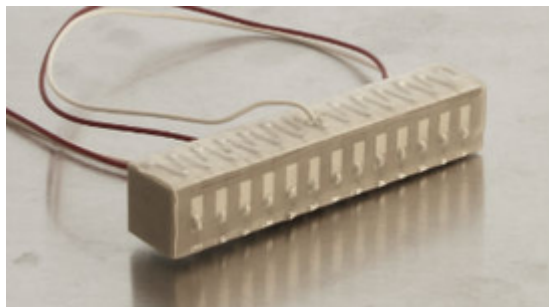


NAC5022-Hxx



Noliac damage tolerant actuator stack NAC5022-Hxx (height in mm – Hxx) is a multilayer actuator that can be stacked to match your requirements. The fuse technology of the damage tolerant stack fuses out any damaged ceramic element and the remaining ceramic elements continue to operate. This makes the damage tolerant stack an effective way to ensure high reliability for critical applications. The damage tolerant stack provides a stroke up to 161.7 μm and blocking force up to 4200 N depending on the height of the stack.

SPECIFICATIONS

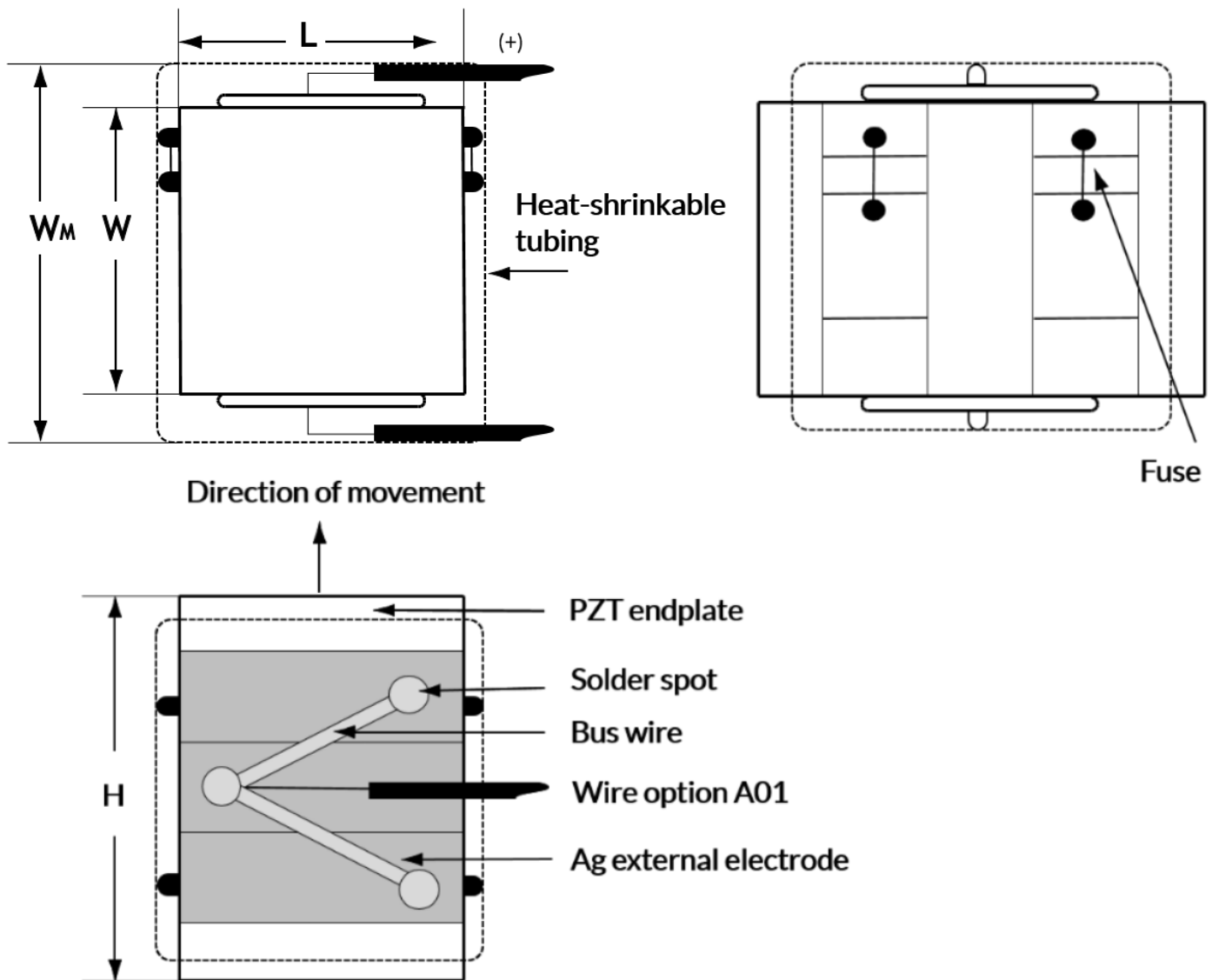
Attributes	Value	Tolerance
Length / outer diameter	10 mm	+0.40/-0.20 mm
Width / inner diameter	10 mm	+0.40/-0.20 mm
Max width / outer diameter max	12.8 mm (see remarks)	
Height	4 — 100 mm	+/-0.2 mm or 1% (whichever is largest)
Operating voltage, max.	200 V	
Free stroke, max.	3.3 — 161.7 μm	+/- 15%
Blocking force, max.	4200 N	+/-20%
Capacitance	400-19400 nF	+/- 15%
Stiffness	1273-26 N/ μm	+/-20%
Maximum operating temperature	150 °C	
Material	NCE51F	
Unloaded resonance frequency	>248 k - 11 k Hz	
Electrodes	Screen-printed Ag and soldered bus wire	
Remarks	Max width and lenght	

