

Hydraulic Valves

Catalogue

Directional Valves

Pressure Valves

Flow Control Accessories

Proportional Valves

2-way Cartridge Valves



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Directional Valves

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Directional Valves

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* * *: New products, for ordering, please consult us, telephone: +86-10-69083290



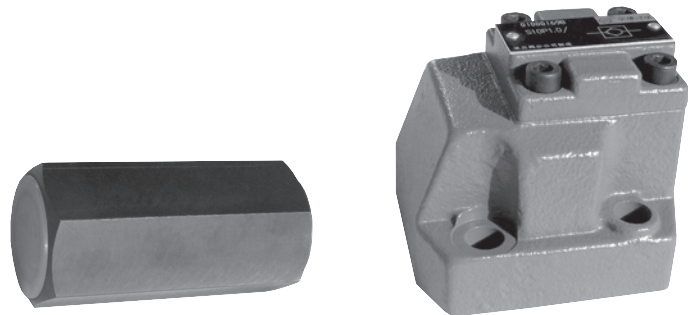
Other Huade Hydraulics Catalogues for Valves

- Pressure Valves
- Flow Control Valves
- Proportional Valves
- Cartridge Valves

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check valve type S			RE 20375/12.2004
	Size 6 to 30	up to 31.5 MPa	up to 400L/min	Replaces: RE 20375/05.2001

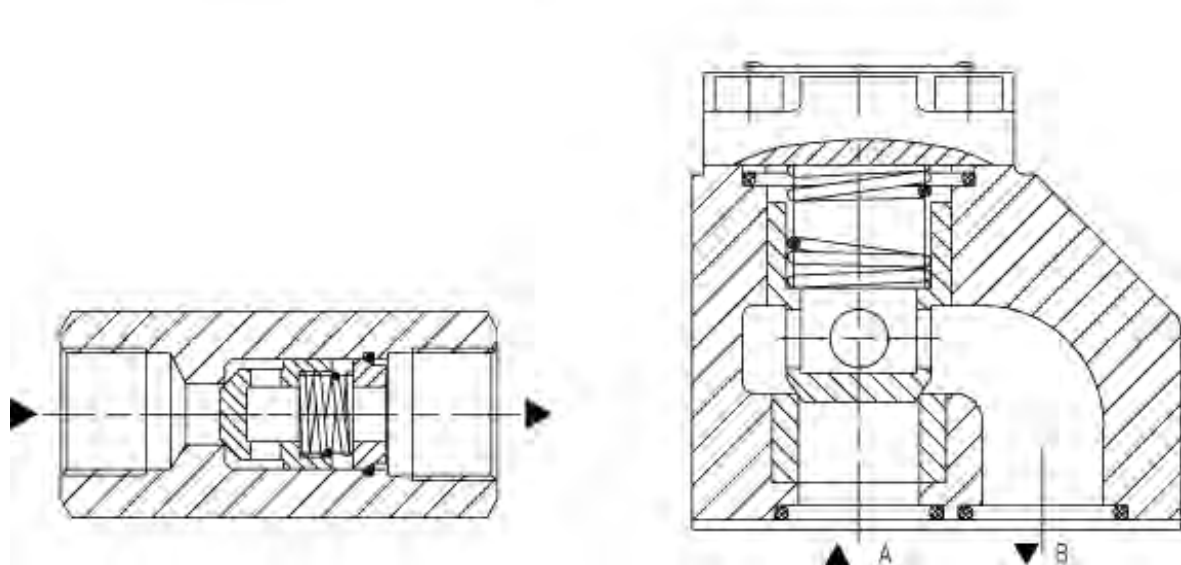
Features:

- For threaded connection
(screw-in connection)
- Subplate mounting
- Leakage-free closure in one direction
- Various cracking pressures, optional
(see ordering details)



Function,section,symbols

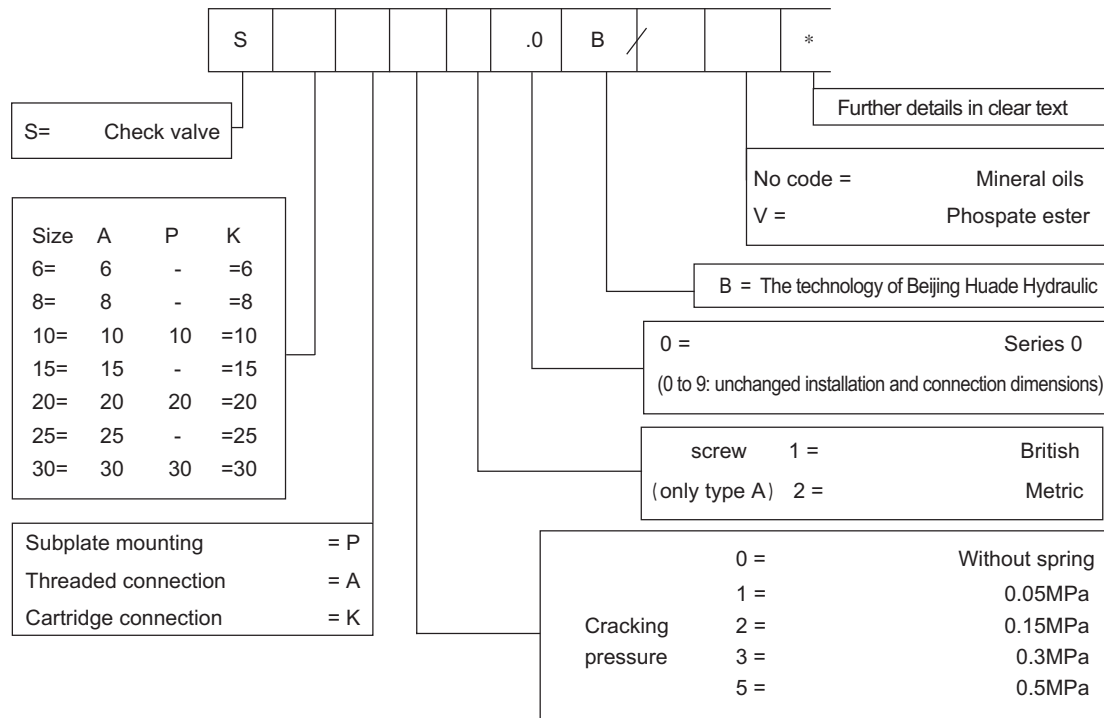
The check valve type S has the task of, preferably closing a flow leak free in one direction and to permit free flow in the opposite direction. The stroke of the poppet, which is guided on its outside diameter, is limited by a mechanical stop. The built-in compression spring supports the closing movement. Furthermore the compression spring holds the poppet in the closed position even when there is no flow through the valve.



Threaded connection

Subplate mounting

Ordering details



The model of check valve cartridge

A straight-through cartridge

	K1	K2	K3
6	301889	301896	301903
8	301890	301897	301904
10	301891	301898	301905
15	301892	301899	301906
20	301893	301900	301907
25	301894	301901	301908
30	301895	301902	301909

A straight-angled cartridge

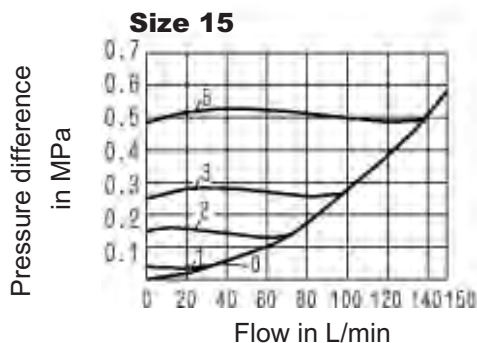
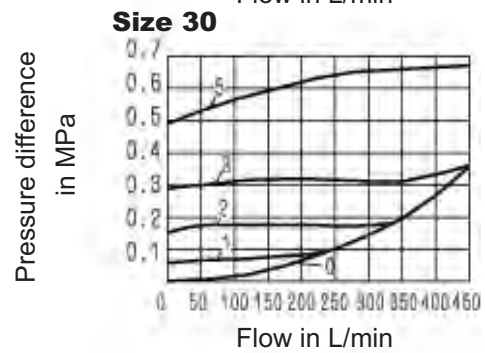
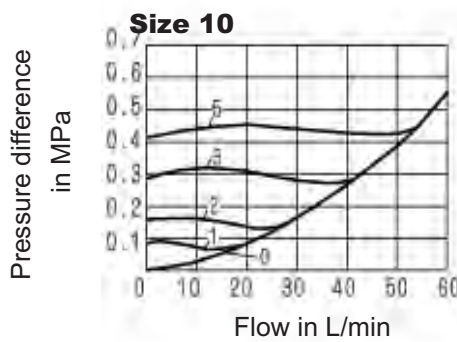
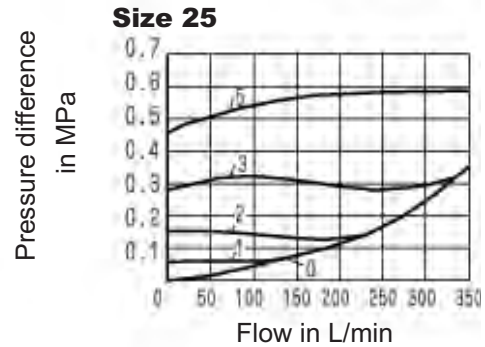
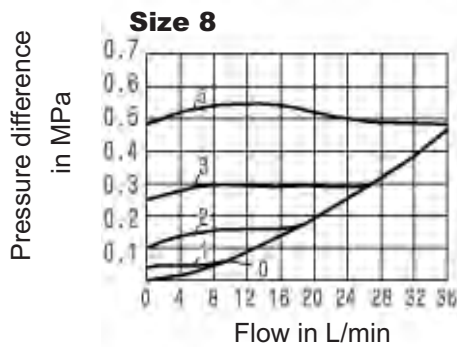
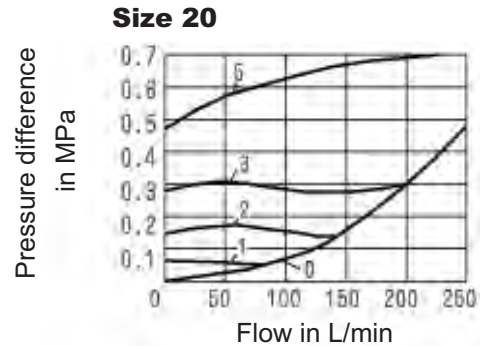
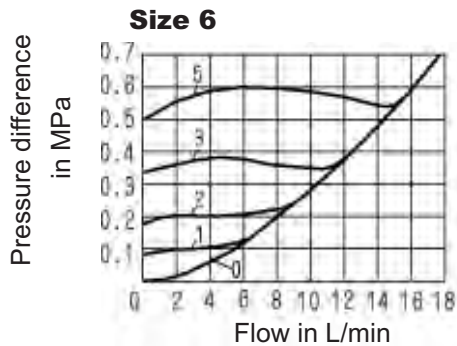
	K1	K2	K3
6	301910	301917	301924
8	317701	317702	317703
10	301912	301919	301926
15	317704	317705	317706
20	301914	301921	301928
25	301915	301922	301929
30	301916	301923	301930

For example. Booked valve inserted of size 6 with opening pressure 0.05MPa, the ordering code is: S6K1-301889

Technical data (For applications outside these parameters, please consult us!)

Pressure fluid		Mineral oils or phosphate ester
Pressure fluid - temperature range	(°C)	-30 ~ +80
Viscosity range	(mm ² /s)	2.8 ~ 500
Max. operating pressure	(MPa)	31.5
Cracking pressure	(MPa)	See characteristic curves below
Maximum flow	(L/min)	

Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

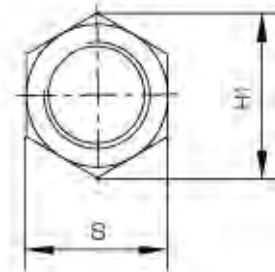
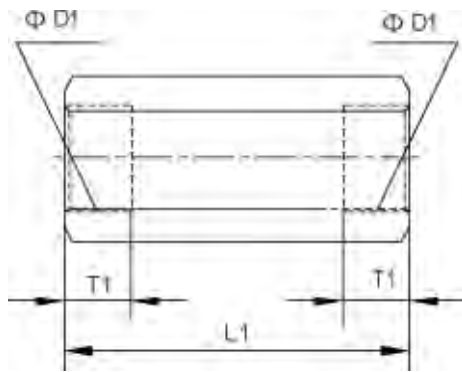


Pressure difference Δp related to the flow q_v at the cracking pressure

Unit dimensions

(Dimensions in mm)

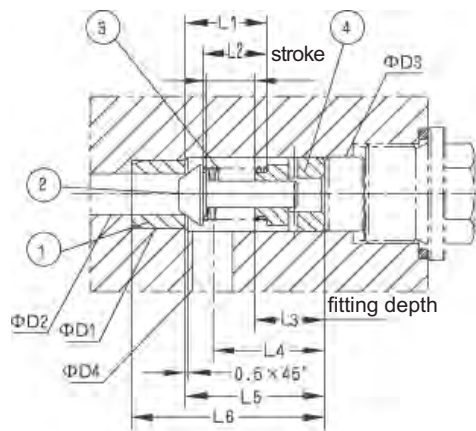
Threaded connection :



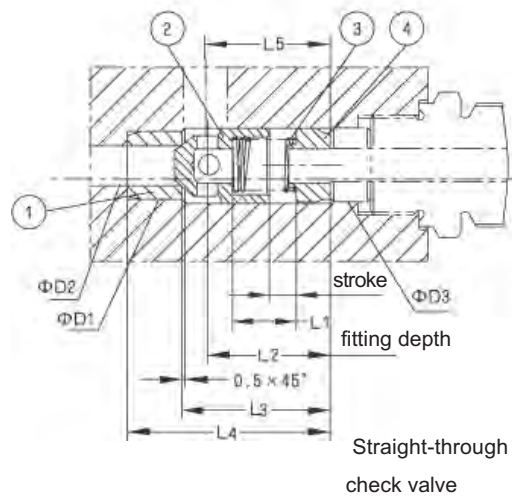
Size	6	8	10	15	20	25	30
D1	G1/4"	G3/8"	G1/2"	G3/4"	G1"	G1 1/4"	G1 1/2"
	M14X1.5	M18X1.5	M22X1.5	M27X2	M33X2	M42X2	M48X2
H1	22	28	34.5	41.5	53	69	75
L1	58	58	72	85	98	120	132
T1	12	12	14	16	18	20	22
S	19	24	30	36	46	60	65
Weight (K g)	0.1	0.2	0.3	0.5	1	2	2.5

Valve cartridge

Straight-angled check valve



NG	6	8	10	15	20	25	30
Φ D1H7	10	13	17	22	28	36	42
Φ D2	6	8	10	15	20	25	30
Φ D3H8	11	14	18	24	30	38	44
Φ D4	6	8	10	15	20	25	30
Journey	4	4	4	5	5	7	7
L1	11.2	11.9	14.3	18	18.8	28.5	28.5
L2	9.5	9.5	11.5	14.5	16	24.5	25
L3	10	16	16	18	23	31	37
L4	16.5	21.5	23.5	25.5	30	43	47.5
L5	20.5	26.5	29.5	34	40.5	57.5	63.5
L6	28.5	36.5	39.5	46	55.5	75.5	83.5
Weight	0.05Kg	0.05Kg	0.05Kg	0.1Kg	0.2Kg	0.25Kg	0.3Kg

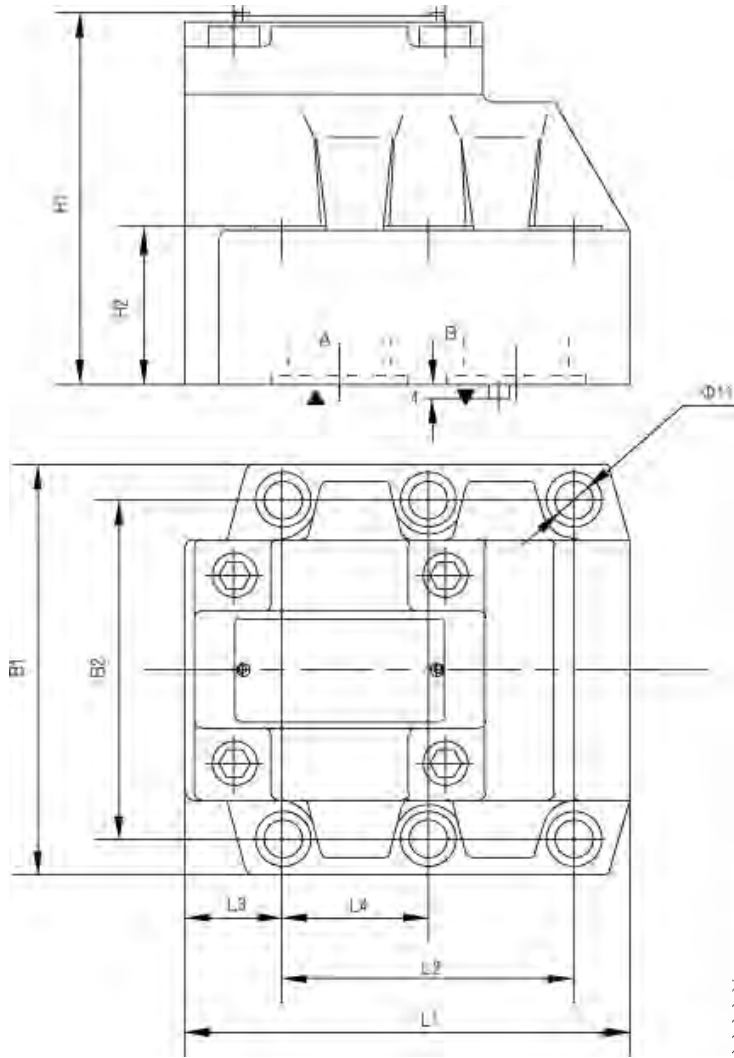


NG	6	8	10	15	20	25	30
Φ D1H7	10	13	17	22	28	36	42
Φ D2	6	8	10	15	20	25	30
Φ D3H8	11	14	18	24	30	38	44
Journey	4	4	4	5	5	7	7
L1	9.5	9.5	11.5	14.5	16	24.5	25
L2	19	18	21	27	29	29	42
L3	21.8	22.8	28.8	36.4	44	55	63
L4	29.8	32.8	38.8	48.4	59	73	83
L5	18	18	23	28	33	41	47
Weight	0.05Kg	0.05Kg	0.05Kg	0.1Kg	0.2Kg	0.25Kg	0.3Kg

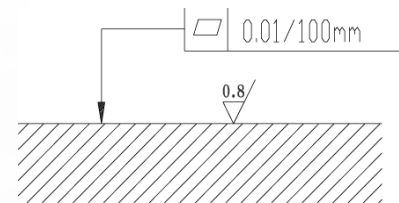
Unit Dimensions

(Dimensions in mm)

Subplate mounting:



Required surface finish of mating piece



Size	The valve fixing screws (GB/T70.1-2000)	Ports A,B O-ring
10	4-M10 × 40 -10.9	17.12 × 2.62
20	4-M10 × 50 -10.9	28.17 × 3.53
30	4-M10 × 70-10.9	34.52 × 3.53

Subplate: NG10:

G460/01 G460/02
G461/01 G461/02

NG20:

G412/01 G412/02
G413/01 G413/02

NG30:

G414/01 G414/02
G415/01 G415/02

must be ordered separately, see page 204

NG	B1	B2	L1	L2	L3	L4	H1	H2
10	85	66.7	78	42.9	17.8	-	66	21
20	102	79.4	101	60.3	23	-	93.5	31.5
30	120	96.8	128	84.2	28	42.1	106.5	46

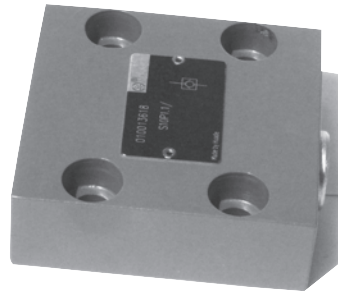
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check valve type S...P...1B/			RE20100/12.2004
	Sizes 10 20 30	up to 31.5 MPa	up to 400 L/min	

Features:

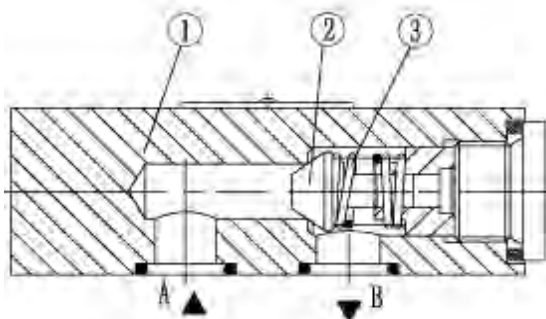
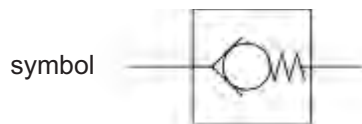
- Leakage-free closure in one direction
- 5 cracking pressure
- Subplate mouting



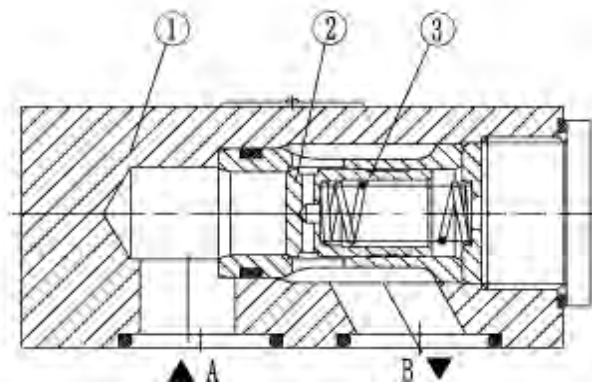
Function,section,symbol

The check valve type S has the task of, preferably closing a flow leakfree in one direction and to permit free flow in the opposite direction.It basically comprises of the housing (1), poppet (2) and the compression spring (3).

The stroke of the poppet (2), which is guided on its outside diameter,is limited by a mechanical stop. The built-in compression spring (3)supports the closing movement. Furthermore the compression spring (3) holds the poppet (2) in the closed position even when there is no flow through the valve.



Type S10P



Type S20、30 P

Ordering details

S		P		1	B	/	*
---	--	---	--	---	---	---	---

Check valve =S

Size	
10	=10
20	=20
30	=30

Subplate mouting = P

Cracking pressure 0.02 MPa	= 1
Cracking pressure 0.05 MPa	= 2
Cracking pressure 0.15 MPa	= 3
Cracking pressure 0.3 MPa	= 4
Cracking pressure 0.5 MPa	= 5

Further details in clear text

No code =	Mineral oils
V =	Phosphate ester

B = The technology of Beijing Huade Hydraulic

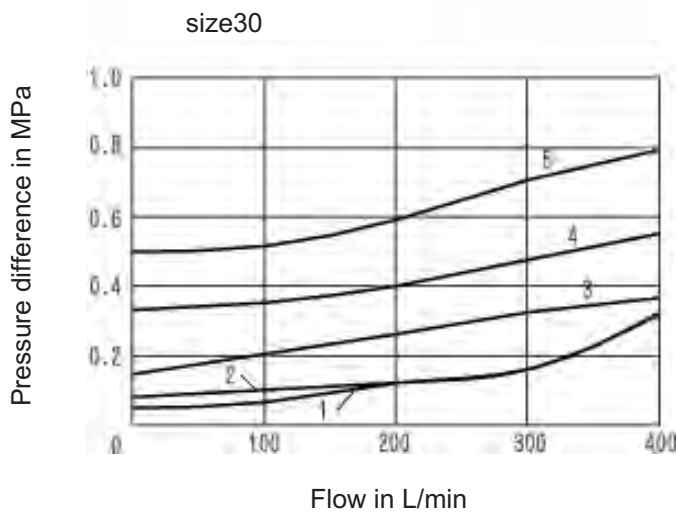
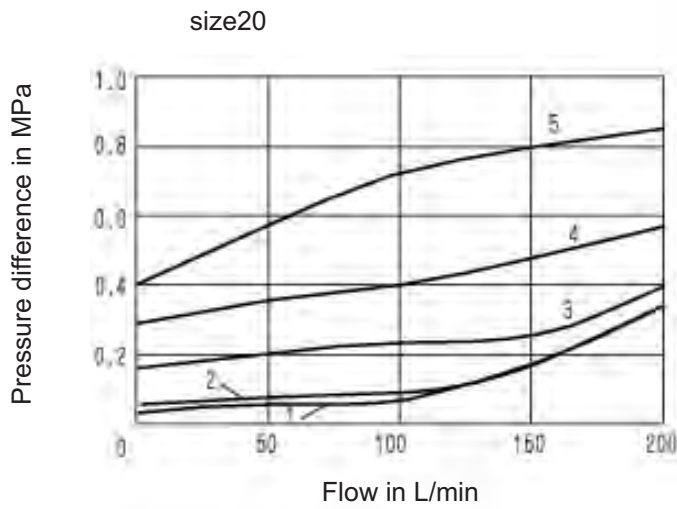
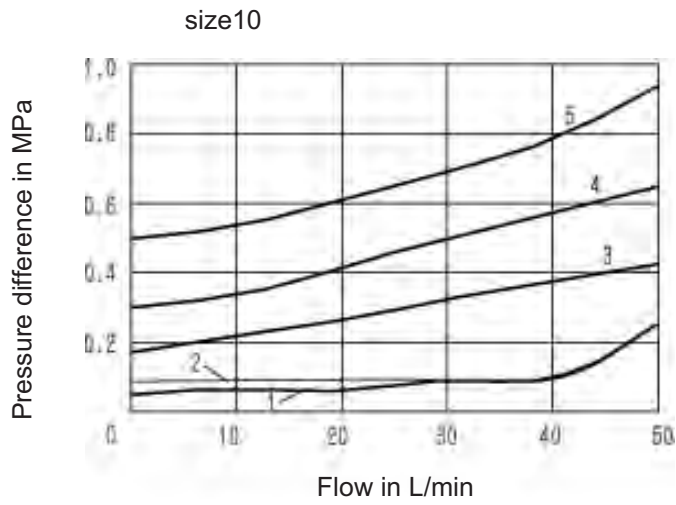
1=	Series 1
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(1 to 9: unchanged installation and connection dimensions)

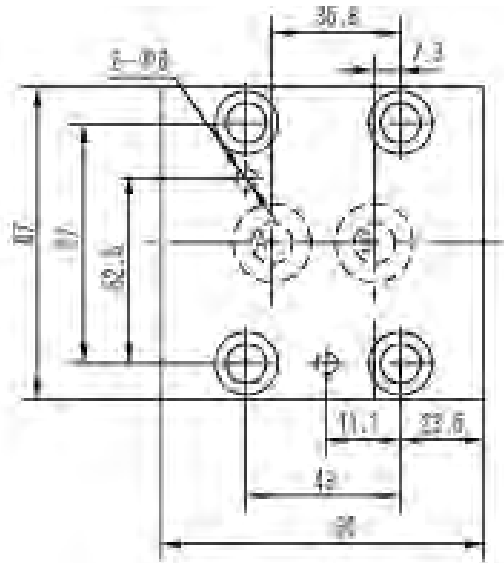
Technical data

Operating fluid		mineral oils or phosphate ester
Operating pressure	(MPa)	31.5
Viscosity range	(mm ² /s)	2.8~500
Maximum flow	(L/min)	See curves
Cracking pressure	(MPa)	
Pressure fluid - temperature range	(°C)	-30~+80
Degree of contamination		maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

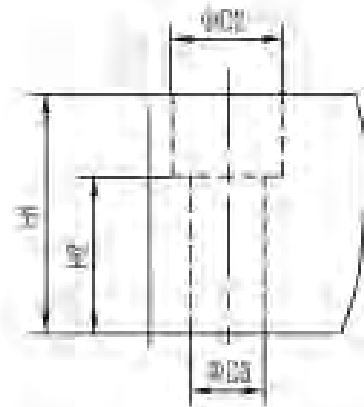
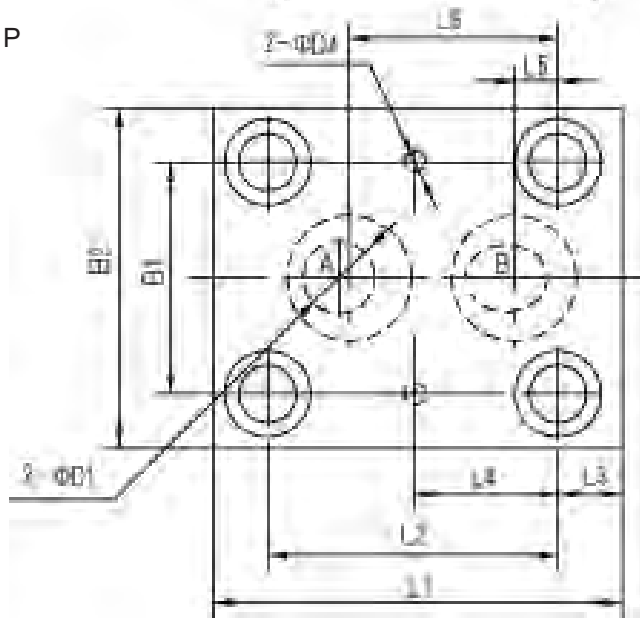
Characteristic curves (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50 \text{ }^\circ\text{C}$)



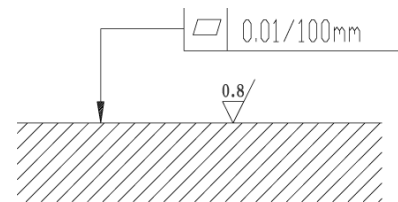
S 10 P



S 20.30 P



Required surface finish of mating piece



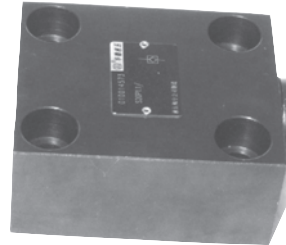
Size	Valve fixing screws (GB/T70.1-2000)	O-ring for ports A ,B
10	4-M10X35-10.9	17.12X2.62
20	4-M14X55-10.9	28.17X3.53
30	4-M18X60-10.9	34.52X3.53

Size	B1	B2	L1	L2	L3	L4	L5	L6	H1	H2	φ D1	φ D2	φ D3	φ D4
20	65	95	114	81	18	40.5	13	59	52	35	20	24	16	6
30	92	130	154	92	43.5	46	20.5	71.5	70	36	28	29	20	6

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	check valve Type Rvp			RE 20400/12.2004
	Size 6 to 40	up to 31.5 MPa	up to 600L/min	Replaces: RE 20400/05.2001

Features:

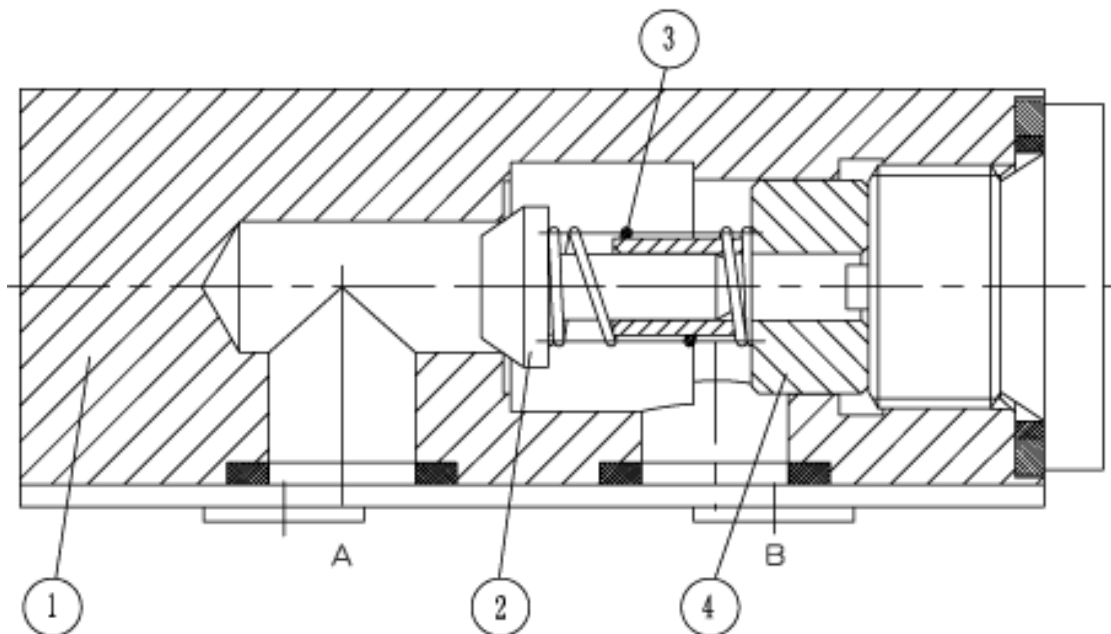
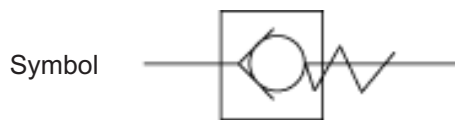
- Subplate connection
- Leakage-free closure in one direction



Description,section,symbol

The check valve type RVP has the task of, preferably closing a flow leakfree in one direction and to permit free flow in the opposite direction.It basically comprises of the housing (1), poppet (2) compression spring (3),and spring seat(4).

The stroke of the poppet (2), which is guided on its outside diameter,is limited by a mechanical stop. The built-in compression spring (3)supports the closing movement. Furthermore the compression spring (3) holds the poppet (2) in the closed position even when there is no flow through the valve.



1. Housing 2.Poppet 3. Spring 4. Spring seat

Ordering details

RV	P		10	B	/	*
----	---	--	----	---	---	---

Check valve

Subplate mounting =P

Size

6	=6
8	=8
10	=10
12	=12
16	=16
20	=20
25	=25
30	=30
40	=40

Futher details in clear text

No code = Mineral oils
V = Phosphate ester

B = The technology of Beijing Huade Hydraulic

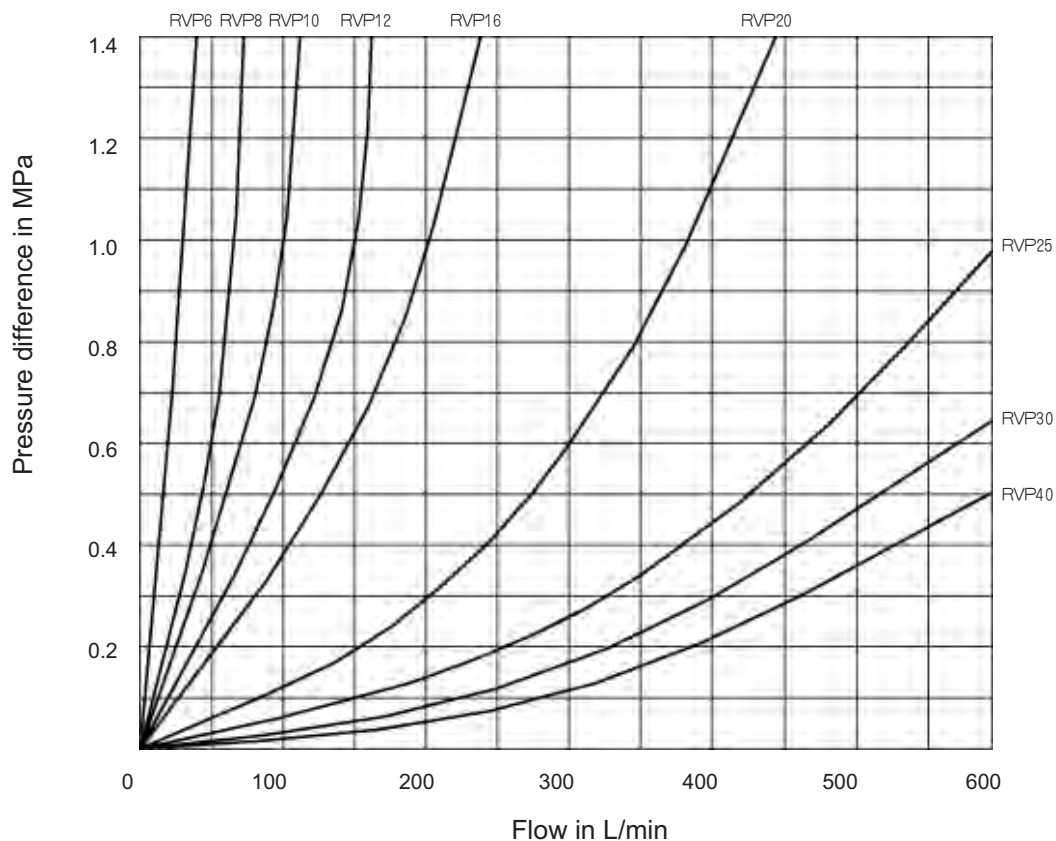
10= series 10 to 19
(10 to 19: unchanged installation and connection dimensions)

Technical data

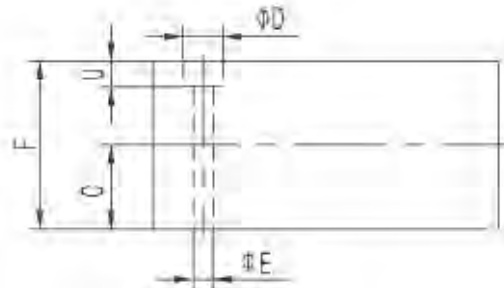
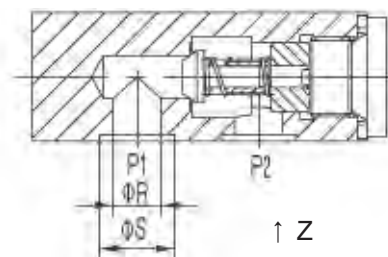
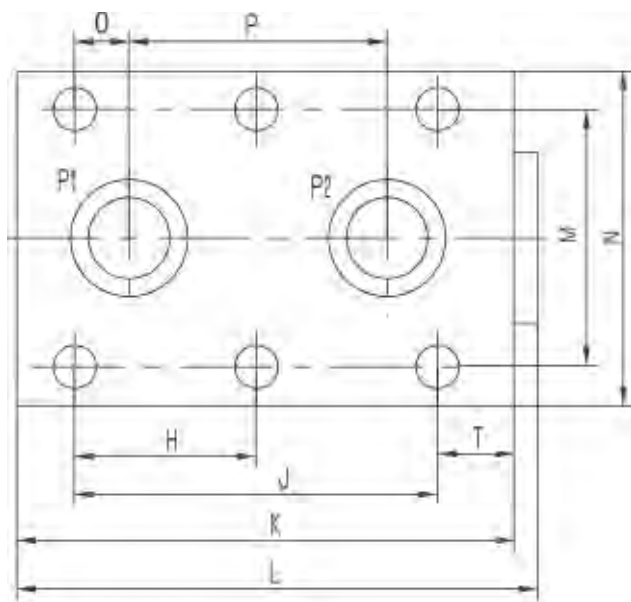
Size		6	8	10	12	16	20	25	30	40	
Operating pressure, max.	(MPa)	31.5									
Opening pressure	(MPa)	0.05									
Pressure fluid		mineral oils or phosphate ester									
Pressure fluid temperature range	(°C)	- 30 to + 80									
Viscosity range	(mm ² /s)	2.8 to 500									
Fixing position		optional									

Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and temperature $t = 50^\circ\text{C}$)

Direction of flow: P1 to P2 The relationship between pressure differential Δp and flow Q



Z 向



Size	C	φD	φE	F	H	J	K	L	
RVP-6	11.5	11	6.6	23	-	19	41.5	46	
RVP-8	13	11	6.6	24	-	35	63.5	67	
RVP-10	13.5	11	6.6	27	-	33.5	70	74	
RVP-12	16	11	6.6	32	-	38	80	84	
RVP-16	22.5	14	9	45	38	76	104	109	
RVP-20	26	14	9	50	47.5	95	127	132	
RVP-25	29	18	11	58	60	120	165	170	
RVP-30	37.5	20	14	75	71.5	143	186	192	
RVP-40	50	20	14	100	67	133.5	192	198	
Size	M	N	O	P	φR	φS	T	U	Weight(Kg)
RVP-6	28.5	41.5	1.6	16	6	12.2	16.1	8	0.26
RVP-8	33.5	46	4.5	25.5	8	13.7	14.3	10	0.50
RVP-10	38	51	4	25.5	10	15.7	18.5	7	0.80
RVP-12	44.5	57.5	4	30	13	21.8	21	7	1.10
RVP-16	54	70	11.4	54	17	24.5	16	12	2.25
RVP-20	60	76.5	19	57	22	31.5	16	12	3.90
RVP-25	76	100	20.6	79.5	28.5	39.2	30	13	6.70
RVP-30	92	115	23.8	95	31	41	28	13	11.0
RVP-40	111	140	25.5	89	45	54	42.5	18	17.0

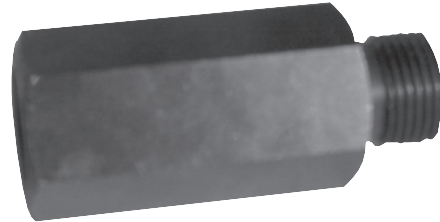
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check valve with damp Type SZ8A			RE 22000/12.2004
	Size 8	up to 31.5MPa	up to 32 L/min	

Features:

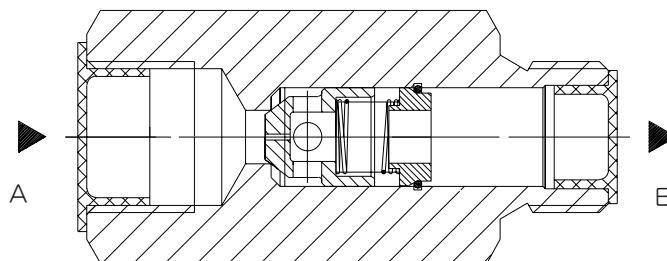
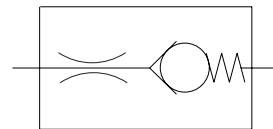
- For threaded connection
- Five cracking pressures, optional(see ordering details)



Function, section, symbol

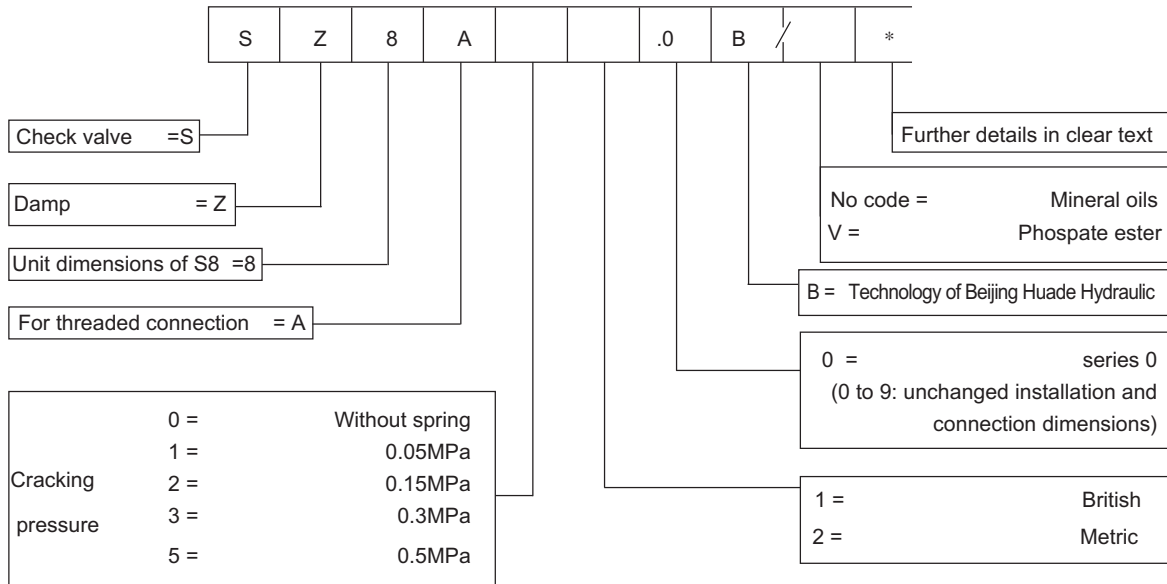
The Check valve with damp type SZ8A valve allow free flow in one direction and limit the flow in the opposite direction .The stroke of the poppet , which is guided on its outside diameter, is limited by a mechanical stop. The built-in compression spring supports the closing movement. The Check valve with damp mainly used in the outlet of pump as back pressure and side through valve.

Symbols



Type SZ8A

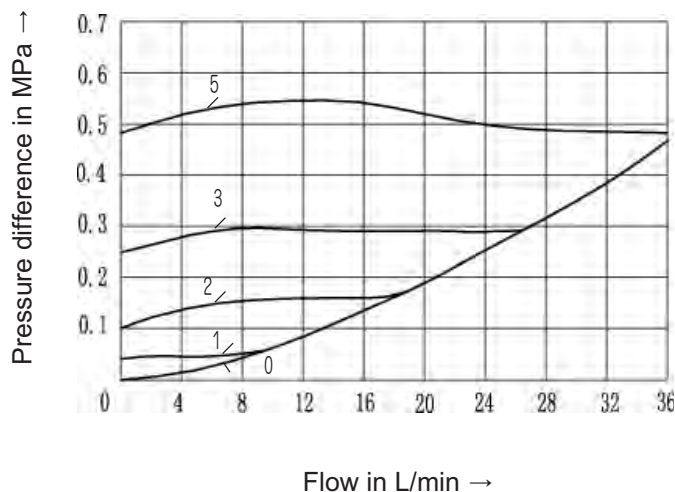
Ordering details

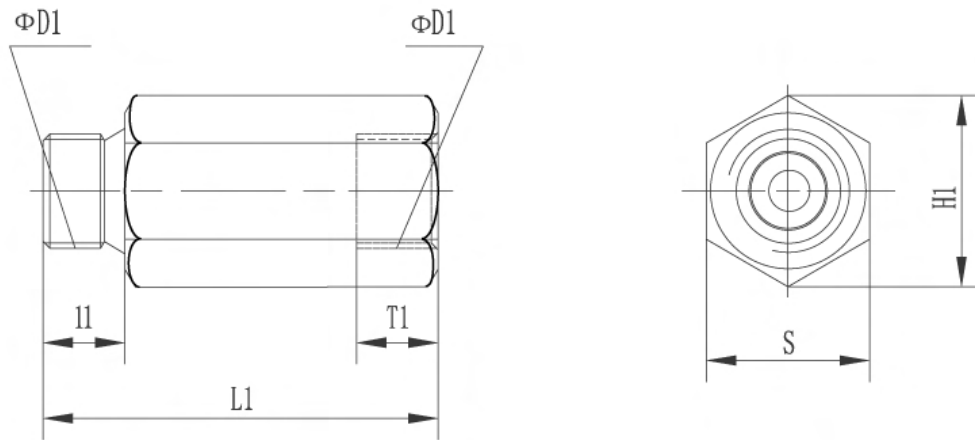


Technical data (For applications outside these parameters, please consult us !)

Hydraulic fluid		Mineral oil or Phosphate ester
Temperature range	(°C)	- 30 ~ + 80
Viscosity range	(mm ² /s)	2.8 ~ 500
Operating pressure	(MPa)	up to 31.5
Cracking pressure	(L /min)	See below Characteristic curves
Flow q _v max	(L /min)	

Characteristic curves (measured at v = 41 mm²/s and t = 50°C)





Size	$\Phi D1$	H1	L1	T1	S	Weight (Kg)
8	3/8"	28	58	12	24	0.2

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check valve cartridge Type M-SR			RE 23000/12.2004
	Size 8 to 30	up to 31.5 MPa	up to 400L/min	

Features:

- For installation in manifold blocks as right angled check valve cartridge
- Leakfree closure in one direction
- 6 opening pressures, optional

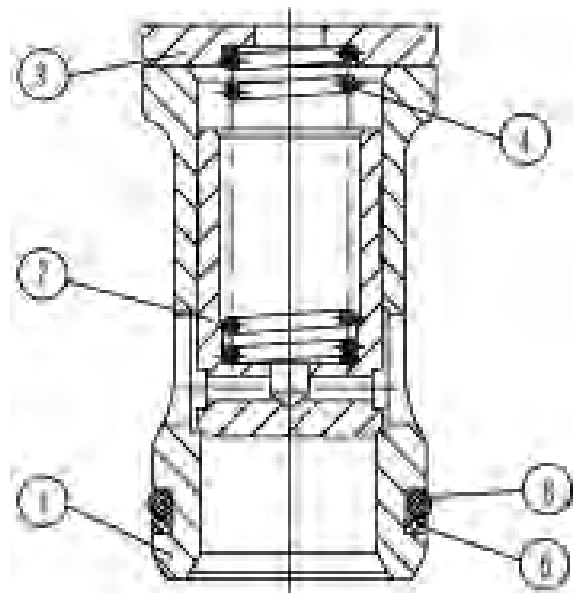


Functions,section,symbols

The check valve type M-SR has the task of, preferably closing a flow in one direction and to permit free flow in the opposite direction.

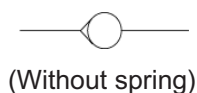
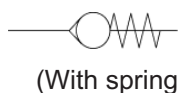
The valve including valve sleeve(1),spool (2),spring seat(3) and springs(4).

It is mainly used in the outlet of pump as back pressure and side through valves.



- | | |
|-----------------|-----------|
| 1. Housing | 2. Poppet |
| 3. Spring valve | 4.Spring |
| 5.Seal ring | 6.O-ring |

Symbols



Ordering details

M-SR KE 10 B *

Check valve =M-SR

Further details in clear text

Size 8	=8
Size 10	=10
Size 15	=15
Size 20	=20
Size 25	=25
Size 30	=30

No code = Mineral oils
V = Phosphate ester

B = The technology of Beijing Huade Hydraulic

Right angled check valve cartridge = KE

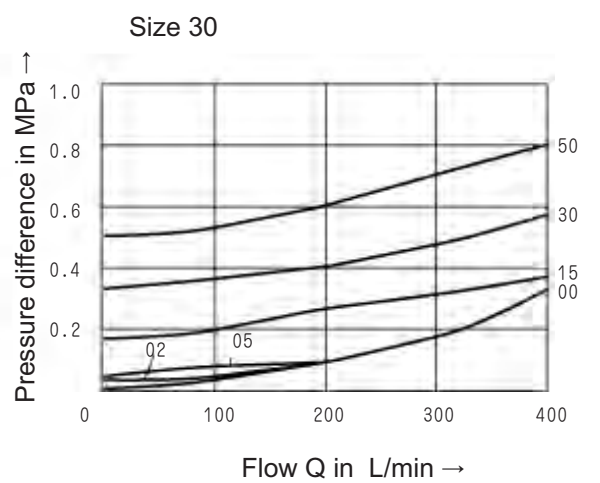
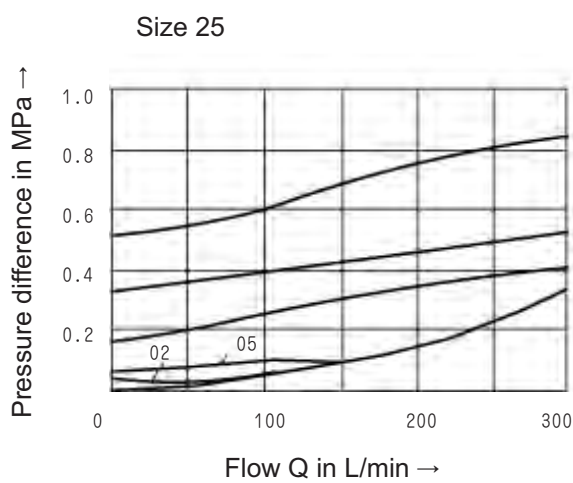
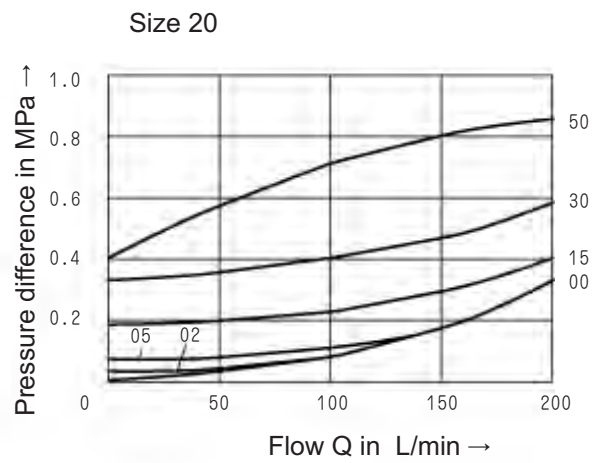
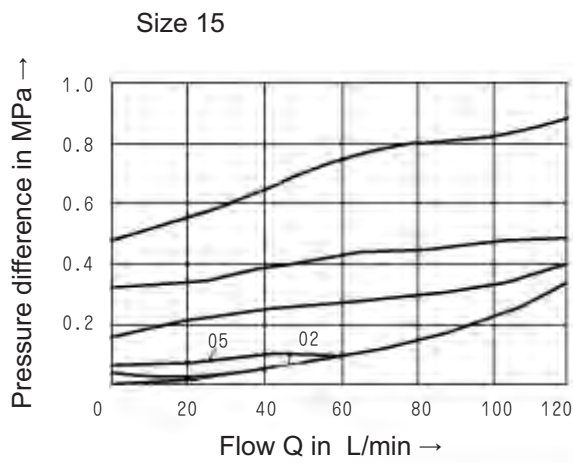
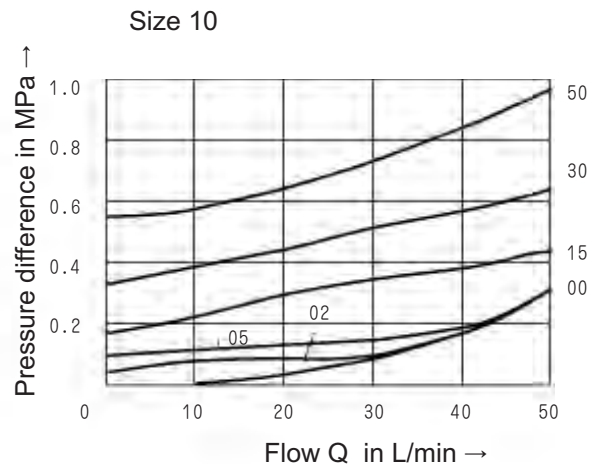
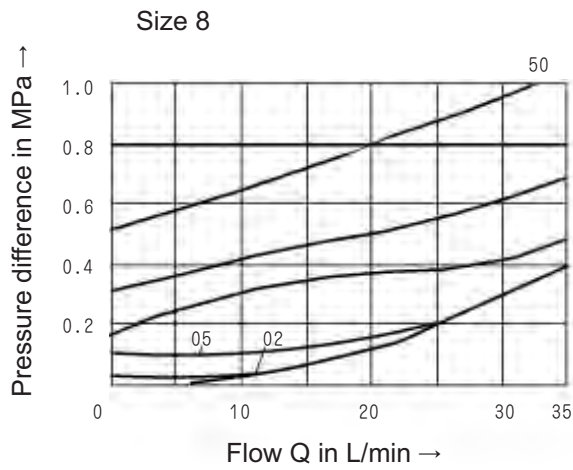
10= Series 10 to 19
(10 to 19 = unchanged installation and connection dimensions)

Without spring (not with straight line check valve)	=00	
Cracking pressure see operating curves	} (standard)	=02
		=05
		=15
		=30
		=50

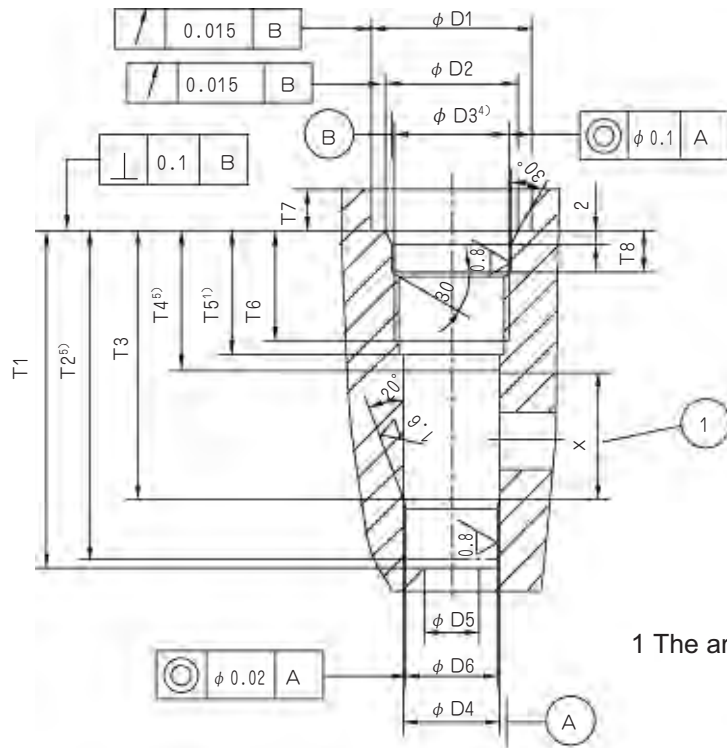
Technical data (for applications outside these parameters, please consult us!)

