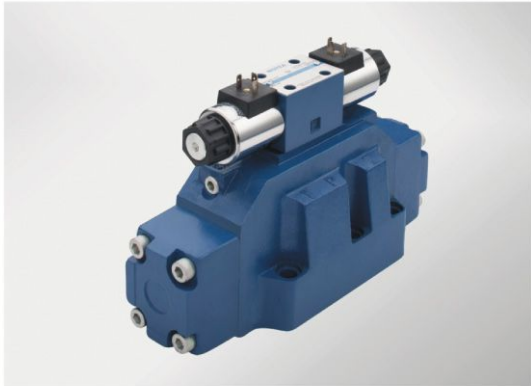


# Electro-hydraulic directional control valve



Electro-hydraulic directional control valve is a control valve which can use the pressure of the hydraulic circuit to pull the spool and change the hydraulic oil direction.

Electro-hydraulic directional control valve is the combination of the electrical operated directional control valve and the hydraulic operated directional control valve. It uses the electrical operated directional control valve to control the hydraulic operated directional control valve, and change the hydraulic oil direction.

Electro-hydraulic directional control valve and hydraulic operated directional control valve are used mostly in hydraulic systems when electrical operated directional control valve can not afford the flow. It may control the movement of the power elements, or control the direction of the flowing oil.

D.8.1

## Technical specification

Specification		03		04		06	
Model		FWH-03	HFWH-03	FWH-04	HFWH-04	FWH-06	HFWH-06
Max. Working pressure (MPa)	P, A, B Port	28	35	28	35	28	35
	T port (internal leakage of control oil)	10		10		10	
	Y port (external leakage of control oil)	10		10		10	
Minimum control pressure (MPa)		1.0 Spring-Return three-way valve two-way valve		1.2 Spring-Return three-way valve two-way valve		1.3 Spring-Return three-way valve two-way valve	
Maximum control pressure (MPa)		to25					
Max. Flow (L/min)		160		300		650	
Working fluid		Mineral oil;phosphate-ester					
Fluid temp. (°C)		-20~70					
Viscosity (mm <sup>2</sup> /s)		2.8~380					
Weight (kg)	Single-head solenoid	6.4		8.5		17.6	
	Double-head solenoids	6.8		8.9		18	
	FH Valve	4		7.3		16.5	
	Adjustor of reversing time	0.8		0.8		0.8	
	Pressure reducing valve	0.5		0.5		0.5	
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 $\beta_{10} \geq 75$ .						

D.8.1

# Electro-hydraulic directional control valve

## Model description

D.8.2

<p style="text-align: center;"><b>* FWH/FH - * * - * - * * * * / * * * * *</b></p> <p>Working pressure Omit 28MPa H 35MPa</p> <p>FWH Electro-hydraulic directional control valve FH Hydraulic operated directional control valve</p> <p>Specification 03 NS 10 04 NS 16 06 NS 20</p> <p>Main valve return type Omit Spring return H Hydraulic centration</p> <p>Function code Details as following symbol table</p> <p>Working voltage D12 DC12V D24 DC24V A110 AC110V A220 AC220V B110 AC110V Rectified B220 AC220V Rectified</p> <p>Z5L Square connector with light Z6 Wire box type</p> <p>Omit without hand emergency N9 with concealed hand emergency</p>	<p style="text-align: right;">Remarks</p> <p style="text-align: right;">Serial number</p> <p style="text-align: right;">Seal material Omit NBR Seals V FPM Seals</p> <p><sup>2)</sup> Omit No reducing valve D3 With reducing valve</p> <p><sup>1)</sup> Omit Without pre-load valve P4.5 With pre-load valve</p> <p>Omit without stroke adjusting device A Head A of main valve with stroke adjustment B Head B of main valve with stroke adjustment W Both heads with stroke adjustment</p> <p>Omit without shifting time adjustment S With shifting time adjustment: Inlet flow control S1 shifting time adjustment: Outlet flow control</p> <p>Omit without damping 08 <math>\Phi</math>0.8 Damping 10 <math>\Phi</math>1.0 Damping 12 <math>\Phi</math>1.2 Damping</p> <p>Omit Intl cntrl intl disch XY Extl cntrl extl disch X Extl cntrl intl disch Y Intl cntrl extl disch</p>

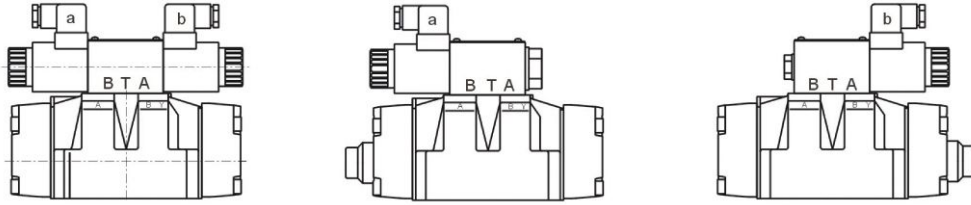
### Explanation

1. For neutral unloaded directional control valve it must be ordered separately.  
There is no model (FWH-03) Electro-hydraulic directional control valve NS10.
2. Only applied when the controlling pressure is higher than 25MPa



