

# Moteurs pas à pas série HN/HS

Moteur hybride néma 23, 34, 42 - MAE

[www.rosier.fr](http://www.rosier.fr)



## Stepper Motors

AMETEK Technical & Industrial Products offers a wide range of MAE brand stepper motor solutions. The HY series hybrid stepper motors feature low rotor inertia for maximum possible acceleration. The HN series hybrid stepper motors offer a calculated balance between low rotor inertia and high torque. The HS series hybrid stepper motors are optimized for superior torque characteristics. Additionally, both the HN and HS series feature low detent torque to holding torque ratios to provide smooth operation as well as the fine positioning capability required for microstep operation.

Motors may be customized with value added features including, but not limited to: gearboxes, encoders, shaft details, leadwire-connector assemblies, and more.

All specifications shown are typical at 20° C unless otherwise noted.

### Shaft extensions

All motors can be supplied with single or double ended shaft.

### Rotation

The motor rotation can run clockwise or counterclockwise, depending on the commutation.

### Operating temperature

Ambient operating temperature: -20° C to +40° C.

### Number of leads

Refer to specifications of individual models for standard lead wire configuration.

Motors can be supplied with 4, 6, or 8 leads upon request; however, rated current and torque may be reduced.

### Angular accuracy

Standard angular accuracy is  $\pm 5\%$ . Angular accuracy is defined as the deviation from a theoretical position, in percentage of one step, after any number of steps.

### Holding torque

The typical values of holding torque of the different models are indicated in the data charts. Holding torque is measured with two phases each supplied at the rated current.

### Specifications and approvals

Motors are manufactured according to EN 60034-1: 1995-02. Motors with drive voltage higher than or equal to 120 V are suitable to be fitted on machines equipped with additional insulation or when the motor itself has the grounding through its clamping screws.

Due to thermal considerations, stepper motors cannot always be operated continuously in dynamic conditions at the level of their static rated phase current.

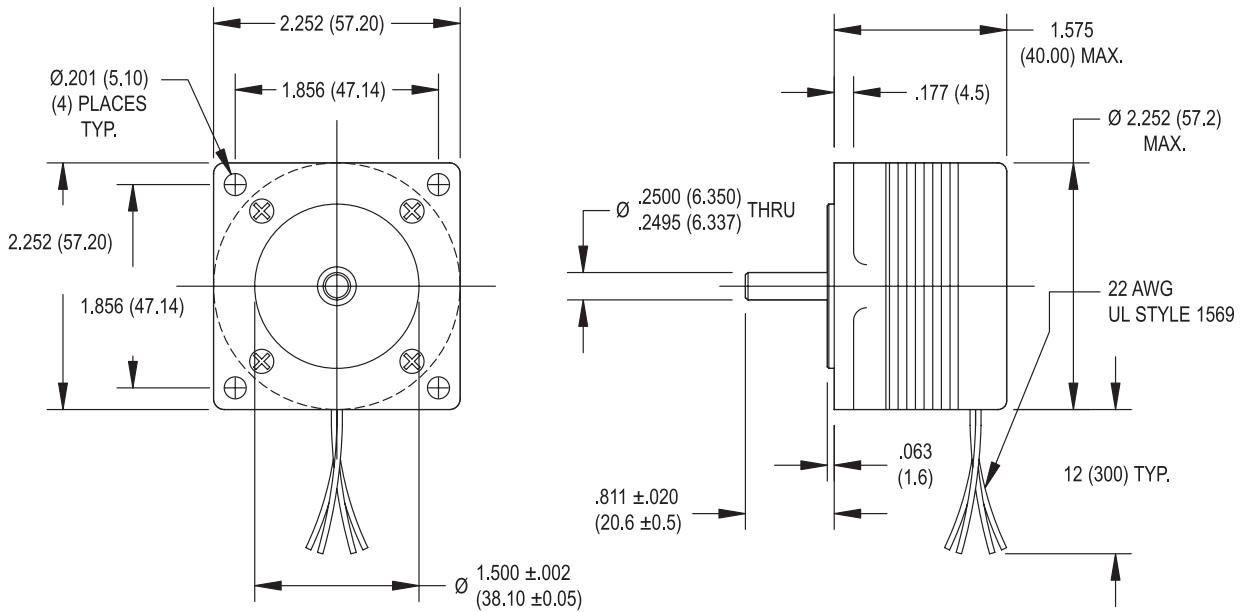
## Stepper Motors

- Accurate open loop control for high performance positioning applications
- Excellent low speed torque
- Simple, rugged construction for high reliability and long service life
- Smooth, quiet operation
- Standard NEMA frame sizes
- Precision honed stators and ground rotors for tight air gap and maximum performance
- CE approved

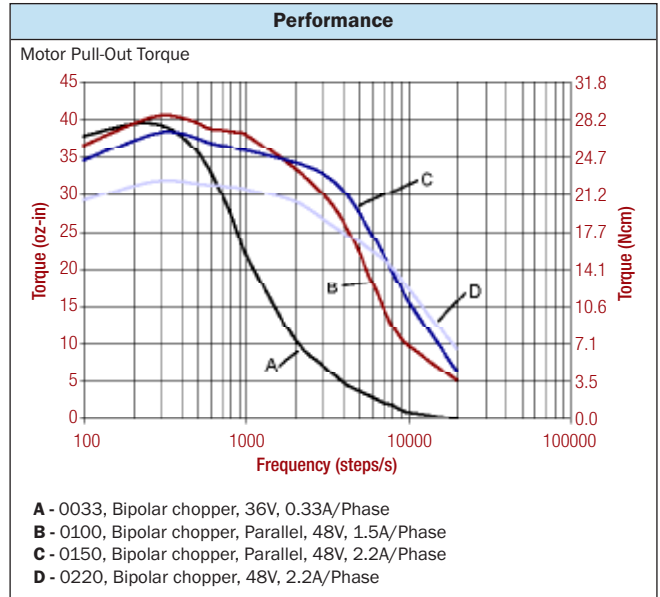


Get same day shipment of sample motors for models listed in this bulletin.

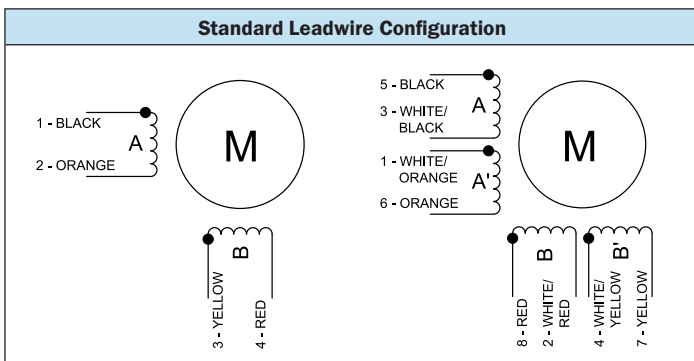
# SIZE 23 STEPPER MOTOR DATA



Specification	Units	HY 200 2215			
		0033	0100	0150 <input checked="" type="checkbox"/>	0220
Rated Phase Current	A	0.33	1.00	1.50	2.20
Phase Resistance	$\Omega$	33.8	3.4	1.5	0.7
Phase Inductance	mH	54.6	3.8	1.5	1.2
Holding Torque Unipolar	oz-in	—	38	35	—
	Ncm	—	27	25	—
Holding Torque Bipolar	oz-in	45	48	47	44
	Ncm	32	34	33	31
Detent Torque	oz-in	4.8	4.8	4.8	4.8
	Ncm	3.4	3.4	3.4	3.4
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	7.9	7.9	7.9	7.9
	g-cm <sup>2</sup>	56	56	56	56
Motor Weight (Mass)	lb	0.75	0.75	0.75	0.75
	kg	0.34	0.34	0.34	0.34
Maximum Voltage	V	75	75	75	75
Std. No. of Leads	—	4	8	8	4



Available through the MotionExpress program.

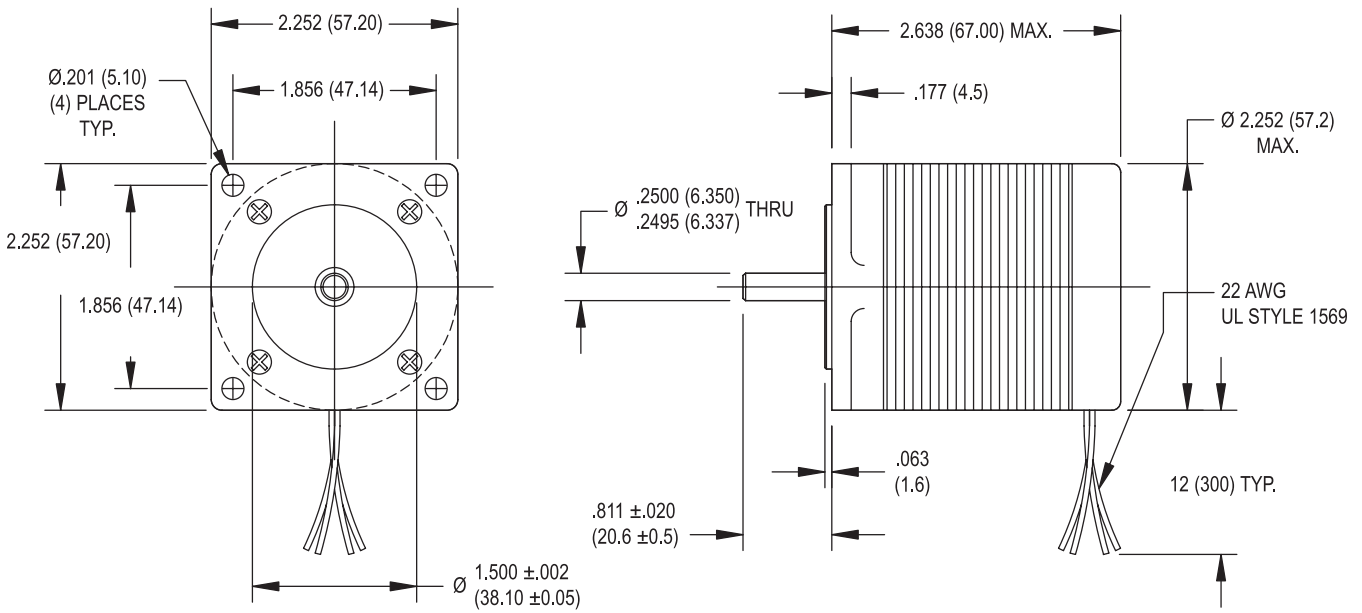


- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - NEMA 23 mounting configuration
  - AlNiCo magnets
  - Additional windings and customization options available
  - CE approved

