PITTMAN® MAE®
PennEngineering®
Motion Technologies

BULLETIN STP

MAE® Stepper Motors

Stepper Motors

PennEngineering Motion Technologies 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 ±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.

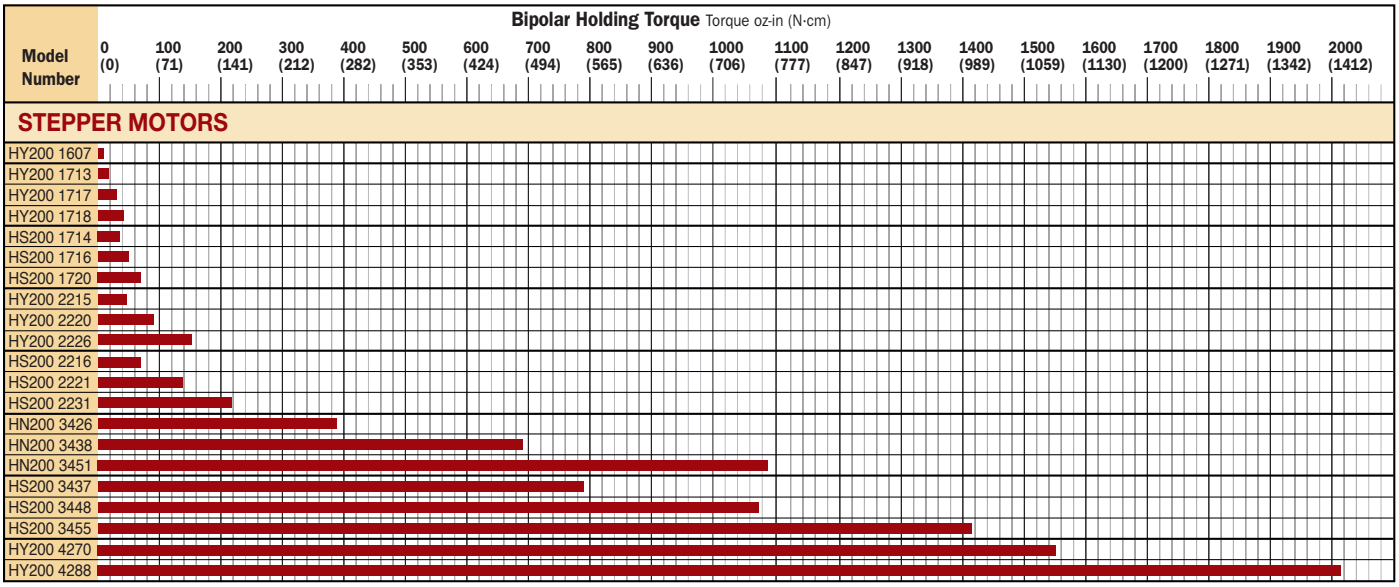
Stepper Motors

- **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**

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

PennEngineering Motion Technologies offers a complete line of PITTMAN® and MAE® brand brush, brushless, and stepper motors which can be customized to meet your exact requirements.

MOTOR SELECTION GUIDE



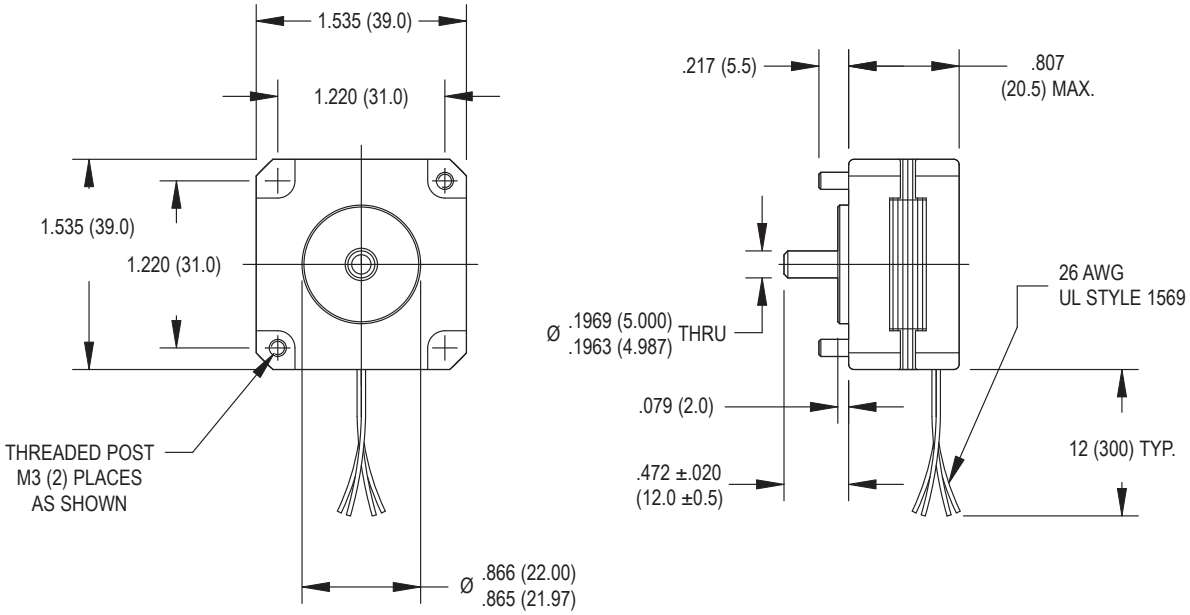
CONNECTION-DEPENDENT RATINGS FOR 8 LEAD MOTORS

Stepper motors supplied with 8 leads provide maximum flexibility and allow the user to decide what connection method is most suitable for their application. Some of the motor phase characteristics are dependent on the connection method chosen for the windings.

The values for current, resistance, and inductance shown in the data tables for 8 lead motors assume a unipolar connection and measure from the center tap to the end of one winding. To determine the phase characteristics for other connection methods, multiply the given unipolar ratings by the conversion factors listed in the chart below that correspond to the chosen connection method.

	Unipolar Connection	Bipolar Series Connnection	Bipolar Parallel Connection
Rated Phase Current	1	0.7	1.4
Phase Resistance	1	2	0.5
Phase Inductance	1	4	1

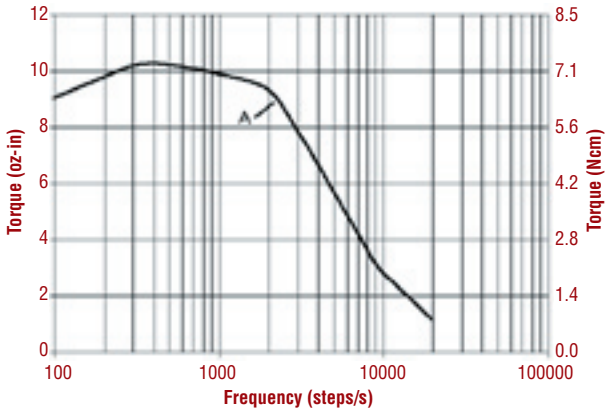
SIZE 16 STEPPER MOTOR DATA



Specification	Units	HY 200 1607
		0060
Rated Phase Current	A	0.60
Phase Resistance	Ω	6.6
Phase Inductance	mH	8.5
Holding Torque Unipolar	oz-in	—
	Ncm	—
Holding Torque Bipolar	oz-in	12
	Ncm	8.7
Detent Torque	oz-in	1.4
	Ncm	1.0
Rotor Inertia	oz-in-s^{2}x10^{-4}	1.6
	g-cm^2	11
Motor Weight (Mass)	lb	0.33
	kg	0.15
Maximum Voltage	V	40
Std. No. of Leads	—	4

Performance

Motor Pull-Out Torque

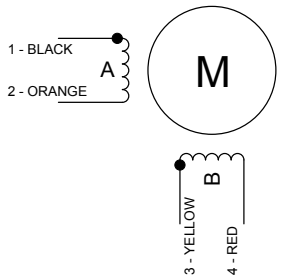


A - 0060, Bipolar chopper, 36V, 0.6A/Phase

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available

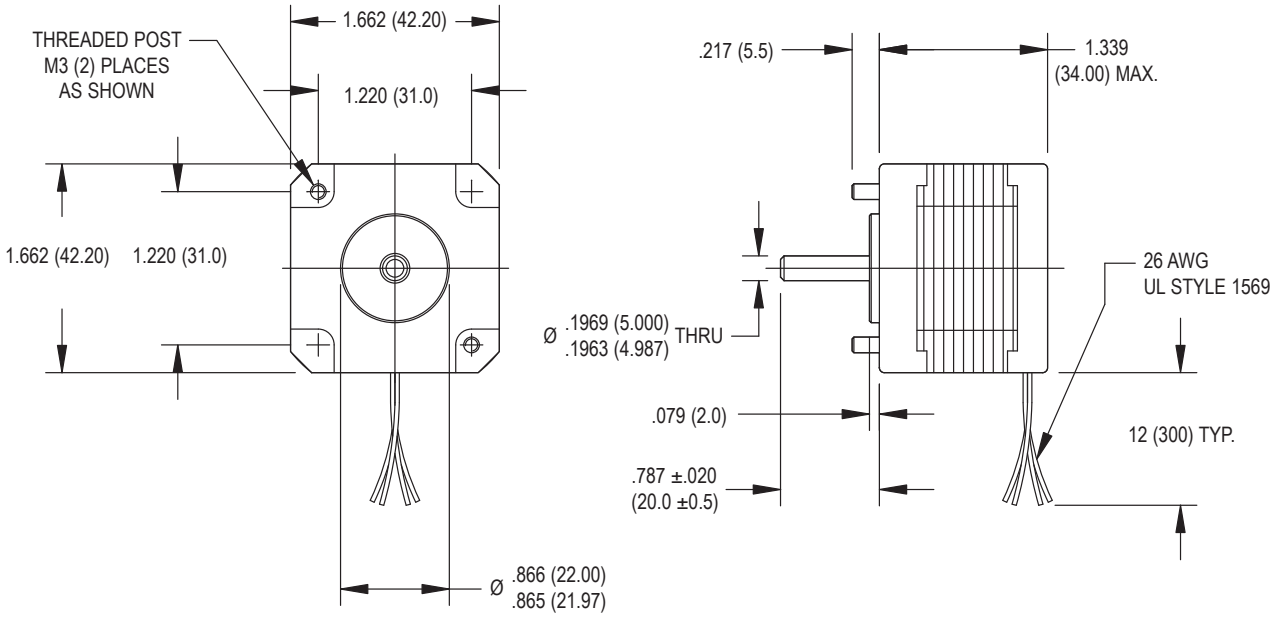
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 17 STEPPER MOTOR DATA

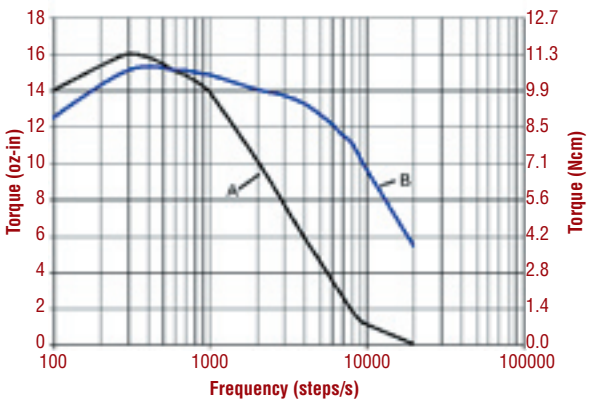


Specification	Units	HY 200 1713	
		0033 ✓	0150
Rated Phase Current	A	0.33	1.50
Phase Resistance	Ω	23.9	1.0
Phase Inductance	mH	28.9	1.2
Holding Torque Unipolar	oz-in	—	—
	Ncm	—	—
Holding Torque Bipolar	oz-in	19.4	18.4
	Ncm	13.7	13.0
Detent Torque	oz-in	2.4	2.4
	Ncm	1.7	1.7
Rotor Inertia	oz-in-s^{2}x10^{-4}	2.5	2.5
	g-cm^2	18	18
Motor Weight (Mass)	lb	0.4	0.4
	kg	0.2	0.2
Maximum Voltage	V	40	40
Std. No. of Leads	—	4	4

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque

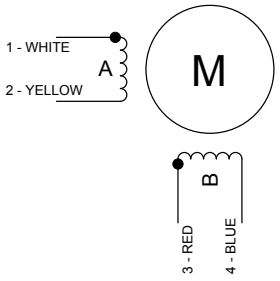


A - 0033, Bipolar chopper, 36V, 0.33A/Phase
B - 0150, Bipolar chopper, 36V, 1.5A/Phase

