

## PIEZO ACTUATORS APPLICATIONS

### Nano-positioning

### Precise machining

Piezo positioning stage  
Microscope and Imaging  
3D Printer  
Linear motors  
Pumps, Valve drive



### Optics

Fiber position  
Add/Drop multiplexer  
Optics switch  
Adaptive optics  
Tunable lasers



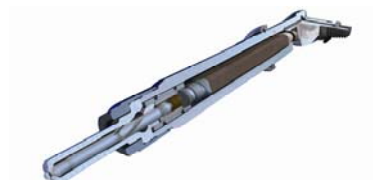
### Medical & life science

Micro-pumps  
Piezo valve for drug dispenser



### Aerospace & Automobile

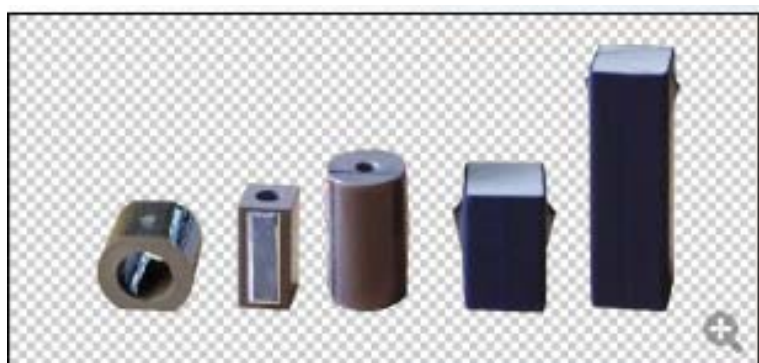
Thrusters  
Active trailing edge  
Fuel injector for common rail system



## MULTILAYER PIEZO ACTUATORS

PANT's multilayer piezo actuators are constructed by up to hundreds of inner electrodes and thin ceramic layers, co-fired to monolithic ceramic, with Maximum height up to 36mm. it will offer a deformation in longitudinal when a voltage is applied on and typically the displacement can reach up to 0.15% of the total product length within a millisecond, meantime exerts a high force.

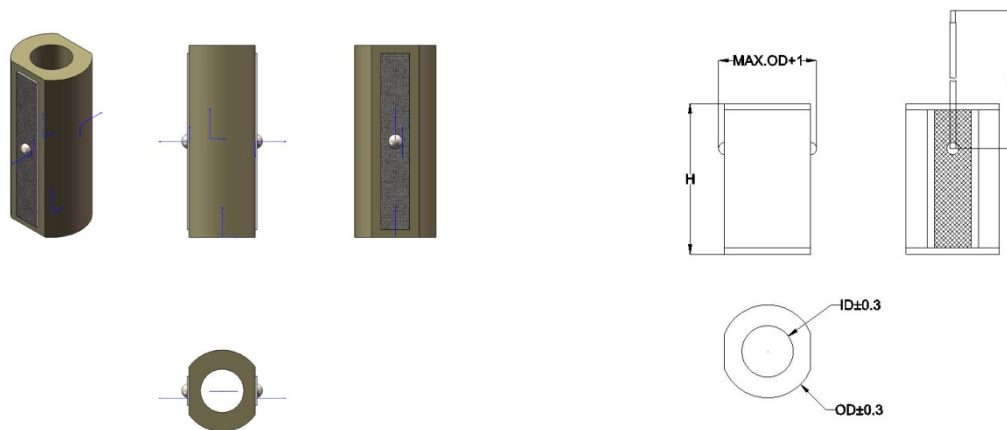
Multilayer piezo actuators are used as liner electromechanical drivers or motors. They act mainly like an expanding element generating a compressive force .The complete motion cycle is nearly proportional to a voltage signal input from DC up to high frequencies.



