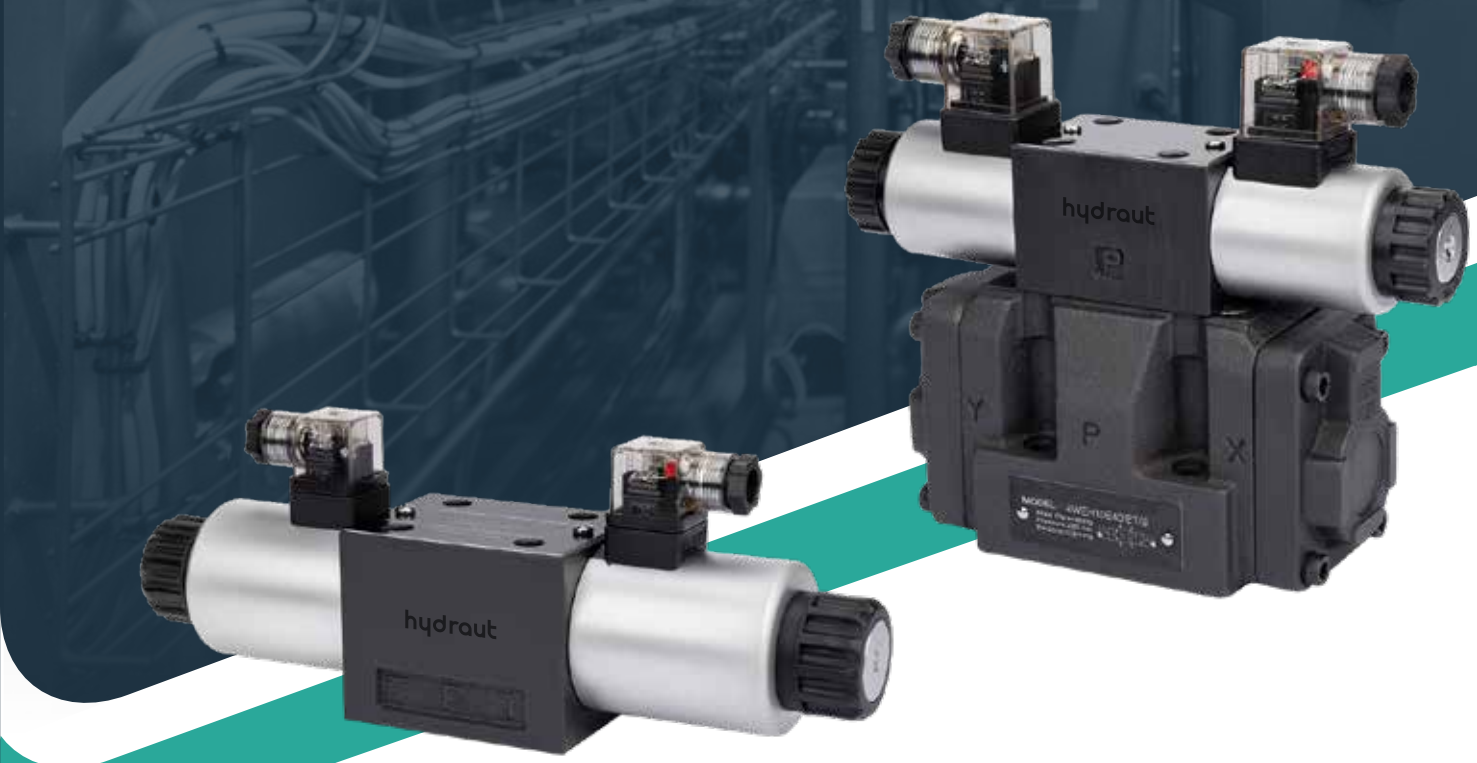
4WE - 4WEH

DIRECTIONAL VALVES



hydraut

4WE - 4WEH

DIRECTIONAL VALVES

Sommary

4WE

4/3 AND 4/2 DIRECTIONAL VALVES WITH WET PIN DC OR AC SOLENOIDS, TYPE 4WE 6 OR 10

Size 6,10
Component sieries 6X/3X
Maximum operating pressure 35 MPa
Maximum flow 120 L/min

FEATURES

- Three position four way two position four way or two position three way odeml
- High power coil, can rotate 90°
- Low voltage directive 201435EU for symbol CE when voltage >50VAC or >75VDC

MODEL CODE

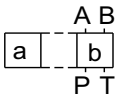
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4WE														

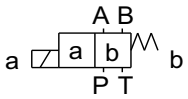
Item	Collection	Code	Explanation
1	Sort	4WE	4/3 and 4/2 Solenoid operated directional valve
2	Nomnail size	6	
		10	
3	Operated directiona cushion	No code	Standard
		S	Cushion operated directional impact is small
4	Symbols		See symbols list
5	Series	6X	For nominal size 6
		3X	For nominal size 10
6	Return mode	No code	Spring return
		O	Without spring return
		OF	With detent
7		E	For nomnial size 6, high power solenoid
		C	For nominal size 10
8	Input voltage	W230	230V/50Hz·240V/60Hz
		W110	110V/50Hz·120V/60Hz
		RAC220	220V/50Hz·240V/60Hz
		RAC110	110V/50Hz·120V/60Hz
		G12	12V
		G24	24V
		G48	48V
9	Hand override	N9	With protected hand override (standard)
		N	With hand override

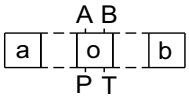
Item	Collection	Code	Explanation
10	Electrical connections	K4	Individual connections with component plug ISO4400 without plug-in connector
11	Plug-in connector	No code	Without plug-in connector
		Z4	With guadrate plug-in connector
		Z5L	Guadrate plug-in connector with indicator light
12	Throttle position*	No code	Without cartridge throttle
		P	Active in the P line
		A	Active in the A line
		B	Active in the B line
13	Throttle diameter*	No code	Without cartridge throttle
		08	Throttle ϕ 0.8 mm
		10	Throttle ϕ 1.0 mm
		12	Throttle ϕ 1.2 mm
14	Seal material	No code	NBR seals
		V	FKM seals
15			Description of other special requirement
16		S	Standard valves

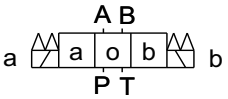
Note: *On request

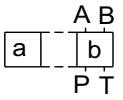
SYMBOLS

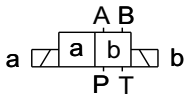












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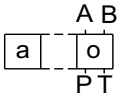

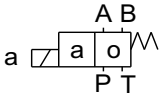

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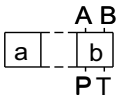

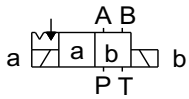

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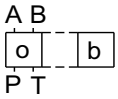

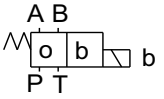

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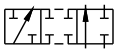

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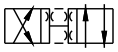

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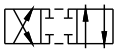

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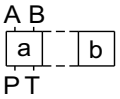

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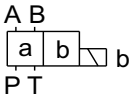

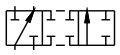

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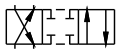

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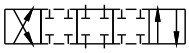

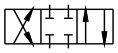

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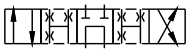

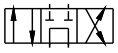

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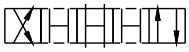

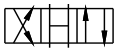

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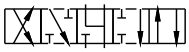

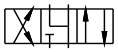

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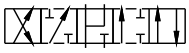
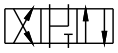




=M

=N

=P

=Q

=R

=T

=U

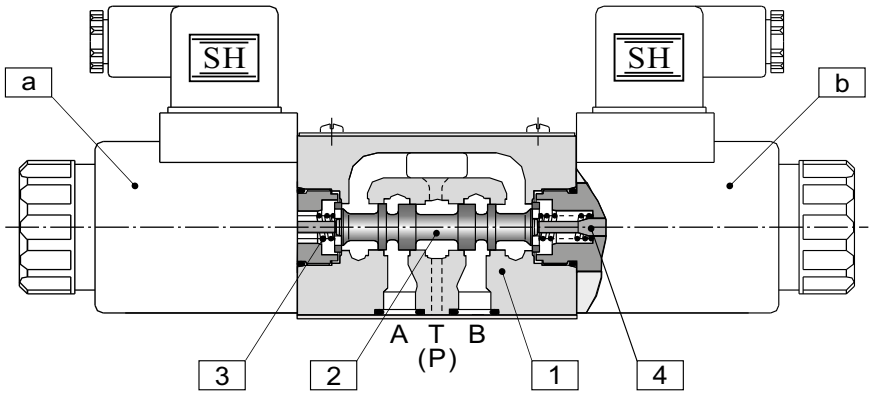
=V

=W

Remark:

1. Example: Spool E with switching position “a”ordering details...EA...
2. The symbol tag is same for W and Q type spool. But the throttle area for W and Q type spool is 3% and 6% of J type spool`s.
3. There are specail cushion spools for C,E,J, L,U codes. Please add S type if need.
4. For special requirement, please contract with our company`s technical department.
We can design special spool.

FUNCTION, SECTION



Section photo 3 Type4:WE 6 .....6X/.....Z5LS

Function description

On the section photo 3, the solenoid power which is brought after solenoid ‘a’ or solenoid ‘b’ gets through electricity can drive the control spool 2 to move right or left inside housing 1 pass plunger 4. So it can flow freely from P to B, A to T or P to A, B to T.

There are three kinds of return type for spool when de-energised solenoid. Spring return type: return spring 3 drive spool back to the initial position; Without spring return type: the spool position when solenoids are de-energized is not defined; Detent or type: spool can keep any position when solenoid stops electricity.

Spring Return Type (4WE .../...)

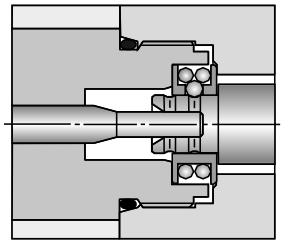
For this kind return type solenoid operated directional valve, solenoid power conquers spring power to drive spool when solenoid gets through electricity. The spool comes back and keeps at one end (two position valve) or middle position (three position valve) because of spring power after the solenoid loses electricity.

Without Spring Return Type (4WE .../O...)

For this kind return type solenoid operated directional valve, solenoid power drives the spool to needed position directly when solenoid gets through electricity. There isn't a fixed position after the solenoid loses electricity.

Orientation Organ Type (4WE .../OF...)

For this kind return type solenoid operated directional valve, solenoid power drives the spool to needed position directly when solenoid gets through electricity. After that, when solenoids are de-energized, the sool is heid in the deent po-sion and thus the solennoids do not need to be centinuously energised.

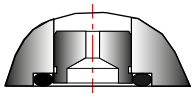


Section photo 4: detent

Cartridge throttle (4WE ...P08...)

In some fixed work condition hydraulic systems, please insert the right throttler into P.A.B oil port based on a detailed situation when the flows exceed permitted power limit of the valve during operation (see section photo 5).

There are three dimensions for damper
are 0.8, 1.0, 1.2 (mm)



Section photo 5: throttle

TECHNICAL DATA

General			Size 6	Size 10
Wight	Valve with 1 solenoids Kg		1.65	4.80
	Valve with 2 solenoids Kg		2.25	6.15
Ambient temperature		°C	-30 to 50	
Installation			optional	

Hydraulic			Size 6	Size 10
Flow Max.		L/min	Up to 80(=);Up to 60(~)	Up to120
Operating pressue max	Ports A, B, P	Bar	350	315
	Ports T	Bar	Up to210(=); Up to160(~) ③	
Pressure fluid: ①suitable for NBR and FKM seals; ②only suitable for FKM seals.			Mineral oil(HL,HLP)to DIN 51524① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil)① HEPG(Polyglycol);HEES(Synthetic ester)②; Other fluids on request	
Pressure fluid temperature range	NBR seals	°C	-30 to +80	
	FKM seals	°C	-15 to +80	-20 to +80
Viscosity range mm^2/s			2.8 to 500	
Degree of fluid contamination			Maximum permissible degree of contamination of fluid is to NAS 1638 class 9.We, therefore, recommend a fither minmun retention rat of $\beta_{10} \geq 25$.	

