

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.

Technical specification

Specification		03		04		06		10	
Model		FWH-03	HFWH-03	FWH-04	HFWH-04	FWH-06	HFWH-06	FWH-16	HFWH-16
Max. Working pressure (MPa)	P、A、B Port	28	35	28	35	28	35	28	35
	T port (internal leakage of control oil)	10		10		10		10	
	Y port (external leakage of control oil)	10		10		10		10	
Minimum control pressure (MPa)		1.0 Spring-Return 4/3 valve 4/2 valve		1.2 Spring-Return 4/3 valve 4/2 valve		1.3 Spring-Return 4/3 valve 4/2 valve		0.8 Spring-Return 4/3 valve 4/2 valve	
Maximum control pressure (MPa)		to25							
Max. Flow (L/min)		160		300		650		1100	
Working fluid		Mineral oil;phosphate-ester							
Fluid temp. (°C)		-20~70							
Viscosity (mm ² /s)		2.8~380							
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 $\beta_{10} \geq 75$.								

Electro-hydraulic Directional Control Valve

Model description

	* FWH/FH - *	* - * - *	* *	* *	* / *	* *	* *	* *	* *	* *	* *	* *	* 5X *	
Working pressure Omit 28MPa H 35MPa														Remarks
FWH Electro-hydraulic directional control valve FH Hydraulic operated directional control valve														Serial number
Specification 03 DN10 04 DN16 06 DN25 10 DN32														Seal material Omit NBR Seals V FPM Seals
Main valve return type Omit Spring return H Hydraulic centration														²⁾ Omit No reducing valve D3 With reducing valve
Function code Details as following symbol table														¹⁾ Omit Without pre-load valve P4.5 With pre-load valve
Working voltage D12 DC12V D24 DC24V A110 AC110V A220 AC220V B110 AC110V Rectified B220 AC220V Rectified														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
Z5L Square connector with light Z6 Wire box type														Omit without shifting time adjustment S With shifting time adjustment: Inlet flow control S1 shifting time adjustment: Outlet flow control
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 Intl cntrl intl disch XY Extl cntrl extl disch X Extl cntrl intl disch Y Intl cntrl extl disch

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

D.6.2

Electro-hydraulic Directional Control Valve

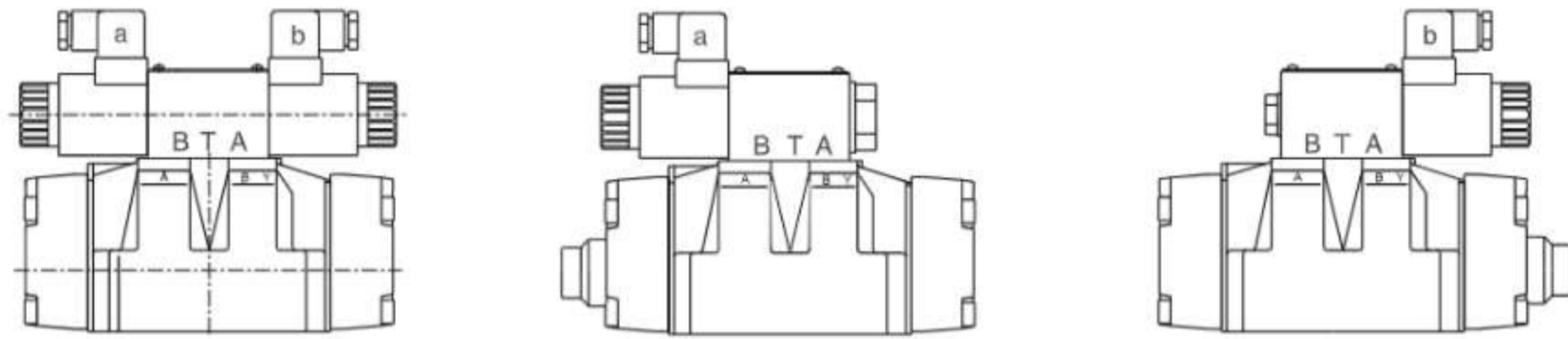
Code symbol

Spring return

3C2		2B2B		2B2BL		2B2	
3C3		2B3B		2B3BL		2B3	
3C4		2B4B		2B4BL		2B8	
3C5		2B5B		2B5BL		2B2L	
3C6		2B6B		2B6BL		2B3L	
3C7		2B7B		2B7BL		2B8L	
3C9		2B9B		2B9BL			
3C10		2B10B		2B10BL			
3C11		2B11B		2B11BL			
3C12		2B12B		2B12BL			
3C25		2B25B		2B25BL			
3C29		2B29B		2B29BL			
						FWH...	
						FWH... X/...	
						FWH... Y/...	
						FWH... XY/...	

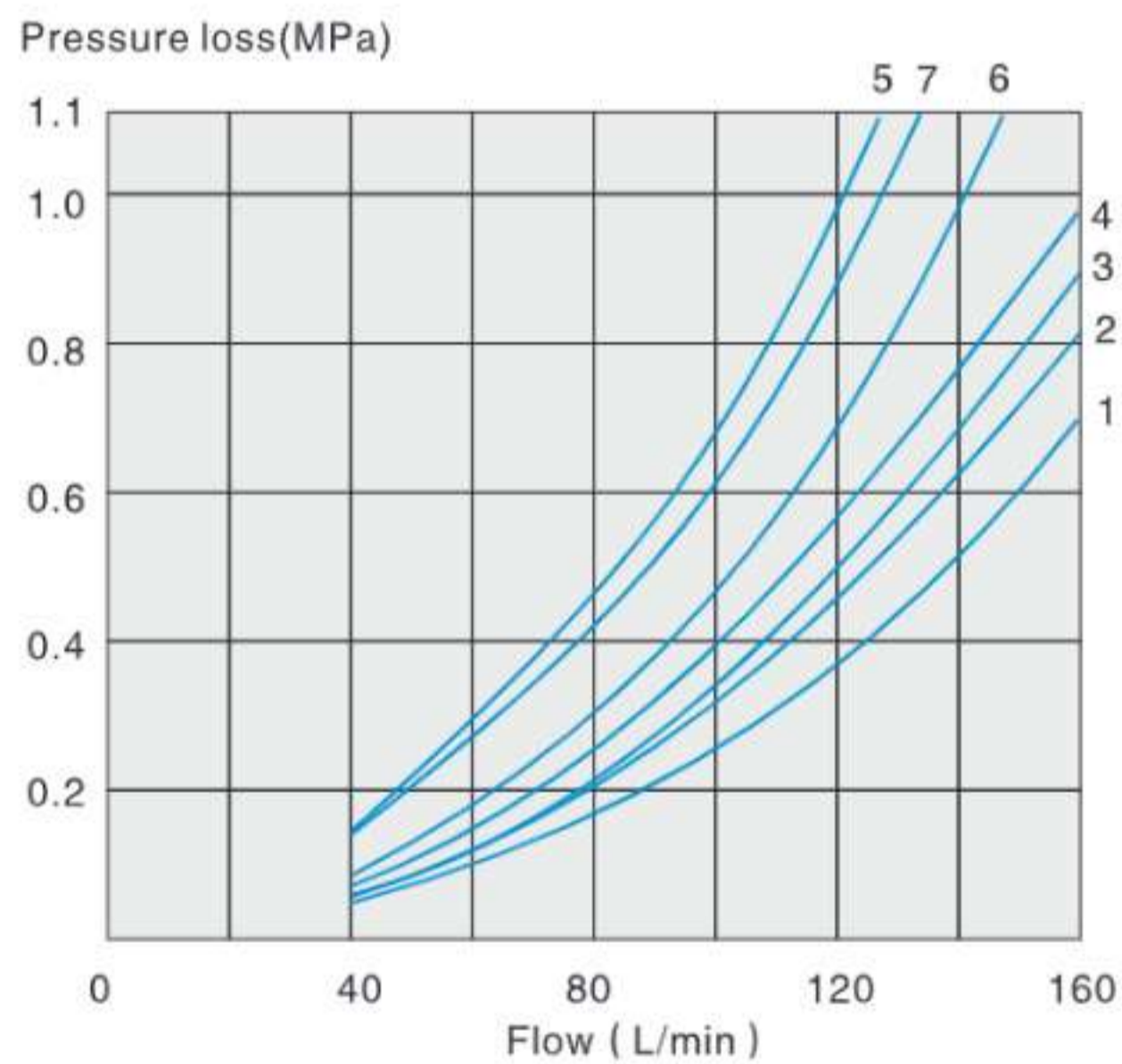
Electro-hydraulic Directional Control Valve

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.
Foor 3C29, when solenoid "a" works , P→A,B

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

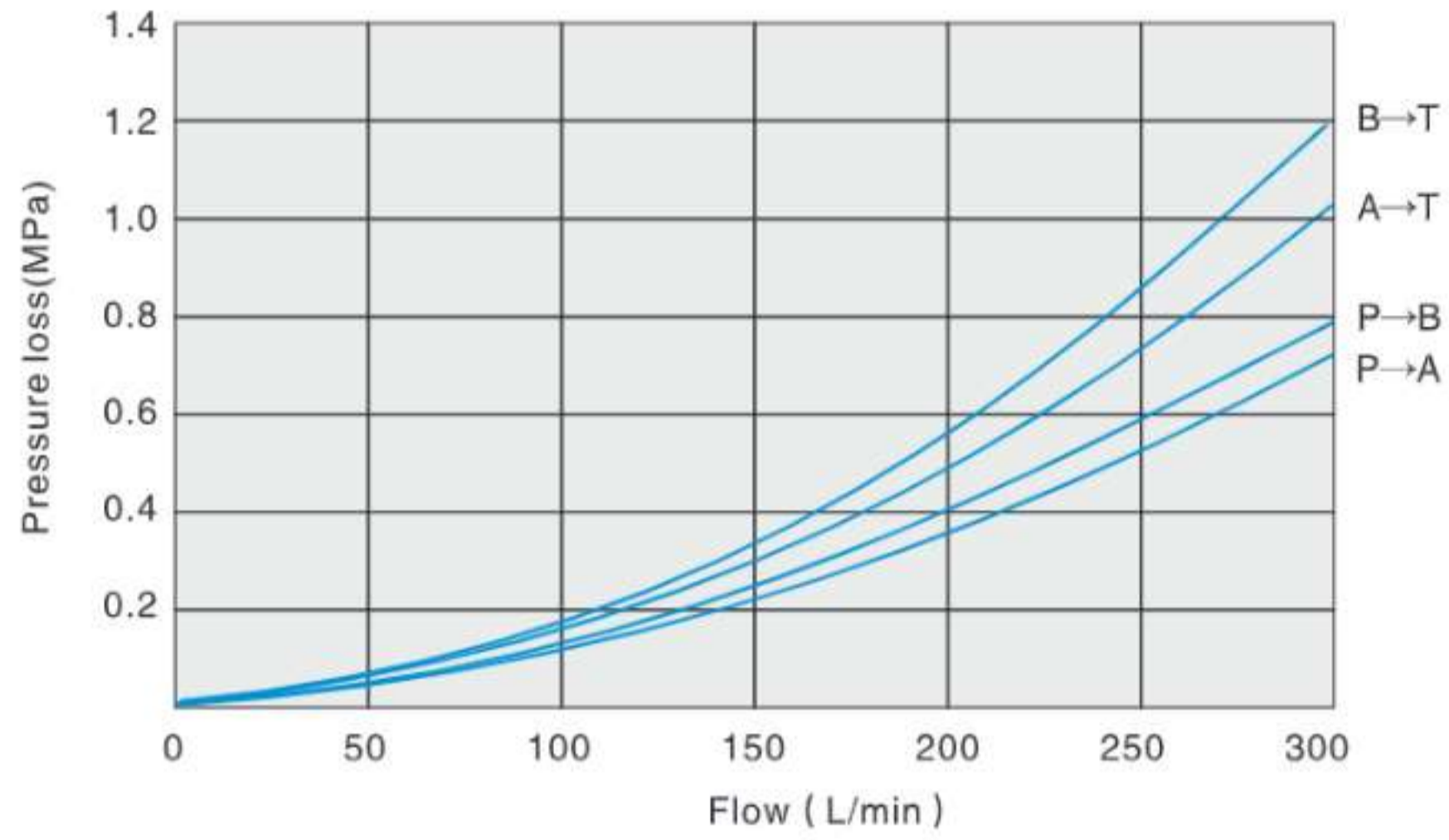
Function	Neutral		
	A→T	B→T	P→T
3C5	3	-	6
3C6	-	-	7
3C3	1	3	5
3C25	-	7	5