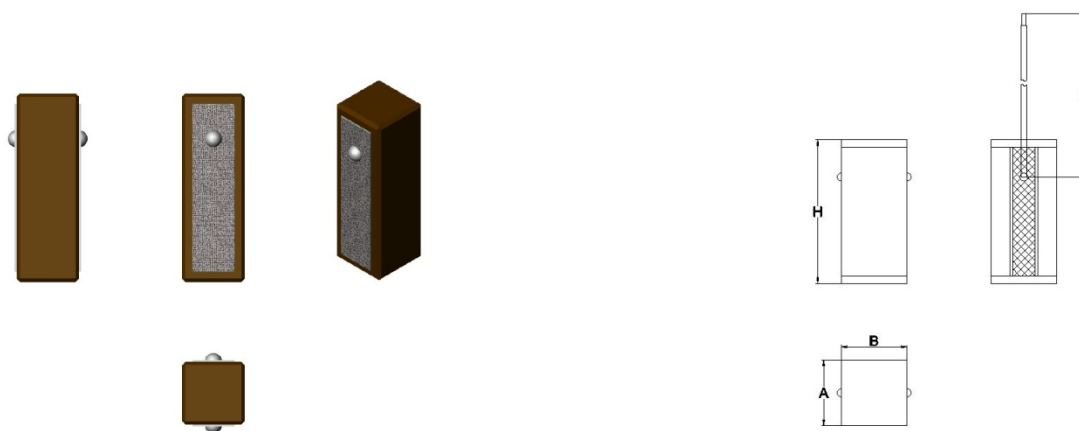
### Part numbering

Example	PT	J	150	05	05	40	1	
								Series No.
								Nominal displacement in um
								Width or inner diameter in mm
								Length or out diameter in mm
								Driving voltage
								Rectangular (H:ring, Y: Special-shaped)
								Product code

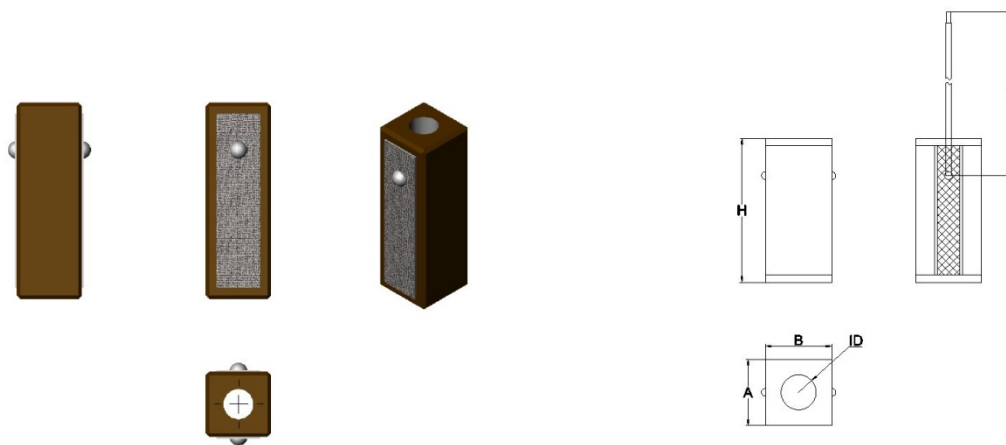
## MULTILAYER PIEZO RING ACTUATORS



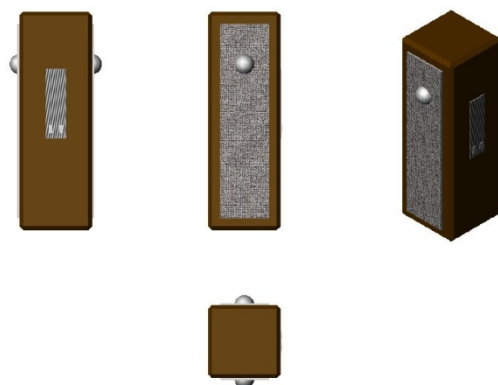
## MULTILAYER PIEZO RECTANGULAR ACTUATORS



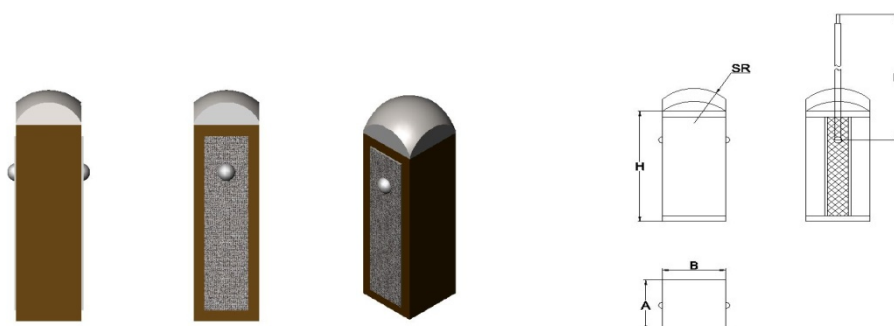
## MULTILAYER PIEZO SPECIAL-SHAPED ACTUATORS