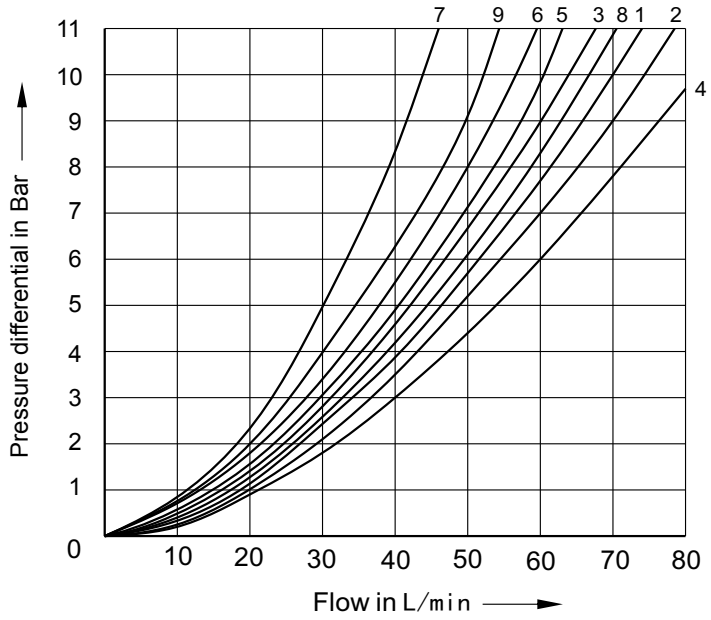
Elecrtical			Size 6		Size 10	
			DC	AC 50/60Hz	DC	AC 50/60Hz
Voltage available		V	12, 24, 48	110,120, 230, 240	12, 24, 48	110,120, 230, 240
Voltage tolerance (normial voltage)		%	±10	±10	±10	±10
Power consumption		W	32	-	<40	50
Holding current		A	-	-	-	0.9
In-rush current		A	-	<2	-	<2
Shifting time to ISO6403	ON	ms	25 to 45	10 to 20	40 to 60	15 to 25
	OFF	ms	10 to 25	15 to 40	20 to 30	20 to 30
Shifting frequency		Sw/h	up to 15000	up to 7200	up to 15000	up to 7200
Insulation to DIN 40 050			IP65	IP65	IP65	IP65
Coil temperature		°C	up to +155	up to +180	up to +155	up to +180

Note: ③For with symbols A and B , port T must be used as a drain port, if the operating pressure is above the permssible tank pressure.

CHARACTERISTIC CURVES

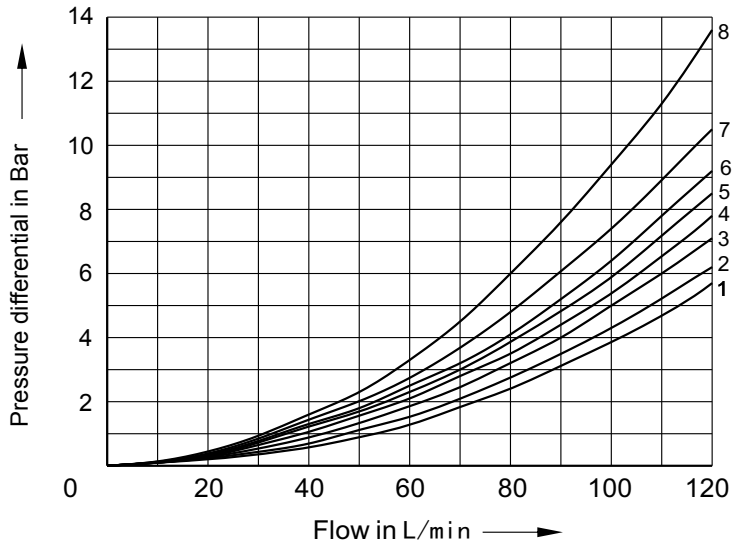
(measured at v=41mm² /s and t=50°C)

Nominal size 6



Symbol	Flow Direction				
	P-A	P-B	A-T	B-T	P-B
A, B	3	3	-	-	-
C, X	1	1	3	1	-
D, Y	5	5	3	3	-
E	3	3	1	1	-
F	1	3	1	1	-
G	6	6	8	8	7
H	2	4	2	2	-
J, Q	1	1	2	1	-
L	3	3	4	8	-
M	2	4	3	3	-
P	3	1	1	1	-
R	5	5	4	-	-
T	9	9	8	8	7
U	3	3	8	4	-
V	1	2	1	1	-
W	1	1	2	2	-

Nominal size 10

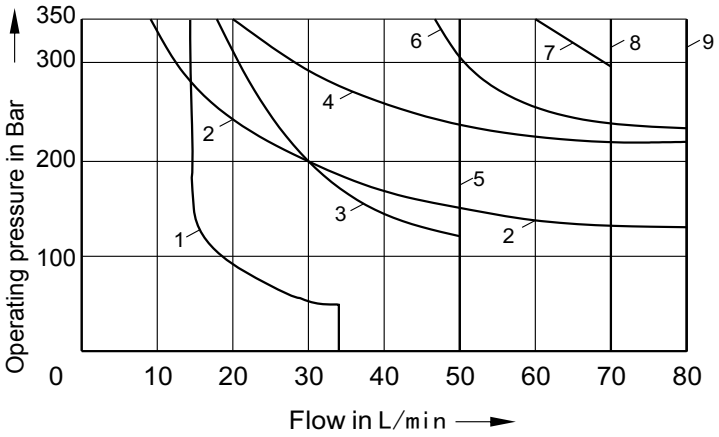


Symbol	Flow Direction				
	P-A	P-B	A-T	B-T	P-B
A, B	3	3	-	-	-
C, X	1	3	4	5	-
D, Y	5	5	6	6	-
E	1	1	4	4	-
F	2	3	7	4	8
G	3	3	6	7	9
H	1	1	6	7	3
J, Q	1	1	3	3	-
L	2	2	3	5	-
M	1	1	4	5	-
P	3	1	1	1	-
R	5	5	4	-	-
T	9	9	8	8	7
U	2	2	3	3	-
V	1	2	1	1	-
W	1	1	2	2	-

SHIFTING POWER LIMITS

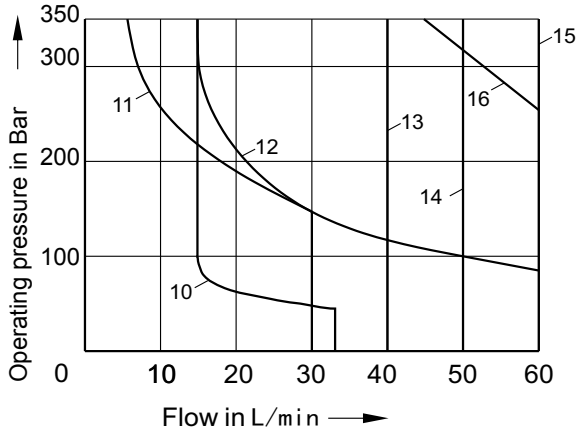
Nominal size 6 DC Solenoid & AC Solenoid

The given switching power limits are for applications with two flow directions and were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.
2 Measured at v=41mm /s and t=50°C



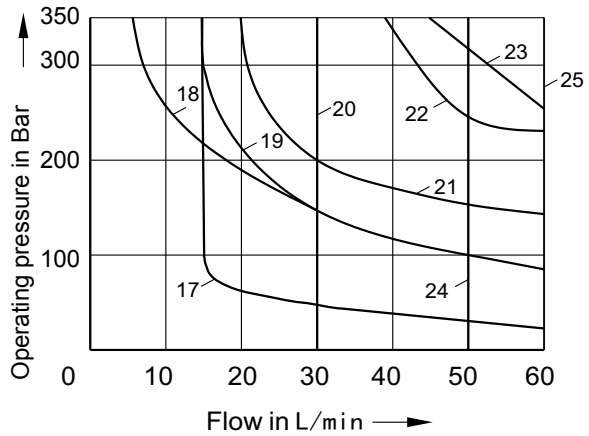
DC Solenoid

Curve	Symbol	Curve	Symbol
1	V	6	A /O、A /OF、L、U
2	A, B	7	C、D、Y
3	F, P	8	M
4	J	9	E、C/O、C/OF D/O、D/OF、Q W、R"
5	G, H, T		



50Hz AC Solenoid

Curve	Symbol	Curve	Symbol
10	V	15	A /O、A/OF C /O、C/OF D/O、D/ OF M、J、Q、R W、E、L、U
11	A, B		
12	F, P		
13	G, T	16	C、D、Y
14	H		



60Hz AC Solenoid

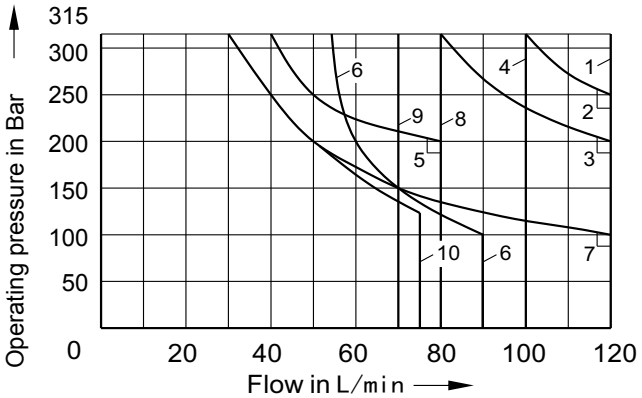
Curve	Symbol	Curve	Symbol
17	V	22	A/O、A/OF、Q、W
18	A, B	23	C、D、Y
19	F, P	24	H
20	G, T	25	C/O、C/OF、D/O D/OF、E、M、R
21	L、U、J		

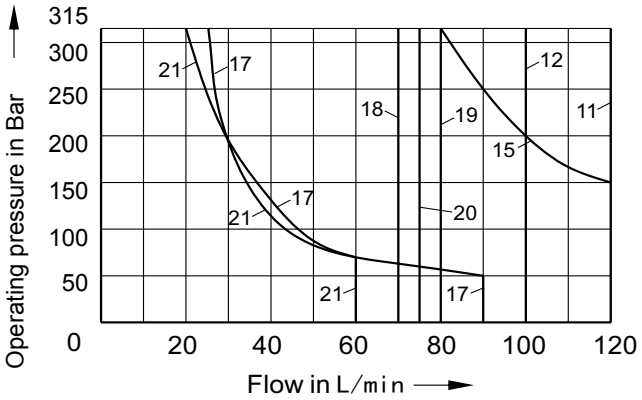
SHIFTING POWER LIMITS

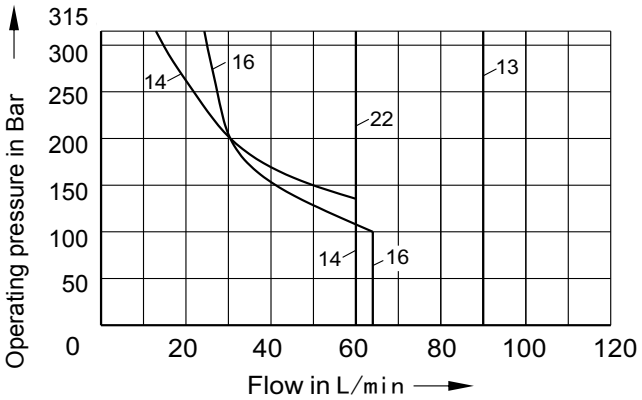
Nominal size 10 DC Solenoid & AC Solenoid

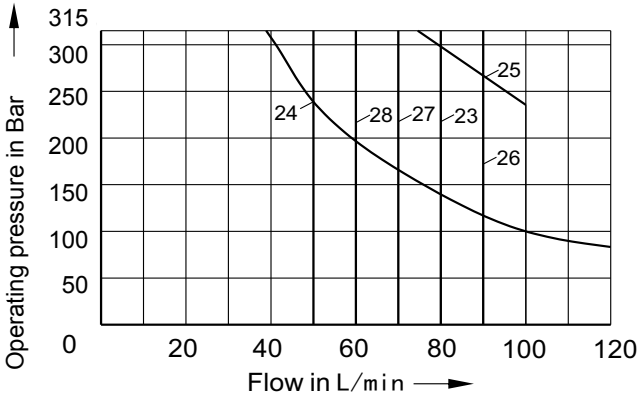
The given switching power limits are for applications with two flow directions and were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.

2 Measured at v=41mm /s and t=50°C









DC Solenoid: 24V

Curve	Symbol	Curve	Symbol
1	C、C/O、C/O F D、D/O、D/O F Y、M	5	G
		6	F, P
2	E	7	A, B
3	A/O、A/OF、LU、J、Q、W	8	R、L①、U①
		9	V
4	H	10	T

① Only fit for the situation at middle position.

AC Solenoid: 110V / 50Hz ; 120V / 60Hz;
220V / 50Hz ; 240V / 60Hz.

