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TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

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with experienced engineers and technicians on staff.

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along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

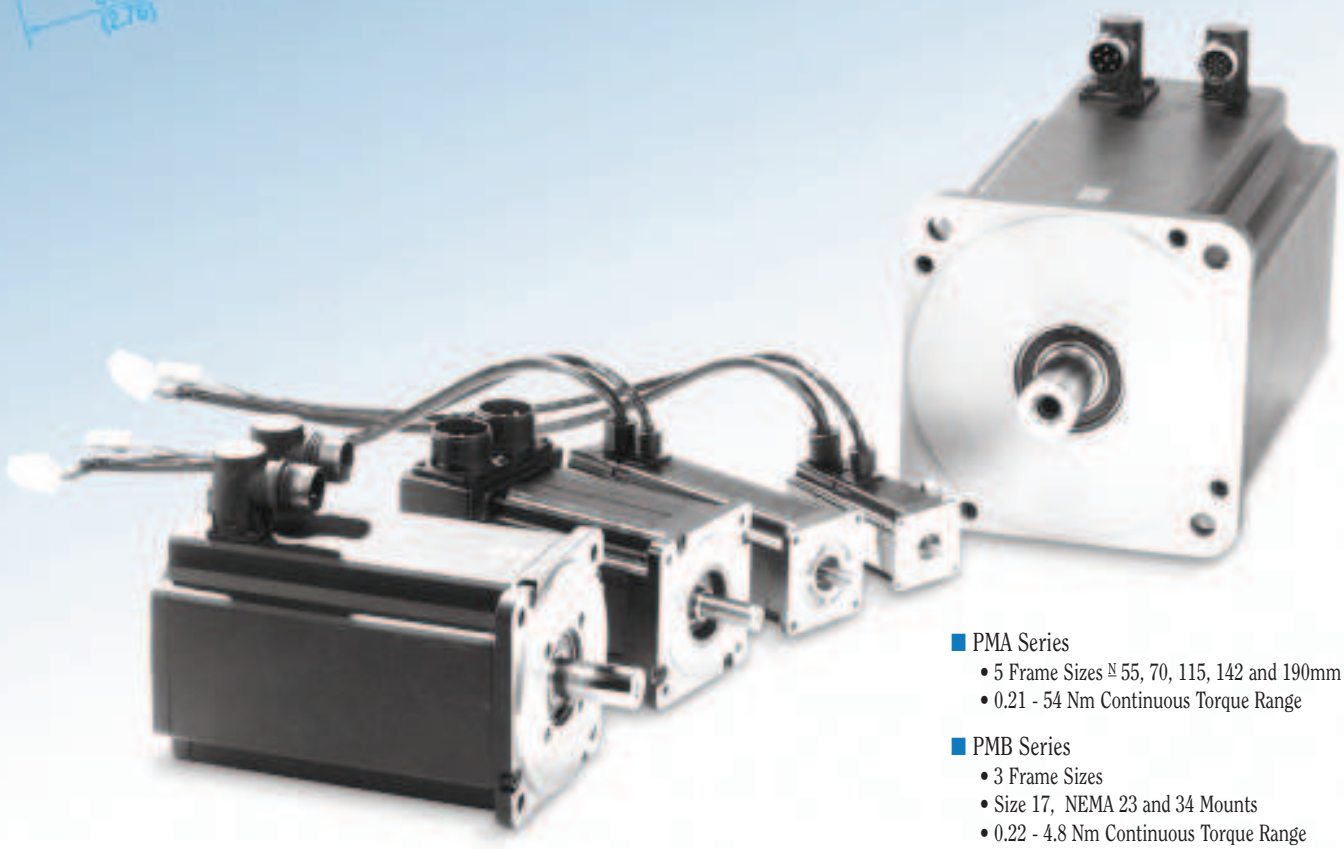
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Find the *Kollmorgen / Pacific Scientific R32GENC-R2-NS-VS-00* at our website: *Click HERE*

HIGH PERFORMANCE SERVO MOTORS



- **PMA Series**
  - 5 Frame Sizes № 55, 70, 115, 142 and 190mm Square
  - 0.21 - 54 Nm Continuous Torque Range
- **PMB Series**
  - 3 Frame Sizes
  - Size 17, NEMA 23 and 34 Mounts
  - 0.22 - 4.8 Nm Continuous Torque Range
- **S Series**
  - 2 Frame Sizes
  - Available in NEMA 23 and 34 Mounts
  - 0.5 - 6.6 Nm Continuous Torque Range
- **R Series**
  - 5 Frame Sizes № 2, 3.25, 4.25, 5.75 and 7.5 Inches Square
  - Explosion Proof Models Available
  - 0.32 - 50 Nm Continuous Torque Range

PACIFIC SCIENTIFIC

HIGH PERFORMANCE MOTORS & DRIVES

March, 2001

ISO 9001

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PACIFIC SCIENTIFIC BRUSHLESS SERVO MOTORS



A Full Spectrum of Powerful Brushless Servomotors

Pacific Scientific servomotors are built for long, maintenance-free service life. Once installed, you probably won't have to look at them



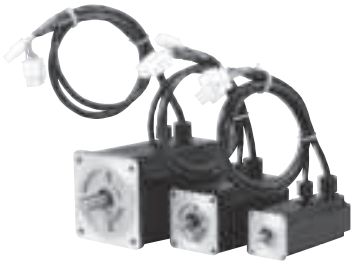
again. The motors in the following pages feature Neodymium-iron-boron or Samarium cobalt magnets for the highest torque-to-inertia ratios possible. Anti-cog stator designs deliver smooth low-speed performance.

PMA Series

The PMA Series of brushless servomotors delivers a comprehensive line of rugged, cost-effective servomotors. Covering frame sizes from 55mm square to 190mm square and a continuous rated torque range of 0.21 to 54 Nm, these motors offer an economic means to satisfy the requirements of your application. Standard IP65 sealing and the availability of IP67 washdown duty as an option on selected models allows the PMA Series to stand up to the rigors of the factory floor. Global certifications and input voltages on most models to 650 volts assure your machine's acceptance worldwide.

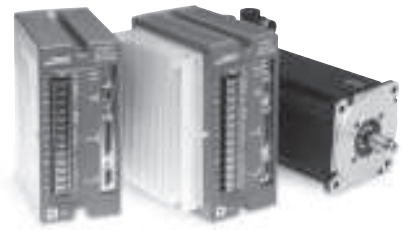
PMB Series

The PMB Series of brushless servomotors introduces an IP40 construction motor in three frames; size 17 and NEMA 23 & 34 to address your need for a high-performance motor in higher-volume applications. With a continuous rated torque range from 0.22 to 4.8 Nm, the cost-effective PMB motors complement our full line of servos.



S Series

The S Series brushless servomotors offer continuous torques from 0.5 to 6.6 Nm. Available in two frame sizes with both metric and NEMA 23 & 34 mounting faces, these compact motors squeeze a lot of torque into a small package.



R Series

R Series servomotors offer the highest torque-to-inertia ratios in the industry. Engineered for the highest dynamic response available, these motors come in five frame sizes – both NEMA and metric mountings. The R Series covers a continuous rated torque range from 0.32 to 50 Nm.

Pacific Scientific Digital Brushless Servo Drives – Harness the Power

When these motors are combined with Pacific Scientific's broad offering of digital brushless servo drives, they offer a cost-effective, high-performance solution that's tough to beat. The systems package motors shown on pages 5 to 9 are only the tip of the iceberg. All of the brushless servomotors are customizable — often with minimal impact on delivery times. From feedback options to application-specific windings, we can help with your servo needs.

Pacific Scientific's SC/SCE900 series brushless servo drives continue to be the flagship of our servo drives. No other brushless servo drive offers higher performance. No other drive offers broader functionality.

