

Rockwell N-Series to MDM N-Series Replacement Conversion Table

Description	Rockwell N-Series P/N	MDM N-Series P/N	MDM Dwg	Speed-Torque Curve	MDM N-Series Motor Configuration File			
					UltraMaster (Ultra 100/200)	Download	UltraWare (Ultra 3000)	Download
Motor, 1000 Line Encoder	N-2302-1-F00AA	T0601T0104	33030-004	T0601T0	T0601T0NSeriesMaster(N2302).mtr		T0601T0NSeriesWare(N2302).mxf	
Motor-24V Brake, 1000 Line Encoder	N-2302-1-F04AA	T0601T0105	Call Factory					
Motor, 1000 Line Encoder	N-2304-1-F00AA	T0601B8100	33030-004	T0601B8	T0601B8NSeriesMaster(N2304).mtr		T0601B8NSeriesWare(N2304).mxf	
Motor-24V Brake, 1000 Line Encoder	N-2304-1-F04AA	T0601B8101	Call Factory					
Motor, 2000 Line Encoder	N-3406-2-H00AA	T0851A0109	31030-078	T0851A0	T0851A0NSeriesMaster(N3406).mtr		T0851A0NSeriesWare(N3406).mxf	
Motor-24V Brake, 2000 Line Encoder	N-3406-2-H04AA	T0851A0110	Call Factory					
Motor, 2000 Line Encoder	N-3412-2-H00AA	T0851C0103	31030-078	T0851C0	T0851C0NSeriesMaster(N3412).mtr		T0851C0NSeriesWare(N3412).mxf	
Motor-24V Brake, 2000 Line Encoder	N-3412-2-H04AA	T0851C0106	Call Factory					
Motor, 2000 Line Encoder	N-4214-2-H00AA	T1101D0102	32030-047	T1101D0	T1101D0NSeriesMaster(N4214).mtr		T1101D0NSeriesWare(N4214).mxf	
Motor-24V Brake, 2000 Line Encoder	N-4214-2-H04AA	T1101D0103	Call Factory					
Motor, 2000 Line Encoder	N-4220-2-H00AA	T1101C6100	32030-047	T1101C6	T1101C6NSeriesMaster(N4220).mtr		T1101C6NSeriesWare(N4220).mxf	
Motor-24V Brake, 2000 Line Encoder	N-4220-2-H04AA	T1101C6101	Call Factory					
Motor, 2000 Line Encoder	N-5630-2-H00AA	T1101D3100	32030-050	T1101D3	T1101D3NSeriesMaster(N5630).mtr		T1101D3NSeriesWare(N5630).mxf	
Motor-24V Brake, 2000 Line Encoder	N-5630-2-H04AA	T1101D3101	Call Factory					
Motor, 2000 Line Encoder	N-5637-2-H00AA	T1102E0103	32030-052	T1102E0	T1102E0NSeriesMaster(N5637).mtr		T1102E0NSeriesWare(N5637).mxf	
Motor-24V Brake, 2000 Line Encoder	N-5637-2-H04AA	T1102E0103	Call Factory					
Motor, 2000 Line Encoder	N-5647-2-H00AA	T1102G3100	32030-052	T1102G3	T1102G3NSeriesMaster(N5647).mtr		T1102G3NSeriesWare(N5647).mxf	
Motor-24V Brake, 2000 Line Encoder	N-5647-2-H04AA	T1102G3101	Call Factory					

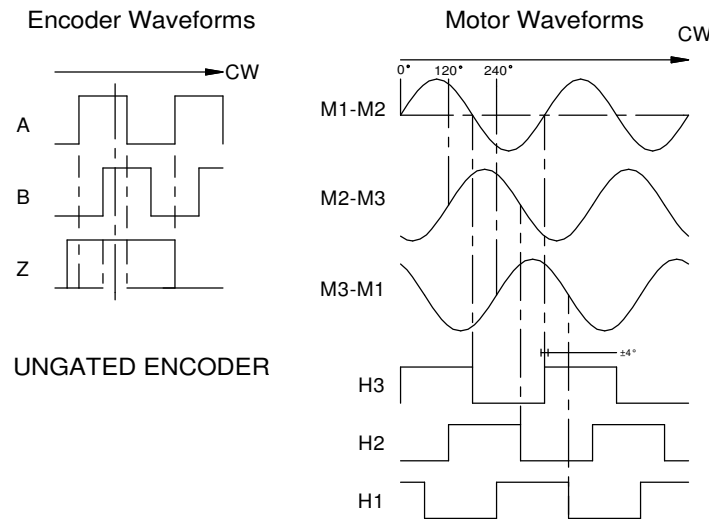
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
A	DR8319	RELEASED	11/8/06	T.M.
B	ECN3230	WAS 33030-004-007, IS 33030-004, NOTES ADDED	07/03/07	J.S.

ENCODER CONN WIRING CODE	
FROM	TO PIN
OUTPUT A	A
OUTPUT A'	B
OUTPUT B	C
OUTPUT B'	D
OUTPUT Z	E
OUTPUT Z'	F
CASE GROUND	G
N/C	H
+ 5 VDC	J
+ 5 VDC	K
COMMON	L
COMMON	M
N/C	N
N/C	P
THERM	R
THERM	S
OUTPUT W (H1)	T
OUTPUT U (H3)	U
OUTPUT V (H2)	V