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

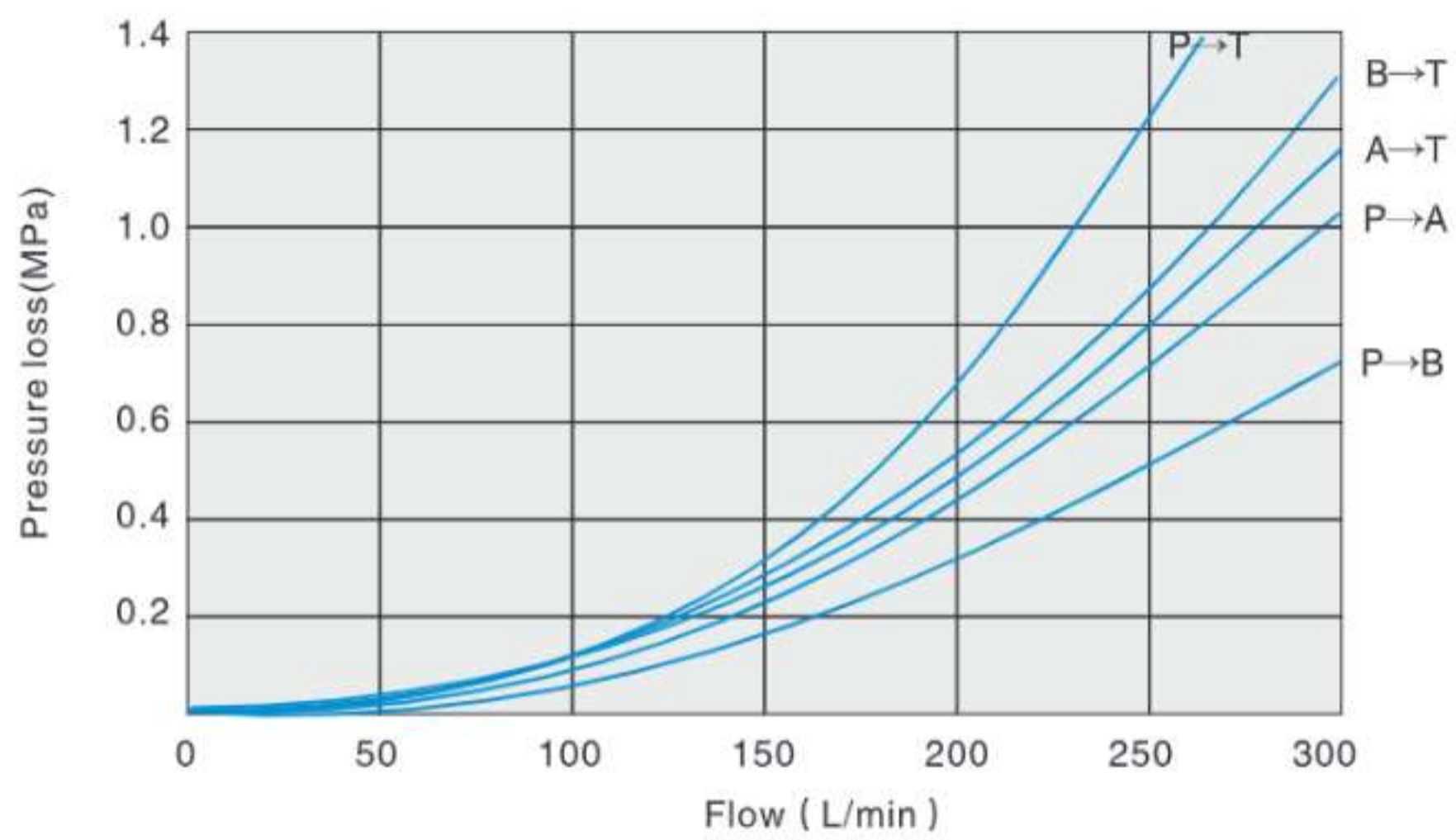
Electro-hydraulic Directional Control Valve

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

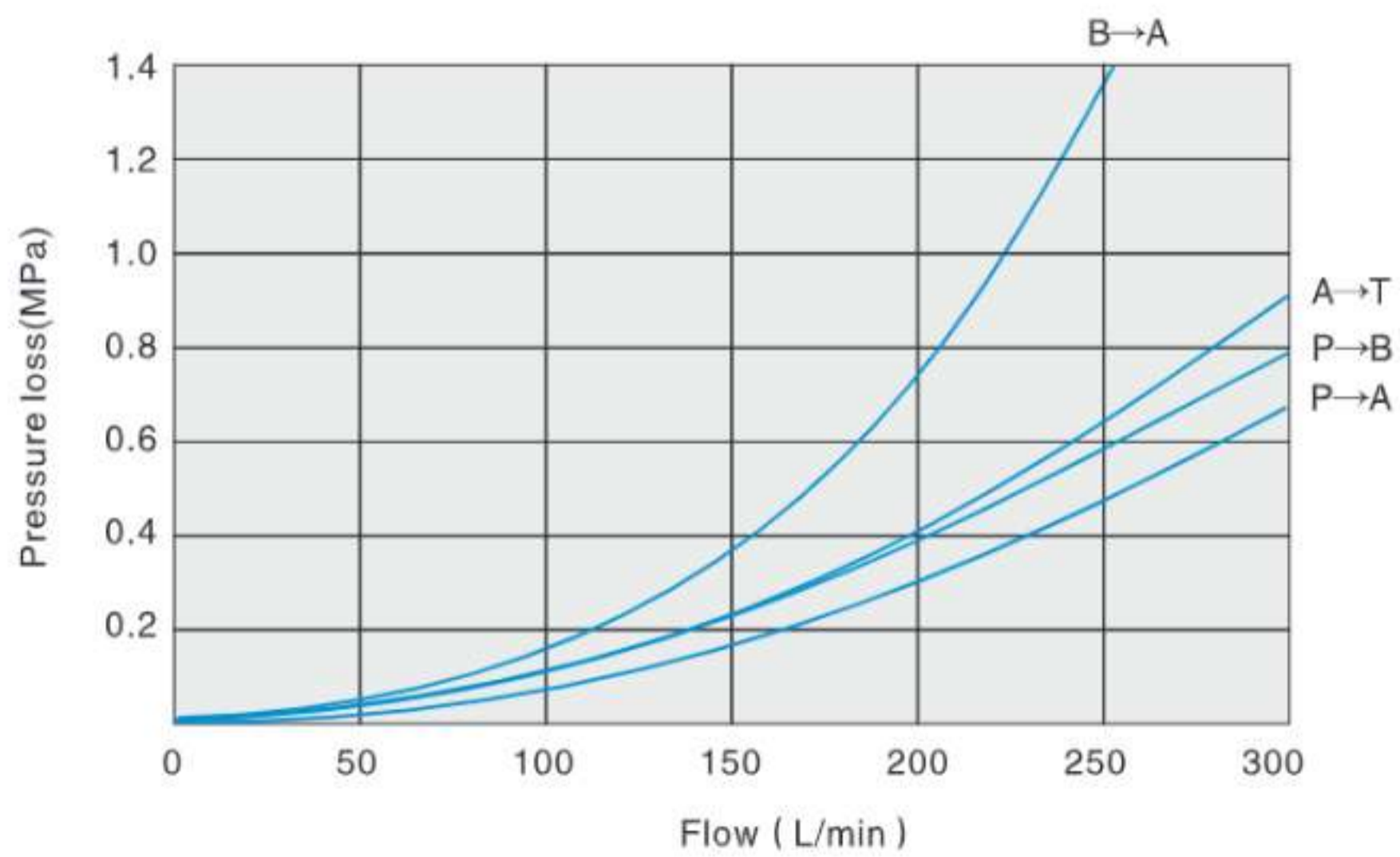
3C2



3C6

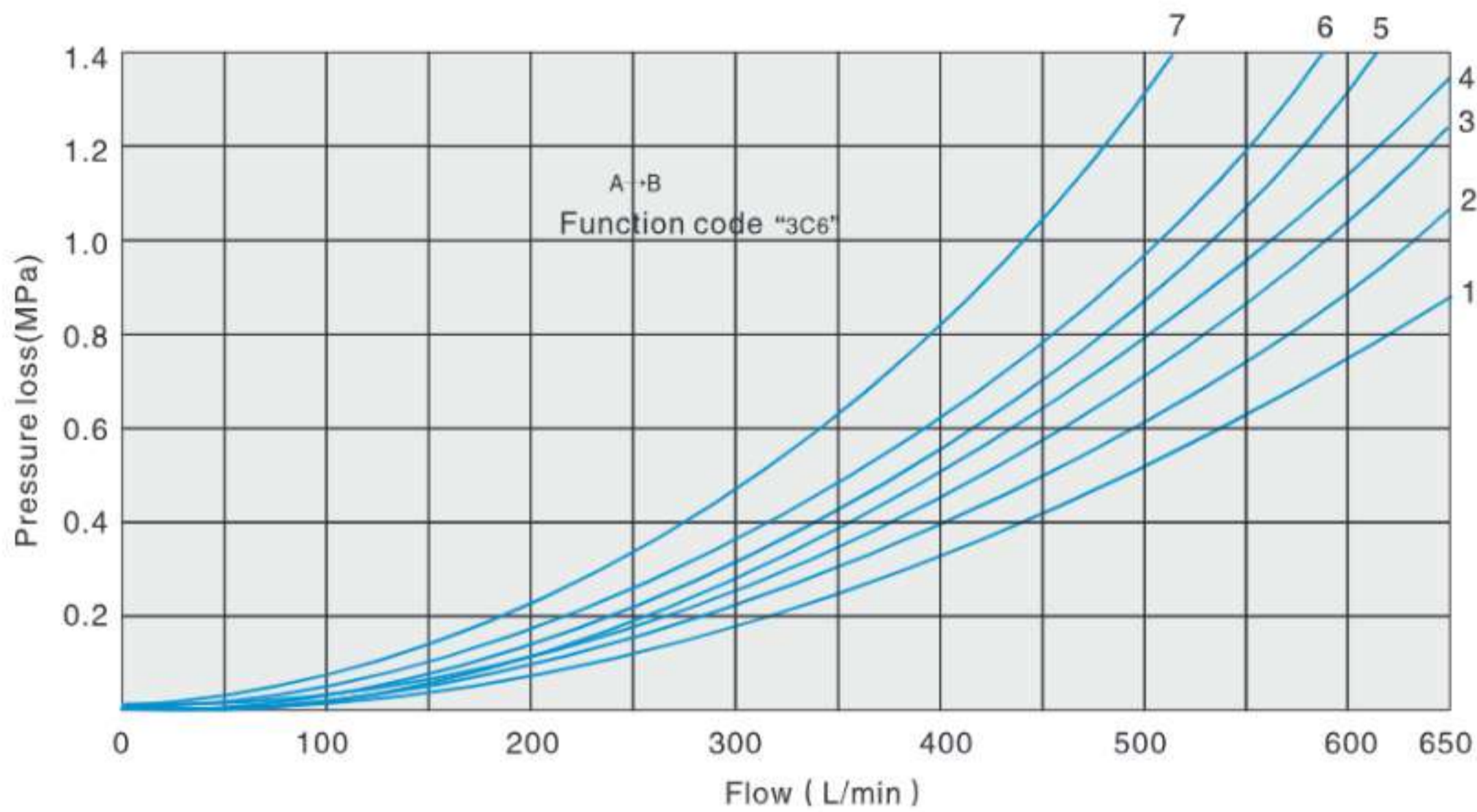


3C29



Electro-hydraulic Directional Control Valve

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



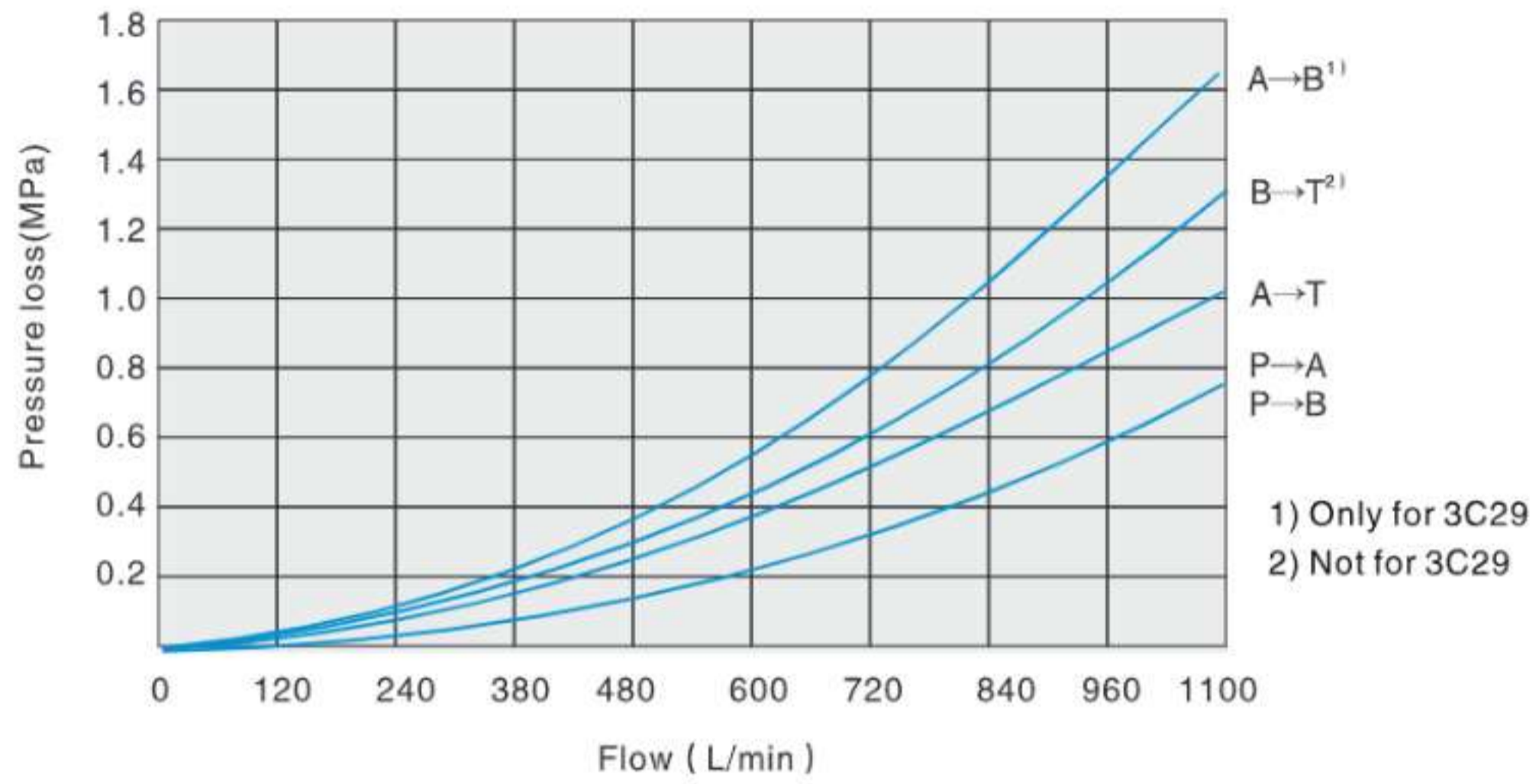
Function	Switching position			
	P→A	P→B	A→T	B→T
3C2	1	1	1	3
3C5	1	4	3	3
3C6	3	1	2	4
3C3	4	4	3	4
3C4	2	2	3	5
3C12	2	2	3	3
3C9	4	4	1	4
3C25	4	1	1	5
3C29	2	1	1	-
3C10	2	1	1	6
3C7	4	4	3	6

7.Function code "3C6" type, neutral position P→T
 8.Function code "3C29" type, control position A→B