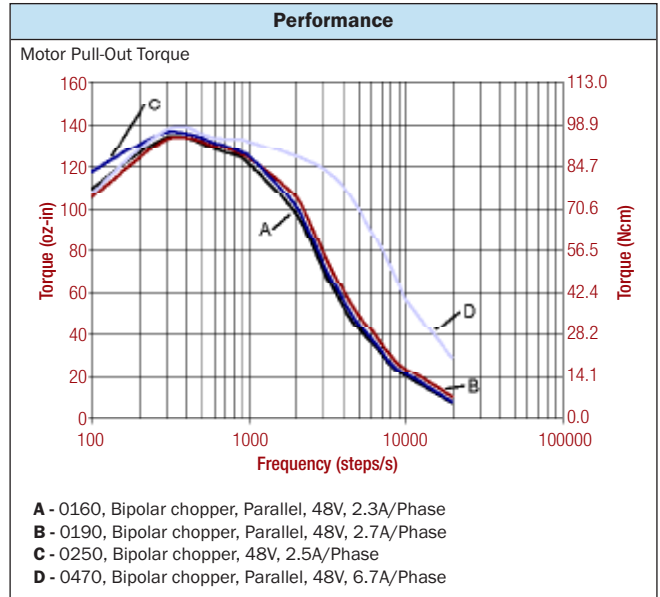
- ### Complementary Products
- Gearboxes
  - Encoders



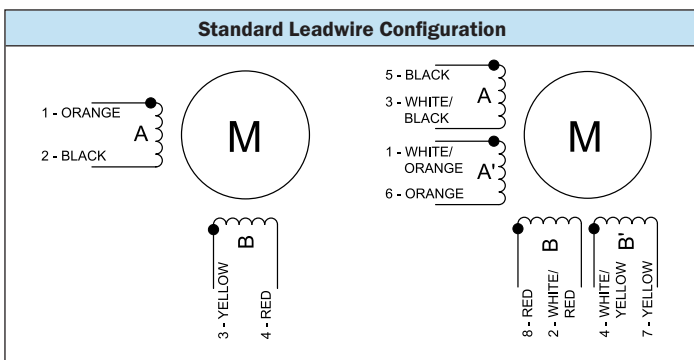
# SIZE 23 STEPPER MOTOR DATA



Specification	Units	HY 200 2226			
		0160	0190	0250	0470
Rated Phase Current	A	1.60	1.90	2.50	4.70
Phase Resistance	$\Omega$	2.6	1.8	1.1	0.33
Phase Inductance	mH	4.7	3.3	4.0	0.5
Holding Torque Unipolar	oz-in	123	126	—	123
	Ncm	87	89	—	87
Holding Torque Bipolar	oz-in	154	160	161	154
	Ncm	109	113	114	109
Detent Torque	oz-in	12.0	12.0	12.0	12.0
	Ncm	8.5	8.5	8.5	8.5
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	28	28	28	28
	g-cm <sup>2</sup>	200	200	200	200
Motor Weight (Mass)	lb	1.5	1.5	1.5	1.5
	kg	0.70	0.70	0.70	0.70
Maximum Voltage	V	75	75	75	75
Std. No. of Leads	—	8	8	4	8



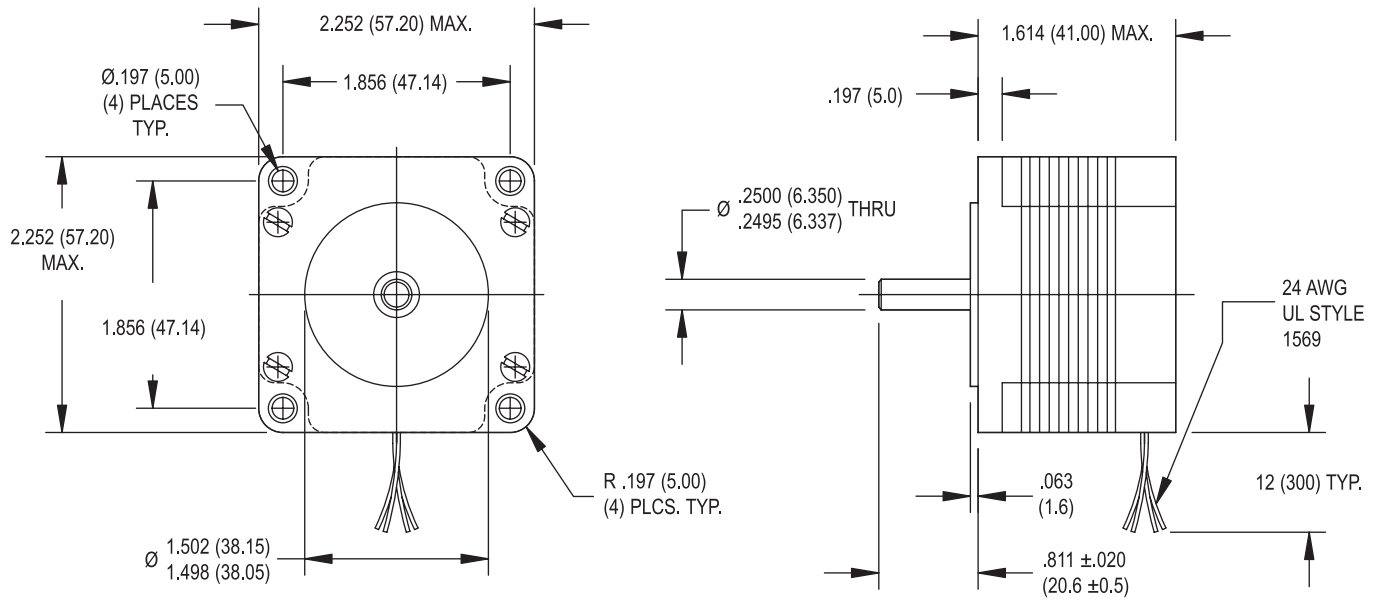
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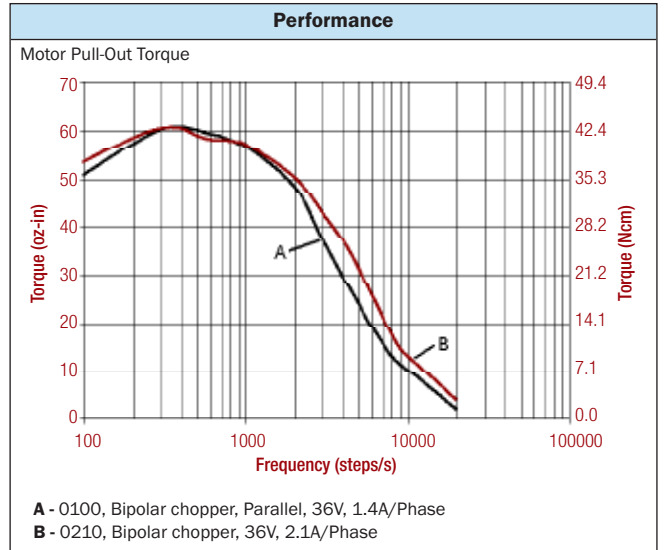
- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - NEMA 23 mounting configuration
  - Neodymium magnets
  - Additional windings and customization options available
  - CE approved

- ### Complementary Products
- Gearboxes
  - Encoders

# SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA

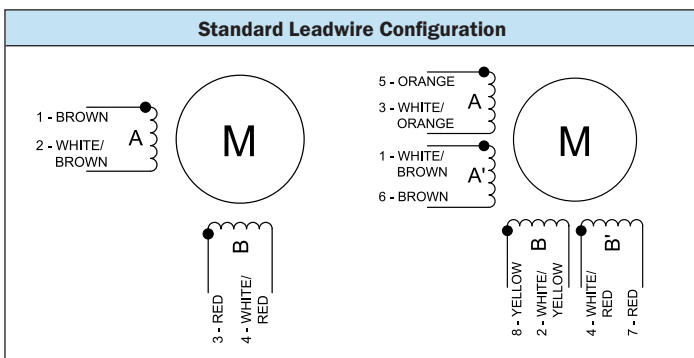


Specification	Units	HS 200 2216	
		0100	0210
Rated Phase Current	A	1.00	2.10
Phase Resistance	$\Omega$	4.6	1.0
Phase Inductance	mH	4.6	2.1
Holding Torque Unipolar	oz-in	52	—
	Ncm	37	—
Holding Torque Bipolar	oz-in	67	67
	Ncm	47	47
Detent Torque	oz-in	3.0	3.0
	Ncm	2.1	2.1
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	11	11
	g-cm <sup>2</sup>	77	77
Motor Weight (Mass)	lb	1.1	1.1
	kg	0.50	0.50
Maximum Voltage	V	75	75
Std. No. of Leads	—	8	4



