

Miniature Linear Stage

With DC or Stepper Motor



L-402

- Travel range 13 mm
- Unidirectional repeatability to 0.5 μm
- Velocity to 5 mm/s
- Load capacity to 1 kg
- Integrated reference and limit switches

Standard-class linear stage

Miniature stage with very compact dimensions, only 22.5 mm width. Fine-threaded drive screw with low play. Linear crossed roller guides. Directly mountable XY and XYZ combinations. Optical reference and limit switches.

Versions

- DC servo motor with rotary encoder on the motor shaft
- 2-phase stepper motor, for minimum incremental motion with microsteps
- Versions with backlash-compensated ball screw on request
- Vacuum-compatible versions to 10^{-6} hPa on request

Crossed roller guide

With crossed roller guides, the point contact of the balls in ball guides is replaced by line contact of the hardened rollers. Consequently, they are considerably stiffer and need less preload, which reduces friction and allows smoother running. Crossed roller guides are also distinguished by high guiding accuracy and load capacity. Force-guided rolling element cages prevent cage creep.

Application fields

Precision microassembly. Research. Automation. Vacuum.

Motion	Unit	Tolerance	L-402.10DD	L-402.10SD
Active axes			X	X
Travel range in X	mm		13	13
Maximum velocity in X, unloaded	mm/s		5	5
Straightness (Linear crosstalk in Y with motion in X)	μm	Typ.	± 3	± 3
Flatness (Linear crosstalk in Z with motion in X)	μm	Typ.	± 3	± 3
Pitch (Rotational crosstalk in θ_Y with motion in X)	μrad	Typ.	± 175	± 175
Yaw (Rotational crosstalk in θ_Z with motion in X)	μrad	Typ.	± 125	± 125

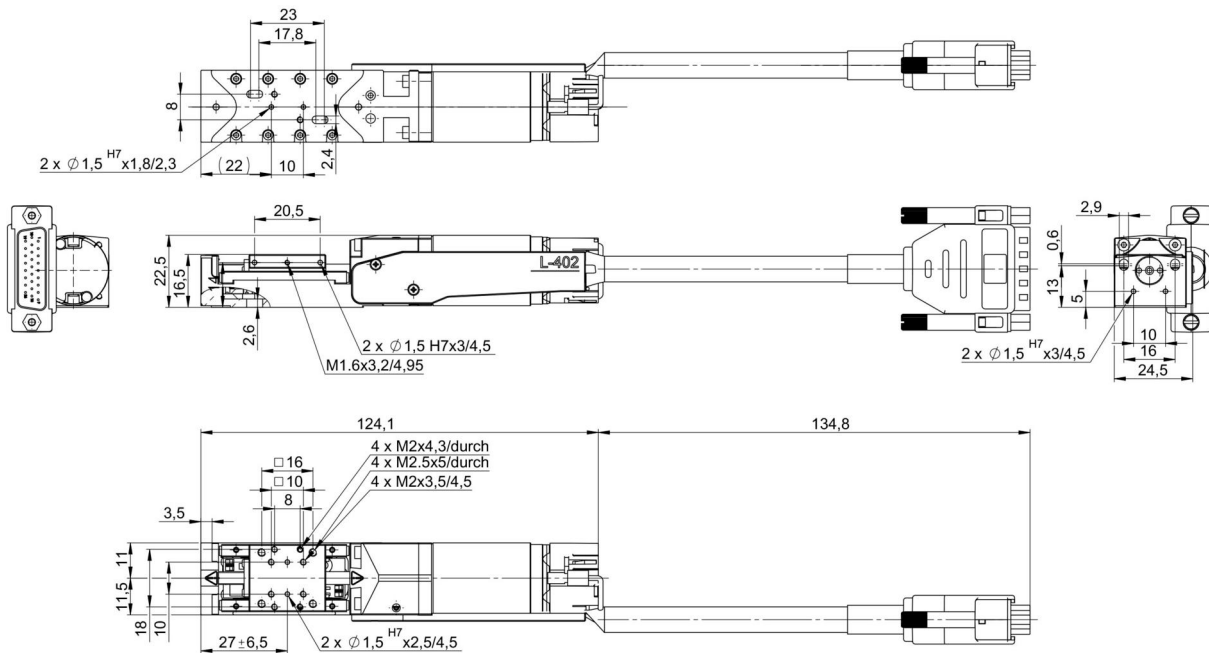
Positioning	Unit	Tolerance	L-402.10DD	L-402.10SD
Integrated sensor			Incremental rotary encoder	
Unidirectional repeatability in X	μm	Typ.	1	0.5
Bidirectional repeatability in X	μm	Typ.	± 5	± 5
Minimum incremental motion in X	μm	Typ.	1	0.5
Sensor signal			A/B quadrature, RS-422	
Sensor resolution	Cts./rev.		4096	
Reference switch			Forked photoelectric sensor, N/C contact, 5 V, NPN	Forked photoelectric sensor, N/C contact, 5 V, NPN
Limit switches			Forked photoelectric sensor, N/C contact, 5 V, NPN	Forked photoelectric sensor, N/C contact, 5 V, NPN

