

CHAPTER
02-2

HYDRAULICS

TRANSPARENT MODELS

Introduction	114
Hydraulics transparent models (FH-230)	115
Components	117

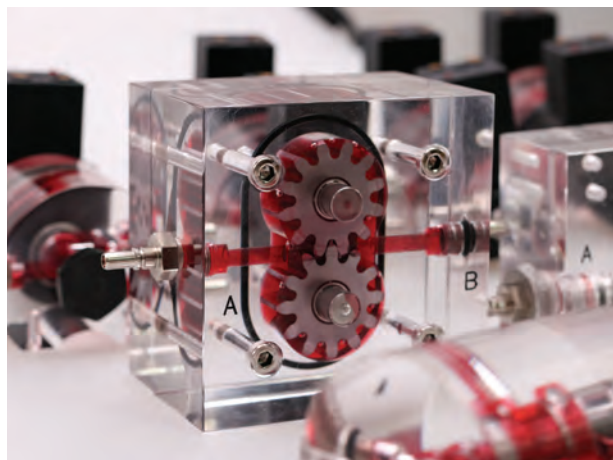
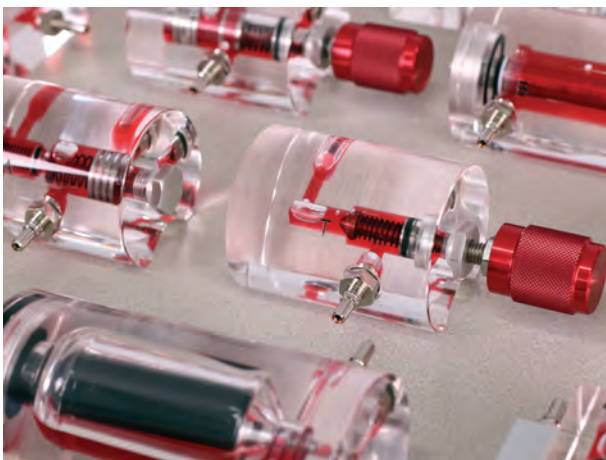
HYDRAULICS TRANSPARENT MODELS

Introduction

The hydraulics transparent models were designed and processed with a special material for effective training by seeing inside of the hydraulic components.

Transparent model power unit (14030) utilizes air injection to demonstrate the flow path and principles.

User can easily see the flow of fluid and understand the principles of hydraulic devices.



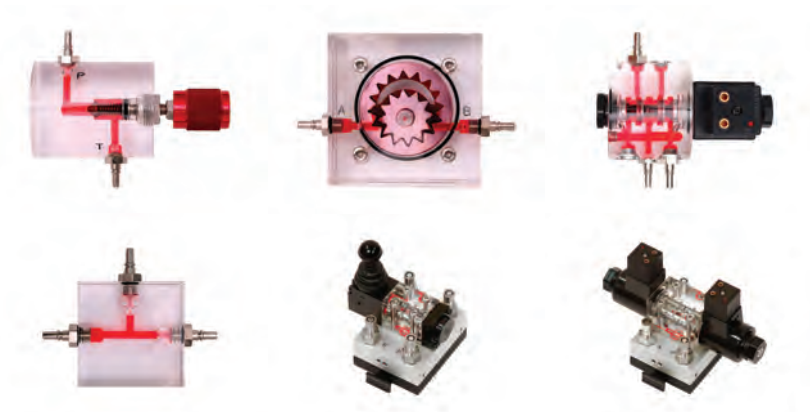
Hydraulics transparent models (FH-230)



02-2

Features

- Demonstrates basic principles of hydraulics and control systems.
- User can see operations inside of hydraulics valves and valve structures.
- User can put an air bubble in the FESTECH transparent hydraulics power unit to understand the operating principles of hydraulics in valves.
- Plumbing system is conveniently connected by quick coupling connector.