# Electro-hydraulic directional control valve

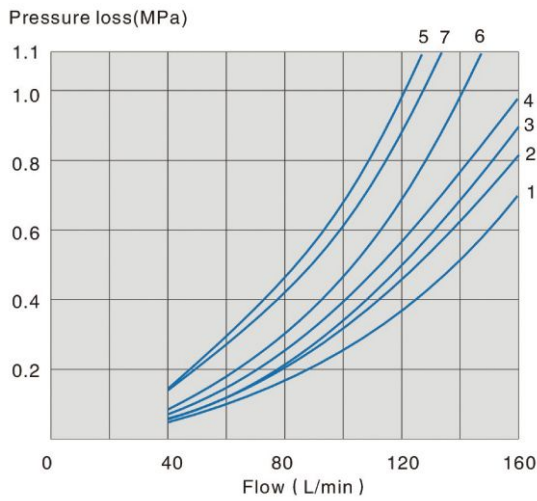
## Name of solenoid



1. aWhen movement a, P→A B→T
2. bWhen movement b, P→B A→T
3. 3C6 Oil flow in the opposite direction with the above-mentioned movement.

D.8.4

## 03 Specification Performance curve ( Measured at $v=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$ )



Function	Switching position			
	P→A	P→B	A→T	B→T
3C2	1	2	4	5
3C5	1	4	1	1
3C6	4	2	2	6
3C3	4	4	1	4
3C4	1	2	1	3
3C12	2	3	1	4
3C9	4	4	3	4
3C25	4	1	3	4
3C29	2	3	3	5
3C10	3	3	3	4
3C7	2	2	3	5

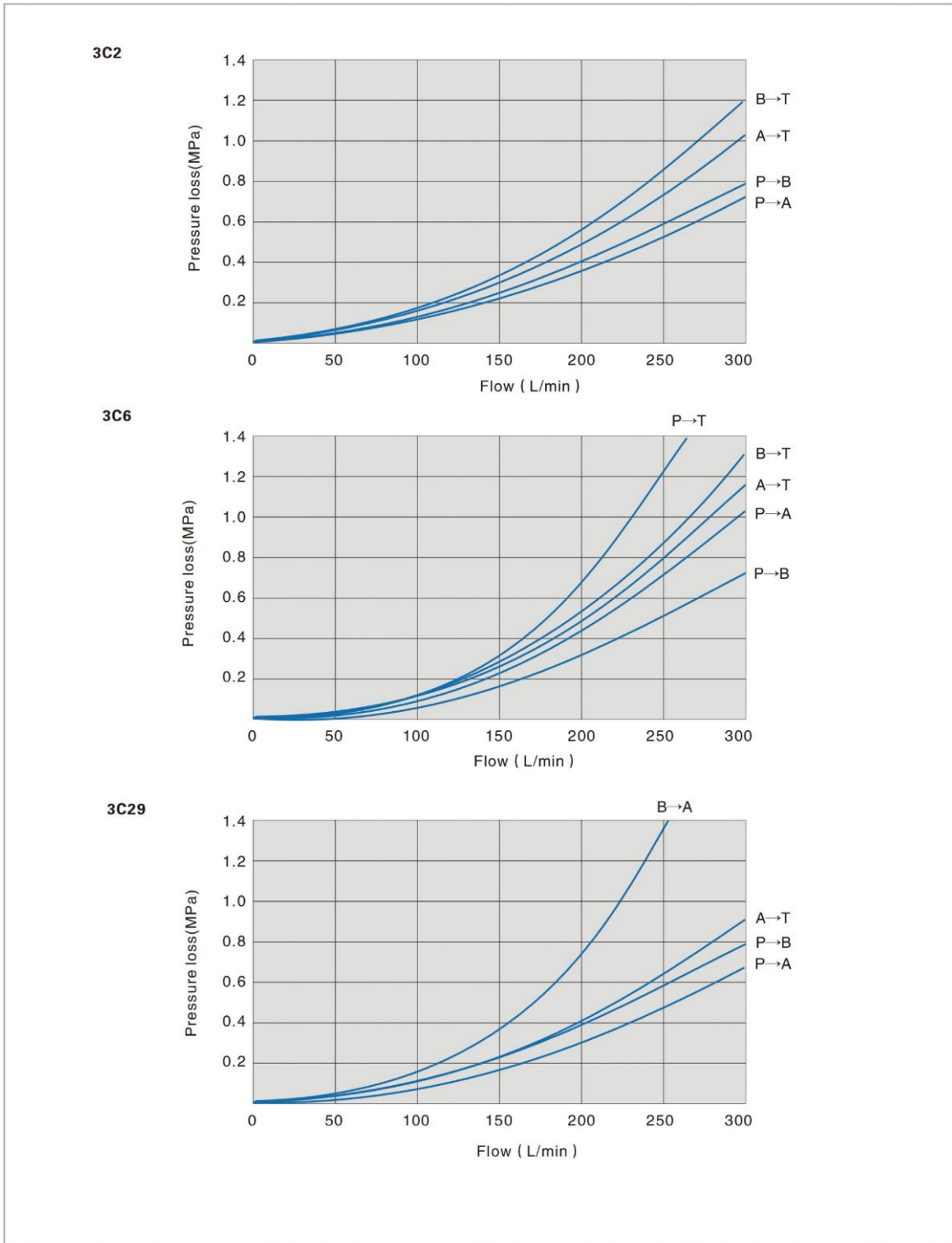
Function	Neutral		
	A→T	B→T	P→T
3C5	3	-	6
3C6	-	-	7
3C3	1	3	5
3C25	-	7	5

