



DESCRIPTION:

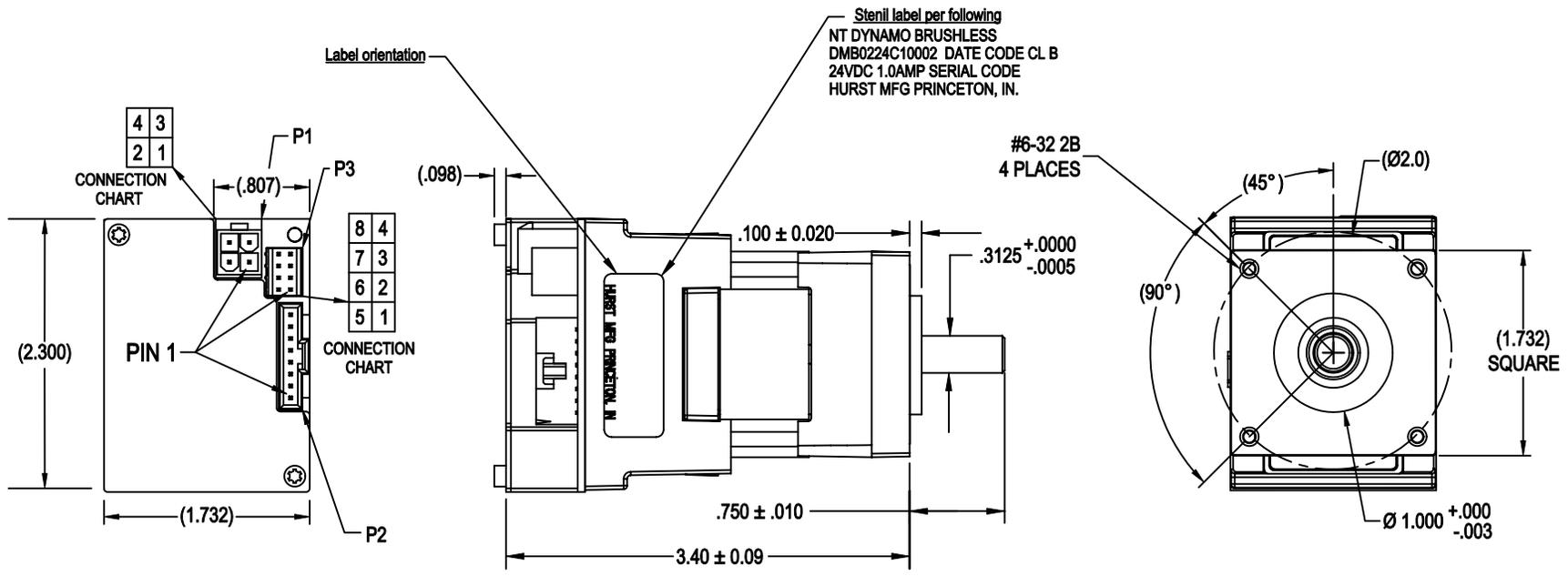
# SIZE 17 MOTOR WITH EXTERNAL MOTOR MODULE 0.75 INCH STACK

**B** PART NO.  
SIZE DMB0224C10002  
SHEET 1 OF 2

SCALE: 1.000 : 1  
DRAFTED: A.Schapker  
DRFT DATE: 02/13/02  
APPROVED:  
APPR DATE:

**TOLERANCES**  
(EXCEPT AS SPECIFIED)  
XXX ± 0.010  
XXXX ± 0.005  
XXXXX ± 0.0005  
ANGLES ± 2°  
Ø WITHIN .005 CONC.  
UNLESS SPECIFIED

REV	ECO #	DATE
A		02/13/03



HALL CONNECTIONS (P2)				POWER CONNECTIONS (P1)	
PIN #	DESCRIPTION	PIN #	DESCRIPTION	PIN #	DESCRIPTION
1	Vs	5	HALL C	1	PHASE C
2	Vs (rtn)	6	BLANK	2	PHASE B
3	HALL B	7	BLANK	3	PHASE A
4	HALL A	8	BLANK	4	FRAME GRND.
ENCODER CONNECTIONS (P3)					
1	+5Vs	4	N/C	7	/B
2	A	5	5Vs (rtn)	8	N/C
3	B	6	/A		

