

# SPECIAL PURPOSE HYBRIDS



**O**ur special purpose hybrid step motors include low inertia rotor hybrids for your special applications. The following pages provide technical and application data to simplify your selection process. Features and benefits, ratings and characteristics are provided for NEMA 23 frame sizes.

## Feature

Two Year Warranty

Wide Range of Industry Standard and Special Winding Configurations

Sigma<sup>max</sup>® Flux Focusing Technology

Extensive Selection of Shaft, End Bell, Termination, Encoder, and Splashproof Options

Optional Low Inertia Rotor - NEMA 23 Frame Only

## Benefit

High quality, dependable operation

Match motor performance to your application

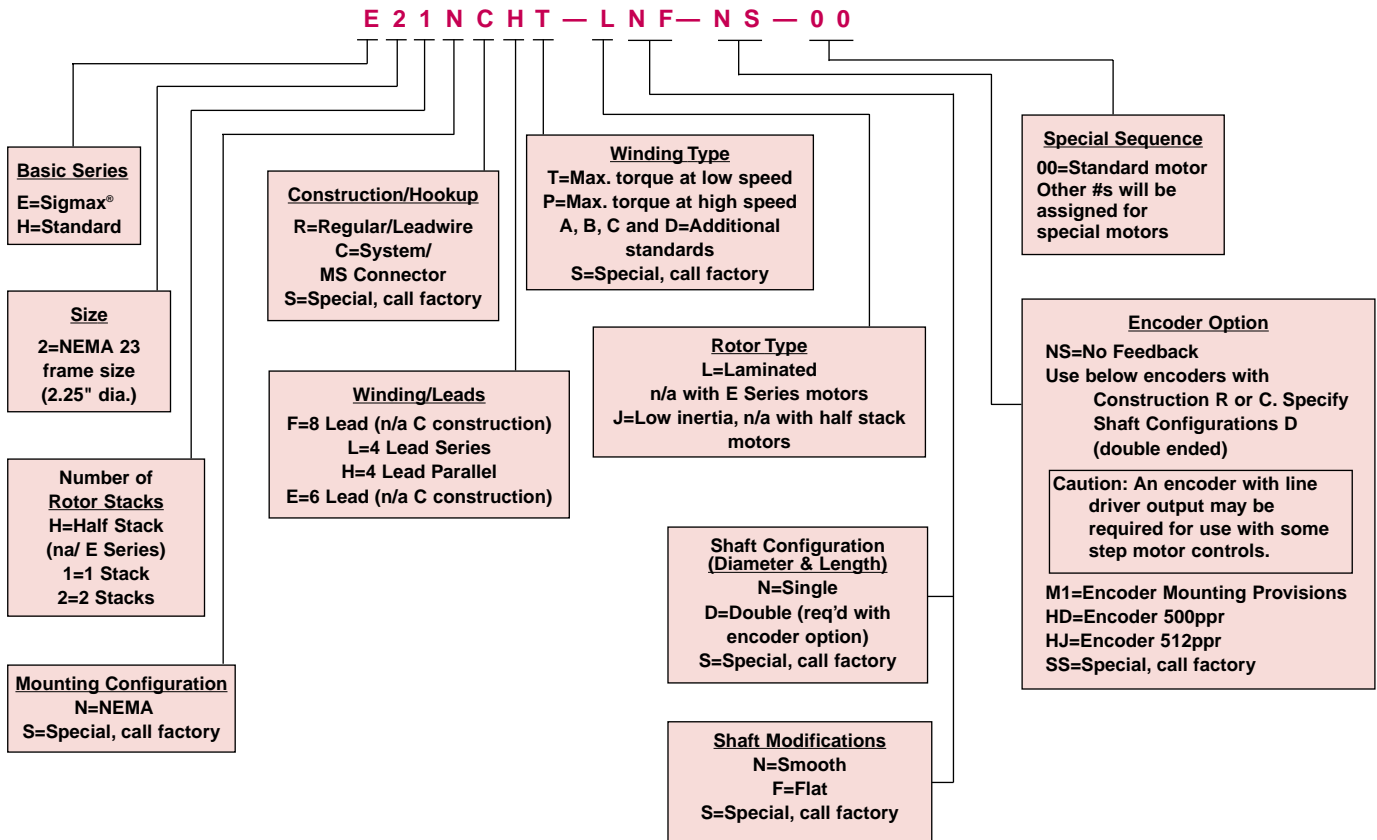
Flux focusing increases torque

An array of options to meet your needs

Produces the highest acceleration rate

## SPECIAL GENERAL PURPOSE—CONVENTIONAL HYBRIDS NEMA 23 FRAME (2.3" Dia.)

### MODEL NUMBER CODE



The example above indicates an E series (Sigma<sup>max</sup>®) NEMA 23 frame motor with one rotor stack. This motor is equipped with an MS connector on the end of a 12 inch cable for power, a bipolar parallel connection, a maximum torque winding and a single ended shaft with a flat.

## HOW TO ORDER

Review the Motor Model Number code to assure that all options are designated. Connections, encoders and phasing diagrams start on page 76. Motor dimensions are on page 60.

