

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/>

Hydraulic Experiments and Performance Test Bench

PN:0401010100

Hydraulic Experiments and Performance Test Bench

Features

Hydraulic Experiments and Performance Test Bench is a professional hydraulic circuit experiments,hydraulic application experiments and hydraulic curriculum design platform.It is designed for training and assessment of subjects such as hydraulic drive,PLC control technology 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,The composition of hydraulic transmission system.
- 2,The basic hydraulic circuit experiments
- 2,Perference test experiments of common hydraulic components(optional)
- 3,PLC electrical control experiment:machine-electric-hydraulic integrated control experiments.

Hydraulic Experiments and Performance Test Bench

Performance

- 1,The training panel is designed as T-slot and all hydraulic components use rapid joint which can inserted for easy operation.
- 2,All hydraulic components and valves are used industrial grade physical components and valves with pressure up to 7MPa,and when beyond this value,

pressure automatic relief.

3,The hydraulic modules are all independent modules with spring pins plate,which can be assembled easily into a variety of hydraulic circuits on the T-slot panel.

4,The quick couplings are used for hydraulic circuits connection and the electrical control circuit use training connecting wires with protective function.The students can build circuits under the guidance of instruction books or design their own system circuits.The hydraulic components in this trainer is complete for designing more complex applications circuits.Various circuits design and constitution up to 90 kinds of experiments.

[Hydraulic Experiments and Performance Test Bench](#)

[Typical Training Contents](#)

Part A.Hydraulic Circuit

1.Pressure control circuits

1.1 Pressure regulated circuit

1.1.1 One-stage pressure regulated circuit

1.1.2 Two-stage pressure regulated circuit

1.1.3 Three-stage pressure regulated circuit

1.1.4 One-stage pressure regulated circuit from remote port

1.1.5 Two-stage pressure regulated circuit from remote port

1.1.6 Dual-pressure circuit

1.2 Pressure reducing circuit

1.2.1 One-stage pressure reducing circuit

1.2.2 Two-stage pressure reducing circuit

1.3 Pressure holding circuit

1.3.1 Pressure holding circuit by reversing valve

1.3.2 Pressure holding circuit by one-way valve

1.3.3 Pressure holding circuit by pilot check valve

1.4 Pressure relief circuit(Pressure-venting circuit)

- 1.4.1 Reversing circuit by two position two-way valve
- 1.4.2 Reversing circuit by two position two-way valve
- 1.4.3 Pressure relief circuit by three position four-way reversing valve(M-type,mid position function)
- 1.4.5 Pressure relief circuit by three position four-way reversing valve(H-type,mid position function)
- 1.4.6 Solenoid valve control double pump oil supply pressure relief circuit
- 1.4.7 Pressure control double pump oil supply pressure relief circuit

1.5 Balancing Circuit

- 1.5.1 Balancing circuit by sequence valve
- 1.5.2 Balancing circuit pilot sequence valve
- 1.5.3 Balancing and pressure holding circuit
- 1.5.4 Balancing circuit by pilot check valve,One-way throttle valve circuit
- 1.5.5 Balancing circuit by pilot check valve and one-way throttle valve

1.6 Buffer circuit

- 1.6.1 Buffer circuit by speed regulated valve
- 1.6.2 Buffer circuit by pressure relief valve/overflow valve

2. Speed control circuits

2.1 Throttle speed regulated circuit

- 2.1.1 Oil-inlet throttle speed regulated circuit by throttle valve
- 2.1.2 Oil-return throttle speed regulated circuit by throttle valve
- 2.1.3 By-pass throttle speed regulated circuit by throttle valve
- 2.1.4 Oil-inlet throttle speed regulated circuit by speed regulated circuit
- 2.1.5 By-pass throttle speed regulated circuit by speed regulated valve
- 2.1.6 Oil-return throttle speed regulated circuit by speed regulated valve
- 2.1.7 Bidirectional/Two-way oil-inlet throttle speed regulated circuit by one-way throttle valve
- 2.1.8 Bidirectional/Two-way oil-inlet throttle speed regulated circuit by one-way throttle valve
- 2.1.9 Bidirectional/Two-way oil-inlet throttle speed regulated circuit by one-way

