

Precision Z Stage

e.g., for compact XYZ combinations with M-511 series



M-501

- Extremely high-resolution encoder
- ActiveDrive Motor
- Zero-play ball screws
- Noncontact limit and reference switches
- Stress-relieved aluminum base for high stability
- Self-locking to 10 kg

Motion	Unit	Tolerance	M-501.1DG	M-501.1PD
Active axes			Z	Z
Travel range in Z	mm		12.5	12.5
Maximum velocity in Z, unloaded	mm/s		1	3
Angular error E_AZ	μrad	Typ.	±150	±150
Angular error E_BZ	μrad	Typ.	±150	±150

Positioning	Unit	Tolerance	M-501.1DG	M-501.1PD
Minimum incremental motion in Z	μm	Typ.	0.1	0.1
Unidirectional repeatability in Z	μm	Typ.	±0.05	±0.05
Bidirectional repeatability in Z	μm	Typ.	6	6
Reference switch			Hall effect	Hall effect
Reference switch repeatability	μm		1	1
Limit switches			Hall effect	Hall effect
Integrated sensor			Incremental rotary encoder	Incremental rotary encoder
Sensor signal			A/B quadrature, RS-422	A/B quadrature, RS-422
Sensor resolution	Cts./rev.		2048	40960

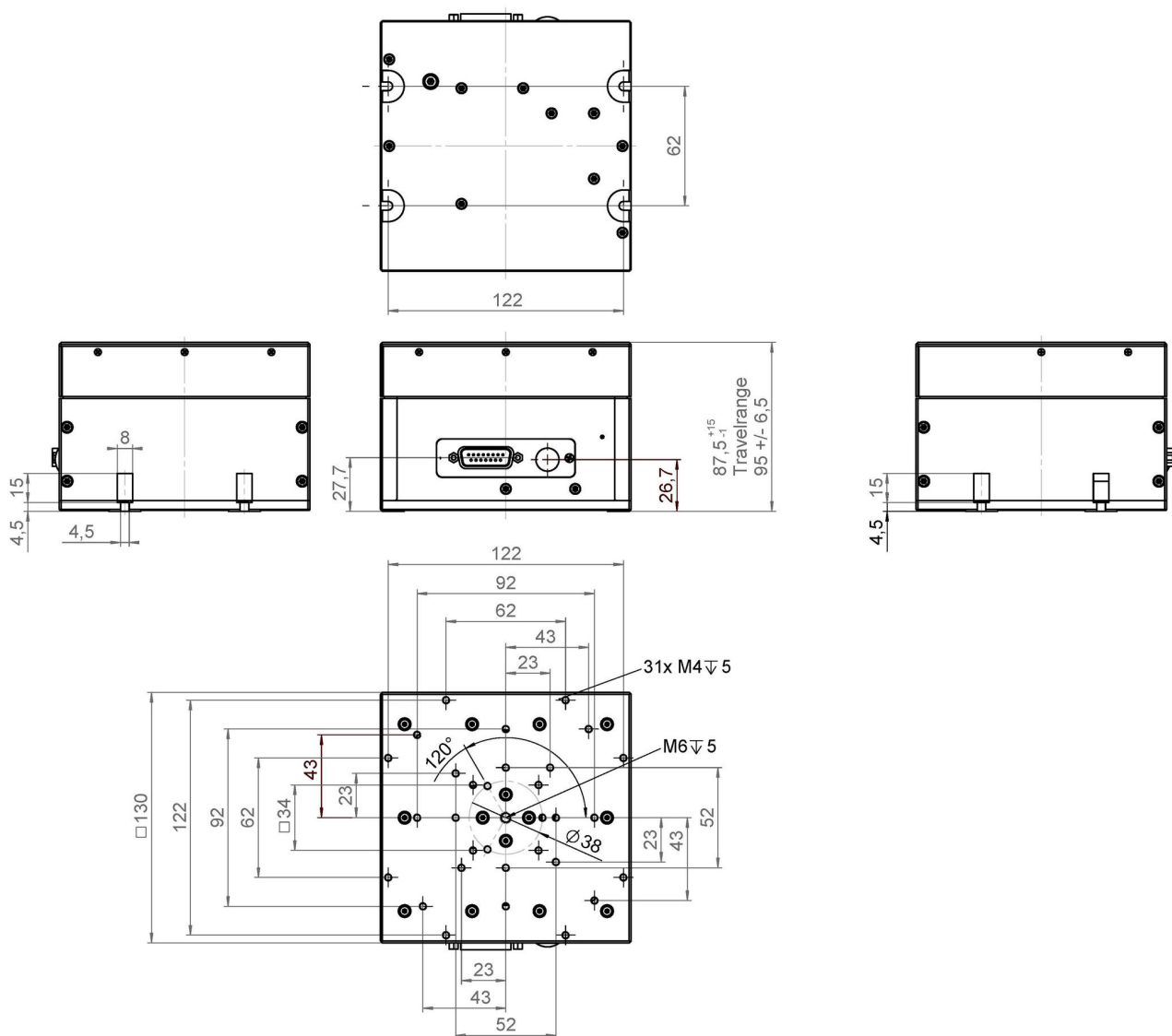
Drive Properties	Unit	Tolerance	M-501.1DG	M-501.1PD
Drive type			DC gear motor	DC motor with ActiveDrive
Nominal voltage	V		12	24
Maximum power consumption	W		4	17
Drive force in positive direction of motion in Z	N	Typ.	100	50
Drive force in negative direction of motion in Z	N	Typ.	100	50
Torque constant	N·m/A	Typ.	14.5	34.6
Number of pole pairs			1	1

Mechanical Properties	Unit	Tolerance	M-501.1DG	M-501.1PD
Permissible push force in Z	N	Max.	100	50
Permissible torque in θX	N·m	Max.	40	40
Permissible torque in θY	N·m	Max.	20	20
Permissible torque in θZ	N·m	Max.	20	20
Holding force in Z, passive	N		100	20
Drive screw type			Ball screw	Ball screw
Drive screw pitch	mm		1	1
Gear ratio i			80 : 26 + 29,6 : 1 gearing (91 : 1)	80 : 26
Guide			Crossed roller guide	Crossed roller guide
Overall mass	g		2600	2600
Material			Anodized aluminum	Anodized aluminum

Miscellaneous	Unit		M-501.1DG	M-501.1PD
Operating temperature range	°C		-20 to 50	10 to 50
Connector			D-sub 15 (m)	D-sub 15 (m)
Recommended controllers / drivers			C-863 C-884	C-863 C-884

At PI, technical data is specified at 22 ± 3 °C. Unless otherwise stated, the values are for unloaded conditions. Some properties are interdependent. The designation "typ." indicates a statistical average for a property; it does not indicate a guaranteed value for every product supplied. During the final inspection of a product, only selected properties are analyzed, not all. Please note that some product characteristics may deteriorate with increasing operating time.

Drawings / Images



M-501, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

Order Information

M-501.1DG

Precision Z stage; DC gear motor; 12.5 mm travel range; 100 N load capacity; 1 mm/s maximum velocity; incremental rotary encoder, 2048 counts/rev sensor resolution, A/B quadrature, RS-422

M-501.1PD

Precision Z stage; DC motor with ActiveDrive; 12.5 mm travel range; 50 N load capacity; 3 mm/s maximum velocity; incremental rotary encoder, 40960 counts/rev sensor resolution, A/B quadrature, RS-422