Curve	Symbol	Curve	Symbol
11	C, C/O, C/O F, D, D/O, D/O F, Y	16	G
		17	F, P
12	E, L, U, Q, W	18	H
		19	R
13	M	20①	L, U
14	A, B	21	T
15	A/O, A/OF, J	22	V

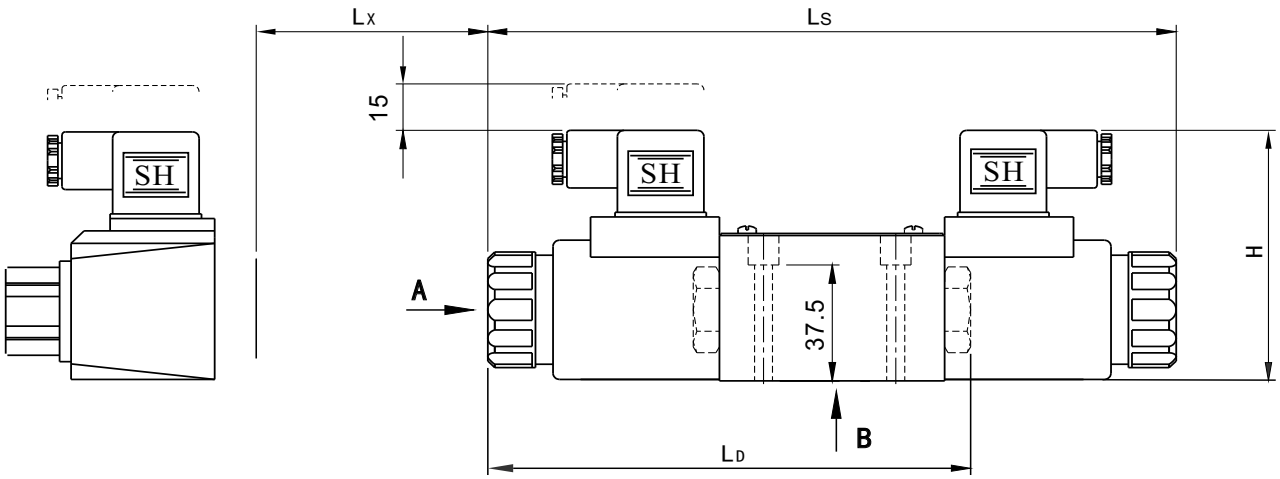
① Only fit for the situation at middle position.

AC Solenoid : 110V / 60Hz ; 220V / 60Hz;

Curve	Symbol	Curve	Symbol
23	C、CO、COF、D DO、DOF、Y	26	M
24	AO、AOF	27	H
25	E	28	V

INSTALLATION DIMENSIONS

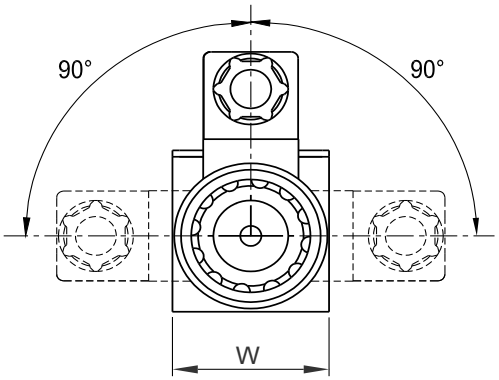
Nominal size 6



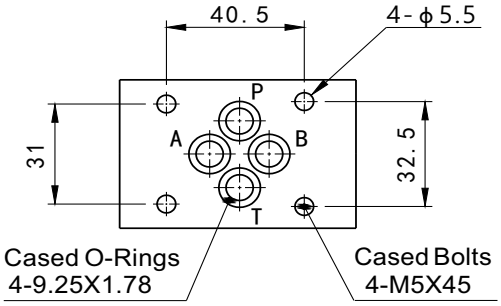
AC Plug-in Connection Type

DC Plug-in Connection Type

A Direction



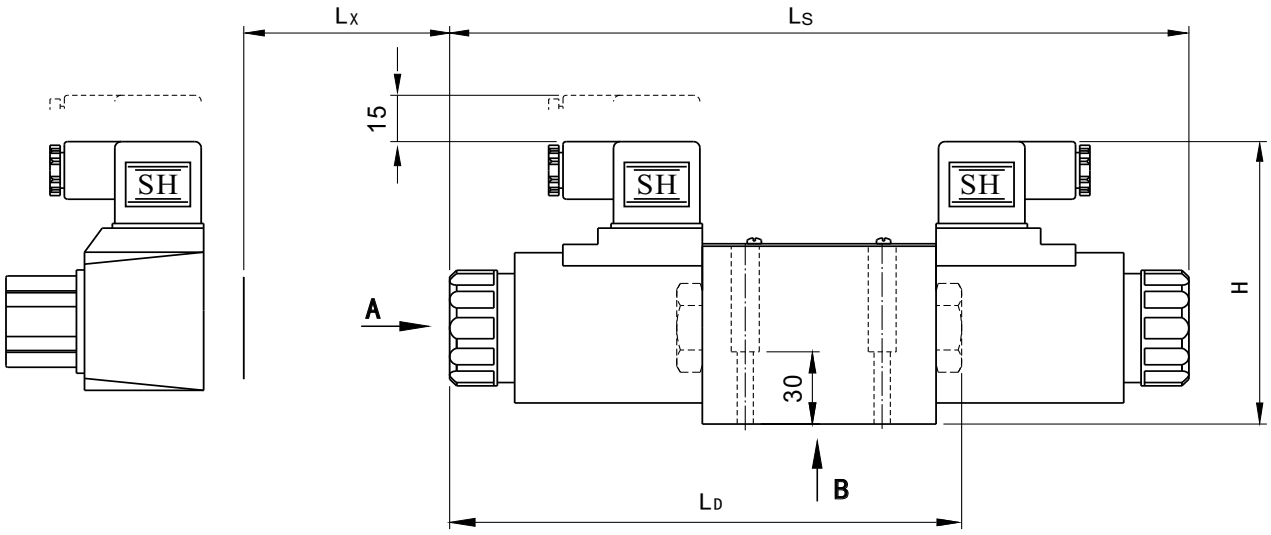
B Direction



Valve type	Total length		Total width (W)	Total high (H)	Take out coil (Lx)
	L_D	L_S			
DC Plug-In Connection Type	148	211	46	81	71
AC Plgu-in Connection Type	141	197	46	81	64

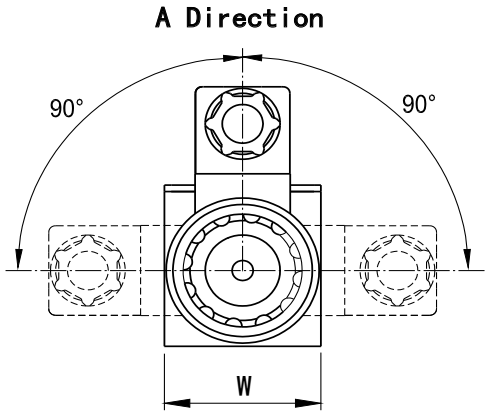
INSTALLATION DIMENSIONS

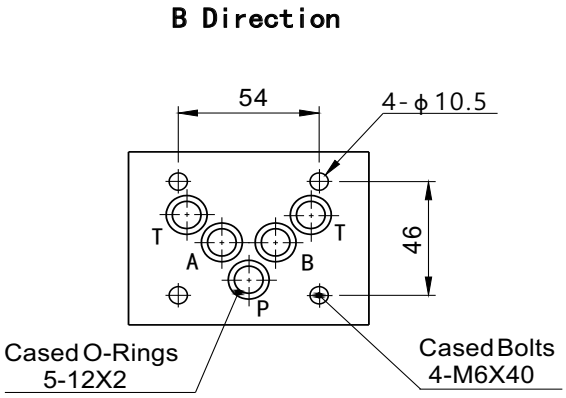
Nominal size 10



AC Plug-in Connection Type

DC Plug-in Connection Type

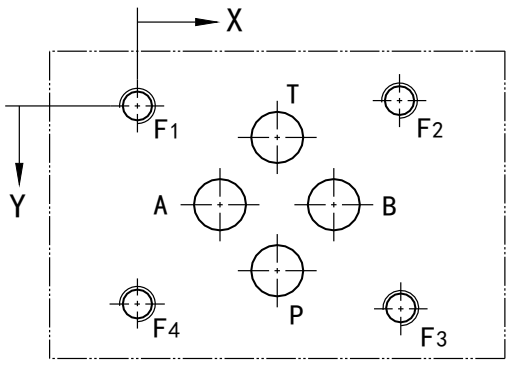


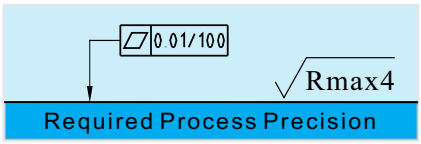


Valve type	Total length		Total width (W)	Total high (H)	Take out coil (Lx)
	L_D	L_S			
DC Plug-In Connection Type	207.3	302	70	111	105
AC Plgu-in Connection Type	168.3	224.2	70	111	66

SUBPLATE INSTALLATION DIMENSIONS (Porting pattern to ISO 4401)

Nominal size 6

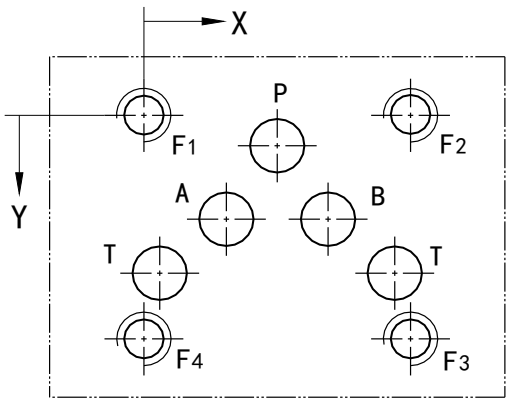


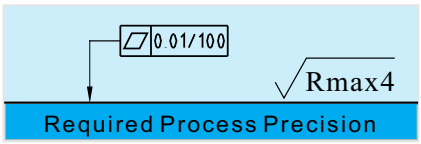


	4-M5 Deep 10				4-ϕ7.6max			
X	0	40.5	40.5	0	12.7	21.5	30.2	21.5
Y	0	-0.75	31.75	31	15.5	5.1	15.5	25.9
Code	F1	F2	F3	F4	A	T	B	P

Note: The tolerance for each hole dimension is ±0.1.

Nominal size 10





	4-M6 Deep 12				5-ϕ10.5max				
X	0	54	54	0	16.7	3.2	50.8	37.3	27
Y	0	0	46	46	21.4	32.5		21.4	6.3
Code	F1	F2	F3	F4	A	T		B	P

Note: The tolerance for each hole dimension is ±0.1.

4WEH

DIRECTIONAL SPOOL VALVES,
PILOT-OPERATED WITH HYDRAULIC OR
ELECTRO-HYDRAULIC ACTUATION

Sizes 10...25
Component series 4X;6X;7X
Maximum opreating pressure 35MPa
Maximum flow 1100 L/min

FEATURES

- For subplate mounting
- Wet-pin DC or AC solenoids,optional
- Spring or pressure centring,spring end position or hydraulic end position
- Pilot throttling regulator

MODEL CODE

1	2	3	4	5	6	7	8	9	10	11
4WE				/			6E			

Item	Collection	Code	Explanation
1	Highest pressure	No code	To 28MPa
		H-	To 35MPa
2	Types of operation	4WEH	Electro-hydraulic
3	Nominal size	10	Size 10
		16	Size 16
		22	Size 22, standard type
		25	Size 25, standard type
4	Spool return	No code	Springs
		H	Hydraulic
5	Symbols		See page
6	Series	4X	For size 10
		6X	For size 25 (high power type) and size 32
		7X	Size 16 and size 25(standard type)
7	Pilot valve spool return	No code	Spring return
		O	Without spring return
		OF	With detent
			Spool return in the pilot valve for 2-position valve and 2 solenoids only possible with spools C,D,K,Z and hydraulicspool return in the main valve
8		6E	High-performance valve
9	Input voltage	W220	220V/50Hz,240V/60Hz
		W110	110V/50Hz,120V/60Hz
		RAC220	220V/50Hz,240V/60Hz
		RAC110	110V/50Hz,120V/60Hz
		G12	V12
		G24	V24
		G48	V48
10	Pilot valves hand override	N9	With protected hand override (standard)
		N*	With hand override
11	Pilot oil supply and drain line	No code	Pilot oil supply external, pilot oil drain external
		E	Pilot oil supply internal, pilot oil drain external
		T	Pilot oil supply external, pilot oil drain internal
		ET	Pilot oil supply internal, pilot oil drain internal

