tied to connector housing
(3) Consult appropriate drive installation manual for cable length limitations.
* Cable assemblies include a connector on motor end, flying leads on drive end
** Cable assemblies include two connectors as indicated

AC servo motors

Brushless servo motor identification matrix: B, C and N series



Blank = Std
SS = Stainless steel

Note: Not all options are available on all motors. Contact your local District Office.

Frame

IEC	NEMA
50	5N
63	6N
80	8N
90	9N
100	10N
132	

Series
B
C
N

Motor size
1
2
3
4

Winding code
50
75
etc.

Motor options

Description	Standard (metric) threaded style	Cables(6)	Optional (inch) quick connect	Flying leads(6)	Connections Rotate-able (metric) threaded(9)
Motor (no shaft seal)	A	E	I	M	R
Motor and brake	B	F	J	N	S
Motor with shaft oil seal	C	G	K	O	T
Motor with brake & shaft oil seal	D	H	L	P	U

Feedback options

A = Resolver
B = Absolute encoder – single-turn (BiSS)
B2 = Absolute encoder – multi-turn (BiSS)
D = Absolute encoder – multi-turn (EnDat)
D2 = Absolute encoder – single-turn (EnDat)
D3 = Absolute encoder – single-turn (Hiperface)
D4 = Absolute encoder – multi-turn (Hiperface)
S1 = Absolute encoder – single-turn (SSI)
S2 = Absolute encoder – multi-turn (SSI)
E = Incremental encoder w/ commutation (1000 ppr)
F = Incremental encoder w/ commutation (2500 ppr)
H = Halls only
V = Encoder mounting only
Y = Resolver mounting only

Accessory options

Blank = No option
M = No keyway
N = DIN 42955-R
O = DIN 42955-R & no keyway
P = Optional motor connector on BSM 90/100 (Note: This option available only if current less than 28 amps)
X = Special option (order by spec no. only)
Z1 = Blower (115 VAC) (not available on all motors)
Z2 = Blower (230 VAC) (not available on all motors)
Z3 = Blower (24 Vdc) (not available on all motors)

(1) The standard BSM50/63/80 series includes two threaded connectors for feedback and motor terminations, square mounting flange.
(2) The standard BSM90/100 series includes, one threaded connector for feedback termination, termination of motor lead wires on terminal block, square mounting flange.
(3) BSM motors do not have shaft seal as standard. BSM motors are IP54. Motors will meet IP55 with shaft oil seal.
(4) SSBSM motors available with IEC mounting and include as standard a shaft seal. SSBSM motors are IP67.
(5) The standard BSM50 series has as standard no keyway.
(6) Shielded cables and flying leads are one meter long as standard. Flying leads option is composed of individual wires with no armored protection.
(7) Order motor power and feedback cable assemblies as separate items.
(8) Motors may be used with 115/230/400/460 volt controls. Verify that maximum speed is not exceeded.
(9) Rotatable connectors not available on BSM50-series. Standard rotatable on models up to BSM100 available (only if current is less than 28 amps) BSM132 requires a larger connector.
(10) Pricing for NEMA versions 5N, 6N, 8N, 9N, and 10N is the same as IEC versions 50, 63, 80, 90, and 100.
(11) Contact your local ABB district office for special options.

AC servo motors

Speed – torque curves (how to read motor performance curves)