POWER CONNECTION P1: (Molex # 39-29-3046 Mini-Fit Jr. 4 pin)  
 HALL CONNECTIONS P2: (Molex # 70543-0007 C-Grid SL Connector 8 pin)  
 ENCODER CONNECTIONS P3: (FCI Connect #69168-108 Vertical Latching System 8 Pin 4X2)

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# Sample Motor Data Sheet

Date: 2/14/02

Customer	Microchip	Model Number	DMB0224C10002
		Serial #	12482

L-L Resistance ( $R_{lm}$ ) Ohms :	4.03	Electrical Time Constant ( $t_e$ ) mSec. :	1.14
L-L Inductance ( $L_{lm}$ ) mH at 1Khz :	4.60	Mechanical Time Constant ( $t_m$ ) mSec. :	3.74
Torque Constant ( $K_t$ ) oz.in./Amp :	9.79	Thermal Resistance ( $R_{th}$ ) °C/watt	4.78
Voltage Constant ( $K_e$ ) $V_{peak}/K_{RPM}$ :	7.24	Thermal Time Constant ( $t_{th}$ ) min. :	16
Amb. Temp. (°C) :	22.7	Rotor Inertia ( $J_r$ ) oz-in-s <sup>2</sup> :	0.000628
		Stack Length:	0.75

**Notes:**

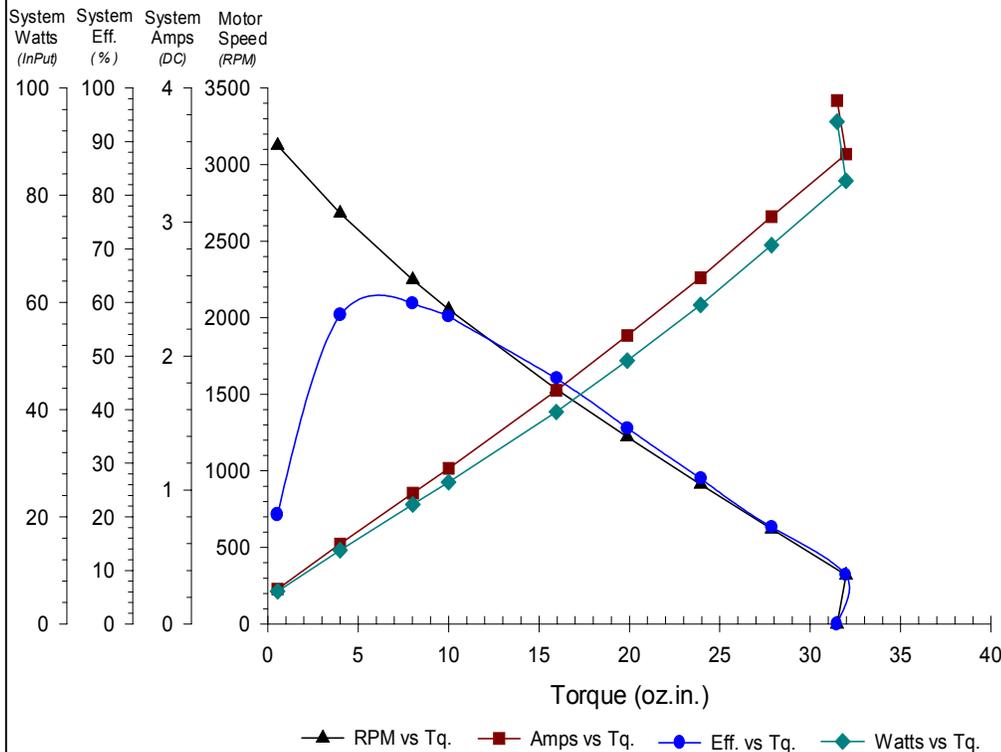
**Speed / Torque Test Data -Control Input set at 100% duty cycle.**

