Hollow shaft motor/encoders

CM-2600 series, 2.6” OD BLDC hollow shaft servo motor/encoder

Description:

The CM-2600 is a high performance 0.748” (19 mm) ID hollow shaft brushless DC motor with integral optical encoder characterized by a very high torque to inertia ratio. For different motor characteristics, please contact the factory.

The motor/encoder was designed for high resolution, direct drive high speed positioning applications.

The following encoder configurations are available:

- ultra low distortion incremental sine/cosine designed for use with interpolators, yielding up to 144 million measuring steps/rev

- digital incremental up to 1,250,000 c/r (5,000,000 measuring steps)

- 16, 18, 20 & 22 bits absolute in serial format . Custom protocols available.

Typical applications include optical instruments, scanners, gimbal actuation and in general ‘direct drive’ applications where a gearbox is unsuitable or not economical.

Mechanical Data:

hollow shaft ID:	0.748” (19 mm) dia through hole
shaft loading:	10 lbs axial, 5 lbs radial
shaft runout:	.0005" T.I.R.
starting torque:	3 oz.in max @20°C
shaft rotation:	continuous, reversible
shaft speed:	4,500 RPM max (mechnical)
shaft material:	stainless steel
housing material:	aluminum (stainless optional)
bearing life:	manufacturer's specs
moment of inertia:	0.06 oz.in.sec^{2}
weight:	approx. 18 oz
temperature:	operating: -20°C to+85°C (extended operating range from -40° to +85°C available)
shock:	50 G's @ 11 ms
vibration:	5-2,000 Hz @ 20 G's
humidity:	98% without condensation
protection class:	IP 40

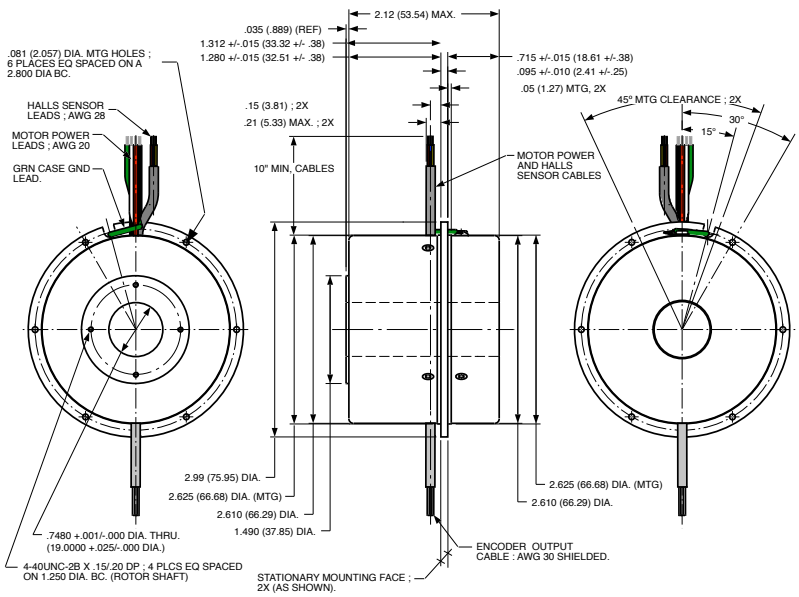
Ordering information:

CM-2600-(linecount): sine/cosine incremental output (0.5Vpp differential), standard linecounts:
1000, 1024, 2000, 2048, 3600, 4096, 5000, 8192 c/r.

CM-2650-(linecount): digital incremental, standard linecounts:
720, 768, 800, 850, 960, 1000, 1024, 1152, 1200, 1440, 1700, 2000, 2048, 3600, 4000, 4096, 5000, 7200, 8192, 10000, 11250, 12000, 16384, 25000, 25600, 31250, 32000, 50000, 51200, 62500, 64000, 90000, 10000, 102400, 112500, 125000, 128000, 156250, 180000, 200000, 205800, 225000, 250000, 256000, 312000, 360000, 400000, 409600, 450000, 500000, 512000, 625000, 720000, 819200, 900000, 1000000, 1024000, 1250000 c/r.

CM-2650A-(bitcount): absolute, 16, 18, 20 & 22 bits/rev, serial out

Outline:



Encoder wire color code:

signal	color
A	yellow
Ai inv	orange
B	blue
B inv.	violet
Index	green
Index inv.	brown
+ 5Vdc	red
ground	black
shield	braid

Motor wire color code:

red	phase A
white	phase B
black	phase C

"Hall" switch color code:

brown	C1
orange	C2
yellow	C3
blue	+ 5V to + 24V
green	ground

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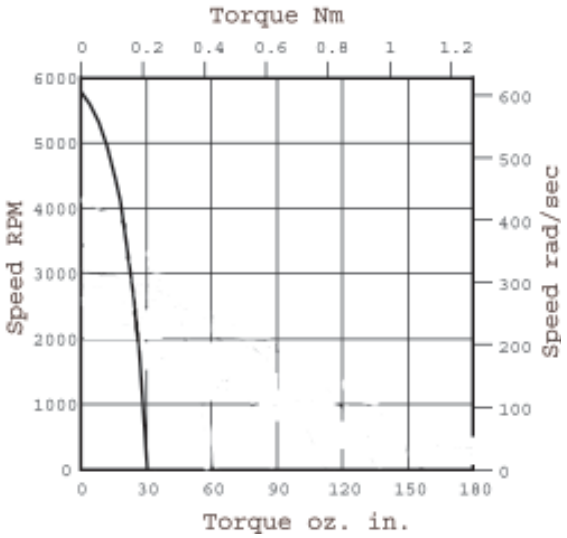
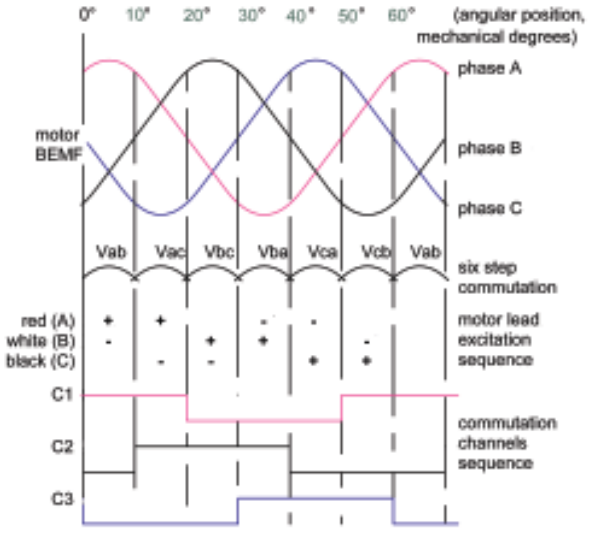
Motor specifications

