



Copyright © 2017 SmarAct GmbH

Specifications are subject to change without notice. All rights reserved. Reproduction of images, tables or diagrams prohibited.

The information given in this catalog was carefully checked by our team and is constantly updated. Nevertheless it is not possible to fully exclude the presence of errors. In order to always get the latest information, please contact our technical sales team.

SmarAct GmbH, Schuette-Lanz-Straße 9, D-26135 Oldenburg
Phone: +49 (0) 441 - 800879-0, Telefax: +49 (0) 441 - 800879-21
Internet: www.smaract.com e-mail: info@smaract.com

TABLE OF CONTENTS

ABOUT LINEAR POSITIONERS	4
SLC-17 SERIES	5
SLC-1720.....	6
SLC-1730.....	7
SLC-1740.....	8
SLC-1750.....	9
SLC-1760.....	10
SLC-1770.....	11
SLC-1780.....	12
SLC-24 SERIES	14
SLC-2430.....	15
SLC-2445.....	16
SLC-2460.....	17
SLC-2475.....	18
SLC-2490.....	19
SLC-24105.....	20
SLC-24120.....	21
SLC-24150.....	22
SLC-24180.....	23
SL SERIES	24
SL-06.....	24
SL-06xx.....	25
SLL SERIES	26
SLL ACCESSORIES	26
SLL12.....	27
SLLA42	28
SLLV42.....	29
SHL SERIES	30
SHL 20N-10	30

LINEAR POSITIONERS

ABOUT LINEAR POSITIONERS

Nanometer Precision Linear Positioners

Based on our patented piezo driving technology, we are offering several lines of linear positioners. Some of those positioners are shown in the following section.

Positioners from the SLC series are based on linear slides with ball or crossed-roller bearings and are characterized by their high rigidity and straightness. They should be chosen for compact nanopositioning systems with or without sensor feedback. Based on the SLC series, the SHL line for heavy loads is available.

Positioners from the SLL series are based on ball or crossed-roller bearings. The small slide in combination with a long rail makes it an interesting solution for long range positioning within limited space and a cost effective micro- and nanopositioning system. Positioners from the SL series are ultra-compact and based on slides with linear ball bearings. They are well-suited for micro-positioning systems, where space is the top priority.

	Product Line	SLC		SL	SLL		SHL
	Positioner Series	SLC-17	SLC-24	SL-06	SLL12	SLL(A/V)42	SHL-20N-10
Mechanical	blocking force [N]	≥ 3.5	≥ 3.5	≥ 1	≥ 3	≥ 5	
	max. normal force [N]	20 .. 30	20 .. 30	1	30	30	
	max. lift force [N]	1.5, 2.2 (-D)	1.5, 2.2 (-D)	0.35	1.5	1.5	20
	cross section [mm ²]	17 x 8.5	24 x 10.5	5.2 x 11	27 x 10	55.8 x 13	65 x 50
	length [mm]	20 .. 80	30 .. 180	11...31	70 .. 495	70 .. 1500	75
	weight [g]	13 .. 51	36 .. 216	≈ 3	≈ 45	≈ 245	200
	pitch torque [Nm]	0.6 .. 12.5	2.2 .. 49.1	0.1	6	25	2.5
	yaw torque [Nm]	0.6 .. 12.5	2.2 .. 49.1	0.1	6	25	2.5
	roll torque [Nm]	0.4 .. 1.9	1.5 .. 6.1	0.1	11	90	2.5
Open-Loop	travel [mm]	12 .. 51	16 .. 123	4.5..16	35 .. 460	10 .. 940	10
	step width [nm]	50 .. 1500	50 .. 1500	50 .. 1500	50 .. 1500	50 .. 3000	50 .. 1500
	piezo scan range [μm]	> 1.5	> 1.5	1.5	> 1.5	> 3	0.5
	scan resolution [nm]	< 1	< 1	< 1	< 1	< 1	< 1
	velocity [mm/s]	> 20	> 20	> 13	> 20	> 20	> 9
	max. frequency [kHz]	18.5	18.5	18.5	18.5	18.5	18.5
Closed-Loop	sensor resolution [nm]	1	1		1	1	1
	cl resolution [nm]	1 (-S, -SC), 4 (-L), 100 (-M)	1 (-S, -SC), 4 (-L), 100 (-M)		1 (-S, -SC) 100 (-M)	1 (-S, -SC) 100 (-M)	1 (-S, -SC), 4 (-L), 100 (-M)
	repeatability, full stroke [nm]	± 25 .. ± 80	± 30 .. ± 180		± 70 .. ± 450	± 70 .. ± 450	± 100
	sensor types	-M, -S, -SC, -I, -L	-M, -S, -SC, -I, -L	no sensor available	-M, -S, -SC	-M, -S, -SC	-M, -S, -SC, -L
	vacuum compatibility	HV, UHV	HV, UHV	HV, UHV	HV	HV	HV, UHV

LINEAR POSITIONERS

SLC-17 SERIES

Nanometer Precision Linear Positioner



The positioners in the SLC-17 series are 17 mm wide and 8.5 mm high each. They are very rigid and therefore ideally suited for micro- and nan positioning systems where stability and high accuracy have first priority.







Despite their small size, a position sensor for micro-

and nan positioning tasks can be optionally integrated into each positioner without affecting the positioner's outer dimensions. Due to this high integration the SLC-1720-S is the smallest available closed-loop nanopositioner with macroscopic travel range.

LINEAR POSITIONERS

SLC-1720

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	12 mm	20 N (2 kg)	available	down to 10 ⁻¹¹ mbar	22 x 17 x 8.5 mm ³

Mechanical Properties

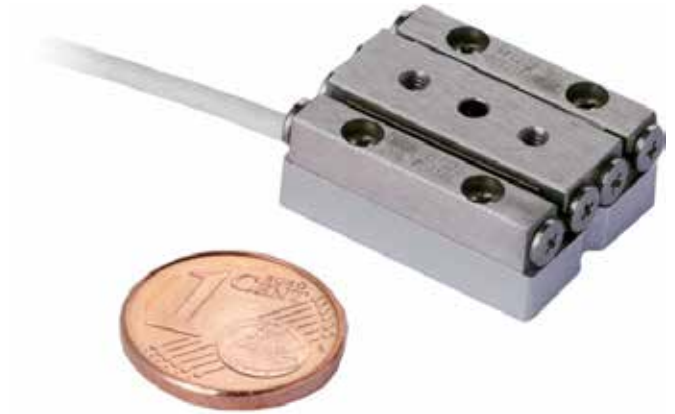
blocking force F_B	> 3.5 N
max. normal force F_N	20 N
max. lift force F_L	> 1.5 N
positioner dimension	22 x 17 x 8.5 mm ³
weight	13 g
pitch torque M_p	0.6 Nm
yaw torque M_y	0.6 Nm
roll torque M_r	0.4 Nm

Positioning

travel	± 6 (12) mm
step width	1 - 1,500 nm*
scan range	> 1.5 μm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options***

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM****)
black anodized (-BK)
external support for increased M_y , M_r (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)

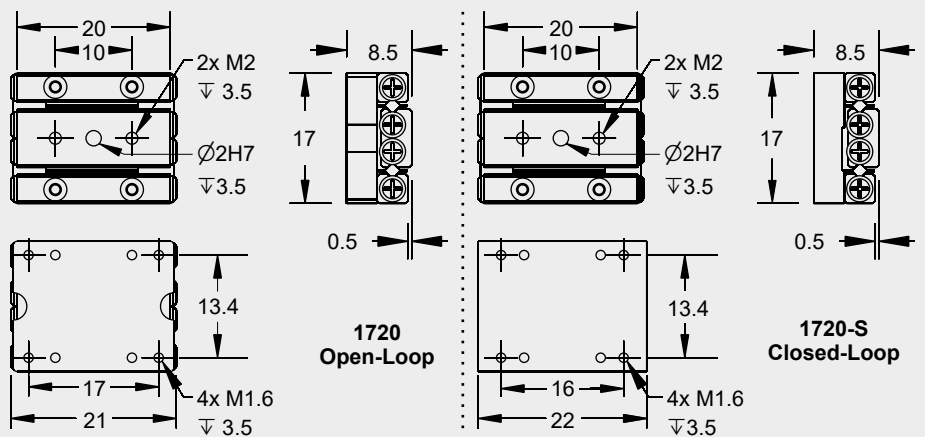


Closed-Loop with -S

sensor resolution	1 nm
repeatability	± 25 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 μm (H)CU ± 50 nm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1730