MOTOR CONN. WIRING CODE	
FROM	TO PIN
MOTOR M1	A
MOTOR M2	B
MOTOR M3	C
CASE	D
N/C	E

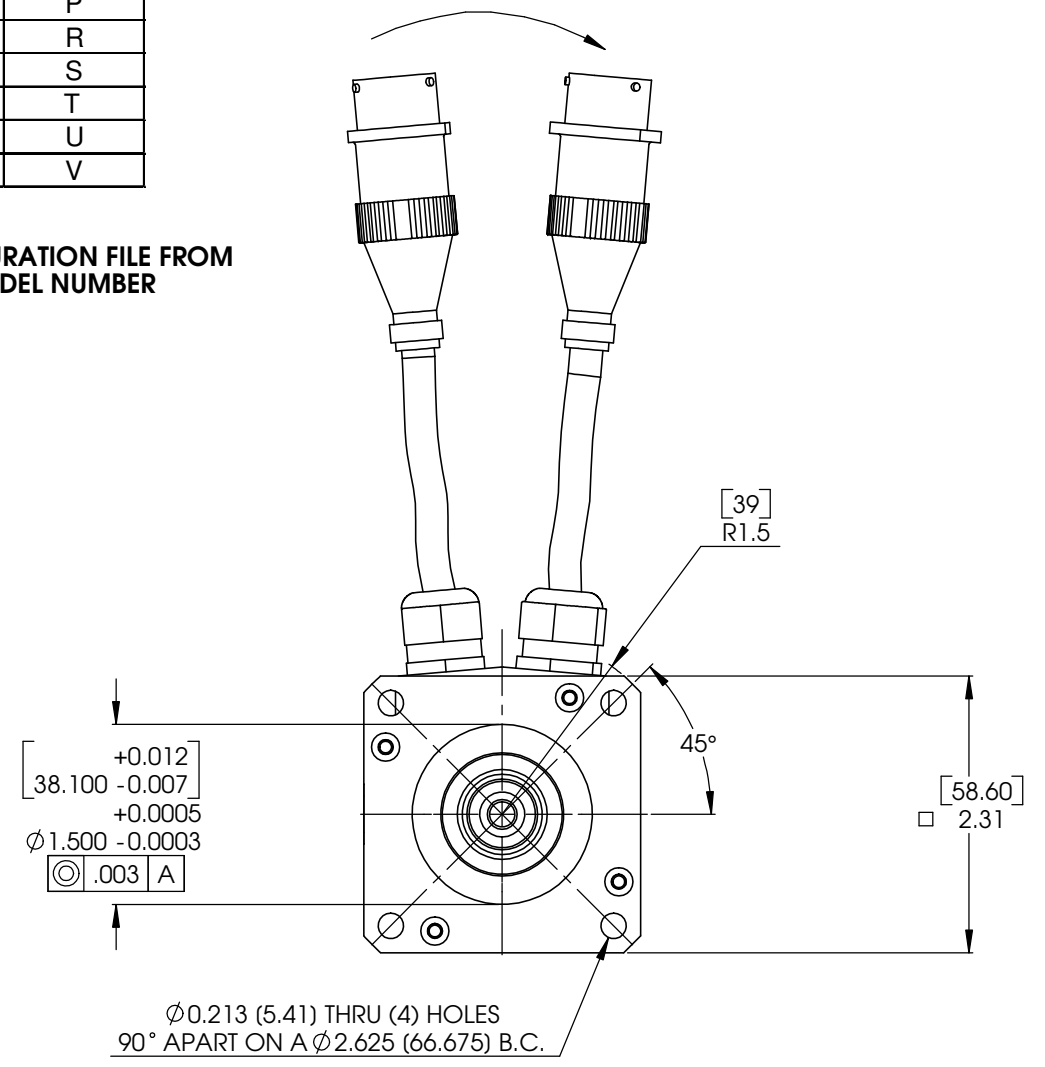
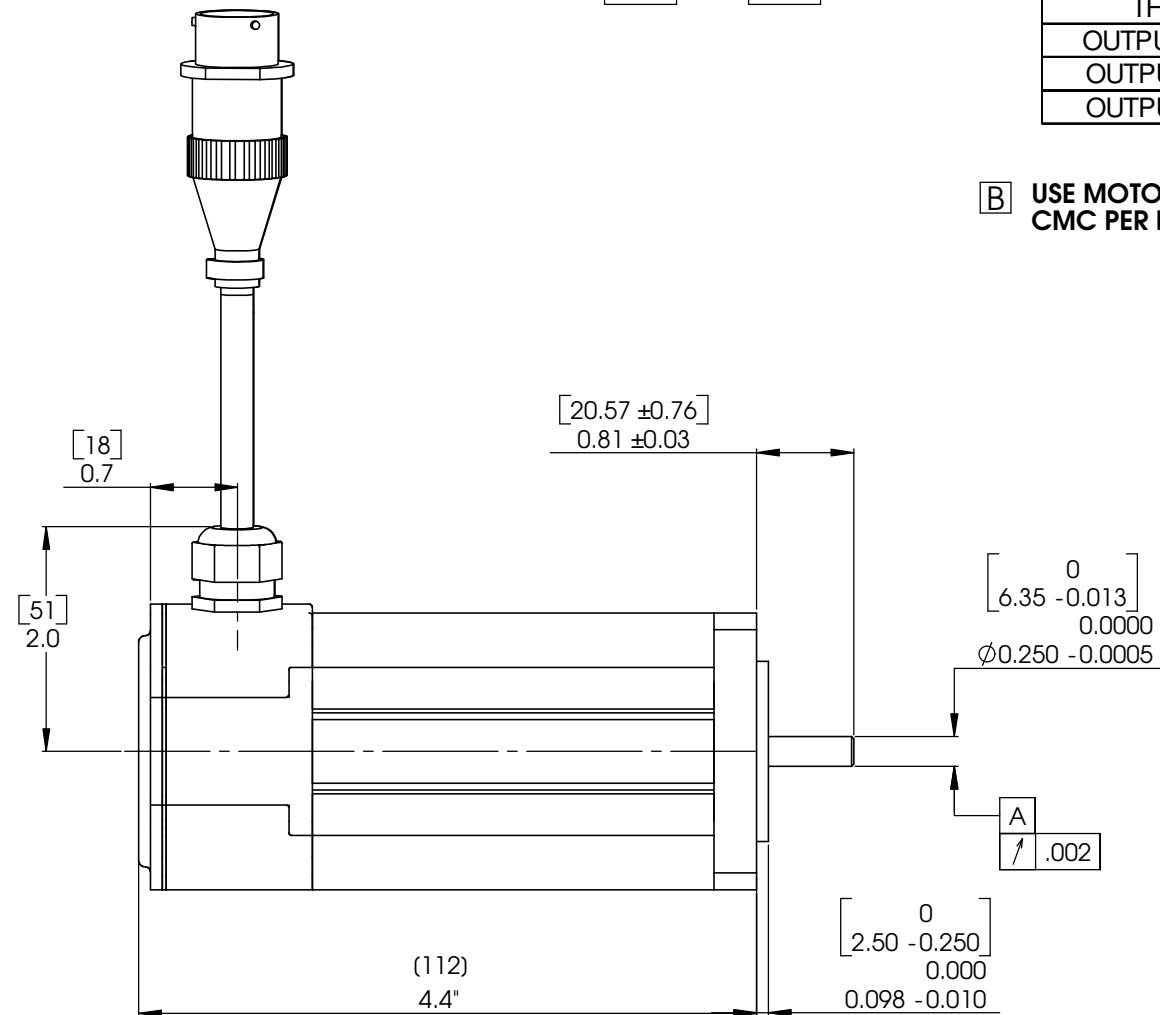
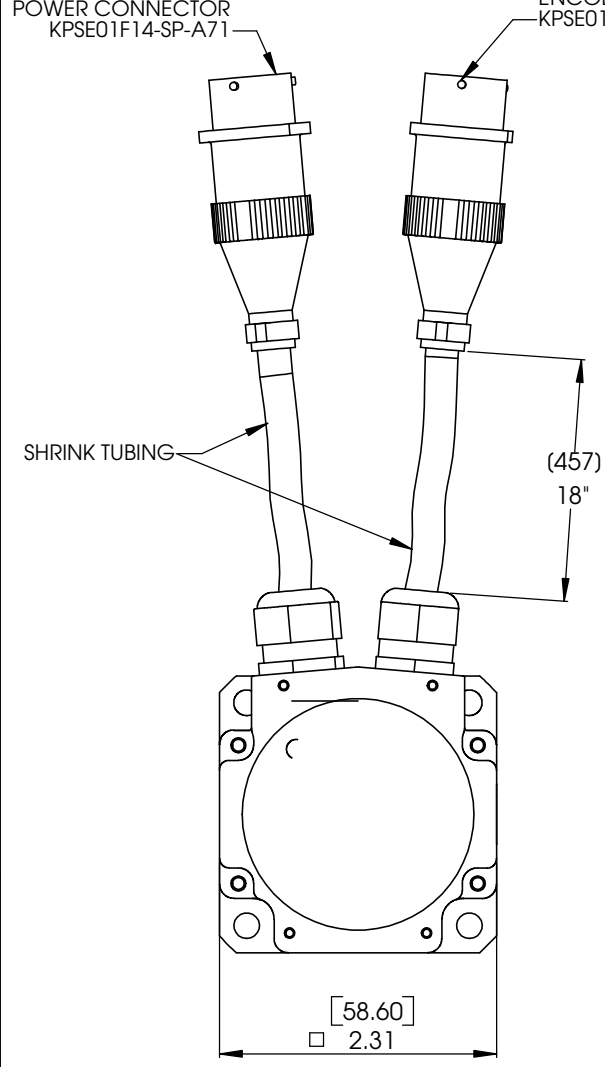
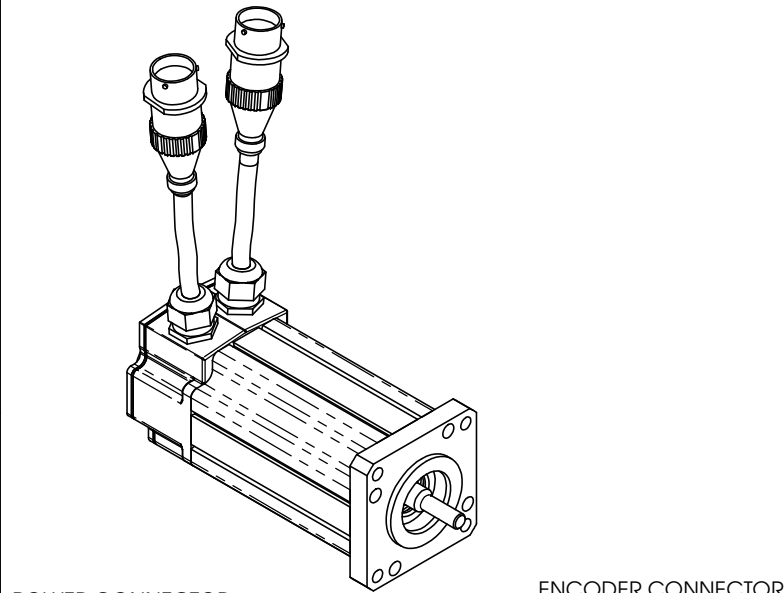
NOTE:
TEMPERATURE SENSOR:
CONTACTS: NORMALLY CLOSED
MAX AMPS: 6 AMP
RATED VOLTAGE: 24VDC

Clockwise rotation, viewed from the motor shaft, results in these waveforms.



UNGATED ENCODER

B USE MOTOR CONFIGURATION FILE FROM CMC PER MOTOR MODEL NUMBER



NOTES:

1. ROTATION: CLOCKWISE MOTOR ROTATION VIEWING DRIVE END OCCURS WHEN PHASE A LEADS PHASE B, PHASE B LEADS PHASE C.

B FRAME: T0601 WITH NEMA 23 FLANGE

DIMENSIONS IN BRACKETS (DUAL) ARE IN MILLIMETERS

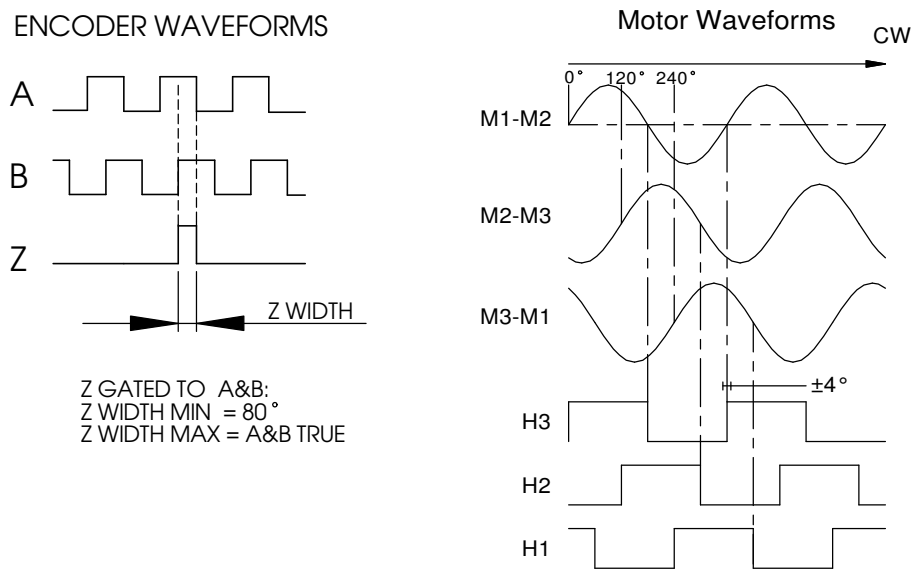
NOTICE <small>Information contained herein is the sole property of Cleveland Motion Controls, Torque Systems Division. This may not be reproduced, copied or traced in any manner in part or whole without the written permission of Cleveland Motion Controls, Torque Systems Division.</small>	MILLIMETERS (mm) TOLERANCES UNLESS OTHERWISE SPECIFIED X ±0.25 XX ±0.25 XXX ±0.100	APPLICATION NEXT ASBY USED ON	Cleveland Motion Controls <small>An Ingersoll Rand Company</small> Torque Systems Division
	ANGLE ±0.30 MATERIAL N/A FINISH N/A	DRAWN T. MEZHER 9/26/06 CHECKED APPROVED TITLE N-2304 ELECTROCRAFT REPLACEMENT DWG. NO. 33030-004 REV. B	

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE.

CAD FILE: 33030-004.SDDRW

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
A	DR8374	RELEASED	1/25/07	T.M.
B	ECN3064	ENCODER WAVEFORM BLOCK REPLACED	02/15/07	J.S.
C	ECN3230	MOTOR CONFIG. & NEMA NOTE ADDED	07/03/07	J.S.

Clockwise rotation, viewed from the motor shaft, results in these waveforms.