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available

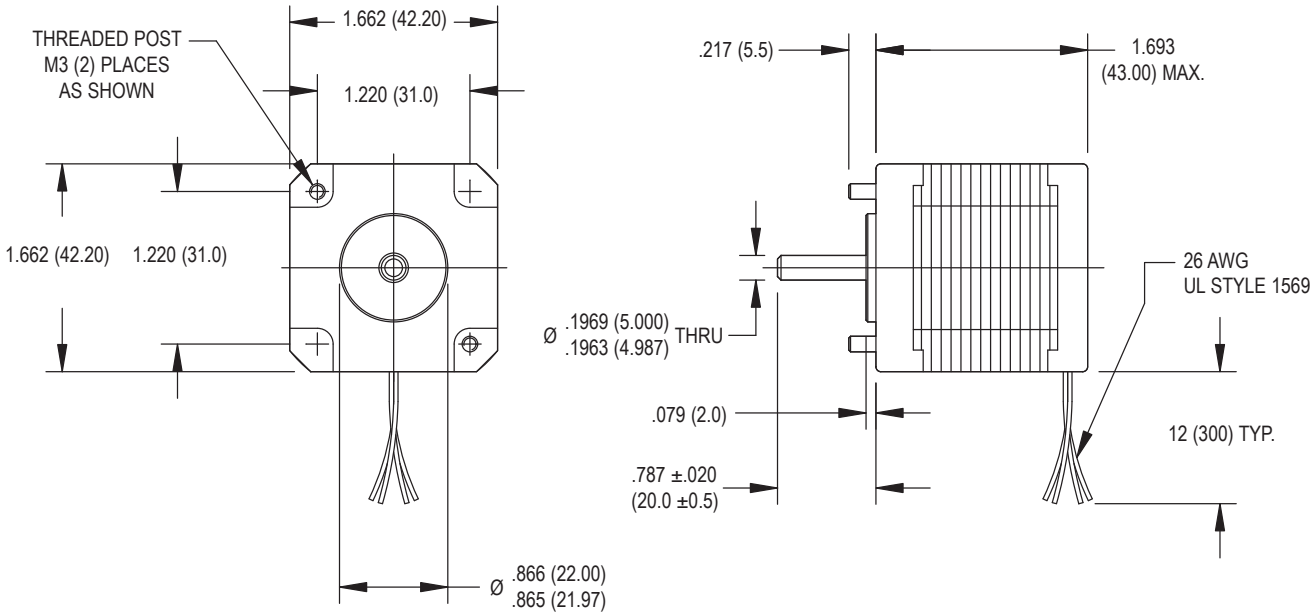
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

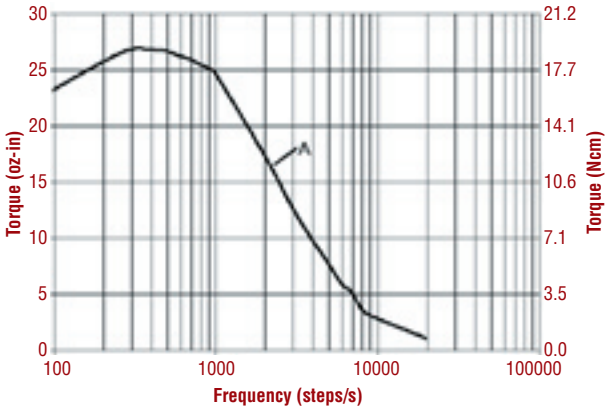
SIZE 17 STEPPER MOTOR DATA



Specification	Units	HY 200 1717
		0100
Rated Phase Current	A	1.00
Phase Resistance	Ω	4.6
Phase Inductance	mH	10.6
Holding Torque Unipolar	oz-in	—
	Ncm	—
Holding Torque Bipolar	oz-in	32.7
	Ncm	23.1
Detent Torque	oz-in	2.4
	Ncm	1.7
Rotor Inertia	oz-in-s^{2}x10^{-4}	4.5
	g-cm^2	32
Motor Weight (Mass)	lb	0.7
	kg	0.3
Maximum Voltage	V	40
Std. No. of Leads	—	4

Performance

Motor Pull-Out Torque

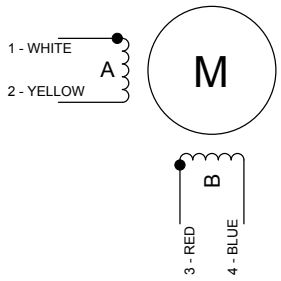


A - 0100, Bipolar chopper, 36V, 1A/Phase

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available

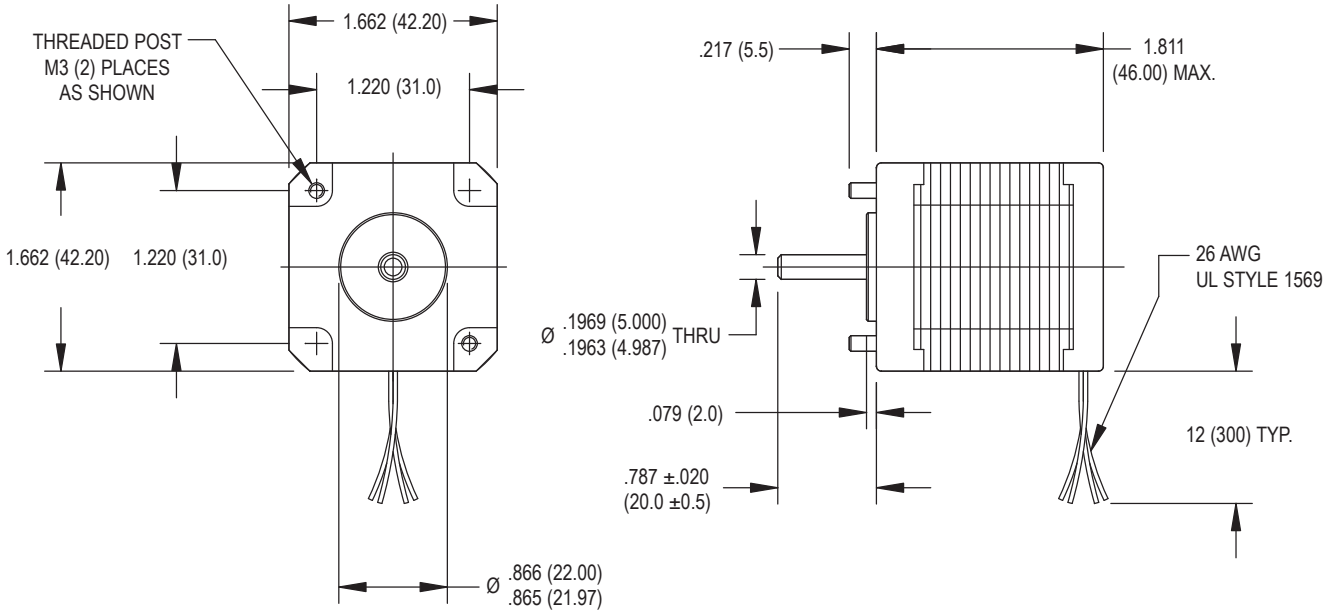
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 17 STEPPER MOTOR DATA

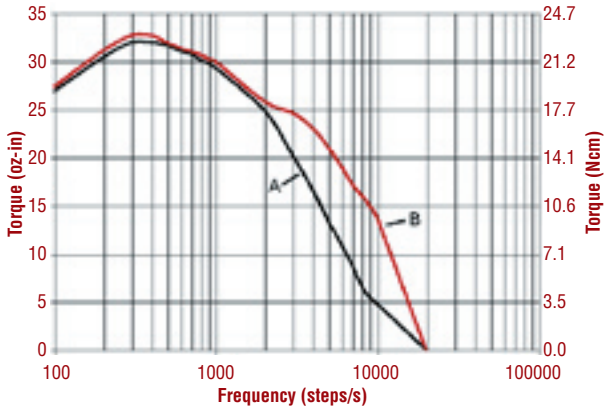


Specification	Units	HY 200 1718	
		0090 ✓	0230
Rated Phase Current	A	0.90	2.30
Phase Resistance	Ω	4.2	0.72
Phase Inductance	mH	5.8	0.83
Holding Torque Unipolar	oz-in	—	—
	Ncm	—	—
Holding Torque Bipolar	oz-in	41.1	41.1
	Ncm	29.0	29.0
Detent Torque	oz-in	6.4	6.4
	Ncm	4.5	4.5
Rotor Inertia	oz-in-s^{2}x10^{-4}	5.1	5.1
	g-cm^2	36	36
Motor Weight (Mass)	lb	0.7	0.7
	kg	0.3	0.3
Maximum Voltage	V	40	40
Std. No. of Leads	—	4	4

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque

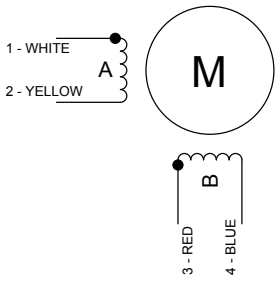


A - 0090, Bipolar chopper, 36V, 0.9A/Phase
B - 0230, Bipolar chopper, 36V, 2.3A/Phase

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available

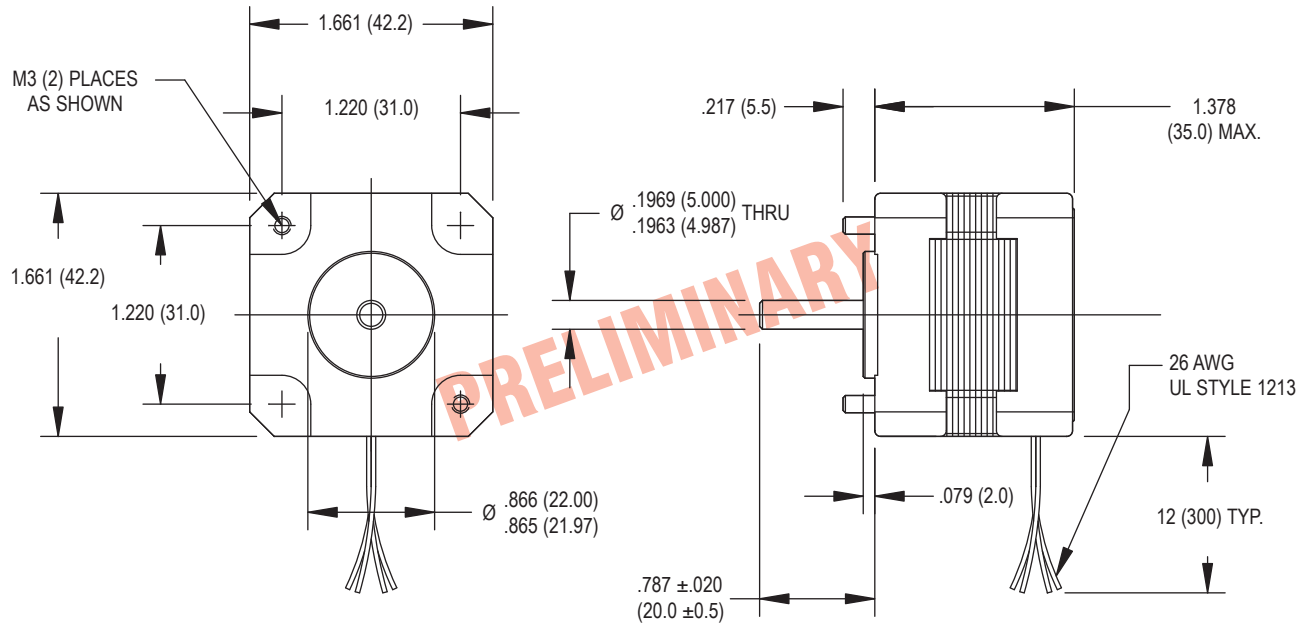
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

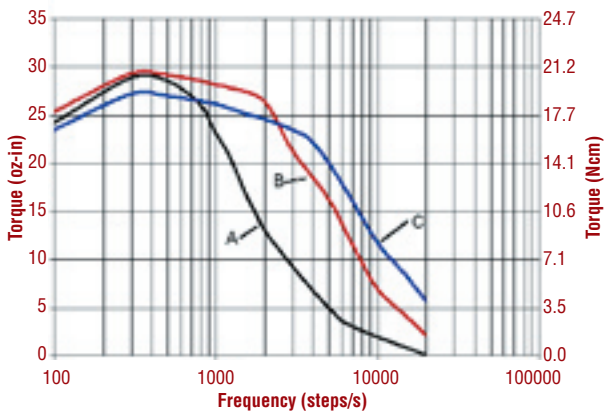
SIZE 17 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 1714		
		0033	0100	0150
Rated Phase Current	A	0.33	1.00	1.50
Phase Resistance	Ω	26.5	2.95	1.25
Phase Inductance	mH	38.8	4.45	1.80
Holding Torque Unipolar	oz-in	—	—	—
	Ncm	—	—	—
Holding Torque Bipolar	oz-in	37	37	37
	Ncm	26	26	26
Detent Torque	oz-in	2.3	2.3	2.3
	Ncm	1.6	1.6	1.6
Rotor Inertia	oz-in-s^{2}x10^{-4}	6.4	6.4	6.4
	g-cm^2	45	45	45
Motor Weight (Mass)	lb	0.51	0.51	0.51
	kg	0.23	0.23	0.23
Maximum Voltage	V	40	40	40
Std. No. of Leads	—	4	4	4

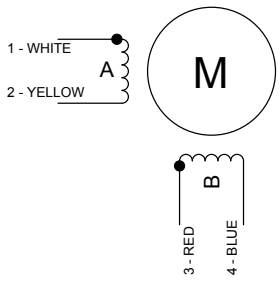
Performance

Motor Pull-Out Torque



A - 0033, Bipolar chopper, 35V, 0.33A/Phase, J_L=75 g cm^2
B - 0100, Bipolar chopper, 35V, 1.0A/Phase, J_L=75 g cm^2
C - 0150, Bipolar chopper, 35V, 1.5A/Phase, J_L=75 g cm^2

