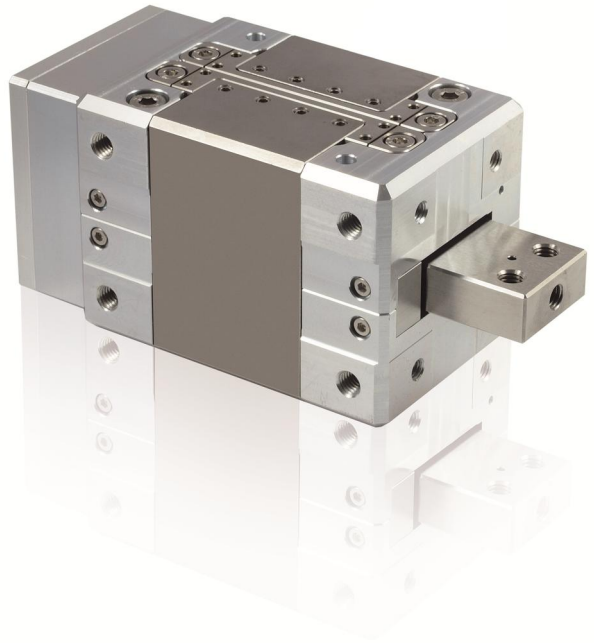
NEXLINE® Linear Actuator

Nanopositioning Over Long Travel Ranges, With High Forces, PiezoWalk® Principle



N-216

- Force generation to 600 N
- Holding force to 800 N
- Travel range 20 mm
- Integrated direct-measuring linear encoder with resolution 5 nm

Application fields

- Industrial precision positioning
- Semiconductor technology
- Semiconductor tests
- Wafer inspection
- Lithography
- Nanoimprinting
- Nanometrology
- Motion in strong magnetic fields and in a vacuum

Nanometer precision and high feed force with PiezoWalk® walking drives

Several piezo actuators perform a walking motion in the PiezoWalk® walking drive that leads to forward feed of a runner. Control of the actuators allows the smallest step and forward feed motion at a resolution of well under one nanometer.

Highly accurate position measuring with incremental linear encoder

Noncontact optical encoders measure the position directly at the platform with the greatest accuracy. Nonlinearity, mechanical play or elastic deformation have no influence on the measurement.

Suitable for sophisticated vacuum applications

Piezo motors from PI can be designed for use in a vacuum and are suitable for operating in strong magnetic fields. Special versions of the drives are available for this purpose. Piezo walking drives can also be used in cleanrooms or in environments with strong ultraviolet radiation.

Motion	Unit	Tolerance	N-216.1A1	N-216.2A1
Active axes			X	X
Travel range in X	mm		20	20
Travel range in X (analog mode)	µm		±3	±3
Velocity (10 % duty cycle, full-step mode)	mm/s	Max.	1	1
Velocity (100 % duty cycle, full-step mode)	mm/s	Max.	0.6	0.6
Velocity (100 % duty cycle, nanostepping mode)	mm/s	Max.	0.4	0.4

Positioning	Unit	Tolerance	N-216.1A1	N-216.2A1
Reference switch			Optical, direction sensing (reference edge track), 5 V, TTL	Optical, direction sensing (reference edge track), 5 V, TTL
Resolution in X, open loop	nm	Typ.	0.03	0.03
Integrated sensor			Incremental linear encoder	Incremental linear encoder
System resolution in X	nm		5	5

Drive properties	Unit	Tolerance	N-216.1A1	N-216.2A1
Drive type			NEXLINE® piezo walking drive	NEXLINE® piezo walking drive
Operating voltage	V		-250 to +250	-250 to +250
Drive force in X	N	Max.	300	600

