

MANUAL OPERATED DIRECTIONAL CONTROL VALVE



Technical Specification

Specification		02	03	04	06
Working pressure (Bar)	Port P,A,B	315			
	Port T	100			
Max. Flow (L/min)		60	100	300	450
Working fluid		Mineral oil; phosphate-ester			
Fluid temp. (°C)		-20~70			
Viscosity (mm²/s)		2.8~380			
Weight (kg)		About 1.4	About 3.3	About 8	About 17
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS 1638. It is suggested that the minimum filter rating should be $\beta_{10} \geq 75$.			

Manual operated directional control valve is a directional control valve, by operating the handle, the spool moves in the axial direction to achieve oil loop switching.

Manual operated directional control valve and electrical operated directional control valve are played the same role in the hydraulic system. Easy operation, reliable work, and without the need for electricity.

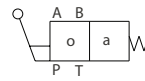
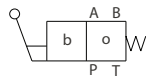
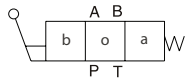
Model Description

Manual operated directional control valve	FS	-	*	-	*	/	*	*	*	50	*	Remarks
Specification 02 : DN6 03 : DN10 04 : DN16 06 : DN25												Serial number
Function code Details as following symbol table												Seal material Omit : NBR Seals V : FPM Seals
Omit : Spring return OF : With detent												Omit without damping 08 : ϕ 08 Damping 10 : ϕ 1.0 Damping 12 : ϕ 1.2 Damping

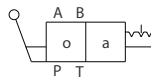
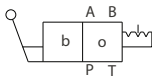
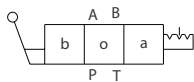
MANUAL OPERATED DIRECTIONAL CONTROL VALVE

Code Symbol

Spring return



With detent

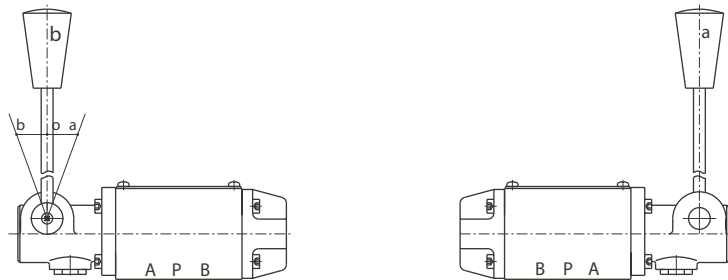


302		2828		2828L	
303		2838		2838L	
304		2848		2848L	
305 (02/03)		2858 (02/03)		2858L (02/03)	
305 (04/06)		2858 (04/06)		2858L (04/06)	
306		2868		2868L	
307		2878		2878L	
309		2898		2898L	
3010		28108		28108L	
3011		28118		28118L	
3012		28128		28128L	
3025 (02/03)		28258 (02/03)		28258L (02/03)	
3025 (04/06)		28258 (04/06)		28258L (04/06)	
3029		28298		28298L	

(02/03)	
(04/06)	
282	
283	
288	
(02)	
(03)	
(04/06)	
282L	
283L	
288L	

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

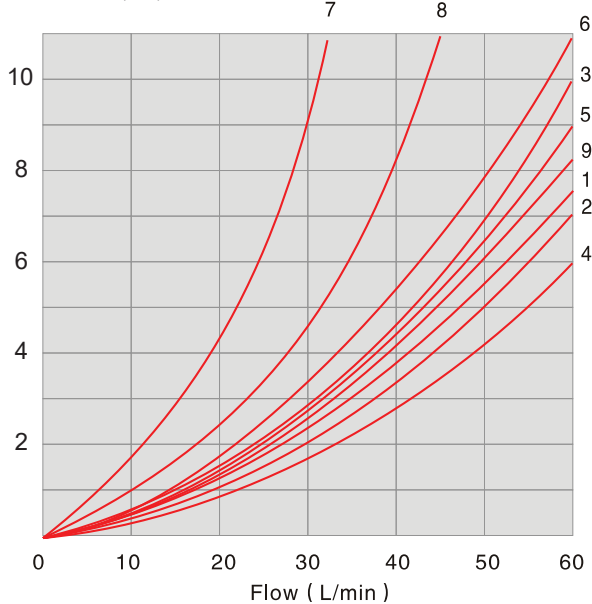
The relationship between the location of the handle and the direction of the oil flow



1. The name of the handle as shown in the picture
2. When the handle is on position b $P \rightarrow B$ $A \rightarrow T$
3. When the handle is on position a $P \rightarrow A$ $B \rightarrow T$
4. Oil flow in the opposite direction with the above-mentioned for 02/03:305,306.
Oil flow in the opposite direction with the above-mentioned movement for 04/06:306.
5. For specification 03 spool type 282L,283L, 288L, the handle is at the side of port 8, details refer to the external dimension.

