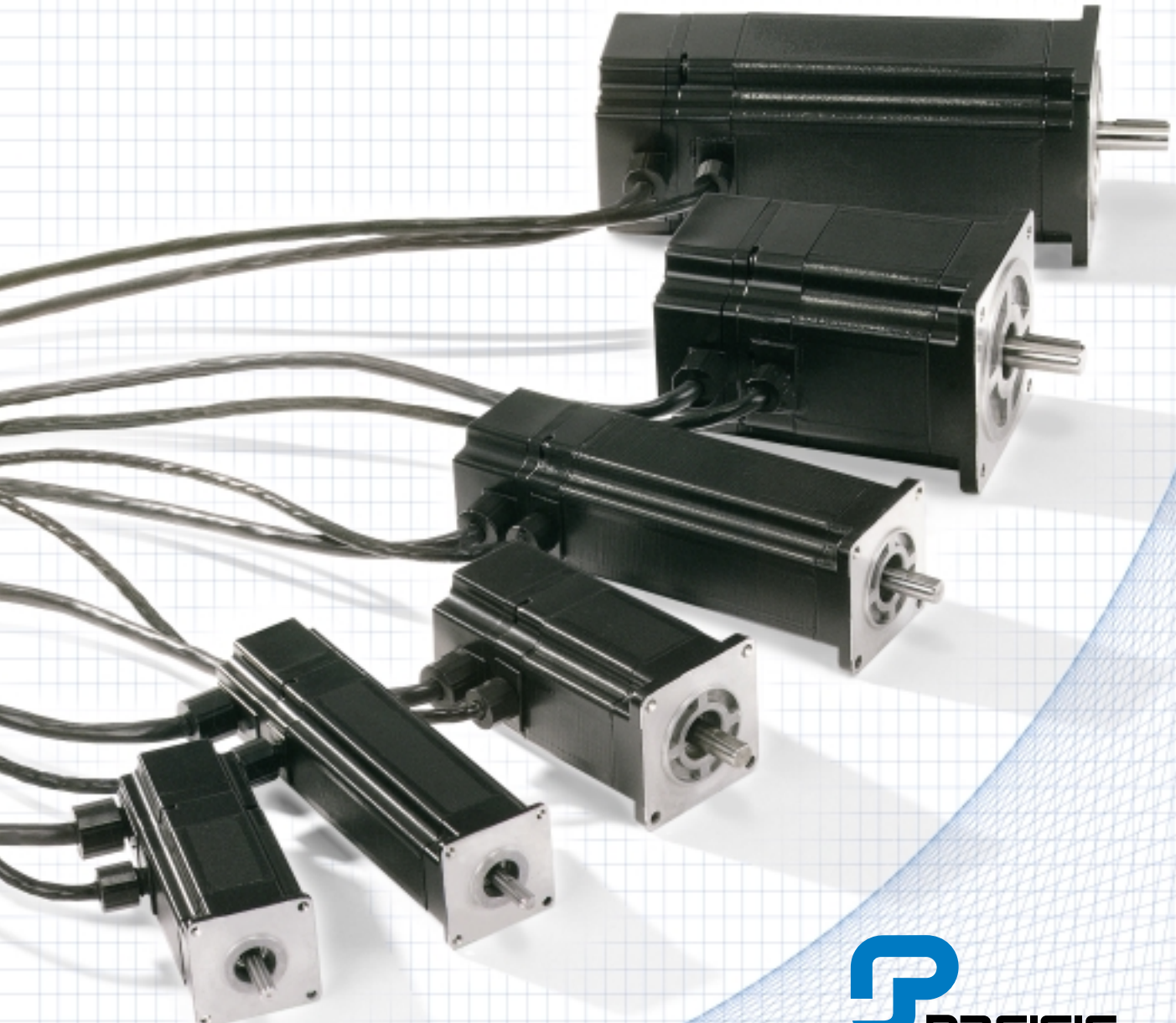
Smart technology.
Motion simplified.

