



PACTORQ™ BRUSHLESS SERVOMOTORS

- Up to 2982 lb-ft. (4041 Nm) Peak, 1367 lb-ft. (1852 Nm) Continuous Torque
- Up to 384 HP at 1750 RPM
- Highest dynamic response, power density and efficiency in the industry
- NEMA 180, 210, 250, 280 and 320 frames, DPBV and TENV enclosures



AUTOMATION TECHNOLOGY GROUP

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PACTORQ™ BRUSHLESS SERVOMOTORS



Brushless Servomotors

Pacific Scientific has supplied high performance, tough and reliable brushless servomotors for customers worldwide for more than 15 years. The REGAL™ Series features standard and custom electrical and mechanical options to meet the most demanding torque, velocity and position control requirements.



REGAL Series

- Five frame sizes, from 2" to 7.5" (square frame)
- Low inertia rotors for fast start-stop performance
- Peak torques from 25 to 1757 lb-in., continuous stall torques from 14 to 451 lb-in.

The newer SENTRY™ Series extends the brushless servomotor offering and complements the REGAL Series of low inertia products by adding a medium inertia, high performance family.



SENTRY Series

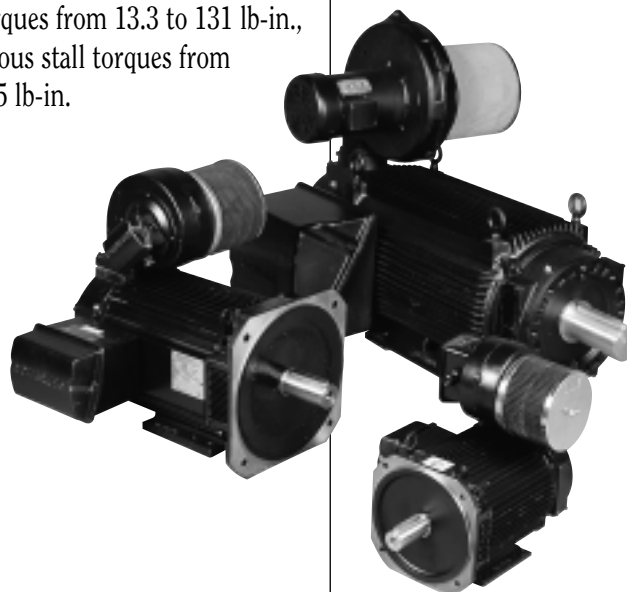
- NEMA 23 and 34 frame sizes
- High torque density per frame size
- Medium rotor inertia for improved load matching
- Peak torques from 13.3 to 131 lb-in., continuous stall torques from 4.3 to 45 lb-in.

PACTORQ Series

This new Series represents a very significant expansion of our high performance brushless servomotor capabilities. Optimized magnetic circuit designs result in extremely high torque in relatively small NEMA frame sizes. In addition to high power density, other key features are high dynamic response and high efficiency.

Rely on the PACTORQ Series for high continuous and peak torque servo performance, energy efficient savings and high power in smaller frames to minimize the size of your machines and equipment.

Discover PACTORQ in the pages that follow.



INDEX

How to use this selection guide

Select the proper motor using one of the following procedures:

- If you are already familiar with these motors and the available options, refer to the Model Number Codes on pages 5 (NEMA 180 diameter frames), 15 (NEMA 210 diameter frames), 25 (NEMA 250 diameter frames), 37 (NEMA 280 diameter frames) and 46 (NEMA 320 diameter frames) to verify the coded information prior to ordering.
- If you are not familiar with these motors and the available options, refer to the selection overview (page 3), the general specifications (page 4) and/or the index at the right. Note that each frame size is covered separately and the Technical Data applies to all motors. Construct a model number after all the technical parameters, including options, are determined.