Load	Volts (DC)	Amps (DC)	Watts (DC)	Speed (RPM)	Torque (oz.in.)	Output (watts)	Output (HP)	Eff. (%)	
1	24.01	0.26	6.11	3125	0.54	1.25	0.002	20.4	
2	24.01	0.60	13.76	2683	4.00	7.94	0.011	57.7	
3	24.01	0.98	22.29	2248	8.02	13.34	0.018	59.9	
4	24.01	1.16	26.46	2054	10.00	15.20	0.020	57.4	Max Continuous Rating
5	24.02	1.74	39.56	1534	15.96	18.12	0.024	45.8	
6	24.02	2.15	49.16	1222	19.88	17.98	0.024	36.6	
7	24.03	2.59	59.55	913	23.94	16.18	0.022	27.2	
8	24.03	3.04	70.70	621	27.86	12.80	0.017	18.1	
9	24.04	3.51	82.69	319	31.98	7.55	0.010	9.1	
10	24.04	3.91	93.72	0	31.48	0.00	0.000	0.0	

**Special Load Points**

1									
2									

**Sample Motor Test Data**



This motor is intended for sampling and customer approval only. No application fitness approval is implied, as that can only be determined by the customer. These data represent performance of a single sample motor. These values are not to be construed as guaranteed values.



## EXTERNAL CONTROL MODULE DATA SHEET

**Description:** The External Control Module simplifies the connection of an external motor drive to the Dynamo motor by providing the user with a standard set of hall signals, numerous encoder options, and a high current connector for the motor phase windings. The module is compatible with external motor drives using a 10 to 48Vdc power supply. The External Control Module provides a standard system for rotor position sensing required by many brushless motor drives. Three hall sensors spaced 120 electrical degrees apart, sense a magnetic disk, which is synchronized to the rotor of the motor. The hall signals can be used to provide inexpensive speed feedback to the motor drive, or for more precise control a wide array of integral two channel quadrature encoder options are available. The quadrature nature of an encoder allows the user to determine the direction of motor rotation as well as speed.

**Environment:** The NT Dynamo uses a TENV (totally enclosed non-ventilated) non-gasket construction. Installation and operating conditions should not exceed the recommended values for humidity and temperature. Contact the Hurst engineering department regarding any special installation issues you may have regarding vapors, oils or dust.

**Storage Temp.: 32-158°F (0-70°C) Humidity: 90% Max. Non-condensing Operating Temp.: 32-104°F (0-40°C)**

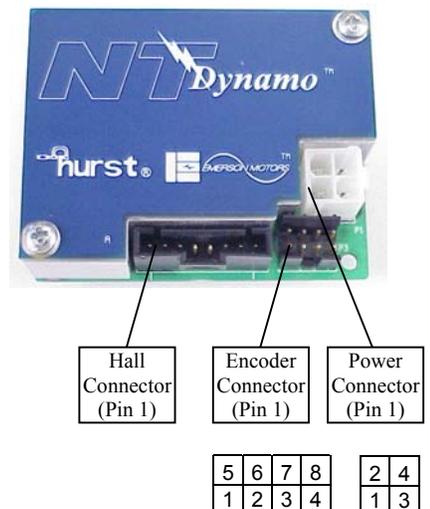
**Power:** Power to the motor windings is via the four pin connector. A regulated DC supply must be provided for the encoder and hall devices. Observe the correct polarity when making these connections. For maximum flexibility and noise immunity, the hall and encoder power supplies are separated. Excessive amounts of voltage ripple can cause shortened product life.