Max.pressure	(MPa)	Up to 31.5
Max.flow	(MPa)	See characteristic curves
Pressure fluid	(L/min)	See characteristic curves
operating fluid		Mineral oil or phosphate ester
Pressure fluid temperature range	(°C)	-30 to +80
Viscosity range	(mm ² /s)	2.8 to 500
Fluid cleanliness		Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

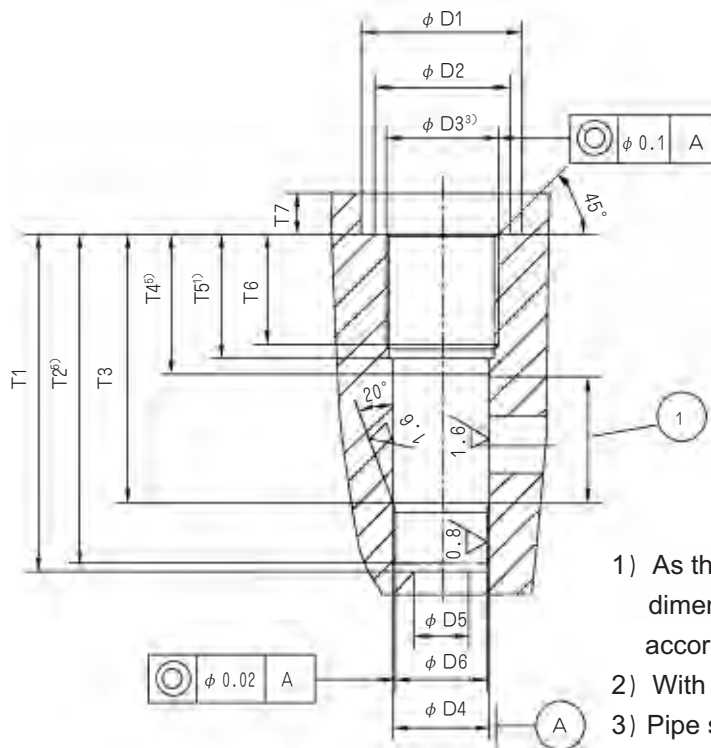
Characterical Curves (measured at $v = 41\text{mm}^2/\text{S}$ and $t = 50^\circ\text{C}$)



Installation bore: Right angled check valve cartridge



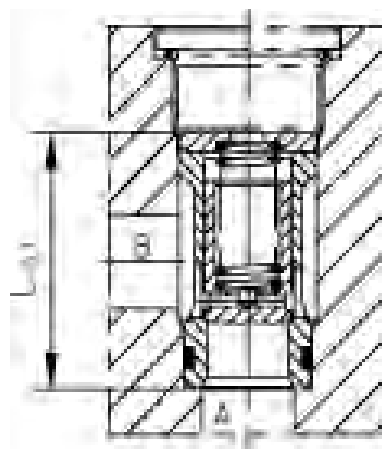
1 The area for downstream bore



- 1) As the cartridge descent, T5 dimensions are enlarged accordingly.
- 2) With NBR seal
- 3) Pipe screw "G..." accord to ISO 228/1
- 4) Metric ISO-fine thread to DIN13
- 5) The depth of clearance

Installation bore: Right angled check valve cartridge
(Dimensions in mm)

Size	L-0.1
8	36.3
10	39.3
15	45.8
20	55.3
25	74.3
30	83.3



Right angled check valve cartridge

Installation bore: Right angled check valve cartridge
(Dimensions in mm)

Size	P (MPa)	φ D1	φ D2	D3	H8		H7	
					φ D4	φ D5	φ D6	
8	31.5	23	17.1	G3/8"	14	8	13	
10	31.5	28	21.4	G1/2"	18	10	17	
15	31.5	33	26.8	G3/4"	24	15	22	
20	31.5	41	33.8	G1"	30	20	28	
25	31.5	51	42.5	G1 ¹ / ₄ "	38	25	36	
30	31.5	56	48.5	G1 ¹ / ₂ "	44	30	42	
25	31.5	56 ^{+0.5}	44H8	M42 × 1.5	38	25	36	
30	31.5	62 ^{+0.5}	50H8	M48 × 1.5	44	30	42	

Size	^{+0.1}								X (kg)	Weight Z
	T1	T2	T3	T4	T5	T6	T7	T8		
8	48.5	47.5	38.5	20	15	12	6	-	18	0.05
10	53.5	52.5	43.5	24	18	14	6	-	19	0.05
15	62	60.5	50	26	20.5	16	6	-	24	0.05
20	71.5	70	56.5	26	20.5	16	7	-	30	0.05
25	90.5	88	72.5	28	22	16	7	-	43	0.1
30	99.5	96.5	79.5	31	22	16	7	-	48	0.1
25	106.5	104	88.5	45	39	33	5	12	43	-
30	115.5	112.5	95.5	48	39	33	5	12	48	-

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check valve sandwich plate Type Z1S			RE 21533/12.2004
	Size 6 to 10	up to 31.5 MPa	up to 100L/min	Replaces: RE 21533/05.2001

Features:

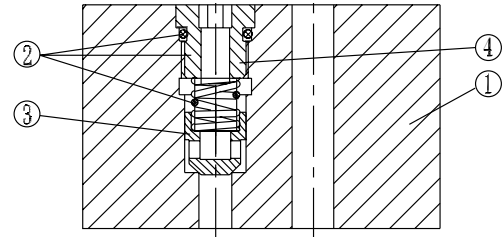
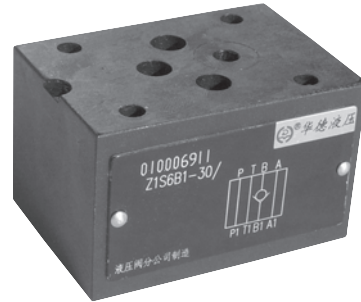
- Sandwich plate valve
for use in vertical stacking assemblies
- 8 different isolating functions

The Z1S 6 valve is a direct operated check valve in sandwich plate design.

It is used for the leak-free closure in one direction and allows free-flow in the counter direction.

This valve type has a metallic seal between poppet (3) and housing (1). Valves of this type are especially suitable for applications with operating pressures above 10.0 MPa and flow velocities over 4 m/s.

- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Ordering details

Z1S				— 30	B /	*
-----	--	--	--	------	-----	---

Size 6	= 6
Size 10	= 10

Further details in clear text

No code = Mineral oils

V = Phosphate ester

B = The technology of Beijing Huade Hydraulic

30 = Series 30 to 39
(30 to 39: unchanged installation and connection dimensions)

1 = Cracking pressure 0.05 MPa

2 = Cracking pressure 0.3 MPa

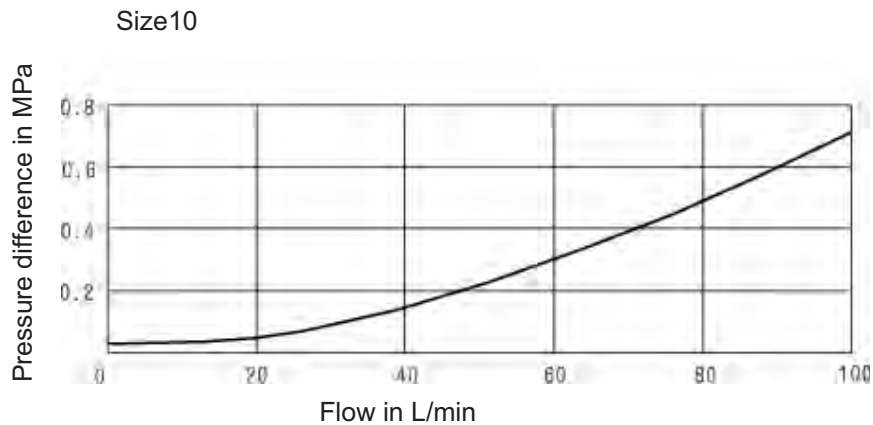
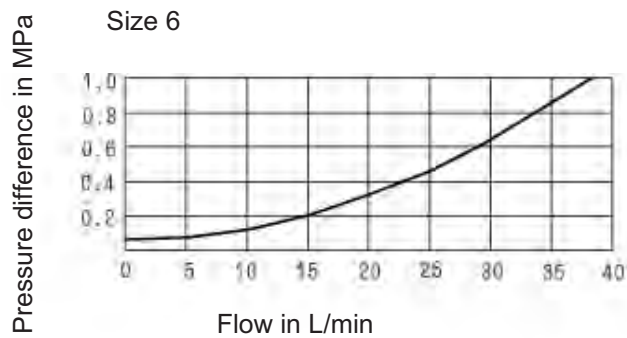
3 = Cracking pressure 0.5 MPa

Technical data

Size		6	10
Max. flow (L/min)		40	100
Max. operating pressure (MPa)		31.5	
Cracking pressure		See the ordering details	
Pressure fluid		Mineral oils(for NBR seal) or phosphate ester(for FPM seal)	
Pressure fluid temperature range (°C)		- 20 to + 80	
Viscosity range (mm ² /s)		2.8 to 500	
Weight (kg)		0.8	2.3

* For application outside these parameter, please consult us!

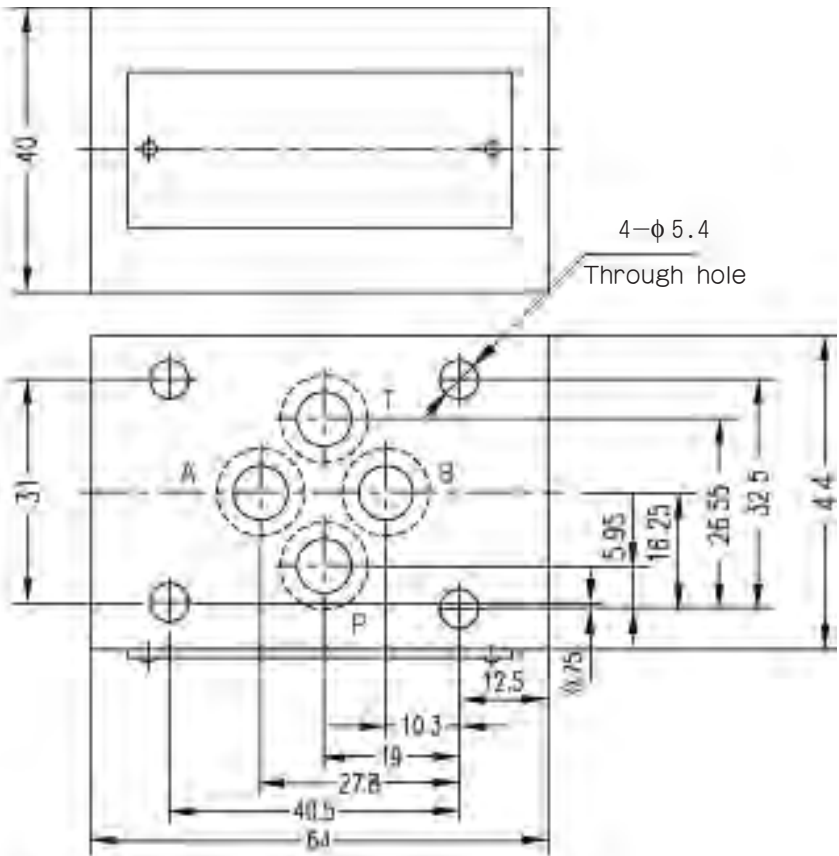
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)



Unit dimensions

(Dimensions in mm)

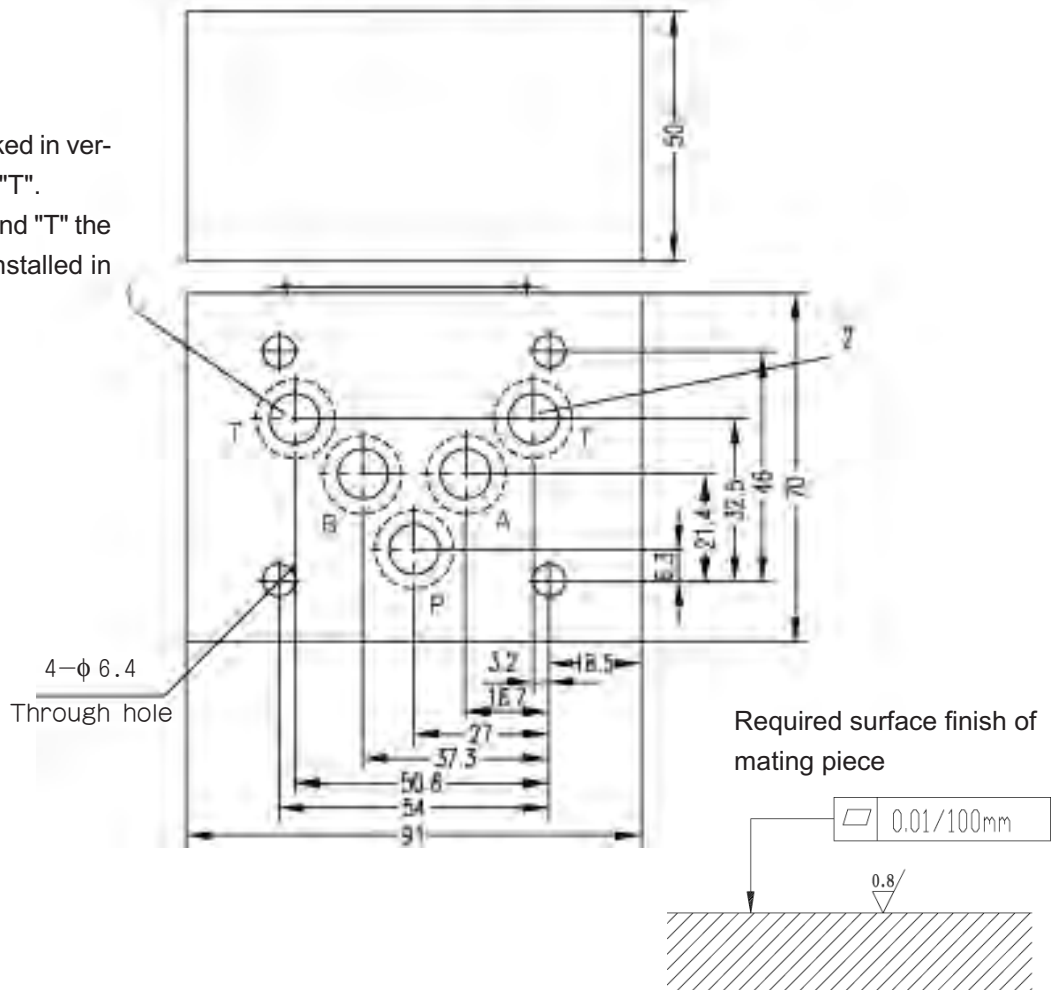
Size 6
O-ring 4-9.25X1.78



Size10

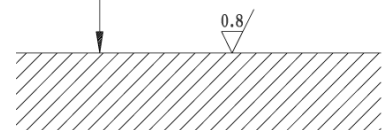
O-ring 5-12X2

- 1 This port is blocked in versions "F" and "T".
- 2 In versions "F" and "T" the check valve is installed in this channel.



Required surface finish of mating piece

0.01/100mm



Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated Check valve sandwich plate Type Z2S		RE 21600/12.2004
	size 6、10 16、22	up to 31.5 MPa	up to 360L/min
			Replace: 21547/05.2001 21551/05.2001 RE: 21556/05.2001 21560/05.2001

Features:

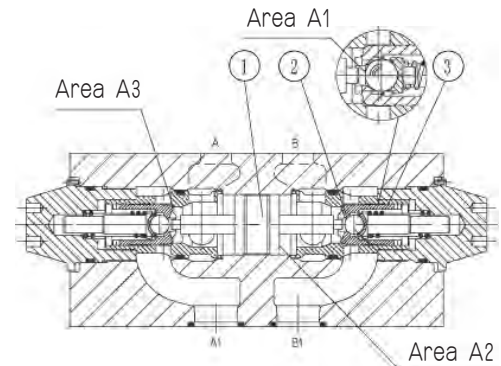
- For the leak free closure of one or two service ports
- Mounting pattern to DIN 24 340 form A, ISO 4401 and ETOP-RP 121H for use in vertical stacking assemblies



Functional, section

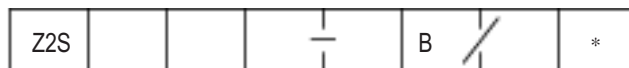
Hydraulic pilot operated check valves type Z2S are of sandwich plate design. They are used for the leak-free closure of one or two service ports, even for long periods of time. Free flow occurs from A1 to A2 or B1 to B2. Flow in the opposite direction is blocked.

In order to ensure correct closing of the valve, the service ports of the directional valve must be connected to tank in the neutral position.



Z2S22...30B/...Sandwich plate valve

Ordering details

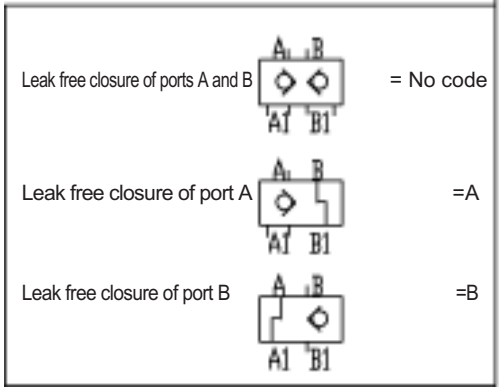


Size 6	= 6
Size 10	= 10
Size 16	= 16
Size 22	= 22

Further details in clear text

No code = Mineral oils
V = Phosphate ester

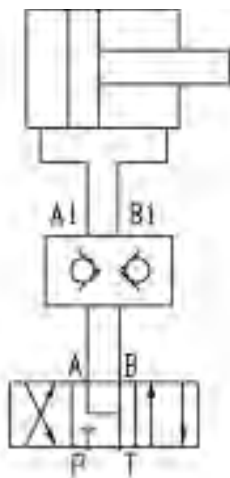
B= The technology of Beijing Huade Hydraulic



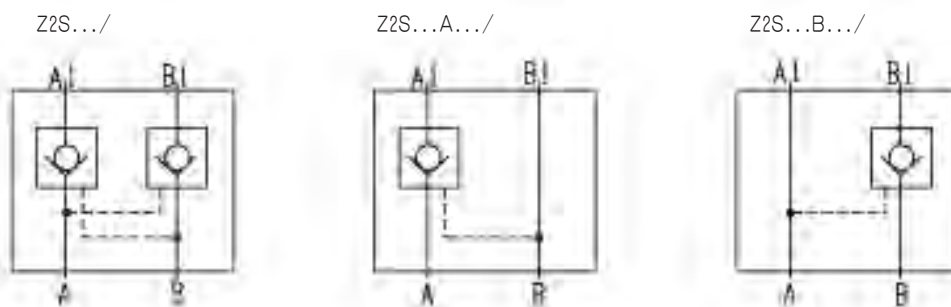
20 = Series 20 to 29 (Apply to size 10)
(20 to 29: unchanged installation and connection dimensions)
30 = Series 30 to 39 (Apply to size 16, 22)
(30 to 39: unchanged installation and connection dimensions)
40 = Series 40 to 49 (Apply to size 6)
(40 to 49: unchanged installation and connection dimensions)

(only for size 10)
1= Cracking pressure 0.15 MPa
2= Cracking pressure 0.3 MPa
3= Cracking pressure 0.6 MPa

Typical circuit example



Symbols



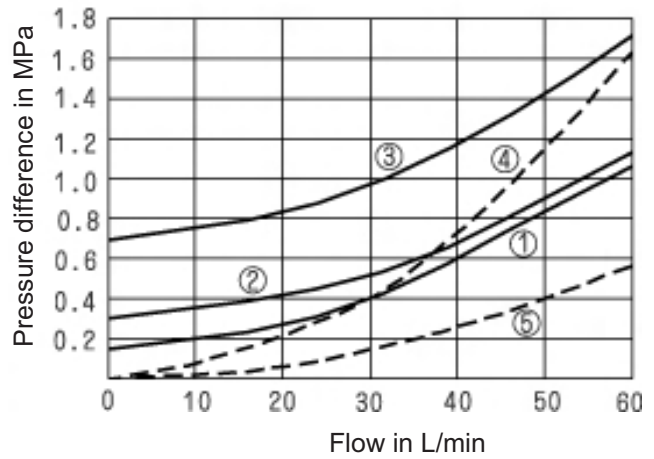
Technical data

Size		6	10	16	22		
Max. flow L/min	(L/min)	to 60	to 120	to 200	to 360		
Max. operating pressure	(MPa)	31.5					
Cracking pressure	(MPa)	0.15	0.15	0.3	0.6	0.25	0.25
Directions		Flow freely via check valve from A to A1 or B to B1 pilot operated from B1 to B or A1 to A					
Area ratio		A1/A2=1:3	$\frac{A1/A2=1:2.86}{A3/A2=1:11.45}$	$\frac{A1/A2=1:11.8}{A3/A2=1:2.8}$	$\frac{A1/A2=1:13.6}{A3/A2=1:2.8}$		
Pressure fluid		Mineral oils(for NBR seal) or phosphate ester(for FPM seal)					
Pressure fluid temperature range	(°C)	-20 to +80					
Viscosity range	(mm ² /s)	2.8 to 500					
Weight	(kg)	0.8	2	7	11.7		

Type Z2S6

— = A → A1; B → B1
 - - - = A1 → A; B1 → B

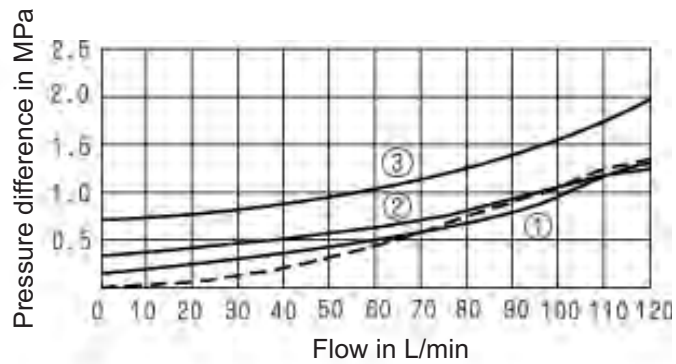
1. Normal cracking
2. Check valve cartridge
3. Flow freely
(without check valve)
4. Through check valve cartridge
5. Flow freely
(without check valve cartridge
Type "A" and type "B")



Type Z2S10

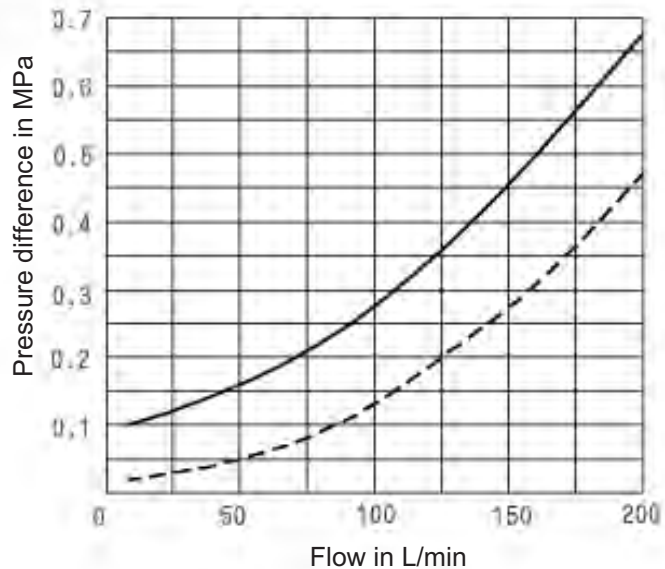
— = A → A1; B → B1
 - - - = A1 → A; B1 → B

1. Cracking pressure 1 = 0.15MPa
2. Cracking pressure 2 = 0.3MPa
3. Cracking pressure 3 = 0.6MPa



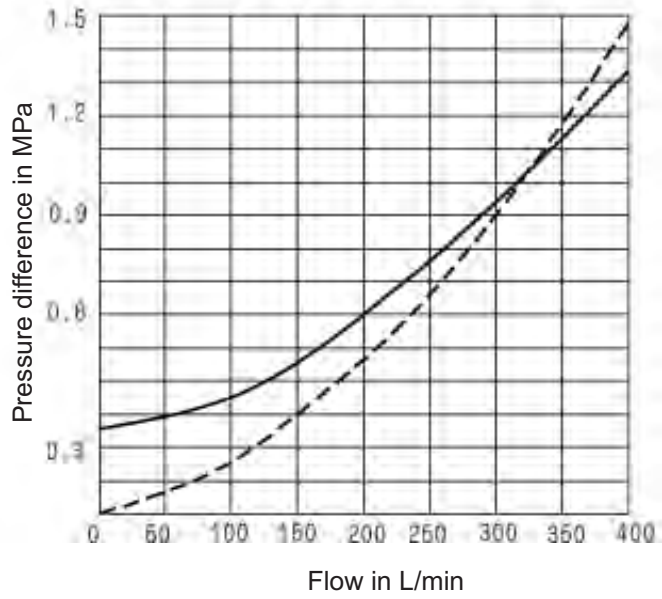
Type Z2S16

— = A → A1; B → B1
 - - - = A1 → A; B1 → B



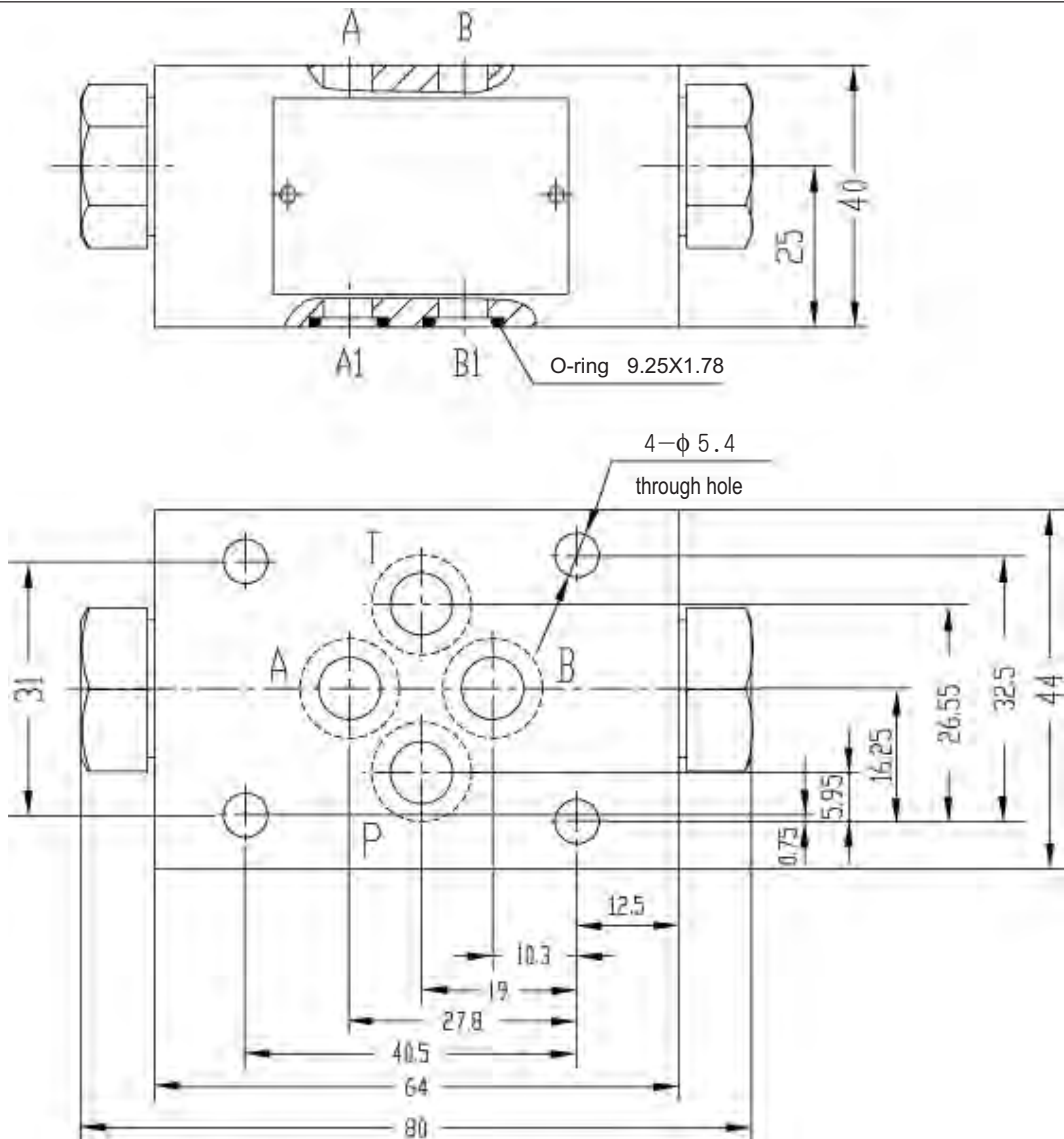
Type Z2S 22

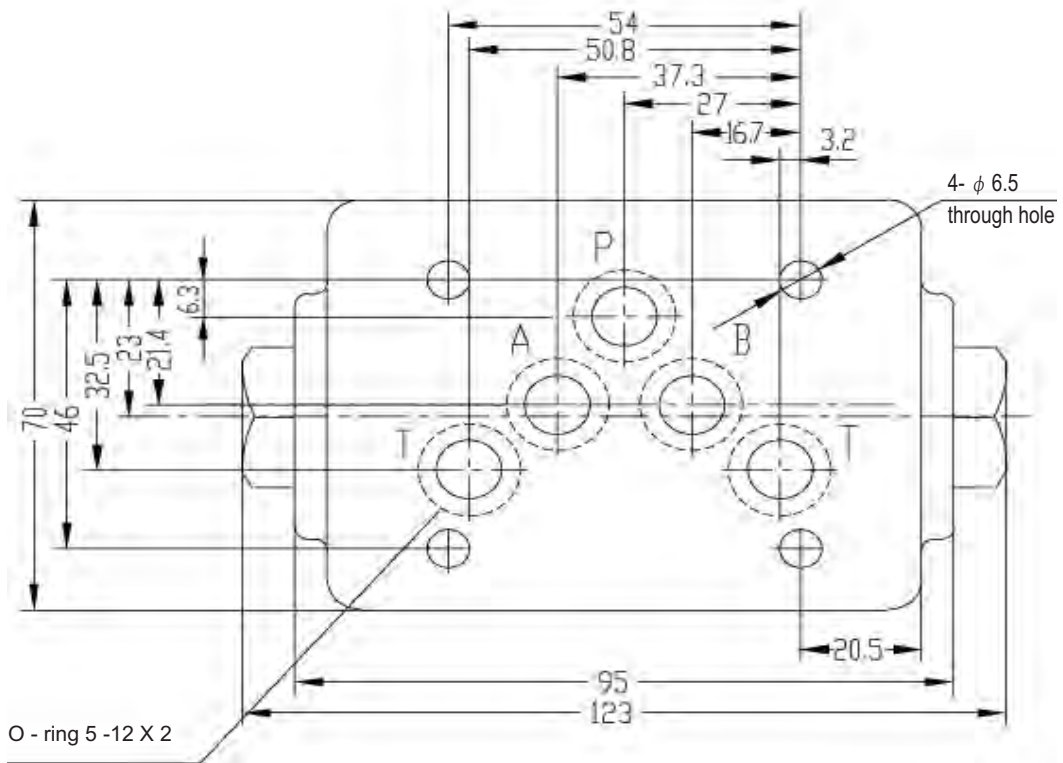
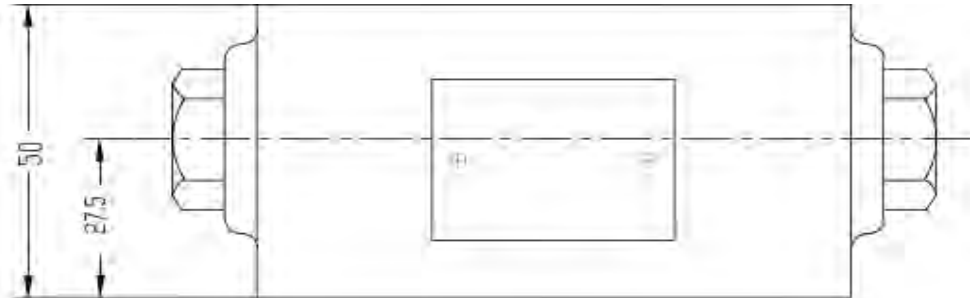
— = A → A1, B → B1
 - - - = A' → A1, B1 → B



Unit dimensions : (Size6)

(Dimensions in mm)

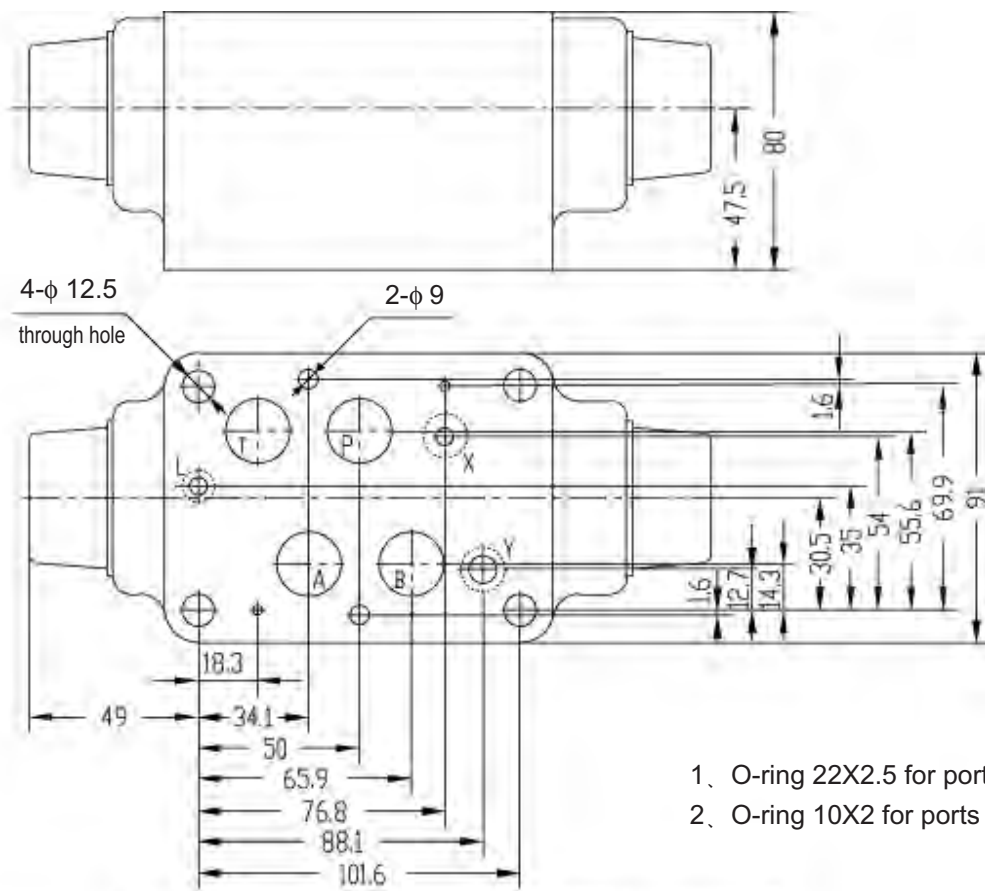




Unit dimensions

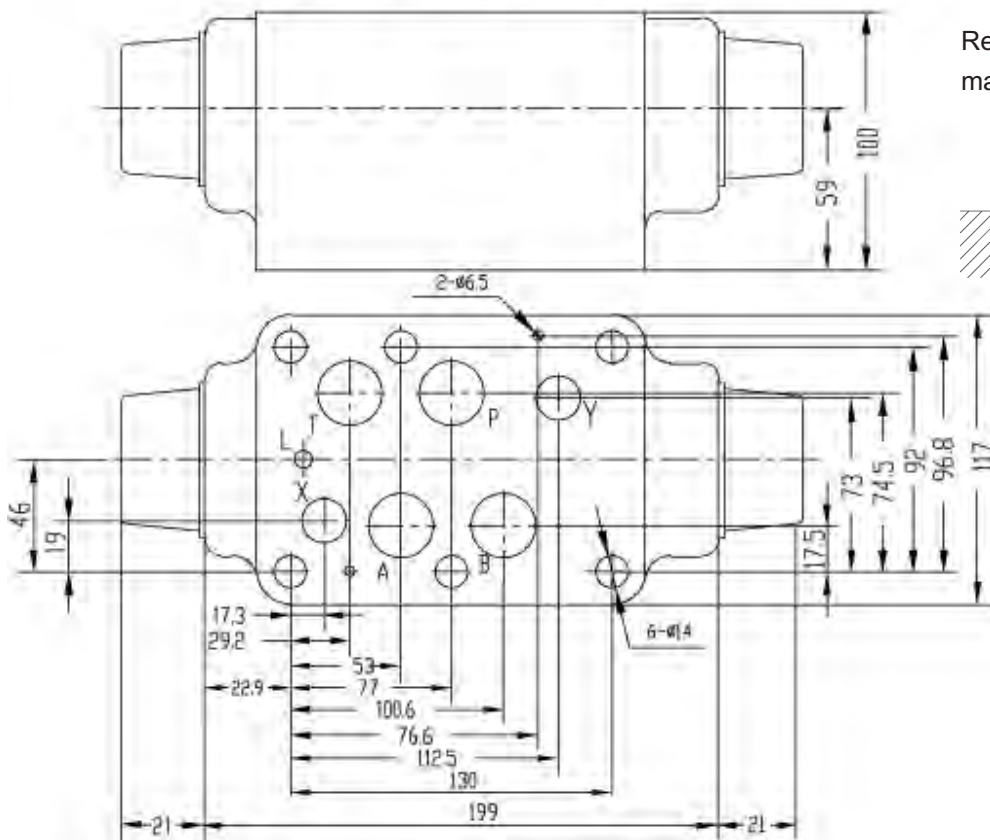
(Dimensions in mm)

Size16

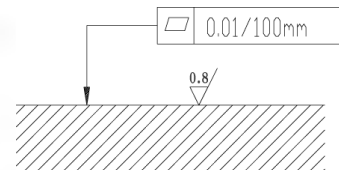


- 1, O-ring 22X2.5 for ports P, A, B, T
- 2, O-ring 10X2 for ports X, Y, L

Size22



Required surface finish of mating piece

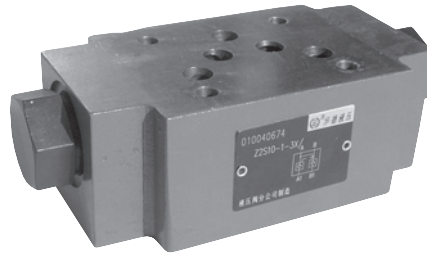


- 1, O-ring 27X3 for ports P, A, B, T
- 2, O-ring 19X3 for ports X, Y, L

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated Check valve sandwich plate Type Z2S (New Series)			RE 21601/12.2004
	Size 6、10 16、22	up to 31.5 MPa	up to 450L/min	

Features:

- For use in vertical stacking assemblies
- For the leak free closure of one or two service ports
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Functional, section

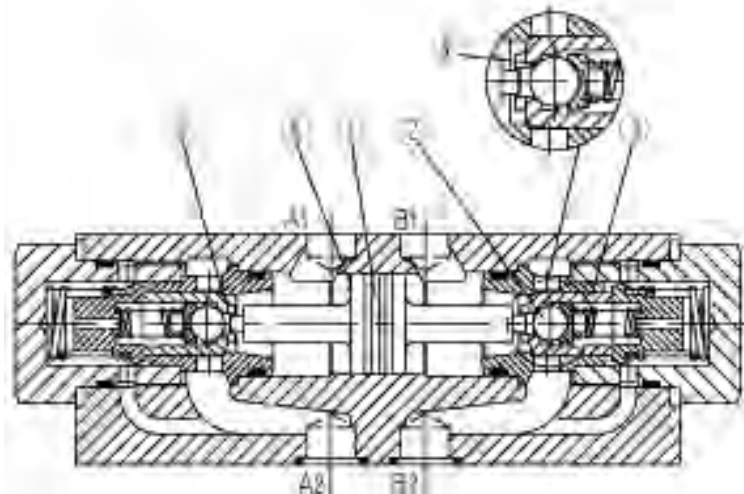
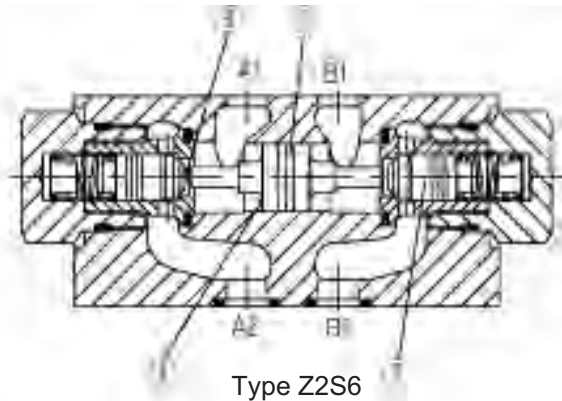
Hydraulic pilot operated check valves type Z2S are of sandwich plate design.

They are used for the leak-free closure of one or two service ports, even for long periods.

Free flow occurs from A1 to A2 or E the opposite direction is blocked.

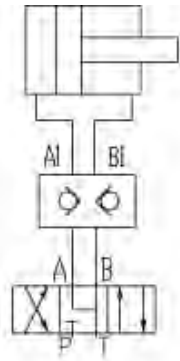
When fluid flows from A1 to A2, the pressured and is pushed to the right opening the ball poppet valve (2) with the poppet (3).

In order to ensure correct closing of service ports of the directional valve connected to tank in the neutral position.



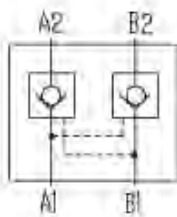
- 1 Spool
- 2 Ball poppet valve
- 3 Poppet
- 4 Area A1
- 5 Area A2
- 6 Area A3

Typical circuit example

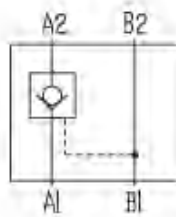


Symbols

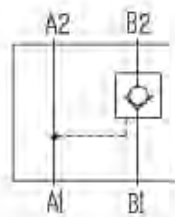
Z2S.../



Z2S...A.../



Z2S...B.../



Ordering details



Size6	= 6
Size10	= 10
Size16	= 16
Size22	= 22

Further details in clear text

No code = Mineral oils

V = Phosphate ester

B = The technology of Beijing Huade Hydraulic

30 = Series 30 to 39 (Apply to size 10)

(30 to 39: unchanged installation and connection dimensions)

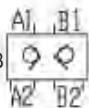
50 = Series 50 to 59 (Apply to size 16,22)

(50 to 59: unchanged installation and connection dimensions)

60 = Series 60 to 69 (Apply to size 6)

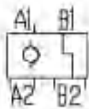
(60 to 69: unchanged installation and connection dimensions)

Leak free closure of ports A and B



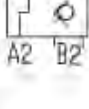
= No code

Leak free closure of port A



= A

Leak free closure of port B



= B

1 = Cracking pressure 0.15MPa (only for size 6, 10)

Cracking pressure 0.3MPa (only for size 16, 22)

2 = Cracking pressure 0.3MPa

Cracking pressure 0.5MPa (only for size 16,22)

3 = Cracking pressure 0.6MPa (only for size 10)

Cracking pressure 0.7MPa (only for 6)

Cracking pressure 0.75MPa (only for 16, 22)

4 = Cracking pressure 1.0MPa (only for 10, 16, 22)

Technical data

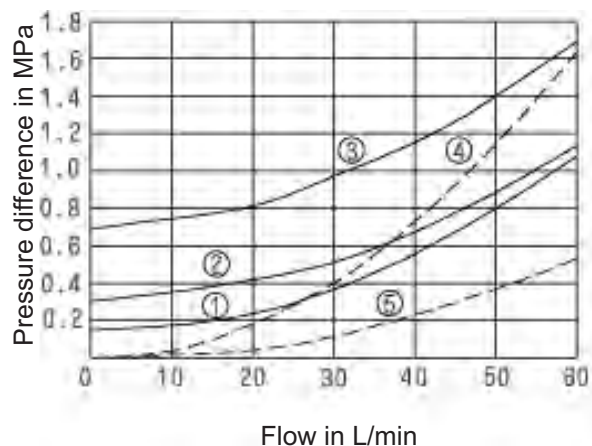
Size		6	10	16	22
Max. flow L/min	(L/min)	to 60	to 120	to 300	to 450
Max. operating pressure	(MPa)	31.5			
Cracking pressure	(MPa)	see curve			
Directions		see symbols			
Area ratio		A1/A2=1:3	A1/A2=1:11.45	A1/A2=1:11.8	A1/A2=1:13.6
			A3/A2=12.86	A3/A2=12.8	A3/A2=12.8
Pressure fluid		Mineral oils(for NBR seal) or phosphate ester(for FPM seal)			
Pressure fluid temperature range	(°C)	-30 to +80			
Viscosity range	(mm ² /s)	2.8 to 500			
Weight	(kg)	approx. 0.8	approx. 3	approx. 6.5	approx. 12

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Type Z2S6

— = A1 → A2; B1 → B2
 - - - = A2 → A1; B2 → B1

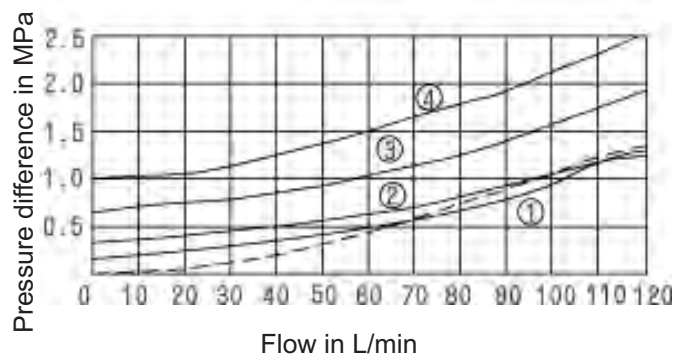
- 1、Cracking pressure 1=0.15MPa
- 2、Cracking pressure 2=0.3MPa
- 3、Cracking pressure 3=0.7MPa
- 4、Through check valve cartridge
- 5、Flow freely
 (Without check valve cartridge type "A" and type "B")



Type Z2S10

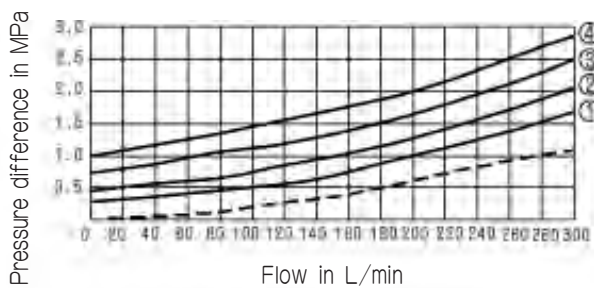
— = A1 → A2; B1 → B2
 - - - = A2 → A1; B2 → B1

- 1、Cracking pressure 1=0.15MPa
- 2、Cracking pressure 2=0.3MPa
- 3、Cracking pressure 3=0.6MPa
- 4、Cracking pressure 4=1.0MPa



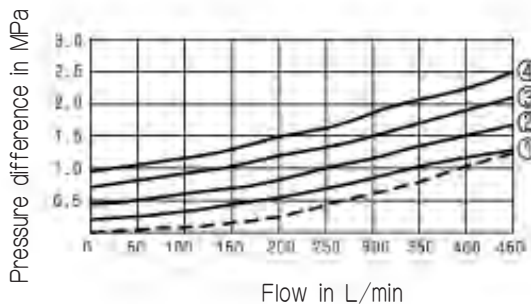
Type Z2S16

- = A1 → A2, B1 → B2
- = A2 → A1, B2 → B1



Type Z2S22

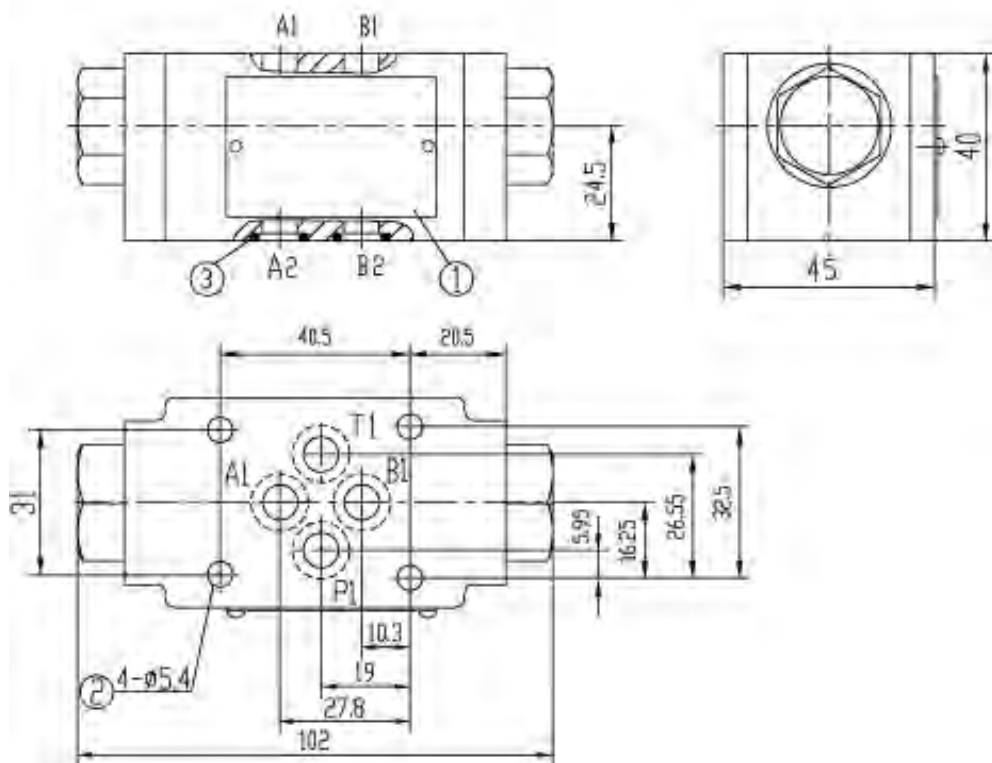
- = A1 → A2, B1 → B2
- = A2 → A1, B2 → B1



Unit dimensions

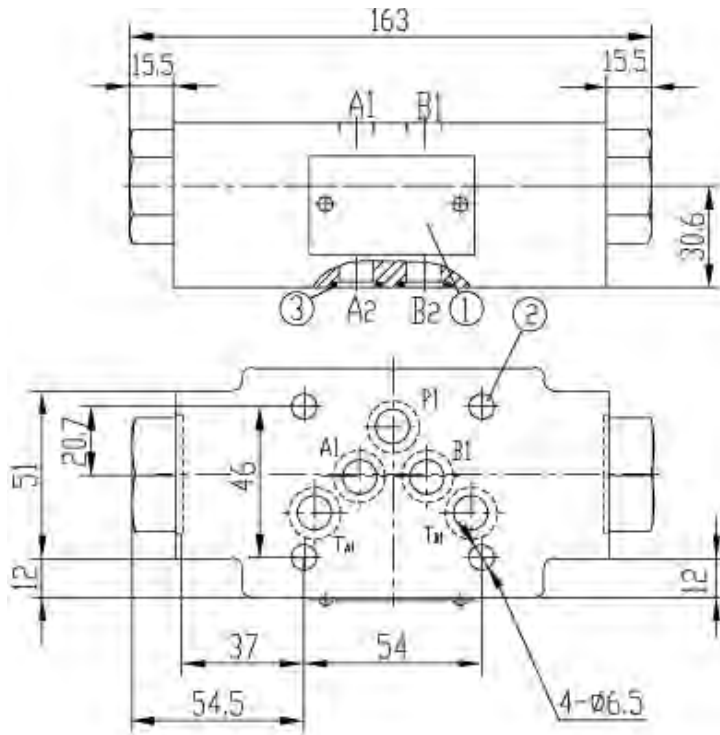
(Dimensions in mm)

Size6



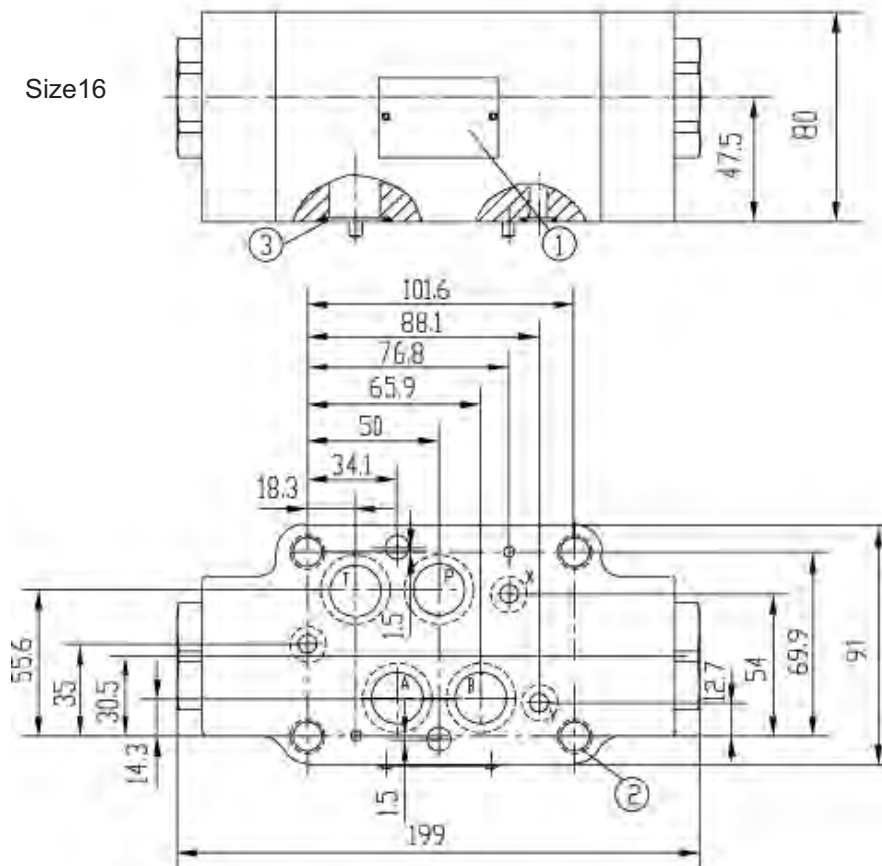
1. Name plate
 2. Holes for mounting
 3. O-rings 9.25 x 1.78 for four ports
- Valve fixing screws 4 - M5 -10.9
(GB/T70.1-2000)
Screw torque: $M_A = 8.9\text{Nm}$

Size10



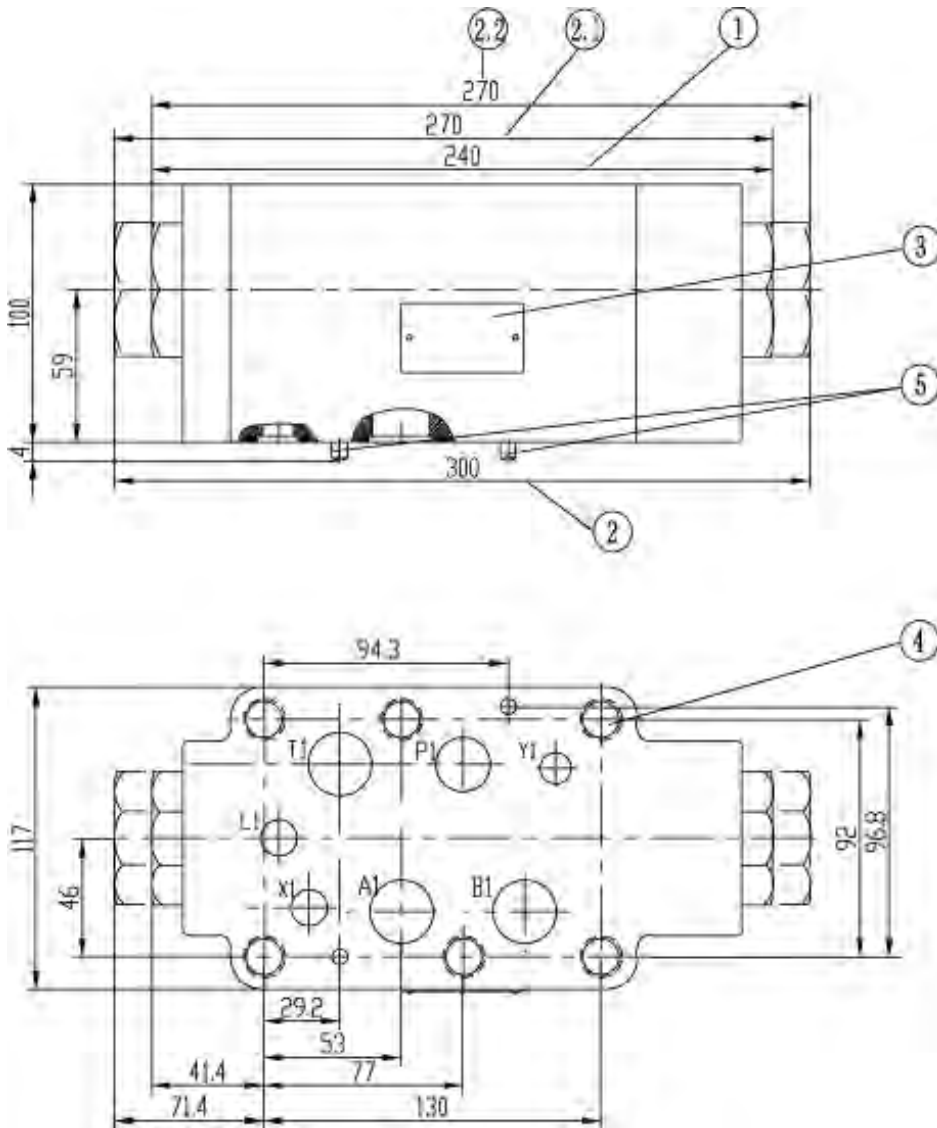
1. Nameplate
2. Holes for mounting
4 - ϕ 6.5
3. O-rings 12x 2 for 5 ports
P、A、B、 T_{A1} 、 T_{B1}
Valve fixing screws
4-M6 -10.9
(GB/T70.1-2000)
Screw torque: $M_A=15.5\text{Nm}$

Size16



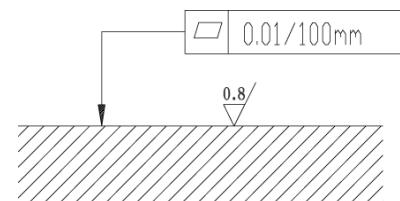
1. Nameplate
2. Holes for mounting
3. O-rings 22x 2.5 for ports
P、A、B、T
10X2 for ports X、Y、L
Valve fixing screws:
① 4-M10 -10.9
(GB/T70.1-2000)
Screw torque: $M_A=75\text{Nm}$
② 2-M6 -10.9
(GB/T70.1-2000)
Screw torque: $M_A=15.5\text{Nm}$

Size22



- 1 Cracking pressure 0.3MPa or 0.5MPa , Leak free closure of ports A and B
- 2 Cracking pressure 0.75MPa or 1.0MPa , Leak free closure of ports A and B
- 2.1 Cracking pressure 0.75MPa or 1.0MPa , Leak free closure of port A
- 2.2 Cracking pressure 0.75MPa or 1.0MPa , Leak free closure of port B
- 3 Label plate
- 4 Valve fixing screws:
- 6- M14-10.9 (GB/T70.1-2000),
Screw torque: $M_A=205\text{Nm}$
- 5 Fixing pin

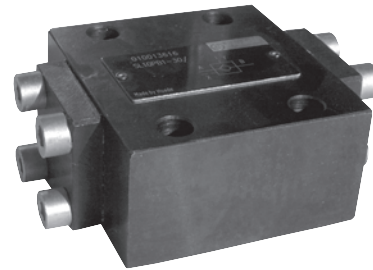
Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated check valves, Types SV and SL...30B/			RE 21467/12.2004
	size 10 to 30	up to 31.5 MPa	up to 400L/min	Replaces: RE 21467/05.2001

Features:

- Check valve controlled by fluid
- For subplate mounting, Mounting pattern to DIN 24 340
- Subplate or screw threaded connection
- With or without leakage port
- With or without pre-opening
- Type with pre-opening, dampened decompression
- 3 opening pressures



Function, section

SV and SL valves are hydraulic pilot operated check valves in poppet type design which may be opened to allow flow in either direction.

