

## KASON FTN3000 Electro-hydraulic Servo Torsion Fatigue Testing Machine



### 1. Introduction:

The development of this series of testing machines draws on the development and manufacturing experience of internationally renowned electro-hydraulic servo dynamic testing machine companies, adopts the development concept of "unitization, modularization, and standardization", and the key units and key supporting components of the electro-hydraulic servo dynamic testing machine are selected from well-known international and domestic brands of similar products. The stability and reliability of the system are greatly improved. The key units and components of the system are manufactured using today's internationally advanced technology, and the overall performance of the entire test system is comparable to the technical level of products from internationally renowned dynamic testing machine companies. This testing machine is mainly used for dynamic torsional fatigue and static mechanical tests of materials and shaft parts.

## 2. Solution description:

KASON-FTN3000 electro-hydraulic servo torsion fatigue testing machine is mainly composed of mainframe, 3000Nm servo swing actuator, 20 L/min series constant pressure servo pump, full digital single channel servo controller and related test software, other necessary accessories, etc. The basic working principle of the system is shown in Figure 1, and the system control block diagram is shown in Figure 2.

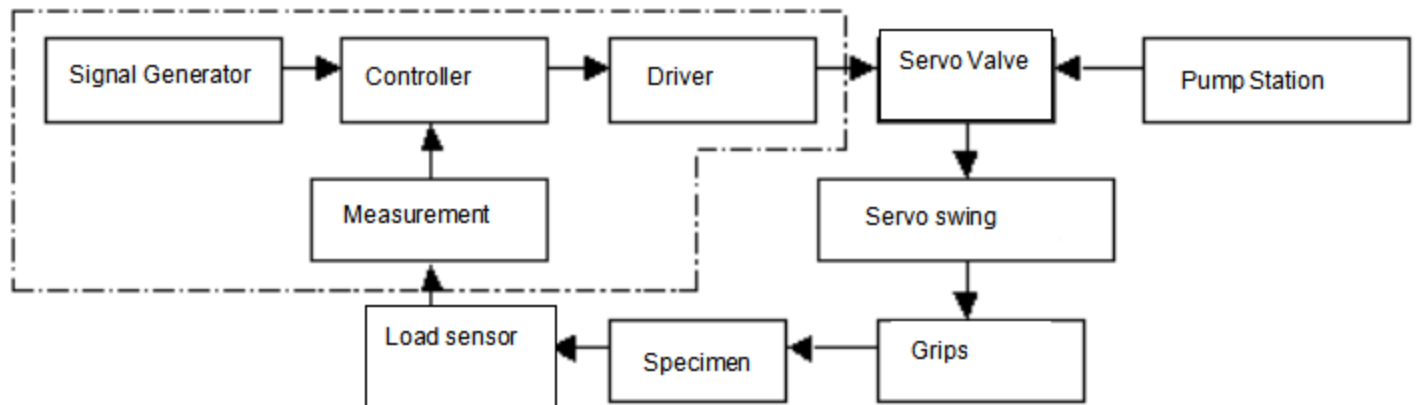


Figure 1 Basic principle diagram of the system working

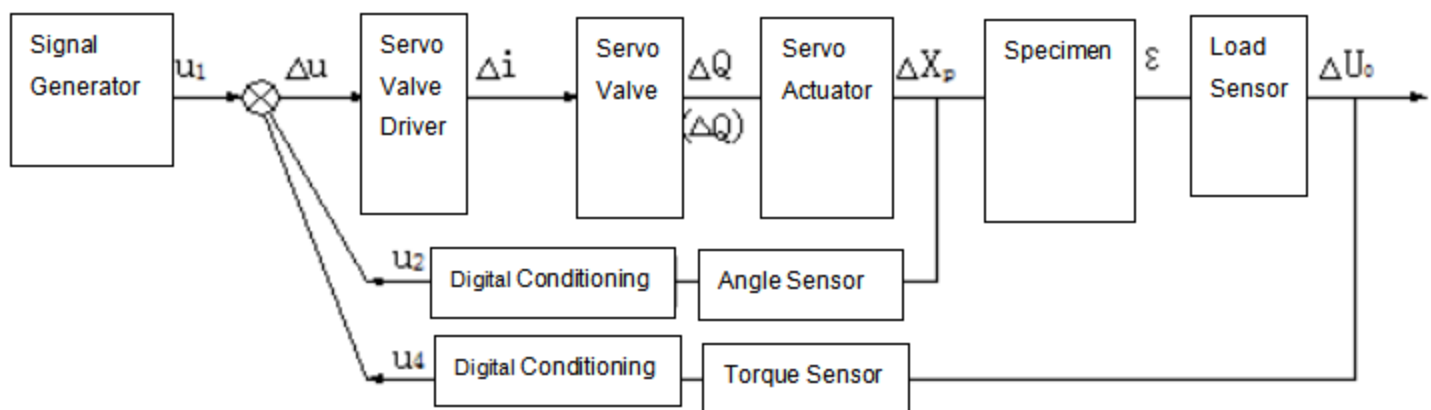


Figure 2 System control block diagram

**2.1 Main machine:** The main machine is a table-type horizontal structure. The servo swing actuator is installed at one end of the flat plate and the tail stock is installed at the other end. The tail stock can be adjusted forward and backward along the T-slot on the flat plate to complete the test of samples of different lengths.

**2.1.1** The test table is made of steel plate.

