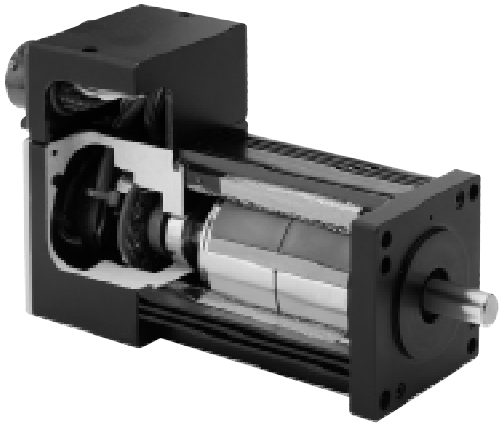
High-performance motors for use with OEM670 series drives

Parker offer three ranges of motors suitable for use with OEM servo drives - SM, NeoMetric and J series.

The SM series are recommended for use with OEM675 drives and they feature a slotless design to minimise detent torque which results in negligible torque ripple. With continuous torque ratings from 0.1 to 1.1Nm, they are available in both size 16 and 23 frames. Options include 500 to 1000 line encoders, MS connectors or flying leads, shaft flats or keyways and an IP65 shaft seal. An economy 'SE' version is also available offering identical performance but with an external encoder and fewer options - further information on this range is available on request.

The larger NeoMetric and J series motors are used in conjunction with OEM670 drives. The NeoMetric range offers exceptional dynamic performance due to the high torque-to-inertia ratio, and uses a bridged stator design to minimise mechanical noise. Continuous torque ratings range from 0.6 to 2.2Nm. J series motors have been specifically designed for applications with higher load



inertias, for example lead screw and belt driven tables. They have identical electrical characteristics to the NeoMetric range, but are equipped with an additional internal mass which is close-coupled to the rotor. This improves the load-to-rotor inertial ratio and allows the motor to successfully drive a larger external inertia. Torque-speed data is identical for both NeoMetric and J series, and they are available in either size 34 or metric 70mm frames. All motors have built-in thermal protection.

SM Series

Series	*Frame-Magnet Length*	*Winding*	*Feedback*	*-*	*Shaft*	*Connections*	*Options*
SM	160 [7]	A-high inductance	D-500 ppr encoder [1]		N-normal	MS-military style [4, 5]	N-none
	161	B-low inductance	E-1000 ppr encoder [1]		F-flat		V-shaft seal [3]
	162				K-keyway [2]		G-Planetary Gearhead [8]
	230 [7]				L-long shaft [2]	TQ-MS connector [4,6]	
	231 232 233					FL-500mm leads	

[1] Includes Hall-effect

[2] Not available on size 16

[3] Size 23 with MS-IP65

[4] Not available on size 160 & 230

[5] One connector includes motor wiring and a temperature switch, the other connector includes encoder and Hall-effect sensor wiring

[6] One connector includes motor wiring, a temperature switch, and Hall-effect sensor wiring, the other connector includes encoder wiring

[7] These motors have externally mounted encoders covered with a plastic housing. Flying leads are the standard wiring configuration. For high-volume applications, a ribbon cable is available for commutation and position signals. These motors are only CE(LVD)compliant when operated at 48VDC or below.

[8] G03, G05, G07, G10-planetary gearheads

Example: SM160AD-NFLN

NeoMetric and J Series

Series	*Frame-Magnet Length*	*Winding*	*Feedback*	*-*	*Shaft*	*Connections*	*Options*
N	0701	D	D-500 ppr encoder [1]		N-normal	MS-military style [2]	N-none
J	0702	E	E-1000 ppr encoder [1]		F-flat	10- 3m cable	V-IP65
	0341	F			K-keyway	FL-500mm leads	W-IP67
	0342					TQ-MS Connectors [3]	B-Brake G-Planetary Gearhead [4]

[1] Includes Hall-effect

[2] One connector includes motor wiring and a temperature switch, the other connector includes encoder and Hall-effect sensor wiring

