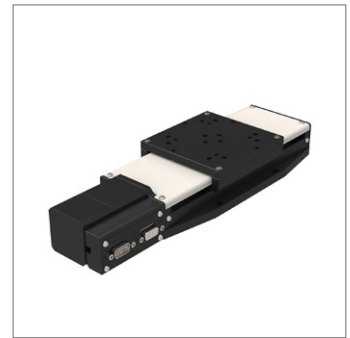
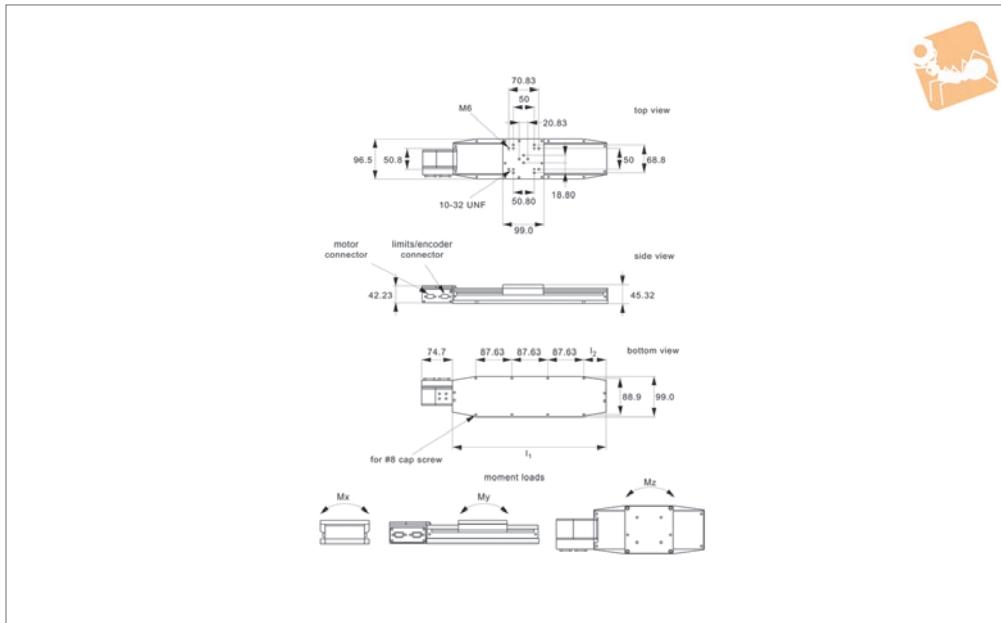
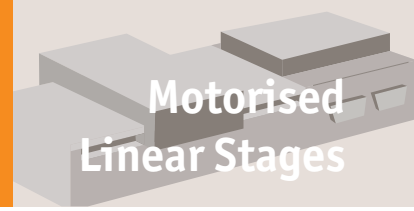




# Medium-Duty Motorised Stages

high precision

## Motorised Linear Stages



### L3500

MOTORISED LINEAR STAGES

#### Material

Black anodised aluminium body (6061).  
Hardened linear guideways, stainless steel  
Acme lead screw (with internally lubricated  
anti-backlash nut).

#### Technical Notes

These are smooth running, precise and stiff linear stages. For ease of use they have separate connections for motor power and limit/encoder signals. Integrated limit switches are provided as standard. Easy plug and play system. Controllable from PC or PLC when used in conjunction with a motion controller. Controllers come with their own software but many pre-existing software packages (such as Labview) can be used. Can be readily supplied in XY, XZ and XYZ configurations.

Applications - research, semi-conductors, fibre optics, automation etc.

**Replace -XXX in part number with the code for your preferred motor type - see second data table for codes and specifications.**

#### Tips

Motor options:

**Stepper** - Nema 17, high torque, brushless. 0.95 Amp/phase, 5.0 Ohm/phase, 3.1 mH/phase, 1.8°/step. Optional Stepper & 1000 line linear encoder.