**Motor Windings:**  
**Encoder:**  
**Halls:**

**Minimum DC Voltage: 10Vdc**  
**Minimum DC Voltage: 4.75Vdc**  
**Minimum DC Voltage: 4.2Vdc**

**Maximum DC Voltage: 48Vdc**  
**Maximum DC Voltage: 5.25Vdc**  
**Maximum DC Voltage: 24Vdc**

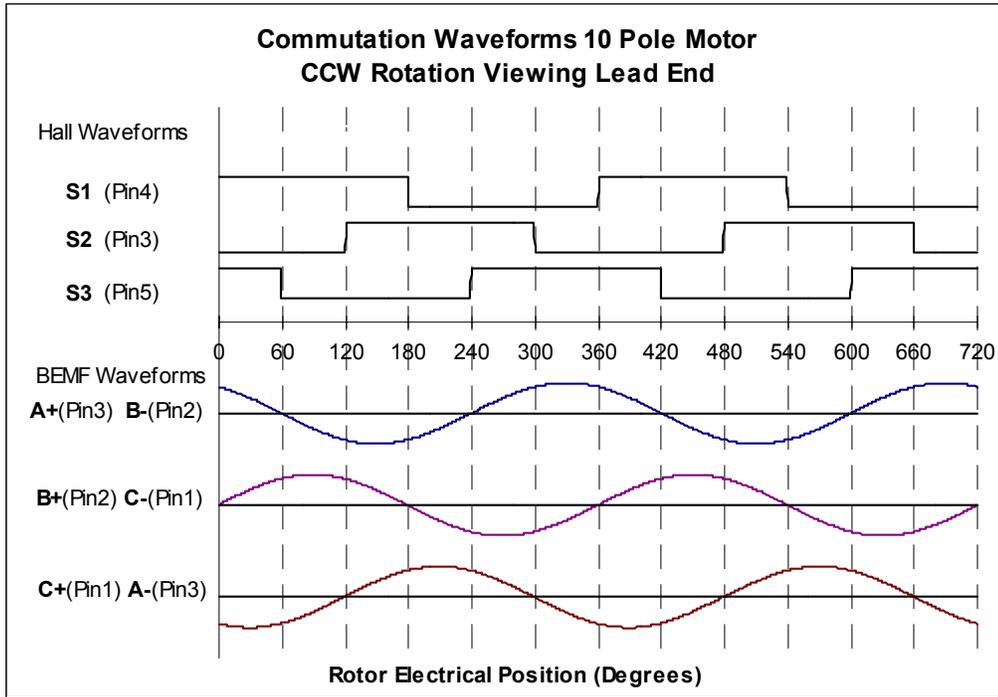
Connector	Pin #	Function	Mating Connector	Mating Terminal	Recommended Wire Size	Cable Length
Power	1	Phase C	Molex 39-01-2040	Molex 39-00-0039	22 AWG	30 ft. Max <sup>1</sup>
	2	Phase B				
	3	Phase A				
	4	Gnd				
Hall	1	V <sub>s</sub>	Molex 50-57-9408	Molex 16-02-0103	22 AWG	30 ft. Max <sup>1</sup>
	2	V <sub>s(RTN)</sub>				
	3	Hall S2				
	4	Hall S1				
	5	Hall S3				
	6	N/A				
	7	N/A				
	8	N/A				
Encoder	1	+5V <sub>s</sub>	FCI 65846-016	FCI 48236-000	22 AWG	30 ft. Max <sup>1</sup>
	2	Encoder A				
	3	Encoder B				
	4	Encoder I				
	5	+5V <sub>s(RTN)</sub>				
	6	Encoder /A				
	7	Encoder /B				
	8	Encoder /I				



**Notes**

- 1) Longer cable runs may require a larger wire size to maintain the correct input voltage level and a signal amplifier / conditioner to avoid erroneous signal values. For cable runs longer than 3 ft, shielded wire is recommended.

**Commutation:**



**Encoder:**

The drive may contain an optional shaft mounted optical encoder. The encoder outputs two or four quadrature signals from which direction and speed can be determined. These outputs can be used by an external drive to close the speed loop.

**For More Information Visit The Website at [www.hurstmfg.com](http://www.hurstmfg.com) or  
Contact Hurst Engineering at 812-385-2564**