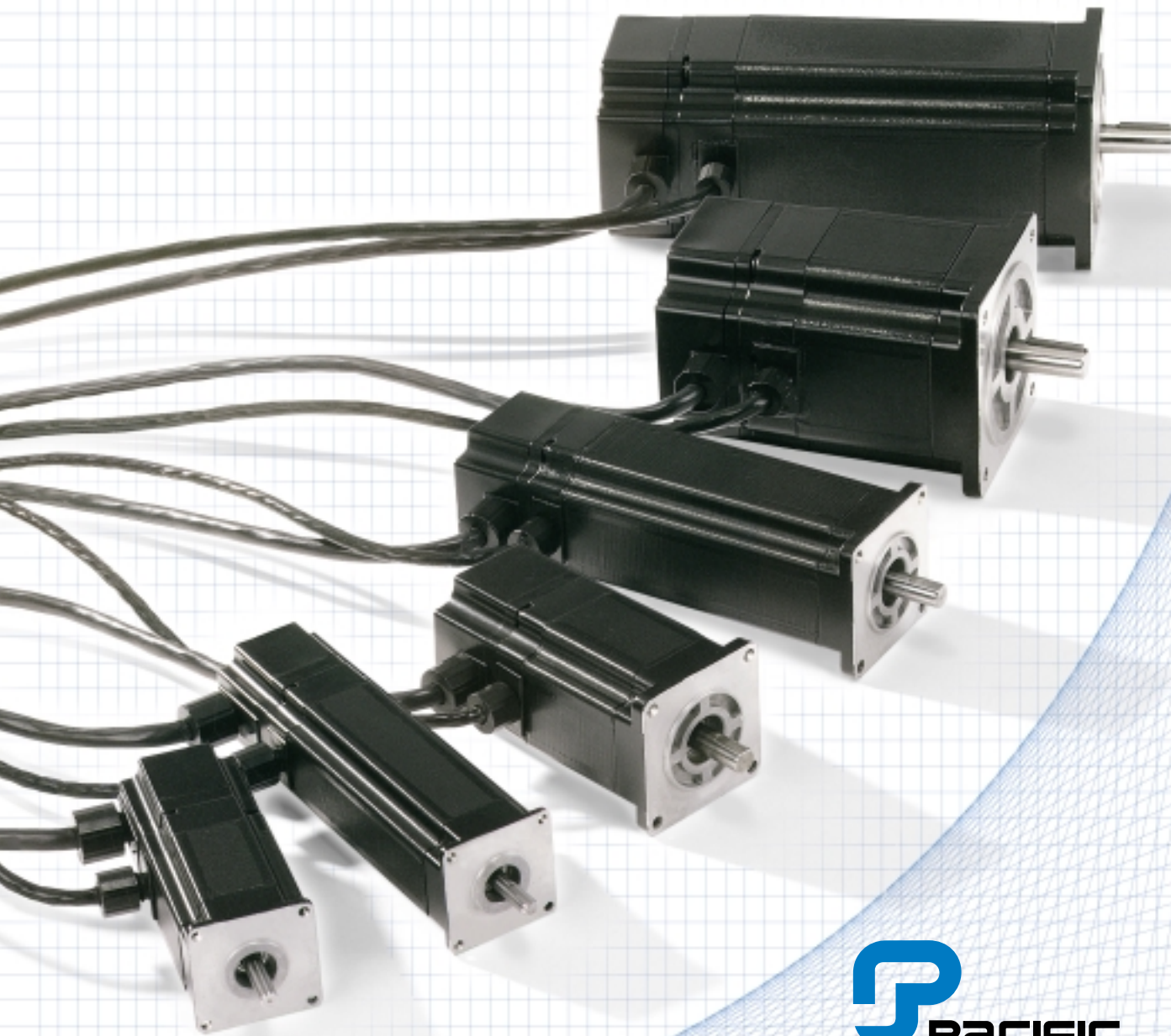


Smart technology.  
Motion simplified.

