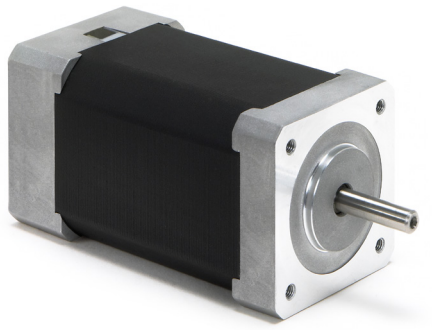
ElectroCraft®
powering innovation™

RP17
RapidPower™ BLDC Motor
High torque density - smooth power delivery.

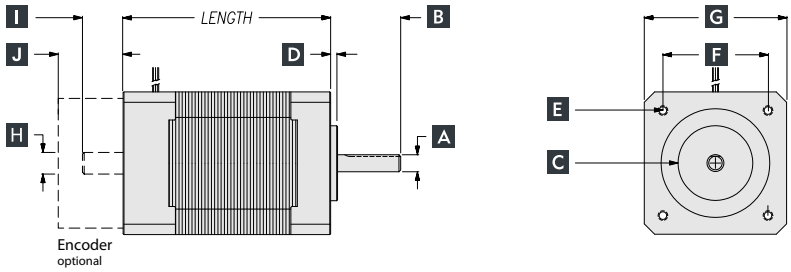
Compact yet powerful.

The ElectroCraft RapidPower™ RP17 is a compact, high-performance and high-speed brushless motor with ball-bearing construction, dynamically balanced rotors, and low audible and magnetic noise. It is compatible with three-phase brushless DC motor drives.



RP17 RapidPower™ BLDC Motor	
Size:	NEMA 17
Peak Torque:	to 136 oz-in or 96 Ncm

Model	MAX Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Pattern	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Differential Encoder Length
RP17M-8	41 mm	5.000 mm (0.1968 in)	20.6 mm (0.81 in)	22.00 mm (0.8660 in)	2 mm (0.08 in)	M3 x 0.5 4.3 mm deep	31 mm (1.22 in)	42 mm (1.65 in)	6.350 mm (0.2500 in)	11.9 mm (0.47 in)	14.0 mm (0.55 in)
RP17M-16	61 mm										
RP17M-25	81 mm										
RP17M-32	101 mm										



RP Model Number

R P	1 7 M	—	3 2	V	2 4	—	1	0	0	—	X
Product Type	Frame Size NEMA 17		Continuous Torque (Ncm) 8 16 25 32		Voltage (VDC) 24 48 60		Rear Shaft 0 - no 1 -yes	Front Shaft 0 - round 1 - flat	Lead Option 0 - flying leads		Encoder X - None C - 500-line differential D - 1000-line differential E - 2000-line differential J - 500-line single ended K - 1000-line single ended L - 2000-line single ended

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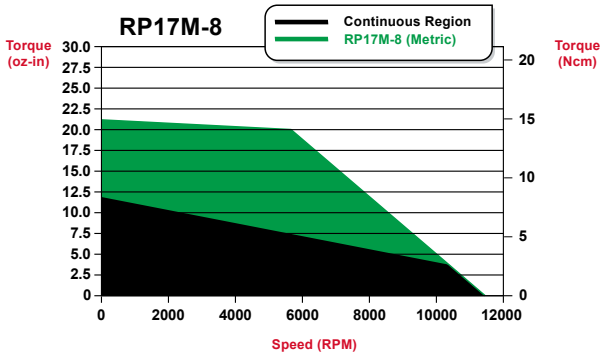
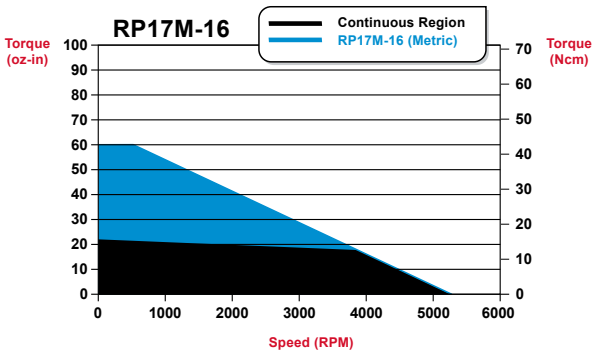
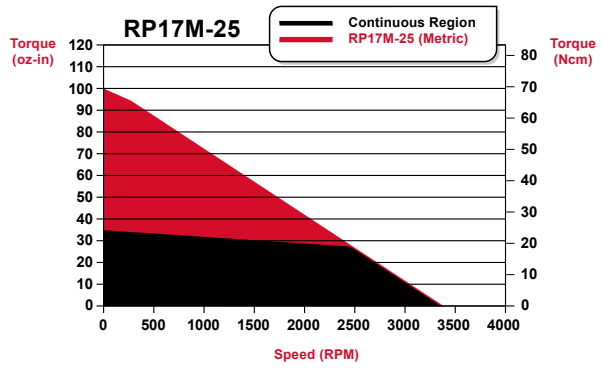
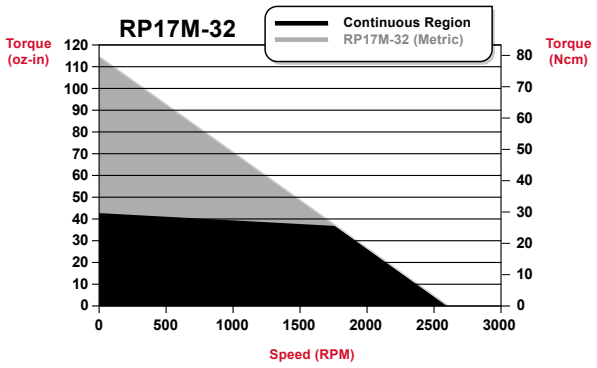
RP17 Speed Torque Performance