**Servo** - Nema 17, brushless DC motor. Continuous stall torque 0.25Nm, peak torque 0.7 Nm, with 1000 line rotary encoder.

**Intelligent stepper** - Nema 17 with a fully programmable motion controller inbuilt (ie no need for an external motion

controller). Two +5 to +24VDC I/O lines. One 10 bit analogue input selectable 0 to +10VDC, 0 to +5VDC. RS422/485 communications. Input voltage +24VDC. Limit switches are wired normally open. Option with 512 line encoder. Drawings show stepper motor configuration. See special pages for further motor options.

#### Important Notes

Max. moment loads:

$M_x = 20 \text{ Nm}$

$M_y = 20 \text{ Nm}$

$M_z = 19 \text{ Nm}$

For 50mm travel stage  $M_a$  and  $M_b = 12 \text{ Nm}$ .

For combined stages, add suffixes:

XY - for XY stage

XZ - for XZ stage

XYZ - for XYZ stage

Order No.	Travel	Motor type	Motor code	Accuracy $\mu\text{m}/\text{mm}$	Bi-directional repeatability	Horizontal load kg max.	Vertical load kg max.	Side load kg max.	Weight kg
L3500.050-STA	50	Stepper	-STA	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-STB	50	Stepper	-STB	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-STC	50	Stepper & enc.	-STC	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-STD	50	Stepper & enc.	-STD	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-IMA	50	Int. stepper	-IMA	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-IMB	50	Int. stepper	-IMB	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-IMC	50	Int. stepper & enc.	-IMC	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-IMD	50	Int. stepper	-IMD	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-SVA	50	Servo & encoder	-SVA	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.050-SVB	50	Servo & encoder	-SVB	0,6 $\mu$	10 $\mu$	23	6.5	18	1.36
L3500.150-STA	150	Stepper	-STA	0,6 $\mu$	10 $\mu$	23	6.5	18	2.41
L3500.150-STB	150	Stepper	-STB	0,6 $\mu$	10 $\mu$	23	6.5	18	2.41
L3500.150-STC	150	Stepper & enc.	-STC	0,6 $\mu$	10 $\mu$	23	6.5	18	2.41