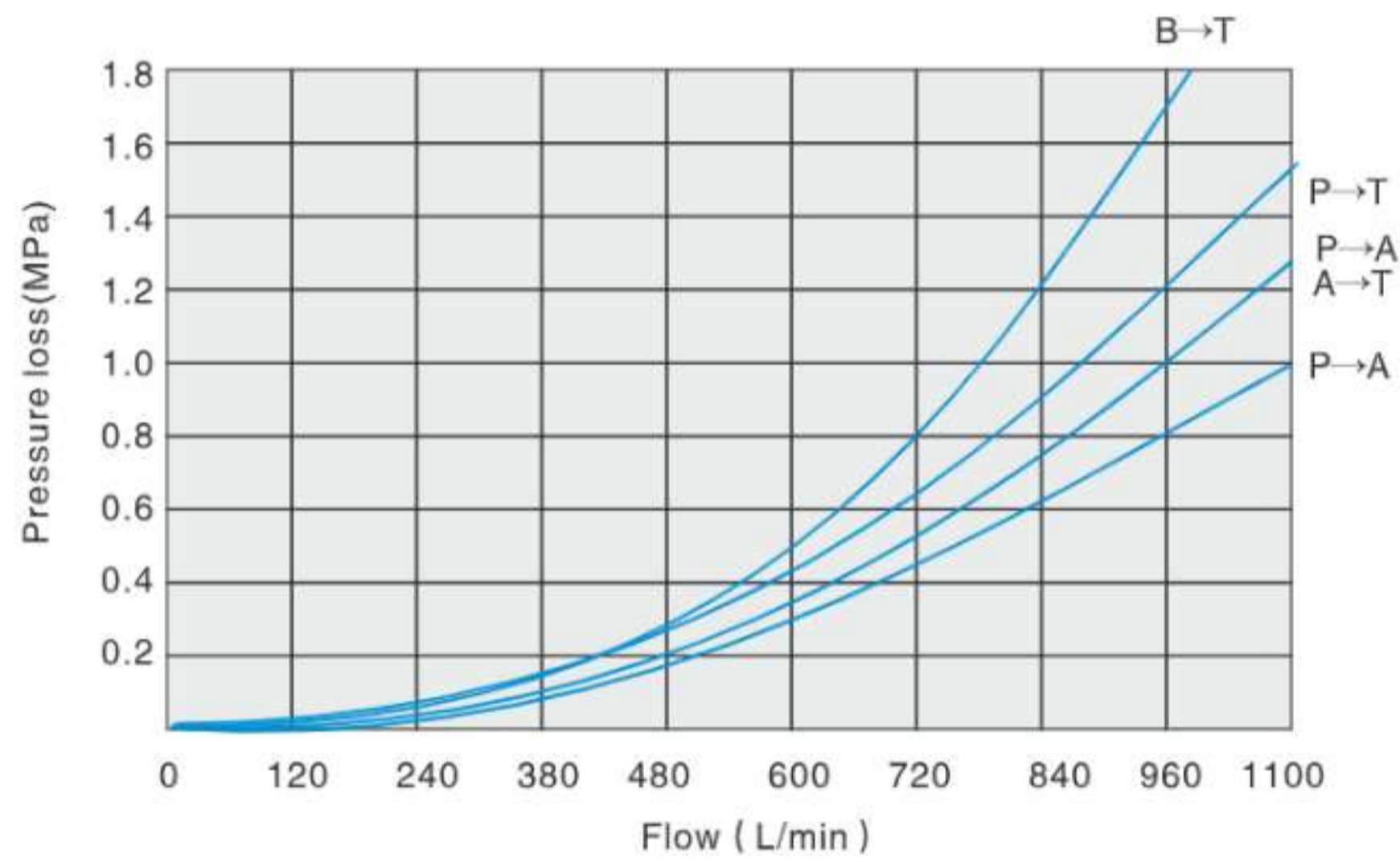
Electro-hydraulic Directional Control Valve

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

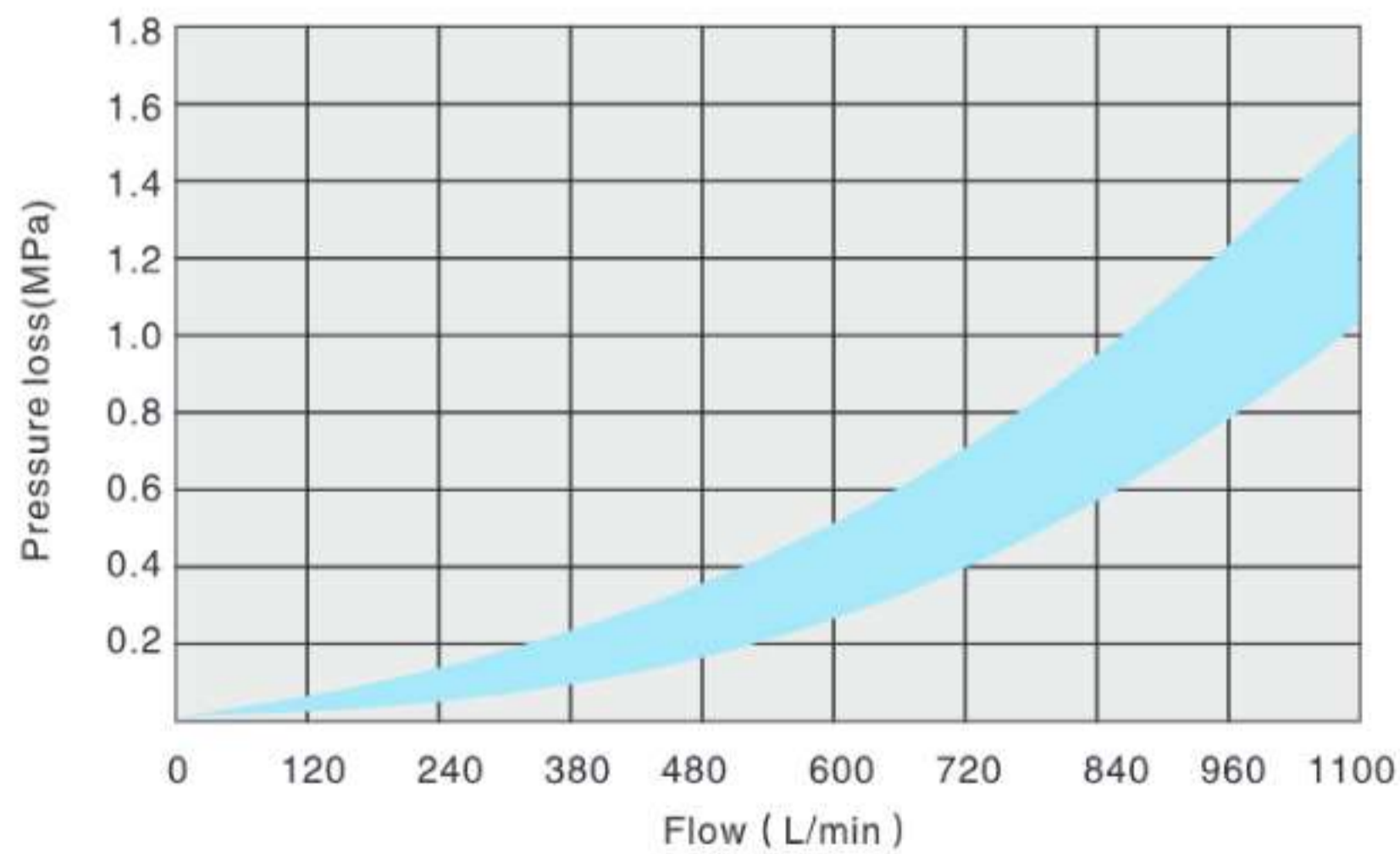
3C2、3C4、3C29



3C6

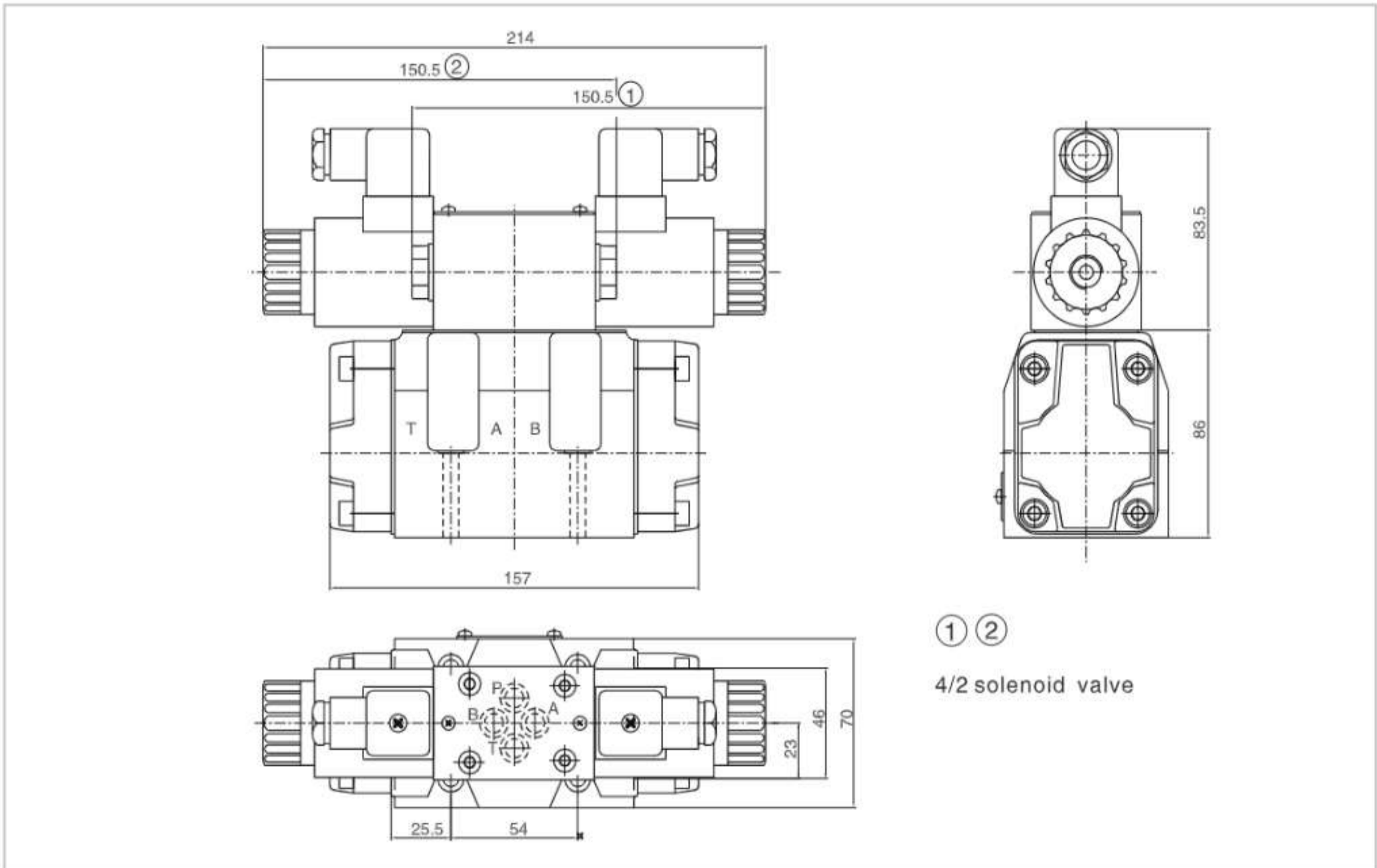


Other spool types

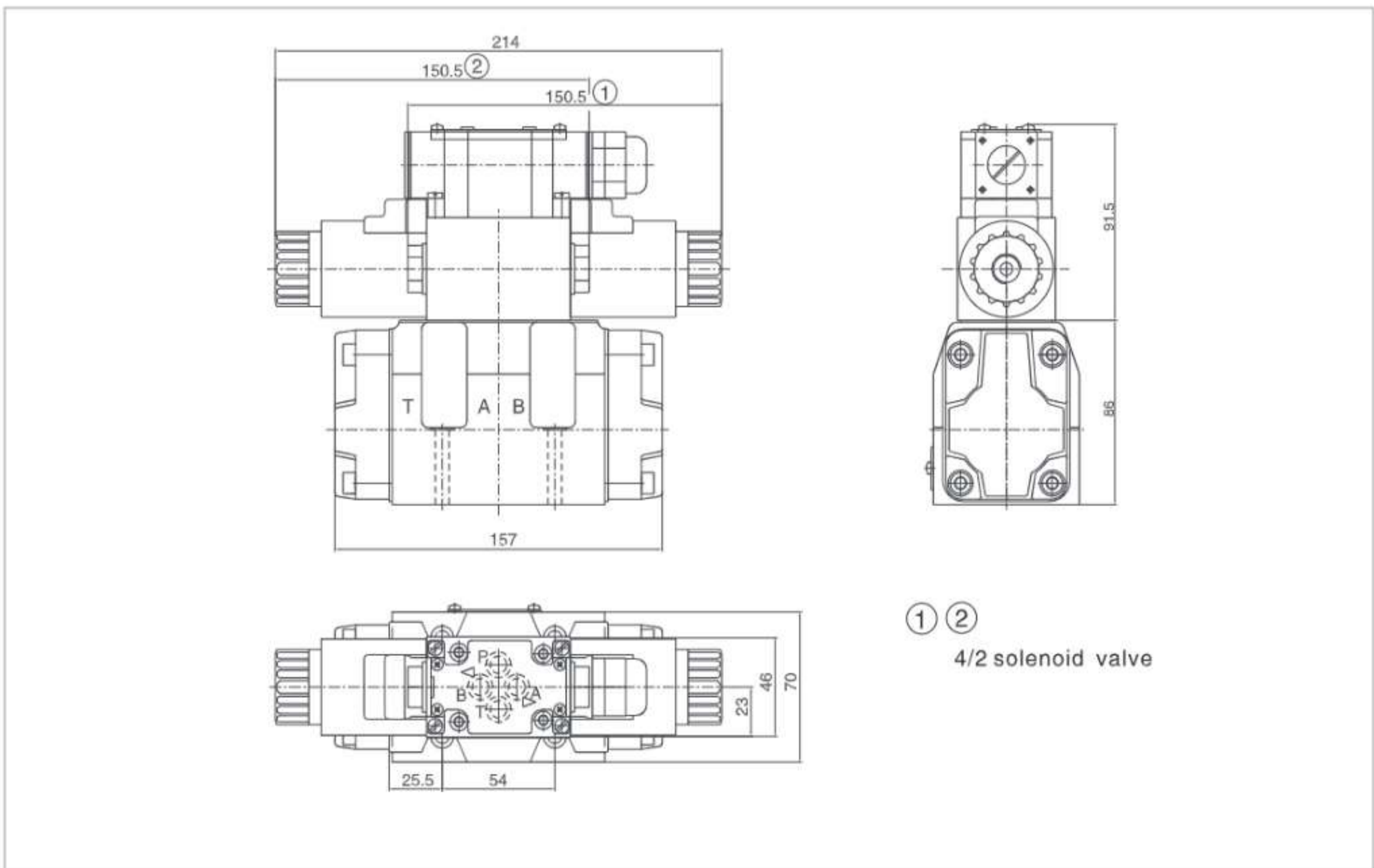


Electro-hydraulic Directional Control Valve

External dimensions (03 Direct current plug type)