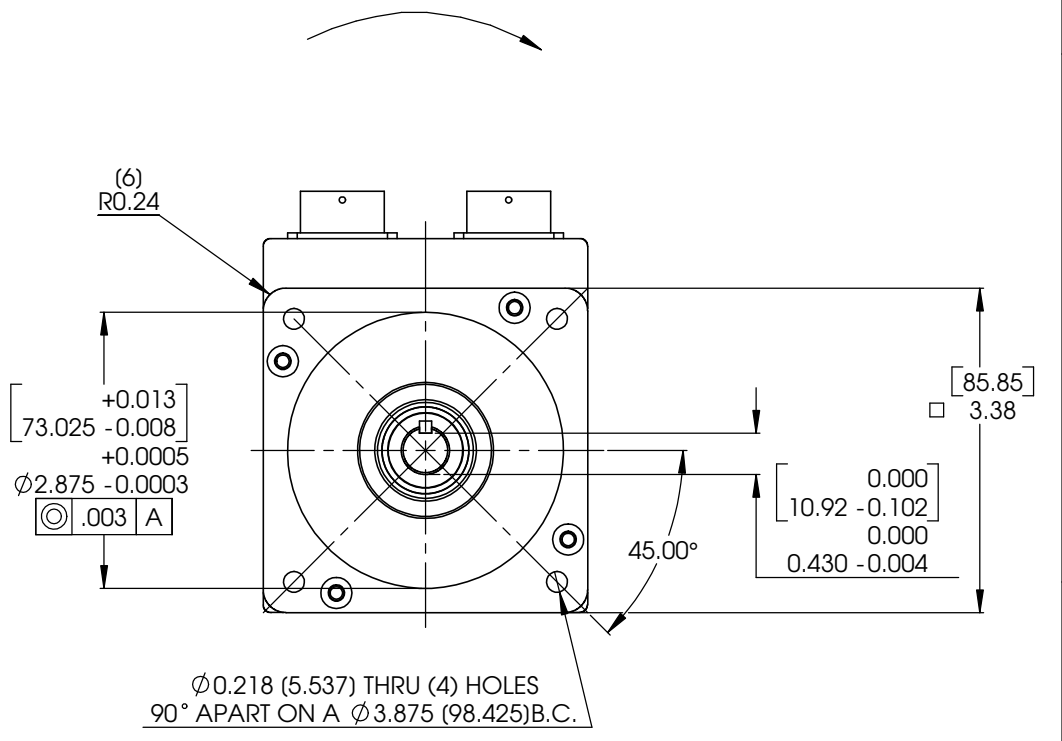
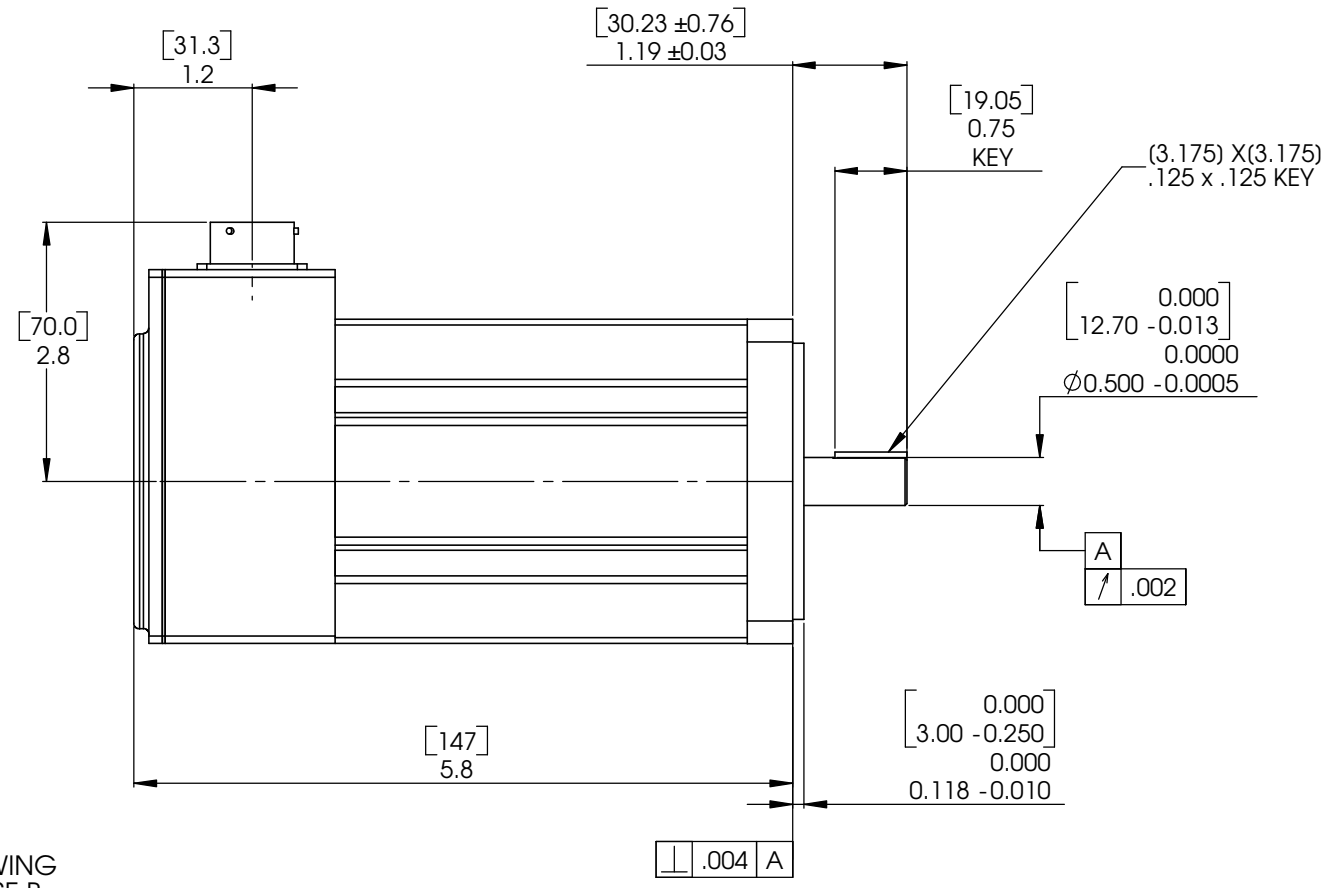
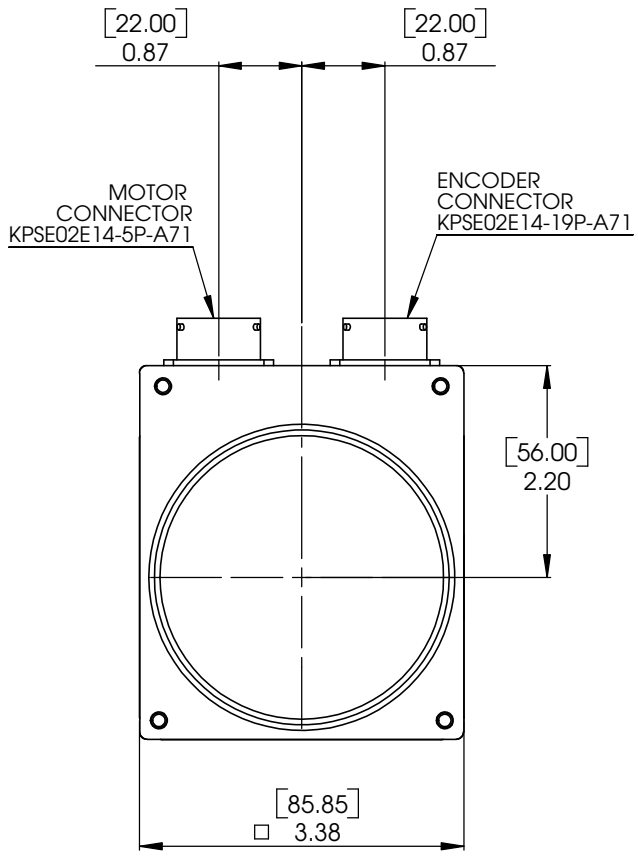
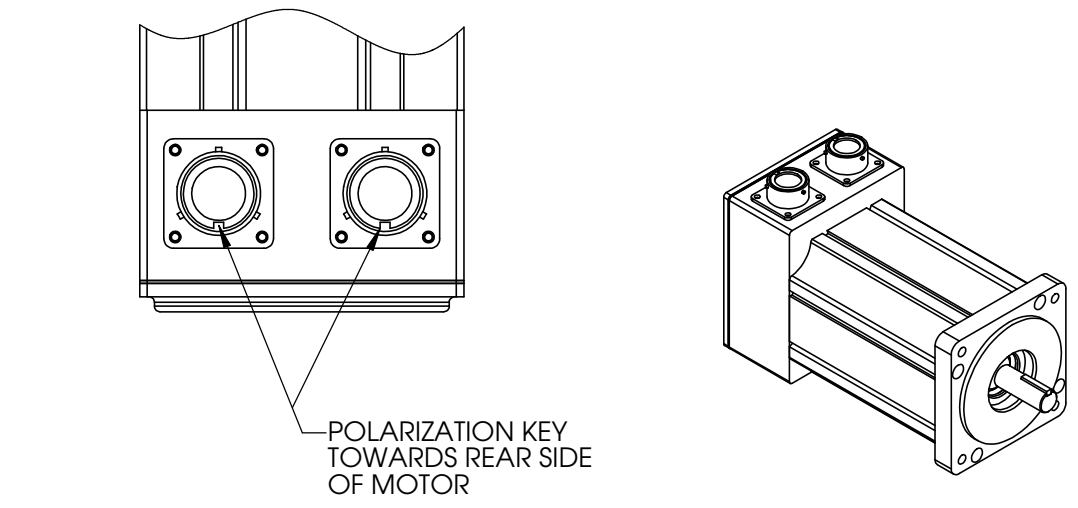


ENCODER CONN WIRING CODE	
FROM	TO PIN
OUTPUT A	A
OUTPUT A'	B
OUTPUT B	C
OUTPUT B'	D
OUTPUT Z	E
OUTPUT Z'	F
CASE GROUND	G
N/C	H
+5 VDC	J
+5 VDC	K
COMMON	L
COMMON	M
N/C	N
N/C	P
THERMOSTAT	R
THERMOSTAT	S
OUTPUT H1	T
OUTPUT H3	U
OUTPUT H2	V