PMB SERIES BRUSHLESS SERVOMOTORS



PACIFIC SCIENTIFIC

HIGH PERFORMANCE MOTORS & DRIVES

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DRIVE & MOTOR PERFORMANCE DATA

Pacific Scientific PMB brushless servo motors offer you cost-effective performance positioning that is both accurate and precise. But the benefits of our new PMB motor series do not end there. The PMB Series family offers high torque density for increased acceleration and cooler running than similar motors. Regulatory compliance assures global acceptance for your machine.

For faster installation, maintenance and overall flexibility, two connection options are available: MS connectors and AMP mini Mate-N-Lock.®

Speaking of flexibility, our new, IP40 rated motors are available in size 17 and NEMA 23 and 34 frame sizes — making them ideal for a variety of light industrial applications including medical equipment, material handling and semiconductor processing equipment — just to name a few.

Each motor in the series comes with three different stack length offerings and is outfitted with windings tailored to match our high-performance drives, including the PC800 and PC3400 series of digital brushless servo drives.

Just our way of guaranteeing the best from your motor/drive combination for your application — all in a Pacific Scientific package.

Throw in a two-year warranty and an optional thermistor to protect against motor damage, and you are well on your way to discovering Pacific Scientific's commitment to offering you the highest performance products available — at a price you can afford. That's Pacific Scientific: making your designs sing and your job easier.

