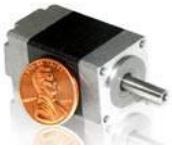
Hybrid Step Motors

The Motion Group's hybrid step motors are precision bi-directional devices with permanently lubricated ball bearings. They are manufactured under rigid quality standards, and are suitable for OEM production applications requiring digital positioning such as: printers, plotters, scanners, X-Y tables, CNC machines, indexers, injector pumps, turn-tables, robots, dispensers/diluters, remote-controls, optical equipment, fax machines, chart recorders, etc.

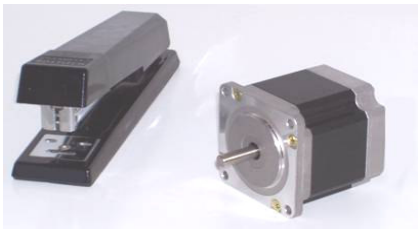
1.8 Degree, 200 Steps/Rev Hybrid Step Motors

TMG Part #	Volts (VDC)	Amps/ Phase	Torque (oz-in)	Resistance (ohms)	Inductance (mH)	Inertia ($oz\text{-}in^2$)	Weight (lbs)
Size 8 (20mm) Standard Motors					✓ Smallest mounting size ✓ Best for compact designs in tight spaces		
2018M-0102F	3.9	0.60	3	6.5	1.7	0.01	0.13
2018L-0102F	4.3	0.80	4	5.4	1.5	0.01	0.18
Size 11 (28mm) Standard Motors					✓ High-torque in a compact frame ✓ Custom features available on all motors		
2818S-0202F	2.2	1.30	9	1.7	1.1	0.05	0.24
2818M-0202F	1.7	1.30	14	1.3	0.8	0.07	0.31
2818L-0202F	2.5	1.30	17	1.9	1.7	0.10	0.44
Size 14 (35mm) Standard Motors					✓ Presice positioning - small mounting size ✓ Cost effective		
3518X-1202	3.6	0.30	6	12.0	4.4	0.06	0.25
3518X-0402F	1.7	0.45	8	3.8	2.7	0.06	0.25
3518M-0702F	6.0	0.80	20	7.5	8.1	0.08	0.40
Size 17 (40mm) Standard Motors					✓ An economical solution for your design ✓ Optimized for high-speed power		
4018X-0702F	5.0	1.00	15	5.0	6.0	0.07	0.27
4018S-0905	4.3	0.85	21	5.0	5.0	0.09	0.37
4018M-0805	6.0	0.80	30	7.5	7.5	0.15	0.44
Size 17 (40mm) High-Torque Motors					✓ High torgue in an economical package ✓ Optimized for low-speed torque		
4218S-0905	3.7	0.95	26	3.9	3.6	0.15	0.40
4218M-1205	3.7	1.20	44	3.1	4.2	0.26	0.60
4218L-0102F	2.4	2.00	75	1.2	2.6	0.37	0.70



Many more models and custom motors are available. Call us with your design requirements.

Hybrid Step Motors (cont.)



1.8 Degree, 200 Steps/Rev Hybrid Step Motors (cont.)

TMG Part #	Volts (VDC)	Amps/ Phase	Torque (oz-in)	Resistance (ohms)	Inductance (mH)	Inertia (oz-in^2)	Weight (lbs)
Size 23 (56mm) Standard Motors					✓ High power - high speed ✓ Cost effective		
5618X-1105	4.0	1.10	46	3.6	4.8	0.30	0.84
5618S-0102	5.0	1.00	60	5.0	7.1	0.60	1.12
5618M-1205	6.0	1.20	90	5.0	6.5	0.87	1.34
5618L-1505	5.0	1.50	131	3.3	5.9	1.20	2.07

Size 23 (56mm) High-Torque Motors					✓ Highest torque in a NEMA 23 frame ✓ Optimized for low-speed torque		
5818S-2005	3.0	2.00	106	1.5	2.6	1.26	1.30
5818S-1005 P	4.3	1.40	148	3.1	4.6	1.26	1.30
5818M-2005	3.4	2.00	153	1.7	3.6	1.58	1.57
5818L-2005	4.8	2.00	197	2.4	5.1	2.35	2.43
5818L-2005 P	3.4	2.80	276	1.2	2.5	2.35	2.43