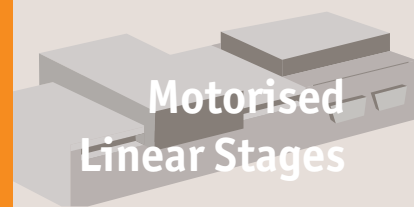


Order No.	Travel	Motor type	Motor code	Accuracy µm/mm	Bi-directional repeatability	Horizontal load kg max.	Vertical load kg max.	Side load kg max.	Weight kg
L3500.150-STD	150	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	2.41
L3500.150-IMA	150	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	2.41
L3500.150-IMB	150	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	2.41
L3500.150-IMC	150	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	2.41
L3500.150-IMD	150	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	2.41
L3500.150-SVA	150	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	2.41
L3500.150-SVB	150	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	2.41
L3500.200-STA	200	Stepper	-STA	0,6µ	10µ	23	6,5	18	2.59
L3500.200-STB	200	Stepper	-STB	0,6µ	10µ	23	6,5	18	2.59
L3500.200-STC	200	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	2.59
L3500.200-STD	200	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	2.59
L3500.200-IMA	200	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	2.59
L3500.200-IMB	200	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	2.59
L3500.200-IMC	200	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	2.59
L3500.200-IMD	200	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	2.59
L3500.200-SVA	200	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	2.59
L3500.200-SVB	200	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	2.59
L3500.250-STA	250	Stepper	-STA	0,6µ	10µ	23	6,5	18	2.86
L3500.250-STB	250	Stepper	-STB	0,6µ	10µ	23	6,5	18	2.86
L3500.250-STC	250	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	2.86
L3500.250-STD	250	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	2.86
L3500.250-IMA	250	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	2.86
L3500.250-IMB	250	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	2.86
L3500.250-IMC	250	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	2.86
L3500.250-IMD	250	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	2.86
L3500.250-SVA	250	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	2.86
L3500.250-SVB	250	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	2.86
L3500.300-STA	300	Stepper	-STA	0,6µ	10µ	23	6,5	18	3.13
L3500.300-STB	300	Stepper	-STB	0,6µ	10µ	23	6,5	18	3.13
L3500.300-STC	300	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	3.13
L3500.300-STD	300	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	3.13
L3500.300-IMA	300	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	3.13
L3500.300-IMB	300	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	3.13
L3500.300-IMC	300	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	3.13
L3500.300-IMD	300	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	3.13
L3500.300-SVA	300	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	3.13
L3500.300-SVB	300	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	3.13
L3500.350-STA	350	Stepper	-STA	0,6µ	10µ	23	6,5	18	3.41
L3500.350-STB	350	Stepper	-STB	0,6µ	10µ	23	6,5	18	3.41
L3500.350-STC	350	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	3.41
L3500.350-STD	350	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	3.41
L3500.350-IMA	350	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	3.41
L3500.350-IMB	350	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	3.41
L3500.350-IMC	350	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	3.41
L3500.350-IMD	350	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	3.41
L3500.350-SVA	350	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	3.41
L3500.350-SVB	350	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	3.41
L3500.400-STA	400	Stepper	-STA	0,6µ	10µ	23	6,5	18	3.68
L3500.400-STB	400	Stepper	-STB	0,6µ	10µ	23	6,5	18	3.68
L3500.400-STC	400	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	3.68
L3500.400-STD	400	Stepper & enc.	-STD	0,6µ	10µ	23	6,5	18	3.68
L3500.400-IMA	400	Int. stepper	-IMA	0,6µ	10µ	23	6,5	18	3.68
L3500.400-IMB	400	Int. stepper	-IMB	0,6µ	10µ	23	6,5	18	3.68
L3500.400-IMC	400	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6,5	18	3.68
L3500.400-IMD	400	Int. stepper	-IMD	0,6µ	10µ	23	6,5	18	3.68
L3500.400-SVA	400	Servo & encoder	-SVA	0,6µ	10µ	23	6,5	18	3.68
L3500.400-SVB	400	Servo & encoder	-SVB	0,6µ	10µ	23	6,5	18	3.68
L3500.500-STA	500	Stepper	-STA	0,6µ	10µ	23	6,5	18	3.95
L3500.500-STB	500	Stepper	-STB	0,6µ	10µ	23	6,5	18	3.95
L3500.500-STC	500	Stepper & enc.	-STC	0,6µ	10µ	23	6,5	18	3.95



