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Hydraulic and Pneumatic Integrated Trainer

(High Pressure)

PN:0401030040

Hydraulic and Pneumatic Integrated Trainer (High Pressure)

The PLC, hydraulic and pneumatic comprehensive trainer adopts "two in one" structures composed by one side of hydraulic training and the other side pneumatic training. Both has independent PLC controller. This trainer can achieve pneumatic control basic circuits experiments and hydraulic control basic circuit experiments. It also can be integrated to complete training such as: electric-pneumatic control, pneumatic-hydraulic control, electric-hydraulic control, and pneumatic-electric-hydraulic comprehensive control. This trainer is an idea tool for skills training of PLC, solenoids, pneumatic, hydraulic, relays and so on. The panel is made of AL, and trainees can design and carry out various experiments of various pneumatic control circuits and hydraulic circuits

1. The hydraulic and pneumatic components, execution modules, relay control unit, PLC and control component are all adopted from industrial physic components.

2. The hydraulic and pneumatic modules with elastic pins which can assemble various circuits on the aluminum T-slot training panel

3. The PLC use Mitsubishi PLC FX1N-20MR, 12-point signal input / 8-point-signal output

4. The system rated pressure is up to 6.3Mpa and it 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 and programmable control system

5. Three-phase power leakage protection, DC power supply with overcurrent protection

Hydraulic and Pneumatic Integrated Trainer (High Pressure)

Typical Hydraulic Training Contents

1. Directional control circuit

1.1 Sequence action circuit

- 1.1.1 Reversing circuit of manual directional/reversing valve
- 1.1.2 Reversing circuit by pilot oriented pressure relief valve/overflow valve

1.2 Sequence action circuit

- 1.2.1 Sequence action circuit of sequence valve
- 1.2.2 Sequence action circuit of pressure relay
- 1.2.3 Sequence action circuit of limit switch
- 1.2.4 Sequence action circuit of travel/reversing valve

1.3 Lock circuit

- 1.3.1 Lock circuit of mid position function solenoid reversing valve
- 1.3.2 Lock circuit by pilot check valve

2. Pressure control circuits

2.1 Pressure regulating circuit

- 2.1.1 Pressure regulating circuit
- 2.1.2 Two-stage pressure regulated circuit

2.2 Pressure reducing circuit

- 2.2.1 Pressure reducing circuit of pressure reducing valve

2.3 Booster circuit

- 2.3.1 Booster circuit of booster cylinder
- 2.4 Pressure relief circuit (Pressure-venting circuit)
- 2.4.1 Pressure relief circuit by reversing valve

3. Speed control circuits

3.1 Throttle speed regulating circuit

- 3.1.1 Oil-inlet throttle speed regulating circuit
- 3.1.2 Oil-return/back throttle speed regulating circuit
- 3.1.3 Reversing speed regulating circuit of gear pump
- 3.1.4 Complex speed control circuit by joint gear pump and speed regulating valve
- 3.1.5 Secondary feed circuit of series speed regulating valve
- 3.1.6 Secondary feed circuit by parallel speed regulating valve

3.2 Speed shift circuit

- 3.2.1 Speed shift circuit of flow valve
- 3.3 Synchronization circuit
- 3.3.1 Synchronization circuit of series hydraulic cylinder

Hydraulic and Pneumatic Integrated Trainer (High Pressure)

Typical Pneumatic Training Contents

1. Pressure control circuits

- 1.1 Secondary pressure control circuit
- 1.2 High and low pressure shift circuit
- 1.3 Overload protection circuit

1.4 Unloading circuit

2. Directional control circuit

2.1 Single-acting cylinder reversing circuit

2.2 Double-acting cylinder reversing circuit

2.3 Single-cylinder reciprocating control circuit

2.4 Single-cylinder continuous reciprocating control circuit

2.5 Sequence action circuit of straight cylinder, rotating cylinder

2.6 Multi-cylinders sequence action circuit

2.7 Double cylinders synchronous action circuit

3. Speed control circuits

3.1 Single-acting cylinder speed regulating circuit

3.2 One-way/Unidirectional speed regulated circuit of double-acting cylinder

3.3 Two-way/Bidirectional speed regulated circuit of Double pneumatic acting cylinder

3.4 Speed shift circuit

3.5 Buffer circuit

4. Other circuits

4.1 Relay circuit

4.2 Counting circuit

4.3 Interlock circuit

4.4 Four cylinders linkage circuit

4.5 The application circuit of OR-gate type shuttle valve

4.6 The application circuit of quick exhaust valve

Hydraulic and Pneumatic Integrated Trainer (High Pressure)

Main Technical Parameters

| Nos | Items | Specification | |
|------------|------------------------|----------------------|----------------|
| 1 | Motor | voltage | 380v/50hz |
| | | Power | 740W |
| 2 | Variable vane pump | Displacement | 8mL / r |
| | | Max Pressure | 7Mpa |
| | | Rated speed | 1380r/min |
| 3 | Air compressor | Power | 250W |
| | | output pressure | 1Mpa |
| | | Voltage | 220V |
| 3 | Hydraulic pump station | Volume | 90L |
| 4 | Power supply | | 380V±10%, 50Hz |