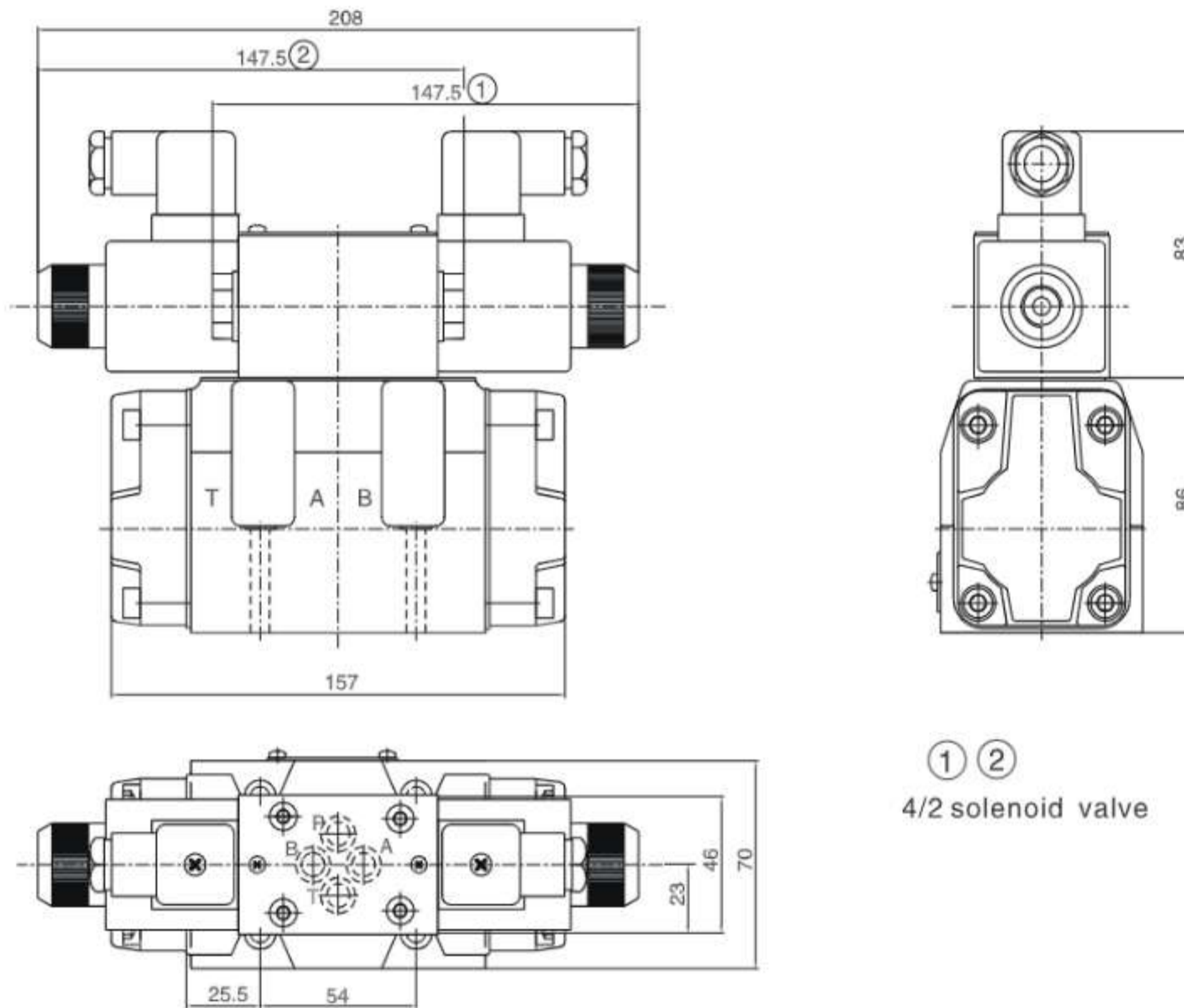


External dimensions (03 Direct current wire box type)

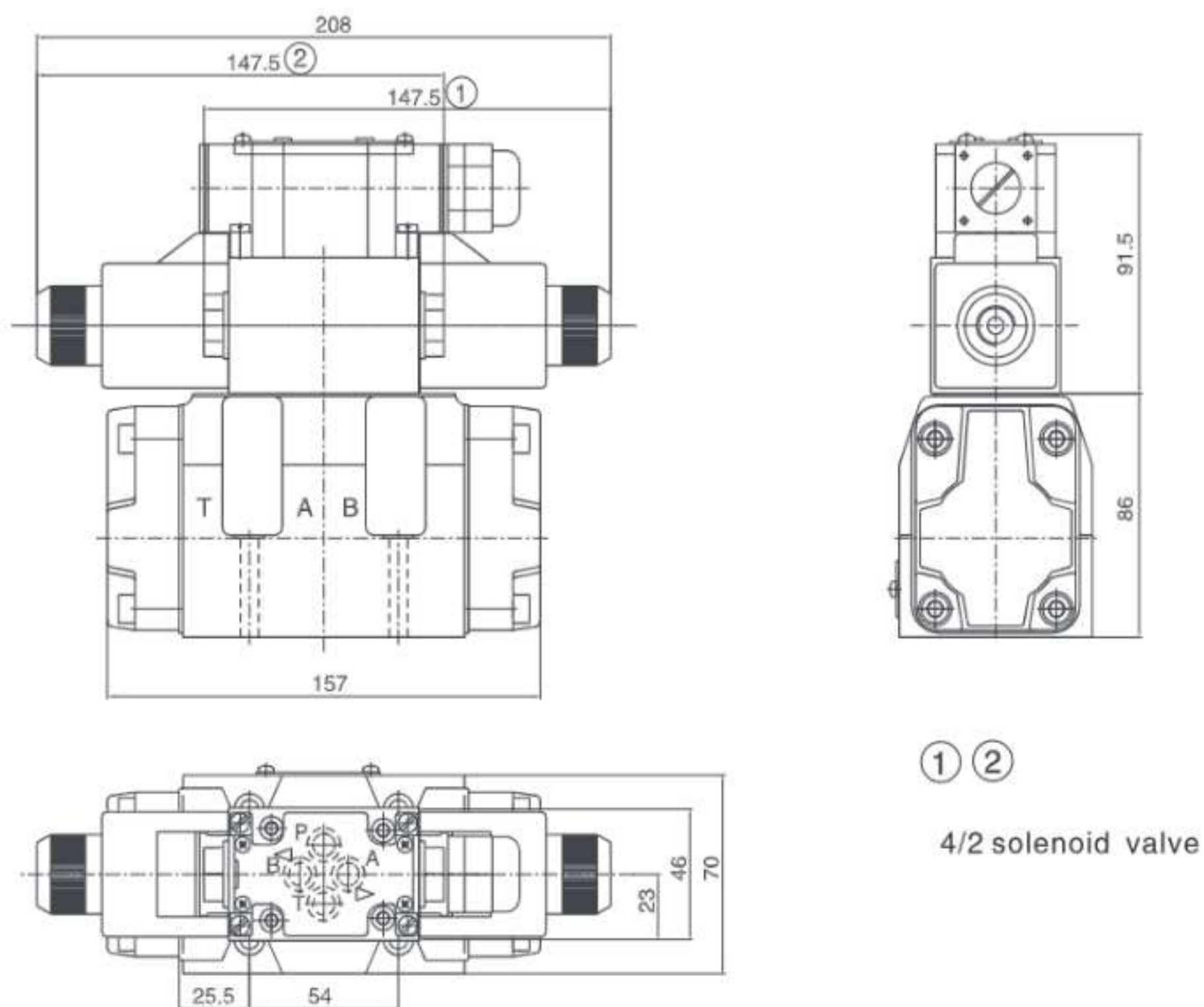


Electro-hydraulic Directional Control Valve

External dimensions (03 Alternating current plug type)

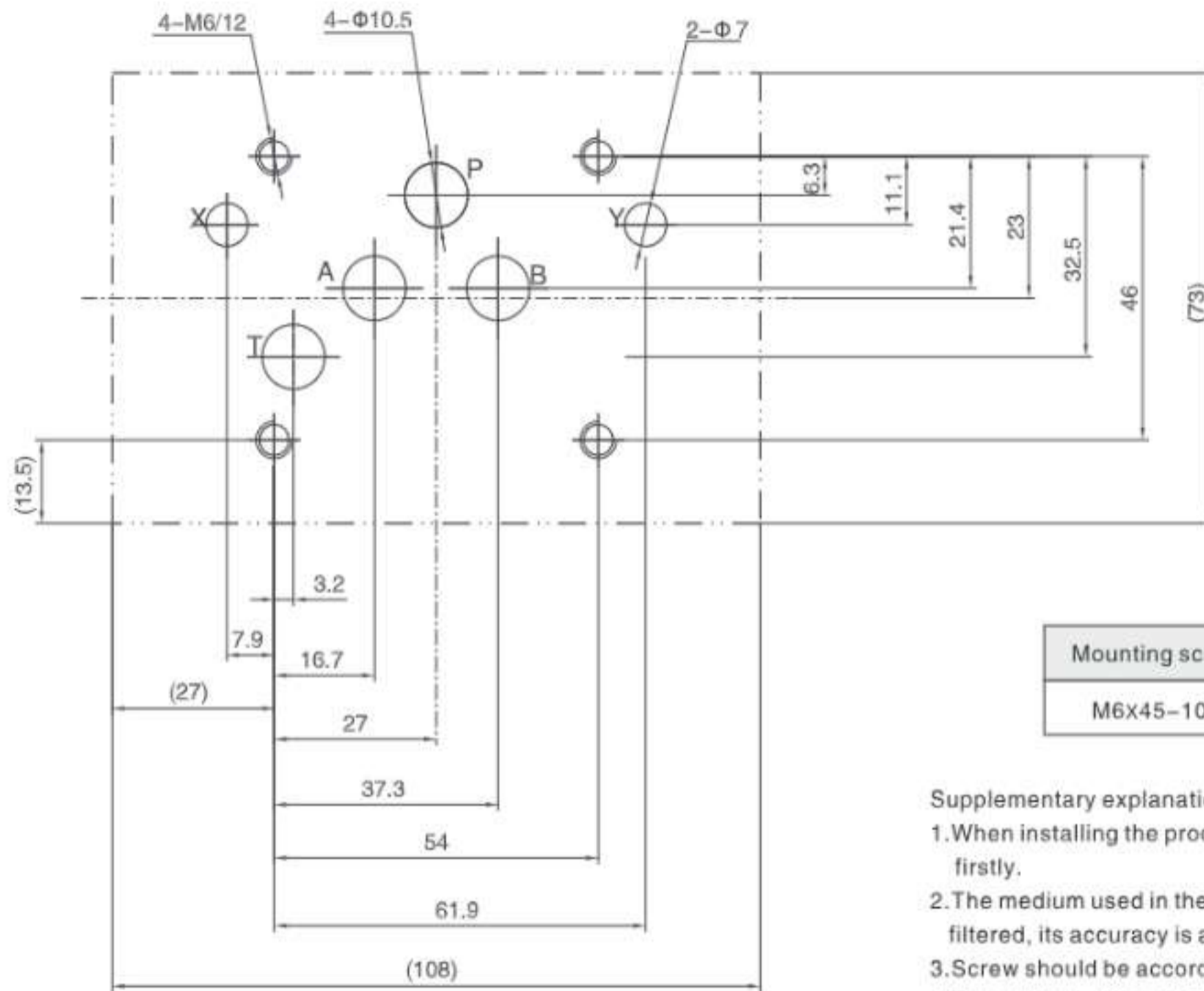


External dimensions (03 Alternating current wire box type)