The PC800 family of brushless servo drives offers a cost-effective, small drive with the best lead time in the industry.

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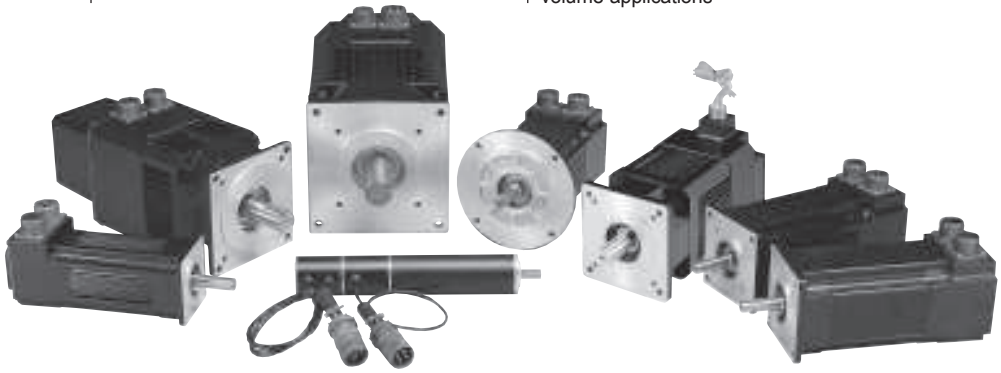
BRUSHLESS SERVO MOTORS FEATURES & BENEFITS

The PC3400 Series of brushless servo drives brings to you a family of cost-effective, easy-to-use, intelligent servos from the leaders in service and performance.

Smart technology. Motion simplified.

These systems are a prime example of Pacific Scientific's commitment to offer you smart technology —— the highest-performance products available, customized to suit your applications, and backed by unmatched customer support and quality. We want to help make your job easier. For more information, contact our Customer Response Center at (815) 226-3100, or visit our website at www.pacsci.com.

FEATURES	BENEFITS
PMA/S/R Series Motors	
Rugged Brushless Construction	Eliminates brush replacement maintenance Stands up to the rigors of the factory floor
High torque over wide speed range	Improved machine throughput
Anti-cog motor design	Smooth low-speed operation
IP65 TENV construction standard	Withstands rigorous environments
Two year warranty	Quality and reliability for reduced machine downtime
Class H insulation	Longer life for reduced machine downtime
Overtemperature thermistor	Protection against motor damage
Global approvals and agency recognition	Eases recognition process for a machine
Multiple feedback options	Allows numerous control methods
Brake option	Improved machine safety
PMA/S Series Motors	
IP67 protection on selected PMA models	Withstands washdown
Neodymium-iron-boron magnets	Maximum performance, maximum value
High quality Interconnectron connectors	Faster installation and maintenance
High voltage models available	Improved application flexibility
S/R Series Motors	
NEMA mounting available	Improved application flexibility
Steel bearing inserts	Longer life for reduced machine downtime
R Series Motors	
High torque-to-inertia ratios	Fast acceleration, improved dynamic response
PMB Series Motors	
MS or AMP mini Mate-N-Lock® connector options	Improved application flexibility
IP40 Construction	Improved cost-effectiveness for higher volume applications



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SELECTION OVERVIEW

			Typical Maximum Continuous Rated Torque (Nm) and Speed (rpm)		
			Torque Range	Speed Range	Page
48V dc bus Brushless Servomotors	PMB	PMB1	0.22 - 0.50	700 - 6,450	17
		PMB2	0.61 - 1.10	600 - 1,300	18

			Typical Maximum Continuous Rated Torque (Nm) and Speed (rpm)		
			Torque Range	Speed Range	Page
240V ac, 320V dc bus Brushless Servomotors	PMA	PMA1	0.21 - 0.60	7,000 - 9,000	11
		PMA2	0.50 - 2.2	3,000 - 6,450	12
		PMA4	3.4 - 9.9	600 - 4,700	13
		PMA5	8.8 - 20.5	900 - 3,450	14
		PMA6	24.5 - 48.5	950 - 1,750	15
	PMB	PMB1	0.14	11,000	17
		PMB2	0.45 - 1.40	4,400 - 10,000	18
		PMB3	1.62 - 4.84	1,300 - 6,000	19
	S Series	S20	0.32 - 1.5	3,400 - 12,500	21
		S30	1.9 - 6.4	1,300 - 3,900	22
	R Series	R20	0.17 - 1.0	3,000 - 11,000	24
		R30	0.76 - 3.7	1,700 - 7,000	26
		R40	3.6 - 7.3	1,500 - 5,300	27
		R60	4.4 - 17.6	1,400 - 6,000	28
		R80	10.1 - 48.6	1,200 - 4,000	29
	R Series Explosion Proof	R30P	0.62 - 3.0	1,900 - 7,000	30
		R60P	3.6 - 14.4	1,500 - 6,000	31

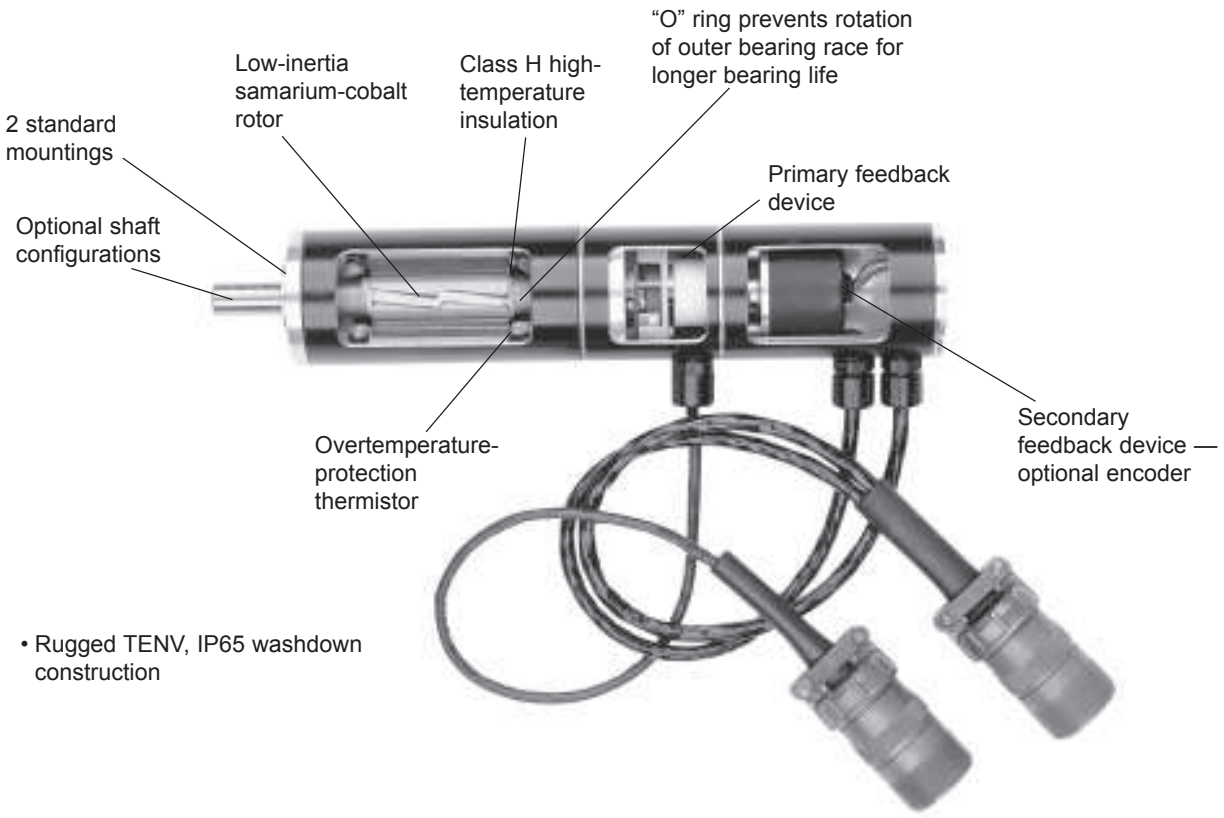
			Typical Maximum Continuous Rated Torque (Nm) and Speed (rpm)		
			Torque Range	Speed Range	Page
400V ac, 560V dc bus Brushless Servomotors	PMA	PMA4	3.0 - 9.5	1,600 - 6,000	13
		PMA5	7.2 - 19.0	1,900 - 4,200	14
		PMA6	19.0 - 43.8	1,350 - 3,300	15
	S Series	S30	4.0 - 4.3	3,000	22

