

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 and Servo Control System

Trainer

PN:0401060020

Electro-hydraulic Proportional and Servo Control System Trainer

Features

This electro-hydraulic proportional and servo control system trainer is a professional platform for experiments of electro-hydraulic, hydraulic application, hydraulic control, electro-hydraulic servo control system, electro-hydraulic proportional system, hydraulic pump, valve performance test and hydraulic curriculum design. It is suitable for students, scholars, experts, engineering and technical personnel in hydraulic to build their own multi-unit integrated design experiments of hydraulic transmission, computer-aided testing system, programmable control system and computer control system in colleges and vocational schools with a variety of hydraulic components modules and programmable controller module. It can meet the teaching of the hydraulic disciplines for teaching and training of:

1. PLC control experiment: machine-electric-hydraulic integrated control experiments.
2. The performance test of hydraulic pump and valves.
3. The performance test of electro-hydraulic proportional valve and electro-hydraulic servo valve
4. Design experiments of computer-controlled electro-hydraulic proportional position control system..
5. To understand the composition, working principle and calibration methods of electro-hydraulic servo position control system and the control characteristics of the electro-hydraulic proportional valve/servo valve

6. The electro-hydraulic proportional hydraulic motor speed control experiment.

Electro-hydraulic Proportional and Servo Control System Trainer

Perference

1. The hydraulic components are industrial-grade with high reliability. High precision, the position control accuracy of proportional reversing valve can reach 0.1mm.

2. The system use a multi-stage accumulator for shock absorbing, and fluctuating of oil source is less than 2.5% of the rated pressure, and the pressure of oil-return system is less than 3% of the rated pressure.

5. The hydraulic unit use dual pump system that provide two different pressure and flow simultaneously to meet the requirements of different experiments.

6. The pump station use quantitative vane pump, variable vane pump and accumulator, combined with electrical control unit to automatic (or hand control) control the temperature of the working medium. There are a variety of filters in circuits, and the filter precise control the fluid.

7. The electrical control system is an independent control cabinet with electrical control and electrical operation two sections. there are operation buttons, on the control panel, proportional amplifier, secondary instrument and a PLC interface port. The electrical cabinet is safety and ease of maintenance.

8. Hydraulic pressure source use professional water-cooled or air cooled, and it effectively overcome the impact of high oil temperature effect experimental accuracy.

9. The three-phase power supply module has leakage protection. When earth leakage current exceeds 30mA, the power will cut off. The electric control use DC 24V with over-voltage protection to prevent damage in case malfunction.

10. This trainer has various sensors, including pressure sensor, pull and push force sensor, grating displacement sensor, displacement sensor, temperature sensor, flow sensor, speed sensor, to meet the needs of various experimental parameters test. Mitsubishi programmable controller.

11. It has various control modes: manual control, solenoid control, relay control, PLC control, microcomputer control.

12.The proportional/servo system test unit

This unit is an integrated structure composed by cylinders, modules, and valves to complete servo / proportional system position, force control experiments. The action cylinder and load cylinder or cylinder stopper (pulleys, weights) are all installed on a channel pedestal, removable and interchangeable. Experimenters can simulate actual working conditions for experiments according to different load forms.

Electro-hydraulic Proportional and Servo Control System Trainer

Typical Training Contents

Part A Design experiment of computer-controlled proportional solenoid system/(electromagnetic proportional system) position control system

1. Performance test of proportional valve

1.1 Performance test of proportional valve

1.1.1 Pressure characteristic test device of proportional relief valve;

1.1.2 The physical meaning and test method of the input and output characteristics of proportional relief valve;

1.1.3 Pressure regulating characteristics and test method of proportional relief valve.

1.2 Dynamic characteristics experiment of the proportional relief valve

1.2.1 the dynamic characteristics test device of proportional relief valve

1.2.2 Pressure step response characteristic curve test method of proportional relief valve

1.2.3 The physical meaning and calculation methods for dynamic characteristics parameters of proportional relief valve.

1.3 Flow characteristics of proportional directional control solenoid valve

1.3.1 Flow characteristic test device of proportional directional control solenoid valve;

1.3.2 The physical meaning and test method of the input and output characteristics of proportional directional control solenoid valve;

1.3.3 Flow characteristics and test method of proportional directional control solenoid valve.

1.4 Dynamic performance test of proportional directional control

solenoid valve

1.4.1 Dynamic characteristic test device of proportional directional control solenoid valve;

1.4.2 Flow step response characteristic curve test method of proportional directional control solenoid valve;

1.4.3 The physical meaning and calculation methods for dynamic characteristics and parameters of proportional directional control solenoid valve.