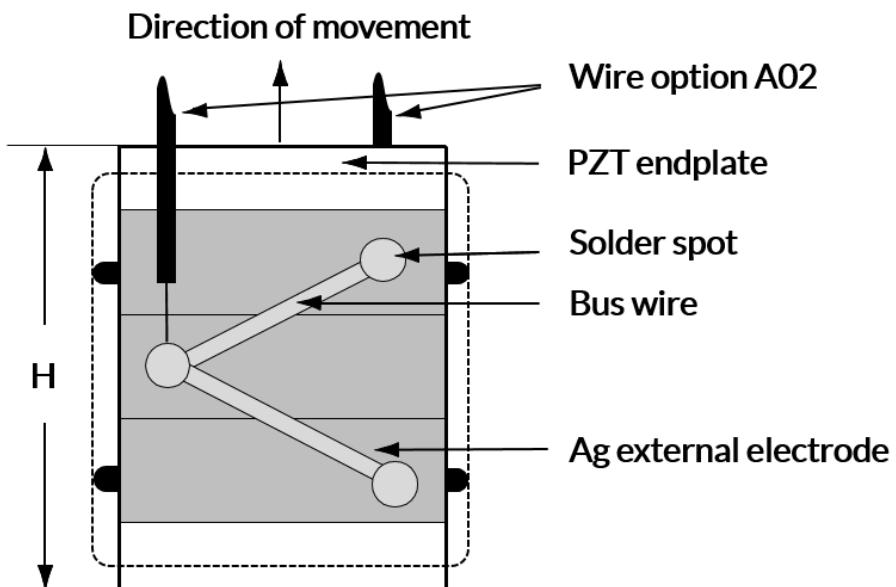
Stack options

Height	Stroke	Capacitance
4 mm	3.3 μm	400 nF

6 mm	6.6 μm	790 nF
8 mm	9.9 μm	1190 nF
10 mm	13.2 μm	1580 nF
12 mm	16.5 μm	1980 nF
14 mm	19.8 μm	2380 nF
16 mm	23.1 μm	2770 nF
18 mm	26.4 μm	3170 nF
20 mm	29.7 μm	3560 nF
22 mm	33 μm	3960 nF
24 mm	36.3 μm	4360 nF
26 mm	39.6 μm	4750 nF
28 mm	42.9 μm	5150 nF
30 mm	46.2 μm	5540 nF
32 mm	49.5 μm	5940 nF
34 mm	52.8 μm	6340 nF
36 mm	56.1 μm	6730 nF
38 mm	59.4 μm	7130 nF
40 mm	62.7 μm	7520 nF
42 mm	66 μm	7920 nF
44 mm	69.3 μm	8320 nF
46 mm	72.6 μm	8710 nF
48 mm	75.9 μm	9110 nF
50 mm	79.2 μm	9500 nF
52 mm	82.5 μm	9900 nF
54 mm	85.8 μm	10300 nF
56 mm	89.1 μm	10690 nF
58 mm	92.4 μm	11090 nF
60 mm	95.7 μm	11480 nF
62 mm	99 μm	11880 nF
64 mm	102.3 μm	12280 nF
66 mm	105.6 μm	12670 nF
68 mm	108.9 μm	13070 nF
70 mm	112.2 μm	13460 nF
72 mm	115.5 μm	13860 nF
74 mm	118.8 μm	14260 nF
76 mm	122.1 μm	14650 nF
78 mm	125.4 μm	15050 nF
80 mm	128.7 μm	15440 nF
82 mm	132 μm	15840 nF
84 mm	135.3 μm	16240 nF
86 mm	138.6 μm	16630 nF
88 mm	141.9 μm	17030 nF
90 mm	145.2 μm	17420 nF
92 mm	148.5 μm	17820 nF
94 mm	151.8 μm	18220 nF
96 mm	155.1 μm	18610 nF
98 mm	158.4 μm	19010 nF
100 mm	161.7 μm	19400 nF