PACTORQ Brushless Servomotors	Inside front cover
How to use this Selection Guide	1
Features & Benefits	2
Selection Overview	3
PACTORQ Product Features	4
E180 Diameter Frames	
Model Number Codes	.5
Ratings and Characteristics	.6
Dimensions	.7 - 9
Performance Curves	.10 - 12
Continuous Power Curves	.13
Efficiency Curves	.14
E210 Diameter Frames	
Model Number Codes	.15
Ratings and Characteristics	.16
Dimensions	.17 - 19
Performance Curves	.20 - 22
Continuous Power Curves	.23
Efficiency Curves	.24
E250 Diameter Frames	
Model Number Codes	.25
Ratings and Characteristics	.26
Dimensions	.27 - 30
Performance Curves	.31 - 34
Continuous Power Curves	.35
Efficiency Curves	.36
E280 Diameter Frames	
Model Number Codes	.37
Ratings and Characteristics	.38
Dimensions	.39 - 41
Performance Curves	.42, 43
Continuous Power Curves	.44
Efficiency Curves	.45
E320 Diameter Frames	
Model Number Codes	.46
Ratings and Characteristics	.47
Dimensions	.48 - 50
Performance Curves	.51 - 53
Continuous Power Curves	.54
Efficiency Curves	.55
Technical Data	
Terminations	.56 - 62
Feedback Devices	.63 - 66
Blower Motor Data (for DPBV Motors)	.67
Holding Brake	.68
Thermal Protection	.69
De-Rating	.70
Bearings and Shaft Loading	.71
Bearing Relubrication Intervals	.72
Sealing	.73
Selection Guide and Application Information	
Typical Applications	.74, 75
Motor Performance Curves	.76
Defining Load Parameters and Motion Profiles	.77, 78
Calculating Torques and Inertias	.79, 80
Mechanics of Motion - Sizing and Selection	.81 - 85
Glossary	86 - 88
Warranty	.89

FEATURES

Optimized magnetic design incorporating high energy Neodymium magnets provides many key benefits.

Brushless construction.

Long life bearings and bearing grease.

Patented, double finned aluminum frame.

Selection of industry standard enclosures with NEMA and Metric mounting options.

Rugged IGBT class "H" insulation system but rated for class "F" temperature rise.

Flexible design incorporates many options.

Agency approvals:
-UL Recognized, file 130709
-CSA Certification Pending
-CE (Conformity European), Pending

Two year warranty.

BENEFITS

Highest dynamic response. Servo motor performance— rapid start-stop capability to position loads fast... high peak torque ratings to move loads even faster. Quick speed changes for precise process control.

Highest power density. Extremely high torque in relatively small standard NEMA frame sizes to minimize the size of machines and equipment. Results in less weight too, compared to same power in other motor technologies.

Highest efficiency motor technology. Significant energy savings at both base speed and much lower than base speed.

Long, trouble-free life. Location flexibility—no brushes to maintain.

Long, maintenance-free operation.

Highest thermal efficiency and light weight.

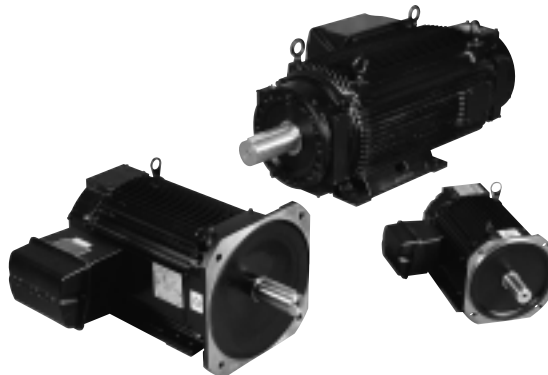
Satisfy broad end use requirements.

Additional assurance of motor integrity over broad temperature range. Longer life for reduced machine downtime.

Choices of mounting, terminations, feedback devices and holding brake to meet your application-specific requirements.

Easier recognition of machine or equipment.

Quality and reliability for reduced machine downtime.