Function	Neutral		
	A→T	B→T	P→T
3C12	3	-	-
3C10	-	4	-

# Electro-hydraulic directional control valve



## 04 Specification Performance curve ( Measured at $v=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$ )

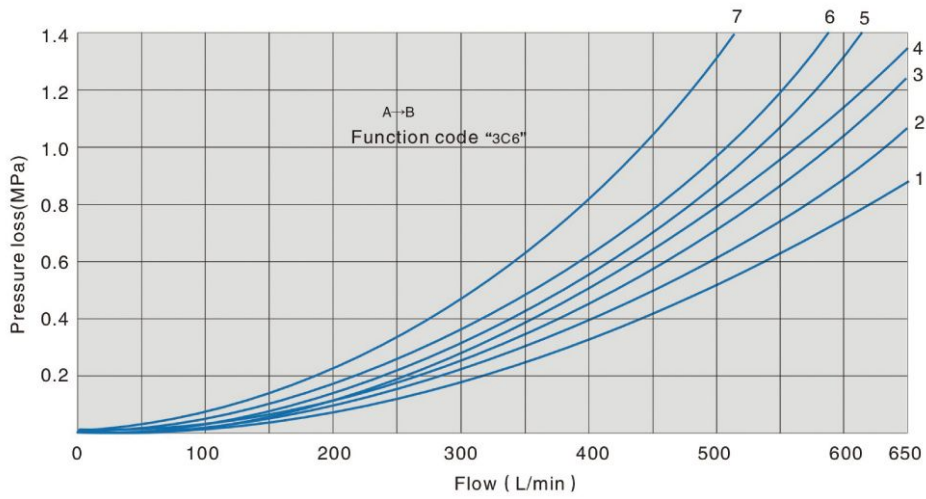




# Electro-hydraulic directional control valve

**06 Specification Performance curve** ( Measured at  $v=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$  )

D.8.6



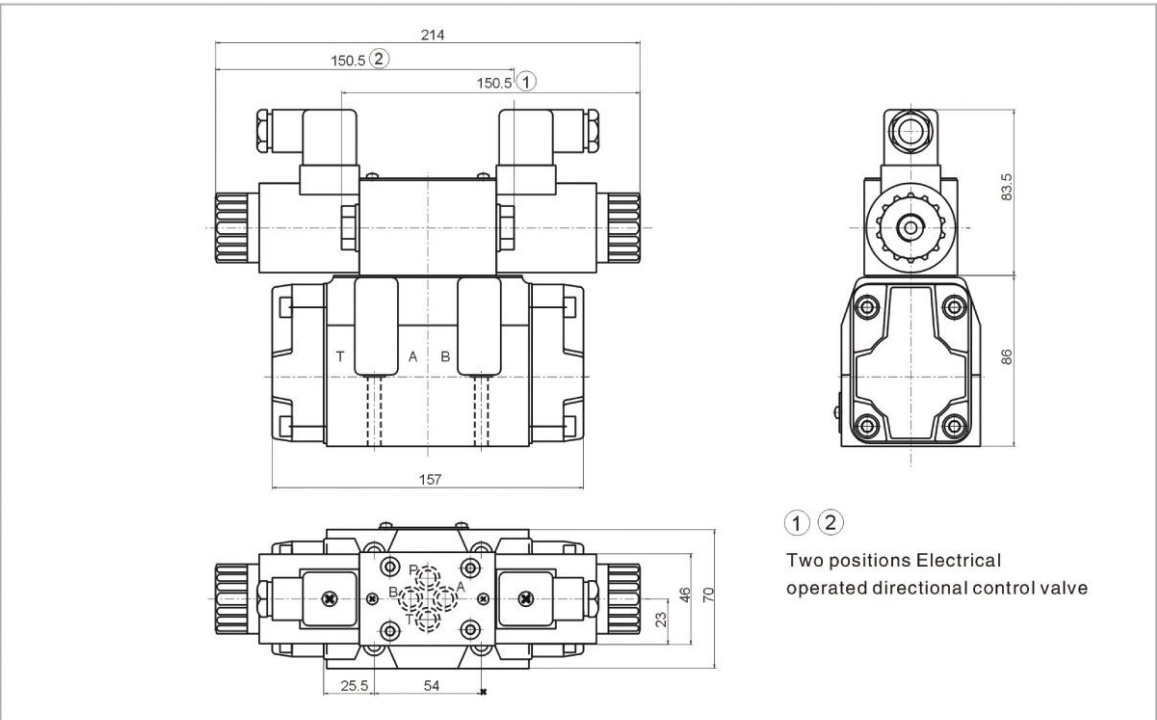
Function	Switching position			
	P→A	P→B	A→T	B→T
3C2	1	1	1	3
3C5	1	4	3	3
3C6	3	1	2	4
3C3	4	4	3	4
3C4	2	2	3	5
3C12	2	2	3	3
3C9	4	4	1	4
3C25	4	1	1	5
3C29	2	1	1	-
3C10	2	1	1	6
3C7	4	4	3	6