# Medium-Duty Motorised Stages

high precision



## Motorised Linear Stages

Order No.	Travel	Motor type	Motor code	Accuracy µm/mm	Bi-directional repeatability	Horizontal load kg max.	Vertical load kg max.	Side load kg max.	Weight kg
L3500.500-STD	500	Stepper & enc.	-STD	0,6µ	10µ	23	6.5	18	3.95
L3500.500-IMA	500	Int. stepper	-IMA	0,6µ	10µ	23	6.5	18	3.95
L3500.500-IMB	500	Int. stepper	-IMB	0,6µ	10µ	23	6.5	18	3.95
L3500.500-IMC	500	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6.5	18	3.95
L3500.500-IMD	500	Int. stepper	-IMD	0,6µ	10µ	23	6.5	18	3.95
L3500.500-SVA	500	Servo & encoder	-SVA	0,6µ	10µ	23	6.5	18	3.95
L3500.500-SVB	500	Servo & encoder	-SVB	0,6µ	10µ	23	6.5	18	3.95
L3500.600-STA	600	Stepper	-STA	0,6µ	10µ	23	6.5	18	4.23
L3500.600-STB	600	Stepper	-STB	0,6µ	10µ	23	6.5	18	4.23
L3500.600-STC	600	Stepper & enc.	-STC	0,6µ	10µ	23	6.5	18	4.23
L3500.600-STD	600	Stepper & enc.	-STD	0,6µ	10µ	23	6.5	18	4.23
L3500.600-IMA	600	Int. stepper	-IMA	0,6µ	10µ	23	6.5	18	4.23
L3500.600-IMB	600	Int. stepper	-IMB	0,6µ	10µ	23	6.5	18	4.23
L3500.600-IMC	600	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6.5	18	4.23
L3500.600-IMD	600	Int. stepper	-IMD	0,6µ	10µ	23	6.5	18	4.23
L3500.600-SVA	600	Servo & encoder	-SVA	0,6µ	10µ	23	6.5	18	4.23
L3500.600-SVB	600	Servo & encoder	-SVB	0,6µ	10µ	23	6.5	18	4.23
L3500.100-STA	100	Stepper	-STA	0,6µ	10µ	23	6.5	18	2.14
L3500.100-STB	100	Stepper	-STB	0,6µ	10µ	23	6.5	18	2.14
L3500.100-STC	100	Stepper & enc.	-STC	0,6µ	10µ	23	6.5	18	2.14
L3500.100-STD	100	Stepper & enc.	-STD	0,6µ	10µ	23	6.5	18	2.14
L3500.100-IMA	100	Int. stepper	-IMA	0,6µ	10µ	23	6.5	18	2.14
L3500.100-IMB	100	Int. stepper	-IMB	0,6µ	10µ	23	6.5	18	2.14
L3500.100-IMC	100	Int. stepper & enc.	-IMC	0,6µ	10µ	23	6.5	18	2.14
L3500.100-IMD	100	Int. stepper	-IMD	0,6µ	10µ	23	6.5	18	2.14
L3500.100-SVA	100	Servo & encoder	-SVA	0,6µ	10µ	23	6.5	18	2.14
L3500.100-SVB	100	Servo & encoder	-SVB	0,6µ	10µ	23	6.5	18	2.14

Order No.	Lead screw pitch	Speed mm/s max.	I <sub>1</sub>	I <sub>2</sub>	Resolution
L3500.050-STA	1.5875	12.0	176	44.5	0,3µ
L3500.050-STB	6.35	50.0	176	44.5	0,13µ
L3500.050-STC	1.5875	12.0	176	44.5	0,4µ
L3500.050-STD	6.35	50.0	176	44.5	1,6µ
L3500.050-IMA	1.5875	12.0	176	44.5	0,4µ
L3500.050-IMB	6.35	12.0	176	44.5	1,6µ
L3500.050-IMC	1.5875	25.0	176	44.5	0,4µ
L3500.050-IMD	6.35	50.0	176	44.5	1,6µ
L3500.050-SVA	1.5875	25.0	176	44.5	0,4µ
L3500.050-SVB	6.35	100.0	176	44.5	1,6µ
L3500.150-STA	1.5875	12.0	277	94.3	0,3µ
L3500.150-STB	6.35	50.0	277	94.3	0,13µ
L3500.150-STC	1.5875	12.0	277	94.3	0,4µ
L3500.150-STD	6.35	50.0	277	94.3	1,6µ
L3500.150-IMA	1.5875	12.0	277	94.3	0,4µ
L3500.150-IMB	6.35	12.0	277	94.3	1,6µ
L3500.150-IMC	1.5875	25.0	277	94.3	0,4µ
L3500.150-IMD	6.35	50.0	277	94.3	1,6µ
L3500.150-SVA	1.5875	25.0	277	94.3	0,4µ
L3500.150-SVB	6.35	100.0	277	94.3	1,6µ
L3500.200-STA	1.5875	12.0	327	119.7	0,3µ
L3500.200-STB	6.35	50.0	327	119.7	0,13µ
L3500.200-STC	1.5875	12.0	327	119.7	0,4µ
L3500.200-STD	6.35	50.0	327	119.7	1,6µ
L3500.200-IMA	1.5875	12.0	327	119.7	0,4µ
L3500.200-IMB	6.35	12.0	327	119.7	1,6µ
L3500.200-IMC	1.5875	25.0	327	119.7	0,4µ
L3500.200-IMD	6.35	50.0	327	119.7	1,6µ
L3500.200-SVA	1.5875	25.0	327	119.7	0,4µ
L3500.200-SVB	6.35	100.0	327	119.7	1,6µ
L3500.250-STA	1.5875	12.0	378	57.5	0,3µ
L3500.250-STB	6.35	50.0	378	57.5	0,13µ