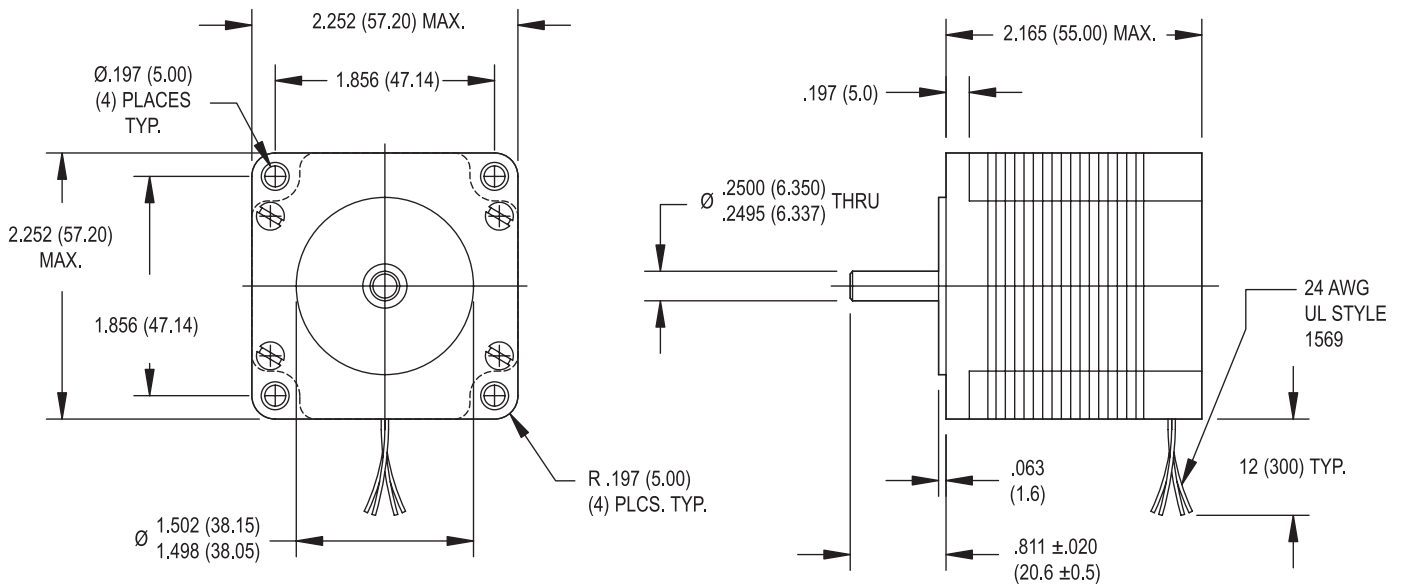
Available through the MotionExpress program.

- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - Optimized for microstep operation
  - NEMA 23 mounting configuration
  - Neodymium magnets
  - Additional windings and customization options available
  - CE approved

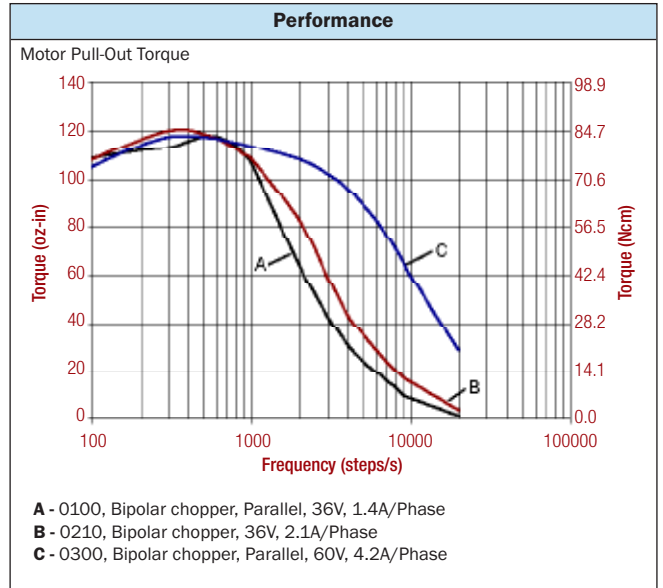


- ### Complementary Products
- Gearboxes
  - Encoders

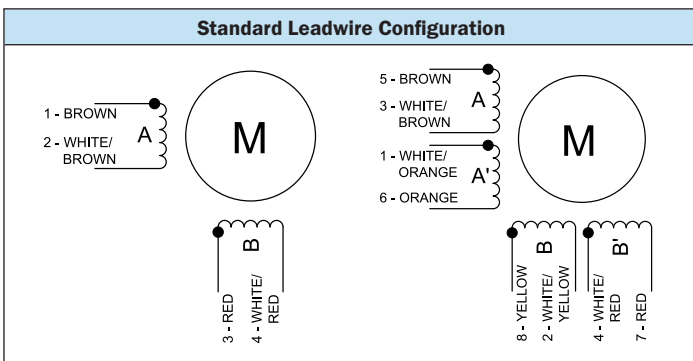
# SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 2221		
		0100	0210	0300
Rated Phase Current	A	1.00	2.10	3.00
Phase Resistance	Ω	6.2	1.4	0.7
Phase Inductance	mH	8.8	3.9	0.9
Holding Torque Unipolar	oz-in	106	—	106
	Ncm	75	—	75
Holding Torque Bipolar	oz-in	139	139	139
	Ncm	98	98	98
Detent Torque	oz-in	5.7	5.7	5.7
	Ncm	4.0	4.0	4.0
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	31	31	31
	g-cm <sup>2</sup>	220	220	220
Motor Weight (Mass)	lb	1.5	1.5	1.5
	kg	0.70	0.70	0.70
Maximum Voltage	V	75	75	75
Std. No. of Leads	—	8	4	8



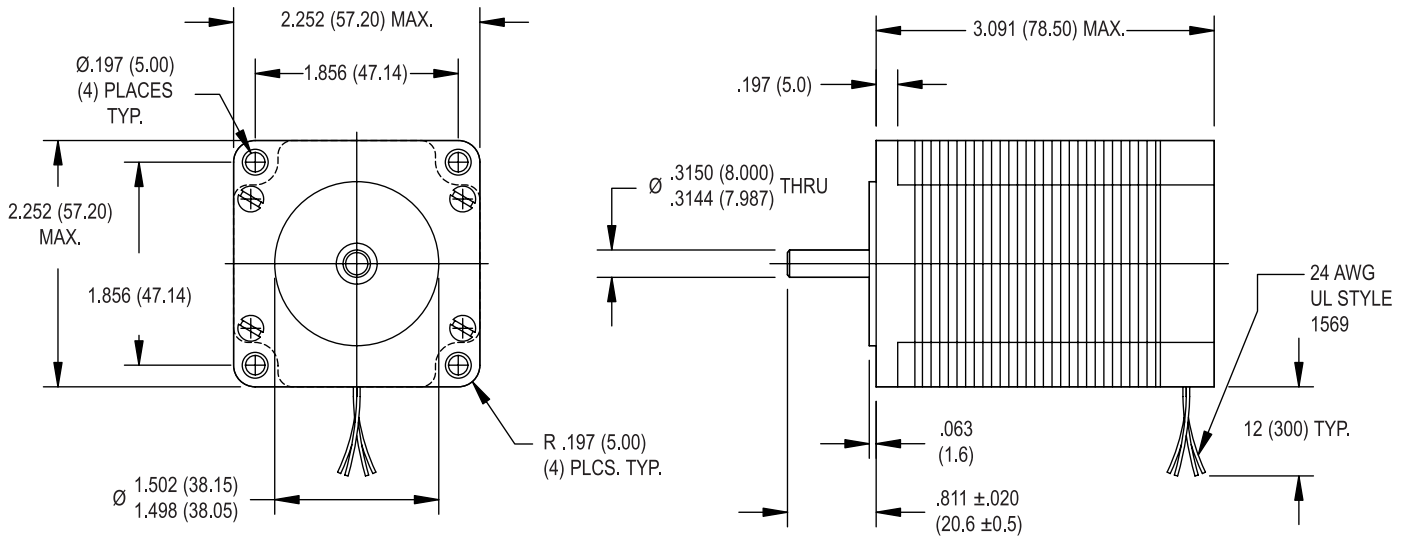
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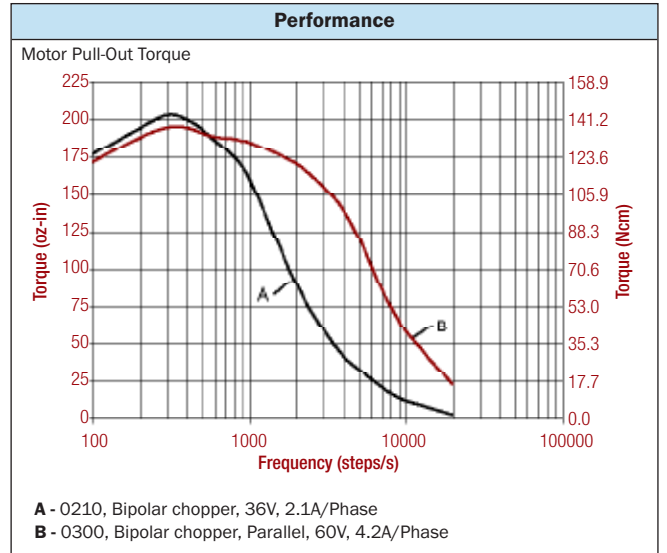
- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130°C)
  - Optimized for microstep operation
  - NEMA 23 mounting configuration
  - AlNiCo magnets
  - Additional windings and customization options available
  - CE approved

- ### Complementary Products
- Gearboxes
  - Encoders

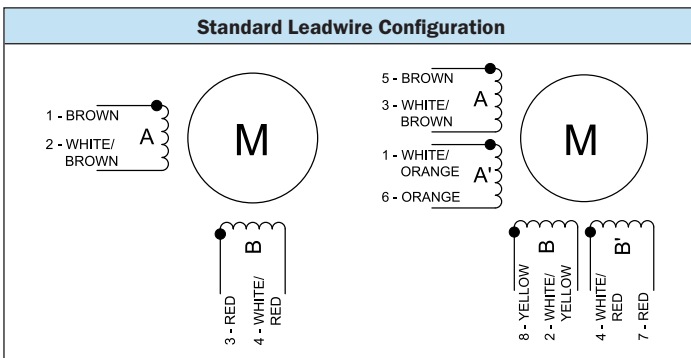
# SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 2231	
		0210	0300
Rated Phase Current	A	2.10	3.00
Phase Resistance	$\Omega$	2.0	1.1
Phase Inductance	mH	6.5	1.7
Holding Torque Unipolar	oz-in Ncm	—	177 125
Holding Torque Bipolar	oz-in Ncm	228 161	231 163
Detent Torque	oz-in Ncm	9.6 6.8	9.6 6.8
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup> g-cm <sup>2</sup>	48 340	48 340
Motor Weight (Mass)	lb kg	2.2 1.0	2.2 1.0
Maximum Voltage	V	75	75
Std. No. of Leads	—	4	8



