Directional Control Valves

DN04 Solenoid valve

Technical specification

Specification		04
Max. working pressure (MPa)	Port P、A、B	25
	Port T	10
Max. Flow	(L/min)	25
Working fluid		Mineral oil;phosphate-ester
Fluid temp.	(℃)	-20~70
Viscosity	(mm^2/s)	2.8~100
Working voltage	(V)	DC 12 DC 24
Insulation grade		IP55
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Solenoid valve is controlled by the solenoid to move the spool, so as to control the oil flow direction. It could be used in hydraulic system directly, control the oil on/off; also could be used as pilot valve, to control other valves.

Model description

4 HYWE4 - * - * * * / * * 50 *

4 4Port

DN04 Solenoid valve

Spool type
Details refer to symbol list

Vdtage
D12 DC12V
D24 DC24V

Z5L Square connector with light
Z6 Wire box type

Omit without hand emergency
N9 with concealed hand emergency

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Seal material
Omit NBR Seals
V FPM Seals

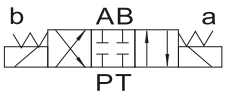
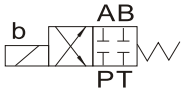
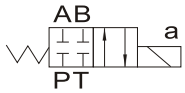
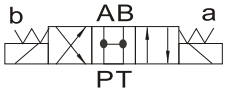
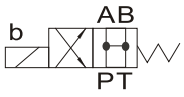
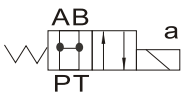
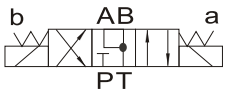
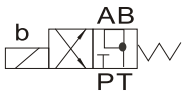
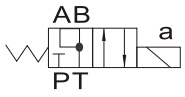
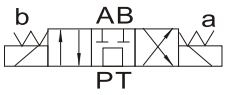
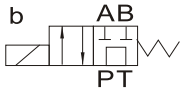
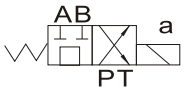
Serial number

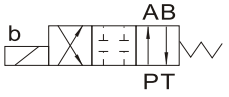
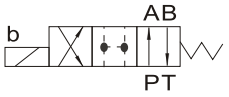
Remarks

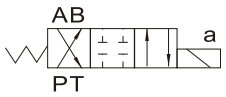
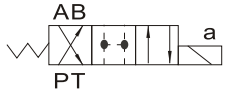
DN04 Solenoid valve

Code symbol

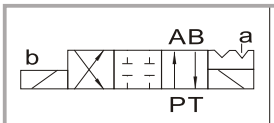
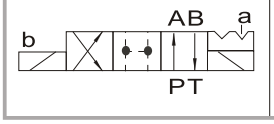
Spring return

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C6		2B6B		2B6BL	

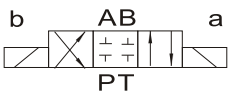
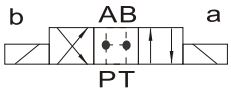
2B2	
2B3	

2B2L	
2B3L	

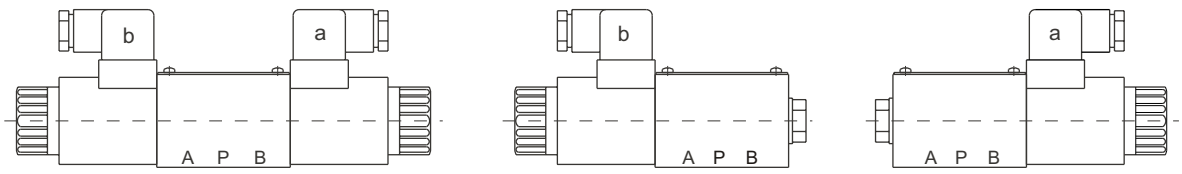
With detent

	2D2
	2D3

No spring return and no detent mechanical positioning

	2N2
	2N3

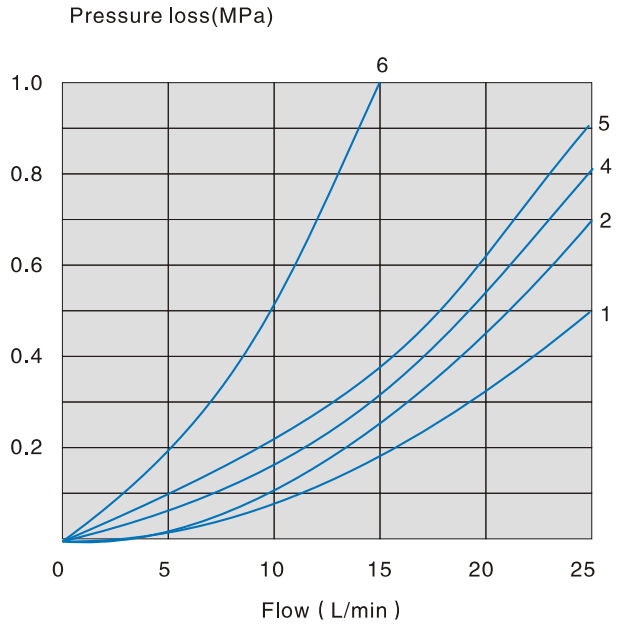
Name of solenoid



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.

