



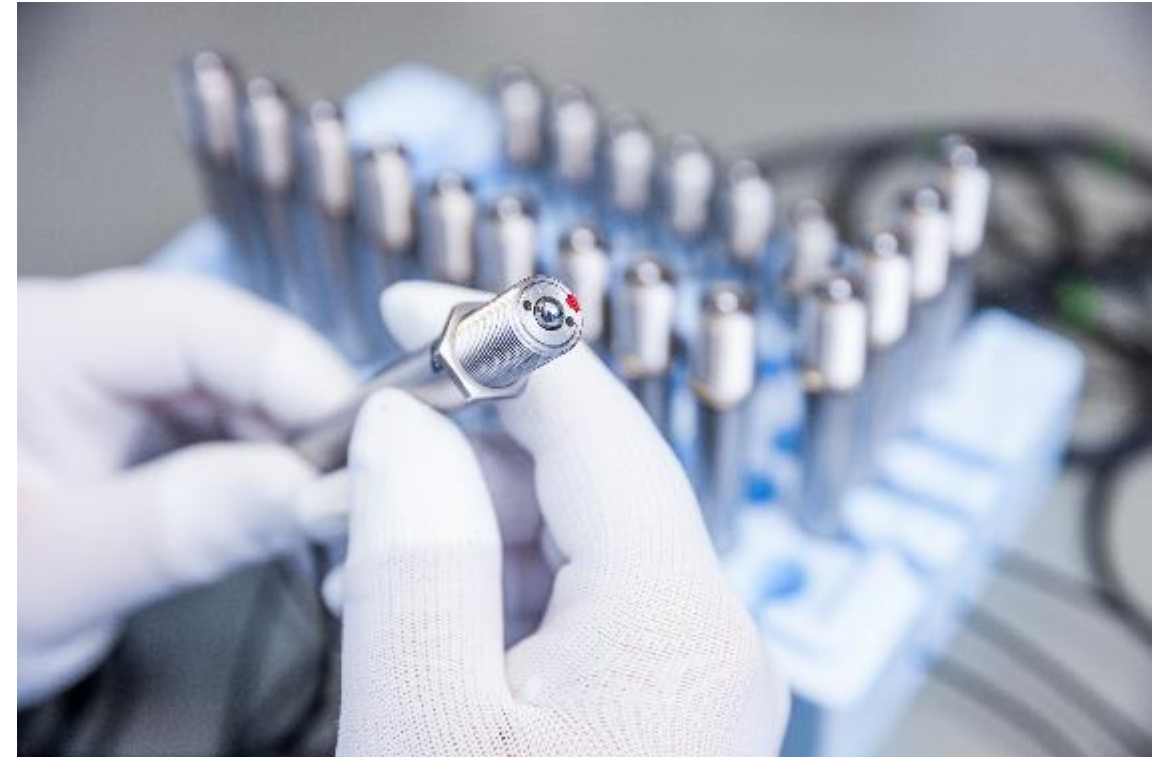
*Every Nanometer matters to us*

piezosystem jena  
application & products

 **piezosystemjena**  
*incredibly precise*

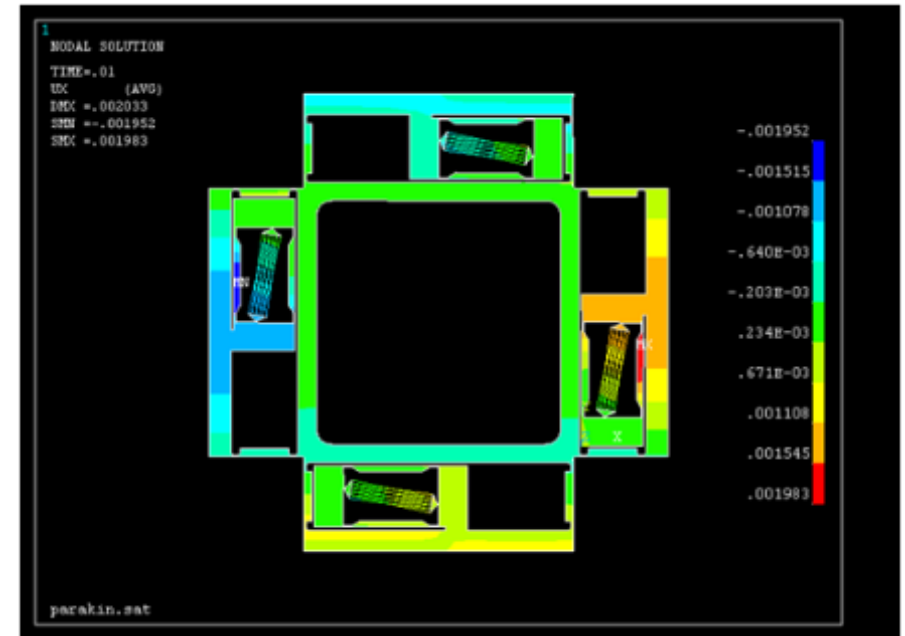
## Welcome to piezosystem jena

- Production, engineering, development based in Germany with ~50 employees
- Founded in 1991 in Germany's optic valley Jena
- Strong team of engineers – experts in the nanoworld
- Developer and manufacturer of piezoelectric positioning systems
- OEM certified semiconductor and display technology supplier
- Application oriented, OEM focused



## Technology & Design

- FEA design tools
- Guided motion by solid state hinges
- Free of mechanical play
- Neither friction nor stiction
- No abrasion
- Maintenance-free operation



*Design Schematic*

## Product Overview



Stack Type Actuators



Microscope Objective Positioners



Piezo Slit/Shutter Systems



Mirror Tilting Systems



Micrometer-Screw Positioners



1-5 Axes Stages



Piezo Gripper Systems



hpower actuators



Optical Fiber Switches/Multiplexer



Piezo Controller



Long travel stages

and many more OEM developments



## Markets and applications



Semi conductor



Wafer Handling



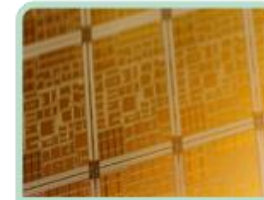
Lithography



Metrology



Solar Industry



FPD



Laser Technology



Laser Beam Deflection



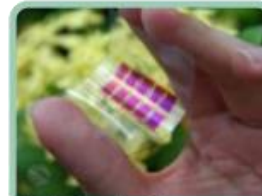