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

Pressure loss (Bar)



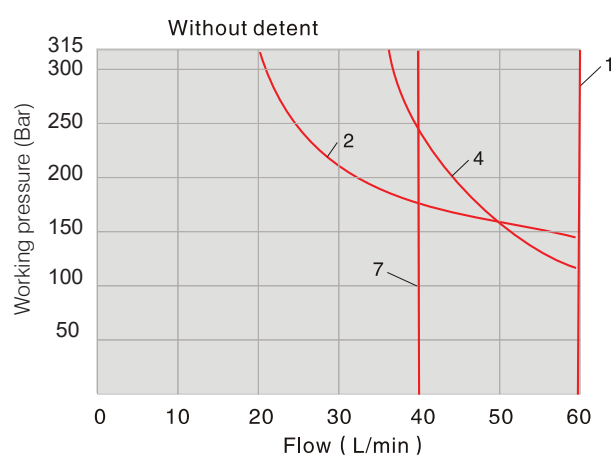
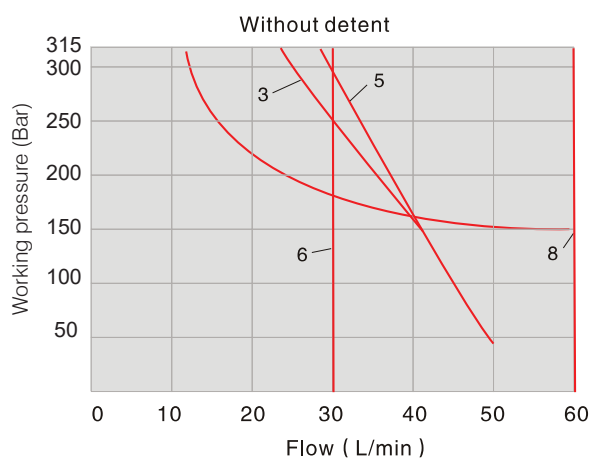
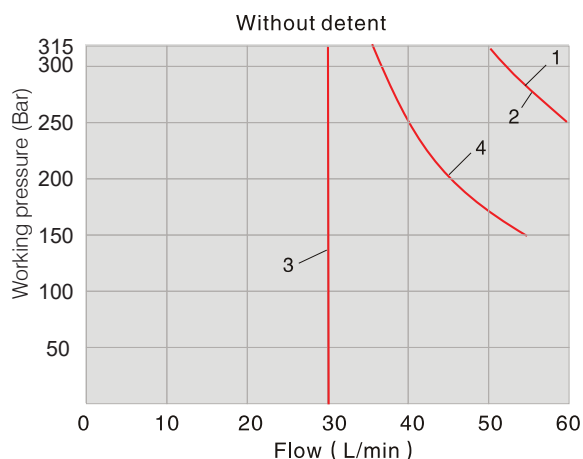
Function code	Switching position			
	P→A	P→B	A→T	B→T
288 288L	3	3	—	—
283	1	1	3	1
282 282L	5	5	3	3
302	3	3	1	1
305	1	3	1	1
306	6	6	9	9
303	2	4	2	2
304	1	1	2	1
3010,3012	3	3	4	9
309	2	3	3	3
3025	3	1	1	1
3029	5	5	4	—
307	1	2	1	1

7. Spool type "3029" located in the control position $A \rightarrow B$
8. Spool symbol 306 in the neutral position $P \rightarrow T$

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

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

As the plug, the switch function of the valve is determined by the filter. In order to reach the largest flow as shown, we suggest to use full-flow filter 20 m m. Every force on the valve can also affect the flow. 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.

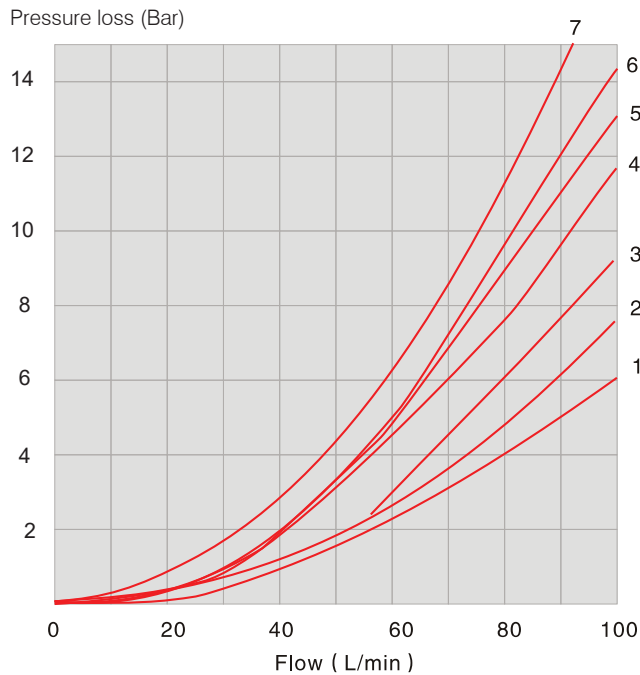


4. Spool symbol "306" in the median position P to T
 7. Spool symbol "3029" in the control position A to B

Performance curve		Function code	Performance curve		Function code
Without detent	1	302 303 283 282 309 3010 306 304 3012 3029 282L	Without detent	1	309 303 283 282 282L
	2	288 288L		2	302 304 3012 3010
	3	307		3	288 288L
	4	305 3025		4	306
				5	305
				6	307
				7	3025
				8	3029

