

## PiezoMike Linear Actuator

With Position Sensor for Closed-Loop Operation



### N-472

- High stability and holding force >100 N
- Self-locking at rest even when closed-loop control is switched off
- Compact design with integrated incremental encoder
- Feed force 22 N
- Lifetime >1,000,000,000 steps

#### Inertia drive

Compact, inexpensive inertia drive principle (stick-slip). At rest, the drive is self-locking, requires no current, and does not generate any heat. It holds the position with maximum force.

#### Integrated position sensor

An incremental encoder measures the relative motion to a freely definable reference position. In conjunction with the E-871 motion controller, the encoder resolution is up to <math><1\text{ nm}</math>.

#### Alignment of mechanical and optomechanical components

Stable alignment of optical paths. Long-term positioning stability: High stability at target position, reliable startup even after longer downtimes. High holding force and resolution by combining piezo actuators with mechanical thread translation. Vacuum-compatible versions to  $10^{-6}$  hPa available.

## Specifications

Motion and positioning	N-472.110 N-472.110Y N-472.120 N-472.120Y	N-472.11V N-472.11VY N-472.12V N-472.12VY	N-472.210 N-472.210Y N-472.220 N-472.220Y	N-472.21V N-472.21VY N-472.22V N-472.22VY	Unit
Active axis	X	X	X	X	
Travel range	7.5	7.5	13	13	mm
Integrated sensor	Incremental, optical	Incremental, optical	Incremental, optical	Incremental, optical	
Sensor signal, analog	1	1	1	1	V <sub>pp</sub>
Reference point definition using reference point or limit switch	-	-	-	-	
Design resolution	5	5	5	5	nm
Minimum incremental motion*	50	50	50	50	nm
Unidirectional repeatability*	200	200	200	200	nm
Linearity error**	2	2	2	2	µm
Typical velocity***	2	2	2	2	mm/min
Operating frequency	2000	2000	2000	2000	Hz
Maximum permissible operating frequency during continuous operation	400	200	400	200	Hz

Mechanical properties	N-472.110 N-472.110Y N-472.120 N-472.120Y	N-472.11V N-472.11VY N-472.12V N-472.12VY	N-472.210 N-472.210Y N-472.220 N-472.220Y	N-472.21V N-472.21VY N-472.22V N-472.22VY	Unit
Mechanical interface	M10×1 mounting thread (N-472.110; N-472.110Y) 9.5 mm clamping shank (N-472.120; N-472.120Y)	M10×1 mounting thread (N-472.11V; N-472.11VY) 9.5 mm clamping shank (N-472.12V; N-472.12VY)	M10×1 mounting thread (N-472.210; N-472.210Y) 9.5 mm clamping shank (N-472.220; N-472.220Y)	M10×1 mounting thread (N-472.21V; N-472.21VY) 9.5 mm clamping shank (N-472.22V; N-472.22VY)	
Holding force, power off	>100	>100	>100	>100	N
Feed force	22	22	22	22	N

Drive properties	N-472.110 N-472.110Y N-472.120 N-472.120Y	N-472.11V N-472.11VY N-472.12V N-472.12VY	N-472.210 N-472.210Y N-472.220 N-472.220Y	N-472.21V N-472.21VY N-472.22V N-472.22VY	Unit
Drive type	Inertia drive	Inertia drive	Inertia drive	Inertia drive	
Maximum operating voltage	80	80	80	80	V

Miscellaneous	N-472.110 N-472.110Y N-472.120 N-472.120Y	N-472.11V N-472.11VY N-472.12V N-472.12VY	N-472.210 N-472.210Y N-472.220 N-472.220Y	N-472.21V N-472.21VY N-472.22V N-472.22VY	Unit
Operating temperature range	10 to 40	10 to 40	10 to 40	10 to 40	°C
Vacuum operation	-	To 10 <sup>-6</sup> hPa	-	To 10 <sup>-6</sup> hPa	
Material	Screw: Stainless steel Housing: Aluminum, bronze	Screw: Stainless steel Housing: Stainless steel, bronze	Screw: Stainless steel Housing: Aluminum, bronze	Screw: Stainless steel Housing: Stainless steel, bronze	
Weight	200	250	210	260	g
Cable length	2 m	1 m inside the vacuum, bare stranded wires; 2 m outside the vacuum, bare stranded wires to Sub- D 15	2 m	1 m inside the vacuum, bare stranded wires; 2 m outside the vacuum, bare stranded wires to Sub- D 15	
Motor / sensor connection	Sub-D 15 (m)	Sub-D 15 (m)	Sub-D 15 (m)	Sub-D 15 (m)	
Recommended electronics	E-871.1A1N	E-871.1A1N	E-871.1A1N	E-871.1A1N	