MOTORISED LINEAR STAGES

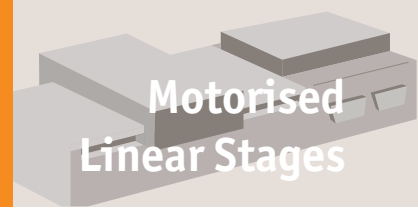


Order No.	Lead screw pitch	Speed mm/s max.	$l_1$	$l_2$	Resolution
L3500.250-STC	1.5875	12.0	378	57.5	0,4μ
L3500.250-STD	6.35	50.0	378	57.5	1,6μ
L3500.250-IMA	1.5875	12.0	378	57.5	0,4μ
L3500.250-IMB	6.35	12.0	378	57.5	1,6μ
L3500.250-IMC	1.5875	25.0	378	57.5	0,4μ
L3500.250-IMD	6.35	50.0	378	57.5	1,6μ
L3500.250-SVA	1.5875	25.0	378	57.5	0,4μ
L3500.250-SVB	6.35	100.0	378	57.5	1,6μ
L3500.300-STA	1.5875	12.0	429	82.7	0,3μ
L3500.300-STB	6.35	50.0	429	82.7	0,13μ
L3500.300-STC	1.5875	12.0	429	82.7	0,4μ
L3500.300-STD	6.35	50.0	429	82.7	1,6μ
L3500.300-IMA	1.5875	12.0	429	82.7	0,4μ
L3500.300-IMB	6.35	12.0	429	82.7	1,6μ
L3500.300-IMC	1.5875	25.0	429	82.7	0,4μ
L3500.300-IMD	6.35	50.0	429	82.7	1,6μ
L3500.300-SVA	1.5875	25.0	429	82.7	0,4μ
L3500.300-SVB	6.35	100.0	429	82.7	1,6μ
L3500.350-STA	1.5875	12.0	480	82.7	0,3μ
L3500.350-STB	6.35	50.0	480	82.7	0,13μ
L3500.350-STC	1.5875	12.0	480	82.7	0,4μ
L3500.350-STD	6.35	50.0	480	82.7	1,6μ
L3500.350-IMA	1.5875	12.0	480	82.7	0,4μ
L3500.350-IMB	6.35	12.0	480	82.7	1,6μ
L3500.350-IMC	1.5875	25.0	480	82.7	0,4μ
L3500.350-IMD	6.35	50.0	480	82.7	1,6μ
L3500.350-SVA	1.5875	25.0	480	82.7	0,4μ
L3500.350-SVB	6.35	100.0	480	82.7	1,6μ
L3500.400-STA	1.5875	12.0	531	133.7	0,3μ
L3500.400-STB	6.35	50.0	531	133.7	0,13μ
L3500.400-STC	1.5875	12.0	531	133.7	0,4μ
L3500.400-STD	6.35	50.0	531	133.7	1,6μ
L3500.400-IMA	1.5875	12.0	531	133.7	0,4μ
L3500.400-IMB	6.35	12.0	531	133.7	1,6μ
L3500.400-IMC	1.5875	25.0	531	133.7	0,4μ
L3500.400-IMD	6.35	50.0	531	133.7	1,6μ
L3500.400-SVA	1.5875	25.0	531	133.7	0,4μ
L3500.400-SVB	6.35	100.0	531	133.7	1,6μ
L3500.500-STA	1.5875	12.0	632	185.5	0,3μ
L3500.500-STB	6.35	50.0	632	185.5	0,13μ
L3500.500-STC	1.5875	12.0	632	185.5	0,4μ
L3500.500-STD	6.35	50.0	632	185.5	1,6μ
L3500.500-IMA	1.5875	12.0	632	185.5	0,4μ
L3500.500-IMB	6.35	12.0	632	185.5	1,6μ
L3500.500-IMC	1.5875	25.0	632	185.5	0,4μ
L3500.500-IMD	6.35	50.0	632	185.5	1,6μ
L3500.500-SVA	1.5875	25.0	632	185.5	0,4μ
L3500.500-SVB	6.35	100.0	632	185.5	1,6μ
L3500.600-STA	1.5875	12.0	734	235.3	0,3μ
L3500.600-STB	6.35	50.0	734	235.3	0,13μ
L3500.600-STC	1.5875	12.0	734	235.3	0,4μ
L3500.600-STD	6.35	50.0	734	235.3	1,6μ
L3500.600-IMA	1.5875	12.0	734	235.3	0,4μ
L3500.600-IMB	6.35	12.0	734	235.3	1,6μ
L3500.600-IMC	1.5875	25.0	734	235.3	0,4μ
L3500.600-IMD	6.35	50.0	734	235.3	1,6μ
L3500.600-SVA	1.5875	25.0	734	235.3	0,4μ
L3500.600-SVB	6.35	100.0	734	235.3	1,6μ
L3500.100-STA	1.5875	12.0	226	68.9	0,3μ
L3500.100-STB	6.35	50.0	226	68.9	0,13μ
L3500.100-STC	1.5875	12.0	226	68.9	0,4μ
L3500.100-STD	6.35	50.0	226	68.9	1,6μ
L3500.100-IMA	1.5875	12.0	226	68.9	0,4μ
L3500.100-IMB	6.35	12.0	226	68.9	1,6μ
L3500.100-IMC	1.5875	25.0	226	68.9	0,4μ
L3500.100-IMD	6.35	50.0	226	68.9	1,6μ
L3500.100-SVA	1.5875	25.0	226	68.9	0,4μ



