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Dynamic Testing Systems

MODEL

- UD-3600
- UD-3800

- CHOOSE U-CAN ; MAKE YOU CAN -

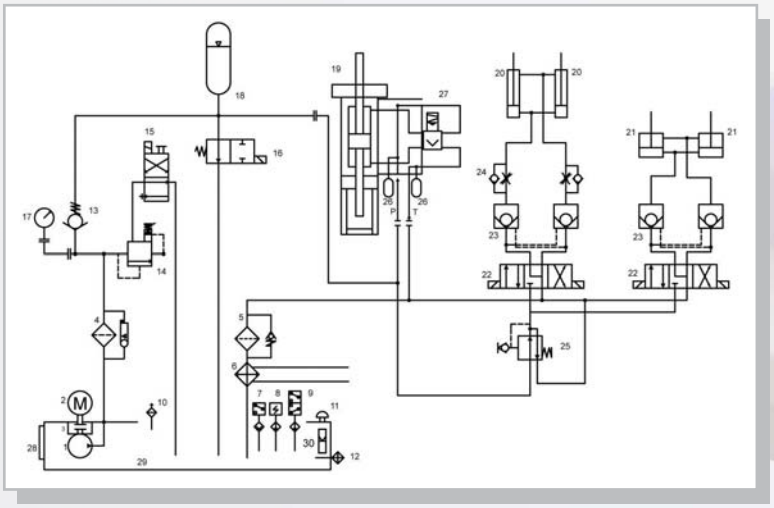
U-CAN Professional Dynamic Testing Systems

- Dynamic Testing Systems are able to test metal, rubber/plastic, and composite material to analyze the material characteristics.
- In addition to adapt multiple test material, also provide with temperature chamber selectable simulating different environment to meet kinds of special conditions.
- Able to customize machine hardware and software function per user's preferences.
- Perform dynamic/static stiffness test, damping coefficient, fatigue test and on-line tests to rubber elastomer, rubber shock-absorber, engine mount, liner, air-spring, etc.

Dynamic Testing System Parts

MOOG Servo Valve

With wideband frequency response, excellent performance in linearity.



Hydraulic System Diagram

The equipment attached with hydraulic system diagram for quick maintenance and troubleshooting.

Test Data Terminology

a. Load Po :
Force which the servo hydraulic cylinder would apply on the test item.

b. Displacement Xo :
Moving length of servo hydraulic cylinder.

c. Damping coefficient C :
During the force servo hydraulic cylinder applied, the value that deformation shift at 90° phase divided by the deformation rate.

d. Loss Angle δ :
Strain and stress, or the phase angle of deformation and load. Its tan value is the correct loss or loss factor.

e. Loss factor Tan δ :
Ratio between loss elasticity and storage elasticity.

f. Storage Spring constant/ Dynamic Spring Constant K' :
Load from the same phase with deformation divided by deformation value.

g. Loss Spring Constant K" :
Load from the deformation shift at 90° phase divided by deformation value.

h. Absolute spring constant K* : $|K^*| = \sqrt{K''^2 + K'^2}$

i. Hysteresis Loop :
A closed curve obtained to explain the continuous stress /strain condition of material cycle deformation.

j. Energy loss :
Unit volume energy loss from one cycle deformation.

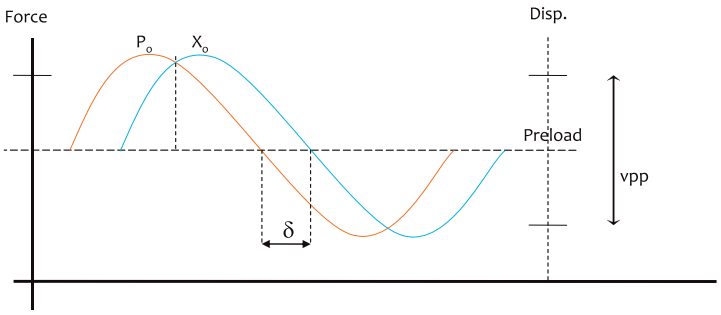
k. Power consumption :
Hysteresis transform to the unit volume power of heat. It is the product of energy and frequency.

l. Modulus :
Young's Modulus, Elasticity Modulus.

Dynamic Curves

Per Single Freq. test, Sweep Freq. test, Static test, Fatigue test, and On-Line test, software provides with corresponding test curves and results.