Electro-hydraulic Directional Control Valve

03 Size of subplate oil port

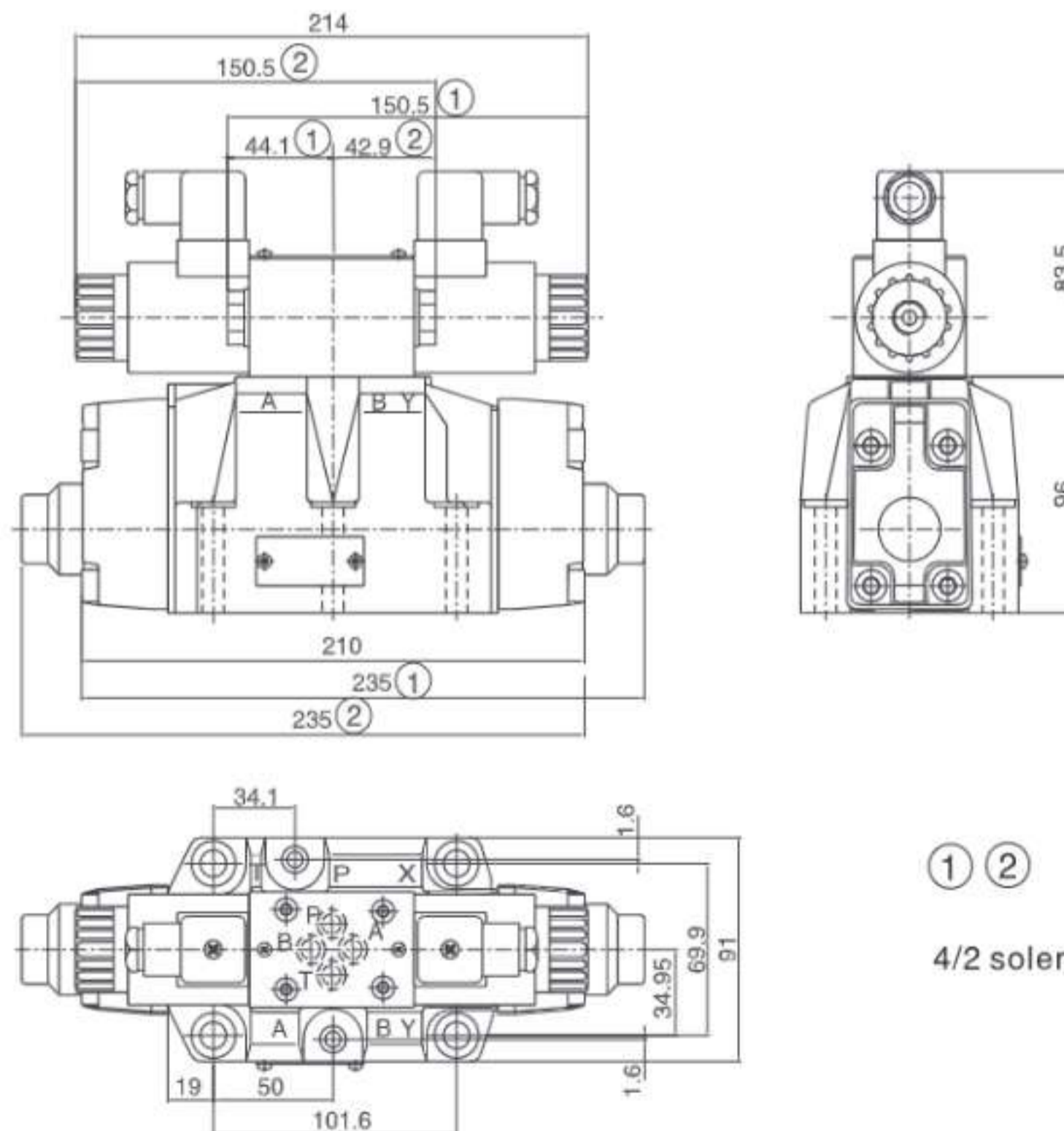


Mounting screw	Amount	Tighten torque
M6X45-10.9	4	15Nm

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.

External dimensions (04 Direct current plug type)

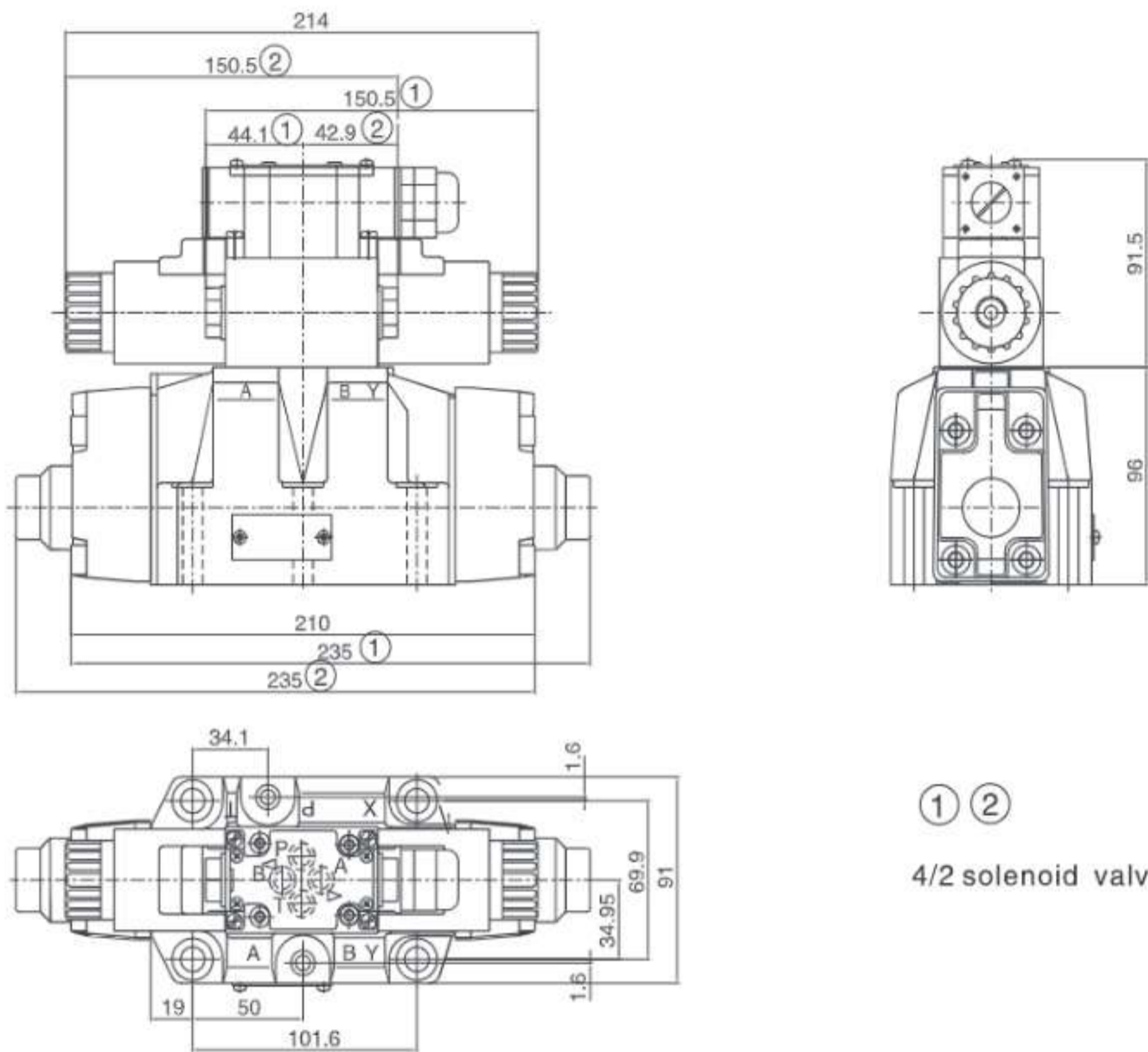


① ②

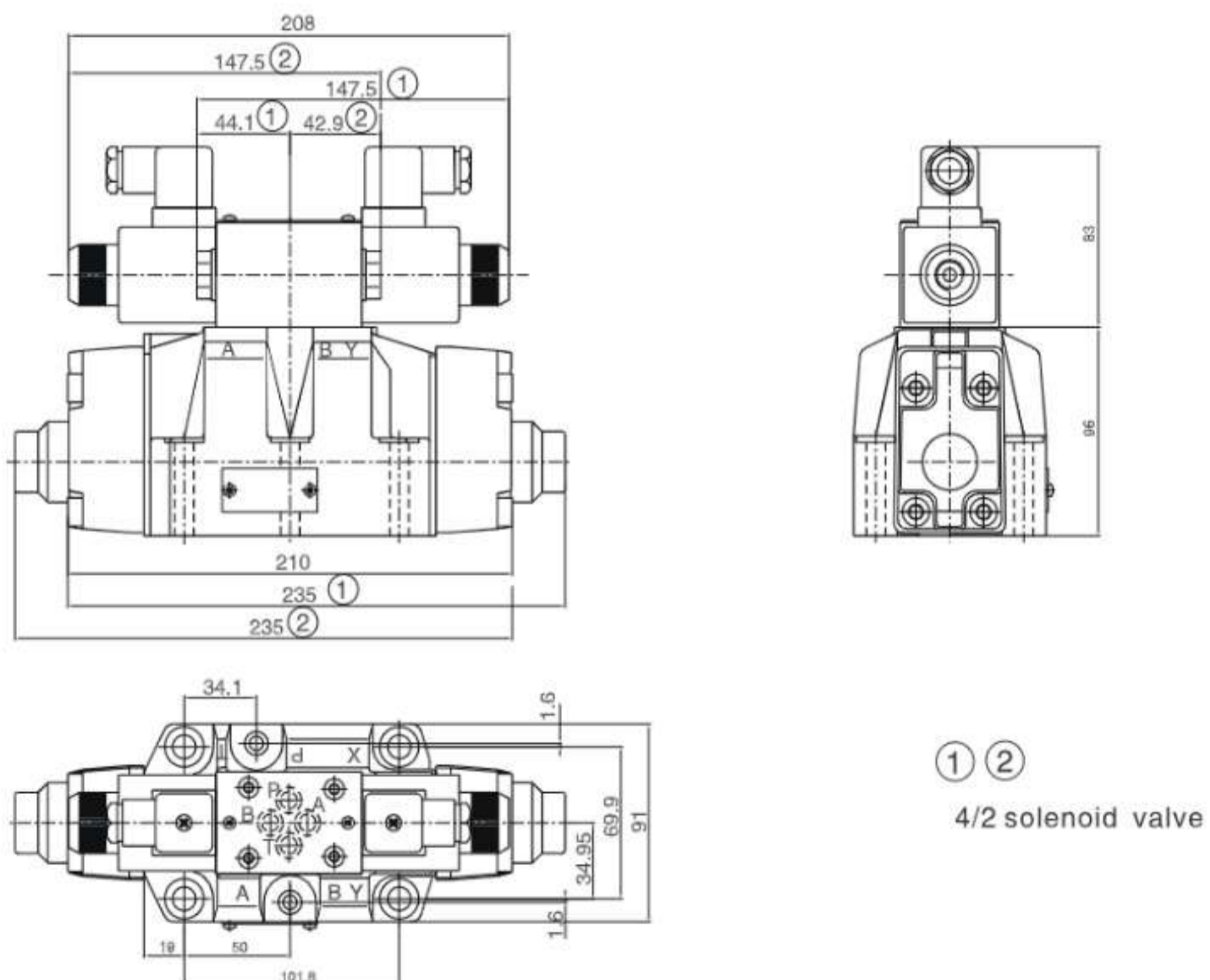
4/2 solenoid valve

Electro-hydraulic Directional Control Valve

External dimensions (04 Direct current wire box type)

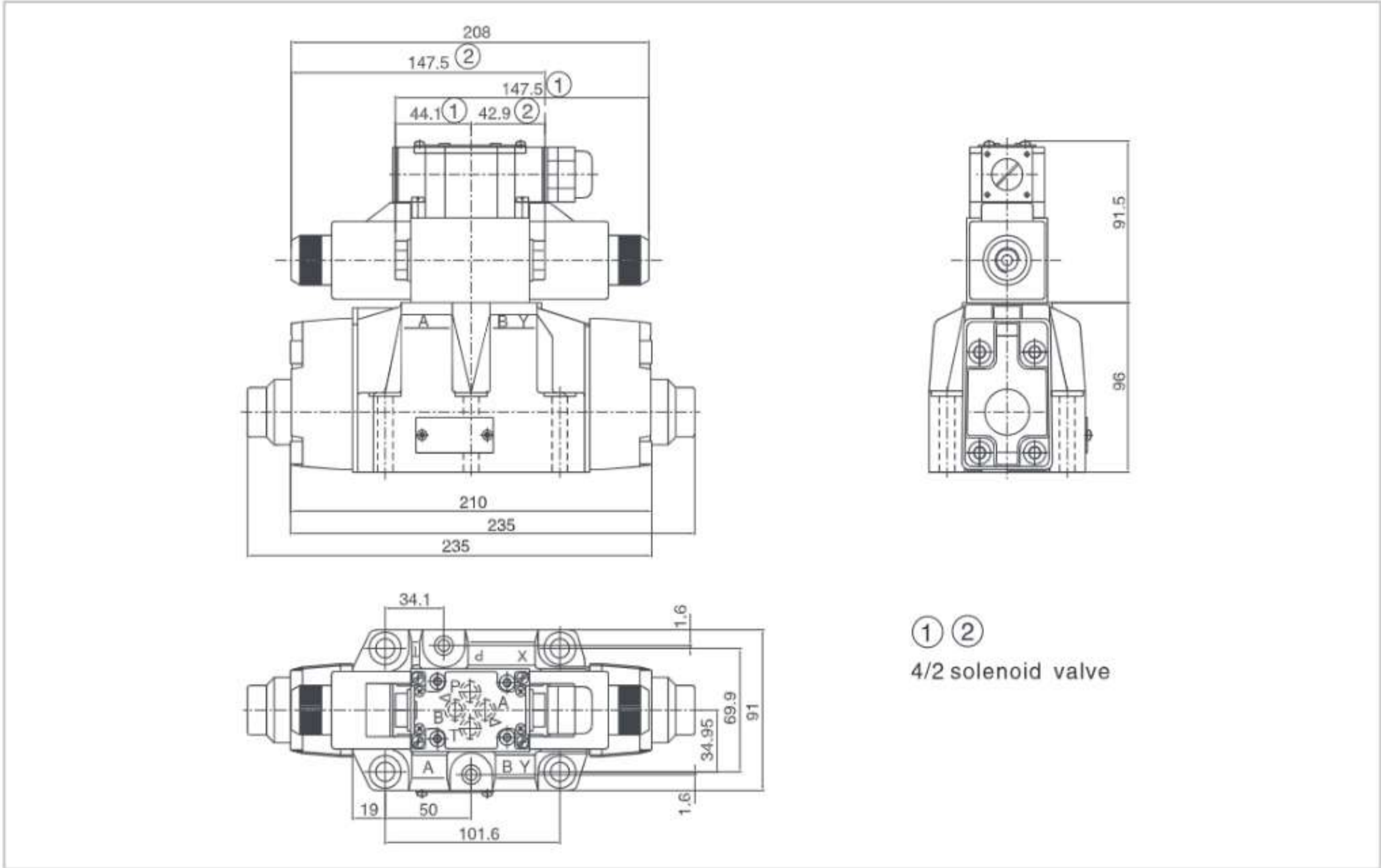


External dimensions (04 Alternating current plug type)