RECOMMENDED MOTOR/DRIVE SYSTEMS, 48V dc, 240V ac — 320V dc bus

Servo Motor Model®	Servo Drive Model	Peak Stall Torque T_{PS} Nm (lb.-in.)	Peak Rated Torque T_{PR} ① Nm (lb.-in.)	Cont. Stall Torque T_{CS} Nm (lb.-in.)	Cont. Rated Torque T_{CR} Nm (lb.-in.)	Rated Speed W_R ⑥ rpm	No-Load Speed W_{NL} rpm	Cont. Stall Current I_{CS} A_{RMS}	Current at Peak Torque I_{PS} A_{RMS}	Inertia ②⑦ J $kgm^2 \times 10^{-3}$ ($lb.-in.-S^2 \times 10^{-3}$)	Inductance Line-Line L mH
48V dc PMB Series motors with PC340xD Drives ①											
PMB11B	PC3402 ②⑤	.45 (4.0)	.45 (4.0)	.22 (2.0)	.22 (2.0)	1,000	5,000	2.4	5.0	0.005 (0.045)	2.5
PMB11D	PC3405 ②⑤	.45 (4.0)	.44 (3.9)	.22 (2.0)	.20 (1.8)	6,450	10,000	4.8	10.0	0.005 (0.045)	0.6
PMB12B	PC3402 ②⑤	.80 (7.1)	.79 (7.0)	.40 (3.5)	.40 (3.5)	700	2,900	2.5	5.0	0.009 (0.079)	3.3
PMB12D	PC3405 ②⑤	.83 (7.3)	.82 (7.3)	.40 (3.5)	.38 (3.3)	3,500	5,600	4.7	10.0	0.009 (0.079)	0.9
PMB13D	PC3405 ②⑤	1.11 (9.8)	1.10 (9.7)	.55 (4.9)	.50 (4.4)	2,350	4,150	4.8	10.0	0.013 (0.113)	1.1
PMB21D	PC3405 ②⑤	1.27 (11.2)	1.26 (11.2)	.64 (5.7)	.61 (5.4)	1,300	3,600	5.0	10.0	0.023 (0.201)	1.2
PMB22D	PC3405 ②⑤	2.2 (19.5)	2.2 (19.5)	1.11 (9.8)	1.10 (9.7)	600	2,150	5.0	10.0	0.044 (0.385)	1.5
240V ac — 320V dc PMB Series motors with PC8xx and SC9xx Drives											
PMB13B	PC8x2, SC9x2/SCE9x2③	1.2 (10.9)	1.2 (10.5)	0.55 (4.9)	0.41 (3.6)	11,000	13,100	2.3	5.3	0.013 (0.118)	4.8
PMB21B	PC8x2, SC9x2/SCE9x2③	1.3 (11.5)	1.3 (11.2)	0.64 (5.7)	0.45 (4.0)	10,000	13,100	2.6	5.3	0.023 (0.206)	4.0
PMB22B	PC8x2, SC9x2/SCE9x2③	2.2 (19.2)	2.1 (18.9)	1.1 (9.8)	1.0 (8.9)	6,250	7,700	2.7	5.3	0.044 (0.390)	5.5
PMB23B	PC8x2, SC9x2/SCE9x2③	2.9 (26.1)	2.9 (25.8)	1.5 (13.6)	1.4 (12.4)	4,400	5,650	2.7	5.3	0.065 (0.576)	7.1
PMB23C	PC8x3, SC9x3 ③	4.5 (39.8)	4.4 (39.4)	1.5 (13.6)	1.4 (12.0)	5,750	7,400	3.5	10.5	0.065 (0.576)	3.7
PMB31B	PC8x2, SC9x2/SCE9x2③	4.1 (36.6)	4.1 (36.5)	2.1 (18.7)	1.9 (16.8)	2,900	4,300	2.7	5.3	0.14 (1.21)	19.6
PMB31D	PC8x4 ③	6.2 (55.0)	6.2 (54.7)	2.1 (18.7)	1.7 (15.0)	5,000	8,400	5.1	15.3	0.14 (1.21)	5.2
PMB31D	SC9x3 ③	4.3 (38.2)	4.3 (37.9)	2.1 (18.7)	1.6 (14.3)	6,000	8,400	5.1	10.6	0.14 (1.21)	5.2
PMB32C	PC8x2, SC9x2/SCE9x2③	6.8 (60.3)	6.8 (60.0)	3.5 (30.6)	3.0 (26.4)	1,900	2,550	2.7	5.3	0.27 (2.39)	22.5
PMB32C	PC8x3, SC9x3 ③	11.4 (101)	11.4 (101)	3.8 (34.0)	3.2 (28.4)	1,400	2,550	3.0	8.9	0.27 (2.39)	22.5