DN04 Solenoid valve

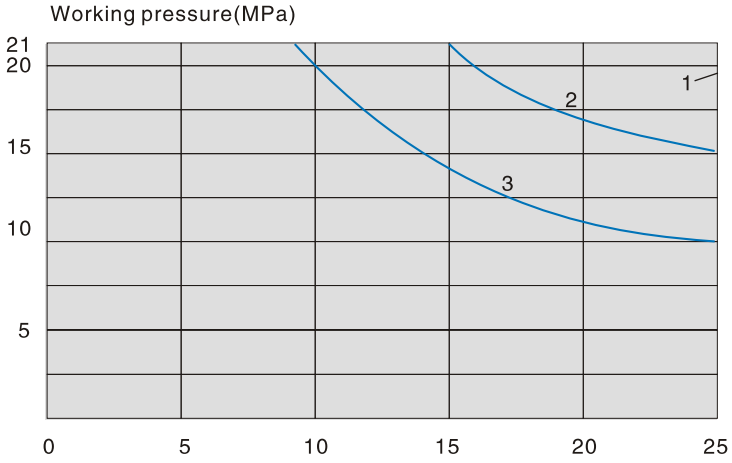
Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



Function code	Direction				
	P→A	P→B	A→T	B→T	P→T
2B2 2B2L	5	5	4	4	–
3C2	4	4	3	3	–
3C6	3	3	4	4	6
3C3	1	1	1	1	–
3C4	5	5	3	3	–

Specification Working limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank)

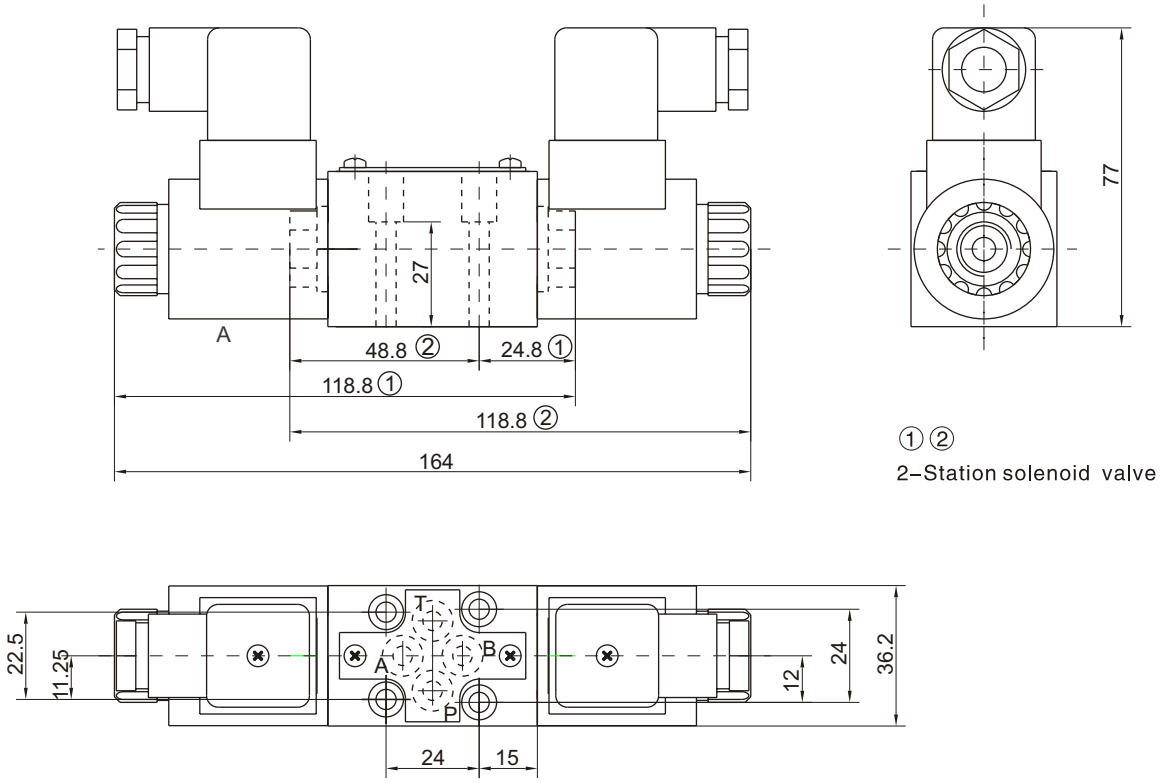
With regard to the four-way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A,and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B,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