MOTOR CONN. WIRING CODE	
FROM	TO PIN
MOTOR M1	A
MOTOR M2	B
MOTOR M3	C
CASE	D

NOTE:
TEMPERATURE SENSOR:
CONTACTS: NORMALLY CLOSED
MAX AMPS: 6 AMP
RATED VOLTAGE: 24VDC

USE MOTOR CONFIGURATION FILE FROM CMC PER MOTOR MODEL NUMBER



- NOTES:
1. ROTATION: CLOCKWISE MOTOR ROTATION VIEWING DRIVE END OCCURS WHEN PHASE A LEADS PHASE B, PHASE B LEADS PHASE C.
 2. THE INDEX PULSE OCCURS WHEN FACING THE MOTOR, THE SHAFT KEYWAY IS ORIENTED 90° ± 10° CLOCLWISE (MECHANICAL) AWAY FROM THE CONNECTORS

FRAME: T0851 WITH NEMA 34 FLANGE

DIMENSIONS IN BRACKETS (DUAL) ARE IN MILLIMETERS

NOTICE Information contained herein is the sole property of Cleveland Motion Controls, Torque Systems Division. This may not be reproduced, copied or traced in any manner in part or whole without the written permission of Cleveland Motion Controls, Torque Systems Division.	MILLIMETERS (mm) TOLERANCES UNLESS OTHERWISE SPECIFIED XX ±0.25 XXX ±0.125 XXXX ±0.050	APPLICATION NEXT ASBY USED ON 85mm	Cleveland Motion Controls An Ingersoll Rand Company Torque Systems Division
	THIRD ANGLE PROJECTION 	ANGLES UNLESS OTHERWISE SPECIFIED XX ±0.30 XXX ±0.150	
MATERIAL FINISH N/A	DRAWN T. MEZHER 1/25/07	CHECKED APPROVED	SHEET NO. 31030-078 SCALE 1:1 SHEET 1 OF 1

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE.

ENTER DRIVE LETTER BELOW(S for Sine, T for Trap)

s

ENTER UNIT LETTER BELOW(M for SI, E for English)

m

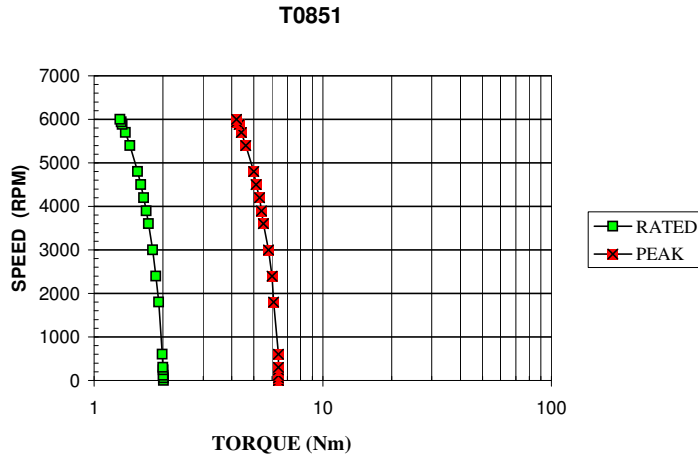
SELECT WINDING FROM DROP DOWN LIST

Ke = C0(Ke = 40 Vpk/krpm)

MODE NUMBER

CHECKED:	SD	T0851		C0(Ke = 40 Vpk/krpm)	DRAWN:	AR
all values at 25 deg c unless stated otherwise		STD		CUST	APPROVED:	
TORQUE & CURRENT AT 40 Deg C AMBIENT		YES			SD	
^SPECIFICATIONS						
Symbol	Units	NOM	MIN	MAX		
Tpk	Torque,peak stall	Nm		6.4		
Tc	Torque,continuous stall	Nm	2.01	2.21		
Ktp	Torque sensitivity (L TO L)	Nm/Apeak	0.331	0.298	0.364	
Kt	Torque sensitivity (L TO L)	Nm/Arms	0.468	0.421	0.515	
Ra	Armature resistance (L TO L)	ohms	1.45	1.23	1.67	
La	Armature inductance (L TO L)	millihenry	7.6	5.32	9.88	
Ip	Amps at Tpk	Apeak	19.5	17.6	21.5	
Isp	Amps at Tc stall	Apeak	7.16	6.44	7.88	
Is	Amps at Tc stall	Arms	5.06	4.55	5.57	
Ke	Back EMF constant	Vpeak/Krpm	40.00	36.00	44.00	
Ke	Back EMF constant	Vrms/Krpm	28.29	25.46	31.12	
Ke	Back EMF constant	Vpeak/rad/sec	0.382	0.298	0.364	
Ke	Back EMF constant	Vrms/rad/sec	0.270	0.243	0.297	
Ep	Volts @ Tpk	Vpeak	28.28			
Fi	Viscous friction	Nm/Krpm	0.009			
Tf	Static friction torque	Nm	0.019			
Ec	volts @ Tc	Vpeak	15.573			
Jm	Moment of inertia	Kg-cm2	0.7345			
Tm	Time constant,mech	milliseconds	0.73			
Te	Time constant,elect	milliseconds	5.24			
Rth	Thermal resistance	deg C/watt	1.35			
Tth	Time constant,thermal	minutes	20			
Oa	Max armature temp	deg C		155	MOTOR IS MOUNTED ON A 254 mmx254 mmx6.35 mm ALUMINUM PLATE IN A 40 DEG.C AMBIENT	
Km	Figure of Merit	Nm/(amp-ohm)	0.27		SPEED/ TORQUE CURVE SHOWN IS RATED. TYPICAL VALUES ARE WITH IN +/- 10% OF RATING	
Nls	Max operating speed	rpmmax		6000	OTHER SPECIFICATIONS	
	# of motor pole		8		REV(Dt)	Description
Wt	weight	Kg	2.8		A(11/11/05)	Initial release
					B(2/8/06)	Add RMS Kt and Ke
					C(3/20/06)	Add # of poles and reconfigured speedtorque
					D(4/6/06)	Sine SI Ke values corrected

SINUSOIDAL DRIVE



RPM	Trated Nm	Peak Voltage	Peak Current	RMS Current	Watts
0	2.012	15.6	7.16	5.06	84
300	2.001	27.5	7.12	5.03	156
600	1.988	39.4	7.07	5.00	229
1200	1.956	63.1	6.96	4.92	368
1800	1.915	86.8	6.81	4.82	501
2400	1.864	110.4	6.63	4.69	623
3000	1.803	133.9	6.41	4.53	733
3600	1.732	157.4	6.16	4.36	831
4200	1.648	180.7	5.86	4.14	908
4800	1.550	204.0	5.51	3.90	967
5400	1.435	227.1	5.10	3.61	998
6000	1.300	250.0	4.62	3.27	996

Rated Speed	Rated Torque
6000	1.3
Rated watts 818	

ENTER DRIVE LETTER BELOW(S for Sine, T for Trap)

s

ENTER UNIT LETTER BELOW(M for SI, E for English)

m

SELECT WINDING FROM DROP DOWN LIST

Ke = D0(Ke = 50 Vpk/krpm)

CHECKED:		SD		
all values at 25 deg c unless stated otherwise				
TORQUE & CURRENT AT 40 Deg C AMBIENT				
^SPECIFICATIONS				
Symbol	Units	NOM	MIN	MAX
Tpk Torque,peak stall	Nm			12.0
Tc Torque,continuous stall	Nm	4.85	4.37	5.34
Ktp Torque sensitivity (L TO L)	Nm/Apeak	0.413	0.372	0.454
Kt Torque sensitivity (L TO L)	Nm/Arms	0.585	0.527	0.644
Ra Armature resistance (L TO L)	ohms	1.04	0.88	1.20
La Armature inductance (L TO L)	millihenry	5	3.50	6.50
Ip Amps at Tpk	Apeak	29.0	26.1	31.9
Isp Amps at Tc stall	Apeak	13.79	12.41	15.17
Is Amps at Tc stall	Arms	9.75	8.78	10.73
Ke _p Back EMF constant	Vpeak/Krpm	50.00	45.00	55.00
Ke _r Back EMF constant	Vrms/Krpm	35.36	31.82	38.90
Ke _l Back EMF constant	Vpeak/rad/sec	0.478	0.372	0.454
Ke _r Back EMF constant	Vrms/rad/sec	0.338	0.304	0.372
Ep Volts @ Tpk	Vpeak	30.16		
Fi Viscous friction	Nm/Krpm	0.031		
Tf Static friction torque	Nm	0.034		
Ec volts @ Tc	Vpeak	21.512		
Jm Moment of inertia	Kg-cm2	2.37288		
Tm Time constant,mech	milliseconds	1.08		
Te Time constant,elect	milliseconds	4.81		
Rth Thermal resistance	deg C/watt	0.51		
Tth Time constant,thermal	minutes	25		
Oa Max armature temp	deg C			155
Km Figure of Merit	Nm/(amp-ohm)	0.406		
Nls Max operating speed	rpmmax			6000
# of motor poles		8		
Wt weight	Kg	4.9		

MODE/NUMBER

T1101 D0(Ke = 50 Vpk/krpm)		DRAWN:	AR
STD	CUST	APPROVED:	
YES		SD	
T1101			
MOTOR IS MOUNTED ON A 304.8 mmx304.8 mmx12.7 mm ALUMINUM PLATE IN A 40 DEG.C AMBIENT			
SPEED/ TORQUE CURVE SHOWN IS RATED. TYPICAL VALUES ARE WITH IN +/- 10% OF RATING			
OTHER SPECIFICATIONS			
		REV(Dt)	Description
		A(11/11/05)	Initial Release
		B(2/10/06)	Add RMS Kt and Ke
		C(3/20/06)	Add # of poles
		D(4/6/06)	Sine SI Ke values corrected
		E(2/20/07)	Add C6 and D3 winding
		F(5/07/07)	Reconfigured speed/torque

RPM	Trated Nm	Peak Voltage	Peak Current	RMS Current	Watts
0	4.845	21.5	13.79	9.75	222
300	4.821	36.4	13.72	9.70	398
600	4.791	51.3	13.63	9.64	572
1200	4.711	80.9	13.41	9.48	907
1800	4.605	110.4	13.10	9.26	1221
2400	4.471	139.8	12.72	8.99	1510
3000	4.306	169.1	12.25	8.66	1766
3600	4.108	198.2	11.69	8.27	1983
4200	3.871	227.2	11.02	7.79	2146
4800	3.590	255.9	10.22	7.23	2247
5400	3.255	284.4	9.26	6.55	2266
6000	2.847	312.6	8.10	5.73	2182

