

**USAutomation** VersaDrive™ leadscrew step motors are the most versatile linear positioning motors on the market. They are available in thru-screw and fixed screw versions with a variety of drive nut and support bushing options. VersaDrive motors are robust and can be easily configured to solve the most difficult application problems. Integration of a leadscrew with a motor saves space, eliminates components, and reduces cost. While many standard configurations are available, custom modifications for OEM customers are welcome.

### FEATURES:

- Three sizes - NEMA 11, 17 and 23
- Selection of motor windings
- Selection of screw leads
- Anti-backlash, self-compensating nut option
- Unique centering bushing option
- Optional cover only on shaft extension
- Nuts and bushings can be mounted on either front or back of motor
- Motor can be full, half or microstepped

### BENEFITS:

- Wide range of forces and speeds
- Choice of winding best matched to drive
- Wide range of positioning resolutions
- Zero backlash operation (no axial play)
- Eliminate radial play, reduce noise
- Protect shaft and cosmetically enhance
- Versatility to configure drive nuts and centering bushing most ideal for each individual application
- Potential for very high linear positioning resolutions



VersaDrive 11



VersaDrive 17

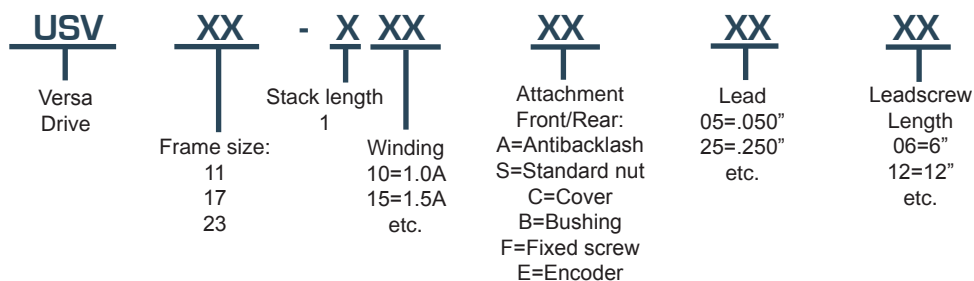


VersaDrive 23

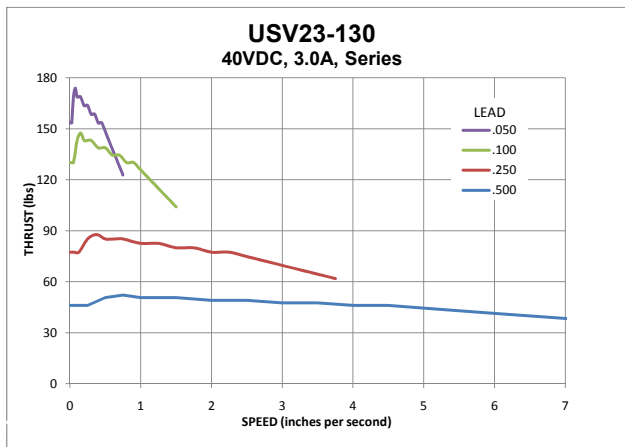
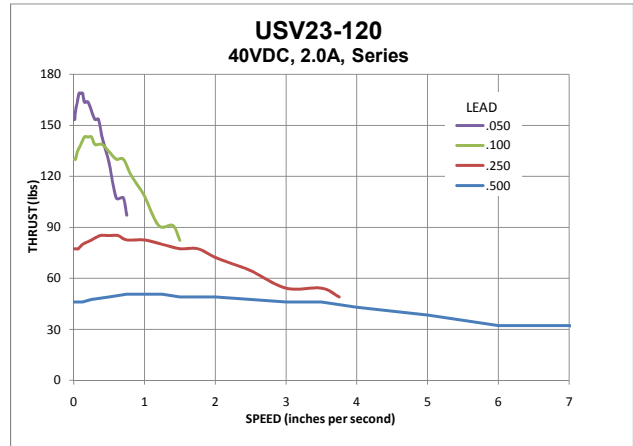
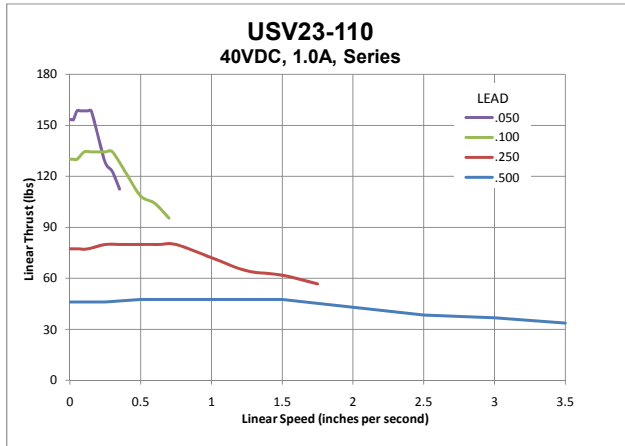
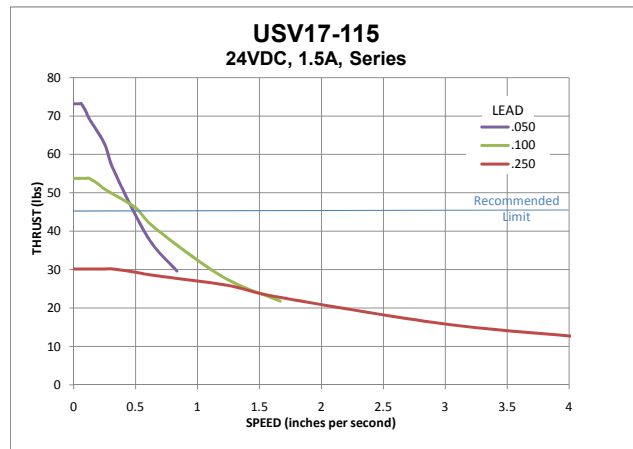
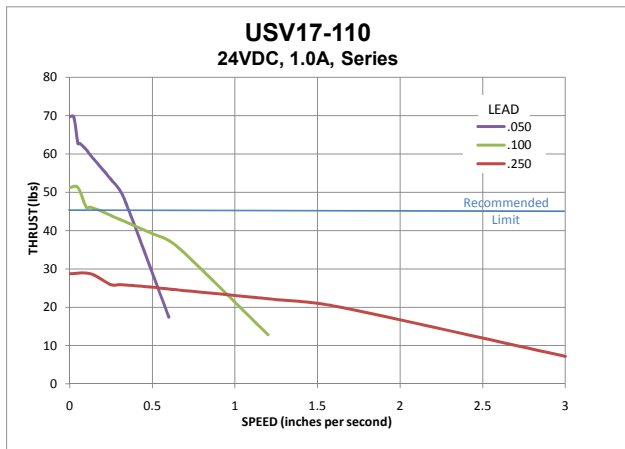
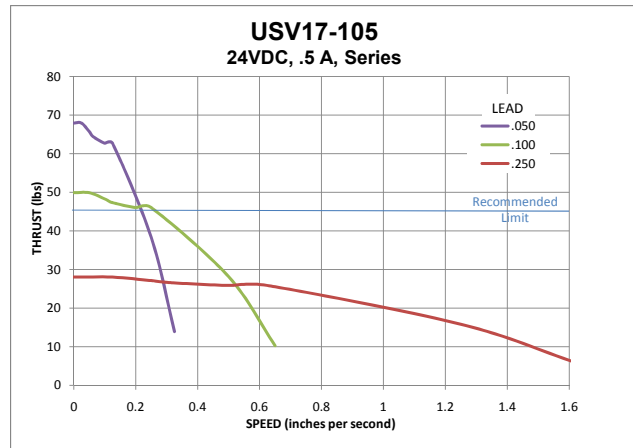
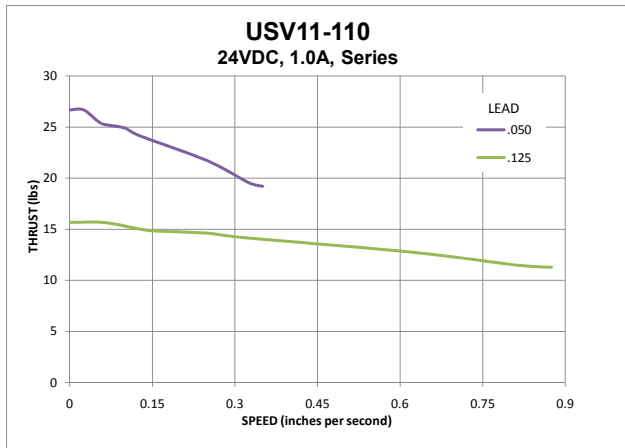
## SPECIFICATIONS

