PATRIOT

D03/D05 Directional Valves

FFP01 - FFP03

Driven by Innovation

Power Precision Performance

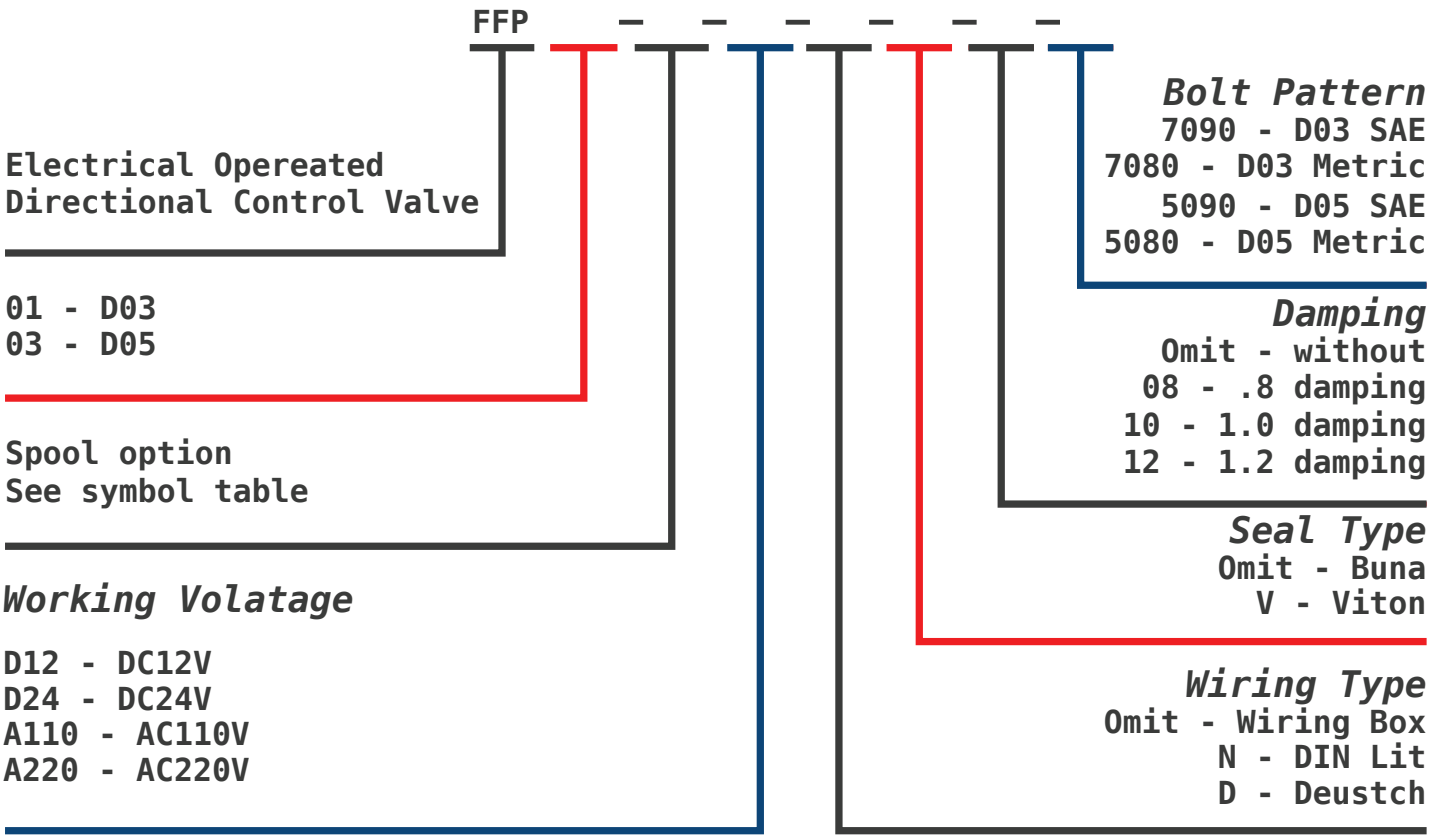
734-479-9641 patriothyd.com

PATRIOT HYDRAULICS

D03/D05 Technical Specification

Specification		D03	D05		
Model		FFP01	FFP03		
Max.Working Pressure (PSI)	Ports P,A,B	5075	4550		
	Tank Port T	1450	1450		
Max. Flow	(GPM)	20	30		
Working Fluid		Mineral oil: phosphate-ester			
Fluid temp.	(°F)	-4 ~ 160			
Viscosity	(mm^2/s)	2.8~100			
Working Voltage (V)	DC	12	24		
	AC	110/50Hz	220/50Hz		
Max. Switch Frequency (T/h)		15000(DC)	7200(AC)		
Insulation grade		IP65			
Weight (kg)	Single Solenoid	1.45(DC)	1.4(AC)	5.1(DC)	4.3(AC)
	Double Solenoid	1.95(DC)	1.9(AC)	6.7(DC)	5.1(AC)
Cleanliness	The minimum allowable cleanliness of the oil should be accouring to 9thdegree of standard NAS1638. It is suggested that the minimum filter rating should be ß 10≥75				

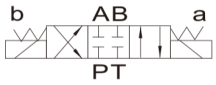
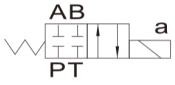
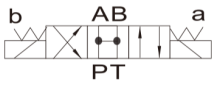
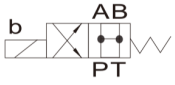
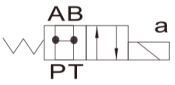
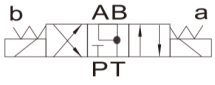
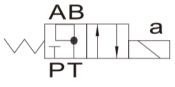
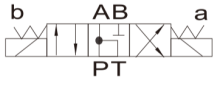
