INSTRON®

The difference is measurable

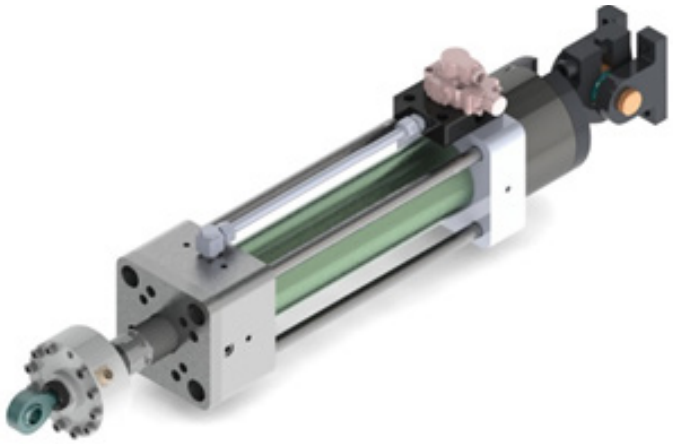
SERVO-HYDRAULIC ACTUATORS - SWIVEL MOUNT
AC-02-1XXX

ENGINEERED FOR RIGOROUS TESTING ENVIRONMENTS

Our AC-02-1XXX Series of fatigue-rated servo-hydraulic actuators is specifically designed to meet the demands of static and quasi-static testing. These actuators are built to deliver controlled displacements, loads, and velocities, ensuring high precision and reliability in your testing applications.

DESIGNED FOR DYNAMIC PERFORMANCE

The AC-02-1XXX Series actuators incorporate a monolithic piston design and heat-treated, hard-chrome plated piston rods to enhance durability and performance. The actuators are equipped with industry-standard internal metric threading, allowing for easy fixture mounting and demounting. With robust side load tolerance and high bearing capacity, these actuators deliver consistent, high-quality results across various testing scenarios.



APPLICATIONS

Versatile Solutions for Diverse Testing Scenarios

Our swivel mount servo-hydraulic actuators are ideal for:

- Civil Structural Testing

Ensuring the integrity of infrastructure through rigorous load simulations.

- Stewart Tables

Providing accurate motion control for multi-axis testing systems.

- Airframe Structural Testing

Simulating real-world conditions to verify the durability and safety of aerospace components.

- Multi-Axis Simulation Test Rigs

Offering precise control over complex motion profiles for testing.

KEY FEATURES

- Fatigue-Rated Performance

Designed to withstand greater than 10-million cycles, ensuring long-term reliability.

- Contamination-Resistant Servo Valves

Built to maintain optimal performance even in challenging environments.

- Hydraulic Cushions

Protect the actuator from high-velocity impacts, extending the lifespan of the equipment for both tension and compression.

- Multiple Configurations

Available in single-ended, double-acting, and double-ended, double-acting options to suit diverse testing needs.

- Integrated Manifold Design

Simplifies hydraulic connections, reducing setup complexity.

- Customizable Options

Including threaded holes for lifting hooks and detachable anti-rotation features.

- Low Friction and Wear-Resistant Seals

Enhances durability and ensures smooth operation over extended periods.

- Coaxially Mounted Displacement Transducers

Integrated for precise measurement and consistent performance across various applications.

ACTUATOR CONSTRUCTION

Body Style

Tie rod design ensuring structural integrity with a low-friction configuration, where breakout or seal friction load is approximately 1% of the rated load (i.e., 30 psi for 3000 psi rated load), facilitating smooth operation and minimizing wear.

Seals

Non-metallic, wear-resistant seals designed for low friction to optimize energy efficiency.

Bearings

Co-axial PTFE bearings combined with seals for reduced friction.

Maintenance

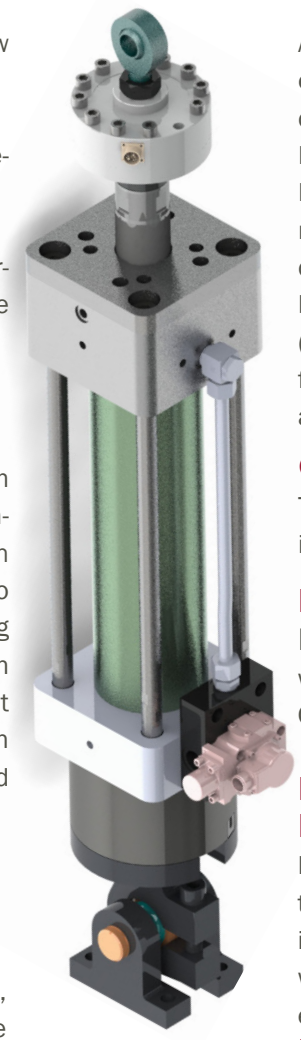
Designed for easy maintenance with rod-end bearings and wiper seals that can be replaced in the field without disassembling the entire actuator