DRAWINGS





MOUNT AND CONNECT

Mounting

The stacks have ground top and bottom insulating ceramic end-plates in order to obtain flat and parallel surfaces for mounting. The stacks may be mounted either by mechanical clamping or gluing.

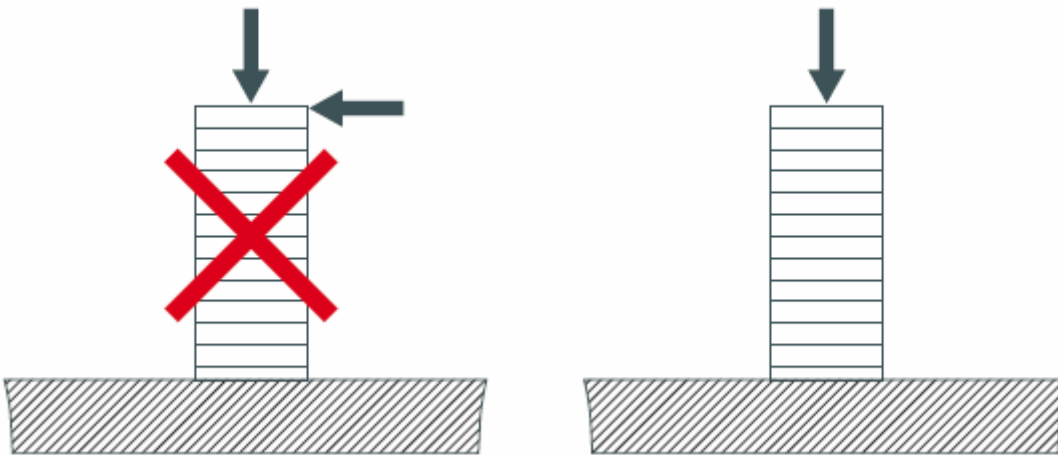
If glued, it is important to ensure a very thin glue line between the actuator and the substrate. It is recommended that a pressure, e.g. 2-5 MPa, is applied during the curing process.

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

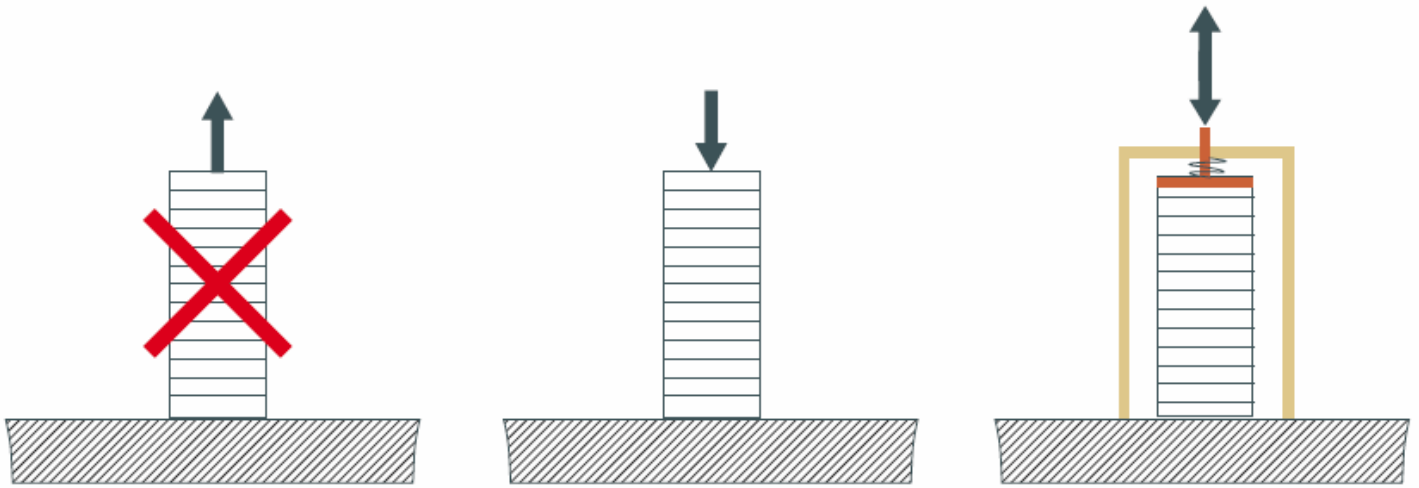
Electrical connection

The positive electrode is indicated by the red wire.