1.5 Flow characteristics of proportional speed regulating valve

1.5.1 Flow characteristic test device of proportional speed regulating valve;

1.5.2 The physical meaning and test method of the input and output characteristics of proportional speed regulating valve;

1.5.3 Flow characteristics and test method of proportional speed regulating valve.

1.6 Dynamic performance test of proportional speed regulating valve

1.6.1 Dynamic characteristic test device of proportional speed regulating valve;

1.6.2 Flow step response characteristic curve test method of proportional speed regulating valve;

1.6.3 The physical meaning and calculation methods for dynamic characteristics and parameters of proportional speed regulating valve.

2 Design and test experiments of proportional system

2.1 Performance experiment of electromagnetic proportional/(proportional solenoid)force control system (valve control cylinder)

2.1.1 The composition,working principle and correction methods of electromagnetic proportional/(proportional solenoid)force control system;

2.1.2 The role computer in electromagnetic proportional/(proportional solenoid)force control system;

2.1.3 the principle of dynamic analysis and time domain parameters test method

2.1.4 The impact of digital PID controller structure parameters on the dynamic performance of the system

2.2 Performance experiment of electromagnetic

proportional/(proportional solenoid)position control system (valve control cylinder)

2.2.1 The composition,working principle and correction methods of electromagnetic proportional/(proportional solenoid)position control system;

2.2.2 The role computer in electromagnetic proportional/(proportional solenoid)position control system;

2.2.3 The principle of dynamic analysis and time domain parameters test method

2.2.4 The impact of digital PID controller structure parameters on the dynamic performance of the system

2.3 Performance experiment of electromagnetic proportional/(proportional solenoid)speed control system (valve control motor)

2.3.1 The composition,working principle and correction methods of electromagnetic proportional/(proportional solenoid)speed control system;

2.3.2 The role computer in electromagnetic proportional/(proportional solenoid)speed control system;

2.3.3 The principle of dynamic analysis and time domain parameters test method

2.3.4 The impact of digital PID controller structure parameters on the dynamic performance of the system

Part B Performance test of servo valve (valve control cylinder)

1. Static characteristic experiment of servo reversing valve

1.1 The flow characteristics test device of servo reversing valve

1.2 The physical meaning and test method of the input and output characteristics of servo reversing valve;

1.3 Flow characteristics and test method of servo reversing valve;

1.4 The pressure gain characteristics test method of servo reversing valve

1.5 The frequency characteristics test method of servo reversing valve

2.Perference test of servo reversing valve force control system(closed-loop control)

2.1 The composition,working principle and correction methods of servo reversing valve force control system;

- 2.2 The role computer in servo reversing valve force control system;
- 2.3 The principle of dynamic analysis and time domain parameters test method
- 2.4 The impact of digital PID controller structure parameters on the dynamic performance of the system
- 2.5 Closed loop force control system

3. Preference test of servo reversing valve position control system(closed-loop control)

- 3.1 The composition,working principle and correction methods of servo reversing valve position control system;
- 3.2 The role computer in servo reversing valve position control system;
- 3.3 The principle of dynamic analysis and time domain parameters test method
- 3.4 The impact of digital PID controller structure parameters on the dynamic performance of the system
- 3.5 Frequency characteristics analysis of the system

