Table of Contents

Motors & Controls

Translation Speed Tables

Translation Speed Tables

To move at your desired scanning speed, use the charts on the following pages to select a lead screw for your application. For information on lead screws and designations, see page 2.12 of this catalog.

Your choice of lead screw also depends on your choice of motor. Here's how to choose a motor:

1. Determine the minimum torque requirement using the formula on page 2.12.
2. For step motors, choose a motor with the necessary torque on page 3.24. For other motors, see http://www.velmex.com/motor_acdc.html for motor speed and torque characteristics. Rated torque of motors is listed to give a relative measure of torque output between motors. Note also maximum thrust load specifications included with each chart.
3. Be sure that the motor that you've chosen is compatible with the UniSlide or BiSlide base you've chosen. Although a specific motor may be used with multiple UniSlide bases, it may be listed only once, usually for the smallest usable Series. See Page 3.7, for a summary of motors compatible with each UniSlide Series .
4. From the chart, select a desired operating speed.

When choosing a lead screw, you'll find several possible choices. In general, a finer pitch beat screw results in better resolution while a coarser pitch beat screw will result in higher translation speed.

For stepping motors and controls, see Stepping Motors subsection, page 3.9.

Linear Translation Speed as a Function of English Pitch Lead Screw and Step Rate

UniSlide Lead Screw Designation BiSlide Lead Screw Designation			W4 &P2.5 E04	W2 & P5	W1 & P10 E01	B & P20	C & P40	
Travel per Revolution			0.400"	0.200"	0.100"	0.050"	0.025"	
Steps/Sec.(0.9 Degree/Step)	**RPM**	**RPS**						
100	15	0.25	6.00	3.00	1.50	0.75	0.38	Inches/Minute
			0.1	0.05	0.025	0.013	0.006	Inches/Second
500	75	1.25	30.00	15.00	7.50	3.75	1.88	Inches/Minute
			0.5	0.25	0.125	0.063	0.031	Inches/Second
1000	150	2.50	60.00	30.00	15.00	7.50	3.75	Inches/Minute
			1.0	0.05	0.25	0.125	0.063	Inches/Second
1500	225	3.75	90.00	45.00	22.50	11.25	5.63	Inches/Minute
			1.5	0.75	0.375	0.188	0.094	Inches/Second
2000	300	5.00	120.00	60.00	30.00	15.00	7.50	Inches/Minute
			2.0	1.0	0.5	0.250	0.125	Inches/Second
3000	450	7.50	180.00	90.00	45.00	22.50	11.25	Inches/Minute
			3.0	1.5	0.75	0.375	0.188	Inches/Second
4000	600	10.00	240.00	120.00	60.00	30.00	15.00	Inches/Minute
			4.0	2.0	1.0	0.500	0.250	Inches/Second
6000	900	15.00	360.00	180.00	90.00	45.00	22.50	Inches/Minute
			6.0	3.0	1.5	0.750	0.375	Inches/Second
VXM control limit is 6000 steps/second.								
8000	1200	20.00	480.00	240.00	120.00	60.00	30.00	Inches/Minute
			8.0	4.0	2.0	1.000	0.500	Inches/Second
Step resolution @ 400 steps/rev.								
Inches/Step			0.001	0.0005	0.00025	0.00013	0.00006	
Millimeters/Step			0.0254	0.0127	0.00635	0.003175	0.00158	
Theoretical Resolution (Microns)			25.4	12.7	6.35	3.175	1.5875	.

System step resolution or smallest repeatable move is dependent on system orientation, rigidity, friction, wear, and applied load.

See next page for Metric Translation Speed Chart.

Linear Translation Speed as a Function of Metric Pitch Lead Screw and Step Rate

UniSlide Lead Screw Designation BiSlide Lead Screw Designation			K1 & Q1 M01	K2 & Q2 M02	
Travel per Revolution			1 mm	2 mm	
Steps/Sec.(0.9 Degree/Step)	**RPM**	**RPS**			
100	15	0.25	1.5	3.0	Centimeters/Minute
			0.25	0.5	Millimeters/Second
500	75	1.25	7.5	15.0	Centimeters/Minute
			1.25	2.5	Millimeters/Second
1000	150	2.50	15.0	30.0	Centimeters/Minute
			2.5	5.0	Millimeters/Second
1500	225	3.75	22.5	45.0	Centimeters/Minute
			3.75	7.5	Millimeters/Second
2000	300	5.00	30.0	60.0	Centimeters/Minute
			5.0	10.0	Millimeters/Second
3000	450	7.50	45.0	90.0	Centimeters/Minute
			7.5	15.0	Millimeters/Second
4000	600	10.00	60.0	120.0	Centimeters/Minute
			10.0	20.0	Millimeters/Second
6000	900	15.00	90.0	180.0	Centimeters/Minute
			15.0	30.0	Millimeters/Second
VXM control limit is 6000 steps/second.					
8000	1200	20.00	120.0	240.0	Centimeters/Minute
			20.0	40.0	Millimeters/Second
Step resolution @ 400 steps/rev.					
Inches/Step			0.0001	0.0002	
Millimeters/Step			0.0025	0.0050	
Theoretical Resolution (Microns)			2.5	5.	

System step resolution or smallest repeatable move is dependent on system orientation, rigidity, friction, wear, and applied load.

See previous page for English Translation Speed Chart.