**2.1.2** The tail stock base plate is installed on the T-slot on the main machine platform. The tailstock can move along the T-slot to adjust the test space to adapt to the test of specimens of different sizes. After the test space adjustment is completed, the tail stock is rigidly fixed to the main

machine platform with T-bolts.

**2.1.3** The torque sensor is installed on the tail frame and is a product of the domestic Aerospace 701 Research Institute.

**2.2** Servo swing actuator: A new type of servo swing actuator designed and manufactured with a new concept.

**2.2.1** The unitized, standardized and modularized servo swing actuator has the characteristics of low damping, high response, long life and large gap design. The design concept is similar to MTS Series 215 & 216 Rotary Actuators.

Completely equivalent.

**2.2.2** The sealing elements of the servo swing actuator are all imported high-speed sealing elements specially used for servo actuators from Germany.

**2.2.3** The support of the piston rod of the servo swing actuator breaks the traditional design and adopts non-metallic support and large gap design, which has the characteristics of high-speed non-sintering and self-lubrication.

**2.2.4** A hydraulic buffer is designed at the amplitude limit position of the servo swing actuator to avoid damage caused by uncontrolled operation.

**2.2.5** The servo swing actuator is elastically supported by multiple layers of elastic steel sheets stacked together on both sides to avoid damage to the servo swing actuator from axial deformation of the specimen during the test.

**2.2.6** Equipped with the special servo valve HY130-30 (flow rate is 17L/min at 7Mpa) of Xiangfan Aerospace Company's high response test machine.

**2.2.7** Configure domestic photoelectric encoder to measure the rotation angle.

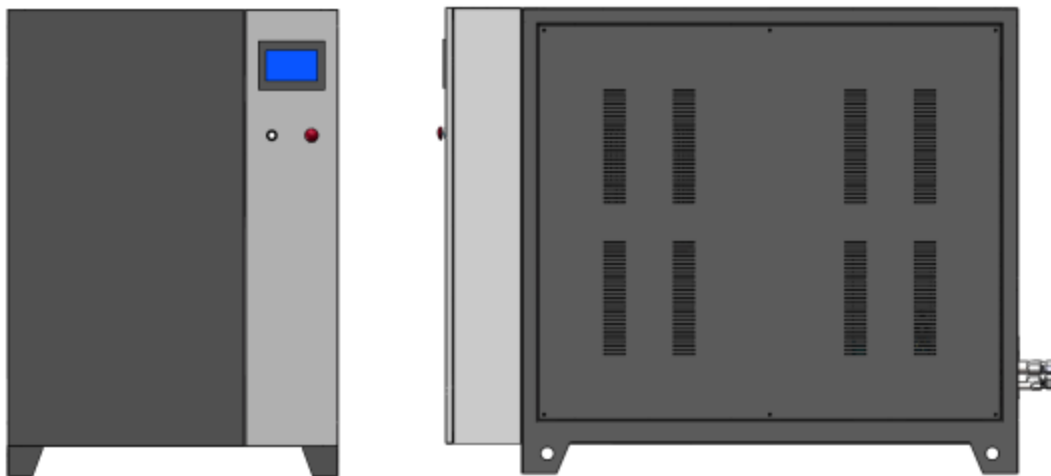
**2.2.8** The rotating shaft and transition coupling plate adopt a unique connection method to further improve the dynamic response performance.