Size 34 (86mm) Standard Motors					✓ Order "E" for high-speed power (>5 revs/sec) ✓ Best for CNC retrofit		
8618S-4505	1.8	4.50	220	0.4	1.0	3.11	3.09
8618S-2805	2.8	2.80	220	1.0	2.6	3.11	3.09
8618S-1205	5.5	1.25	236	4.4	15.0	3.10	3.09
8618S-1205 E	3.9	1.75	401	2.2	7.5	3.10	3.09
8618M-4005	3.0	4.00	430	0.8	2.4	6.00	5.51
8618M-2005	6.0	2.00	500	3.0	13.0	6.00	5.51
8618L-3505	4.2	3.50	583	1.2	4.7	9.83	7.72
8618L-3505 E	2.9	4.90	991	0.6	2.4	9.83	7.72

Size 34 (86mm) High-Torque Motors					✓ Order "E" for high-speed power (>5 revs/sec) ✓ Optimized for low-speed torque		
8818S-0302	3.0	3.00	310	1.0	3.5	7.66	3.85
8818M-0602	3.9	3.00	615	1.3	5.9	14.80	5.94
8818L-0402	4.5	4.50	920	1.0	4.1	21.90	8.44
8818L-0202 E	5.3	2.80	1288	1.9	9.8	21.90	8.44

Custom features include custom shafts (flat, slot, hollow, cross drilled, custom length, etc.), high-temp, vacuum and clean-room options, custom finishes, housings and lead wire lengths. Call our sales office for details at 800-424-STEP (7837).

Hybrid Step Motors (cont.)

0.9 Degree, 400 Steps/Rev Hybrid Step Motors

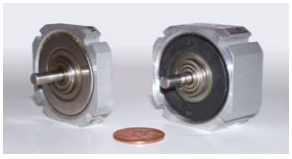
TMG Part #	Volts (VDC)	Amps/ Phase	Torque (oz-in)	Resistance (ohms)	Inductance (mH)	Inertia (oz-in^2)	Weight (lbs)
Size 14 (35mm) Standard Motors					✓ Compact size - Smooth operation ✓ Great for high-speed applications		
3509V-0302F	3.6	1.20	16	3.0	1.2	0.07	0.27
3509V-0602F	5.6	0.80	16	7.0	6.0	0.07	0.27

Size 14 (35mm) Modular Motor					✓ Installed in your housing - a fully custom solution ✓ Optimized features for your application		
3609Z-1202F	4.6	0.30	4	15.4	2.0	0.02	0.12
3609Y-5102F	2.4	0.60	6	4.0	2.8	0.02	0.16
3609X-5102F	3.0	0.60	6	5.0	2.8	0.04	0.18
3609V-0302F	3.6	1.20	16	3.0	2.0	0.07	0.27
3609V-0602F	5.6	0.80	16	7.0	6.0	0.07	0.27

Size 17 (40mm) Standard Motors					✓ High accuracy ✓ Smooth operation		
4009S-0805	4.0	0.80	16	5.0	5.0	0.09	0.38
4009M-0805	6.0	0.80	26	7.5	11.0	0.15	0.44

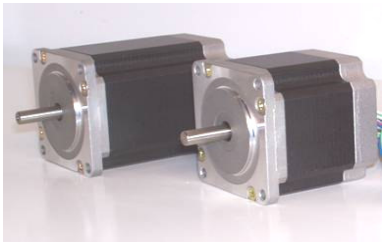
Size 17 (40mm) Super Slim Motors					✓ Super low profile for small spaces ✓ Optimized for high-speed		
4009Y-5102F	2.1	0.70	6	3.0	1.8	0.03	0.20
4009X-5102F	3.2	0.60	8	5.4	2.8	0.04	0.23

Size 17 (40mm) Extruded Motors					✓ Low profile, fast and quiet ✓ Stackable (with concentric hollow shafts)		
4109Z-5102F	2.1	0.50	3	4.1	2.5	0.02	0.12
4109Y-5102F	3.0	0.60	6	5.0	2.8	0.03	0.16
4109X-5102F	3.0	0.60	7	5.0	2.8	0.04	0.18
4109V-5102F	3.6	1.20	15	3.0	2.2	0.08	0.28



Don't know which motor you need? Our application engineers are always available to help you find the right motor for your design that will work the first time. Don't waste time and money. Call us first at 800-424-STEP (7837).

Hybrid Step Motors (cont.)