PMB32D	SC9x3 ③	7.7 (68.4)	7.7 (68.0)	3.8 (34.0)	2.8 (25.2)	3,500	4,550	5.2	10.6	0.27 (2.39)	7.4
PMB32D	PC8x4, SC9x4 ③	11.3 (100)	11.3 (100)	3.8 (34.0)	3.0 (26.5)	3,000	4,550	5.2	15.6	0.27 (2.39)	7.4
PMB32E	PC8x4, SC9x4 ③	11.3 (100)	11.3 (100)	3.8 (34.0)	2.8 (25.1)	4,150	5,950	6.8	20.4	0.27 (2.39)	4.2
PMB33C	PC8x2, SC9x2/SCE9x2③	9.7 (86.3)	9.7 (86.0)	5.0 (44.5)	4.8 (42.8)	1,300	1,900	2.7	5.3	0.40 (3.57)	27.2
PMB33C	PC8x3, SC9x3 ③	15.9 (141)	15.9 (141)	5.4 (48.0)	5.0 (44.3)	950	1,900	2.9	8.7	0.40 (3.57)	27.2
PMB33E	SC9x3 ③	9.7 (86.0)	9.7 (85.5)	4.9 (43.6)	4.4 (39.0)	3,000	3,800	5.3	10.6	0.40 (3.57)	6.8
PMB33E	PC8x4, SC9x4 ③	16.0 (142)	15.9 (141)	5.4 (48.0)	4.6 (40.4)	2,550	3,800	5.8	17.5	0.40 (3.57)	6.8
PMB33F	SC9x4 ③	12.5 (111)	12.5 (111)	5.4 (48.0)	4.1 (36.0)	4,500	5,700	9.0	21.2	0.40 (3.57)	2.8
240V ac — 320V dc PMB Series motors with PC34xxA Drives											
PMB13B	PC3403 ④	1.4 (12.2)	1.3 (11.9)	0.55 (4.9)	0.41 (3.6)	11,000	13,100	2.3	6.0	0.013 (0.113)	4.8
PMB21B	PC3403 ④	1.5 (13.0)	1.4 (12.7)	0.64 (5.7)	0.45 (4.0)	10,000	13,100	2.6	4.7 ⑨	0.023 (0.206)	4.0
PMB22B	PC3403 ④	2.5 (21.8)	2.4 (21.4)	1.1 (9.8)	1.0 (9.0)	6,050	7,700	2.7	6.0	0.044 (0.390)	5.5
PMB23B	PC3403 ④	3.3 (29.6)	3.3 (29.3)	1.5 (13.6)	1.4 (12.4)	4,200	5,650	2.7	6.0	0.065 (0.576)	7.1
PMB23C	PC3403 ④	2.6 (22.7)	2.5 (22.2)	1.3 (11.7)	1.2 (10.6)	6,450	7,400	3.0	6.0	0.065 (0.576)	3.7
PMB23C	PC3406 ④	3.7 (33.0)	3.7 (32.6)	1.5 (13.6)	1.3 (11.9)	6,000	7,400	3.5	8.7 ⑨	0.065 (0.576)	3.7
PMB31B	PC3403 ④	4.7 (41.4)	4.7 (41.3)	2.1 (18.7)	1.9 (16.9)	2,700	4,300	2.7	6.0	0.14 (1.21)	19.6
PMB31D	PC3406 ④	4.9 (43.3)	4.8 (42.9)	2.1 (18.7)	1.6 (14.5)	5,750	8,400	5.1	12.0	0.14 (1.21)	5.2
PMB32C	PC3403 ④	7.7 (68.2)	7.7 (68.0)	3.8 (34.0)	3.0 (26.8)	1,800	2,550	3.0	6.0	0.27 (2.39)	22.5
PMB32D	PC3406 ④	8.7 (77.3)	8.7 (77.0)	3.8 (34.0)	2.9 (25.5)	3,400	4,550	5.2	12.0	0.27 (2.39)	7.4
PMB32E	PC3410 ⑤	9.5 (83.8)	9.4 (83.3)	3.8 (34.0)	2.8 (24.5)	4,450	5,950	6.8	17.0 ⑨	0.27 (2.39)	4.2
PMB33C	PC3403 ④	11.0 (97.4)	11.0 (97.4)	5.4 (48.0)	4.9 (43.0)	1,250	1,900	2.9	6.0	0.40 (3.57)	27.2
PMB33E	PC3406 ④	11.0 (97.4)	10.9 (96.5)	5.4 (48.0)	4.4 (39.3)	2,900	3,800	5.8	12.0	0.40 (3.57)	6.8
PMB33F	PC3410 ⑤	11.8 (104)	11.7 (104)	5.4 (48.0)	4.0 (35.8)	4,600	5,700	9.0	20	0.40 (3.57)	2.8