Standard Leadwire Configuration



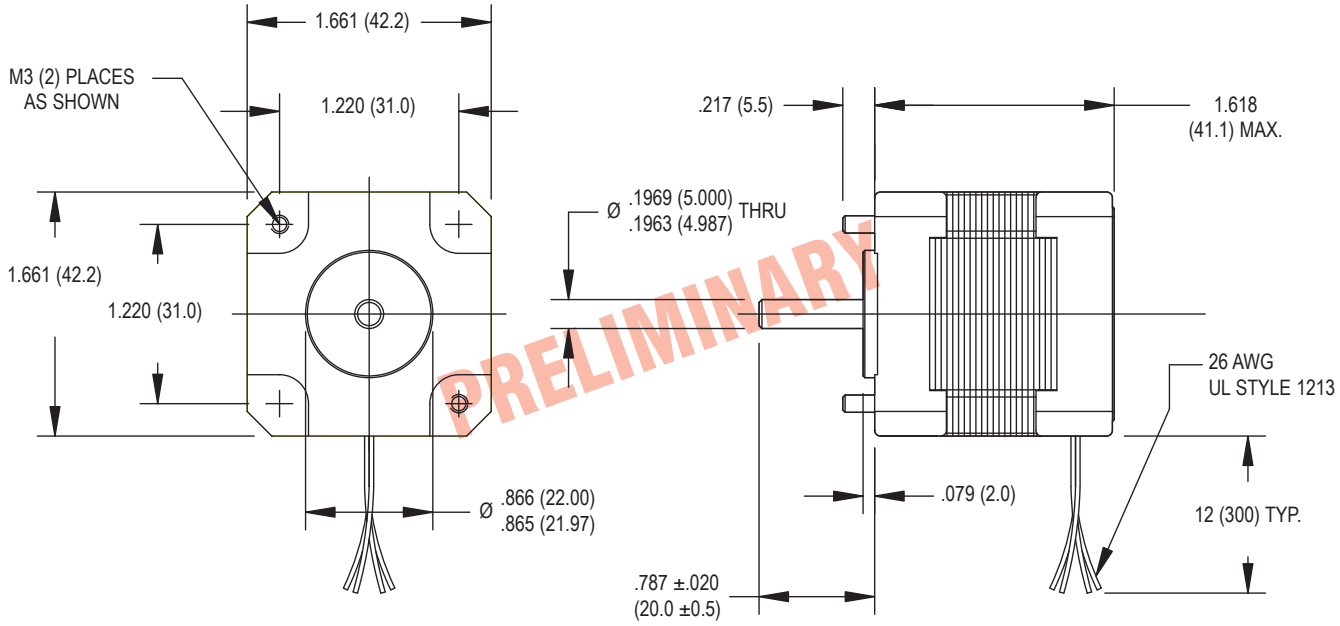
Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

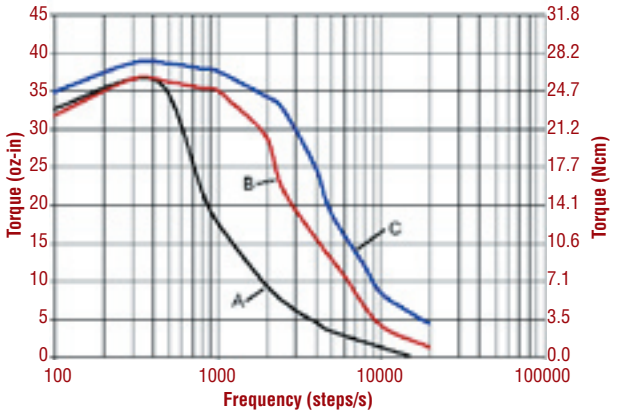
SIZE 17 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 1716		
		0033	0100	0150
Rated Phase Current	A	0.33	1.00	1.50
Phase Resistance	Ω	27.2	2.86	1.40
Phase Inductance	mH	66.7	6.74	3.25
Holding Torque Unipolar	oz-in	—	—	—
	Ncm	—	—	—
Holding Torque Bipolar	oz-in	47	47	47
	Ncm	33	33	33
Detent Torque	oz-in	2.3	2.3	2.3
	Ncm	1.6	1.6	1.6
Rotor Inertia	oz-in-s^{2}x10^{-4}	9.3	9.3	9.3
	g-cm^2	66	66	66
Motor Weight (Mass)	lb	0.66	0.66	0.66
	kg	0.30	0.30	0.30
Maximum Voltage	V	40	40	40
Std. No. of Leads	—	4	4	4

Performance

Motor Pull-Out Torque

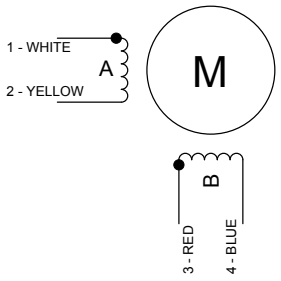


A - 0033, Bipolar chopper, 35V, 0.33A/Phase, J_L=75 g cm^2
B - 0100, Bipolar chopper, 35V, 1.0A/Phase, J_L=75 g cm^2
C - 0150, Bipolar chopper, 35V, 1.5A/Phase, J_L=75 g cm^2

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

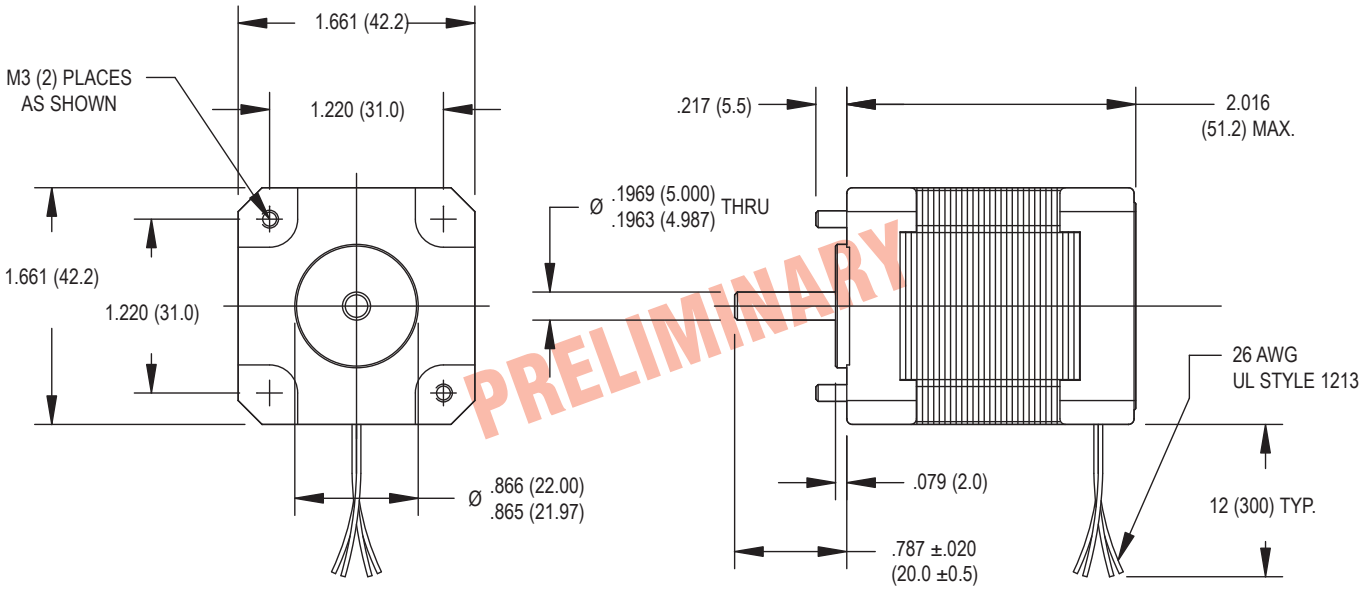
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

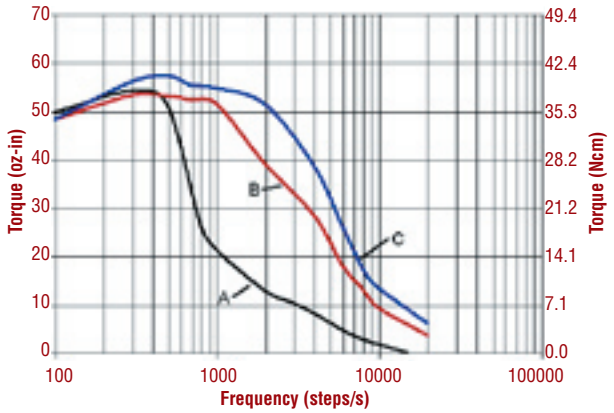
SIZE 17 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 1720		
		0033	0100	0150
Rated Phase Current	A	0.33	1.00	1.50
Phase Resistance	Ω	28.0	3.00	1.45
Phase Inductance	mH	50.0	5.50	2.90
Holding Torque Unipolar	oz-in	—	—	—
	Ncm	—	—	—
Holding Torque Bipolar	oz-in	71	71	71
	Ncm	50	50	50
Detent Torque	oz-in	3.5	3.5	3.5
	Ncm	2.5	2.5	2.5
Rotor Inertia	oz-in-s^{2}x10^{-4}	12.7	12.7	12.7
	g-cm^2	90	90	90
Motor Weight (Mass)	lb	0.84	0.84	0.84
	kg	0.38	0.38	0.38
Maximum Voltage	V	40	40	40
Std. No. of Leads	—	4	4	4

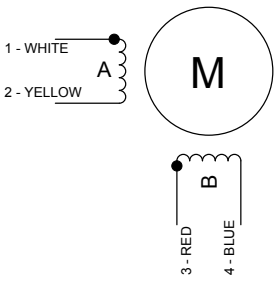
Performance

Motor Pull-Out Torque



A - 0033, Bipolar chopper, 35V, 0.33A/Phase, J_L=75 g cm^2
B - 0100, Bipolar chopper, 35V, 1.0A/Phase, J_L=75 g cm^2
C - 0150, Bipolar chopper, 35V, 1.5A/Phase, J_L=75 g cm^2

Standard Leadwire Configuration



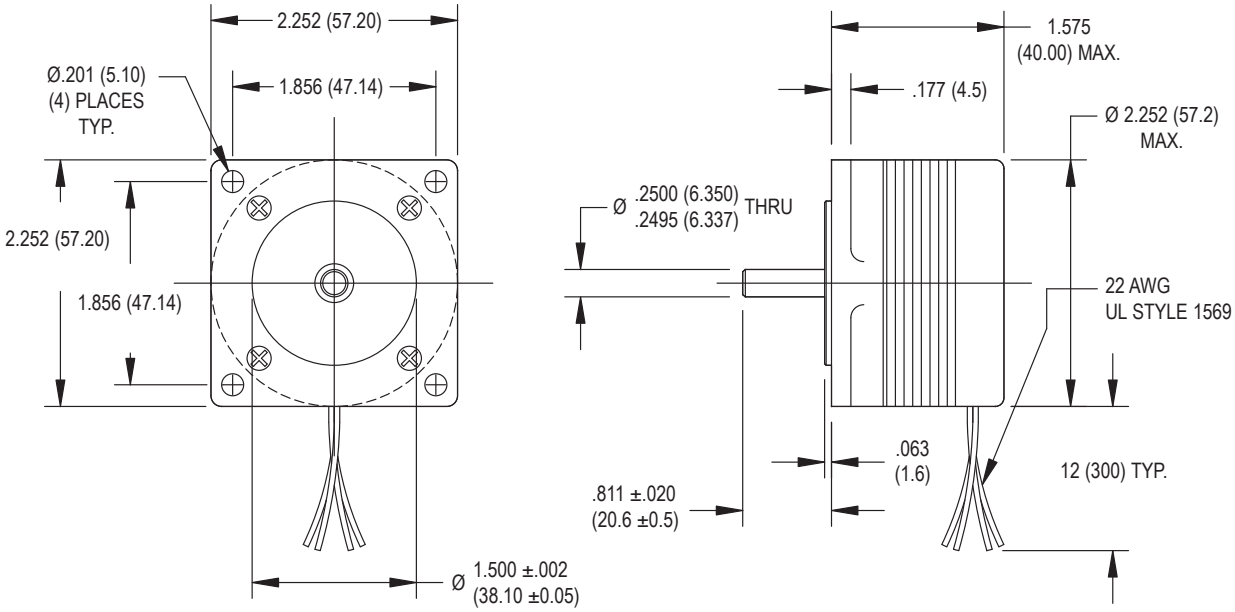
Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 17 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 STEPPER MOTOR DATA

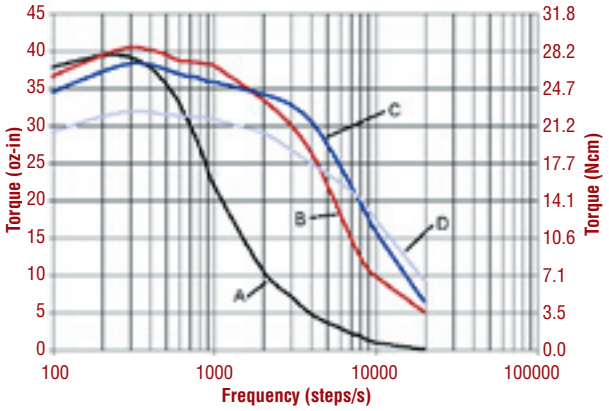


Specification	Units	HY 200 2215			
		0033	0100	0150 ✓	0220
Rated Phase Current	A	0.33	1.00	1.50	2.20
Phase Resistance	Ω	33.8	3.4	1.5	0.7
Phase Inductance	mH	54.6	3.8	1.5	1.2
Holding Torque Unipolar	oz-in	—	38	35	—
	Ncm	—	27	25	—
Holding Torque Bipolar	oz-in	45	48	47	44
	Ncm	32	34	33	31
Detent Torque	oz-in	4.8	4.8	4.8	4.8
	Ncm	3.4	3.4	3.4	3.4
Rotor Inertia	oz-in-s^{2}x10^{-4}	7.9	7.9	7.9	7.9
	g-cm^2	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.