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

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

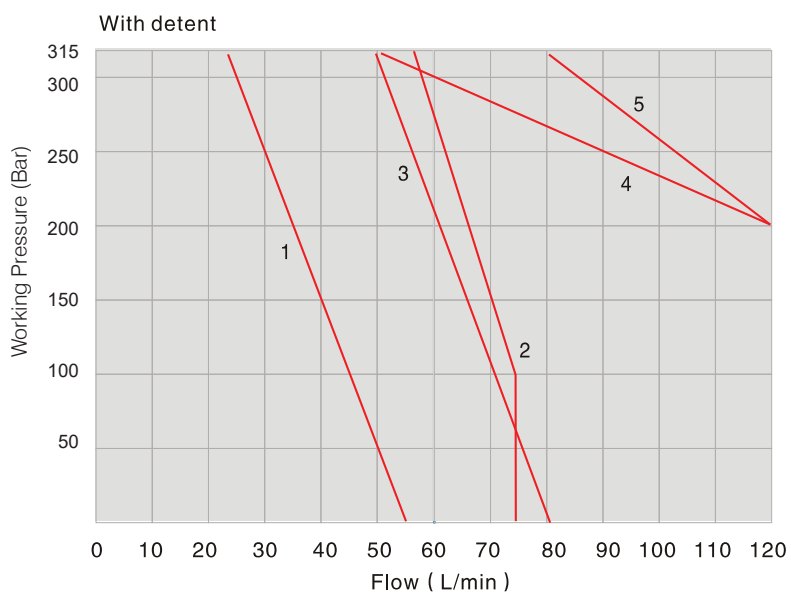


Function Code	Switching position			
	P→A	P→B	A→T	B→T
288	2	2	-	-
288L	2	2	-	-
283	2	2	3	3
282	2	2	3	3
302	2	2	4	4
305	2	3	3	5
306	3	3	4	6
303	1	1	4	5
304	2	2	3	3
3012	2	2	3	5
309	1	1	5	5
3025	3	2	5	3
3029	2	4	3	-
3010	2	2	3	5
307	2	2	4	4
282L	2	2	5	3

4. Spool symbol 306 in the neutral position $P \rightarrow T$

7. Spool type "3029" located in the control position $A \rightarrow B$

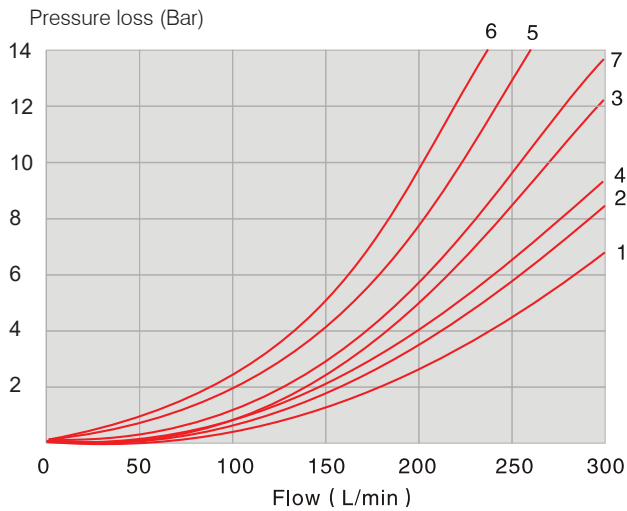
03 Specification Working Limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank.)



Performance curve	Function code
1	288 288L
2	303
3	305 306 3025 3029
4	304 3012 3010
5	282 283 302 309 307 307 282L

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

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



Function Code	Direction			
	P→A	P→B	A→T	B→T
302 282 282L	1	1	1	3
305	2	2	3	3
306	5	1	3	7
303 283	2	2	3	3
307	2	2	3	3
304 3012	1	1	3	3
3029	2	2	4	–
3010	2	2	4	–
30	1	1	4	7

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

04 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.)