High Power Lasers



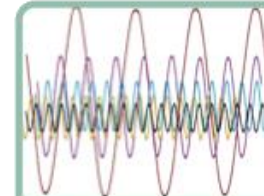
Automation



Handling Systems



Material Research



Vibration Excitation



Vibration Damping



## Application: hpower – high performance actuators

- High forces up to 70kN
- Dynamics up to 100kHz and more
- Accelerations up to 10'000g
- Products: shock generators, piezo shaker, ring actuators, stack type actuators
- Integration in machines for fine adjustment
- High duty cycles due to cooling options



***hpower actuator PIA***

## Application: low voltage piezo actuators

- Forces up to 3500N
- Dynamics up to several kHz
- Various types and sizes of piezo stacks for easy integration
- For integration in different applications
- Open and closed loop operation



***PA actuator***

## Application: fast steering mirrors

- Fast tilting platforms for mirrors up to 50mm in diameter
- kHz resonant frequencies
- Various types and sizes for easy integration
- Open and closed loop operation
- Space application tested
- Sub  $\mu$ rad resolution



***PSH tip-tilt system***



## Application: scanius – line of long travel stages

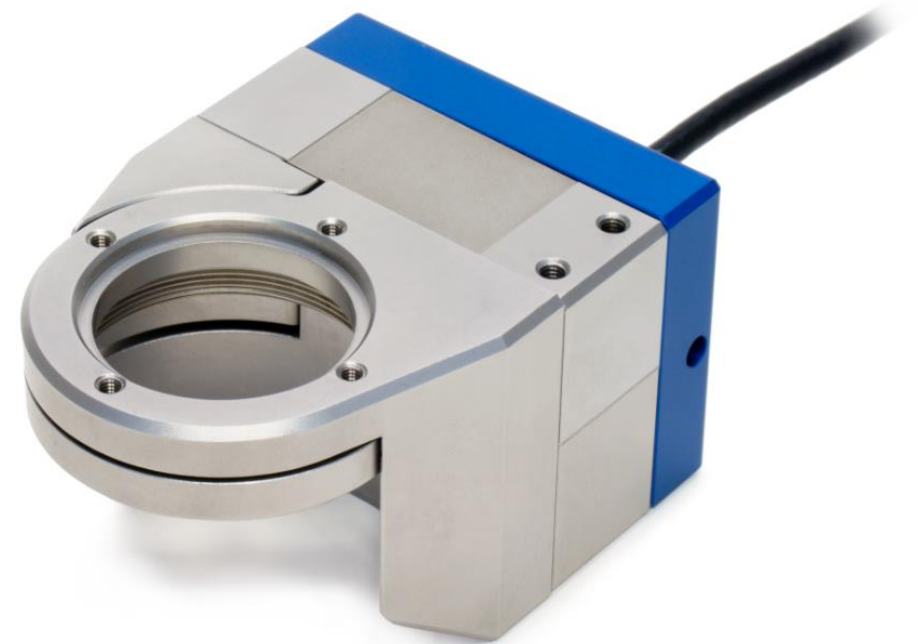
- X and XY linear stages
- 40nm resolution for scanning
- Up to 160mm/s speed
- Load capacity up to 3 kg
- Digital control or via joystick
- No magnetic field generation
- Probe positioning in regard of the optical path