			Typical Maximum Continuous Rated Torque (Nm) and Speed (rpm)		
			Torque Range	Speed Range	Page
480V ac, 640V dc bus Brushless Servomotors	PMA	PMA4	2.6 - 9.3	2,100 - 6,800	13
		PMA5	6.8 - 18.6	2,200 - 4,750	14
		PMA6	17.5 - 42.2	1,600 - 3,800	15
	S Series	S30	3.6 - 3.9	3,600 - 3,900	22

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R20 SERIES
2" OD ROUND -FRAME MOTOR

HIGH DYNAMIC RESPONSE OVER A WIDE SPEED RANGE — IN A COMPACT PACKAGE



- Rugged TENV, IP65 washdown construction

MODEL NUMBER CODE. . .R20 Series

To construct a motor listing, select the combination of features required and put all the coded information in the proper sequence. Please account for all entries. Include the factory-preassigned "N" and "A" as noted.
The model number shown is an example of a properly specified motor.

R 2 1 G E N A — H S — L B — N V — 0 1

Motor Series
R 2 1
R 2 2
R 2 3
R 2 4

Winding
G
H

Shaft and mounting
E = English
N = NEMA 23
M = Metric

Factory preassigned

Magnet type
R = Rare earth (samarium cobalt)

Motor OD to nearest inch

Magnet stack length to nearest inch

Primary feedback
HS = Hall sensors
NP = No primary
RI = Frameless resolver, transmitter type, size 15

Secondary feedback
LB = Encoder, 1000 ppr. line driver output
LC = Encoder, 1024 ppr. line driver output
NS = No secondary

Shaft sealing
NV = No shaft seal
VS = Viton shaft seal

Sequence number
00 = Optional 18" flying leads
01 = Standard free standing MS connectors on end of flying leads
11 = Rear mounted MS connector

R-SERIES

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R20 SERIES MOTOR — 2" OD (round frame)



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- 240V ac, 320V dc bus maximum operation
- Anti-cog stator design
- MS-type connectors on 18" leads
- Rated speeds to 11,000 RPM

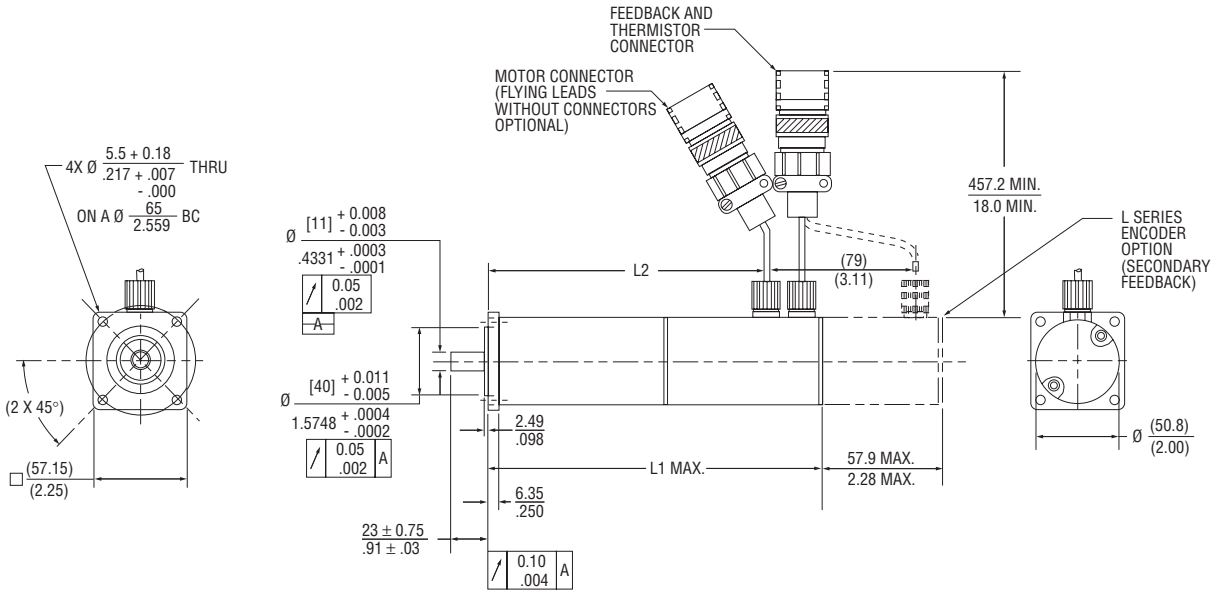
The R20 Series of round brushless servomotors covers a continuous torque range from 0.3 to 1.1 Nm. These compact motors are well-suited for speed and position control applications that require high acceleration and torque in a compact package.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R21		R22		R23		R24	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	0.3 (2.7)		0.6 (5.3)		0.9 (8.0)		1.1 (9.7)	
Peak torque④	T_{PK}	Nm (lb.-in.)	0.88 (7.8)		1.62 (14.3)		2.54 (22.5)		3.07 (27.2)	
Inertia③	J_M	kgm^2x10^{-3} ($lb.-in.-sec^2x10^{-3}$)	0.01 (0.09)		.014 (.12)		.018 (0.16)		0.021 (.19)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.01 (0.10)		0.02 (0.17)		0.03 (0.24)		0.04 (0.31)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.003 (0.03)		0.005 (0.04)		0.006 (0.05)		0.008 (0.07)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	1.65		1.43		1.27		1.27	
Thermal time constant	τ_{TH}	min.	8.0		12.0		15.0		17.0	
Weight (motor only)	W	kg (lbs.)	0.68 (1.5)		0.95 (2.1)		1.3 (2.8)		1.5 (3.4)	
WINDING DATA			**G**	**H**	**G**	**H**	**G**	**H**	**G**	**H**
Torque constant (RMS)②	K_T	Nm/A_{RMS} ($lb.-in./A_{RMS}$)	0.4 (3.5)	0.2 (1.8)	0.4 (3.5)	0.2 (1.8)	0.6 (5.3)	0.3 (2.7)	0.7 (6.2)	0.4 (0.24)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.24 (25.1)	0.12 (12.6)	0.24 (25.1)	0.12 (12.6)	0.36 (37.7)	0.18 (18.8)	0.43 (45.0)	3.5 (25.1)
Continuous stall current①	I_{CS}	A_{RMS}	0.7	1.5	1.4	2.7	1.5	3.0	1.1	1.1
Current at peak torque④	I_{PK}	A_{RMS}	2.1	4.5	4.2	8.1	4.5	9.0	4.5	9.0
Resistance (line-to-line)	R_C	Ohms	62.0	16.0	22.0	5.4	20.0	4.9	22.0	5.5
Inductance (line-to-line)	L	mH	47.0	12.0	21.0	5.3	26.0	6.5	26.0	6.5
Typical Rated Speed @ 240V ac, 320V dc bus	W_R	RPM	4,000	11,000	5,300	8,000	3,800	8,000	3,000	7,700
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	0.31 (2.7)	0.17 (1.5)	0.47 (4.2)	0.29 (2.6)	0.80 (7.1)	0.61 (5.4)	1.03 (9.1)	0.79 (7.0)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 10" x 10" x 1/4" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 10" x 10" x 1/4" aluminum heat sink.