Training contents

- Learning structure of hydraulics parts
- Understanding flow of fluid
- Feature of valves and cylinders
- Electro-hydraulic control circuit
- Safety of hydraulics system
- Structure of hydraulics motor
- Hydraulics control circuit
- Hydraulics cylinder mid-stop

Hydraulics transparent models (FH-230)

Component

No.	Component	Order number	Qty
1	Transparent model training table	14020	1
2	Transparent model power unit	14030	1
3	Hydraulic transparent model clamp	17050	1
4	Pressure relief valve, directly controlled	17001	1
5	Pressure relief valve, cushion, directly controlled	17002	1
6	Pressure reducing valve	17003	1
7	2-way flow control valve	17004	1
8	Orifice valve	17005	1
9	One-way flow control valve	17006	1
10	Pressure compensative flow control valve	17007	1
11	Hydraulic check valve	17008	1
12	Hydraulic check valve, pilot actuated	17009	1
13	2/2-way valve	17010	1
14	3/2-way valve	17011	1
15	4/2-way valve	17012	1
16	4/3-way valve	17013	1
17	Hydraulic double-acting cylinder	17014	1
18	5/2-way valve, pilot actuated	17015	1
19	Shut-off circuit	17016	1
20	Pressure relief valve, pilot actuated	17017	1
21	Pressure relief valve, externally actuated	17018	1
22	Double check valve, pilot actuated	17019	1
23	Flow dividing valve	17020	1
24	3-way pressure flow control valve	17021	1
25	Rectifier circuit	17022	1

No.	Component	Order number	Qty
26	Vane motor	17023	1
27	Internal gear motor	17024	1
28	External gear motor	17025	1
29	Linear motor	17026	1
30	Rotary vane motor	17027	1
31	Axial piston motor	17028	1
32	Pressure gauge	17029	1
33	Pressure switch	17030	1
34	Piston accumulator	17031	1
35	Diaphragm accumulator	17032	1
36	Bladder accumulator	17033	1
37	3/2-way single solenoid valve	17042	1
38	4/2-way single solenoid valve	17043	1
39	4/2-way double solenoid valve	17044	1
40	4/3-way solenoid valve(PT connected)	17045	1
41	4/3-way solenoid valve(ABT connected)	17046	1
42	4/3-way solenoid valve(PABT connected)	17047	1
43	T connector	17054	1
44	+ connector	17055	1
45	Transparent model hose	17056	5
46	Power supply	13090	1
47	Push-button switch set (3-fold)	13033	1
48	Cable(500mm red)	13085	7
49	Cable(500mm blue)	13085	5

Components

Transparent model training table	Order number : 14020
----------------------------------	----------------------



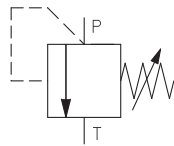
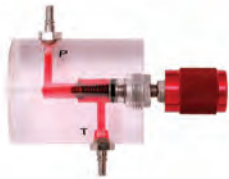
- Size : 1500×790×870 mm
- Cabinet (locking type)
 - 430(L)×700(W)×680(H)mm
 - Drawer : 360×620 mm
 - transparent model socket panel

Transparent model power unit	Order number : 14030
------------------------------	----------------------



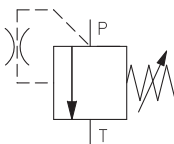
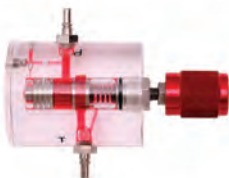
- Tank capacity : 7,5 L
- Hydraulic oil : ISO VG32
- Motor : AC 220 V, 60 Hz,
- Max. pressure : 18bar
- Size : 510×265×200 mm
- Weight : 17 kg, oil included
- Hydraulic pump

Pressure relief valve, directly controlled	Order number : 17001
--	----------------------



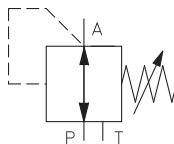
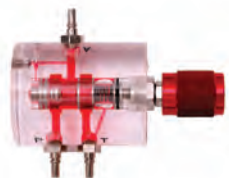
- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Adjusting lever operated

Pressure relief valve, cushion, directly controlled	Order number : 17002
---	----------------------



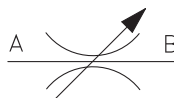
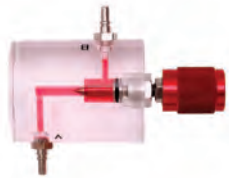
- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Adjusting lever operated
- Cushion type

Pressure reducing valve	Order number : 17003
-------------------------	----------------------



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port
- Spring adjustable
- Adjusting lever operated