[3] One connector includes motor wiring, a temperature switch, and Hall-effect sensor wiring, the other connector includes encoder wiring

[4] G03, G05, G07, G10-planetary gearheads (only available with 34 Frame motors)

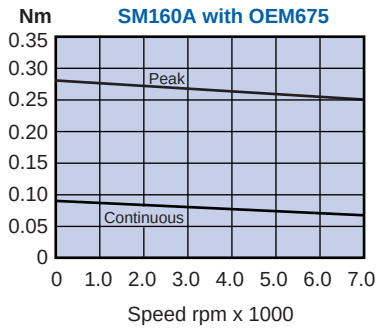
Example: N0701DE-KMSB

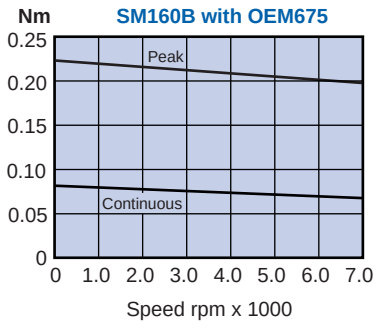
SM Series Size 16 (4-pole, winding class H, encoder feedback)

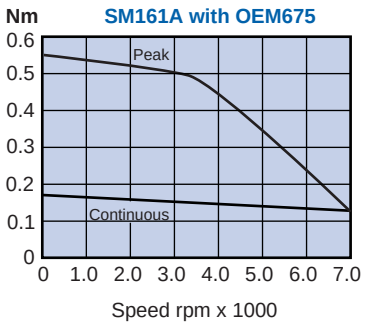
Parameter:	*Symbol:*	*Units:*	*SM160A*	*SM160B*	*SM161A*	*SM161B*	*SM162A*	*SM162B*
Stall Torque Continous [1]	Tcs	Nm	0.09	0.09	0.18	0.18	0.33	0.34
Stall Current Continuous [1, 7]	Ics(trap)	Amps DC	2.5	4.8	2.3	4.5	2.3	4.4
Peak Torque [6]	Tpk	Nm	0.28	0.28	0.55	0.54	0.99	1.02
Peak Current [6, 7]	Ipk(trap)	Amps DC	7.4	14.4	7.0	13.4	6.8	13.2
Rated Speed [2]	Wr	rpm	7500	7500	7500	7500	7500	7500
Current @ Rated Speed	Ir(trap)	Amps	2.2	4.2	1.9	3.6	1.9	3.8
Torque @ Rated Speed	Tr	Nm	0.07	0.07	0.13	0.13	0.26	0.26
Shaft Power @ Rated Speed	Po	watts	57	55	97	100	205	204
Voltage Constant [3, 4]	Ke	V/Krpm	4.02	2.08	8.27	4.29	15.39	8.17
Torque Constant [3, 4]	Kt(trap)	Nm/A DC	0.038	0.020	0.078	0.041	0.146	0.077
Resistance [3]	R	Ohms	3.43	0.90	4.53	1.24	6.50	1.73
Inductance [5]	L	mH	0.53	0.13	0.81	0.21	1.39	0.33
Maximum Bus Voltage	Vm	Volts DC	100	100	170	170	170	170
Thermal Resistance Wind-Amb	Rth w-a	deg C/watt	3.20	3.20	2.70	2.70	2.00	2.00
Thermal Time Constant	Tau_th	minutes	10	10	11.6	11.6	14.2	14.2
Intermittent Torque Duration [8]	T_2x	seconds	8	8	9	9	14	14
Peak Torque Duration [9]	T_3x	seconds	3	3	4	4	5	5
Rotor Inertia	J	kg-cm^2	0.05	0.05	0.11	0.11	0.18	0.18
Weight	kg		0.3	0.3	0.5	0.5	0.7	0.7