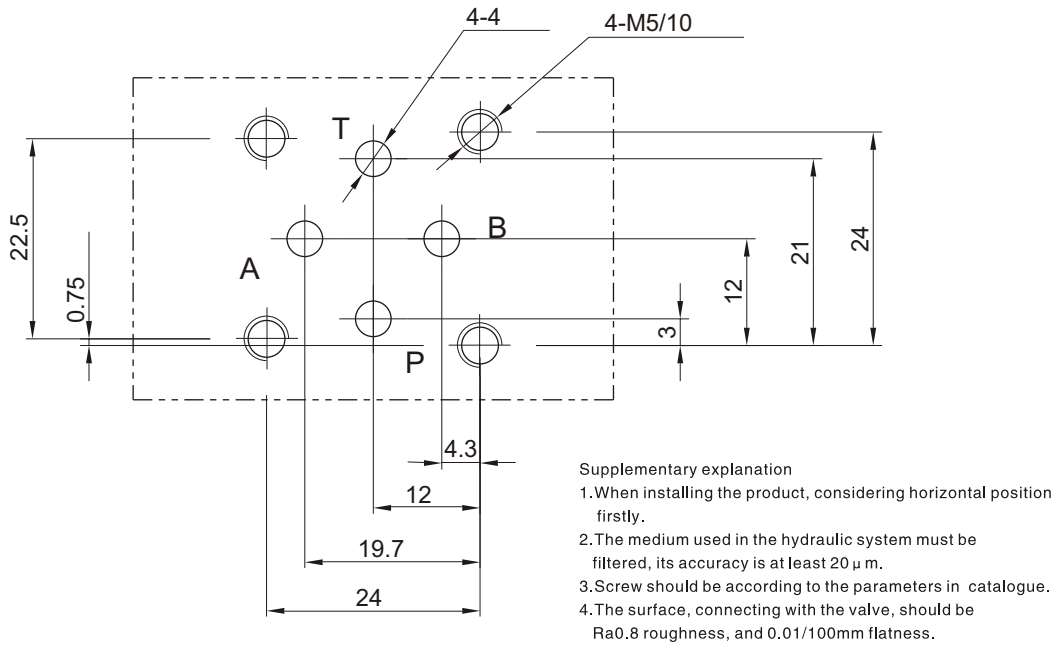
Cunoe	Spool
1	2B2 2D2 2N2 2B2L
2	3C2 3C4
3	3C6

DN04 Solenoid valve

External dimensions



Size of subplate



Electrical operated directional control valve

Technical specification

Specification		02	03
Working pressure (MPa)	Oil ports P、A、B	31.5	31.5
	Oil ports T	10	10
Max. Flow	(L/min)	80	120
Working fluid		Mineral oil;phosphate-ester	
Fluid temp.	(℃)	-20~70	
Viscosity	(mm^2/s)	2.8~100	
Working voltage (V)	DC	12	24
	AC	110V/50Hz	220V/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 solenoids	1.95(DC)	1.9(AC)	6.7(DC)	5.1(AC)

Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.

Model description

FW - * - * - * * * / * * 50 *

Electrical Operated
Directional Control Valve

Specification
02 NS 6
03 NS 10

Function code
Details as following symbol table

Working voltage
D12 DC12V
D24 DC24V
A110 AC110V
A220 AC220V
B110 AC110V Rectified
B220 AC220V Rectified

Z5L Square connector with light
Z6 Wire box type

Omit without hand emergency
N9 with concealed hand emergency

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Omit NBR Seals
V FPM Seals
Seal material
50 Rexroth
60 Vickers
70 Yuken

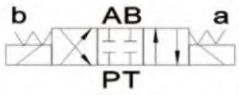
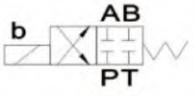
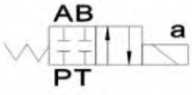
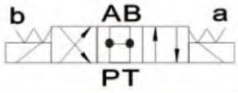
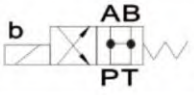
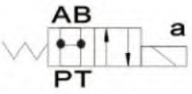
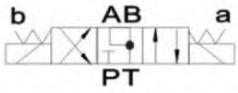
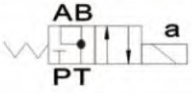
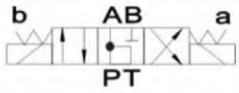
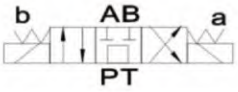
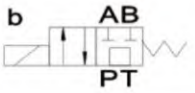
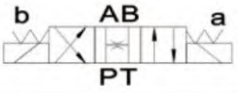
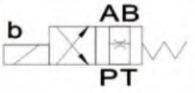
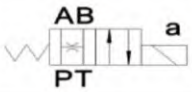
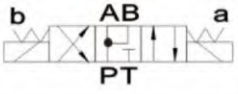
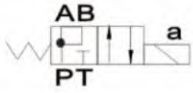
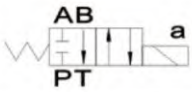
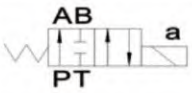
Serial number

Remarks

Electrical operated directional control valve

Code symbol

Spring return

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
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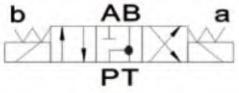
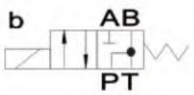
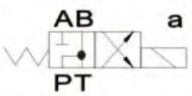
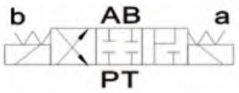
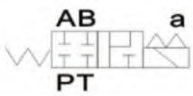
3C25		2B25B		2B25BL	
3C29		2B29B		2B29BL	

