

High-Precision Nanopositioning Stage

Highly Dynamic and Stable Piezo Scanner with Extremely Accurate Guiding



P-752

- Resolution 0.1 nm
- Fast response behavior
- Travel range up to 35 μm
- Highest linearity due to capacitive sensors
- Friction-free flexure guides for very high travel accuracy
- Outstanding lifetime thanks to PICMA® piezo actuators

Application fields

- Scanning microscopy
- Measuring technology
- Test procedures and quality assurance
- Photonics
- Fiber positioning

Outstanding lifetime due to PICMA® piezo actuators

The PICMA® piezo actuators are all-ceramic insulated. This protects them against humidity and failure resulting from an increase in leakage current. PICMA® actuators offer an up to ten times longer lifetime than conventional polymer-insulated actuators. 100 billion cycles without a single failure are proven.

Subnanometer resolution with capacitive sensors

Capacitive sensors measure with subnanometer resolution without contacting. They guarantee excellent linearity of motion, long-term stability, and a bandwidth in the kHz range.

High guiding accuracy due to zero-play flexure guides

Flexure guides are free of maintenance, friction, and wear, and do not require lubrication. Their stiffness allows high load capacity and they are insensitive to shock and vibration. They work in a wide temperature range.

Automatic configuration and fast component exchange

Mechanics and controllers can be combined as required and exchanged quickly. All servo and linearization parameters are stored in the ID chip of the mechanics' D-sub connector. The auto calibration function on the digital controller automatically uses this data every time the controller is switched on.

Maximum accuracy due to direct position measuring

Motion is measured directly at the motion platform without any influence from the drive or guide elements. This allows optimal repeatability, outstanding stability, and stiff, fast-responding control.

Motion	Unit	Tolerance	P-752.11C	P-752.1CD	P-752.21C	P-752.2CD
Active axes			X	X	X	X
Travel range in X	μm		15	15	30	30
Travel range in X, open loop, at -20 to 120 V	μm	+20 / -0 %	20	20	35	35
Linearity error in X	%	Typ.	0.03	0.03	0.03	0.03
Pitch (Rotational crosstalk in θY with motion in X)	μrad	Typ.	± 1	± 1	± 1	± 1
Yaw (Rotational crosstalk in θZ with motion in X)	μrad	Typ.	± 1	± 1	± 1	± 1

Positioning	Unit	Tolerance	P-752.11C	P-752.1CD	P-752.21C	P-752.2CD
Unidirectional repeatability in X	nm	Typ.	±1	±1	±2	±2
Resolution in X, open loop	nm	Typ.	0.1	0.1	0.2	0.2
Integrated sensor			Capacitive, direct position measuring			
System resolution in X	nm		0.1	0.1	0.2	0.2

Drive Properties	Unit	Tolerance	P-752.11C	P-752.1CD	P-752.21C	P-752.2CD
Drive type			Piezo actuator/PICMA®	Piezo actuator/PICMA®	Piezo actuator/PICMA®	Piezo actuator/PICMA®
Electrical capacitance in X	µF	±20%	2.1	2.1	3.7	3.7