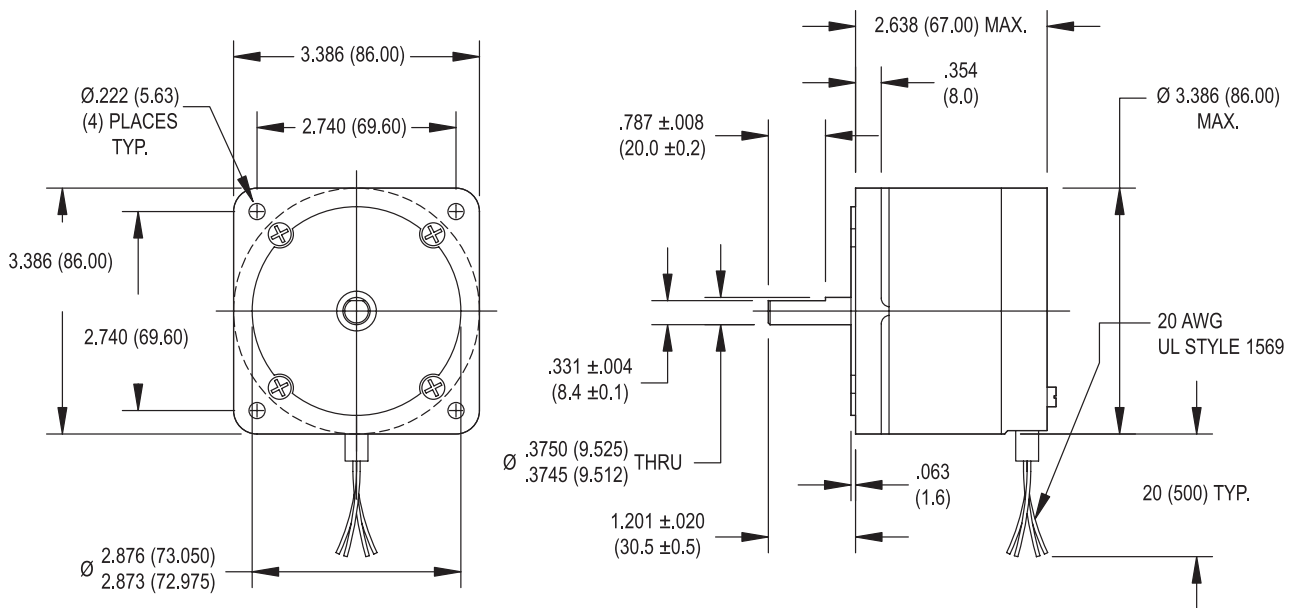
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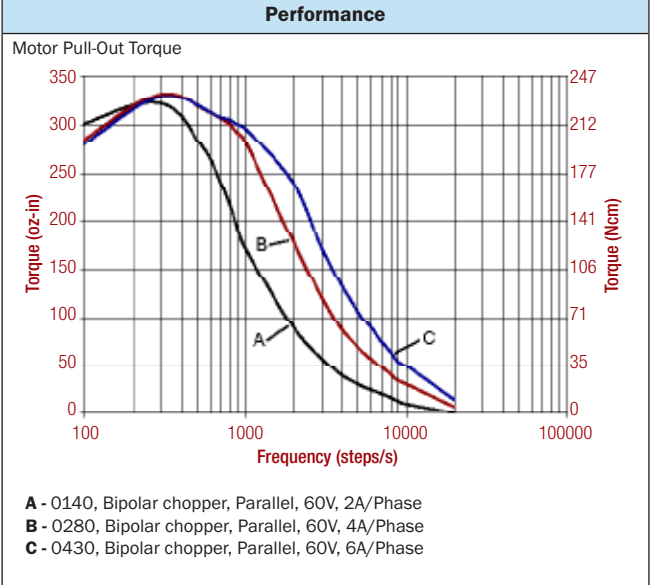
- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - Optimized for microstep operation
  - NEMA 23 mounting configuration
  - AlNiCo magnets
  - Additional windings and customization options available
  - CE approved

- ### Complementary Products
- Gearboxes
  - Encoders

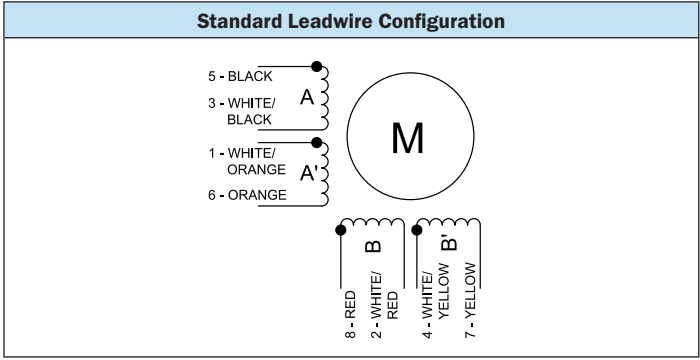
# SIZE 34 STEPPER MOTOR DATA



Specification	Units	HN 200 3426		
		0140	0280	0430
Rated Phase Current	A	1.40	2.80	4.30
Phase Resistance	$\Omega$	5.0	1.3	0.55
Phase Inductance	mH	21	5.1	2.1
Holding Torque Unipolar	oz-in	326	326	326
	Ncm	230	230	230
Holding Torque Bipolar	oz-in	397	397	397
	Ncm	280	280	280
Detent Torque	oz-in	12	12	12
	Ncm	8.5	8.5	8.5
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	93	93	93
	g-cm <sup>2</sup>	660	660	660
Motor Weight (Mass)	lb	3.5	3.5	3.5
	kg	1.6	1.6	1.6
Maximum Voltage	V	90	90	90
Std. No. of Leads	-	8	8	8



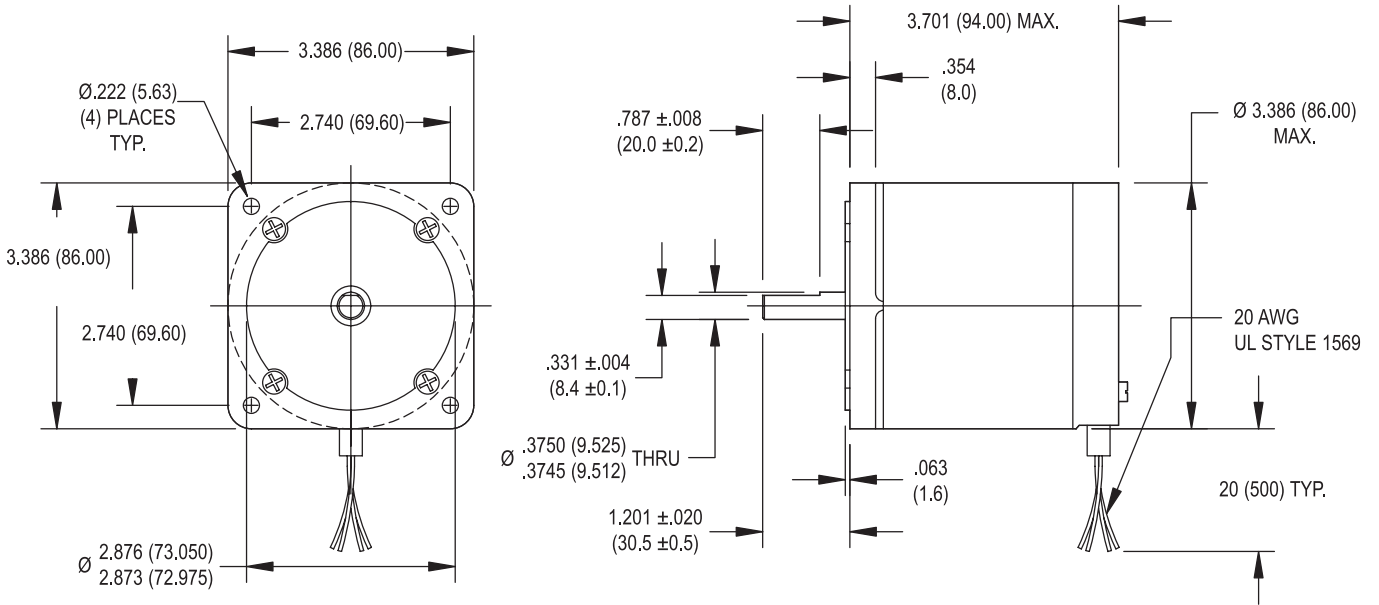
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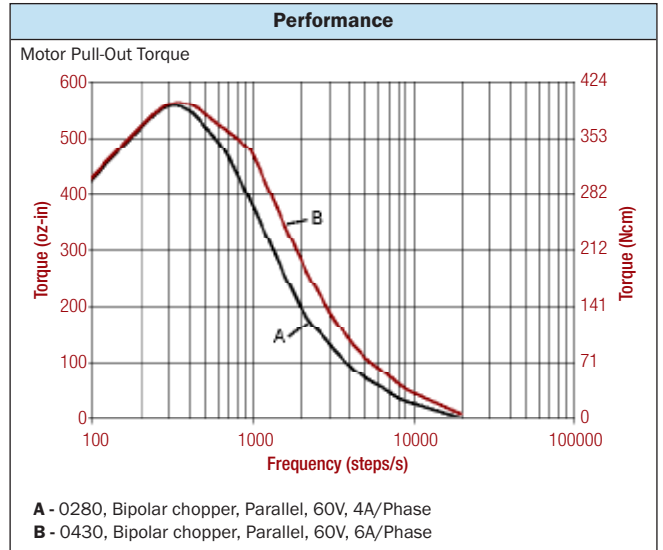
- Standard Features**
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130°C)
  - NEMA 34 mounting configuration
  - Neodymium magnets
  - Additional windings and customization options available
  - CE approved

