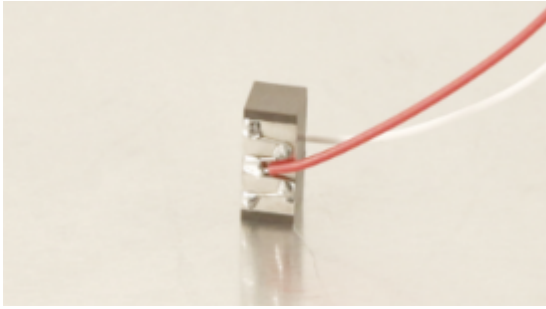


NAC6024-Hxx



Noliac high temperature plate stack actuator NAC6024-Hxx (height in mm - Hxx) is designed to perform at high temperature and high frequency. The maximum operating temperature is 200 °C, and combined with a high frequency operation, this is a perfect match for applications, where high temperature and high frequency is a challenge. The actuator can be stacked to match your specific requirements. The standard range of NAC6024-Hxx is produced in a height between 4-30 mm at an unloaded resonance frequency up to 35 kHz depending of the height of the stack.

SPECIFICATIONS

Attributes	Value	Tolerance
Length / outer diameter	3 mm	+0.30/-0.10 mm
Width / inner diameter	3 mm	+0.30/-0.10 mm
Max width / outer diameter max	4.8 mm	
Height	4 — 30 mm	+/-0.2 mm or 1% (whichever is largest)
Operating voltage, max.	200 V	
Free stroke, max.	1.81 — 25.3 µm	+/- 15%
Blocking force, max.	290 N	+/-20%
Capacitance	25-350 nF	+/- 15%
Stiffness	161-11 N/µm	+/-20%
Maximum operating temperature	200 °C	
Material	NCE46	
Unloaded resonance frequency	>250 k - 35 k Hz	
Electrodes	Screen-printed Ag and soldered bus wire	