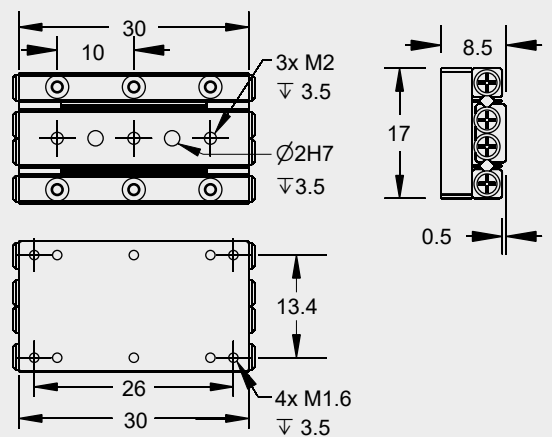
Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	21 mm	30 N (2 kg)	available	down to 10 ⁻¹¹ mbar	30 x 17 x 8.5 mm ³

Mechanical Properties	
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	30 x 17 x 8.5 mm ³
weight	20 g
pitch torque M_p	1.2 Nm
yaw torque M_y	1.2 Nm
roll torque M_r	0.6 Nm
Positioning	
travel	± 10.5 (21) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz
Materials and Vacuum Options****	
steel base (-ST), titanium base (-TI)	
non magnetic materials (-NM*****)	
black anodized (-BK)	
external support for increased M_y , M_r (-W)	
high precision bearing (-P)	
increased blocking force (-D, +1.5 N)	
integrated connecting elements (-O)	



Closed-Loop with -S	
sensor resolution	1 nm
repeatability	± 30 nm**
Closed-Loop with -L***	
sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 60 nm MCS
Closed-Loop with -M***	
sensor resolution	100 nm
closed loop resolution	± 500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1740

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	26 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	40 x 17 x 8.5 mm ³

Mechanical Properties

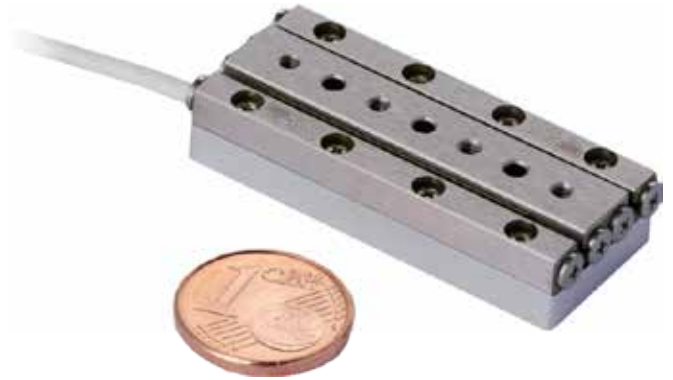
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	40 x 17 x 8.5 mm ³
weight	26 g
pitch torque M_p	3.0 Nm
yaw torque M_y	3.0 Nm
roll torque M_R	1.0 Nm

Positioning

travel	± 13 (26) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM*****)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

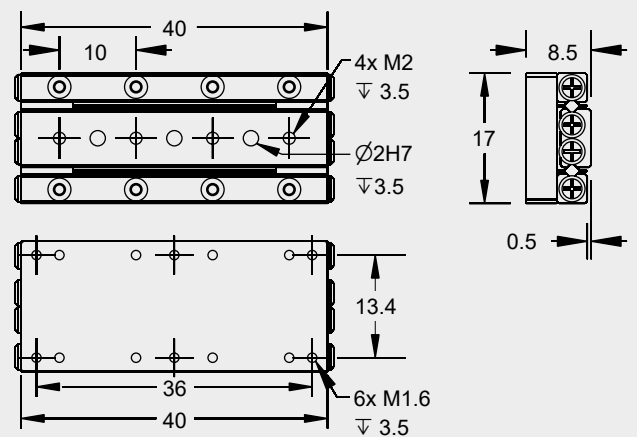
sensor resolution	1 nm
repeatability	± 40 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 80 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1750

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	31 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	40 x 17 x 8.5 mm ³

Mechanical Properties

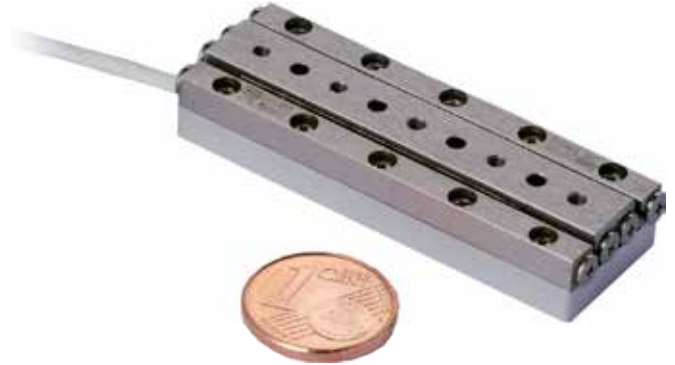
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	50 x 17 x 8.5 mm ³
weight	32 g
pitch torque M_p	4.6 Nm
yaw torque M_y	4.6 Nm
roll torque M_R	1.2 Nm

Positioning

travel	± 15.5 (31) mm
step width	1 - 1,500 nm*
scan range	> 1.5 μm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM*****)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

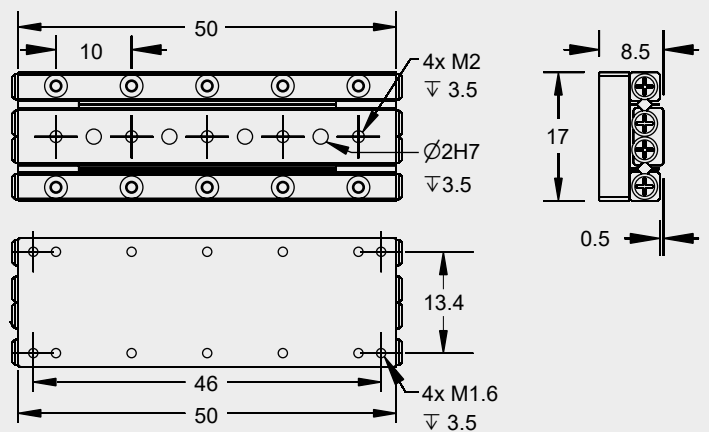
sensor resolution	1 nm
repeatability	± 50 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 μm (H)CU ± 100 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 μm (H)CU ± 0.5 μm MCS



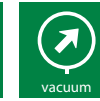
Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1760

Nanometer Precision Linear Positioner



Mechanical Properties

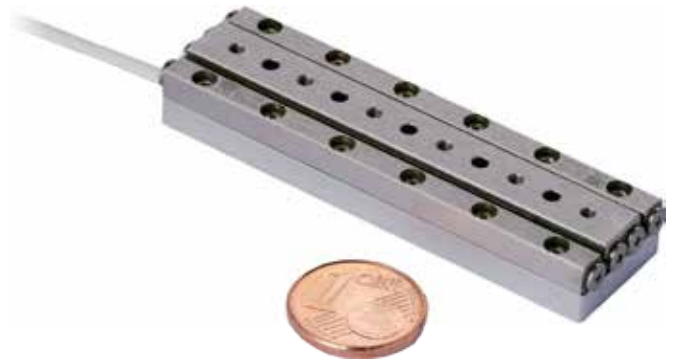
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	60 x 17 x 8.5 mm ³
weight	38 g
pitch torque M_p	7.6 Nm
yaw torque M_y	7.6 Nm
roll torque M_R	1.4 Nm

Positioning

travel	± 20.50 (41) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM*****)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)