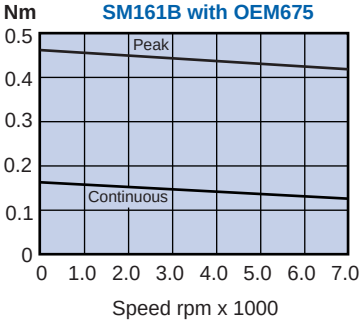
1 @ 25C ambient, 125C winding temperature, motor connected to a 250 x 250 x 6mm aluminium mounting plate. @40C ambient derate phase currents and torques by 12%.
2 Maximum speed is 7500 RPM with 500 line Encoder. For 1000 line encoders, derate to 6000RPM.
3 Measured Line to Line, +/- 10%.
4 Value is measured peak of sine wave.
5 +/-30%, Line-to-Line, inductance bridge measurement @1Khz.
6 Initial winding temperature must be 60 C or less before Peak Current is Applied.
7 DC current through a pair of motor phases of a trapaziodally (six state) commutated motor.
8 Maximum Time duration with 2 times rated current applied with initial winding temp at 60 C.
9 Maximum Time duration with 3 times rated current applied with initial winding temp at 60 C.

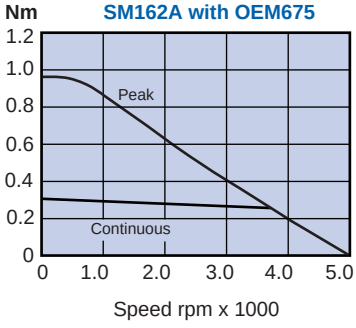
Performance curves

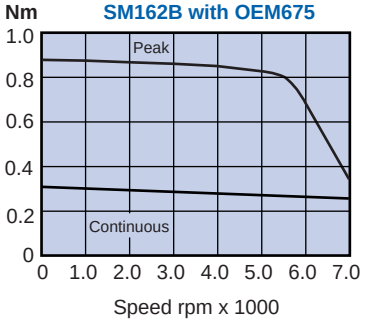












SM Series Size 23 (4-pole, winding class H, encoder feedback)

Parameter:	*Symbol:*	*Units:*	*SM230A*	*SM230B*	*SM231A*	*SM231B*	*SM232A*	*SM232B*	*SM233A*	*SM233B*
Stall Torque Continous [1]	Tcs	Nm	0.19	0.18	0.43	0.38	0.74	0.78	1.13	1.09
Stall Current Continuous [1, 7]	Ics(trap)	Amps DC	2.4	4.7	2.5	4.8	2.4	4.7	2.4	4.5
Peak Torque [6]	Tpk	Nm	0.57	0.55	1.27	1.12	2.21	2.34	3.38	3.27
Peak Current [6, 7]	Ipk(trap)	Amps DC	7.1	14.2	7.6	14.3	7.2	14.0	7.1	13.6
Rated Speed [2]	Wr	rpm	7500	7500	7500	7500	7500	7500	5800	5800
Current@Rated Speed	Ir(trap)	Amps	2.1	4.2	2.2	4.2	2.0	3.9	2.0	4.0
Torque@Rated Speed	Tr	Nm	0.15	0.15	0.33	0.31	0.57	0.60	0.90	0.85
Shaft Power@Rated Speed	Po	watts	122	116	261	244	449	477	553	519
Voltage Constant [3, 4]	Ke	V/Krpm	8.48	4.09	17.70	8.27	32.46	17.70	50.68	25.34
Torque Constant [3, 4]	Kt(trap)	Nm/A DC	0.080	0.039	0.168	0.078	0.307	0.168	0.480	0.240
Resistance [3]	R	Ohms	4.43	1.12	5.22	1.46	7.50	2.00	9.65	2.58
Inductance [5]	L	mH	1.19	0.28	1.64	0.44	2.90	0.78	4.08	1.06
Maximum Bus Voltage	Vm	Volts DC	100	100	170	170	340	170	340	170
Thermal Resistance Wind-Amb	Rth w-a	deg C/watt	2.67	2.67	2.00	2.00	1.54	1.54	1.25	1.25
Thermal Time Constant	Tau_th	minutes	18.3	18.3	20	20	21.6	21.6	23.3	23.3
Intermittent Torque Duration [8]	T_2x	seconds	11	11	11	11	18	18	20	20
Peak Torque Duration [9]	T_3x	seconds	5	5	4	4	6	6	7	7
Rotor Inertia	J	kg-cm^2	0.27	0.27	0.52	0.52	0.93	0.93	1.32	1.32
Weight	-	kg	0.5	0.5	1.0	1.0	1.4	1.4	1.8	1.8