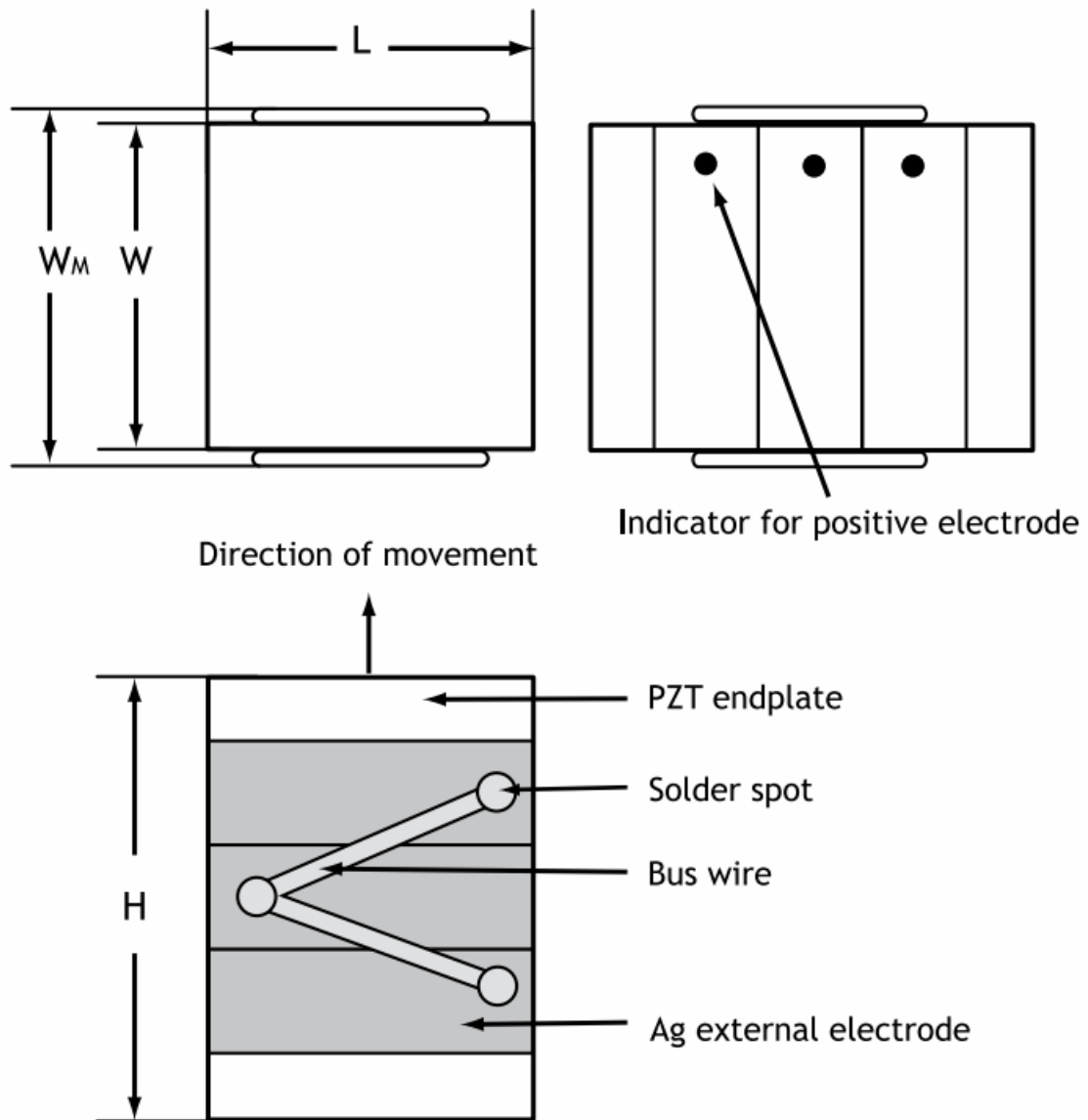
Stack options

Height	Stroke	Capacitance
4 mm	1.8 µm	30 nF
6 mm	3.6 µm	50 nF

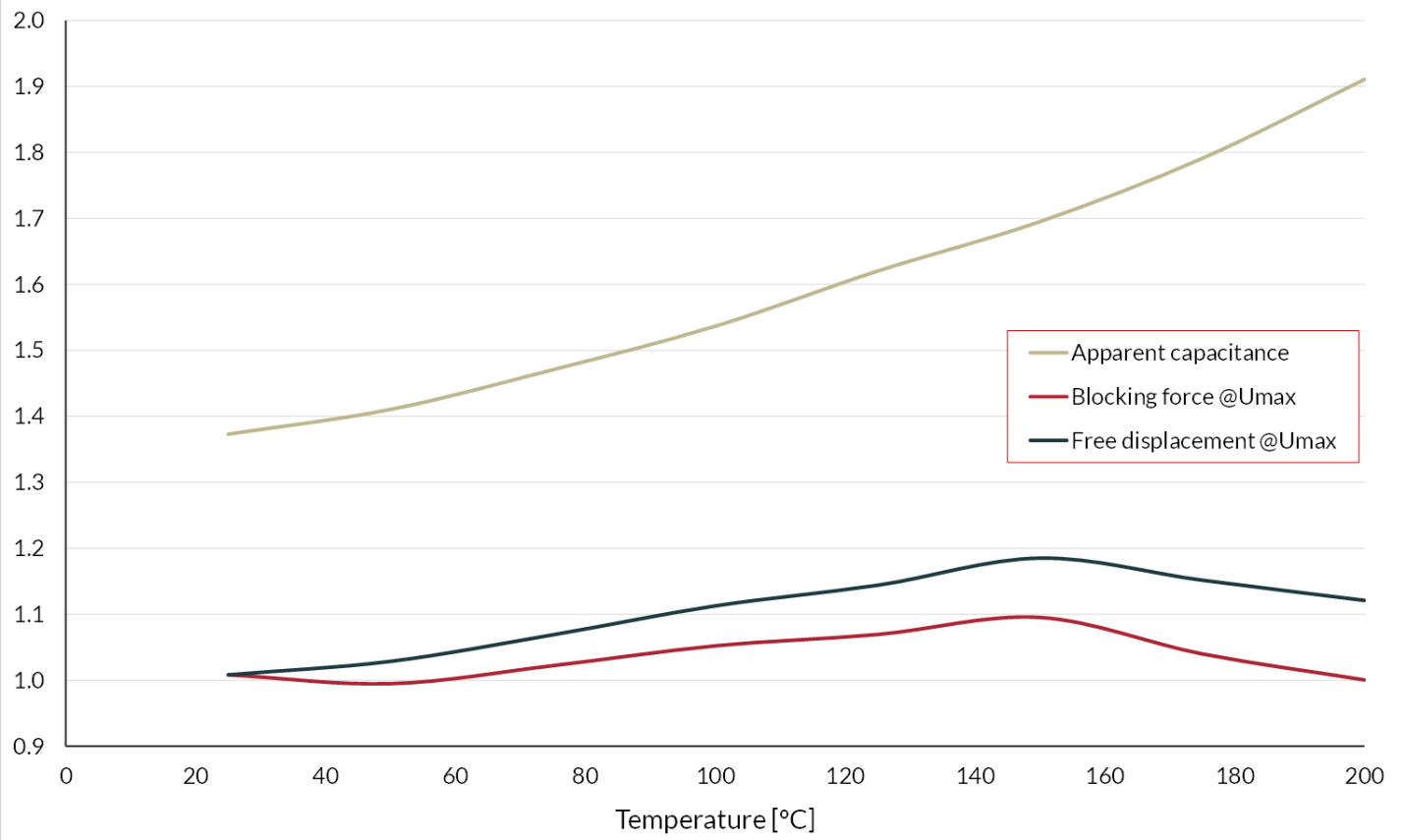
8 mm	5.4 μm	80 nF
10 mm	7.2 μm	100 nF
12 mm	9 μm	130 nF
14 mm	10.8 μm	150 nF
16 mm	12.6 μm	180 nF
18 mm	14.4 μm	200 nF
20 mm	16.2 μm	230 nF
22 mm	18.1 μm	250 nF
24 mm	19.9 μm	280 nF
26 mm	21.7 μm	300 nF
28 mm	23.5 μm	330 nF
30 mm	25.3 μm	350 nF

