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PLC and Hydraulic Trainer(High Pressure and Hydraulic Components Test)

PN:0401010090

PLC and Hydraulic Trainer(High Pressure and Hydraulic Components Test)

Features

PLC and Hydraulic Trainer(High Pressure and Hydraulic Components Test) is a professional hydraulic circuit experiments,hydraulic application experiments and hydraulic components test 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.This trainer is especially suitable for students,scholars, experts, engineering and technical personnel in hydraulic discipline to build their own multi-unit integrated design experiments of hydraulic transmission,computer-aided testing system,programmable control system and computer control system.

- 1,The composition of hydraulic transmission system.
- 2,The basic hydraulic circuit experiments
- 2,Performance test experiments of common hydraulic components
- 3,PLC electrical control experiment:machine-electric-hydraulic integrated control experiments.

4,The structure and working principle of various parts of a hydraulic transmission system observing,disassembly and assembly training.

PLC and Hydraulic Trainer(High Pressure and Hydraulic Components Test)

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.

5,The hydraulic circuit can be electrical controlled independently by relay unit or by PLC.It highlights the advantages of PLC control by comparison of this two control modes to make students have a better understanding of PLC.

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Typical Training Contents

Part A.Hydraulic Circuit

1.Pressure control circuits

1.1 Pressure regulating circuit

- 1.1.1 Pressure regulating circuit by pressure relief valve/overflow valve
- 1.1.2 Balancing circuit(by pressure relief valve/overflow valve)
- 1.1.3 Pressure regulating circuit from remote port by pressure relief valve/overflow valve
- 1.1.4 Pressure regulating circuit by multi-stage pressure relief valve/overflow valve

1.2 Pressure holding circuit

- 1.2.1 Pressure holding circuit by pilot check valve
- 1.2.2 Pressure holding circuit by accumulator

1.3 Decompression circuit

- 1.3.1 Decompression circuit by throttle valve
- 1.3.2 Decompression circuit by sequence valve

1.4 Pressure reducing circuit

- 1.4.1 One-stage pressure reducing circuit
- 1.4.2 Two-stage pressure reducing circuit
- 1.4.3 Two-stage pressure regulating circuit
- 1.4.4 Multi-stage pressure reducing circuit

1.5 Pressure relief circuit(Pressure-venting circuit)

- 1.5.1 Pressure relief circuit by two position two-way valve
- 1.5.2 Pressure relief circuit by three position four-way valve
- 1.5.3 Pressure relief circuit by pressure relief valve/overflow valve

2.Speed control circuits

2.1 Speed regulating circuit

- 2.1.1 Oil-inlet throttle speed regulating circuit (constant pressure throttle governor,variable pressure throttle governor)
- 2.1.2 Speed regulated circuit by speed regulating valve (constant pressure,variable pressure)
- 2.1.3 Oil-return throttle speed regulating circuit
- 2.1.4 By-pass throttle speed regulating circuit
- 2.1.5 Differential connection fast-speed movement circuit

2.1.6 Speed-reducing/Slow-speed circuit by solenoid valve and speed regulated valve

2.1.7 Secondary feed circuit by throttle valve and speed regulated valve in parallel

2.1.8 Secondary feed circuit by throttle valve and speed regulated valve in series

2.1.9 Differential circuit of two position three-way valve

2.1.10 Differential circuit of three position four-way valve

2.1.11 Differential full pressure speed shift circuit

2.1.12 Differential action speed shift circuit

2.1.13 Fast-speed movement circuit by accumulator

2.1.14 Secondary feed action circuit

2.1.15 Three feed action circuit

2.2 Synchronization circuit

2.2.1 Double/Twin cylinders synchronization action circuit

2.2.2 Synchronization circuit by throttle valve

3 Directional control circuit

3.1 Reversing circuit

3.1.1 Reversing circuit by reversing valve

3.1.2 Balancing circuit by sequence valve

3.1.3 Sequence action circuit by sequence valve

3.1.4 Sequence action circuit by pressure relay

3.1.5 Sequence action circuit by two position four-way valve, proximity switch

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 Lock circuit by reversing valve

4. Relay control circuit

4.1 Single-cylinder reciprocating action by relay

4.2 Double/Twin-cylinders reciprocating action by relay

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

- 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.Performance test experiments of common hydraulic components

1. Static performance test of pressure relief valve/overflow valve

- 1.1 Pressure regulated range measurement
- 1.2 Pressure run-out measurement
- 1.3 Pressure offset measurement
- 1.4 Pressure loss measurement
- 1.5 Unloading loss measurement
- 1.6 Opening and closing characteristics measurement

2. Dynamic performance test of pressure relief valve/overflow valve

Pressure step response characteristic curve measurement of pressure relief valve and the physical meaning and calculation methods for dynamic characteristics parameters of pressure relief valve.

- 2.1 Steady-state pressure,
- 2.2 Test flow
- 2.3 Unloading pressure
- 2.4 Pressure amplitude,pressure overshoot
- 2.5 Peak pressure
- 2.6 Rise time
- 2.7 Relief time
- 2.8 Transition time

3. Static performance test of pressure reducing valve

3.1. Static characteristic parameters test of pressure reducing valve including pressure regulated range, pressure run-out, pressure offset, etc. inlet

3.2. Outlet characteristic curve test of pressure reducing valve

3.3. Outlet pressure-flow characteristic curve test of pressure reducing valve

4. Dynamic performance test of pressure reducing valve

4.1 Pressure step response characteristic curve measurement of pressure reducing valve

4.2 The physical meaning and calculation methods for dynamic characteristics parameters of pressure reducing valve. (steady-state pressure, test flow, unloading pressure, pressure amplitude, pressure overshoot, peak pressure, rise time, relief time, transition time, etc.)