Rated Speed	Rated Torque
5400	3.3
Rated watts 1844	

SINUSOIDAL DRIVE

ENTER DRIVE LETTER BELOW(S for Sine, T for Trap)

s

ENTER UNIT LETTER BELOW(M for SI, E for English)

m

SELECT WINDING FROM DROP DOWN LIST

Ke = C6(Ke = 34 Vpk/krpm)

CHECKED:		SD		
all values at 25 deg c unless stated otherwise				
TORQUE & CURRENT AT 40 Deg C AMBIENT				
^SPECIFICATIONS				
Symbol	Units	NOM	MIN	MAX
Tpk Torque,peak stall	Nm			12.0
Tc Torque,continuous stall	Nm	5.07	4.56	5.58
Ktp Torque sensitivity (L TO L)	Nm/Apeak	0.281	0.253	0.309
Kt Torque sensitivity (L TO L)	Nm/Arms	0.398	0.358	0.438
Ra Armature resistance (L TO L)	ohms	.44	0.37	0.51
La Armature inductance (L TO L)	millihenry	2.3	1.61	2.99
Ip Amps at Tpk	Apeak	42.6	38.3	46.9
Isp Amps at Tc stall	Apeak	21.20	19.08	23.32
Is Amps at Tc stall	Arms	14.99	13.49	16.49
Ke _p Back EMF constant	Vpeak/Krpm	34.00	30.60	37.40
Ke _r Back EMF constant	Vrms/Krpm	24.05	21.65	26.46
Ke _p Back EMF constant	Vpeak/rad/sec	0.325	0.253	0.309
Ke _r Back EMF constant	Vrms/rad/sec	0.230	0.207	0.253
Ep Volts @ Tpk	Vpeak	18.74		
Fi Viscous friction	Nm/Krpm	0.031		
Tf Static friction torque	Nm	0.034		
Ec volts @ Tc	Vpeak	13.992		
Jm Moment of inertia	Kg-cm ²	2.37288		
Tm Time constant,mech	milliseconds	0.99		
Te Time constant,elect	milliseconds	5.23		
Rth Thermal resistance	deg C/watt	0.51		
Tth Time constant,thermal	minutes	25		
Oa Max armature temp	deg C			155
Km Figure of Merit	Nm/(amp-ohm)	0.424		
Nls Max operating speed	rpmmax			6000
# of motor poles		8		
Wt weight	Kg	4.9		

MODE/NUMBER

T1101 C6(Ke = 34 Vpk/krpm)		DRAWN:	AR
STD	CUST	APPROVED:	
YES		SD	
T1101			
MOTOR IS MOUNTED ON A 304.8 mmx304.8 mmx12.7 mm ALUMINUM PLATE IN A 40 DEG.C AMBIENT			
SPEED/ TORQUE CURVE SHOWN IS RATED. TYPICAL VALUES ARE WITH IN +/- 10% OF RATING			
OTHER SPECIFICATIONS			
		REV(Dt)	Description
		A(11/11/05)	Initial Release
		B(2/10/06)	Add RMS Kt and Ke
		C(3/20/06)	Add # of poles
		D(4/6/06)	Sine SI Ke values corrected
		E(2/20/07)	Add C6 and D3 winding
		F(5/07/07)	Reconfigured speed/torque

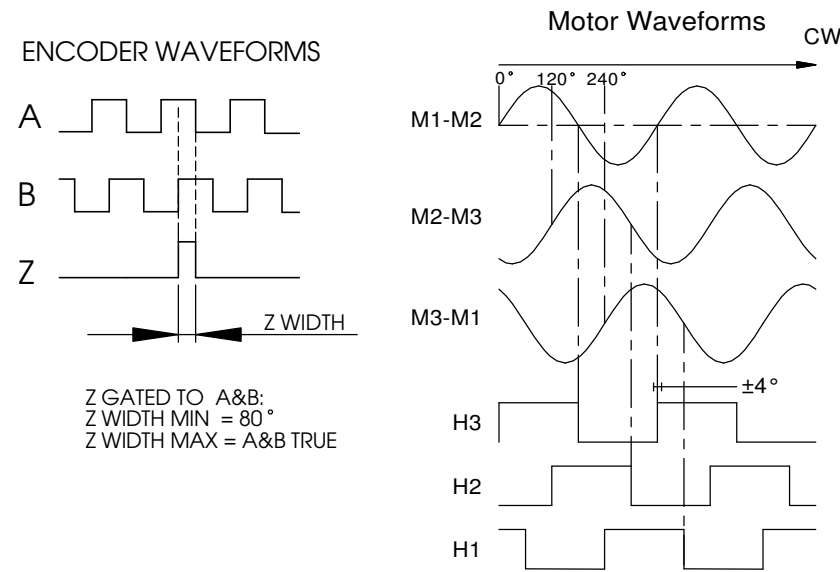
SINUSOIDAL DRIVE

RPM	Trated Nm	Peak Voltage	Peak Current	RMS Current	Watts
0	5.066	14.0	21.20	14.99	222
300	5.042	24.1	21.10	14.92	407
600	5.011	34.2	20.97	14.83	588
1200	4.928	54.4	20.62	14.58	939
1800	4.818	74.5	20.16	14.26	1270
2400	4.678	94.5	19.58	13.85	1574
3000	4.507	114.4	18.86	13.34	1843
3600	4.301	134.3	18.00	12.73	2069
4200	4.054	154.0	16.97	12.00	2241
4800	3.762	173.6	15.74	11.13	2347
5400	3.411	193.0	14.27	10.09	2370
6000	2.986	212.3	12.50	8.84	2286

Rated Speed	Rated Torque
5400	3.4
Rated watts 1932	

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
A	DR8318	RELEASED	11/1/06	T.M.
B	ECN3230	ADDED MTR CONFIG AND FRAME NOTES	07/03/07	J.S.

Clockwise rotation, viewed from the motor shaft, results in these waveforms.

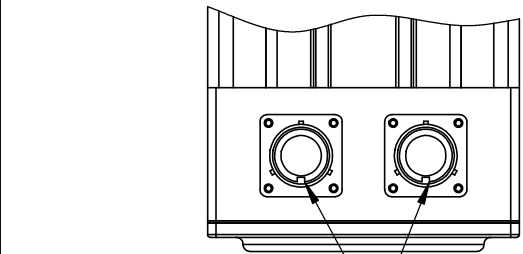


ENCODER CONN WIRING CODE	
FROM	TO PIN
OUTPUT A	A
OUTPUT A'	B
OUTPUT B	C
OUTPUT B'	D
OUTPUT Z	E
OUTPUT Z'	F
CASE GROUND	G
N/A	H
+ 5 VDC	J
+ 5 VDC	K
COMMON	L
COMMON	M
N/A	N
N/A	P
THERMOSTAT	R
THERMOSTAT	S
OUTPUT W (H1)	T
OUTPUT U (H3)	U
OUTPUT V (H2)	V