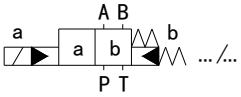
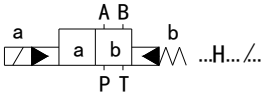
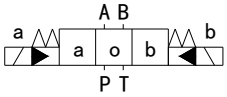
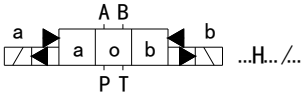
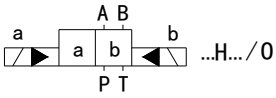
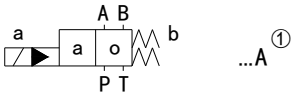
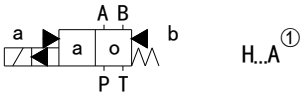
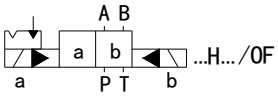
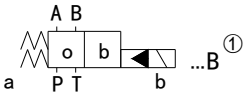
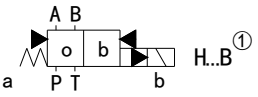
MODEL CODE

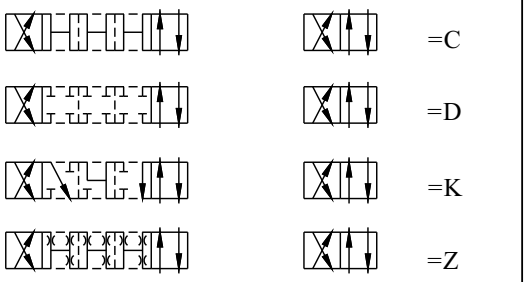
12	13	14	15	16	17	18	19	20	21

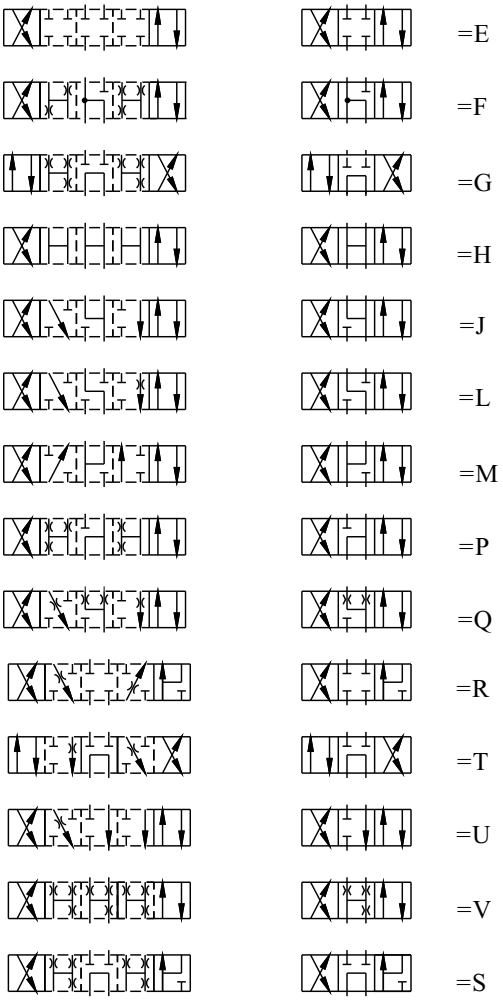
Item	Collection	Code	Explanation
12	Shifting time adjustment	No code	Without shifting time adjustment
		S*	Shifting time adjustment as meter-in control
		S2*	Shifting time adjustment as meter-out control
13	Electrical connections	K4	Individual connections with component plug ISO4400 with plug-in connector
14	Plug-in connector	No code	Without plug-in connector
		Z5L	Guadrate plug-in connector with indicator light
15	Moving space Adjustment*	No code	Without moving space adjustment
		10	A and B side with moving space adjustment
		11	A side with moving space adjustment
		12	B side with moving space adjustment
16	Throttle position*	No code	Without cartridge throttle
		P	Active in the P line
		A	Active in the A line
		B	Active in the B line
		T	Active in the T line
17	Throttle diameter*	No code	Without cartridge throttle
		08	Throttle ϕ 0.8 mm
		10	Throttle ϕ 1.0 mm
		12	Throttle ϕ 1.2 mm
18	Pre-load valve*	No code	Without pre-load valve
		P	With pre-load valve
19		S	Standard valve
20		S	Standard valve
21	Pressure reducing valve	No code	Without pressure reducing valve
		D3	With pressure reducing valve°

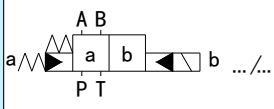
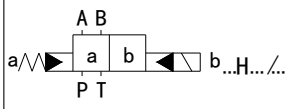
* On request
° Only in conjunction with throttle insert “B10"

SYMBOLS

Sort	2-position valve		3-position valve	
	Spring return	Hydraulic return	Spring return	Hydraulic return
4WEH				
	—			
	—			





4WEH		

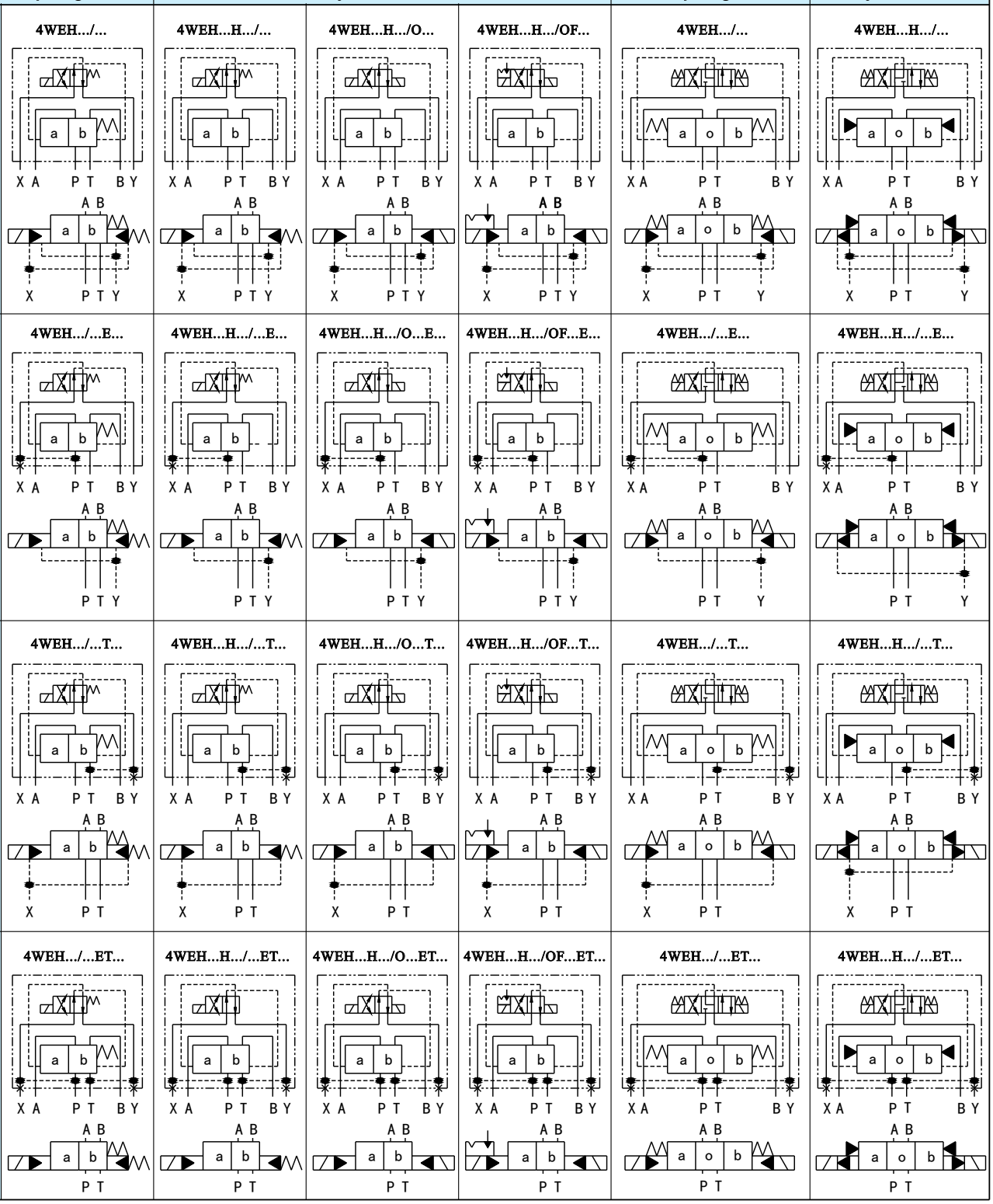
NOTE

1- The two position valve is derived from three position valve. Giving an example for symbols.
For example,EA, HEA.

2 - Please consult us for other special symbol.

SPOOL RETURNS

	Springs	Hydraulic			Springs	Hydraulic①
X=external ; Y=external	4WEH.../...	4WEH...H.../...	4WEH...H.../O...	4WEH...H.../OF...	4WEH.../...	4WEH...H.../...
X=internal ; Y=external	4WEH.../...E...	4WEH...H.../...E...	4WEH...H.../O...E...	4WEH...H.../OF...E...	4WEH.../...E...	4WEH...H.../...E...
X=external ; Y=internal	4WEH.../...T...	4WEH...H.../...T...	4WEH...H.../O...T...	4WEH...H.../OF...T...	4WEH.../...T...	4WEH...H.../...T...
X=internal ; Y=internal	4WEH.../...ET...	4WEH...H.../...ET...	4WEH...H.../O...ET...	4WEH...H.../OF...ET...	4WEH.../...ET...	4WEH...H.../...ET...



NOTE

1 - At present , this code only apply on size 16, size 25 (high power type).

- For hydraulic middle 3-position valve, it`s preferential choice for pilot oil supply external and drain external.

FUNCTION, SECTION

TYPE: 4WEH 10 E 4X/6EG24N9K4Z5LH

Initialization

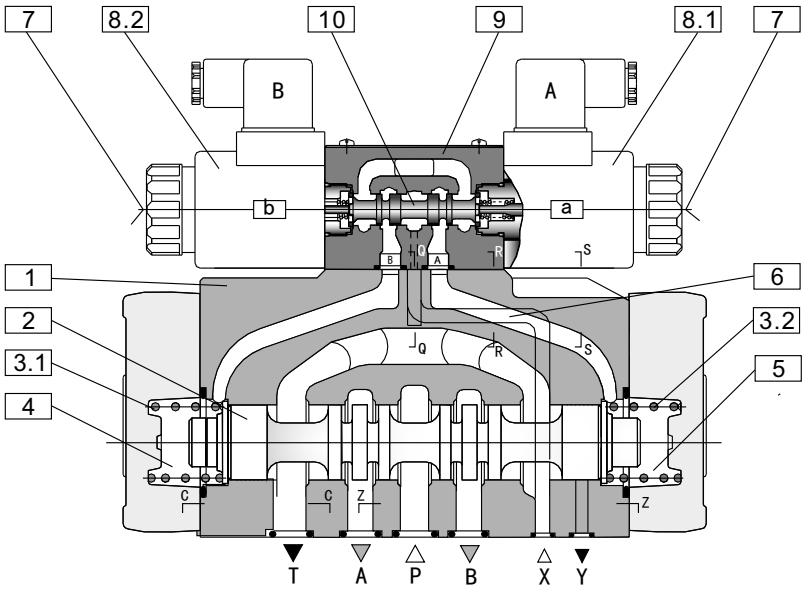
Pilot valve at middle position. Main spool at two end pass oil box.

Work state

Solenoid “a” gets through electricity. Pilot spool **10** moves to left to control oil from pilot valve's **P** port to **B** port. After that, the oil entermain spool's left antrum **4**. It drives main spool **2** to move to right after conquering the spring power of spring **3.2**. Finally, it comes true **P** pass to **B** and **A** pass to **T** for main valve. Solenoid “b” gets through electricity. The **P** pass to **A** and **B** pass to **T** for main valve.

Main valve spring return

Solenoid loses electricity. The main spool return to original position under spring power of spring **3.1** or **3.2**.