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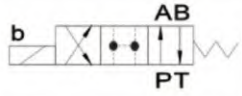
2B3	
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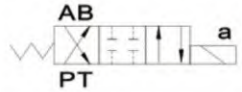
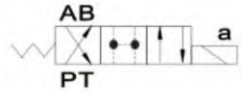
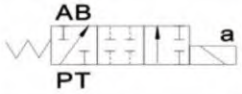
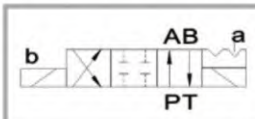
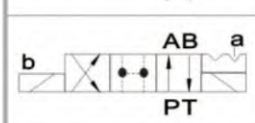
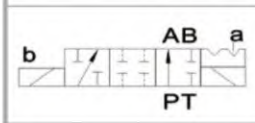
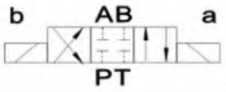
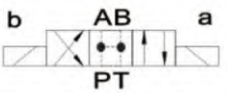
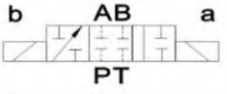
2B2L	
2B3L	
2B8L	

With detent

	2D2
	2D3
	2D8

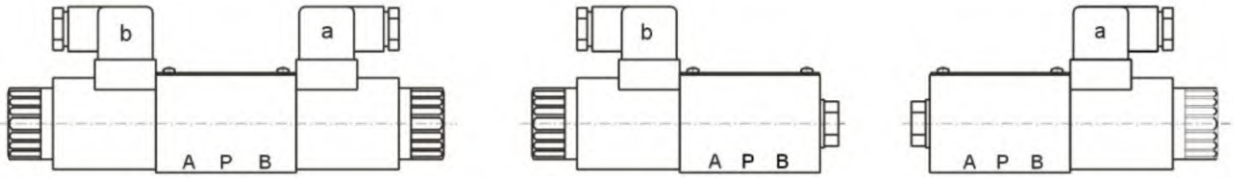
No spring return and no mechanical positioning

	2N2
	2N3
	2N8

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

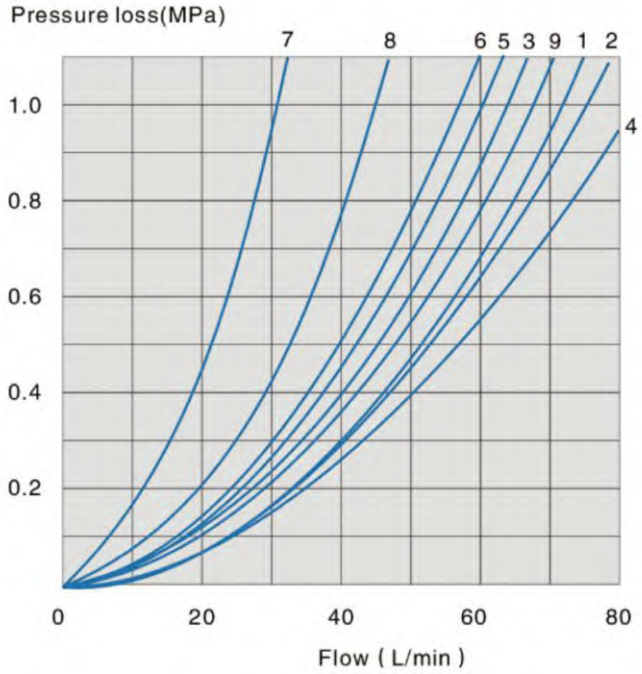
Electrical operated directional control valve

Name of solenoid



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.

02 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



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

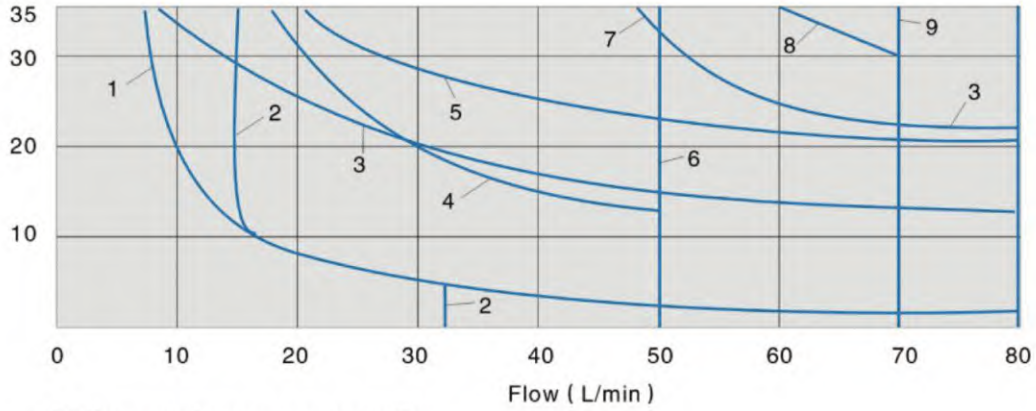
Electrical operated directional control valve

02 Specification Working limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank)

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 D24, D1 2, B220, B110		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		

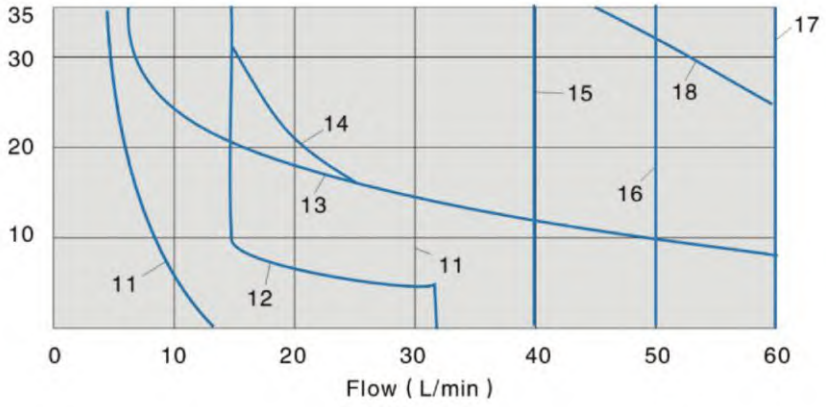
Working pressure(MPa)