4/2 valve With detent					
Function code	Working pressure (bar)				
	7	14	21	28	35
	Flow (L/min)				
283	300	300	300	260	220
282	300	300	210	190	160

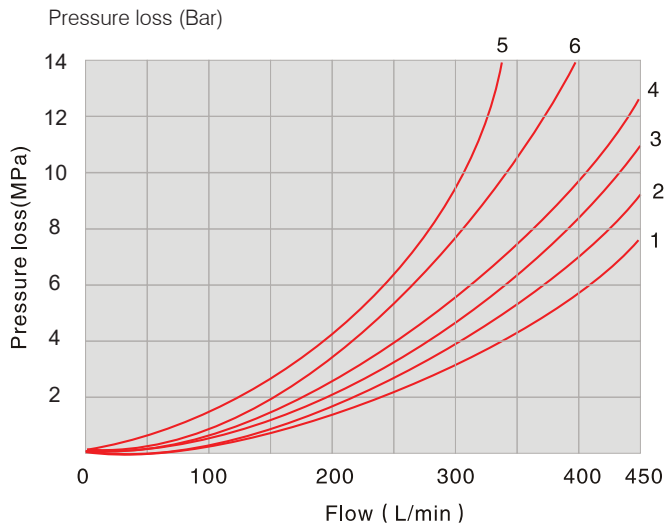
4/2 valve With detent					
Function code	Working pressure (bar)				
	7	14	21	28	35
	Flow (L/min)				
282 283	300	300	300	260	220

4/3 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
302 303 304 3012 309 3029 3010	300	300	300	300	300
305 3025	300	300	210	190	170
306	300	300	220	210	180
307	300	260	200	180	170

4/3 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
302 303 304 3012 309 3029 3010	300	300	300	300	300
305 3025	300	300	280	230	230
306	300	300	230	230	230
307	300	300	250	230	230

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

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



Function code	Direction			
	P→A	P→B	A→T	B→T
302	2	2	1	4
305	1	2	1	2
306	2	2	2	4
303	2	2	1	3
304	2	2	1	3
3012	2	2	1	2
309	2	2	1	4
3025	2	2	1	4
3029	1	2	1	—
3010	2	2	1	4
307	2	2	1	4

4. Spool symbol "3C12" in the neutral position A → T

6. Spool symbol "3C10" in the neutral position B → T

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

4/2 valve With detent					
Function code	Working pressure (bar)				
	7	14	21	28	35
	Flow (L/min)				
283	450	300	250	200	180
282	350	300	275	250	200

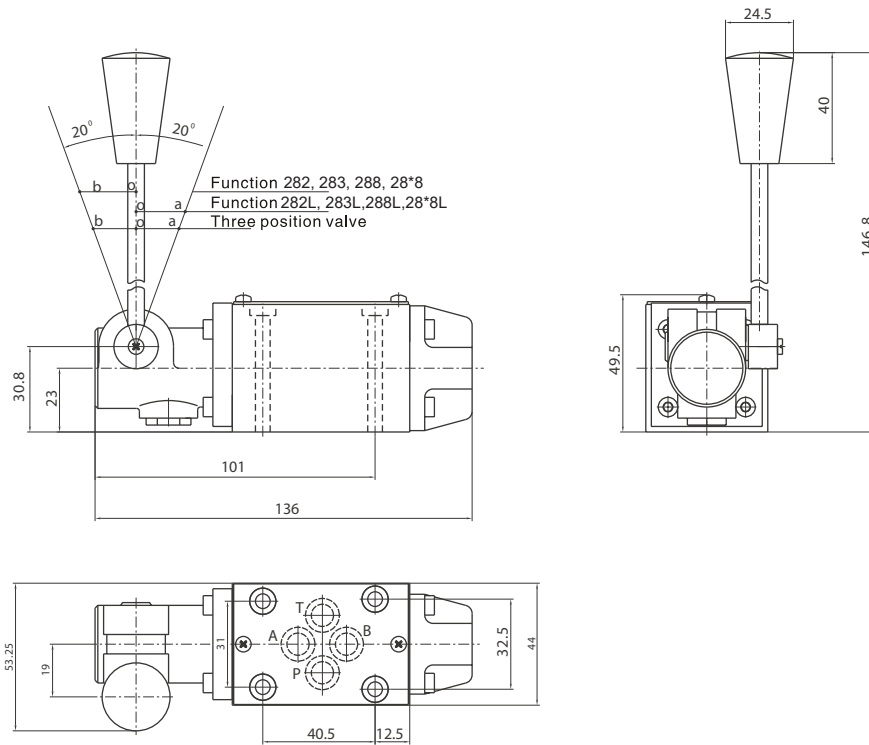
4/2 valve With detent					
Function code	Working pressure (bar)				
	7	14	21	28	35
	Flow (L/min)				
282 283	450	450	450	450	450

4/3 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
302 303 304 3012 309 3029 3010	450	450	450	450	450
305	450	250	200	135	110
306	450	330	290	230	180
303	450	450	400	400	350
3025	450	310	240	215	150
307	450	310	280	270	200