Hydraulic and Pneumatic Integrated Trainer (High Pressure)
Hydraulic Configuration List

| Nos | Items | Quantity |
|-------------------------------------|--|-----------------|
| Hydraulic Station | | |
| 1 | Motor | 1 |
| 2 | Variable vane pump | 1 |
| 3 | High precision Digit tachometer | 1 |
| 4 | Pilot oriented pressure relief valve/overflow valve | 1 |
| 5 | Oil tank | 1 |
| 6 | Hydraulic station board | 1 |
| 7 | Pressure gauge | 1 |
| 8 | Oil level gauge | 1 |
| 9 | Oil filter | 1 |
| 10 | Air filter | 1 |
| 11 | Hydraulic oil | none |
| Hydraulic Control Components | | |
| 12 | Cylinder | 2 |
| 13 | Two-way flow valve | 2 |
| 14 | Three position and four-way solenoid directional/reversing valve | 1 |
| 15 | Three position and four-way solenoid directional/reversing valve | 1 |
| 16 | Two position and three-way solenoid directional/reversing valve | 2 |
| 17 | Two position and four-way solenoid directional/reversing valve | 1 |
| 18 | Two position and four-way solenoid directional/reversing valve | 1 |
| 19 | Pilot oriented pressure relief valve/overflow valve | 1 |
| 20 | Direct-acting pressure relief valve/overflow valve | 1 |
| 21 | Direct-acting sequence valve | 1 |

| Nos | Items | Quantity |
|--|--|-----------------|
| 22 | Direct-acting pressure reducing valve | 1 |
| 23 | One-way throttle valve | 1 |
| 24 | Pilot check valve | 2 |
| 25 | One-way valve | 1 |
| 26 | Pressure Relay | 2 |
| Monitoring and Control Components | | |
| 27 | Control button module | 1 |
| 28 | Power module | |
| 29 | Relay control module | 1 |
| 30 | Limit switch(normally open, normally closed) | 4 |
| 31 | PLC | 1 |
| 32 | PLC communication cable | 1 |
| 33 | Pressure relay plug wire | 1 |
| 34 | Solenoid cable | 3 |
| Software and Documentation | | |
| 35 | PLC programming software | 1 |
| 36 | Experimental instructions | 1 |
| Auxiliary Components | | |
| 37 | Tee | 3 |
| 38 | Four-way connection | 3 |
| 39 | Compression resistant hose | 23pcs |
| 40 | Pressure gauge | 1 |

| Nos | Items | Quantity |
|-----------------------------------|----------------------|-----------------|
| 41 | Motor cable | 1 |
| Tools | | |
| 42 | Phillips screwdriver | 1 |
| 43 | Screwdriver | 1 |
| 44 | Allen wrench | 2 |
| 45 | Adjustable wrench | 1 |
| 46 | Scissor | 1 |
| 47 | Needle-nose plier | 1 |
| 48 | Inner ring plier | 1 |
| 49 | Snap ring plier | 1 |
| 50 | Oil plug | 4 |
| 51 | Tool box | 1 |
| Spare Parts and Worn Parts | | |
| 52 | Quick connector | 4 |
| 53 | O-ring(various siz) | 5 |
| Bench&Cabinet | | |
| 54 | Training bench | 1 |
| 55 | Training cabinet | 1 |

Pneumatic Configuration List

| Nos | Items | Quantity |
|----------------------------|-------------------------------|-----------------|
| Pneumatic Actuators | | |
| 56 | Triplet | 1 |
| 57 | Double acting single cylinder | 1 |
| 58 | Single acting cylinder | 1 |

| Nos | Items | Quantity |
|--|--|-----------------|
| 59 | Rotating cylinder | 1 |
| Pneumatic Control Components | | |
| 60 | Pressure reducing valve | 1 |
| 61 | Manual reversing valve | 1 |
| 62 | Two position five-way single solenoid reversing valve | 2 |
| 63 | Two position five-way double solenoid reversing valve | 1 |
| 64 | Three position five-way double solenoid reversing valve | 1 |
| 65 | Two position five-way single air control reversing valve | 2 |
| 66 | Two position five-way double air control reversing valve | 1 |
| 67 | Travel reversing valve | 1 |
| 68 | Non-return valve | 1 |
| 69 | Shuttle valve(OR-gate valve) | 2 |
| 70 | Quick exhaust valve | 2 |
| 71 | Sequence valve | 2 |
| 72 | One way throttle valve | 2 |
| 73 | One way throttle valve | 1 |
| 74 | One-way valve | 2 |
| Monitoring and Control Components | | |
| 75 | Control button | 1 |
| 76 | Relay | 1 |
| 77 | Limit switch(mounted on the cylinder) | 2 |
| 78 | PLC | 1 |
| 79 | PLC communication cable | 1 |

| Nos | Items | Quantity |
|-----------------------------------|---------------------------|-----------------|
| 80 | Solenoid cable | 3 |
| 81 | Silent air compressor | 1 |
| Software and Documentation | | |
| 82 | PLC programming software | 1 |
| 83 | Experimental instructions | 1 |
| Auxiliary Components | | |
| 84 | T- type tee | 4 |
| 85 | Y- type tee | 1 |
| 86 | Four-way pipe joint | 2 |
| 87 | Six-way pipe joint | 2 |
| 88 | L-type 601 coupling crank | 2 |
| 89 | L-type 602 coupling crank | 2 |
| 90 | Air lock Ø 6 | 5 |
| 91 | Silencer 1/8 | 2 |
| 92 | Silencer 3/8 | 1 |
| 93 | Air-capacitor | 1 |
| 94 | Plastic pipe | 15m |
| Tools | | |
| 95 | Phillips screwdriver | 1 |
| 96 | Screwdriver | 1 |
| 97 | Allen wrench | 2 |
| 98 | Adjustable wrench | 1 |
| 99 | Scissor | 1 |
| 100 | Needle-nose plier | 1 |
| 101 | Tool box | 1 |

| Nos | Items | Quantity |
|-----------------------------------|------------------|----------|
| Spare Parts and Worn Parts | | |
| 102 | Teflon tape | 1 |
| 103 | Fuse | 2 |
| Bench&Cabinet | | |
| 104 | Training bench | 1 |
| 105 | Training cabinet | 1 |

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