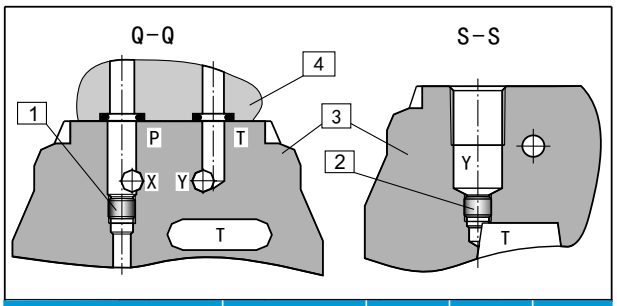
Main valve hydraulic return

The main spool's two ends pass to control oil. After solenoid gets through electricity, one end controls oil to return to the oil box and main spool to move. It comes true oil road's shift for the main valve.

After solenoid loses electricity, the main spool's two end return under hydraulic power.

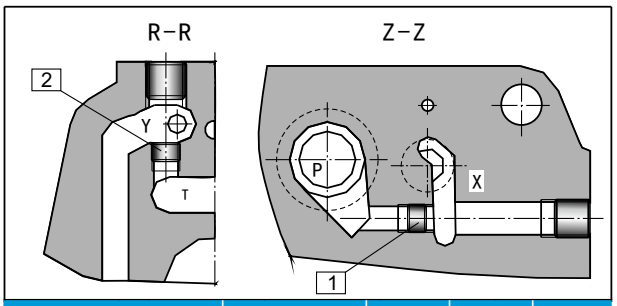
PILOT CONTROL TYPE

4WEH10...



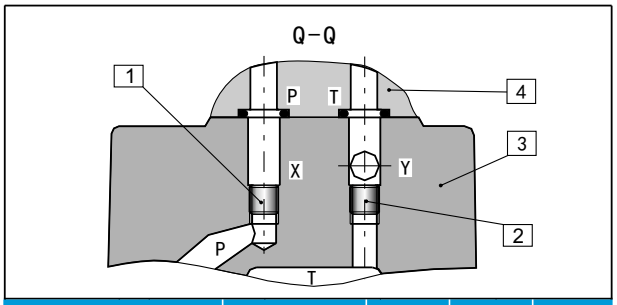
Installation	No code	ET	E	T
Screw plug 1	O	O	X	X
Screw plug 2	O	X	O	X

4WEH16...



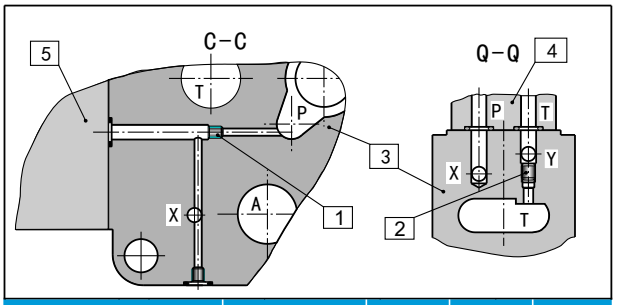
Installation	No code	ET	E	T
Screw plug 1	O	O	X	X
Screw plug 2	O	X	O	X

4WEH22...



Installation	No code	ET	E	T
Screw plug 1	O	O	X	X
Screw plug 2	O	X	O	X

4WEH25...

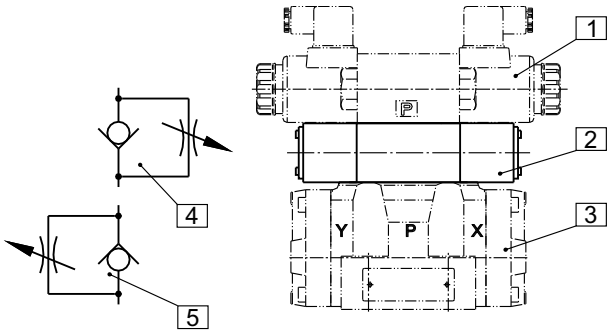


Installation	No code	ET	E	T
Screw plug 1	O	O	X	X
Screw plug 2	O	X	O	X

SHIFTING TIME ADJUSTMENT

In order to adjust the shifting time adjustment, there is a modular check relief valve **2** (Type: Z2FS6) during pilot valve **1** and the main valve **3**. Adjustment way: circumgyrate adjustment bolt as clockwise, the main valve's shift time is longer. Otherwise, shifting time is shorter.

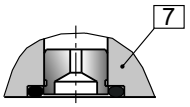
Inlet relief **4** changes to outlet relief **5**'s way: dismantle pilot valve. Reassembling modular type check relief valve to circle long shaft to circumgyrate 180. Then assembling the pilot valve again.

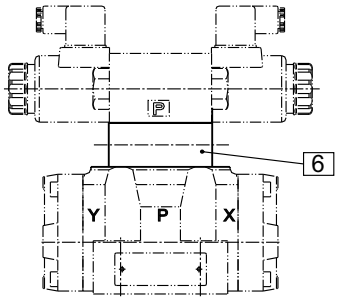


PILOT PRESSURE AND FLOW ADJUSTMENT

In order to reduce impact of main valve shift, it must install a modular type fix rate reducing valve **6** when the oil control pressure is more than 25MPa. Reduce rate is 1:0.66. After assembling the fixed rate reducing valve, min. oil control pressure must improve 1/0.66=1.515 times in technical data.

It can't install fix rate reducing valve when control type chooses pilot oil drain internal, installs prefill valve (P0.45) and control pressure reduces to 0.3MPa. It can install throttle **7** when control oil's flow needs limit. There are 0.6, 0.8, 1.0, 1.2 (mm) four dimensions for throttle aperture.

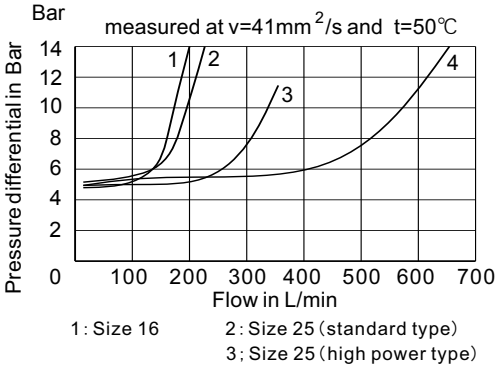




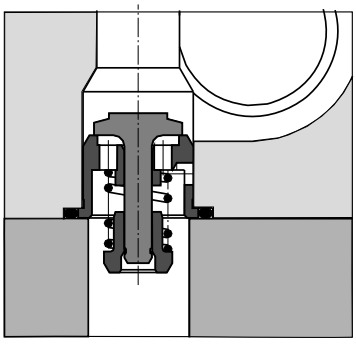
PRE-LOAD VALVE

In order to ensure lowest control oil pressure, it must install a preload valve at P port when control oil inside supply and there is an unload pass way.

After installing the prefill valve, the total pressure loss of the valve is the sum for main valve's and preload valve's pressure loss.



1 : Size 16
2 : Size 25 (standard type)
3 : Size 25 (high power type)



TECHNICAL DATA

Nominal size (ordering code)				...10...	...16...	...22...	...25...
Max . operating pressure							
4WEH	Port P, A, B	4WEH	bar	280	280	280	-
		H-4WEH	bar	350	350	350	350
	Port T	Pilot oil drain external	bar	315	250	250	250
		Pilot oil drain internal	bar	210 (DC);160 (AC)			
	Port Y	Pilot oil supply external	bar	210 (DC);160 (AC)			
Max . pilot pressure				**250**	**250**	**250**	**250**
Min . pilot pressure				**210**			
Pilot oil supply internal (for spool D, K, E, J, L, M, Q, U, W) Pilot oil supply external	3-position valve spring-centered	H-4WEH	bar	10	14	12	13
		4WEH	bar	10	14	10	13
	3-position valve hydraulic-centered		bar		14		18
	2-position valve spring return	H-4WEH	bar	10	14	14	13
		4WEH	bar	10	14	11	13
	2-position valve hydraulic return		bar	7	14	8	8
Pilot oil supply internal (for spool C, F, G, H, P, T, V, Z, D)			bar	4.5	4.5	4.5	4.5

Pilot oil colume for the main valve shifting								
3-position valve , spring-centred			cm^3	**2.04**	5.72	7.64	14.2	29.4
2-position valve			cm^3	**4.08**	11.45	15.28	28.4	58.8
3-position valve hydraulic-centred	From middleposition to position a	WH	cm^3	-	2.83	-	7.15	14.4
		WEH	cm^3	-	2.83	-	7.15	14.4
	From position a to middle position	WH	cm^3	-	5.72	-	14.18	29.4
		WEH	cm^3	-	2.9	-	7.0	15.1
	From middle position to position b	WH	cm^3	-	5.72	-	14.18	29.4
		WEH	cm^3	-	5.72	-	14.15	29.4
	From position b to middle position	WH	cm^3	-	8.55	-	19.88	43.8
		WEH	cm^3	-	2.83	-	5.73	14.4

Pilot oil flow for the shortest shifting time	L/min	about 35	about 35	about 35	about 35

Weight (data only for reference)					
Single solenoid valve	kg	6.4	8.5	11.5	17.6
Double solenoids valve spring-centred	kg	6.8	8.9	11.9	18.0
Double solenoids valve hydraulic-centred	kg	6.8	8.9	11.9	19.0
Hydraulic operated directional valve	kg	6.5	7.3	10.5	16.5
Shifting time adjustment set	kg	0.8	0.8	0.8	0.8
Pressure reducing valve	kg	0.4	0.4	0.4	0.4

Working environment temperature range	C°	-30 TO +50
Installation position	Valves for HC,HD,HK,HX,HZ,HY symbols must install flatly. It can choose freely for others.	

SHIFTING TIMES

Nominal size 10 AC (~) and DC (=)

Pilot pressure			Bar	70		140		210		250	
Voltage type				~	=	~	=	~	=	~	=
Shifting time of the valve from neutral position to shifted position			ms	30	65	25	60	20	55	15	50
			ms	35	80	30	75	25	70	20	65
Shifting time of the valve from shifted position to neutral position			ms	30	30	30	30	30	30	30	30
			ms	35	40	30	35	25	30	20	25

Nominal size 16 Ac (~) and DC (=)

Pilot pressure			Bar	70		140		210		250	
Voltage type				~	=	~	=	~	=	~	=
Shifting time of the valve from neutral position to shifted position	3-position valve spring-centred		ms	25-30	40	25-30	40	25-30	40	20-25	40
	2-position valve		ms	30-35	55	30-35	55	30-35	55	25-30	50
	3-position valve hydraulic centred	o to a	ms	30	40	30	40	30	35	30	35
		o to a	ms	30	40	30	40	30	40	30	40
Shifting time of the valve from shifted position to neutral position	3-position spring-centred		ms	35-50	45	35-50	45	30-45	40	30-45	35
	2-position valve		ms	35-50	45	35-50	45	30-45	40	30-45	35
	3-position valve hydraulic centred		ms	25-35	20	25-55	20	20-35	20	20-35	20

Nominal size 25 (Standard, AC (~) and DC (=)

Pilot pressure		Bar	35		70		140		210	
Voltage type			~	=	~	=	~	=	~	=
Shifting time of the valve from neutral position to shifted position	3-position valve	ms	50	100	40	80	35	65	30	60
	2-position valve	ms	100	160	90	110	75	95	70	85
Shifting time of the valve from shifted position to neutral position	3-position valve	ms	35-50	35	35-50	35	35-50	35	35-50	35
	2-position valve	ms	90-105	95	65-80	70	65-80	55	45-60	50

Nominal size 25 (High power standard, Ac (~) and DC (=)

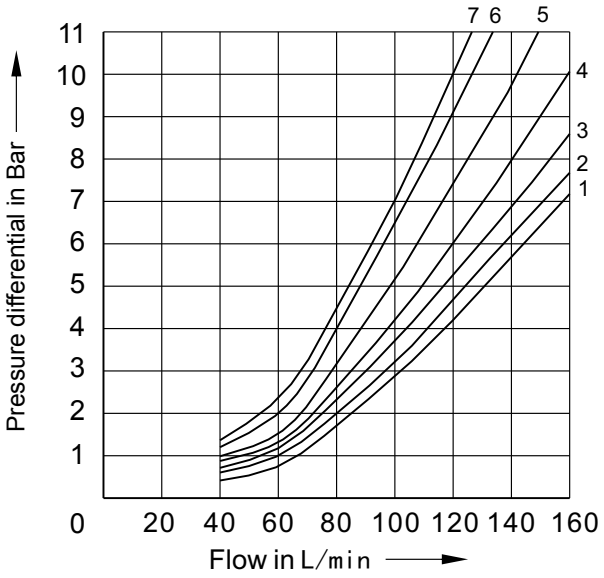
Pilot pressure			Bar	70		140		210		250	
Voltage type				~	=	~	=	~	=	~	=
Shifting time of the valve from neutral position to shifted position	3-position valve spring-centred		ms	50	85	40	75	35	70	30	65
	2-position valve		ms	120	160	100	130	75	120	70	105
	3-position valve hydraulic centred	o to a	ms	30	55	30	55	25	50	25	50
		o to b	ms	35	65	35	65	30	60	30	60
Shifting time of the valve from shifted position to neutral position	3-position spring-centred		ms	40-55	40	40-55	40	40-55	40	40-55	40
	2-position valve		ms	35-50	45	35-50	45	30-45	40	30-45	35
	3-position valve hydraulic centred		ms	30-50	30	30-50	30	30-50	30	30-50	30

CHARACTERISTIC CURVES (measured at v=41mm2 /s and t=50°C)

4WEH10...