① 48V dc figures shown for reference. Operation available from 18-74V dc.

② DC drives offer operation with encoder feedback only. Inertia figures include encoder feedback.

③ Peak torque ratings are for 5 seconds.

④ Peak torque ratings are for 2 seconds.

⑤ Peak torque ratings are for 1 second.

⑥ Rated speed is provided for operation on 240V ac 3-phase line. Reduce to approximately 65% for 240V ac 1-phase line operation and to 40% for 120V ac 1-phase line operation.

⑦ Motors with AC drives include resolver feedback inertia.

⑧ Each system requires one feedback and one motor power cable.

⑨ Characteristics shown with drive default parameters limited to 2.5x of the motor's continuous rating. Higher peak system performance available. Contact the factory.

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MODEL NUMBER CODES

To construct a motor model number code, select the combination of features required and put all of the coded information in the proper sequence. Please account for an entry in each field. The model number shown is an example of a properly specified motor.

P	M	B	1	1	B	-	0	0	1	0	0	-	0	0

Pacific Scientific

Brushless Servomotors

Product Series

Frame Size

1 = Size 17
2 = NEMA Size 23
3 = NEMA Size 34

Stack Length

1-3 = Stack length multiple

Winding

Winding Designator: 240V ac max.	Nominal Stall Current, A_{RMS}
B	**2.7**
C	**3.8**
D	**5.4**
E	**7.4**
F	**11.0**

Factory Preassigned

Shaft

0 = Flat
1 = Round
2 = Square Key (Size 2 & 3 only)
3 = .25" Diameter Round (Size 2 only)
4 = Woodruff Key (Size 2 only)

Connector①

1 = Flying leads with amp connectors
2 = Flying leads with MS connectors

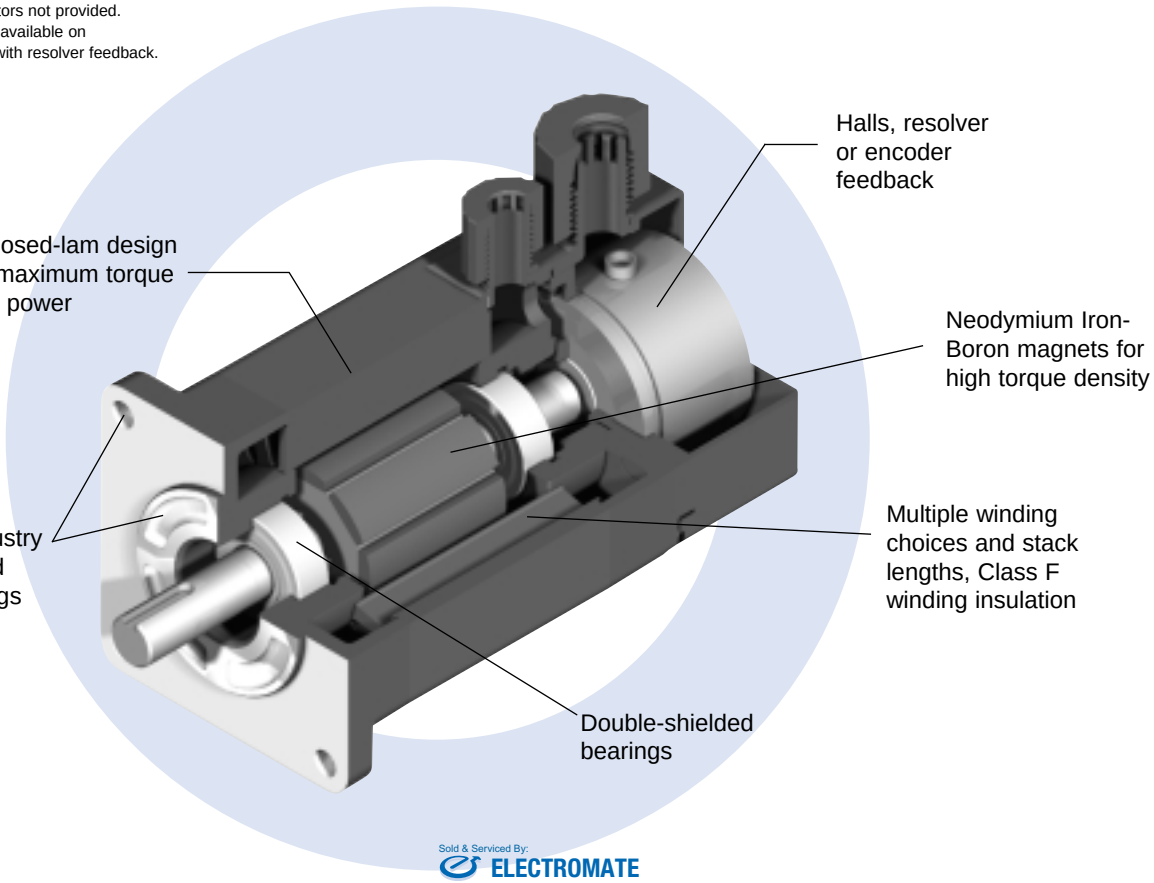
Sensor

00 = Resolver
01 = Hall Sensor
14 = Digital Encoder with commutation, 2048 ppr
16 = Digital Encoder with commutation, 4096 ppr