Drive Properties	Unit	Tolerance	L-402.10DD	L-402.10SD
Drive type			DC motor	2-phase stepper motor
Motor resolution	Full steps/rev.			200
Nominal voltage	V		24	24
Peak voltage	V		48	48
Drive force in negative direction of motion in X	N	Typ.	10	10
Drive force in positive direction of motion in X	N	Typ.	10	10

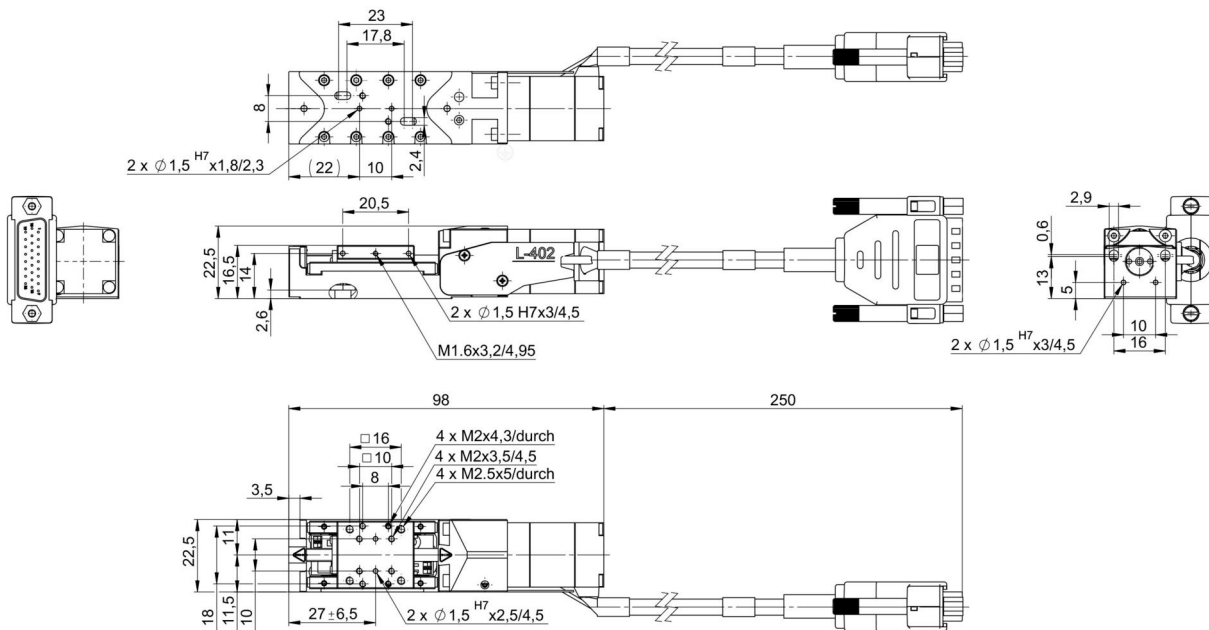
Mechanical Properties	Unit	Tolerance	L-402.10DD	L-402.10SD
Guide			Crossed roller guide	Crossed roller guide
Drive screw type			Metric leadscrew	Metric leadscrew
Drive screw pitch	mm		0.5	0.5
Holding force in X, passive	N		10	10
Moved mass in X, unloaded	g		0.02	0.02
Permissible push force in Y	N	Max.	5	5
Permissible push force in Z	N	Max.	10	10
Permissible torque in θx	N·m	Max.	1	1
Permissible torque in θY	N·m	Max.	1	1
Permissible torque in θZ	N·m	Max.	1	1
Overall mass	g		160	150
Material			Aluminum, anodized, stainless steel	Aluminum, anodized, stainless steel

Miscellaneous	Unit		L-402.10DD	L-402.10SD
Connector			HD D-sub 26-pin (m)	HD D-sub 26-pin (m)
Recommended controllers / drivers			C-863 (single axis) C-884 (up to 6 axes) C-885 with C-863.20C885 (up to 40 axes) ACS modular controller	C-663.12 (single axis) C-885 with C-663.12C885 (up to 20 axes) ACS modular controller
Cable length	m		0.14	0.25
Operating temperature range	°C		5 to 40	5 to 40

Drawings / Images



L-402.10DD, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.



L-402.10SD, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.



L-402 with DC motor: L-402.10DD

Order Information

L-402.10DD

Miniature linear stage; DC motor; 13 mm travel range; 10 N load capacity; 5 mm/s maximum velocity; metric leadscrew; incremental rotary encoder, 4096 counts/rev. sensor resolution, A/B quadrature, RS-422; 0.14 m cable length

L-402.10SD

Miniature linear stage; 2-phase stepper motor; 13 mm travel range; 10 N load capacity; 5 mm/s maximum velocity; metric lead-screw; 0.25 m cable length