## CUSTOM DESIGNS



## Strain gage glued type



## Tips mounted type

## SPECIFICATION for PT150 series    Max. driving voltage=150VDC

Model	Dimensions A×B×H ±0.05 [mm]	Displacement [um@150V] ±10%	Blocking force [N@150V]	Stiffness [N/um]	Capacitance [uF] ±20%
PTJ1500303051	3×3×6	5	330	66	0.18
PTJ1500303101	3×3×10	10	330	33	0.30
PTJ1500303181	3×3×18	18	330	18	0.5
PTJ1500505051	5×5×6	5	900	180	0.55
PTJ1500505101	5×5×10	10	900	90	0.8
PTJ1500505201	5×5×18	20	900	45	1.5
PTJ1500505301	5×5×28	30	900	30	2.2
PTJ1500505401	5×5×36	40	900	28	4.5
PTJ1500707101	7×7×10	10	1800	180	2.2
PTJ1500707201	7×7×18	20	1800	90	4
PTJ1500707301	7×7×28	30	1800	60	7
PTJ1500707361	7×7×30	36	1800	50	4.8
PTJ1500707362	7×7×30	36	1800	50	4.8
PTJ1500707381	7×7×32	38	1800	47	5
PTJ1500707501	7×7×42	50	1800	36	8
PTJ1501010101	10×10×10	10	3600	360	3.8
PTJ1501010201	10×10×18	20	3600	180	8
PTJ1501010301	10×10×28	30	3600	120	12.5
PTJ1501010401	10×10×36	40	3600	90	17
PTJ1501414101	14×14×10	10	7200	720	3.8
PTJ1501414201	14×14×20	20	7200	360	7.7
PTJ1501414301	14×14×30	30	7200	240	11.6
PTJ1501414401	14×14×40	40	7200	180	16

## SPECIFICATION for PTJ200 series Max. driving voltage=200VDC

Model	Dimensions A×B×H ±0.05 [mm]	Displacement [um@200V] ±10%	Blocking force [N@200V]	Stiffness [N/um]	Capacitance [uF] ±20%
PTJ2000303051	3×3×6	5	330	66	0.11
PTJ2000303101	3×3×10	10	330	33	0.25
PTJ2000505051	5×5×6	5	900	180	0.35
PTJ2000505101	5×5×10	10	900	90	0.55
PTJ2000505201	5×5×18	20	900	45	0.9
PTJ2000505301	5×5×28	30	900	30	0.8
PTJ2000505302	5×5×30	30	900	30	0.7
PTJ2000505401	5×5×36	40	900	23	2.7
PTJ2000707101	7×7×10	10	1800	180	1.0
PTJ2000707201	7×7×18	20	1800	90	1.9
PTJ2000707301	7×7×28	30	1800	60	3.0
PTJ2000707381	7×7×32	38	1800	47	3.2
PTJ2000707501	7×7×42	50	1800	36	4.5
PTJ2001010101	10×10×10	10	3600	360	2.0
PTJ2001010201	10×10×18	20	3600	180	3.5
PTJ2001010301	10×10×28	30	3600	120	6
PTJ2001010401	10×10×36	40	3600	90	9
PTJ2001414101	14×14×10	10	7200	720	3.5
PTJ2001414201	14×14×20	20	7200	360	8.5
PTJ2001414301	14×14×30	30	7200	240	13
PTJ2001414401	14×14×40	40	7200	180	21

## SPECIFICATION for Ring series

Model	Dimensions OD×ID×H [mm]	Displacement [um@150V] ±10%	Blocking force [N@150V]	Stiffness [N/um]	Capacitance@1v,1kHz [uF] ±20%
PTH1500525051	5×2.5×6	5	600	120	0.3
PTH1500525101	5×2.5×10	10	700	70	0.5
PTH1500525201	5×2.5×18	20	700	35	1
PTH1500845101	8×4.5×10	10	1300	130	0.8
PTH1500845201	8×4.5×18	20	1300	65	1.5
PTH1501005101	10×5.5×10	10	1500	150	1.2
PTH1501205201	12×5×20	20	3400	170	6.0
*PTH2501203201	12×3×20	20	3500@250V	175	4.6