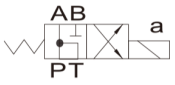
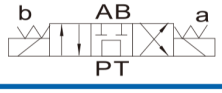
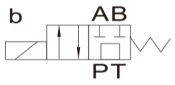
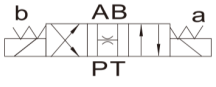
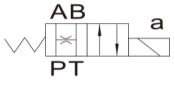
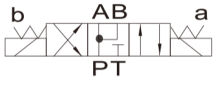
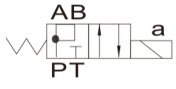
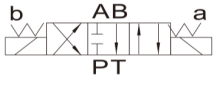
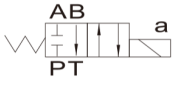
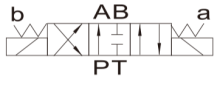
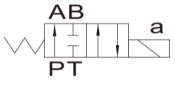
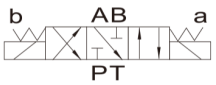
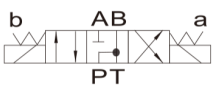
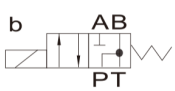
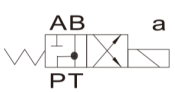
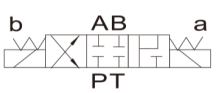
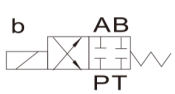
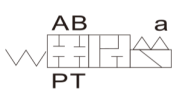
D03/D05 Model Description

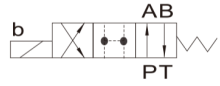


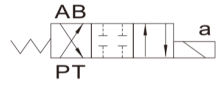
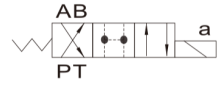
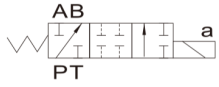
Code Symbols

Electrical Operated Directional Control Valve

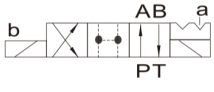
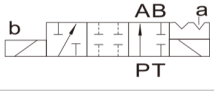
Stocked Spools:

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C60		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25		2B25B		2B25BL	
3C29		2B29B		2B29BL	