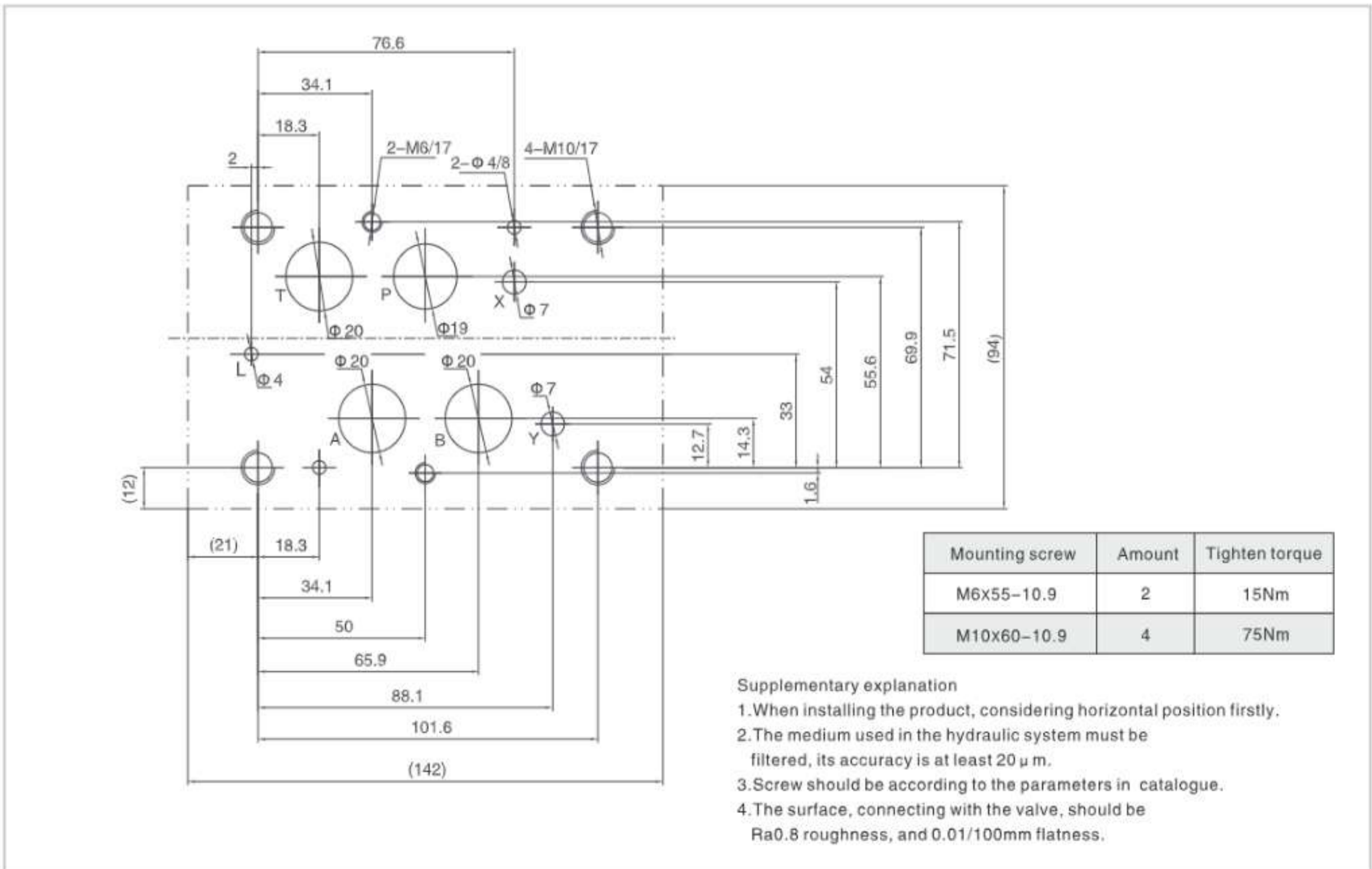
Electro-hydraulic Directional Control Valve

External dimensions (04 Alternating current wire box type)



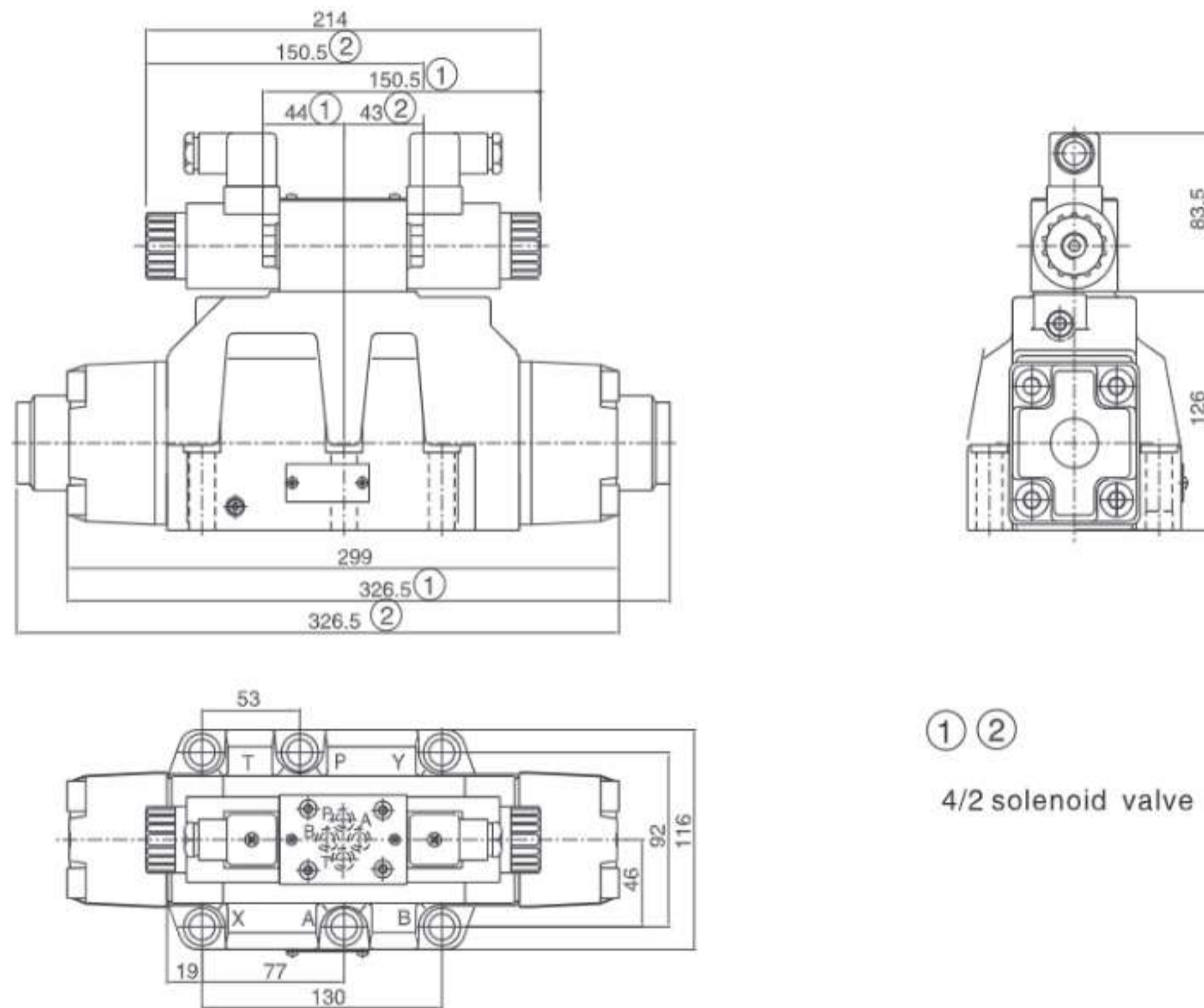
D.6.12

04 Size of subplate oil port

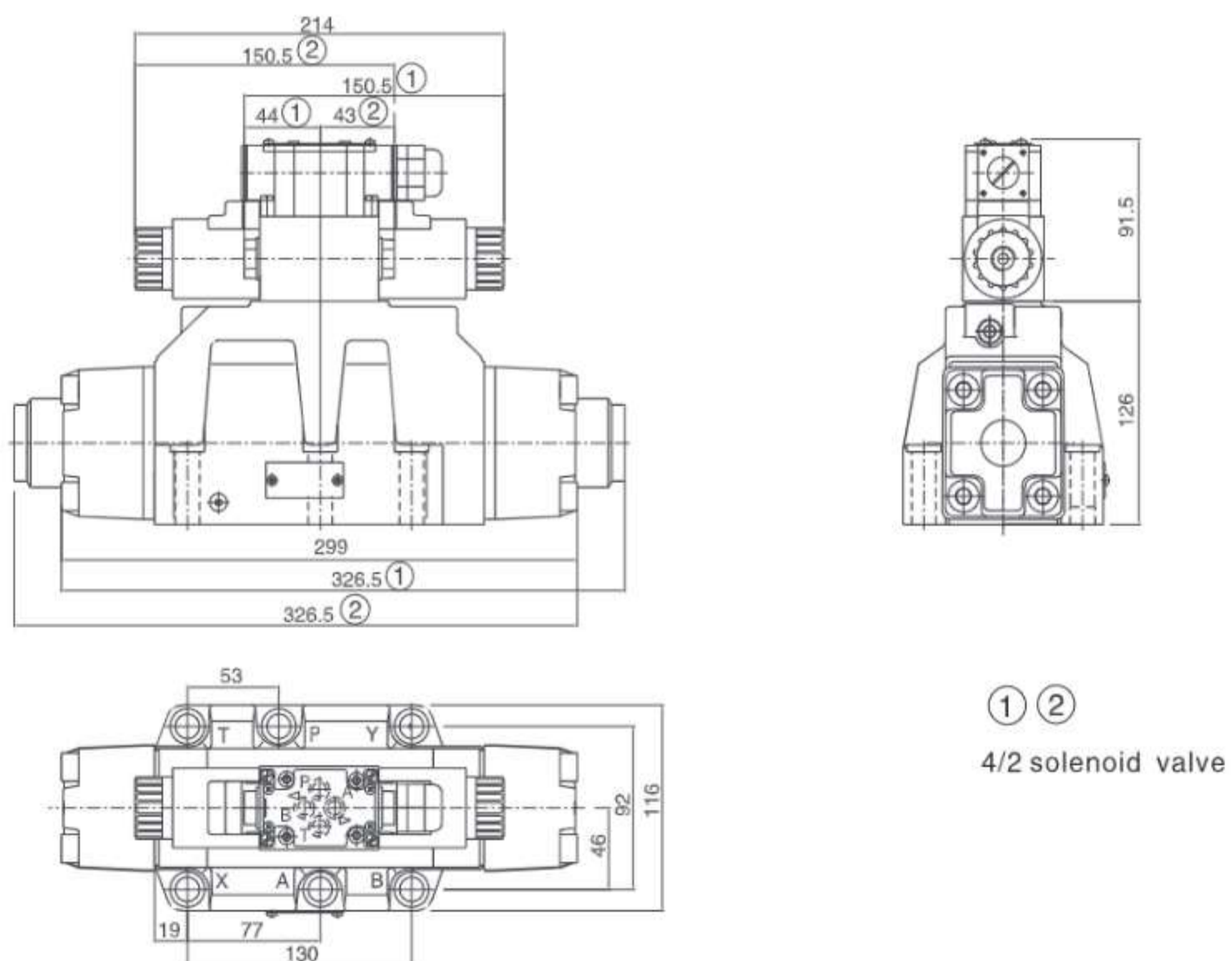


Electro-hydraulic Directional Control Valve

External dimensions (06 Direct current plug type)

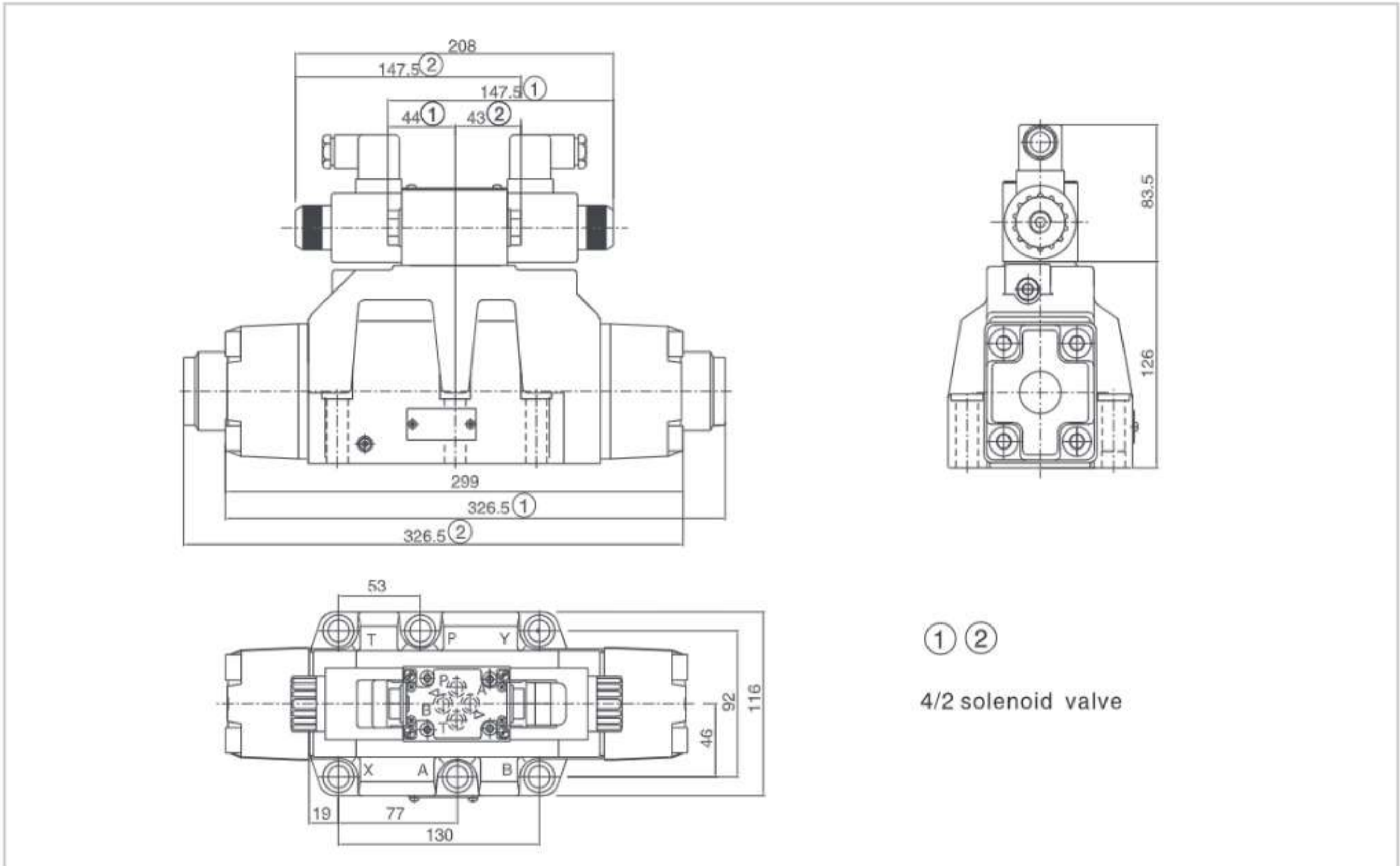


External dimensions (06 Direct current wire box type)