7.Function code "3C6" type, neutral position P→T

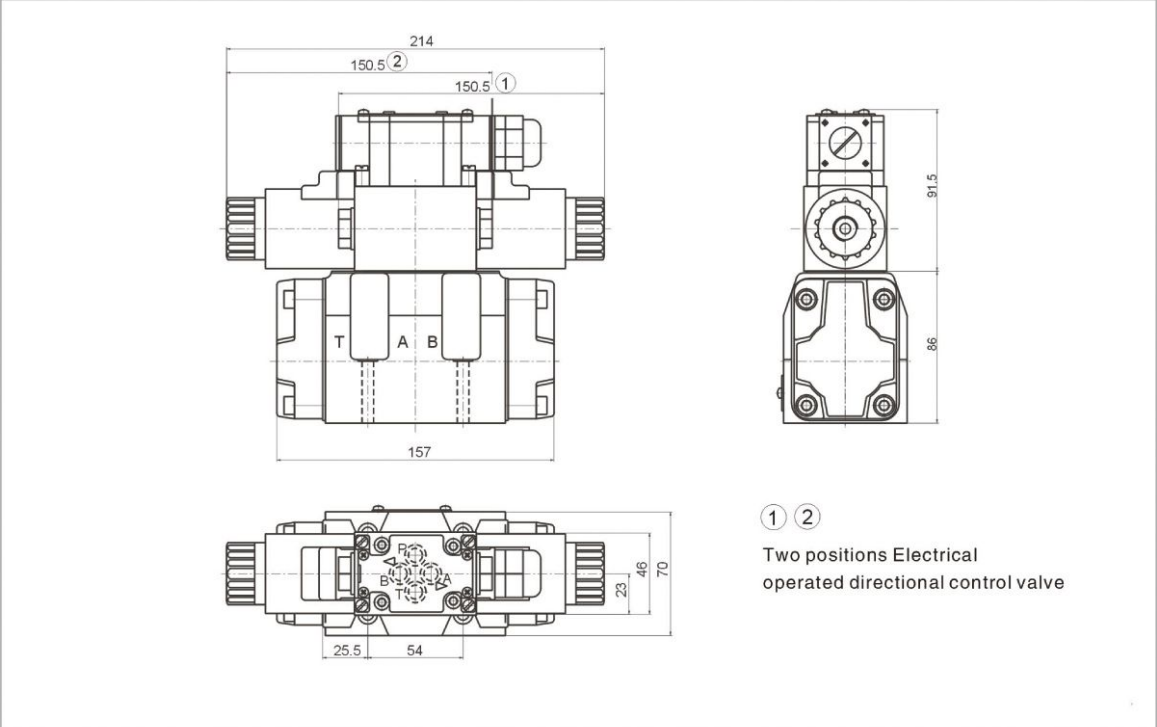
# Electro-hydraulic directional control valve