# Medium-Duty Motorised Stages

high precision



## Motorised Linear Stages

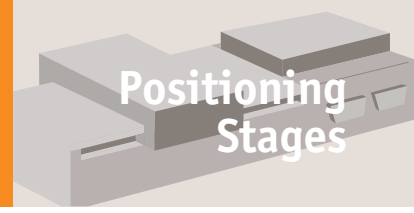
Order No.	Lead screw pitch	Speed mm/s max.	$I_1$	$I_2$	Resolution
<b>L3500.100-SVB</b>	6.35	100.0	226	68.9	1,6 $\mu$



MOTORISED LINEAR STAGES



<p><b>L3500</b> Medium duty motorised stage</p> 	<p><b>L3504</b> Heavy-duty motorised stage</p> 	<p><b>L3505</b> Motorised linear stage</p> 	<p><b>L3506</b> Miniature motorised stage</p> 
<p><b>L3508</b> Motorised linear stage</p> 	<p><b>L3510</b> Motorised linear stage</p> 	<p><b>L3521</b> Single axis stepper controller</p> 	<p><b>L3522</b> Two axes stepper controller</p> 
<p><b>L3524</b> Multi-axes stepper controller</p> 	<p><b>L3525</b> Single axis servo controller</p> 	<p><b>L3550</b> Motorised rotary stage Ø50</p> 	<p><b>L3552</b> Motorised rotary stage Ø75</p> 
<p><b>L3554</b> Motorised rotary stage Ø75</p> 	<p><b>L3556</b> Motorised rotary stage Ø125</p> 	<p><b>L3558</b> Motorised rotary stage Ø125</p> 	<p><b>L3559</b> Manual rotary stage Ø125</p> 
<p><b>L3562</b> Motorised rotary stage Ø200</p> 	<p><b>L3569</b> High speed rotary table</p> 	<p><b>L3591</b> Vertical lift stage motorised</p> 	<p><b>L3592</b> Vertical lift stage motorised</p> 



Our motorised linear stages are precise, heavy duty and available from 25mm stroke to 800mm.