Dynamic Test Data Calculation :

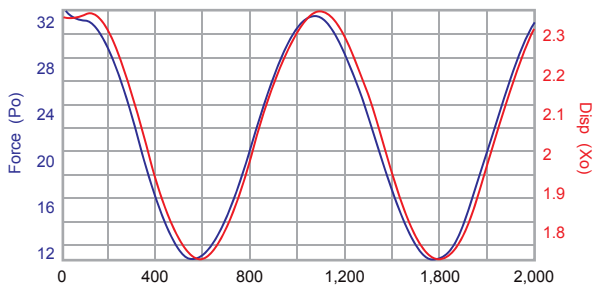


$\delta = \tan^{-1} K''/K'$ $\quad P_o = \text{force} \cdot vpp/2$

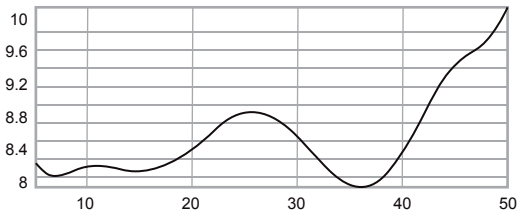
$K' = K^* \cos\delta$ $\quad X_o = \text{Disp.} \cdot vpp/2$

$K'' = K^* \sin\delta$ $\quad K^* = P_o/X_o$

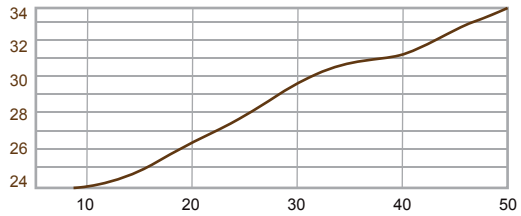
Po/Xo



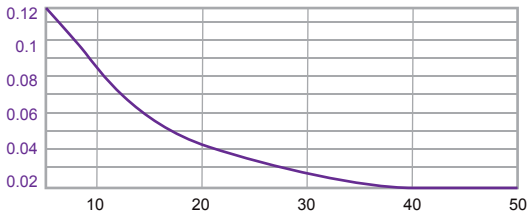
Loss Angle Freq. Response Phase (deg)



Spring Modulus Freq. Response Frequency K* (N/mm)



Damping Coef. Freq. Response C (NS/mm)



Grips

Engine Cushion grip

Engine Support grip

Connecting Rod grip

Bushing grip

Pliers grip

Test Samples

Shock-absorber

Transmission

Shock-absorber

Engine

Engine

Rubber Boots

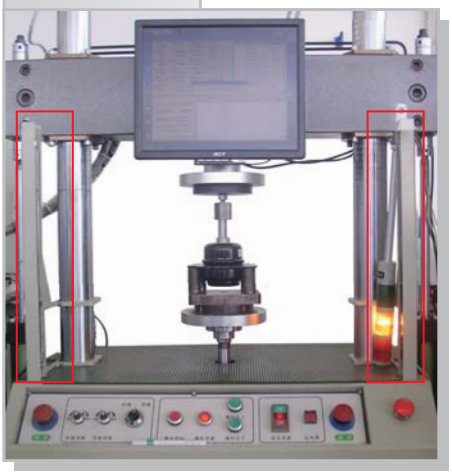
Optional-hardware Function

4 Column 20 tons Dynamic Testing Systems

4 Column 20 tons Dynamic Testing Systems

Enhanced structural stiffness on 20 tons Dynamic Testing Systems, use 4 high stiffness support column working with hydraulic system enables crosshead movement freely and its unclamping interlock be able to sustain 20 tons dynamic movement.

Safety Grating



Safety Grating

With optional grating, it is able to enhance operator's safety.

Specifications:

Dynamic testing systems consists of one main testing unit, one unit of servo hydraulic power package, and one unit of control and data analysis unit with 1GB compatible computer and colour jet printer.

A. Frame Structure of main testing unit

a. Crosshead moveable range : 500 mm
b. The upper crosshead is fitted with hydraulic power unclamping interlock.
c. Crosshead stiffness : ≧380 KN/mm.

B. Electro-Hydraulic Servo Actuator

a. Capacity : 1,000 kgf（10 KN）, or discretionary at user's pleasure.
b. Cylinder : ±50 mm, or discretionary at user's pleasure.
c. Frequency : 0.05~100 Hz
d. Display resolution : 0.001 mm
e. Servo-Valve :
   (1) Rated flowrate : 38 L/min
   (2) Rated pressure : 210 Kg/c㎡（21 MPA）
   (3) Band width : ≧100 Hz
f. Displacement Sensor : LVDT（LVDT-Built-In）
   (1) DC Type
   (2) Non-linearity : 0.25% F.S.
   (3) Stroke : 100 mm
g. Loadcell :
   (1) Fatigue type loadcell
   (2) Capacity : 1,000 kgf（10 KN）
   (3) Calibration error : ±1%

C. Power Package

a. Motor : 15 Hp, AC220V / 380V, 3 phase.
b. Pump :
   (1) Pressure : 210 Kg/c㎡
   (2) Flow : 45 L/min
c. Oil Filter : 5 μm
d. Provide over heated protection and alarm for shortage of oil.
e. Accumulator : Pressure end 1L and servo-valve 1L.
f. Cooler : 1 set of water/air dual cyclical cooler.