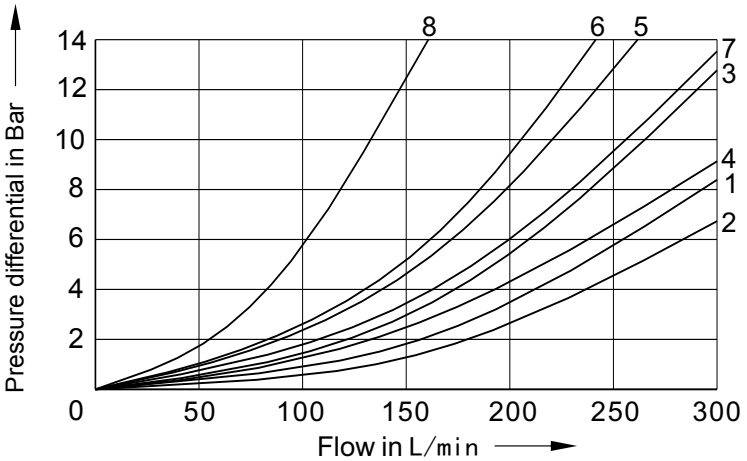
Symbol	Flow direction			
	P-A	P-B	A-T	B-T
E, Y, D	2	2	4	5
F	1	4	1	4
G, T	4	2	2	6
H, C	4	4	1	4
J, K	1	4	1	4
L	2	3	1	4
M	4	4	3	4
P	4	1	3	4
Q, V, W, Z	2	2	3	5
R	2	2	3	-
U	3	3	3	4

Symbol	Neutral Position		
	A-T	B-T	P-T
F	3	-	3
G, T	-	-	7
H	1	3	5
L	3	-	-
P	-	7	5
U	-	4	-



4WEH16...

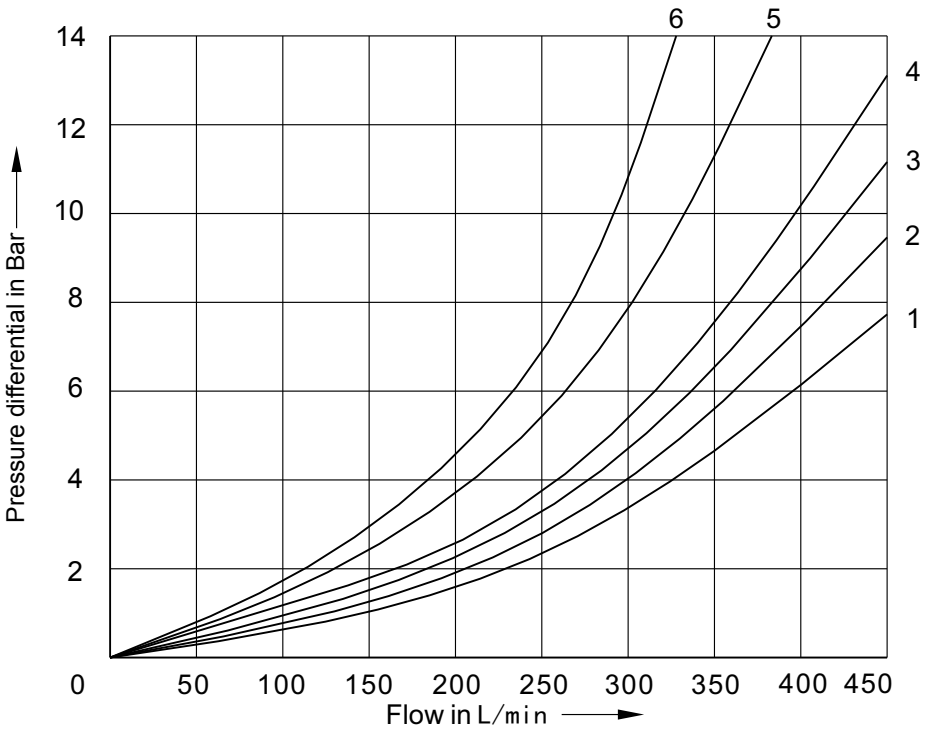
Symbol	Flow direction				
	P-A	P-B	A-T	B-T	P-T
E, D, Y	1	1	1	3	-
F	2	2	2	3	-
G, T	5	1	3	7	6
H, C, Q, V, Z	2	2	3	3	-
J, K, L	1	1	3	3	-
M, W	2	2	4	3	-
R	2	2	4	-	-
U	1	1	4	7	-



4WEH22...

Symbol	Flow direction			
	P-A	P-B	A-T	B-T
E, M, P, Q, U, V	2	2	1	4
F	1	2	1	2
G, T	2	2	2	4
H, J, W	1	2	1	3
L	2	2	1	2
R	1	2	1	-

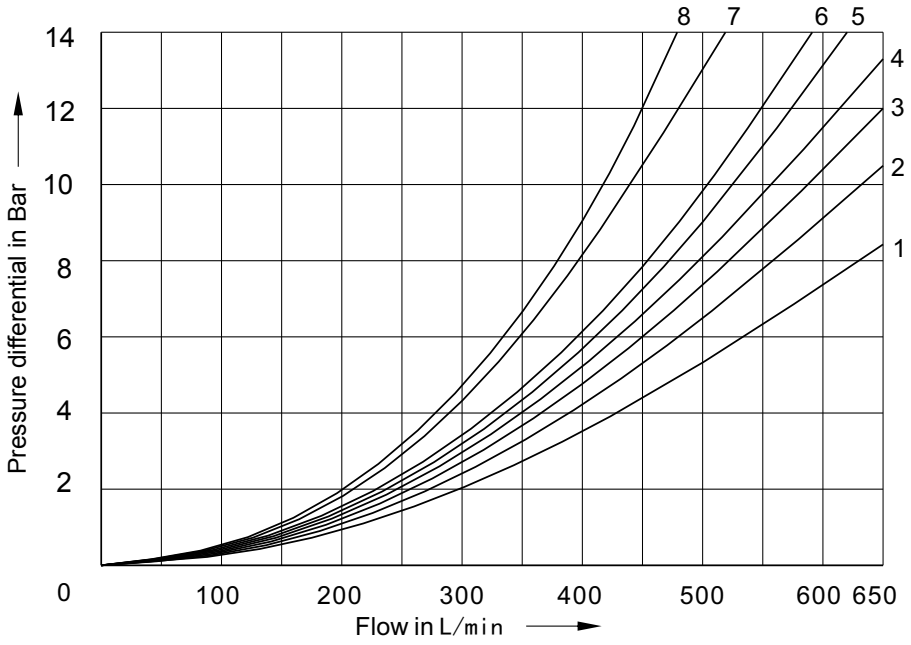
Symbol	Neutral Position		
	A-T	B-T	P-T
F	-	-	4
G, P	-	-	6
H	-	-	2
L	4	-	-
T	-	-	5
U	-	6	-



CHARACTERISTIC CURVES (measured at v=41mm2 /s and t=50°C)

4WEH25...

Symbol	Flow direction			
	P-A	P-B	A-T	B-T
E	1	1	1	3
F	1	4	3	3
G	3	1	2	4
H	4	4	3	4
J, Q	2	2	3	5
L	2	2	3	3
M	4	4	1	4
P	4	1	1	5
R	2	1	1	-
U	4	1	1	6
V	2	4	3	6
W	1	1	1	3
T	3	1	2	4



SHIFTING PERFORMANCE LIMITS

4WEH10...

Flow L/min / Spools	Operating pressure in bar		
	200	250	315
E, J, L M, Q, R, U, V, W, C, D, K, Z, Y	160	160	160
H	160	150	120
G, T	160	160	140
F, P	160	140	120

NOTE:
- Data of left table is only fit for flowing to two direction at the same time. For single flow direction (for example:P to A, B plugged),the permit flow is reduced obviously.Please contract with our company's technical dep. for detail information.
- The power limit is measured under solenoid on work temperature, 10% return voltage and without return oil back pressure.

4WEH16...
2-position valves permissible flow in L/min

	Symbol	Operating pressure in bar				
		70	140	210	280	350
①	C	300	300	300	300	300
	D, Y	300	270	260	250	230
	K	300	250	240	230	210
	Z	300	260	190	180	160
Hydraulic return	HC, HD, HK HZ, HY	300	300	300	300	300

NOTE:
① Showing flow data is the limit data of driving spool back to end position when pilot pressure disappear.
- Main valve spring return and pilot oil supply external type. Main valve permit flow is 300 L/min within adjustment pressure range when smallest pilot control oil pressure is 12 bar.
- If using pilot oil supply internal type and flow is smaller than 160L/min, it needs to install prefill valve on main valve P port for C, D, Y, K, Z, HC, HD, HK, HZ, HY spools.

3-position valves permissible flow in L/min

	Symbol	Operating pressure in bar				
		70	140	210	280	350
Main valve spring return	E, H, J, L, M Q, U, W, R	300	300	300	300	300
	F, P	300	250	180	170	150
	G, T	300	300	240	210	190
	S	300	300	300	250	220
Hydraulic return	V	300	250	210	200	180
	all spool	300	300	300	300	300

NOTE:
- It must improve control pressure when using 3-position,4-pass direction valve of main spool spring centred and using pressure more than limit. For example,work pressure is 350 bar, flow is 300L/min, pilot control pressure should be 16 bar.
- It needs to install prefill valve at P port when V type spool's flow for pilot oil supply external and hydraulic centred smaller than 160L/min.
- If using pilot oil supply internal type, It needs to install prefill valve at P port for F,G,M,P,S.

4WEH22...
2-position valves permissible flow in L/min

	Symbol	Operating pressure in bar				
		70	140	210	280	350
① Main valve spring return	C	450	450	320	250	200
	D, Y	450	450	450	400	320
	K	450	215	150	120	100
	Z	350	300	290	260	160
Hydraulic return	HC, HD, HK, HZ, HY	450	450	450	450	450
	HC.../O ...	450	450	450	450	450
	HD.../O ...	450	450	450	450	450
	HK.../O ...	450	450	450	450	450
	HZ.../O ...	450	450	450	450	450
	HC.../OF ...	450	450	450	450	450
	HC.../OF ...	450	450	450	450	450
	HC.../OF ...	450	450	450	450	450
	HC.../OF ...	450	450	450	450	450

3-position valves permissible flow in L/min

	Symbol	Operating pressure in bar				
		70	140	210	280	350
Main valve spring return	E, J, L, M Q, U, W	450	450	450	450	450
	H	450	450	300	260	230
	G	400	350	250	200	180
	F	450	270	175	130	110
	V	450	300	240	220	160
	T	400	300	240	200	160
	P	450	270	180	170	110

NOTE:
① Showing flow data is the limit data of driving spool back to end position when pilot pressure disappear.
- If using pilot oil supply internal type and flow is smaller than 160L/min, it needs to install prefill valve on main valve P port for F, G, M, P, T spools.

SHIFTING PERFORMANCE LIMITS

4WEH25...