# PMB SERIES BRUSHLESS SERVOMOTORS



## 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.<sup>®</sup>

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 <sup>®</sup>   | Servo Drive Model                | Peak Stall Torque<br>$T_{PS}$<br>Nm (lb.-in.) | Peak Rated Torque<br>$T_{PR}$ <sup>①</sup><br>Nm (lb.-in.) | Cont. Stall Torque<br>$T_{CS}$<br>Nm (lb.-in.) | Cont. Rated Torque<br>$T_{CR}$<br>Nm (lb.-in.) | Rated Speed<br>$W_R$ <sup>②</sup><br>rpm | No-Load Speed<br>$W_{NL}$<br>rpm | Cont. Stall Current<br>$I_{CS}$<br>$A_{RMS}$ | Current at Peak Torque<br>$I_{PS}$<br>$A_{RMS}$ | Inertia <sup>②⑦</sup><br>$J$<br>kgm <sup>2</sup> x 10 <sup>3</sup><br>(lb.-in.-S <sup>2</sup> x 10 <sup>3</sup> ) | Inductance Line-Line<br>$L$<br>mH |
|--|----------------------------------|---|--|--|--|--|----------------------------------|--|---|---|-----------------------------------|
| <b>48V dc PMB Series motors with PC340xD Drives<sup>①</sup></b>        |                                  |   |  |  |  |  |                                  |  |   |   |                                   |
| PMB11B   | PC3402 <sup>②⑤</sup>             | .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 <sup>②⑤</sup>             | .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 <sup>②⑤</sup>             | .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 <sup>②⑤</sup>             | .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 <sup>②⑤</sup>             | 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 <sup>②⑤</sup>             | 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 <sup>②⑤</sup>             | 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                               |
| <b>240V ac — 320V dc PMB Series motors with PC8xx and SC9xx Drives</b> |                                  |   |  |  |  |  |                                  |  |   |   |                                   |
| PMB13B   | PC8x2, SC9x2/SCE9x2 <sup>③</sup> | 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/SCE9x2 <sup>③</sup> | 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/SCE9x2 <sup>③</sup> | 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/SCE9x2 <sup>③</sup> | 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 <sup>③</sup>        | 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/SCE9x2 <sup>③</sup> | 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 <sup>③</sup>               | 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 <sup>③</sup>               | 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/SCE9x2 <sup>③</sup> | 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 <sup>③</sup>        | 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 <sup>③</sup>               | 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 <sup>③</sup>        | 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 <sup>③</sup>        | 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/SCE9x2 <sup>③</sup> | 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 <sup>③</sup>        | 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 <sup>③</sup>               | 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 <sup>③</sup>        | 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 <sup>③</sup>               | 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                               |
| <b>240V ac — 320V dc PMB Series motors with PC34xxA Drives</b>         |                                  |   |  |  |  |  |                                  |  |   |   |                                   |
| PMB13B   | PC3403 <sup>④</sup>              | 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 <sup>④</sup>              | 1.5 (13.0)                                    | 1.4 (12.7)   | 0.64 (5.7)                                     | 0.45 (4.0)                                     | 10,000                                   | 13,100                           | 2.6  | 4.7 <sup>⑥</sup>                                | 0.023 (0.206)   | 4.0                               |
| PMB22B   | PC3403 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 3.7 (33.0)                                    | 3.7 (32.6)   | 1.5 (13.6)                                     | 1.3 (11.9)                                     | 6,000                                    | 7,400                            | 3.5  | 8.7 <sup>⑥</sup>                                | 0.065 (0.576)   | 3.7                               |
| PMB31B   | PC3403 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 9.5 (83.8)                                    | 9.4 (83.3)   | 3.8 (34.0)                                     | 2.8 (24.5)                                     | 4,450                                    | 5,950                            | 6.8  | 17.0 <sup>⑥</sup>                               | 0.27 (2.39)   | 4.2                               |
| PMB33C   | PC3403 <sup>④</sup>              | 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 <sup>④</sup>              | 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 <sup>④</sup>              | 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 85% for 240V ac 1-phase line operation and to 40% for 120V ac 1-phase line operation.