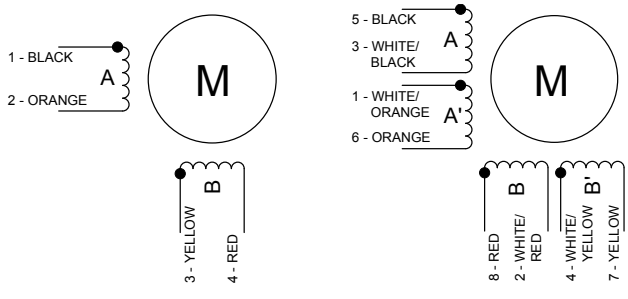
Performance

Motor Pull-Out Torque



A - 0033, Bipolar chopper, 36V, 0.33A/Phase
B - 0100, Bipolar chopper, Parallel, 48V, 1.5A/Phase
C - 0150, Bipolar chopper, Parallel, 48V, 2.2A/Phase
D - 0220, Bipolar chopper, 48V, 2.2A/Phase

Standard Leadwire Configuration



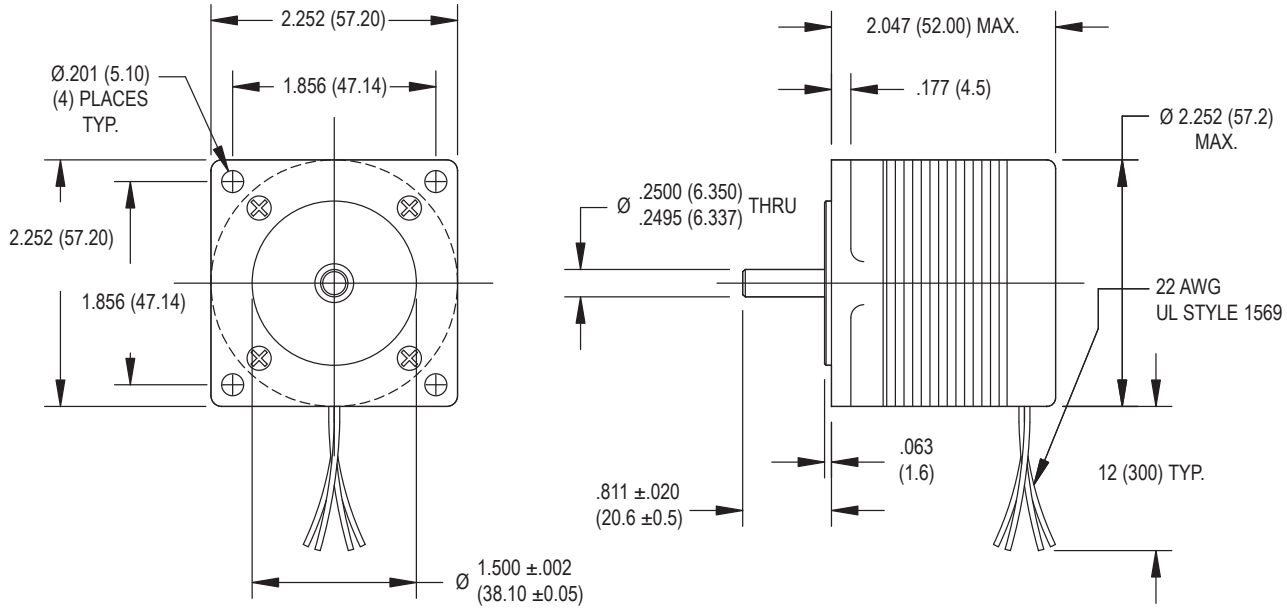
Standard Features

- 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 (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 STEPPER MOTOR DATA

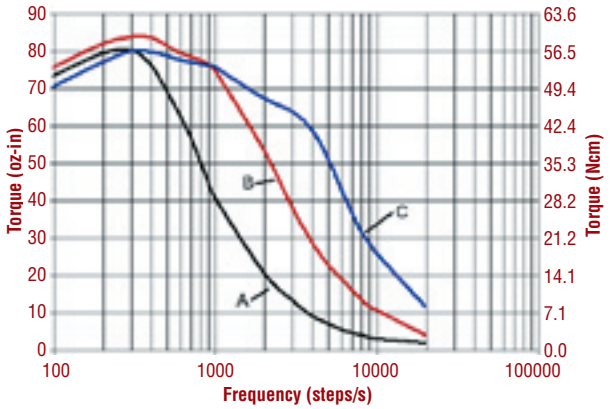


Specification	Units	HY 200 2220		
		0044	0100 ✓	0210 ✓
Rated Phase Current	A	0.44	1.00	2.10
Phase Resistance	Ω	23.0	5.0	1.1
Phase Inductance	mH	39.2	8.0	1.7
Holding Torque Unipolar	oz-in	74	75	74
	Ncm	52	53	52
Holding Torque Bipolar	oz-in	92	98	91
	Ncm	65	69	64
Detent Torque	oz-in	7.5	7.5	7.5
	Ncm	5.3	5.3	5.3
Rotor Inertia	oz-in-s^{2}x10^{-4}	17.6	17.6	17.6
	g-cm^2	124	124	124
Motor Weight (Mass)	lb	1.1	1.1	1.1
	kg	0.50	0.50	0.50
Maximum Voltage	V	75	75	75
Std. No. of Leads	—	8	8	8

✓ Available through the MotionExpress program.

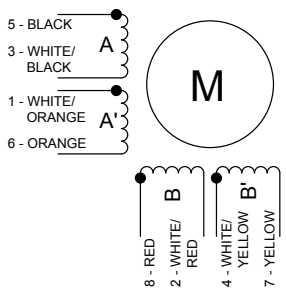
Performance

Motor Pull-Out Torque



A - 0044, Bipolar chopper, Parallel, 36V, 0.62A/Phase
B - 0100, Bipolar chopper, Parallel, 48V, 1.5A/Phase
C - 0210, Bipolar chopper, Parallel, 48V, 3A/Phase

Standard Leadwire Configuration



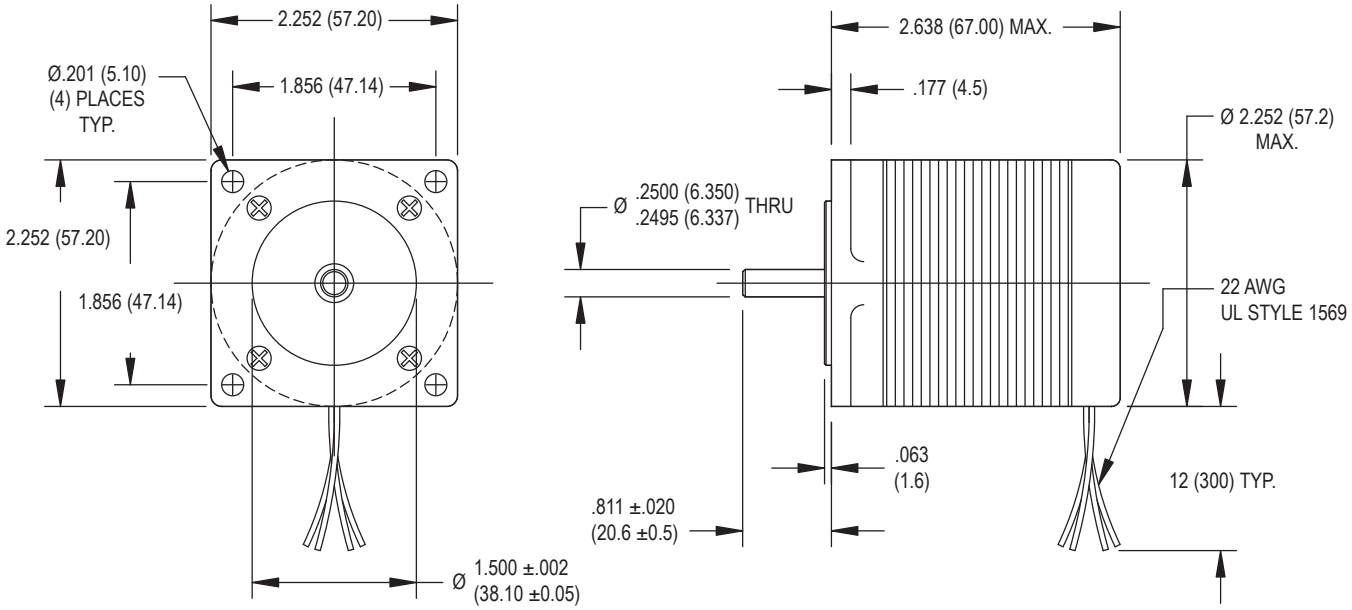
Standard Features

- 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 (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 STEPPER MOTOR DATA

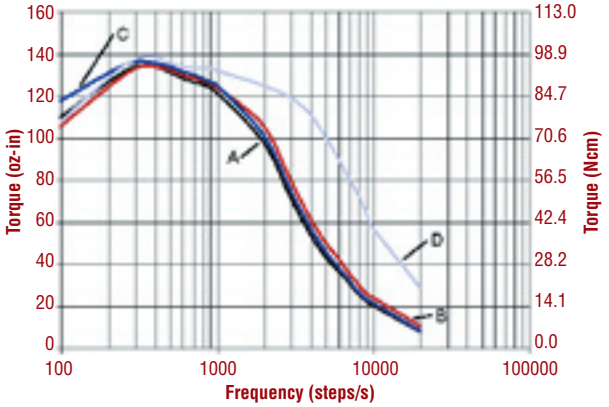


Specification	Units	HY 200 2226			
		0160 ✓	0190 ✓	0250	0470
Rated Phase Current	A	1.60	1.90	2.50	4.70
Phase Resistance	Ω	2.6	1.8	1.1	0.33
Phase Inductance	mH	4.7	3.3	4.0	0.5
Holding Torque Unipolar	oz-in	123	126	—	123
	Ncm	87	89	—	87
Holding Torque Bipolar	oz-in	154	160	161	154
	Ncm	109	113	114	109
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^{2}x10^{-4}	28	28	28	28
	g-cm^2	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

✓ Available through the MotionExpress program.

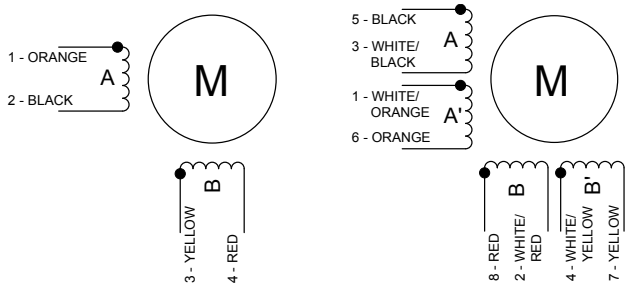
Performance

Motor Pull-Out Torque



A - 0160, Bipolar chopper, Parallel, 48V, 2.3A/Phase
B - 0190, Bipolar chopper, Parallel, 48V, 2.7A/Phase
C - 0250, Bipolar chopper, 48V, 2.5A/Phase
D - 0470, Bipolar chopper, Parallel, 48V, 6.7A/Phase

Standard Leadwire Configuration



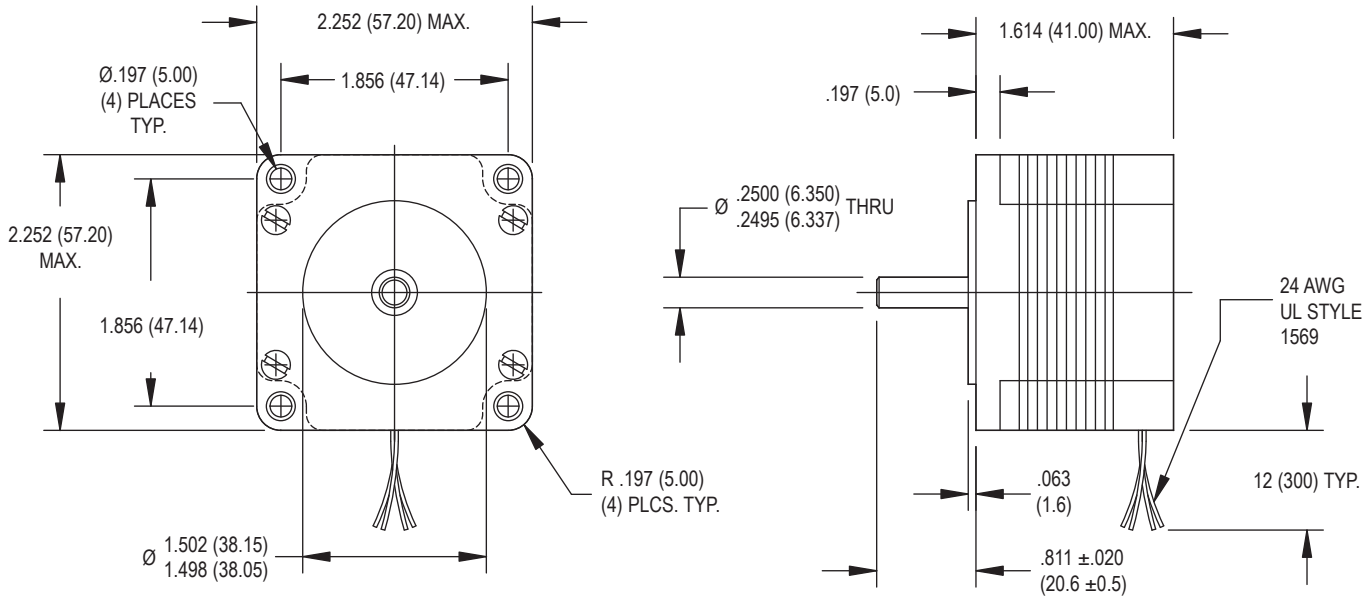
Standard Features

- 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 (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA

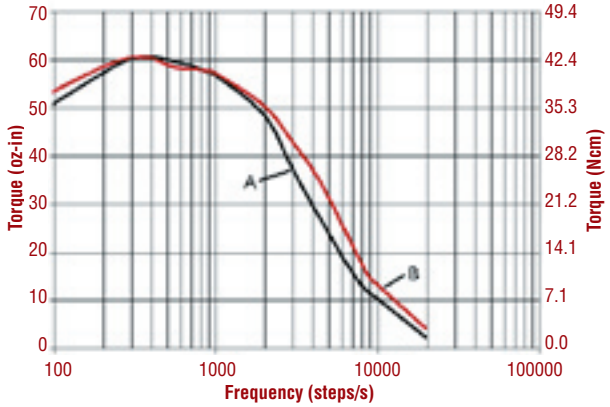


Specification	Units	HS 200 2216	
		0100 ✓	0210
Rated Phase Current	A	1.00	2.10
Phase Resistance	Ω	4.6	1.0
Phase Inductance	mH	4.6	2.1
Holding Torque Unipolar	oz-in	52	—
	Ncm	37	—
Holding Torque Bipolar	oz-in	67	67
	Ncm	47	47
Detent Torque	oz-in	3.0	3.0
	Ncm	2.1	2.1
Rotor Inertia	oz-in-s^{2}x10^{-4}	11	11
	g-cm^2	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.