Closed-Loop with -S

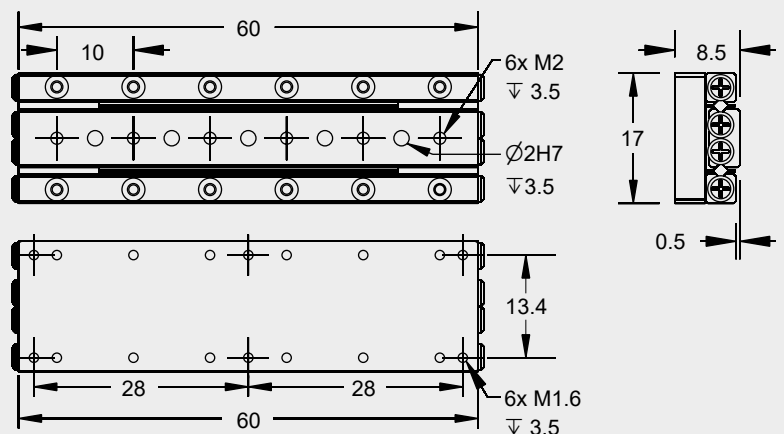
sensor resolution	1 nm
repeatability	± 60 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 120 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1770

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	46 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	70 x 17 x 8.5 mm ³

Mechanical Properties

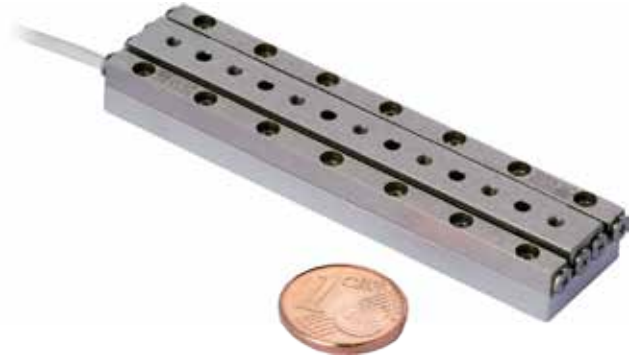
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	70 x 17 x 8.5 mm ³
weight	45 g
pitch torque M_p	10.1 Nm
yaw torque M_y	10.1 Nm
roll torque M_R	1.6 Nm

Positioning

travel	± 23 (46) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM*****)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y, M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

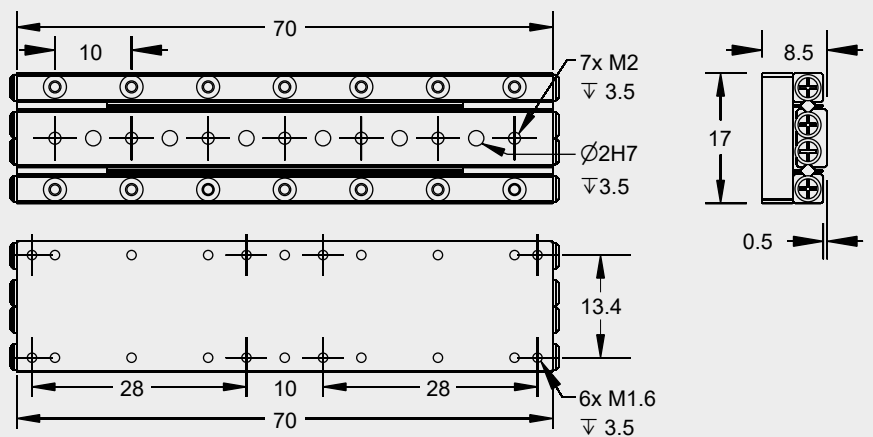
sensor resolution	1 nm
repeatability	± 70 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 140 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS



Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm

LINEAR POSITIONERS

SLC-1780

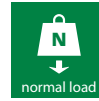
Nanometer Precision Linear Positioner



resolution
< 1 nm



travel range
51 mm



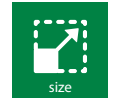
normal load
30 N (3 kg)



non magnetic
available



vacuum
down to
 10^{-11} mbar



size
80 x 17 x 8.5
mm³

Mechanical Properties

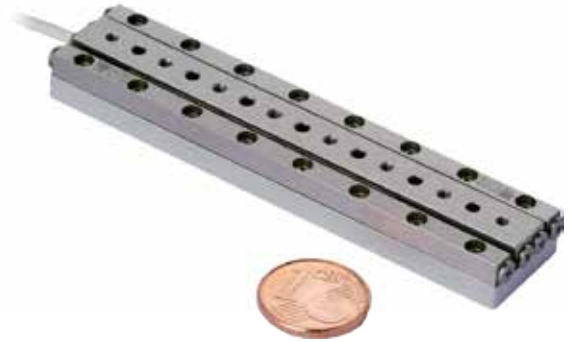
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	80 x 17 x 8.5 mm ³
weight	51 g
pitch torque M_p	12.5 Nm
yaw torque M_y	12.5 Nm
roll torque M_R	1.9 Nm

Positioning

travel	± 25.5 (51) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM*****)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)



Closed-Loop with -S

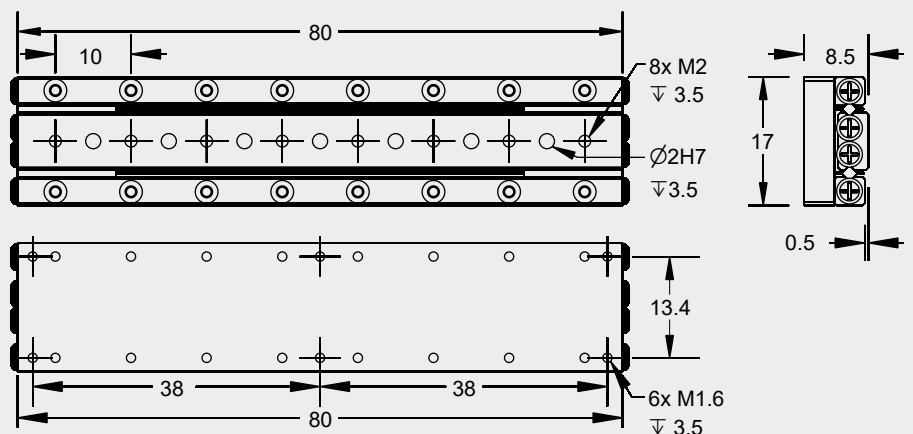
sensor resolution	1 nm
repeatability	± 80 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 160 nm MCS

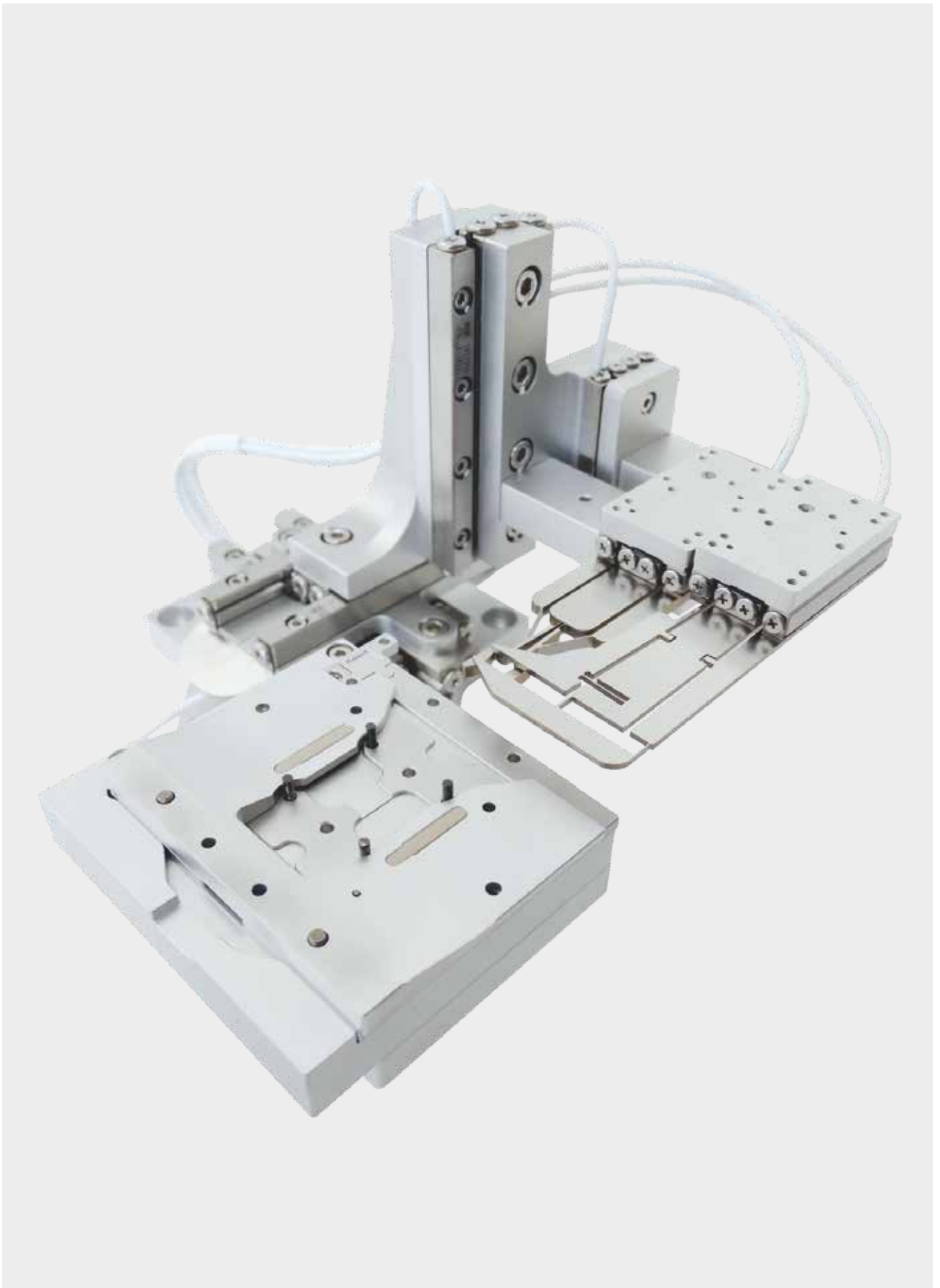
Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS



Linear dimensions are given in mm.

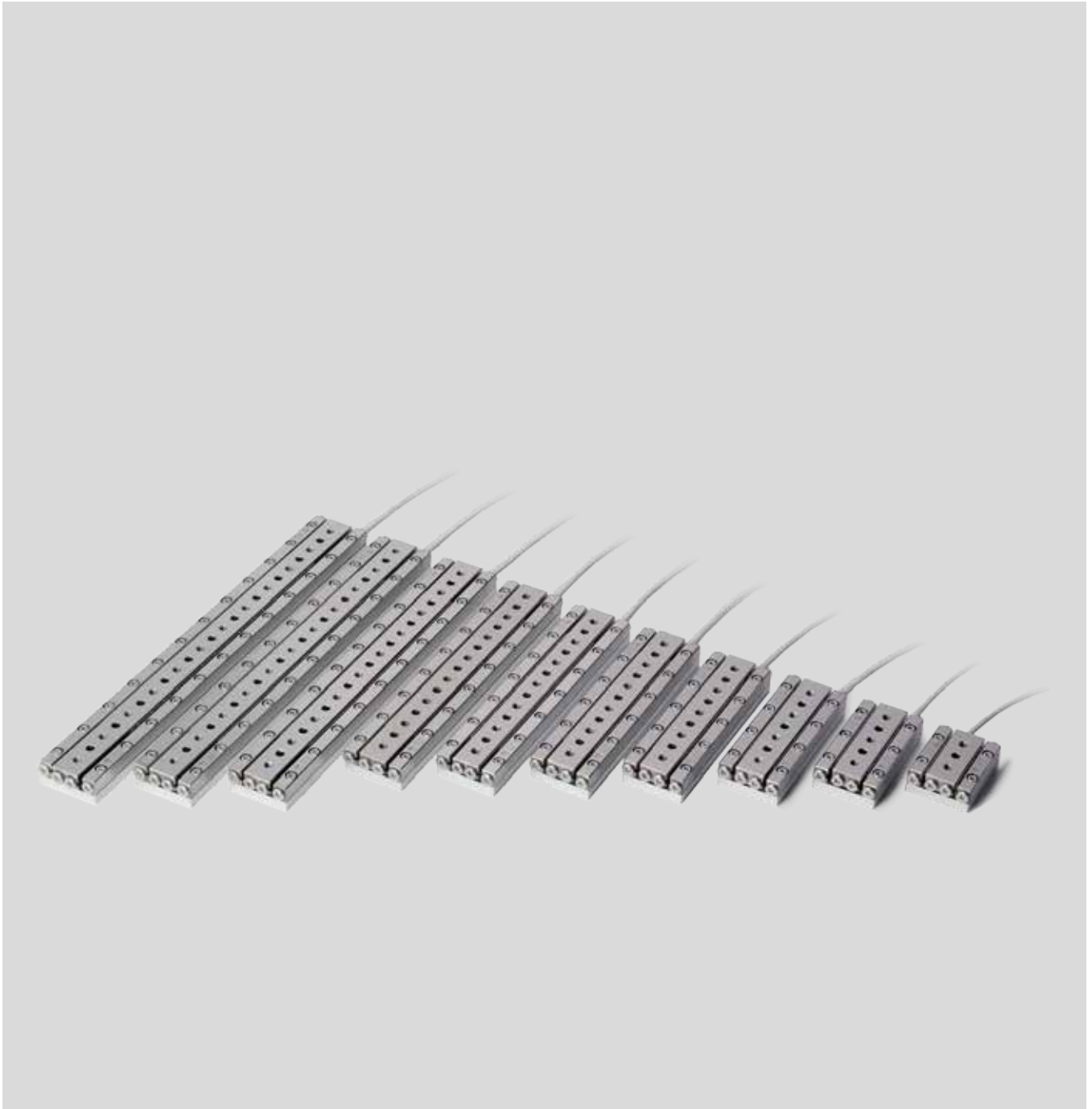
* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized
 ***** all holes M1.6, no dowel holes, screwing depth: min. 3 mm, max. 3.5 mm



LINEAR POSITIONERS

SLC-24 SERIES

Nanometer Precision Linear Positioner









The positioners in the SLC-24 series are 24 mm wide and 10.5 mm high each. They are even more rigid than the positioners in the SLC-17 series and their high straightness allows for an excellent positioning accuracy. With positioners of this series you can perform nan positioning tasks when you have the need of very large travel ranges.

Optionally, a position sensor for closed loop micro- and nan positioning tasks can be integrated without affecting the positioner's outer dimension.

LINEAR POSITIONERS

SLC-2430

Nanometer Precision Linear Positioner

 resolution < 1 nm	 travel range 16 mm	 normal load 20 N (2 kg)	 non magnetic available	 vacuum down to 10^{-11} mbar	 size 30 x 24 x 10.5 mm ³
---	--	---	--	---	--

Mechanical Properties

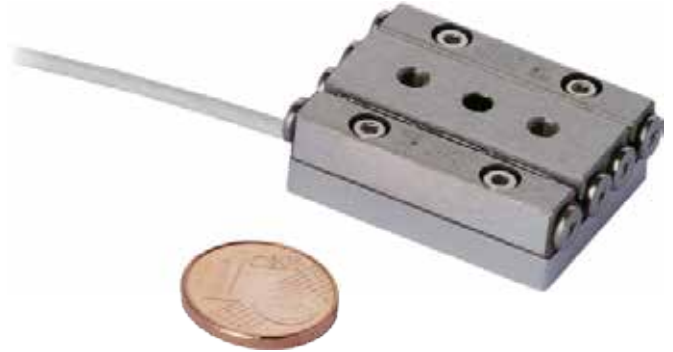
blocking force F_B	> 3.5 N
max. normal force F_N	20 N
max. lift force F_L	> 1.5 N
positioner dimension	30 x 24 x 10.5 mm ³
weight	36 g
pitch torque M_p	2.2 Nm
yaw torque M_y	2.2 Nm
roll torque M_R	1.5 Nm

Positioning

travel	± 8 (16) mm
step width	1 - 1,500 nm*
scan range	> 1.5 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)



Closed-Loop with -S

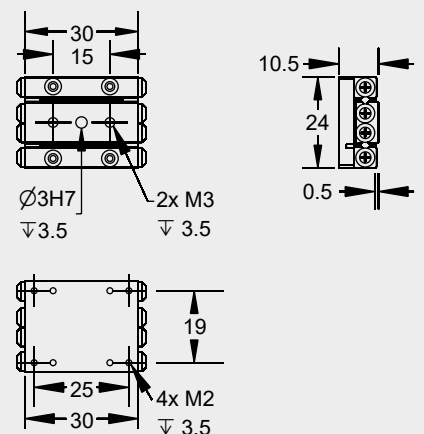
sensor resolution	1 nm
repeatability	± 30 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 μ m (H)CU ± 60 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 μ m (H)CU ± 0.5 μ m MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-2445