- Complementary Products**
- Gearboxes
  - Encoders

# SIZE 34 STEPPER MOTOR DATA

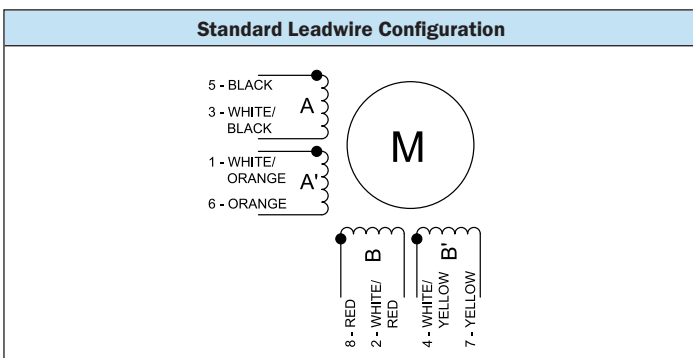


Specification	Units	HN 200 3438	
		0280	0430
Rated Phase Current	A	2.80	4.30
Phase Resistance	$\Omega$	1.7	0.75
Phase Inductance	mH	7.7	3.5
Holding Torque Unipolar	oz-in	538	538
	Ncm	380	380
Holding Torque Bipolar	oz-in	680	680
	Ncm	480	480
Detent Torque	oz-in	18	18
	Ncm	13	13
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	170	170
	g-cm <sup>2</sup>	1200	1200
Motor Weight (Mass)	lb	5.3	5.3
	kg	2.4	2.4
Maximum Voltage	V	90	90
Std. No. of Leads	-	8	8



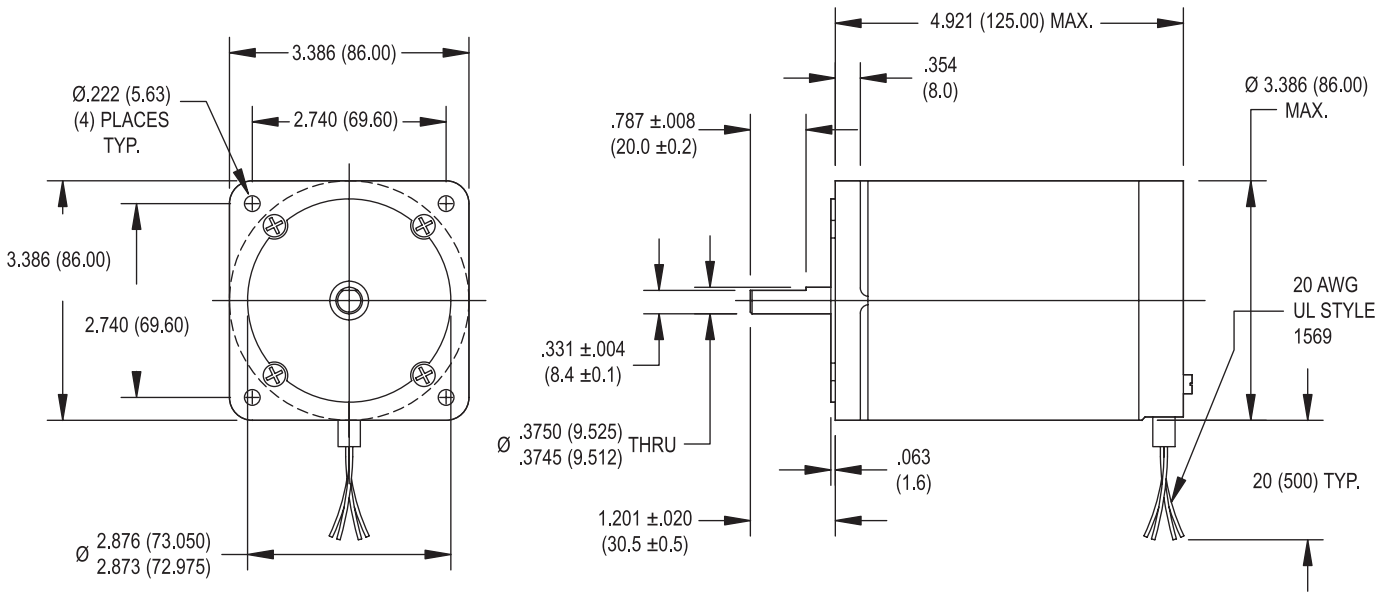
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- Standard Features**
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - NEMA 34 mounting configuration
  - Neodymium magnets
  - Additional windings and customization options available
  - CE approved



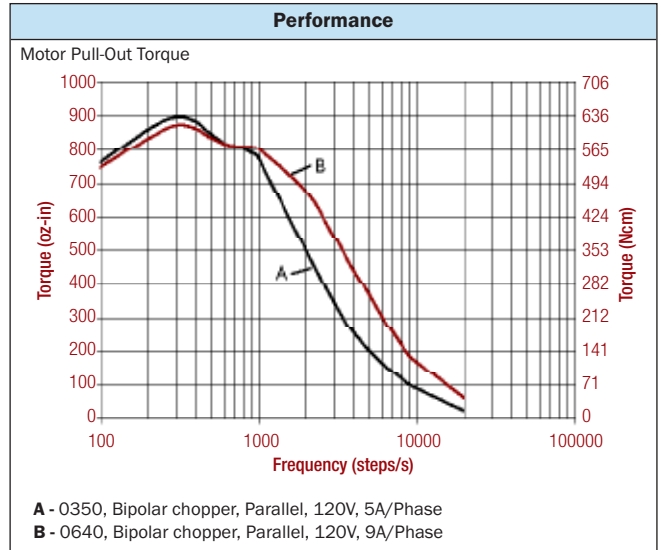
- Complementary Products**
- Gearboxes
  - Encoders

# SIZE 34 STEPPER MOTOR DATA



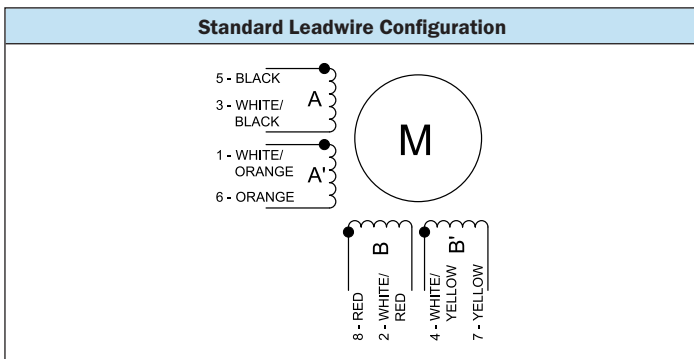
Specification	Units	HN 200 3451	
		0350	0640
Rated Phase Current	A	3.50	6.40
Phase Resistance	Ω	1.5	0.50
Phase Inductance	mH	8.5	2.5
Holding Torque Unipolar	oz-in	878	878
	Ncm	620	620
Holding Torque Bipolar	oz-in	1076	1076
	Ncm	760	760
Detent Torque	oz-in	33	33
	Ncm	23	23
Rotor Inertia	oz-in-s²x10⁻⁴	255	255
	g-cm²	1800	1800
Motor Weight (Mass)	lb	7.9	7.9
	kg	3.6	3.6
Maximum Voltage	V	140	140
Std. No. of Leads	—	8	8

Available through the MotionExpress program.

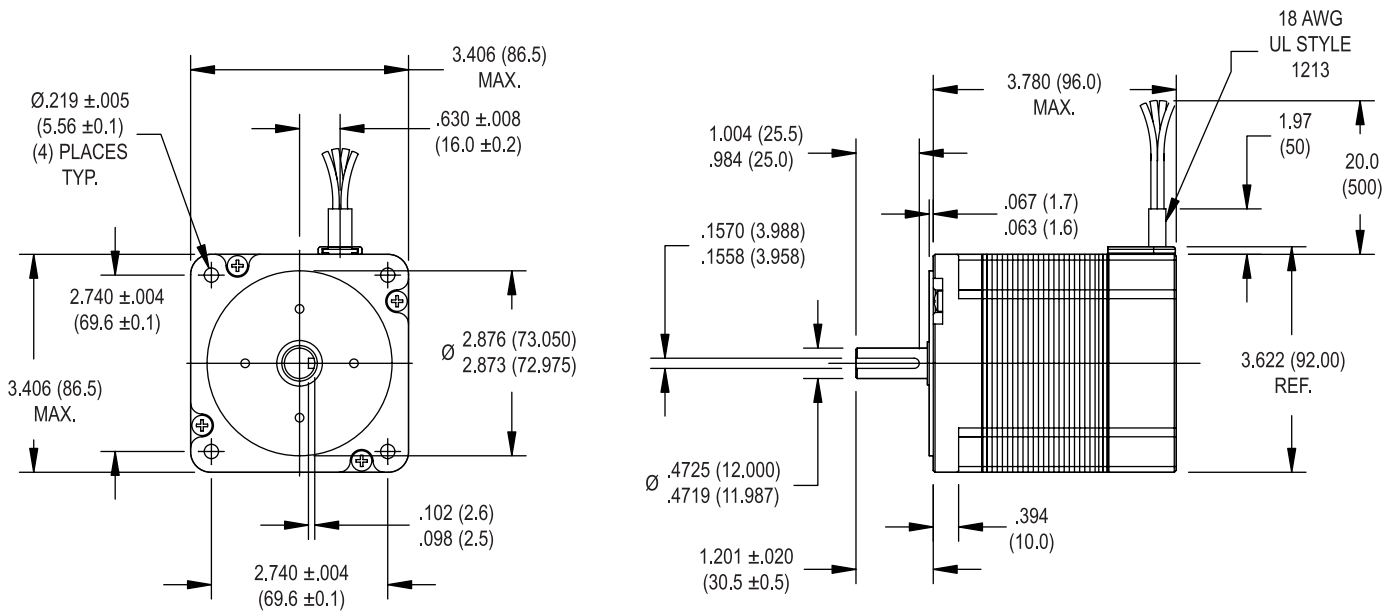


- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130 °C)
  - NEMA 34 mounting configuration
  - Neodymium magnets
  - Additional windings and customization options available
  - CE approved