## External dimensions ( 03 Direct current plug type )

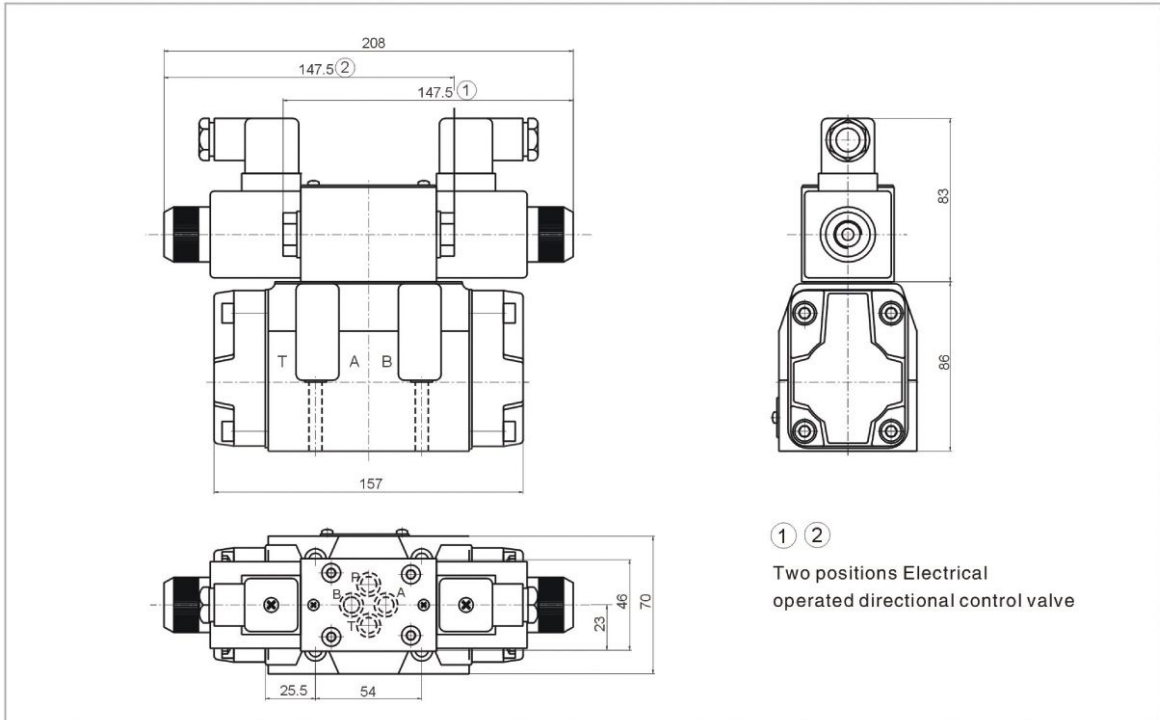


## External dimensions ( 03 Direct current wire box type )

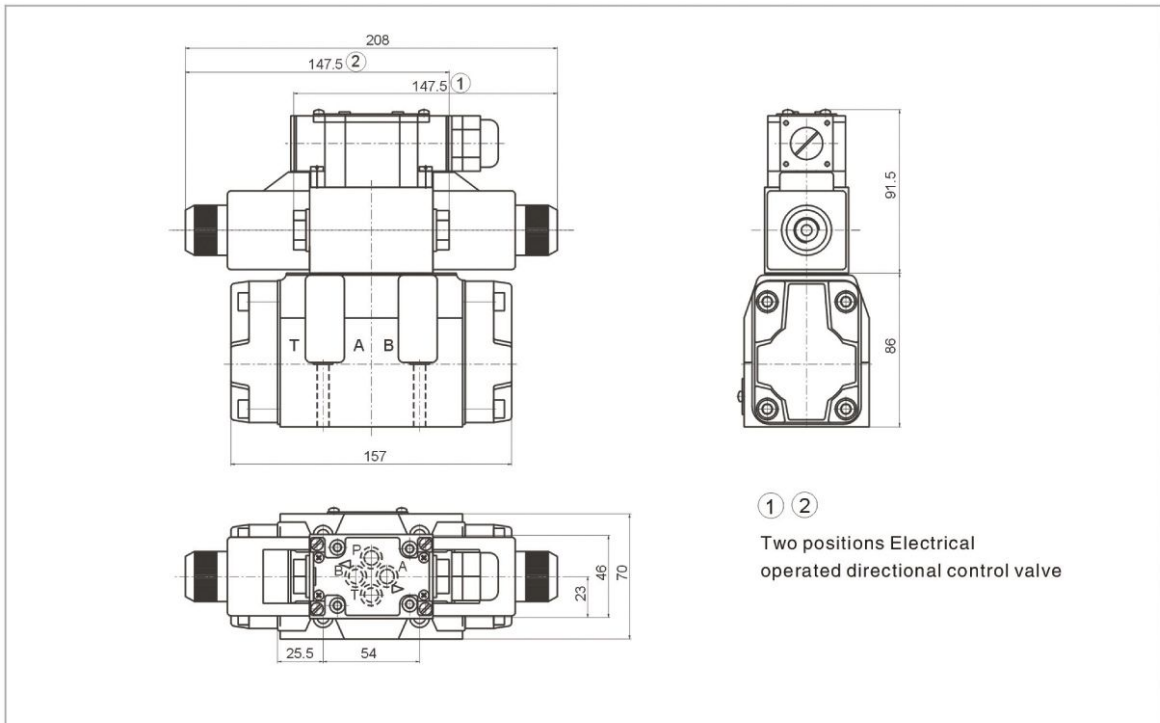


# Electro-hydraulic directional control valve

## External dimensions ( 03 Alternating current plug type )



## External dimensions ( 03 Alternating current wire box type )





# Electro-hydraulic directional control valve



## 03 Size of subplate oil port

Technical drawing of the subplate oil port showing dimensions and mounting screw specifications. The drawing includes a top view and a side view. Dimensions are provided in millimeters. The top view shows a rectangular subplate with a width of 73 mm and a length of 108 mm. The side view shows a height of 13.5 mm. The drawing includes labels for mounting screws: 4-M6/12, 4-Φ10.5, and 2-Φ7. The subplate has ports labeled X, P, A, B, and Y. Dimensions include 6.3, 11.1, 21.4, 23, 32.5, 46, 13.5, 7.9, 3.2, 16.7, 27, 37.3, 54, 61.9, and (27).

Mounting screw	Amount	Tighten torque
M6x45-10.9	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 μm.
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.