1 @ 25C ambient, 125C winding temperature, motor connected to a 250x250x6mm aluminium mounting plate.
@40C ambient derate phase currents and torques by 12%.

2 Maximum speed is 7500 RPM with 500 line Encoder. For 1000 line encoders, derate to 6000RPM.

3 Measured Line to Line, +/- 10%.

4 Value is measured peak of sine wave.

5 +/-30%, Line-to-Line, inductance bridge measurement @1Khz.

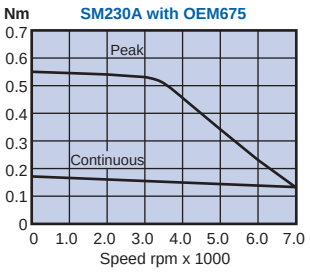
6 Initial winding temperature must be 60 C or less before Peak Current is Applied.

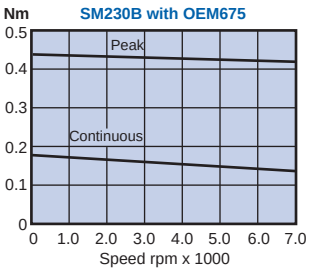
7 DC current through a pair of motor phases of a trapaziodally (six state) commutated motor.

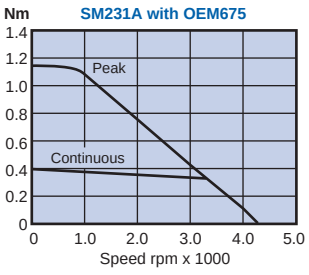
8 Maximum Time duration with 2 times rated current applied with initial winding temp at 60 C.

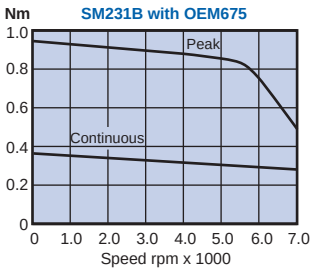
º9 Maximum Time duration with 3 times rated current applied with initial winding temp at 60 C.

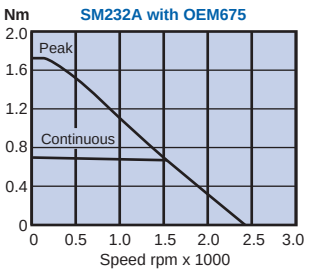
Performance curves

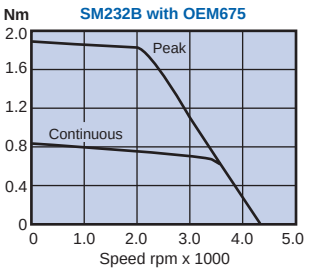


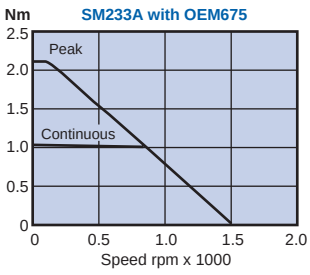


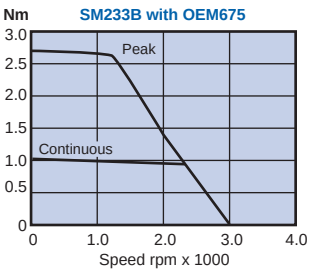












NeoMetric Series/J Series 70mm or 34 Frame (4-pole, winding class H, encoder feedback)

