Servomotor/encoder

CM-850 scanner motor/encoder

Description:

The CM-850 was specifically designed for high resolution scanning applications. Main features are:

- high resolution encoder up to 1,250,000 full A and B cycles per revolution (5,000,000 measuring steps)
- no zero drift and very low temperature drift
- virtually no cogging
- very low friction torque
- high torque to inertia ration
-10 mm shaft diameter for high torsional resonance frequency (> 12 KHz)

Avalable standard linecounts (A/B cycles per revolution):

25k, 25,6k, 31,25k, 32k, 50k, 51,2k, 62,5k, 64k, 90k, 100k, 102,4k, 112,5k, 125k, 128k, 156,25k, 180k, 200k, 204,8k, 225k, 250k, 256k, 312,5k, 360k, 400k, 409,6k, 450k, 500k, 512k, 625k, 720k, 819,2k, 900k, 1,000k, 1,024k & 1,250k)

mechanical:

shaft diameter:	.4722 - .4725 (11.99 - 12.0015 mm)
shaft loading:	20 lbs radial and axial
shaft runout:	0.0002” T.I.R.
bearing grease:	Nig Ace W, 15% fill
bearings:	ABEC 7
shaft material:	416 stainless
housing material:	aluminum
bearing life:	manufacturer's specs
moment of inertia:	see motor data
weight:	see motor data
temperature:	operating: -20°C to+85°C
shock:	50 G's @ 11 ms
vibration:	5-2,000 Hz @ 20 G's
humidity:	98% without condensation
protection:	IP 64

encoder:

power supply:	5 Vdc
code:	incremental, quadrature
line count:	see text
output format:	complementary A, B and index signals, RS 422 comaptible (linedriver), phase shift 90°±20° between A and B channels
repeatability:	better than 5 µ radians
temperature drift::	< 1 ppm over the temperature range
zero drift:	no zero drift
delay time:	< 0.1 µs
max. output frequency:	2 MHz

wire color assignments:

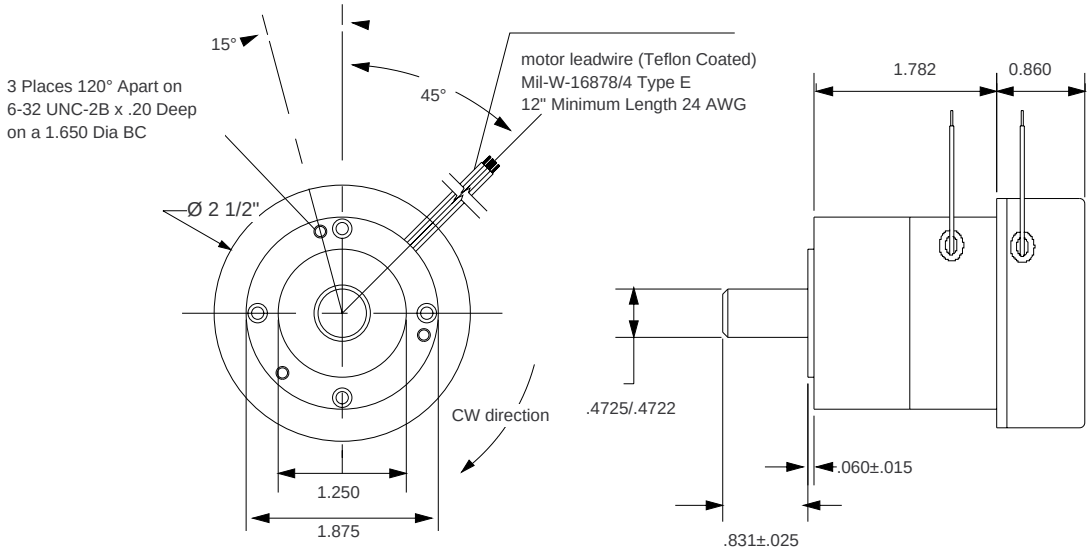
encoder (28 gauge wires, 12” long)

signal	wire color
power ground	black
index inverse	white
index	green
B inverse	violet
B channel	blue
+ 5Vdc	red
A inverse	orange
A channel	yellow

motor (24 gauge wires, 12” long)

coil	color
A	red
B	white
C	black

Outline:



Motor specifications

size constants @ 20°C ambient:

parameter	symbol	unit	value
maximum rated torque	Tr	in-oz	140.6
@ temperature rise of 75°C		Nm	0.99
maximum continuous stall torque	Tc	in-oz	10.9
@ temperature rise of 75°C		mNm	76
maximum continuous output power	Pout	Watts	104.6
@ temperature rise of 75°C	Smpo	rpm	19,769
motor constant	Km	in-oz/ W	3.05
		mNm/W	21.5
electrical time constant	Te	ms	0.45
mechanical time constant	Tm	ms	1.39
thermal time constant	Tth	minutes	2.96
thermal resistance*	TPR	°C/Watt	3.89
maximum cogging torque	Tf	in-oz	0.57
		mNm	4
viscous damping (infinite source)	Fi	in-oz/rpm	1.92E-05
		mNm/rpm	1.4E-04
hysteresis drag torque	Th	in-oz	.18
		mNm	1.3
number of poles		P	6
rotor inertia	Jm	in-oz-sec^2	9.07E-05
		kg.m^2	6.4E-07

(*) TPR assumes motor mounted to an aluminum heatsink of 12.1" x 12.1" x 0.50 in still air.

winding constants @ 20°C ambient*:

design voltage	Vp	Volt	12.0
peak torque, ± 25%	Tp	in-oz	17.78
		mNm	130
peak current, ± 25%	Ip	Ampere	2.85
torque sensitivity, ±10%	Kt	in-oz/A	6.23
		mNm/A	44
no-load speed	Snl	rpm	2,560
		rad/s	268
voltage constant	Kb	V/krpm	4.61
		V/rad/s	0.044
terminal resistance, ± 12%	Rm	Ohm	4.21
terminal inductance,	Lm	mH	1.9

motor performance @ 48 V:

Continuous power output @	power	Watt	12.00
-temperature rise of 75°C,		horsepower	0.004
-still air cooling	torque	in-oz	10.8
-ambient temperature of 20°C		mNm	80
	speed	rpm	402
	current	Ampere	1.88
	efficiency	%	14.2