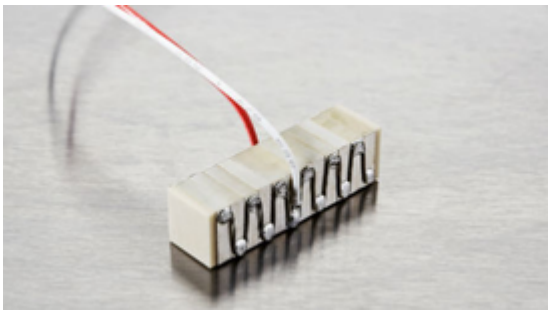
noliac Your piezo partner

NAC2013-Hxx



Noliac plate stack actuator NAC2013-Hxx (height in mm – Hxx) is based on the multilayer actuator NAC2013 and can be stacked to match you requirements. The standard range of NAC2013-Hxx is produced in a height between 4-50 mm. The plate stack provides a stroke up to 79.2 µm and blocking force up to 1050 N depending on the height of the stack.

SPECIFICATIONS

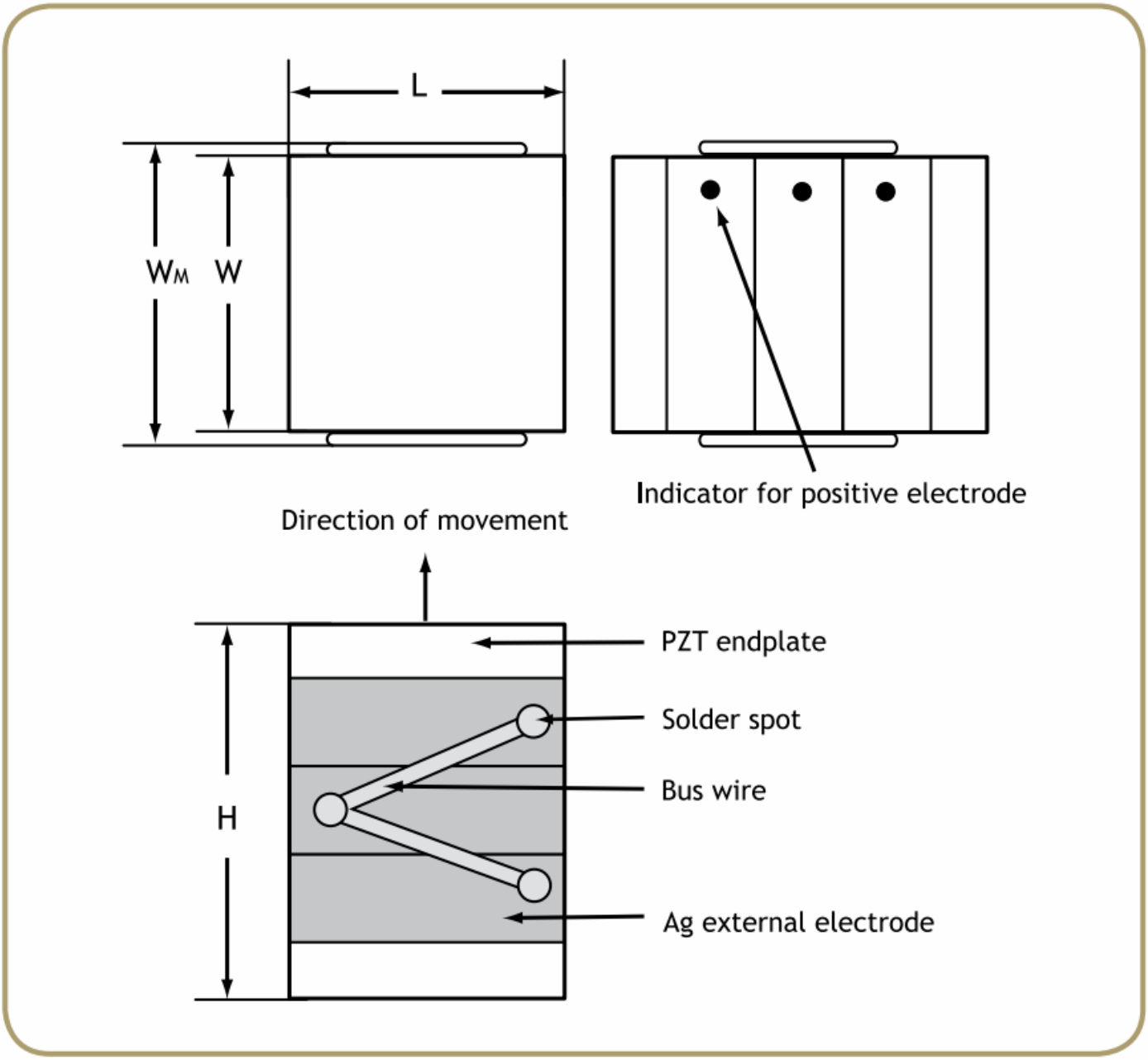
Attributes	Value	Tolerance
Length / outer diameter	5 mm	+0.30/-0.10 mm
Width / inner diameter	5 mm	+0.30/-0.10 mm
Max width / outer diameter max	6.8 mm	
Height	4 — 50 mm	+/-0.2 mm or 1% (whichever is largest)
Operating voltage, max.	150 V	
Free stroke, max.	3.3 — 79.2 µm	+/- 15%
Blocking force, max.	1050 N	+/-20%
Capacitance	180-4330 nF	+/- 15%
Stiffness	318-13 N/µm	+/-20%
Maximum operating temperature	150 °C	
Material	NCE51F	
Unloaded resonance frequency	>248 k - 22 k Hz	
Electrodes	Screen-printed Ag and soldered bus wire (option: glued connections)	