**Remarks:**

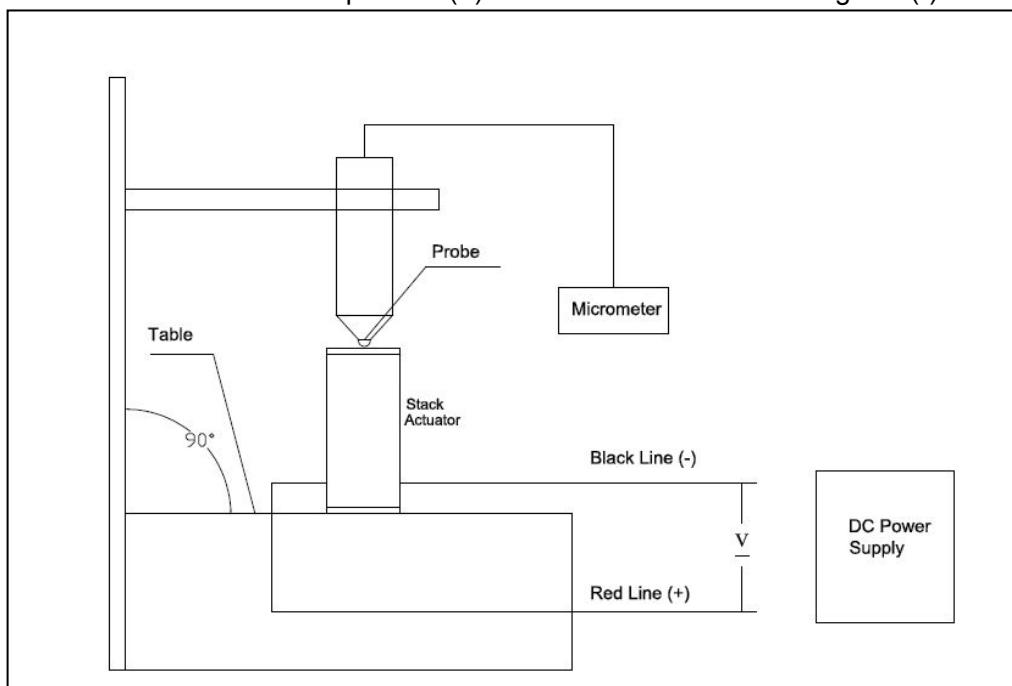
- 1 Measuring voltage range: 0 to150V and/or 0 to 200V
- 2 Recommended preload for dynamic operation: 15MPa
- 3 Maximum preload for constant force: 30MPa.
- 4 Operating voltage: -20 to 150V DC and/or -20 to 200V DC
- 5 Operating temperature range:-40 to 150℃
- 6 Wire lead, Φ0.75×100mm with the red is for electrode (+), and the black is for electrode (-).
- 7 Custom designs or modified specifications are available on request.**

## Testing method

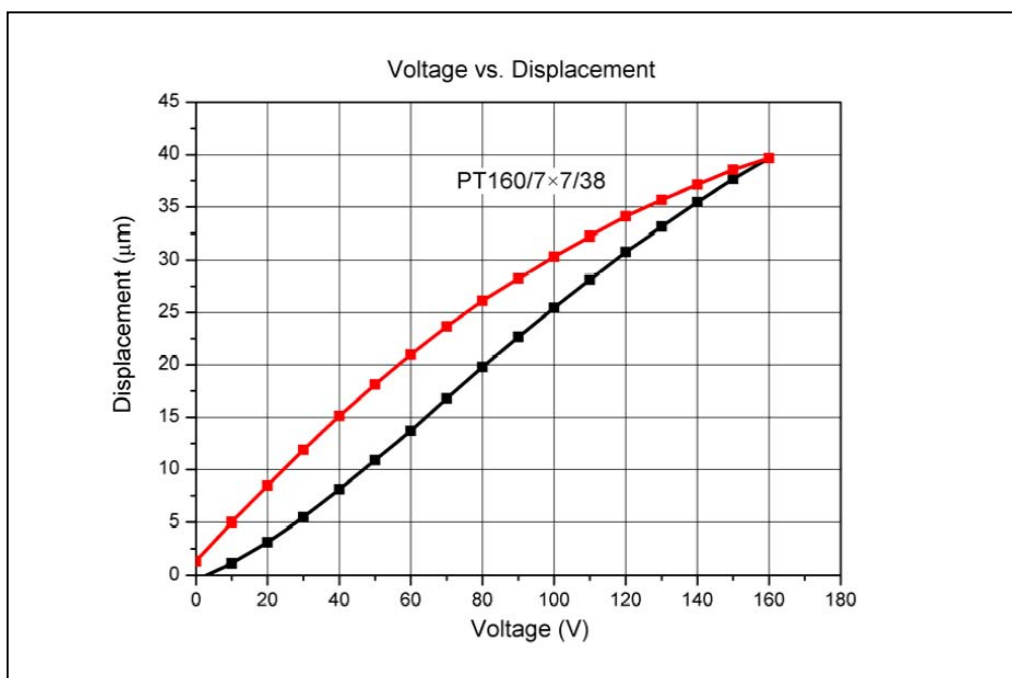
The actuator shall be placed vertically on the table which must be kept level before testing. The test contactor must be set vertically to the table and kept in contact with the center of top of the actuator during testing.