Model Number	Series Voltage V	Series Current A	Series Resistance Ohms	POWER W	Series Inductance mH	Rotor Inertia oz in sec <sup>2</sup> (gm cm <sup>2</sup> )	Number of Leads	Weight (Motor only) oz (g)	Length in (mm)
USV11-105XXXXXX	3.2	1.0	3.2	3.2	30.0	1.28 x 10 <sup>-4</sup> (9)	4	3.9 (110)	1.26 (32.0)
USV17-105XXXXXX	7.6	0.5	15.00	3.7	30.0	4.96 x 10 <sup>-4</sup> (35)	4	8.0 (227)	1.30 (33.0)
USV17-110XXXXXX	3.8	1.0	3.60	3.6	7.0	4.96 x 10 <sup>-4</sup> (35)	4	8.0 (227)	1.30 (33.0)
USV17-115XXXXXX	2.5	1.5	1.67	3.8	3.1	4.96 x 10 <sup>-4</sup> (35)	4	8.0 (227)	1.30 (33.0)
USV23-110XXXXXX	5.0	1.0	5.00	5.0	15.7	1.70 x 10 <sup>-3</sup> (120)	4	18.3 (521)	1.75 (44.5)
USV23-120XXXXXX	2.8	2.0	1.40	5.6	4.1	1.70 x 10 <sup>-3</sup> (120)	4	18.3 (521)	1.75 (44.5)
USV23-130XXXXXX	1.8	3.0	.60	5.4	1.9	1.70 x 10 <sup>-3</sup> (120)	4	18.3 (521)	1.75 (44.5)