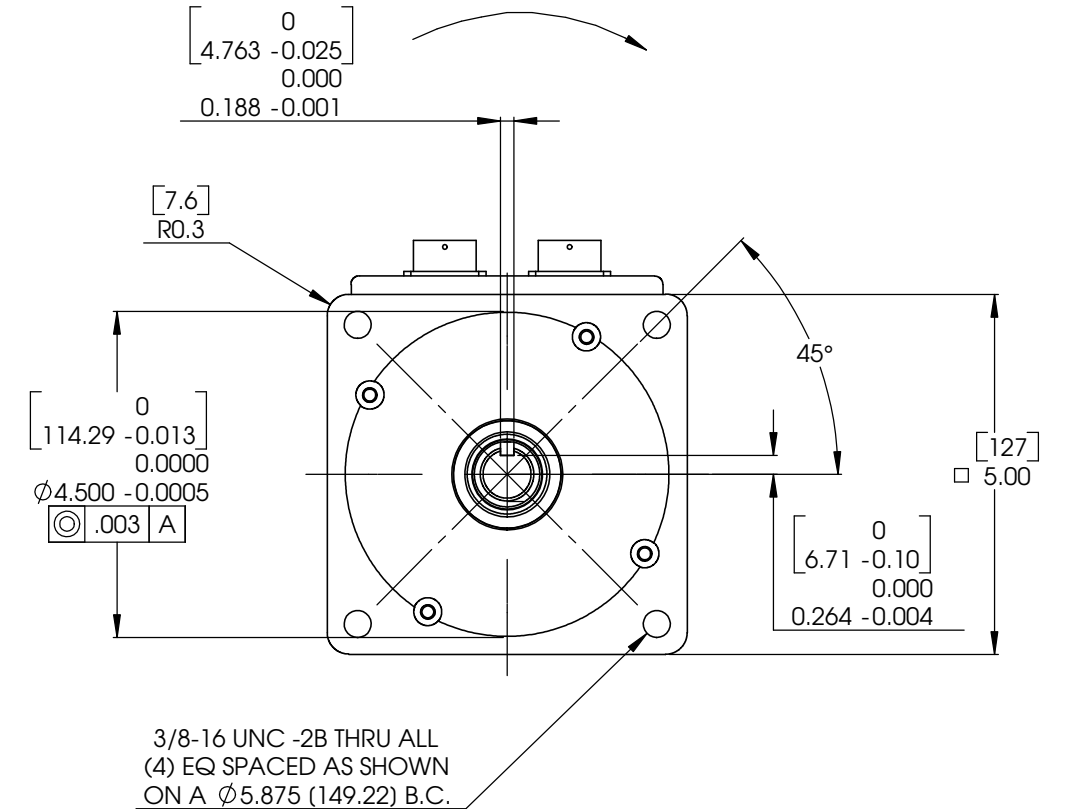
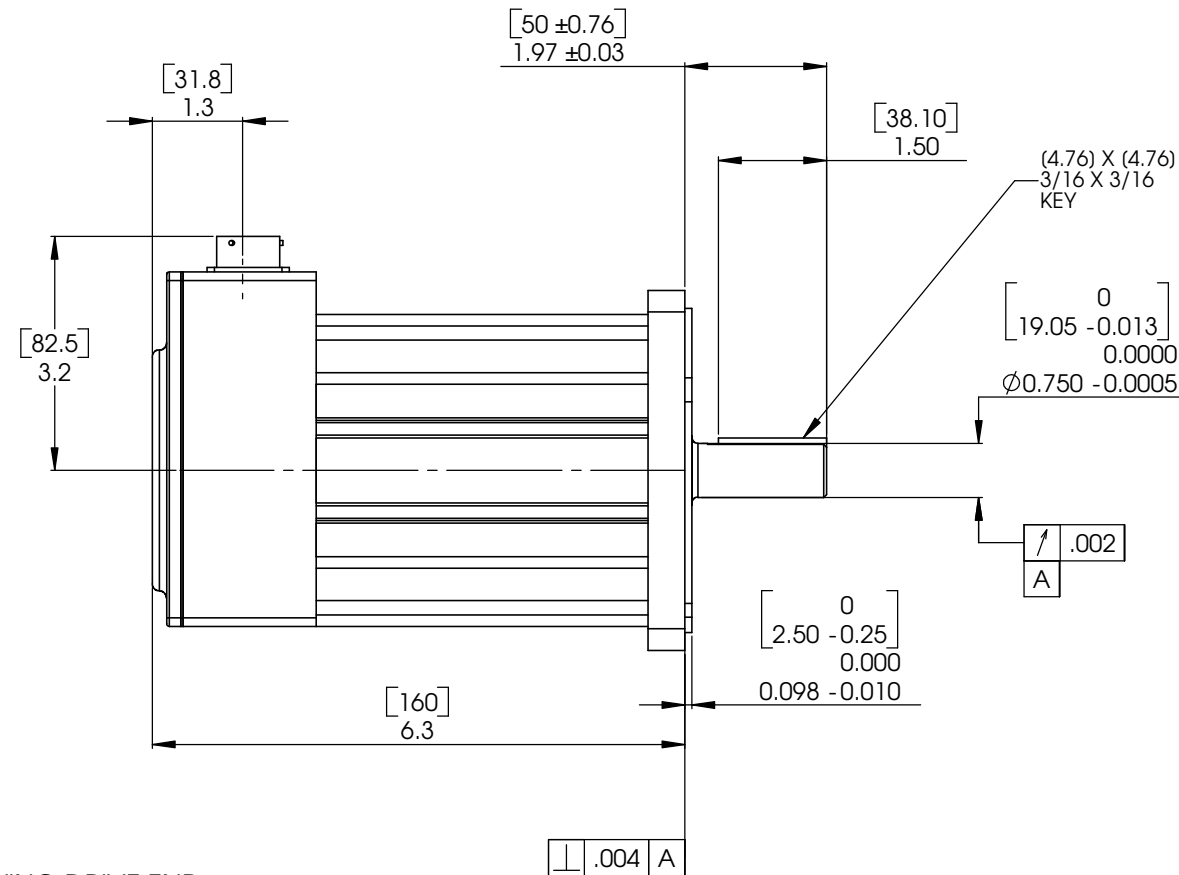
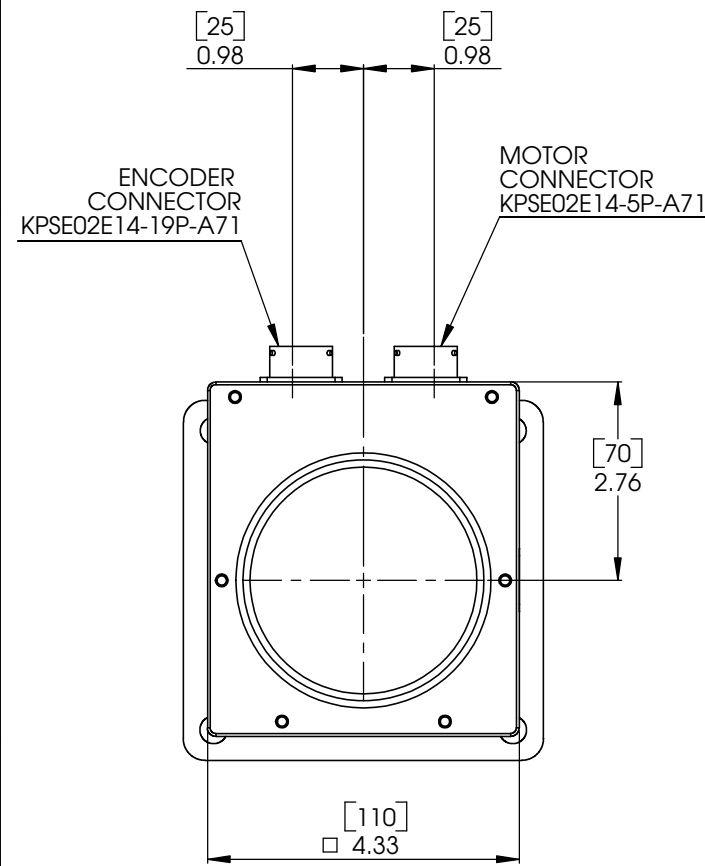
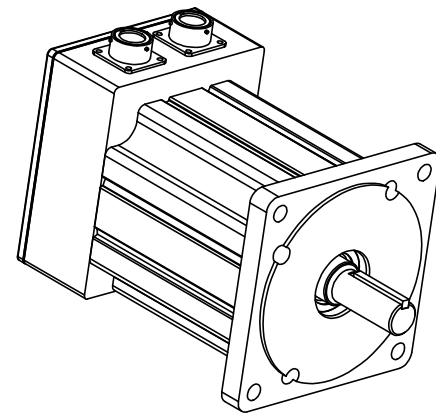
MOTOR CONN. WIRING CODE	
FROM	TO PIN
MOTOR M1	A
MOTOR M2	B
MOTOR M3	C
CASE	D

NOTE:
TEMPERATURE SENSOR CONTACTS: NORMALLY CLOSED
MAX AMPS: 6 AMP
RATED VOLTAGE: 24VDC

B USE MOTOR CONFIGURATION FILE FROM CMC PER MOTOR MODEL NUMBER



POLARIZATION KEY TOWARDS REAR SIDE OF MOTOR



3/8-16 UNC -2B THRU ALL
(4) EQ SPACED AS SHOWN
ON A Ø5.875 (149.22) B.C.

NOTES:

1. ROTATION: CLOCKWISE MOTOR ROTATION VIEWING DRIVE END OCCURS WHEN PHASE A LEADS PHASE B, PHASE B LEADS PHASE C.
2. THE INDEX PULSE OCCURS WHEN FACING THE MOTOR, THE SHAFT KEYWAY IS ORIENTED 90° ± 10° CLOCKWISE (MECHANICAL) FROM CONNECTORS.

B FRAME: T1101 WITH NEMA 56 FLANGE

DIMENSIONS IN BRACKETS (DUAL) ARE IN MILLIMETERS

NOTICE Information contained herein is the sole property of Cleveland Motion Controls, Torque Systems Division. This may not be reproduced, copied or traced in any manner in part or whole without the written permission of Cleveland Motion Controls, Torque Systems Division.	MILLIMETERS (mm) TOLERANCES UNLESS OTHERWISE SPECIFIED X ±0.25 XX ±0.25 XXX ±0.300	APPLICATION NEXT ASY USED ON 110mm	 Cleveland Motion Controls An Ingersoll Rand Company Torque Systems Division	
	THIRD ANGLE PROJECTION 	ANGLES UNLESS OTHERWISE SPECIFIED ±0.30		DRAWN T. MEZHER 1/29/07
TOLERANCES IN MILLIMETERS (mm) UNLESS OTHERWISE SPECIFIED H7/g6 and H8/g6 per ASME Y14.5M-1994	FINISH N/A	CHECKED APPROVED	SEE DWG. NO. 32030-050	REV. B

CAD GENERATED DRAWING.
DO NOT MANUALLY UPDATE

CAD FILE: 32030-050.SUDRW

SHEET 1 OF 1

ENTER DRIVE LETTER BELOW(S for Sine, T for Trap)

s

ENTER UNIT LETTER BELOW(M for SI, E for English)

m

SELECT WINDING FROM DROP DOWN LIST

Ke = D3(Ke = 47 Vpk/krpm)

CHECKED: SD		all values at 25 deg c unless stated otherwise		
		TORQUE & CURRENT AT 40 Deg C AMBIENT		
^SPECIFICATIONS				
Symbol	Units	NOM	MIN	MAX
Tpk Torque,peak stall	Nm			12.0
Tc Torque,continuous stall	Nm	4.98	4.48	5.48
Ktp Torque sensitivity (L TO L)	Nm/Apeak	0.389	0.350	0.428
Kt Torque sensitivity (L TO L)	Nm/Arms	0.550	0.495	0.605
Ra Armature resistance (L TO L)	ohms	.87	0.74	1.00
La Armature inductance (L TO L)	millihenry	4.4	3.08	5.72
Ip Amps at Tpk	Apeak	30.8	27.7	33.9
Isp Amps at Tc stall	Apeak	15.08	13.57	16.59
Is Amps at Tc stall	Arms	10.66	9.59	11.73
Ke _p Back EMF constant	Vpeak/Krpm	47.00	42.30	51.70
Ke _r Back EMF constant	Vrms/Krpm	33.24	29.92	36.56
Ke _l Back EMF constant	Vpeak/rad/sec	0.449	0.350	0.428
Ke _r Back EMF constant	Vrms/rad/sec	0.318	0.286	0.350
Ep Volts @ Tpk	Vpeak	26.80		
Fi Viscous friction	Nm/Krpm	0.031		
Tf Static friction torque	Nm	0.034		
Ec volts @ Tc	Vpeak	19.679		
Jm Moment of inertia	Kg-cm ²	2.37288		
Tm Time constant,mech	milliseconds	1.02		
Te Time constant,elect	milliseconds	5.06		
Rth Thermal resistance	deg C/watt	0.51		
Tth Time constant,thermal	minutes	25		
Oa Max armature temp	deg C		155	
Km Figure of Merit	Nm/(amp-ohm)	0.417		
Nls Max operating speed	rpmmax			6000
# of motor poles		8		
Wt weight	Kg	4.9		