Motor	R21	R22	R23	R24
L1 Max	162.1 (6.38)	187.5 (7.38)	212.9 (8.38)	238.3 (9.38)
L2	125.2 (4.93)	150.6 (5.93)	176.0 (6.93)	201.4 (7.93)

mm (in.)

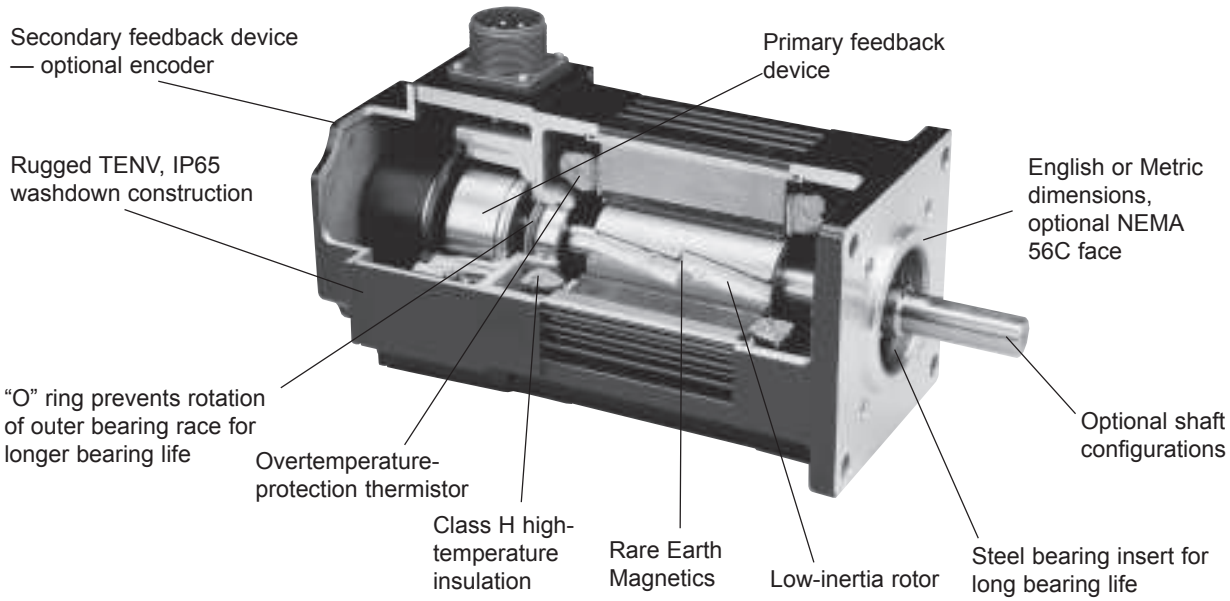
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R SERIES

3.25," 4.25," 5.75," AND 7.5" SQUARE FRAME MOTORS

All motors are UL Recognized (Files E103510 and E61960)

HIGH TORQUE-TO-INERTIA FOR UNMATCHED PERFORMANCE



MODEL NUMBER CODE. . .R30/R40/R60/R80 Series

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

R 4 3 G E N A — H S — N D — N V — 0 0

Motor Series

R 3 2	R 6 3
R 3 3	R 6 5
R 3 4	R 6 7
R 3 5	R 8 4
R 4 3	R 8 6
R 4 5	R 8 8
R 4 6	R 8 A

Winding
G
H
J*
K*
*R34 and R35 only

Sequence number
Insert 00 if all parts are standard. Factory-assigned if any parts are custom

Shaft sealing
NV = No shaft seal
VS = Viton shaft seal

Magnet type
R = Rare earth (samarium cobalt)

Shaft and mounting
E = English
M = Metric
C = NEMA Face, R40 series only

Secondary feedback
ND = Encoder, 500 ppr, line driver output
NF = Encoder, 1000 ppr, line driver output
NG = Encoder, 1024 ppr, line driver output
NS = No secondary

Motor width to nearest inch

Holding brake option
N = No brake
A = 24V dc brake
B = 100V dc brake

Primary feedback
HS = Hall sensors
NP = No primary
R2 = Frameless resolver, transmitter type, size 21
TS = Tachsyn

Magnet stack length to nearest inch
A = 10"

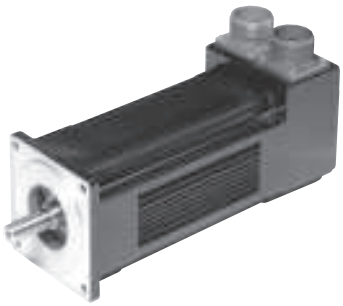
C = R30 series only
P = R30 & R60 explosion proof series only
A = All other series

R-SERIES

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R30 SERIES MOTOR — 3.25" width/height (square frame)

All motors are UL Recognized (Files E103510 and E61960)



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- Rated speeds to 7,000 RPM

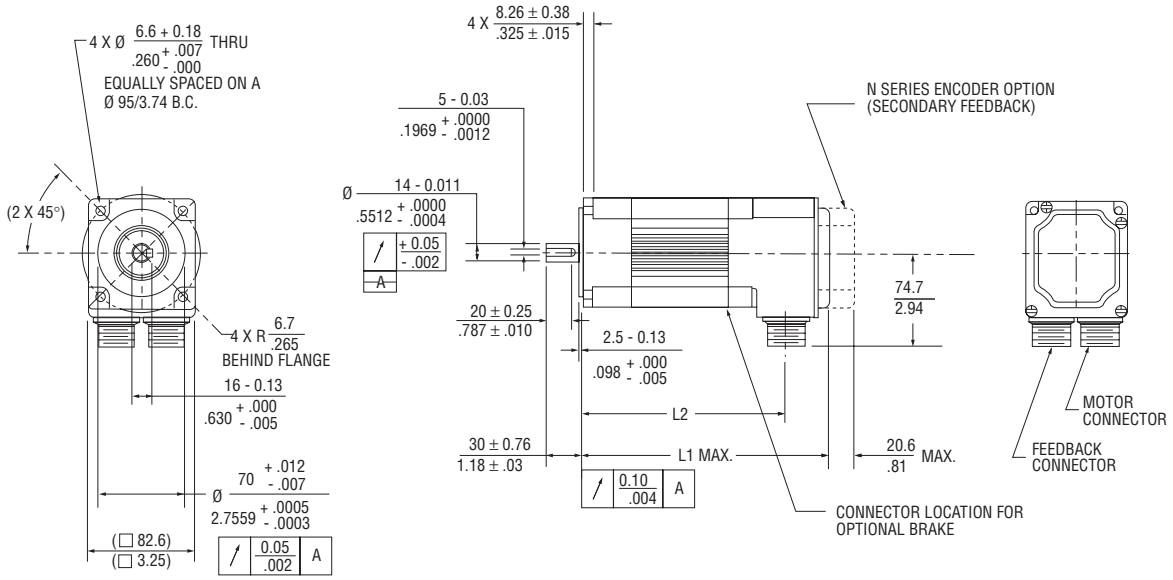
The R30 Series motors cover a continuous torque range from 1.7 to 3.8 Nm. These compact motors are well-suited for speed and position control applications that require maximum performance in minimum space.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R32		R33		R34		R35	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	1.7 (15.0)		2.5 (22.1)		3.2 (28.3)		3.8 (33.6)	
Peak torque ④	T_{PK}	Nm (lb.-in.)	4.40 (39.0)		6.54 (57.9)		8.30 (73.5)		10.1 (89.4)	
Inertia③	J_M	kgm^2x10^{-3} (lb.-in.-sec^2x10^{-3})	.071 (.63)		0.093 (.82)		0.11 (1.00)		.13 (1.19)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.03 (0.23)		0.04 (0.31)		0.04 (0.39)		0.05 (0.47)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.005 (0.04)		0.007 (0.06)		0.01 (0.09)		0.012 (0.11)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.93		0.84		0.76		0.70	
Thermal time constant	τ_{TH}	min.	20.0		23.0		26.0		29.0	
Weight (motor only)	W	kg (lbs.)	2.5 (5.5)		3.2 (7.1)		3.9 (8.7)		4.6 (10.2)	
WINDING DATA			**G**	**H**	**G**	**H**	**J**	**K**	**J**	**K**
Torque constant (RMS)②	K_T	Nm/A_{RMS} (lb.-in./A_{RMS})	0.6 (5.3)	0.3 (2.7)	0.8 (7.1)	0.4 (3.5)	1.1 (9.7)	0.5 (4.4)	1.3 (11.5)	0.6 (5.3)
Voltage constant (RMS) ②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.36 (37.7)	0.18 (18.8)	0.49 (51.3)	0.24 (25.1)	0.67 (70.2)	0.3 (31.4)	0.79 (82.7)	0.36 (37.7)
Continuous stall current①	I_{CS}	A_{RMS}	2.9	5.8	3.2	6.4	3.0	6.1	2.9	6.0
Current at peak torque④	I_{PK}	A_{RMS}	8.7	17.4	9.6	19.2	9.0	18.3	8.7	18.0
Resistance (line-to-line)	R_C	Ohms	7.3	1.8	6.9	1.7	8.1	2.0	9.2	2.3
Inductance (line-to-line)	L	mH	23.0	5.8	22.0	5.6	30.0	7.5	42.0	10.5
Typical Rated Speed @ 240V ac, 320V dc bus	W_R	RPM	4,000	7,000	3,000	6,000	2,300	4,000	1,700	4,200
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	1.2 (10.5)	0.76 (6.7)	1.9 (16.6)	1.2 (10.7)	2.9 (25.3)	1.9 (17.2)	3.7 (32.5)	2.4 (21.6)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 10" x 10" x 1/4" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 10" x 10" x 1/4" aluminum heat sink.