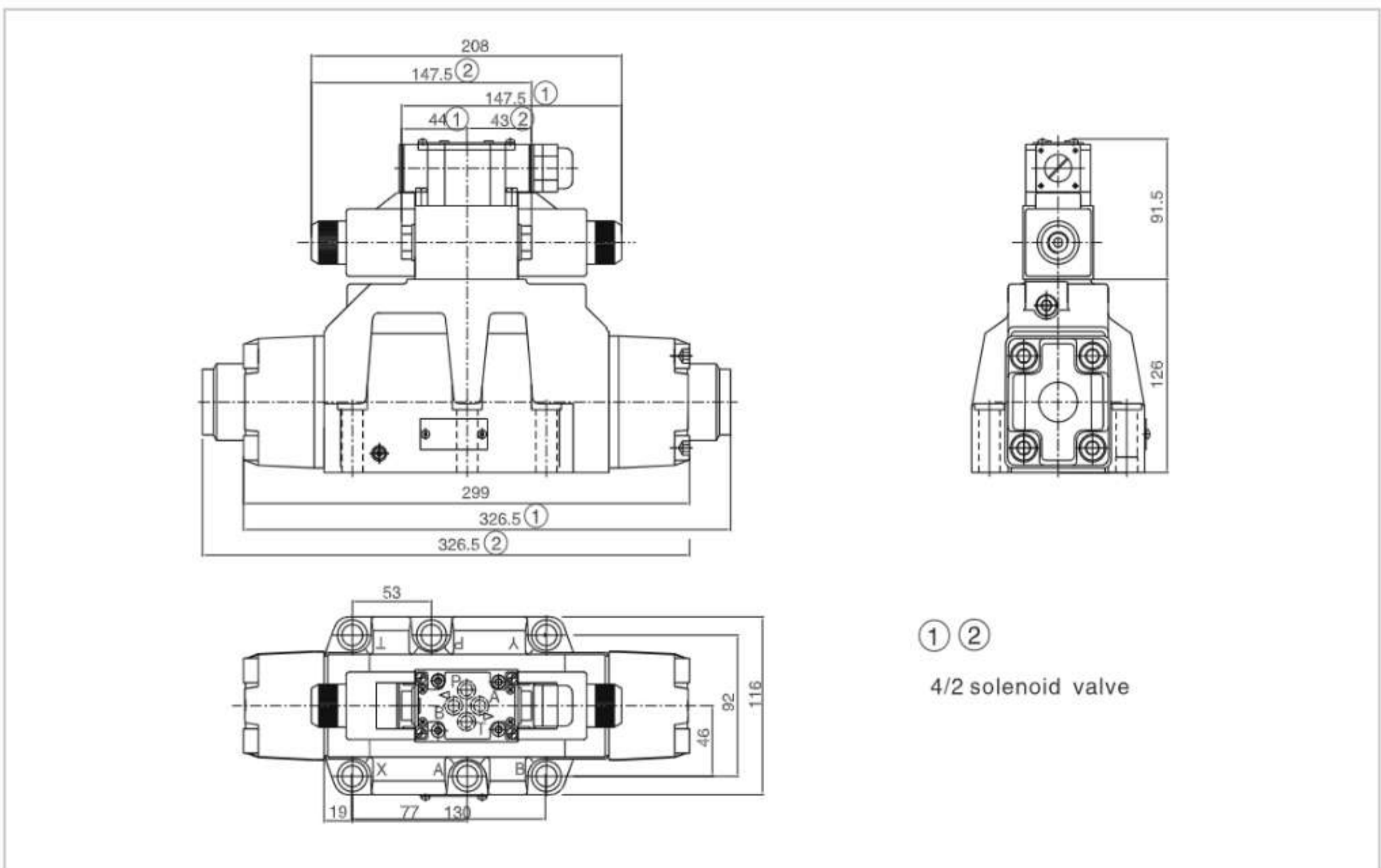


Electro-hydraulic Directional Control Valve

External dimensions (06 Alternating current plug type)



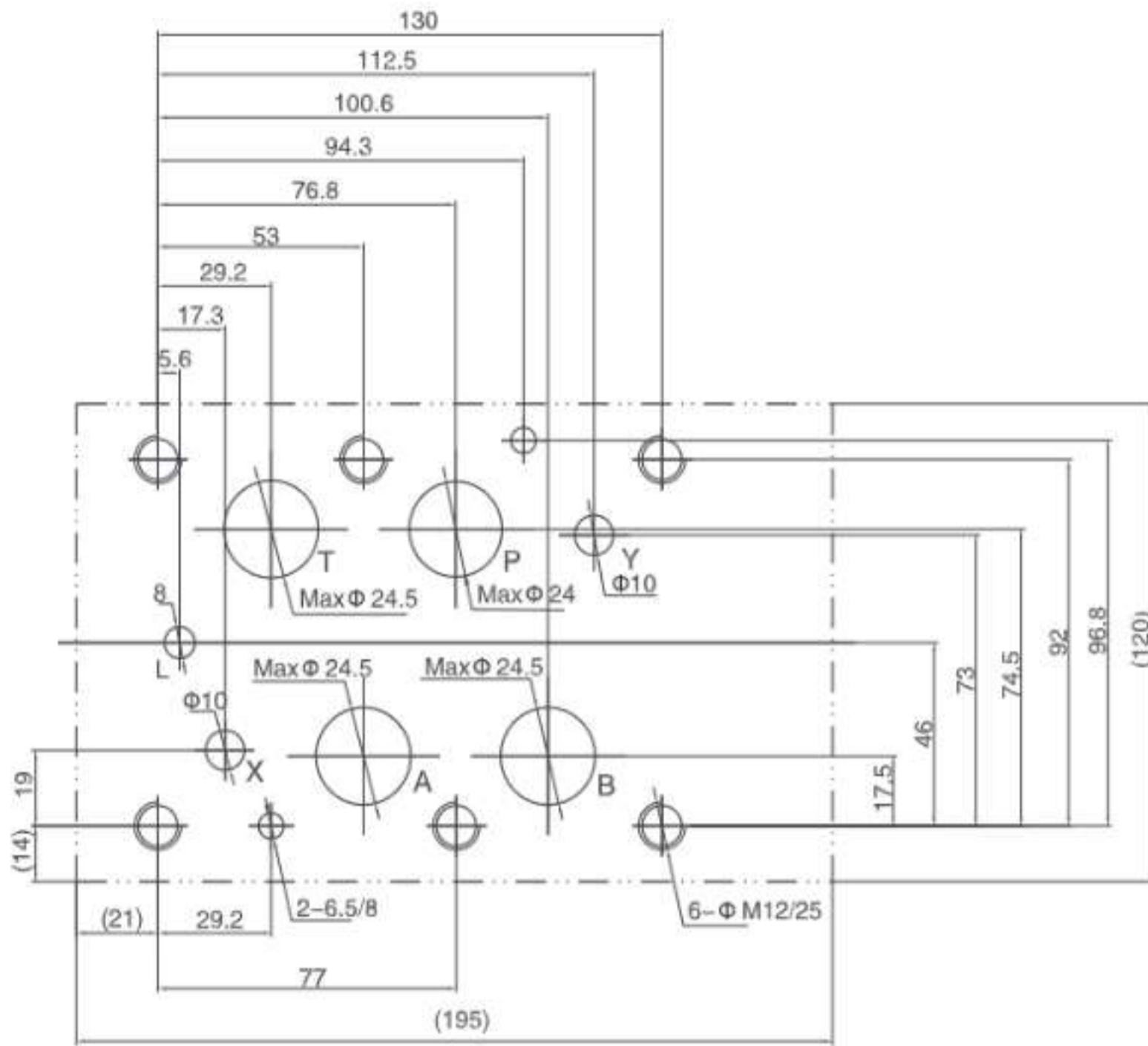
External dimensions (06 Alternating current wire box type)



D.6.14

Electro-hydraulic Directional Control Valve

06 Size of subplate oil port

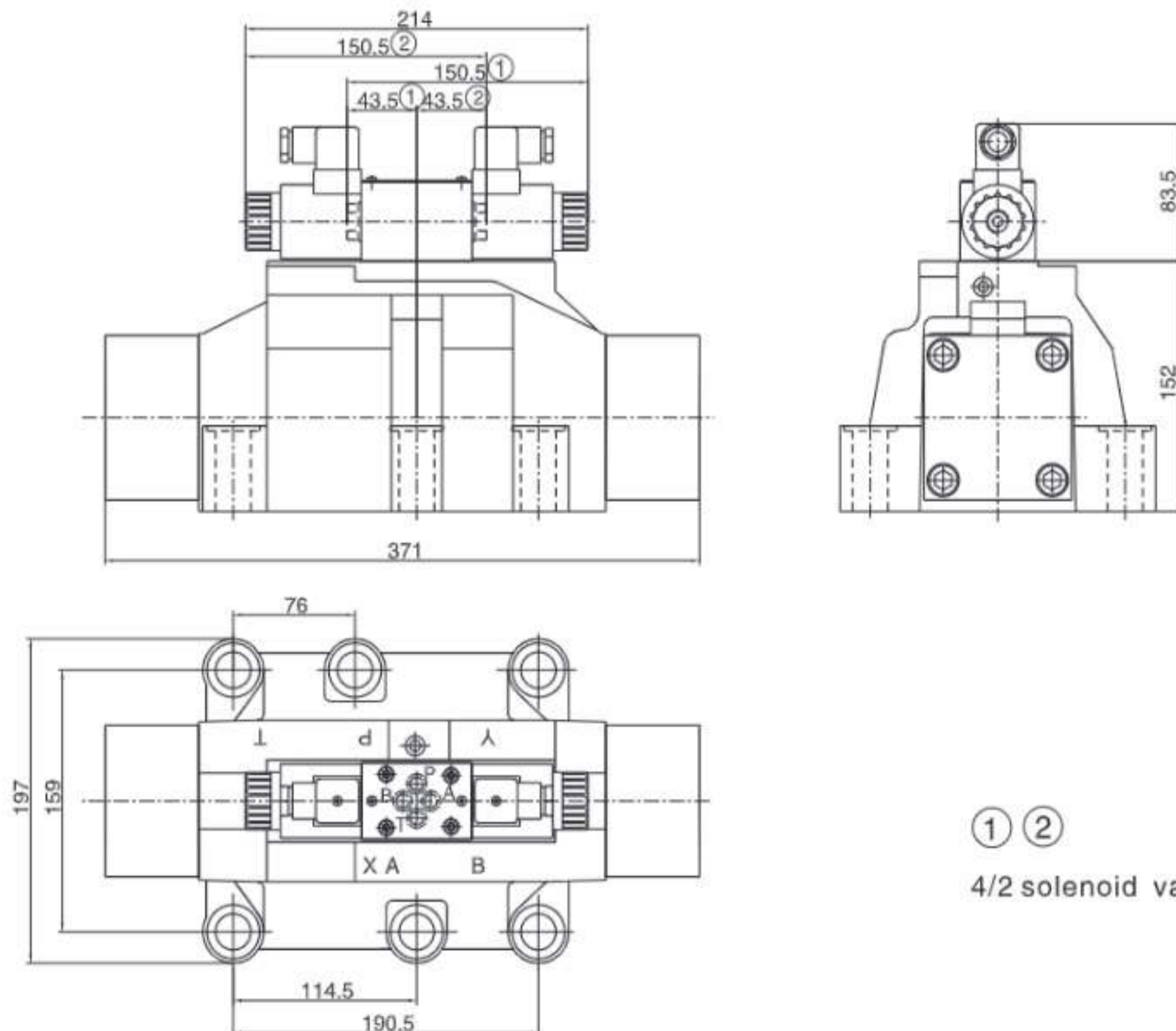


Mounting screw	Amount	Tighten torque
M12X60-10.9	6	130Nm

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.

