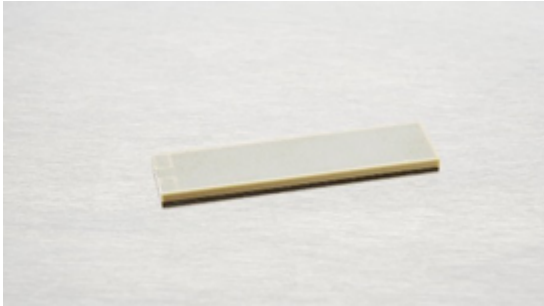


## CMBP02

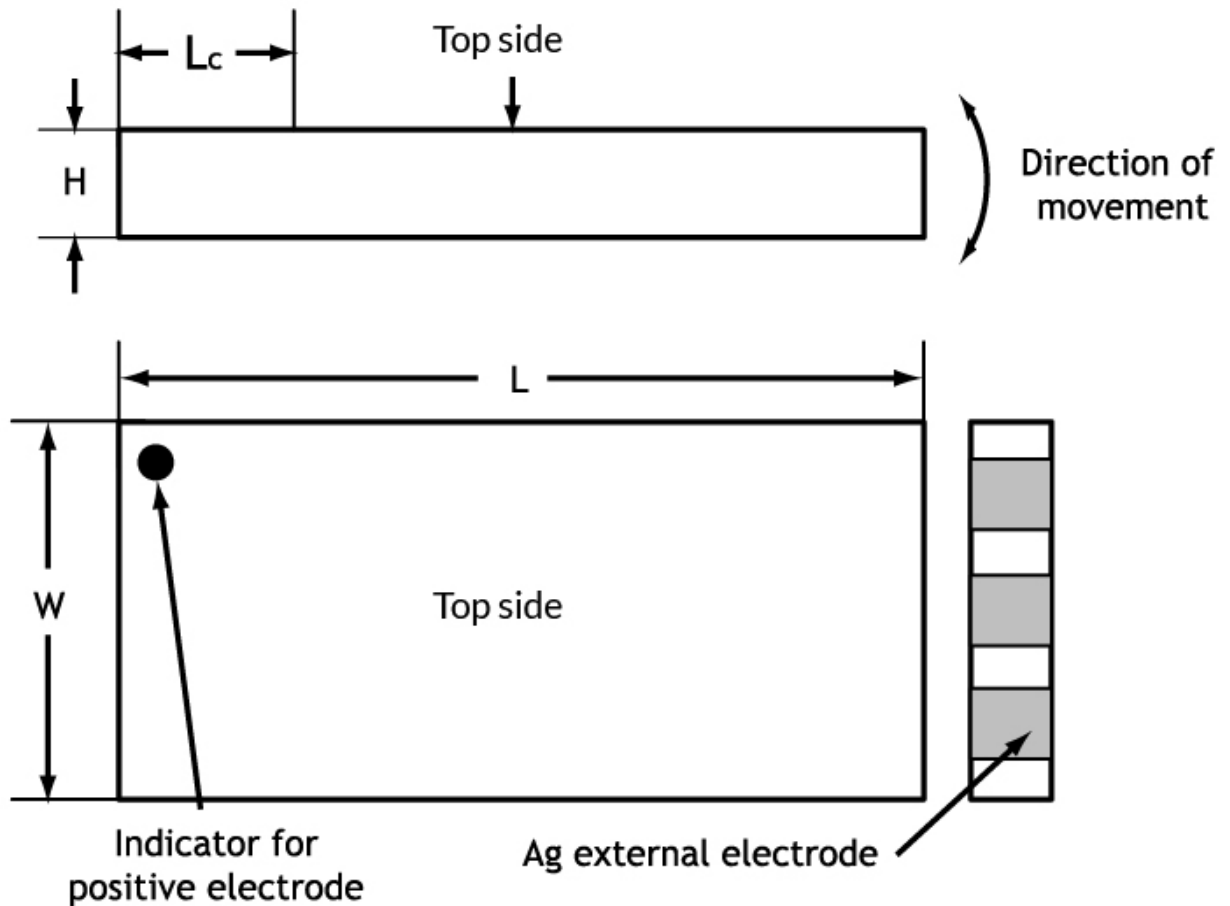


Noliac plate benders are manufactured with ceramic layer thickness down to 67µm as standard to facilitate very low operating voltage for full performance of the piezo material. CMBP02 measures 21x7.8x1.3 mm. The plate bender provides stroke of +/- 120 µm and a blocking force of 3.7 N.