These valves are used for the isolation of operating circuits under pressure, as safeguard against the lowering of a load when a line break occurs or against creeping movements of hydraulically locked-in actuators.

Basically these valves consist of housing (1), poppet (2), compression spring (3), control spool (4) as well as a pre-opening, as poppet valve (5), optionally.

The valve enables free flow from A to B, in the counter direction the poppet (2) is held on its seat by the system pressure, additionally to the spring force.

Through the pressure connection at control port X the control piston (4) is moved to the right. This pushes the poppet (2) from the seat. Now the valve may also have a flow from B to A.

In order to ensure the proper opening of the valve via the control piston (4) a certain minimum control pressure is necessary

Type SV..A.. and SL..A.. (with pre-opening, section 1)

This valve has a additional pre-opening. Through pressure connection at control port X the control piston (4) is pushed to the right.

This first pushes the poppet (5) and then the poppet (2) from the seat. Now the valve may also have a flow from B to A.

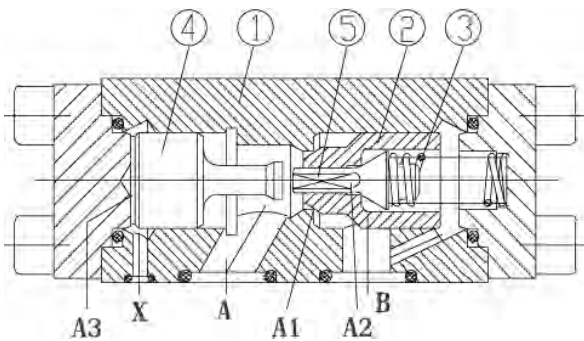
Because of the pre-opening there is a dampened decompression of the fluid under pressure. Through this possible pressure shocks are avoided.

Type SL... (with leakage port, section 2)

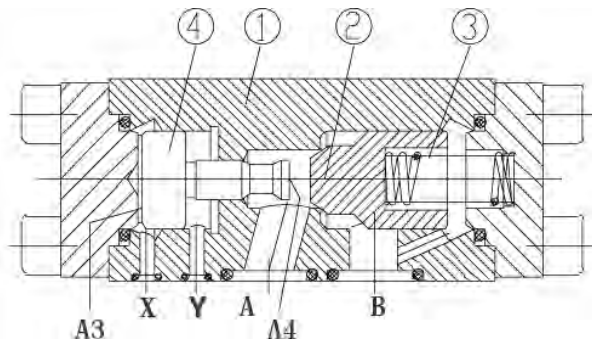
The function of this valve is principally the same as the valve SV.

The difference is the additional leakage port Y. With this the annulus area of the control piston (4) is separated from port A.

The pressure present at port A only effects area A_4 of the control piston (4).



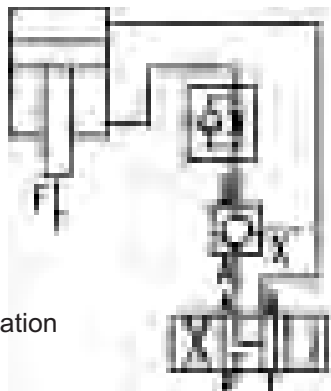
SV...PA (with pre-opening)



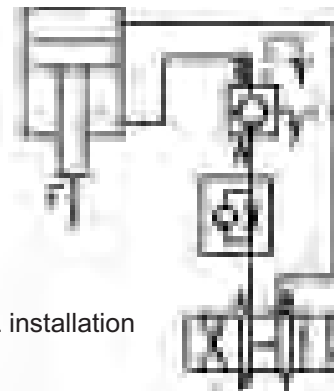
SL...PB (without pre-opening)

Type	A1 (cm ²)	A2 (cm ²)	A3 (cm ²)	A4 (cm ²)
SV/SL10	1.13	0.28	3.15	0.50
SV/SL20	3.14	0.78	9.62	1.13
SV/SL30	5.30	1.33	15.9	1.54

Typical Circuit Example



Type SV installation



Type SL installation

Ordering details

S								-	30	B	/	*
---	--	--	--	--	--	--	--	---	----	---	---	---

Without drain port	=V
With drain port	=L

Further details in clear text

No code =	Mineral oils
V =	Phosphate ester

Style	SV		SL	
Connection	G	P	G	P
ordering code				
Size10	=10	=10	=10	=10
Size15	=15	-	=15	-
Size20	=20	=20	=20	=20
Size25	=25	-	=25	-
Size30	=30	=30	=30	=30

B = The technology of Beijing Huade Hydraulic

30 = Series 30 to 39
(30 to 39: unchanged installation and connection dimensions)

1=	}	Cracking pressure
2=		See curve A to B
3=		

Plate mounting	=P
Thread connection	=G

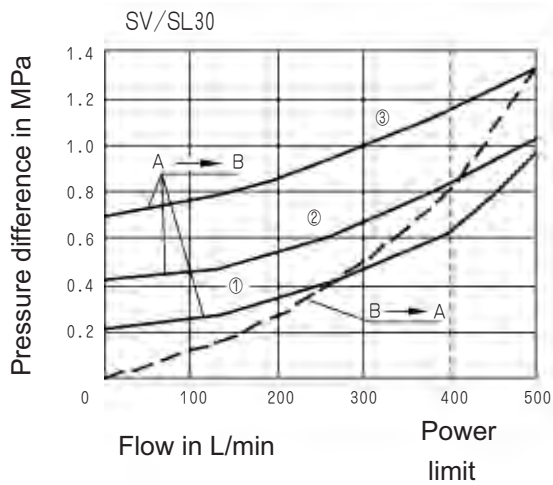
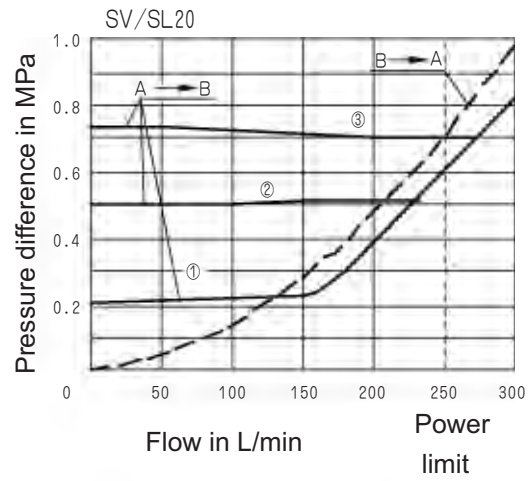
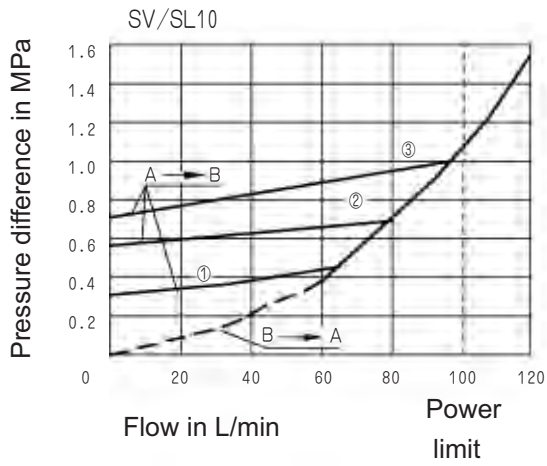
A=	With pilot valve
B=	Without pilot valve

Technical data

Type	SV10	SL10	SV15、20	SL15、20	SV25、30	SL25、30
Control volume - port X (cm ³)	2.2		8.7		17.5	
Control volume - port Y (cm ³)	-	1.9	-	7.7	-	15.8
Direction of flow	From A to B free, from B to A when pilot operated					
Operating pressure, max. (MPa)	to 31.5					
Control pressure, max. (MPa)	0.5~31.5					
Pressure fluid	Mineral oils(for NBR seal) or phosphate ester(for FPM seal)					
Pressure fluid temperature range (°C)	-30 to +80					
Viscosity range (mm ² /s)	2.8 to 500					
Weight (kg)	SV10	SL10	SV15、20	SL15、20	SV25、30	SL25、30
	2.5		4.0	4.5	8.0	

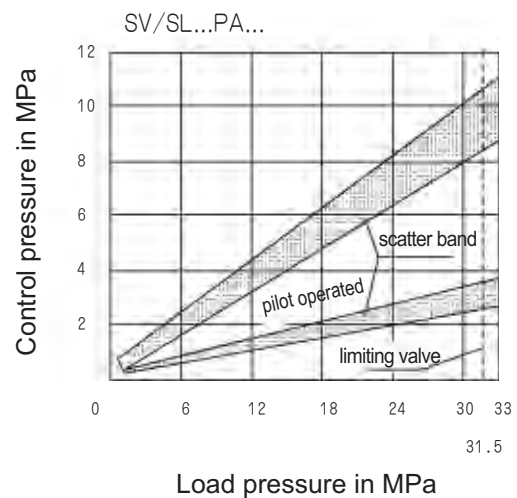
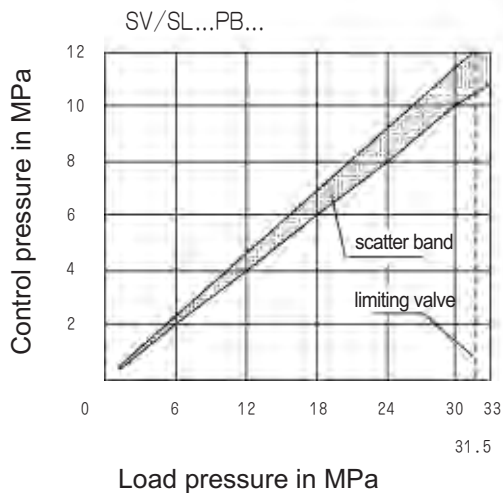
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Pressure difference / flow curves



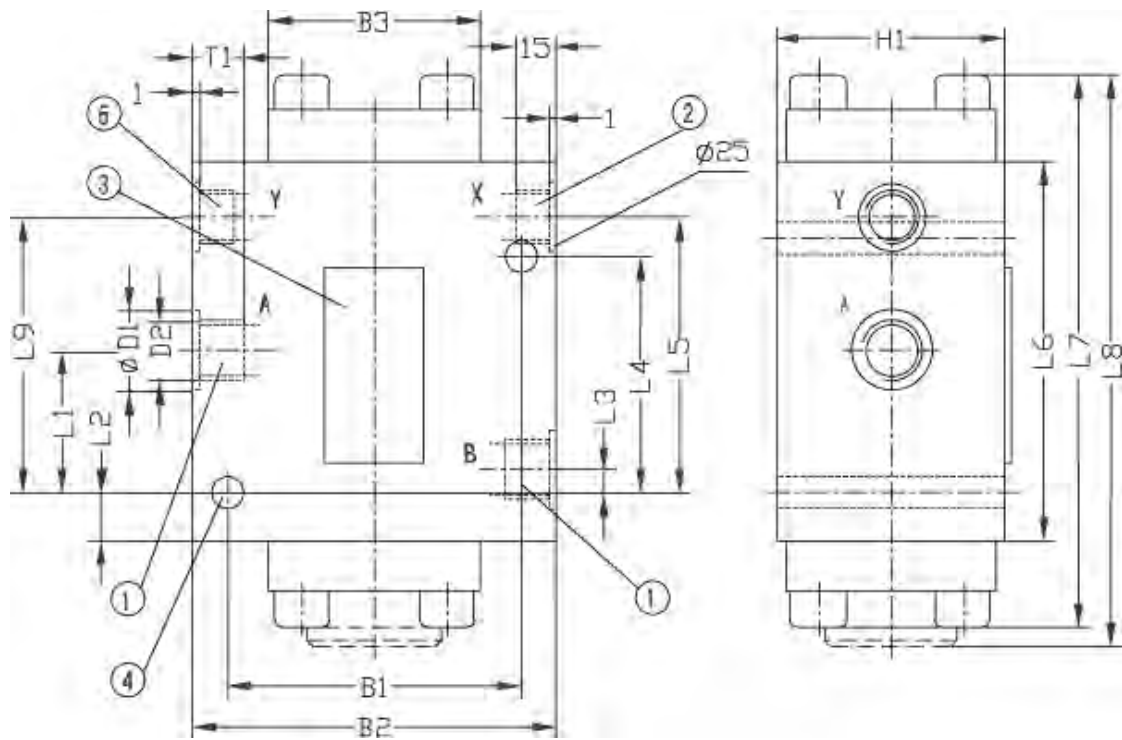
Curve one ,two and three are corresponding to one, two and three in the ordering code

Control pressure / Load pressure curves



Unit dimensions: for threaded connection

(Dimensions in mm)



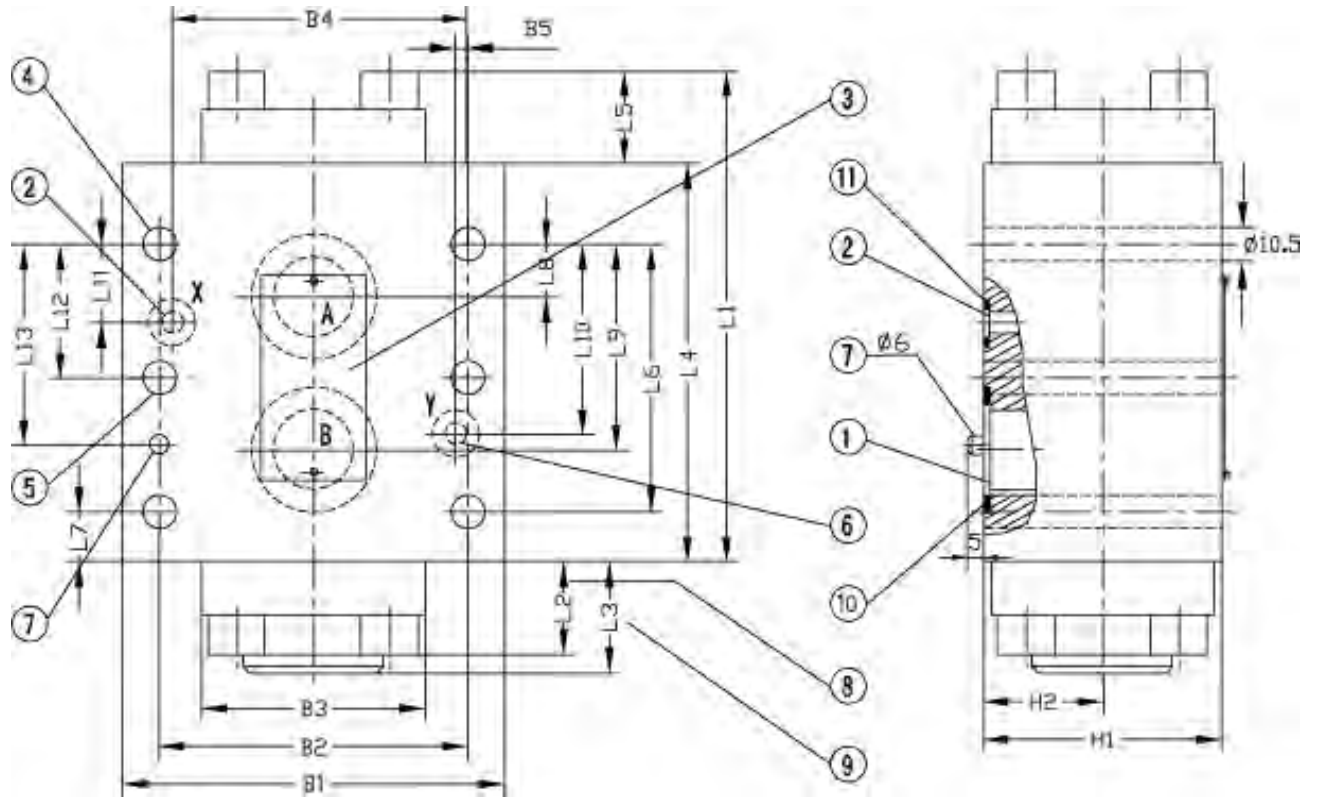
Type		B1	B2	B3	Φ D1	D2
SV	10	66.5	85	40	34	G1/2"or M22X1.5
	15	79.5	100	55	47	G3/4"or M27X2
	20	79.5	100	55	47	G1"or M33X2
	25	97	120	70	65	G1 1/4"or M42X2
	30	97	120	70	65	G1 1/2"or M48X2
SL	10	66.5	85	40	34	G1/2"or M22X1.5
	15	79.5	100	55	47	G3/4"or M27X2
	20	79.5	100	55	47	G1"or M33X2
	25	97	120	70	65	G1 1/4"or M42X2
	30	97	120	70	65	G1 1/2"or M48X2

- 1、 Ports A and B
- 2、 Port X, G1/4 "or M14X1.5
- 3、 Name plate
- 4、 Valve fixing holes Φ 10.5
- 5、 Port Y, G1/4 "or M14X1.5
- * Valve with cracking pressure "1" and "2" (dimension L7)
- * Valve with cracking pressure "3" (dimension L8)

Type		H1	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1
SV	10	42	27.5	18.5	10.5	33.5	49	80	116	116	-	14
	15	57	36.5	17.5	13	50.5	67.5	95	135	146	-	16
	20	57	36.5	17.5	13	50.5	67.5	95	135	146	-	18
	25	75	54.5	15.5	20.5	73.5	89.5	115	169	179	-	20
	30	75	54.5	15.5	20.5	73.5	89.5	115	169	179	-	22
SL	10	42	22.5	18.5	10.5	33.5	49	80	116	116	51.5	14
	15	57	30.5	17.5	13	50.5	72.5	100	140	151	72.5	16
	20	57	30.5	17.5	13	50.5	72.5	100	140	151	72.5	18
	25	75	51	15.5	20	84	99.5	125	179	189	99.5	20
	30	75	51	15.5	20	84	99.5	125	179	189	99.5	22

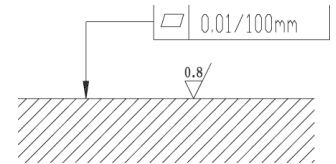
Unit dimensions: for subplate mounting

(Dimensions in mm)



- 1. Inlet ports A and B
- 2. Port X
- 3. Nameplate
- 4. 4 fixing holes with type SV/SL 10 SV/SL 20 valve
- 5. 6 fixing holes with type SV/SL 30 valve
- 6. Port Y with valve type "SL"
(with valve type "SV" this port is closed)
- 7. Fixing pin
- 8. Valve with cracking pressure types "1" and "2" (dimension L2)
- 9. Valve with cracking pressure types "3" (dimension L3)
- 10. O-ring
For ports A and B
O-ring 15 × 3 (size10)
O-ring 24 × 3 (size20)
O-ring 34 × 3 (size30)
- 11 For ports X and Y
O-ring 10 × 2.5
(size10,20,30)

Required surface finish of mating piece



Valve fixing screw
(included in goods)
Size10

4 - M10 × 50-10.9 (GB/T70.1-2000)

Screw torque: $M_A = 75\text{Nm}$

Size20

4 - M10 × 70-10.9 (GB/T70.1-2000)

Screw torque: $M_A = 75\text{Nm}$

Size30

6 - M10 × 85-10.9 (GB/T70.1-2000)

Screw torque: $M_A = 75\text{Nm}$

Subplate:

Size10 G460/01(G3/8") G460/02(M18 × 1.5)

G461/01(G1/2") G461/02(M22 × 2)

Size20 G412/01(G3/4") G412/02(M27 × 2)

G413/01(G1") G413/02(M33 × 2)

Size30 G414/01(G1 1/4") G414/02(M42 × 2)

G415/01(G1 1/2") G415/02(M48 × 2)

must be ordered separately order:

see page 204

Type	Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
SV	10	98	18	18	80	18	43	18.5	7.2	35.8	-
	20	115	20	31	95	20	60.5	17.3	11.1	49.2	-
	30	144	29	35	115	29	84	15.5	16.5	67.5	-
SL	10	98	18	18	80	18	43	18.5	7.2	35.8	21.5
	20	115	20	31	100	20	60.5	17.3	11.1	49.2	39.7
	30	144	29	35	125	29	84	15.5	16.5	67.5	59.5

Type	Size	L11	L12	L13	B1	B2	B3	B4	B5	H1	H2
SV	10	21.5	-	$32_{-0.3}^0$	85	66.5	40	58.5	-	42	21
	20	20.6	-	$44.5_{-0.2}^0$	100	79.5	55	73	-	57	28.5
	30	24.5	42	$63_{-0.3}^0$	120	97	70	92.8	-	75	37.5
SL	10	21.5	-	$32_{-0.3}^0$	85	66.5	40	58.5	7.9	42	21
	20	20.6	-	$44.5_{-0.2}^0$	100	79.5	55	73	6.4	57	28.5
	30	24.5	42	$63_{-0.3}^0$	120	97	70	92.8	3.8	75	37.5

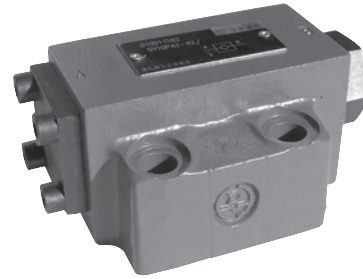
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated check valves, Types SV and SL...40B/ (new series)			RE 21500/12.2004
	Size 10 to 32	up to 31.5 MPa	up to 550L/min	

Features:

- check valve controlled by fluid
- For subplate mounting, Mounting pattern to DIN 24 340
- Subplate or screw threaded connection
- With or without leakage port
- With or without pre-opening
- Type with pre-opening, dampened decompression
- 4 opening pressures
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function, section, symbols

SV and SL valves are hydraulic pilot operated check valves in poppet type design which may be opened to allow flow in either direction.

These valves are used for the isolation of operating circuits under pressure, as safeguard against the lowering of a load when a line break occurs or against creeping movements of hydraulically locked-in actuators.

Basically these valves consist of housing (1), poppet (2), compression spring (3), control spool (4) as well as a preopening, as ball poppet valve (5), optionally.

The valve enables free flow from A to B, in the counter direction the poppet (2) is held on its seat by the system pressure, additionally to the spring force.

Through the pressure connection at control port X the control piston (4) is moved to the right. This pushes the poppet (2) from the seat. Now the valve may also have a flow from B to A.

In order to ensure the proper opening of the valve via the control piston (4) a certain minimum control pressure is necessary

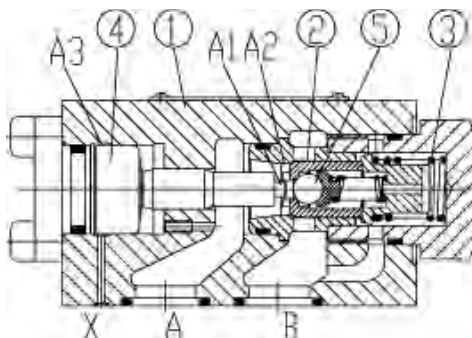
Type SV..A.. and SL..A.. (with pre-opening, section 1)

This valve has a additional pre-opening. Through pressure connection at control port X the control piston (4) is pushed to the right.

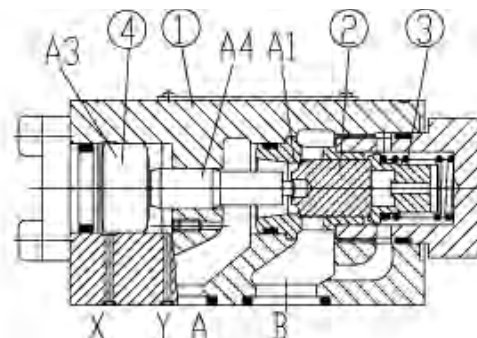
This first pushes the ball (5) and then the poppet (2) from the seat. Now the valve may also have a flow from B to A. Because of the pre-opening there is a dampened decompression of the fluid under pressure. Through this possible pressure shocks are avoided.

Type SL... (with leakage port, section 2)

The function of this valve is principally the same as the valve SV. The difference is the additional leakage port Y. With this the annulus area of the control piston (4) is separated from port A. The pressure present at port A only effects area A_4 of the control piston (4).



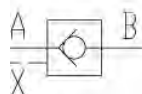
Type SV..PA (without leakage port, with pre-opening)



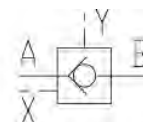
Type SL..PB (with leakage port, without pre-opening)

Symbols:

Type SV



Type SL



Ordering details

		S				-	40	B	/		*
--	--	---	--	--	--	---	----	---	---	--	---

Without leakage port	=V
With leakage port	=L

Further details in clear text

No code =	Mineral oils
V =	Phosphate ester

B = The technology of Beijing Huade Hydraulic

40 = Series 40 to 49
(40 to 49: unchanged installation and connection dimensions)

1=	}	Cracking pressure See curve A to B
2=		
3=		
4=		

Style	SV		SL	
Connection	G	P	G	P

Ordering code

Size10	=10	=10	=10	=10
Size16	=15	-	=15	-
Size20	=20	=20	=20	=20
Size25	=25	-	=25	-
Size32	=30	=30	=30	=30

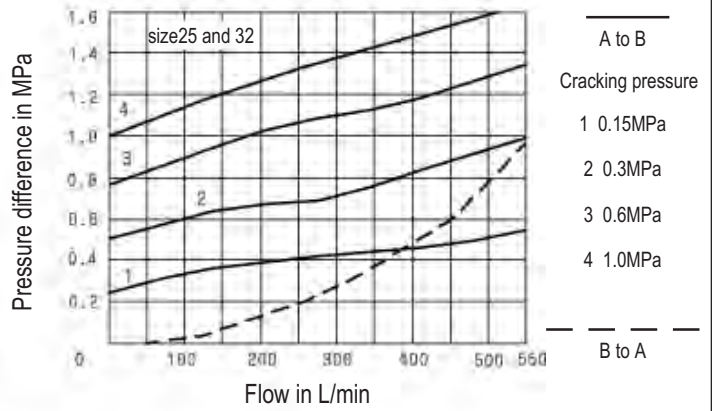
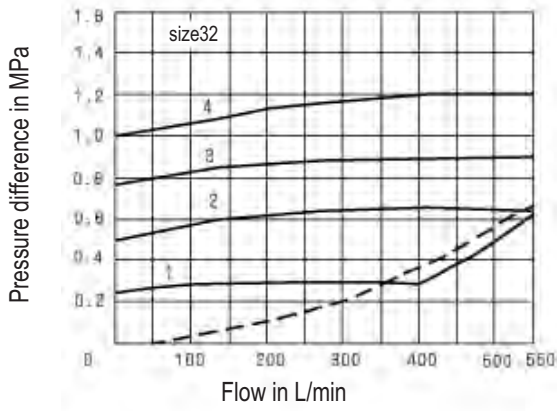
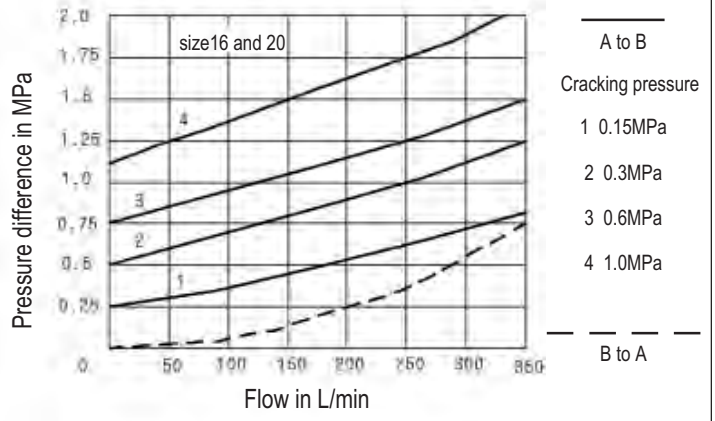
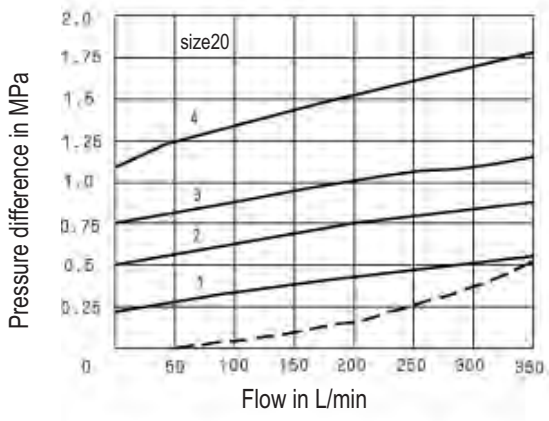
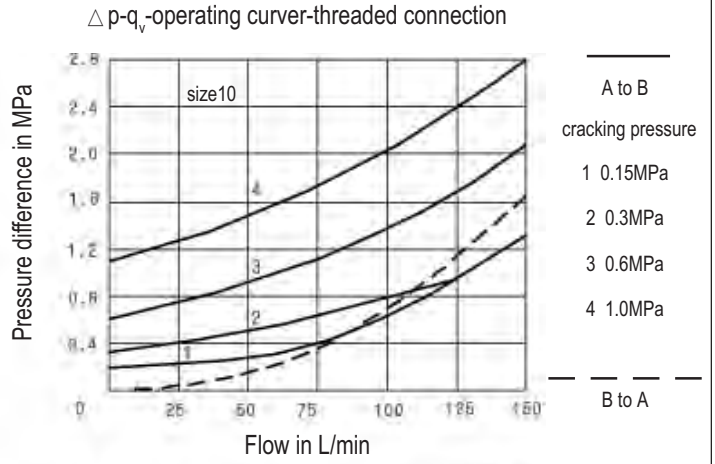
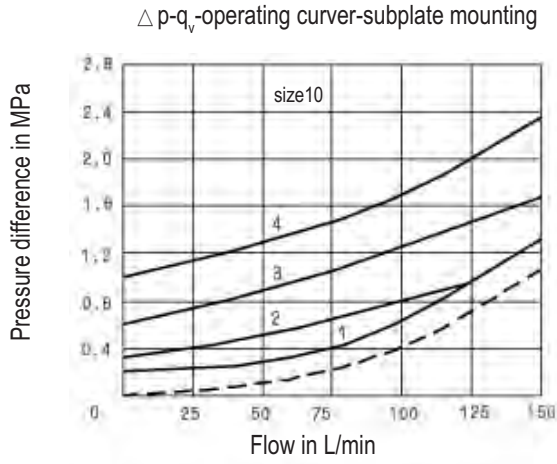
Plate mounting	=P
Thread connection	=G

A=	With pre-opening
B=	Without pre-opening

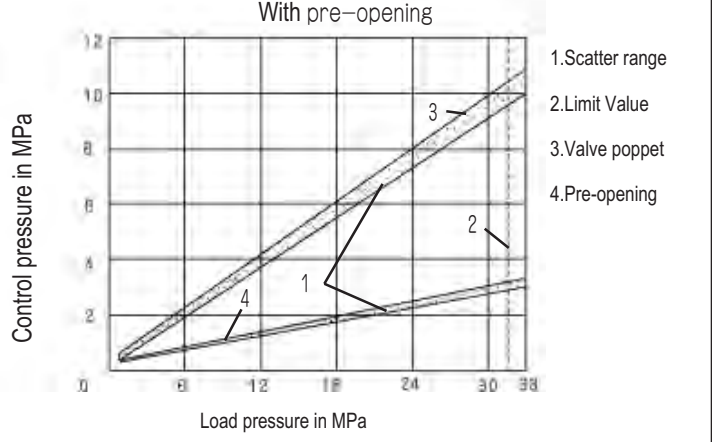
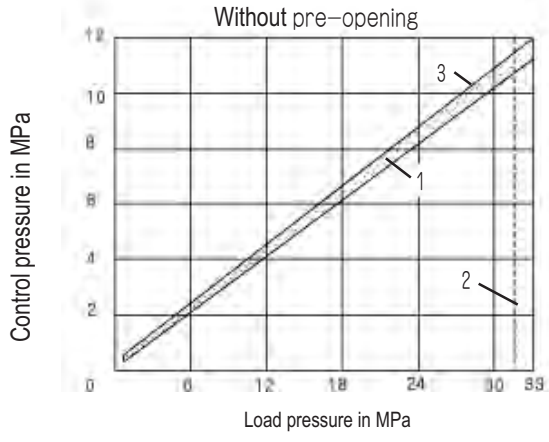
Technical data

Style		10	16	20	25	30
Weight	- subplate mounting (kg)	1.8	-	4.7	-	7.8
	- threaded connection (kg)	2.1	5.4	5.4	10	10
Installation position (MPa)		Optional				
Direction of flow (MPa)		From A to B free, from B to A through opening				
Operating pressure, max. (MPa)		0.5~31.5				
Control pressure, max. (MPa)		0.5~31.5				
Control volume - port X (cm ³)		2.5	10.8	10.8	19.27	19.27
Control volume - port Y (cm ³)		2.0	9.6	9.6	17.5	17.5
Control areas	- area A1 (cm ²)	1.3	3.46	3.46	5.72	5.72
	- area A2 (cm ²)	0.33	0.7	0.7	1.33	1.33
	- area A3 (cm ²)	3.8	10.17	10.17	16.61	16.61
	- area A4 (cm ²)	0.79	1.13	1.13	1.54	1.54
Pressure fluid		Mineral oils(for NBR seal) or phosphate ester(for FPM seal)				
Pressure fluid temperature range (°C)		- 30 to + 80				
Viscosity range (mm ² /s)		2.8 to 500				

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

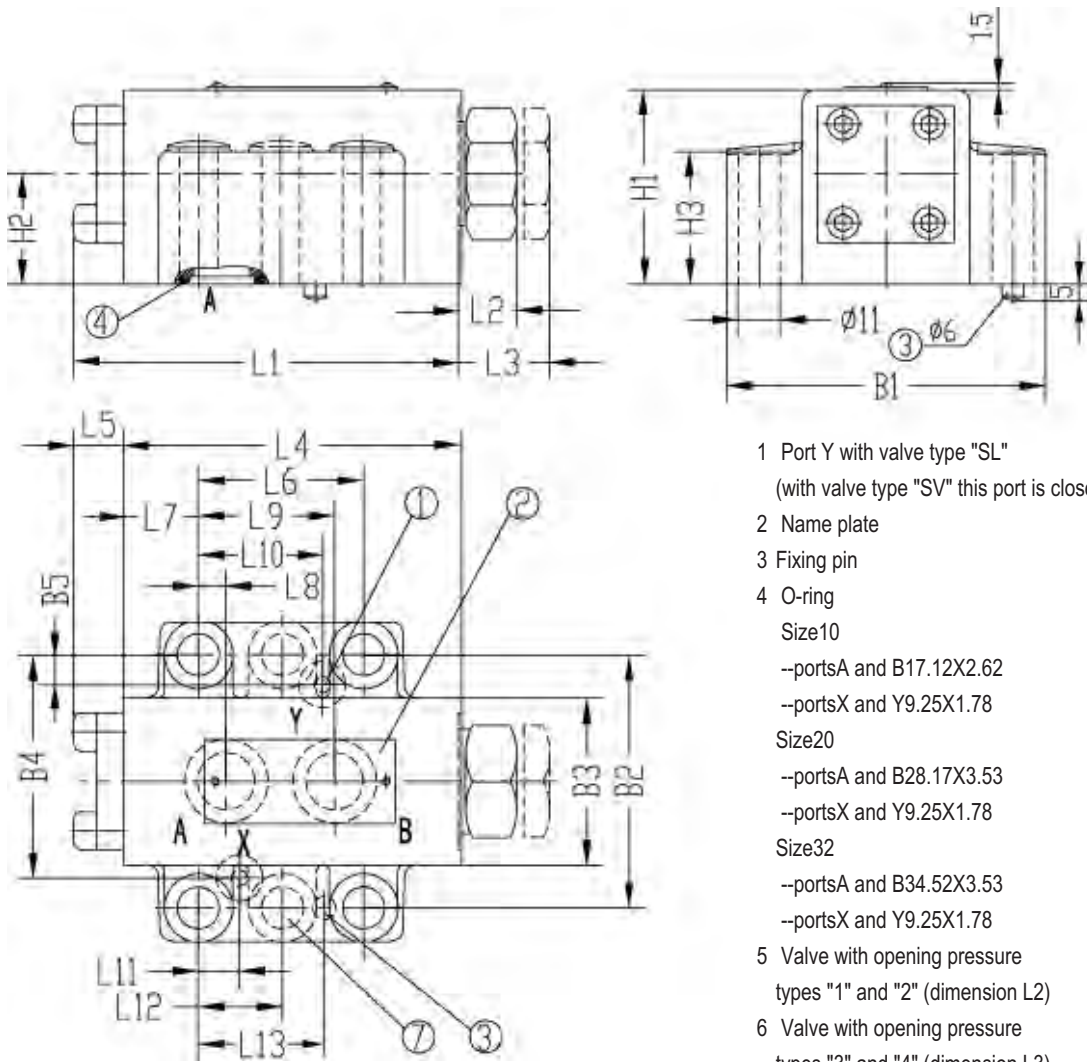


Control pressure-load pressure-operating curves



Unit dimensions: for subplate mounting

(Dimensions in mm)



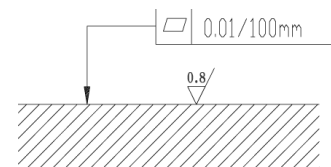
- 1 Port Y with valve type "SL"
(with valve type "SV" this port is closed)
- 2 Name plate
- 3 Fixing pin
- 4 O-ring
Size10
--portsA and B17.12X2.62
--portsX and Y9.25X1.78
Size20
--portsA and B28.17X3.53
--portsX and Y9.25X1.78
Size32
--portsA and B34.52X3.53
--portsX and Y9.25X1.78
- 5 Valve with opening pressure types "1" and "2" (dimension L2)
- 6 Valve with opening pressure types "3" and "4" (dimension L3)
- 7 6 valve fixing holes with type SV/SL 30 (valves fitting screws included in goods)
Size10
4 M10 × 50-10.9 (GB/T70.1-2000) M_A=75N.m
Size20
4 M10 × 70-10.9 (GB/T70.1-2000) M_A=75N.m
Size30
6 M10 × 85-10.9 (GB/T70.1-2000) M_A=75N.m

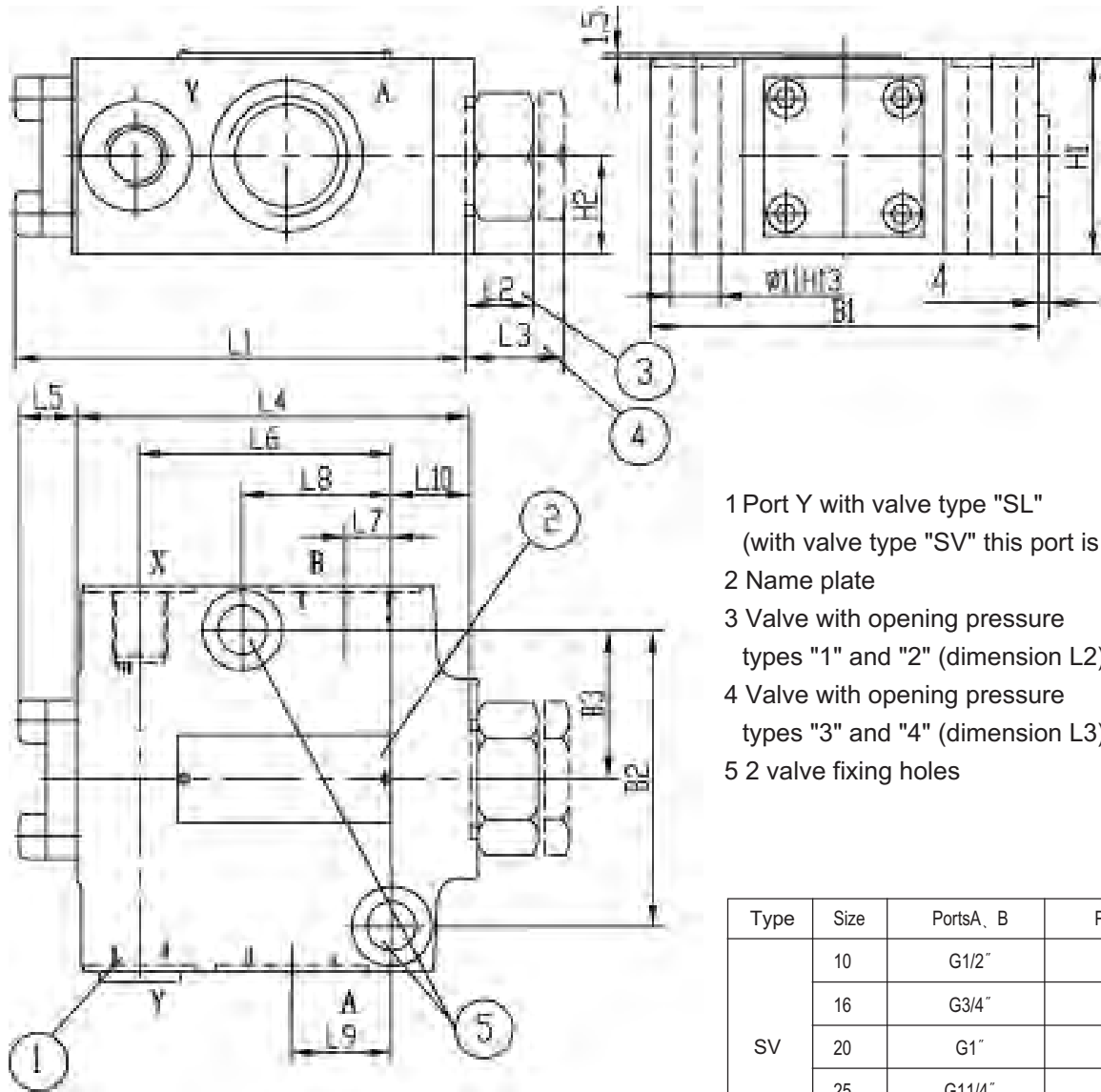
Valve type	Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
SV	10	100.8	15.5	15.5	87.8	13	42.9	18.5	7.2	35.8	-
	20	135	17.7	47.7	117	18	60.3	27.5	11.1	49.2	-
	30	156.1	36.1	46.1	134	22.1	84.2	39	16.7	67.5	-
SL	10	100.8	15.5	15.5	87.8	13	42.9	18.5	7.2	35.8	21.5
	20	135	17.7	47.7	117	18	60.3	27.5	11.1	49.2	39.5
	30	156.1	36.1	46.1	134	22.1	84.2	39	16.7	67.5	59.5

Valve type	Size	L11	L12	L13	B1	B2	B3	B4	B5	H1	H2	H3
SV	10	21.5	-	31.8	84	66.7	44	58.8	-	51	29	36
	20	20.6	-	44.5	100	79.4	61	73	-	70	37	55
	30	24.6	42.1	62.7	118	96.8	75	92.8	-	85	42.5	70
SL	10	21.5	-	31.8	84	66.7	44	58.8	7.9	51	29	36
	20	20.6	-	44.5	100	79.4	61	73	6.4	70	37	55
	30	24.6	42.1	62.7	118	96.8	75	92.8	3.8	85	42.5	70

Subplate:
must be ordered separately. see page 204
Size10 G460/01(G3/8") G461/01(G1/2")
Size20 G412/01(G3/4") G413/01(G1")
Size30 G414/01(G1 1/4") G415/01(G1 1/2")

Required surface finish of mating piece





- 1 Port Y with valve type "SL"
(with valve type "SV" this port is closed)
- 2 Name plate
- 3 Valve with opening pressure types "1" and "2" (dimension L2)
- 4 Valve with opening pressure types "3" and "4" (dimension L3)
- 5 2 valve fixing holes

Type	Size	PortsA, B	PortsX, Y
SV	10	G1/2"	G1/4"
	16	G3/4"	G1/4"
	20	G1"	G1/4"
	25	G1 1/4"	G1/4"
	30	G1 1/2"	G1/4"
SL	10	G1/2"	G1/4"
	16	G3/4"	G1/4"
	20	G1"	G1/4"
	25	G1 1/4"	G1/4"
	30	G1 1/2"	G1/4"

Valve type	Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2	B3	H1	H2
SV	10	100.8	15.5	15.5	87.8	13	56.5	10.5	33.5	22.5	17.3	87	66.7	33.4	44	22
	16;20	133	17.7	47.7	115	18	74.5	17	50.5	36	27	105	79.4	39.7	68	34
	25;32	156.1	35.7	45.7	134	22.1	101	24	84	49	18	130	96.8	48.4	85	42.5
SL	10	100.8	15.5	15.5	87.8	13	56.5	10.5	33.5	22.5	17.3	87	66.7	33.4	44	22
	16;20	133	17.7	47.7	115	18	74.5	17	50.5	36	27	105	79.4	39.7	68	34
	25;32	156.1	35.7	45.7	134	22.1	101	24	84	49	18	130	96.8	48.4	85	42.5

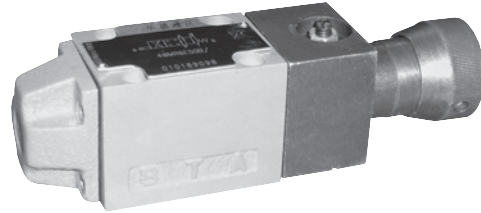
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves, manual operation, Type WMD			RE 23500/12.2004
	Size 6 to 10	up to 31.5 MPa	up to 120L/min	Replaces: RE 22279/05.2001

Features:

- Direct controlled directional spool valve
- subplate mounting
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Functional , section

Directional valves type WMD are manual operated directional spool valves. They control the start, stop and direction of a volume flow.

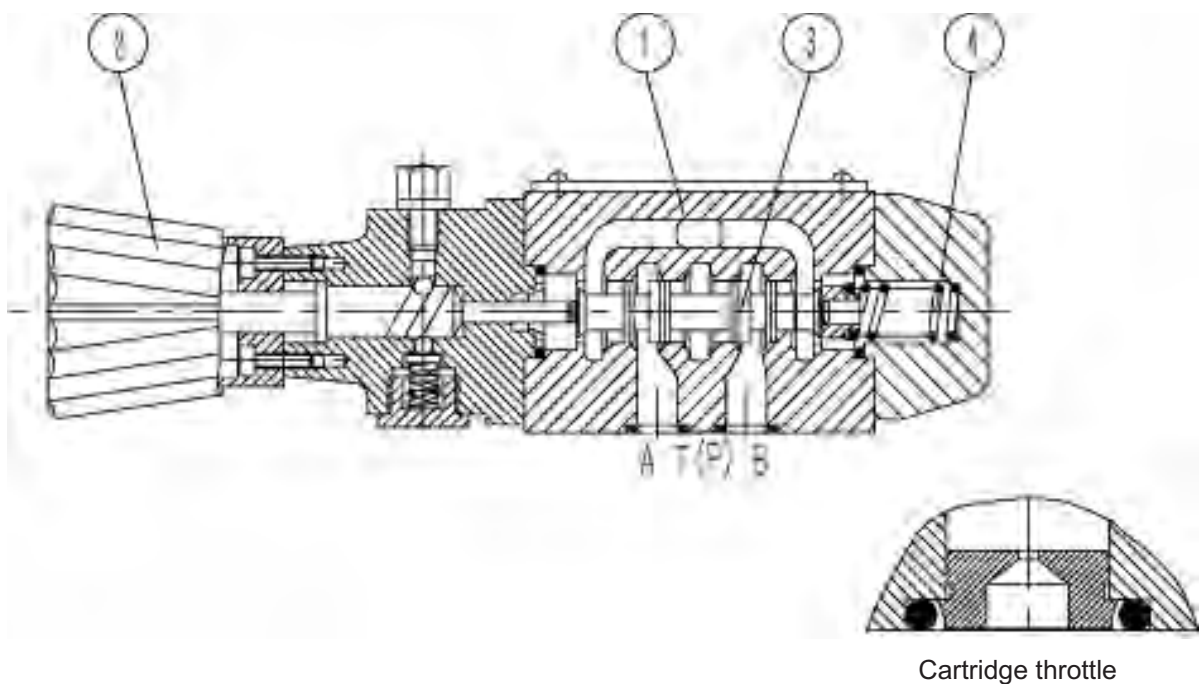
The valves consist basically of the housing (1), an operating rotary knob(2), the control spool (3), and one return springs (4). In an unoperated condition, the control spool (3) is held in the neutral or starting position by the return springs (4) - or by a detent .The control spool (3) is pushed into the required control position by means of the operating element.

Detent

Directional valves with rotary knob operation are supplied with detent as standard. it is possible to fix any control position.

Cartridge throttle

Use of the cartridge throttle is necessary when operating conditions are such, that during the switching process larger flows can occur than the performance limits of the valve allow. It is fitted in the P-line of the directional valve or in the control circuit.



Ordering detail



3 service ports =3
4 service ports =4

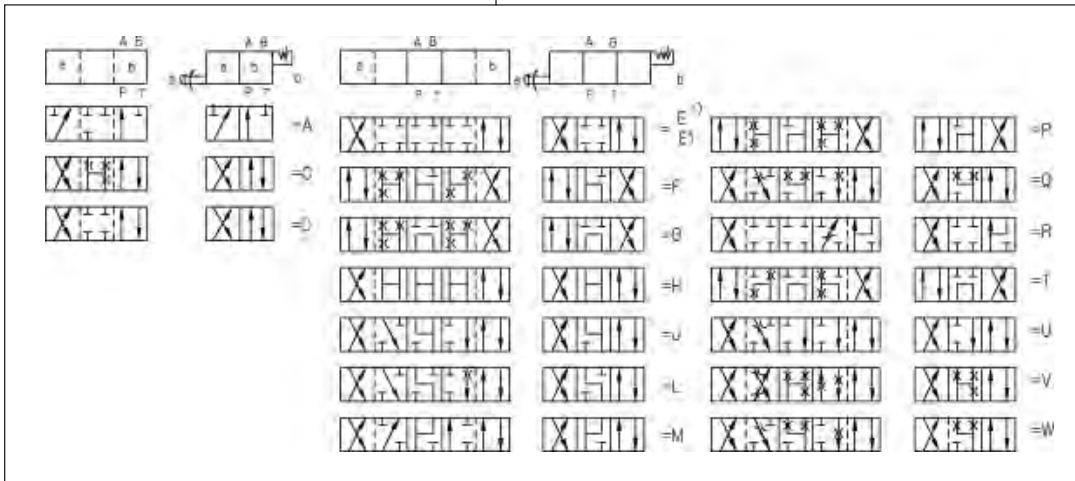
Size 6 =6
Size 10 =10

Further details in clear text

No code = Mineral oils
V = Phosphate ester

B = The technology of Beijing Huade Hydraulic

50 = Series 50 to 59 (50 to 59 = unchanged installation and connection dimensions) (size 6)
30 = Series 30 to 39 (30 to 39 = unchanged installation and connection dimensions) (size 10)



Symbol E1: P A/B pre-opening (only for size 6)

Example:

Spool type E with switched position "a", Ordering code ..EA..

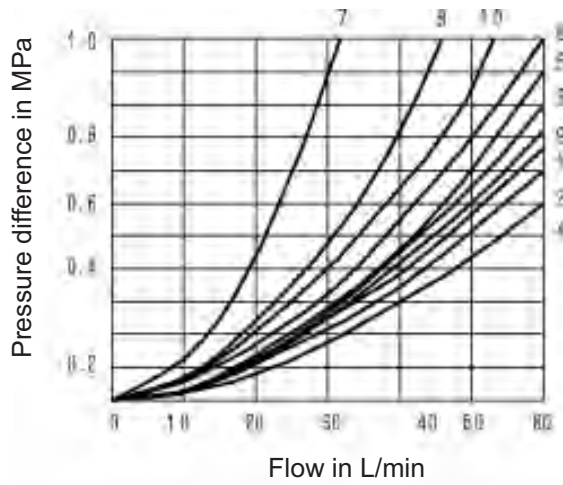
Spool type E with switched position "b", Ordering code ..EB..

Technical data (For applications outside these parameters, please consult us!)

Size	6	10
Operating pressure	ports A, B, P (MPa) up to 31.5	
	ports T (MPa) Up to 6	Up to 16
for symbols A or B, port T must be used as a drain port if the operating pressure is higher than the permissible tank pressure.		
Flow.max (L/min)	Up to 60	Up to 120
Flow cross section (control position O)	for symbol Q, 6% of nominal cross section	
	for symbol W 3% of nominal cross section	
Pressure fluid	Mineral oils(for NBR seal) or phosphate ester(for FPM seal)	
Pressure fluid - temperature range (°C)	-20 to +80	
Viscosity range (mm ² /s)	2.8 to 500	
Weights (Kg)	Approx.1.4	Approx.3.3
Operating force (N)	Approx.150	Approx.250

Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Pressure difference flow curves, type WMD6

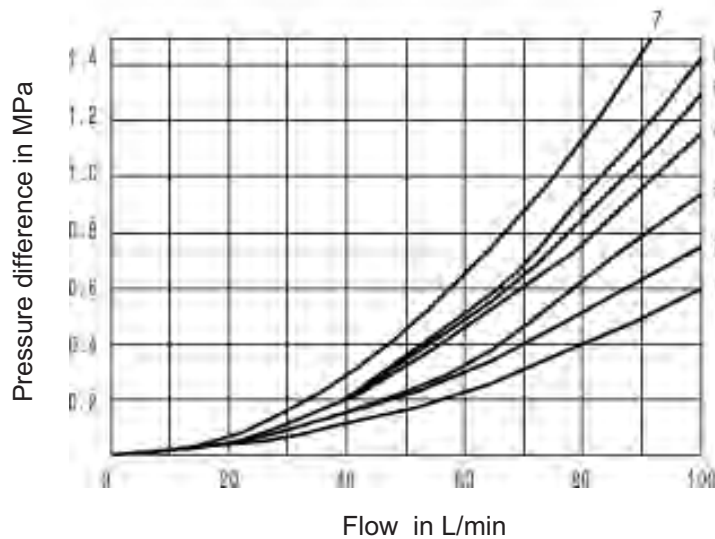


- 7.Symbol "R" in switched positions A-B
- 8.Symbol "G" and "T" in neutral position P-T

Symbol	Flow direction			
	P → A	P → B	A → T	B → T
A	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	-
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2

Pressure difference flow curves , type WMD10

- 4.Symbol "G" and "T" in neutral position P-T
- 7.Symbol "R" in switched positions A-B



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

Performance limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

The performance limits shown apply when the valve is subject to simultaneous flow in two directions (e.g. from P to A and from B to T).

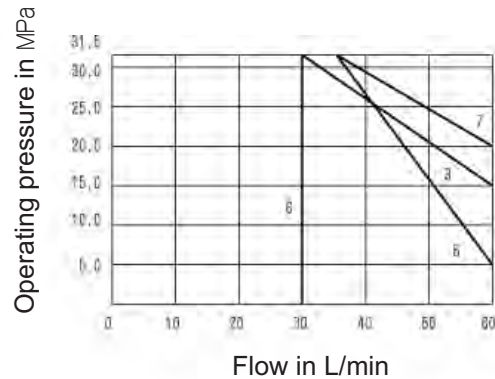
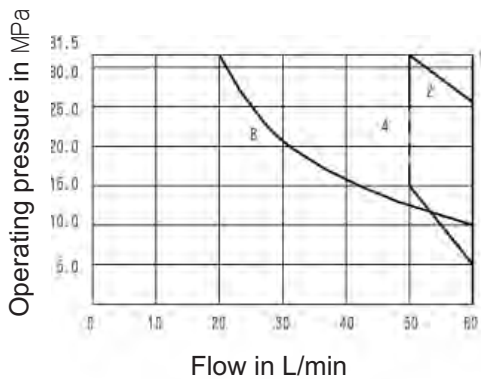
performance limits for one path(e.g. from P to A and with B blocked) may be considerably reduced!

(Please consult us in such cases.)