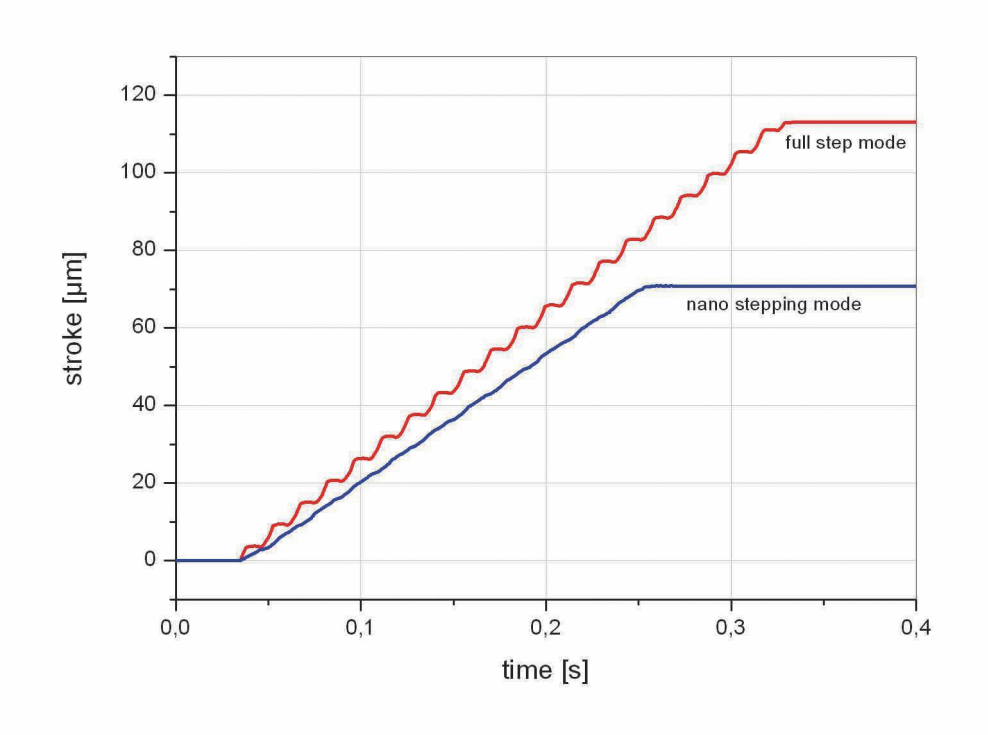
Mechanical properties	Unit	Tolerance	N-216.1A1	N-216.2A1
Holding force in X, passive	N	Min.	400	800
Overall mass	g		1150	1250
Material			Aluminum, stainless steel	Aluminum, stainless steel

Miscellaneous	Unit	Tolerance	N-216.1A1	N-216.2A1
Operating temperature range	°C		0 to 55	0 to 55
Connector			D-sub 25 (m)	D-sub 25 (m)
Cable length	m	+50 mm / -0 mm	2	2
Recommended controllers/ drivers			E-713	E-713

Velocity in full-step mode: Depending on drive electronics.
Velocity in nanostepping mode: Depending on drive electronics. The maximum velocity in nanostepping mode is designed for the best possible constancy so that no velocity variations occur when performing the steps.
Drive force: Data refer to full step mode operation.