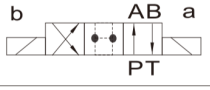
2B2	
2B3	
2B8	

2B2L	
2B3L	
2B8L	

With detent

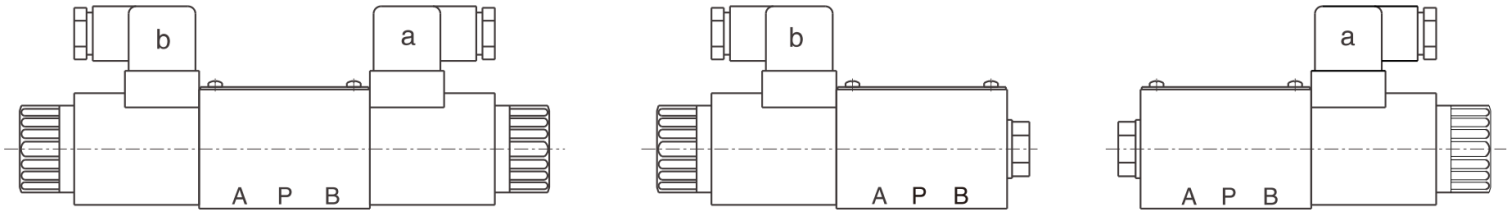
	2D2
	2D3
	2D8

No spring return and no detent mechanical positioning

	2N2
	2N3
	2N8

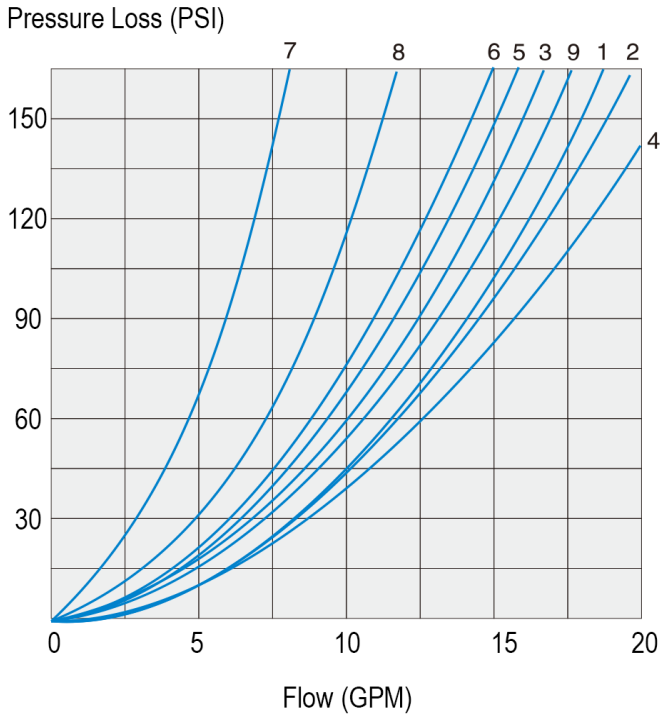
Note: *D*(No spring return mechanical positioning)
solenoid directional control valve should be installed horizontally.

Solenoid Operation



1. a When movement a，P→A B→T
2. b When movement b，P→B A→T
3. Oil flow in the opposite direction with the above-mentioned movement for 3C5、3C6symbol Valve.

FFP01 Performance Curve



Function code	Direction			
	P→A	P→B	A→T	B→T
2B8 2B8L	3	3	–	–
2B3	1	1	3	1
2B2 2B2L	5	5	3	3
3C2	3	3	1	1
3C5	1	3	1	1
3C6	6	6	9	9
3C3	2	4	2	2
3C4	1	1	2	1
3C10,3C12	3	3	4	9
3C9	2	3	3	3
3C25	3	1	1	1
3C29	5	5	4	–
3C7	1	2	1	1

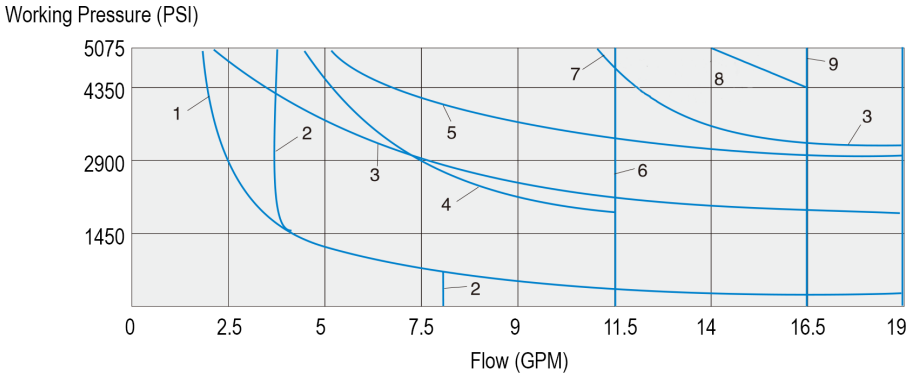
7.Spool type “3C29” located in the control position A →B