## SPECIAL PURPOSE CONVENTIONAL HYBRIDS WITH LOW INERTIA ROTORS E “J” AND H “J” Series



### NEMA 23 FRAME SIZE

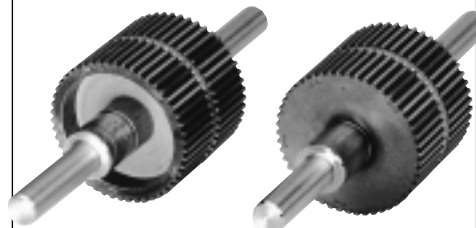
- Unique hollow rotor construction
- Rapid start/stop and acceleration characteristics
- Very high torque to inertia
- Winding configurations for unipolar and bipolar drivers
- Industry standard mounting

These H and E Series motors employ special hollow, low mass rotors to achieve the industry's highest torque to inertia ratios.

Use low inertia motors for applications requiring exceptionally rapid start/stop, point to point positioning, and acceleration capabilities.

This high acceleration capability makes the low inertia motors most effective for operation below 2,000 RPM. See the ratings and characteristics on the following pages to determine whether your application can benefit from low inertia step motors.

Both standard hybrid and Sigmax® technology motors are offered to meet a broad range of performance requirements.



Low inertia rotor

Standard rotor

### ROTOR INERTIA CHARACTERISTICS

Single and double stack motors are available with both standard and low inertia rotors. Choose low inertia to produce the highest acceleration rates possible. Choose standard to generate maximum torque.

# SPECIAL PURPOSE—CONVENTIONAL HYBRIDS WITH LOW INERTIA ROTORS

## NEMA 23 FRAME (2.3" Dia.)—Ratings and Characteristics

Review the Model Number Code, page 73, to assure that all options are designated. Connections, encoders and phasing diagrams start on page 76. Motor dimensions are on page 60. In addition to those below, motors with characteristics for specific performance requirements are offered. Contact factory for more details.

Motor Model Number <sup>△</sup>	Connection <sup>△</sup>			Holding Torque <sup>△</sup> (2 phases on) oz-in (Nm) ±10%	Rated Current/Phase <sup>△</sup> (amps DC)	Phase Resistance (ohms) ±10%	Phase Inductance <sup>△</sup> (mH) Typical	Detent Torque oz-in (Nm)	Thermal Resistance <sup>△</sup> (°C/watt)	Rotor Inertia oz-in-S <sup>2</sup> (kgm <sup>2</sup> x 10 <sup>-3</sup> )	Weight lbs (kg)
	Parallel	Series	Unipolar								
<b>Torque range: 77-108 oz-in. .54-.77 Nm</b>											
E21NXHT-JXX-XX-00	•			108 (0.77)	2.8	0.72	2.2				
<b>SIGMAX®</b> E21NXLT-JXX-XX-00		•		108 (0.77)	1.39	2.8	9.0	4.5		0.0012	1.1
<b>E21 Series</b> E21NXET-JXX-XX-00			•	77 (0.54)	1.97	1.42	2.2	(0.032)	6.0	(0.008)	(0.50)
<b>1 rotor stack</b>											
<b>Torque range: 54-77 oz-in. .38-.54 Nm</b>											
H21NXHT-JXX-XX-00	•			77 (0.54)	2.8	0.72	2.1				
<b>STANDARD</b> H21NXLT-JXX-XX-00		•		77 (0.54)	1.39	2.8	8.4	1.8		0.0012	1.1
<b>H21Series</b> H21NXET-JXX-XX-00			•	54 (0.38)	1.97	1.42	2.1	(0.019)	6	(0.008)	(0.50)
<b>1 rotor stack</b>											
<b>Torque range: 139-196 oz-in. .98-1.39 Nm</b>											
E22NXHT-JXX-XX-00	•			196 (1.39)	5.0	0.33	1.2				
<b>SIGMAX®</b> E22NXLT-JXX-XX-00		•		196 (1.39)	2.5	1.2	4.6	9.2		0.0023	2.0
<b>E22 Series</b> E22NXET-JXX-XX-00			•	139 (0.98)	3.5	0.62	1.2	(0.065)	4.4	(0.016)	(0.91)
<b>2 rotor stacks</b>											
<b>Torque range: 99-141 oz-in. .70-.99 Nm</b>											
H22NXHT-JXX-XX-00	•			141 (0.99)	5.0	0.33	1.3				
<b>STANDARD</b> H22NXLT-JXX-XX-00		•		141 (0.99)	2.5	1.2	5.0	4.4		0.0023	2.0
<b>H22 Series</b> H22NXET-JXX-XX-00			•	99 (0.70)	3.5	0.62	1.3	(0.031)	4.4	(0.016)	(0.91)
<b>2 rotor stacks</b>											

All ratings typical and at 25°C unless otherwise noted.

<sup>△</sup> An "X" in the Model Number Code indicates an undefined option. Colored letter indicates winding. See How to Order and Model Number Code on page 73.

<sup>△</sup> Motor connections are determined by the Windings/Leads designation in the Model Number Code on Page 73. Note that the F designation, although not shown in the above tables, is an 8-lead option...see Terminations, page 76. In addition to the lead wire termination, terminal board and MS connector hookup for parallel, series or unipolar operation is also available.

<sup>△</sup> With rated current applied. Windings at 130°C and motor unmounted and in still air at 40°C (without heat sink).

<sup>△</sup> Windings at 130°C and motor in still air at 40°C (without heat sink). Operation of these motors above rated current may cause demagnetization. Contact factory.

<sup>△</sup> Small signal inductance as measured with impedance bridge at 1kHz, 1 amp.

<sup>△</sup> Thermal resistance measured with motor hanging in still air (unmounted).