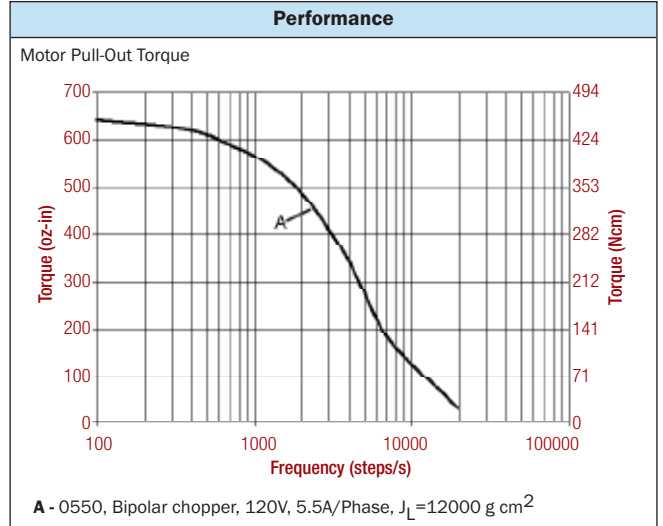
- ### Complementary Products
- Gearboxes
  - Encoders



# SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA

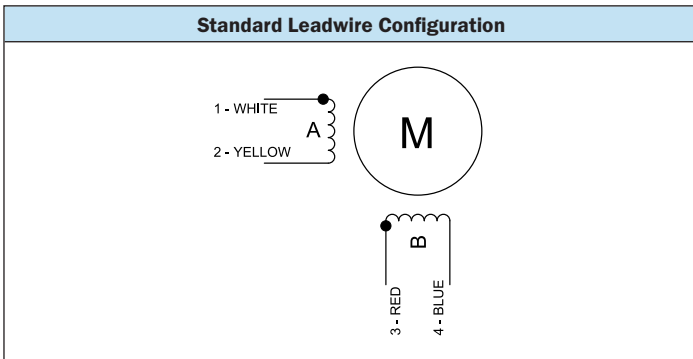


Specification	Units	HS 200 3437		
		0300	0550	0800
Rated Phase Current	A	3.00	5.50	8.00
Phase Resistance	$\Omega$	1.37	0.42	0.19
Phase Inductance	mH	11	3.6	1.6
Holding Torque Unipolar	oz-in Ncm	—	—	—
Holding Torque Bipolar	oz-in Ncm	779 550	779 550	779 550
Detent Torque	oz-in Ncm	28 20	28 20	28 20
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup> g-cm <sup>2</sup>	490 3460	490 3460	490 3460
Motor Weight (Mass)	lb kg	6.6 3.0	6.6 3.0	6.6 3.0
Maximum Voltage	V	160	160	160
Std. No. of Leads	—	4	4	4

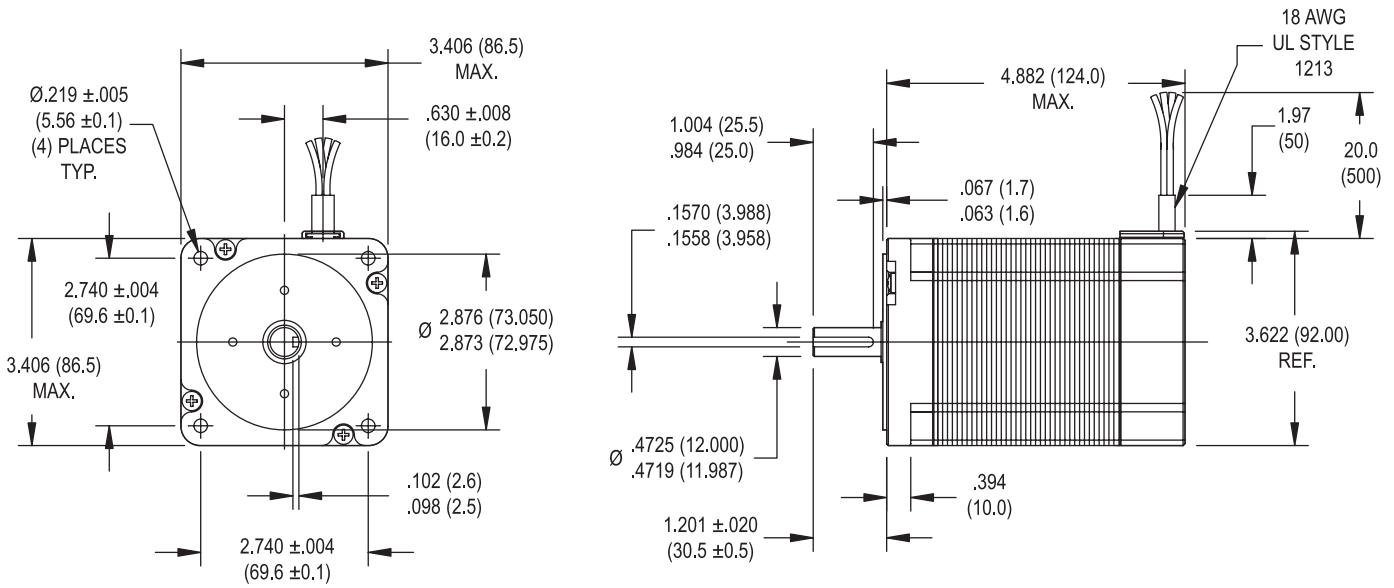


- Standard Features**
- Step angle: 1.8°
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  - Insulation class: B (130 °C)
  - Optimized for microstep operation
  - NEMA 34 mounting configuration
  - Neodymium magnets
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  - CE approval pending

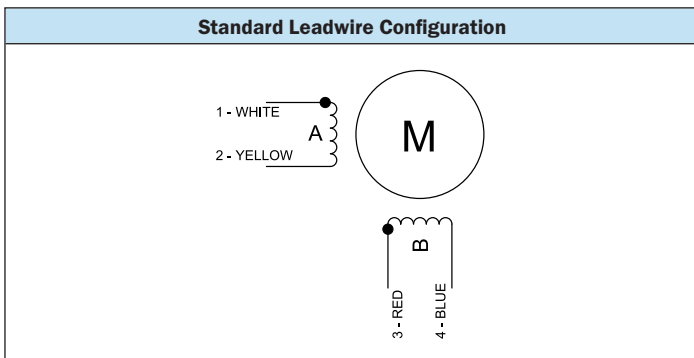
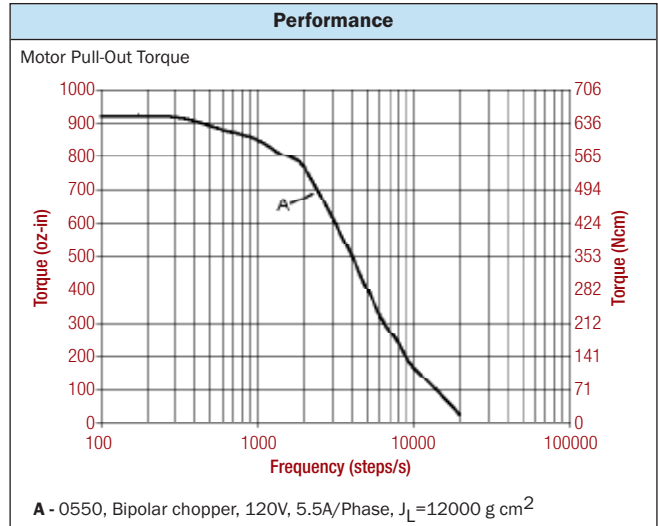
- Complementary Products**
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# SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA



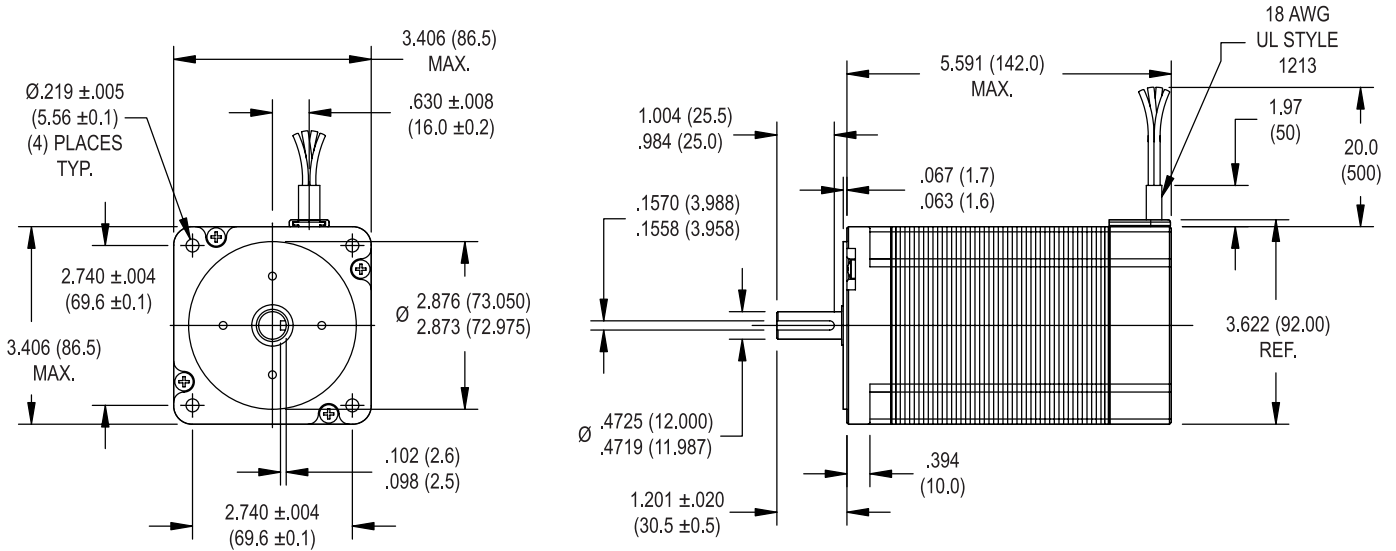
Specification	Units	HS 200 3448		
		0300	0550	0800
Rated Phase Current	A	3.00	5.50	8.00
Phase Resistance	Ω	1.56	0.46	0.22
Phase Inductance	mH	14	4.0	1.9
Holding Torque Unipolar	oz-in	—	—	—
	Ncm	—	—	—
Holding Torque Bipolar	oz-in	1062	1062	1062
	Ncm	750	750	750
Detent Torque	oz-in	28	28	28
	Ncm	20	20	20
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	548	548	548
	g-cm <sup>2</sup>	3870	3870	3870
Motor Weight (Mass)	lb	8.8	8.8	8.8
	kg	4.0	4.0	4.0
Maximum Voltage	V	160	160	160
Std. No. of Leads	—	4	4	4