8. Spool symbol 3C6 in the neutral position P →T

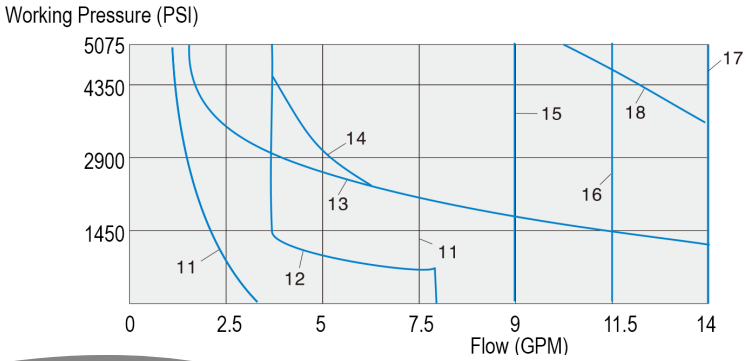
FFP01 Working Limits

With regard to the four–way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A,and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B, used as a three–way valve, the Maximum flow may be very small in the serious condition.

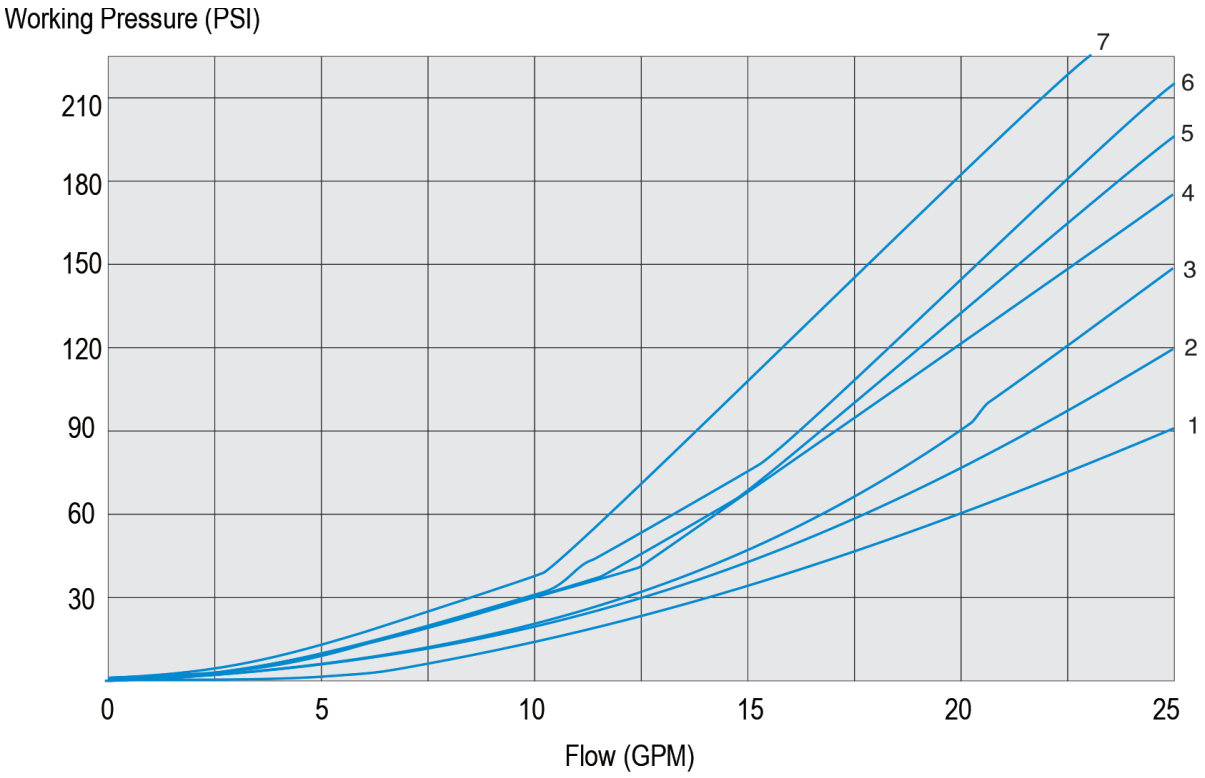
DC solenoid operation DC D24, D1 2, B220, B110		AC solenoid operation AC A110, A220, 50HZ	
Curve	Symbol	Curve	Symbol
1	2B8 2B8L1)	11	2B8 2B8L1
2	3C7	12	3C7
3	2B8 2B8L	13	2B8 2B8L
4	3C5 3C25	14	3C5 3C25
5	3C4	15	3C6
6	3C6 3C3	16	3C3
7	2N8 2D8 3C10 3C12	17	2N8 2D8 2N3 2D3
8	2B3 2B2 2B2L		2N2 2D2 3C2 3C4 3C10
9	3C9		3C9 3C29 3C12
10	3C2 3C29 2N3	18	2B3 2B2 2B2L
	2D3 2N2 2D2		