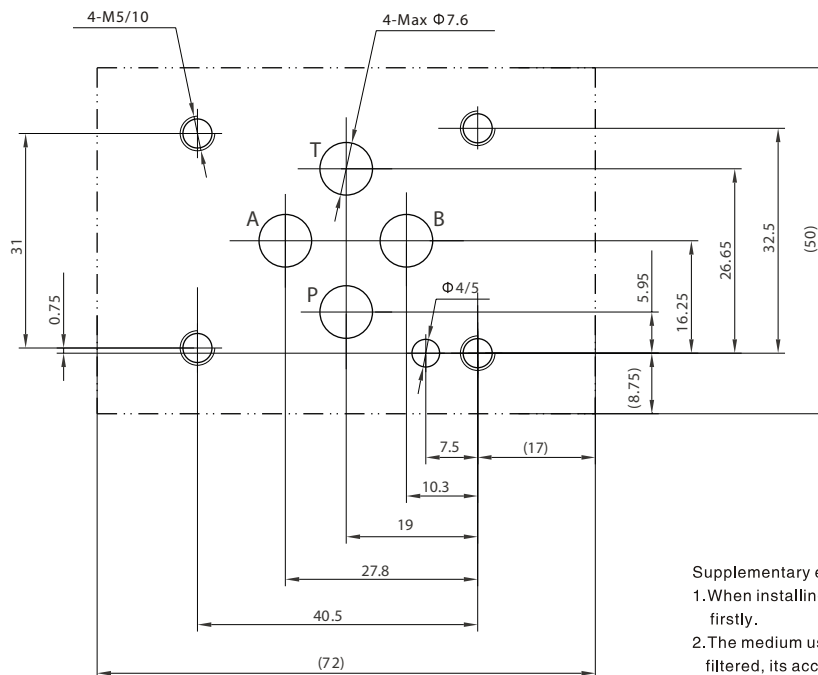
4/3 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
302 305 306 303 304 3010 309 3025 3029 3012	450	450	450	450	450
307	450	450	400	350	300

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

02 External dimensions



02 Size of subplate oil port



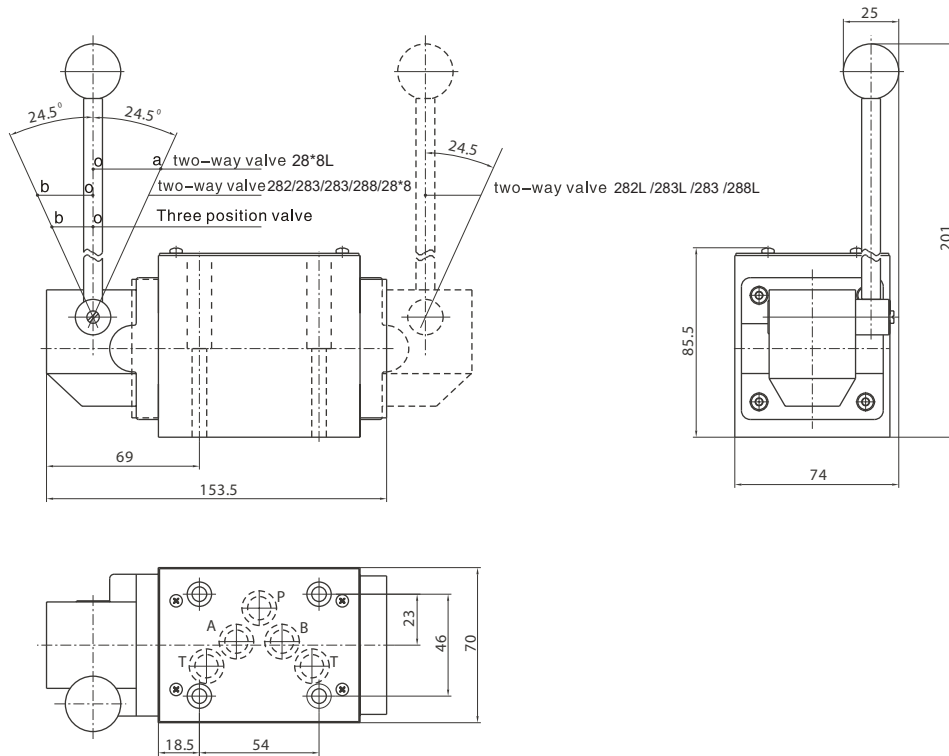
Mounting screw	Amount	Tighten torque
M5x50-10.9	4	9Nm