1) No manual emergency operation

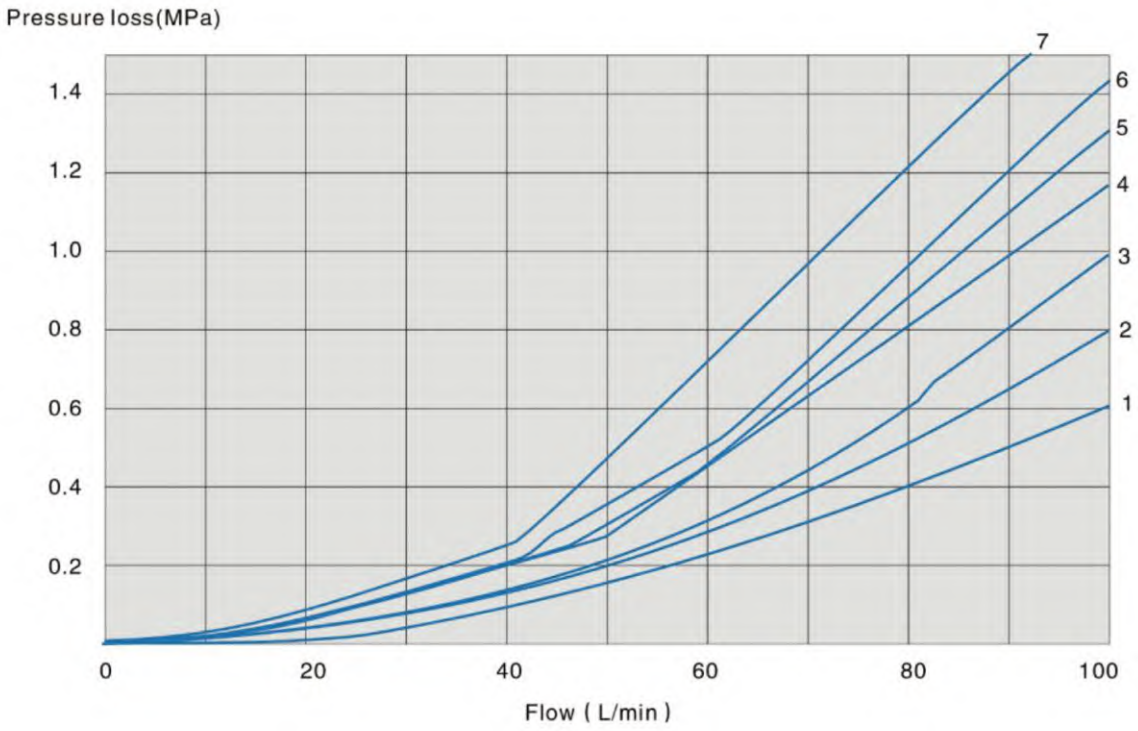
2) Oil return from actuator to oil tank

Working pressure(MPa)



Electrical operated directional control valve

03 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



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	–

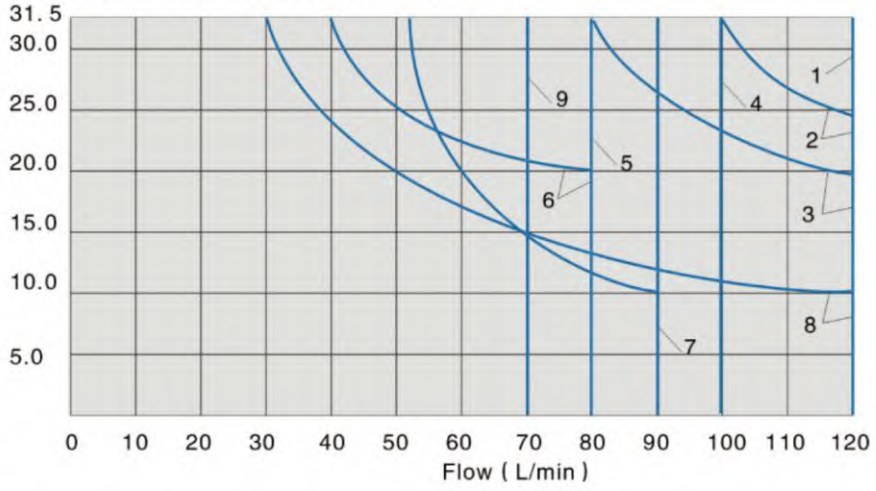
7.Spool symbol "3C29" in the shifting position A → B
4. Spool symbol 3C6 in neutral position P → T