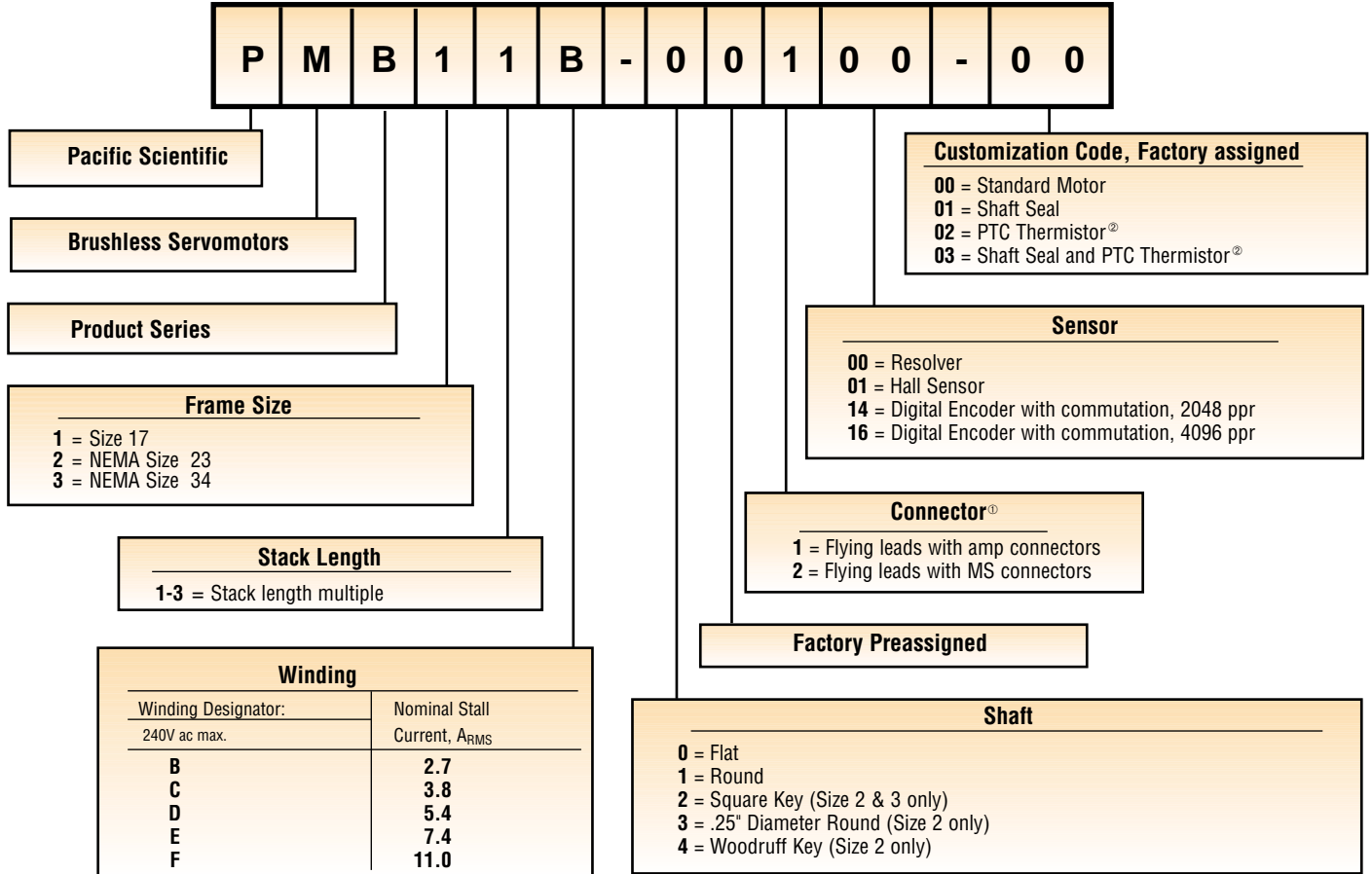
⑦ Motors with AC drives include resolver feedback inertia.