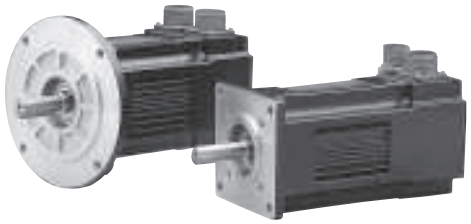
Motor	R32	R33	R34	R35
L1 Max	180.1 (7.09)	205.5 (8.09)	230.9 (9.09)	256.3 (10.09)
L2	142.7 (5.62)	168.1 (6.62)	193.5 (7.62)	218.9 (8.62)

mm (in.)

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R40 SERIES MOTOR — 4.25" width/height (square frame)

All motors are UL Recognized (Files E103510 and E61960)



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- Rated speeds to 5,300 RPM

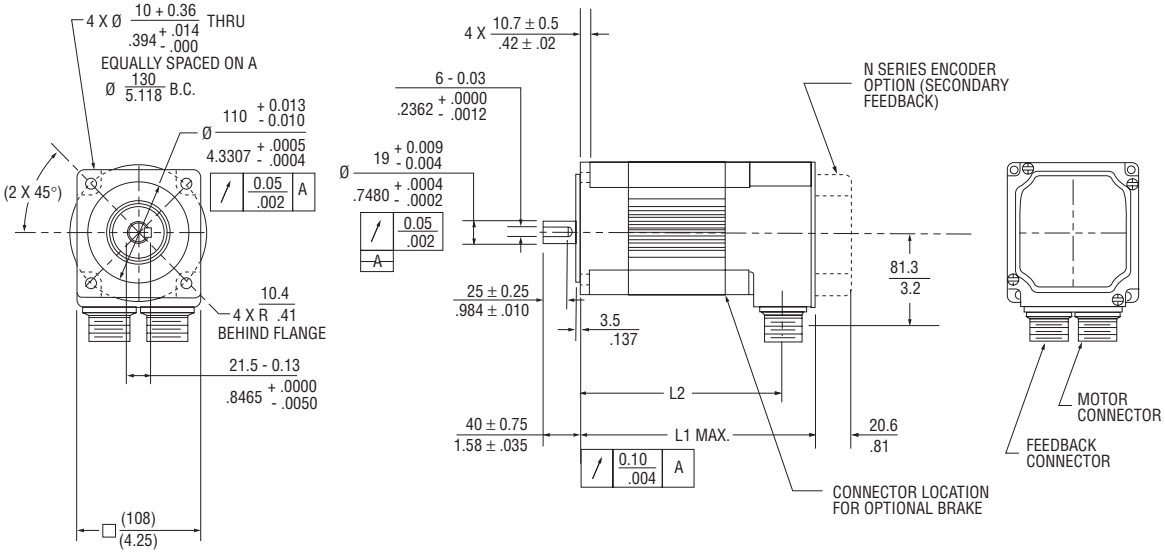
The R40 Series motors cover a continuous torque range from 3.9 to 7.6 Nm. These motors are characterized by smooth operation at low speeds, rapid acceleration and deceleration, and high torque production throughout a wide speed range.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R43		R45		R46	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	3.9 (34.5)		5.7 (50.4)		7.6 (67.3)	
Peak torque ④	T_{PK}	Nm (lb.-in.)	10.4 (92.1)		15.1 (134)		20.2 (179)	
Inertia③	J_M	kgm^2x10^{-3} ($lb.-in.-sec^2x10^{-3}$)	.22 (1.98)		.31 (2.78)		.40 (3.58)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.03 (0.26)		0.04 (0.33)		0.04 (0.39)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.011 (0.10)		0.016 (0.14)		0.019 (0.17)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.72		0.61		0.52	
Thermal time constant	τ_{TH}	min.	19.0		29.0		35.0	
Weight (motor only)	W	kg (lbs.)	6.8 (15.0)		9.1 (20.0)		11.3 (25.0)	
WINDING DATA			**G**	**H**	**G**	**H**	**G**	**H**
Torque constant (RMS)②	K_T	Nm/A_{RMS} ($lb.-in./A_{RMS}$)	1.3 (11.5)	0.7 (6.2)	1.0 (8.9)	0.5 (4.4)	1.4 (12.4)	0.7 (6.2)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.79 (82.7)	0.43 (45.0)	0.61 (63.9)	0.30 (31.4)	0.85 (89.0)	0.43 (45.0)
Continuous stall current①	I_{CS}	A_{RMS}	2.9	5.6	5.5	10.9	5.5	11.0
Current at peak torque④	I_{PK}	A_{RMS}	8.7	16.8	16.5	32.7	16.5	33.0
Resistance (line-to-line)	R_C	Ohms	10.0	2.5	3.2	0.81	3.7	0.93
Inductance (line-to-line)	L	mH	53.0	13.3	20.0	4.9	25.0	6.2
Typical Rated Speed @ 240V ac, 320V dc bus	W_R	RPM	1,500	3,700	2,400	5,300	1,700	4,000
Typical Rated Torque @240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	3.9 (34.6)	3.6 (31.7)	5.5 (48.5)	4.7 (41.9)	7.3 (64.6)	5.7 (50.3)

Metric Mount Shown — also available in NEMA and English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 10" x 10" x 1/4" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 10" x 10" x 1/4" aluminum heat sink.

Motor	R43	R45	R46
L1 Max	213.4 (8.4)	251.5 (9.9)	289.6 (11.4)
L2	178.1 (7.01)	216.2 (8.51)	254.3 (10.01)

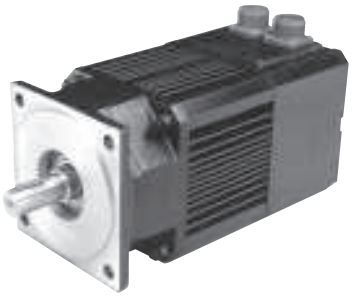
mm (in.)