Performance

Motor Pull-Out Torque

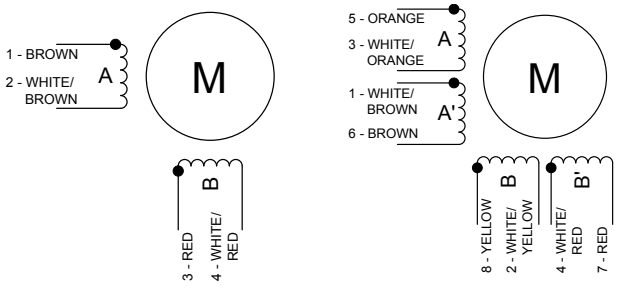


A - 0100, Bipolar chopper, Parallel, 36V, 1.4A/Phase
B - 0210, Bipolar chopper, 36V, 2.1A/Phase

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

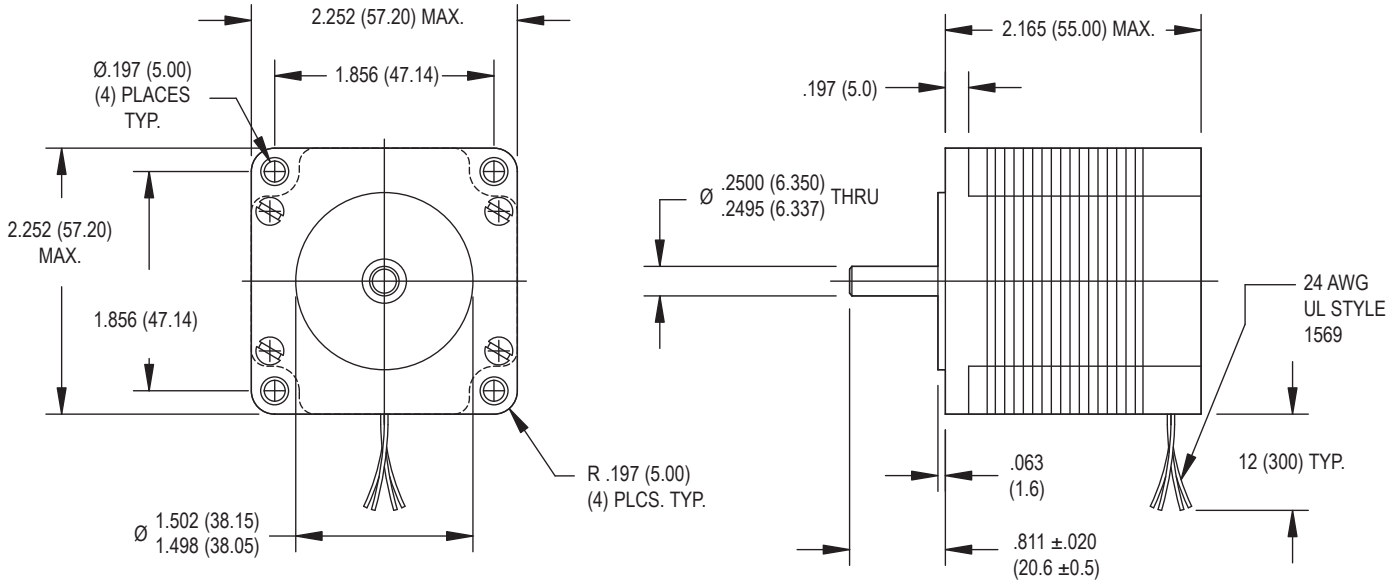
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA

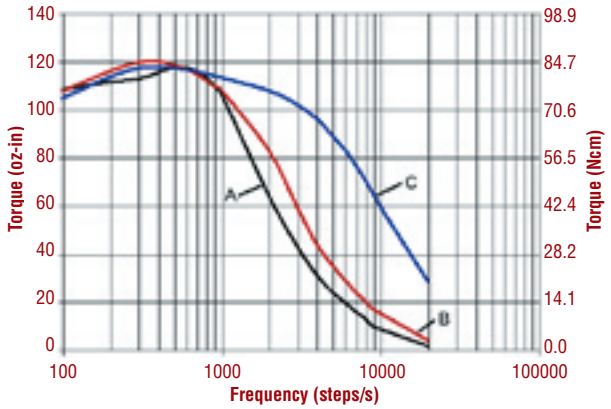


Specification	Units	HS 200 2221		
		0100	0210 ✓	0300 ✓
Rated Phase Current	A	1.00	2.10	3.00
Phase Resistance	Ω	6.2	1.4	0.7
Phase Inductance	mH	8.8	3.9	0.9
Holding Torque Unipolar	oz-in	106	—	106
	Ncm	75	—	75
Holding Torque Bipolar	oz-in	139	139	139
	Ncm	98	98	98
Detent Torque	oz-in	5.7	5.7	5.7
	Ncm	4.0	4.0	4.0
Rotor Inertia	oz-in-s^{2}x10^{-4}	31	31	31
	g-cm^2	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

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque

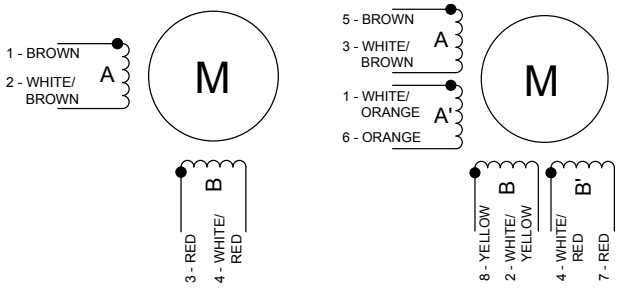


A - 0100, Bipolar chopper, Parallel, 36V, 1.4A/Phase
B - 0210, Bipolar chopper, 36V, 2.1A/Phase
C - 0300, Bipolar chopper, Parallel, 60V, 4.2A/Phase

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

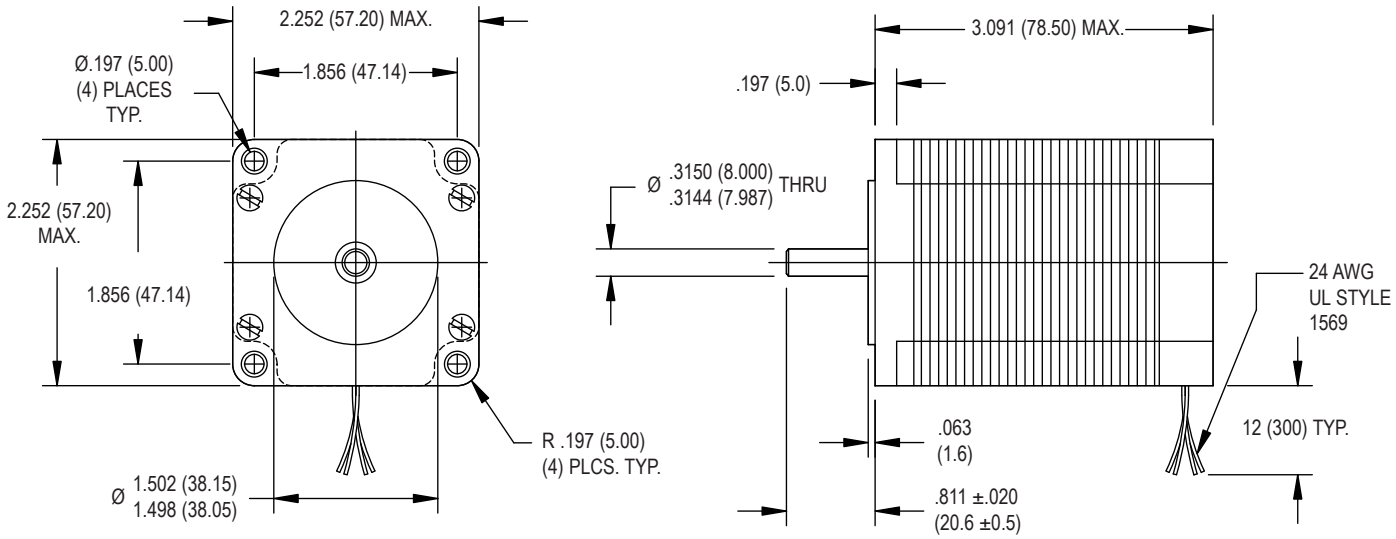
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 23 HIGH PERFORMANCE STEPPER MOTOR DATA

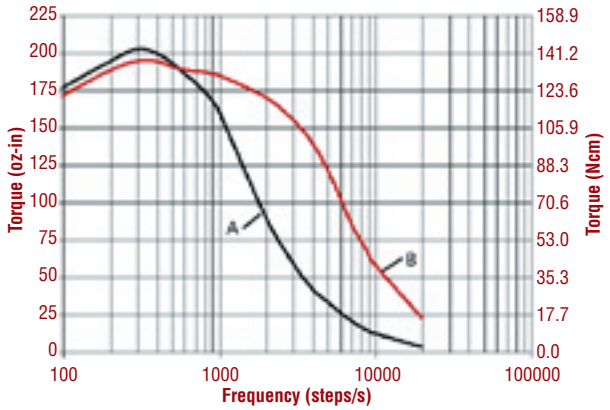


Specification	Units	HS 200 2231	
		0210	0300 ✓
Rated Phase Current	A	2.10	3.00
Phase Resistance	Ω	2.0	1.1
Phase Inductance	mH	6.5	1.7
Holding Torque Unipolar	oz-in	—	177
	Ncm	—	125
Holding Torque Bipolar	oz-in	228	231
	Ncm	161	163
Detent Torque	oz-in	9.6	9.6
	Ncm	6.8	6.8
Rotor Inertia	oz-in-s^{2}x10^{-4}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

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque



A - 0210, Bipolar chopper, 36V, 2.1A/Phase
B - 0300, Bipolar chopper, Parallel, 60V, 4.2A/Phase

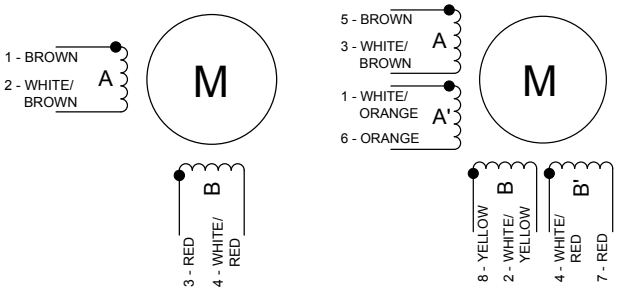
Standard Features

- 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

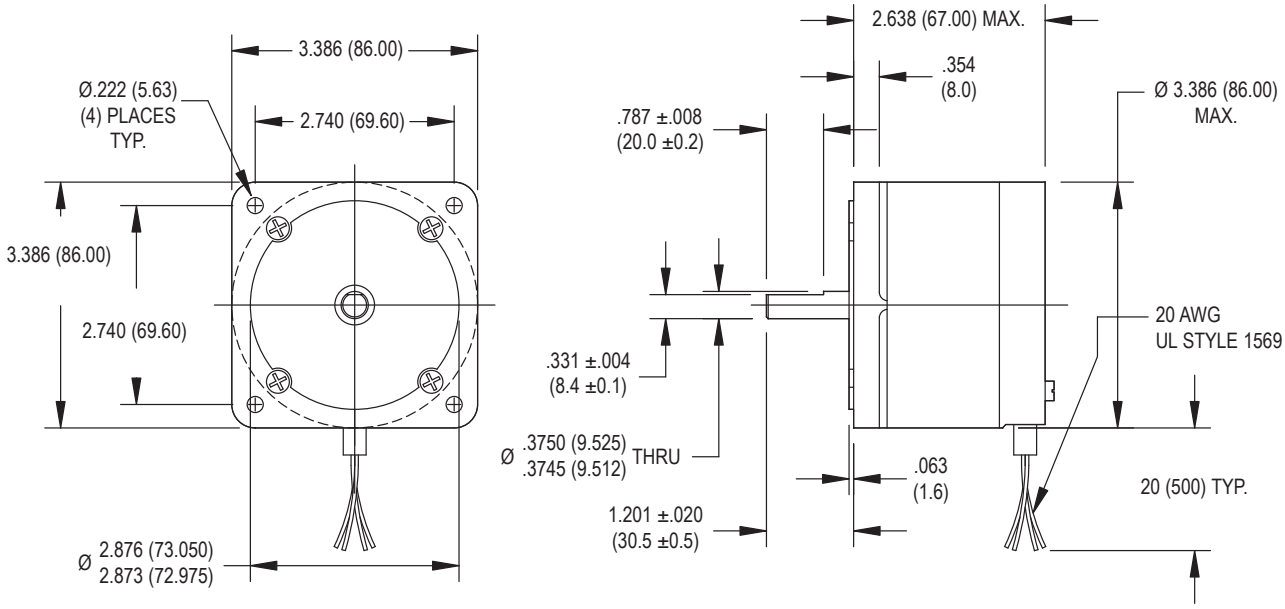
Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