Due to the flow forces occurring within the valve, the permissible

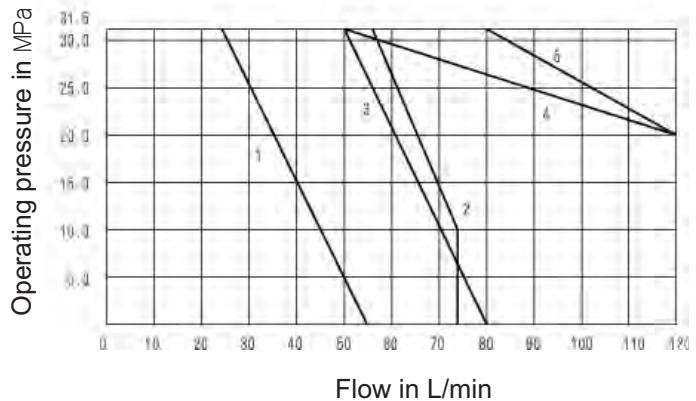
Type WMD6

Curve	Symbol
1	E, E1, H, C, D, M, Q, U, W
2	J, L
3	A
4	G, P
5	F
6	V
7	R
8	T

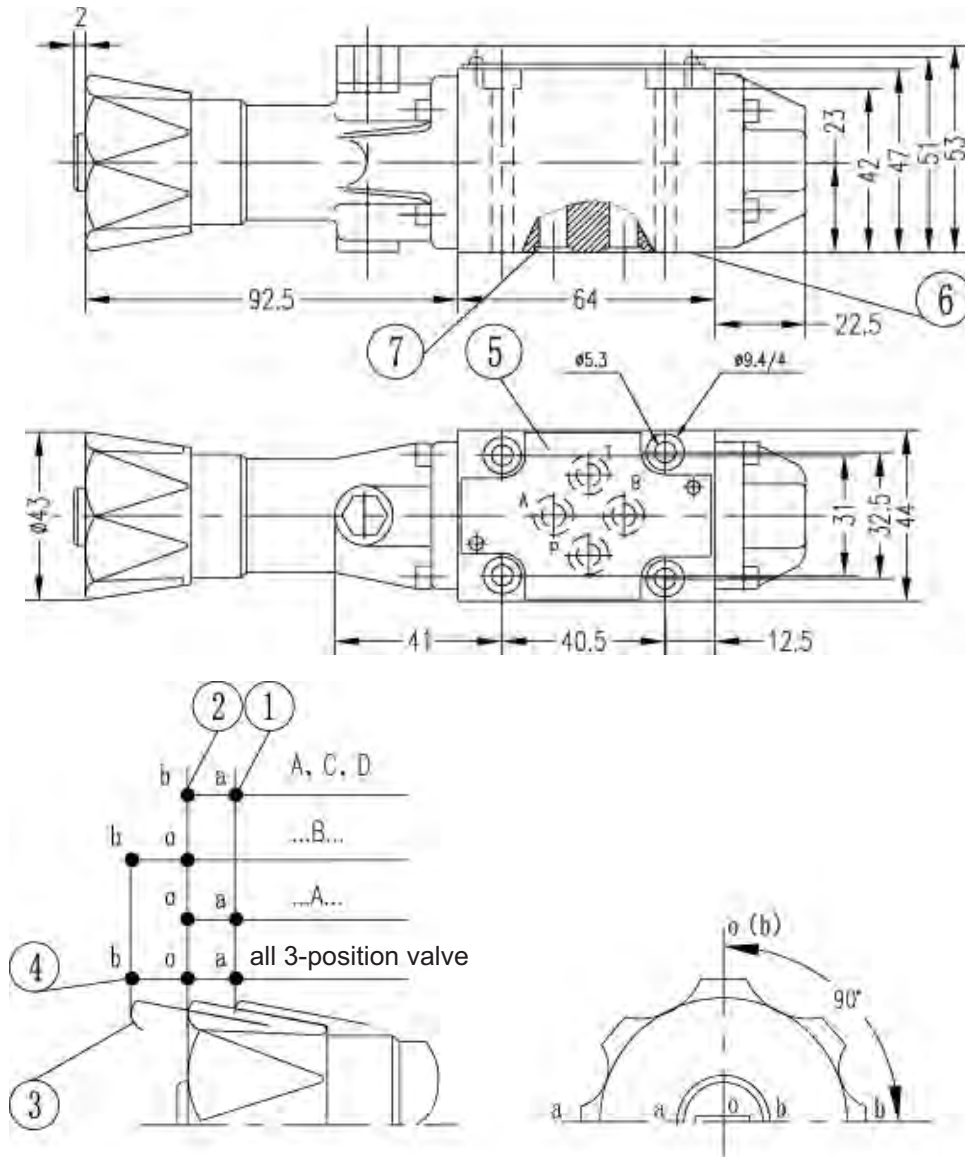


Type WMD10

Curve	Symbol
5	C, D, E, M, V, Y



Type WMD6



Unit dimensions for ports

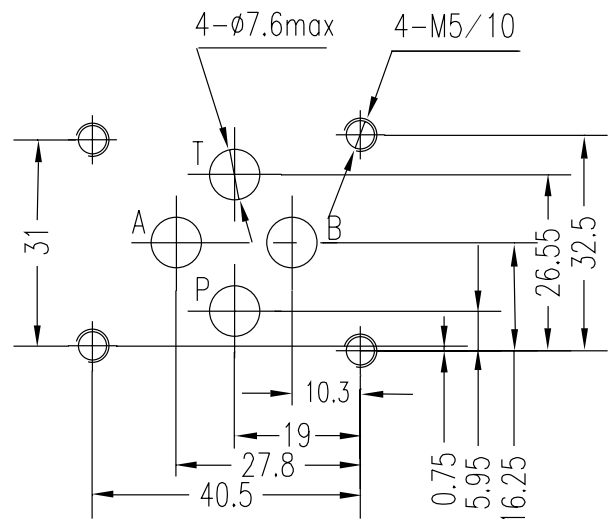
Subplates: see page 205

G341/01 (G1/4"); G341/02 (M14X1.5)

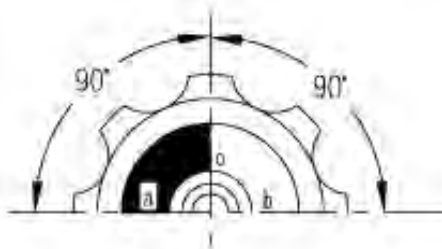
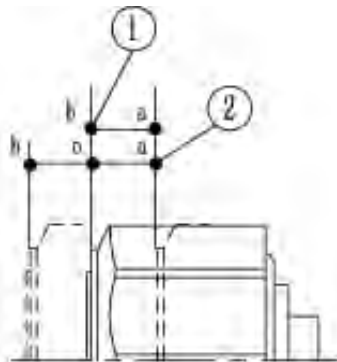
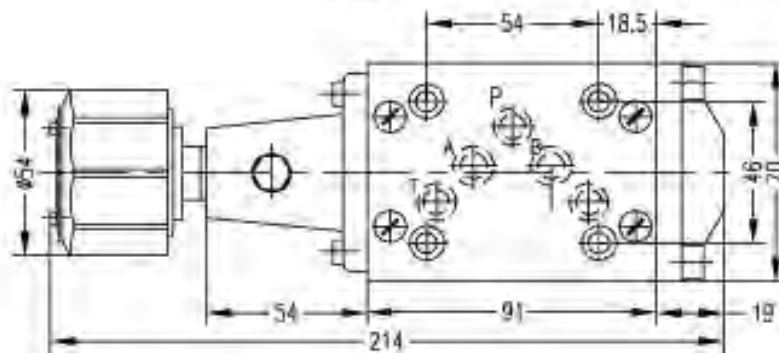
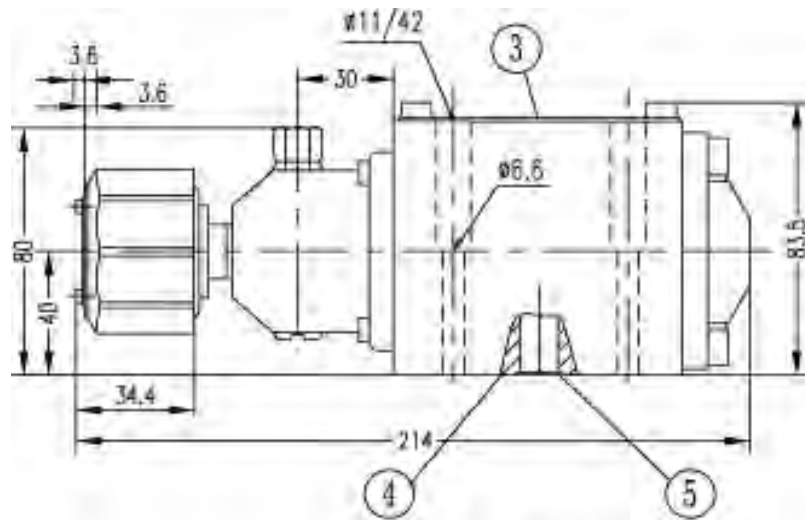
G342/01 (G3/8"); G342/02 (M18X1.5)

G502/01 (G1/2"); G502/02 (M22X1.5)

- 1. Switched position a
- 2. Switched position 0 and b
(b for 2-position valves)
- 3. Switched position b
- 4. Operating valve 90° clockwise and
90° anti-clockwise 3-position valve
- 5. Nameplate
- 6. Valve connecting surface
- 7. O-ring 9.25X1.78 (for ports A, B, P, and T)



Type WMD10



Unit dimensions for ports

Sub-plates: see page 206

G66/01 (G3/8"); G66/02 (M18X1.5)

G67/01 (G1/2"); G67/02 (M22X1.5)

G534/01 (G3/4"); G534/02 (M27X2)

1、 2-position valves: A、 C、 D、 ...EA...

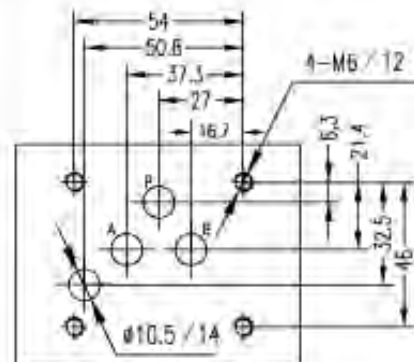
2、 3-position

3、 Nameplate

5、 Connecting surface

6、 O-ring 9.25X1.78

(for ports A、 B、 P、 and T)



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/3 and 4/2 directional control valves with hand lever, Type WMM			RE 22277/12.2004
	Size 6、10、 16、25	up to 35MPa	up to 450L/min	Replaces: RE 22275/05.2001

Features:

- Direct actuated directional spool valve with hand lever
- With spring return or detent, optional
- For subplate mounting
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



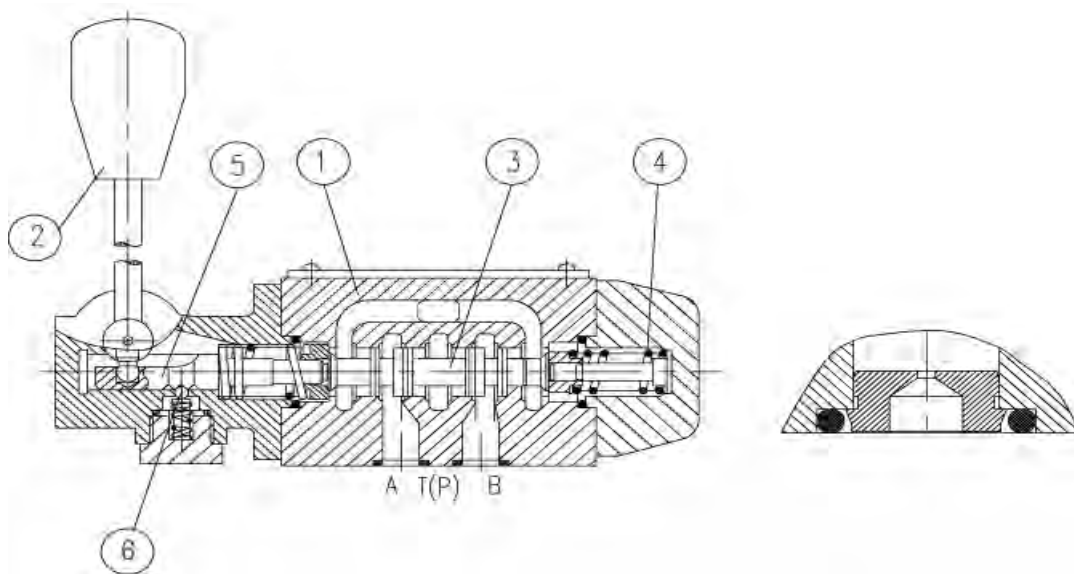
Function, section

The type WMM valves are hand lever actuated directional spool valves. They control the start, stop and direction of a flow.

The directional valves basically comprise of a housing (1), hand lever(2), control spool (3), as well as one or two return springs (4). In the unoperated condition the control spool (3) is held in the neutral or its initial position by the return springs (4). The control spool(3) is actuated via the hand lever (2), this acts via a joint and the pin(5) directly onto the control spool (3). The spool is thereby moved out of its rest position into its required switched position. After the hand lever (2) has been returned to the switched position zero, the spool (3) is returned to the neutral position via the return springs (4).

Type H-4WMM../F.. (with detent)

These valves are either 2 or 3 position directional control valves which are fitted with a detent (6), which operates in all of the switched positions.



Type 4WMM6

Ordering details

H- WM B / *

35MPa (Only Size 16, 25)

3 service ports = 3
4 service ports = 4

Size 6 = 6
Size 10 = 10
Size 16 = 16
Size 25 = 25

Further etails in clear text

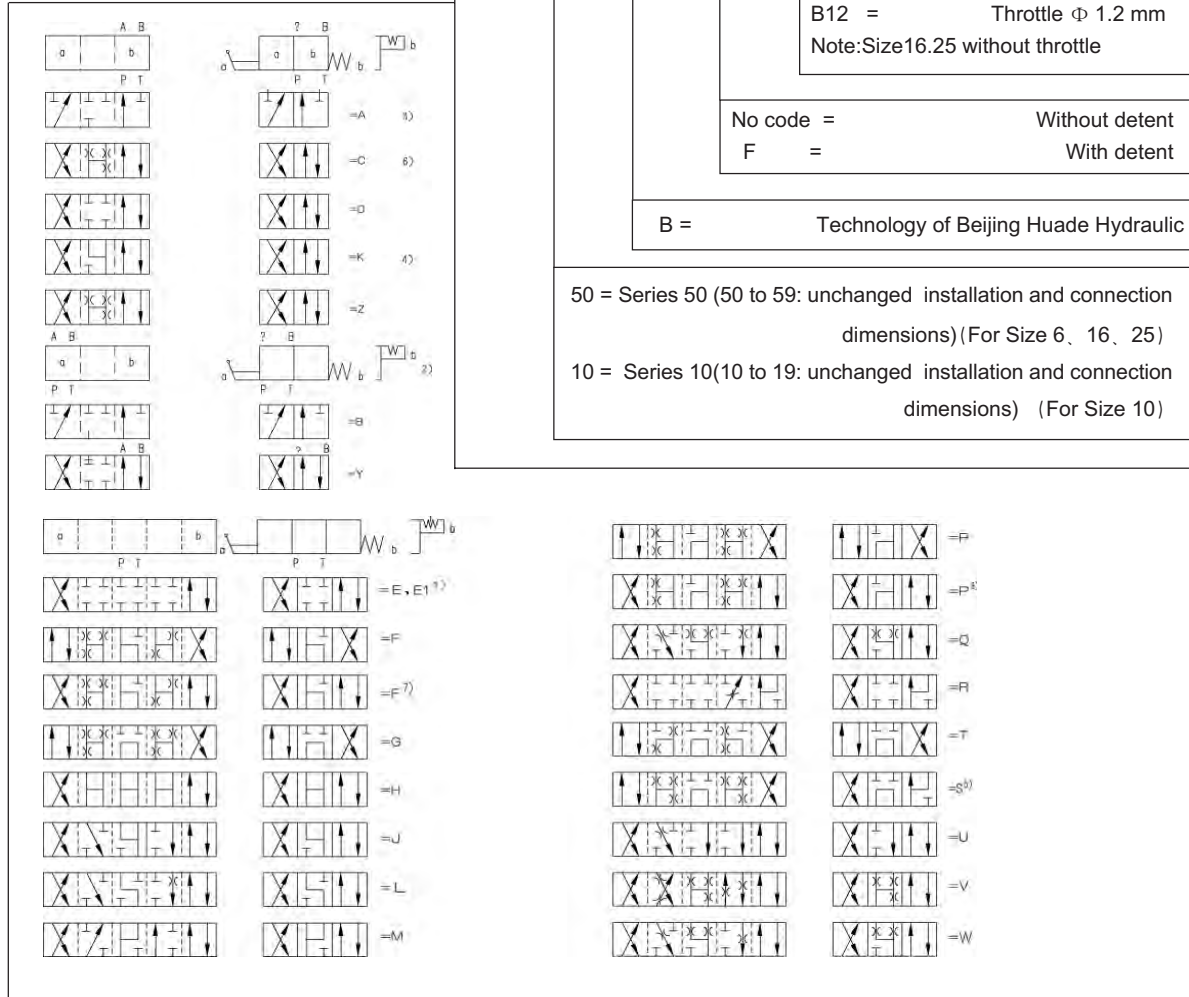
No code = Mineral oils
V = Phosphate ester

Only for Size 6 and 10
No code = Without throttle insert
B08 = Throttle Φ 0.8 mm
B10 = Throttle Φ 1.0 mm
B12 = Throttle Φ 1.2 mm
Note: Size 16, 25 without throttle

No code = Without detent
F = With detent

B = Technology of Beijing Huade Hydraulic

50 = Series 50 (50 to 59: unchanged installation and connection dimensions) (For Size 6, 16, 25)
10 = Series 10 (10 to 19: unchanged installation and connection dimensions) (For Size 10)



Example: Spool E on side "a".

Order example: ...EA...

Spool E on side "b".

Order example: ...EB...

- 1) Spool E1: P, A/B, preview port (only for Size 6).
- 2) For Size 10, Spool B, Y, hand lever on side B.
- 3) Spool A and B only for Size 6 and 10.
- 4) Spool K and Z only for Size 16 and 25.

5) Spool S only for Size 16.

6) For Size 16 and 25, spool C is the same as spool H.

For Size 16 and 25, spool D is the same as spool E.

7) Only for Size 16 and 25.

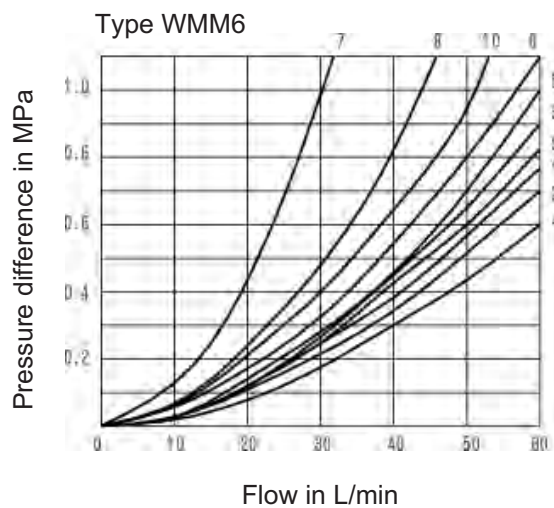
8) Only for Size 16 and 25.

Technical data (For applications outside these parameters, please consult us!)

Size	6	10	16	25
Maximum port A, B, P (MPa)	to31.5		to35	
Working pressure port T (MPa)	to16	to15	to25	to25
Maximum fluid (L/min)	to60	to100	to300	to450
Flow cross section (control position 0)	for symbol Q, 6% of nominal cross section for symbol W, 3% of nominal cross section		for symbol Q, V, 16% of nominal cross section for symbol W, 3% of nominal cross section	
Pressure fluid	Mineral oil or Phosphate ester			
Fluid temperature range (°C)	-30~ + 80			
Viscosity range (mm ² /s)	2.8~ + 500			
Weight (Kg)	approx.1.4	approx3.3	approx8	approx17
Control power of push lever (N)	Without return pressure approx20 Without return pressure approx30	with detent approx.16~23 without detent approx. 20~27	approx75	approx120

Characteristic curves (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Characteristic curves:



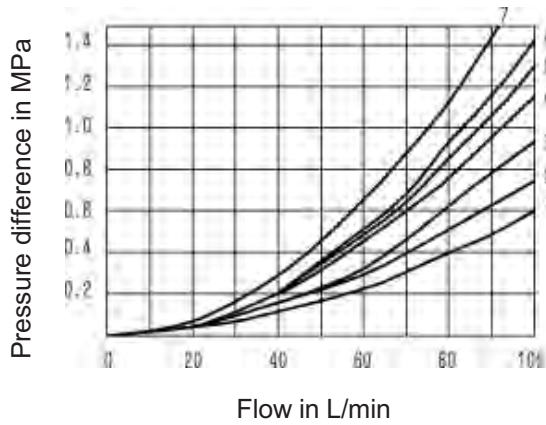
Spool	Shifted position			
	P → A	P → B	A → T	B → T
A	3	3	-	-
B	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	1
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2
Y	5	5	3	3

7 Spool "R" at controller position A to B

8 Spool "G" and "T" at middle position P to T

Characteristic curves: Type WMM10

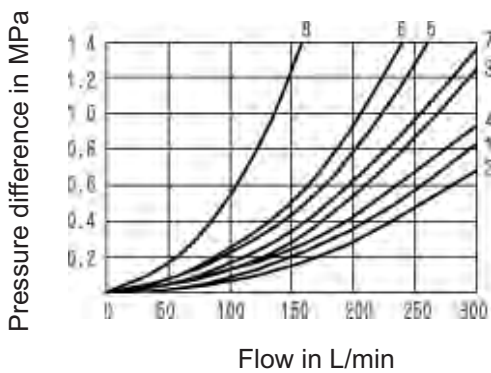
4 Spool "G" and "T" at middle position P to T
 7 Spool "R" at switch position A to B



Spool	Shifted position			
	P → A	P → B	A → T	B → T
A	2	2	-	-
B	2	2	-	-
C	2	2	3	3
D	2	2	3	3
E	2	2	4	4
F	2	3	3	5
G	3	3	4	6
H	1	1	4	5
J	2	2	3	3
L	2	2	3	5
M	1	1	5	5
P	3	2	5	3
Q	2	2	4	4
R	2	4	3	-
T	3	5	5	6
U	2	2	3	5
V	2	2	5	5
W	2	2	5	5
Y	2	2	5	3

Characteristic curves: Type WMM16

6 Spool "G" and "T" at middle position P to T
 8 Spool "S" at middle position P to T

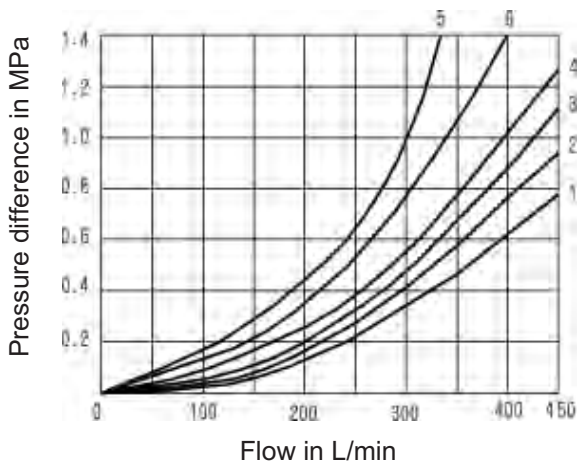


Spool	Shifted position			
	P → A	P → B	A → T	B → T
E, D, Y	1	1	1	3
F	2	2	3	3
G, T	5	1	3	7
H, C, Q	2	2	3	3
V, Z	2	2	3	3
J, K, L	1	1	3	3
M, W	2	2	4	-
R	2	2	4	-
U	1	1	4	7
S	4	4	4	-

Characteristic curves: Type WMM25

4 Spool "L" at A to T

6 Spool "U" at B to T



Spool	Shifted position			
	P → A	P → B	A → T	B → T
E	2	2	1	4
F	1	2	1	2
G	2	2	2	4
H	2	2	1	3
J	2	2	1	3
L	2	2	1	2
M	2	2	1	4
P	2	2	1	4
Q	2	2	1	4
R	1	2	1	-
T	2	2	2	4
U	2	2	1	4
V	2	2	1	4
W	2	2	1	3

Performance limits:

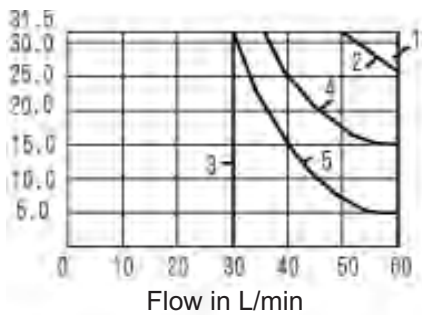
The switching function of the valve is, due to the sticking effect, dependent on the filtration. The flow forces acting within the valve also affects the flow performance limits.

For 4-way valves the stated flow data is valid for the normal application case of 2 directions of flow (e.g. from P to A and at the same time return flow from B to T) (see table). If there is only one direction of flow then the permissible flow can be considerably lower, (e.g. when using a 4-way directional valve as a 3-way directional valve with ports A or B plugged).

Performance limits of WMM6:

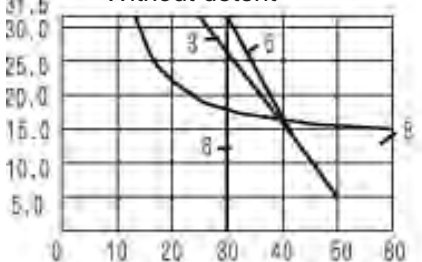
Operating pressure in MPa

Without detent



Operating pressure in MPa

Without detent

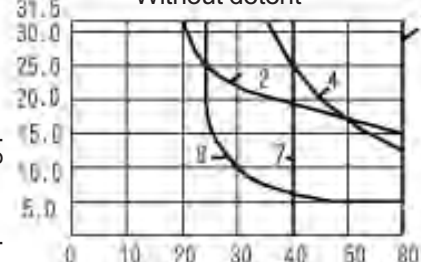


Flow in L/min

Characteristic curves		Spool	Characteristic curves		Spool
without detent	1	E, E1, H, C, D, M, Q, U, W, G, J, L, R, Y	with detent	1	E1, M, H, C, D, Y
	2	A, B		2	E, J, Q, L, U, W
	3	V		3	A, B
	4	F, P		4	G, T
	5	T		5	F, V, P, R, T
		6			
		7			
		8			
		9			

Operating pressure in MPa

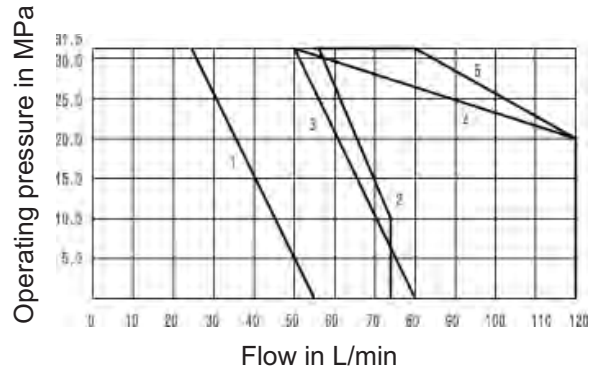
Without detent



Flow in L/min

Characteristic curves: Type WMM10

Characteristic curves:	Spool
1	A, B
2	H
3	F, G, P, R, T
4	J, L, Q, U, W
5	C, D, E, M, V, Y



Characteristic curves: Type WMM16

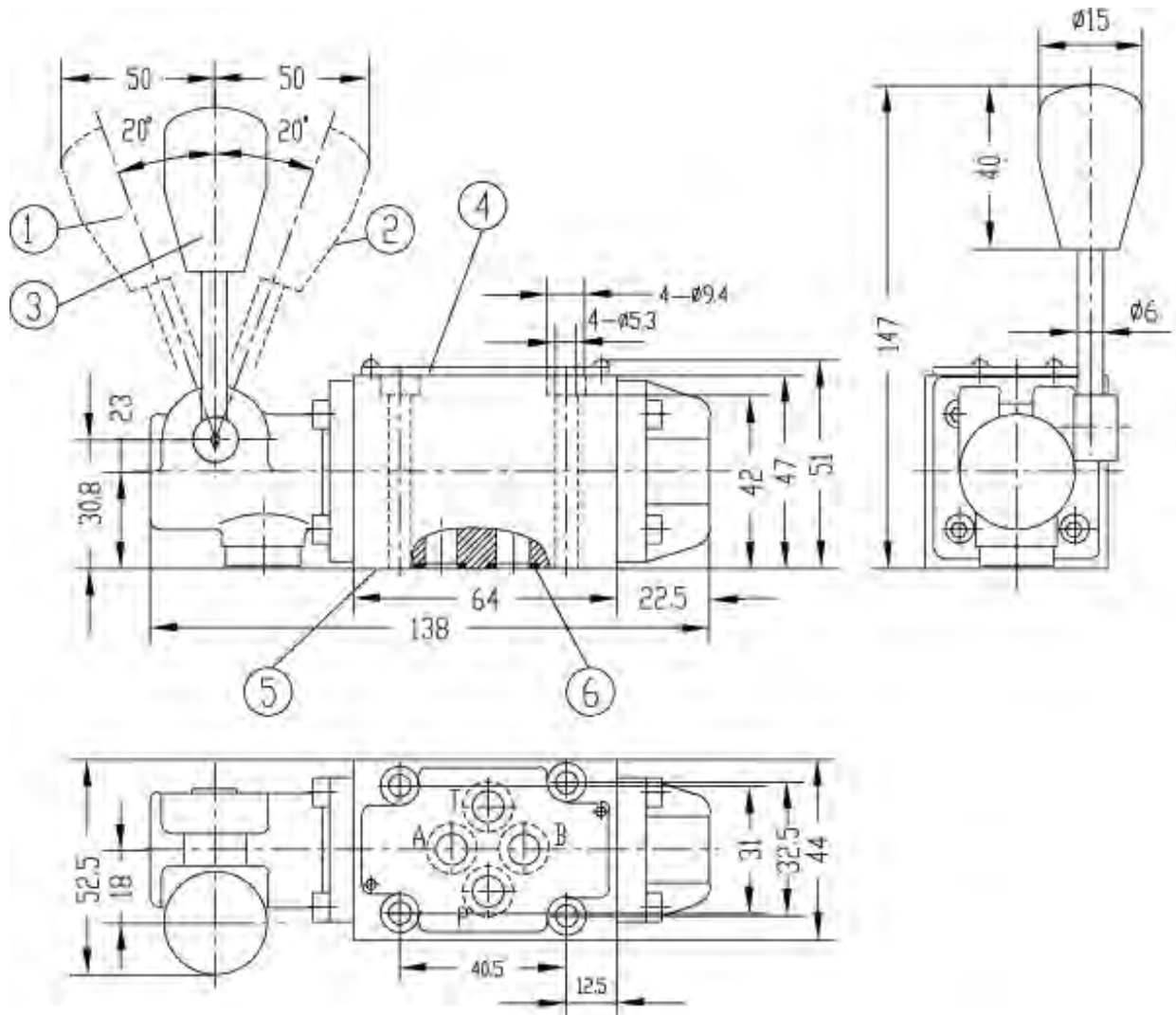
2-position valves , without detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
C	300	300	300	260	220
D	300	300	210	190	160
K	300	300	200	150	130
Z	300	240	190	170	150
3-position valves without detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
E, H, J, L, M Q, R, U, W	300	300	300	300	300
F, P	300	300	210	190	170
G, S, T	300	300	220	210	180
V	300	260	200	180	170

Characteristic curves: Type WMM25

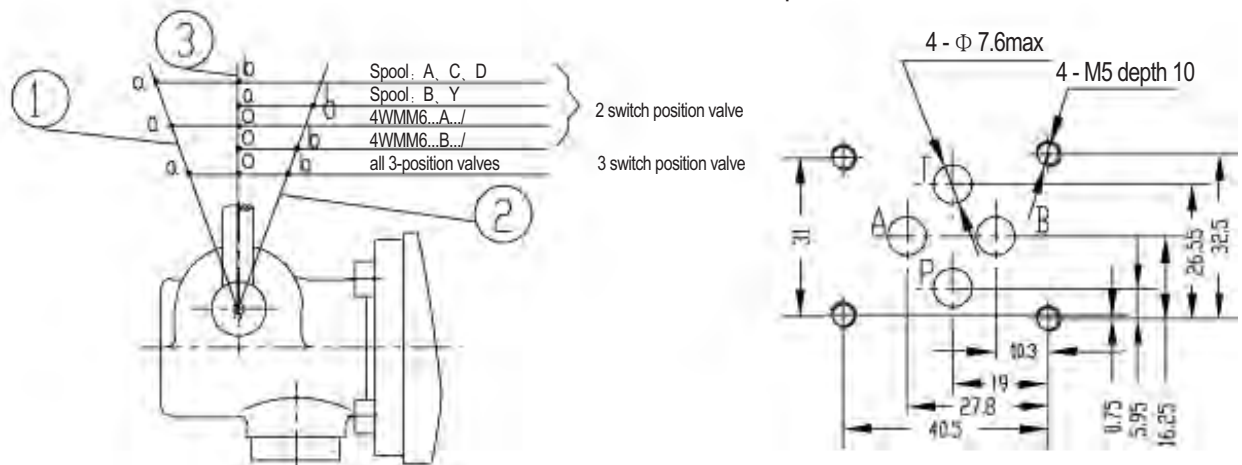
2-position valves , with detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
C, D, K, Z	300	300	300	300	300
3-position valves with detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
E, H, J, L, M Q, R, U, W	300	300	300	300	300
F, P	300	300	280	230	230
G, T, S	300	300	230	230	230
V	300	300	250	230	230

2-position valves without detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
C	450	300	250	200	180
D	350	300	275	250	200
K	200	150	140	130	120
Z	300	270	240	220	200
3-position valves without detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
E, J, L, M Q, R, U, W	450	450	450	450	450
F	450	250	200	135	110
G, T	450	330	290	230	180
H	450	450	400	400	350
P	450	310	240	215	150
V	450	310	280	270	200

2-position valves with detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
C, D, K, Z	450	450	450	450	450
3-position valves with detent					
flow q_v in L/min	Operating pressure max(MPa)				
Spool	7	14	21	28	35
E, F, G, H, J L, M, P, R, T U, W	450	450	450	450	450
V	450	450	400	350	300



Unit dimensions of ports:



Subplates: see page 205

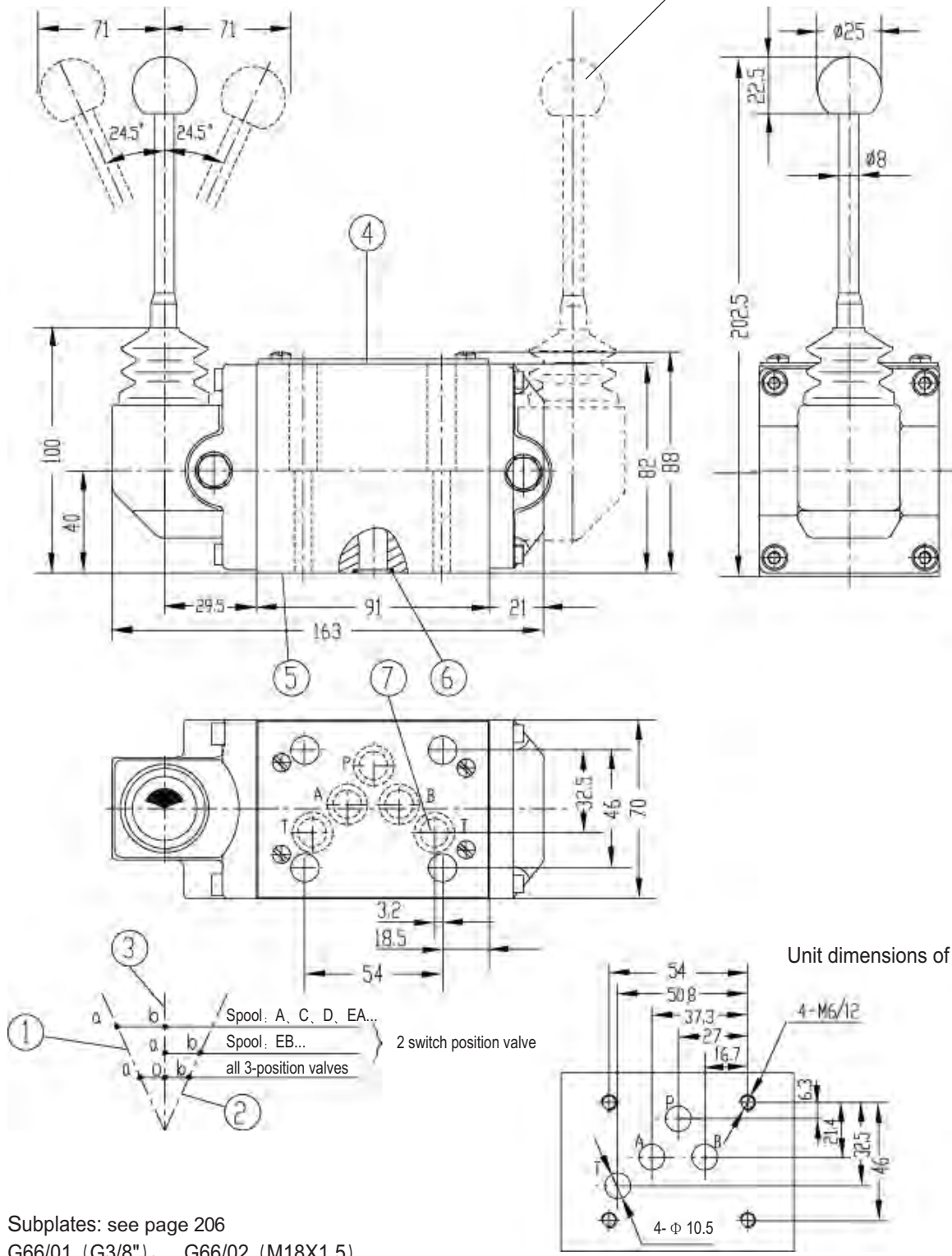
- G341/01 (G1/4"); G341/02 (M14X1.5)
- G342/01 (G3/8"); G342/02 (M18X1.5)
- G502/01 (G1/2"); G502/02 (M22X1.5)

- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0, a, b
(a and b on 2-position valve)
- 4 Nameplate
- 5 Connection surface
- 6 O-ring 9.25 x 1.78 (for ports A, B, P and T)

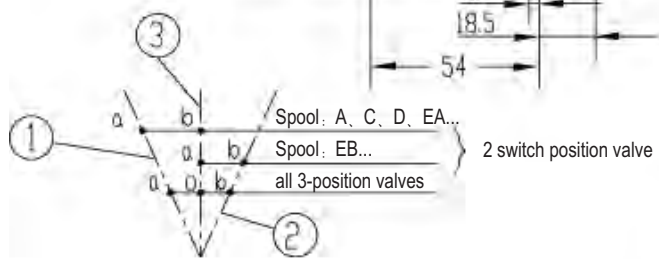
Unit dimensions: Type WMM10(with detent)

(Dimensions in mm)

2-way valve, the hand lever of spool B, Y on side port B



Unit dimensions of ports:



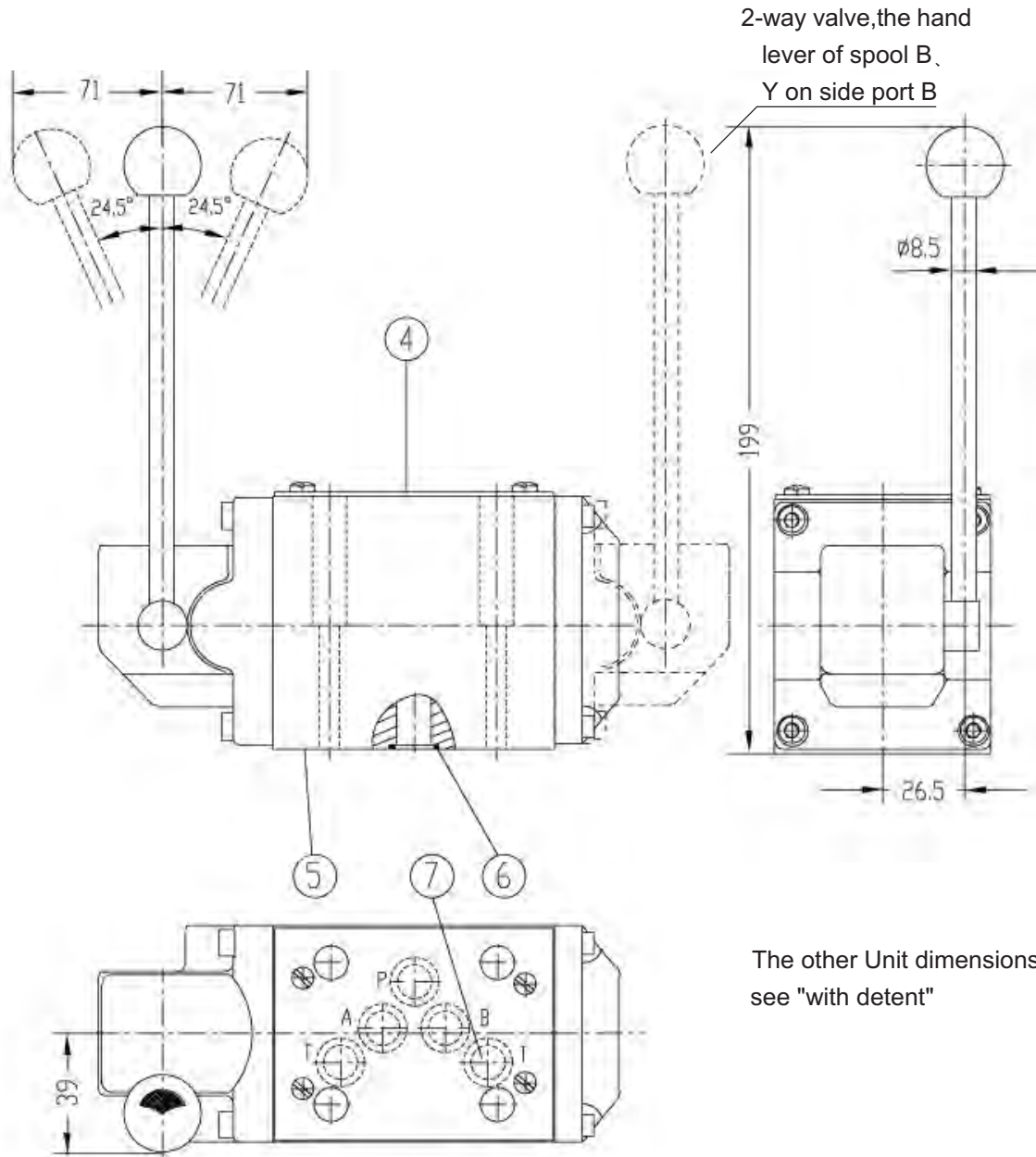
Subplates: see page 206
 G66/01 (G3/8"); G66/02 (M18X1.5)
 G67/01 (G1/2"); G67/02 (M22X1.5)
 G534/01 (G3/4"); G534/02 (M27X2)

- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0, a, b
(a and b on 2-position valve)

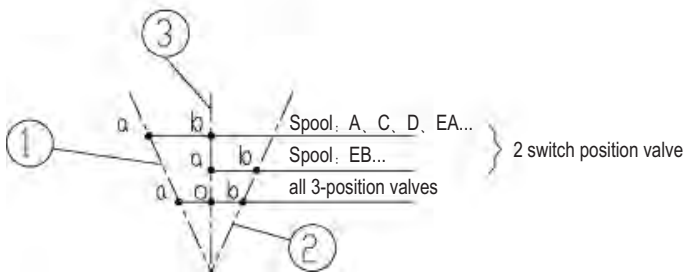
- 4 Nameplate
- 5 Connection surface
- 6 O-ring 12 x 2(for ports A, B, P and T)
- 7 When using control piece, may regarded as assistant return port

Unit dimensions: Type WMM10(without detent)

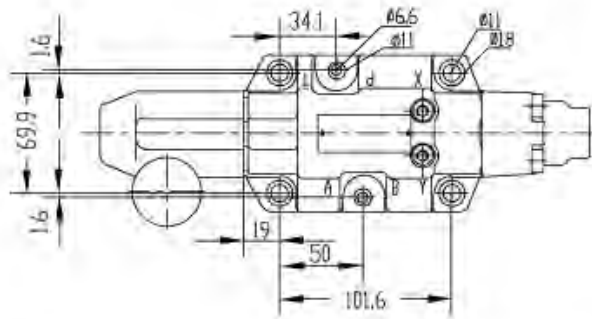
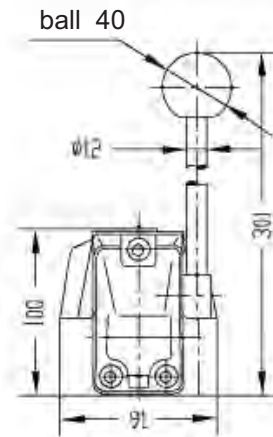
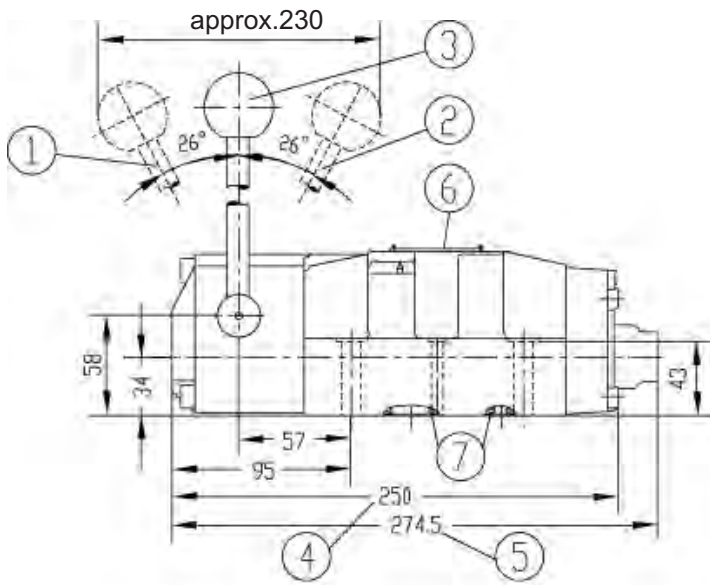
(Dimensions in mm)



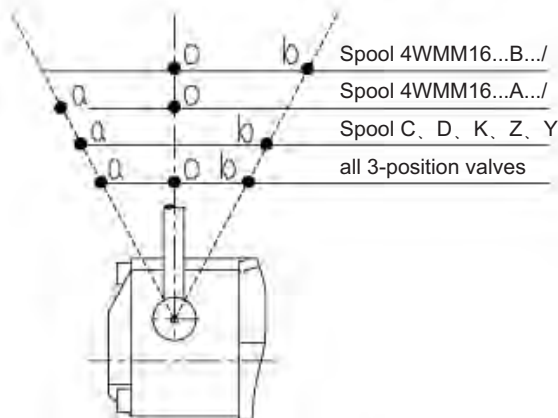
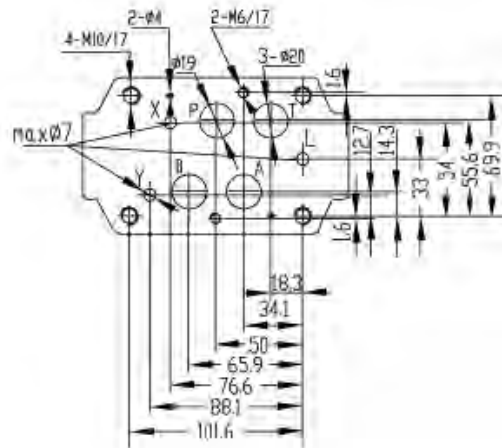
The other Unit dimensions see "with detent"



- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0、 a、 b
(a and b on 2-position valve)
- 4 Nameplate
- 5 Connection surface
- 6 O-ring 12 x 2(for ports A, B, P and T)
- 7 When using control piece,may regarded as assistant return port



Unit dimensions of ports :



Subplates (see page207, 208)

G172/01; G172/02

G174/01; G174/02

G174/08

1 Switched position a

2 Switched position b

3 Switched position 0 (a and b on 2-position valve)

4 2-position valve and 3-position valves , with detent.

3-position valve, spring-centred

5 2-position valve, without detent

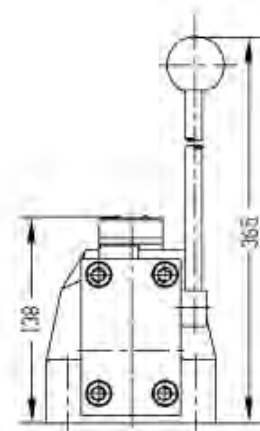
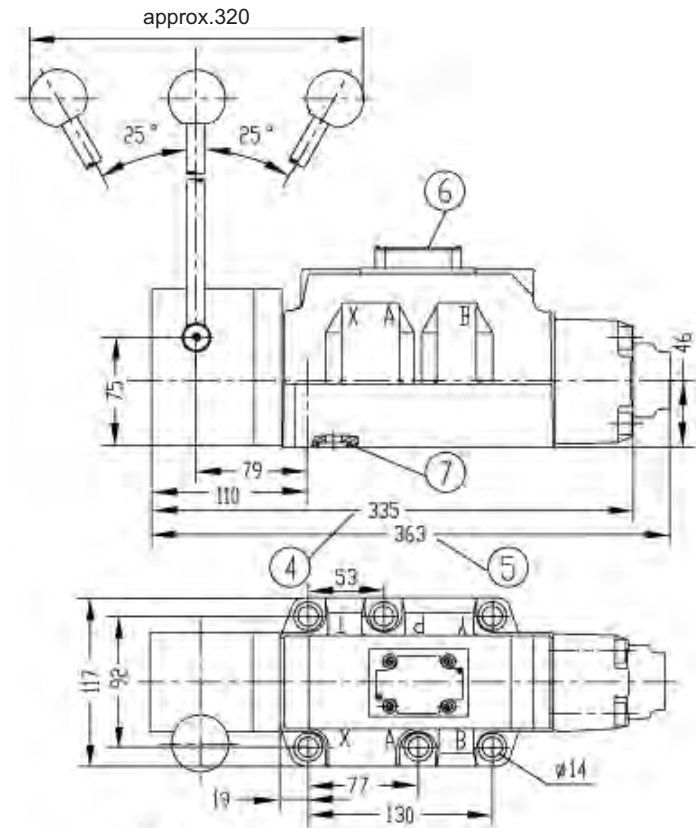
6 Nameplate

7 O-ring 22 x 2.5 (For ports A, B, P and T)

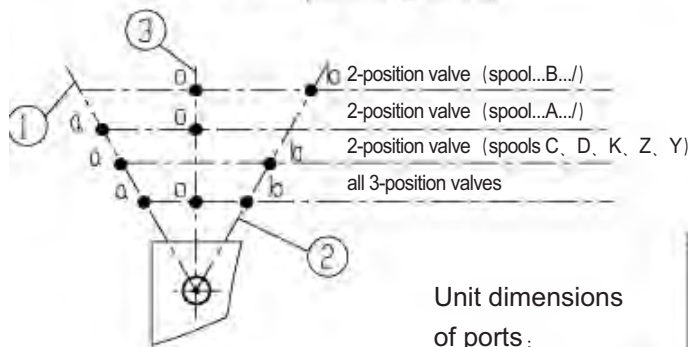
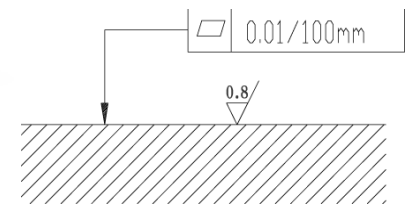
O-ring 10 x 2 (For ports X, Y and L)

Unit dimensions: Type WMM25

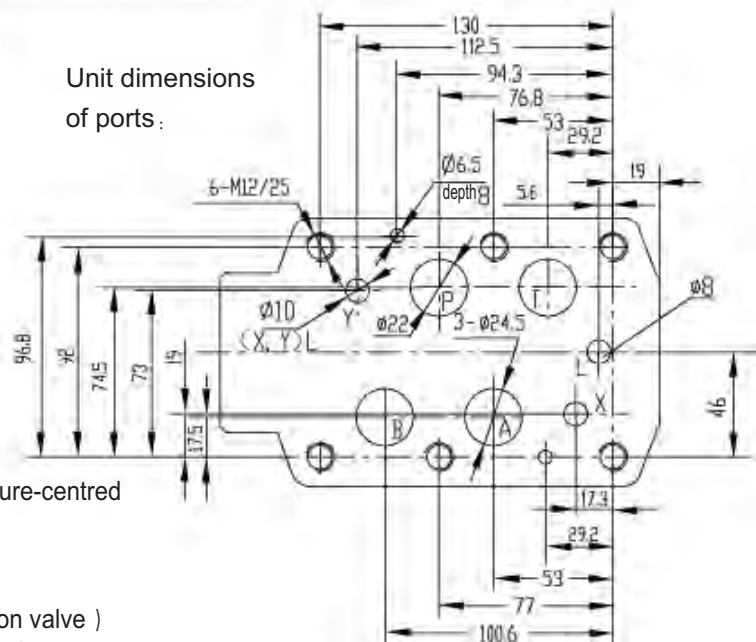
(Dimensions in mm)



Required surface finish of mating piece



Unit dimensions of ports :



Subplates (see page 209)

G151/01 (G1"); G151/02 (M33X2)

G153/01 (G1"); G153/02 (M33X2)

G154/01 (G1 1/4"); G154/02 (M42X2)

G156/01 (G1 1/2"); G156/02 (M48X2)

G153 only used on valves which are pressure-centred

1 Switched position a

2 Switched position b

3 Switched position 0 (a and b on 2-position valve)

4 2-position valve and 3-position valve with detent,
3-position valve, spring-centred

5 2-position valve, without detent

6 Nameplate

7 O-ring 27 x 3 (for ports A, B, P and T)

O-ring 19 x 3 (for ports X, Y and L)

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/3 and 4/2 directional control valves with hand lever, Type WMM (New Series)			RE 22331/12.2004
	Size10	up to 31.5 MPa	up to 120L/min	

Features:

- Direct actuated directional spool valve with hand lever
- With spring return or detent, optional
- For subplate mounting
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



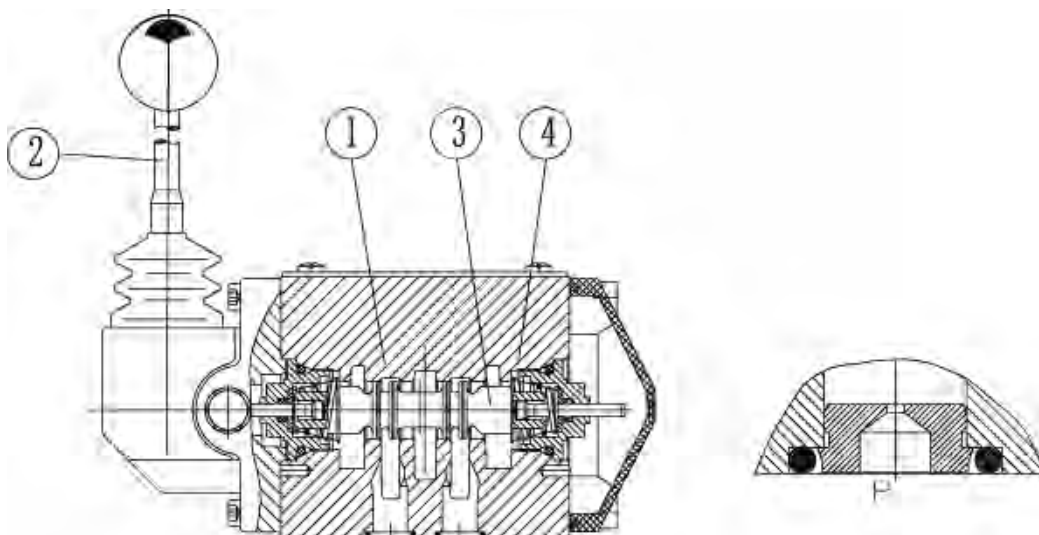
Function,section

The type WMM valves are hand lever actuated directional spool valves. They control the start, stop and direction of a flow.

The directional valves basically comprise of a housing (1), hand lever (2), control spool (3), as well as one or two return springs (4). In the unoperated condition the control spool (3) is held in the neutral or its initial position by the return springs (4). The control spool (3) is actuated via the hand lever (2), this acts via a joint and the pin (5) directly onto the control spool (3). The spool is thereby moved out of its rest position into its required switched position. After the hand lever (2) has been returned to the switched position zero, the spool (3) is returned to the neutral position via the return springs (4).

Type H-4WMM../F.. (with detent)

These valves are either 2 or 3 position directional control valves which are fitted with a detent, which operates in all of the switched positions.



Type 4WMM

Cartridge throttle

Ordering details

	WMM			30	B	/			*
--	-----	--	--	----	---	---	--	--	---

3-way = 3
4-way = 4

Size 10 =10

Further etails in clear text

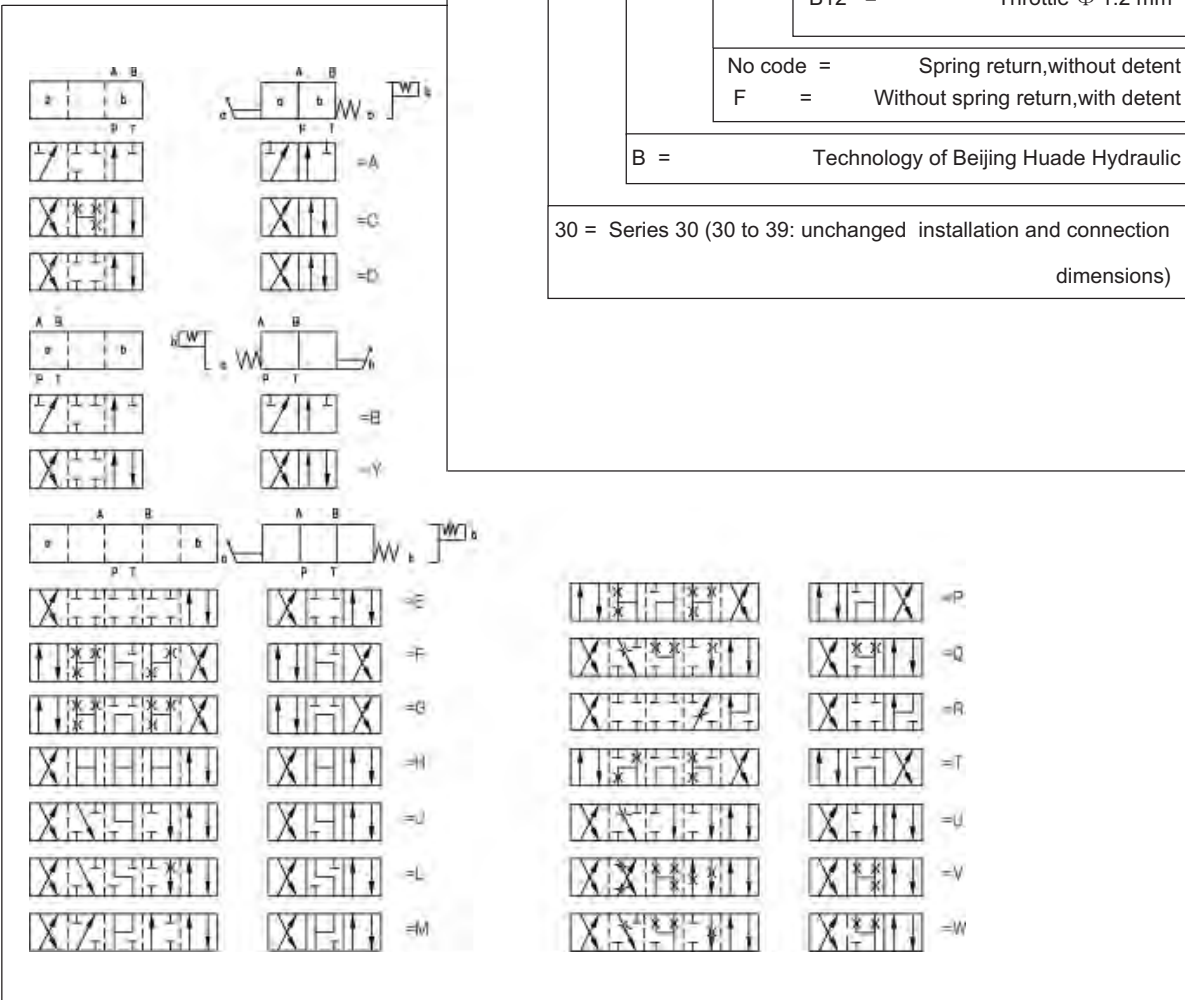
No code = mineral oils
V = phosphate ester

No code = Without throttle insert
B08 = Throttle Φ 0.8 mm
B10 = Throttle Φ 1.0 mm
B12 = Throttle Φ 1.2 mm

No code = Spring return,without detent
F = Without spring return,with detent

B = Technology of Beijing Huade Hydraulic

30 = Series 30 (30 to 39: unchanged installation and connection dimensions)



Example:

Spool E on side "a", Order example:...EA...

