

Force Piezo Actuators

☑ Objective >>>

Force Piezoelectric Actuators (FPA) are new long stroke linear piezo actuators for micro/nano positioning applications where high forces or stiffness are required. They operate by accumulation of small steps in motor mode to achieve large displacements or as a standard direct piezoelectric actuator in fine position mode to achieve high resolutions. All the while they offer large force and stiffness in a miniature casing. Using an adaptation card, this type of actuator can be powered using a single channel from any CEDRAT TECHNOLOGIES linear amplifiers (CA45 or LA75 families).

In summary, FPAs offer:

- High force and high stiffness in a small volume
- Blocking at rest in any position (locking without power supply)
- Nano positioning resolution all along the stroke
- Non magnetic behavior
- Single channel power amplifier and low current consumption

☑ PERFORMANCE >>>

Typical performances are given in the following table. This table is not exhaustive as many other actuators can be designed by CEDRAT TECHNOLOGIES using its design tools, lab facilities and technological know-how.

References	Unit	FPA30	FPA70
Notes		Preliminary	Preliminary
Stroke	mm	limited only by shaft length	limited only by shaft length
Blocking force at rest	N	40	100
Actuation force	N	30	70
Stiffness	N/ μ m	>50	0-150
Speed (using LA75B power amplifier)	mm/s	4,4	1,4
Fine position stroke	μ m	10	10
Fine position max. frequency	kHz	15	7
Fine position resolution	nm	<1	<1
Diameter x length	mm	$\varnothing 15 \times 20$	$\varnothing 25 \times 25$
Mass	g	11	36

☑ Applications >>>

Force Piezoelectric Actuators (FPA) find applications as micro/nano positioning, locking mechanism, valves actuators. Rugged versions can be developed for vacuum and/or low temperature environments as encountered in space or cryogenic applications.

For short strokes, FPA are in competition with Amplified Piezoelectric Actuators from CEDRAT TECHNOLOGIES. For long stroke, they are in competition with Magnetic Actuators, which are technologies also mastered by CEDRAT TECHNOLOGIES.

☑ Keywords >>>

Force piezo motor ; piezo actuator ; piezo actuators ; micro motor ; piezo motor ; linear motor ; miniature ; piezo driver ; nano positioning ; SPA ; CEDRAT