1) No manual emergency operation
2) Oil return from actuator to oil tank



FFP03 Performance Curve



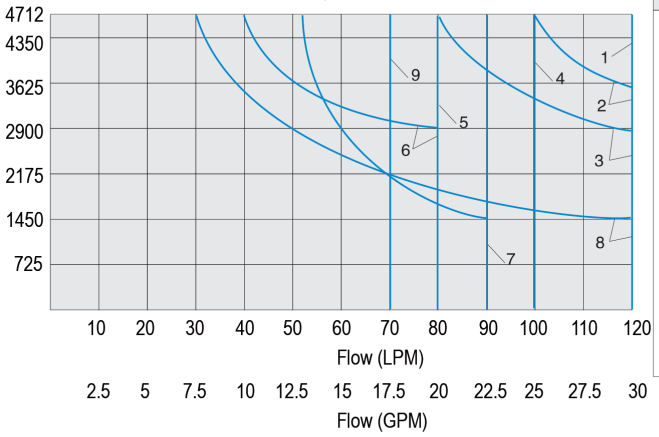
Function code	Direction			
	P→A	P→B	A→T	B→T
2B8 2B8L	2	2	–	–
2B3 2B2 2B2L	2	2	3	3
3C2 3C7	2	2	4	4
3C5	2	3	3	5
3C6	3	3	4	6
3C3	1	1	4	5
3C10 3C12	2	2	3	5
3C9	1	1	5	1
3C25	3	2	5	3
3C29	2	4	3	–

7.Spool symbol “3C29” in the shifting position A → B
4. Spool symbol 3C6 in neutral position P → T

FFP03 Working Limits

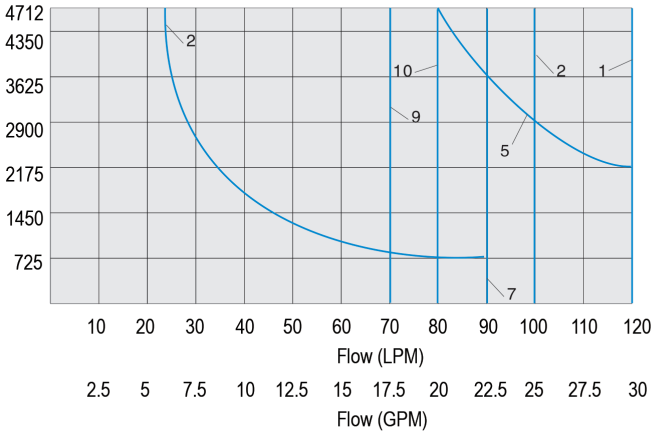
With regard to the four–way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A, and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B, used as a three–way valve, the Maximum flow may be very small in the serious condition.

Working Pressure (PSI) DC solenoid operation



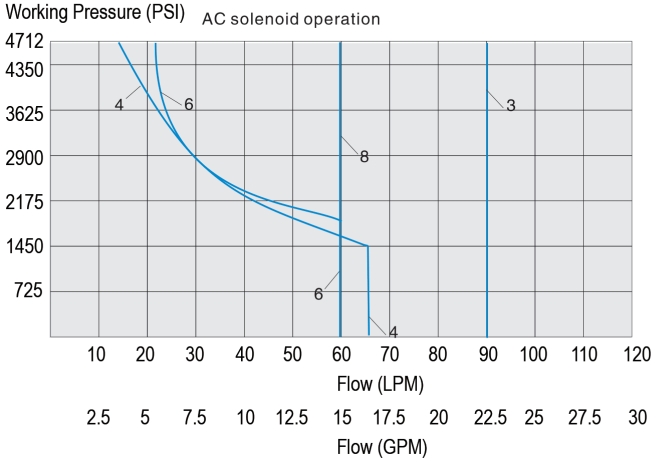
Curve	Symbol
1	2B3 2N3 2D3 2B2 2N2 2D2 2B2L 3C9
2	3C2
3	2N8 2D8 3C10 3C12 3C4
4	3C3
5	3C29
6	3C6
7	3C5 3C25
8	2B8 2B8L
9	3C7
1)	Return circuit (Independent of area ratio)