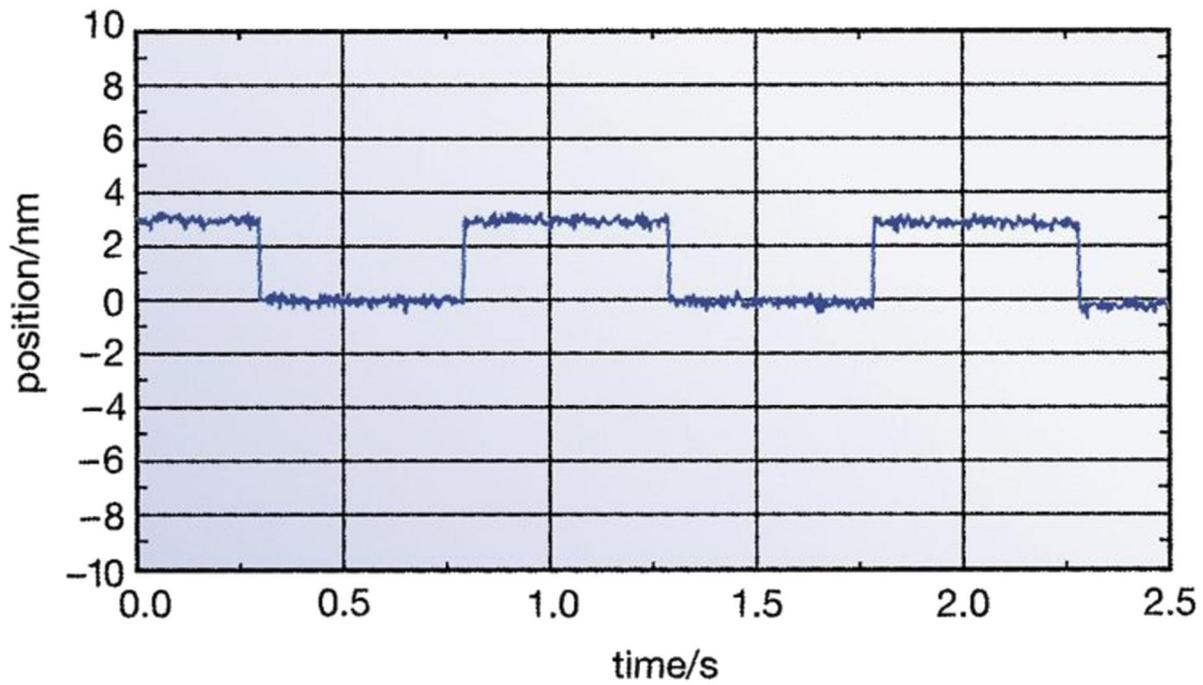
Mechanical Properties	Unit	Tolerance	P-752.11C	P-752.1CD	P-752.21C	P-752.2CD
Stiffness in X	N/µm	±20%	30	30	20	20
Resonant frequency in X, unloaded	Hz	±20%	3200	3200	2100	2100
Resonant frequency in X, under load with 300 g	Hz	±20%	980	980	600	600
Permissible push force in X	N	Max.	100	100	100	100
Permissible push force in Z	N	Max.	30	30	30	30
Permissible pull force in X	N	Max.	10	10	10	10
Guide			Flexure guide/Flexure guide with lever amplification			
Overall mass	g	±5%	250	250	350	350
Material			Steel	Steel	Steel	Steel

Miscellaneous	Unit	Tolerance	P-752.11C	P-752.1CD	P-752.21C	P-752.2CD
Operating temperature range	°C		-20 to 80	-20 to 80	-20 to 80	-20 to 80
Connector			LEMO FFS.00.250.CTCE24	D-sub 7W2 (m)	LEMO FFS.00.250.CTCE24	D-sub 7W2 (m)
Sensor connector			LEMO FFA.00.250.CTLC31		LEMO FFA.00.250.CTLC31	
Cable length	m	+50 / -0 mm	1.5	1.5	1.5	1.5
Recommended controllers / drivers			E-505, E-610, E-625, E-754			

Repeatability: Typical, full travel.