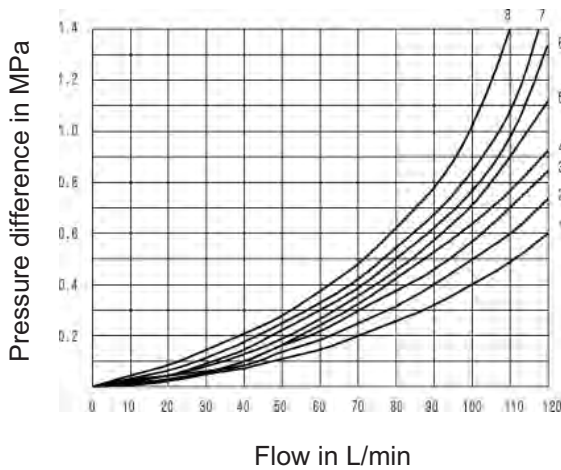
Spool E on side "b", Order example:...EB...

Technical data (For applications outside these parameters, please consult us!)

Size	10	
Maximum working pressure	port A, B, P (MPa)	to 31.5
	port T (MPa)	to 15
Maximum flow (L/min)	to 120	
Flow cross section (control position 0)	for symbol Q, 6% of nominal cross section for symbol W, 3% of nominal cross section	
Pressure fluid	Mineral oil or Phosphate ester	
Fluid temperature range (°C)	-30~+80	
Viscosity range (mm ² /s)	2.8~500	
Weight (kg)	approx.3.3	
Control power on handle (N)	with detent approx.16~23	
	without detent approx.20~27	

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Characteristic curves:

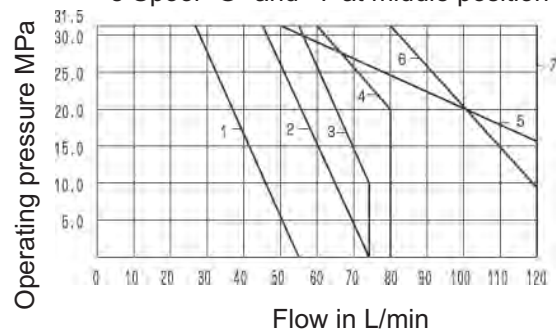


Characteristic curves:

Characteristic curves:	Spool
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	C/O, C/OF, D/O/D/OF

Spool	Shifted position			
	P → A	P → B	A → T	B → T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
Y	4	4	6	6
E	2	2	4	4
F	1	2	3	4
G, T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3

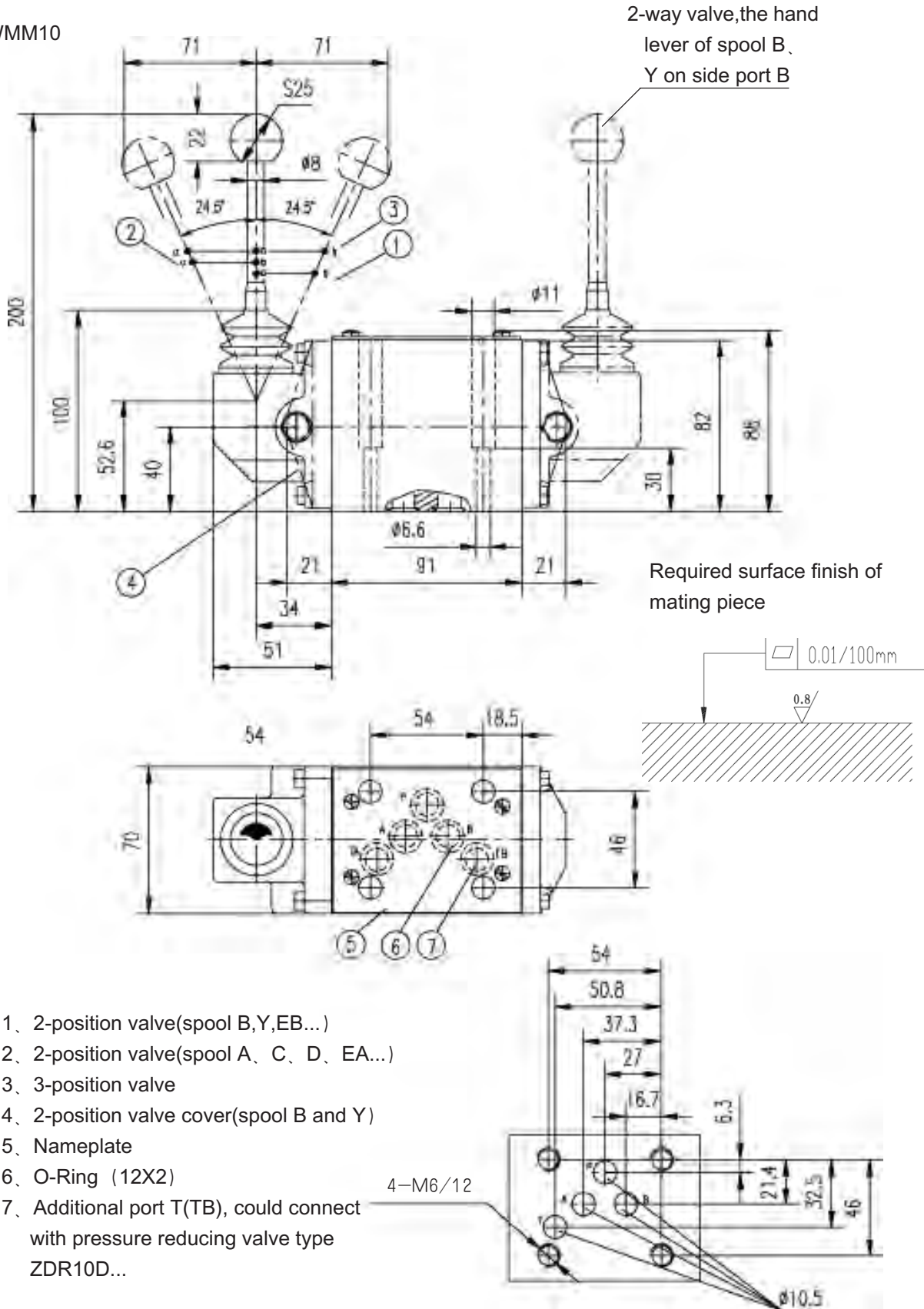
7 Spool "R" at controller position A to B
8 Spool "G" and "T" at middle position P to T



Unit dimensions:

(Dimensions in mm)

Type WMM10



Subplate: see page 206

G66/01 (G3/8"); G66/02 (M18X1.5)

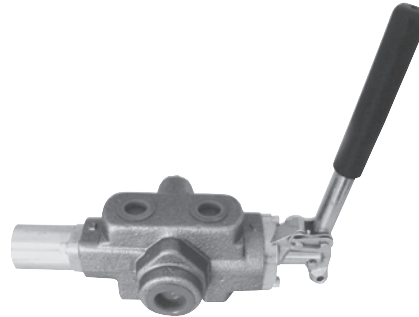
G67/01 (G1/2"); G67/02 (M22X1.5)

G534/01 (G3/4"); G534/02 (M27X2)

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valve ,Type B-H10			RE 23400/12.2004
	Size10	up to 25MPa	up to 80L/min	

Features:

- Direct actuated directional spool valve with hand lever
- With spring return or detent, optional
- Pipe installation

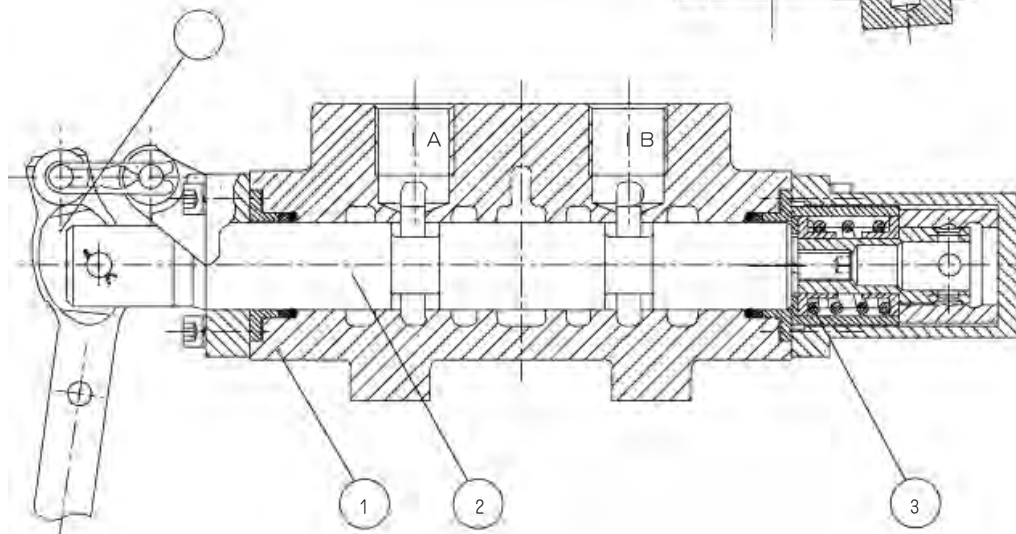
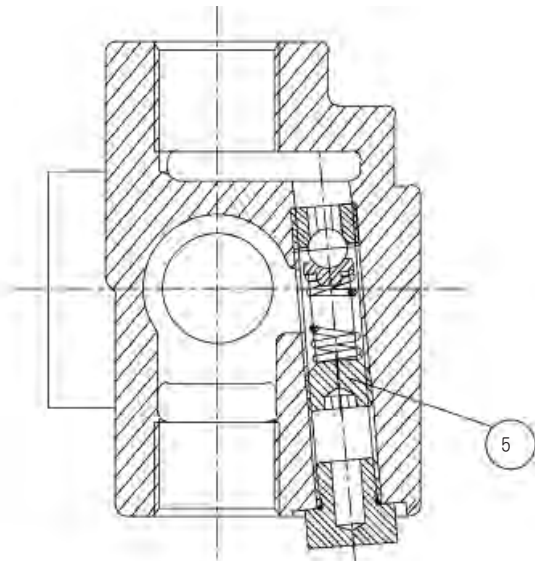


Function, section

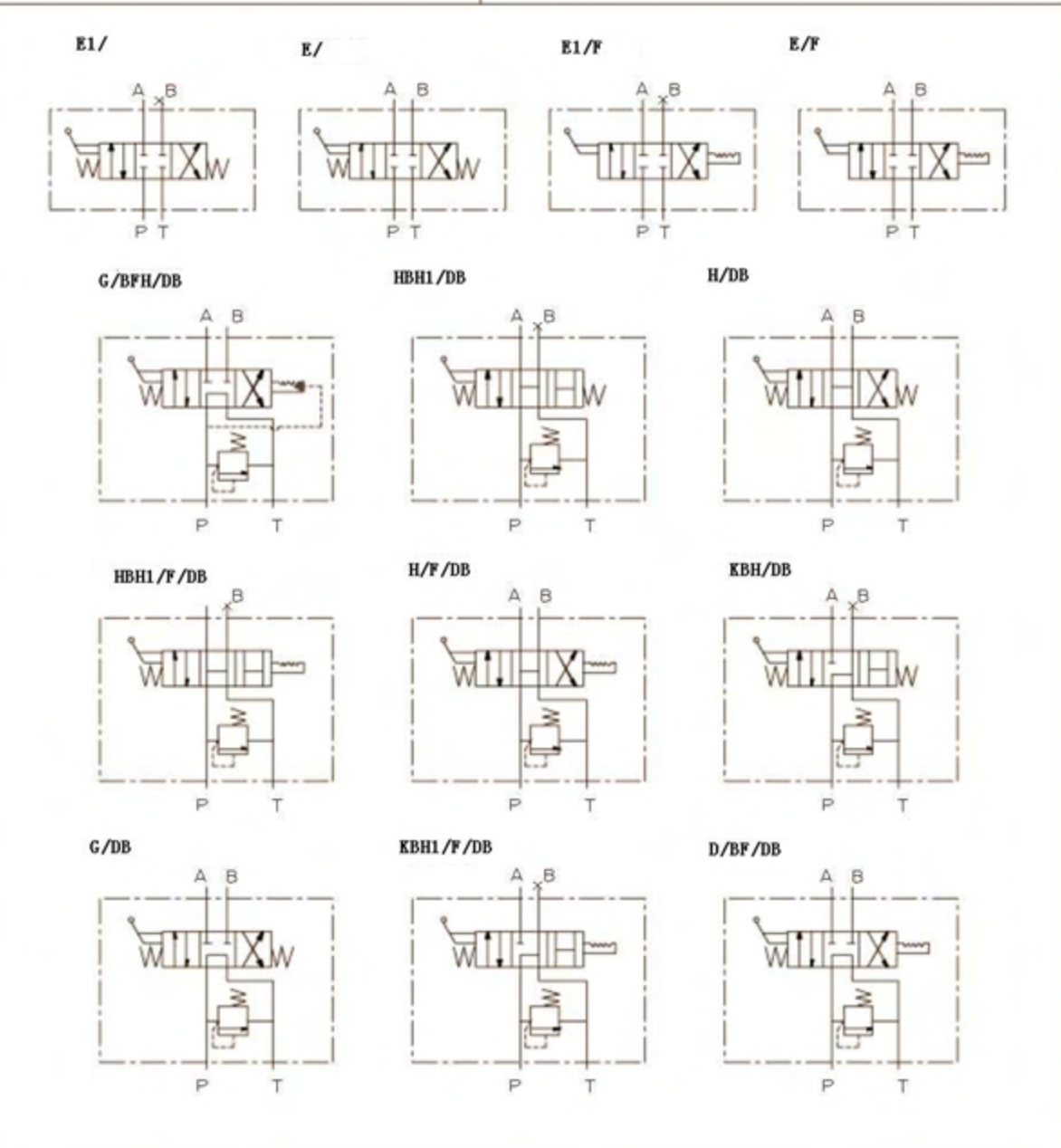
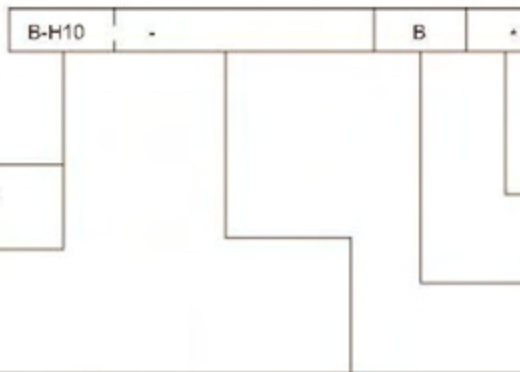
The type B-H10 valves are hand lever actuated directional spool valves.

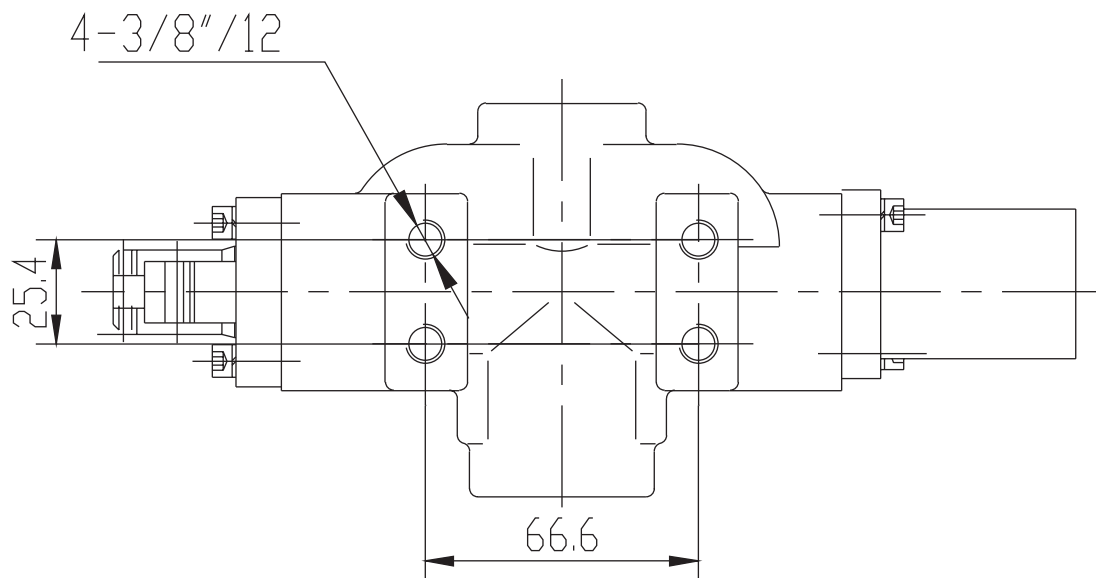
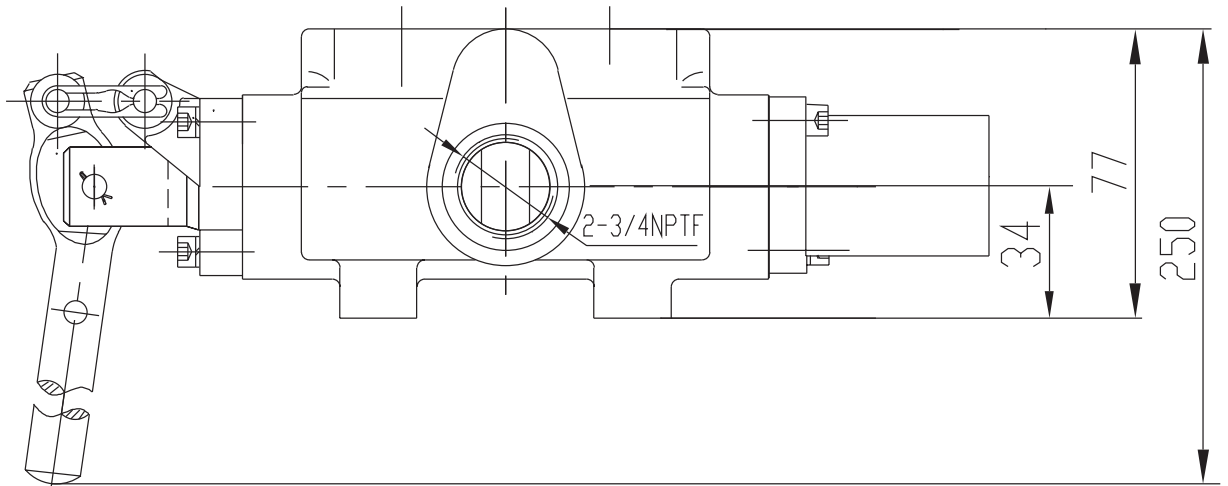
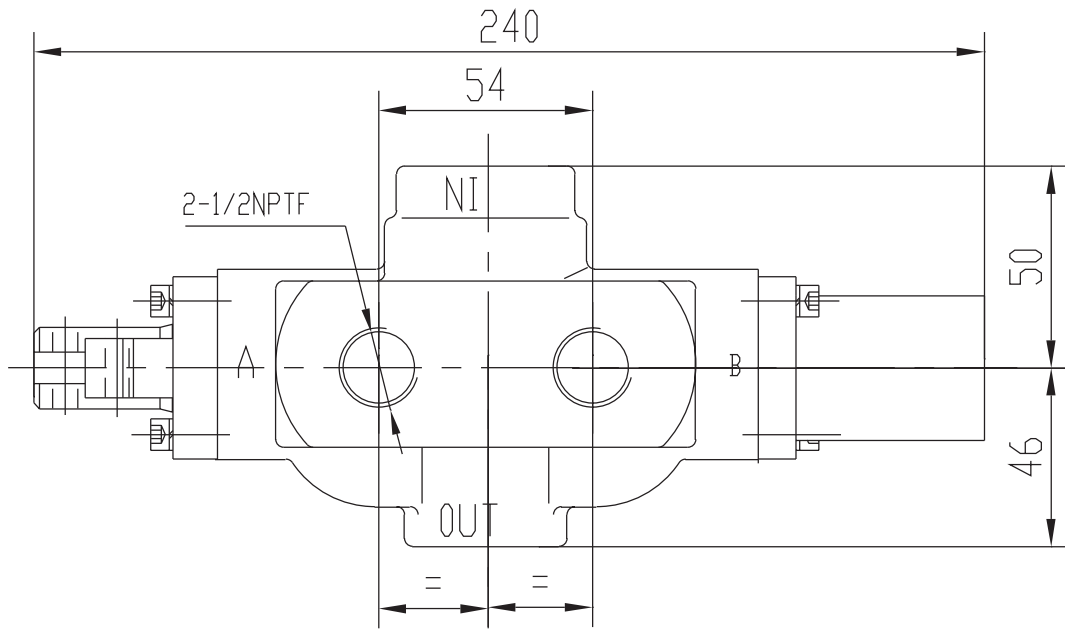
They control the start, stop and direction of a flow.

The directional valves basically comprise of a housing (1), hand lever(4), control spool (2), as well as one return springs (3). In the unoperated condition the control spool (2) is held in the neutral or its initial position by the return springs (3). The control spool(2) is actuated via the hand lever (4), this acts via a joint and the pin directly onto the control spool (2). The spool is thereby moved out of its rest position into its required switched position. After the hand lever (4) has been returned to the switched position zero, the spool (2) is returned to the neutral position via the return springs (3).



Ordering details





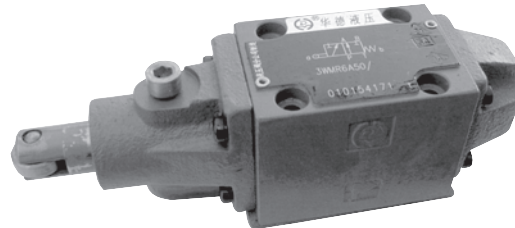
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves mechanical operation Type 4WMU/R			RE 22275/12.2004
	Size 6 、 10	up to 31.5 MPa	up to 120L/min	Replaces: RE 22275/05.2001

Features:

- Direct operated directional spool valve with adjustable roller operation
- Roller lever assembly may be stepped in 90°
- Radial forces absorb reliably (up to 30°)
- 19 kinds standard spool function

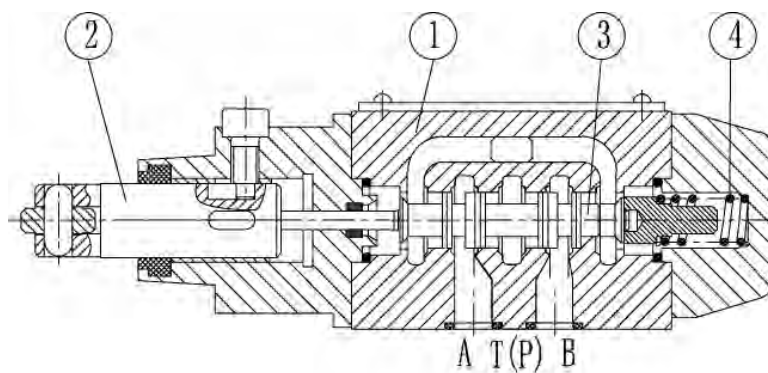


Funtion,section

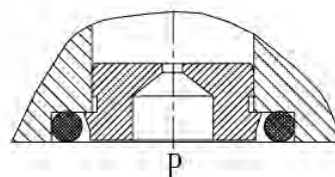
Directional valves type WMR are roller operated directional valves.

They basically consist of the housing (1), the roller lever (2), the control spool (3) and the return spring (4).

A plug-in throttle is required if flow greater than the permitted value may occur while the valve spool is being from one position to another. The plug-in orifice is fitted in the P port of the directional valve.



Type 4WMR6



Cartridge throttle

Ordering details

	WM					B	/		*
--	----	--	--	--	--	---	---	--	---

Further details in clear text

No code = mineral oils
V = phosphate ester

No code = Without throttle insert
B08 = Throttle Φ 0.8 mm
B10 = Throttle Φ 1.0 mm
B12 = Throttle Φ 1.2 mm

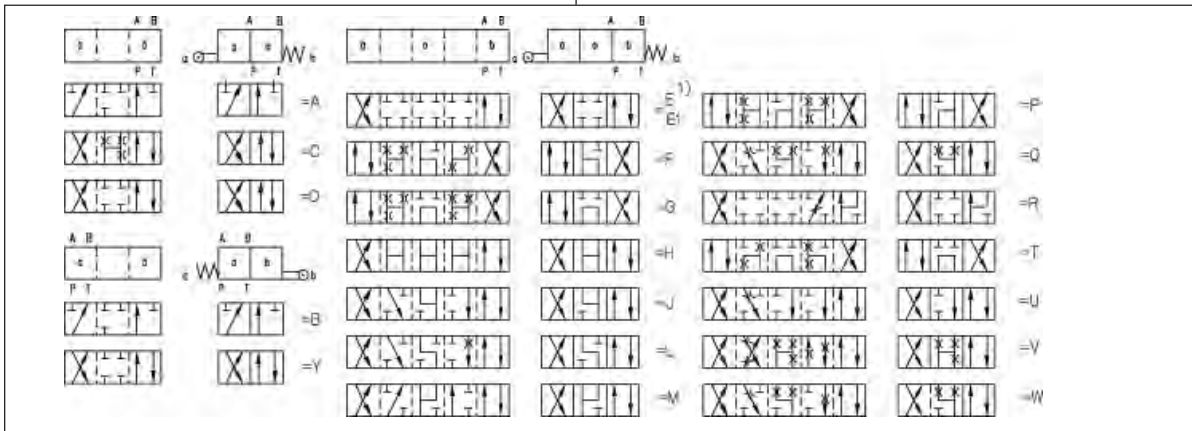
B = The technology of Beijing Huade Hydraulic

3 service ports = 3
4 service ports = 4



Size 6 = 6
Size 10 = 10

50 = Series 50 to 59
(50 to 59: unchanged installation and connection dimensions)
(for size 6)
30 = Series 30 to 39
(30 to 39: unchanged installation and connection dimensions)
* (for size 10)



1) Symbol E1:P to A and B with pre-opening

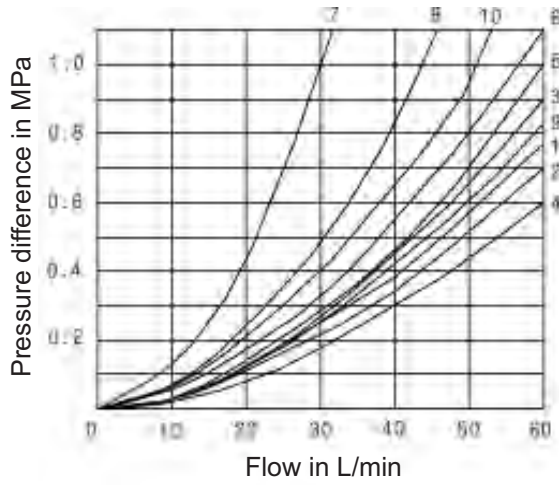
Warning: please consider pressure intensification with single rod cylinders

Technical data

Size	6	10		
Operating ports A, B, P (MPa)	up to 31.5			
Pressure port T (MPa)	up to 6	up to 16		
In symbols A and B, the T port must be used as a drain connection if the operating pressure is above the pressure permitted at the T port				
Max. flow (L/min)	up to 60	up to 120		
Flow cross section (control position 0)	for symbol Q, 6% of nominal cross section for symbol W, 3% of nominal cross section			
Pressure fluid	mineral oils or phosphate ester			
Pressure fluid temperature range (°C)	- 30 to + 80			
Viscosity range (mm ² /s)	2.8 to 500			
Weight (kg)	approx. 1.4	approx. 3.3		
Operating force at roller lever (N)	at zero tank pressure	100 to 121	two positions valve	70 to 140
	at a pressure	184 to 205	three positions valve	70 to 175

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

WM_U^R6

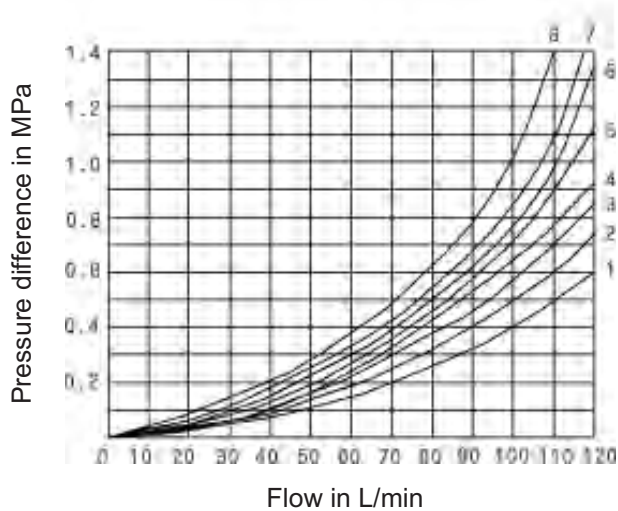


Symbols	Direction of flow			
	P → A	P → B	A → T	B → T
A	3	3	-	-
B	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	-
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2
Y	5	5	2	3

7、Symbol "R" with position A-B

8、Symbols "G" and "T" with mid position P-T

WM_U^R10



Symbols	Direction of flow			
	P → A	P → B	A → T	B → T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
Y	4	4	6	6
E	2	2	4	4
F	1	2	3	4
G、T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3

7、Symbol "R" with position A-B

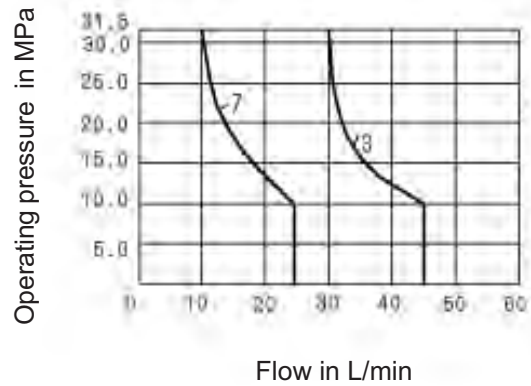
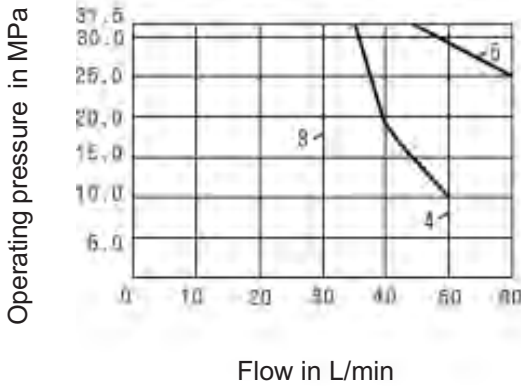
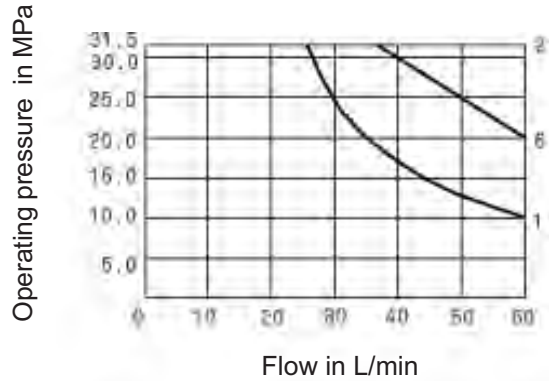
8、Symbols "G" and "T" with mid position P-T

Performance limits (measured at $v=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

The operation of the valve is dependent upon the effect of filtration. In order to achieve the given permissible flow rates, full flow filtration $20\mu\text{m}$ is required. The flow forces operating within the valve influence the valve performance. For 4 way valves, the flows given are valid for normal operation with 2 directions of flow (e.g. from P to A and from B to T). If only one flow path is operative e.g. if port A or B is blocked and the valve is used as a 3 way valve, the permissible flows can be very much lower.

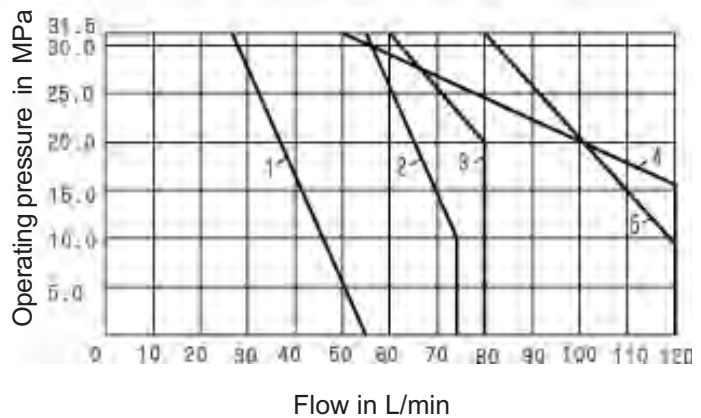
WM_U^R 6

Curve	symbol
1	A, B
2	C, D, Y, E, E1, H, M, Q, U, W
3	F, P
4	G
5	J, L
6	R
7	T
8	V

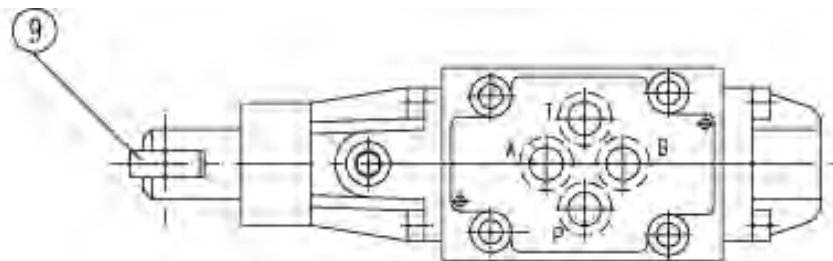
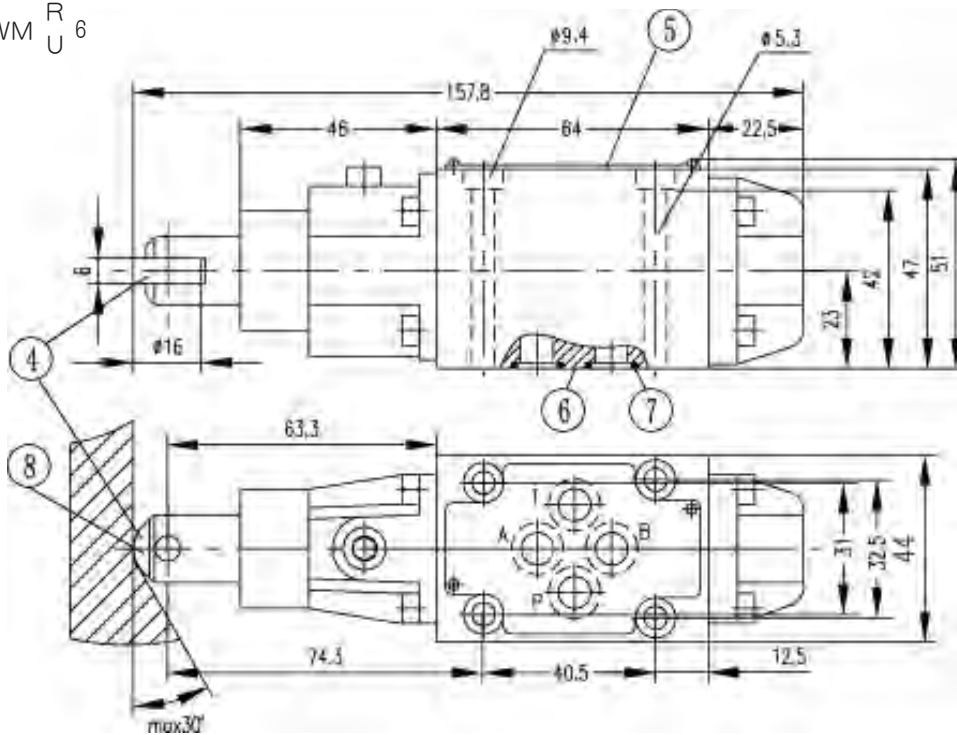


WM_U^R 10

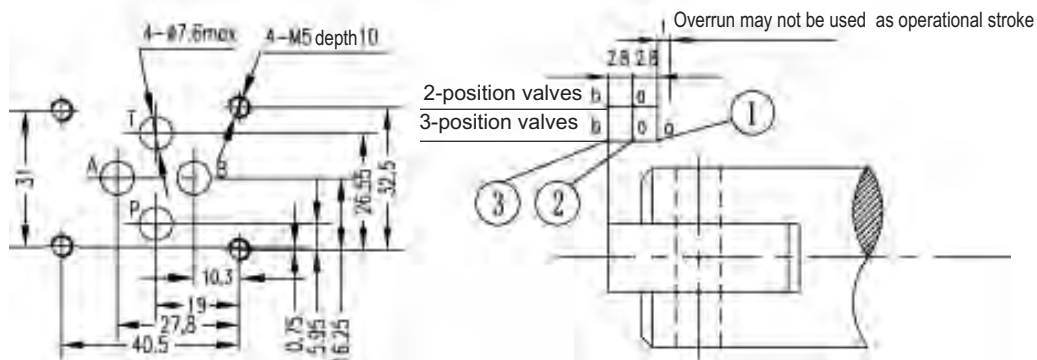
Curve	Symbol
1	A, B
2	H
3	F, G, P, R, T
4	J, L, Q, U, W
5	C, D, E, M, V, Y



WM_U^R 6



Roller lever assembled next to B end in 2-position valves of spools B.Y



Subplates: see page 205

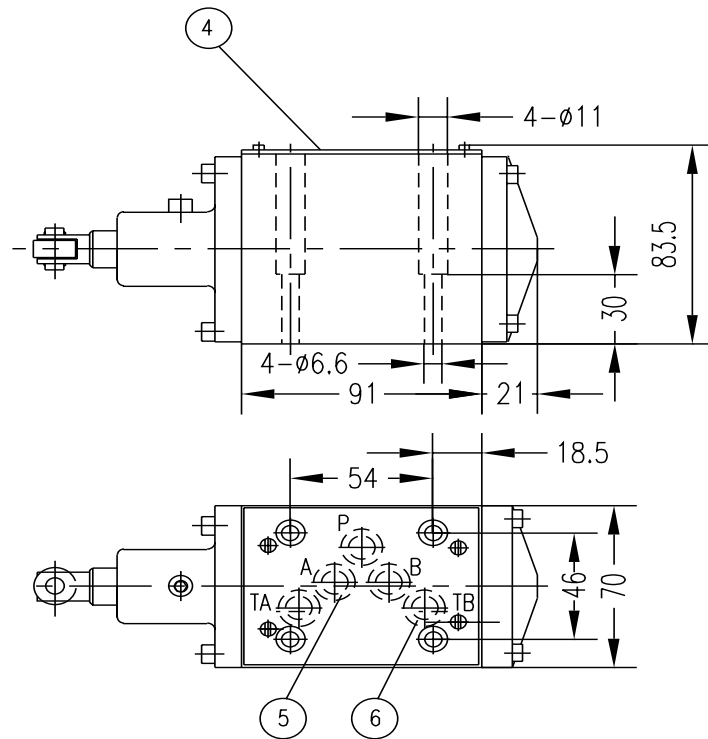
G341/01 (G1/4"); G341/02 (M14X1.5)

G342/01 (G3/8"); G342/02 (M18X1.5)

G502/01 (G1/2"); G502/02 (M22X1.5)

- 1, Spool position "a"
- 2, Spool position "o" and "a" (for 2-position valve)
- 3, Spool position "b"
- 4, Roller lever assembly may be stepped in 90°
- 5, Nameplate
- 6, Connection surface
- 7, O-ring 9.25X1.78 (for ports A, B, P, and T)
- 8, WMR, the code "R"
- 9, WMU, the code "U"

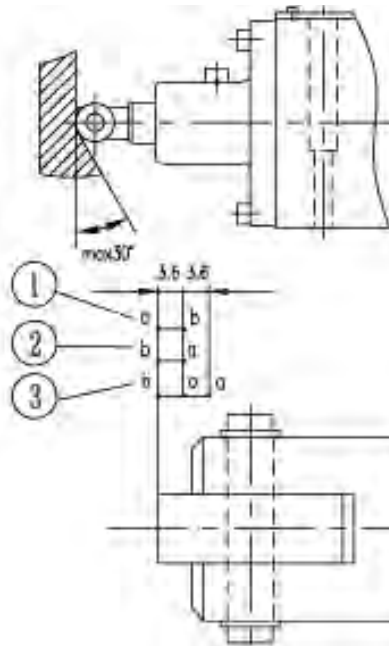
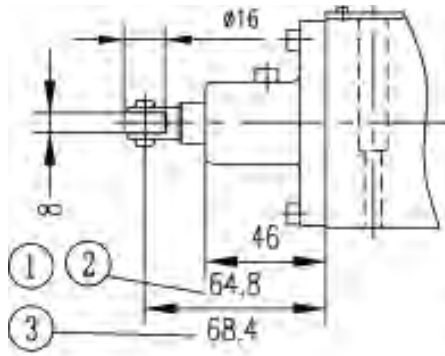
WM R_{10}
U



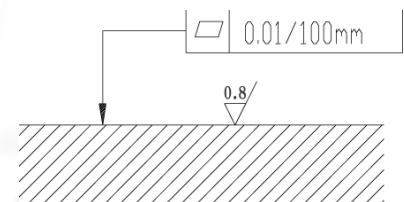
WMR

WMU

Roller lever assembled next to B end in 2-position valves of spools B.Y



Required surface finish of mating piece



Subplates: see page 206

G66/01 (G3/8"); G66/02 (M18X1.5)

G67/01 (G1/2"); G67/02 (M22X1.5)

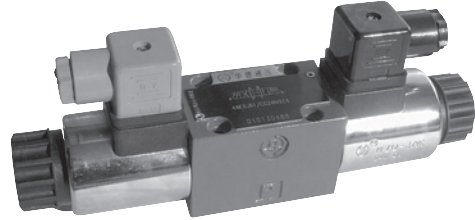
G534/01 (G3/4"); G534/02 (M27X2)

- 1、 Two position valve (B, Y)
- 2、 Two position valve (A, C, D)
- 3、 Three position valve
- 4、 Nameplate
- 5、 O-ring 12X2 (for ports A, B, P, and T)
- 6、 Adjunctive port T can be connected with ZDR10D... in special condition

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves, electrically operated Type WE 4			RE23140/12.2004
	size 4	up to 21 MPa	up to 25 L/min	Replaces : RE23140/05.2001

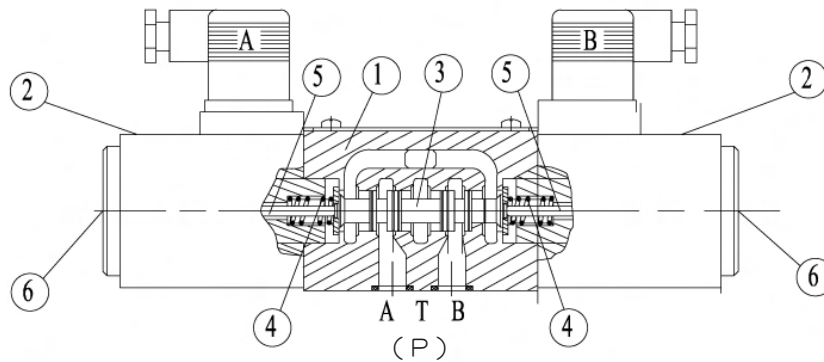
Features:

- Directional valves of type WE4 are solenoid operated directional spool valves
- Wet pin solenoids of direct or alternating current
- Porting pattern to ISO 4401 and CETOP-RP 121H



Function,section

Type 4WE4E 10B/



Directional valves of type WE4 are solenoid operated directional spool valves. They control the start, stop and direction of a fluid flow.

These directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), and one or two return springs(4).

The control spool (3) is held by the return spring (4) in the central or in the initial position (except for detented spools).The control spool (3) is actuated via wet pin solenoids (2). In the energized condition.The force of the solenoid (2) acts via the plunger (5) on the control spool (3) and shifts the same from its rest position to the desired end position.Thus, the required flow pattern from P to A and B to T or P to B and A to T is selected. When the solenoid (2) is de-energized, the control spool (3) is returned to its neutral position by the return spring (4).A covered manual override is provided so that the control spool (3)can be operated without energizing the solenoid.

A

Type 4WE4 C 10B/O...

D

This version is a directional valve with 2 switching positions and 2 solenoids without detent and springs. There is no defined switching position in the de-energized condition.

A

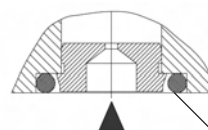
Type 4WE4 C 10B/OF...

D

This version is a directional valve with 2 switching position,2 solenoids and a detent.Thus, the relevant switching positions are fixed and continuous energization of the solenoid is not necessary

Throttle inserts

The use of throttle inserts is only required, if, due to the operating conditions,flows are to be expected,which are higher than the stated maximum performance limits of the valve. It is inserted in the P channel of the directional valve.



Type 4WE 4-10B/...B..
O-ring 7 x 1.5

Ordering details

	WE	4		10	B /	A						*
--	----	---	--	----	-----	---	--	--	--	--	--	---

3 service ports = 3
4 service ports = 4

Nominal size 4 = 4

Symbols see below

Series 10 to 19 = 10
(10 to 19 unchanged installation and connection dimensions)

The technology of Beijing Huade Hydraulic = B

Spring return = No code
Without spring return = O
Without spring return with detent = OF

Standard solenoid = A

12 V DC = 12
220 V AC 50 Hz = W220-50
24 V DC = G24
DC solenoid commuting automatically = W110/220R

Further details in
clear text

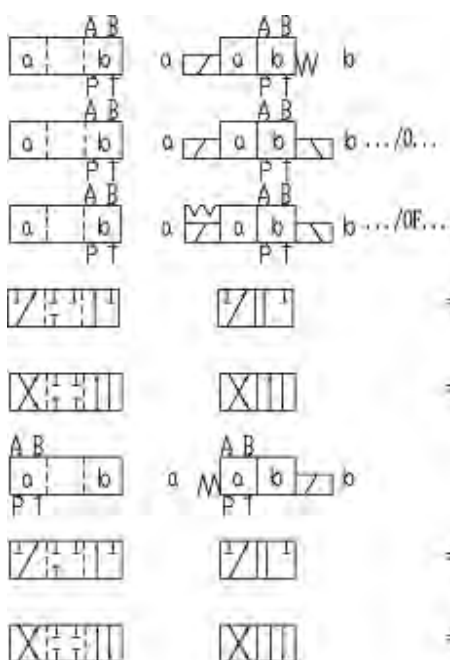
No code = mineral oils
V = phosphate ester

No code = without cartridge throttle
B08 = throttle ϕ 0.8 mm
B10 = throttle ϕ 1.0 mm
B12 = throttle ϕ 1.2 mm

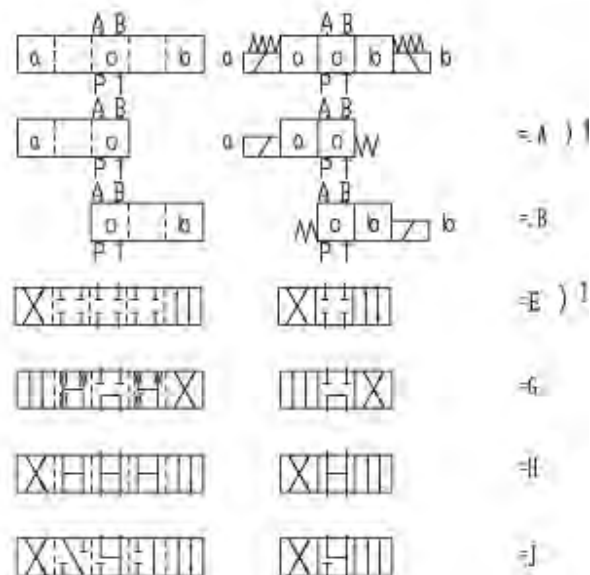
Z4 = normal plug
Z5 = Large angled plug
Z5L = Large angled plug with indicator light

N9 = With covered hand override
No = Without covered hand override

Symbols



1) Example: Spool E with switching position "a" ordering details..EA

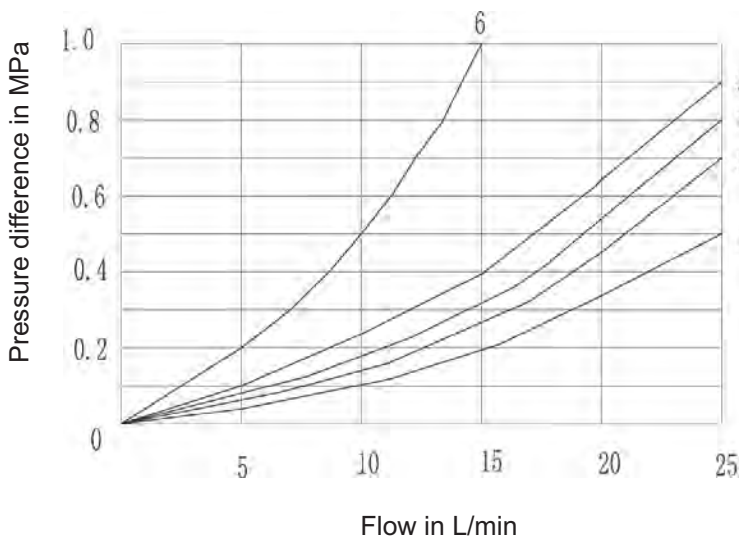


Technical data

Hydraulic technical data			
Max. operating pressure - Ports A, B, P	(MPa)	up to 21.0	
- Port T	(MPa)	10.0, With symbols A or B port T must be used as leakage port when the operating pressure is above the permissible tank pressure	
Max. flow	(L/min)	up to 25	
Pressure fluid		Mineral oil phosphate ester	
Viscosity range	(mm ² /s)	2.8 to 500	
Pressure fluid temperature range	(°C)	- 30 to + 80	
Degree of contamination	(µm)	<=20 (recommendation 10)	
Weight	(Kg)	- Valve with 1 solenoid 0.9 - Valve with 2 solenoids 1.3	
Electrical technical data			
Available voltages	(V)	12, 24, 220, 110R, 220R	
Power consumption	(W)	22	
Duty		continuous	
Switching time	ON	(ms)	20 to 30
	OFF	(ms)	10 to 20
Max. ambient temperature	(°C)	+50	
Max. coil temperature	(°C)	+150	
Protection to DIN 40 050		IP65	
Switching frequency	(cycles/h)	15000	

With electric connection the protective conductor (PE) must be connected according to the relevant regulations.

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ °C}$)



Symbol	Flow direction				
	P → A	P → B	A → T	B → T	P → T
A	5	5	-	-	-
B	5	5	-	-	-
D,Y	5	5	4	4	-
E	4	4	3	3	-
G	3	3	4	4	6
H	1	1	1	1	-
J	5	5	3	3	-

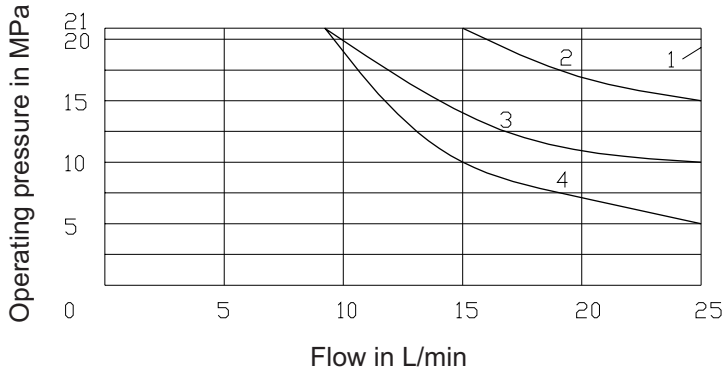
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Attention!

The given operating limits are valid for the use with two flow directions (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces active inside the valves the permissible operating limit may be significantly lower if only one flow direction from P to A and closed port B) is used!

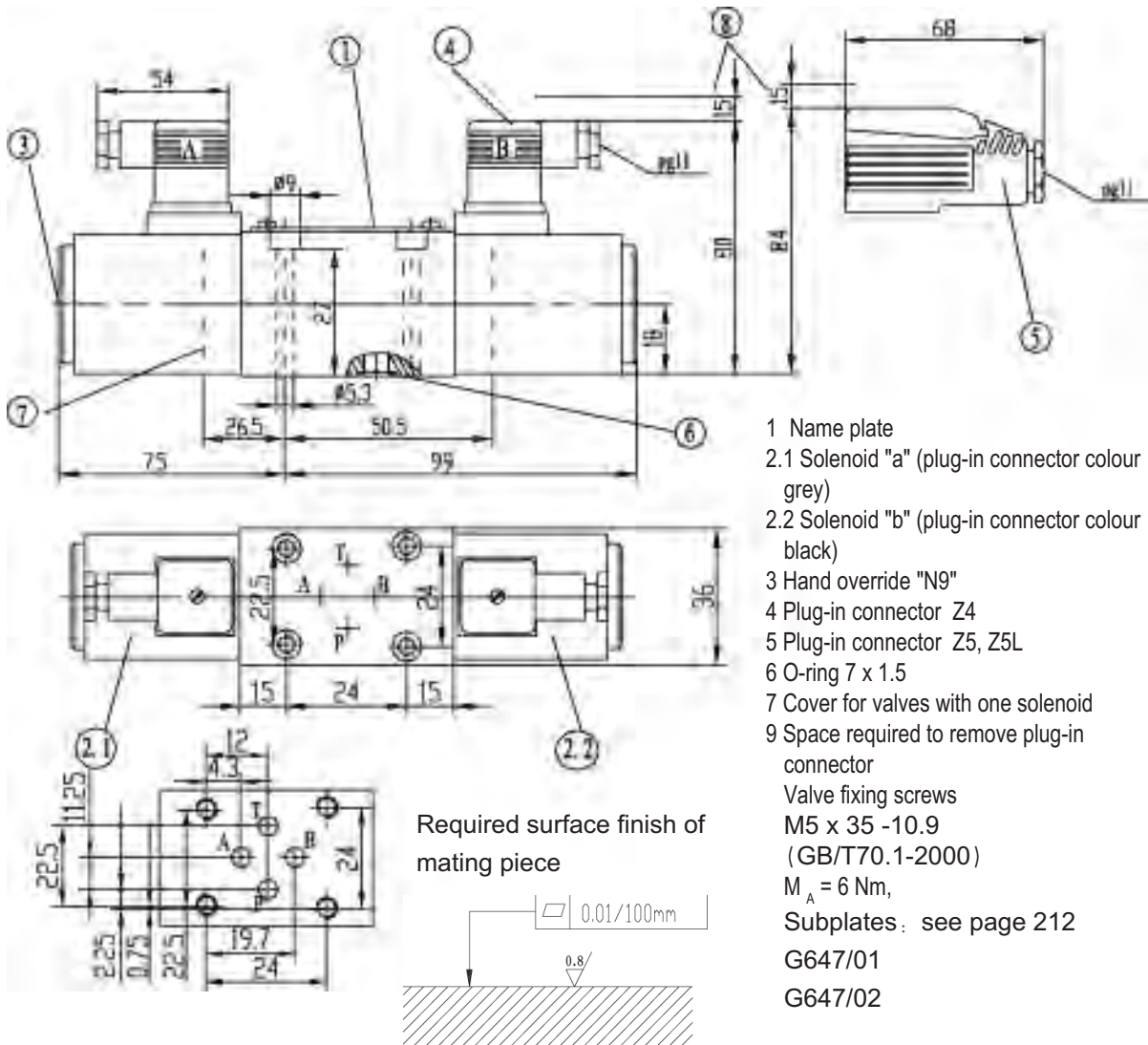
The operating limits were measured with solenoids at operating temperature, 10% under voltage and without tank back pressure.



Char. curve	Symbol
1	D,D/O,D/OF,H,Y
2	E,J
3	G
4	A,B

Unit dimensions

(Dimensions in mm)

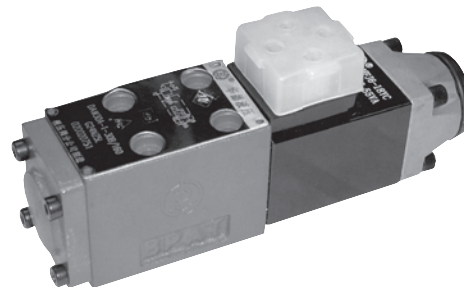


- 1 Name plate
 - 2.1 Solenoid "a" (plug-in connector colour grey)
 - 2.2 Solenoid "b" (plug-in connector colour black)
 - 3 Hand override "N9"
 - 4 Plug-in connector Z4
 - 5 Plug-in connector Z5, Z5L
 - 6 O-ring 7 x 1.5
 - 7 Cover for valves with one solenoid
 - 9 Space required to remove plug-in connector
- Valve fixing screws
M5 x 35 -10.9
(GB/T70.1-2000)
 $M_A = 6 \text{ Nm}$,
Subplates: see page 212
G647/01
G647/02

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves, electrically operated Type WE 5			RE 23166/12.2004
	Size5	up to 25 MPa	up to 14L/min	Replaces: RE23166/05.2001

Features:

- Direct solenoid actuated directional spool valve
- Wet pin DC or AC solenoids



Function, section

Directional valves of type WE5 are solenoid operated directional spool valves. They control the start, stop and direction of a fluid flow.

These directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), and one or two return springs(4).

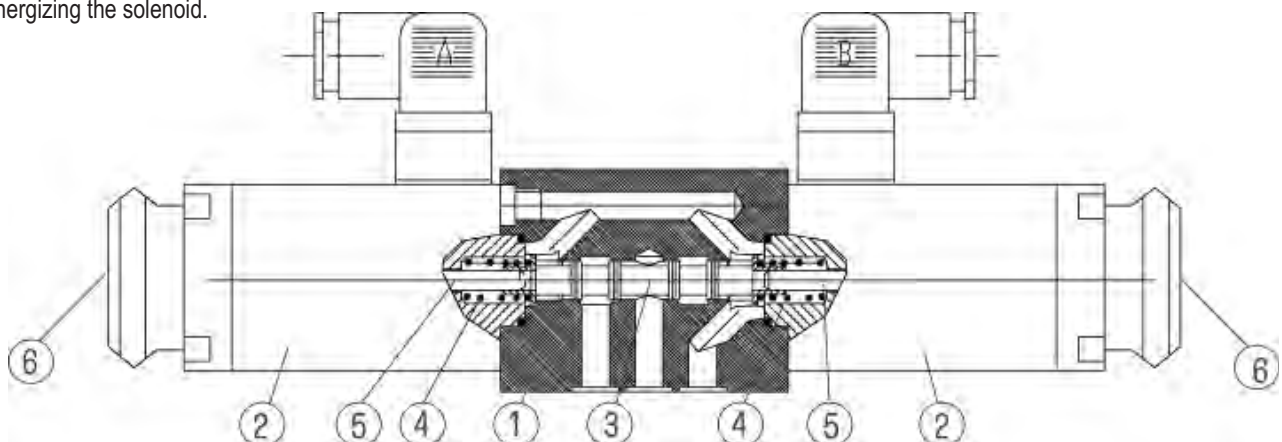
The control spool (3) is held by the return spring (4) in the central or in the initial position (except for detented spools).The control spool (3) is actuated via wet pin solenoids (2). In the energized condition.The force of the solenoid (2) acts via the plunger (5) on the control spool (3) and shifts the same from its rest position to the desired end position.Thus, the required flow pattern from P to A and B to T or P to B and A to T is selected. When the solenoid (2) is de-energized, the control spool (3) is returned to its neutral position by the return spring (4).A covered manual override is provided so that the control spool (3)can be operated without energizing the solenoid.

Type 4WE5 N 6.0B/O...

This version is a directional valve with 2 switching positions and 2 solenoids without detent and springs. There is no defined switching position in the de-energized condition.

Type 4WE5 N 6.0B/OF...

This version is a directional valve with 2 switching position,2 solenoids and a detent.Thus, the relevant switching positions are fixed and continuous energization of the solenoid is not necessary



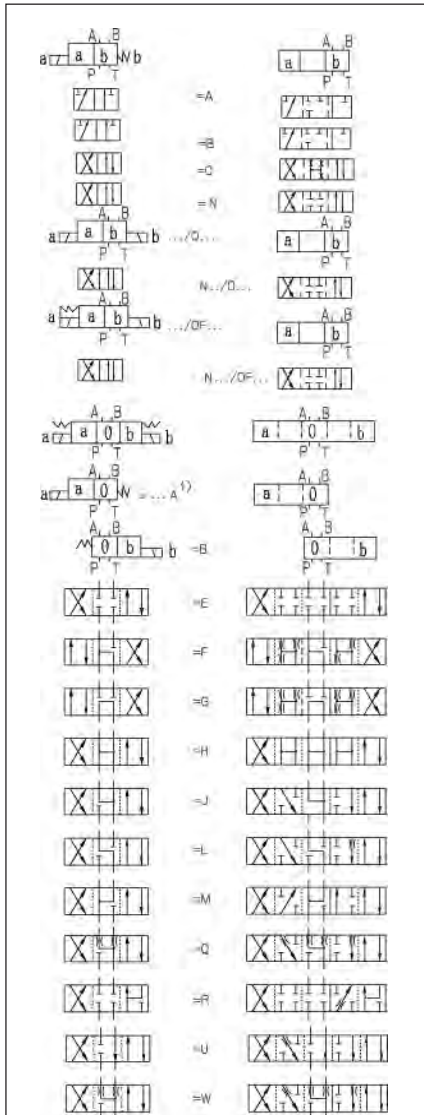
Type WE5

Ordering details

WE 5 6.0 B / A *

3 Service ports = 3
4 Service ports = 4

Nominal size 5 = 5



1) Example: Spool E with switching position "a"
ordering details..EA
Spool E with switching position "b"
ordering details..EB

Series 6.0 to 6.9 = 6.0
(6.0 to 6.9: unchanged installation and connection dimentions)

Further details in cleartext

No code = mineral oils
V = phospate ester

z4= plug-in connector
z5= large plug-in connector
z5L=large plug-in connector with indicator

N= With manual override
No = Without manual override

W220-50= 220 V AC 50 Hz
G24= 24 V DC
W220R = DC solenoid commuting automatically

A= wet pin solenoid

No= Standard,with spring return
OF= Without spring return, with detent
O = Without spring return

B = Technology of Beijing Huade Hydraulic

* With spool types A and B port T must be used as a drain port when operating pressure exceeds 6 MPa

Technical data

Hydraulic			
Hydraulic fluid	mineral oils, phosphate ester		
Fluid temperature range (°C)	-30 ~ +80		
Viscosity range (mm ² /s)	2.8 ~ 500		
Operating pressure, max. (MPa)	Port A, B, P	Port T	
	up to 25	up to 6	
Flow area (switching position 0):	With symbol W	With symbol Q	
	approx. 3% of nominal cross section	approx. 6% of nominal cross section	
Weight (kg)	valve	subplate G115/01	subplate G96/01
	approx. 1.4	approx. 0.7	approx. 0.5
Electrical			
AC Voltage (V)	110, 220, in 50Hz		
DC Voltage (V)	12, 24, 110		
Voltage type	AC	DC	
Power requirement (W)	26		
Holding power (VA)	-	46	
Switch-on power (VA)	-	130	
Duty cycle	continue		
Switching time	ON (ms)	40	25
	OFF (ms)	30	20
Environment temperature (°C)	+50		
Coil temperature (°C)	+150		
Switching frequency cycles (cycles/h)	15000	7200	
Type of protection to DIN 40 050	IP65		

Switching limits

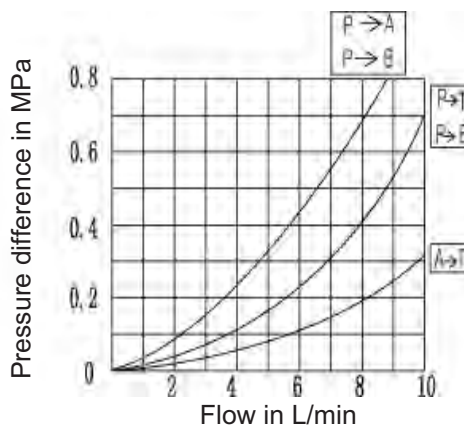
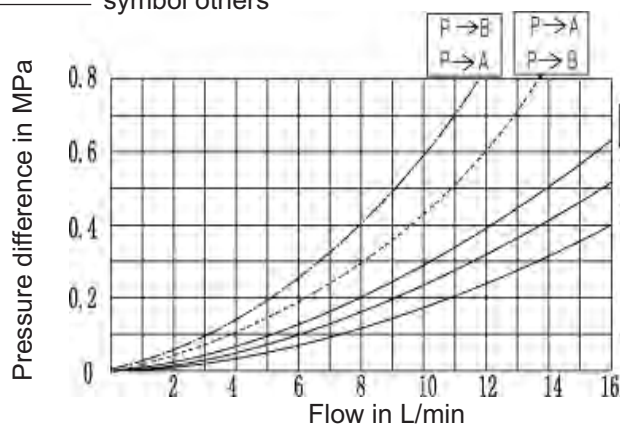
Attention!

The given operating limits are valid for the use with two flow directions (e.g. from P to A and simultaneous return flow from B to T). Due to the flow forces active inside the valves the permissible operating limit may be significantly lower if only one flow direction from P to A and closed port B) is used! The operating limits were measured with solenoids at operating temperature, 10% under voltage and without tank back pressure.

symbol	flow in L/min	operating pressure in MPa		
		5	10	25
A, B, C, N, E, F, H, J, L, M, Q, R, V, W		14	14	12
G		10	10	9

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

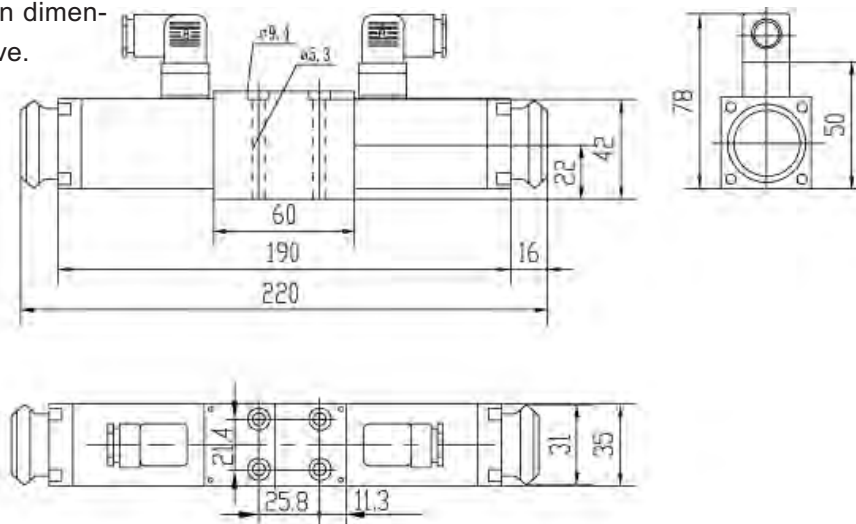
- symbol B
- - - - - symbol R
- symbol others



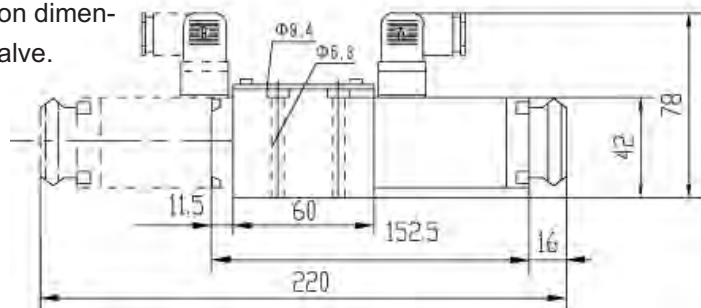
Unit dimensions

(Dimensions in mm)

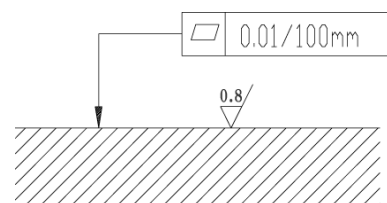
Shape and connection dimensions of 3-position valve.



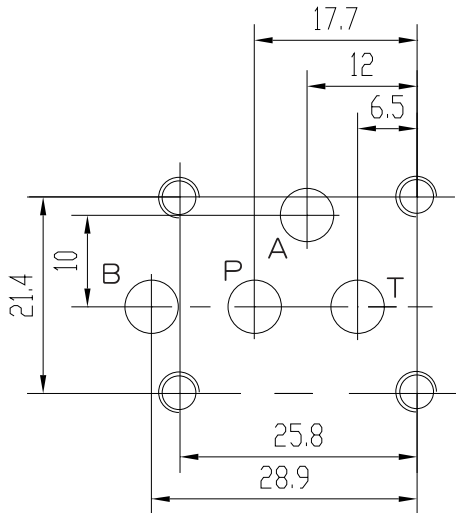
Shape and connection dimensions of 2-position valve.



Required surface finish of mating piece



The connection dimensions of service ports



O-ring	7X1.5
Valve fixing screws	4-M5X50-10.9 (GB/T70.1-2000) $M_A=9N.m$

Subplates:

G115/01; G96/01

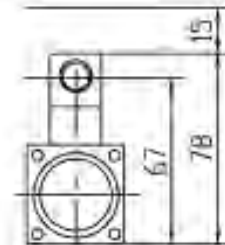
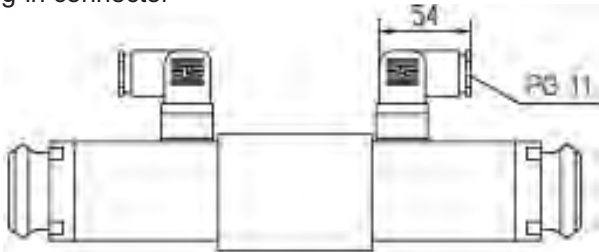
G115/02; G96/02

see page 212

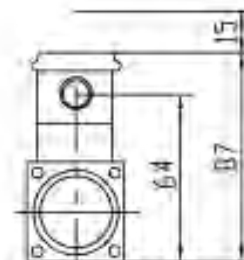
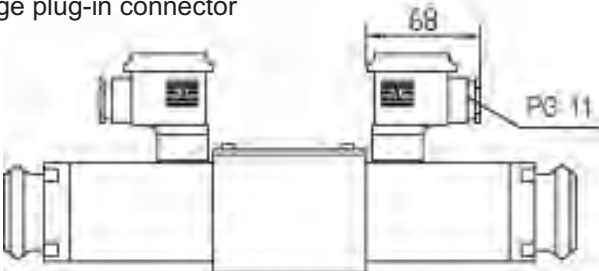
Dimensions of the electrical connection

(Dimension in mm)

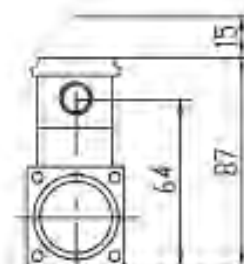
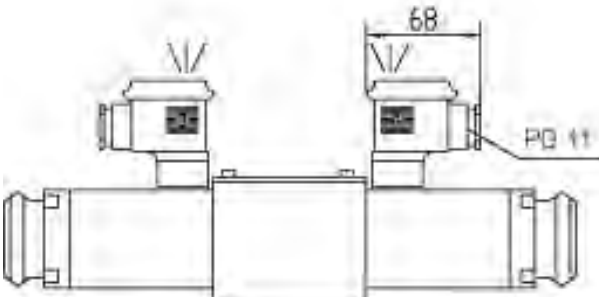
z4 plug-in connector



z5 large plug-in connector



z5L large plug-in connector with indicator



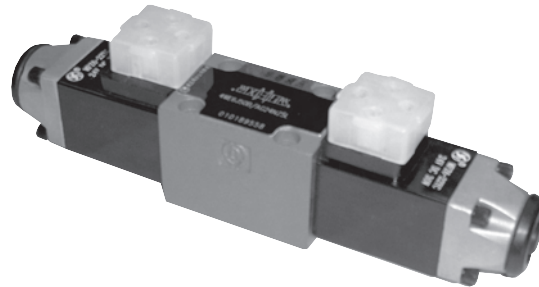
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves, electrically operated Type WE 6...50B/...			RE 23177/12.2004
	Size 6	up to 31.5 MPa	up to 80L/min	Replaces: RE23177/05.2001

Features:

- Direct operated directional spool valve with solenoid operation in standard design
- Wet pin DC or AC solenoids
- high-power solenoid
- 53 kinds spool function
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Functional, section

Directional valves of type WE6 are solenoid operated directional spool valves. They control the start, stop and direction of a fluid flow.

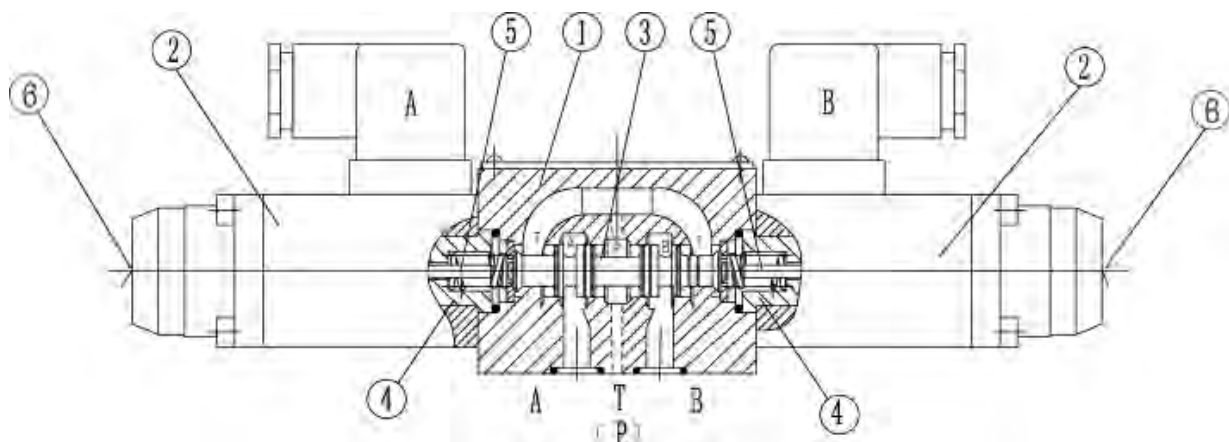
These directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), and one or two return springs (4).

In the de-energized condition, the control spool (3) is held by the return springs (4) in the central or in the initial position (except for detented spools). The control spool (3) is actuated via wet pin solenoids(2). The force of the solenoid (2) acts via the plunger (5)

on the control spool (3) and shifts the same from its rest position to the desired end position. Thus, the required flow pattern from P to A and B to T or P to B and A to T is selected.

When the solenoid (2) is de-energized, the control spool (3) is returned to its neutral position by the return spring (4).

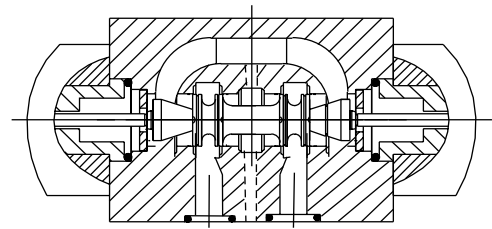
A manual override (6), optional, is provided for emergency operation of the control spool (3) without energization of the solenoid.



Type 4WE 6 E50B/

4WE6... 50B/O :

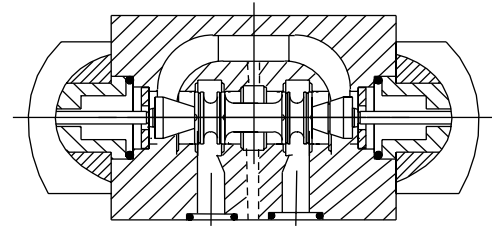
This version is a directional valve with 2 switching positions and 2 solenoids without detent. There is no defined switching position in the de-energized condition.



WE6...50B/O

WE6... 50B/OF :

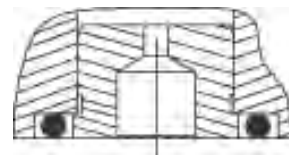
This version is a directional valve with 2 switching position, 2 solenoids and a detent. Thus, the relevant switching positions are fixed and continuous energization of the solenoid is not necessary.



WE6...50B/OF

Throttle inserts:

The use of throttle inserts is only required, if, due to the operating conditions, flows are to be expected, which are higher than the stated maximum performance limits of the valve. It is inserted in the P channel of the directional valve.



Solenoid

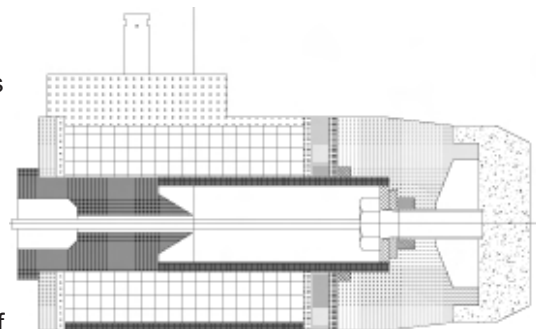
Wet pin solenoid life is much longer because gag bit moves in the oil ,just lessening hydraulic impact and abrasion , improving the speed of emanating heat.

The characteristics of DC solenoids :

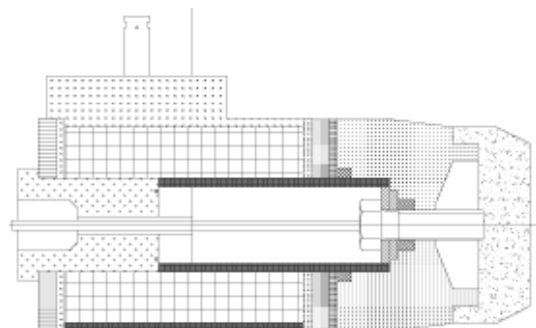
- Switching gently ,high frequency.
 - Coils are all safety wherever gag bit stays at any position of the solenoid .
 - Its response is not rapid for lower voltage ,go beyond voltage instantly,over loading or jamming of mechanism .
- AC power supply can be used through commuting.

The characteristic of AC solinoids :

- The circuit of electrical control is easy.
- Action time is short.
- It is not necessary of special protect device for on-off.



DC solenoid



AC solenoid

Ordering details

WE 6 50 B / / / / / / / / / *

3 Service ports = 3
 4 Service ports = 4
 Nominal size 6 =6

Further details in clear text

No code = mineral oils
 V = phosphate ester

No code = without throttle insert
 B08= Throttle, Φ 0.8 mm
 B10 = Throttle, Φ 1.0 mm
 B12= Throttle, Φ 1.2 mm

Electrical connection see back

N= With manual override
 No code= Without manual override

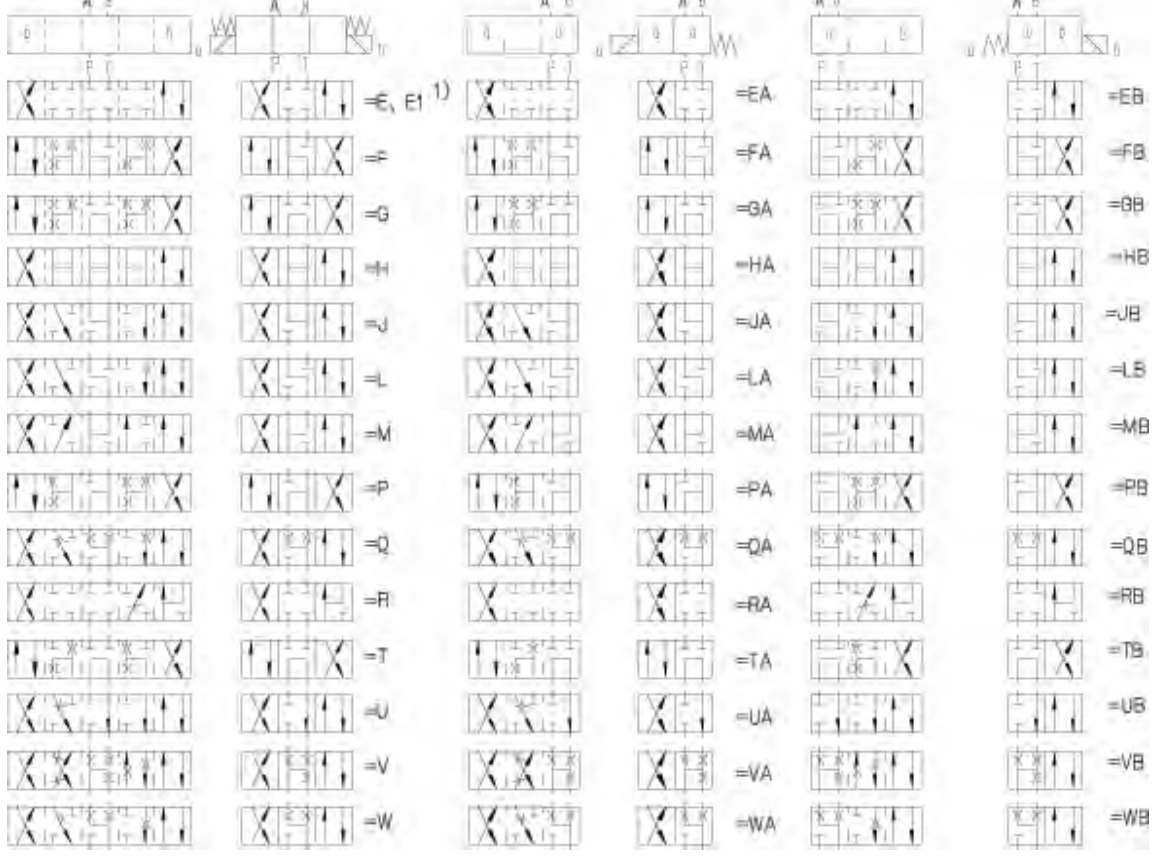
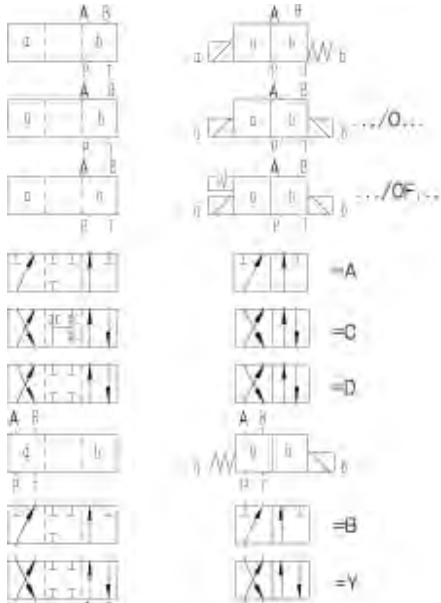
W220 -50= 220 V AC, 50 Hz
 G24= 24 V DC
 W220R = AC 110V 220V
 W110R = AC solenoid with plug Z5

A = standard solenoid
 B = high-power solenoid

No code= With spring return
 OF= Without spring return, with detent
 O= Without spring return

B = Technology of Beijing Huade Hydraulic

50= Series 50 to 59
 (50 to 59: unchanged installation and connection dimensions)



Technical data

Hydraulic

Solenoid		Standard solenoid A	High-power solenoid B
Operating press., max.	Port A, B, P (MPa)	up to 31.5	up to 35
	Port T (MPa)	up to 16 (=) up to 10 (~)	up to 16
Flow, max. q_v (L/min)		up to 60	up to 80 (=); up to 60 (~)
Flow area (switching position 0):		for symbol Q, 6% of nominal cross section for symbol W, 3% of nominal cross section	
Hydraulic fluid		mineral oils, phosphate ester	
Fluid temperature range (°C)		- 30 to + 80	
Viscosity range (mm ² /s)		2.8 to 500	
Weight (Kg)	Valve with 1 solenoid	1.2	1.35
	Valve with 2 solenoids	1.6	1.6

With symbol A and B, port T must be used as drain port, if the operating pressure is higher than the permissible tank pressure.

Electrical

Solenoid		Standard solenoid A		High-power solenoid B	
		–	~	–	~
Available voltages (V)		12, 24, 110	110, 220/50Hz	12, 24, 110	110, 220/50Hz
Power requirement (W)		26	–	30	–
Holding power (VA)		–	46	–	35
Switch-on (VA)		–	130	–	220
Duty cycle		continuous	continuous	continuous	continuous
Switching time	ON (ms)	20–45	10–25	20–45	10–20
	OFF (ms)	10–25	10–25	10–25	15–40
Environment temperature (°C)		+ 50			
Coil temperature (°C)		+ 150			
Switching frequency (cycles/h)		15000	7200	15000	7200
Type of protection to		DIN 40 050		IP65	

When connecting the electrics, the protective conductor (PE) must be connected according to relevant regulations.

Switching limits

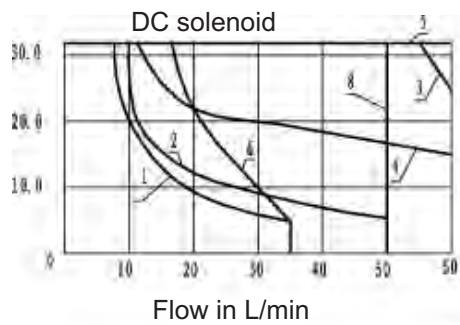
The switching limits are valid for use with two directions of flow (e.g. from P to A with simultaneous return flow from B to T). Due to the flow forces within the valve, the permissible switching capacity limits can be much lower with only one direction of flow (e.g. from P to A, and port B blocked)!

Switching limits of the solenoid type A

DC solenoid				AC solenoid (50Hz)			
Char. curve	Symbol	Char. curve	Symbol	Char. curve	Symbol	Char. curve	Symbol
1	A,B***	7	G	14	A,B***	22	H
2	A,B	8	H	15	A,B	23	J,L,Q,U,W
3	C,D,Y	9	J,L,Q,U,W	16	C,D,Y	24	M
4	E	10	R**	17	E	25	R**
5	M,C/O,E1	11	V	18	E1	26	V
6	D/O,C/O,F,D/O,F	12	A/O,A/O,F	19	C/O,D/O	27	A
	F,P	13	T	20	F,P	28	T
				21	G		

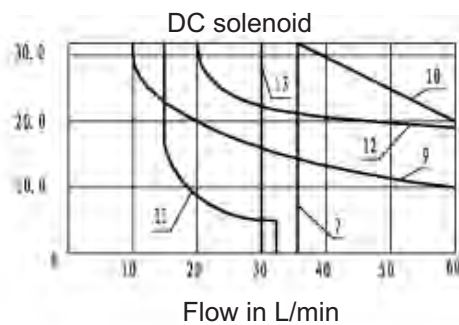
Return flow from the actuator to the tank-T; *Without manual override

Operating pressure in MPa



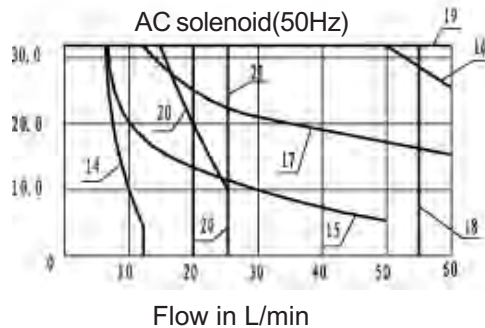
Flow in L/min

Operating pressure in MPa



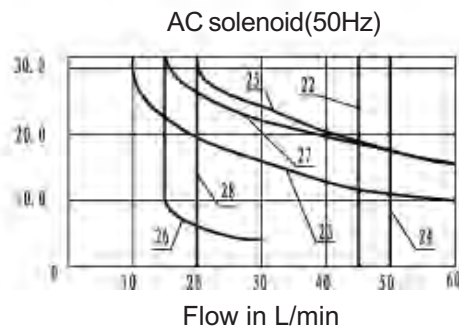
Flow in L/min

Operating pressure in MPa



Flow in L/min

Operating pressure in MPa



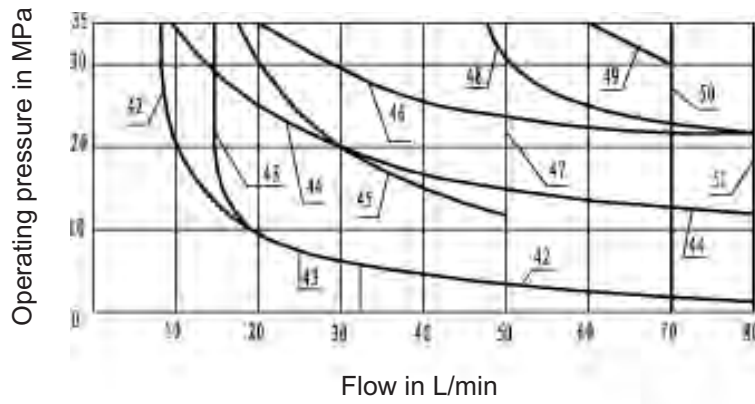
Flow in L/min

Switching limits of the solenoid type B

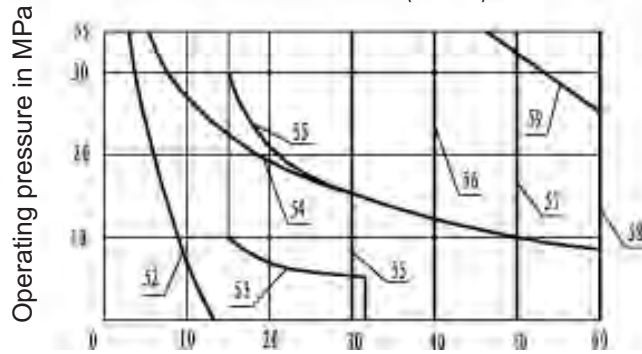
DC solenoid		AC solenoid (50Hz)	
Char. curve	Symbol	Char. curve	Symbol
42	A,B***	52	A,B***
43	V	53	V
44	A,B	54	A,B
45	F,P	55	F,P
46	J,L,U	56	G,T
47	G,H,T	57	H
48	A/O,A/O,F,Q,W	58	A/O,D/O,F,C/O,C/O,F
49	G,D,Y		D/O,D/O,F,E,J,L,E1
50	M		M,Q,R**,U,W
51	E,R**,C/D,C/O,F,E1	59	C,D,Y
	D/O,D/O,F		

Return flow from the actuator to the tank-T; *Without manual override

DC solenoid

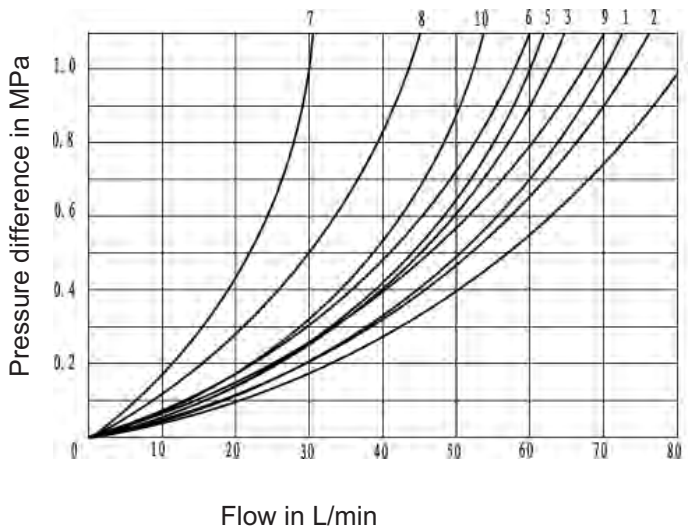


AC solenoid (50Hz)

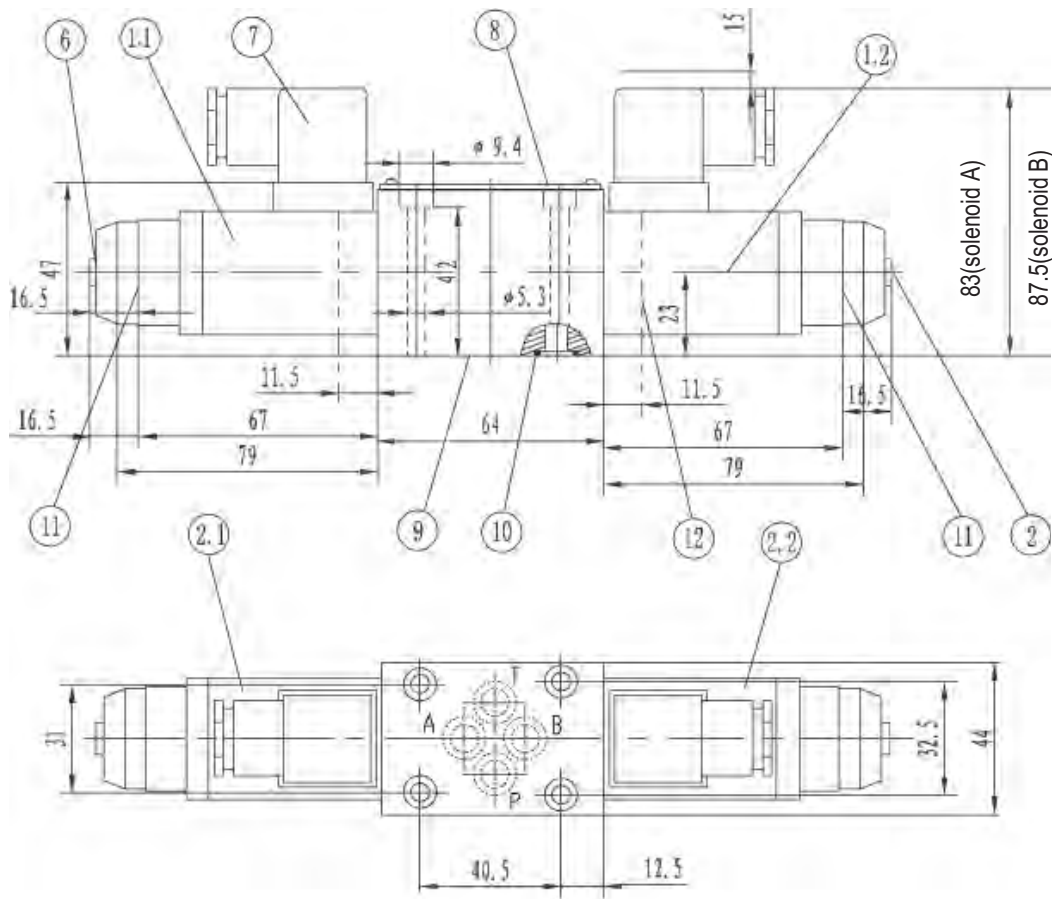


Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

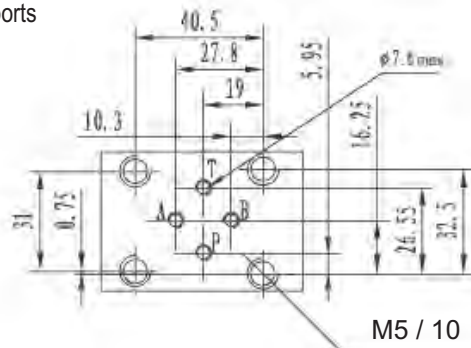
7 Symbol "R" in switching position A → B
 8 Symbol "G" and "T" in central position P → T



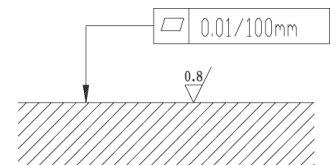
Symbol	Direction of flow			
	P → A	P → B	A → T	B → T
A,B	3	3	-	-
C	1	1	3	1
D,Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J,Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9



The connection dimensions of service ports



Required surface finish of mating piece



- 1.1 Solenoid "a" (colour of the plug-in connector: grey)
- 1.2 Solenoid "b" (colour of the plug-in connector: black)
- 2 Manual override "N"
- 7 Plug Z4
- 8 Nameplate
- 9 Service port
- 10 O-ring 9.25x1.78
- 11 Solenoid without manual override
- 12 Cover for valve with one solenoid

Valve fixing screws
4-M5x50-10.9 (GB/T70.1-2000)

$M_A=9N.m$

Subplates:

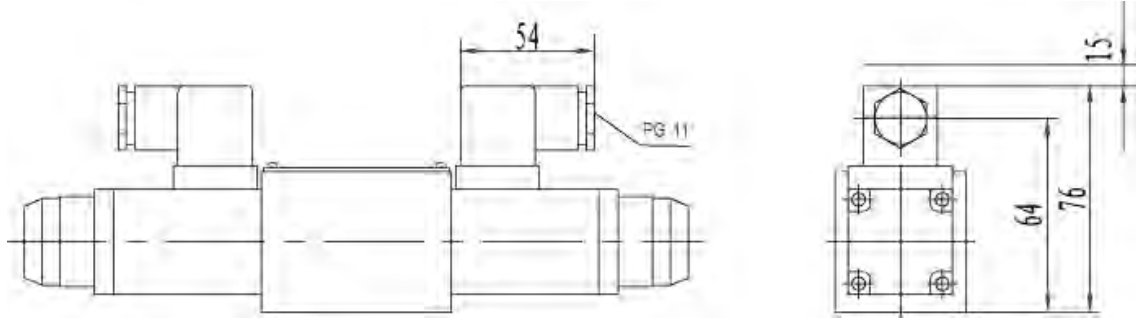
G341/01(G1/4 ") G341/02(M14x1.5)

G342/01(G3/8 ") G342/02(M18x1.5)

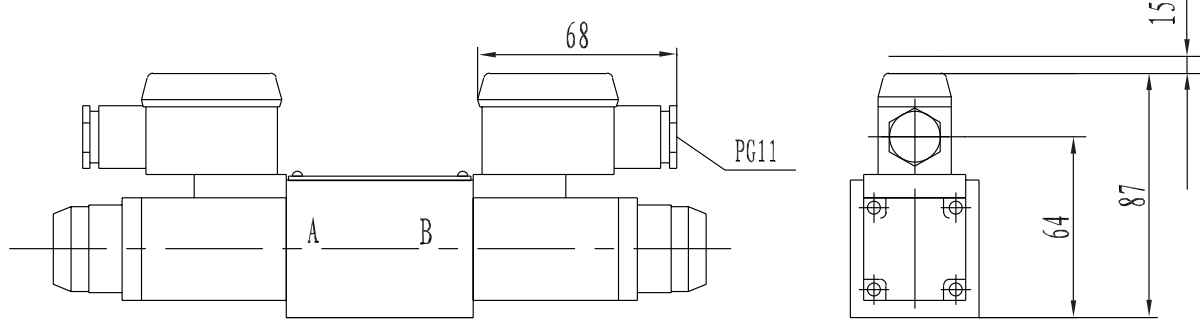
G502/01(G1/2 ") G502/02(M22x1.5)

see page 205

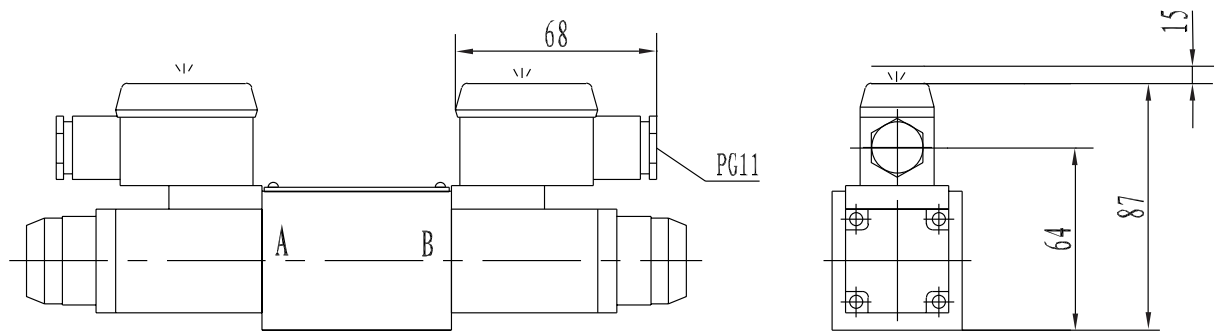
Z4 Individual connections



Z5 large angled plug (could with rectifier)



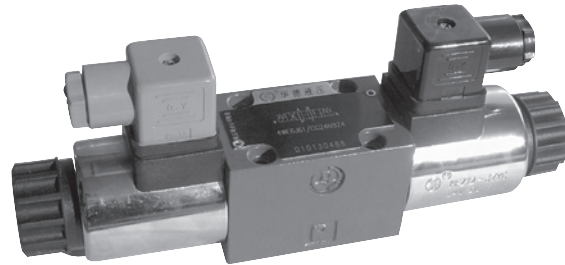
Z5L large angled plug with indicator light



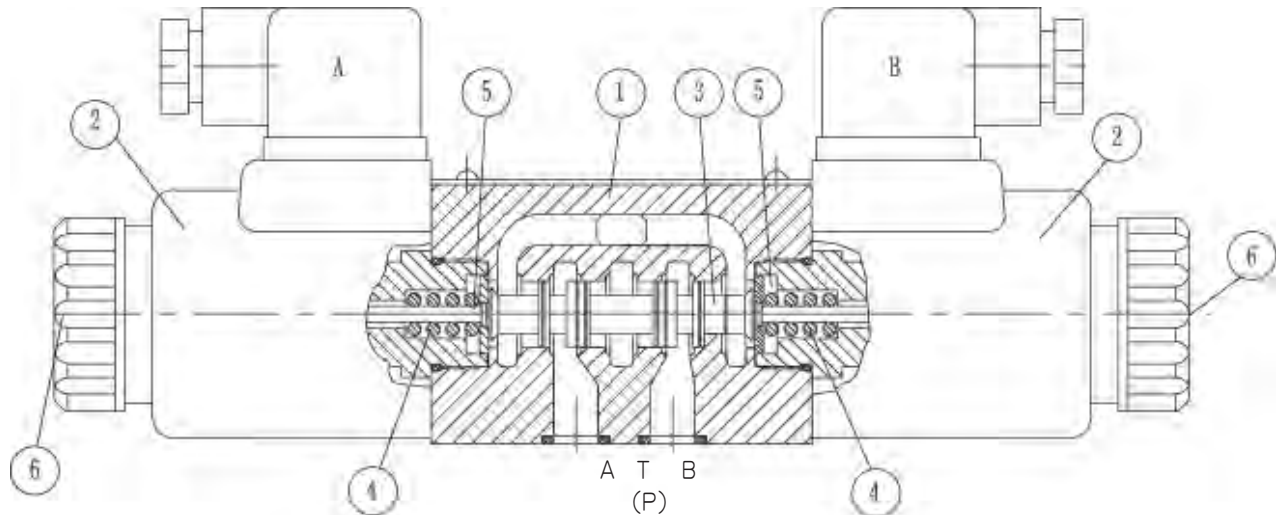
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves Type WE 6...61B/... (new series)			RE 23188/12.2004
	Size 6	up to 35 MPa	up to 80L/min	Replaces: 23188/05.2001 RE: 23316/05.2001

Features:

- Direct solenoid actuated directional spool valve high performance version
- Wet pin DC or AC solenoids with removable coil
- Solenoid coil can be rotated through 90 °
- It is not necessary to open the pressure tight chamber when changing the coil
- Electrical connections either as individual or central connections
- Hand override, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function, section



Type WE6...60B/

Essentially the directional control valves consist of housing (1), one or two solenoids (2), the control spool (3), and one or two return springs (4)

In the de-energized condition the control spool (3) is held in the neutral or initial position by means of return springs (4) (except for impulse spools). The control spool (3) is actuated via wet pin solenoids (2)

The force of the solenoids (2) acts via the plunger (5) on the control spool (3) and pushes this from its neutral position to the required end position. This gives free-flow

from P to A and B to T or P to B and A to T.

When solenoid (2) is de-energized, the control spool (3) is returned to its neutral position by means of the return springs (4).

An optional hand override (6), allows movement of the control spool (3) without energising the solenoid.

Ordering details.

	WE	6		61	B /	E						*
--	----	---	--	----	-----	---	--	--	--	--	--	---

3 service ports = 3
4 service ports = 4

Nominal size 6 = 6

Symbols see below

Series 60 to 69 = 61
(60 to 69: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

Spring return = No code
Without spring return = O
Without spring return with detent = OF

High power solenoid = E
Wet pin (oil immersed) with removable coil

12 V DC = G12
220 V AC 50 Hz = W220-50
24 V DC = G24
DC solenoid commuting automatically = W220R

Further details in clear text

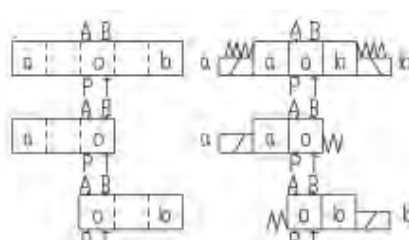
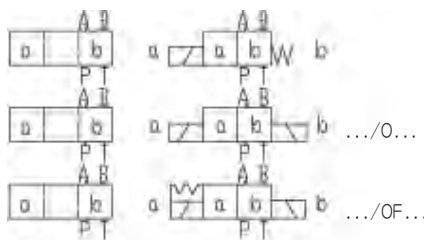
No code = mineral oils
V = phosphate ester

No code = Without cartridge throttle
B08 = Throttle Φ 0.8 mm
B10 = Throttle Φ 1.0 mm
B12 = Throttle Φ 1.2 mm

Individual connections:
K4 = with component plug without plug-in connector
Z4 = normal plug
Z5L = Large angled plug with indicator light
Central connections:
DKL = Central connection on cover with indicator light (without angled plug-in connector)

N9 = With protected hand override (standard)
N = With hand override
No code = Without hand override

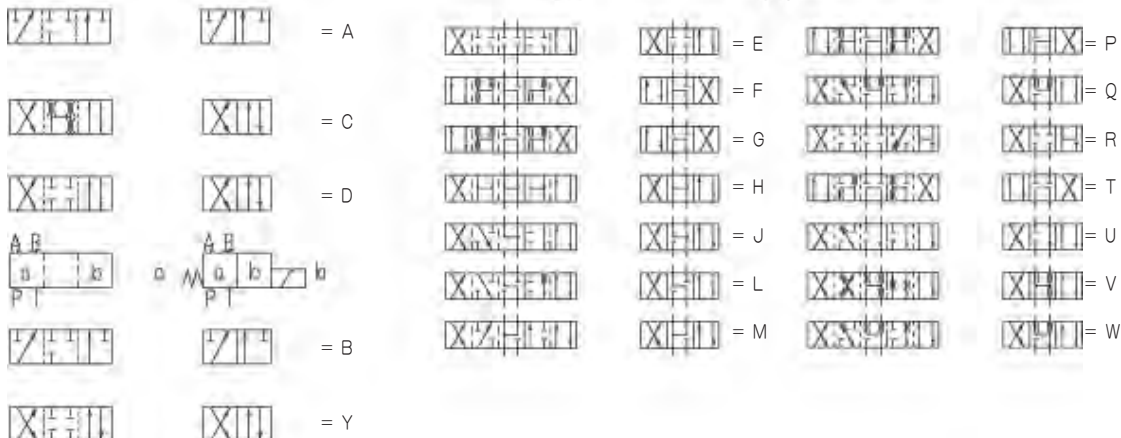
Symbols



1) Example: Spool E with switching position "a" ordering details..EA "b"

= .A 1)

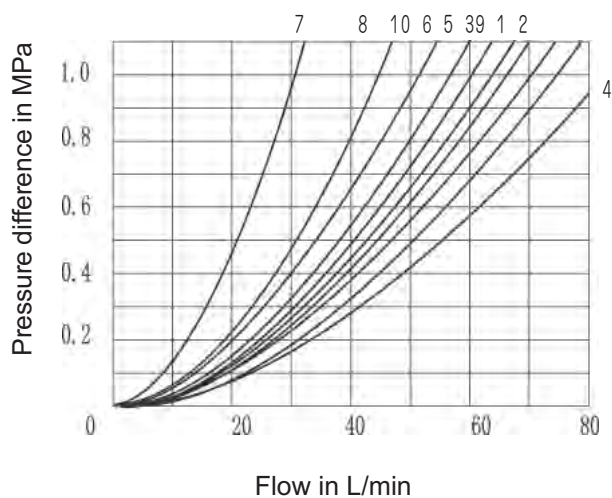
= .B



Technical data			
Hydraulic			
Max.operating pressure Ports A,B,P	(MPa)	up to 35.0	
Port T	(MPa)	21 (-);16 (~)	
		with symbols A and B,port T must be used as adrain port if the operating pressure is above the permitted tank pressure.	
Max.flow	(L/min)	80 (-);60 (~)	
Pressure fluid		mineral oil, phospate ester	
Viscosity range	(mm ² /s)	2.8 ~ 500	
Pressure fluid temperature range	(°C)	-30 ~ +80	
Degree of contamination		≤ 20(recommendation 10)	
Electrical			
Voltage type		DC	AC 50/60 Hz
Available voltages	(V)	12、 24、 42、 60、 96、	42、 110、 120、 230
		110、 180、 205、 220	50/60Hz
Power consumption	(W)	30	
Holding power	(VA)	-	50
Switch-on power	(VA)	-	220
Duty		continuous	continuous
Switching time to ISO 6403	ON	(ms)	25 to 45
	OFF	(ms)	10 to 25
Protection to DIN		IP 65	
Switching frequency	(cycles/h)	up to 15000	up to 7200
With electrical connections the protective conductor (PE) must be connected according to the relevant regulations.			

Characteristic curves (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50^\circ\text{C}$)

7 Symbol "R " in switched position A → B
 8 Symbols "G " and "T " in mid position P → T



Symbols	Flow direction			
	P→A	P→B	A→T	B→T
A, B	3	3	-	-
C	1	1	3	1
D, Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T, G	10	10	9	9
H	2	4	2	2
J, Q	1	1	2	1
L, U	3	3	4	9
M	2	3	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2

Performance limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

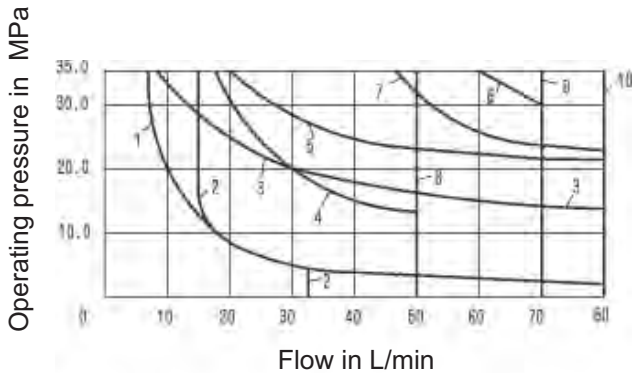
The given switching power limits are for applications with two flow directions (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces active within the valves the permissible switching power limit may be significantly less if there is only one direction of flow (e.g. from P to A and port B blocked)!

(Please consult us for applications of this kind.)

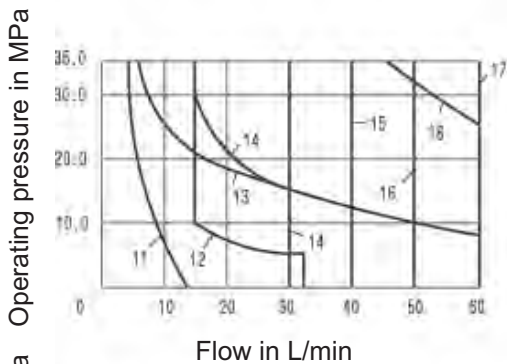
The switching power limits were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.