Electrical operated directional control valve

03 Specification Working limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank)

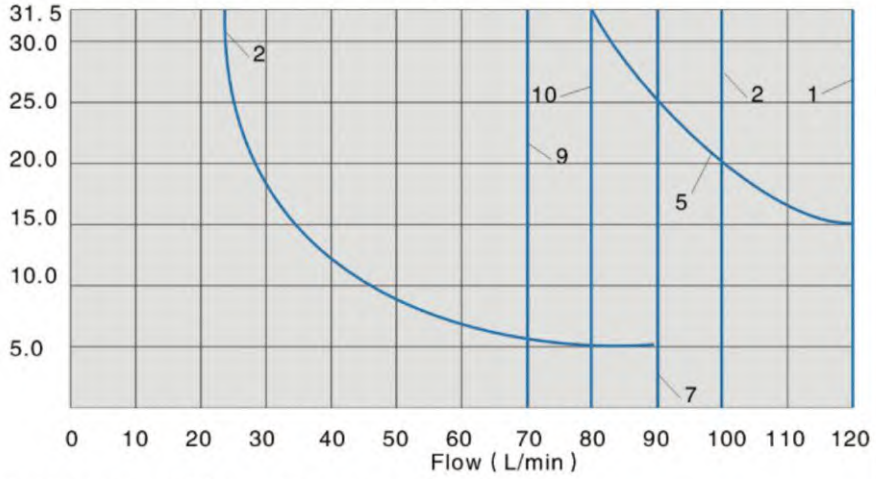
With regard to the four-way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A, and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B,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

Working pressure(MPa) 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)

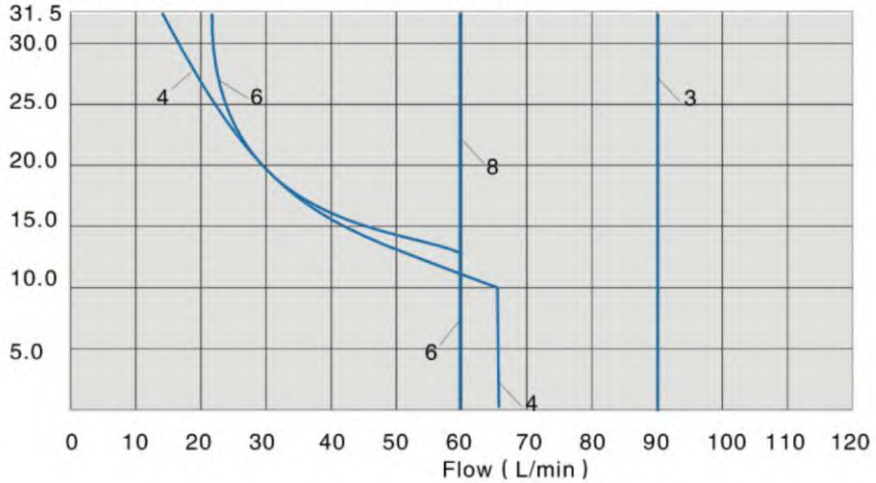
Working pressure(MPa) AC solenoid operation



110V,50Hz; 120V,60Hz;
220V,50Hz; 240V,60Hz;

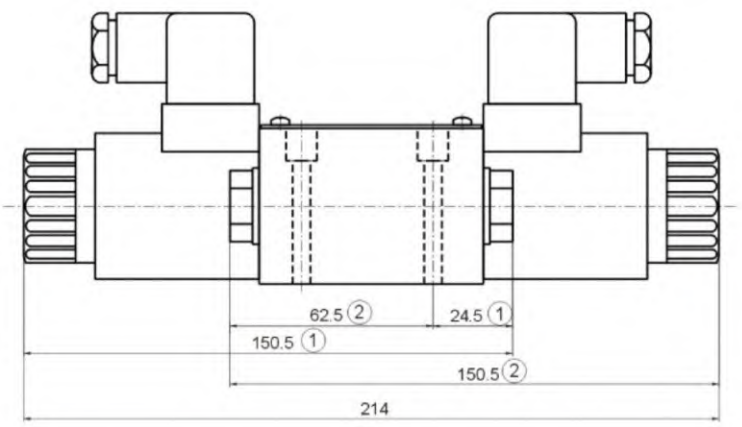
Curve	Symbol
1	2B3 2N3 2D3 2B2 2N2 2D2 2B2L
2	3C2 3C10
3	3C12 3C9
4	2B8 2B8L
5	2N8 2D8 3C4
6	3C6
7	3C5 3C25
8	3C7
9	3C3
10	3C29

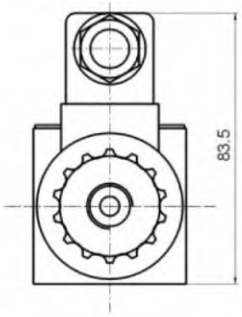
Working pressure(MPa) AC solenoid operation



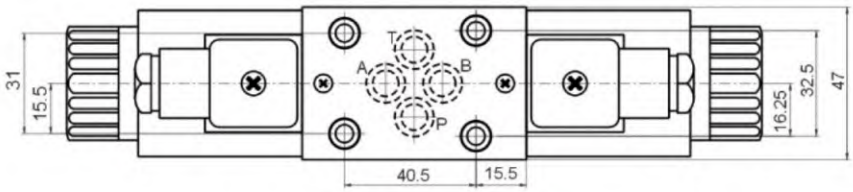
Electrical operated directional control valve