Customization Code, Factory assigned

00 = Standard Motor
01 = Shaft Seal
02 = PTC Thermistor②
03 = Shaft Seal and PTC Thermistor②

NOTES:
① Mating connectors not provided.
② Thermistor not available on PMB1 motors with resolver feedback.



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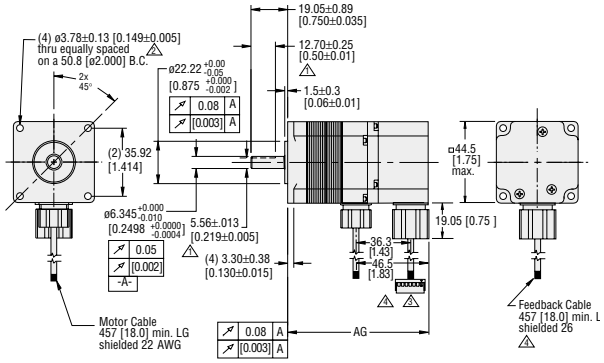
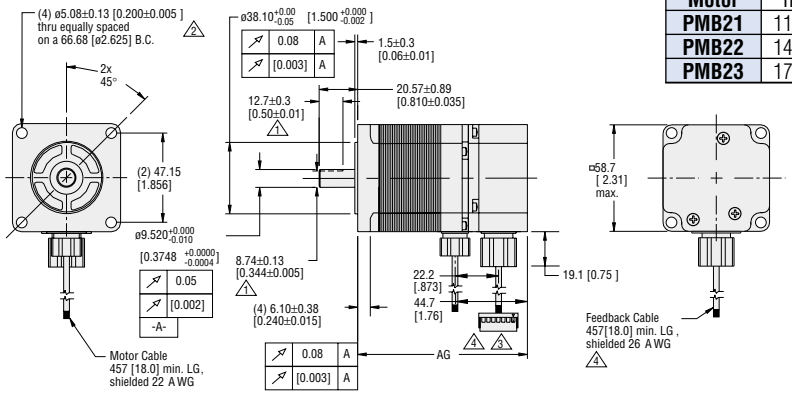
PMB SERIES MOTORS

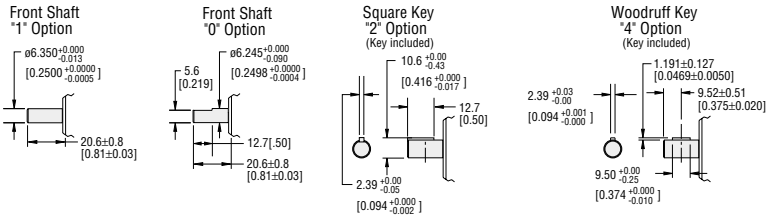
dimensions mm
(in.)