### SPECIFICATIONS

| Attributes                    | Value       | Tolerance  |
|-------------------------------|-------------|------------|
| Length / outer diameter       | 21 mm       | +/-0.45 mm |
| Width / inner diameter        | 7.8 mm      | +/-0.15 mm |
| Height                        | 1.3 mm      | +/-0.10 mm |
| Operating voltage, max.       | 200 V       |            |
| Free stroke, max.             | ± 120 µm    | +/- 15%    |
| Blocking force, max.          | 3.7 N       | +/-20%     |
| Capacitance                   | 2 x 220 nF  | +/- 15%    |
| Stiffness                     | 0.0308 N/µm | +/-20%     |
| Maximum operating temperature | 150 °C      |            |
| Material                      | NCE57       |            |
| Unloaded resonance frequency  | >1300 Hz    |            |

### DRAWINGS



## MOUNT AND CONNECT

### Mounting

Bending plate actuators may be mounted either by mechanical clamping or gluing. Bending plate actuators are not machined on top and bottom surfaces and as such may have small variations in the surface. For this reason a mechanical clamping should be done with moderate force, approximately 5 times the specified blocking force.

If mounted with glue it should be emphasized that the gluing contact surface is restricted to cover only the inactive part of the bender in order not to reduce the stroke of the bender.

Epoxy glues are well suited for gluing piezoceramics and several alternatives exist.



Your piezo partner

## Control instructions

Bending actuator plates can be controlled by:

### Differential voltage control

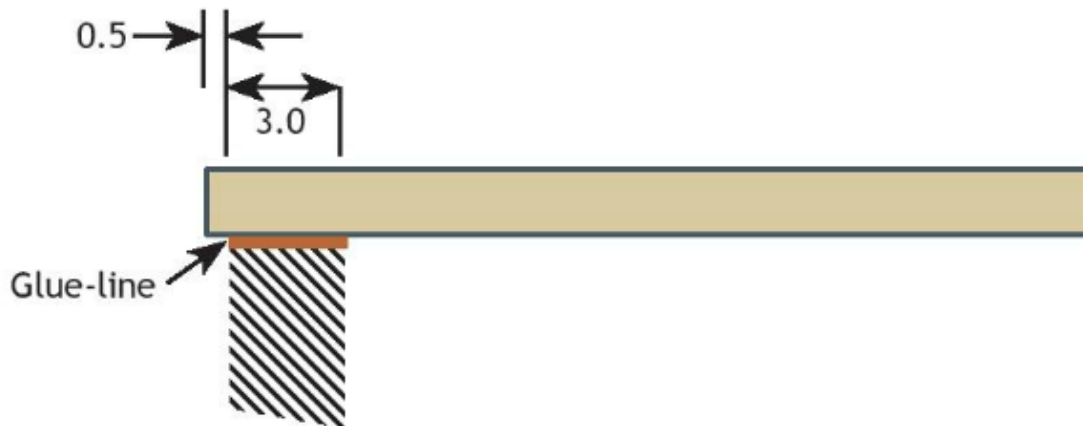
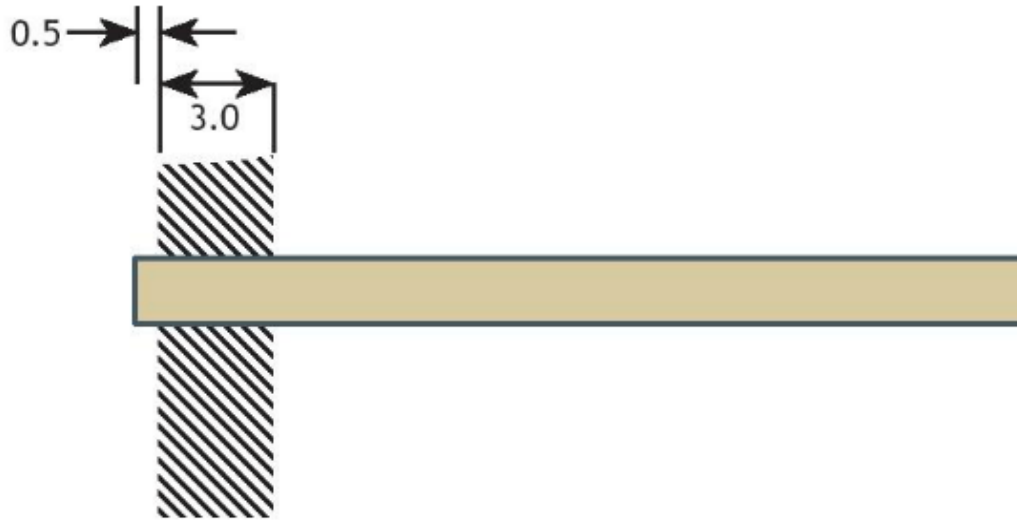
In this mode the bending can be controlled both upwards and downwards. Apply +100 V to the positive electrode (indicated by the black dot), -100 V to the negative electrode and a voltage  $V_{in}$  to the middle electrode such as  $-100 V < V_{in} < 100 V$ .