2-way flow control valve	Order number : 17004
--------------------------	----------------------



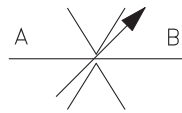
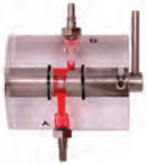
- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Adjusting lever operated

02-2

Components

Orifice valve

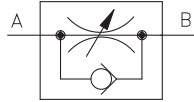
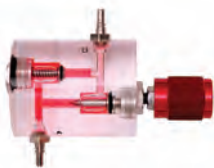
Order number : 17005



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Hand lever operated

One-way flow control valve

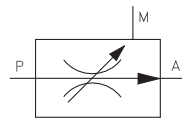
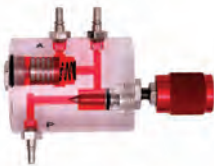
Order number : 17006



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Adjusting lever operated
- Spring check type

Pressure compensative flow control valve

Order number : 17007



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port
- Adjusting lever operated
- Spring spool type
- Inside pressure measurement

Hydraulic check valve

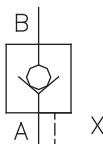
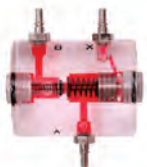
Order number : 17008



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Spring check type

Hydraulic check valve, pilot actuated

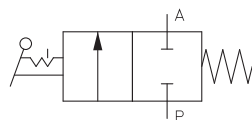
Order number : 17009



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port
- Adjusting lever operated
- Spring spool type
- Spring check type

2/2-way valve

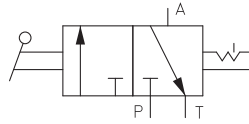
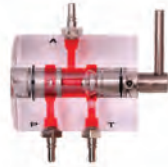
Order number : 17010



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Hand lever operated

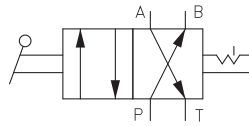
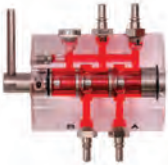
Components

3/2-way valve Order number : 17011



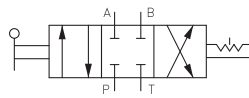
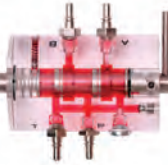
- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port
- Hand lever operated

4/2-way valve Order number : 17012



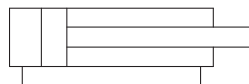
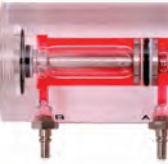
- Pressure range : 10bar
- Length : 80mm
- Width : 60mm
- 4 port
- Hand lever operated

4/3-way valve Order number : 17013



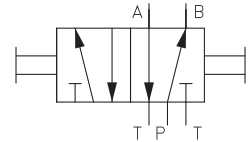
- Pressure range : 10bar
- Length : 80mm
- Width : 60mm
- 4 port
- Hand lever operated
- All port block

Hydraulic double acting cylinder Order number : 17014



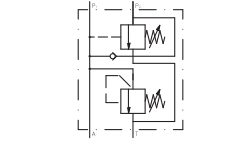
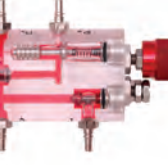
- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 2 port
- Piston diameter : 15mm
- Stroke : 50mm

5/2-way valve, pilot actuated Order number : 17015



- Pressure range : 10bar
- Length : 95mm
- Width : 60mm
- 5 port
- Push lever operated

Shut-off circuit Order number : 17016

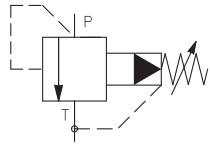
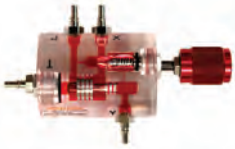


- Pressure range : 10bar
- Length : 95mm
- Width : 60mm
- 4 port
- Adjusting lever operated
- Spring check type

Components

Pressure relief valve, pilot actuated

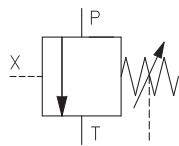
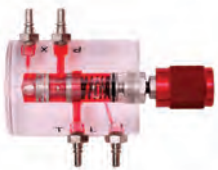
Order number : 17017



- Pressure range : 10bar
- Length : 80mm
- Width : 60mm
- 4 port
- Adjusting lever operated
- Spring spool type