DRAWINGS

Here you can find a drawing of the outline of the high temperature stacks and a number of graphs showing different aspects of the performance at high temperature.



Relative evolution of performance with temperature



MOUNT AND CONNECT

Mounting

High temperature actuators must be mounted under preload by mechanical clamping.

If glued, it is important to ensure a very thin glue line between the actuator and the substrate. It is recommended that a pressure, e.g. 2-5 MPa, is applied during the curing process.

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

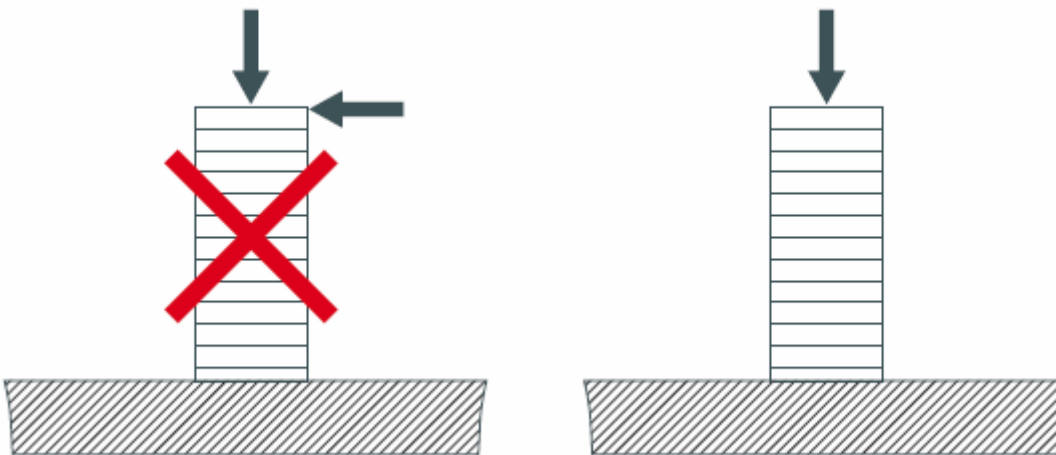
During manufacturing or handling, minor chips on the end-plates can appear. Minor chips cannot be avoided, but such chips do not affect performance.