**2.2.9** has two closed loops: torque and angle.

### **2.3 Constant pressure servo power source.**

- The pumping station is a standardized pumping station with modular design, good scalability and flexible use.
- Total flow rate 20 L/min, pressure 21Mpa. (Adjust according to experimental requirements)
- Total power 5.5 kW, 380V, three phase, 50hz, AC.

- The pump station is manufactured according to standard modular design, with mature technology and stable performance; it is equipped with a relay voltage stabilizing module and connected to the actuator.
- The pump station consists of oil pump, motor, high and low pressure switching valve group, accumulator, oil filter, oil tank, pipeline system, etc.
- The filtration system adopts three-stage filtration: oil pump suction port, 100 $\mu$ ; oil source outlet, filtration accuracy 3 $\mu$ ; relay voltage stabilization module, filtration accuracy 3 $\mu$ .
- The oil pump uses the German Rexroth intelligent variable displacement pump, which has low noise, intelligent variable displacement, excellent durability and long life;
- A high- and low-pressure switching valve group is used to start and stop the hydraulic system.
- Fully enclosed standard servo oil tank, the oil tank capacity is not less than 220L ; with functions such as temperature measurement, air filtration, and oil level display;



## 2.4 Fully digital single-channel servo control system

The controller uses the most popular and advanced digital signal processing (DSP) technology in the current control field. The command signal and control signal are all generated by high-speed DSP digital operations, thereby improving the reliability and repeatability of the system. Since the DSP digital technology was introduced into China, it has completely replaced the single-chip microcomputer, avoiding the shortcomings of the single-chip microcomputer technology being outdated, slow in operation speed, poor stability, and low reliability. The DSP and the computer communicate through the ISA bus, with a maximum sampling rate of 5000 times/second. The computer collects test data in real time through interruption.

- The key components of the signal measurement part are all designed with the latest high-performance analog components of American AD Company ( ANALOG DEVICE ), with a very high data acquisition and control frequency that can reach 5 KHz .
- Test frequency: 0.01- 20 Hz;
- Test waveform: sine wave, square wave, triangle wave, ramp wave;
- With amplitude stabilization and PIDF control functions;
- The test software runs in WinXP environment and supports single-core and dual-core industrial control computers such as Advantech, EVOC, and North China Industrial Control.

### **2.5 Other configurations and necessary accessories:**

2.5.1 All hydraulic pipe fittings and high-pressure hoses are imported products from Parker PARK of the United States (the standard configuration of the high-pressure hose from the constant-pressure servo pump station to the actuator is 5 meters) to ensure that there is no oil leakage in the entire system and the test environment is clean.

2.5.2 Design and process a set of test connectors according to the test piece drawings provided by the equipment purchaser.

2.5.3 Accessories for flushing the pump station and actuator are provided to facilitate users to regularly replace the hydraulic oil and clean the hydraulic system.

2.5.4 Two precision oil filter elements are provided free of charge to facilitate users to regularly replace the hydraulic oil and clean the hydraulic system.

2.5.5 Configure Advantech or EVOC industrial computer.

2.5.6 Configure 500VA UPS power supply.

### **3. Main technical performance indicators:**

3.1 Maximum torque:  **$\pm 3\ 000\ \text{Nm}$**  , with an accuracy of no more than  $\pm 1\%$  within the range of 5 %—100% FS (**200-3000 Nm**) .