Nanometer Precision Linear Positioner

 resolution < 1 nm	 travel range 29 mm	 normal load 30 N (3 kg)	 non magnetic available	 vacuum down to 10 ⁻¹¹ mbar	 size 45 x 24 x 10.5 mm ³
--	--	--	---	--	--

Mechanical Properties

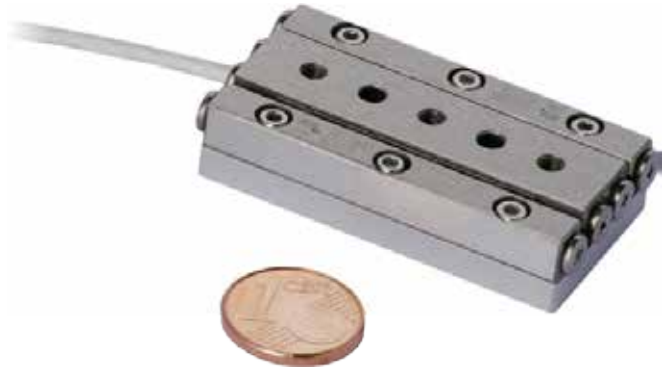
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	45 x 24 x 10.5 mm ³
weight	54 g
pitch torque M_p	7.5 Nm
yaw torque M_y	7.5 Nm
roll torque M_R	2.6 Nm

Positioning

travel	± 14.5 (29) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

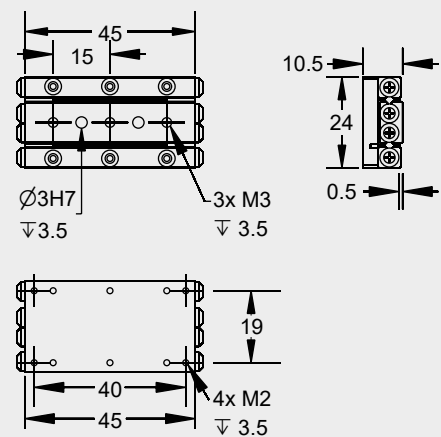
sensor resolution	1 nm
repeatability	± 45 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 90 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-2460 Nanometer Precision Linear Positioner

 resolution < 1 nm	 travel range 35 mm	 normal load 30 N (3 kg)	 non magnetic available	 vacuum down to 10^{-11} mbar	 size 60 x 24 x 10.5 mm ³
---	--	---	--	---	--

Mechanical Properties

blocking force F_B	> 3.5 N
max. normal force F_N	20 N
max. lift force F_L	> 1.5 N
positioner dimension	60 x 24 x 10.5 mm ³
weight	72 g
pitch torque M_p	12.8 Nm
yaw torque M_y	12.8 Nm
roll torque M_R	3.2 Nm

Positioning

travel	± 17.5 (35) mm
step width	1 - 1,500 nm*
scan range	> 1.5 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y, M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)



Closed-Loop with -S

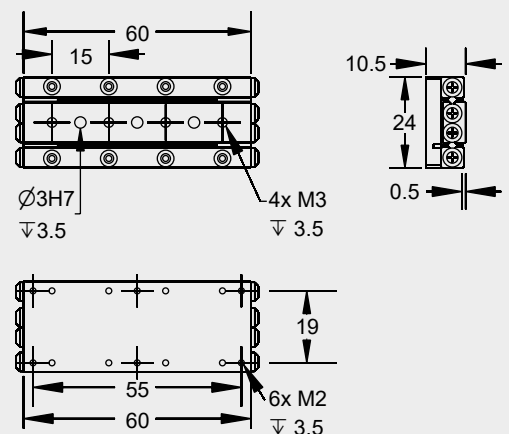
sensor resolution	1 nm
repeatability	± 60 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 μ m (H)CU ± 120 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 μ m (H)CU ± 0.5 μ m MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-2475

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	49 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	75 x 24 x 10.5 mm ³

Mechanical Properties

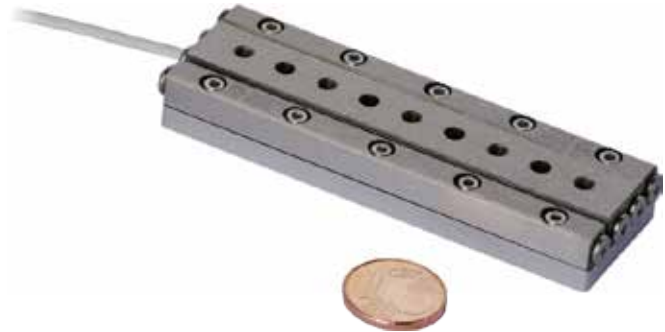
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	75 x 24 x 10.5 mm ³
weight	90 g
pitch torque M_p	18.1 Nm
yaw torque M_y	18.1 Nm
roll torque M_R	3.9 Nm

Positioning

travel	± 24.5 (49) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

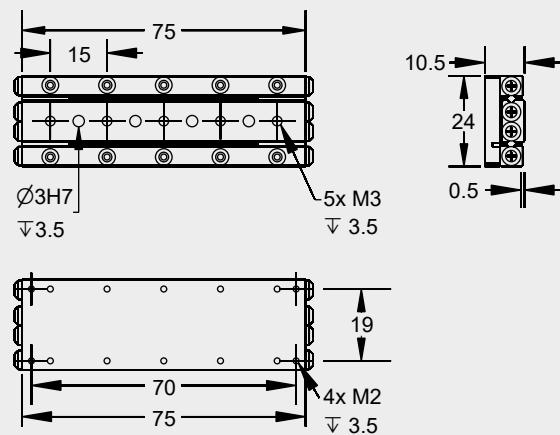
sensor resolution	1 nm
repeatability	± 75 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 150 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-2490

Nanometer Precision Linear Positioner

 resolution < 1 nm	 travel range 63 mm	 normal load 30 N (3 kg)	 non magnetic available	 vacuum down to 10 ⁻¹¹ mbar	 size 90 x 24 x 10.5 mm ³
---	--	---	--	--	--

Mechanical Properties

blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	90 x 24 x 10.5 mm ³
weight	108 g
pitch torque M_p	29.5 Nm
yaw torque M_y	29.5 Nm
roll torque M_R	4.8 Nm

Positioning

travel	± 31.5 (63) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

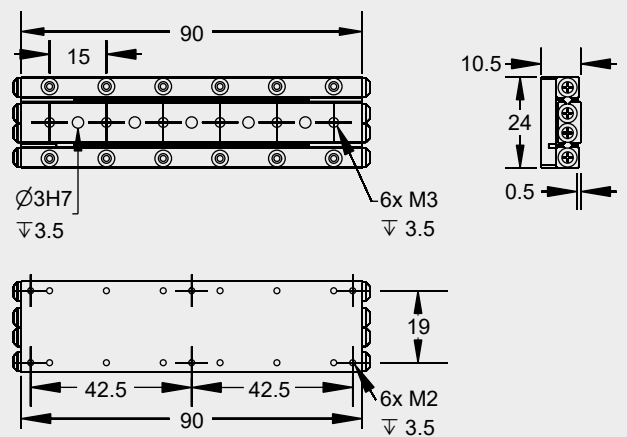
sensor resolution	1 nm
repeatability	± 90 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 180 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-24105

Nanometer Precision Linear Positioner

 resolution	 travel range	 normal load	 non magnetic	 vacuum	 size
< 1 nm	69 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	105 x 24 x 10.5 mm ³

Mechanical Properties

blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	105 x 24 x 10.5 mm ³
weight	126 g
pitch torque M_p	37.5 Nm
yaw torque M_y	37.5 Nm
roll torque M_R	5.8 Nm

Positioning

travel	± 34.5 (69) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y, M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)



