

HYTECH

202A, Umashankar, PAUD ROAD, PUNE 411 038.

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HYDRAULIC TRAINER

HYTECH HYDRAULIC TRAINER WITH AUTOMATIC CIRCUIT OF SOLENOID VALVE

Fluid power technologies safely control linear and rotary movements both with regard to very large forces and extreme precision in terms of displacement and speed. The advantages of this technology, namely that of infinitely variable transmission of energy with a high power density and of producing linear movement by extremely simple means using HYDRAULIC cylinders, have opened up potential fields of application in all areas of mechanical engineering. The installation and maintenance of HYDRAULIC systems requires specially trained experts. This presupposes precise knowledge of the mode of operation involved and understanding of the various fields of HYDRAULICS.

The teaching and training-systems from **HYTECH** paves the way for such knowledge and supplies both the theoretical and practical basis for trainers and trainees.

Salient Features (Hydraulic Trainer) :-

- Mobile and self contained unit, only electrical connections are required.
- Distribution blocks are fitted at four corners.
- Modern Industrial components from reputed manufacturers are used operating at realistic working pressure i.e. (40 bar).
- Realistic Industrial circuits are demonstrated.
- Simplicity of Operation designed for amateur use.
- Built in safety valve is fitted.
- mounting of valve and base plates. No tools or spanner is required for mounting.
- Tried and tested equipment and circuits.
- Special fixture used for pipe bending and ferrule fitting arrangement.

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- System is flushed with very high velocity (4 times the working) by separate oil which maintains class A cleanliness of system.
- All valves , cylinder are tested at 150% working pressure.
- Cylinder from precision honed tube, hardened ground, hard chrome plated piston rod and imported quality seals.
- Flow measurement with Rotameter.
- Training of Trainers offered at regular intervals.
- Non Contact type Proximity Sensor hence no wear & Tear.
- SMPS with short circuit protection
- 24 V DC supply with all safety measurement.
- Two years performance guarantee for any manufacturing defect.

List of Experiments (Hydraulic Trainer):-

1. Study of pressure built up in hydraulic system.
2. Introduction of control valves.
3. Study of double acting cylinder.
4. Study of 4/2 way dcv.
5. Study of 4/3 way dcv.
6. Pressure adjustment/setting of relief valve.
7. Control of double acting cylinder 4/3 way dcv.
8. Control of double acting cylinder 4/2 way dcv.
9. Speed control of double acting cylinder.
10. Hydraulic motor operation.
11. Hydraulic motor operation at different speeds.
12. Operation of Single Acting Cylinder.
13. Meter-in speed control circuit.
14. Meter-out speed control circuit.
15. Bleed-Off speed control unit.
16. Study of pressure reducing valve.
17. Study of sequence valve.
18. Sequencing of Hydraulic Cylinder & Motor
19. Study of pressure switch and it's pressure settings.
20. Operation of Double acting cylinder with 4/3 solenoid operated DCV.
21. Automatic return of Double Acting cylinder
22. Operation of Double acting cylinder using inching operation.
23. Introduction of Pressure Switch
24. Manual Control of Double Acting Cylinder with Lever Operated Direction Control Valve.

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Scope of Supply for Electro-Hydraulic Trainer with PLC

| Sr. No. | Components | Qty. |
|----------------|--|-------------|
| 1. | Trolley with frame & caster wheels | 1 |
| 2. | Hydraulic Tank with Filter & Breat | 1 |
| 3. | 3 Phase Foot & Flange mounted Electric Motor | 1 |
| 4. | Bell Housing | 1 |
| 5. | Flexible coupling | 1 |
| 6. | Pressure Gauges | 3 |
| 7. | Hydraulic Pump | 1 |
| 8. | Relief Valve | 1 |
| 9. | 4/3 way Direction control valve. | 1 |
| 10. | Valve mounting plate | 1 |
| 11. | Flow control valve | 1 |
| 12. | Check valve | 1 |
| 13. | Single Acting cylinder | 1 |
| 14. | Double acting cylinder | 2 |
| 15. | Hydraulic motor | 1 |
| 16. | 4/2 way Direction control valve | 1 |
| 17. | Valve mounting Block | 1 |
| 18. | Sequence valve | 1 |
| 19. | Pressure Reducing valve | 1 |
| 20. | Flowmeter | 1 |
| 21. | Pressure switch | 1 |
| 22. | 4/3 way Double Solenoid operated Direction control valve | 1 |
| 23. | 4/2 way Single solenoid operated Direction control valve | 1 |
| 24. | Limit Switches | 2 |
| 25. | Proximity sensor | 2 |
| 26. | Electro Hydraulic controller | 1 |
| 27. | Hydraulic High Pressure Hose | 14 |
| 28. | Quick coupling | 16 |

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SCOPE OF SUPPLY FOR HYDRAULIC TRAINER

1) Trolley with Frame

Make : Hytech
No.of Wheels : 4 Nos., Two fixed & two Swivel type
Load mounting capacity : 500 Kg.