throttle valve

2.1.10 Bidirectional/Two-way oil-return throttle speed regulated circuit by two-way throttle valve

2.1.11 Oil-inlet throttle speed regulated circuit of back Pressure Valve

2.2 Fast-speed movement circuit

2.2.1 Differential connection fast-speed movement circuit by one-way valve

2.2.2 Differential connection fast-speed movement circuit by two position and three-way solenoid directional valve

2.3 Speed shift circuit

2.3.1 Speed shift between fast and slow circuit

2.3.2 Oil-inlet control speed shift circuit

2.3.3 Oil-return control speed shift circuit

2.3.4 Bidirectional/Two-way speed shift circuit

2.3.5 Speed shift circuit by series speed regulated valve

2.3.6 Speed shift circuit by parallel regulated valve

2.3.7 Fast and slow speed connection circuit by travel valve

2.3.8 Differential connection by two position and two-way solenoid valve

2.3.9 Differential connection by two position and three-way solenoid valve

2.3.10 Oil-return control speed shift circuit by parallel regulated valve

3. Directional control circuit

3.1 Reversing circuit

3.1.1 Continuous reciprocating motion circuit by two position and four-way solenoid valve

3.1.2 Continuous reciprocating motion circuit by three position and four-way solenoid valve

3.2 Lock circuit

3.2.1 Lock circuit by one-way valve

3.2.2 Lock circuit by pilot check valve

3.2.3 Pressure relief circuit by three position four-way solenoid reversing valve(O-type,mid position function)

3.2.4 Pressure relief circuit by three position four-way solenoid reversing valve(M-type,mid position function)

4. Multi cylinders control action circuit

4.1 Sequence action circuit

4.1.1 Sequence action circuit by single sequential valve

4.1.2 Sequence action circuit by dual sequential valve

4.1.3 Sequence action circuit by travel switch/limit switch

4.1.4 Sequence action circuit by pressure relay

4.1.5 Sequence action circuit by joint sequence valve and travel switch/limit switch

4.1.6 Sequence action circuit by joint sequence valve and travel switch/limit switch

4.2 Synchronization action control circuit

4.2.1 Oil-out throttle synchronization circuit speed regulated valve

4.2.2 Oil-out throttle synchronization circuit speed regulated valve

4.2.3 Oil-inlet throttle bidirectional/two-way synchronization circuit

4.2.4 oil-return throttle bidirectional/two-way synchronization circuit

Part B.PLC electrical control experiment: machine - electric - hydraulic integrated control experiment.

1.PLC programming instructions and ladder programming

2.Learn and use PLC programming software

3.Communication of PLC and computer

4.PLC application and optimization solutions in the hydraulic transmission system.

Part C.Electro-hydraulic Proportional Valve Performance Test(Optional)

1.Electro-hydraulic proportional directional valve performance test

1.1 Pressure gain characteristics

1.2 Flow load characteristics

1.3 Valve pressure drop characteristics

1.4 Step response characteristics

1.5 Frequency response characteristics

1.6 Detection experimental device

1.7 The control characteristics test of constant valve pressure drop

1.8 System parameters on the dynamic performance test

2.Electro-hydraulic proportional directional valve control servo cylinder closed loop position system performance experiment (closed-loop control)

2.1 Step response characteristics

2.2 Frequency response characteristics

2.3 Detection experimental device

2.4 System parameters on the dynamic performance test

2.5 Sine wave application in the position control system

2.6 Displacement performance test

2.7 The components, working principle and correction methods of position control system

2.8 Sine wave application in the position control system

2.9 Error experiments of control system

2.10 Computer application in the position control system

3.Electro-hydraulic proportional relief valve performance test

3.1 Steady-state pressure control characteristics

3.2 Steady-state load characteristics

3.3 Step response characteristics of input current signal

3.4 Load flow step characteristics

3.5 Frequency response characteristics test

3.6 Detection experimental device

3.7 System parameters on the dynamic performance

3.8 Sine wave application in the position control system

3.9 Error experiments of control system

3.10 Computer application in the proportion of overflow test system

4. Electro-hydraulic proportional flow control valve performance test

- 4.1 steady-state flow control characteristics
- 4.2 Steady-state pressure - flow control characteristics
- 4.3 Detection experimental device
- 4.4 System parameters on the dynamic performance test
- 4.5 Sine wave application in the position control system
- 4.6 Error experiments of control system
- 4.7 Computer application in the position control system

5. Electro-hydraulic proportional servo valve performance test

- 5.1 Pressure gain characteristics
- 5.2 No-load flow characteristics
- 5.3 Load flow characteristics
- 5.4 Step response characteristics
- 5.5 Frequency response characteristics
- 5.6 Physical meaning and calculation method of each parameter
- 5.7 Sine wave application in the position control system
- 5.8 Error experiments of control system
- 5.9 Computer applications in the position control system

6. Electro-hydraulic proportional servo valve control servo-cylinder position system performance experiment (closed-loop control)

- 6.1 Step response characteristics
- 6.2 Frequency response characteristics
- 6.3 Detection experimental device
- 6.4 Compare system parameters on the dynamic performance
- 6.5 Sine wave application in the position control system
- 6.6 Error experiments of control system
- 6.7 Computer application in the position control system

Part D Other experiments(Optional)

- 1. Hydraulic components and systems, creative design experiments.

2. Pressure forming experiments
3. Various industrial hydraulic components works principle demo.
8. Hydraulic cylinder characteristics experiment
9. Hydraulic motor performance test
10. Hydraulic pump static / dynamic characteristics experiment
11. Relief valve static / dynamic characteristics experiments
12. Flow valve characteristics experimental
13. Hydraulic system throttling governor characteristics experiment
14. Fluid mechanics characteristics experiment (liquid resistance characteristic of experiments)

Hydraulic Experiments and Performance Test Bench

The Main Technical Parameters

Nos	Items	Specification	
1	Variable vane pumps	Rated power	1.5kw
		Voltage	380v/50hz
		Displacement	12L/min
		Max Pressure	7Mpa
		Rated speed	1380r/min
2	Quantitative vane pump	Rated power	2.2kw
		Voltage	380v/50hz
		Displacement	8ml/r
		Rated speed	1440r/min
		Pressure	7 MPa
3	Fluid air cooling circulator	Rated power	38w
		Voltage	220v
		Displacement	20L/min
		Pressure	1.4Mpa
4	Cooling tank	volume	60L
5	Dimensions	L*W*H	1570*560*1650mm