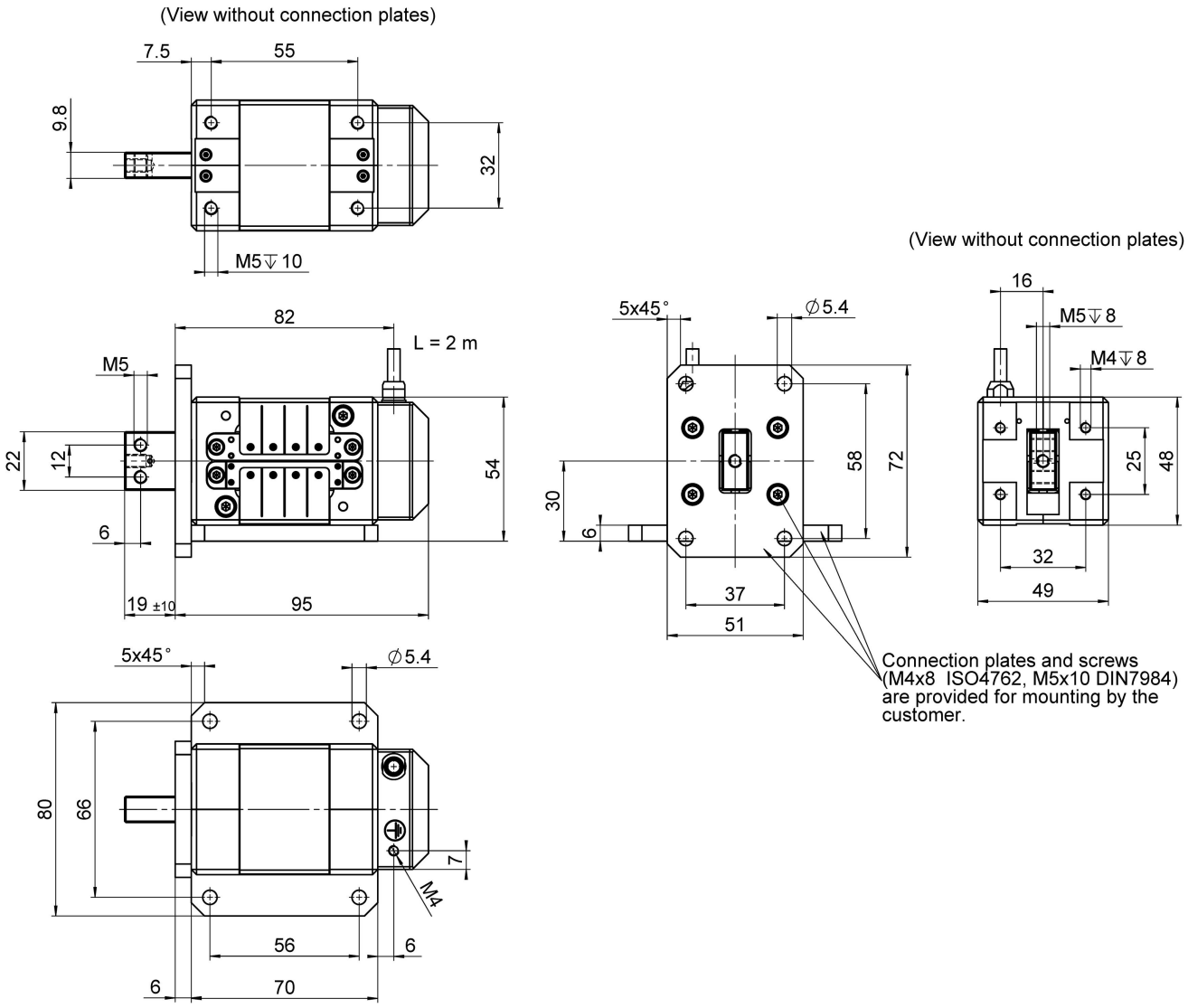
At PI, technical data is specified at 22 ±3 °C. Unless otherwise stated, the values are for unloaded conditions. Some properties are interdependent. The designation "typ." indicates a statistical average for a property; it does not indicate a guaranteed value for every product supplied. During the final 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



Comparison of the motion type of a NEXLINE® actuator: The nanostepping mode provides very smooth motion. Full step mode allows higher speed.

Drawings / Images



N-216, dimensions in mm

Order Information

N-216.1A1
NEXLINE® linear actuator; NEXLINE® piezo walking drive; 20 mm travel range; 300 N feed force; incremental linear encoder; 2 m cable length

N-216.2A1
NEXLINE® linear actuator; NEXLINE® piezo walking drive; 20 mm travel range; 600 N feed force; incremental linear encoder; 2 m cable length