Stack options

Height	Stroke	Capacitance
4 mm	3.3 µm	180 nF
6 mm	6.6 µm	360 nF
8 mm	9.9 µm	540 nF
10 mm	13.2 µm	720 nF

12 mm	16.5 µm	900 nF
14 mm	19.8 µm	1080 nF
16 mm	23.1 µm	1260 nF
18 mm	26.4 µm	1440 nF
20 mm	29.7 µm	1620 nF
22 mm	33 µm	1810 nF
24 mm	36.3 µm	1990 nF
26 mm	39.6 µm	2170 nF
28 mm	42.9 µm	2350 nF
30 mm	46.2 µm	2530 nF
32 mm	49.5 µm	2710 nF
34 mm	52.8 µm	2890 nF
36 mm	56.1 µm	3070 nF
38 mm	59.4 µm	3250 nF
40 mm	62.7 µm	3430 nF
42 mm	66 µm	3610 nF
44 mm	69.3 µm	3790 nF
46 mm	72.6 µm	3970 nF
48 mm	75.9 µm	4150 nF
50 mm	79.2 µm	4330 nF

DRAWINGS


L
WM
W
Indicator for positive electrode
Direction of movement
PZT endplate
Solder spot
Bus wire
H
Ag external electrode

MOUNT AND CONNECT

Mounting
The actuators are usually grinded on top and bottom surfaces (perpendicular to the direction of expansion) in order to obtain parallel surfaces for mounting. The actuators may be mounted either by mechanical clamping or gluing.

Avoiding short circuit can either be achieved by:

- Adding Kapton foil on the metallic surfaces.
- Having inactive ceramic plates between the actuator and the metal plate.
- Stacked actuators are manufactured with top and bottom insulating ceramic end-plates.

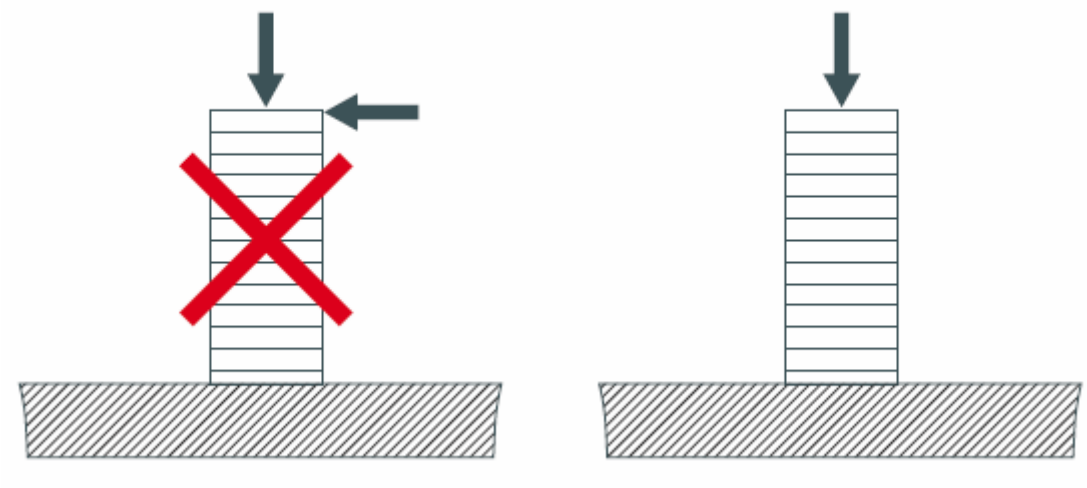
If glued, it is important to ensure a very thin glue line between the actuator and the substrate. It is recommended that a pres applied during the curing process.