R-SERIES

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R60 SERIES MOTOR — 5.75" width/height (square frame)

All motors are UL Recognized (Files E103510 and E61960)



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- Rated speeds to 6,000 RPM

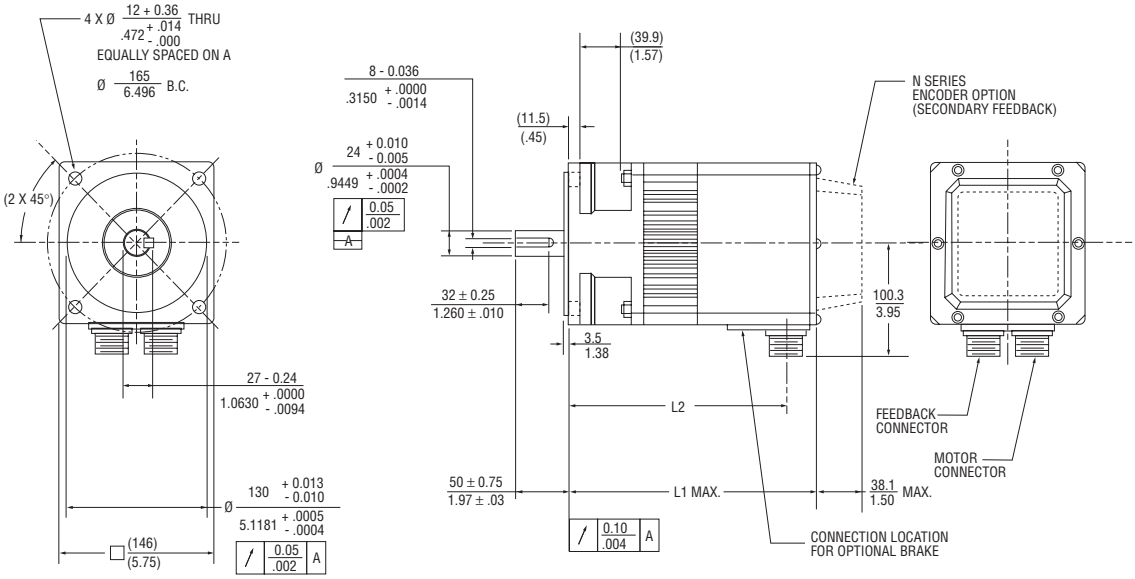
The R60 Series motors cover a continuous torque range from 8.3 to 19.9 Nm. Built for heavy duty applications, these motors deliver excellent torque, speed and/or velocity control.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R63		R65		R67	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	8.3 (73.5)		13.6 (120)		19.9 (176)	
Peak torque④	T_{PK}	Nm (lb.-in.)	20.5 (181)		33.3 (295)		48.9 (433)	
Inertia③	J_M	kgm^2x10^{-3} ($lb.-in.-sec^2x10^{-3}$)	.81 (7.2)		1.26 (11.2)		1.72 (15.2)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.16 (1.4)		0.26 (2.3)		0.36 (3.2)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.046 (0.41)		0.075 (0.66)		0.104 (0.92)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.51		0.42		0.30	
Thermal time constant	τ_{TH}	min.	19.0		36.0		72.0	
Weight (motor only)	W	kg (lbs.)	13.0 (29.0)		18.0 (39.0)		22.0 (49.0)	
WINDING DATA			**G**	**H**	**G**	**H**	**G**	**H**
Torque constant (RMS)②	K_T	Nm/A_{RMS} ($lb.-in./A_{RMS}$)	0.8 (7.1)	0.4 (3.5)	1.3 (11.5)	0.6 (5.3)	1.8 (15.9)	0.9 (8.0)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.49 (51.3)	0.24 (25.1)	0.79 (82.7)	0.36 (37.7)	1.09 (114)	0.55 (57.6)
Continuous stall current①	I_{CS}	A_{RMS}	11.0	22.0	10.7	21.4	11.3	22.5
Current at peak torque④	I_{PK}	A_{RMS}	33.0	66.0	32.1	64.2	33.9	67.5
Resistance (line-to-line)	R_C	Ohms	0.93	0.23	1.20	0.34	1.50	0.37
Inductance (line-to-line)	L	mH	8.9	2.2	13.7	3.40	18.2	4.60
Typical Rated Speed @240V ac, 320V dc bus	W_R	RPM	3,400	6,000	2,000	4,300	1,400	3,000
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	6.8 (60.1)	4.4 (39.3)	12.2 (108)	9.9 (87.6)	17.6 (156)	15.7 (139)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 18" x 18" x 1/2" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 18" x 18" x 1/2" aluminum heat sink.

Motor	R63	R65	R67
L1 Max	237.7 (9.36)	288.5 (11.36)	339.3 (13.36)
L2	206.2 (8.12)	257 (10.12)	307.8 (12.12)

mm (in.)

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R80 SERIES MOTOR — 7.5" width/height (square frame)

All motors are UL Recognized (Files E103510 and E61960)



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- Rated speeds to 4,000 RPM

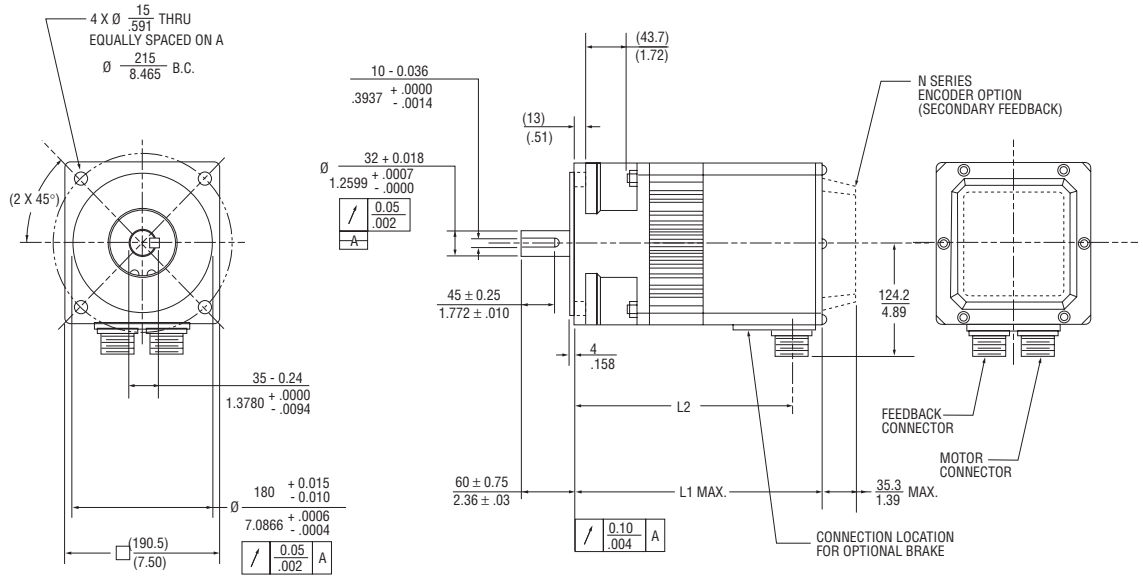
The R80 Series motors cover a continuous torque range from 22.5 to 53.4 Nm. Providing excellent torque, speed and/or velocity control, they are built for extremely high torque and power applications.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R84		R86		R88		R8A	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	22.5 (199)		32.7 (289)		42.2 (374)		53.4 (473)	
Peak torque④	T_{PK}	Nm (lb.-in.)	44.5 (394)		66.6 (590)		86.1 (762)		109 (961)	
Inertia③	J_M	kgm^2x10^{-3} (lb.-in.-sec^2x10^{-3})	4.43 (39.2)		6.57 (58.2)		8.61 (76.2)		10.8 (95.2)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.28 (2.5)		0.42 (3.7)		0.56 (5.0)		0.70 (6.3)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.11 (0.96)		0.16 (1.4)		`0.20 (1.8)		0.25 (2.2)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.30		0.25		0.23		0.21	
Thermal time constant	τ_{TH}	min.	40.0		54.0		59.0		63.0	
Weight (motor only)	W	kg (lbs.)	27.0 (60.0)		35.0 (77.0)		43.0 (94.0)		49.0 (111)	
WINDING DATA			**G**	**H**	**G**	**H**	**G**	**H**	**G**	**H**
Torque constant (RMS)②	K_T	Nm/A_{RMS} (lb.-in./A_{RMS})	0.8 (7.1)	0.4 (3.5)	1.1 (9.7)	0.5 (4.4)	1.4 (12.4)	0.7 (6.2)	2.2 (19.5)	1.1 (9.7)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.49 (51.3)	0.24 (25.1)	0.67 (70.2)	0.30 (31.4)	0.85 (89.0)	0.43 (45.0)	1.34 (140)	0.67 (70.2)
Continuous stall current①	I_{CS}	A_{RMS}	26.9	53.9	30.2	60.4	29.4	59.6	24.5	49.0
Current at peak torque④	I_{PK}	A_{RMS}	80.7	162	90.6	181	88.2	179	73.5	147
Resistance (line-to-line)	R_C	Ohms	0.26	0.07	0.25	0.06	0.28	0.07	0.46	0.12
Inductance (line-to-line)	L	mH	3.2	0.8	3.6	0.9	4.0	1.0	7.4	1.9
Typical Rated Speed @ 240V ac, 320V dc bus	W_R	RPM	3,300	4,000	2,500	3,500	1,900	3,500	1,200	2,600
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	17.4 (154)	10.1 (89.7)	23.5 (208)	16.6 (147)	36.8 (326)	20.5 (181)	48.6 (430)	26.8 (237)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 18" x 18" x 1/2" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 18" x 18" x 1/2" aluminum heat sink.