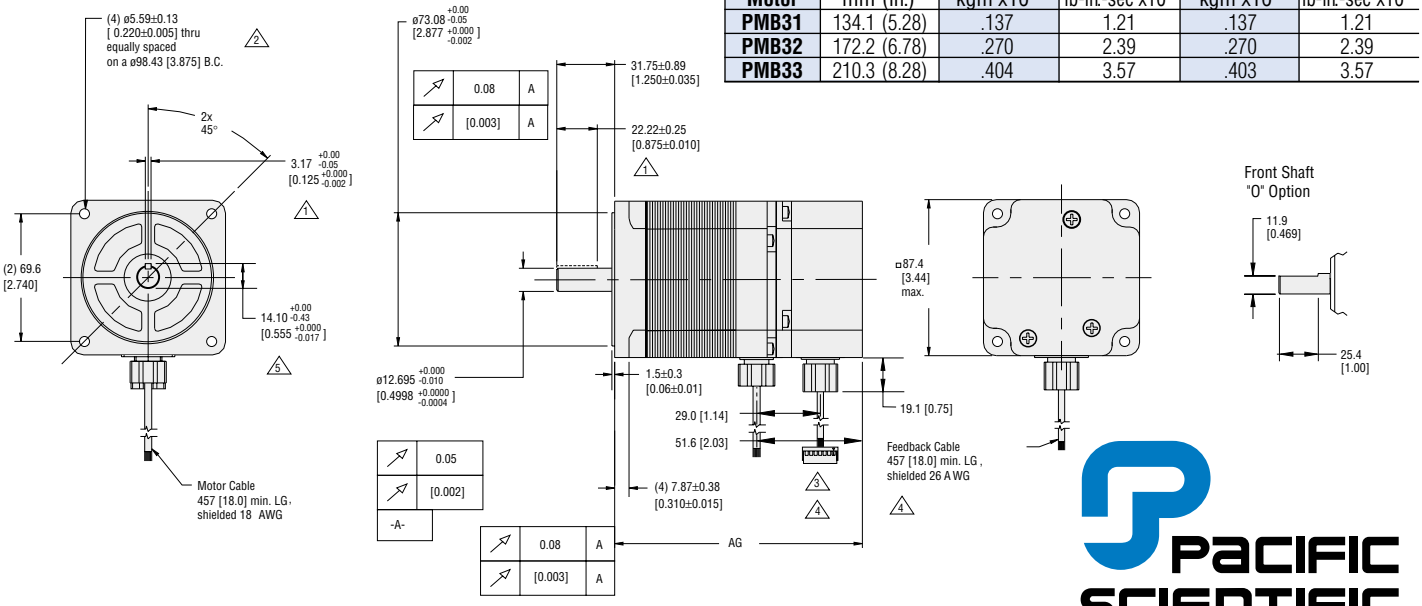
Motor	Length mm (in.)	Inertia - with resolver kgm²x10⁻³	Inertia - with resolver lb-in.-sec²x10⁻³	Inertia - with encoder kgm²x10⁻³	Inertia - with encoder lb-in.-sec²x10⁻³
PMB11	108.0 (4.25)	.006	.050	.005	.045
PMB12	133.4 (5.25)	.009	.084	.009	.079
PMB13	158.8 (6.25)	.013	.118	.013	.113



Motor	Length mm (in.)	Inertia - with resolver kgm²x10⁻³	Inertia - with resolver lb-in.-sec²x10⁻³	Inertia - with encoder kgm²x10⁻³	Inertia - with encoder lb-in.-sec²x10⁻³
PMB21	112.8 (4.44)	.023	.206	.023	.201
PMB22	142.0 (5.59)	.044	.390	.044	.385
PMB23	176.3 (6.94)	.065	.576	.065	.571



Motor	Length mm (in.)	Inertia - with resolver kgm²x10⁻³	Inertia - with resolver lb-in.-sec²x10⁻³	Inertia - with encoder kgm²x10⁻³	Inertia - with encoder lb-in.-sec²x10⁻³
PMB31	134.1 (5.28)	.137	1.21	.137	1.21
PMB32	172.2 (6.78)	.270	2.39	.270	2.39
PMB33	210.3 (8.28)	.404	3.57	.403	3.57



Notes:

1. "0" option (flat) shaft shown.
2. Recommended mounting hardware: (4) fillister-lead or socket-lead cap screws – #6 for PMB1 & 2, #10 for PMB3.
3. Option "1" includes an AMP® mini universal Mate-N-Lock connector for power and feedback .
4. Cable minimum bend radius 57.2 mm (2.25 in.).
5. "2" option (square key shown) for shaft.

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