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

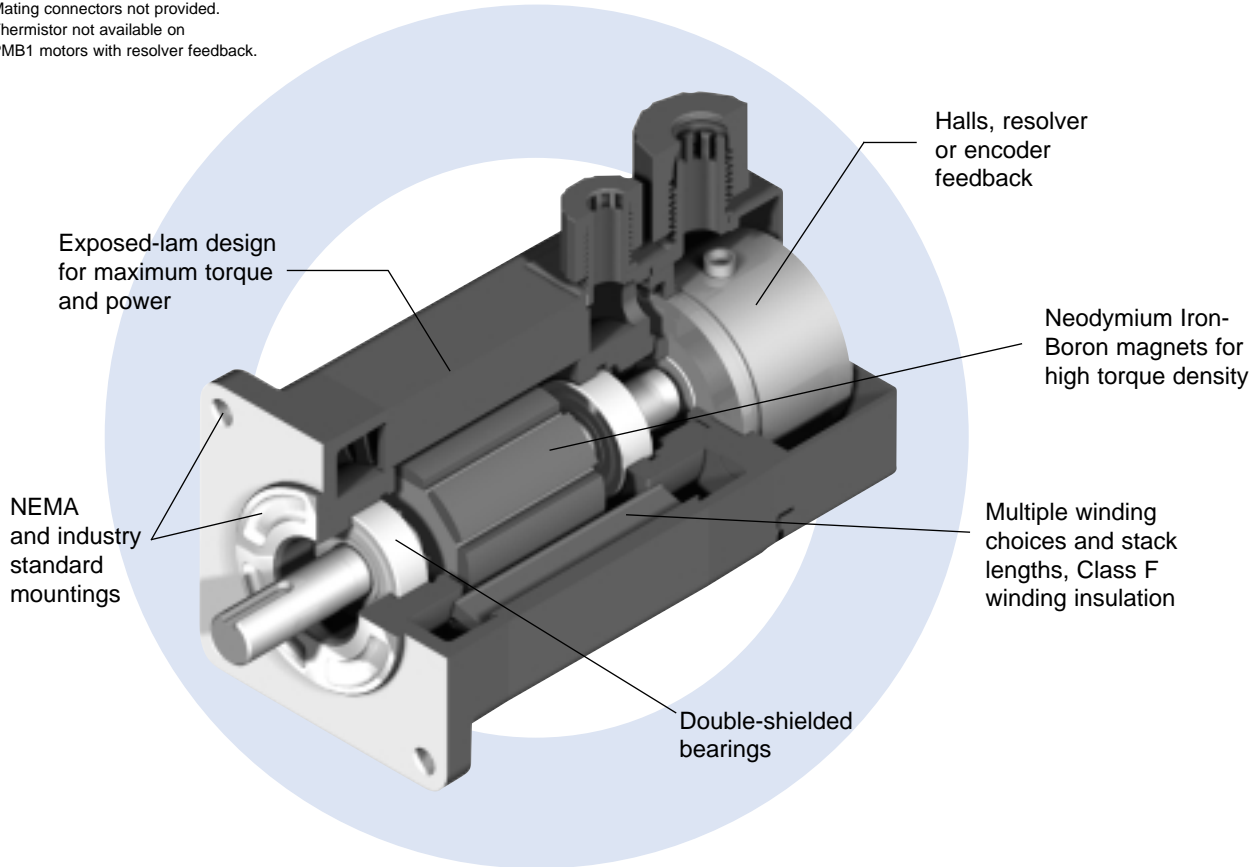
⑨ Characteristics shown with drive default parameters limited to 2.5x of the motor's continuous rating. Higher peak system performance available. Contact the factory.

# 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.

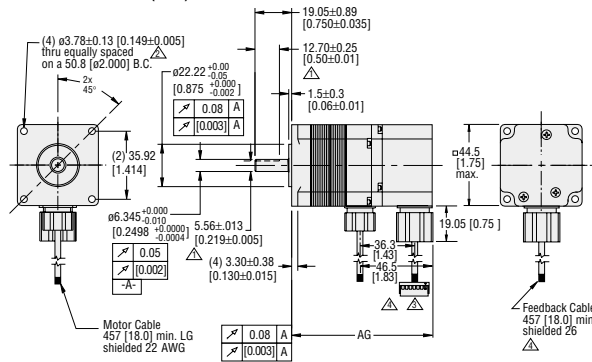


- NOTES:
- ① Mating connectors not provided.
  - ② Thermistor not available on PMB1 motors with resolver feedback.

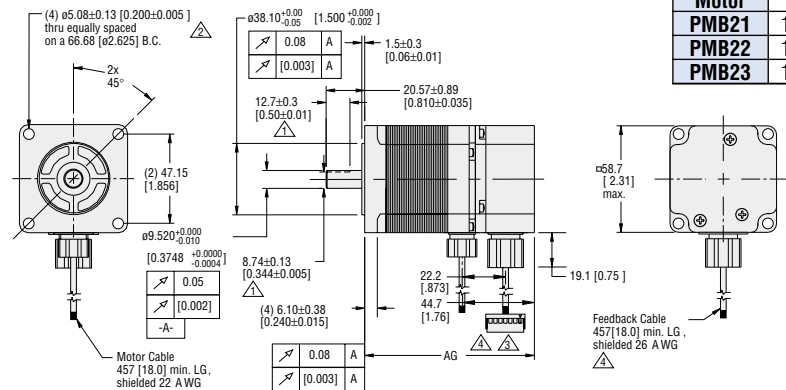


# PMB SERIES MOTORS

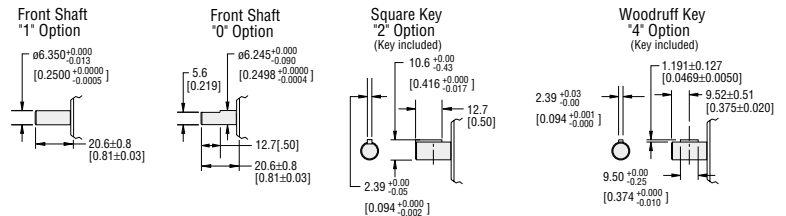
dimensions mm  
(in.)