0.9 Degree, 400 Steps/Rev Hybrid Step Motors (cont.)

TMG Part #	Volts (VDC)	Amps/ Phase	Torque (oz-in)	Resistance (ohms)	Inductance (mH)	Inertia (oz-in^2)	Weight (lbs)
Size 23 (56mm) Standard Motors							
					✓ Optimized for high speed		
					✓ Best for small-scale CNC machines		
5609X-0102	4.0	1.10	28	3.6	5.1	0.30	0.75
5609M-0102	6.0	1.20	80	5.0	13.5	0.74	1.20
5609L-0502	5.4	1.50	120	3.6	7.3	1.20	1.90

Size 23 (56mm) High-Torque Motors							
					✓ High torque for low speed applications		
					✓ High step accuracy		
5809X-0102	3.0	2.00	70	1.5	1.5	0.70	1.05
5809M-0502	3.6	2.00	125	1.8	2.5	1.50	1.50
5809L-0102	4.6	2.00	188	2.3	3.8	2.60	2.20

0.45 Degree, 800 Steps/Rev Hybrid Step Motors

TMG Part #	Volts (VDC)	Amps/ Phase	Torque (oz-in)	Resistance (ohms)	Inductance (mH)	Inertia (oz-in^2)	Weight (lbs)
Size 23 (56mm) High-Torque Motors							
					✓ Highest step accuracy in the industry		
					✓ Smoothest operation		
5804X-1002 F	8.6	0.90	75	9.6	11.9	1.00	1.05
5804X-0202 F	3.6	1.80	75	2.0	1.8	1.00	1.05
5804M-0202 F	5.4	1.80	140	3.0	3.3	2.10	1.50
5804M-1002 F	10.5	0.90	140	11.7	16.4	2.10	1.50

Motors designated with "F" in the part number are only available in 4-wire configurations. All other motors are available in 4, 6 or 8-wire configurations.

Motor Options (add to the end of the part number):
P = Coils in parallel, yields 40% more torque. Torque curve optimized for high-speed applications.
S = Coils in series, yields 40% more torque. Torque curve optimized for low-speed applications.
E = Eight-wire configuration.
F = Four-wire configuration.
B = Add "B" shaft (rear shaft or encoder shaft).
A = Delete "A" shaft (front shaft)
SC = Special configuration/environment options. Append option from list below:

- **1 = Clean. No oil, paint, organics, fingerprints. Clean room grade to Class 6.**
- **2 = Dry stainless steel bearing with no lube.**
- **2b = Dry stainless steel bearing with customer specified lube.**
- **3 = 105C high-temp Teflon wire & high-temp magnetic wire (85C standard).**
- **4 = High-vacuum (non gassing) bonding epoxy. Used on Slim-Line, Super Slim-Line and Gold-Line motors**
- **5 = Stainless steel end bells (no aluminum parts).**
- **6 = Stainless steel body sleeve (sealed motor).**
- **7 = Winding to customer specification.**
- **8 = Custom shaft (length and diameter).**
- **8b = Custom flat on shaft.**
- **9 = Nickel plated (rust resistance).**
- **10 = Dust and splash sealing tape.**

Other custom options are available. Some options are not available on certain motors. Please call to discuss your application needs with a Sales Engineer (800-424-STEP).

Linear Actuators

The Motion Group offers advanced linear actuators with extreme resolution and accuracy that can not be found anywhere else on the market. Built around our high-accuracy 400 and 800 step-per-rev motors, our linear actuators use exclusive super high-pitch lead screws to achieve resolutions of 16,000 to 1,280,000 steps per inch with Octal-Step™ drivers. This means that there is no micro-step error in step-to-step spacing as there is with other linear actuators. The Motion Group is your only source for precise mechanical positioning with nanometer resolution.

Our linear actuators feature:

- Encoder shaft extensions
- Custom lead screw lengths and end journals
- Thumbwheels for manual operation

0.9 Degree, 400 Steps/Rev Base Motors

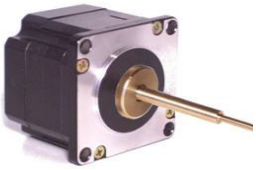
TMG Part #	Lead Screw	Resolution (steps-per-inch)
4009X-LA-2/56	2/56	22,400 Full-Step / 179,200 Octal-Step
4009X-LA-4/40	4/40	16,000 Full-Step / 128,000 Octal-Step
4009X-LA-6/32	6/32	12,800 Full-Step / 102,400 Octal-Step
4009X-LA-6/80	6/80	32,000 Full-Step / 256,000 Octal-Step

TMG Part #	Lead Screw	Resolution (steps-per-inch)
4109V-LA-6/32	6/32	12,800 Full-Step / 102,400 Octal-Step
4109V-LA-6/80	6/80	32,000 Full-Step / 256,000 Octal-Step
4109V-LA-25/80	1/4 - 80	32,000 Full-Step / 256,000 Octal-Step
4109V-LA-25/200	1/4 - 200	80,000 Full-Step / 640,000 Octal-Step