Closed-Loop with -S

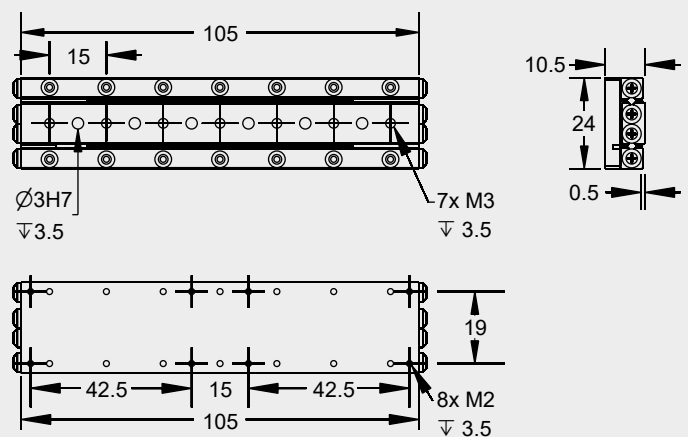
sensor resolution	1 nm
repeatability	± 105 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 210 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS



Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-24120 Nanometer Precision Linear Positioner

resolution	travel range	normal load	non magnetic	vacuum	size
< 1 nm	83 mm	30 N (3 kg)	available	down to 10 ⁻¹¹ mbar	120 x 24 x 10.5 mm ³



Mechanical Properties

blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	120 x 24 x 10.5 mm ³
weight	144 g
pitch torque M_p	49.1 Nm
yaw torque M_y	49.1 Nm
roll torque M_R	6.1 Nm

Positioning

travel	± 41.5 (83) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)

Closed-Loop with -S

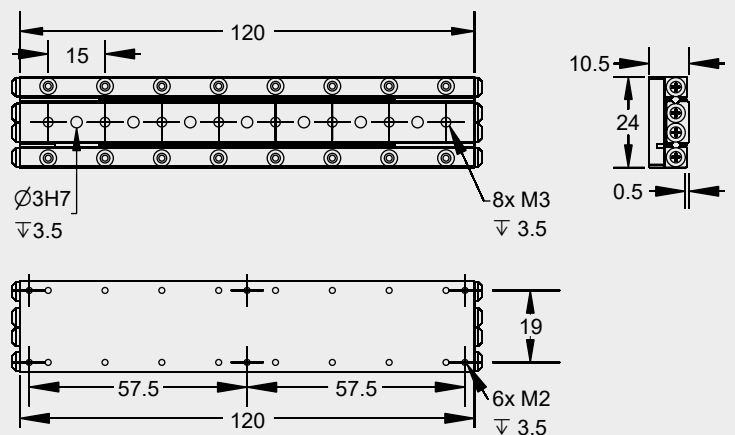
sensor resolution	1 nm
repeatability	± 120 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 240 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS



Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-24150

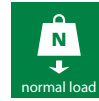
Nanometer Precision Linear Positioner



resolution
< 1 nm



travel range
103 mm



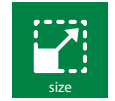
normal load
30 N (3 kg)



non magnetic
available



vacuum
down to
 10^{-11} mbar



size
150 x 24 x
10.5 mm³

Mechanical Properties

blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	150 x 24 x 10.5 mm ³
weight	180 g
pitch torque M_p	49.1 Nm
yaw torque M_y	49.1 Nm
roll torque M_R	6.1 Nm

Positioning

travel	± 51.5 (69) mm
step width	1 - 1,500 nm*
scan range	> 1.5 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options****

steel base (-ST), titanium base (-TI)
non magnetic materials (-NM)
black anodized (-BK)
integrated connecting elements (-O)
external support for increased M_y, M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)



Closed-Loop with -S

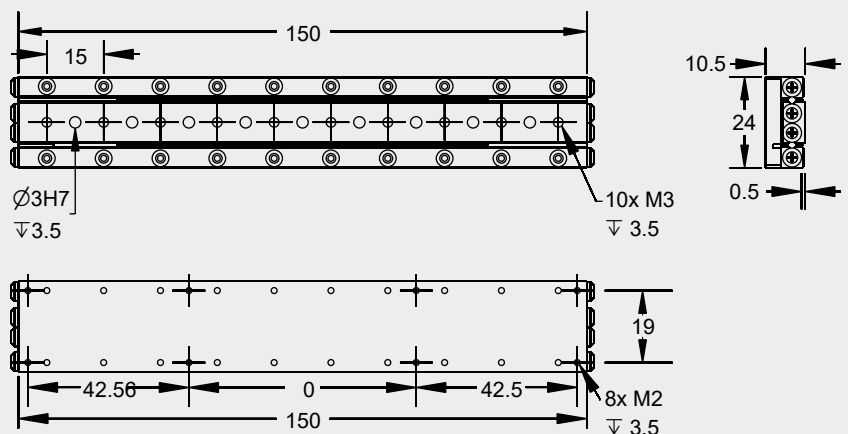
sensor resolution	1 nm
repeatability	± 150 nm**

Closed-Loop with -L***

sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 μ m (H)CU ± 300 nm MCS

Closed-Loop with -M***

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 μ m (H)CU ± 0.5 μ m MCS









Linear dimensions are given in mm.

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** with mechanical end stops, 3 mm reduced travel
 **** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SLC-24180

Nanometer Precision Linear Positioner

 resolution < 1 nm	 travel range 123 mm	 normal load 30 N (3 kg)	 non magnetic available	 vacuum down to 10 ⁻¹¹ mbar	 size 180 x 24 x 10.5 mm ³
---	---	---	--	--	---

Mechanical Properties	
blocking force F_B	> 3.5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
positioner dimension	180 x 24 x 10.5 mm ³
weight	216 g
pitch torque M_p	49.1 Nm
yaw torque M_y	49.1 Nm
roll torque M_R	6.1 Nm

Positioning	
travel	± 61.5 (123) mm
step width	1 - 1,500 nm*
scan range	> 1.5 µm
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

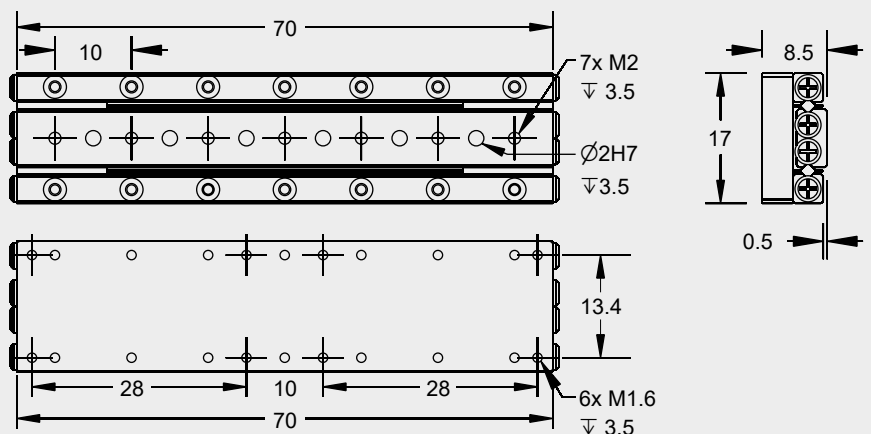
Materials and Vacuum Options****	
steel base (-ST), titanium base (-TI)	
non magnetic materials (-NM)	
black anodized (-BK)	
integrated connecting elements (-O)	
external support for increased M_y , M_R (-W)	
high precision bearing (-P)	
increased blocking force (-D, +1.5 N)	
-HV (10 ⁻⁶ mbar), -UHV / -UHVT (10 ⁻¹¹ mbar)	



Closed-Loop with -S	
sensor resolution	1 nm
repeatability	± 180 nm**

Closed-Loop with -L***	
sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 360 nm MCS

Closed-Loop with -M***	
sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	± 2.5 µm (H)CU ± 0.5 µm MCS



Linear dimensions are given in mm.