D.8.9

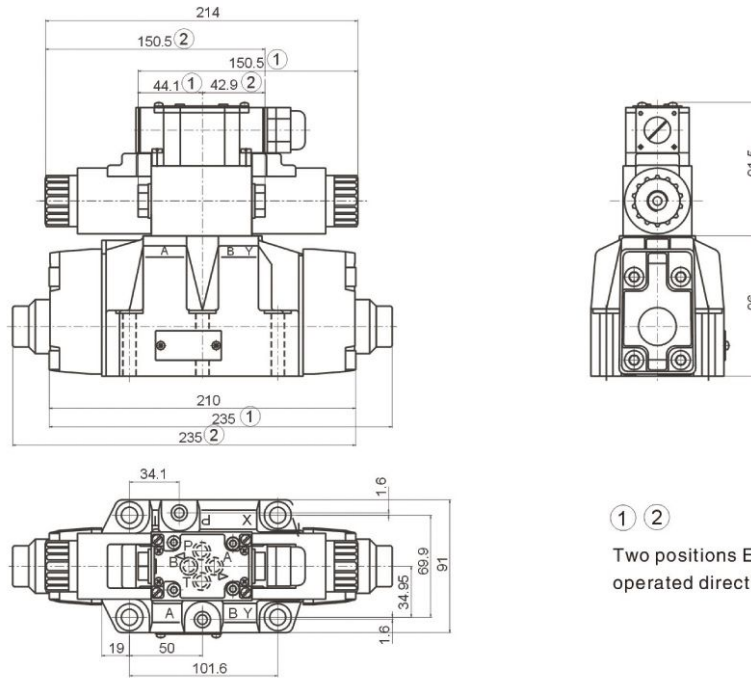
## External dimensions ( 04 Direct current plug type )

Technical drawing of the external dimensions for the 04 Direct current plug type valve. The drawing includes a top view, a side view, and a front view. Dimensions are provided in millimeters. The top view shows a width of 214 mm and a height of 235 mm. The side view shows a height of 83.5 mm and a width of 96 mm. The front view shows a width of 101.6 mm and a height of 91 mm. The drawing includes labels for ports: A, B, X, P, and Y. Dimensions include 214, 150.5 (2), 150.5 (1), 44.1 (1), 42.9 (2), 210, 235 (1), 235 (2), 34.1, 1.6, 66.9, 91, 19, 50, 101.6, 1.6, 34.95, and 83.5.

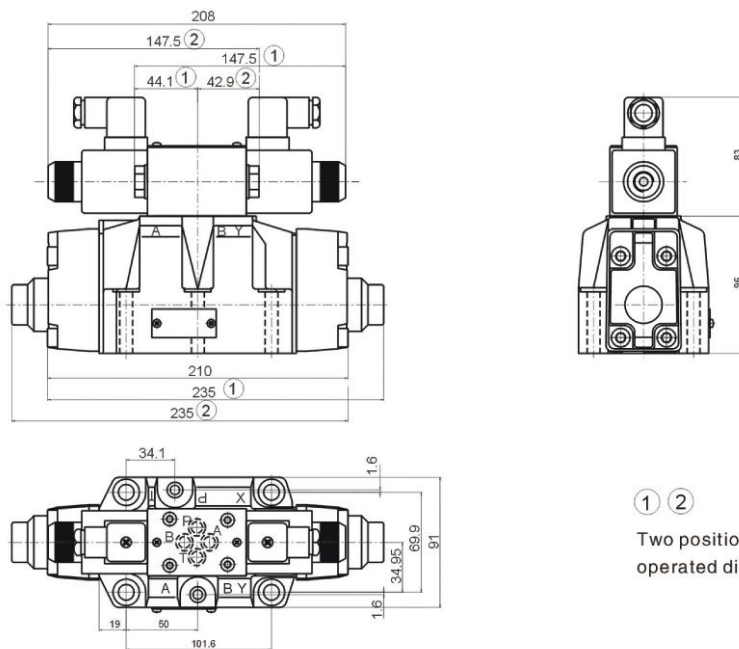
① ②  
Two positions Electrical operated directional control valve