***ScaniusTwo – XY Stage***

## Application: Optical Inspection

- Piezo focus fine adjustment for objectives
- Motion range up to 600 $\mu$ m in Z
- Sub nm resolution
- Parallel motion inside the optical beam
- Flexible use on different microscopes, white light interferometers, topography inspection and in other optical systems



***Mipos 600***

## Application: high load Z-stage for optical systems

- Confocal Microscopy
- Z-stack image acquisition
- Autofocus
  
- Motion range up to 500 $\mu$ m in Z
- Patented push-pull design to improve performance and stiffness



*nanoX 400 with 5kg load*

## Application: pixel shifting and autofocus

- 3-in-one solution for XYZ movement of an objective
- Motion range up to 100 $\mu$ m in XYZ
- Compact design 80x80x30mm



***Tritor 102 with objective thread***

## Application: Semiconductor Industry

- 3D piezo-stage with 20 kg load capability
- Motion range 40/40/320  $\mu\text{m}$  in XYZ
- 0.8nm resolution
- 150x150 mm open aperture
- Application: precision positioning of heavy objects such as wafer chucks, bonding tools and pick and place platforms



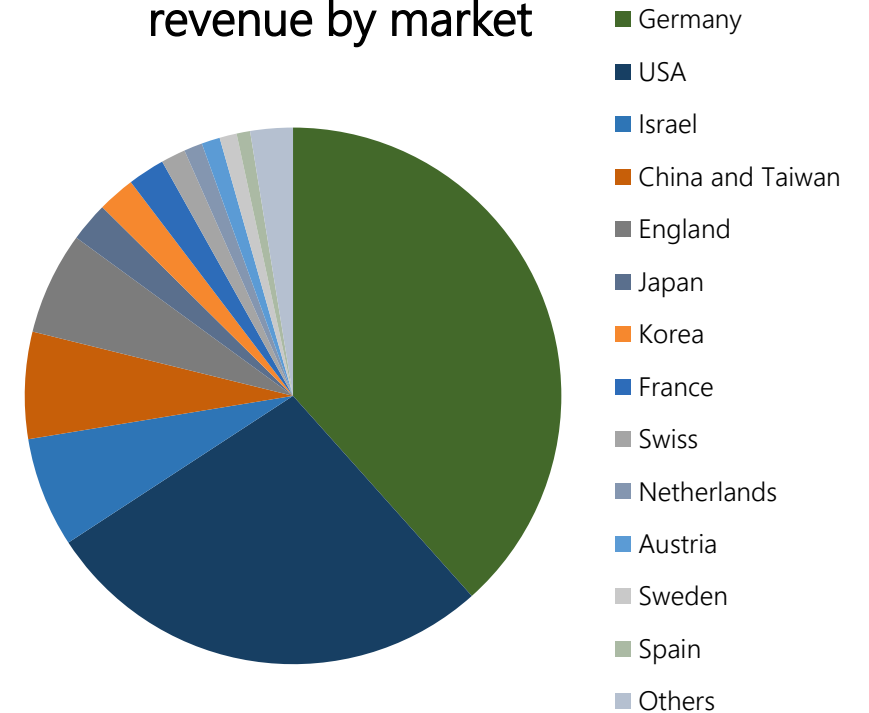
**Tritor 320**



## Global presence



revenue by market



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