Standard Leadwire Configuration



SIZE 34 STEPPER MOTOR DATA

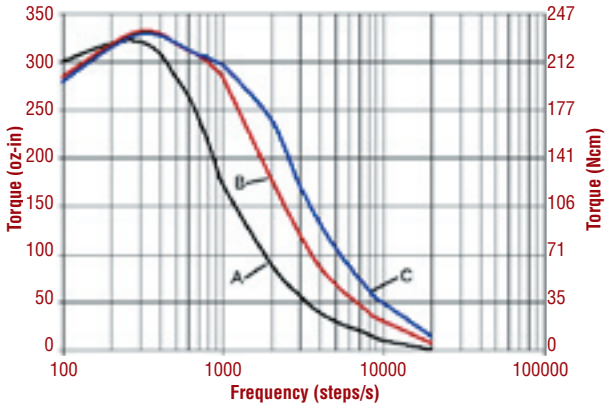


Specification	Units	HN 200 3426		
		0140	0280	0430 ✓
Rated Phase Current	A	1.40	2.80	4.30
Phase Resistance	Ω	5.0	1.3	0.55
Phase Inductance	mH	21	5.1	2.1
Holding Torque Unipolar	oz-in	326	326	326
	Ncm	230	230	230
Holding Torque Bipolar	oz-in	397	397	397
	Ncm	280	280	280
Detent Torque	oz-in	12	12	12
	Ncm	8.5	8.5	8.5
Rotor Inertia	oz-in-s^{2}x10^{-4}	93	93	93
	g-cm^2	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

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque

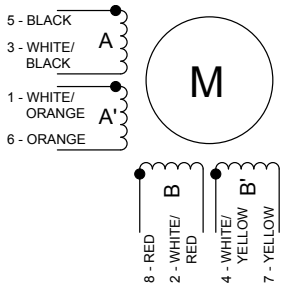


A - 0140, Bipolar chopper, Parallel, 60V, 2A/Phase
B - 0280, Bipolar chopper, Parallel, 60V, 4A/Phase
C - 0430, Bipolar chopper, Parallel, 60V, 6A/Phase

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

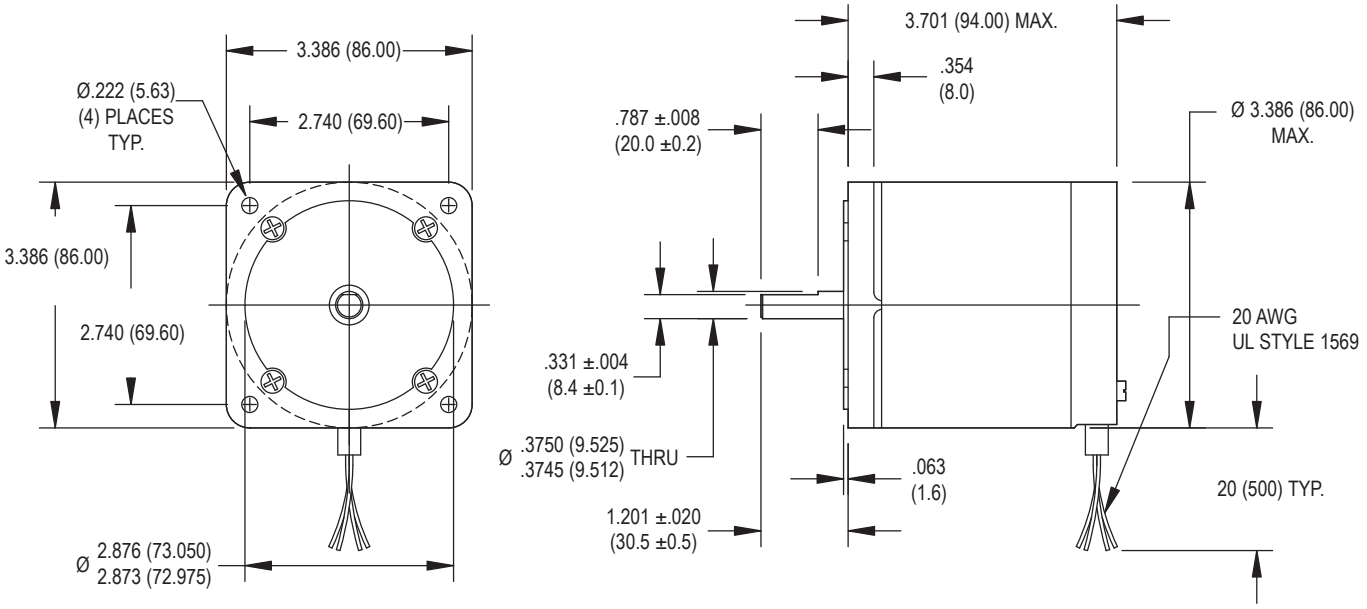
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 34 STEPPER MOTOR DATA

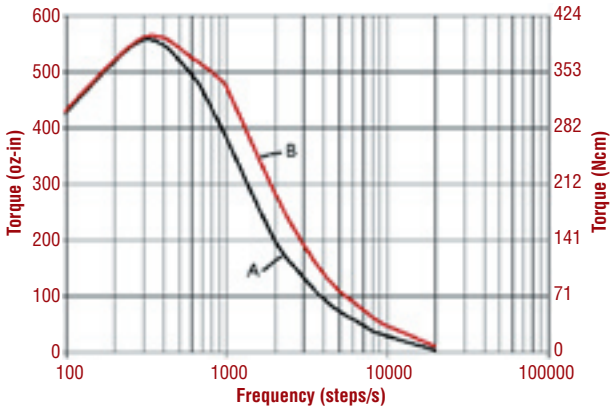


Specification	Units	HN 200 3438	
		0280	0430 ✓
Rated Phase Current	A	2.80	4.30
Phase Resistance	Ω	1.7	0.75
Phase Inductance	mH	7.7	3.5
Holding Torque Unipolar	oz-in	538	538
	Ncm	380	380
Holding Torque Bipolar	oz-in	680	680
	Ncm	480	480
Detent Torque	oz-in	18	18
	Ncm	13	13
Rotor Inertia	oz-in-s^{2}x10^{-4}	170	170
	g-cm^2	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

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque



A - 0280, Bipolar chopper, Parallel, 60V, 4A/Phase
B - 0430, Bipolar chopper, Parallel, 60V, 6A/Phase

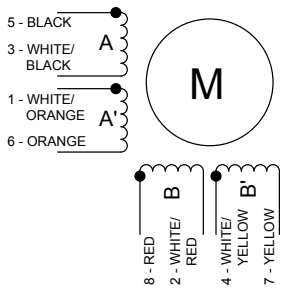
Standard Features

- 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

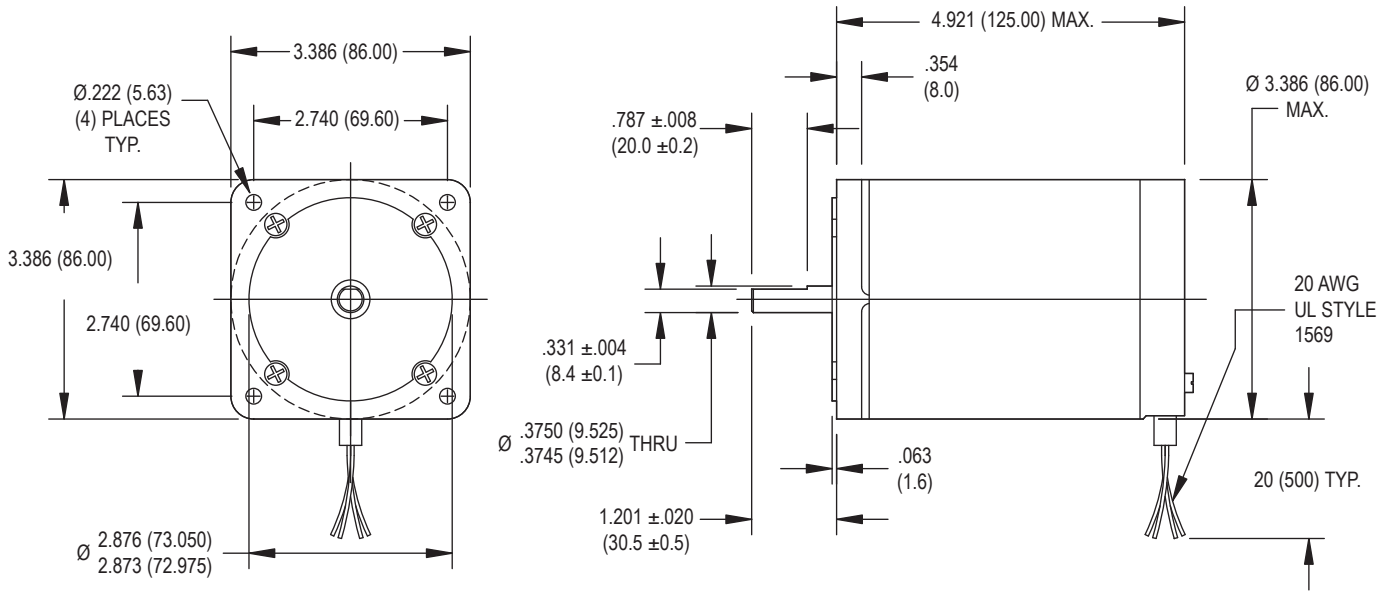
Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

Standard Leadwire Configuration



SIZE 34 STEPPER MOTOR DATA

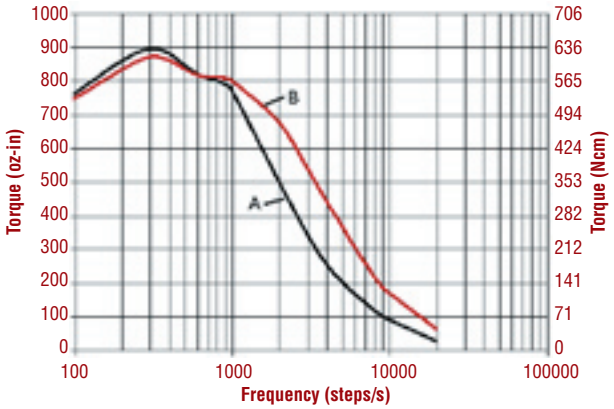


Specification	Units	HN 200 3451	
		0350 ✓	0640 ✓
Rated Phase Current	A	3.50	6.40
Phase Resistance	Ω	1.5	0.50
Phase Inductance	mH	8.5	2.5
Holding Torque Unipolar	oz-in	878	878
	Ncm	620	620
Holding Torque Bipolar	oz-in	1076	1076
	Ncm	760	760
Detent Torque	oz-in	33	33
	Ncm	23	23
Rotor Inertia	oz-in-s^{2}x10^{-4}	255	255
	g-cm^2	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.

Performance

Motor Pull-Out Torque

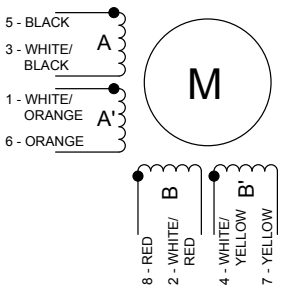


A - 0350, Bipolar chopper, Parallel, 120V, 5A/Phase
B - 0640, Bipolar chopper, Parallel, 120V, 9A/Phase

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

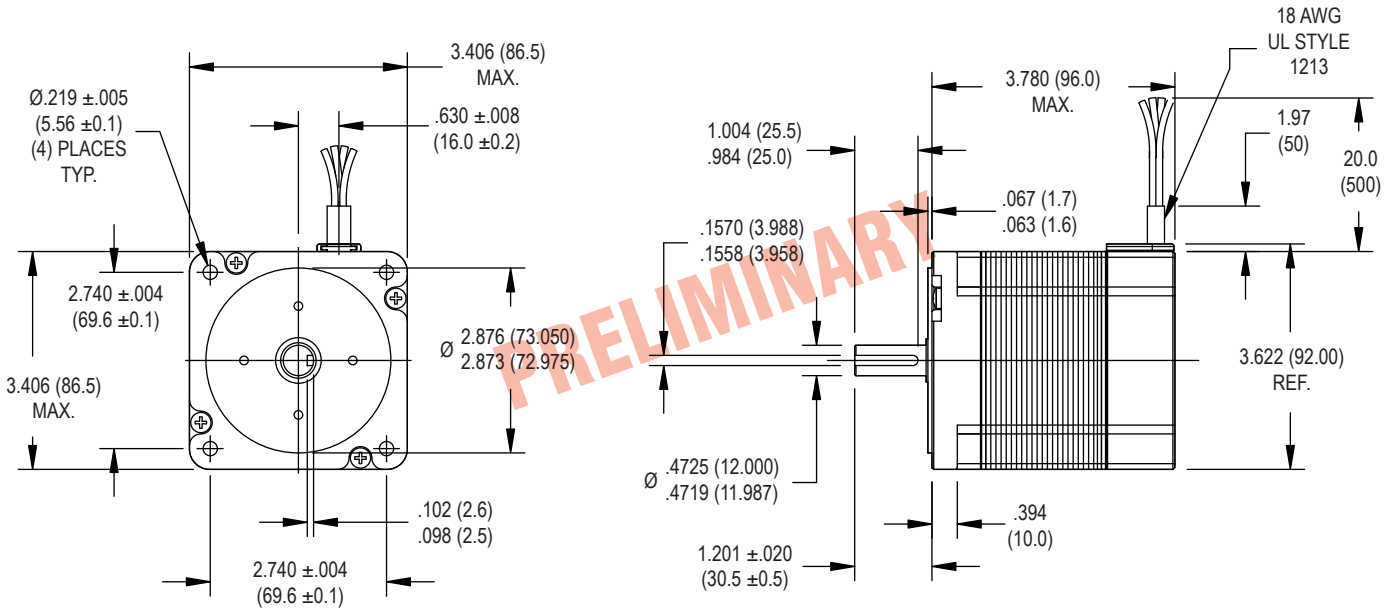
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