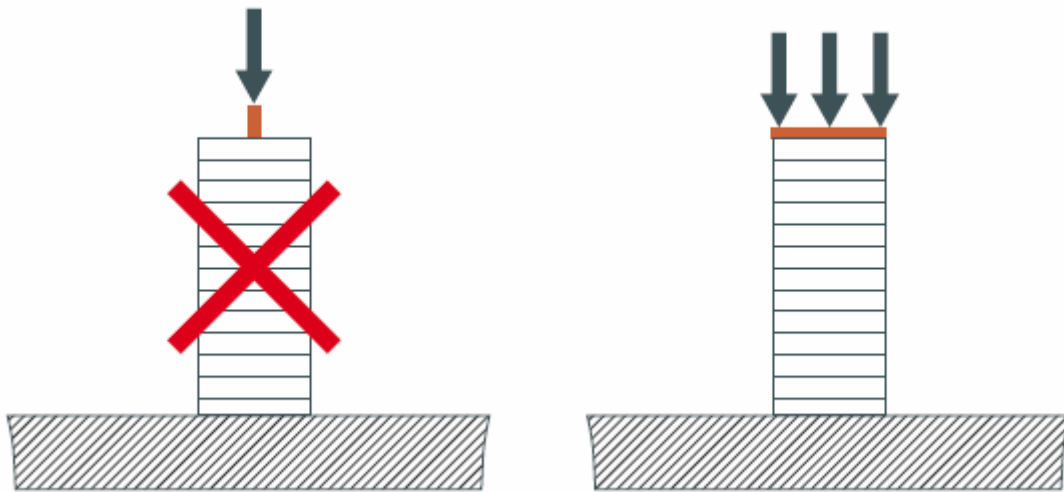
The actuators may only be stressed axially. Tilting and shearing forces must be avoided.



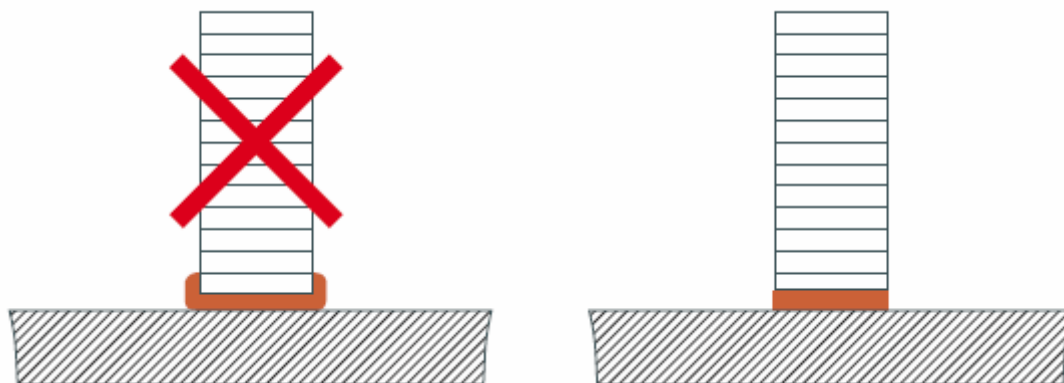
The actuators without preload are sensitive to pulling forces. It is recommended to apply a pre-load in order to optimize the performances of the actuators.



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

The Noliac fuse stack is delivered with wires. Therefore, when you order a fuse stack from Noliac, you have to select one of our wire options below. You should consider these parameters, when you select a wire for connection:

- Operation voltage
- Intensity of current
- Operating temperature
- Environment

We recommend Teflon wires

Teflon wires can stand temperatures above 200 °C, whereas PVC wires only resist temperatures up to 80 °C. In tough operating conditions or in vacuum, it is recommended always to use Teflon isolated wires to guarantee the proper performances of PZT elements.

Wire thickness (AWG)

The wire thickness 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