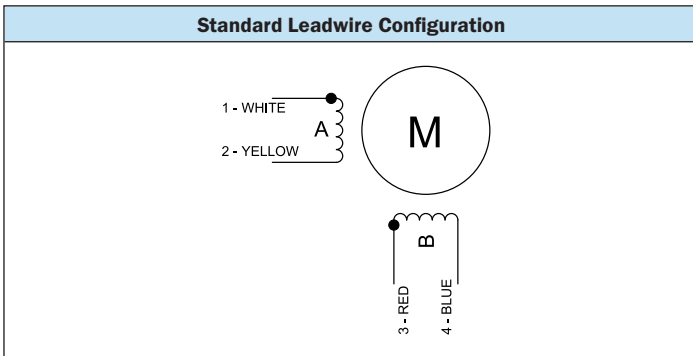
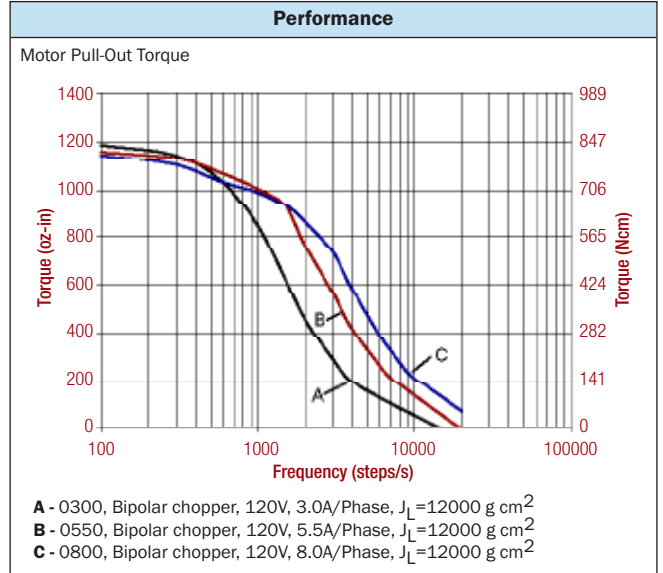
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- ### Complementary Products
- Gearboxes
  - Encoders

# SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA



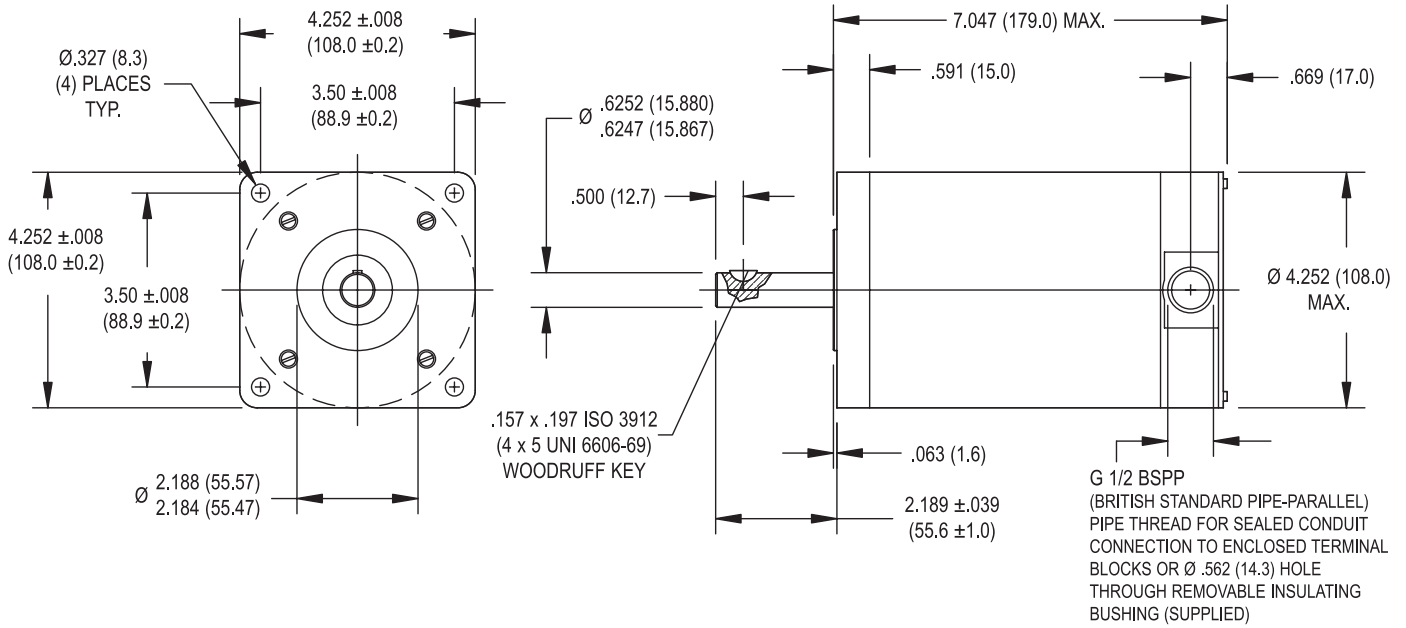
Specification	Units	HS 200 3455		
		0300	0550	0800
Rated Phase Current	A	3.00	5.50	8.00
Phase Resistance	$\Omega$	1.70	0.55	0.29
Phase Inductance	mH	20	5.6	2.6
Holding Torque Unipolar	oz-in Ncm	—	—	—
Holding Torque Bipolar	oz-in Ncm	1416 1000	1416 1000	1416 1000
Detent Torque	oz-in Ncm	42 30	42 30	42 30
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup> g-cm <sup>2</sup>	694 4900	694 4900	694 4900
Motor Weight (Mass)	lb kg	10.8 4.9	10.8 4.9	10.8 4.9
Maximum Voltage	V	160	160	160
Std. No. of Leads	—	4	4	4



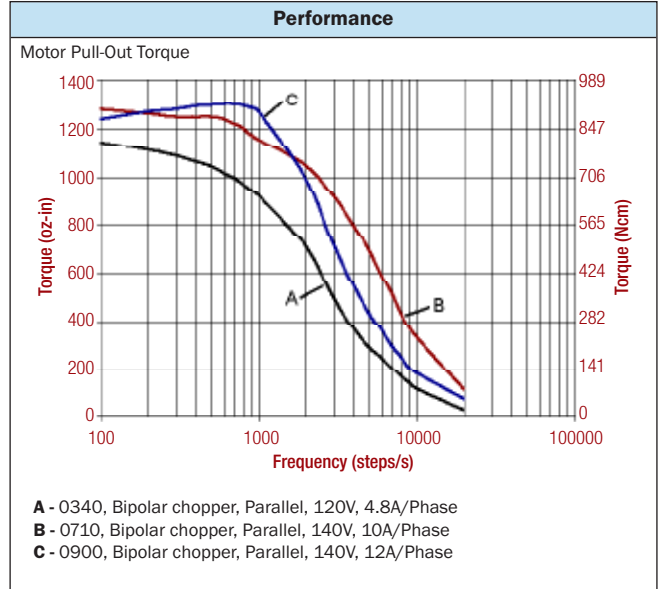
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  - Encoders

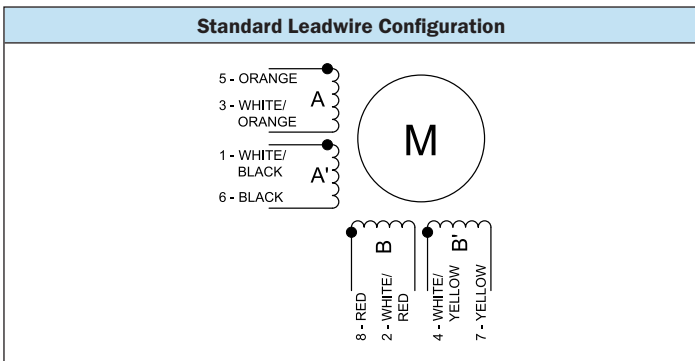
# SIZE 42 STEPPER MOTOR DATA



Specification	Units	HY 200 4270		
		0340	0710	0900
Rated Phase Current	A	3.40	7.10	9.00
Phase Resistance	Ω	1.1	0.30	0.34
Phase Inductance	mH	6.3	2.0	2.7
Holding Torque Unipolar	oz-in	1130	1175	1450
	Ncm	798	830	1024
Holding Torque Bipolar	oz-in	1402	1459	1798
	Ncm	990	1030	1270
Detent Torque	oz-in	99	99	99
	Ncm	70	70	70
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	779	779	779
	g-cm <sup>2</sup>	5500	5500	5500
Motor Weight (Mass)	lb	16	16	16
	kg	7.3	7.3	7.3
Maximum Voltage	V	140	140	140
Std. No. of Leads	—	8	8	8