3.2 Test frequency range : **0.1-20 Hz** .

3.3 Maximum rotation angle:  $\pm 5\ 5^\circ$  , indication accuracy 1%.

3.4 Maximum speed: **4.0r/min**

3.5 Torque unit: kg-m, Nm, N-cm

3.6 Main test waveforms: sine wave, square wave, triangle wave, ramp wave.

3.7 Maximum test space: **500mm**.

3. 8 has two closed-loop control circuits: angle and torque.

3. 9 With safety stop: it will stop automatically when overload, sample damage, sample deformation or reaching the preset value.

3.10 Test items: fracture test, fatigue test, angle test, stage fracture test, torque wrench test

3. 11 Constant pressure servo pump station specifications: flow rate 20 L/min, pressure 21Mpa, motor power 5.5 kW.

# Why choose us!

## 19 YEARS

Professional focused on testing equipment

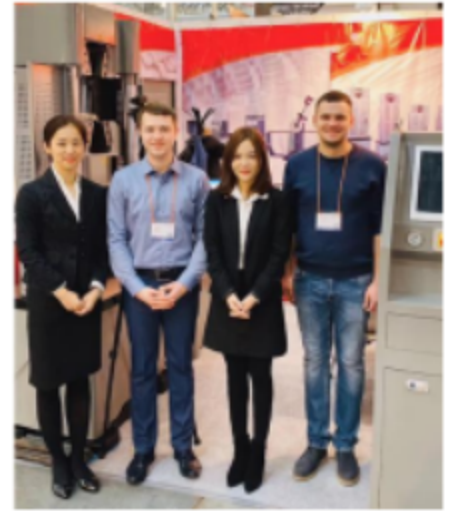
KASON is established in 2003, owns more than 8000 square meters factory, has a professional sales teams, modern enterprise technology center, scientific and technological research and development team.

Machines passed the European CE authentication, American FDA certificate and ISO 9001.

Products sold to USA, Canada, Australia, Europe, Africa etc, more than 130 countries and supply OEM service for many customers

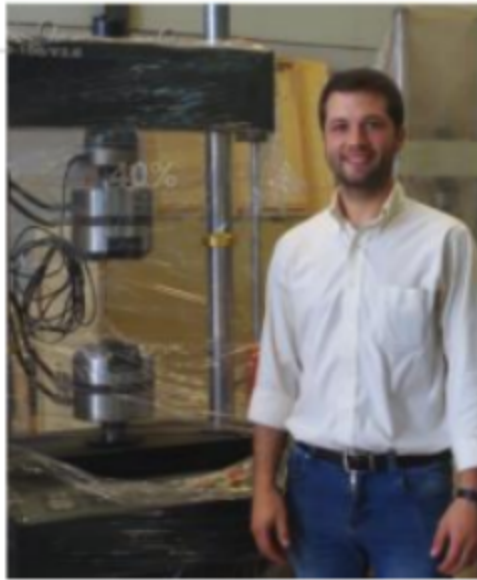
## PROFESSIONAL TEAM

KASON has a professional sales teams, modern enterprise technology center, scientific and technological research and development team.



## OUR CUSTOMERS (more than 130 countries)





## OUR CERTIFICATE (CE / ISO / SGS)



### MACHINERY DIRECTIVE ATESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and audit has been completed successfully.

2006/42/EC Machinery Directive Annex VII has been taken as references for these processes.