Motor	R84	R86	R88	R8A
L1 Max	277.6 (10.93)	328.4 (12.93)	379.2 (14.93)	430.0 (16.93)
L2	242.8 (9.56)	293.6 (11.56)	344.4 (13.56)	395.2 (15.56)

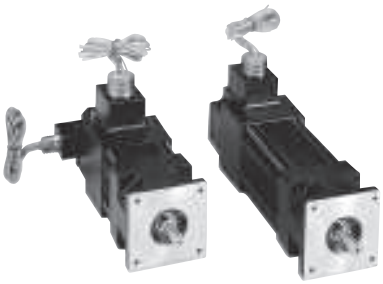
mm (in.)

R-SERIES

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R30P SERIES MOTOR — 3.25" width/height (square frame)

UL Listed file US E150845 UL/cUL
Meets Cenelec requirements
cert. no. 99E 9844204 EE. dIIB



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- UL Listed, file 150845. Meets UL Division 1, Class 1, Groups C & D
- Meets Cenelec requirements of EN 50014-1992.
- Built-in thermostat
- Rated speeds to 7,000 RPM

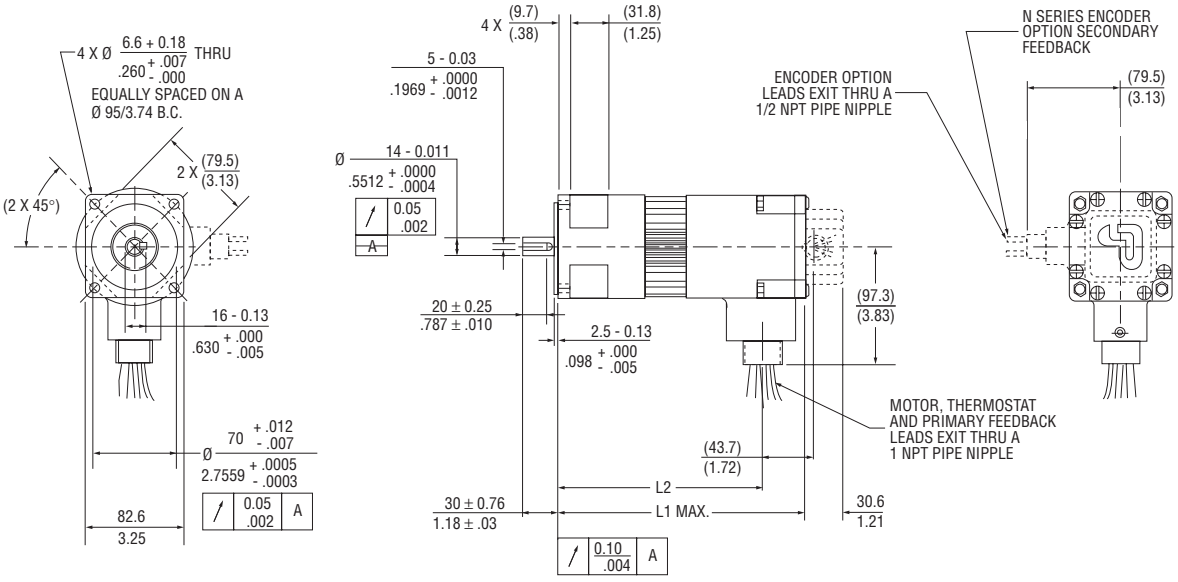
R30P Series Explosion Proof motors cover a continuous torque range from 1.3 to 3.1 Nm. These compact motors are well-suited for speed and position control applications that require maximum performance in minimum space — wherever hazardous conditions are present.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R32P		R33P		R34P		R35P	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	1.3 (11.5)		2.0 (17.7)		2.6 (23.0)		3.1 (27.4)	
Peak torque④	T_{PK}	Nm (lb.-in.)	3.70 (32.8)		5.31 (47.0)		6.90 (61.1)		8.31 (73.5)	
Inertia③	J_M	kgm^2x10^{-3} ($lb.-in.-sec^2x10^{-3}$)	.071 (.63)		.093 (.82)		.11 (1.00)		.13 (1.19)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.03 (0.23)		0.04 (0.31)		0.04 (0.39)		0.05 (0.47)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.005 (0.04)		0.007 (0.06)		0.010 (0.09)		0.012 (0.11)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.93		0.84		0.76		0.70	
Thermal time constant	τ_{TH}	min.	20.0		23.0		26.0		29.0	
Weight (motor only)	W	kg (lbs.)	2.5 (5.5)		3.2 (7.1)		3.9 (8.7)		4.6 (10.2)	
WINDING DATA			**G**	**H**	**G**	**H**	**J**	**K**	**J**	**K**
Torque constant (RMS)②	K_T	Nm/A_{RMS} ($lb.-in./A_{RMS}$)	0.6 (5.3)	0.3 (2.7)	0.8 (7.1)	0.4 (3.5)	1.0 (8.9)	0.5 (4.4)	1.2 (10.6)	0.6 (5.3)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.36 (37.7)	0.18 (18.8)	0.49 (51.3)	0.24 (25.1)	0.61 (63.9)	0.30 (31.4)	0.73 (76.4)	0.36 (37.7)
Continuous stall current①	I_{CS}	A_{RMS}	2.5	4.8	2.6	5.2	2.5	5.1	2.5	4.9
Current at peak torque④	I_{PK}	A_{RMS}	7.3	14.4	7.8	15.6	7.5	15.3	7.5	14.7
Resistance (line-to-line)	R_C	Ohms	7.3	1.8	6.9	1.7	8.1	2.0	9.2	2.3
Inductance (line-to-line)	L	mH	23.0	5.8	22.0	5.6	30.0	7.5	42.0	10.5
Typical Rated Speed @ 240V ac, 320V dc bus	W_R	RPM	4,500	7,000	3,500	7,000	2,600	5,700	1,900	4,500
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	0.9 (8.3)	0.62 (5.5)	1.5 (13.4)	0.9 (7.6)	2.3 (20.6)	1.4 (12.5)	3.0 (26.5)	2.0 (17.4)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 10" x 10" x 1/4" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 10" x 10" x 1/4" aluminum heat sink.