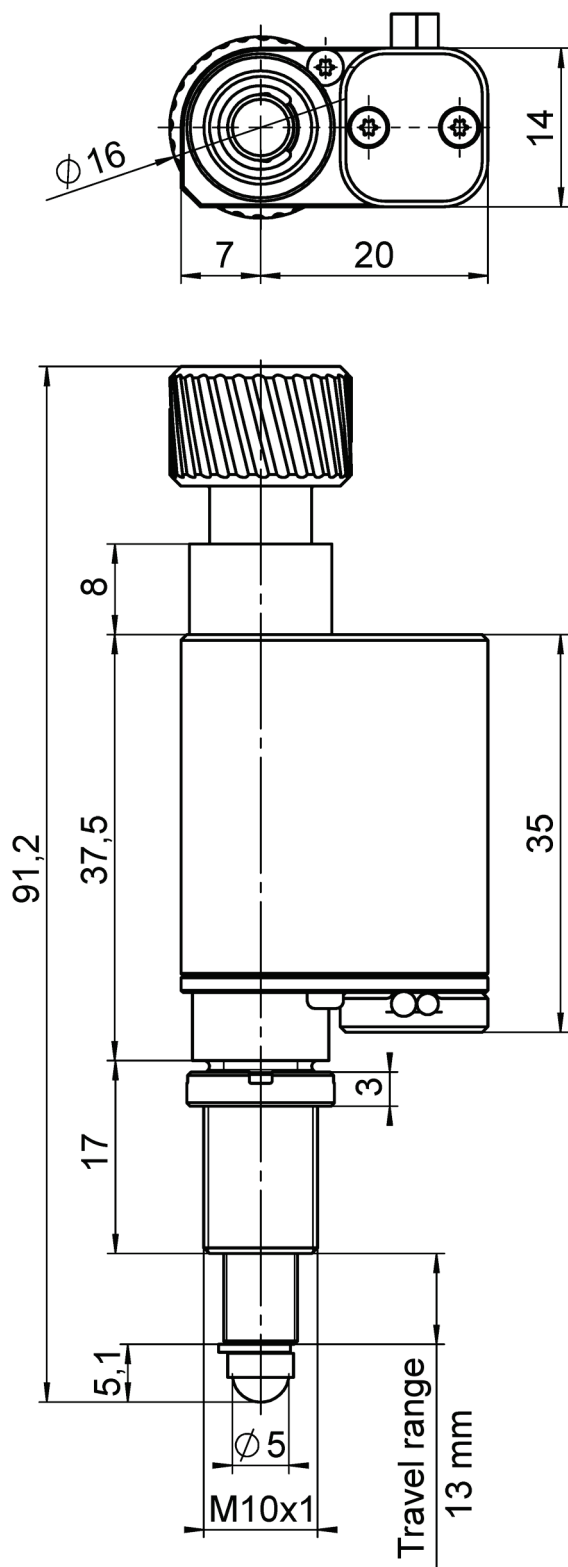
\* 20 N preload, measured at 100 µm stroke, compensated for temperature drift

\*\* 20 N preload, measured over the entire stroke, compensated for temperature drift

