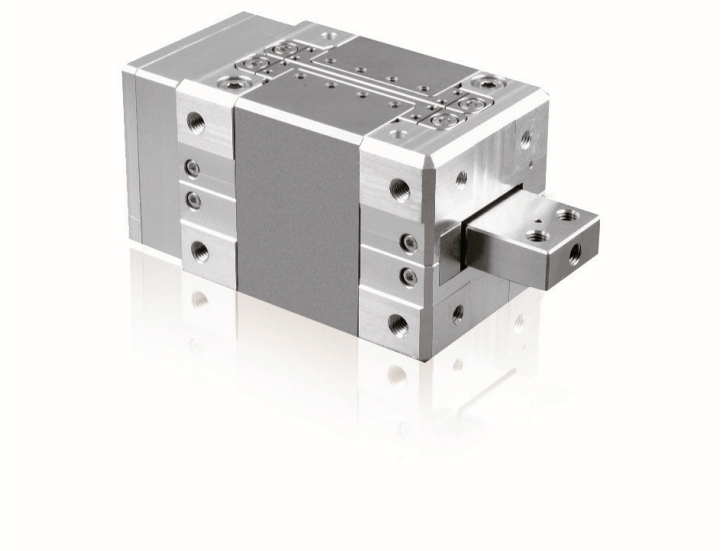
# NEXLINE® Linear Actuator

**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

### Fields of application

- 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 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

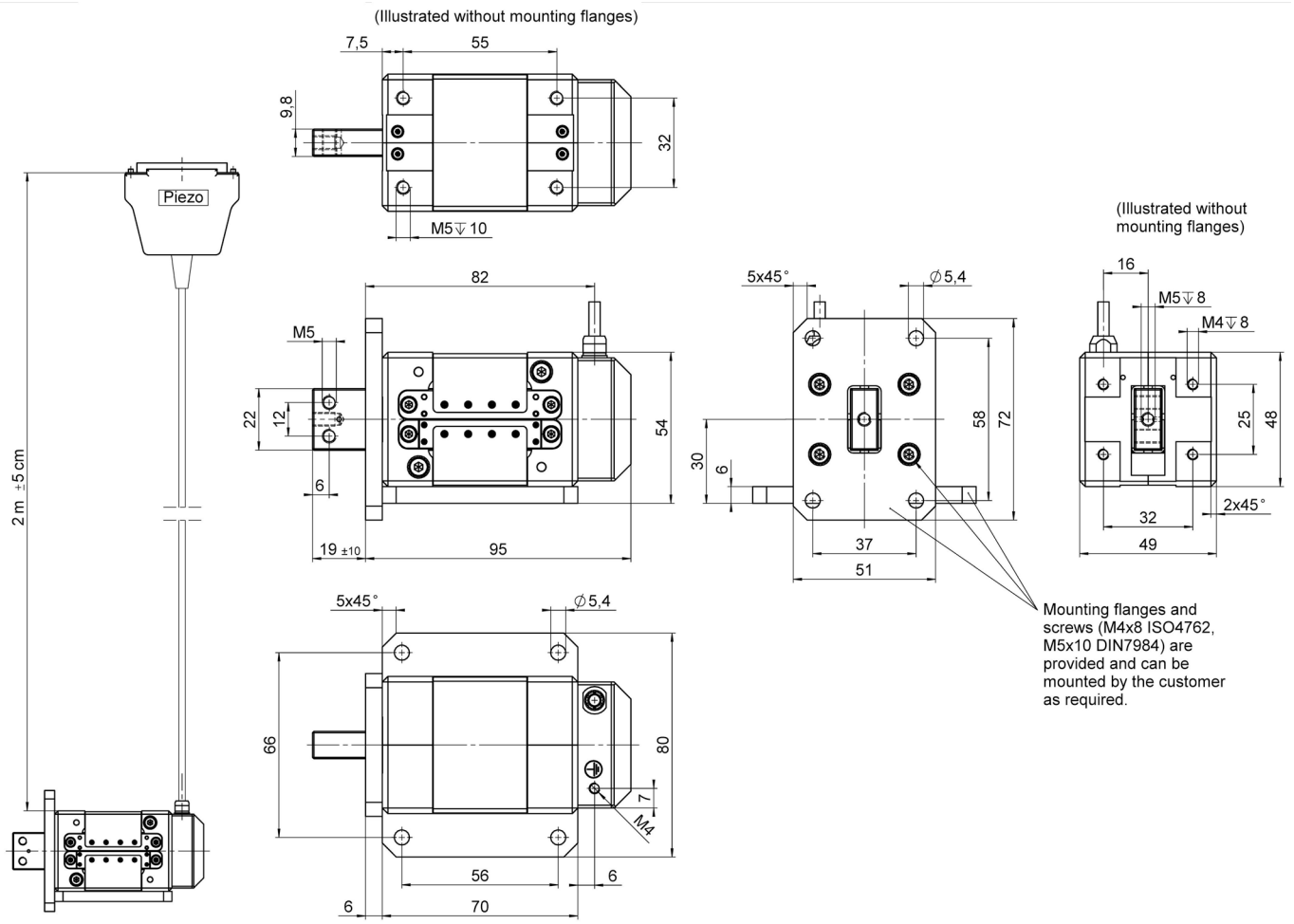
Piezo motors from PI can be designed for use in a vacuum and are suitable for operating in strong magnetic fields. Special versions of the drives are available for this purpose. Piezo walking drives can also be used in cleanrooms or in environments with strong ultraviolet radiation.