Parameter:	*Symbol:*	*Units:*	*N0701D or N0341D*	*N0701F or N0341F*	*N0702E or N0342E*	*N0702F or N0342F*	*N0703F or N0343F*	*N0703G or N0343G*	*N0704F or N0344F*	*N0704G or N0344G*
Stall Torque Continous [1]	Tcs	Nm	0.63	0.63	1.17	1.16	1.77	1.77	2.18	2.19
Stall Current Continuous [1, 7]	Ics(trap)	Amps DC	2.9	4.5	3.3	4.6	4.5	6.3	4.7	6.5
Peak Torque [6]	Tpk	Nm	1.90	1.88	3.50	3.49	5.30	5.30	6.54	6.56
Peak Current [6, 7]	Ipk(trap)	Amps DC	8.7	13.5	10.0	13.9	13.6	19.0	14.1	19.6
Rated Speed [2]	Wr	rpm	7500	7500	7500	7500	6800	7500	5500	7500
Current @ Rated Speed	Ir(trap)	Amps	2.6	4.1	2.8	3.9	3.8	5.0	4.0	4.9
Torque @ Rated Speed	Tr	Nm	0.53	0.52	0.80	0.88	1.21	1.27	1.58	1.41
Shaft Power @ Rated Speed	Po	watts	416	411	632	699	870	1010	919	1115
Voltage Constant [3, 4]	Ke	Volts/KRPM	23.14	14.66	36.97	26.49	41.05	29.53	49.01	35.40
Torque Constant [3, 4]	Kt(trap)	Nm/Amp DC	0.219	0.139	0.350	0.251	0.389	0.280	0.464	0.335
Resistance [3]	R	Ohms	5.52	2.27	5.22	2.70	3.36	1.74	3.47	1.80
Inductance [5]	L	mH	12.98	5.23	15.80	8.16	12.13	6.30	14.50	7.55
Maximum Bus Voltage	Vm	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	Rth w-a	deg C/watt	1.44	1.44	1.15	1.15	0.96	0.96	0.87	0.87
Thermal Time Constant	Tau_th	minutes	16.6	16.6	21.7	21.7	22.5	22.5	23.3	23.3
Intermittent Torque Duration [8]	T_2x	seconds	22	22	32	32	39	39	38	38
Peak Torque Duration [9]	T_3x	seconds	9	9	11	11	13	13	12	12
NeoMetric Rotor Inertia	J	kg-cm^2	0.12	0.12	0.19	0.19	0.27	0.27	0.35	0.35
J Series Rotor Inertia	J	kg-cm^2	1.29	1.29	1.37	1.37	1.45	1.45	N/A	N/A
NeoMetric Weight	-	kg	1.6	1.6	2.1	2.1	2.7	2.7	3.3	3.3
J Series Weight	-	kg	2.0	2.0	2.5	2.5	3.1	3.1	N/A	N/A

1 @ 25ºC ambient, 125ºC winding temperature, motor connected to a 250 x 250 x 6mm aluminium mounting plate.
@40ºC ambient derate phase currents and torques by 12%.

2 Maximum speed is 7500 RPM with 500 line Encoder. For 1000 line encoders, derate to 6000RPM..

3 Measured Line to Line, +/- 10%.

4 Value is measured peak of sine wave.

5 +/-30%, Line-to-Line, inductance bridge measurement @1Khz.

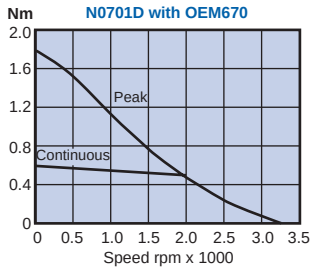
6 Initial winding temperature must be 60º C or less before Peak Current is Applied.