D. Grip

1 set of standard grip.

E. Data Acquisition System

a. Load cell amplification : 10 times, 5 times, 2 times, 1 times. It is tunable by operator.
b. A/D Converter
   (1) Resolution : 16 Bits
   (2) Non-Linearity : 3 LSB
   (3) Bandwidth : 200 KHz
c. D/A Converter
   (1) Resolution : 16 Bits
   (2) Non-Linearity : 3 LSB
   (3) Bandwidth : 25 KHz
d. Operation system : Windows XP

F. Software Functions

a. Test functions :
   (1) Dynamic test（Single Frequency Test, Sweep Frequency Test）
   (2) Static test
   (3) Fatigue test
   (4) On-Line test
b. Test results can be measured and analyzed in real-time.
c. Provide upper/lower limit setting, software would judge the result as GO or NG automatically.
d. Flexible test flow edit by operator.

G. Test Waveform

Standard :
a. Sine wave
b. Triangular wave
c. Square wave

Optional :
a. Positive wave
b. Negative wave
c. Sawtooth wave
d. Trapezoidal wave

H. Database

a. Provide test sequence management.
b. Peak value real-time display.
c. Real-Time Display following diagrams :
   (1) Force v.s. Time Diagram
   (2) Displacement v.s. Time Diagram
   (3) Force v.s. Displacement v.s. Time Diagram
d. Time interval limit control
e. Data Storage : Automatically storage test data and diagram.
f. Test Report Editor
g. Data analysis
h. Data storage : Automatic in-time data storage, max capacity for 4000 waveforms.

Specifications:

Fatigue tester consists of one main testing unit, one unit of servo hydraulic power package, and one unit of control and data analysis unit with 1GB compatible computer and colour jet printer.

A. Frame Structure of main testing unit

a. Crosshead moveable range : 500 mm
b. The upper crosshead is fitted with hydraulic power unclamping interlock.
c. Crosshead stiffness : ≧380 KN/mm.

B. Electro-Hydraulic Servo Actuator

a. Capacity : 1,000 kgf（10 KN）
b. Cylinder : ±50 mm
c. Test frequency : 1~20 Hz
d. Display resolution : 0.001 mm
e. Servo-Valve :
(1) Rated flowrate : 19 L/min
(2) Rated pressure : 190 Kg/c㎡（19 MPA）
(3) Band width : ≧100 Hz
f. Displacement Sensor : LVDT（LVDT-Built-In）
(1) DC Type.
(2) Non-linearity : 0.5% F.S.
(3) Stroke : 100 mm
g. Loadcell
(1) Fatigue type loadcell
(2) Capacity : 1,000 kgf（10 KN）
(3) Calibration error : ±1%.

C. Power Package

a. Motor : 10 Hp, AC220V / 380V, 3 phase.
b. Pump :
(1) Pressure : 210 Kg/c㎡
(2) Flow : 19 L/min
c. Oil Filter : 5 μm
d. Provide over heated protection and alarm for shortage of oil.
e. Accumulator : Pressure end 1L and servo-valve 1L.
f. Cooler : 1 set of water/air dual cyclical cooler.

D. Grip

1 set of standard grip.

E. Data Acquisition System

a. Load cell amplification : 10 times, 5 times, 2 times, 1 times. It is tunable by operator.
b. A/D Converter
(1) Resolution : 16 Bits
(2) Non-Linearity : 3 LSB
(3) Bandwidth : 200 KHz
c. D/A Converter
(1) Resolution : 16 Bits
(2) Non-Linearity : 3 LSB
(3) Bandwidth : 25 KHz
d. Operation system : Windows XP

F. Software Functions

a. Test functions : Fatigue test
b. Test results can be measured and analyzed in real-time.
c. Provide upper/lower limit setting, software would judge the result as GO or NG automatically.

G. Test Waveform

Standard :
a. Sine wave
b. Triangular wave
c. Square wave

Optional :
a. Positive wave
b. Negative wave
c. Sawtooth wave
d. Trapezoidal wave

H. Database

a. Provide test sequence management.
b. Peak value real-time display.
c. Setup data storage method.

Dynamic Testing Systems

Main Unit

Control and Data Analysis Unit

Hydraulic Power Package

U-CAN

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