HYDRAULIC FITTINGS AND ADAPTERS

All hydraulic fittings and adapters are made from 304-grade stainless steel. The hydraulic interconnection tube between the extension and retraction ports is designed with sufficient wall thickness to withstand proof pressure (1.5 times the working pressure). The assembly features a single length piping with a swivel nut fitting at the retraction port connection, designed without a banjo bolt and with a direct connection to the servo valve manifold block.

ACTUATOR BASE (REAR END CAP) MOUNTING STYLE

Clevis assembly with spherical bearing rod eye end, offering a tilt angle upto ±18° and a swivel angle of ±90°. The detachable clevis bracket allows for easy mounting to the test structure without disrupting the tie rods during maintenance.



MATERIALS OF CONSTRUCTION

Cylinder Body

Cold-drawn seamless honed carbon steel tube.

Front (Rod End) and

Rear Cylinder Head (End Cap)

Made from high-strength alloy steel.

Tie Rods

Alloy steel, preloaded to exceed the actuator's rated load capacity, ensuring durability under fatigue conditions.

Piston and Piston Rod

Fabricated from hardened alloy steel to withstand rated loads. The piston rod surface is either hard chrome plated (HCP) or coated with tungsten carbide, featuring a micro-hardness of 600-746 HV (0.1) and a minimum thickness of 50µm. The surface is micro-ground and super-polished to achieve a surface roughness value of Ra 0.1-0.3µm.

COATING AND PAINTING

The actuator body is coated in jet black or customized to customer specifications.

PISTON ROD END THREADING

Integral male or female thread (Metric Standard) with spanner flats for easy load cell attachment or C-spanner accommodation.

PISTON ROD END INTERFACING WITH LOAD CELL

Eye end with spherical ball bearing (as per customer drawings post-order). The eye end assembly is attached to the load cell with a stud and spiral washers, preloaded with torque. The eye end is nickel-plated for enhanced durability.

LIFTING ARRANGEMENTS

The actuator body is equipped with threaded holes to accommodate lifting hooks for safe and convenient handling.

MANIFOLD (SERVO VALVE INSTALLATION)

Constructed from corrosion-resistant steel (GGG40 / EN 8 or equivalent) with EN plating. The manifold is mounted on the actuator body and is designed to accommodate the servo valve. It features a ¼" Minimess coupling for pressure verification and air bleeding, along with provisions for external pilot control oil supply.

LOAD CELL ADAPTATION

Assembled to the piston rod end with an interface stud and a pair of spiral washers preloaded with torque, or using preloading plates as required.

SPECIFICATIONS

Model Number	Force Rating, kN	Total Stroke, mm
AC-02-1110	10	Up to 500 mm
AC-02-1125	25	Up to 750 mm
AC-02-1150	50	Up to 750 mm
AC-02-1210	100	Up to 750 mm
AC-02-1215	150	Up to 750 mm
AC-02-1225	250	Up to 750 mm
AC-02-1250	500	Up to 750 mm

Note: Indicated tension force rating is lower than the compression force rating.

SWIVEL DETAILS

Model Number	Capacity, kN	Tilt Angle (α)	Swivel Angle (β)
AC-0-0701	10	±18^0	±90^0
AC-0-0702	25		
AC-0-0705	50		
AC-0-0710	100		
AC-0-0730	300	±17^0	
AC-0-0750	500	±6.5^0	

GENERAL

Operating frequency	Up to 5Hz
Force rating	Up to 1000 kN
Stroke range	Up to 1000mm
Maximum Operating Pressure	210 bar / 3000 psi
Pilot Pressure	210 bar / 3000 psi
Operating Fluid	Hydraulic Oil, Grade ISOVG-46, with a viscosity index of 95 to 98.
Fluid Operating Temperature Range	+25°C to +50°C
Fluid Cleanliness Requirement	ISO 4406 (18/15/12), equivalent to NAS Class 6
System Operating Environment Temperature	Ambient temperature ranging from +20°C to +40°C
Actuator Test Pressure (Proof Pressure)	310 bar

*Images are for reference purposes only.

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