Pressure relief valve, externally actuated

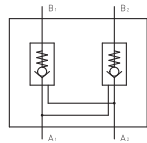
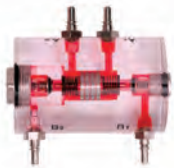
Order number : 17018



- Pressure range : 10bar
- Length : 80mm
- Width : 60mm
- 4 port
- Adjusting lever operated
- Spring spool type

Double check valve, pilot actuated

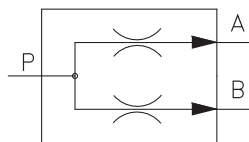
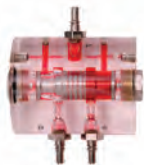
Order number : 17019



- Pressure range : 10bar
- Length : 95mm
- Width : 60mm
- 4 port
- Spring spool type

Flow dividing valve

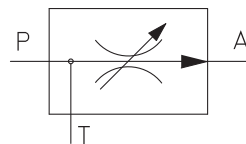
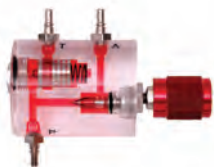
Order number : 17020



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 4 port
- Spring spool type

3-way pressure flow control valve

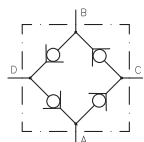
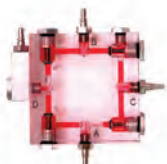
Order number : 17021



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port
- Adjusting lever operated
- Spring spool type

Rectifier circuit

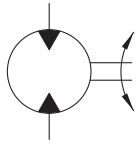
Order number : 17022



- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 4 port
- Spring check type
- 4 check valved

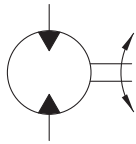
Components

Vane motor Order number : 17023



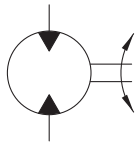
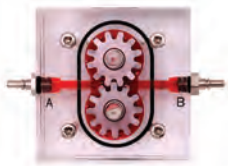
- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 2 port

Internal gear motor Order number : 17024



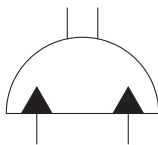
- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 2 port

External gear motor Order number : 17025



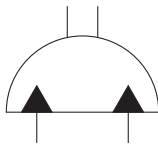
- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 2 port

Linear motor Order number : 17026



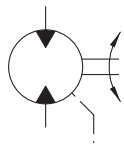
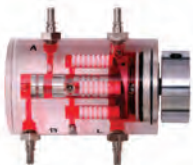
- Pressure range : 10bar
- Length : 90mm
- Width : 60mm
- 2 port

Rotary vane motor Order number : 17027



- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 2 port

Axial piston motor Order number : 17028

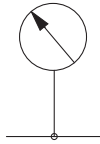


- Pressure range : 10bar
- Length : 110mm
- Width : 60mm
- 4 port

Components

Pressure gauge

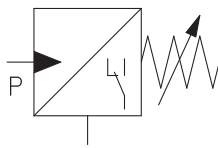
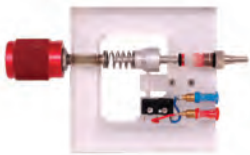
Order number : 17029



- Pressure range : 10bar
- Length : 50mm
- Width : 50mm
- 1 port

Pressure switch

Order number : 17030



- Pressure range : 10bar
- Length : 90mm
- Width : 90mm
- 1 port
- 4mm socket included
- Adjusting lever operated

Piston accumulator

Order number : 17031



- Pressure range : 2~4bar
- Length : 110mm
- Width : 60mm
- 2 port

Diaphragm accumulator

Order number : 17032



- Pressure range : 2~4bar
- Length : 80mm
- Width : 60mm
- 2 port

Bladder accumulator

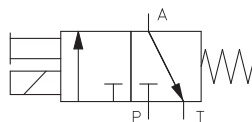
Order number : 17033



- Pressure range : 2~4bar
- Length : 120mm
- Width : 60mm
- 2 port

3/2-way solenoid valve

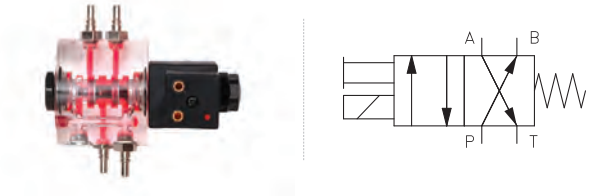
Order number : 17042



- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 3 port
- 4mm socket included
- Power : DC 24V