SELECTION OVERVIEW

DRIPPROOF BLOWER VENTILATED (DPBV) MOTORS

NEMA Frame	Stack Length [△]	Continuous Stall Torque lb-ft (Nm)	Peak Torque [△] lb-ft (Nm)	Rated Current at 1750 RPM [△]	Rated Power at 1750 RPM [△]		Page
				Amps (rms)	HP	KW	
E180	2	41 (56)	164 (222)	14.8	12.8	9.6	6
	3	66 (90)	250 (339)	24.0	20.8	15.6	6
	4	86 (116)	335 (454)	31.5	26.9	20.2	6
E210	3	128 (192)	420 (569)	43.3	40.2	30.1	16
	5	160 (217)	554 (751)	54.7	49.2	36.9	16
	8	190 (258)	720 (976)	63.6	57.0	42.7	16
E250	4	254 (344)	462 (626)	86	76	57.0	26
	6	280 (379)	558 (756)	92	81	60.8	26
	8	356 (482)	775 (1050)	123	102	76.5	26
	9	475 (644)	945 (1280)	156	138	103.5	26
E280	A	531 (720)	1250 (1694)	166	153	114.7	38
	C	722 (978)	1670 (2263)	252	205	153.7	38
E320	8	900 (1220)	1955 (2649)	286	263	197.3	47
	B	1089 (1476)	2276 (3084)	357	315	236.2	47
	D	1367 (1852)	2982 (4041)	435	384	288.0	47

TOTALLY ENCLOSED, NON-VENTILATED (TENV) MOTORS

NEMA Frame	Stack Length [△]	Continuous Stall Torque lb-ft (Nm)	Peak Torque [△] lb-ft (Nm)	Rated Current at 1750 RPM [△]	Rated Power at 1750 RPM [△]		Page
				Amps (rms)	HP	KW	
E180	2	16 (22)	164 (222)	3.6	3.0	2.2	6
	3	29 (39)	250 (339)	8.2	6.8	5.1	6
	4	38 (51)	335 (454)	10.3	8.4	6.3	6
E210	3	64 (87)	420 (569)	17.4	15.7	11.7	16
	5	81 (110)	554 (751)	20.9	18.2	13.6	16
	8	100 (136)	720 (976)	23.0	19.9	14.9	16
E250	4	139 (189)	462 (626)	35.0	30.2	22.6	26
	6	173 (235)	558 (756)	42.6	36.9	27.6	26
	8	211 (286)	775 (1050)	-	-	-	26
	9	245 (332)	945 (1280)	-	-	-	26
E280	A	275 (373)	1250 (1694)	-	-	-	38
	C	374 (507)	1670 (2263)	-	-	-	38
E320	8	440 (597)	1955 (2649)	-	-	-	47
	B	530 (719)	2276 (3084)	-	-	-	47
	D	680 (923)	2982 (4041)	-	-	-	47

Note:

[△] See Model Number Code in section starting on page referenced in table.

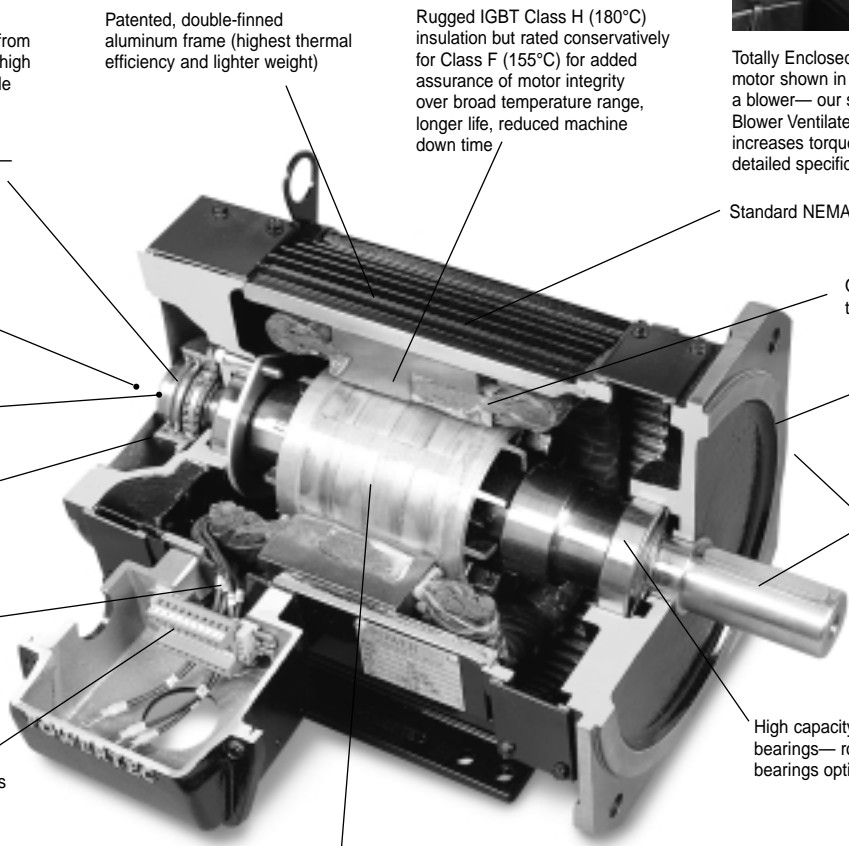
[△] For ratings at other base speeds, see Ratings and Characteristics in section starting on page referenced in table.