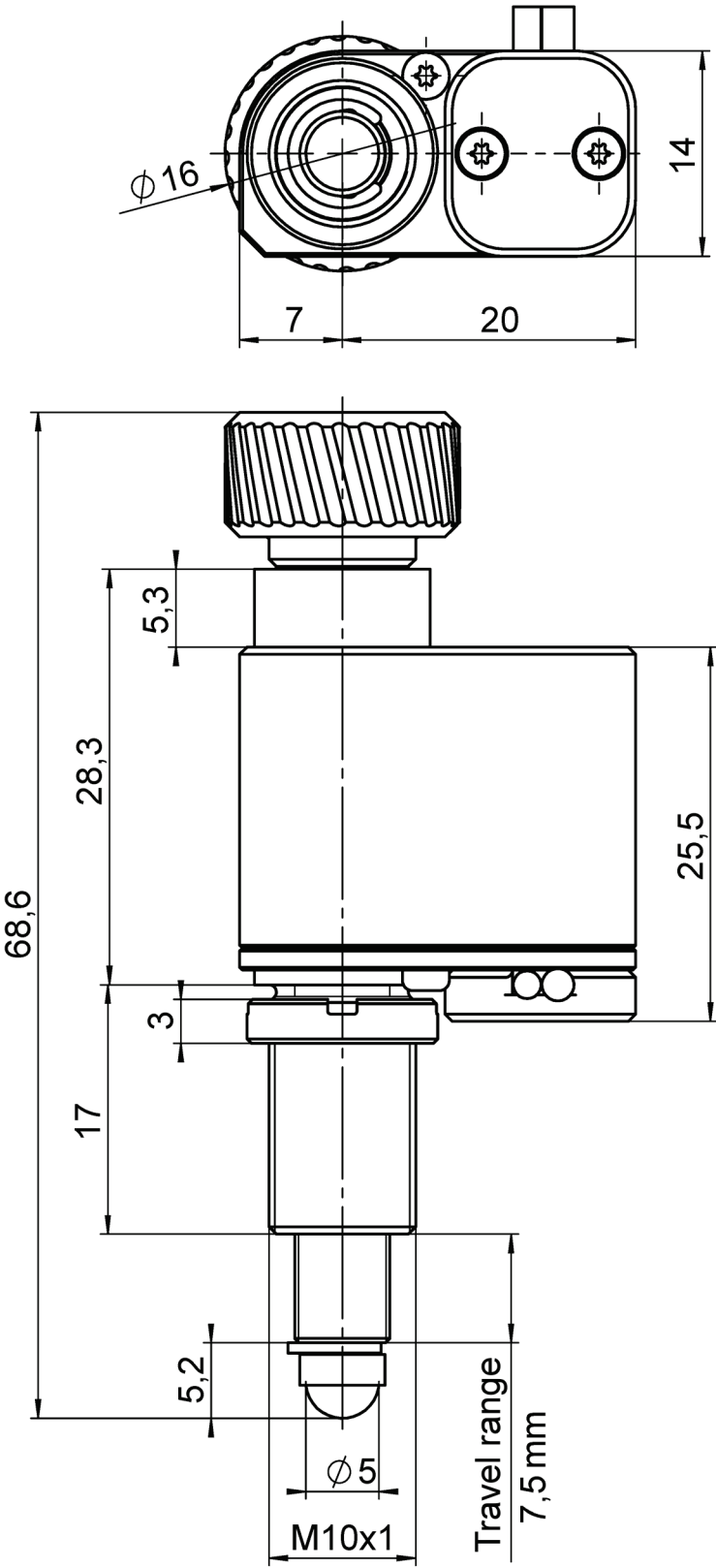
\*\*\* Not suitable for continuous operation

Ask about customized versions.

## Drawings / Images



N-472.210, dimensions in mm



N-472.110, dimensions in mm

## Ordering Information

**N-472.110**

Closed loop PiezoMike linear actuator, 7.5 mm, M10×1 thread

**N-472.110Y**

Closed loop PiezoMike linear actuator, 7.5 mm, M10×1 thread, offset cable exit

**N-472.11V**

Closed loop PiezoMike linear actuator, 7.5 mm, M10×1 thread, vacuum compatible to  $10^{-6}$  hPa

**N-472.11VY**

Closed loop PiezoMike linear actuator, 7.5 mm, M10×1 thread, vacuum compatible to  $10^{-6}$  hPa, offset cable exit

**N-472.120**

Closed loop PiezoMike linear actuator, 7.5 mm, 9.5 mm (0.375") clamping shank

**N-472.120Y**

Closed loop PiezoMike linear actuator, 7.5 mm, 9.5 mm (0.375") clamping shank, offset cable exit

**N-472.12V**

Closed loop PiezoMike linear actuator, 7.5 mm, 9.5 mm (0.375") clamping shank, vacuum compatible to  $10^{-6}$  hPa

**N-472.12VY**

Closed loop PiezoMike linear actuator, 7.5 mm, 9.5 mm (0.375") clamping shank, vacuum compatible to  $10^{-6}$  hPa, offset cable exit

**N-472.210**

Closed loop PiezoMike linear actuator, 13 mm, M10×1 thread

**N-472.210Y**

Closed loop PiezoMike linear actuator, 13 mm, M10×1 thread, offset cable exit

**N-472.21V**

Closed loop PiezoMike linear actuator, 13 mm, M10×1 thread, vacuum compatible to  $10^{-6}$  hPa

**N-472.21VY**

Closed loop PiezoMike linear actuator, 13 mm, M10×1 thread, vacuum compatible to  $10^{-6}$  hPa, offset cable exit

**N-472.220**

Closed loop PiezoMike linear actuator, 13 mm, 9.5 mm (0.375") clamping shank

**N-472.220Y**

Closed loop PiezoMike linear actuator, 13 mm, 9.5 mm (0.375") clamping shank, offset cable exit

**N-472.22V**

Closed loop PiezoMike linear actuator, 13 mm, 9.5 mm (0.375") clamping shank, vacuum compatible to  $10^{-6}$  hPa

**N-472.22VY**

Closed loop PiezoMike linear actuator, 13 mm, 9.5 mm (0.375") clamping shank, vacuum compatible to  $10^{-6}$  hPa, offset cable exit