Working Pressure (PSI) AC solenoid operation

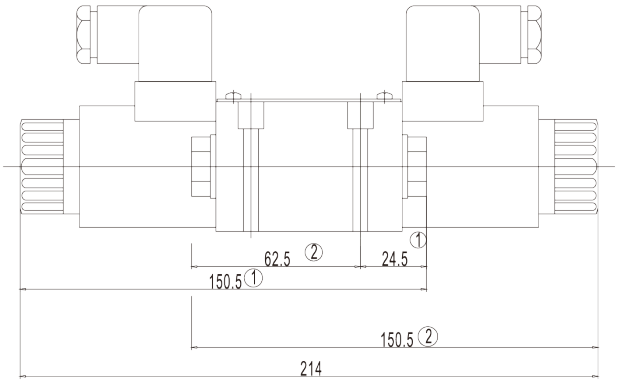


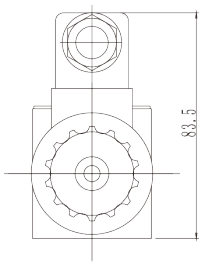
110V,50Hz; 120V,60Hz; 220V,50Hz; 240V,60Hz;	
Curve	Symbol
1	2B3 2N3 2D3 2B2 2N2 2D2 2B2L
2	3C2 3C10
3	3C12 3C9
4	2B8 2B8L
5	2N8 2D8 3C4
6	3C6
7	3C5 3C25
8	3C7
9	3C3
10	3C29