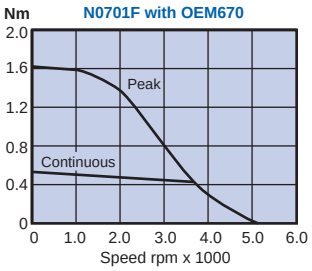
7 DC current through a pair of motor phases of a trapaziodally (six state) commutated motor.

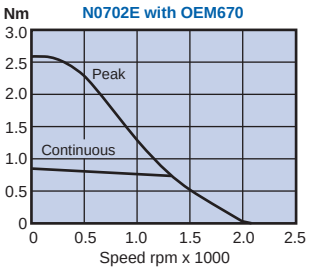
8 Maximum Time duration with 2 times rated current applied with initial winding temp at 60º C.

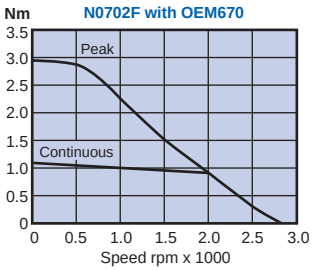
9 Maximum Time duration with 3 times rated current applied with initial winding temp at 60º C.

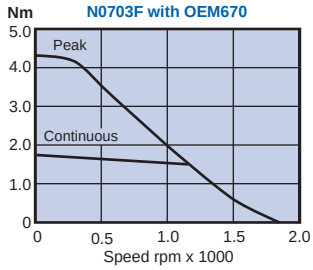
Performance curves

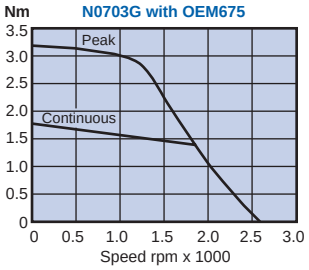


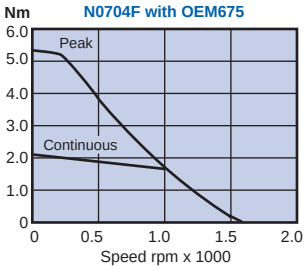


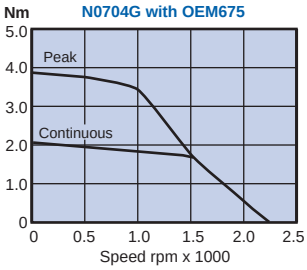






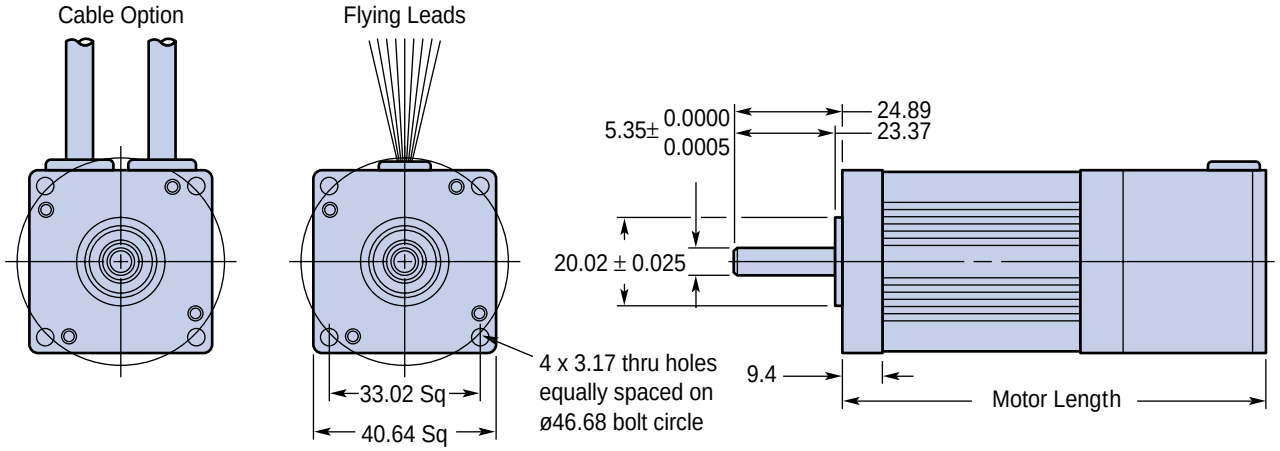