# Electro-hydraulic directional control valve

## External dimensions ( 04 Direct current wire box type )



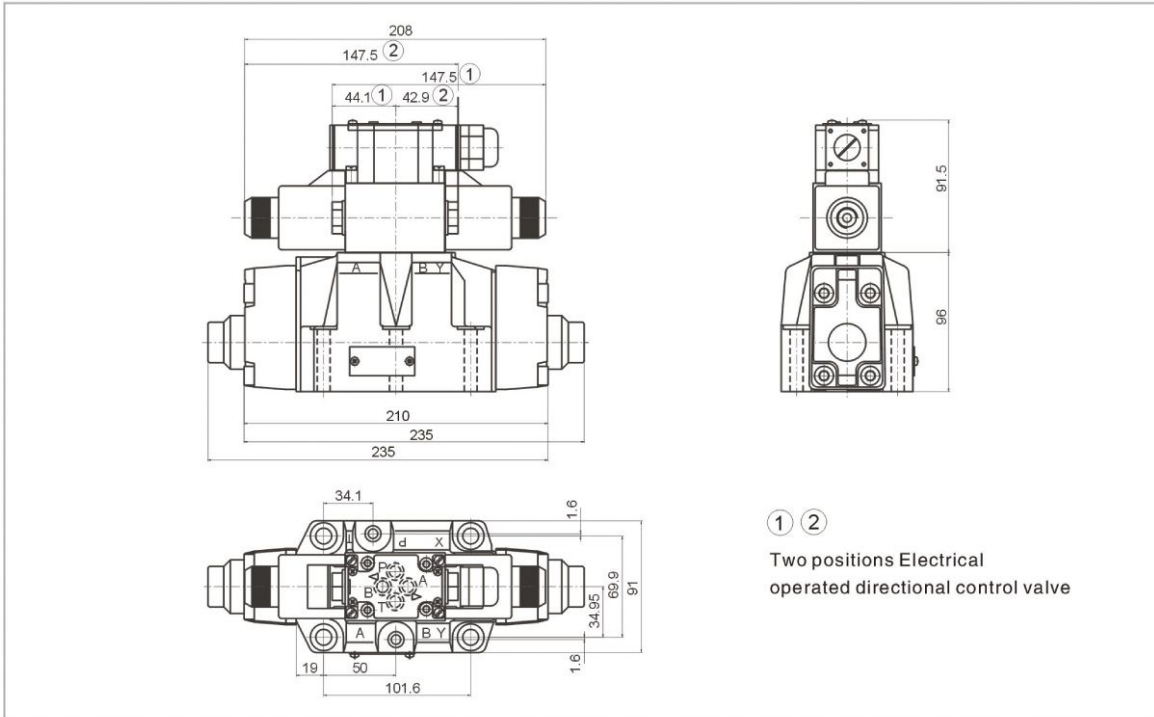
## External dimensions ( 04 Alternating current plug type )



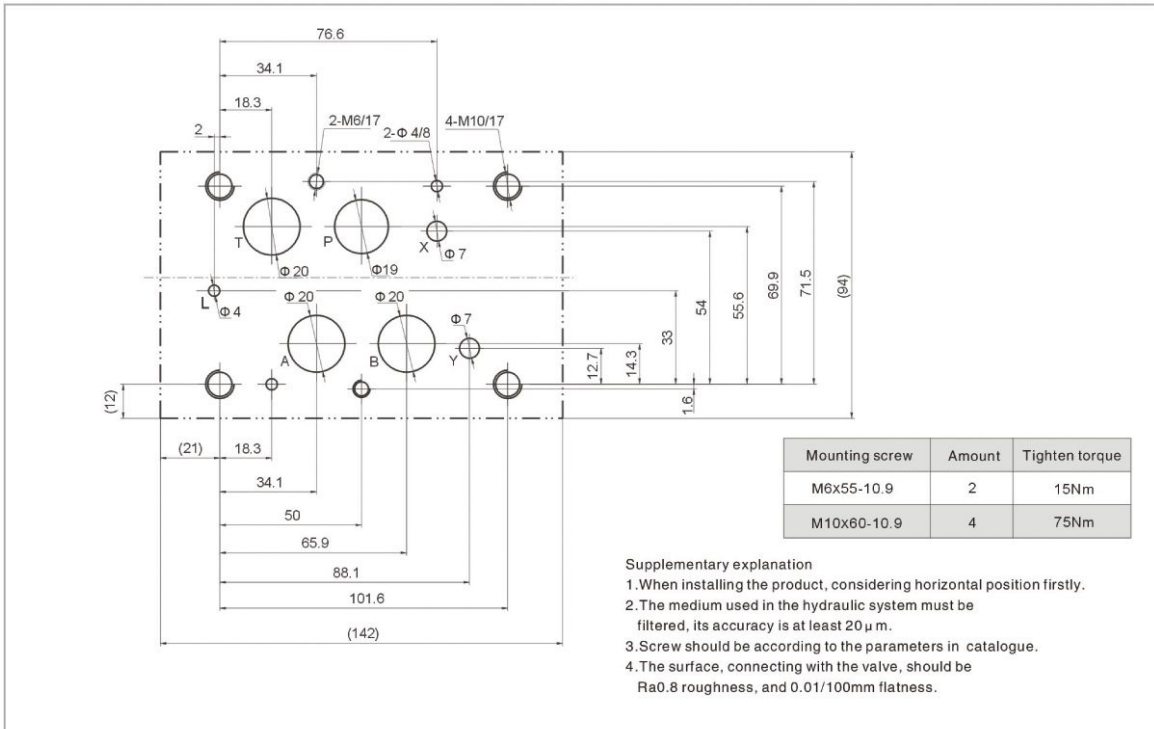
# Electro-hydraulic directional control valve