5. Hydraulic pump performance test

5.1 Hydraulic pump no-load performance test

5.2 Efficiency characteristics of the hydraulic pump (mechanical efficiency, volumetric efficiency, overall efficiency) test

6. Performance test of throttle speed regulated circuit (Hydraulic cylinder load performance test)

6.1 To learn characteristics and test of speed-load characteristics and power characteristics curve under variable load conditions;

6.2 To learn characteristics and test power curve under constant load conditions;

7. Characteristics test of the hydraulic cylinder

7.1 Minimum starting pressure test;

7.2 Load efficiency test of the hydraulic cylinder.

Part D. Hydraulic Circuits Simulation Software (optional)

[PLC and Hydraulic Trainer\(High Pressure and Hydraulic Components Test\)](#)

[The Main Technical Parameters](#)

Nos	Items	Specification	
1	Motor	Rated power	2.2KW
		Rated speed	1420r/Min
2	Variable vane pump	Displacement	6.7cc/rev
		Pressure	4-7 MPa
3	Quantitative vane pump	Displacement	11cc/rev
		Pressure	7 MPa
4	Dimensions	L*W*H	1580×650×1820mm

[PLC and Hydraulic Trainer\(High Pressure and Hydraulic Components Test\) Configuration List](#)

Nos	Items	Specification	Qty	Marks
1	Motor		2	
2	Variable vane pump		1	
3	Quantitative vane pump		1	
4	Throttle valve		1	
5	Pilot oriented pressure relief valve/overflow valve		2	
6	Oil tank	60L	1	
7	Hydraulic station board		1	
8	Shockproof pressure gauge	0-10MPa 2.5 class	2	
9	Pressure transmitter	10MPa	1	
10	Oil level gauge		1	
11	Oil suction filter		1	
12	Air filter		1	

Nos	Items	Specification	Qty	Marks
13	hydraulic oil		1	No supply
14	Air cooler (20L)	AC220V	1	
15	Ball valve		2	
16	Hydraulic cylinder		2	
17	Three position and four-way solenoid directional/reversing valve(O-type)		1	
18	Three position and four-way solenoid directional/reversing valve(M-type)		1	
19	Two position and four-way solenoid directional/reversing valve		2	
20	Two position and three-way solenoid directional/reversing valve		1	
21	Three position and four-way manual directional/reversing valve		1	
22	Pilot oriented pressure relief valve/overflow valve		1	
23	Direct-acting pressure relief valve		1	
24	Pilot oriented sequence valve		2	
25	Pilot oriented pressure reducing valve		1	
26	Throttle valve		2	
27	Speed regulated valve		1	
28	Pilot check valve		2	
29	Tube type one-way valve		2	
30	Pressure Relay		1	
31	Power supply module		1	

Nos	Items	Specification	Qty	Marks
32	Button module		1	
33	Electronic control module	4 core socket,6 2 core socket,6	1	
34	Relay module	DC24V	1	
35	PLC module	12 Road DC input 8 relay outputs	1	
36	Sensor interface module		1	
37	Pressure sensor	Accuracy: 0.2 Range: 0-8MPa(10MP)	4(3)	
38	Flow sensor	Accuracy:0.5	1	
39	Rotary transducer	0-5000r/min	1	
40	Displacement sensor	0-200mm	1	
41	Proximity switch	NPN, DC24V	4	
42	Data acquisition card		1	
43	37-pin data communication cable		1	
44	37-pin data communication cable		1	
45	PLC communication cable		1	
46	Diego plug	Red 1000mm	2	
47	Diego plug		2	
48	Diego plug		8	
49	Diego plug		8	

Nos	Items	Specification	Qty	Marks
50	Diego plug		12	
51	Diego plug		12	
52	Sheath socket			
53	Acquisition card manual		1	Optional
54	Acquisition card CD-ROM drive		1	Optional
55	System acquisition and control software		1	Optional
56	PLC programming software		1	Optional
57	Simulation control software		1	Optional
58	CD		1	
59	Experimental instructions		1	
60	Tee	M22×1.5	6	
61	Tee	M20×1.5	4	
62	Tee	M14×1.5	2	
63	Quick couplings(male)	M22×1.5	80	
64	Quick couplings(female)	M22×1.5	40	
65	Accumulator		1	
66	Compression resistant hose	25Mpa	18	
67	Pressure gauge	0~10MPa	4	
68	Hydraulic modular valve block		15	
69	Top-cylinder experimental device		1	
70	Open-end wrench	5-6	1	
71	Open-end wrench	8-10	1	

Nos	Items	Specification	Qty	Marks
72	Open-end wrench	12-14	1	
73	Open-end wrench	17-19	1	
74	Phillips screwdriver		1	
75	Screwdriver		1	
76	Allen wrench		1	
77	Tool box		1	
78	Dust cover		1	
79	Pad		10	
80	O-ring		18	
81	O-ring		5	
82	O-ring		5	
83	O-ring		8	
84	O-ring		4	
85	Plug		5	
86	Combination pad	φ10	5	
87	Button switch		2	
88	Button switch		2	
89	Training bench		1	

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

*Optionals above is available for orders above 40 sets.