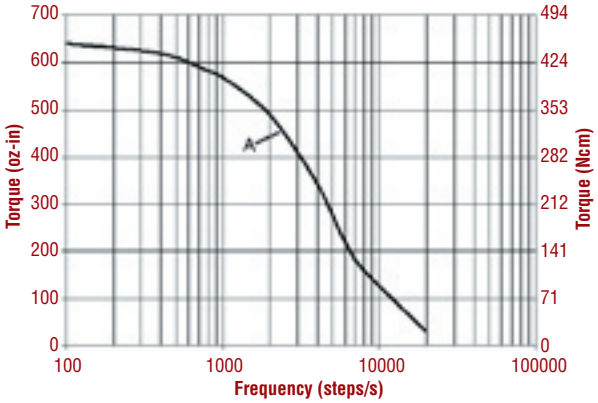
SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 3437		
		0300	0550	0800
Rated Phase Current	A	3.00	5.50	8.00
Phase Resistance	Ω	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	779	779	779
	Ncm	550	550	550
Detent Torque	oz-in	28	28	28
	Ncm	20	20	20
Rotor Inertia	oz-in-s^{2}x10^{-4}	490	490	490
	g-cm^2	3460	3460	3460
Motor Weight (Mass)	lb	6.6	6.6	6.6
	kg	3.0	3.0	3.0
Maximum Voltage	V	160	160	160
Std. No. of Leads	—	4	4	4

Performance

Motor Pull-Out Torque

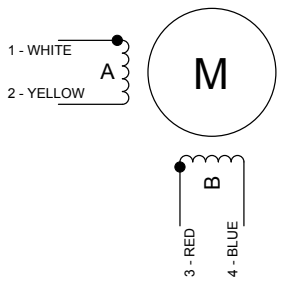


A - 0550, Bipolar chopper, 120V, 5.5A/Phase, J_L=12000 g cm^2

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 34 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

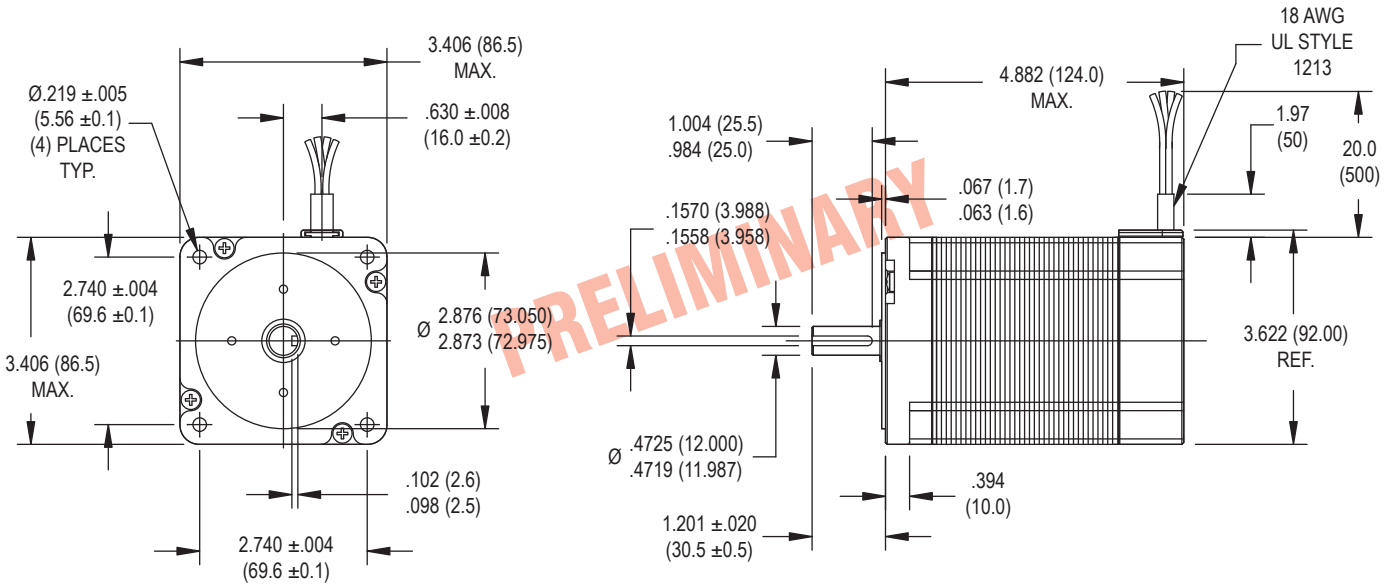
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

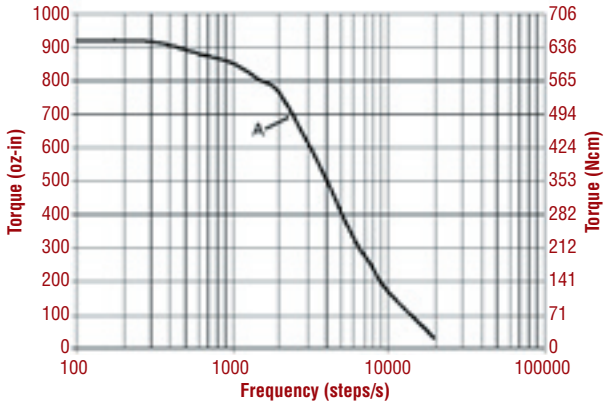
SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA



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^{2}x10^{-4}	548	548	548
	g-cm^2	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

Performance

Motor Pull-Out Torque

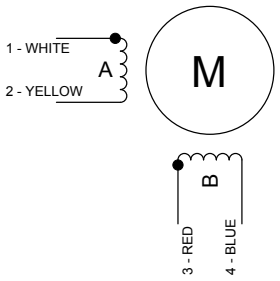


A - 0550, Bipolar chopper, 120V, 5.5A/Phase, J_L=12000 g cm^2

Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 34 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

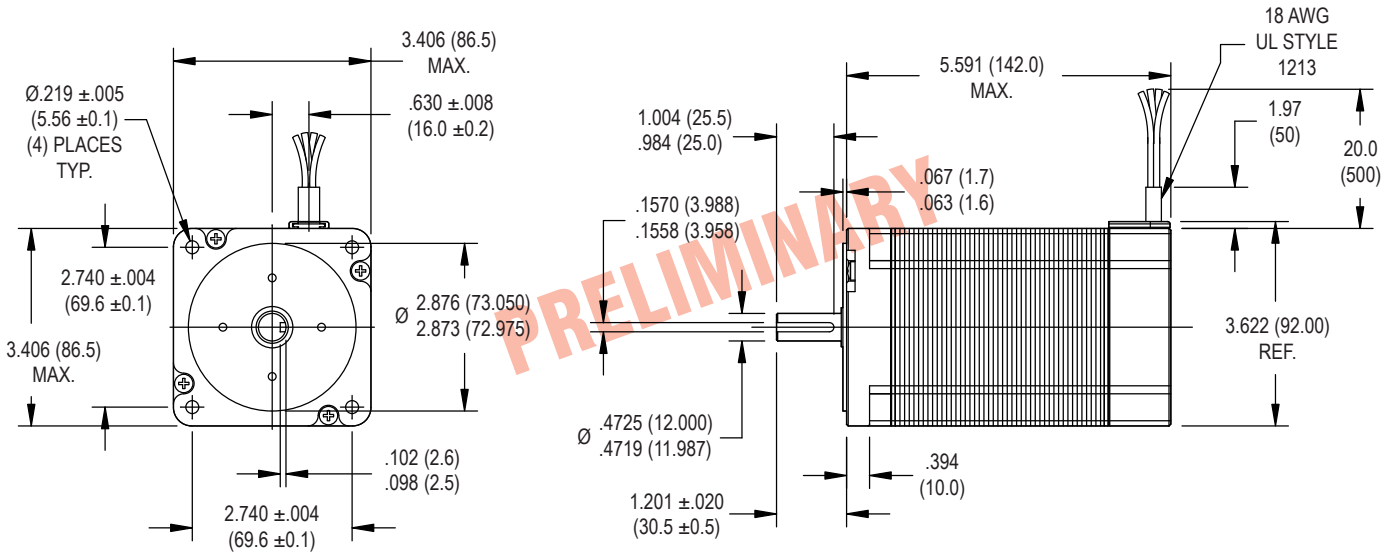
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

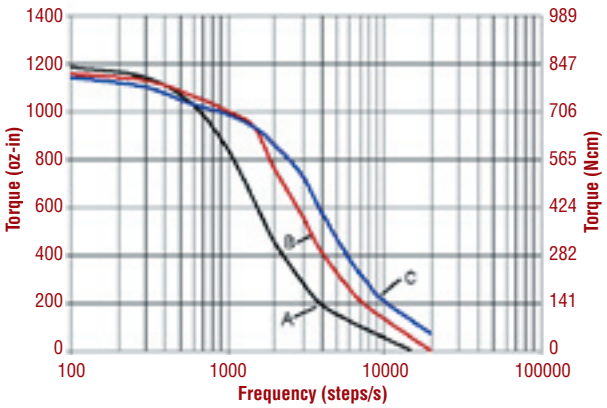
SIZE 34 HIGH PERFORMANCE STEPPER MOTOR DATA



Specification	Units	HS 200 3455		
		0300	0550	0800
Rated Phase Current	A	3.00	5.50	8.00
Phase Resistance	Ω	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	1416	1416	1416
	Ncm	1000	1000	1000
Detent Torque	oz-in	42	42	42
	Ncm	30	30	30
Rotor Inertia	oz-in-s^{2}x10^{-4}	694	694	694
	g-cm^2	4900	4900	4900
Motor Weight (Mass)	lb	10.8	10.8	10.8
	kg	4.9	4.9	4.9
Maximum Voltage	V	160	160	160
Std. No. of Leads	—	4	4	4

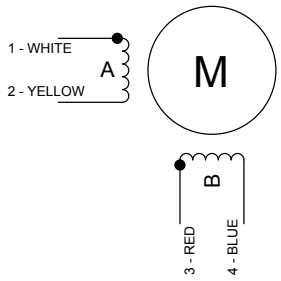
Performance

Motor Pull-Out Torque



A - 0300, Bipolar chopper, 120V, 3.0A/Phase, J_L=12000 g cm^2
B - 0550, Bipolar chopper, 120V, 5.5A/Phase, J_L=12000 g cm^2
C - 0800, Bipolar chopper, 120V, 8.0A/Phase, J_L=12000 g cm^2

Standard Leadwire Configuration



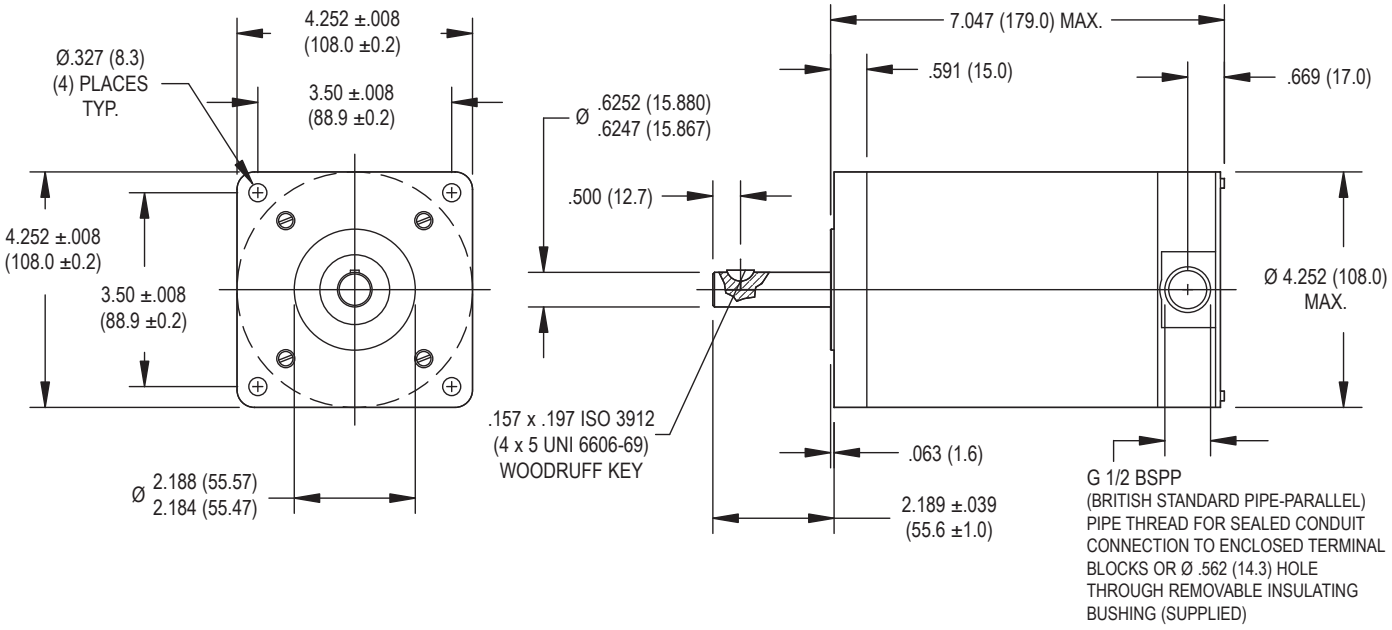
Standard Features

- Step angle: 1.8˚
- Step angle accuracy: 5%
- Insulation class: B (130˚C)
- Optimized for microstep operation
- NEMA 34 mounting configuration
- Neodymium magnets
- Additional windings and customization options available
- CE approval pending

Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 42 STEPPER MOTOR DATA

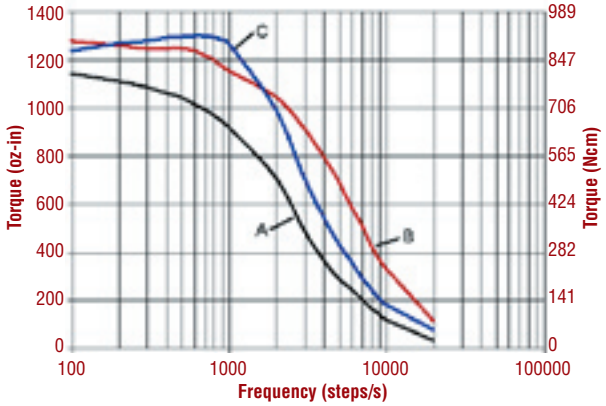


Specification	Units	HY 200 4270		
		0340	0710	0900 ✓
Rated Phase Current	A	3.40	7.10	9.00
Phase Resistance	Ω	1.1	0.30	0.34
Phase Inductance	mH	6.3	2.0	2.7
Holding Torque Unipolar	oz-in	1130	1175	1450
	Ncm	798	830	1024
Holding Torque Bipolar	oz-in	1402	1459	1798
	Ncm	990	1030	1270
Detent Torque	oz-in	99	99	99
	Ncm	70	70	70
Rotor Inertia	oz-in-s^{2}x10^{-4}	779	779	779
	g-cm^2	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.