Supplementary explanation

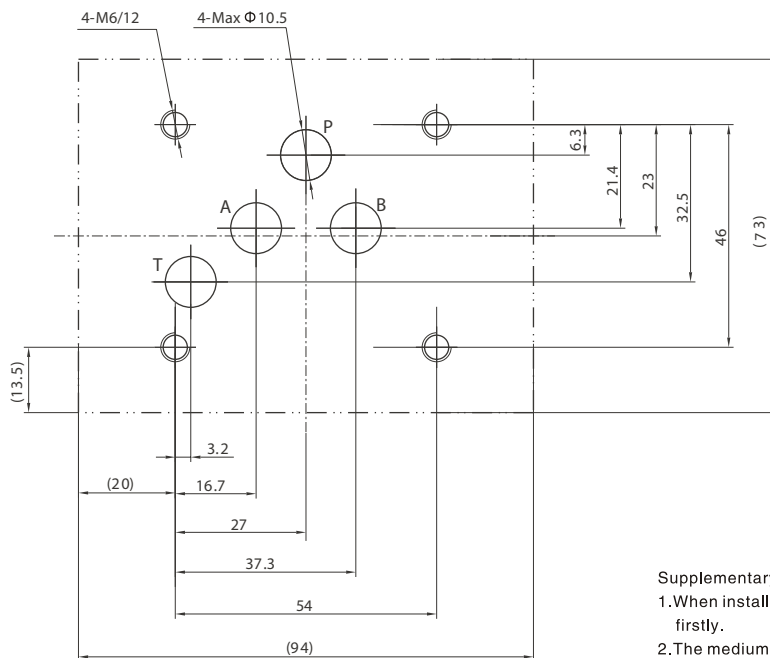
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least $20 \mu m$.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness,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

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

03 Spring type External dimensions



03 Spring type Size of subplate oil port



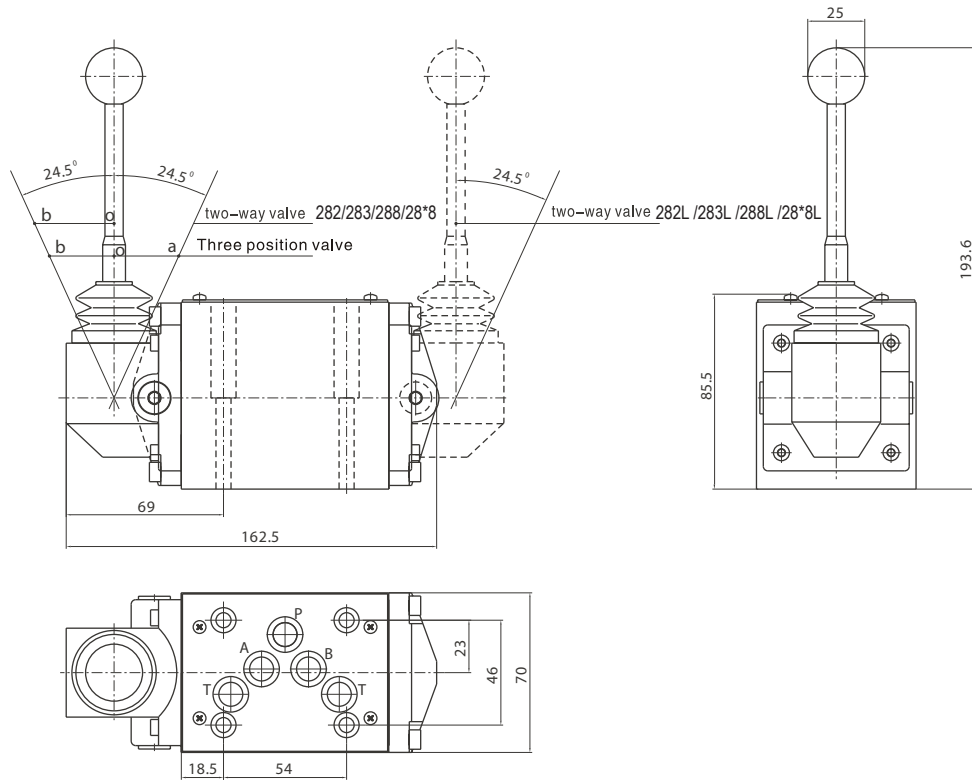
Mounting screw	Amount	Tighten torque
M6x50-10.9	4	15Nm

Supplementary explanation

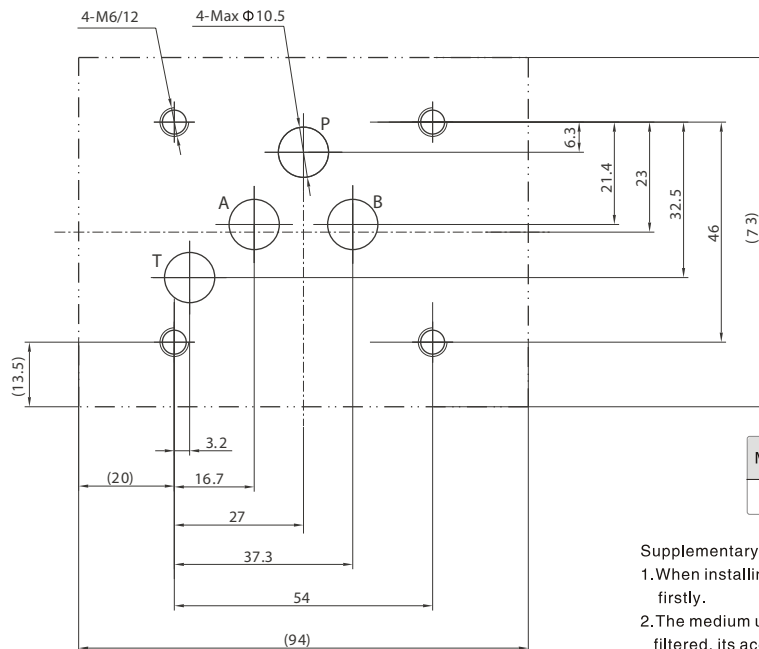
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least $20 \mu m$.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness,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