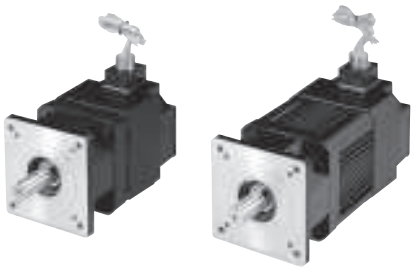
Motor	R32	R33	R34	R35
L1 Max	214.6 (8.45)	240.0 (9.45)	265.4 (10.45)	290.8 (11.45)
L2	173.0 (6.81)	198.4 (7.81)	223.8 (8.81)	249.2 (9.81)

mm (in.)

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R60P SERIES MOTOR — 5.75" width/height (square frame)

UL Listed file US E150845 UL/cUL
Meets Cenelec requirements
cert. no. 99E 9844204 EE. dIIB



- 4-pole synchronous servomotors
- Samarium-cobalt permanent magnets for maximum torque-to-inertia without demagnetization
- Low rotor inertia for rapid accel/decel
- 240V ac, 320V dc bus operation
- Anti-cog stator design
- UL Listed, file 150845. Meets UL Division 1, Class 1, Groups C & D
- Meets Cenelec requirements of EN 50014-1992.
- Built-in thermostat
- Rated speeds to 6,000 RPM

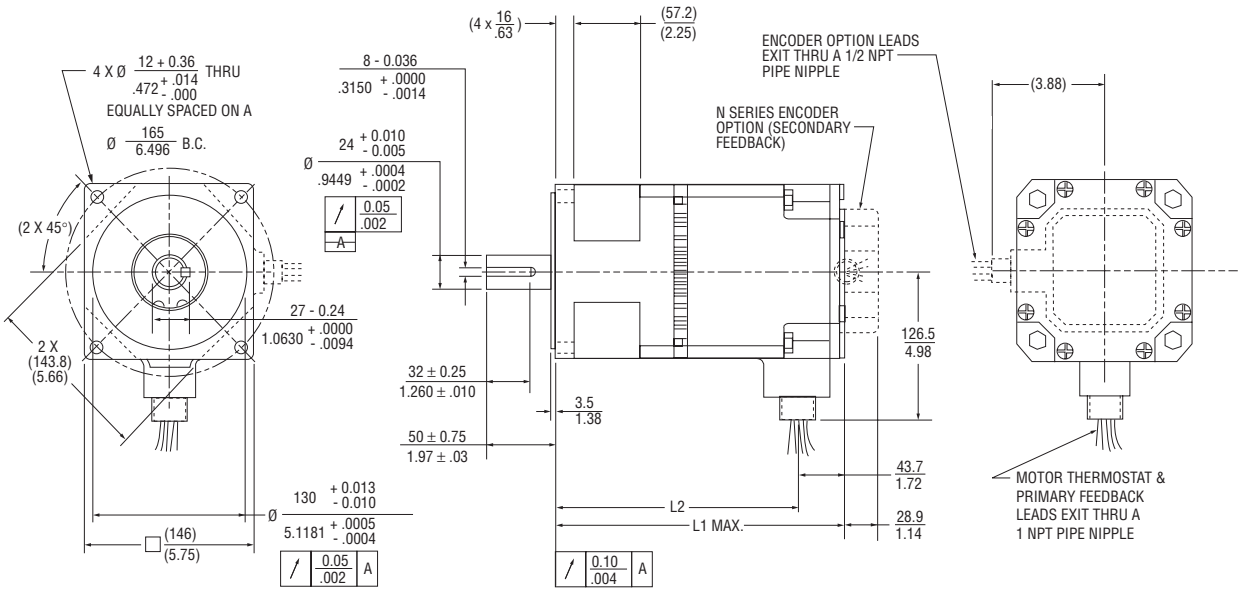
The R60P Series motors cover a continuous torque range from 8.3 to 19.9 Nm. Built for heavy duty applications, these motors deliver excellent torque, speed and/or velocity control, wherever hazardous conditions are present.

RATINGS AND CHARACTERISTICS

Motor parameters and winding data. See system data beginning on page 4 for typical torque/speed performance.

PARAMETER	SYMBOL	UNITS	R63P		R65P		R67P	
Continuous stall torque①	T_{CS}	Nm (lb.-in.)	6.8 (60.2)		11.2 (99.1)		15.9 (141)	
Peak torque④	T_{PK}	Nm (lb.-in.)	16.6 (147)		27.8 (246)		40.0 (354)	
Inertia③	J_M	kgm^2x10^{-3} ($lb.-in.-sec^2x10^{-3}$)	.81 (7.2)		1.26 (11.2)		1.72 (15.2)	
Static friction (max.)	T_f	Nm (lb.-in.)	0.16 (1.4)		0.26 (2.3)		0.36 (3.2)	
Viscous damping coefficient	K_{DV}	Nm/kRPM (lb.-in./kRPM)	0.05 (0.41)		0.08 (0.66)		0.10 (0.92)	
Thermal resistance⑤	R_{TH}	deg. C/Watt	0.51		0.42		0.30	
Thermal time constant	τ_{TH}	min.	19.0		36.0		72.0	
Weight (motor only)	W	kg (lbs.)	13.0 (29.0)		18.0 (39.0)		22.0 (49.0)	
WINDING DATA			**G**	**H**	**G**	**H**	**G**	**H**
Torque constant (RMS)②	K_T	Nm/A_{RMS} ($lb.-in./A_{RMS}$)	0.7 (6.2)	0.4 (3.5)	1.2 (10.6)	0.6 (5.3)	1.7 (15.0)	0.9 (8.0)
Voltage constant (RMS)②	K_E	V_{RMS}/rad/sec (V_{RMS}/kRPM)	0.43 (45.0)	0.24 (25.1)	0.73 (76.4)	0.36 (37.7)	1.03 (108)	0.55 (57.6)
Continuous stall current①	I_{CS}	A_{RMS}	9.1	18.2	9.4	17.7	9.3	18.6
Current at peak torque④	I_{PK}	A_{RMS}	27.3	54.6	28.3	53.0	27.9	54.8
Resistance (line-to-line)	R_C	Ohms	0.93	0.23	1.20	0.34	1.5	0.37
Inductance (line-to-line)	L	mH	8.9	2.2	13.7	3.4	18.2	4.6
Typical Rated Speed @240V ac, 320V dc bus	W_R	RPM	3,600	6,000	2,100	4,500	1,500	3,200
Typical Rated Torque @ 240V ac, 320V dc bus	T_{CR}	Nm (lb.-in.)	65.5 (48.9)	3.6 (32.2)	9.9 (87.9)	9.0 (80.0)	14.4 (127)	12.8 (113)

Metric Mount Shown — also available in English mount. Consult factory or website for details.



Note: All values at 25°C unless otherwise noted.

① Windings at 155°C. Motor in 25°C ambient and mounted to a 18" x 18" x 1/2" aluminum heat sink.

② RMS value of a sinusoidal waveform, measured line to neutral.

③ Motor with resolver feedback.

④ Caution: For peak torques or peak currents greater than 3x the continuous rating, consult the factory for thermal considerations.

⑤ Motor in 25°C ambient, mounted to a 18" x 18" x 1/2" aluminum heat sink.

Motor	R63	R65	R67
L1 Max	254.8 (10.03)	305.6 (12.03)	356.4 (14.03)
L2	211.6 (8.33)	262.4 (10.33)	313.2 (12.33)

mm (in.)

R-SERIES

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