To avoid significant loss of performance, the mounting of the actuators should avoid mechanical clamping and/or gluing on th actuator.

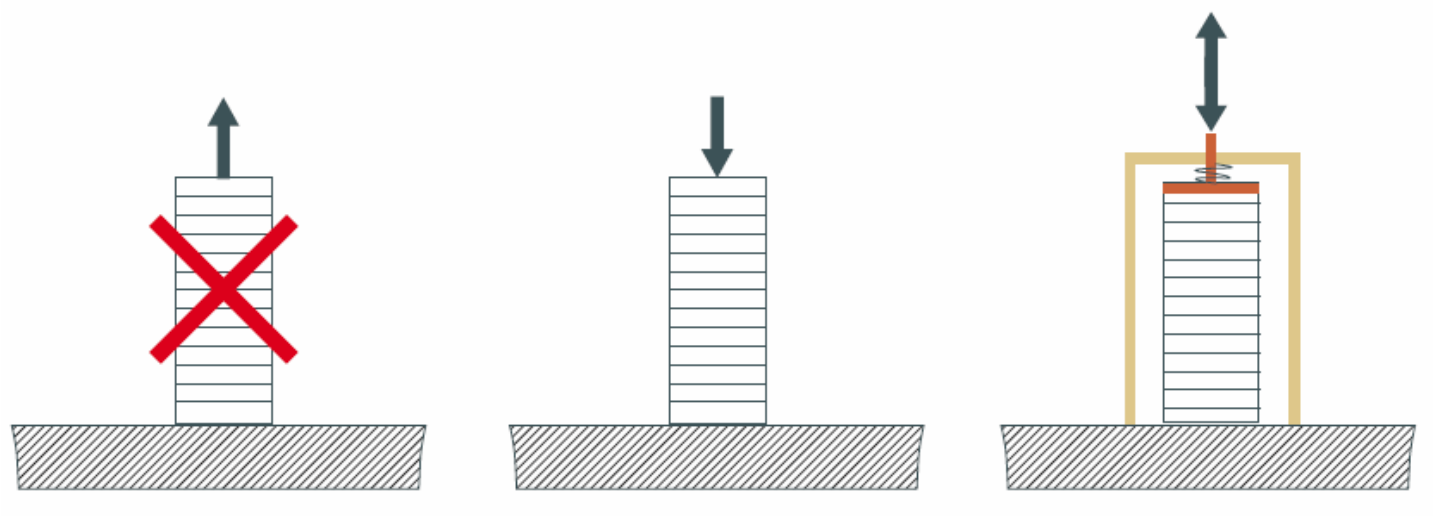
During manufacturing or handling, minor chips on the end-plates can appear. Minor chips cannot be avoided, but such chips performance.

Electrical connection

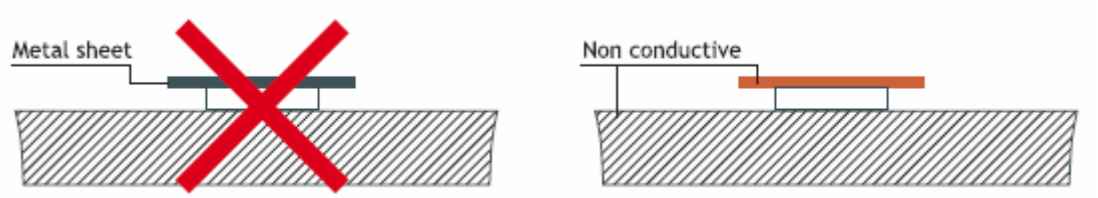
The actuators may only be stressed axially. Tilting and shearing forces must be avoided.



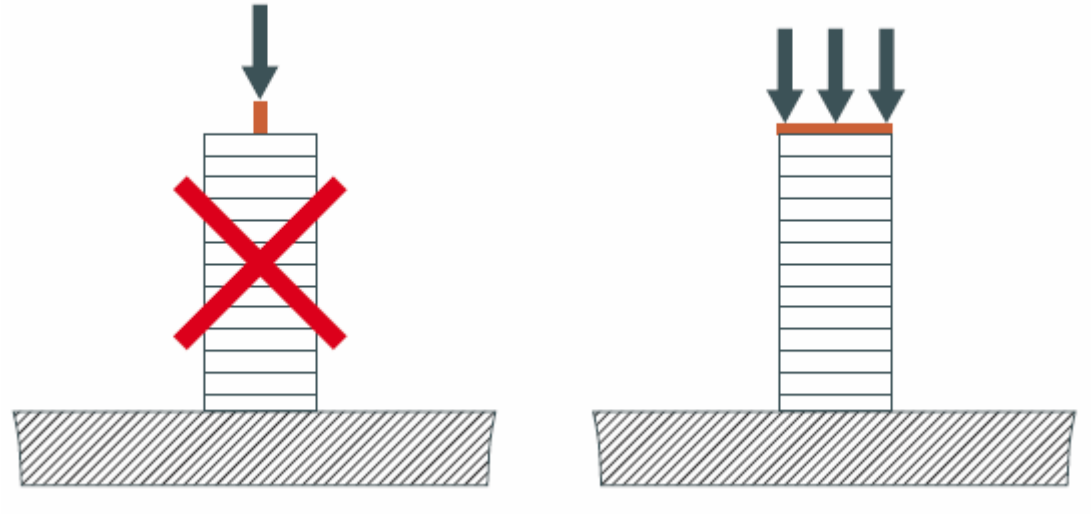
The actuators without preload are sensitive to pulling forces. It is recommended to apply a pre-load in order to optimize the performances of the actuators.