Working Pressure (PSI) AC solenoid operation



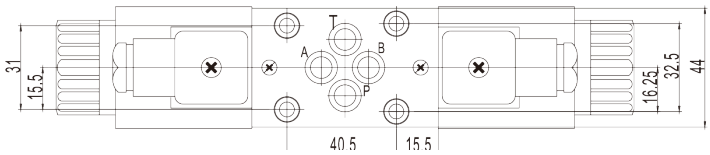
FFP01 DC Plug type



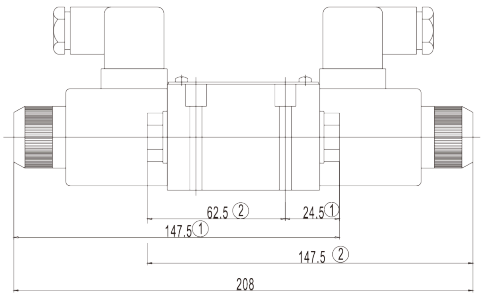


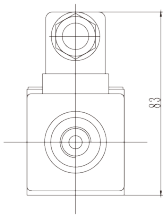
① ②

Two positions Electrical
operated directional control valve



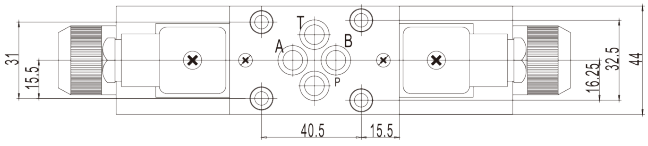
FFP01 DC Wire Box



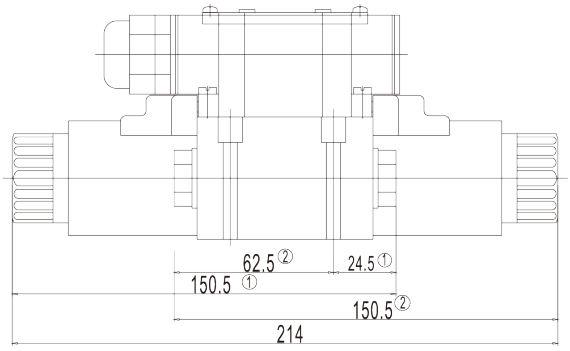


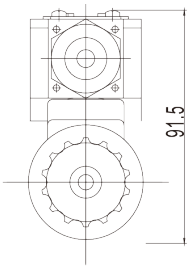
① ②

Two positions Electrical
operated directional control valve



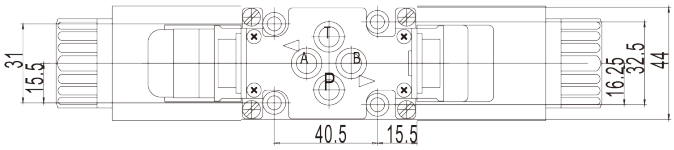
FFP01 AC Plug Type



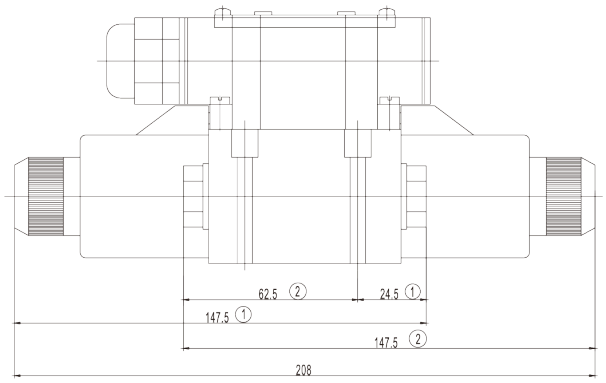


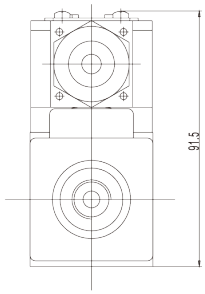
① ②

Two positions Electrical
operated directional control valve



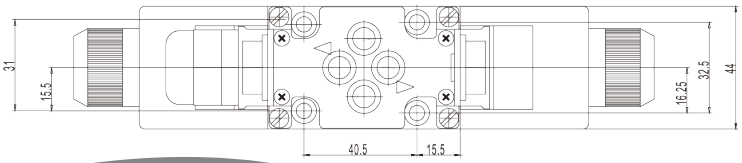
FFP01 AC Wire Box



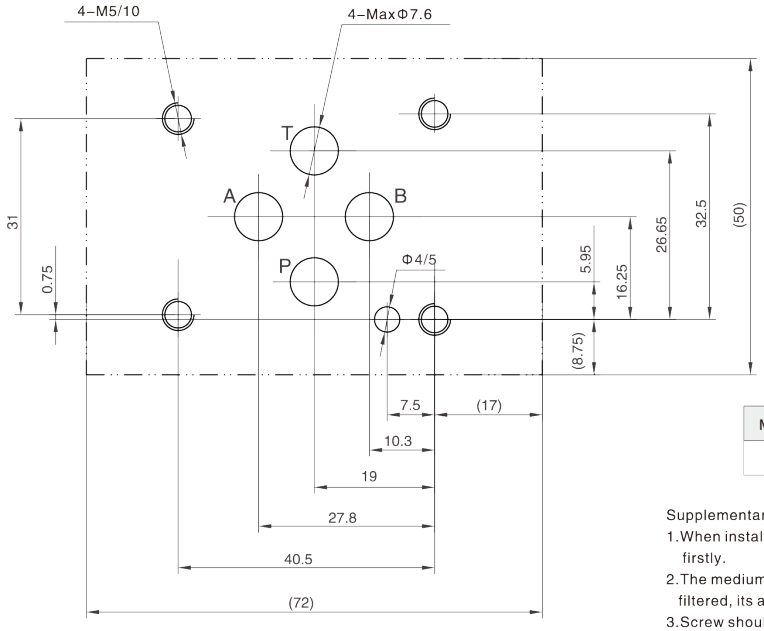


① ②

Two positions Electrical
operated directional control valve



FFP01 Subplate Oil Port

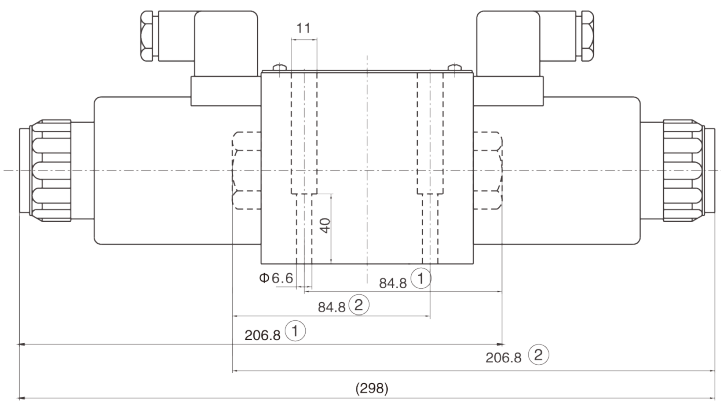


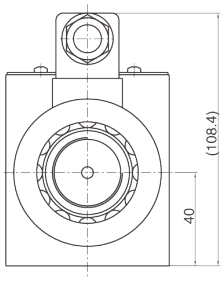
Mounting screw	Amount	Tighten torque
M5x45-10.9	4	9Nm