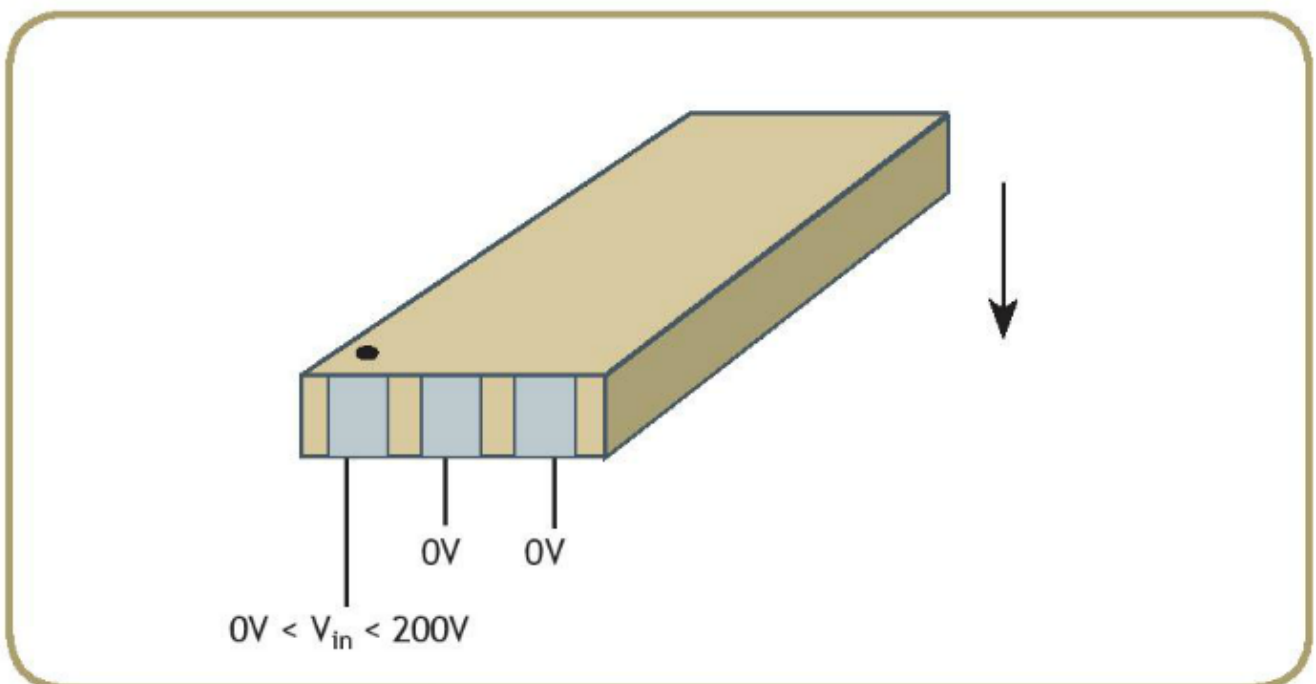
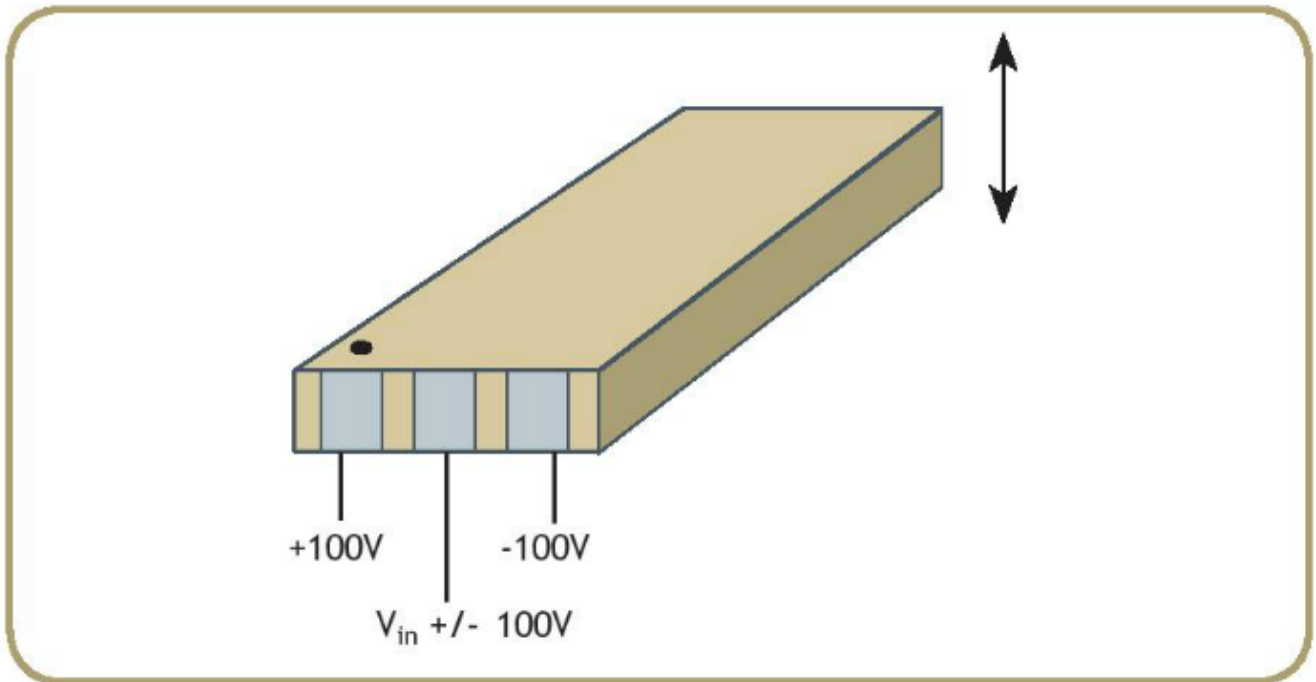
If  $0 V < V_{in} < 100 V$ , the plate will bend up with the black spot facing up.