DC solenoid G24;24V		AC solenoid - W220;220V,50Hz		AC solenoid - 60Hz W220;220V,60Hz	
Char. curve	Symbol	Char. curve	Symbol	Char. curve	Symbol
1	A, B ¹⁾	11	A, B ¹⁾	19	A, B ¹⁾
2	V	12	V	20	V
3	A, B	13	A, B	21	A, B
4	F, P	14	F, P	22	F, P
5	J	15	G, T	23	G, T
6	G, H, T	16	H	24	J,L,U
7	A/O, A/OF, L, U	17	A/O, A/OF, C/O, C/OF	25	A/O, A/OF, Q,W
8	C, D, Y		DO, DOF, E, E ¹⁻²⁾ , J, L	26	C, D, Y
9	M		M, Q, R ³⁾ , U, W	27	H
10	E, E ¹⁻²⁾ , R ³⁾ , C/O C/OF, D/O, D/OF, Q, W	18	C, D, Y	28	C/O, C/OF, D/O, D/OF, E, E ¹⁻²⁾ , M, R ²⁾

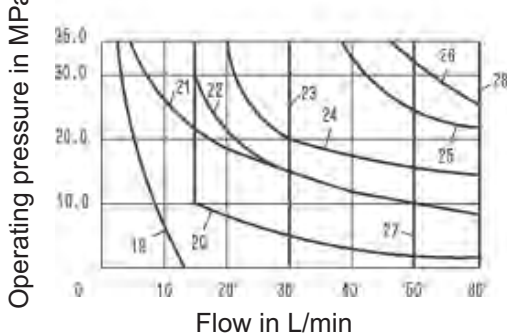


- 1) With hand override
- 2) P → A/B pre-opening
- 3) Return flow from actuator to tank

DC solenoid
Char. curve
1 to 10



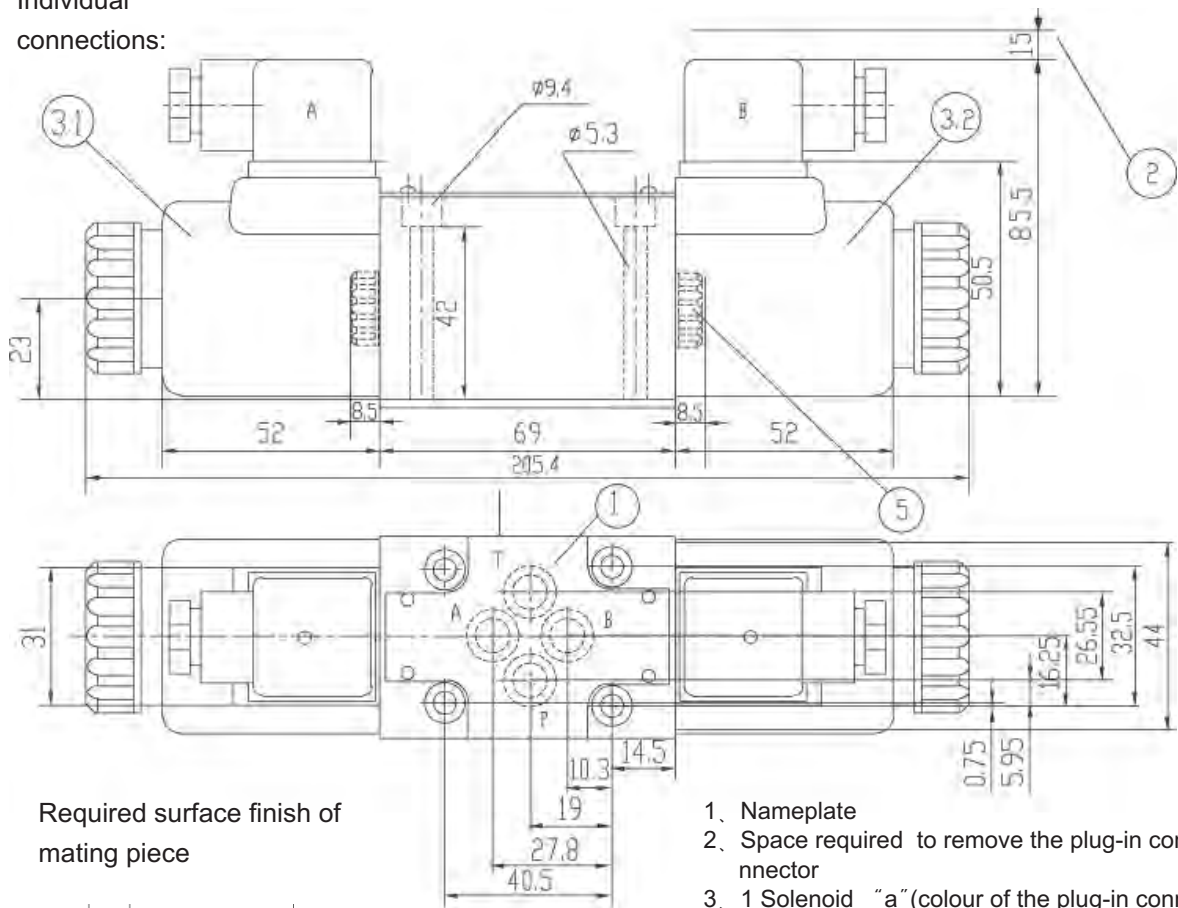
AC solenoid		
Char. curve	Solenoid voltage	
11 to 18	W42	42V, 50Hz
	W110	110V, 50Hz
		120V, 60Hz
W220	220V, 50Hz	



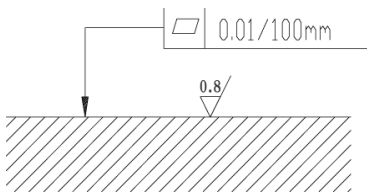
AC solenoid		
Char. curve	Solenoid voltage	
19 to 20	W42	42V, 60Hz
	W110	110V, 60Hz
	W220	220V, 60Hz

Unit dimensions: valve with DC solenoid

Individual connections:

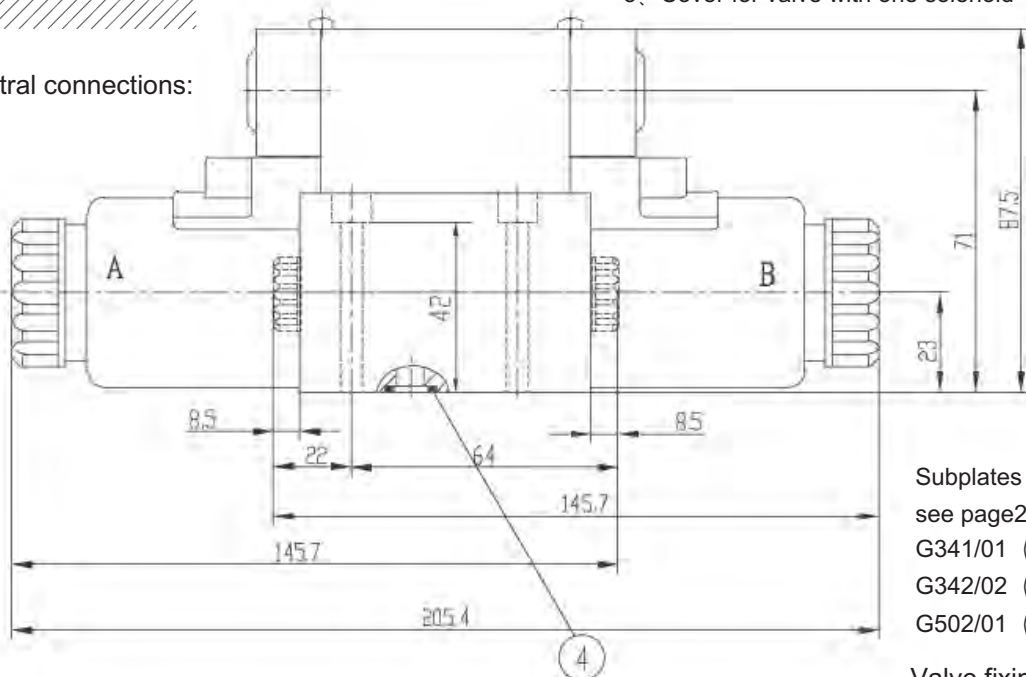


Required surface finish of mating piece



1. Nameplate
2. Space required to remove the plug-in connector
3. 1 Solenoid "a" (colour of the plug-in connector. grey)
3. 2 Solenoid "b" (colour of the plug-in connector. black)
4. O-ring: 9.25X1.78
5. Cover for valve with one solenoid

Central connections:

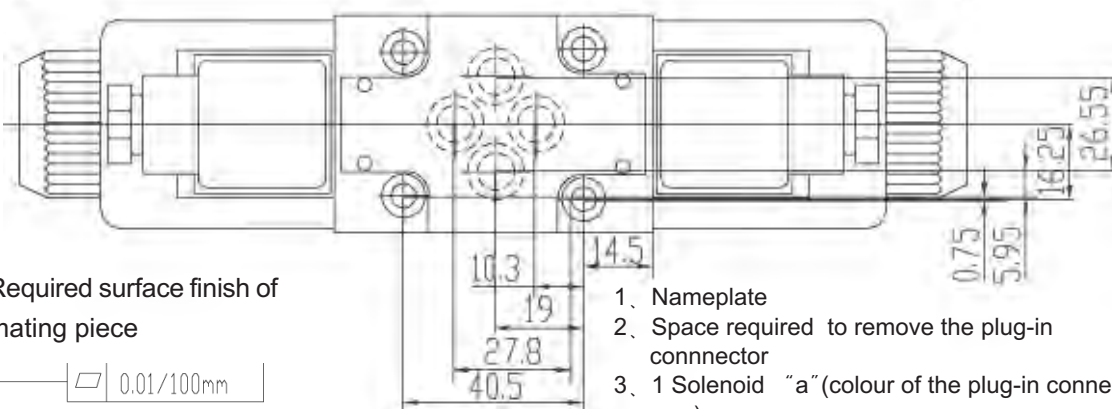
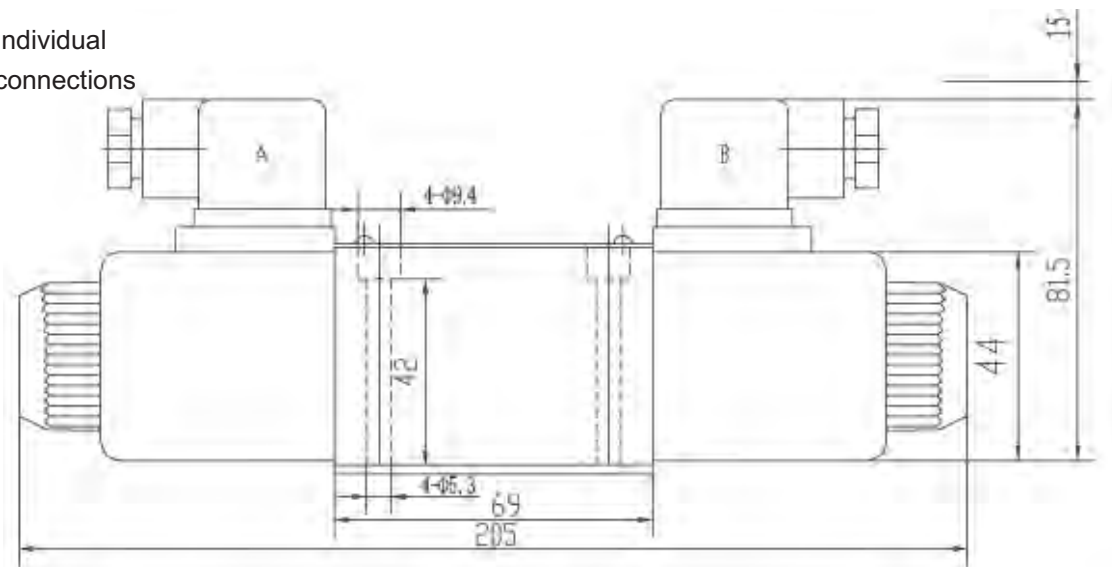


Subplates
see page 205
G341/01 (G1/4");
G342/02 (G3/8");
G502/01 (G1/2");

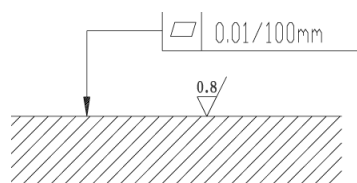
Valve fixing screws
M5X50 -10.9
(GB/T70.1-2000)
 $M_A = 8.9\text{Nm}$

Unit dimensions: valve with AC solenoid

Individual connections

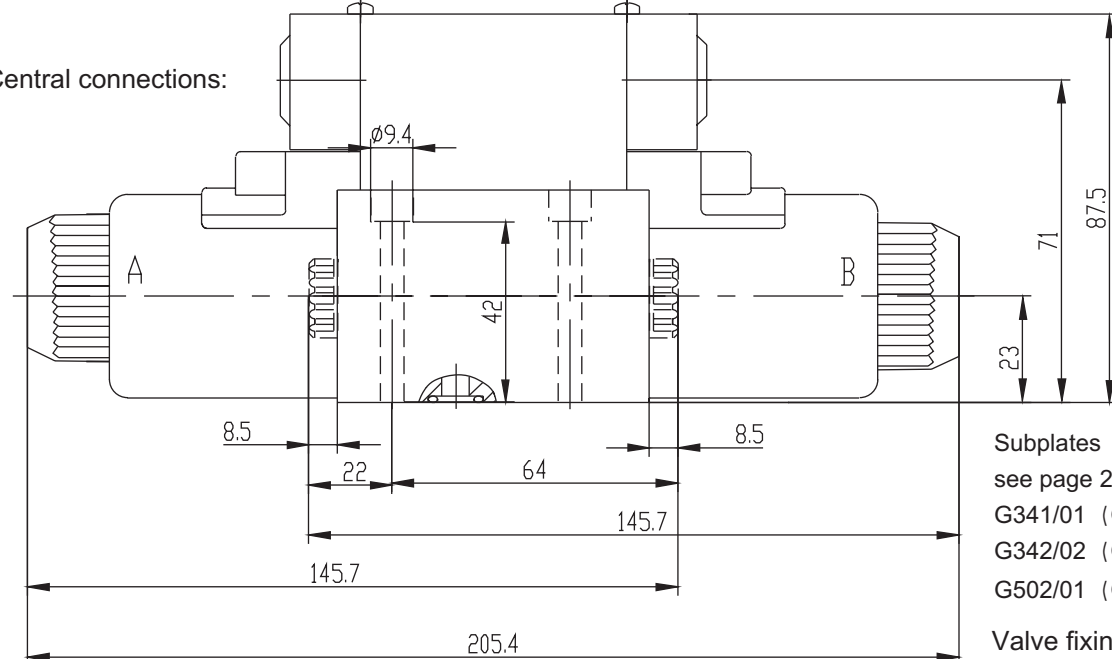


Required surface finish of mating piece



1. Nameplate
2. Space required to remove the plug-in connector
3. 1 Solenoid "a" (colour of the plug-in connector. grey)
3. 2 Solenoid "b" (colour of the plug-in connector. black)
4. O-ring: 9.25X1.78
5. Cover for valve with one solenoid

Central connections:



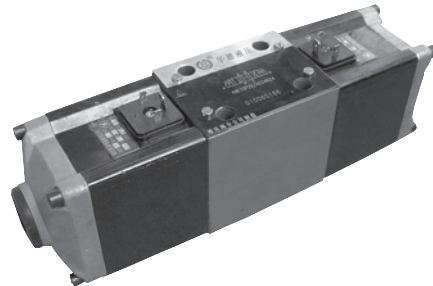
Subplates
see page 205
G341/01 (G1/4");
G342/02 (G3/8");
G502/01 (G1/2");

Valve fixing screws
M5X50 -10.9
(GB/T70.1-2000)
 $M_A = 8.9\text{Nm}$

BEIJING HUADE HYDRAULICS INDUSTRIAL GROUP CO.,LTD.	Directional control valves Type WE 10...20B/			RE 23314/12.2004
	Size 10	up to 31.5 MPa	up to 100L/min	Replaces: RE 23314/05.2001

Features:

- Direct solenoid operated directional spool valve as standard version
- 53 kinds spool function
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Functional,section

Directional valves of type WE are solenoid operated directional spool valves. They control the start, stop and direction of a fluid flow.

These directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), and one or two return springs (4).

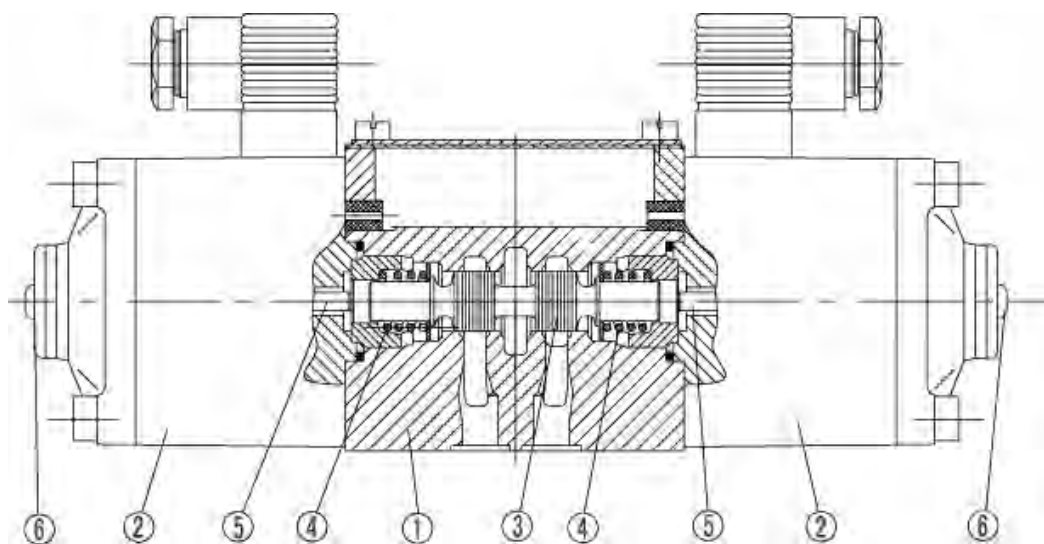
In the de-energized condition, the control spool (3) is held by the return springs (4) in the central or in the initial position (except for detented spools). The control spool (3) is actuated via wet pin solenoids(2).

The force of the solenoid (2) acts via the plunger (5) on

the control spool (3) and shifts the same from its rest position to the desired end position. Thus, the required flow pattern from P to A and B to T or P to B and A to T is selected.

When the solenoid (2) is de-energized, the control spool (3) is returned to its neutral position by the return spring (4).

A manual override (6), optional, is provided for emergency operation of the control spool (3) without energization of the solenoid.



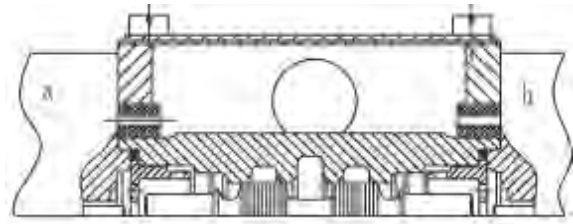
Type WE10...20B/A...

A

Type WE 10 C 20B/OA :

D

This version is a directional valve with 2 switching positions and 2 solenoids without detent. and spring return There is no defined switching position in the de-energized condition.



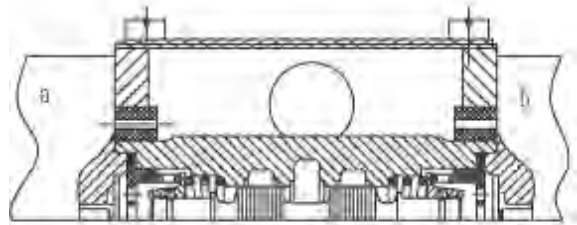
Type WE10...20B/OA

A

Type WE 10 C 20B/O FA :

D

This version is a directional valve with 2 switching position, 2 solenoids and a detent without spring return. Thus, the relevant switching positions are fixed and continuous energization of the solenoid is not necessary.



Type WE10...20B/OFA

Throttle inserts

The use of throttle inserts is only required, if, due to the operating conditions, flows are to be expected, which are higher than the stated maximum performance limits of the valve.

It is inserted in the P channel of the directional valve.



cartridge throttle

Solenoid

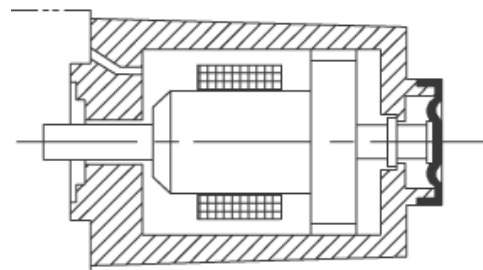
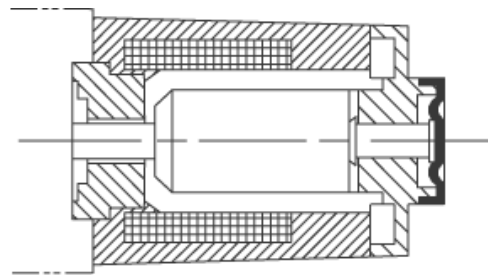
Wet pin solenoid life is much longer because gag bit moves in the oil ,just lessening hydraulic impact and abrasion ,i mproving the speed of emanating heat.

The characteristics of DC solenoids :

- Switching gently ,high frequency.
- Coils are all safety wherever gag bit stays at any position of the solenoid .
- Its response is not rapid for lower voltage ,go beyond voltage instantly,over loading or jamming of mechanism .
- AC power supply can be used through commuting.

The characteristic of AC solenoids :

- The circuitry of electrical control is easy.
- Action time is short.
- It is not necessary of special protect device for on-off.



Ordering code

	WE	10		20	B /		A				*
--	----	----	--	----	-----	--	---	--	--	--	---

3 Service ports = 3

4 Service ports = 4

Nominal size 10 =10

Further details in clear text

No code = mineral oils

V = phosphate ester

No code = Without cartridge throttle

B08 = Throttle, Φ 0.8 mm

B10 = Throttle, Φ 1.0 mm

B12 = Throttle, Φ 1.2 mm

Electrical connection see back

N= With manual override

No code= Without manual override

W220-50= 220 V AC 50 Hz

G24= 24 V DC

W220R = AC 110V 220V

W110R = AC solenoid with plug Z5

No code= With spring return

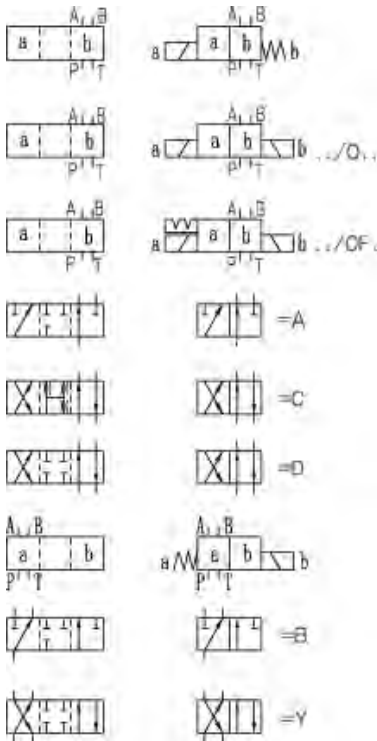
OF= Without spring return, with detent

O= Without spring return

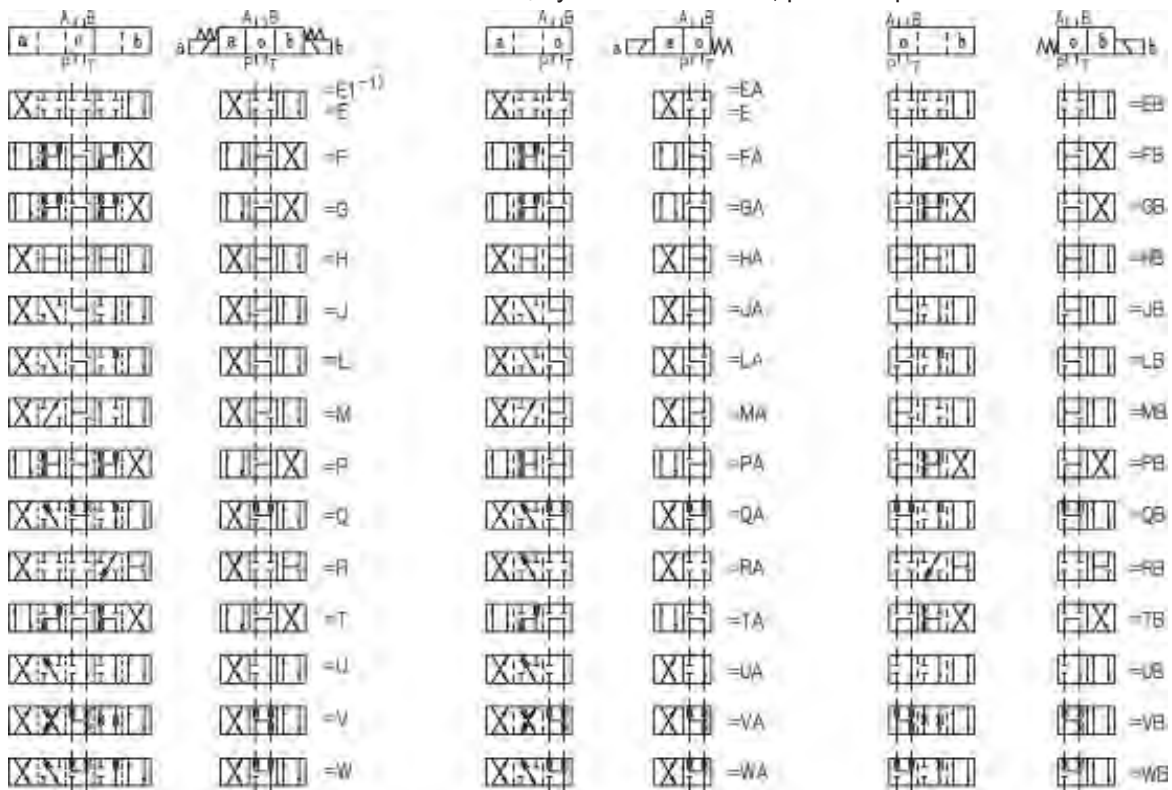
B = Technology of Beijing Huade Hydraulic

20 = Series 20 to 29

(20 to 29: unchanged installation and connection dimensions)



1) symbol E1- P A/B, previous port



Technical data

Hydraulic

Operating press., max.	Port A, B, P (MPa)	up to 31.5
	Port T (MPa)	up to 16
Flow, max. q_v	(L/min)	up to 100
Flow area (switching position 0)		With symbol Q approx. 6 % of the nominal area With symbol W approx. 3 %
Hydraulic fluid		mineral oils, phosphate ester
Fluid temperature range	(°C)	-30~+80
Viscosity range	(mm ² /s)	2.8~500
Weight (Kg)	Valve with 1 solenoid	4.7 (DC); 4.2 (AC)
	Valve with 2 solenoids	6.6 (DC); 5.6 (AC)

Note: With symbol A and B, port T must be used as drain port, if the operating pressure is higher than the permissible tank pressure.

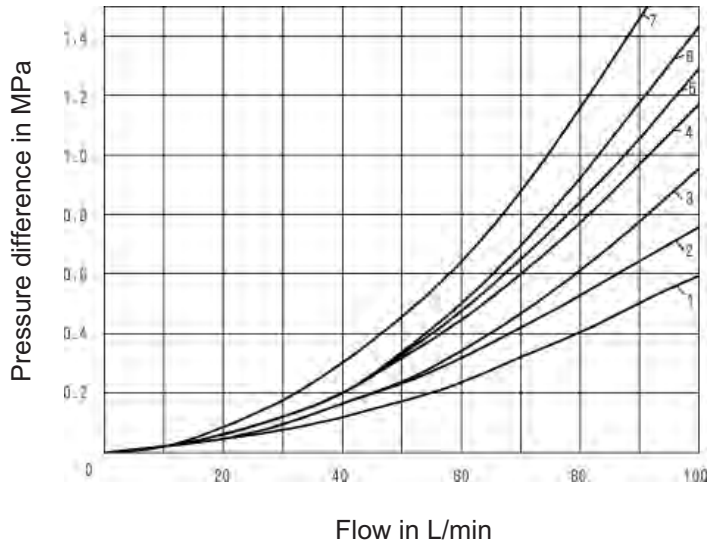
Electrical

Voltage type		AC	DC
Voltages available (V)		110, 220/50Hz	12, 24, 110
Power consumption (W)		-	35
Holding power P (VA)		65	-
Making current P (VA)		480	-
Duty cycle		Continuous	
Switching time ON (ms)		15~25	50~60
Switching time OFF (ms)		40~60	50~70
Environment temperature (°C)		+50	
Coil temperature (°C)		+150	
Switching frequency (cycles/h)		7200	15000
Insulation to DIN 40 050		IP65	

Note: When connecting the electrics, the protective conductor (PE) must be connected according to relevant regulations.

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

7 Symbol "R" in switched position A → B
 8 Symbols "G" and "T" in mid position P → T

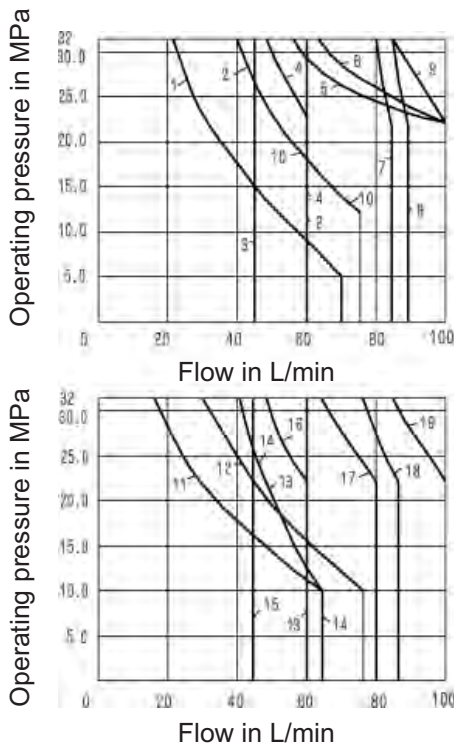


Symbol	Flow direction			
	P - A	P - B	A - T	B - T
A,B	2	2	-	-
C,D,Y,J	2	2	3	3
E,Q,V	2	2	4	4
F	2	3	3	5
G	3	3	4	6
H	1	1	4	5
L,U	2	2	3	5
M	1	1	5	5
P	3	2	5	3
R	2	4	3	-
T	3	5	5	6
W	2	2	5	5

Switching power limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

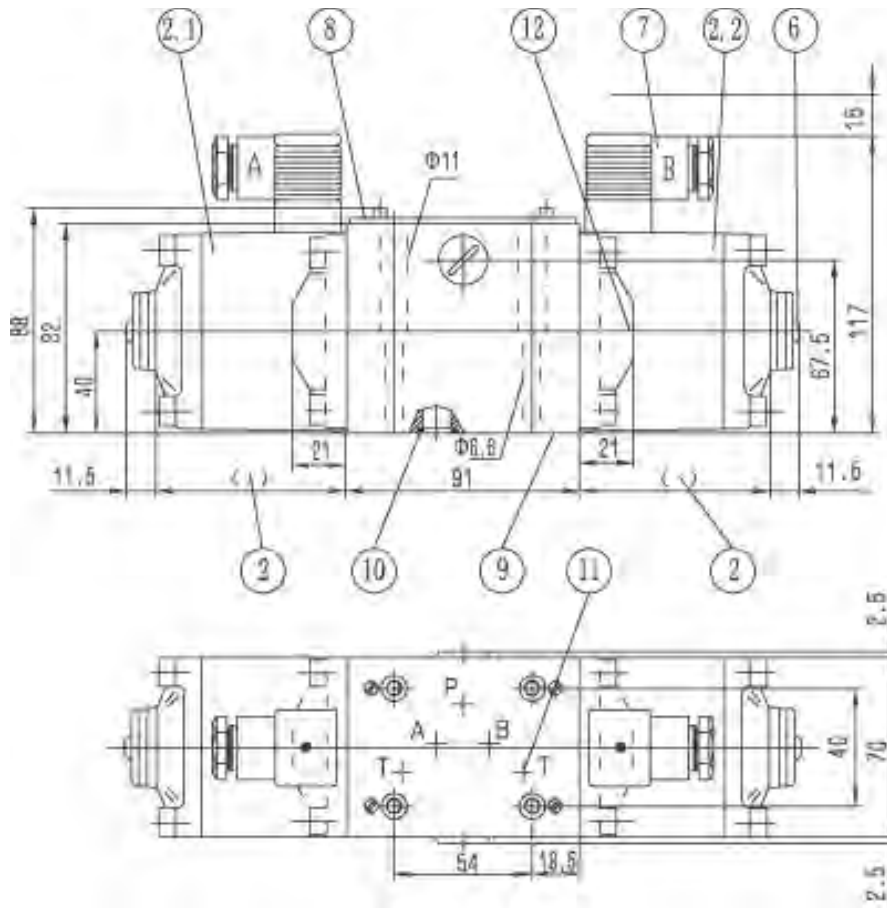
Because gluing effect influence valves switching, for attaining the biggest recomendatory value, suggest adopting the whole flux filter of $20\mu\text{m}$ in system the hydraulic impetus also affects the flux ability of valve, so different spool valve contain different work curve. for the valve of size 4, the value is given in the condition that two passages work nomally (e.g from P to A at the same time B to T) due to the flow forces active within the valves the permissible switching power limit may be significantly less if there is only one direction of flow.

The switching power limits were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.

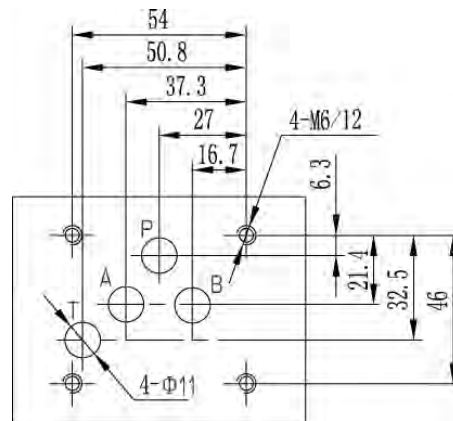


DC solenoid		AC solenoid	
Char. curve	Symbol	Char. curve	Symbol
1	A,B	11	A,B
2	F,P,T	12	H
3	V	13	F,P,T
4	G	14	A/O
5	E,L,Q,U,W	15	V
6	J	16	G
7	D,Y	17	J,L,U
8	G,R	18	C, D, Y, Q, R, W
9	M,C/O,D/O	19	C/O,D/O,E,M
10	H,A/O		

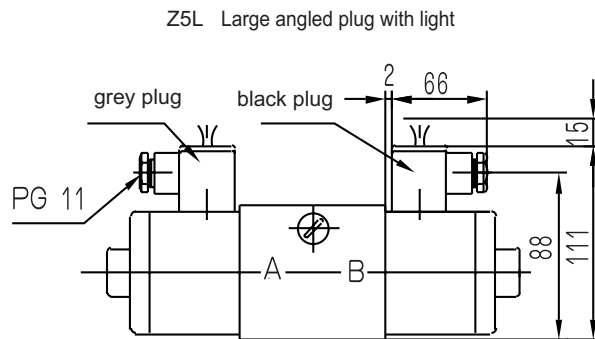
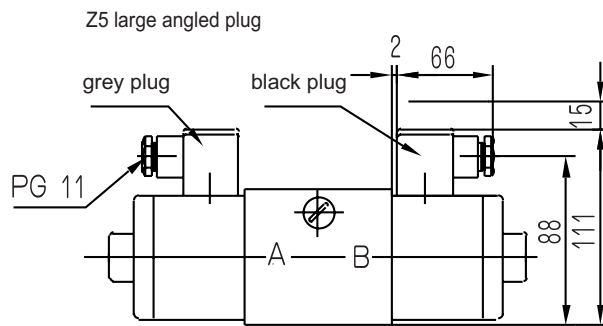
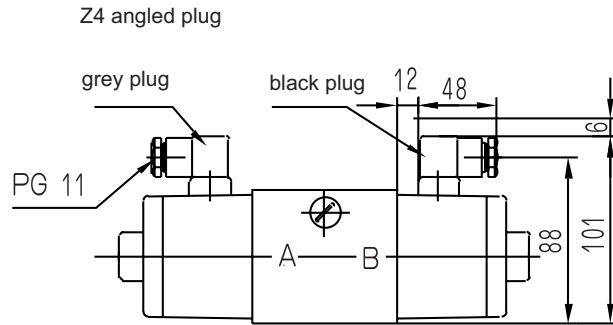
Unit dimensions



the connection dimensions of service ports



- | | |
|--|---|
| <p>2 DC solinoid(without manual override)
94mm
AC solinoid(without manual override)
75mm</p> <p>2.1 Solenoid "a" (colour of the plug-in connector: grey)</p> <p>2.2 Solenoid "b" (colour of the plug-in Connector: black)</p> <p>6 Manual override "N"</p> <p>7 Plug Z4</p> <p>8 Nameplate</p> | <p>9 Service port</p> <p>10 O-ring12x2</p> <p>11 Accessional T must be used(except for ZDR10D...)if making a hole at subplate</p> <p>12 Cover for valve with one solenoid
Subplates: see page206
G66/01(G3/8") G66/02(M18 × 1.5)
G67/01(G1/2") G67/02(M22 × 1.5)
G534/01(G3/4") G534/02(M27 × 2)</p> <p>※ Valve fixing screws
4-M6 × 50-10.9 (GB/T70.1-2000)
M_A=15 N.m</p> |
|--|---|



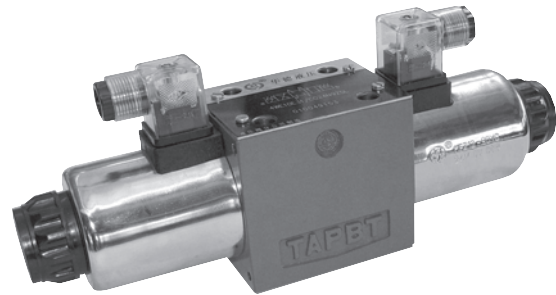
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves Type WE 10...30B/			RE 23316/12.2004
	Size 10	up to 31.5 MPa	up to 120L/min	Replaces: RE 23316/05.2001

Features:

- Direct solenoid operated directional spool valve as standard version
- Wet pin DC or AC solenoids with removable coils
- perfect outline
- Coils may be replaced without opening the pressure-tight chamber
- Choice of either central or individual electrical connections
- Optional hand over-ride
- long life
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H

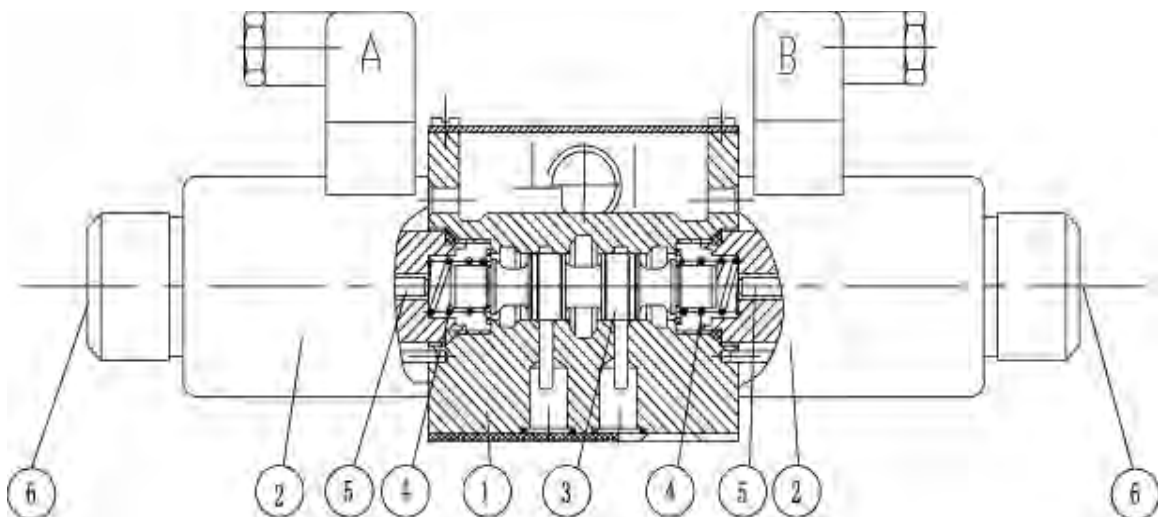


Functional, section

Directional valves basically comprise the housing (1), one or two solenoids (2), control spool (3), and one or two return springs (4). At rest, control spool (3) is held in its central or initial position by means of return springs (4) (except in the case of impulse spools). Control spool (3) is operated by wet pin solenoids (2). The force of solenoid (2) acts on control spool (3) and moves it from its rest position to the desired end position. This permits free flow from P to A and B to T or P to B and A to T.

On de-energizing solenoid (2) control spool (3) is returned to its initial position by return spring (4).

Optional hand over-ride (5) permits control spool (3) to be moved without the solenoids being energized.



Type 4WE 10 ...30B/...C

Ordering code

WE 10 31 B / C

Further details in clear text

3 service ports = 3
4 service ports = 4

No code = mineral oils
V = phospate ester

Size 10 = 10

Symbols see below

Series 30 to 39 = 31
(30 to 39: unchanged installation and connection dimensions)

No code = Without cartridge throttle
B08= Throttle, Φ 0.8 mm
B10 = Throttle, Φ 1.0 mm
B12= Throttle, Φ 1.2 mm

Technology of Beijing Huade Hydraulic =B

With spring return = No code
Without spring return, but with detent = OF
Without spring return = O

Wet pin solenoid with removable coil = C

W220= 220 V AC 50 or 240V AC 60 Hz
G24= 24 V DC
W220R = DC solinoid commuting automatically

With protected hand override (standard) = N9
Without hand override = No code
With hand override = N

Individual connections:
With component plug without plug-in connector =K4
Normal plug =Z4
Large angled plug =Z5
Large angled plug with indicator light =Z5L
Central connection:
Cable entry at side = No code
Cable entry in cover, with lamp = DL
Central connection in cover, with lamp (without angled plug-in connector) = DKL

Symbols

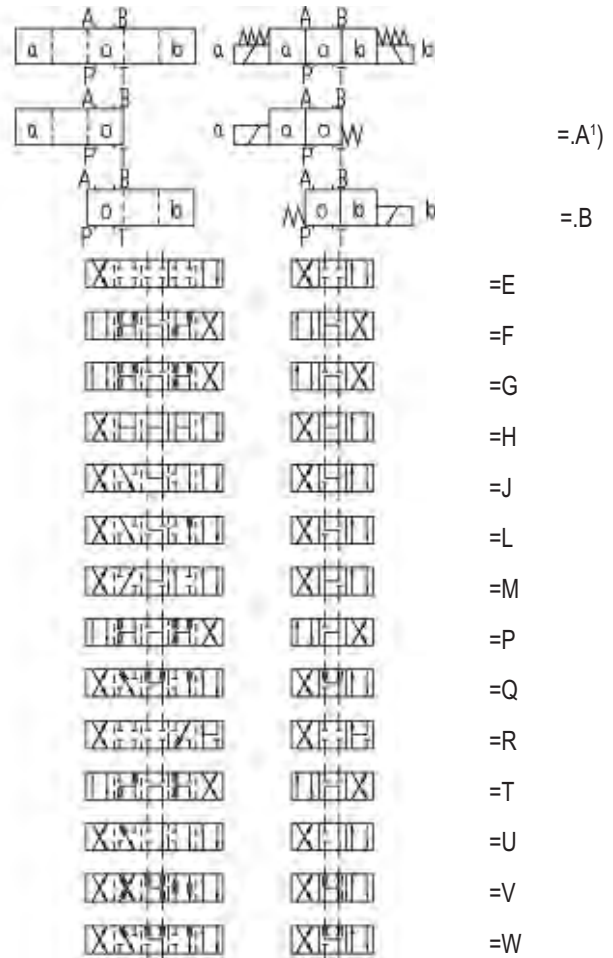
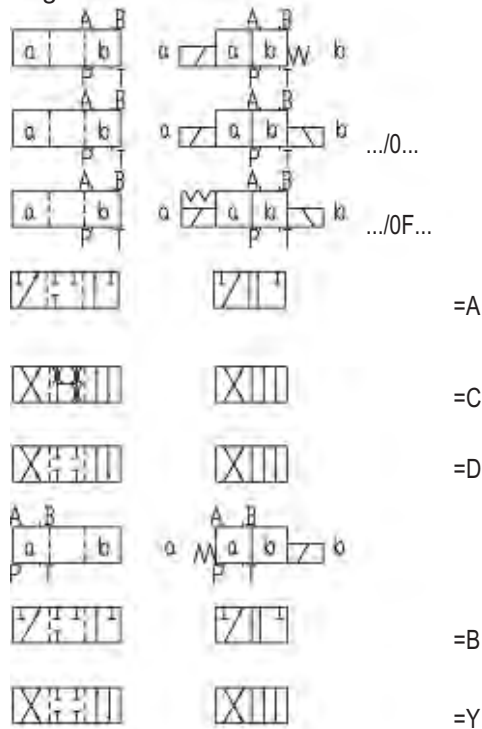
4) Example:

Spool E with switching position "a"

Ordering code ..EA..

Spool E with switching position "b"

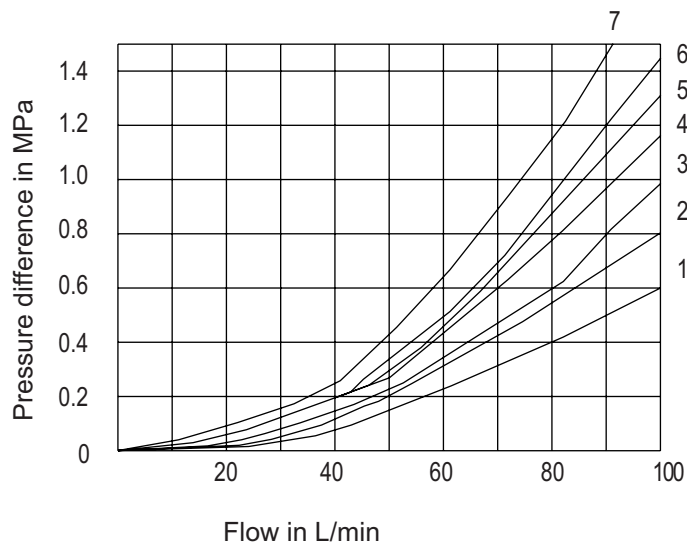
Ordering code...EB...



Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

7 Symbol "R" in switched position A → B

8 Symbols "G" and "T" in mid position P → T



Symbols	Direction of flow			
	P-A	P-B	A-T	B-T
A, B	2	2	-	-
C, D, Y, J	2	2	3	3
E, Q, V	2	2	4	4
F	2	3	3	5
G	3	3	4	6
H	1	1	4	5
L, U	2	2	3	5
M	1	1	5	1
P	3	2	5	3
R	2	4	3	-
T	3	5	5	6
W	2	2	5	5

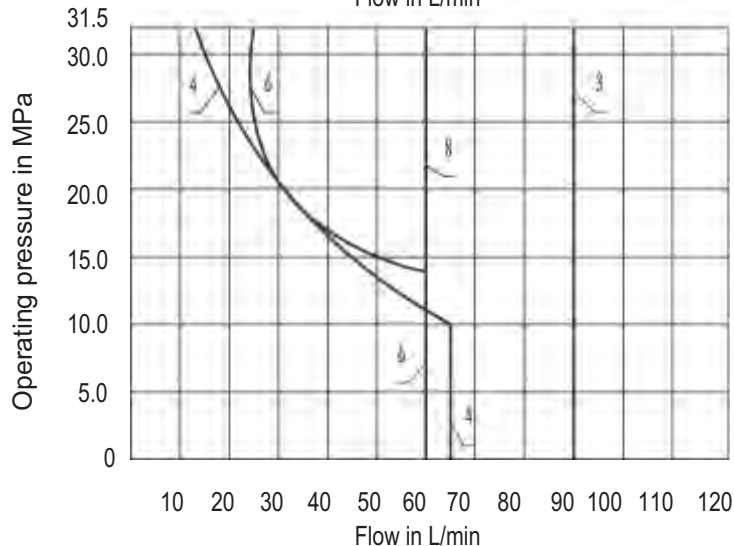
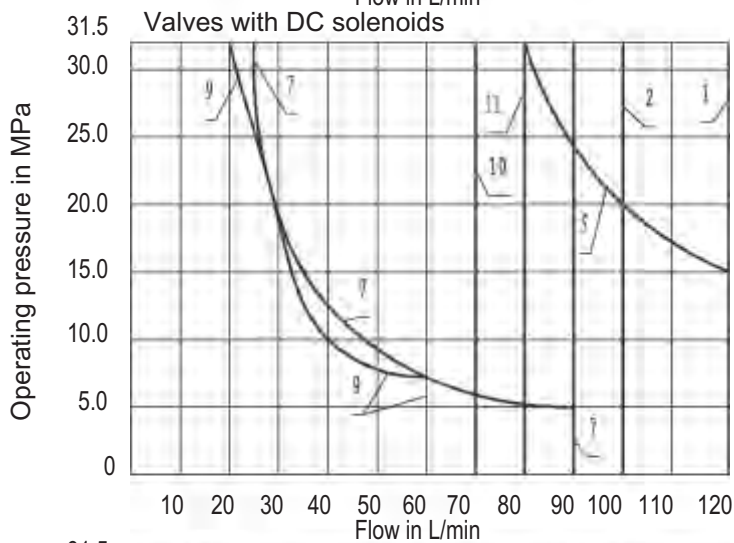
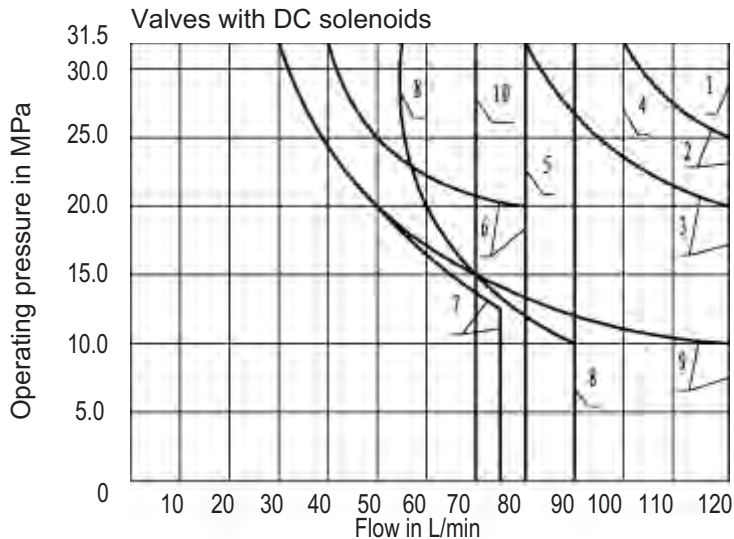
Switching power limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

The given switching power limits are for applications with two flow directions (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces active within the valves the permissible switching power limit may be significantly less if there is only one direction of flow (e.g. from P to A and port B blocked)!

(Please consult us for applications of this kind.)

The switching power limits were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.

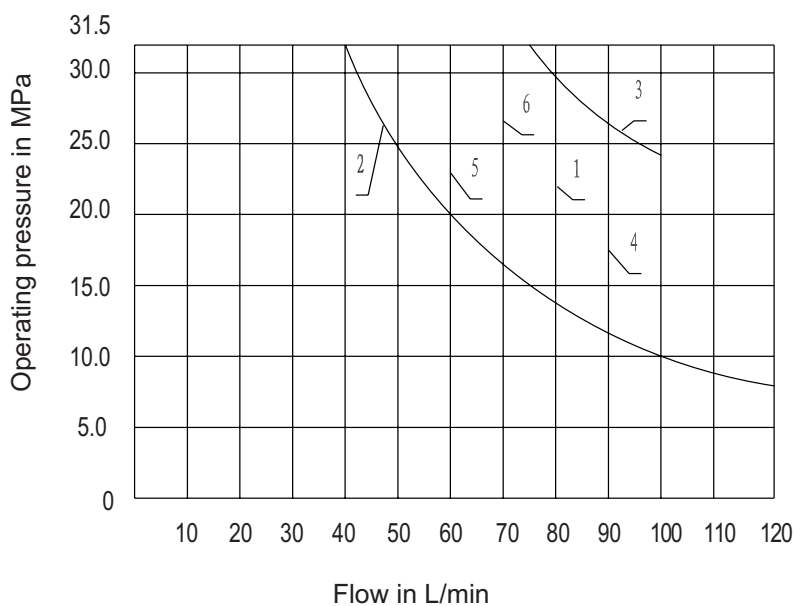


Curve	Symbols
1	C,D/O,C/OF D,D/O,D/OF Y,M
2	E
3	A/O,A/OF L,U,J,Q,W
4	H
5 ¹⁾	R
6	G
7	T
8	F,P
9	A,B
10	V

42V,50Hz;110V,50Hz;120V,60Hz;
127V,50Hz;220V,50Hz;240V,60Hz

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

Switching power limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



42V,60Hz,110V,60Hz 127V,60Hz,220V,60Hz	
Curve	Symbols
1	C,C/O,C/OF D,D/O,D/OF Y
2	A/O,A/OF
3	E
4	M
5	V
6	H
Switching power limits for other spools on enquiry!	

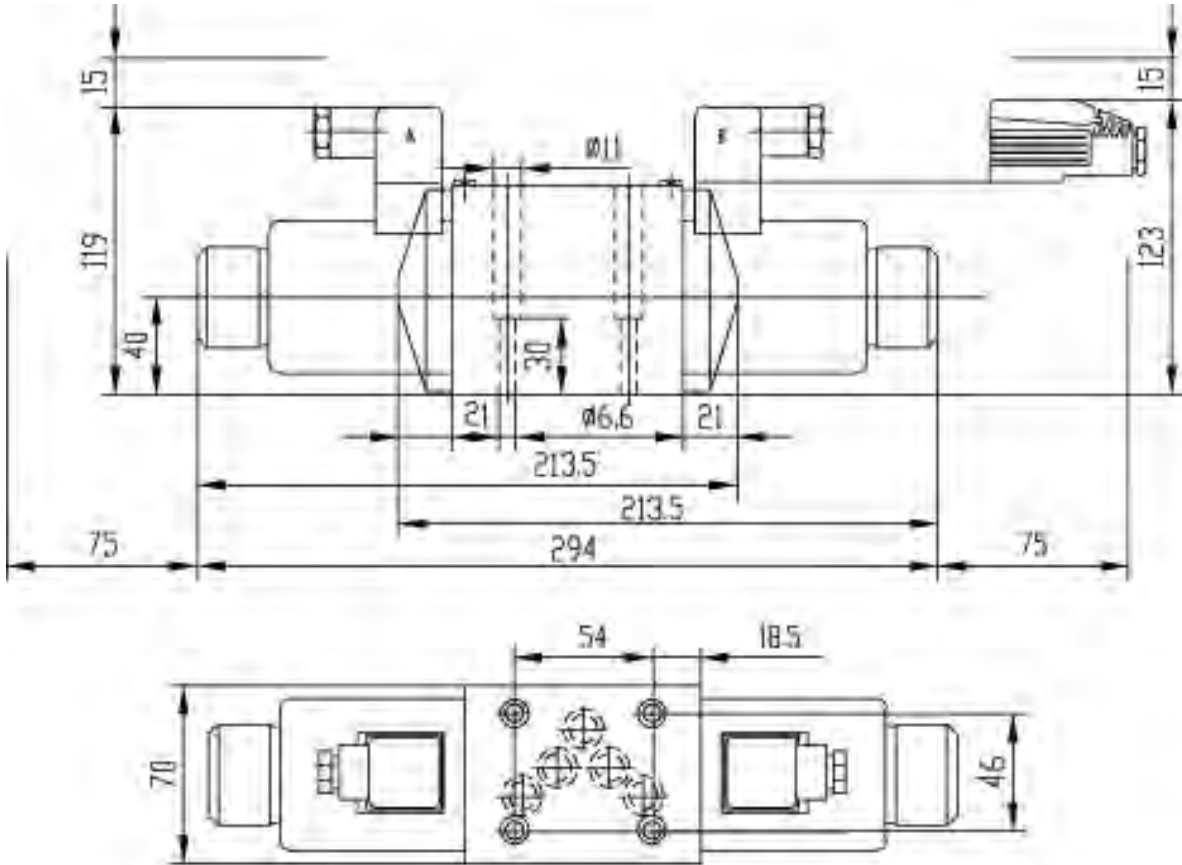
Technical data

Operating pressure max.	Ports A, B, P (MPa)	31.5
	Ports T (MPa)	16
Flow max.	(L/min)	120
Cross section (switching position 0):	With symbol Q approx. 6 % of the nominal area With symbol W approx. 3 %	
Pressure fluid	Mineral oils(for NBR seal) or phosphate ester(for FPM seal)	
Pressure fluid temperature range	(°C)	-30 ~ + 80
Viscosity range	(mm ² /s)	2.8 ~ 500
Weight (kg)	Valve with 1 solenoid	5.1(DC), 4.3(AC)
	Valve with 2 solenoids	6.7(DC), 5.1(AC)

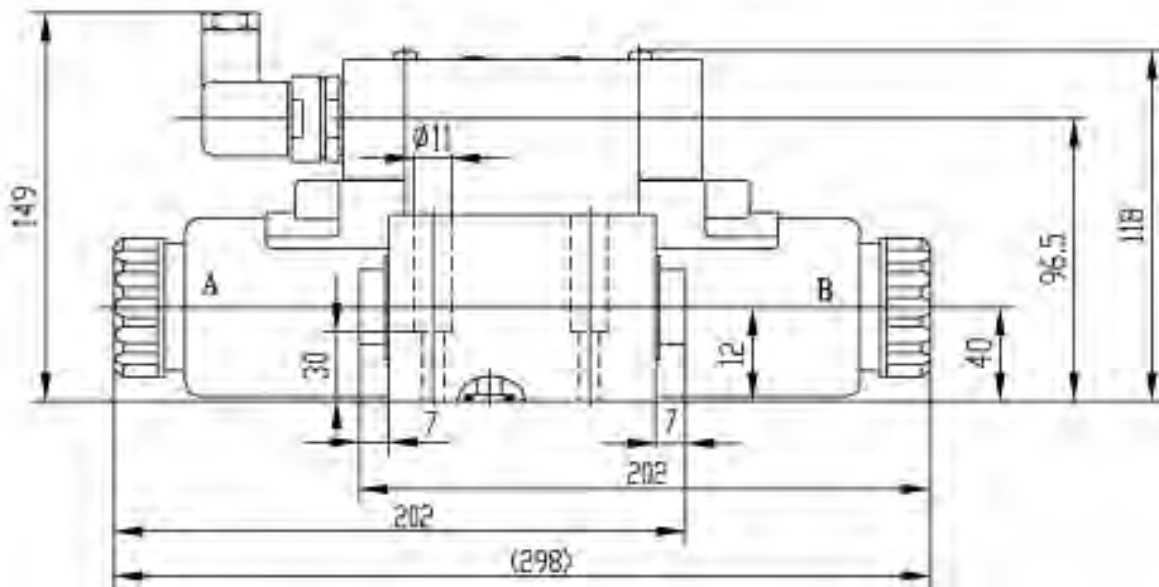
For symbols A and B, port T must be used as a drain line, if the operating pressure is higher than the permissible tank pressure.