2) HYDRULIC Tank

Make : Hytech, At most cleanliness maintenance
Capacity : 50 Liters
Operating Oil volume : 40 Liters
Baffle Plate : Provided, which suppresses oil waves
Magnetic Drain Plug : Provided, supported magnetic particle
Suction Strainer (50 micron) : Provided, safe grounds pumps
Return Line Filter (10 micron) : Provided
Motor mounting Plate : Provided

3) Electrical motor

Make : ISI Mark, Kirloskar or Siemens, Crompton
HP : 2 HP, 1440 rpm
Type : Squirrel cage induction motor,
3 Phase 50 Hz
Mounting : Foot & Flange mounting

4) Bell Housing

Location : One side motor flange & other side Pump Flange
Location diameter, Alignment of motor & pump is safeguarded.
Permissible Runout : 0.020 mm max.
Make : Hytech

5) FLEXIBLE COUPLING

Function : Flexible coupling between motor & pump
Make : Lovejoy
Model : L099

6) GEAR PUMP

Type : Gear Pump
Make : Vickers, Rexroth
Flow rate : 6 LPM at 70 Bar
Operating Pressure : 40 Bar
Max Pump Pressure : 140 Bar (140 Kg/cm²)
Pump Efficiency : 85% minimum

7) Relief Valve :

Type : Direct operated Relief valve Guided poppet design
cushion arrangement for greater stability
Port connection : 1/2" BSP
Max Permissible flowrate : 30 LPM
Pressure Adjustment : With hand knob
Make : Yuken, Vickers, Rexroth Polyhydon
Pressure Range : Upto 100 Bar

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8) 4/3 Way Manually Operated direction control valve

Type of Spool : Tendon centre
No. of ports : 4 Nos.
No. of position : 3 Nos.
Spool position at centre : P to T & A, B Blocked
Type of Operation : Lever Operated
Mounting : Sub plate mounting interface
Nomination flow Rate : 32 LPM
Make : Vickers, Yuken, Polyhydron, Rexroth

9) Direction Control Valve Mounting Plate :

Make : Hytech
Type : Precisely ground & Port connection of pipe at the top.
Max. Test Pressure : 210 Bar

10) Throttle valve :

Max Operating Pressure : 140 Bar
Port connection : 3/8" BSP
Make : Hydrain, Max pressure 210 Bar

11) Flow control valve

Type : Flow control Valve
Construction : Spool type with Knob operation
Mounting type : Threaded body subplate mounting
Flowrate : 2 to 25 LPM
Max. Operating Pressure : 140 Bar
Pressure drop across valve : 7 Bar max
Make : Vickers, Yuken, Polyhydron, Rexroth

12) Check Valve

Port connection : 3/8" BSP
Max. Operating Pressure : 210 Bar
Make : Hytech, Polyhydron

13) Single Acting Cylinder

Type : SINGLE ACTING with Spring Return
RAM : ϕ 20 mm
Qty : One No.

14) Double Acting cylinders

Type : Double acting cylinder with Piston rod
Base Diameter : 40 or 50 mm
Rod Diameter : 22 mm or 28 mm
Stroke : 250 mm
Seals : Piston & rod seals PTFEGT Ring.
Max operating Pressure : 140 Bar
Normal operating Pressure : 40 Bar

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15) HYDRAULIC MOTOR

Type : Gear Motor/Piston Motor
Direction of Rotation : Unidirectional.
Port connection : 1/2" BSP
Operating Pressure : Max 100 Bar
Max Pressure : 140 Bar (140 Kg/cm²)
Motor Efficiency : 85% minimum

16) 4/2 Way Manually Operated direction control valve

Make : Vickers, Yuken, Polyhydron, Rexroth
Type of Spool : Tendon centre
No. of ports : 4 Nos.
No. of position : 2 Nos.
Type of Operation : Lever Operated
Mounting : Sub plate mounting interface
Nomination flow capacity : 32 LPM

17) DC Valve Mounting Plate

Make : Hytech
Type : Precisely ground & Port connection of pipe at the top.
Max Test Pressure : 210 Bar

18) Sequence Valve

Type : Pressure controlled Direct operated sequence valve
Port connection : 3/8 " BSP
Mounting : Base plate mounting
Make : Yuken , Polyhydron, Vickers

19) Pressure Reducing Valve

Type : Pressure controlled Direct operated Pr Reducing Valve
Port connection : 3/8 " BSP
Mounting : Base plate mounting
Make : Hytech, Polyhydron, Vickers

20) Flow Meter

Type : Acrylic hone type flow meter with scale, Rotameter
Pressure : up to 10 Bar

21) 4/3 Way Double Solenoid Operated Valve.

Type of Spool : Tendon centre
No. of ports : 4 Nos.
No. of position : 3 Nos.
Spool position at centre : P to T & A, B Blocked
Type of Operation : Double Solenoid operated, with spring centre.
Operating Voltage : 24 VDC.
Mounting : Subplate mounting interface
Max. Operating Pressure : 210 Bar.
Nomination flow handling : 16 LPM capacity
Make : Vickers, Yuken, Rexroth

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22) Proximity sensor

Type : Contact less Proximity sensor PNP type
Operating Voltage : 10 to 24 V DC
Sensing Distance : 2 mm min.

23) Electro Hydraulic Controller

Make : Hytech
Function : To connect various electric circuits
Qty. : 1 No.
Operating Voltage : 24 V DC

28) Hoses :

Type : High Pressure Hoses
Max Operating Pressure : 88 Bar SAE R3
Nos. : 8 Nos.

29) Quick coupling arrangement

Type : Ball type Quick coupling
Max. Operating Pressure : 210 Bar
Quantity : As required.