TMG Part #	Lead Screw	Resolution (steps-per-inch)
4009M-LA-6/32	6/32	12,800 Full-Step / 102,400 Octal-Step
4009M-LA-6/80	6/80	32,000 Full-Step / 256,000 Octal-Step
4009M-LA-25/80	1/4 - 80	32,000 Full-Step / 256,000 Octal-Step
4009M-LA-25/200	1/4 - 200	80,000 Full-Step / 640,000 Octal-Step

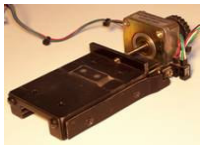
0.45 Degree, 800 Steps/Rev Base Motors

TMG Part #	Lead Screw	Resolution (steps-per-inch)
5804X-LA-25/80	1/4 - 80	64,000 Full-Step / 512,000 Octal-Step
5804X-LA-25/200	1/4 - 200	160,000 Full-Step / 1,280,000 Octal-Step

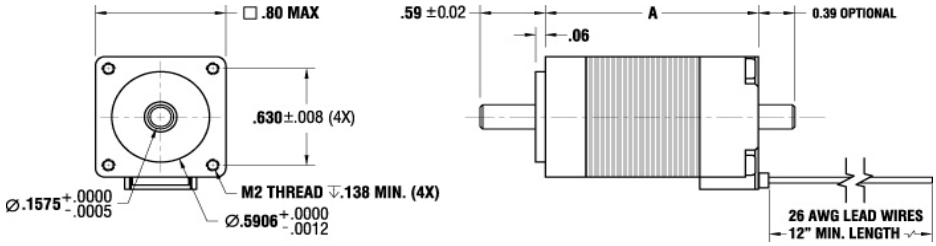


Also Available:

- Custom high-precision lead screw and nut sets
- Retrofit kits for linear slides - convert your X-Y table to 200 threads per inch!
- Complete high-precision (640,000 steps per inch) mechanical assemblies such as linear slides and X-Y tables



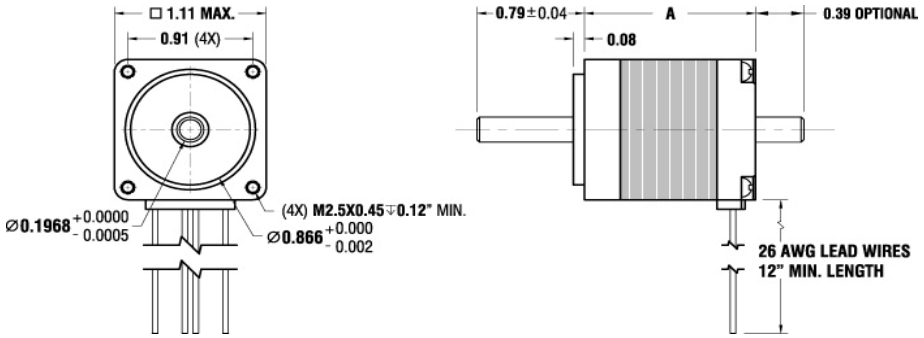
Size 8 (20mm) Motors



Max Length (Dimension "A")

M = 1.3"
L = 1.7"

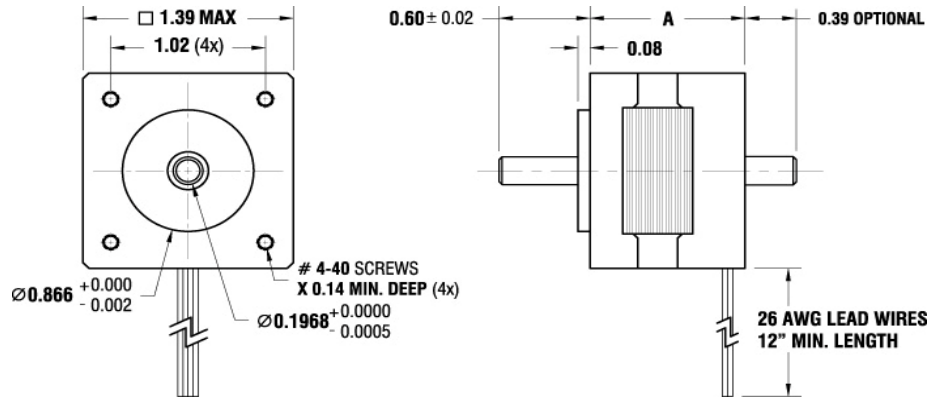
Size 11 (28mm) Motors



Max Length (Dimension "A")