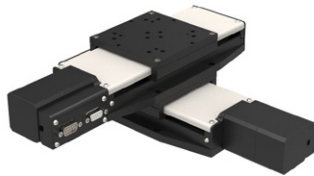
They can be easily controlled either with an Intelligent motor (this is a motor with an inbuilt driver and controller) or with a motor and one of our motion controller stages.

Programming for both the intelligent motor (less expensive) and the motion controllers is very simple and we provide free software and sample source code for Labview, VB, C++, OSX etc. It is also possible to download a stand-alone programmed to the device so it can run independently of a host.

We also offer a Joystick controller.

The stages can be readily supplied in X, XY, XZ and XYZ configurations and can also be used with our range of rotary tables (L3550 to L3562).

XY Assembly



XY Assembly



XY Assembly



### Using intelligent motors

- RS-485 - USB connection.
- Can run independently from host.
- Joystick control option

### Using motion controllers

- RS-485 - USB connection.
- Can run independently from host.
- Joystick control option



### Stepper limitations

For all of their advantages, stepper motors have a number of limitations which can cause significant implementation and operational issues depending on your application. Stepper motors do not have any reserve power. In fact, stepper motors lose a significant amount of their torque as they approach their maximum driver speed. A loss of 80% of the rated torque at 90% of the maximum speed is typical.

Stepper motors are also not as good as servo motors in accelerating a load. Attempting to accelerate a load too fast where the stepper cannot generate enough torque to move to the next step before the next drive pulse will result in a skipped step and a loss in position. If positional accuracy is essential, either the load on the motor must never exceed its torque or the stepper must be combined with a position encoder to ensure positional accuracy.

Stepper motors may also suffer from vibration and resonance problems. At certain speeds, partially depending on the load dynamics, they may resonate and be unable to drive the load. This may result in skipped steps, stalled motors, excessive vibration and noise.

### Servo limitations

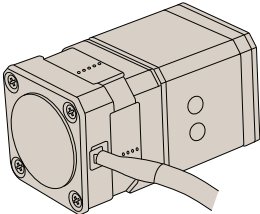
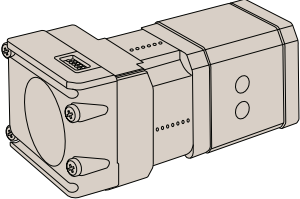
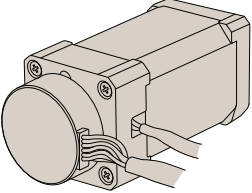
Servo motors are capable of delivering more power than stepper motors, but do require much more complex drive circuitry and positional feedback for accurate positioning. Servo motors are also much considerably expensive than stepper motors and are often harder to find. Servo motors often require gear boxes, especially for lower speed operation.

The requirement for a gearbox and a position encoder makes servo motor designs more mechanically complex and increases the maintenance requirements for the system. To top it all off, servo motors are more expensive than stepper motors before adding on the cost of a position encoder.

### Summary

Selecting the best motor for your application depends on a few key design criteria for your system including cost, positional accuracy requirements, torque requirements, drive power availability, and acceleration requirements. Overall, servo motors are best for high speed, high torque applications while stepper motors are better suited for lower acceleration, high holding torque applications as well as generally being less expensive and easier to control.

### Motor options

	<p><b>Stepper motor</b></p> <ul style="list-style-type: none"> <li>• Standard</li> <li>• With rotary encoder (1000 line)</li> </ul>
	<p><b>Intelligent stepper motor</b></p> <ul style="list-style-type: none"> <li>• Standard</li> <li>• With rotary encoder (512 line)</li> </ul>
	<p><b>Servo motor</b></p> <ul style="list-style-type: none"> <li>• Standard</li> <li>• With rotary encoder (1000 line)</li> </ul>