Electro-hydraulic Proportional and Servo Control System Trainer

The Main Technical Parameters

Nos	Items	Specification	
1	Motor	Rated power	11KW
		Rated speed	1440r/min
2	Variable displacement piston pump	Displacement	17.8ml / rev
		Maximum pressure	25Mpa
3	Axial piston hydraulic motor	Rated pressure	31.5Mpa
		Maximum working pressure	21 Mpa
		Displacement	10ml / rev
4	Dimensions	Experimental bench	1300 × 830 × 950mm
		Control cabinet	500 × 420 × 900mm

Electro-hydraulic Proportional and Servo Control System Trainer

Configuration List

Nos	Items	Specification	Qty	Marks
1	Motor	Rated output: 11 KW Speed: 1440 r / min	1	
2	Variable plunger pump	Rated pressure: 25Mpa Displacement: 17.8ml / rev	1	
3	Axial piston hydraulic motor	Rated pressure: 31.5Mpa Displacement: 10ml / rev	1	
4	Pilot oriented pressure relief valve/overflow valve	Diameter: 10 mm Pressure regulator: 31.5 MPa Maximum flow: 250 L / min Installation: panel mounting	1	
5	Shockproof pressure gauge	0-25MPa	1	
6	Precision pressure gauge	0-25MPa	4	
7	Circuit board		1	
8	Oil tank	100L	1	
9	Accumulator		1	
10			1	
11	Oil level gauge	180mm	1	
12	Oil suction filter	Filtering accuracy: 20 μ m	1	
13	Tube-type one-way valve		1	
14	Oil-return filter	Filtering accuracy: 10 μ m	1	
15	High pressure filter	Filtering accuracy: 3 μ m	1	
16	Air filter	Filtering accuracy: 10 μ m	1	
17	Magnetic filter	Filtering accuracy: 60 μ m	1	

Nos	Items	Specification	Qty	Marks
18	Hydraulic oil			none
19	Water cooler		1	
20	Ball valve		4	
21	Servo cylinder		1	
22	Pilot oriented proportional relief valve		1	
23	Proportional amplifier		1	
24	Proportional solenoid reversing valve		1	
25	Proportional amplifier		1	
26	Proportional solenoid speed regulating valve		1	
27	Proportional amplifier		1	
28	Electro-hydraulic servo valve		1	
29	Servo amplifier		1	
30	Pressure transmitter		1	
31	Flow sensor		1	
32	Tension and compression load cell(Built-in amplifier)		1	
33	Hall speed sensor	M10×1×35	1	
34	Flow digital display meter		1	
35	Rotationl speed digital display meter		1	
36	Grating displacement sensor		1	
37	Temperature controller		1	
38	Thermocouple	Measuring range -50 ~ 150 °C	1	

Nos	Items	Specification	Qty	Marks
39	Heater	3KW	1	
40	Electrical control module		1	
41	Data universal interface board		1	
42	37-pin data communication cable (male)		1	
43	37-pin data communication cable (female)		1	
44	PC		1	
45	PC desk		1	
46	Data acquisition card		1	
47	Dynamic frequency data acquisition card		1	
48	Grating ruler		1	
49	System acquisition and control software		1	Optional
50	Acquisition card CD-ROM drive		1	Optional
51	Acquisition card manual		1	Optional
52	Flow sensor manual		1	Optional
53	Flow digital display meter manual		1	Optional
54	Grating displacement sensor manual		1	Optional
55	Compression resistant hose	25Mpa	5	
56	Servo /proportional system test device		1	
57	Load weights		4	
58	Open-end wrench	10"	1	

Nos	Items	Specification	Qty	Marks
59	Open-end wrench	12"	1	
60	Open-end wrench	8-10	1	
61	Open-end wrench	12-14	1	
62	Open-end wrench	17-19	1	
63	Inner ring plier		1	
64	Snap ring plier		1	
65	Phillips screwdriver		1	
66	Screwdriver		1	
67	Allen wrench		1	
68	Tool box		1	
69	Dust cover		1	
70	O-ring		8	
71	O-ring		8	
72	O-ring		8	
73	Signal light		2	
74	Button switch		2	
75	Pressure gauge		1	

*Products and configuration list described herein are subject to changes without notice.

*Optionals above is available for orders above 30 sets.