External dimensions （02 Direct current plug type）

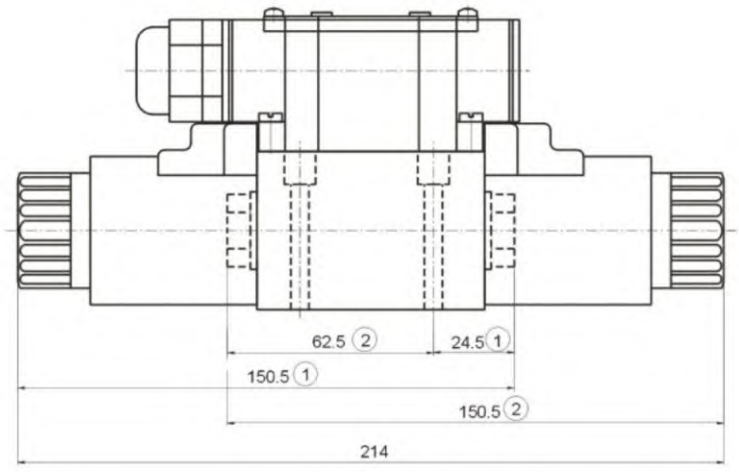


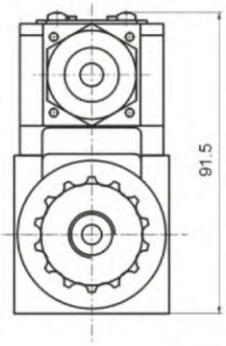


① ②
Two positions Electrical
operated directional control valve

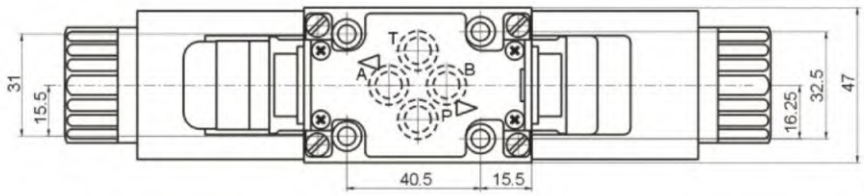


External dimensions(02 Direct current wire box type)



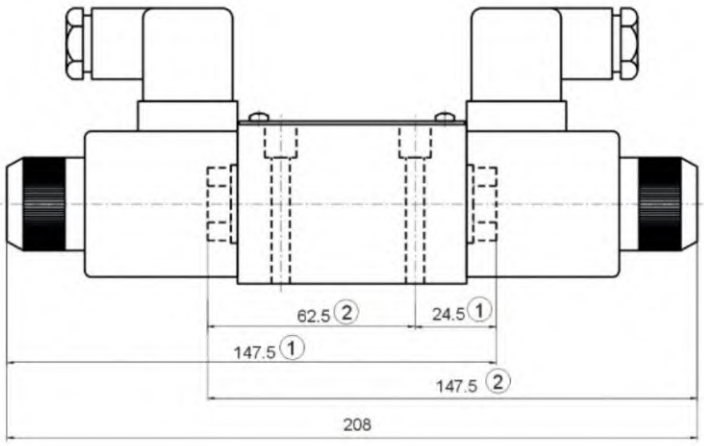


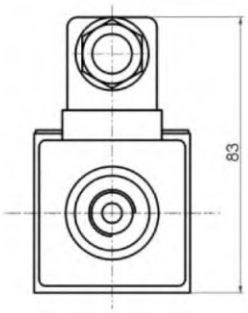
① ②
Two positions Electrical
operated directional control valve



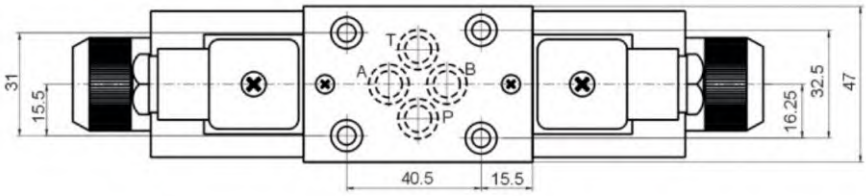
Electrical operated directional control valve

External dimensions (02 Alternating current plug type)

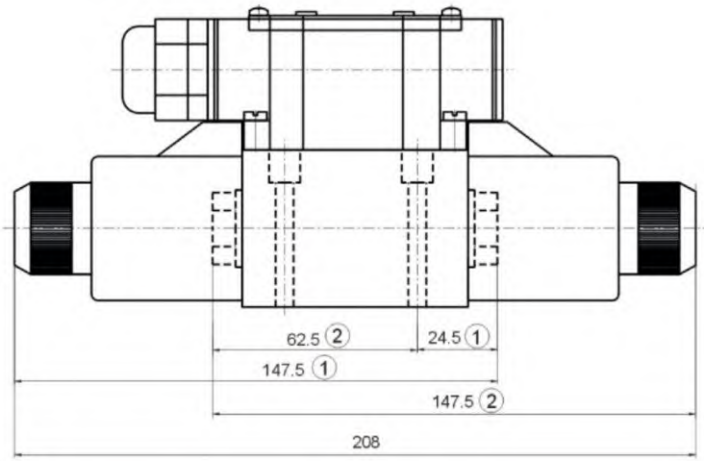


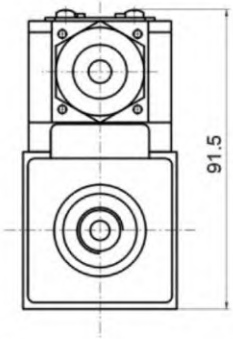


① ②
Two positions Electrical
operated directional control valve

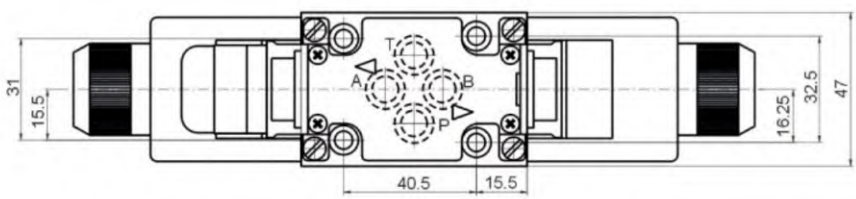


External dimensions (02 Alternating current wire box type)



