

**Servohydraulic
Test Cylinders
Series EPZ**



Basic Information

For reproducible loading of samples and components suitable high-precision actuators must be used. Especially for heavy loads, servo-hydraulic technology offers great flexibility and a clear cost benefit. For many years FORM+TEST has specialized in the production of different servo-hydraulic test cylinders. These can be operated as single test cylinders on a clamping field/clamping plate or in combination with a test frame/test portal.

Our test cylinders are specially designed and matched to the respective static and dynamic tasks in material and component testing. This guarantees the best possible performance, accuracy and durability.

In addition to the test cylinders, FORM+TEST can also offer you complete solutions with digital controller, test frame/test portal, clamping fields, clamping plates and other necessary components.

Due to the high vertical range of manufacture at FORM+TEST, a long service life and production quality is guaranteed. Convince yourself of our know-how in our production in Riedlingen - typically Swabian with passion for quality and innovation.

If you have any questions, please contact us or our representatives.



Single Test Cylinders of the Series EPZ-D

The differential cylinders of the EPZ-D series are equipped with friction-optimized slide bearings and are double-acting. They offer a high cost-benefit advantage for quasistatic and slow dynamic loads. The design of the cylinders is particularly low-maintenance. Stroke and test force can be adjusted according to the requirements of the testing task.



Advantages & Features:

- low friction
- compact design and low weight
- integrated distance measuring system
- compatible with common force transducers and servo valves
- common connecting dimensions for use in existing test frames

Summary of Important Points:

- test forces of 5 - 10,000 kN
- system pressure 210 or 280 bar
- standard stroke lengths 50/100/150/250/400 mm
- especially suitable for applications up to 5 Hz test frequency and amplitudes greater than 1 mm
- customized special cylinders on request

Single Test Cylinders of the Series EPZ-H

If high dynamics are required during testing or if the amplitudes during testing are very small, then a plain bearing must be omitted. At high piston speeds, the sliding seal shows high mechanical wear and can also be damaged more quickly by high friction temperatures. At small amplitudes, the danger of seal buckling is high, which means that no relative movement takes place directly at the contact surface and the control quality of the system can be influenced. In these cases the friction in the bearing must be reduced. This can be achieved by a hydrostatic oil bearing. In addition, hydrostatically bedded cylinders can be loaded with high lateral forces.

FORM+TEST also offers a cylinder series for this application from own construction and production. In addition to the defined standard sizes, the cylinders can be customized in stroke and max. load. In combination with the hydraulic power units, high-quality servo valves and our own machines, the test cylinders enable the highest quality of control. The main reason for the extraordinary design is that the EPZ-H cylinders usually do not require a leakage oil pump, which makes operation very reliable and efficient.

Advantages & Features:

- high test frequency
- frictionless due to hydrostatic bearing
- almost wear-free
- can be loaded with high shear forces
- integrated distance measuring system
- compatible with common force transducers and servo valves
- common connecting dimensions for use in existing test frames

Summary of Important Points:

- test forces of 5 - 10,000 kN
- system pressure 210 or 280 bar
- standard stroke lengths 50/100/150/250/400 mm
- test frequencies up to 200 Hz and piston speeds > 10 m/s
- customized special cylinders on request