S = 1.26"
M = 1.77"
L = 2.01"

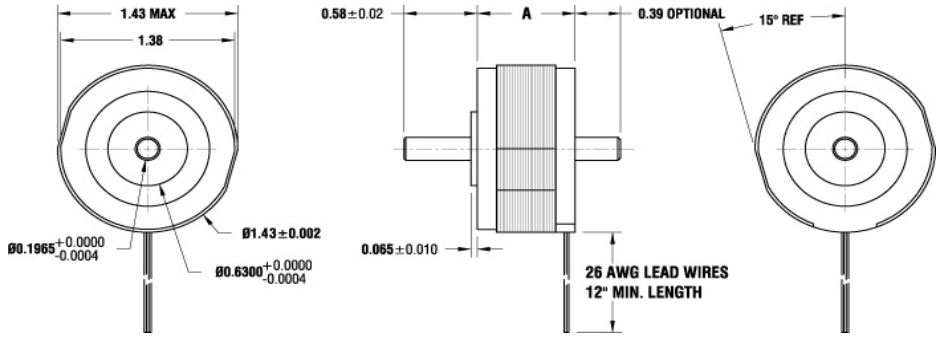
Size 14 (35mm) Motors



Max Length (Dimension "A")

X = 1.02"
M = 1.34"

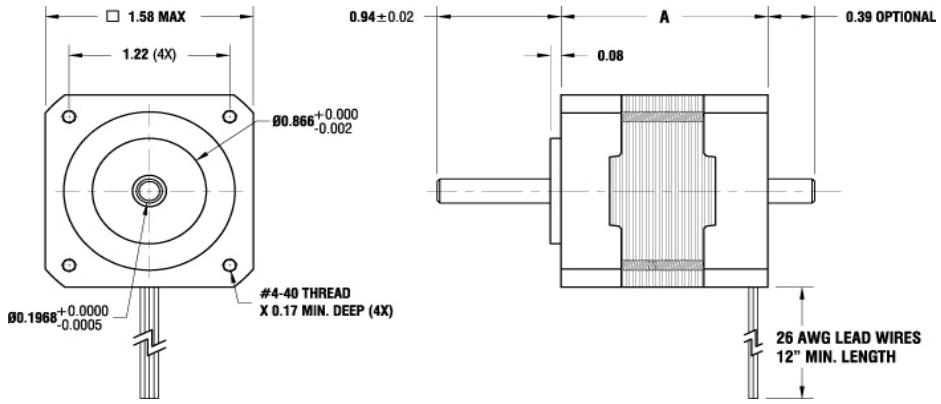
Size 14 (35mm) Modular Motors



Max Length (Dimension "A")

Z = 0.47"
Y = 0.55"
X = 0.58"
V = 0.78"

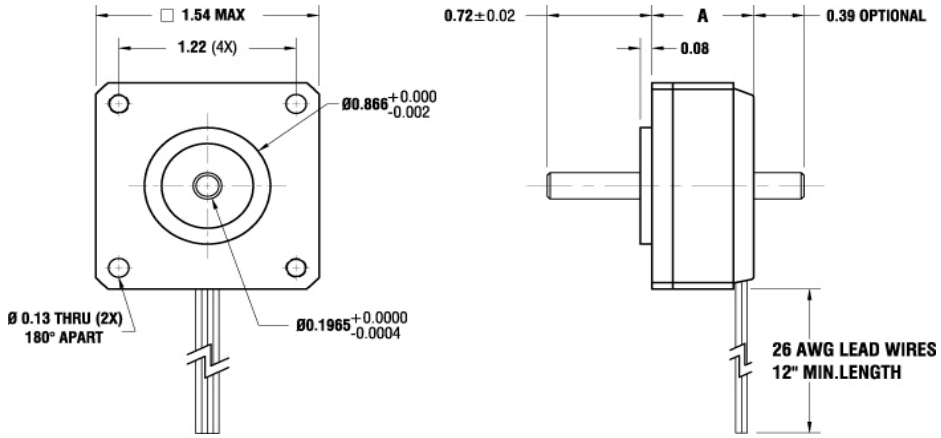
Size 17 (40mm) Standard and High-Torque Motors



Max Length (Dimension "A")

X = 1.03"
S = 1.33"
M = 1.57"
L = 1.88"