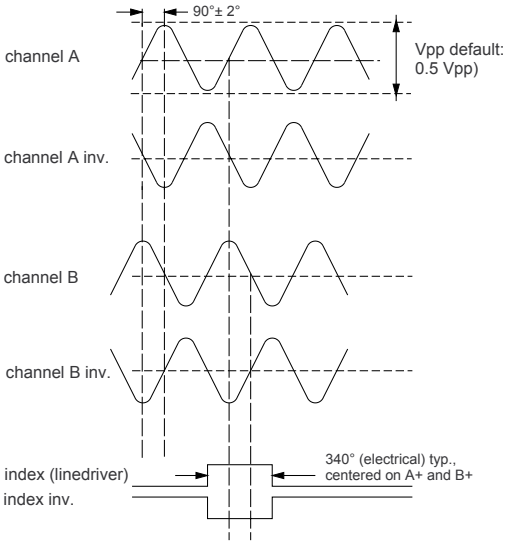
		size constants	
maximum rated torque	Tmax	oz.in	329
		Nm	2.32
maximum continuous stall torque	Tc	oz.in	30
		Nm	0.215
maximum continuous power	Pout	W	56
motor constant	Km	oz.in/vwatt	7.9
		Nm/vwatt	0.056
electrical time constant	Te	msec	0.34
mechanical time constant	Tm	msec	5.3
thermal resistance	TPR	°C/Watt	3.7
hysteresis drag torque	Th	oz.in	1.05
		Nm	0.007
viscous damping coefficient	Fi	oz.in	8.2E-4
		Nm	5.8E-6
maximum cogging torque	Tr	oz.in	1.9
		Nm	0.01
irotor + shaft inertia	Jm	oz.in.s^2	6.0E-3
		kg.m^2	4.3E-5
number of poles	n		12

		winding constants @ 20°C ambient*:	
design voltage	Vp	Volt	24
peak torque, ± 25%	Tp	in-oz	97
		Nm	0.68
peak current, ± 25%	Ip	Ampere	6.2
torque sensitivity, ±10%	Kt	in-oz/A	15.6
		Nm/A	0.11
no-load speed	Snl	rpm	2027
		rad/s	212
voltage constant	Kb	V/krpm	11.6
		V/rad/s	0.11
terminal resistance, ± 12%	Rm	Ohm	3.89
terminal inductance,	Lm	mH	1.32



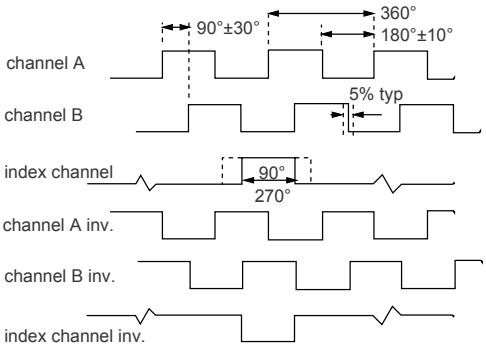


Encoder specifications



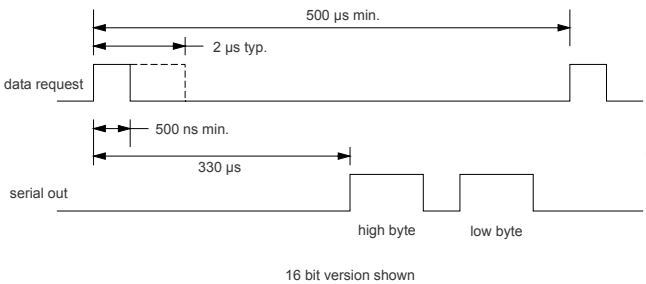
sine/cosine:

power supply:	+5 Vdc ± 5% @ 60 mA max.
code:	incremental, sine/cosine
output format:	A and B chanel in quadrature, index
output:	default Vout = ± 0.5 V , zero-centered
frequency response:	flat up to 100 kHz
absolute accuracy of zero-crossings:	± 12 arcseconds typ.
distortion:	less than 5% (Rmax/Rmin)



digital, incremental:

power supply:	+ 5Vdc ± 5% @ 150 mA max (no load)
output format:	incremental, digital
frequency response:	up to 16,384 c/r 150 kHz min. @ 85 °C over 16,384 c/r 4.0 MHz min. @ 85°C
linedriver output:	26LS31,EIA std. RS 422 & DIN 66259 compatible
absolute accuracy:	± 12 arcseconds typ.



16 bit version shown

digital, absolute:

power supply:	+ 5Vdc ± 5% @ 200 mA max (no load)
output format:	serial binary, 8-N-1 @ 230 k BPS
output:	LVDS
absolute accuracy	± 12 arcseconds typ.