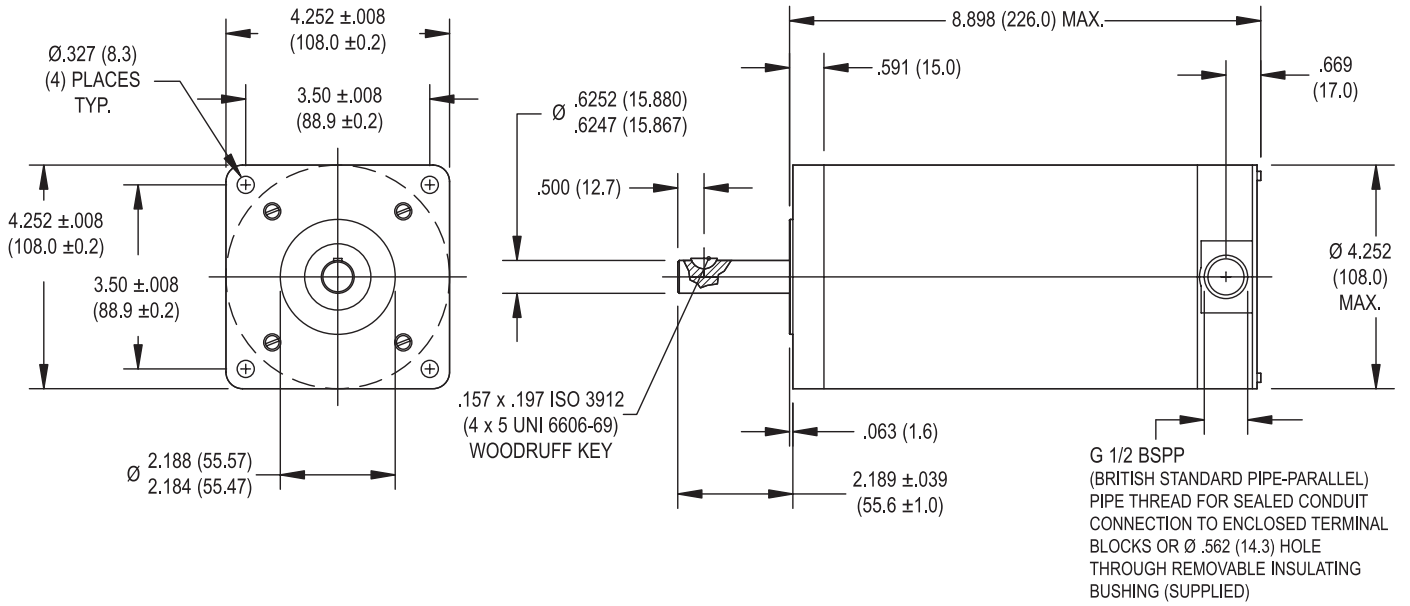
Available through the MotionExpress program.



- Standard Features**
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130°C)
  - NEMA 42 mounting configuration
  - AlNiCo magnets
  - Additional windings and customization options available
  - CE approved

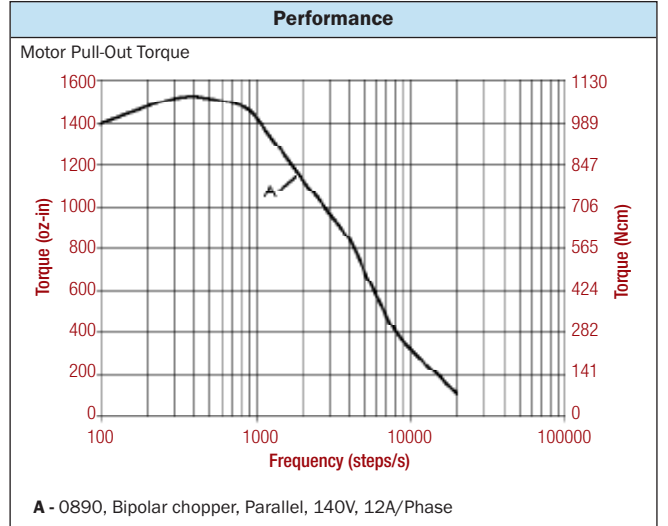
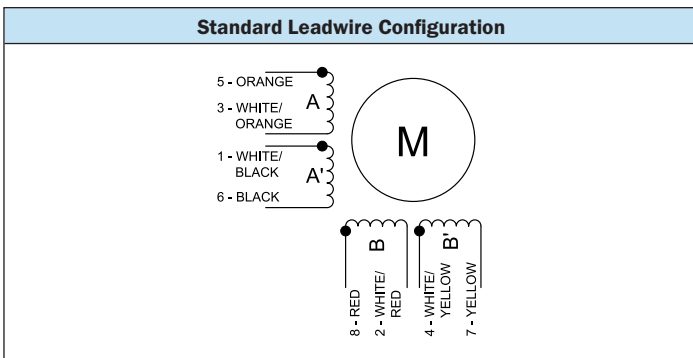
- Complementary Products**
- Gearboxes
  - Encoders

# SIZE 42 STEPPER MOTOR DATA



Specification	Units	HY 200 4288	
		0890	
Rated Phase Current	A	8.90	
Phase Resistance	$\Omega$	0.31	
Phase Inductance	mH	2.3	
Holding Torque Unipolar	oz-in	1614	
	Ncm	1140	
Holding Torque Bipolar	oz-in	2018	
	Ncm	1425	
Detent Torque	oz-in	92	
	Ncm	65	
Rotor Inertia	oz-in-s <sup>2</sup> x10 <sup>-4</sup>	1175	
	g-cm <sup>2</sup>	8300	
Motor Weight (Mass)	lb	23	
	kg	10.5	
Maximum Voltage	V	140	
Std. No. of Leads	-	8	

Available through the MotionExpress program.

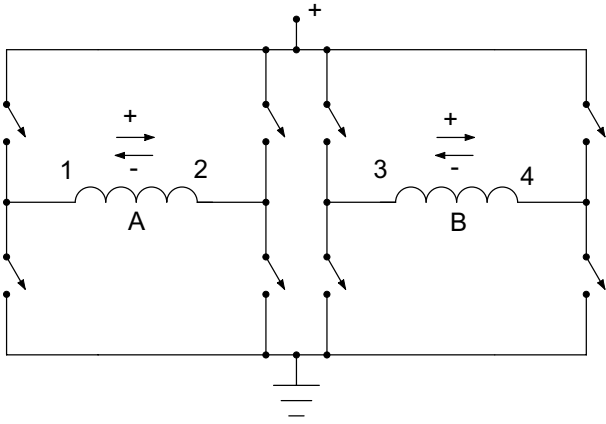


- ### Standard Features
- Step angle: 1.8°
  - Step angle accuracy: 5%
  - Insulation class: B (130°C)
  - NEMA 42 mounting configuration
  - AlNiCo magnets
  - Additional windings and customization options available
  - CE approved

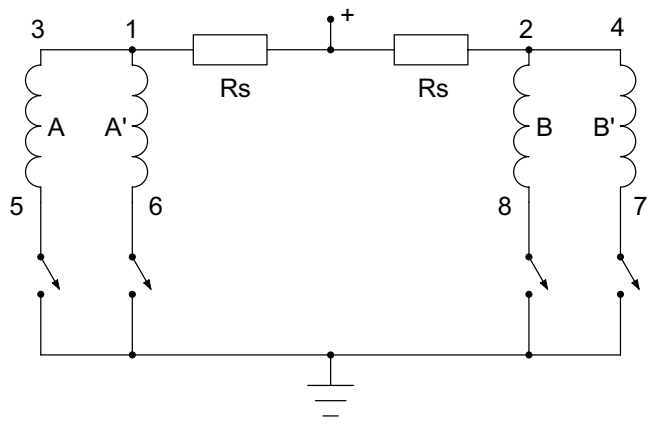
- ### Complementary Products
- Gearboxes
  - Encoders

# CONNECTION DIAGRAMS

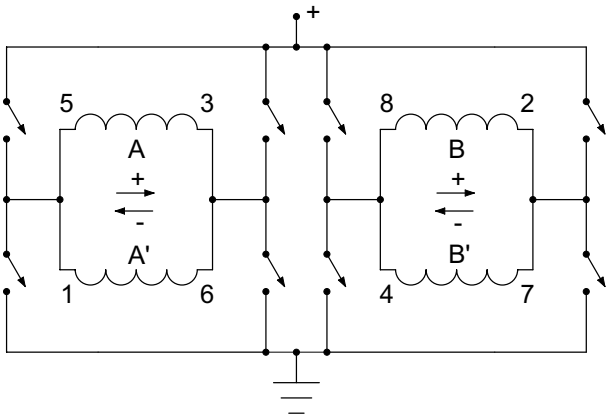
**BIPOLAR**



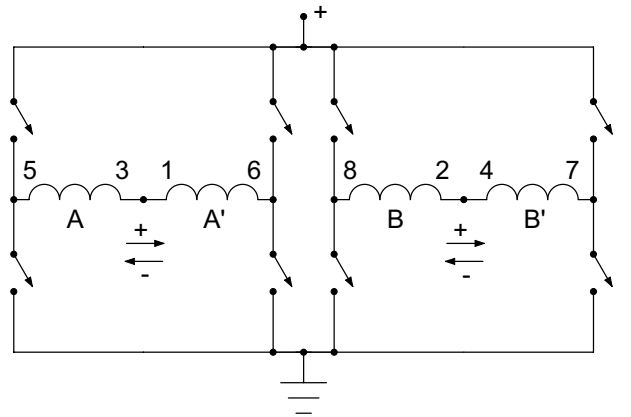
**UNIPOLAR**



**BIPOLAR (PARALLEL)**



**BIPOLAR (SERIES)**







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