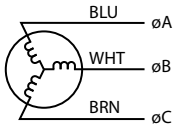


RP17 Connection

Senor Output		
S1	S2	S3
0	0	1
0	1	1
0	1	0
1	1	0
1	0	0
1	0	1

Driver Output		
ØA	ØB	ØC
X	HI	LOW
HI	X	LOW
HI	LOW	X
X	LOW	HI
LOW	X	HI
LOW	HI	X

Rotation: CCW Facing Lead End



MOTOR SCHEMATIC

Hall Pinouts	
Color	Function
ORANGE	+4.5-24 VDC
BLACK	GROUND
YELLOW	S1
GREY	S2
GREEN	S3

Low Profile Encoder	
Character	Lines
J	500 CPR
K	1000 CPR
L	2000 CPR
Encoder Pinouts	
Color	Function
BLACK	GROUND
ORANGE	CHANNEL Z
YELLOW	CHANNEL A
RED	+5 VDC
BLUE	CHANNEL B
GREEN	S1
BROWN	S2
WHITE	S3
BRN	S2

Differential Encoder	
Character	Lines
C	500 CPR
D	1000 CPR
E	2000 CPR
Encoder Pinouts	
Color	Function
YELLOW	CH A
YEL/WHT	CH A COMP
BLUE	CH B
BLU/WHT	CH B COMP
ORANGE	CH Z
ORG/WHT	CH Z COMP
GREEN	S1
GRN/WHT	NOT USED
BROWN	S2
BRN/WHT	NOT USED
WHITE	S3
GREY/WHT	NOT USED
RED	VCC
BLACK	GROUND
GREY	NOT USED

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RP17 Mechanical / Winding Data

	Stack Size and Winding Models											
Specifications	RP17M-8V24	RP17M-8V48	RP17M-8V60	RP17M-16V24	RP17M-16V48	RP17M-16V60	RP17M-25V24	RP17M-25V48	RP17M-25V60	RP17M-32V24	RP17M-32V48	RP17M-32V60
Design Voltage (VDC)	24	48	60	24	48	60	24	48	60	24	48	60
No load speed (RPM)	11,400			5,300			3,400			2,600		
Peak Torque (oz-in)	22			60			100			136		
Peak Torque (Ncm)	15			42			71			96		
Peak Current (Amps)	7.6	3.8	3.0	9.8	4.9	3.9	10.4	5.2	4.2	11.0	5.5	4.4
Continuous Stall Torque (oz-in)	12			22			36			45		
Continuous Stall Torque (Ncm)	8			16			25			32		
Continuous Stall Current (Amps)	4.2	2.1	1.7	3.6	1.8	1.4	3.7	1.9	1.5	3.6	1.8	1.4
Continuous Rated Torque (oz-in)	4.0	4.0	4.0	17.0	17.5	17.5	29.0	29.0	29.0	37.0	37.0	37.0
Continuous Rated Torque (Ncm)	2.8	2.8	2.8	12.0	12.3	12.3	20.5	20.5	20.5	26.1	26.1	26.1
Continuous Rated Current (Amps)	2.1	1.0	0.6	2.9	1.4	1.2	3.1	1.7	1.2	3.0	1.5	1.2
Continuous Rated Speed (RPM)	10,100	10,400	10,250	3,900	3,900	3,900	2,437	2,437	2,460	1,650	1,485	1,760
Voltage Constant (V / kRPM)	2.1	4.2	5.3	4.5	9.0	11.3	7.1	14.2	17.8	9.2	18.4	23.0
Torque Constant (oz-in / Amp)	2.8	5.7	7.2	6.1	12.2	15.2	9.6	19.2	24.1	12.4	24.9	31.1
Torque Constant (Ncm / Amp)	2.0	4.0	5.1	4.3	8.6	10.7	6.8	13.6	17.0	8.8	17.6	22.0
Resistance (Ohms)	0.7	2.7	4.0	1.1	4.4	5.5	1.5	6.4	7.2	2.0	8.5	11.4
Inductance (mH)	0.5	2.3	3.0	1.2	4.8	6.2	1.8	7.2	7.5	2.3	9.2	14.0
Motor Constant (oz-in / √ Watt)	3.5			5.8			8.4			9.0		
Motor Constant (Ncm / √ Watt)	2.5			4.1			5.9			6.4		
Electrical Constant (msec)	0.8			1.1			1.1			1.2		
Mechanical Constant (msec)	8.5			4.4			3.1			2.7		
Rotor Inertia (oz-in-sec^2)	0.0008			0.0012			0.0016			0.0019		
Rotor Inertia (g-cm^2)	53.7			83.3			112.3			134.9		
Thermal Resistance (C / Watts)	6.3			5.5			4.0			3.4		
Weight (oz)	9.0			17.0			23.5			31.0		
Weight (Kg)	0.3			0.5			0.7			0.9		
Length (inch)	1.6			2.4			3.1			3.9		
Length (mm)	40.6			61			78.7			99.1		
Number of Poles	4			4			4			4		

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