**Company Name :** Jinan Kason Testing Equipment Co., Ltd.

**Company Address :** No.4715, Jingshi West Road, Huaiyin District, Jinan, Shandong, China

**Related Directives and Annex :** 2006/42/EC Machinery Directive/Annex VII

**Related Standards :** EN ISO 12100:2010; EN 60204-1:2018

**Product Name :** Testing Machine

**Report No and Date :** TCF-30TE230005-MD

**Product Brand/Model/Type :** WEIS-1, WEIS-2, WEIS-3, WEIS-4, WEIS-5, WEIS-6, WEIS-7, WEIS-8, WEIS-9, WEIS-10, WEIS-11, WEIS-12, WEIS-13, WEIS-14, WEIS-15, WEIS-16, WEIS-17, WEIS-18, WEIS-19, WEIS-20, WEIS-21, WEIS-22, WEIS-23, WEIS-24, WEIS-25, WEIS-26, WEIS-27, WEIS-28, WEIS-29, WEIS-30, WEIS-31, WEIS-32, WEIS-33, WEIS-34, WEIS-35, WEIS-36, WEIS-37, WEIS-38, WEIS-39, WEIS-40, WEIS-41, WEIS-42, WEIS-43, WEIS-44, WEIS-45, WEIS-46, WEIS-47, WEIS-48, WEIS-49, WEIS-50, WEIS-51, WEIS-52, WEIS-53, WEIS-54, WEIS-55, WEIS-56, WEIS-57, WEIS-58, WEIS-59, WEIS-60, WEIS-61, WEIS-62, WEIS-63, WEIS-64, WEIS-65, WEIS-66, WEIS-67, WEIS-68, WEIS-69, WEIS-70, WEIS-71, WEIS-72, WEIS-73, WEIS-74, WEIS-75, WEIS-76, WEIS-77, WEIS-78, WEIS-79, WEIS-80, WEIS-81, WEIS-82, WEIS-83, WEIS-84, WEIS-85, WEIS-86, WEIS-87, WEIS-88, WEIS-89, WEIS-90, WEIS-91, WEIS-92, WEIS-93, WEIS-94, WEIS-95, WEIS-96, WEIS-97, WEIS-98, WEIS-99, WEIS-100, WEIS-101, WEIS-102, WEIS-103, WEIS-104, WEIS-105, WEIS-106, WEIS-107, 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**Certificate Number :** M.2023.206.C86313

**Initial Assessment Date :** 07.06.2023

**Registration Date :** 08.06.2023

**Release Date/No :** -

**Expiry Date :** 07.06.2026



**UDEM International Certification  
Auditing Training Centre Industry  
and Trade Inc. Co.**



The validity of the certificate can be checked through [www.udem.com.cn](http://www.udem.com.cn). Types completion of EC declaration of conformity is based solely on the manufacturer's responsibility. This certificate is issued by the property of UDEM International Certification Auditing Training Centre Industry and Trade Inc. Co. to whom it must be returned upon request. The above named the manufacturer a copy of this certificate for 10 years from the registration of certificate. The certificate only covers the product(s) named above and UDEM must be notified in case of any changes on the product(s).

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E-mail: info@udem.com.tr www.udem.com.tr



中华合格(北京)认证中心  
CSHCC.CN

### Authentication Certificate of Quality Management System

Registration No.19922Q01072R05

This is to certify that

#### Jinan Kason Testing Equipment Co., Ltd.

Unified Social Credit Code: 913701045894939X0  
Registered/Production Address: No. 4715, Jingshi West Road,  
Huaiyin District, Jinan City, Shandong Province

Office Address: Room 2-1108, Harmony Square, Huaiyin District, Jinan City

In conformity with :

### GB/T 19001-2016/ISO 9001:2015

The certificate is valid for the following scope :

Assembly and sales of testing machines

This certificate should be used effectively with the legal requirements of the administrative license, qualification license, compulsory certification, which the certification scope is involved.

In the case that the organization regularly receives surveillance assessments, the certificate shall be valid when used together with the Quick Response Code.


Date of Issue: 2022-07-19

Date of Expiry: 2025-07-19

Date of Initial Certification: 2022-07-19



**General Manager**



INTERNATIONAL  
ASSOCIATION OF  
CERTIFICATION BODIES



中国合格  
评定国家  
管理体系  
认证认可  
监督管理委员会  
CNAS C182-M



China Standard Huaxin (Beijing)  
Certification Center Co., Ltd.

Address of Certification Authority: 7 Floor Yituan Building No.3 Shiqingtan Road, Shiqingtan District, Jinan City, 250049  
Note: The detailed information is available on the Certification and Accreditation Administration of the People's Republic of China official website [www.cnas.gov.cn](http://www.cnas.gov.cn), the authority's website [www.cas.org.cn](http://www.cas.org.cn) and the Quick Response Code on the left.

KASON reserves the right to modify the technical and stetics characteristics included in this document, without previous notice

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