Electrical connection

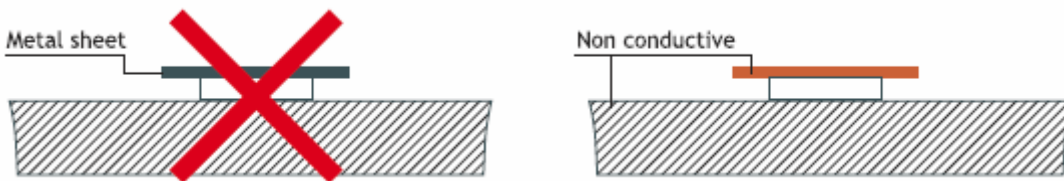
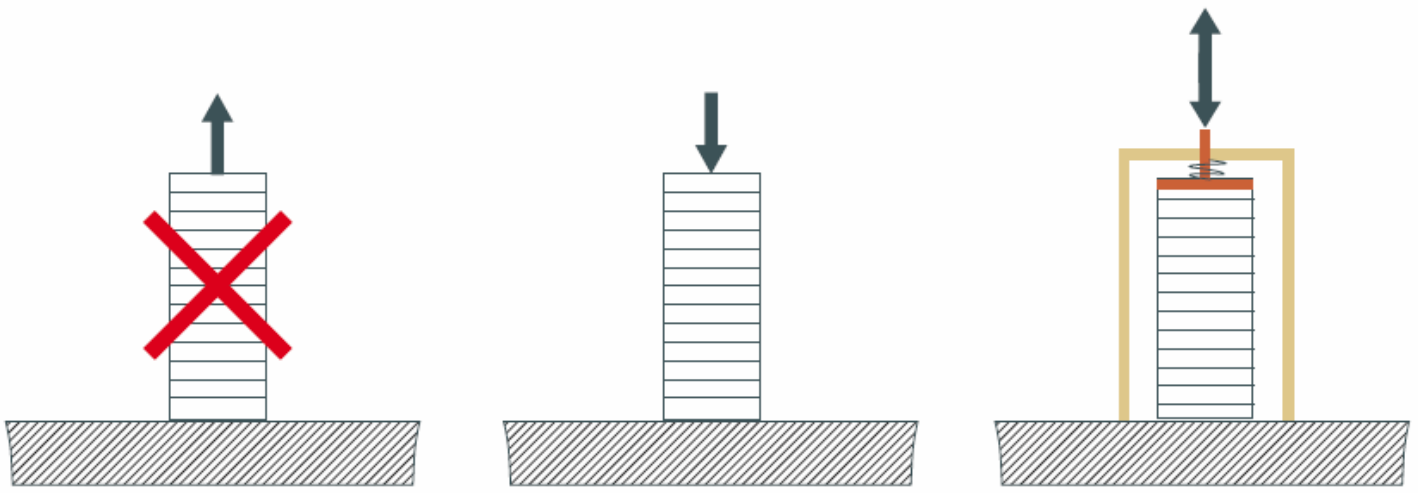
External electrodes

The external electrodes are screen printed silver as standard.