External dimensions (10 Direct current plug type)

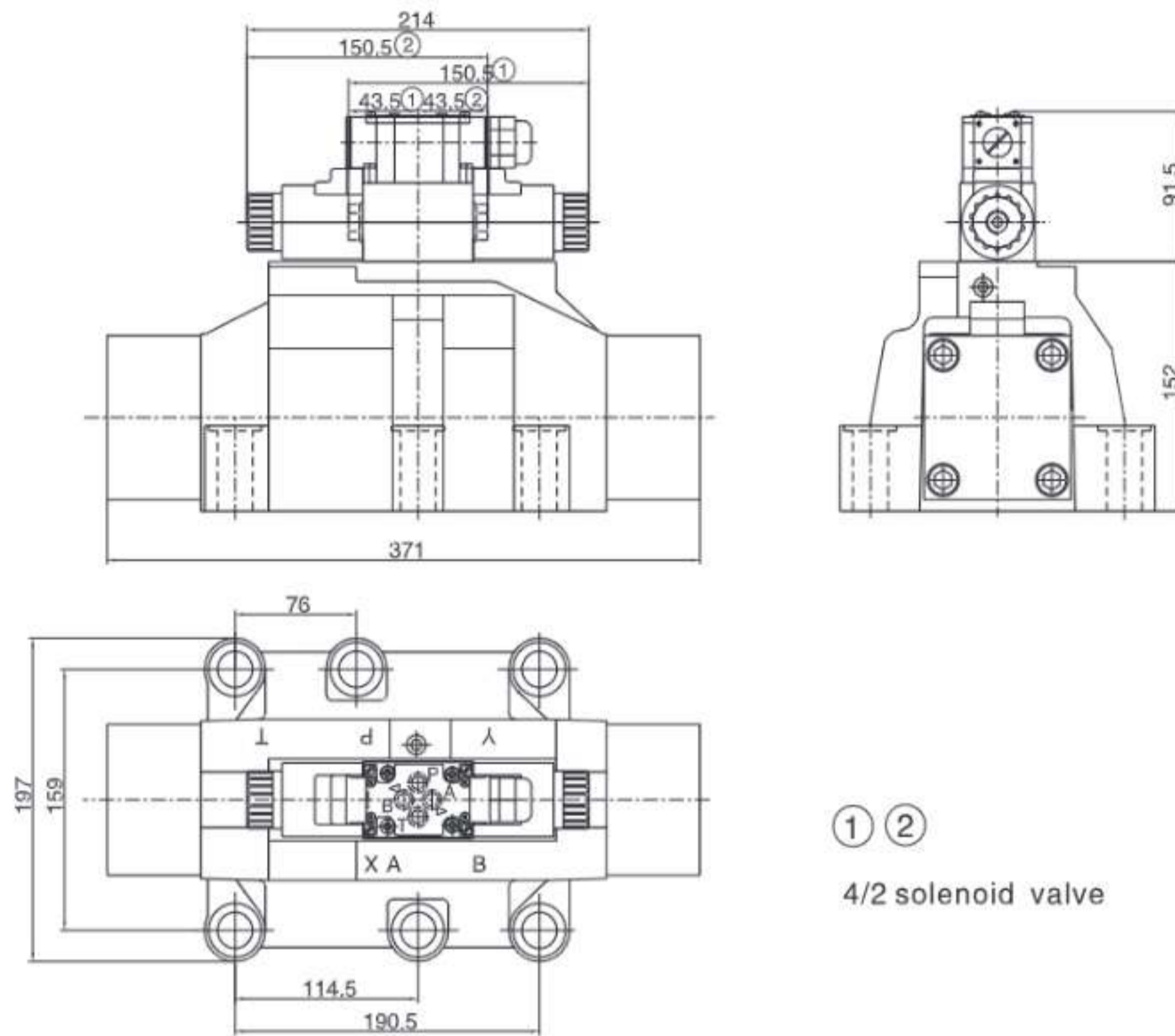


① ②

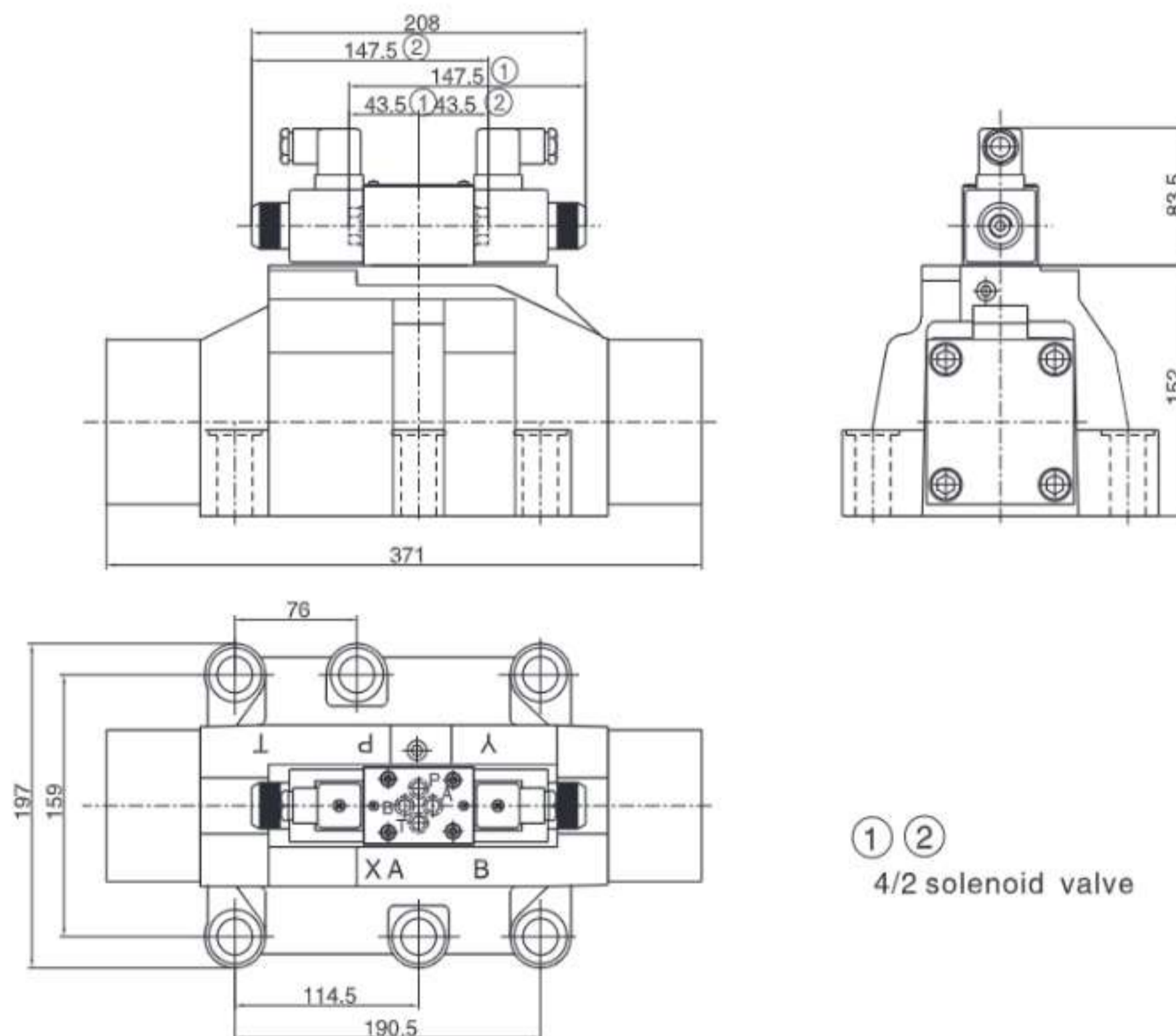
4/2 solenoid valve

Electro-hydraulic Directional Control Valve

External dimensions (10 Direct current wire box type)

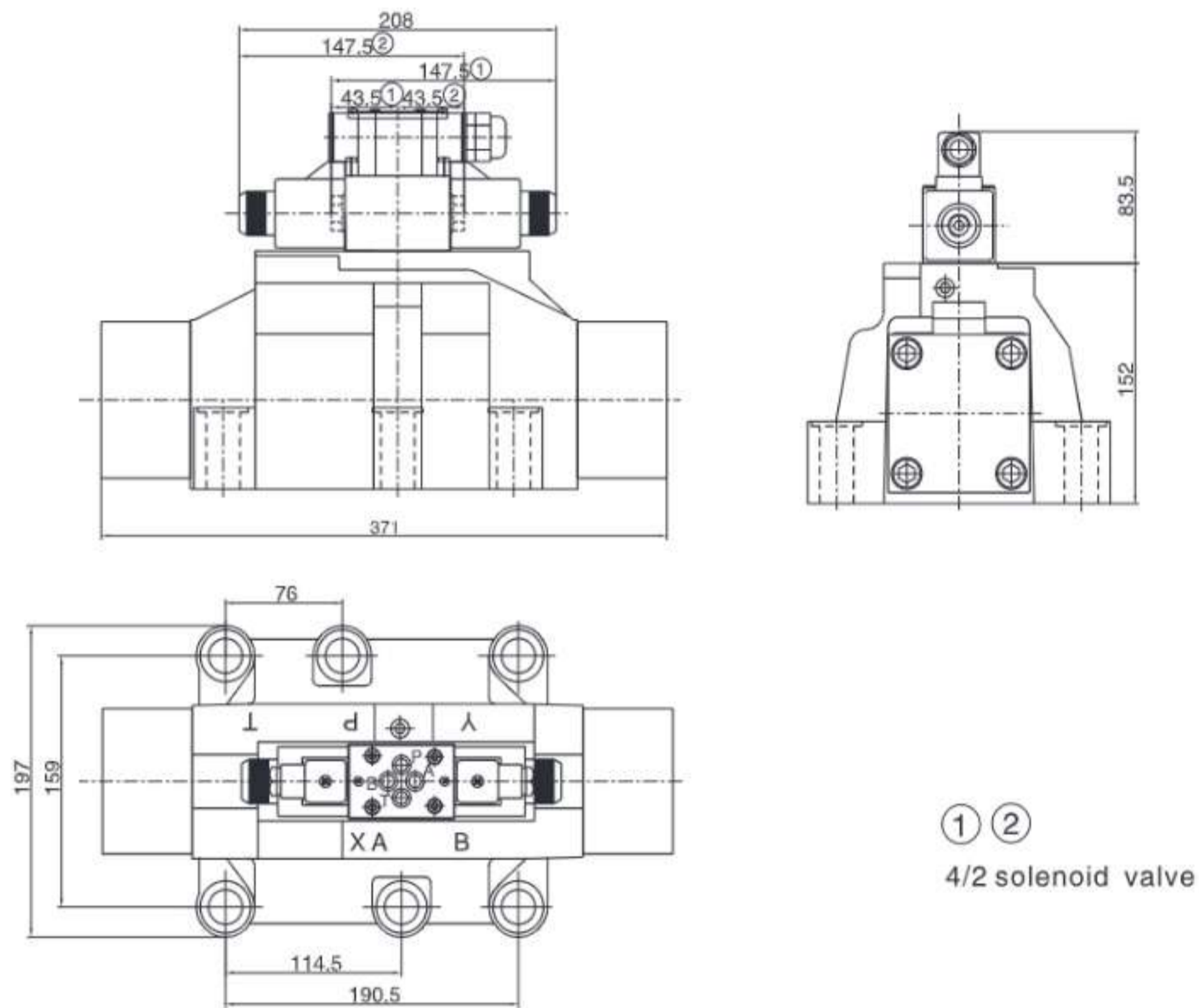


External dimensions (10 Alternating current plug type)

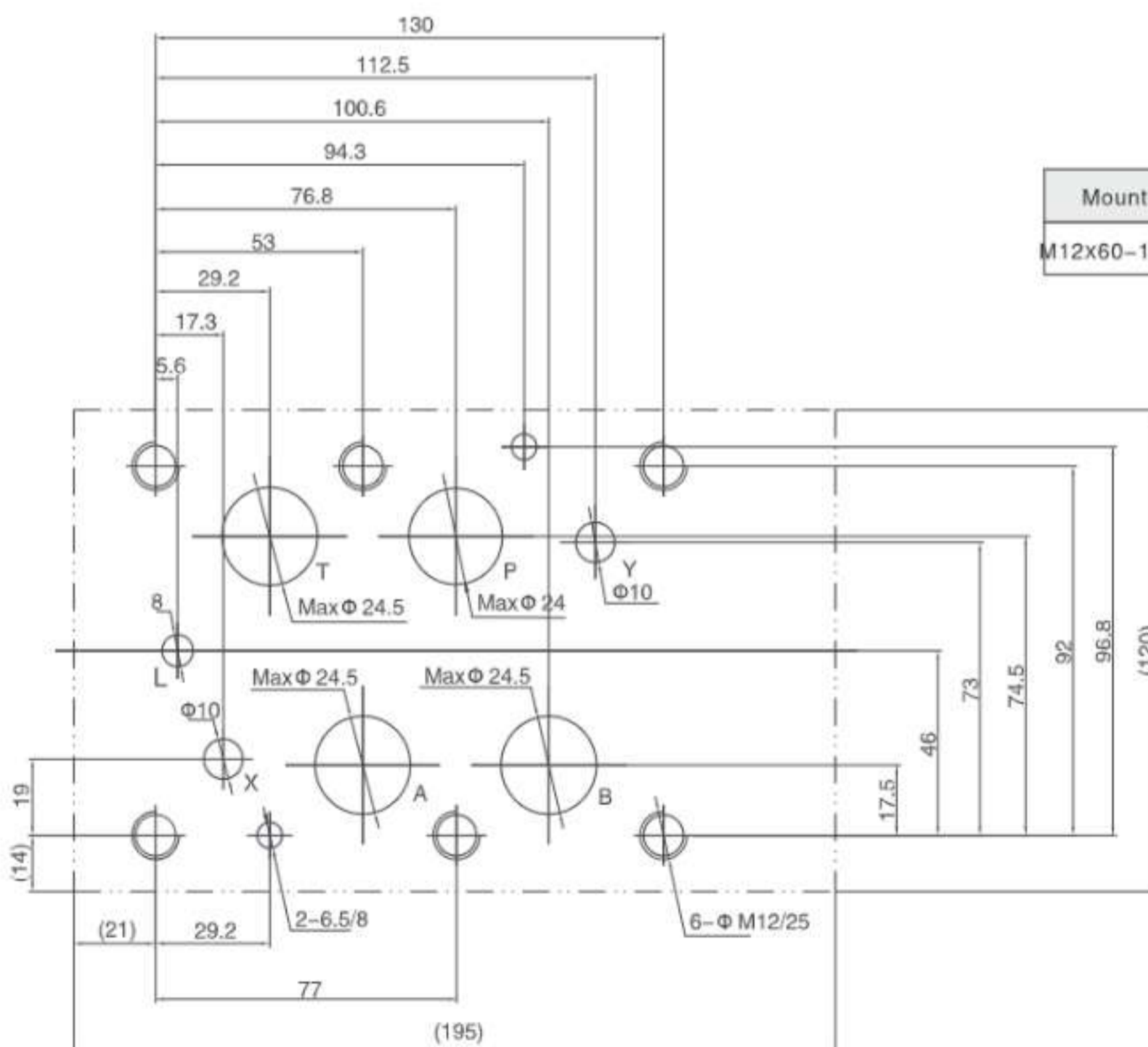


Electro-hydraulic Directional Control Valve

External dimensions (10 Alternating current wire box type)



10 Size of subplate oil port



Mounting screw	Amount	Tighten torque
M12x60-10.9	6	130Nm

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 $20 \mu\text{m}$.
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.