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

03 With detent type External dimensions



03 With detent type Size of subplate oil port



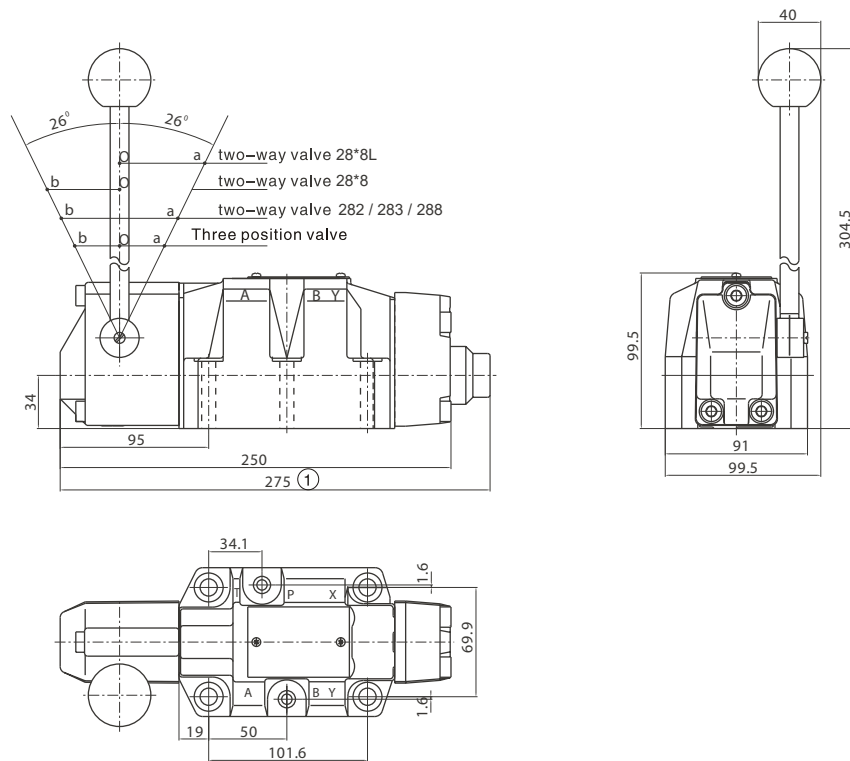
Mounting screw	Amount	Tighten torque
M6x50-10.9	4	15Nm

Supplementary explanation

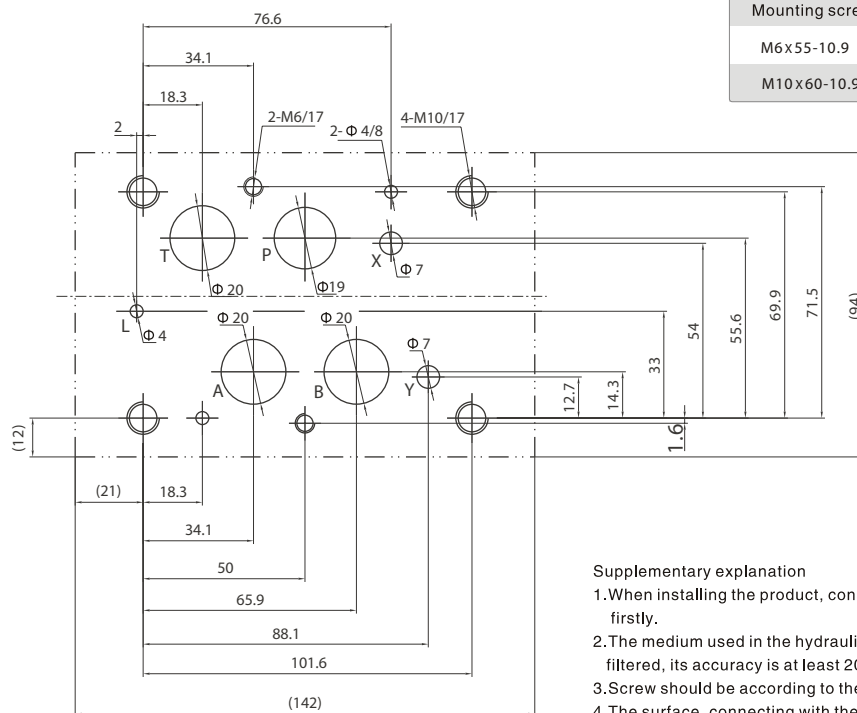
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least $20 \mu m$.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness,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