LINEAR POSITIONERS

SL SERIES

SL-06

Nanometer Precision Linear Positioner



< 1 nm



70 .. 1480
mm



30 N (3 kg)

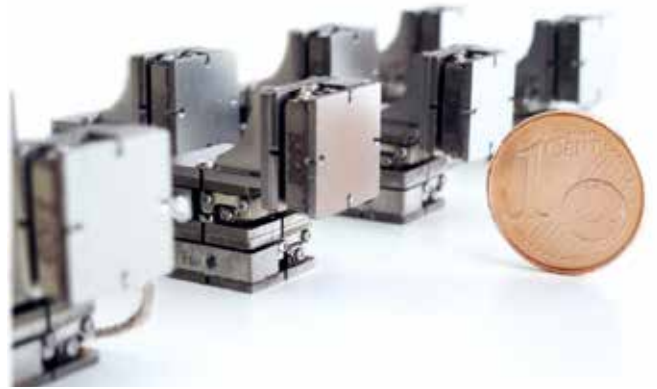


down to
 10^{-6} mbar



54 x 60 x 13
mm³

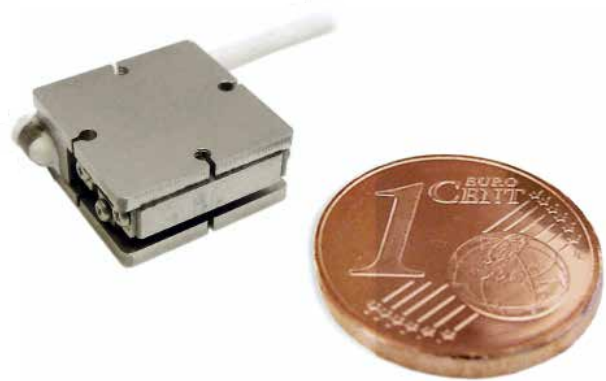
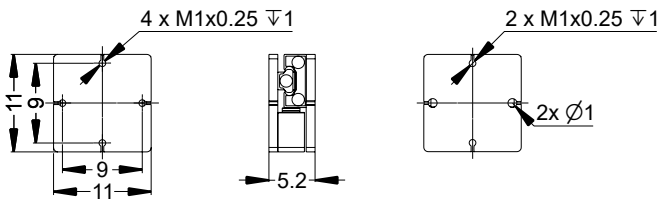
Mechanical Properties	
blocking force F_B	1.6 N
max. normal force F_N	1 N
max. lift force F_L	0.35 N
positioner dimension	150 x 24 x 10.5 mm ³
weight	≈ 3 - 9 g
pitch torque M_p	0.1 Nm
yaw torque M_y	0.1 Nm
roll torque M_R	0.1 Nm
Positioning	
travel	± 51.5 (69) mm
step width	1 - 1,500 nm
resolution of motion	50 nm
velocity	> 15 mm/s
max. frequency	18.5 kHz
Materials and Vacuum Options	
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)	



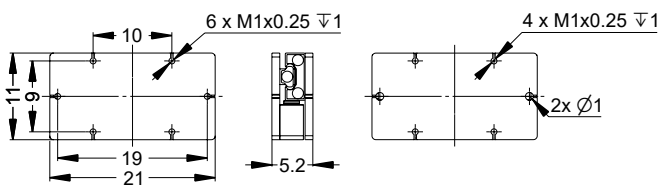
LINEAR POSITIONERS

SL-06xx Nanometer Precision Linear Positioner

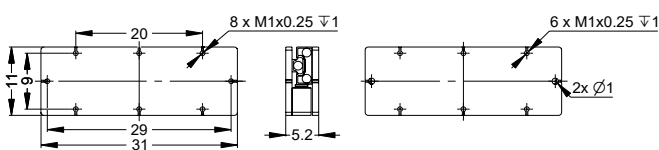
SL-0610	
travel	± 2.25 (4.5) mm
weight	≈ 3 g
positioner dimension	11 x 11 x 5.2 mm ³



SL-0620	
travel	± 5.5 (11) mm
weight	≈ 6 g
positioner dimension	21 x 11 x 5.2 mm ³



SL-0630	
travel	± 8 (16) mm
weight	≈ 9 g
positioner dimension	31 x 11 x 5.2 mm ³



Linear dimensions are given in mm.

LINEAR POSITIONERS

SLL SERIES

Nanometer Precision Linear Rail Positioner

Positioners from the SLL line are based on recirculating ball slides. The small slide in combination with rails of different length make it an interesting solution either for precise long range positioning or if you need large travel ranges within limited space. It is possible to put multiple slides on the same rail.

SLL positioners can be operated by any of our control units and are also available for high vacuum.

SLL ACCESSORIES

In order to use the SLL positioners as an optical bench SmarAct offers a large variety of equipment, including adapter plates. This allows easy integration of the piezo driven rails into your experimental setup.

A small selection of the broad SLL product variety is given below. If you require special parts, please don't hesitate to contact us.

- **Passive Carrier**

To mount existing components or other positioners onto the same rail we offer a passive carrier which is equipped with a clamp for fixation.



- **Endstop Bracket**

In order to limit the travel range of SLL positioners we are offering removable and fixed endstops.



- **Breadboard adapter**

To mount the rail to an existing bread board we are offering mounting adapters and variable end stops which are available for every common hole pattern.



- **Optomechanical mounts**

To attach optomechanical components to the rails, various mounts are available, too.

LINEAR POSITIONERS

SLL12

Nanometer Precision Linear Positioner



resolution

< 1 nm



travel range

70..475mm



normal load

30N (3 kg)



vacuum

down to
10⁻⁶ mbar



size

33.8 x 27 x
13 mm³

Mechanical Properties

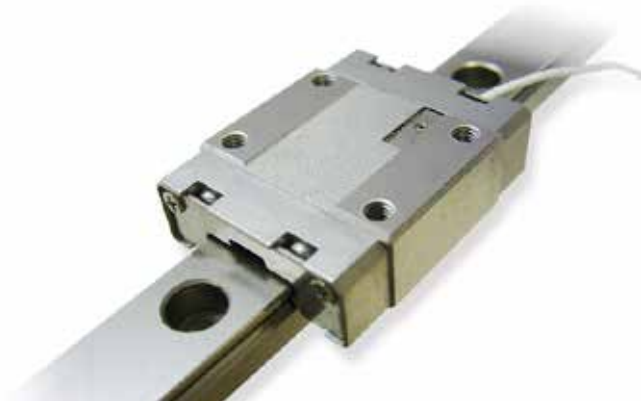
blocking force F_B	> 3 N
max. normal force F_N	30 N
max. lift force F_L	> 1 N
carriage dimension	33.8 x 27 x 13 mm ³
weight of carriage	44 g
weight of rail	59 g / 100 mm
pitch torque M_p	6 Nm
yaw torque M_y	6 Nm
roll torque M_R	11 Nm

Positioning

rail length	70 .. 475 mm
step width	1 - 1,500 nm*
scan range	> 1.5 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options***

multiple carriages
counterbores, tapped holes (M4)
tapped holes M4 necessary for closed-loop
-HV (10 ⁻⁶ mbar)***

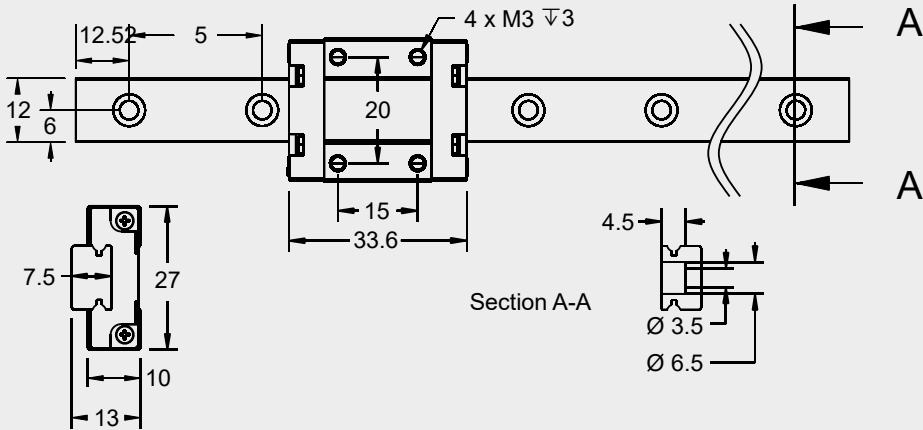


Closed-Loop with -S

sensor resolution	1 nm
repeatability	\pm 70 .. 450 nm**

Closed-Loop with -M

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	\pm 2.5 μ m (H)CU \pm 0.5 μ m MCS



SLL12 open-loop version, linear dimensions are given in mm. ***

* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** positioner dimensions, mounting holes and travel range may vary and can be customized