Only DC voltage shall be applied.

Connect the red lead to the positive (+) and the black lead to the negative(-).



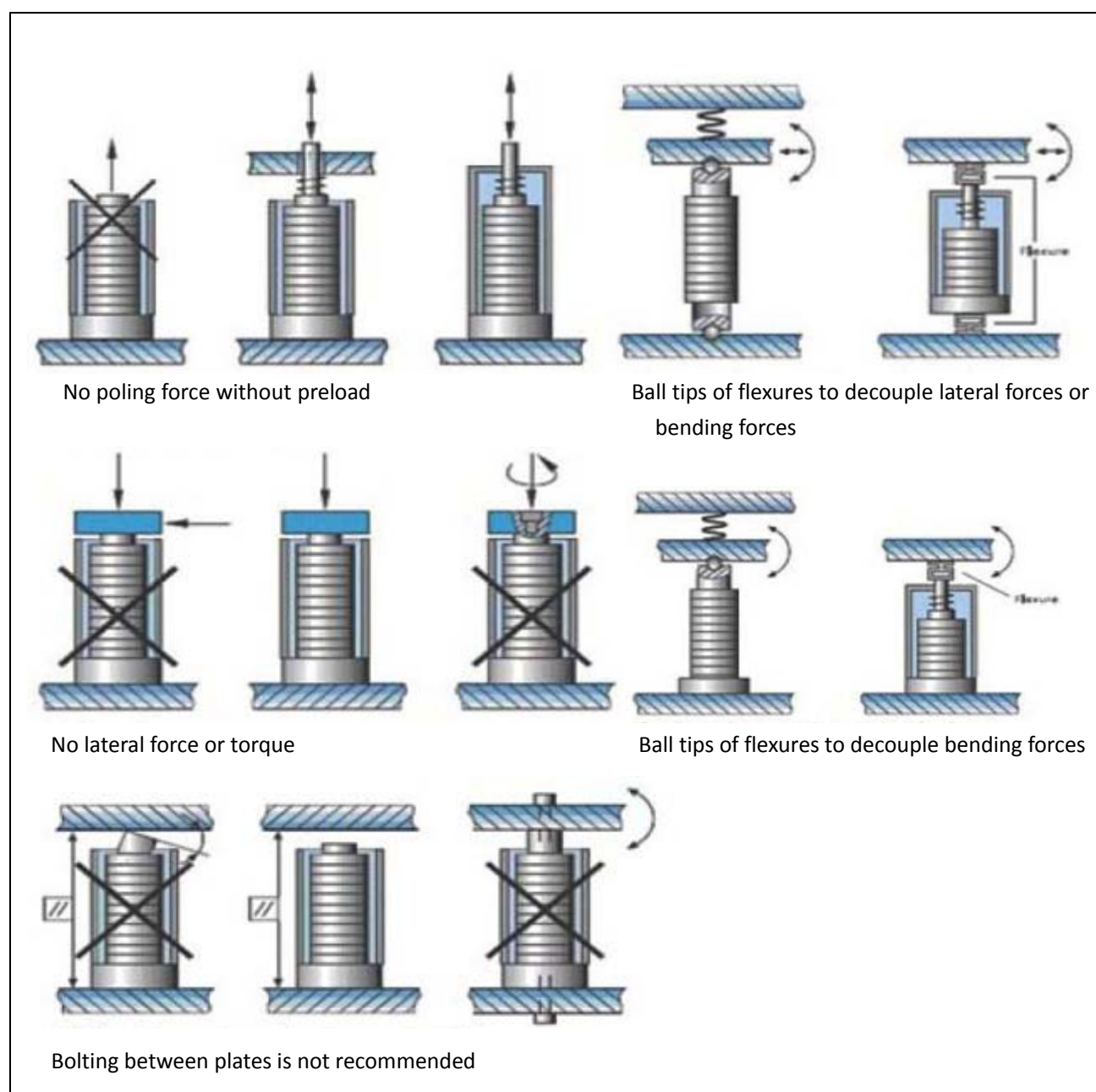
## Performance by measured value

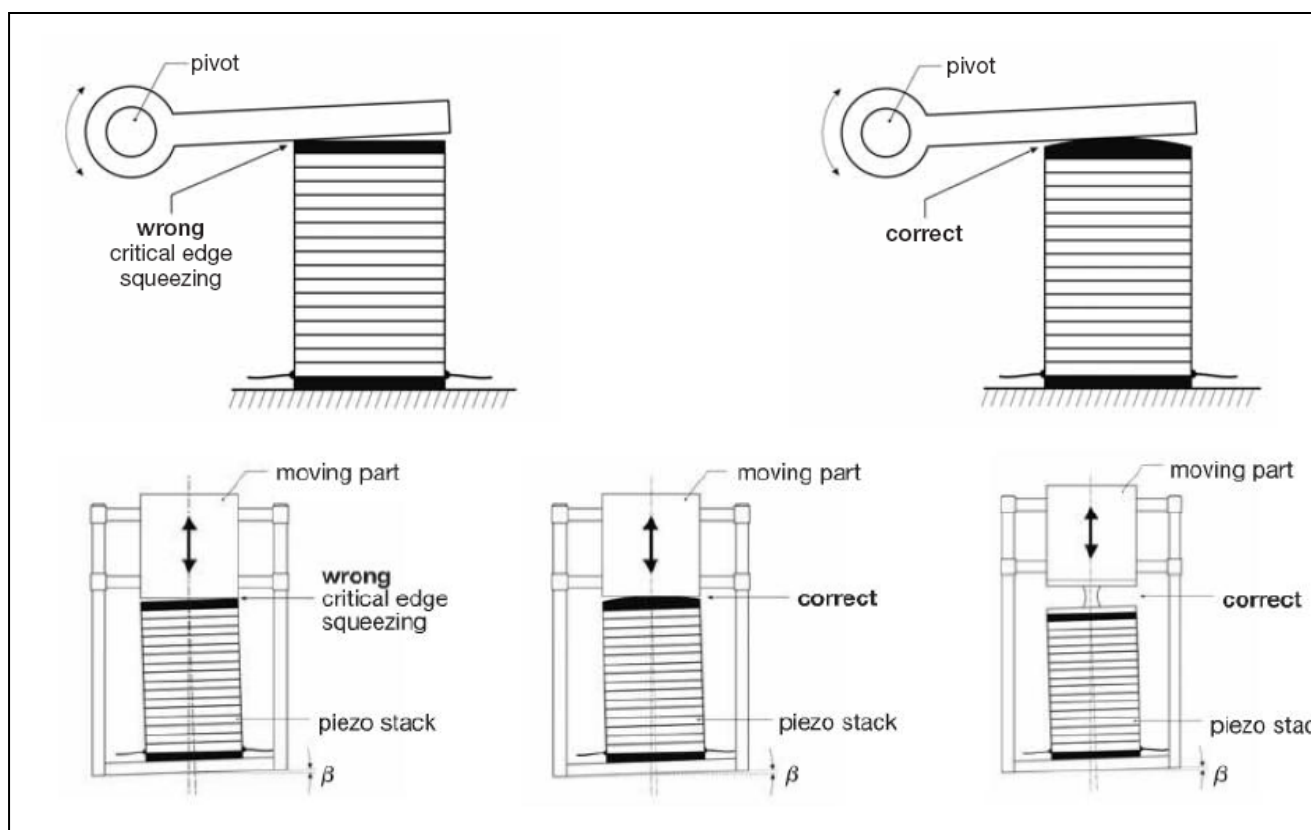




## Guide to use

- The actuator shall be connected exactly with the element which to be driven by rigid connection.
- Use the actuator without load is prohibited so that preload is necessary before use.
- Do not apply a voltage exceeding Max. driving voltage value to the actuator.
- The actuator shall be used in a dry atmosphere below 60% RH and in a range of temperature -20~85°C. Otherwise, Insulation resistance dropping or shortened working life may occur.
- The actuator of resin-coated type is weak to a tensile force because of its structure so direction of generated force must be same with the center axis of the actuator. Please see the examples shown below.





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