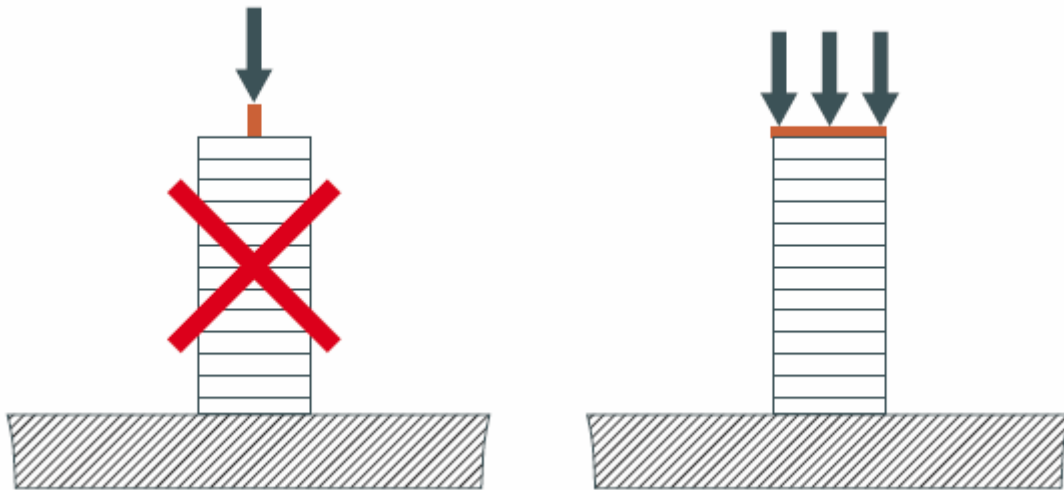
The actuators may only be stressed axially. Tilting and shearing forces must be avoided.



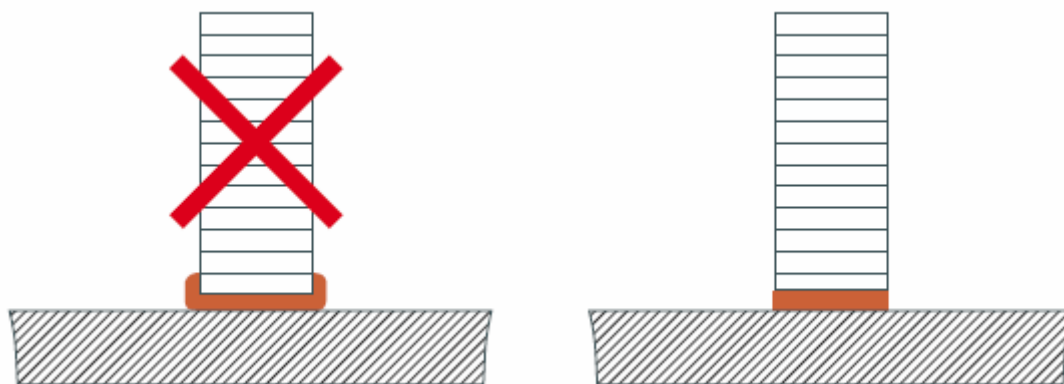
The purpose of the epoxy used in HT stacks is to hold the components between shipment and assembly. At high temperature, the epoxy cannot ensure sufficient adhesion, so it is necessary to apply a preload to maintain the integrity of the stack. A compressive preload of 5MPa is recommended, although higher values can be applied if the application requires it.



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
- Environment for example vacuum

We recommend Teflon wires

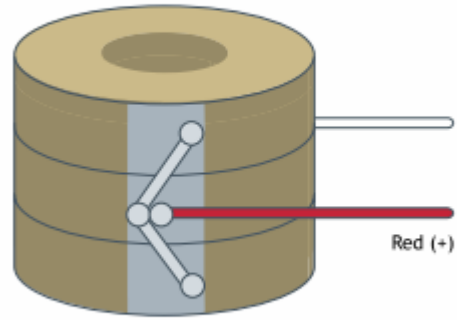
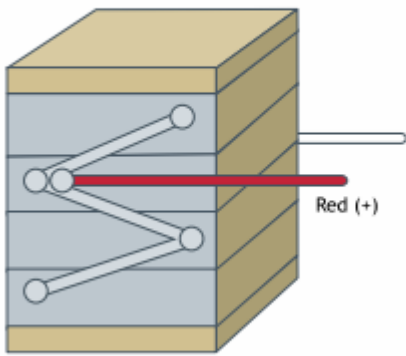
Teflon wires can stand temperatures above 200 °C, whereas PVC wires only resist temperatures up to 80 °C. High-temperature stacks are fitted with Teflon isolated wire to guarantee the proper performance of PZT-elements. For Ultra-High Vacuum (UHV) operations, high-temperature stacks are fitted with Kapton isolated wires.

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 U_{p-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