MODE/NUMBER

	T1101 D3(Ke = 47 Vpk/krpm)	DRAWN:	AR
	STD	CUST	APPROVED:
	YES		SD

T1101

MOTOR IS MOUNTED ON A 304.8 mmx304.8 mmx12.7 mm ALUMINUM PLATE IN A 40 DEG.C AMBIENT

SPEED/ TORQUE CURVE SHOWN IS RATED. TYPICAL VALUES ARE WITH IN +/- 10% OF RATING

OTHER SPECIFICATIONS	
REV(Dt)	Description
A(11/11/05)	Initial Release
B(2/10/06)	Add RMS Kt and Ke
C(3/20/06)	Add # of poles
D(4/6/06)	Sine SI Ke values corrected
E(2/20/07)	Add C6 and D3 winding
F(5/07/07)	Reconfigured speed/torque

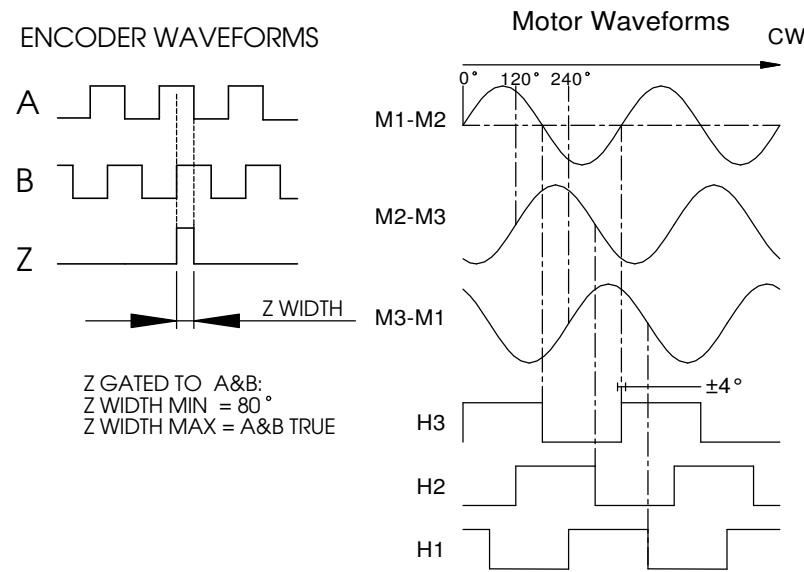
RPM	Trated Nm	Peak Voltage	Peak Current	RMS Current	Watts
0	4.981	19.7	15.08	10.66	222
300	4.957	33.7	15.00	10.61	404
600	4.926	47.7	14.91	10.54	581
1200	4.845	75.5	14.66	10.37	927
1800	4.736	103.3	14.33	10.13	1250
2400	4.598	131.0	13.92	9.84	1549
3000	4.430	158.5	13.41	9.48	1813
3600	4.226	185.9	12.79	9.04	2033
4200	3.984	213.1	12.06	8.53	2205
4800	3.696	240.2	11.19	7.91	2308
5400	3.351	267.0	10.14	7.17	2329
6000	2.933	293.6	8.88	6.28	2246

Rated Speed	Rated Torque
5400	3.4
Rated watts 1898	

SINUSOIDAL DRIVE

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
A	DR8384	RELEASED	1/29/07	T.M.
B	ECN3230	LABEL REMOVED FROM DRG, NOTES ADDED	07/03/07	J.S.

Clockwise rotation, viewed from the motor shaft, results in these waveforms.

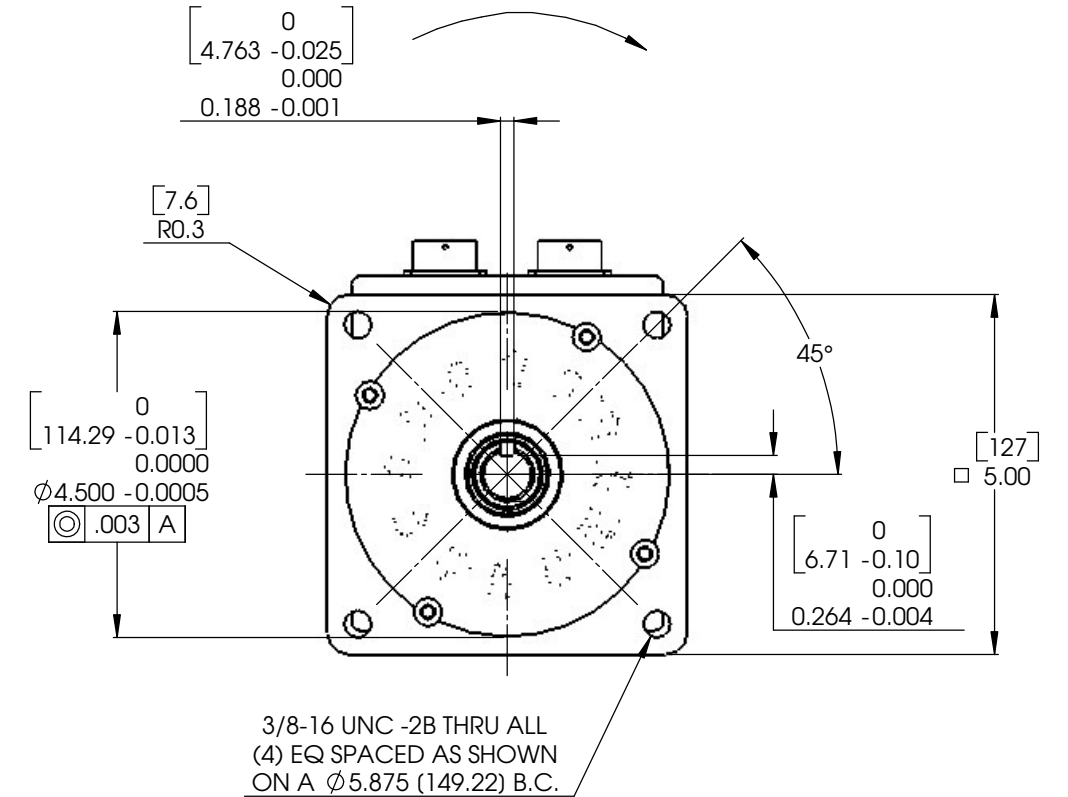
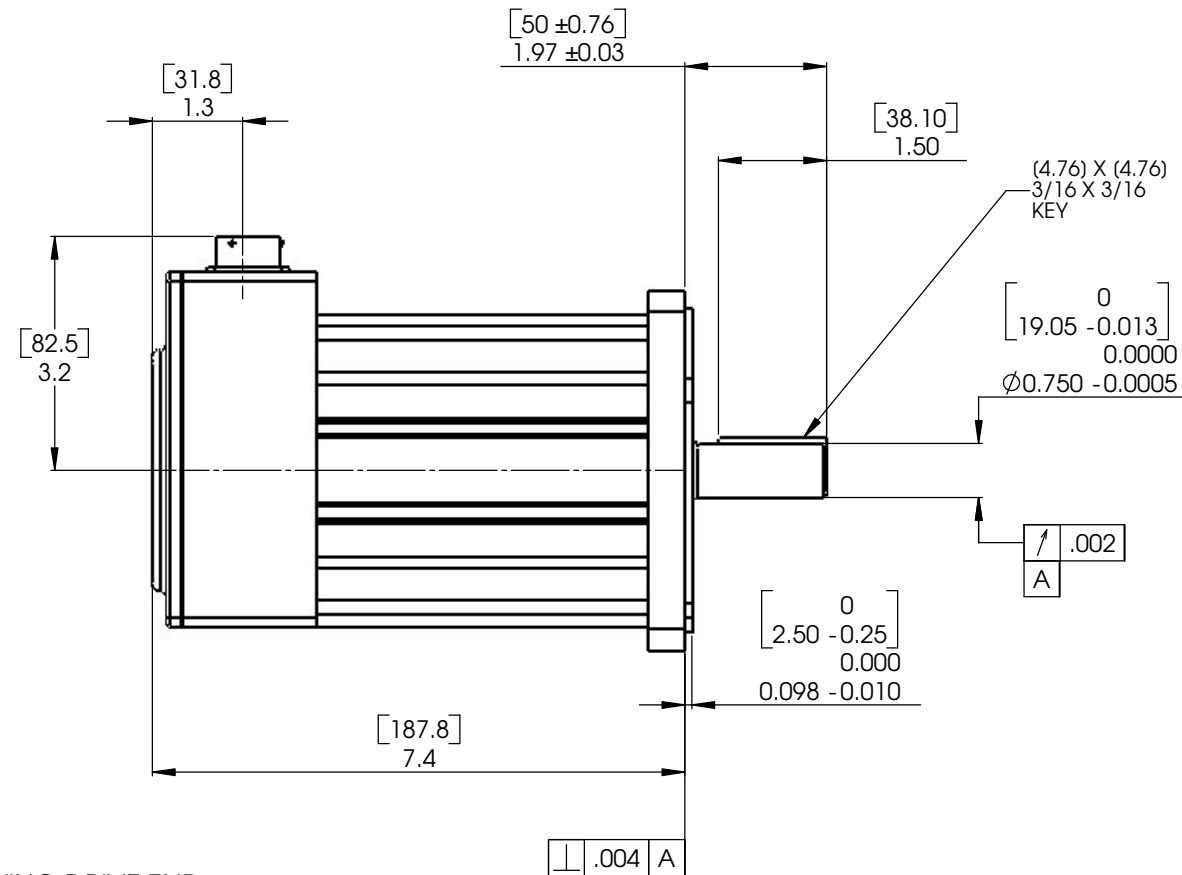
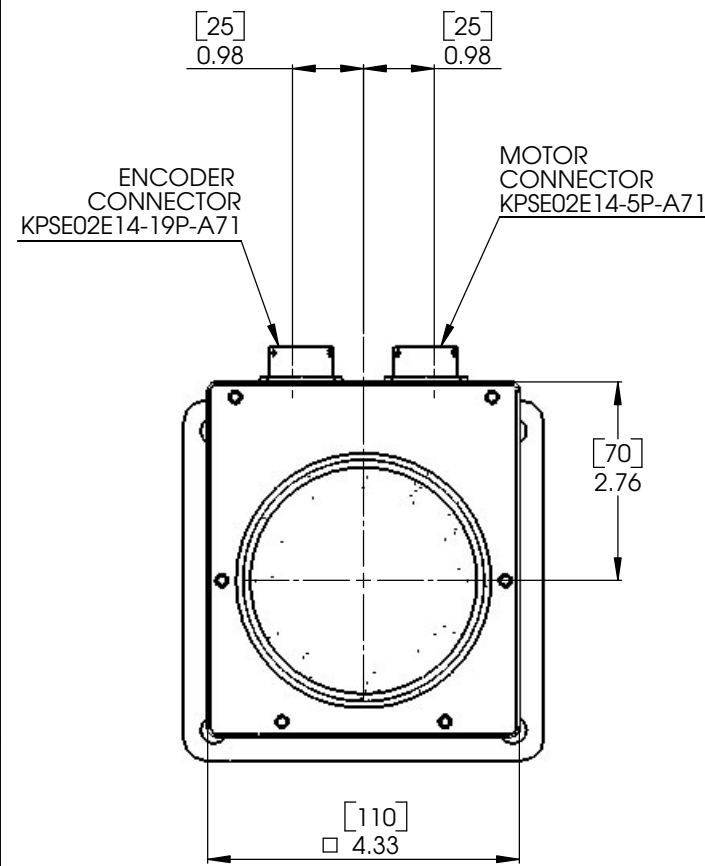
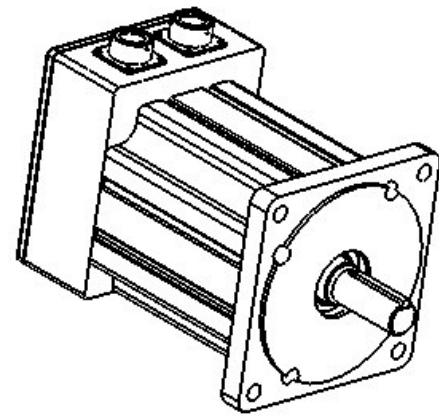
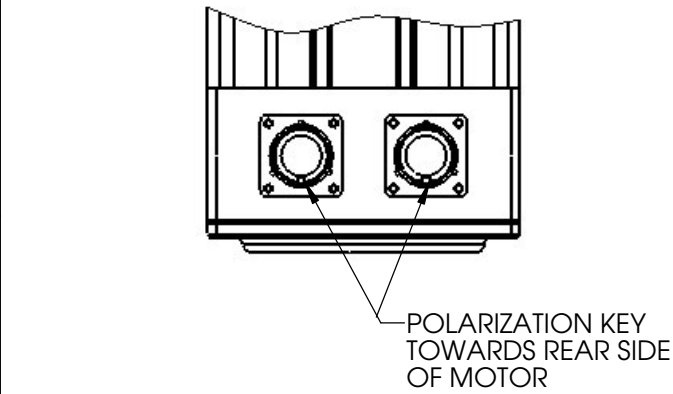