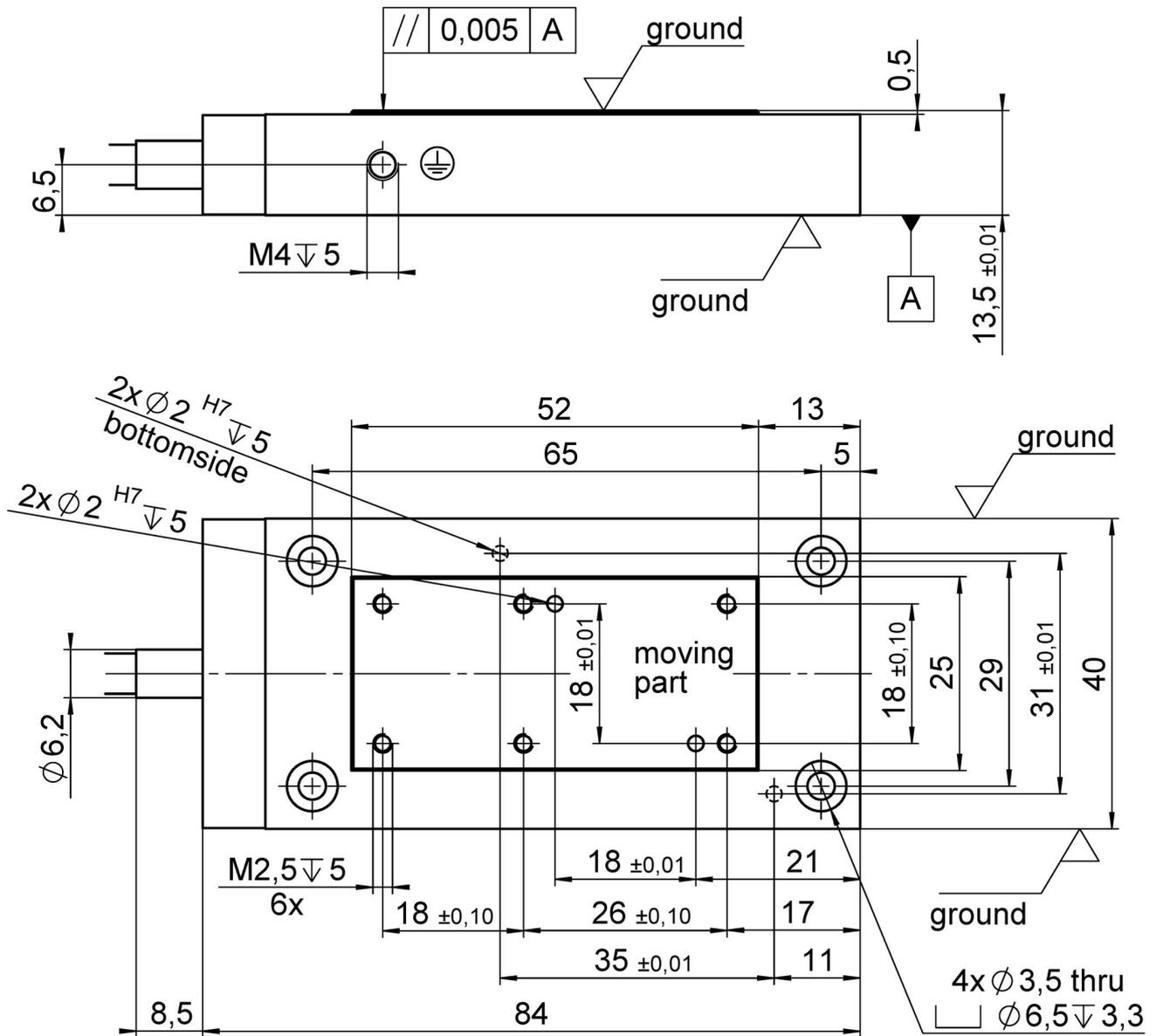
The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

Drawings / Images



Response behavior of a P-752.11C to square wave control with an amplitude of 3 nm. Sub-nm resolution, stability, and bidirectional repeatability are clearly visible. Controller: E-501.00, E-503.00, E-509.C1; servo control settings: 240 Hz bandwidth.

Drawings / Images



P-752.2xx, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

Order Information

P-752.11C

High-precision nanopositioning stage; 15 μm travel range; capacitive, direct position measuring; LEMO connectors; 1.5 m cable length

P-752.1CD

High-precision nanopositioning stage; 15 μm travel range; capacitive, direct position measuring; D-sub 7W2 (m); 1.5 m cable length

P-752.21C

High-precision nanopositioning stage; 30 μm travel range; capacitive, direct position measuring; LEMO connectors; 1.5 m cable length

P-752.2CD

High-precision nanopositioning stage; 30 μm travel range; capacitive, direct position measuring; D-sub 7W2 (m); 1.5 m cable length