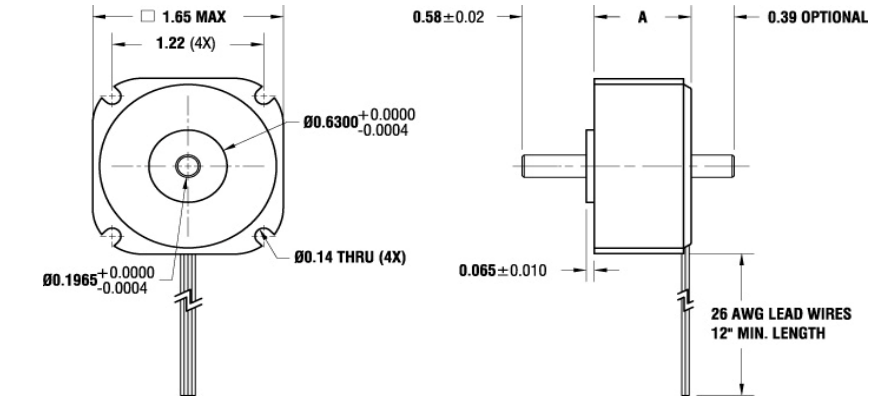
Size 17 (40mm) Super Slim Motors



Max Length (Dimension "A")

Y = 0.50"
X = 0.65"

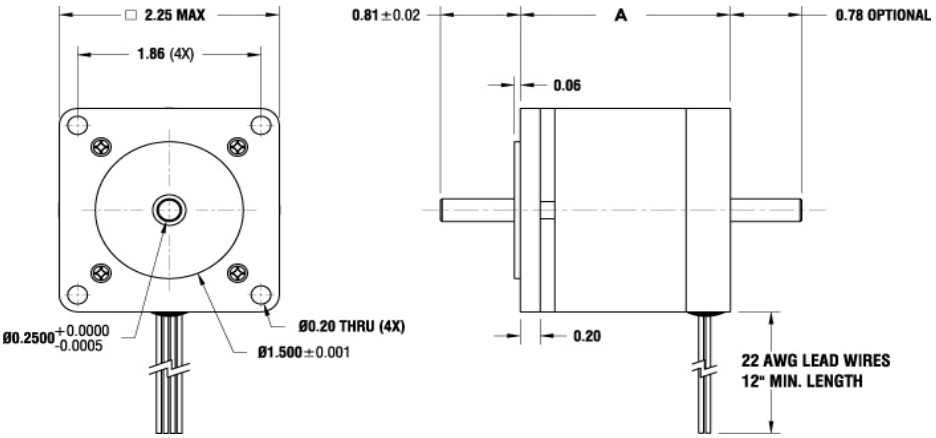
Size 17 (40mm) Extruded Frame Motors



Max Length (Dimension "A")

Z = 0.47"
Y = 0.55"
X = 0.58"
V = 0.78"

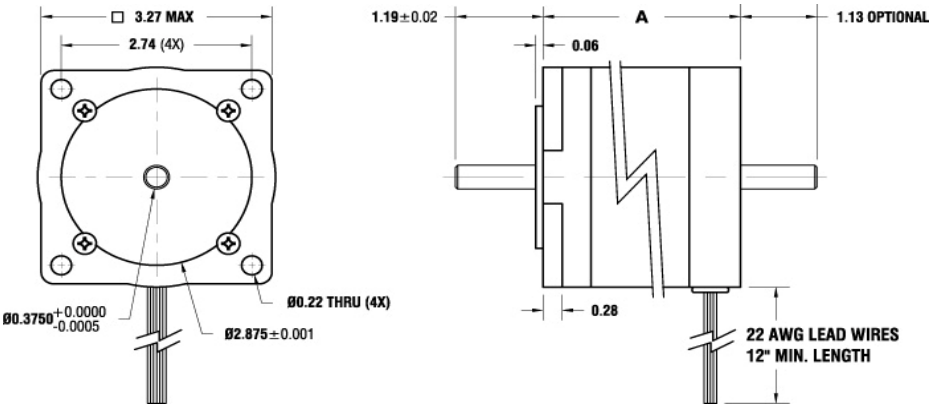
Size 23 (56mm) Standard and High-Torque Motors



Max Length (Dimension "A")

X = 1.55"
S = 2.08"
M = 2.20"
L = 3.08"

Size 34 (86mm) Standard and High-Torque Motors



Max Length (Dimension "A")

S = 2.46"
M = 3.70"
L = 5.04"