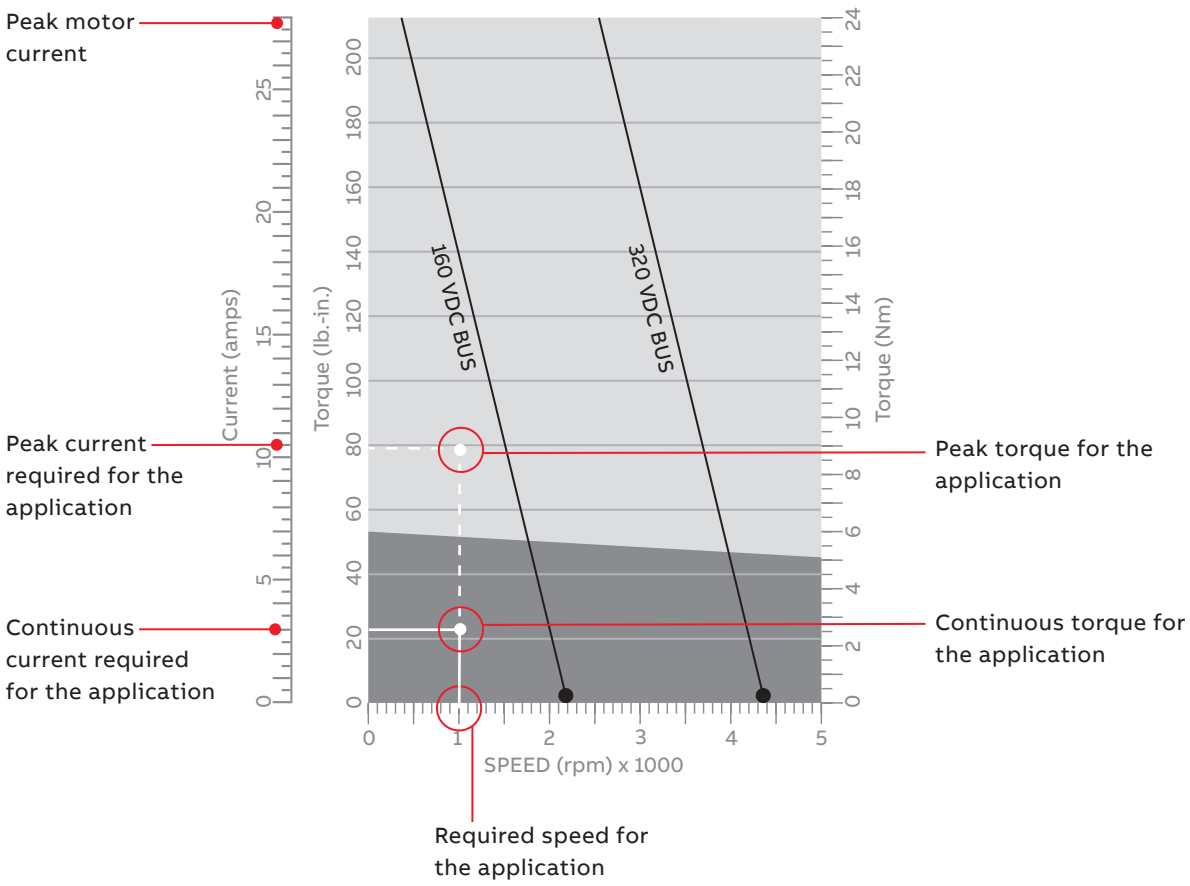
We have provided the following curves in order to simplify the process of selecting both a motor and control for a specific application. The following paragraphs explain how the information in these curves should be interpreted.

In constant speed applications, motors are defined in terms of horsepower or kilowatts (which is torque at a base speed). Servo motors normally operate over a wide speed range. The curves show continuous torque (defined as torque which will not overheat the motor) and peak torque (defined as intermittent acceleration torque).

It is also necessary to know the current and voltage required for the motor to operate. The curves have a scale that shows current required for any torque, and voltage required for any speed.

As an example, an application requires a continuous torque of 25 lb-in (2.8 Nm) at a speed of 1000 RPM. The peak torque required for acceleration is 80 lb-in (9 Nm).

This curve shows that the motor will work in this application. The bus voltage required is 160Vdc. The continuous and peak currents required are 3.0 and 10.5 amps.



AC servo motors

How to interpret motor information

How to interpret motor information
Rated voltage/speed: Rated conditions refer to measurement points and are selected as an easy and convenient reference or measurement point. Manufacturers select a rated voltage, operate with a rated torque, to verify that rated speed is reached.

Note that any voltage may be applied to the BSM series of brushless servo motors, so either 160 Vdc, 320 Vdc or 650 Vdc may be applied. However, the design limits must be observed, and those are: 1) maximum speed (RPM) limit, 2) demagnetization (max torque/current) limit and 3) 650 Vdc maximum.

Motor data
All BSM motors are 3-phase WYE connected. Connection is important because the motor/feedback is phase sensitive. All motor parameters are expressed as phase-to-phase (line-to-line) figures. This includes voltage constant, resistance and inductance.

The phase-to-phase voltage constant (back-emf) is a sinusoidal wave, which is measured while driving the motor (as a generator) at 1000 RPM and measuring the output voltage. The peak of this measured output voltage is shown in the literature as Vpk/kRPM; the RMS of the output voltage is Vrms/kRPM.

Some data in the motor tables are expressed as “cold” figures (25°C), while others are “hot” (155°C) values. The cold figures are: voltage constant, torque constant, resistance, inductance. The hot figures are: continuous stall torque, continuous stall current, peak torque and peak current.

Note: The torque constant Kt decreases in a non-linear manner as the torque increases, the Kt values are considered valid until approximately 2 times cont. stall torque.

The temperature coefficient between cold and hot voltage constant (and torque constant) is 0.90 for N-series, 0.80 for B-series, 0.80 for C-series and 0.85 for BSM132 series. Motor resistance changes by a factor of 1.5 from 25°C to 155°C.

Motor temperature
BSM series servo motors are rated for a maximum continuous winding temperature of 155°C. These conditions are ploted in a 25°C ambient on the motor speed-torque curves. For operation at 40°C ambient, derate by 6%.

The temperature rise of the motor windings depends upon the amount of torque which is being delivered to the load. In this brochure, the thermal limit line (line dividing dark and light shaded areas on the speed-torque curves) indicates the 155°C limit.

Temperature range - normal operating range of bearing grease is - 29°C to 155°C.

Altitude - the motors are rated for operation at 1000m or lower; derate 10% per 1000m.

The BSM motors include an internal thermal switch (bi-metallic), which is normally closed. It opens at 155°C ±5°. This switch may be connected to the input of a motion controller, programmable logic device or other type of machine control via an isolating relay. Any of these devices could then sense this switch and shut power down when the thermal switch opens.

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