Supplementary explanation

1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy at least 20 μ m.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

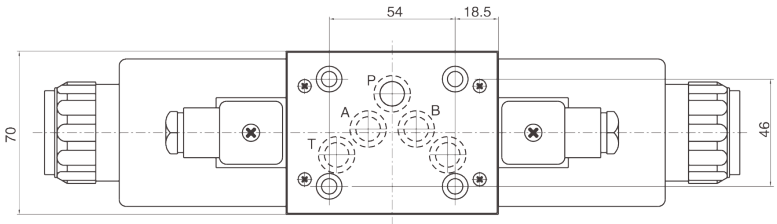
FFP03 DC Plug Type



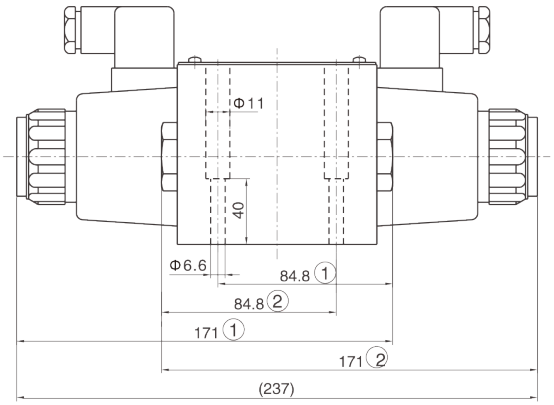


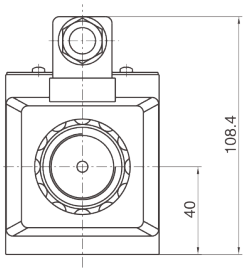
① ②

Two positions Electrical operated directional control valve

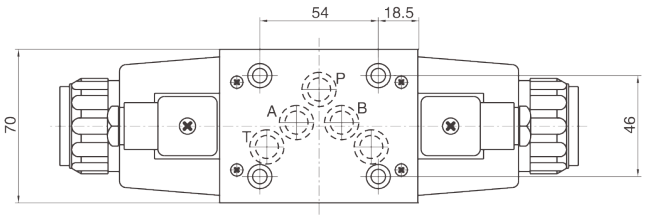


FFP03 AC Plug Type

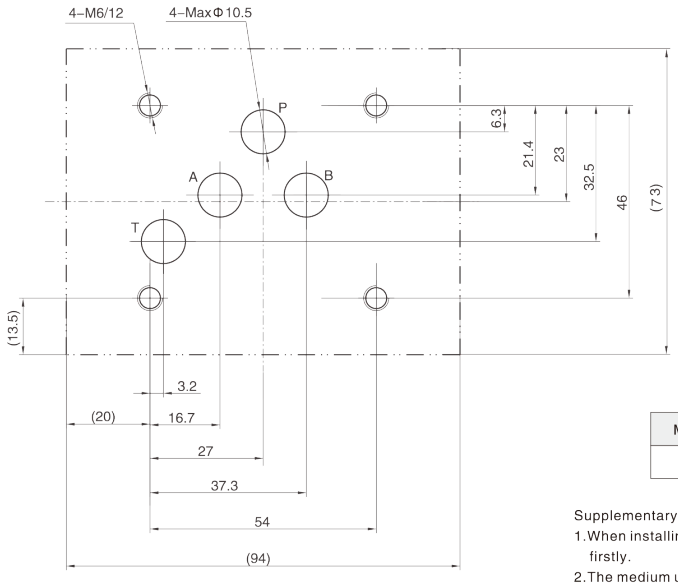




① ②
Two positions Electrical operated directional control valve



FFP03 Subplate oil port



Mounting screw	Amount	Tighten torque
M6x50–10.9	4	15Nm

Supplementary explanation
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.