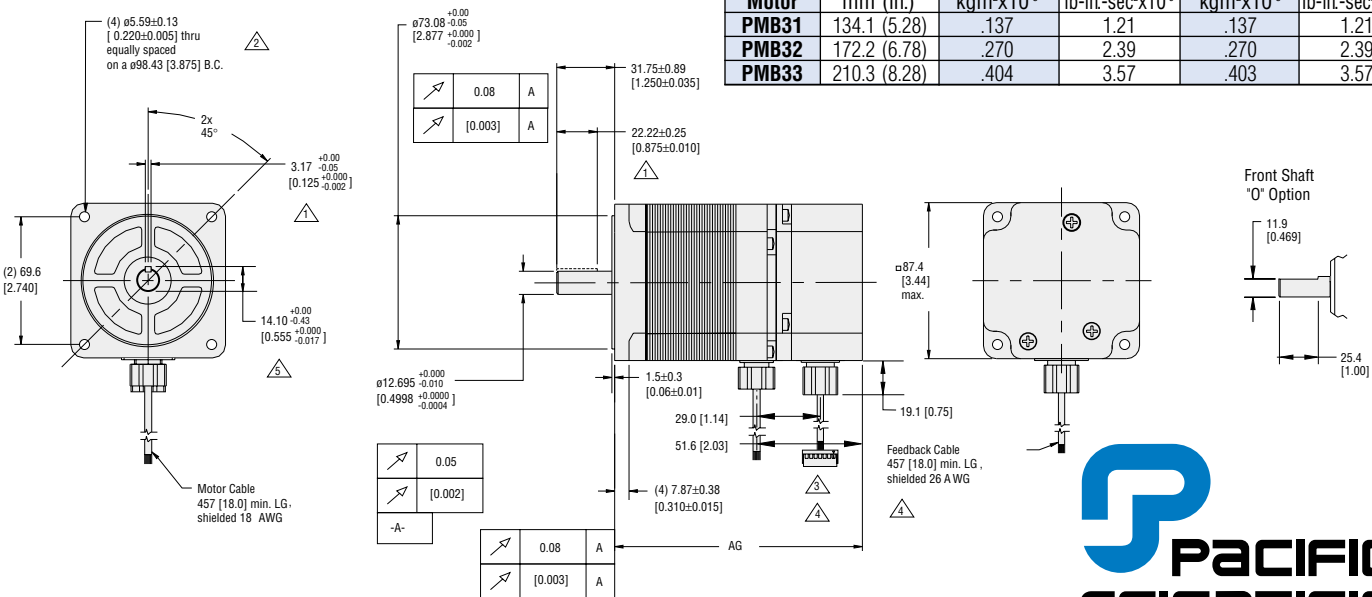
| Motor | Length<br>mm (in.) | Inertia - with resolver            |  | Inertia - with encoder             |  |
|-------|--------------------|------------------------------------|--|------------------------------------|--|
|       |                    | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> |
| 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<br>mm (in.) | Inertia - with resolver            |  | Inertia - with encoder             |  |
|-------|--------------------|------------------------------------|--|------------------------------------|--|
|       |                    | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> |
| 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<br>mm (in.) | Inertia - with resolver            |  | Inertia - with encoder             |  |
|-------|--------------------|------------------------------------|--|------------------------------------|--|
|       |                    | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> | kgm <sup>2</sup> x10 <sup>-3</sup> | lb-in-sec <sup>2</sup> x10 <sup>-3</sup> |
| 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:
- ⚠ "0" option (flat) shaft shown.
  - ⚠ Recommended mounting hardware: (4) fillister-lead or socket-lead cap screws – #6 for PMB1 & 2, #10 for PMB3.
  - ⚠ Option "1" includes an AMP® mini universal Mate-N-Lock connector for power and feedback.
  - ⚠ Cable minimum bend radius 57.2 mm (2.25 in.).
  - ⚠ "2" option (square key shown) for shaft.



HIGH PERFORMANCE MOTORS & DRIVES

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