2-position valves permissible flow in L/min

	Symbol	Operating pressure in bar				
		70	140	210	280	350
① Spring return	C	700	700	700	700	650
	D, Y	700	650	400	350	300
	K	700	650	420	370	320
	Z	700	700	650	480	400
Hydraulic centred	HC, HD, HK, HZ, HY	700	700	700	700	700
	HC../O	700	700	700	700	700
	HD../O	700	700	700	700	700
	HK../O	700	700	700	700	700
	HZ../O	700	700	700	700	700
	HC../OF	700	700	700	700	700
	HC../OF	700	700	700	700	700
	HC../OF	700	700	700	700	700
	HC../OF	700	700	700	700	700

3-position valves permissible flow in L/min

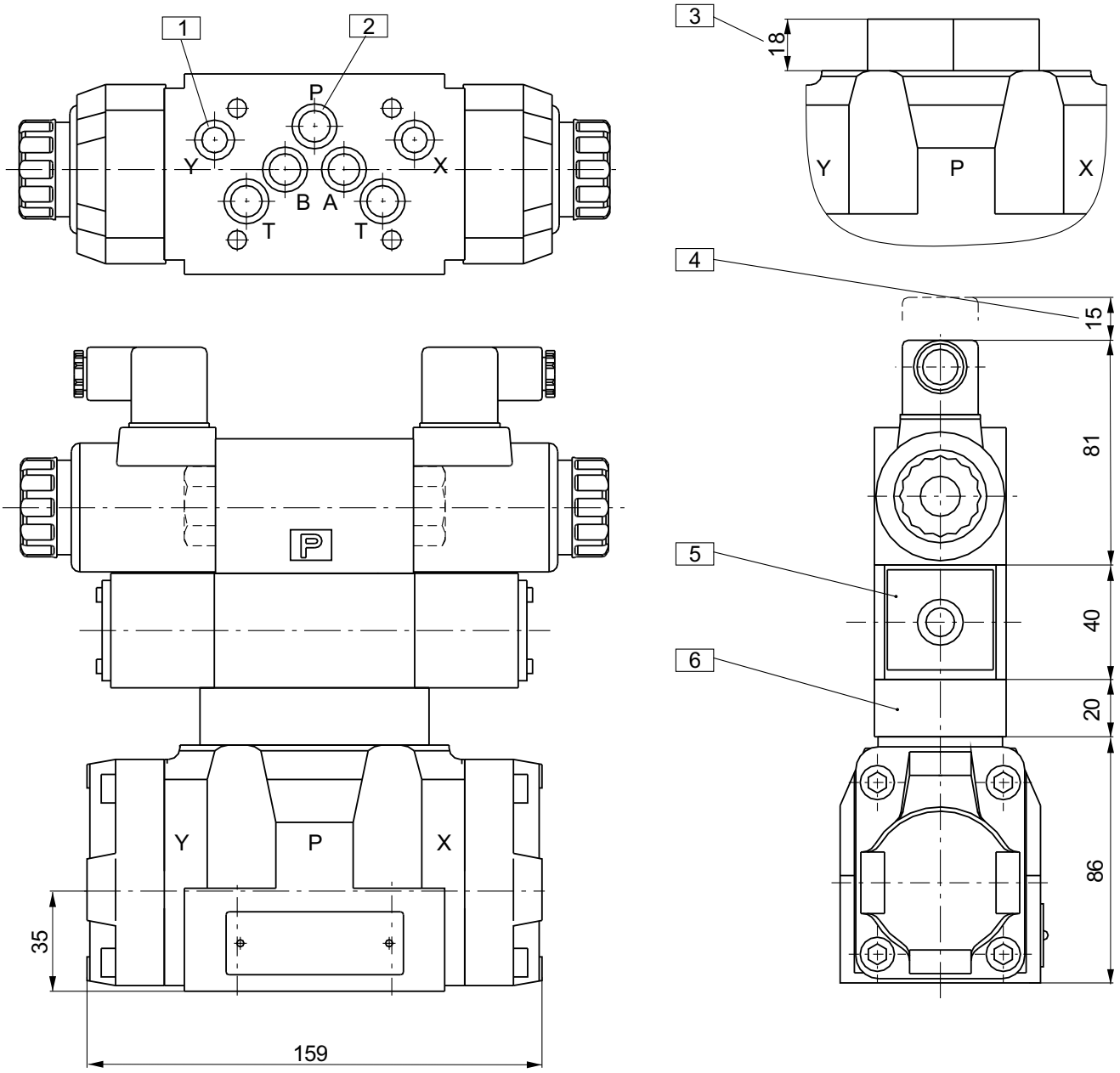
	Symbol	Operating pressure in bar				
		70	140	210	280	350
Spring centred	E, L, M Q, U, W	700	700	700	700	650
	G, T	400	400	400	400	400
	F	650	550	430	330	300
	H	700	650	550	400	360
	J	700	700	650	600	520
	P	650	550	430	330	300
	V	650	550	400	350	310
	R	700	700	700	650	580
Hydraulic centred	E, F, H, J L, M, P, Q R, U, V, W	700	700	700	700	650
	G, T	400	400	400	400	400
Hydraulic centred	G, T	700	700	700	700	650

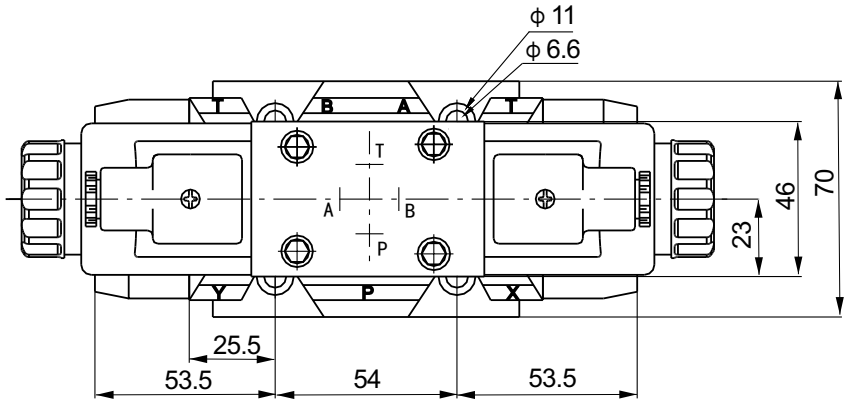
NOTE:

① Showing flow data is the limit data of driving spool back to end position when pilot pressure disappear.

- If using pilot oil supply internal type and flow is smaller than 180L/min, it needs to install prefill valve on main valve P port for H, HZ, V, C, HC, F, P, T spools.
- Main valve spring return and choosing pilot oil supply external type. Main valve permit flow is 700L/min under 280 bar when smallest pilot control oil pressure is 13 bar. The flow should be 650L/min when pressure is 350 r.

INSTALLATION DIMENSIONS 4WEH10...





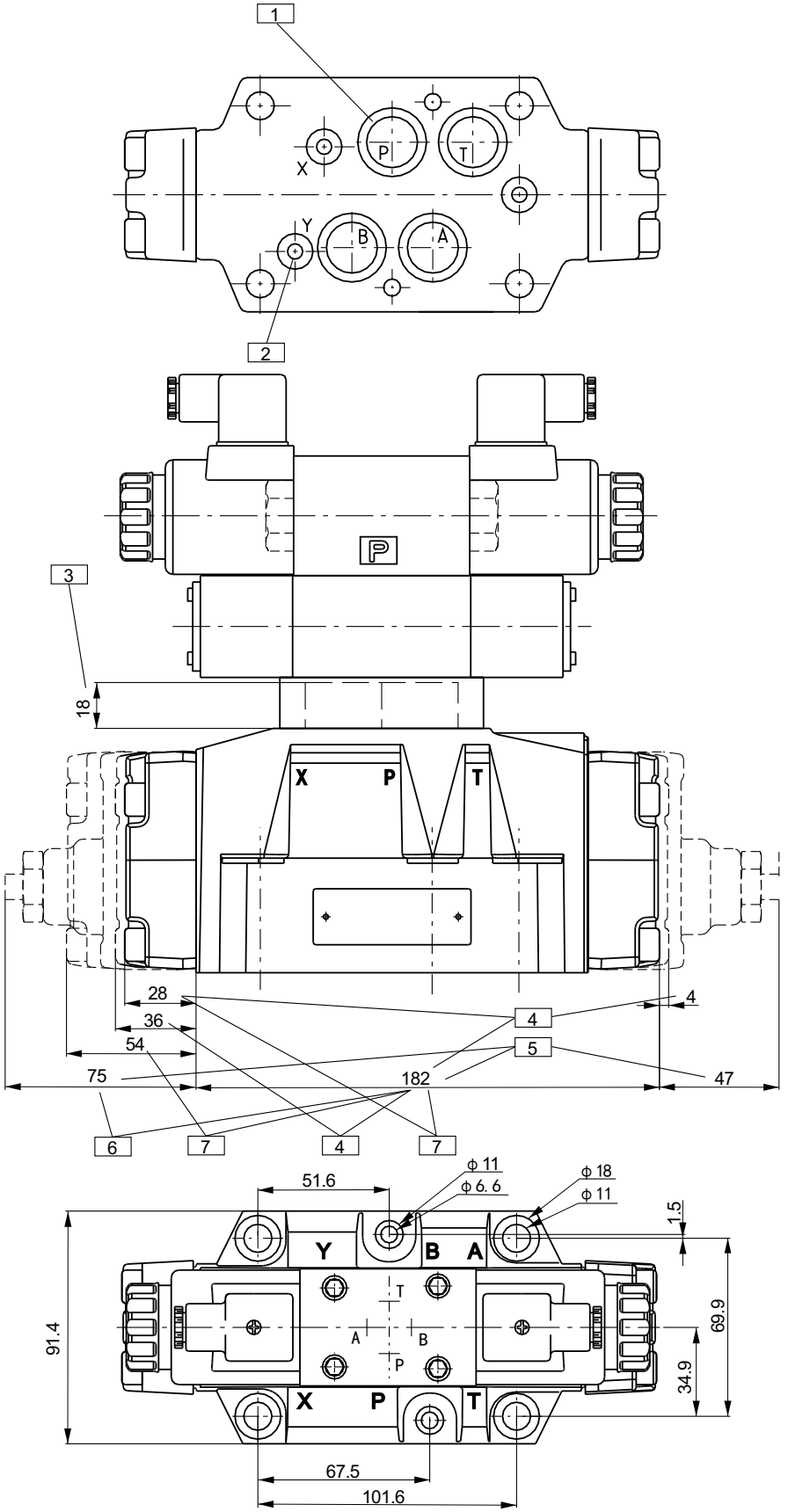
EXPLANATION

1. O Ring 2-10.6x1.8;
2. O Ring 5-12x2;
3. Connection subplate thickness for hydraulic operate (4WH...);
4. Space for pulling out plug;
5. Shifting time adjustment ;
6. reducing valve;

VALVE FIX BOLTS

4-M6x45 GB/T70. 1-2000-12. 9, MA=15. 5N. M

INSTALLATION DIMENSIONS 4WEH16...



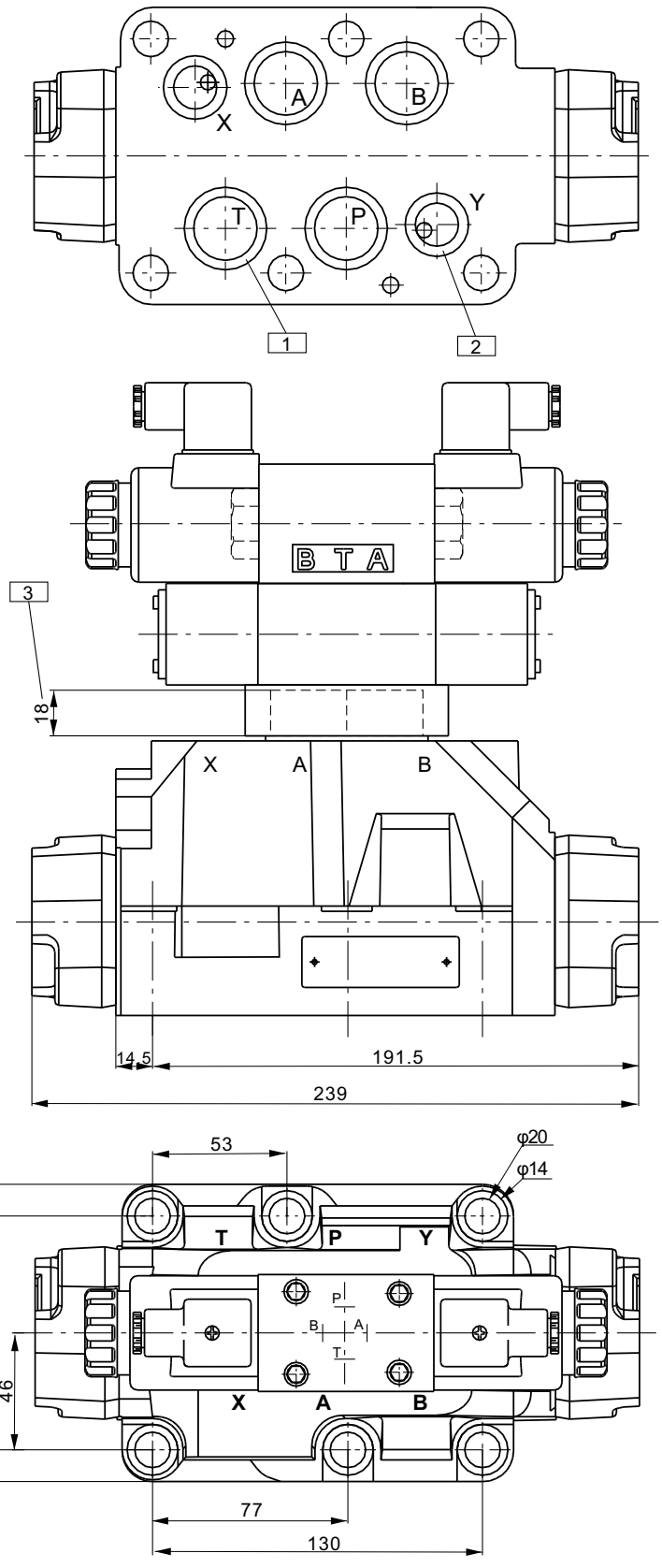
VALVE FIX BOLTS

Valve fix bolts
4-M10x60 GB/T70.1-2000-12.9, M_A=75N.M
2-M6x60 GB/T70.1-2000-12.9, M_A=15.5N.M

EXPLANATION

1. O Ring 4-22.4x2.65;
2. O Ring 2-9.8x2.4;
3. Connection subplate thickness for hydraulic operate (4WH...);
4. 2-position valve for main valve spring deflection;
5. Space for pulling out plug;
6. Moving space adjustment;
7. 3-position valve, spring centred;
   2- position valve, main valve hydraulic return;
8. Space for pulling out plug;
9. Shifting time adjustment;
10. Reducing valve;

INSTALLATION DIMENSIONS 4WEH22 ...