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

04 External dimensions



04 Size of subplate oil port

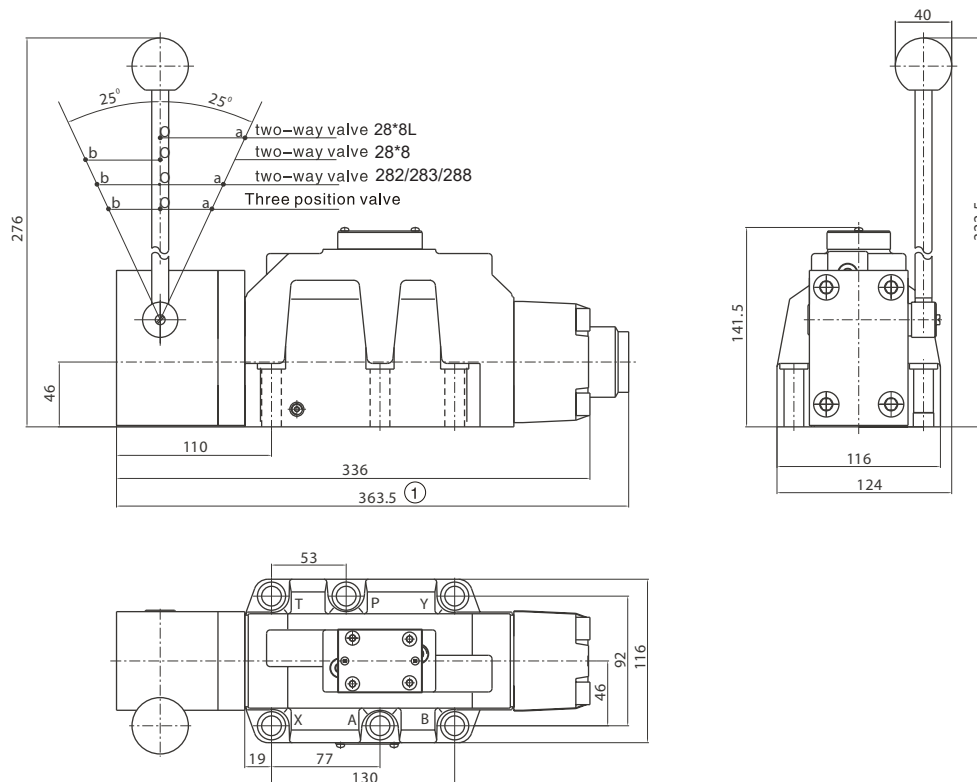


Supplementary explanation

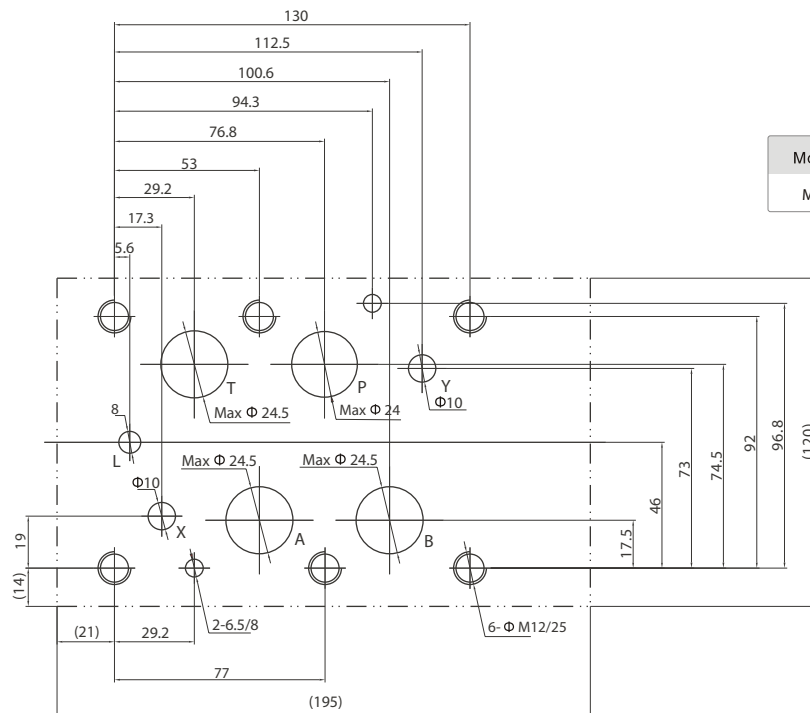
- When installing the product, considering horizontal position firstly.
- The medium used in the hydraulic system must be filtered, its accuracy is at least $20 \mu\text{m}$.
- Screw should be according to the parameters in catalogue.
- The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

MANUAL OPERATED DIRECTIONAL CONTROL VALVE

06 External dimensions



06 Size of subplate oil port



Mounting screw	Amount	Tighten torque
M12 x 60-10.9	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 $20 \mu m$.
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.