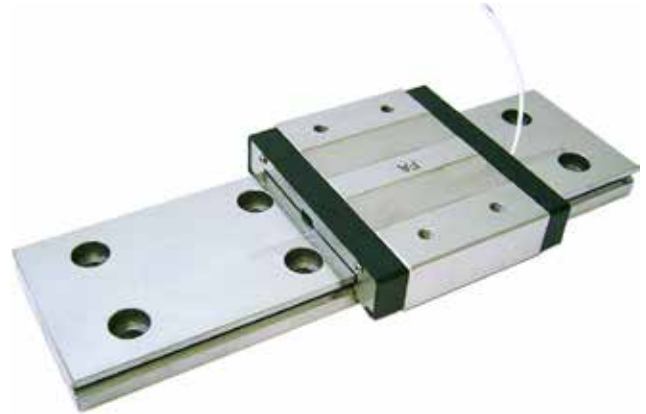
LINEAR POSITIONERS

SLLA42

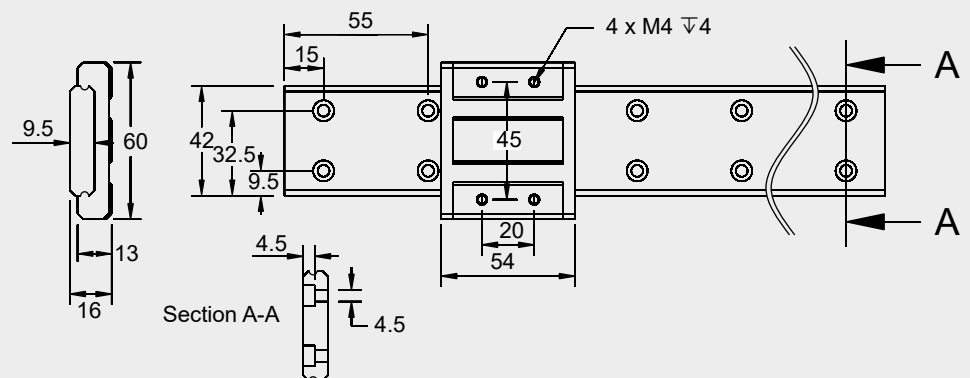
Nanometer Precision Linear Positioner



Mechanical Properties	
blocking force F_B	> 5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
carriage dimension	54 x 60 x 16 mm ³
weight of carriage	148 g
weight of rail	286 g / 100 mm
pitch torque M_p	25 Nm
yaw torque M_y	25 Nm
roll torque M_R	90 Nm
Positioning	
rail length	70 .. 1480 mm
step width	1 - 1,500 nm*
scan range	> 3 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz
Materials and Vacuum Options***	
multiple carriages	
counterbores, tapped holes (M4)	



Closed-Loop with -S	
sensor resolution	1 nm
repeatability	\pm 70 .. 450 nm**



Linear dimensions are given in mm.***

LINEAR POSITIONERS

SLLV42

Nanometer Precision Linear Positioner



resolution
< 1 nm



travel range
70 .. 1480 mm



normal load
30 N (3 kg)



vacuum
down to
10⁻⁶ mbar



size
54.8 x 60 x
13 mm³

Mechanical Properties

blocking force F_B	> 5 N
max. normal force F_N	30 N
max. lift force F_L	> 1.5 N
carriage dimension	54.8 x 60 x 16 mm ³
weight of carriage	148 g
weight of rail	286 g / 100 mm
pitch torque M_p	25 Nm
yaw torque M_y	25 Nm
roll torque M_R	90 Nm

Positioning

rail length	70 .. 475 mm
step width	1 - 1,500 nm*
scan range	> 3 μ m
scan resolution	< 1 nm
velocity	> 20 mm/s
max. frequency	18.5 kHz

Materials and Vacuum Options***

multiple carriages
counterbores, tapped holes (M4)
-HV (10 ⁻⁶ mbar)***
external support for increased M_y , M_R (-W)
high precision bearing (-P)
increased blocking force (-D, +1.5 N)
-HV (10 ⁻⁶ mbar)

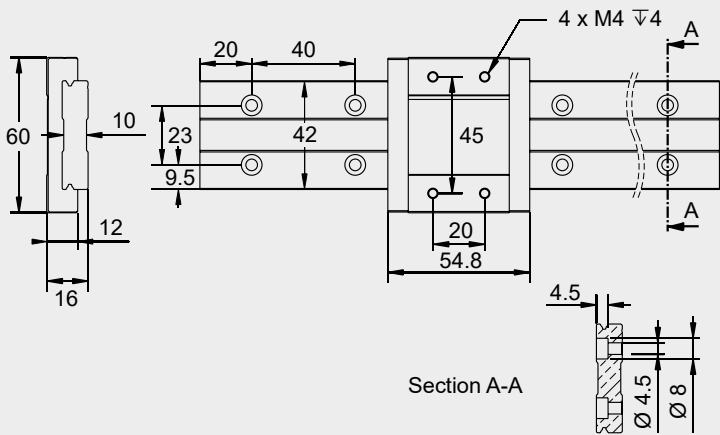


Closed-Loop with -S

sensor resolution	1 nm
repeatability	\pm 70 .. 450 nm**

Closed-Loop with -M

sensor resolution	100 nm
closed loop resolution	500 nm (H)CU 100 nm MCS
repeatability	\pm 2.5 μ m (H)CU \pm 0.5 μ m MCS



Linear dimensions are given in mm.***

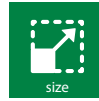
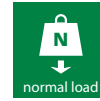
* for low-vibration mode (-LV), for scan-mode < 1 nm, otherwise 50 - 1,500 nm
 ** measured over the complete travel range, for shorter travel much better
 *** positioner dimensions, mounting holes and travel range may vary and can be customized

LINEAR POSITIONERS

SHL SERIES

SHL 20N-10

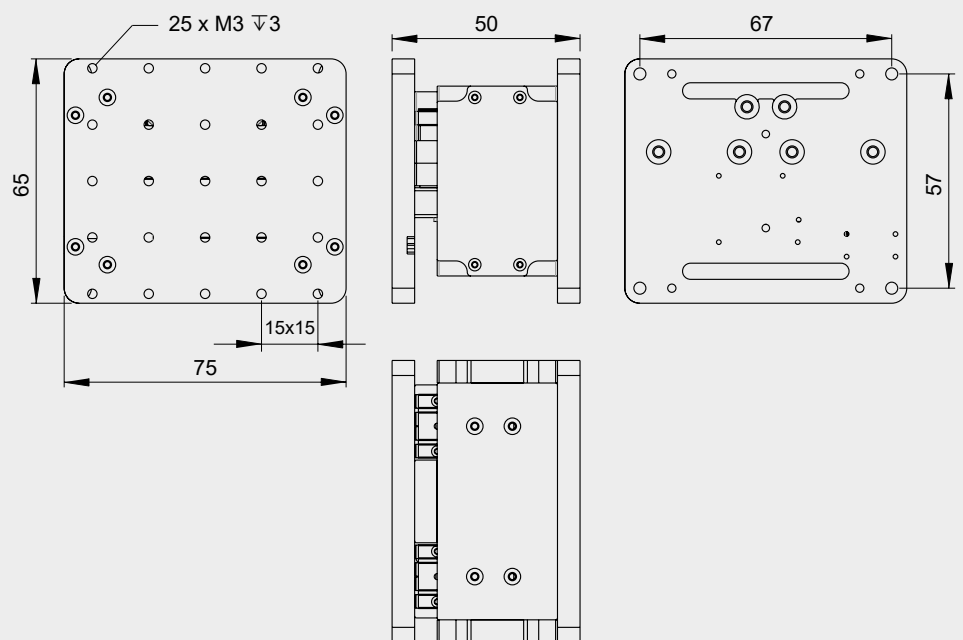
Nanometer Precision Linear Positioner



Mechanical Properties	
max. normal force F_N	20 N
max. lift force F_L	20 N
positioner dimension	65 x 75 x 50 mm ³
weight	200 g
Positioning	
travel	± 5 (10) mm
step width	1 - 1,500 nm*
scan range	> 500 nm
scan resolution	< 1 nm
velocity	> 9 mm/s
max. frequency	10 kHz
Materials and Vacuum Options***	
steel base (-ST), titanium base (-TI)	
black anodized (-BK)	
-M sensor on Demand (-M)	
-HV (10^{-6} mbar), -UHV / -UHVT (10^{-11} mbar)	



Closed-Loop with -S	
sensor resolution	1 nm
repeatability	± 100 nm **
Closed-Loop with -L	
sensor resolution	4 nm
closed loop resolution	± 500 nm (H)CU 4 nm MCS
repeatability	± 1 µm (H)CU ± 200 nm MCS



Linear dimensions are given in mm.