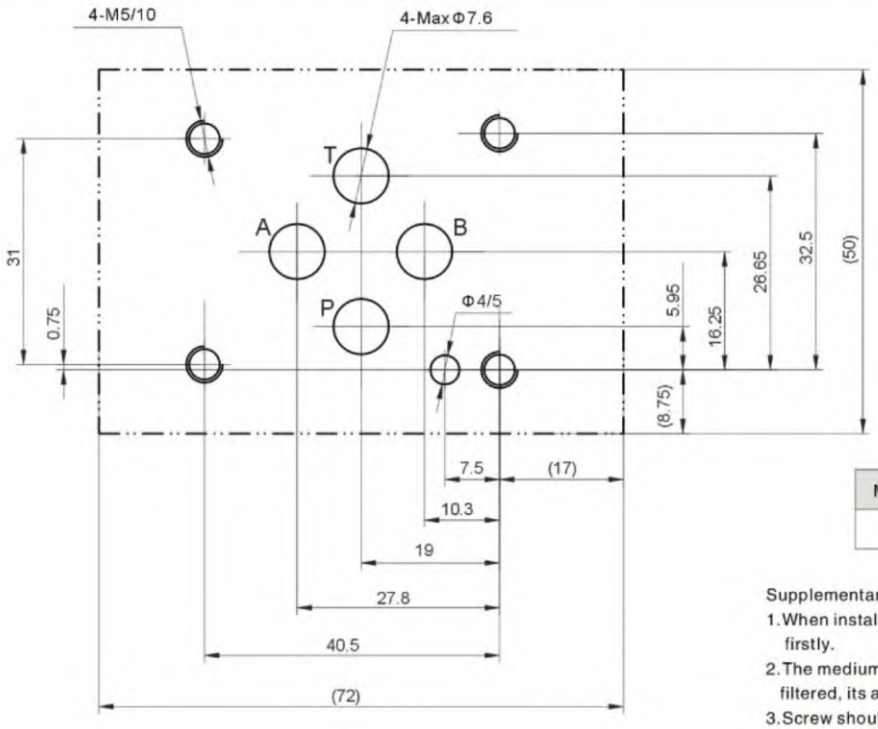


① ②
Two positions Electrical
operated directional control valve



Electrical operated directional control valve

02 Size of subplate oil port

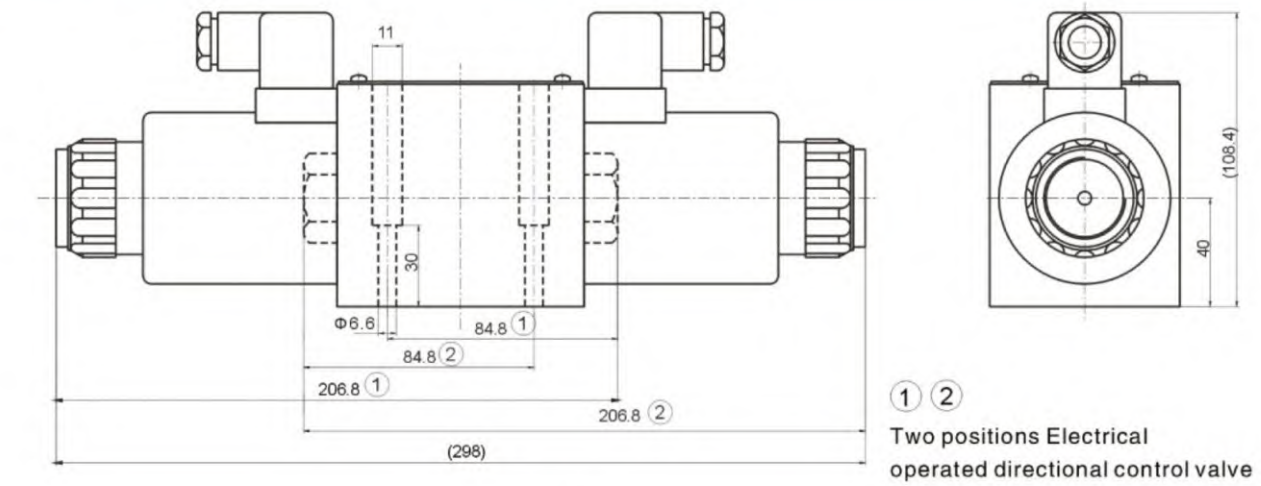


Mounting screw	Amount	Tighten torque
M5x45-10.9	4	9Nm

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.

External dimensions （03 Direct current plug type）



① ②

Two positions Electrical operated directional control valve