## External dimensions ( 04 Alternating current wire box type )

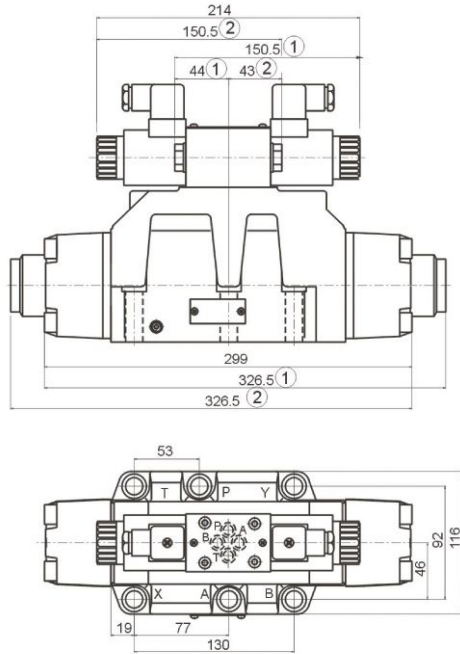


## 04 Size of subplate oil port



# Electro-hydraulic directional control valve

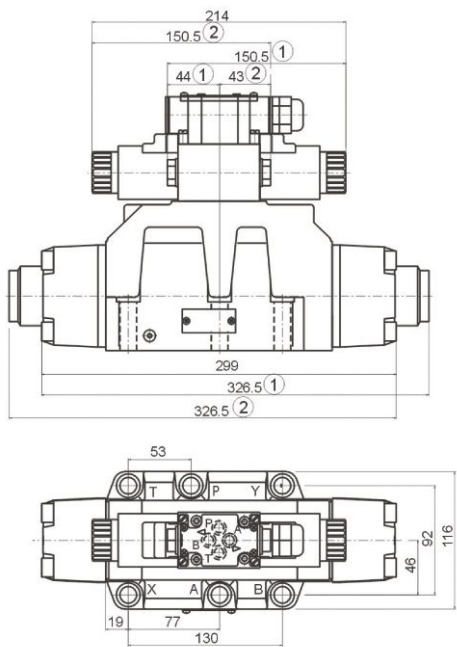
## External dimensions ( 03 Direct current plug type )



① ②

Two positions Electrical operated directional control valve

## External dimensions ( 03 Direct current wire box type )



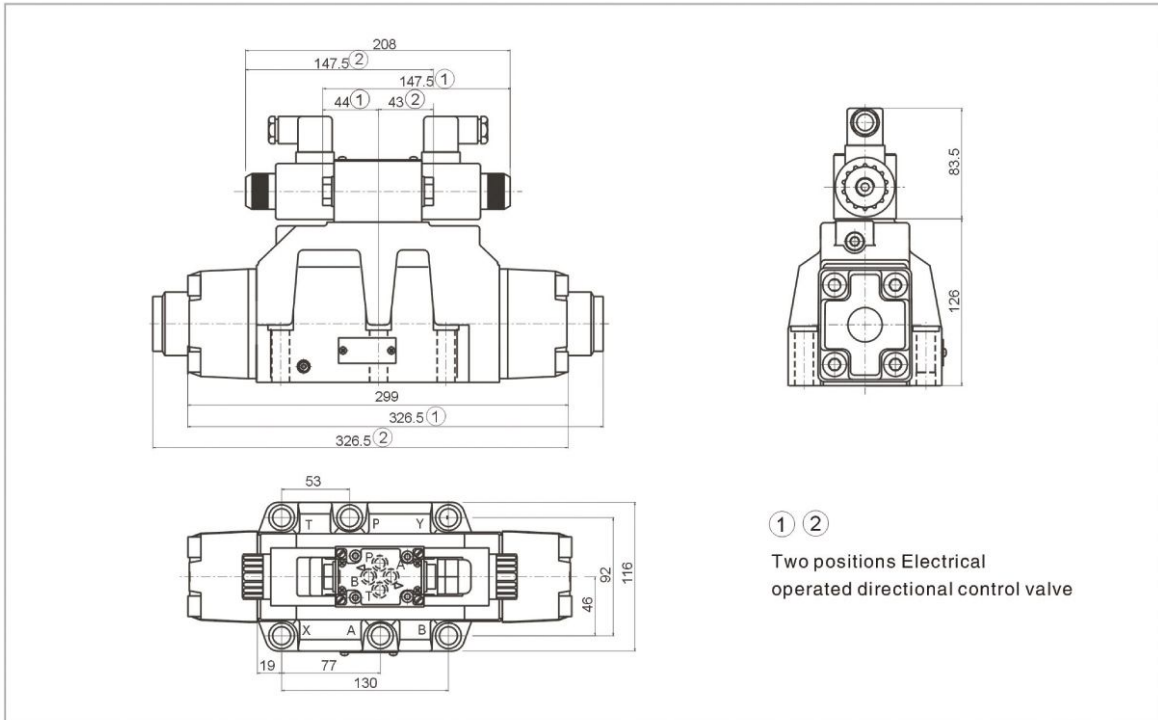
① ②

Two positions Electrical operated directional control valve

# Electro-hydraulic directional control valve



## External dimensions ( 06 Alternating current plug type )



## External dimensions ( 06 Alternating current wire box type )