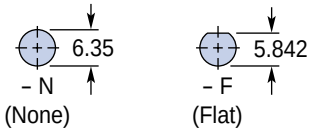
Parker Hannifin
Electromechanical Division
Offenburg, Germany & Poole, UK

SM16 series



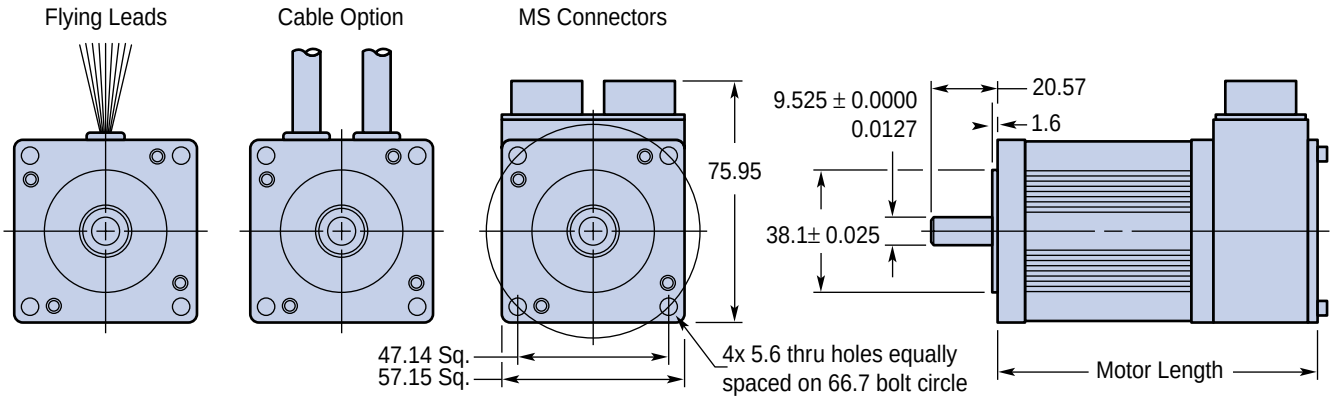
Motor Sizes	
Model	**Motor Length**
SM160	83.4
SM161	96.3
SM162	121.7
SM160w/MS	98.4
SM161w/MS	111.5
SM162w/MS	136.9

Shaft Options

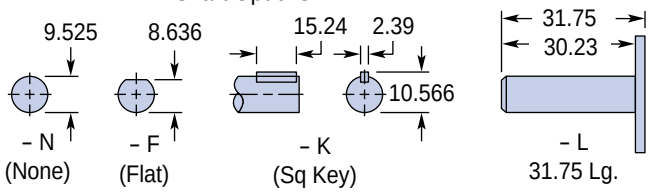


Cable Options	
Part#	Description
- FL	0.5 Flying Leads
- 10	3 Metre Cable

SM23 series



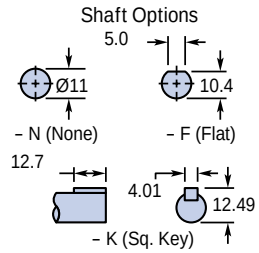
Shaft Options

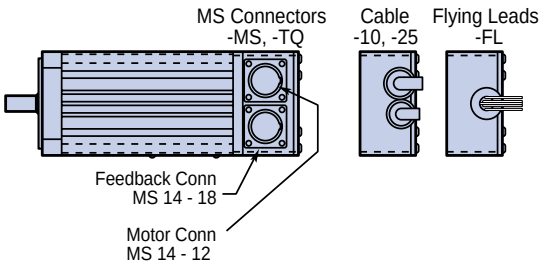


Motor Sizes		
Model	**Shaft dia.**	**Motor Length**
SM230	6.350	85.3
SM231	9.525	101.1
SM232	9.525	126.5
SM233	9.525	151.9