ENCODER CONN WIRING CODE	
FROM	TO PIN
OUTPUT A	A
OUTPUT A'	B
OUTPUT B	C
OUTPUT B'	D
OUTPUT Z	E
OUTPUT Z'	F
CASE GROUND	G
N/A	H
+ 5 VDC	J
+ 5 VDC	K
COMMON	L
COMMON	M
N/A	N
N/A	P
THERMOSTAT	R
THERMOSTAT	S
OUTPUT W (H1)	T
OUTPUT U (H3)	U
OUTPUT V (H2)	V

MOTOR CONN. WIRING CODE	
FROM	TO PIN
MOTOR M1	A
MOTOR M2	B
MOTOR M3	C
CASE	D

NOTE:
TEMPERATURE SENSOR CONTACTS: NORMALLY CLOSED
MAX AMPS: 6 AMP
RATED VOLTAGE: 24VDC

B USE MOTOR CONFIGURATION FILE FROM CMC PER MOTOR MODEL NUMBER



NOTES:

1. ROTATION: CLOCKWISE MOTOR ROTATION VIEWING DRIVE END OCCURS WHEN PHASE A LEADS PHASE B, PHASE B LEADS PHASE C.
2. THE INDEX PULSE OCCURS WHEN FACING THE MOTOR, THE SHAFT KEYWAY IS ORIENTED 90° ± 10° CLOCKWISE (MECHANICAL) FROM CONNECTORS.

B FRAME: T1102 with nema 56 flange

DIMENSIONS IN BRACKETS (DUAL) ARE IN MILLIMETERS

NOTICE		MILLIMETERS (mm) TOLERANCES UNLESS OTHERWISE SPECIFIED		APPLICATION	
Information contained herein is the sole property of Cleveland Motion Controls, Torque Systems Division. This may not be reproduced, copied or traced in any manner in part or whole without the written permission of Cleveland Motion Controls, Torque Systems Division.		X	+/- 0.25	NEXT ASY	USED ON
THIRD ANGLE PROJECTION		XX	+/- 0.25		110mm
Tolerances in millimeters from first angle are as specified. Interpret per ASME Y14.5M-1994.		XXX	+/- 0.100	CHECKED	1/29/07
		MATERIAL	N/A	APPROVED	
		FINISH	N/A		

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE.

CMC Cleveland Motion Controls An Ingersoll Rand Company Torque Systems Division	
TITLE: OUTLINE N-5637, N-5647 ELECTROCRRAFT REPLACEMENT	
SIZE: D	DWG. NO.: 32030-052
SCALE: 1:1	REV: B

CAD FILE: 32030-052.SUDDRW

ENTER DRIVE LETTER BELOW (S for Sine, T for Trap)

ENTER BUS VOLT BELOW(Vdc)

s

325

ENTER UNIT LETTER BELOW (M for SI, E for English)

m

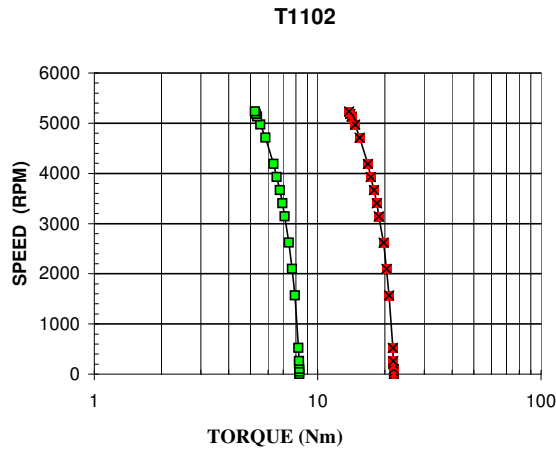
SELECT WINDING FROM DROP DOWN LIST

Ke = E0(Ke = 60 Vpk/krpm)

CHECKED:		SD			
all values at 25 deg c unless stated otherwise					
TORQUE & CURRENT AT 40 Deg C AMBIENT					
^SPECIFICATIONS					
Symbol	Units	NOM	MIN	MAX	
Tpk Torque,peak stall	Nm			21.9	
Tc Torque,continuous stall	Nm	8.29	7.46	9.12	
Ktp Torque sensitivity (L TO L)	Nm/Apeak	0.496	0.446	0.546	
Kl Torque sensitivity (L TO L)	Nm/Arms	0.702	0.632	0.772	
Ra Armature resistance (L TO L)	ohms	0.58	0.49	0.67	
La Armature inductance (L TO L)	millihenry	3.6	2.52	4.68	
Ip Amps at Tpk	Apeak	44.2	39.8	48.6	
Isp Amps at Tc stall	Apeak	19.66	17.69	21.63	
Is Amps at Tc stall	Arms	13.90	12.51	15.29	
Ke _p Back EMF constant	Vpeak/Krpm	60.00	54.00	66.00	
Ke Back EMF constant	Vrms/Krpm	42.43	38.19	46.67	
Ke _p Back EMF constant	Vpeak/rad/sec	0.573	0.446	0.546	
Ke Back EMF constant	Vrms/rad/sec	0.405	0.365	0.446	
Ep Volts @ Tpk	Vpeak	25.64			
Fi Viscous friction	Nm/Krpm	0.350			
Tf Static friction torque	Nm	0.500			
Ec volts @ Tc	Vpeak	17.104			
Jm Moment of inertia	Kg-cm2	4.29379			
Tm Time constant,mech	milliseconds	0.76			
Te Time constant,elect	milliseconds	6.21			
Rth Thermal resistance	deg C/watt	0.45			
Tth Time constant,thermal	minutes	28			
Oa Max armature temp	deg C			155	
Km Figure of Merit	Nm/(amp-ohm)	0.65			
Nls Max operating speed	rpmmax			5237	
# of motor poles		8			
Wt weight	Kg	6.7			

MODE NUMBER

T1102	E0(Ke = 60 Vpk/krpm)	DRAWN:	AR
	STD	CUST	APPROVED:
	YES		SD



RPM	Rated Nm	Peak Voltage	Peak Current	RMS Current	Watts
0	8.290	17.1	19.66	13.90	252
262	8.249	32.7	19.56	13.83	516
524	8.199	48.4	19.44	13.75	776
1047	8.071	79.5	19.14	13.53	1280
1571	7.902	110.6	18.74	13.25	1759
2095	7.691	141.6	18.24	12.90	2203
2619	7.434	172.5	17.63	12.47	2603
3142	7.128	203.2	16.90	11.95	2945
3666	6.766	233.9	16.04	11.34	3223
4190	6.338	264.5	15.03	10.63	3420
4713	5.834	294.8	13.83	9.78	3512
5237	5.231	325.0	12.40	8.77	3475

Rated Speed	Rated Torque
4713	5.8
Rated watts	2884

MOTOR IS MOUNTED ON A 304.8 mmx304.8 mmx12.7 mm ALUMINUM PLATE IN A 40 DEG.C AMBIENT
 SPEED/ TORQUE CURVE SHOWN IS RATED. TYPICAL VALUES ARE WITH IN +/- 10% OF RATING

OTHER SPECIFICATIONS

SINUSOIDAL DRIVE

REV(Dt)	Description
A(11/11/05)	Initial Release
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C(3/20/06)	Add # of poles
D(4/6/06)	Sine SI Ke values corrected
E(2/20/07)	Add G3 winding
F(5/07/07)	Reconfigured speed/torque