If  $-100 V < V_{in} < 0 V$ , the plate will bend down with the black spot facing up.

### Single side voltage control

In this mode, the bending can be controlled for one side only, i.e. bending down with the black dot facing up. Apply 0 V to the negative and middle electrode, and up to 200 V to the positive electrode.





Noliac attaches these wires as standard to our plate and ring benders:

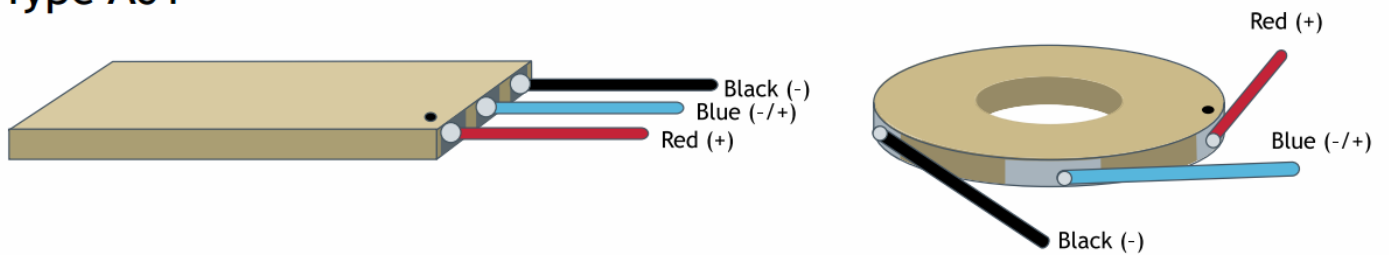
- 28 AWG Teflon wires to products with a thickness equal to or thicker than 1.2 mm.
- 30 AWG Teflon Wire Wrap to products thinner than 1.2 mm and thicker than 0.5 mm.

On products thinner than 0.5 mm we recommend the customer to glue the wire onto the terminals using conductive glue e.g. EPO-TEK®H27D.

We solder red wires to the positive electrode, black to the negative and blue to the control terminal on benders.

|           | Option A01                  | Option A02              | Option C      |
|-----------|-----------------------------|-------------------------|---------------|
| Type      | 28/30 AWG Teflon            | 28 AWG Teflon           | Custom        |
| Length    | 200 +/- 10mm                | 200 +/- 10mm            | To be defined |
| Position  | Middle of the component     | Middle of the component | To be defined |
| Direction | Perpendicular to the height | Toward bottom           | To be defined |

### Type A01



### Type A02