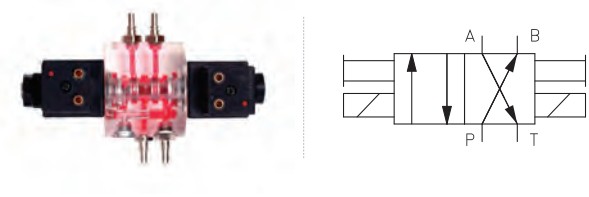
Components

4/2-way single solenoid valve Order number : 17043



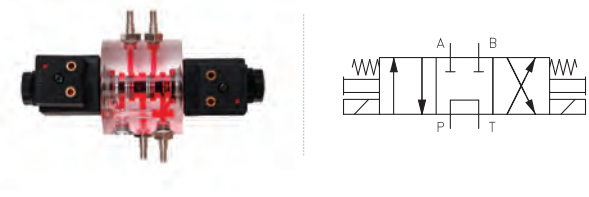
- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 4 port
- 4mm socket included
- Power : DC 24V

4/2-way double solenoid valve Order number : 17044



- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 4 port
- 4mm socket included
- Power : DC 24V

4/3-way solenoid valve (PT connected) Order number : 17045



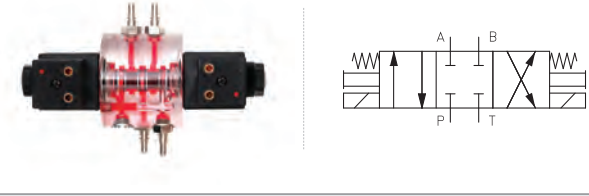
- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 4 port
- 4mm socket included
- Power : DC 24V

4/3-way solenoid valve (ABT connected) Order number : 17046



- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 4 port
- 4mm socket included
- Power : DC 24V

4/3-way solenoid valve (All block type) Order number : 17047



- Pressure range : 10bar
- Length : 100mm
- Width : 60mm
- 4 port
- 4mm socket included
- Power : DC 24V

Hydraulic transparent model clamp Order number : 17050

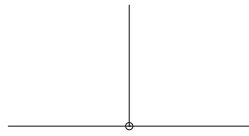
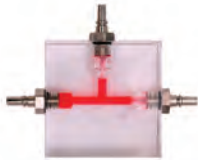


- Used for fixing components on the table.
- Material : plastic

Components

T connector

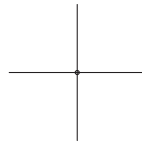
Order number : 17054



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 3 port

+ connector

Order number : 17055



- Pressure range : 10bar
- Length : 75mm
- Width : 60mm
- 4 port

Transparent model hose

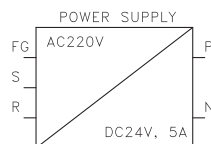
Order number : 17056



- Pressure range : 10bar
- Length : 1M
- Inner diameter : 4mm
- Quantity : 5ea

Power supply

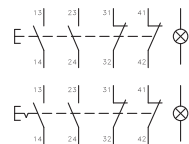
Order number : 13090



- Power : AC 220 V, 50/60Hz
- Output power : DC 24V
- Output current : 5A

Push-button switch set (3-fold)

Order number : 13033



- Power : DC 24V
- Consist of : 2 momentary push-buttons, 1 locking push-button
- Contact : 2 a-contact, 2 b-contact
- Contact allowable : Max, 1A
- Power consumption : 0,48W

Cable(500mm red)

Order number : 13085



- Color : red
- Length : 500mm
- High elasticity and special coating

Components

Cable(500mm blue)

Order number : 13085



- Color : blue
- Length : 500mm
- High elasticity and special coating

Hydraulic transparent model workbook

Order number : 17070



- Manual for orifice, flow control valve, pressure reducing valve, pressure relief valve, directional control valve, hydraulics check valve, double-acting cylinder, pilot operated flow control valve, various hydraulics motor, and various accumulators etc.