

Changsha Fanli Edusupports Co.,Limited

Add:No.137, Yuelu Street, Changsha City, 410000, Hunan, China

Tel: 0086-731-82201784 Fax: 0086-731-82201784

Email:sales@edusupports.com Web:<https://www.edusupports.com/>

Electro-hydraulic Proportional, Servo and Control System Trainer

PN:0401060030

Electro-hydraulic Proportional,Servo Test and Control System Trainer

Features

This Electro-hydraulic Proportional,Servo Test and Control System Trainer is a professional platform for experiments of electro-hydraulic, hydraulic application, hydraulic control, electro-hydraulic servo position control system, electro-hydraulic proportional system, hydraulic pump and valve performance test, and hydraulic curriculum design.This trainer is composed by hydraulic pump station, electro-hydraulic servo valves and common proportional valves, typically proportional electro-hydraulic servo control system, test instruments and sensors, data acquisition system, computer test and control software,etc.This bench can meet requirements of the universities for teaching advanced electro-hydraulic control.

Electro-hydraulic Proportional,Servo Test and Control System Trainer

Performance

1. Electro-hydraulic Proportional,Servo Test and Control System Trainer can test the performance of electro-hydraulic servo valves,proportional valves.This trainer can meet the high precision requirement for teaching,research and industrial test.
2. Computer-control electro-hydraulic servo proportional system.
3. to understand and do experiments of control method and algorithm applied to electro-hydraulic proportional servo control system,including,PID controller, state feedback controller, PID controller, fuzzy controller and single neuron

adaptive controller, etc.

Electro-hydraulic Proportional, Servo Test and Control System Trainer

Typical Training Contents

Part A Valve Static and Dynamic Performance Test

Section One Valve Static Performance Test

Static characteristic test for electro-hydraulic servo valve, proportional directional flow valve and servo proportional valve, including no load flow characteristics, pressure gain, constant pressure drop flow characteristics, internal leakage, output flow-load differential pressure (valve pressure drop), throttle regulating characteristics, threshold and resolution, bias and so on.

1.1 Flow characteristics test of electro-hydraulic servo valve under constant load

1.1.1 Test the output flow-valve current characteristic curve under constant valve pressure drop.

1.1.2 The main characteristic parameter test of the servo valve: rated flow, flow gain, linearity, hysteresis, symmetry.

1.2 Servo valve pressure characteristics test

1.2.1 Test servo valve pressure gain-valve current characteristic curve.

1.2.2 The main characteristic parameter test of the servo valve: pressure gain.

1.3 Servo valve inner leakage characteristics

1.3.1 Test servo valve inner leakage-valve current characteristic curve

1.3.2. Measure the main characteristic parameters of servo valve: internal leakage (pre-stage and power stage)

1.4 Servo valve output flow - load pressure characteristics test

1.4.1 Test servo valve output flow-load difference pressure

1.4.2 Test output flow-valve pressure drop characteristics

1.5 Servo valve throttle characteristics test

1.5.1 Test each valve port flow characteristics of servo valve's main spool,

1.5.2 Obtain $P \rightarrow A$ $A \rightarrow T$ $P \rightarrow B$ $B \rightarrow T$ flow-valve current curves

1.6 Servo valve resolution characteristics test

1.6.1 Test servo response sensitivity valve to slight positive input current

1.6.2 Measure the main characteristic parameters of servo valve: resolution

1.7 Servo valve threshold characteristics test

- 1.7.1. Test servo response sensitivity valve to slight reverse input current
- 1.7.2. Measure the main characteristic parameters of servo valve: threshold

1.8 Servo valve transient response test

- 1.8.1 Test servo valve response curve to step input signal
- 1.8.2. Measure the main characteristics parameter of servo valve: response time

Section Two Valve Dynamic Performance Test

Dynamic characteristics test of electro-hydraulic servo valve,proportional valve and servo proportional valve,that is, frequency response (amplitude-frequency characteristics and phase-frequency characteristics),transient response, etc.

1.1 Electro-hydraulic proportional relief valve characteristic test

- 1.1.1 No load flow and input current (or heart valve opening degree)
- 1.1.2 Frequency response
- 1.1.3 Transient response

1.2 Electro-hydraulic proportional speed regulated valve performance test

- 1.2.1 Flow characteristics
- 1.2.2 Frequency response
- 1.2.3 Transient response

1.3 Electro-hydraulic proportional pressure/flow complex valve(PQ valve)characteristics test

- 1.3.1 Flow characteristics (bidirectional flow)
- 1.3.2 Frequency response
- 1.3.3 Transient response

Part B System Control Characteristics Experiment

1.Electro-hydraulic proportional force control system performance test(valve control cylinder)

- 1.1 Open-loop and closed-loop control performance comparison
- 1.2 Step response characteristics (rise time, peak time, adjustment time, overshoot,steady-state error,etc.)
- 1.3 System parameter changes on the dynamic performance

2. Electro-hydraulic proportional position control system performance test (valve control cylinder)

2.1 Step response characteristics (rise time, peak time, adjustment time, overshoot, steady-state error, etc.)

2.2 System parameter changes on the dynamic performance

3. Electro-hydraulic proportional speed control system performance test (valve control motor)

3.1 Open-loop and closed-loop control performance comparison

3.2 Step response characteristics (rise time, peak time, adjustment time, overshoot, steady-state error, etc.)

3.3 System parameter changes on the dynamic performance

4. Electro-hydraulic servo force control system dynamic performance test (valve control cylinder)

4.1 Frequency response characteristics (system Bode plot-logarithmic amplitude-frequency characteristics and phase-frequency characteristics)

4.2 Step response characteristics (rise time, peak time, adjustment time, overshoot, steady-state error, etc.)

4.3 System parameter changes on the dynamic performance.

5. Electro-hydraulic servo position control system dynamic performance test (valve control cylinder)

5.1 Frequency response characteristics (system Bode plot-logarithmic amplitude-frequency characteristics and phase-frequency characteristics)

5.2 Step response characteristics (rise time, peak time, adjustment time, overshoot, steady-state error, etc.)

5.3 System parameter changes on the dynamic performance.

6. Electro-hydraulic servo speed control system dynamic performance test (Servo Motor)

6.1 Frequency response characteristics (system Bode plot-logarithmic amplitude-frequency characteristics and phase-frequency characteristics)

6.2 Step response characteristics (rise time, peak time, adjustment time, overshoot, steady-state error, etc.)

6.3 System parameter changes on the dynamic performance.

Part C System Control Method Experiments

1. Classic digital PID control experiment

1.1 PID control parameters on the dynamic performance of the system

1.2 The structure in the form of a combination of the PID controller

1.3 Integral separated PID controller;

2. State feedback controller experiment

2.1 Design of the structure and the feedback factor of state feedback controller

2.2 System dynamics performance

3. Intelligent PID controller experiment

3.1 Adaptive PID controller structure, and parameter optimization design

3.2 System dynamics performance, etc;

4. Fuzzy controller experiment

4.1 Fuzzy controller structure and parameter optimization design

4.2 System dynamics performance, etc;

5. Single neuron adaptive controller experiment

5.1 Single neuron adaptive controller structure

5.2 To learn algorithm

5.3 Parameter optimization design

5.4 System dynamics performance