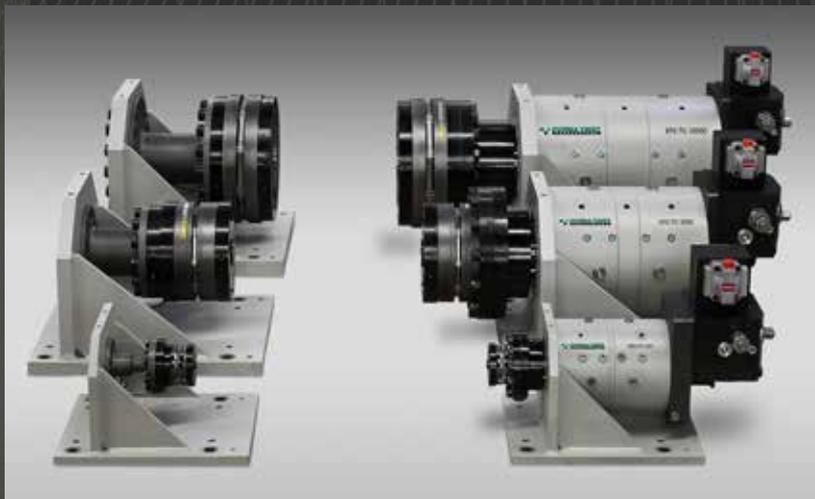


Torsion Drives of the Series EPZ-TH

With the EPZ-TH series, FORM+TEST develops and builds high-precision and high-quality hydraulic rotary actuators. Due to the rotary wing principle the rotary actuators are backlash-free. They also offer high replay accuracy and very finely adjustable torques or angles of rotation.

The special design ensures that a stable oil film is built up between the moving components even before the test begins. In this way accelerated friction wear can be avoided. In addition, the oil film of the hydrostatic bearing allows highest test frequencies. It prevents a stick-slip effect, especially when the direction of rotation changes rapidly.

Axial or radial additional loads for different applications are no problem for the torsion cylinders. This also enables their use in combined test structures and tension-torsion drives. The head plates can be equipped with different connecting flanges.



Advantages & Features:

- backlash-free drive
- frictionless due to hydrostatic bearing
- flexible combination possibilities

Summary of Important Points:

- nominal torque of 250 - 32,000 Nm
- rotation angle +/- 50°
- system pressure 280 bar
- customized special cylinders on request



Combined Tension-Torsion-Drive of the EPZ-HT Series

Suitable tests are necessary to describe the material and component behaviour under multi-axial loading. A combination of linear loading and torsion can be used for this purpose.

The FORM+TEST product portfolio includes both types of cylinders, so that they can be used in combination in one test rig. The use of hydrostatic bearings offers high dynamics with hardly any wear.

Linear and torsion cylinders are connected to each other in a common longitudinal axis almost without play via a special coupling joint.

With a suitable multi-channel controller, both load components can be controlled completely independently of each other. Applying this, the material behaviour under complex, phase-shifted stress can be represented.

Thus, FORM+TEST's tension-torsion system offers the possibility to improve the design of components subjected to complex stresses in order to increase their operational reliability and at the same time to optimize important design tools.



Advantages & Features:

- low wear and tear
- high power density
- flexible variation possibilities

Summary of Important Points:

- test forces of 5 - 10,000 kN
- nominal torque max. 20,000 Nm
- rotation angle +/- 50°
- system pressure 280 bar
- standard stroke lengths 50/100/150/250/400 mm
- customized special cylinders on request
- customized configurations on request

Repair and Maintenance

Extreme forces regularly act on hydraulic cylinders. In the worst case this leads to wear. Machines do not run accurately because they are damaged. This endangers the entire application process. Often a repair is an inexpensive way, since the test cylinder is then fully functional and as good as new again.

A competent revision by FORM+TEST

- improves the measurement results
- stabilizes the processes and minimizes the risk of failure
- increases the performance
- keeps machine downtime to a minimum
- meets all current requirements for test engineering and testing

We have the know-how to recondition hydraulic cylinders of all makes to give them their full performance effectively and cost-efficiently.

FORM+TEST offers:

- manufacturer-independent repairs and overhauls of all cylinder types up to 10 MN
- preventive repair of cylinders from all manufacturers
- component repair and renewal
- complete technical production processing from one source
- maintenance and service
- construction of cylinders according to customer specifications

Procedure for Repairs:

- damage analysis
- statement of costs
- determination and documentation of dimensions
- change of seal set and standard parts
- assembly, flushing process and function test
- measurement protocol

Optional:

- re-chrome pistons and grind them to a perfect fit
- honing works
- refinish guides

The complete repair process is carried out in our own production. In order to ensure that new cylinders or cylinders reworked by us can be used for as long as possible, please ask for our professional service for your components.



The logo for FORM+TEST PRÜFSYSTEME features a stylized green and black graphic on the left, followed by the text "FORM+TEST" in a bold, green, sans-serif font, and "PRÜFSYSTEME" in a bold, black, sans-serif font below it.

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