Performance

Motor Pull-Out Torque

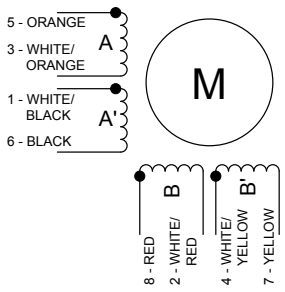


A - 0340, Bipolar chopper, Parallel, 120V, 4.8A/Phase
B - 0710, Bipolar chopper, Parallel, 140V, 10A/Phase
C - 0900, Bipolar chopper, Parallel, 140V, 12A/Phase

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

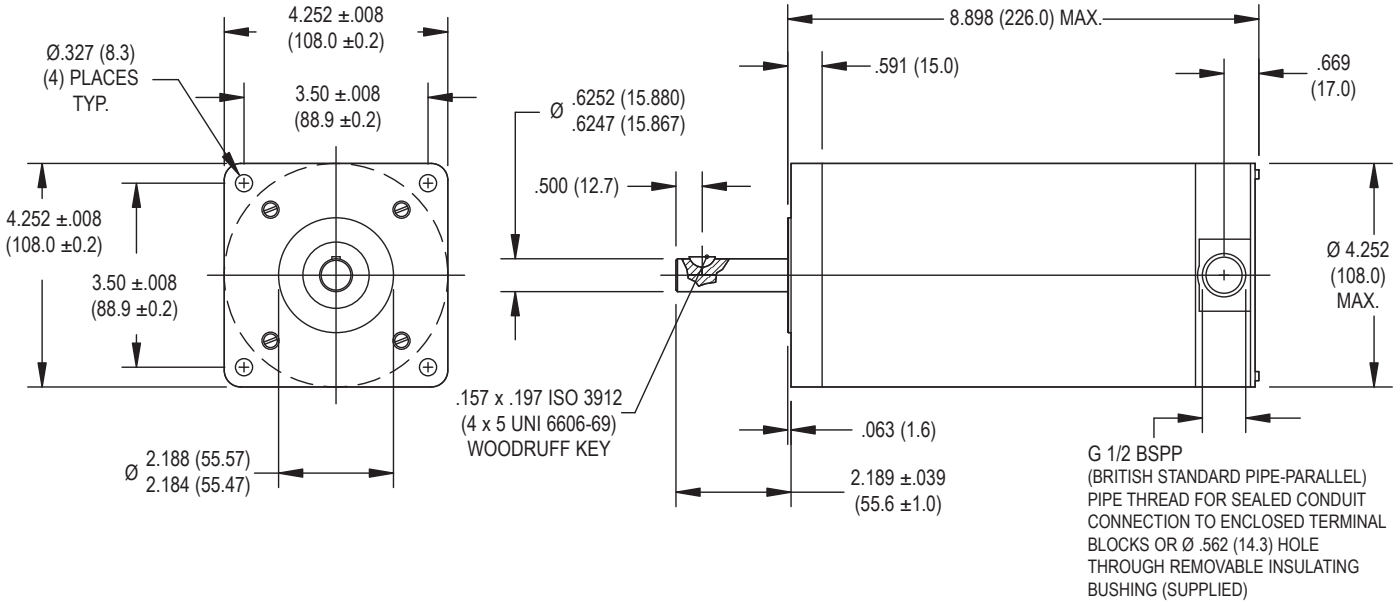
Standard Leadwire Configuration



Complementary Products (See Bulletin CO)

- Gearboxes
- Encoders

SIZE 42 STEPPER MOTOR DATA

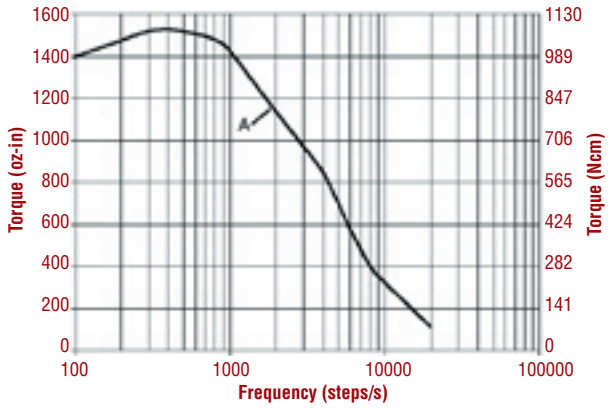


Specification	Units	HY 200 4288
		0890 ✓
Rated Phase Current	A	8.90
Phase Resistance	Ω	0.31
Phase Inductance	mH	2.3
Holding Torque Unipolar	oz-in	1614
	Ncm	1140
Holding Torque Bipolar	oz-in	2018
	Ncm	1425
Detent Torque	oz-in	92
	Ncm	65
Rotor Inertia	oz-in-s^{2}x10^{-4}	1175
	g-cm^2	8300
Motor Weight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

✓ Available through the MotionExpress program.

Performance

Motor Pull-Out Torque



A - 0890, Bipolar chopper, Parallel, 140V, 12A/Phase

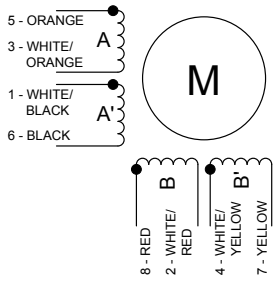
Standard Features

- 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 (See Bulletin CO)

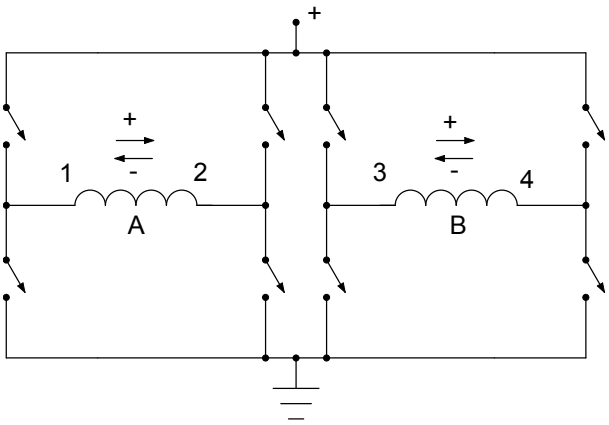
- Gearboxes
- Encoders

Standard Leadwire Configuration

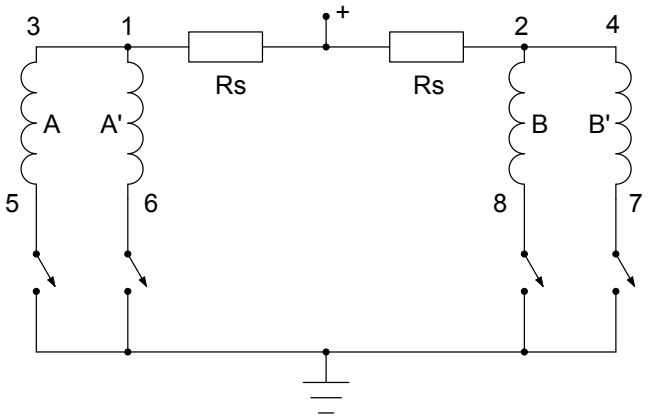


CONNECTION DIAGRAMS

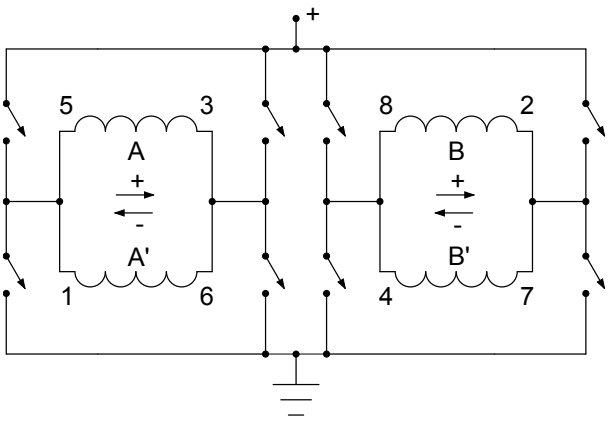
BIPOLAR



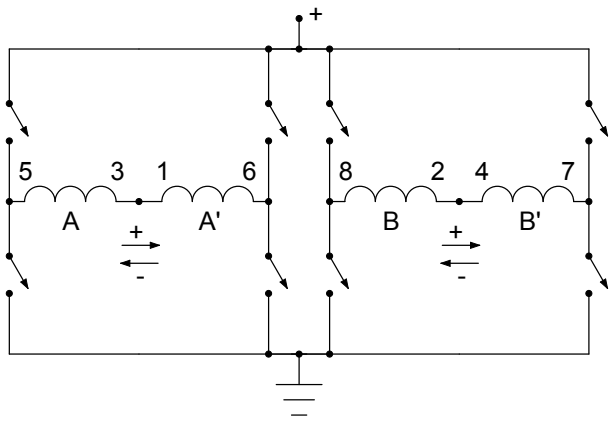
UNIPOLAR



BIPOLAR (PARALLEL)



BIPOLAR (SERIES)



STEP SEQUENCES

FULL STEP OPERATION

One Phase On

	Unipolar					*Bipolar*	
	A	A'	B	B'		A	B
1	+	0	0	0	1	0	+
2	0	0	+	0	2	–	0
3	0	+	0	0	3	0	–
4	0	0	0	+	4	+	0
1	+	0	0	0	1	0	+

Two Phases On

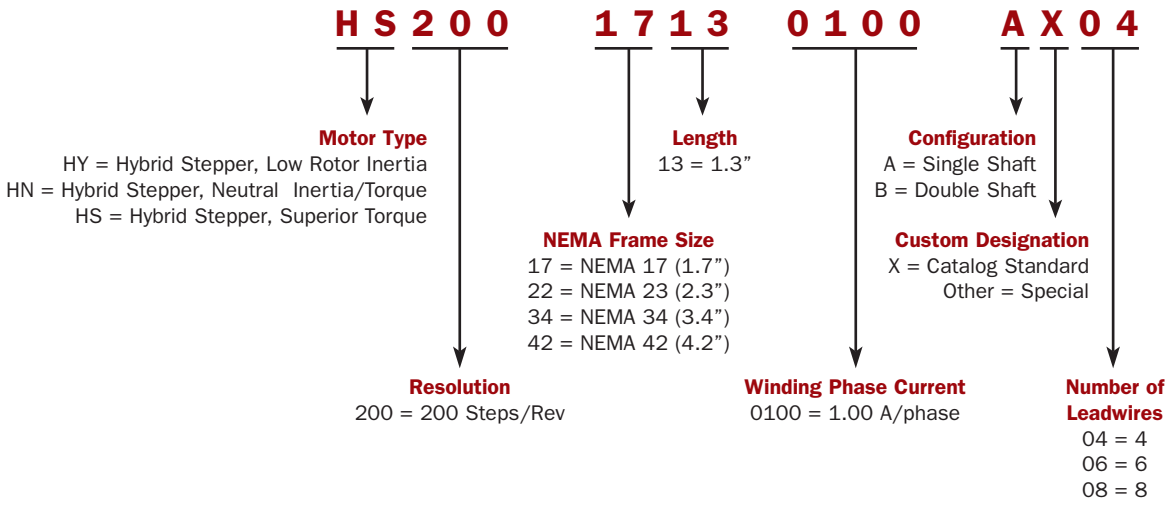
	Unipolar					*Bipolar*	
	A	A'	B	B'		A	B
1	+	0	0	+	1	+	–
2	+	0	+	0	2	+	+
3	0	+	+	0	3	–	+
4	0	+	0	+	4	–	–
1	+	0	0	+	1	+	–

HALF STEP OPERATION

	Unipolar					*Bipolar*	
	A	A'	B	B'		A	B
1	+	0	0	+	1	+	+
2	+	0	0	0	2	0	+
3	+	0	+	0	3	–	+
4	0	0	+	0	4	–	0
5	0	+	+	0	5	–	–
6	0	+	0	0	6	0	–
7	0	+	0	+	7	+	–
8	0	0	0	+	8	+	0
1	+	0	0	+	1	+	+

NOTE: Following the above steps in sequential order results in clockwise rotation of the shaft when viewed from the mounting end. Reversing the sequence results in counter-clockwise rotation.

CATALOG PART NUMBER DESCRIPTION



NOTE: The factory may assign a part number that differs from the catalog designation for purposes of uniqueness and brevity.

Specifications subject to change without notice.

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11/05