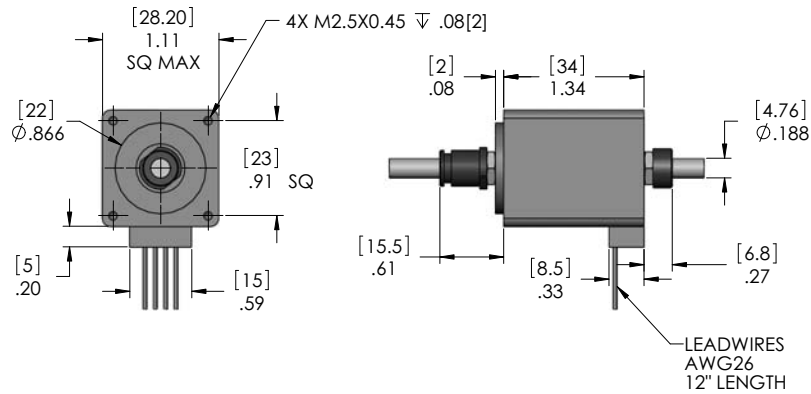
### CONFIGURE PART NUMBER



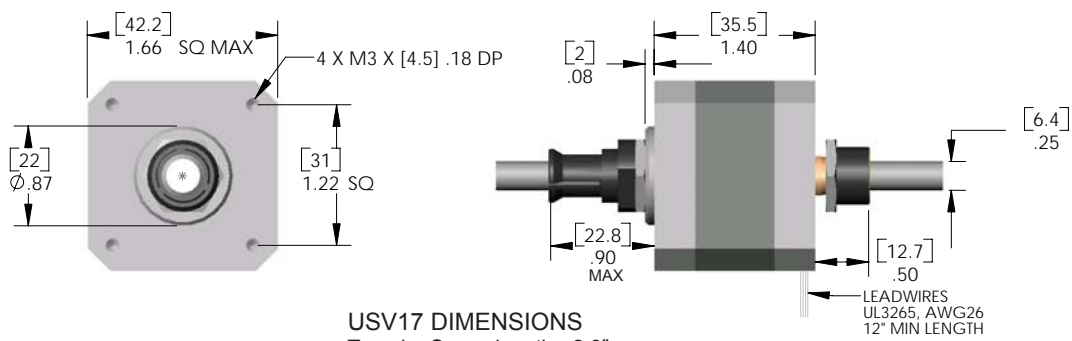
# FORCE VS SPEED PERFORMANCE



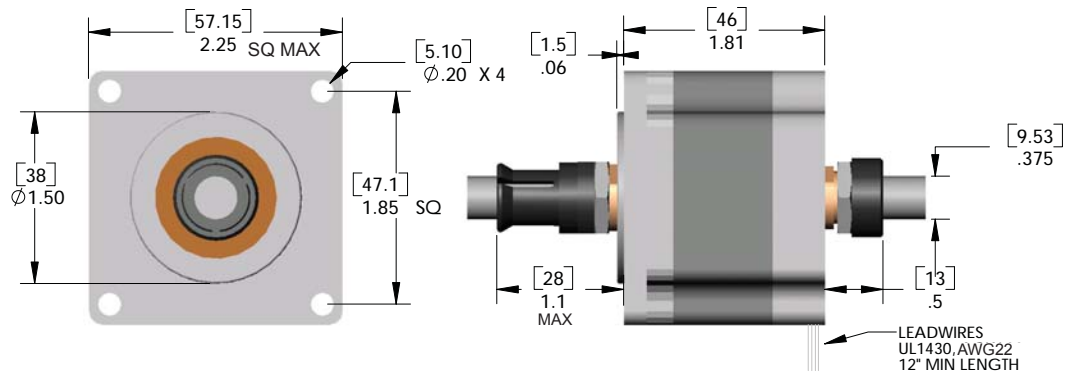
# VERSADRIIVE DRAWINGS



**USV11 DIMENSIONS**  
Travel = Screw length - 2.2"

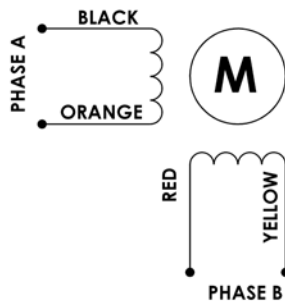


**USV17 DIMENSIONS**  
Travel = Screw length - 2.8"



**USV23 DIMENSIONS**  
Travel = Screw length - 3.4"

# WIRING DIAGRAM



STEP	BLACK	ORANGE	RED	YELLOW
1	+	-	+	-
2	-	+	+	-
3	-	+	-	+
4	+	-	-	+

Switching sequence



## LINEAR TRAVEL PER STEP

Model Number	Screw Lead in (mm)	Static Force lb (N)	Dynamic Force <sup>1</sup> lb (N)	Travel per Full Step <sup>2</sup> in (µM)	Travel per Microstep <sup>3</sup> in (µM)	Positioning Accuracy <sup>4</sup> in/in (mm/mm)
USV11-1XXXX05XX	.050 (1.27)	32 (143)	27 (120)	.00025 (6.35)	.98 x 10 <sup>-6</sup> (.0248)	.0004 (.0004)
USV11-1XXXX12XX	.125 (3.18)	20 (89)	16 (71)	.00063 (15.8)	2.44 x 10 <sup>-6</sup> (.0620)	.0004 (.0004)
USV17-1XXXX05XX	.050 (1.27)	82 (365)	70 (311)	.00025 (6.35)	.98 x 10 <sup>-6</sup> (.0248)	.0004 (.0004)
USV17-1XXXX10XX	.100 (2.54)	82 (365)	50 (222)	.00050 (12.7)	1.95 x 10 <sup>-6</sup> (.0496)	.0004 (.0004)
USV17-1XXXX25XX	.250 (6.35)	82 (365)	28 (125)	.00125 (31.8)	4.88 x 10 <sup>-6</sup> (.1240)	.0004 (.0004)
USV23-1XXXX05XX	.050 (1.27)	165 (734)	150 (667)	.00025 (7.35)	.98 x 10 <sup>-6</sup> (.0248)	.0004 (.0004)
USV23-1XXXX10XX	.100 (2.54)	165 (734)	128 (569)	.00050 (12.7)	1.95 x 10 <sup>-6</sup> (.0496)	.0004 (.0004)
USV23-1XXXX25XX	.250 (6.35)	165 (734)	76 (338)	.00125 (31.8)	4.88 x 10 <sup>-6</sup> (.1240)	.0004 (.0004)
USV23-1XXXX50XX	.500 (12.7)	165 (734)	45 (200)	.00250 (63.5)	9.77 x 10 <sup>-6</sup> (.2480)	.0004 (.0004)

<sup>1</sup> Max dynamic force at low speeds. See Force vs. Speed curves.

<sup>2</sup> Assuming 200 steps per revolution.

<sup>3</sup> Assuming a microstep resolution of 51,200 per revolution.

<sup>4</sup> Using anti-backlash nut.

## MODIFICATIONS - OPTIONS

**USA**Automation welcomes the opportunity to customize VersaDrive motors for our OEM customers to better meet your requirements or supply a drop-in solution. Contact us with your ideas and we'll generate the necessary drawings, product specifications and quotes. Here are just a few options we have had experience with:

- Custom motor windings
- Alternate lead configurations - 6 lead, 8 lead
- Longer motor stack lengths
- Custom cabling and/or connectors
- Encoder feedback
- Alternate screw leads
- Machined screw journals to print
- Teflon coating on screw
- Custom drive nut materials or designs
- Subassemblies - VersaDrive as a component



VersaDrive  
Encoder option



VersaDrive  
Fixed screw option