[△] Theoretical (cold). Also see individual torque speed curves for performance at rated temperature.

FACTORQ PRODUCT FEATURES



Totally Enclosed, Non-Ventilated (TENV) motor shown in cutaway. The addition of a blower—our standard Dripproof Blower Ventilated (DPBV) motor significantly increases torque and HP ratings. See detailed specifications



Standard top speeds from 3000 to 6000 RPM—high speed options available

Patented, double-finned aluminum frame (highest thermal efficiency and lighter weight)

Rugged IGBT Class H (180°C) insulation but rated conservatively for Class F (155°C) for added assurance of motor integrity over broad temperature range, longer life, reduced machine down time

Primary feedback devices—Hall sensors or resolver

Standard NEMA frames

Optional secondary feedback device—factory mounted optical encoder or encoder mounting provisions on rear end bell

Overtemperature protection—thermostat or thermistor

Optional integral (rear mounted) holding brake

NEMA or Metric mounting

Rugged TENV construction, sealed per IP44 and IP56

Custom shafts and mounting available

Stator connection flexibility—four separate connections provide four different power and speed ratings

Termination versatility—to terminal block in oversized terminal box or MS connectors

High capacity ball bearings—roller bearings optional

Long maintenance-free brushless construction—no harmonically induced bearing pitting... no brushes to replace provides location flexibility

Optimized magnetic design using neodymium rare earth magnets provides:

Two year warranty

- High torque to rotor inertia ratios for highest dynamic response. Servo motor performance—rapid start-stop capability to position loads fast... high peak torque ratings to move loads even faster. Quick speed changes for precise process control
- Highest power density—very high torque in smaller NEMA frames to minimize size of machine... less weight than other motor technologies
- Highest efficiency motor technology—significant energy savings at both base speed and much lower

Linear torque-current characteristics—predictable performance



* Pending

PRIMARY FEEDBACK OPTIONS

- Hall Sensors (with dual channel in quadrature outputs)
- Integral, through shaft frameless resolver

SECONDARY FEEDBACK OPTIONS

- 600, and 1024 - line driver encoder

OTHER OPTIONS

- 100V dc brakes
- Encoder feedback mounting kit
- Max capacity ball bearings & roller bearings
- Wide variety of windings to match torque and speed requirements
- Wide selection of termination options
- Custom mounting and shaft extensions

GENERAL SPECIFICATIONS

Number of poles	6 (E180 & 210), 8 (E250, E280, & E320)
Winding	3 phase Wye or Delta (12 lead reconnectable)
Magnet type	Neodymium Iron Boron
Enclosures	TENV (IP44, IP56), DPBV standard
Mounting	NEMA C & D face, foot mounting, IEC D square flange
Terminations	High-capacity (oversized) Terminal Box: F1, F2, or top mounting; MS feedback connector with power terminal block; MS power and feedback connectors
Thermal Protection	Thermal switch with Hall Sensor Feedback, NTC Thermistor with Resolver