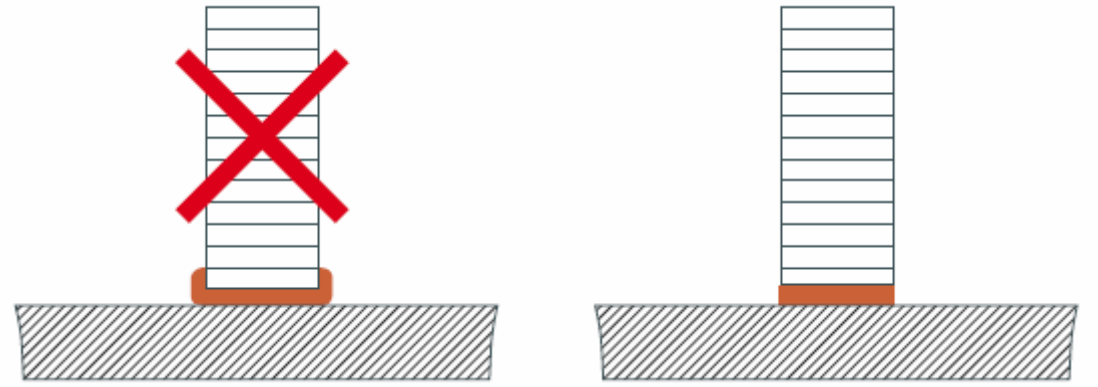
For linear actuators it is recommended not to use a metal plate on top and bottom in order to avoid short circuit.



The force must be applied on the full surface of the actuator in order to assure a good load distribution.



Epoxy glues are well suited for gluing piezoceramics.



WIRES

When you order actuators from Noliac, you can have wires fitted to save time and money. However, you should consider these parameters, when you select a wire for connection:

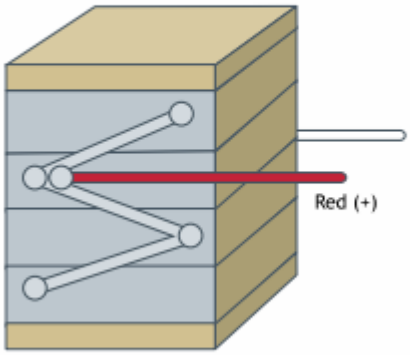
- Operation voltage
- Intensity of current
- Operating temperature
- Environment for example vacuum

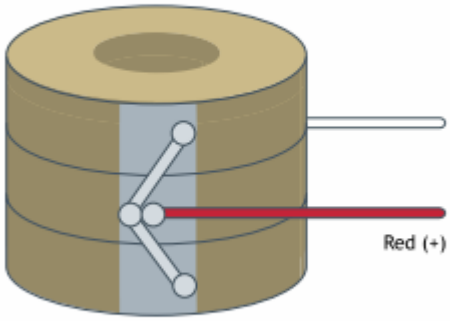
We recommend Teflon wires
Teflon wires can stand temperatures above 200 ºC, whereas PVC wires only resist temperatures up to 80 ºC. In tough operating conditions or in vacuum, it is recommended always to use Teflon isolated wire to guarantee the proper performance of PZT-elements.

Wire thickness (AWG)
The wire thickness (AWG) is determined by the current that has to be transmitted to and from the PZT-element. The required current is determined by the capacitance of the PZT-element, the maximum driving frequency and the maximum voltage Up-p.

	Option A01	Option A02	Option C
Type	28 AWG Teflon	28 AWG Teflon	Custom
Length	200 +/- 10mm	200 +/- 10mm	To be defined
Position	Middle of the actuator	Middle of the actuator	To be defined
Direction	Perpendicular to the height	Toward top	To be defined

Type A01





Type A02