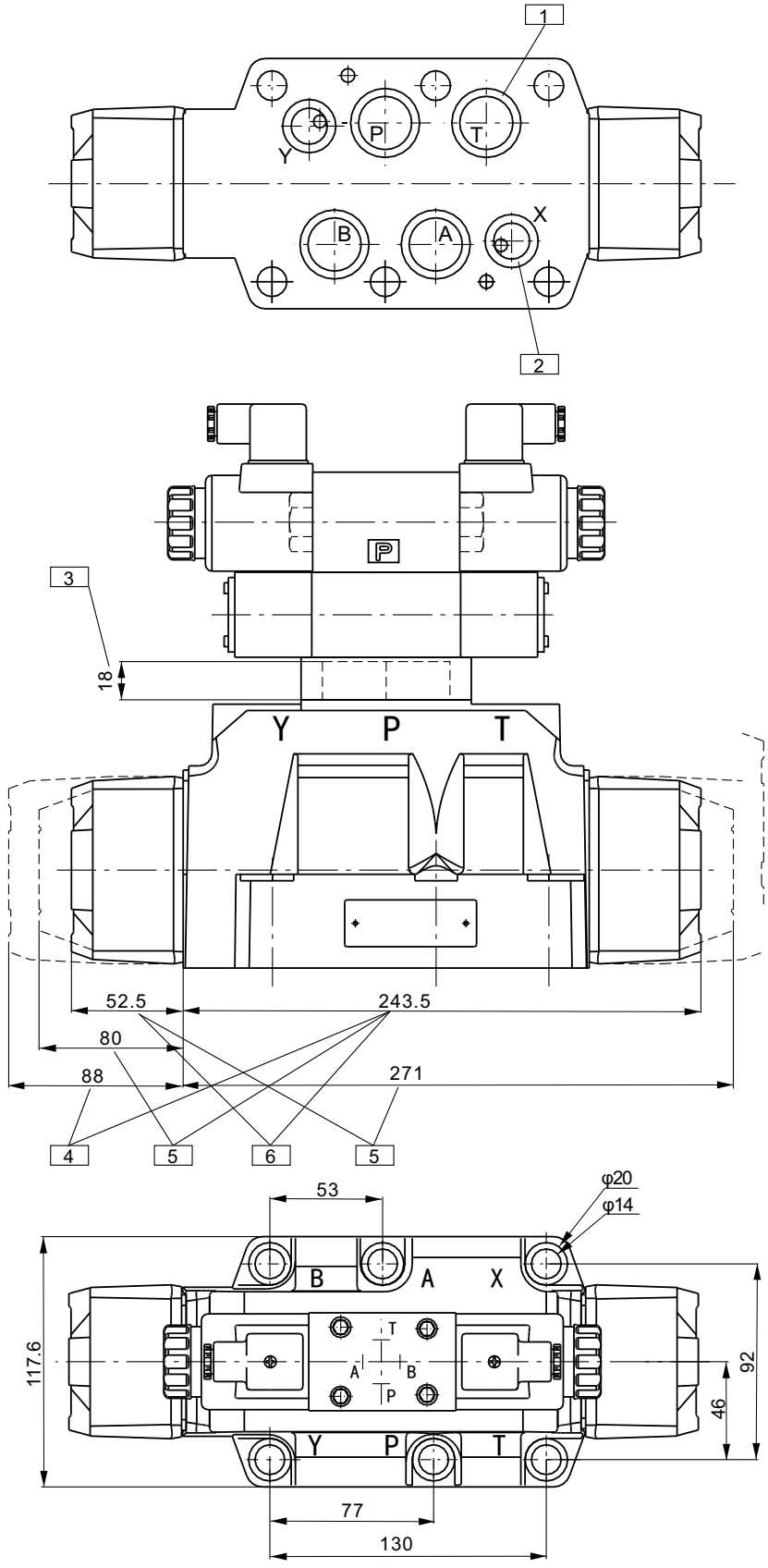
VALVE FIX BOLTS

6-M12x60
GB/T70.1-2000-12.9,
M_A=150N.M

EXPLANATION

1. O Ring 4-27x3;
2. Connection subplate thickness for hydraulic operate (4WH...);
3. O Ring 2-20.8x2.4;
4. Space for pulling out plug;
5. Shifting time adjustment;
6. Reducing valve.

INSTALLATION DIMENSIONS 4WEH16...



VALVE FIX BOLTS

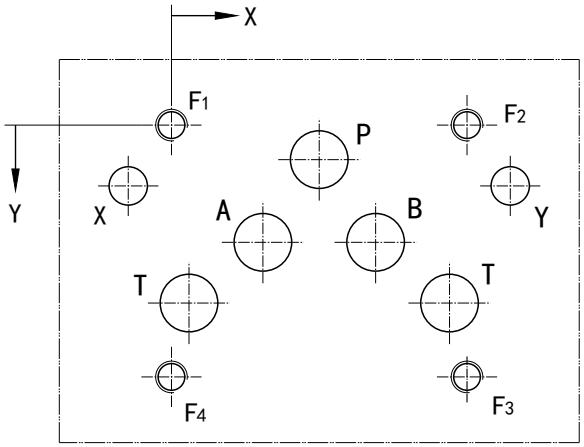
6-M12x60
GB/T70.1-2000-12.9,
M_A=130N.M

EXPLANATION

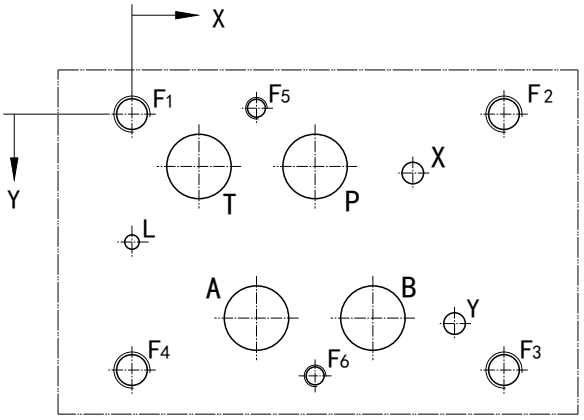
1. Connection subplate thickness for hydraulic operate (4WH...);
2. 3-position valve, pressure centred;
3. 2-position valve for main valve spring deflection;
4. 3-position valve, spring centred;
5. 2-position valve, main valve hydraulic return;
6. O Ring 4-29.7x3.5
7. O Ring 2-20.8x2.4
8. Space for pulling out plug;
9. Shifting time adjustment; reducing valve.

SUBPLATE INSTALLATION DIMENSIONS

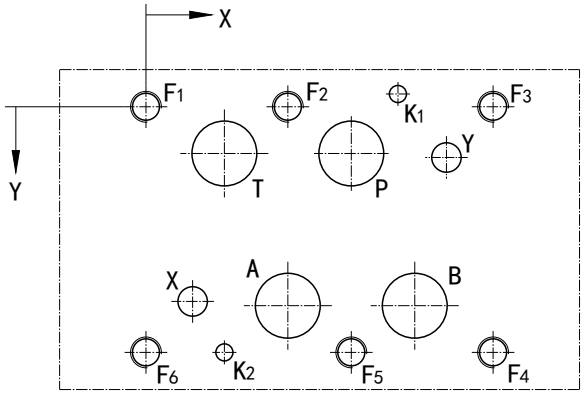
4WEH10



4WEH16



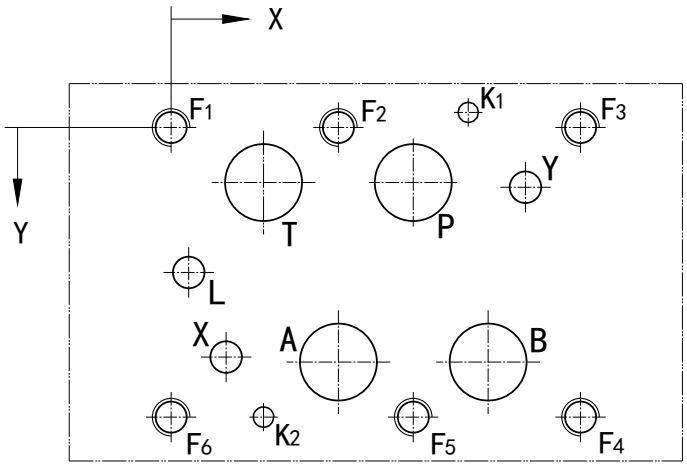
4WEH22



Size	Des. / Code	Position		Character	
		X	Y		Deep
4WEH10	F_1	0	0	M6	12
	F_2	54	0	M6	12
	F_3	54	46	M6	12
	F_4	0	46	M6	12
	P	27	6.3	ϕ10.5	-
	A	16.7	21.4	ϕ10.5	-
	B	37.3	21.4	ϕ10.5	-
	T	3.2 50.8	32.5	ϕ10.5	-
	X	-7.9	11.1	ϕ7	-
	Y	61.9	11.1	ϕ7	-
4WEH16	F_1	0	0	M10	19
	F_2	101.6	0	M10	19
	F_3	101.6	69.9	M10	19
	F_4	0	69.9	M10	19
	F_5	34.1	-1.6	M6	12
	F_6	50	71.5	M6	12
	L	0	35	ϕ4	-
	T	18.3	55.6	ϕ17.5	-
	A	34	14.2	ϕ17.5	-
	P	50	55.6	ϕ17.5	-
	B	65.8	14.2	ϕ17.5	-
	X	76.7	53.8	ϕ6	-
	Y	88.1	12.7	ϕ6	-
4WEH22	F_1	0	0	M12	24
	F_2	53.2	0	M12	24
	F_3	130.2	0	M12	24
	F_4	130.2	92.1	M12	24
	F_5	77	92.1	M12	24
	F_6	0	92.1	M12	24
	K_1	94.5	-4.8	ϕ6.5	8
	K_2	29.4	92.1	ϕ6.5	8
	T	29.4	17.5	ϕ24.5	-
	A	53.2	74.6	ϕ24.5	-
	B	100.8	74.6	ϕ24.5	-
	P	77	17.5	ϕ22	-
	X	17.5	73	ϕ11.2	-
	Y	112.7	19	ϕ11.2	-

SUBPLATE INSTALLATION DIMENSIONS

4WEH25



Size	Des. / Code	Position		Character	
		X	Y		Deep
4WEH25	F_1	0	0	M12	24
	F_2	53.2	0	M12	24
	F_3	130.2	0	M12	24
	F_4	130.2	92.1	M12	24
	F_5	77	92.1	M12	24
	F_6	0	92.1	M12	24
	L	5.6	-4.8	ϕ10	-
	K_1	94.5	-4.8	ϕ6.5	8
	K_2	29.4	92.1	ϕ6.5	8
	T	29.4	17.5	ϕ24.5	-
	A	53.2	74.6	ϕ24.5	-
	B	100.8	74.6	ϕ24.5	-
	P	77	17.5	ϕ22	-
	X	17.5	73	ϕ11.2	-
	Y	112.7	19	ϕ11.2	-

NOTE

NOTE


HYDRAUT WARRANTY
INTERNATIONAL
CERTIFICATION
FOR 24 MONTHS