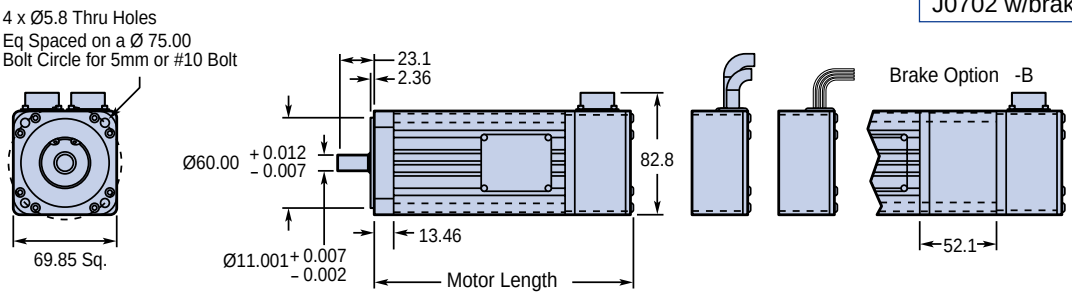
Cable Options	
Part#	Description
- FL	0.5 Flying Leads
- 10	3 Metre Cable

Size 70mm

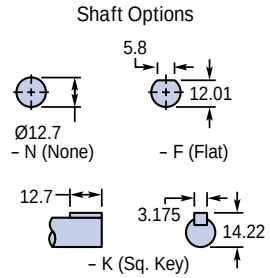


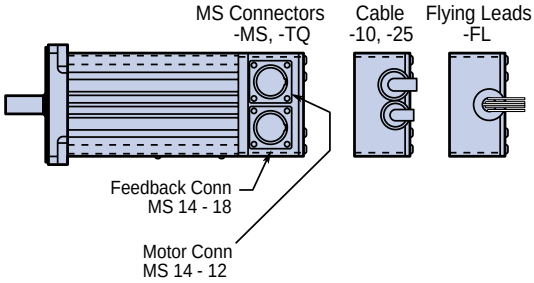


Motor Sizes	
Model	**Motor Length**
N0701	125.48
J0701	150.88
N0702	150.88
J0702	176.28
N0701 w/brake	177.60
J0701 w/brake	203.00
N0702 w/brake	203.00
J0702 w/brake	228.60

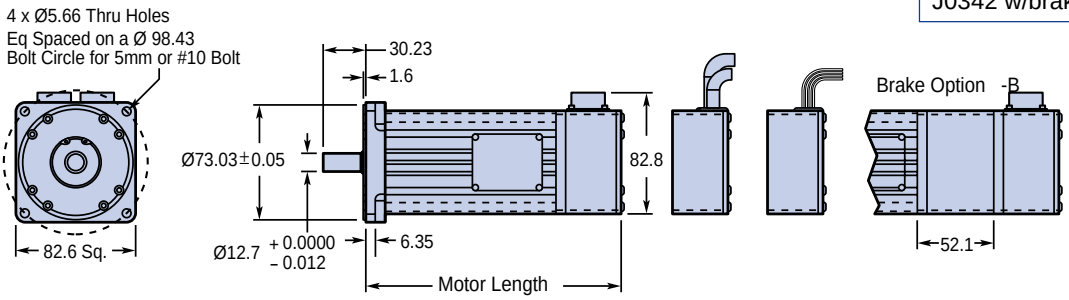


Size 34 frame





Motor Sizes	
Model	**Motor Length**
N0341	125.48
J0341	150.88
N0342	150.88
J0342	176.28
N0341 w/brake	177.60
J0341 w/brake	203.00
N0342 w/brake	203.00
J0342 w/brake	228.60



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