

Piezoelectric Actuator

01.04.XX.14.0001 - 01.04.XX.14.0002

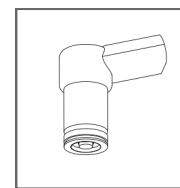
01.04.XX.14.0003 - 01.04.XX.14.0004

01.04.XX.14.0005 - 01.04.XX.14.0006

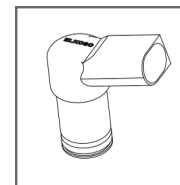
01.04.XX.14.0007 - 01.04.XX.14.0008

ELKOSO has developed a piezoelectric actuator that meets all original equipment manufacturer (OEM) standards, providing a reliable replacement for damaged parts.

Designed with precision engineering, these actuators match the performance, durability, and dimensions of OEM components, ensuring seamless integration and optimal functionality. Their high-quality construction makes them a dependable solution for restoring systems to their original performance levels.



SW Isometric



NE Isometric

The new piezoelectric actuator from **ELKOSO** features the following key characteristics:

- High Precision: Capable of delivering precise and repeatable movements.
- Fast Response: Quickly reacts to changes in the electric field, enabling high-speed operations.
- No Magnetic Interference: Ideal for environments sensitive to electromagnetic disruptions.
- Dimensional Compatibility: Exact size and fit with the original equipment.
- Material Standards: Utilizing high-grade piezoelectric ceramics or materials equivalent to the OEM part.
- Electrical Characteristics: Compliance with original voltage and frequency requirements.



Actual Product

Note: this piezoelectric actuators is not compatible with Hartridge test bench (for different capacitances).

Explanation:

The Original injector piezoelectric actuators have their own internal codes, and Hartridge test bench is a test equipment authorized by the original manufacturer, it can only identify the internal code of its own original piezoelectric actuators and exclude the product code from aftermarket manufacturer. Therefore, there is an identification code that fails and displayed in the form of capacitance. It is shown 0.75-2.1uF on Hartridge test bench while on capacitance meter is generally $\geq 2.1\mu\text{F}$. After being tested with different test equipment and repeated running test on vehicles, this data does not affect product quality. Manually skip that code and continue to the next step to install the injector calibration, the product can be used.

All ELKOSO piezoelectric actuators have undergone comprehensive testing on a wide range of advanced test benches, ensuring their durability, precision, and reliability in demanding applications. These rigorous evaluations are designed to replicate real-world operating conditions and confirm the actuators' compliance with strict OEM standards. By simulating various environmental and operational scenarios, ELKOSO guarantees that each actuator meets or exceeds the quality, performance, and safety requirements of original parts, making them an ideal choice for replacing damaged components while maintaining system integrity and efficiency.

ELKOSO piezoelectric actuators have been passed the test bench from:



Type 1
01.04.XX.14.0001
01.04.XX.14.0005



Type 2
01.04.XX.14.0002
01.04.XX.14.0006



Type 3
01.04.XX.14.0003
01.04.XX.14.0007



Type 4
01.04.XX.14.0004
01.04.XX.14.0008

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ELKOSO piezoelectric actuators are consistently benchmarked and rigorously tested alongside OEM components to ensure their performance, reliability, and compatibility. This direct comparison validates their compliance with strict OEM standards and confirms their capability to deliver equivalent or superior functionality. Through these meticulous evaluations, ELKOSO ensures that their actuators are a dependable solution for replacing damaged original parts, offering precision, durability, and seamless integration into existing systems.

Benchmark

	OEM	ELKOSO
Capacitance	>2.1uF ≥6	>2.1uF
Insulation resistance	GΩ @ 300V 25	≥ 7 GΩ @ 300V
Stroke	≥250um @ 100V	≥ 250um @ 100V
Resistance	200 kΩ± 10	200 kΩ±10

Performance metrics

Insulation resistance :	>9.99 GΩ	@	300 V
Actuator resistance :	199 kΩ		
Initial capacitance :	3.03 uF		
()Stroke :	--.-μ m	@	---V
Actuator gap : Minimal	--.-μ m		
resistance : Maximal	195 kΩ	@	
resistance :	200 KΩ	@	

Tolerance limits

	ECAL	MIN	MAX
Setting Voltage V	140V	140	140
Energy Average mJ	21.4	14.8	23
Energy loss uJ Pulse	6	4.9	11
first voltage V Pulse	147.5	137	150
last voltage V Setting	145	135	150
voltage V Power refill	100	100	100
mW Dynamic	126	115	165
capacitor uf	4.27	3.6	4.7

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Product quality standards

- Resistance > 1850 kΩ
- Capacitance > 2.8 μF - 1V
- Insulation resistance > 1.2 GΩ @ 300V

Electrical Polarity

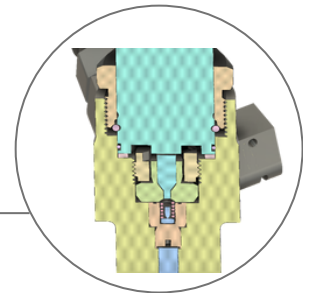
- The polarity must always remain consistent to ensure optimal operating conditions for the actuator.



Reversed polarity may result in actuator failure, which is not covered under warranty.

Shim requirements

- Shim must be original, ELKOSO or something with the proper hardness at the one mentioned.
- Force of tightening must not be higher than 35N.



Over-tightening or the use of an unqualified shim may lead to actuator failure, which is not covered under warranty.

Shim Adjustment

• Actuator Installation Precautions

When installing the actuator onto the injector body, ensure that the contact point of the actuator and the contact point of the injector's control valve maintain a distance greater than zero.

Do not tighten the actuator if this distance is exactly zero or negative, as it may cause irreversible and permanent damage to the actuator.

• Shim Thickness

If you are equipped with a proper tool of measuring the touch points, then you must follow it.

In case you do not have the appropriate equipment, start with a thick washer and gradually reduce its thickness until the injector operates correctly.



By reducing the shim until the injector operates correctly, you must be aware not to reach zero or negative gap.