## Specifications

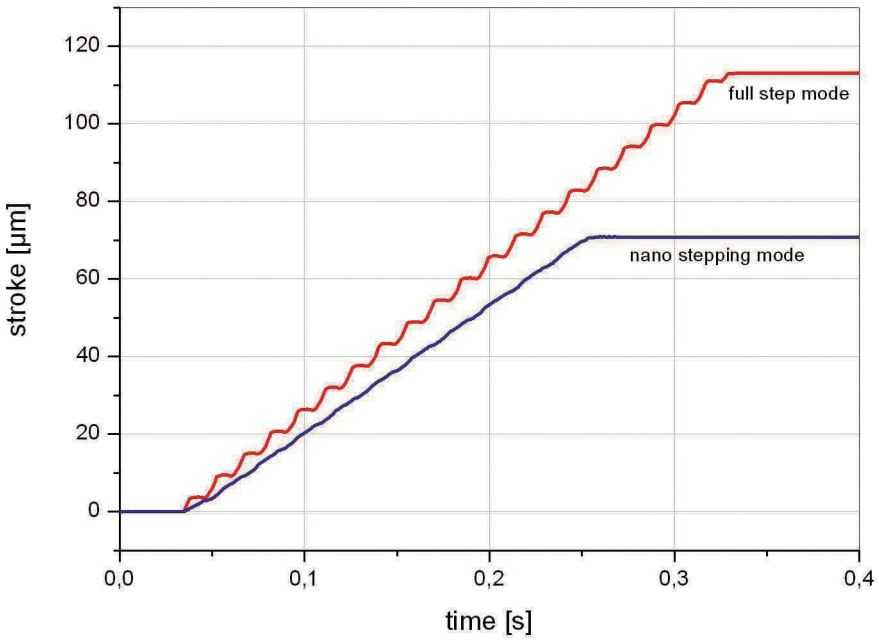
| | N-216.101 / N-216.1A1 | N-216.201 / N-216.2A1 | Tolerance |
|---|---|---|---|
| Active axes | X | X | |
| **Motion and positioning** | | | |
| Travel range | 20 mm | 20 mm | |
| Travel range in analog mode | ±3 µm | ±3 µm | |
| Integrated sensor | N-216.101: Without<br>N-216.1A1: Linear encoder | N-216.201: Without<br>N-216.2A1: Linear encoder | |
| Resolution, open loop | 0.03 nm | 0.03 nm | typ. |
| Resolution, closed loop | - / 5 nm (N-216.1A1) | - / 5 nm (N-216.2A1) | |
| Velocity (10 % duty cycle, full step mode)* | 1.0 mm/s | 1.0 mm/s | max. |
| Velocity (100 % duty cycle, full step mode)* | 0.6 mm/s | 0.6 mm/s | max. |
| Velocity (100 % duty cycle, nanostepping mode)** | 0.4 mm/s | 0.4 mm/s | max. |
| **Mechanical properties** | | | |
| Drive force (active)*** | 300 N | 600 N | max. |
| Holding force (passive) | 400 N | 800 N | min. |
| **Drive properties** | | | |
| Motor type | NEXLINE® | NEXLINE® | |
| Operating voltage | -250 V to +250 V | -250 V to +250 V | |
| **Miscellaneous** | | | |
| Operating temperature range | 0 to 55 °C | 0 to 55 °C | |
| Material | Aluminum, stainless steel | Aluminum, stainless steel | |
| Mass | 1150 g | 1250 g | |
| Cable length | 2.0 m | 2.0 m | |
| Connector | Sub-D 25 (m) | Sub-D 25 (m) | |
| Recommended electronics | E-712.1AM | E-712.1AM | |

* Depending on drive electronics.
** 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.
*** Data refer to full step mode operation.
All specifications based on room temperature (22 °C ±3 °C).
Ask about customized versions.

## Drawings / Images




*N-216, dimensions in mm. Mounting flanges for side or front mounting are included in the delivery.*




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

## Ordering Information

**N-216.101**
NEXLINE® piezo-walking high-load actuator , 20 mm, 300 N, open loop

**N-216.1A1**
NEXLINE® piezo-walking high-load actuator, 20 mm, 300 N, linear encoder, 5 nm resolution

**N-216.201**
NEXLINE® piezo-walking high-load actuator , 20 mm, 600 N, open loop

**N-216.2A1**
NEXLINE® piezo-walking high-load actuator, 20 mm, 600 N, linear encoder, 5 nm resolution