Unit dimensions with DC solenoids

Individual connection



Central connection



Valve fixing screws: 4-M6x40-10.9 (GB/T70.1-2000)

$M_A = 15N.m$

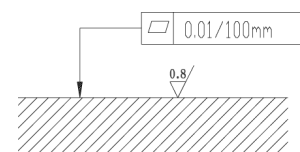
Subplate: G66/01(G3/8 ") G66/02(M18x1.5)

G67/01(G1/2 ") G67/02(M22x1.5)

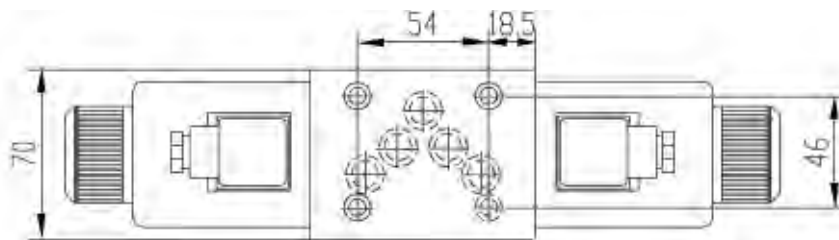
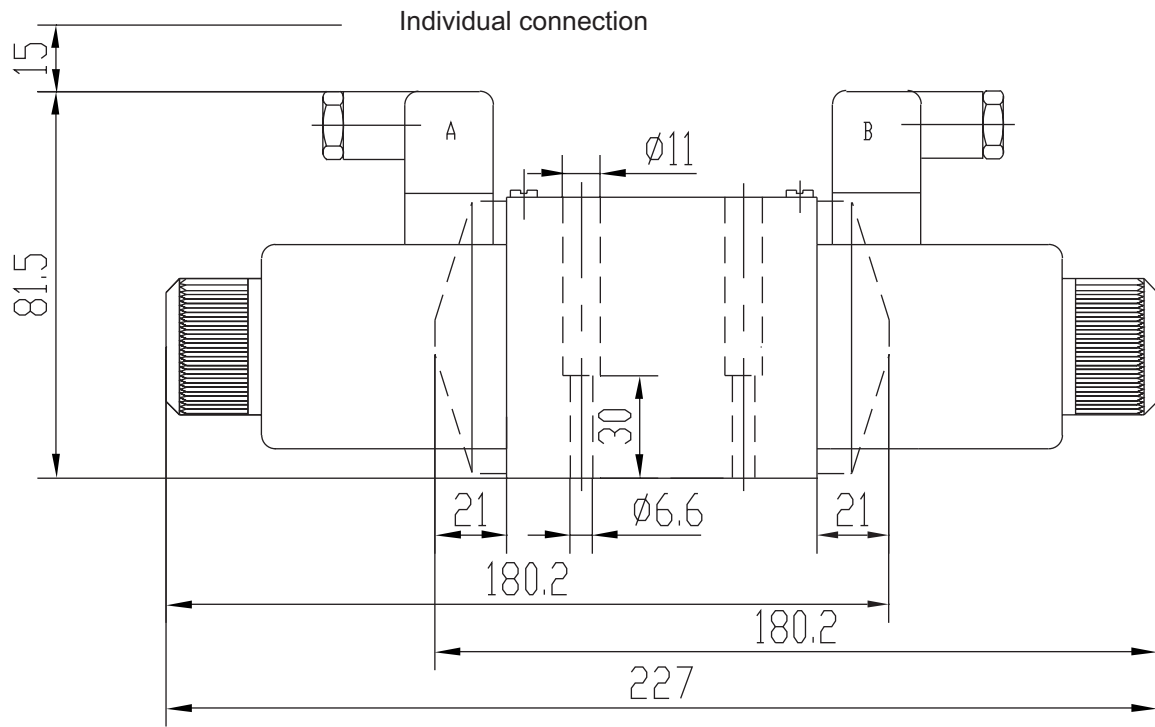
G534/01(G3/4 ") G534/02(M22x1.5)

(see page 206)

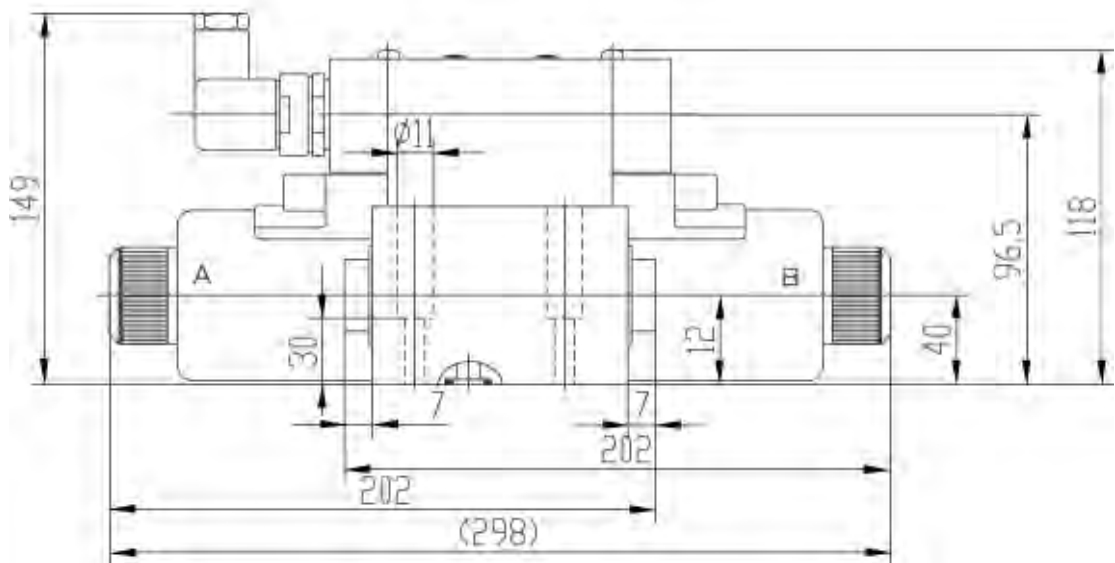
Required surface finish of mating piece



Unit dimensions with AC solenoids



Central connection



Valve fixing screws: 4-M6x40-10.9 (GB/T70.1-2000)

$M_A = 15 \text{ N.m}$

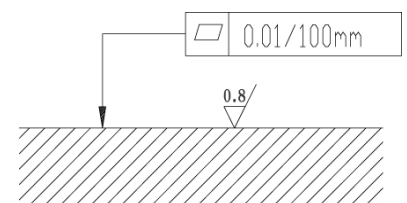
Subplate: G66/01(G3/8 ") G66/02(M18x1.5)

G67/01(G1/2 ") G67/02(M22x1.5)

G534/01(G3/4 ") G534/02(M22x1.5)

(see page 206)

Required surface finish of
mating piece



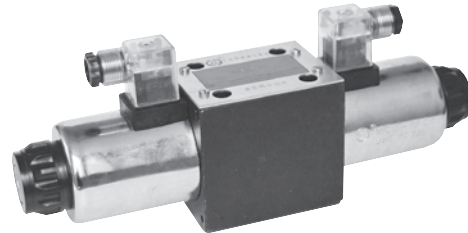
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

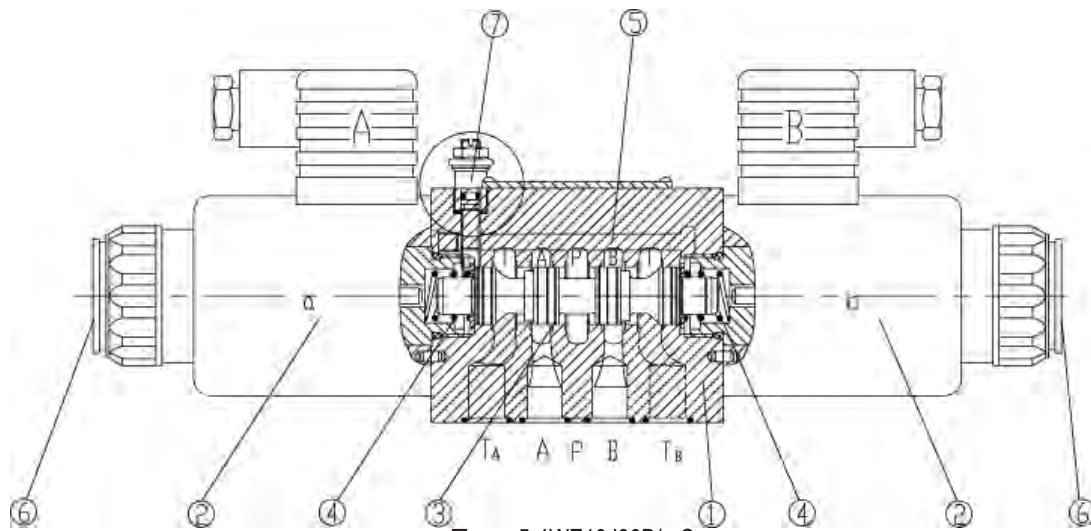
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/3-, 4/2- and 3/2- directional valves with switching time adjustment, Type 5-WE 10			RE 23320/12.2004
	Size 10	up to 31.5 MPa	up to 120 L/min	

Features:

- Direct solenoid actuated directional spool valve
- Wet pin DC solenoids with removable coil (AC voltages possible via a rectifier)
- Solenoid coil can be rotated through 90°
- The coil can be replaced without opening the pressure-tight chamber
- Individual electrical connections
- Hand override, optional
- Adjustable spool switching time, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function, section



5-chamber directional valves of type 5-.WE are solenoid operated directional spool valves. They control the start, stop and direction of flow with the additional option of adjusting the spool switching time. These directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), as well as one or two return springs (4). The two spring chamber are connected by a connecting bore (5). As the spool switches, the flow is displaced from one spring chamber to the other via this passage. If the area of this connecting bore is reduced by an orifice, the switching time changes accordingly. The T channels are isolated from the spring chambers. This means that switching pulses do not affect the control spool (3) and thus, soft switching of the spool can be achieved. In the de-energized condition, the control spool (3) is held in the central or initial position by return springs (4) (except for impulse spools). The control spool (3) is actuated by wet pin solenoids (2).

In order to ensure correct functioning, care must be taken to ensure that the pressure chamber of the solenoid is filled with oil.

The force of the solenoid (2) acts on the control spool (3) and switches it from its rest position to the required end position. This then permits flow from P to A and B to T or P to B and A to T. When the solenoid (2) is de-energized the control spool (3) is returned to its rest position by the return spring (4). A hand override (6), optional, enables the control spool (3) to be moved without energization of the solenoids.

Adjustable spool switching time (only with DC solenoids)
The optional installation of an orifice screw (7) or orifice (8) - see below - offers the possibility of increasing switching time

- with orifice screws type 5-.WE 10 ../..CG../C..
- with throttle type 5-.WE 10 ../..CG../A..

Funtion,secion

With the installation of orifices, the spool switching time may be lengthened by more than 100 ms. The actual time is dependent upon the individual system (e.g. pressure, flow and viscosity).

When retro-fitting or modifying a throttling system, care must be taken that the fluid volume in the spring chambers and the connecting bore (5) is retained, as this is a prerequisite for the smooth operation of the switching time adjustment.

Type 5-WE 10.30/OC...

(only possible with symbols A, C and D)

This version is a directional valve with 2 switched positions and 2 solenoids without detent. There is no defined spool position in the de-energized condition.

Type 5-WE 10.30/OFC... (impulse spool), with detent

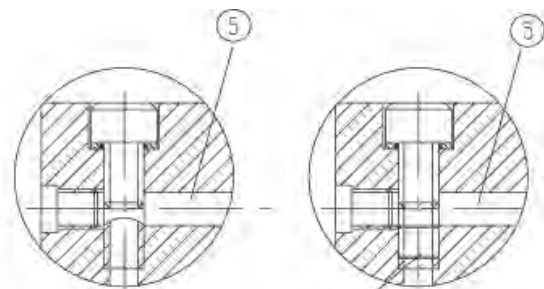
(only possible with symbols A, C and D)

This version is a directional valve with 2 detented switched positions and 2 solenoids. Thus, the spool is held in the last switched position, permanent energisation of the solenoid is not required.

Throttle insert (type 5-WE 10.30/.../B...)

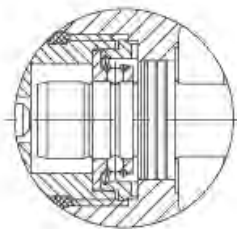
The use of a throttle insert is required if, due to the operating conditions, flows can occur during the switching process which are larger than the performance limits of the valve allow.

The orifice is to be inserted into the P channel of the directional valve.

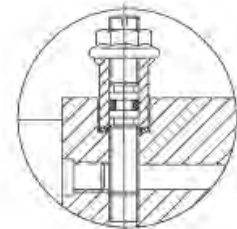


Without spool throttle

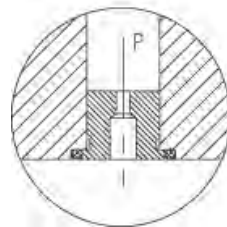
with orifice



With detent

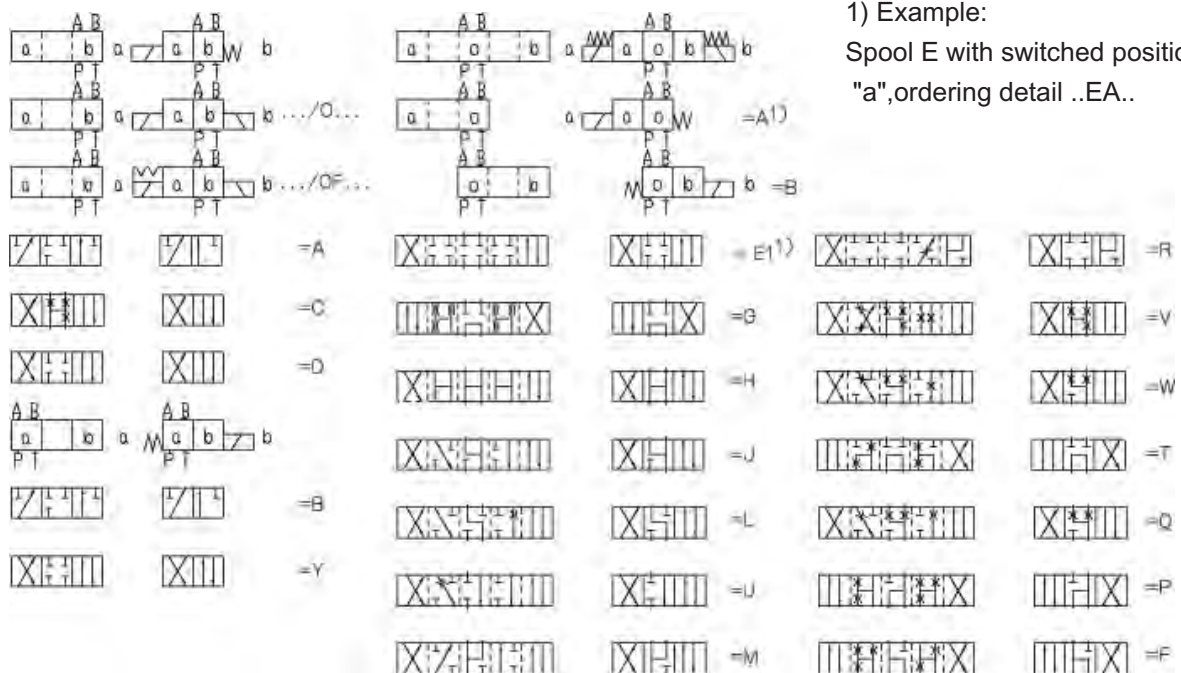


With throttle screw (without throttle bore)



Throttle insert

Symbols



Ordering details

5- WE 10 31 B / * -

3 service ports = 3
4 service ports = 4

Nominal size 10 = 10

Symbol e.g. C, E, EA, EB etc.
- for possible versions, see sheet below

Series 30 to 39 = 31
(30 to 39: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

With spring return = No code
Without spring return with detent = OF
Without spring return = O

Wet pin solenoid (oil immersed) with removable coil = C

24VDC = G24

220VAC, 50Hz or 240VAC, 60Hz = W220

DC solenoid commuting automatically = W220R

With protected manual override (standard) = N9

Without hand override = No code

Hand override with protective cap = N

Further details
in clear text

No code = mineral oils
V = phosphate ester

No code= Without cartridge throttle

B08 = Throttle Φ 0.8 mm

B10= Throttle Φ 1.0 mm

B12= Throttle Φ 1.2 mm

B15= Throttle Φ 1.5 mm

B30= Throttle Φ 3.0 mm

No code=Without switching time adjustment

C= With throttle screw

A06= Orifice Φ 0.6 mm

A07= Orifice Φ 0.7 mm

A08= Orifice Φ 0.8 mm

A10= Orifice Φ 1.0 mm

Single connection

Z = Plug-in connector on side

ZL= Plug-in connector on side, with light(s)

Central connection

D = Cable fed into cover

DL = Cable fed into cover, with light(s)

DZ = Plug-in connector on cover

DZL = Plug-in connector on cover, with light(s)

Technical data (For applications outside these parameters, please consult us!)

General

Installation	optional	
Max. ambient temperature	(°C)	-30~+50
Weight	Valve with 1 solenoid	(kg) 5.1(DC) ; 4.3(AC)
	Valve with 2 solenoids	(kg) 6.7(DC) ; 5.1(AC)

Hydraulic data

Max. operating pressure	Ports A, B, P	(MPa)	31.5
	Ports T	(MPa)	21 (DC) ; 16 (AC)
Flow area	with symbols A and B, port T must be used as drain port, if the operating pressure is higher than the permissible tank pressure.		
Max. flow	(L/min)	120	
Pressure fluid	Mineral oil or phosphate ester		
Fluid temperature range	(°C)	- 30 to + 80	
Viscosity range	(mm ² /s)	2.8~500	
Degree of contamination	We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.		
Flow cross-section (switched position 0)	For symbol V	(mm ²)	11 of nominal cross section (A/B → T) ; 10.3 of nominal cross section (P → A/B)
	For symbol W	(mm ²)	2.5 of nominal cross section (A/B → T)
	For symbol Q	(mm ²)	5.5 of nominal cross section (A/B → T)

Electrical data

Type of voltage	DC		AC
Available voltages (See below when ordering AC solenoids)	12, 24, 42, 60, 96, 110, 180, 205, 220		42, 110, 220, 230, 240 50/60Hz
Power consumption (W)	35		-
Holding power (VA)	-		90
Switching power (VA)	-		550
Duty continuous	Continuous		Continuous
Switching time to ISO 6403	ON (ms)	45 to 60	15 to 25
	OFF (ms)	20 to 30	20 to 30
Switching frequency (cycles/h)	15000		7200
Protection to DIN 40 050	IP65		
Insulation class VDE 0580	F		H
Max. coil temperature (°C)	150		180

1) special voltages on request

When connecting the electrics, the protective conductor (PE $\overline{\text{I}}$) must be connected according to the relevant regulations.

Note:

These solenoids may be used for 2 types of supply:

e.g. solenoid type W110 for:

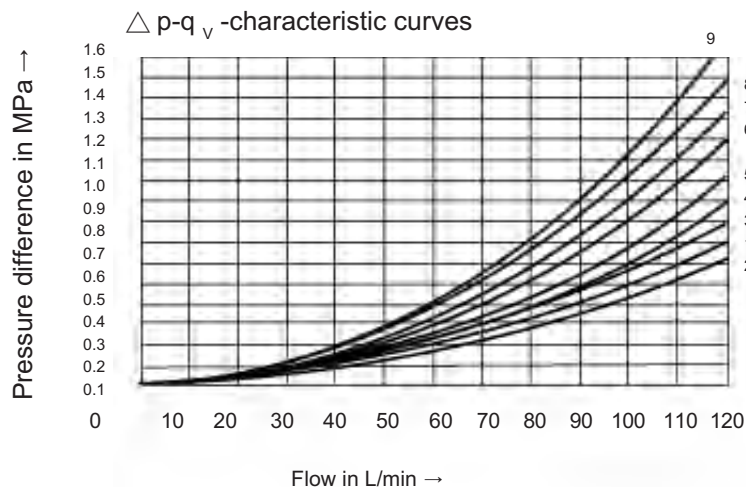
110V, 50Hz

120V, 60Hz

Order Type	W42	42V, 50Hz 42V, 60Hz
	W110	110V, 50Hz 120V, 60Hz 110V, 60Hz

Order Type	W230	230V, 50Hz 230V, 60Hz
	W220	220V, 50Hz 220V, 60Hz

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



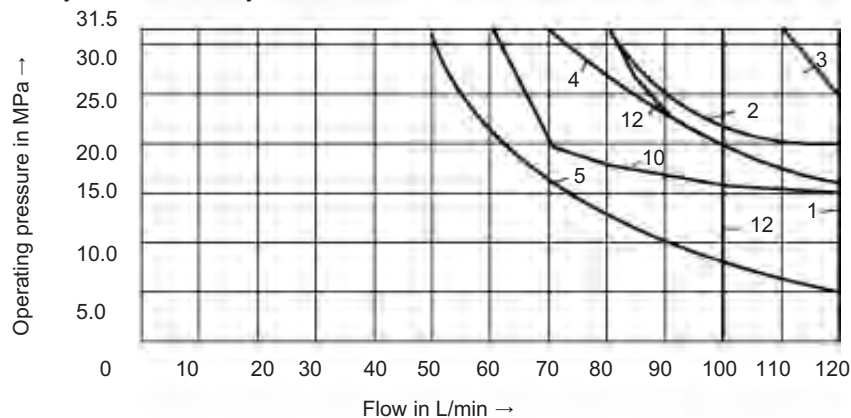
Symbols	Direction of flow			
	P-A	P-B	A-T	B-T
A,B	1	1	-	-
D,Y	2	2	1	3
E	2	2	3	4
F	2	1	4	7
G	4	4	6	8
H	2	2	1	3
J,L	1	1	4	4
M	2	2	3	4
P	2	1	1	7
Q,V	1	1	3	4
R	1	4	3	-
T	4	4	5	7
U	11	1	3	5
Centr. position		B-T	A-T	P-T
F	-	-	5	4
G	-	-	-	8
P	-	7	-	6
T	-	-	-	8
Choice. position		B-A		
R		9		-

Performance limits: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

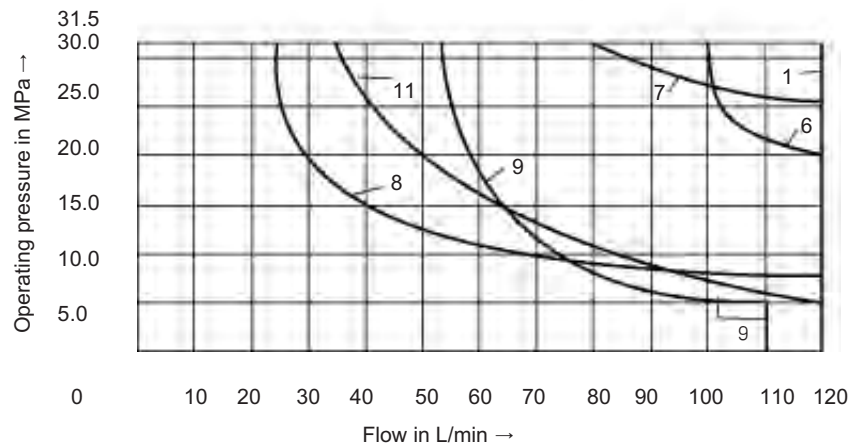
The performance limits shown are valid when the valve is used with two directions of flow (e.g. from P to A with simultaneous return flow from B to T). Due to the flow forces occurring within the valves, the permissible switching performance limits can be significantly lower with only one direction of

flow (e.g. from P to A and with port B blocked)! (For these applications, please consult us.)

The performance limits were determined with the solenoid at operating temperature, 10 % under voltage and with no preloading of the tank.

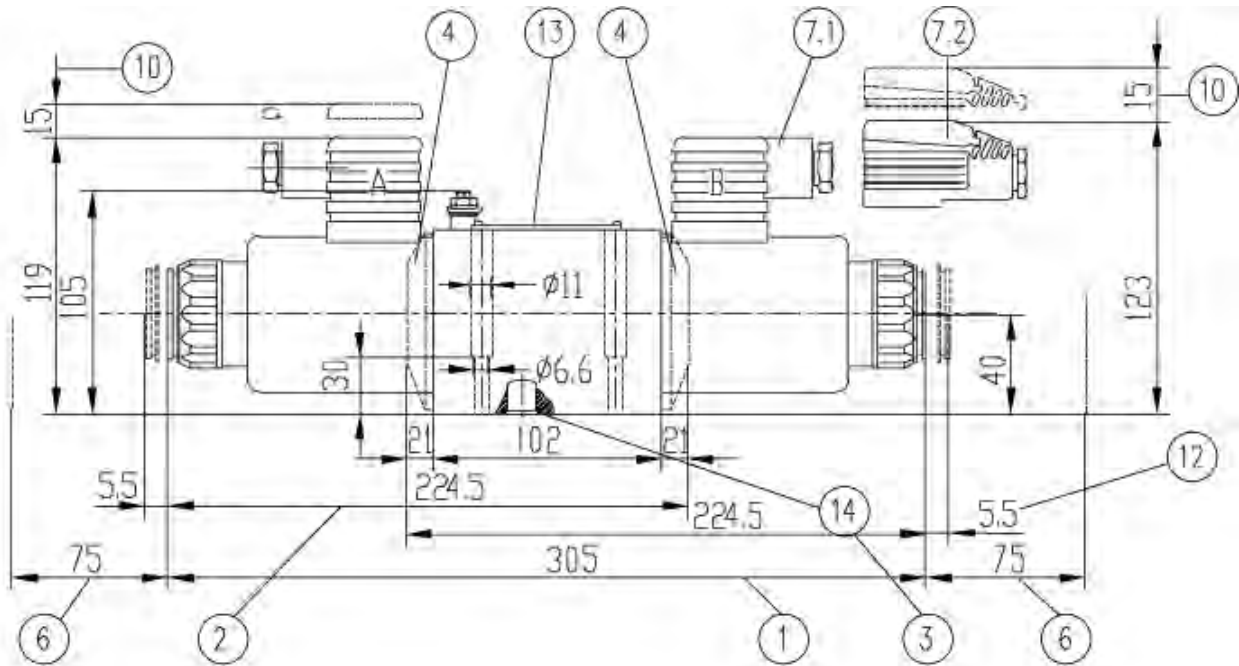


Char. curve	Symbols
With orifice $\Phi 0.6 \text{ mm}$ ("A06")	
3	D,Y
12	C
With or without orifice	
1	C/O,C/OF
	D/O,D/OF,M
2	A/O,A/OF,E
	J,L,U,Q,W
4	G
5	F,P
10	H

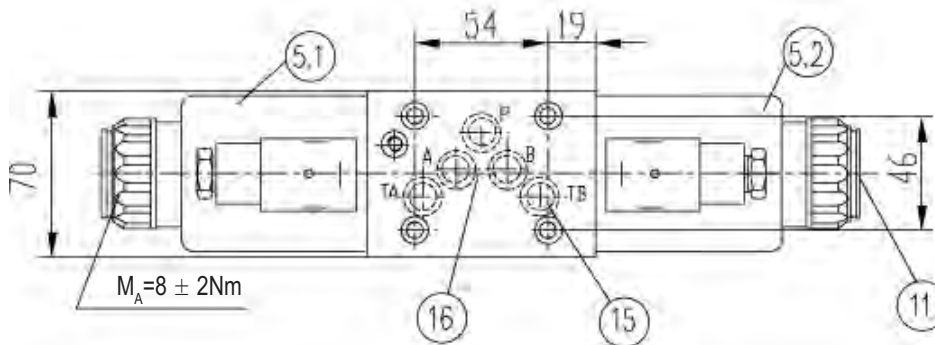


Char. curve	Symbols
Without orifice	
1	D,Y
6	C
7	R
8	T
9	V
11	A,B

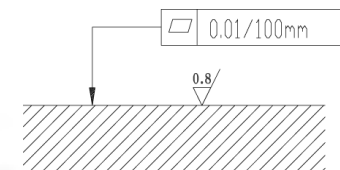
Individual connections



Central connection



Required surface finish of mating piece



- 1 3-Position valve
- 2 2-Position valve
With 1solenoid (A, C, D, EA...)
- 3 2-Position valve
With 1solenoid (B, Y, EB...)
- 4 Plug for valve with 1 solenoid
- 5.1 Solenoid "a" (Plug-inconnector
colour grey)
- 5.2 solenoid "b" (Plug-inconnector
colour black)
- 6 Spece required to remove solenoid
- 7.1 Plug-in connector (may be rotated by 90°)
- 7.2 Plug-in connector of large code (may be
rotated by 90°)
- 10 Spece required to remove plug in connection
(A, C, D, EA...)

- 11 Hand override "N"
 - 12 Dimension of hand override "N"
 - 13 Namplate
 - 14 O-rings 12X2
 - 15 Additional T port (TB) may optionally be
used in conjunction with drilled blocks
 - 16 Porting pattern to Din 24340 form A
ISO44101 and CETOP-RP121H
- Subplates:
C66/01(G3/8)
C67/01(G1/2)
G534/04(G3/4)
- Valve fixing screws
M6X40DIN912-10.9
(GB/T70.1-2000)
M_A=15.5Nm
must be ordered separately (see page 206)

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional control valves, hydraulically operated Type WH			RE22282/12.2004
	Size 6、 10	up to 31.5 MPa	up to 120L/min	Replaces: RE22282/05.2001

Features:

- Direct operated directional spool valve
- Two position valve with stroke limit optional
- Subplate mounting
- Mounting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function,section

WH valves are hydraulic operated directional spool valves. They are used for the control of stop, start and direction of a flow.

The directional valves mainly consist of housing (1), one or two operating elements (2) (hydraulically, pneumatically operating cylinder), the control spool (3), as well as one or two return springs (4).

At rest the control spool (3) is kept in the centre or starting position by the return springs (3) (except impulse valve).

The control spool (3) is pushed into the required switching position by the operating elements.

With detent, type ..OF/..

Hydraulically or pneumatically operated directional valves are also available as 2-position valves with detent (5). When the operating elements with detent are used every switching position may be locked.

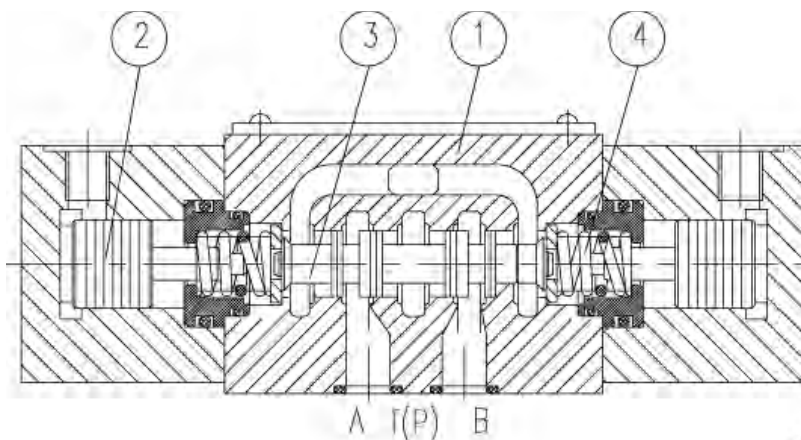
Without return spring, without detent, type ..O/..

When using operating elements without return spring and without detent there is no defined switching position at rest.

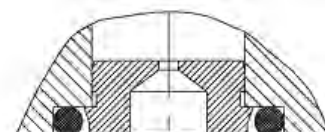
Plug-in throttle

The use of a plug-in throttle is then necessary when during the switching procedures in the given operating conditions flows occur which exceed the performance limits of the valve.

It is plugged into the P-channel of the directional valve.



Type 4WH6...



Cartridge throttle

Ordering code



3 service ports = 3
4 service ports = 4

Size 6 = 6
Size 10 = 10

Further details in clear text

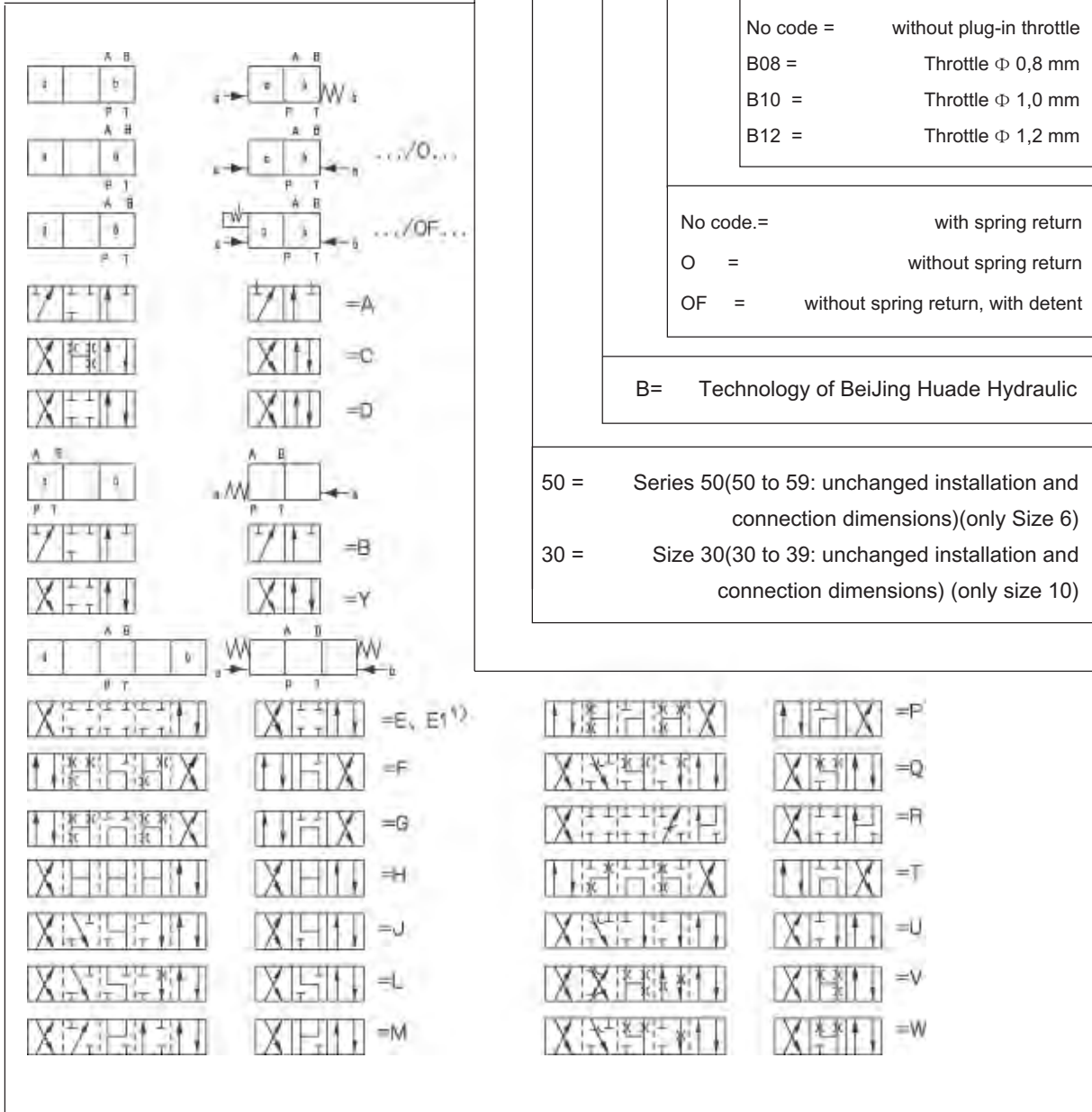
No code = mineral oils
V = phosphate ester

No code = without plug-in throttle
B08 = Throttle Φ 0,8 mm
B10 = Throttle Φ 1,0 mm
B12 = Throttle Φ 1,2 mm

No code.= with spring return
O = without spring return
OF = without spring return, with detent

B= Technology of BeiJing Huade Hydraulic

50 = Series 50(50 to 59: unchanged installation and connection dimensions)(only Size 6)
30 = Size 30(30 to 39: unchanged installation and connection dimensions) (only size 10)



Example:

Spool E in switching position "a", ordering code ..EA..

Spool E in switching position "b", ordering code ..EB..

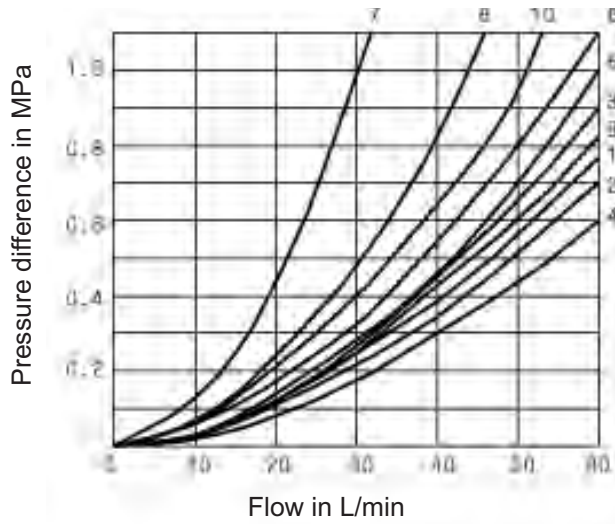
1) Symbol E1: P → A/B, pre-opening(only for size 6)

Technical data

Size		6	10
Max.operating pressure	Ports A, B, P (MPa)	to 31.5	
	Port T (MPa)	to 16	
With symbols A and B ,port T must be used as a leakage port if the operating pressure is greater than 16.0 MPa.			
Flow max.	(L/min)	up to 60	up to 120
Operating to flow (Spool position 0)		Symbol Q ,6% of nominal cross-sectional area	
		Symbol W, 3% of nominal cross-sectional area	
Fluid		Mineral oil or phosphate ester	
Fluid temperature range	(°C)	-20 to +80	
Viscosity range	(mm ² /s)	2.8 to 500	
Weight (kg)	1 operating cylinder	approx.2	approx.3.5
	2 operating cylinder	approx.2.2	approx.4.5
Pilot pressure (MPa)	min.	0.6 to 1> tank pressure	0.5
	max.	20	6

Operating curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

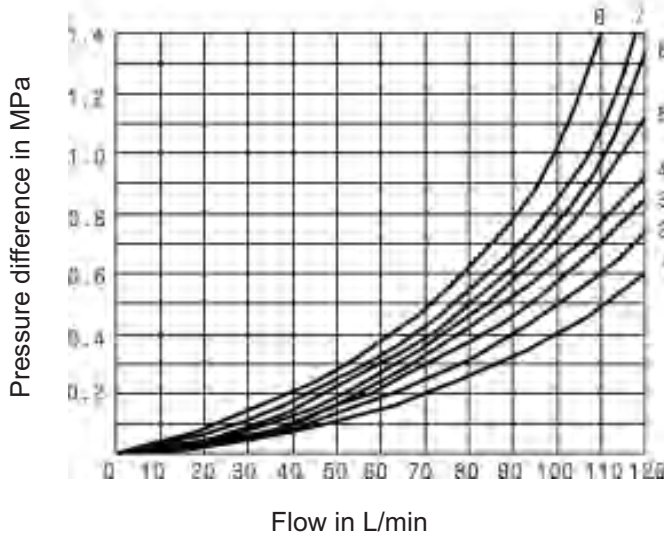
Δp - q_v operating curves, type WH6



Symbol	Flow direction			
	P → A	P → B	A → T	B → T
A	3	3	-	-
B	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	-
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2
Y	5	5	3	3

7.Symbol "R" in switching position A → B
8.Symbol "G" and "T" in neutral position P → T

Δp - q_v operating curves, type WH10



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

7.Symbol "R" in switching position A → B
8.Symbol "G" and "T" in neutral position P → T

Performance limits:

The function of the valves is dependent on the filtering due to the sticking effect. In order to achieve the given permissible flow.

Values a full flow volume filtration rate of 20µm is recommended.

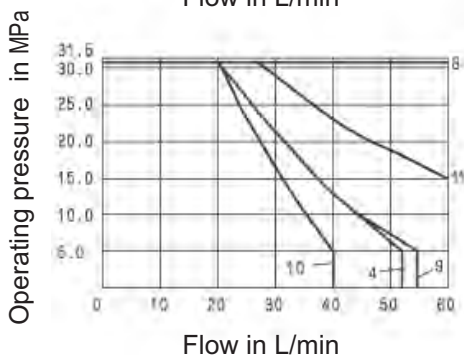
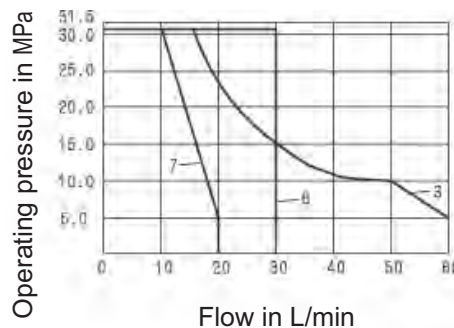
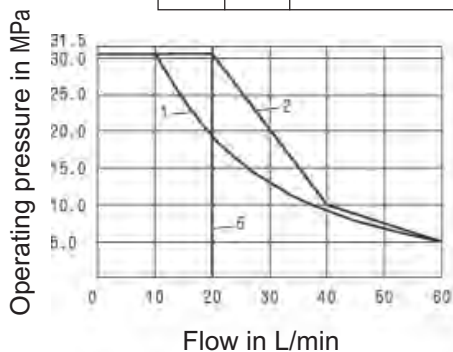
The flow forces effective inside the valves also influence the flow performance.

With 4-way valves the given flow data is therefore valid for the normal use with 2 flow directions (e.g. from P to A and at the same time return flow from B to T) (see table).

If only one flow direction is available the permissible flow may be much lower in critical cases (e.g. when using a 4-way directional valve with blocked port A or B as 3-way directional valve).

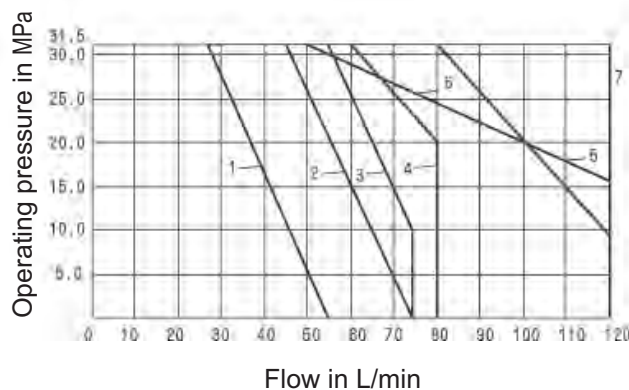
Type WH6

Control pressure 0.6 Mpa > T-pressure			Control pressure 1 Mpa > T-pressure		
Operating curve		Symbol	Spring return		Symbol
Spring return	1	A, B	Spring return	1	A, B
	2	C, D, Y		8	C, D, Y, E, G
	3	E, J, L, U, M		1	H, J, L, U, M
	4	Q, V, W, F		9	Q, V, W, E1
	5	F, P		10	F, P
	7	T		11	R
...	8	A, C, D	...	8	A, C, D
...

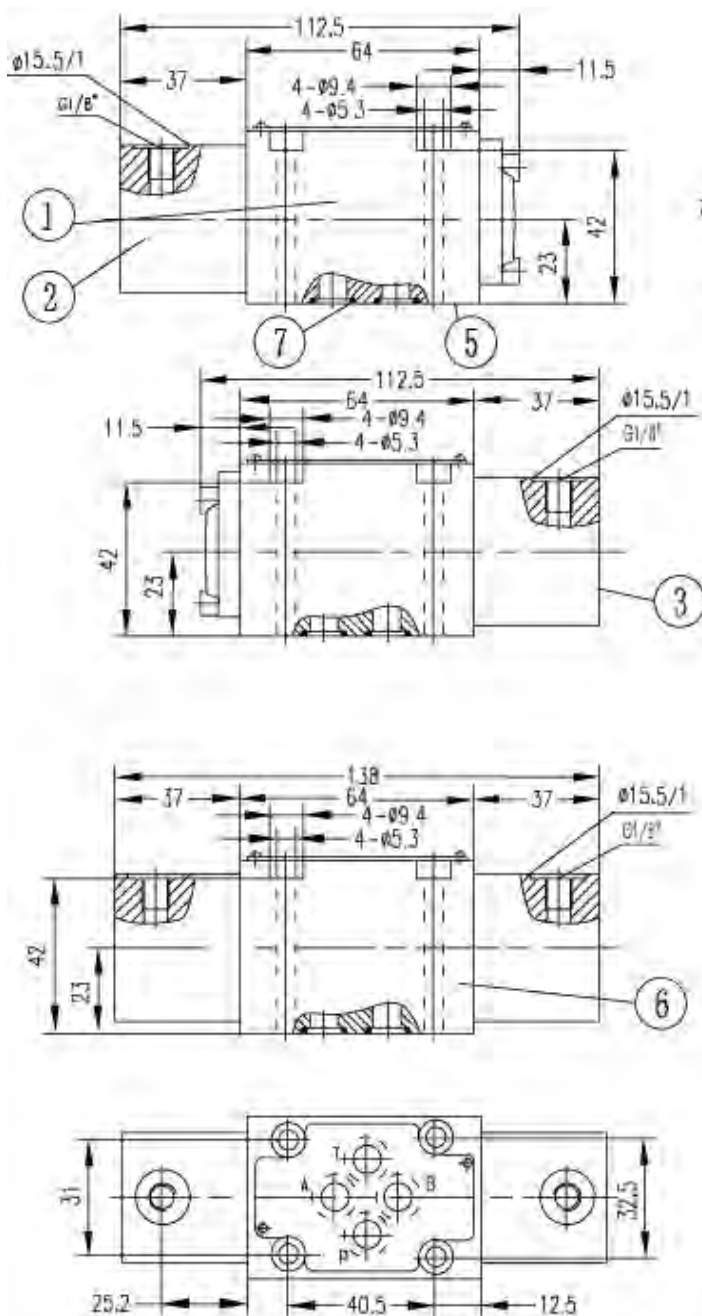


Type WH10

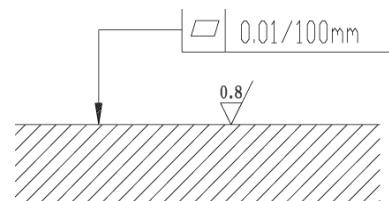
curves	symbols
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	CV/O, C/O, D/O, D/O, F



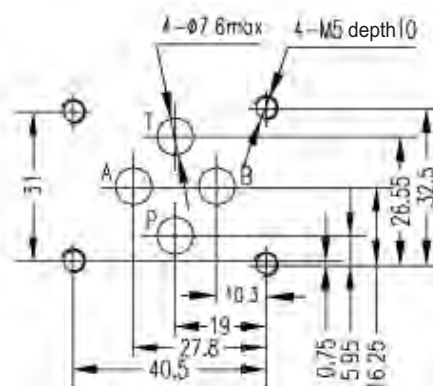
Type WH6



Required surface finish of mating piece



Units for ports's connecting surface

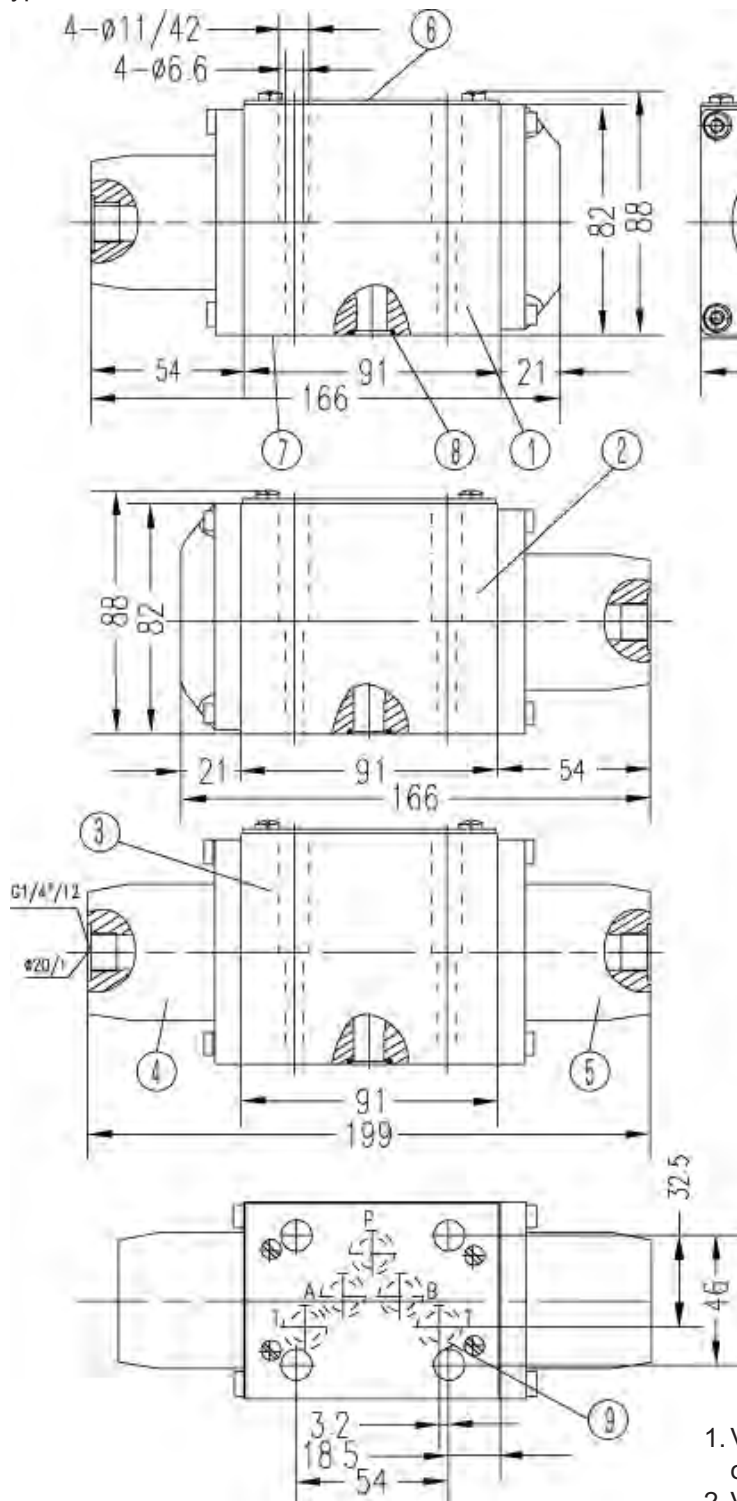


- 1. Valve with 2 switching positions and 1 operating cylinders
- 2. Operating cylinder "a"
- 3. Operating cylinder "b"
- 4. Nameplate
- 5. Connecting surface
- 6. Valve with 2 switching positions and 2 operating cylinders
- Valve with 3 switching positions and 2 operating cylinders
- 7. O-ring 9.81 x 1.78 with ports A, B, P, T

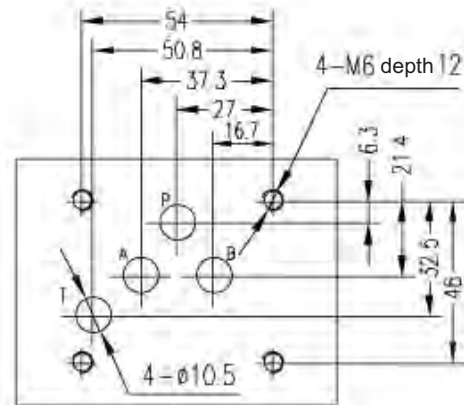
Subplate(see page 205)

- G341/01 (G1/4"); G341/02 (M14X1.5)
- G342/01 (G3/8"); G342/02 (M18X1.5)
- G502/01 (G1/2"); G502/02 (M22X1.5)

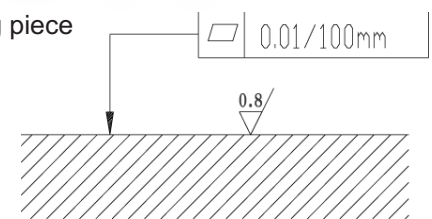
Type WH10



Units for ports' s connecting surface



Required surface finish of mating piece



Subplate(see page 206)

G66/01 (G3/8"); G66/02 (M18X1.5)

G67/01 (G1/2"); G67/02 (M22X1.5)

G534/01 (G3/4"); G534/02 (M27X2)

1. Valve with 2 switching positions and operating cylinder "a"
2. Valve with 2 switching positions and operating cylinder "b"
3. Valve with 3 switching positions and 2 operating cylinders
4. Operating cylinder "a"
5. Operating cylinder "b"
6. Nameplate
7. Valve connecting surface
8. O-ring 12 x 2 with ports A, B, P, T
9. If use control block , it used as assistant port

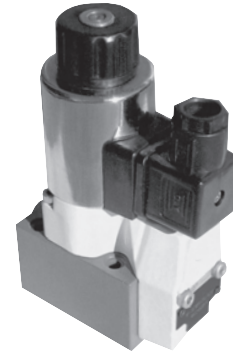
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	2/2-, 3/2- and 4/2-way poppet directional valves, solenoid actuated Type M-.SEW 6			RE 22058/12.2004
	Size 6	up to 42/63 MPa	up to 25 L/min	Replaces: RE22058/05.2001

Features:

- Direct actuated directional poppet valve, solenoid actuated
- Closed port is leak-free
- Switching is ensured even after long periods of being under pressure
- Solenoid coil can be rotated by 90°
- Individual electrical connection
- With protected hand override, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Type
M-3SEW6U30B/420MG24N9K4
with plug-in connector

Function,section

General:

The 2 type M-.SEW directional valve is a solenoid actuated directional poppet valve. They control the start, stop and direction of a flow. They basically consist of a housing (1), the solenoids (2), the hardened valve system (3) and the ball(s) (4) as the closing element.

Basic principle:

In the initial position the ball (4) is pressed onto the seat by the spring (9), and in the switched position by the solenoid (2). The solenoid (2) force acts via the lever (6) and the ball (7) on the actuator pin (8), which is sealed on two sides. The chamber between the two sealing elements is connected with port P. The valve system (3) is thereby pressure balanced with regard to the actuating forces (solenoid or return spring). The valves can, therefore, be used up to a pressure of 63 MPa.

Note:

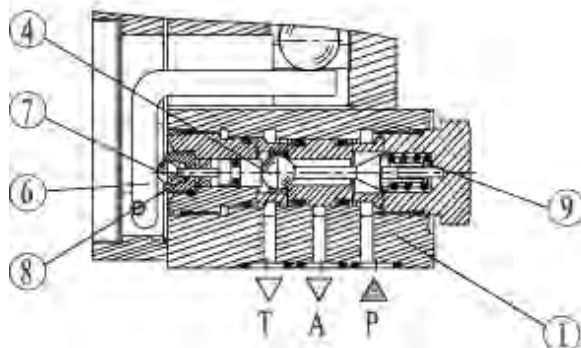
The 3/2-way poppet valves have a "negative switching overlap". Therefore, port T must always be connected. This means that during the switching procedure from the start of opening one valve seat to the closing of the other seat - all of the ports P-A-T are connected with each other. This, however, takes place in such a short space of time that in most applications it is irrelevant.

The hand override (10) makes it possible to switch the valve without energizing the solenoids.

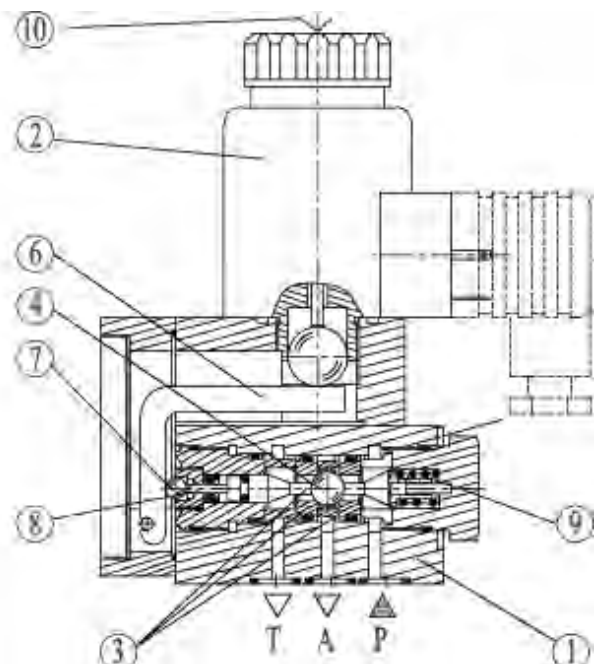
Care has to be taken to ensure that the stated maximum flows are not exceeded! If necessary a cartridge throttle for flow limitation has to be fitted (see below).

The following possibilities are obtainable via the seat orientation:

	2/2-way poppet valve	3/2-way poppet valve
Symbol	"P" 	"U"
Initial position	P and T connected	P and A connected, T closed leak-free
Switched position	P closed leak-free	P closed leak-free, A and T connected
Symbol	"N" 	"C"
Initial position	P closed leak-free	P closed leak-free, A and T connected
Switched position	P and T connected	P and A connected, T closed leak-free



Type M-2SEW6N...



Type M-3SEW6U...

Illustration: 4/2-way poppet valve

In conjunction with a sandwich plate, a plus-1 plate, under the 3/2-way poppet valve this valve can be used as 4/2-way poppet valve.

Function of the plus-1 plate:

Initial position:

The main valve is not actuated. The spring (9) holds the ball (4.1) on the seat (11). Port P is closed and A is connected to T. In addition, a control line runs from A to the large area of the control spool (12), which is thus unloaded to tank. The pressure applied via P now moves the ball (13) onto seat (14). Thus, P is connected to B and A to T.

Transition position:

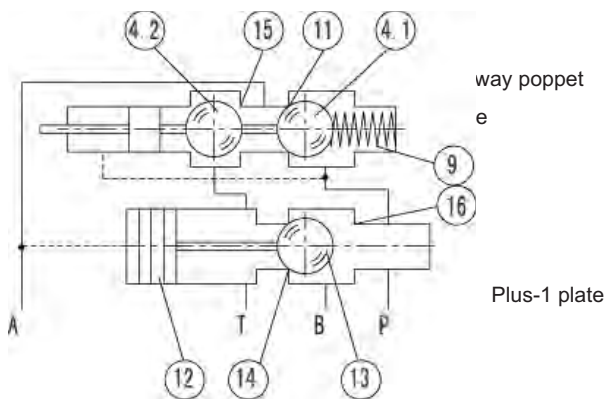
When the main valve is operated, the ball (4.2) is pushed against the spring (9) and then pressed onto the seat (15). Port T is then blocked, P, A and B are connected to each other for a short time.

Switched position:

P is connected to A. As the pump pressure acts via A on the large area of the control spool (12), ball (13) is pushed onto seat (16). Thus, B is connected to T and P to A. Ball (13) in the plus-1 plate has a "positive switching overlap".

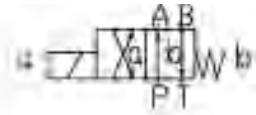
In order to avoid pressure intensification when single rod cylinders are used, the annulus area of the cylinder must be connected to A.

Schematic illustration: initial position

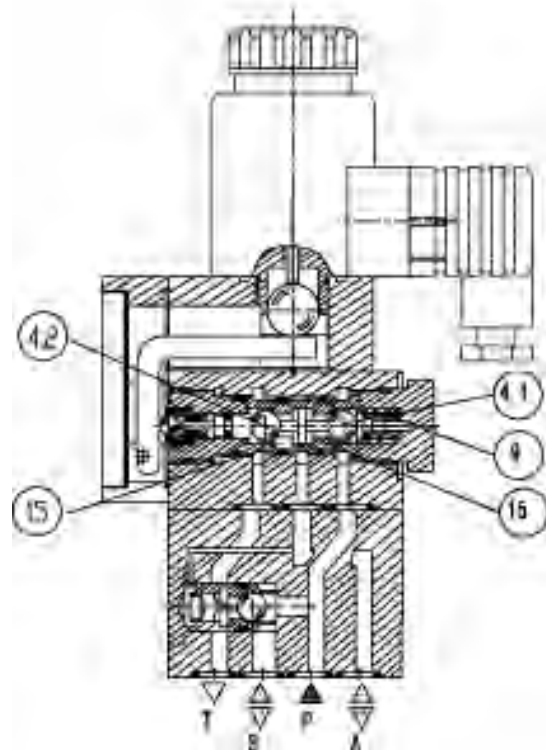


Due to the use of the plus-1 plate and the arrangement of the seats, the following combinations are possible:

Symbol "D":



Symbol "Y":



Type M-4SEW6Y...

Cartridge throttle

The use of the cartridge throttle is necessary when, due to operational conditions during the switching process, flows can occur that exceed the valve performance limits.

Example:

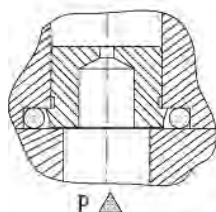
- Accumulator operation,
- Use as a pilot valve with internal pilot oil supply.

3/2-way poppet valve

The cartridge throttle is fitted into port P of the poppet valve.

4/2-way poppet valve (see next page)

The cartridge throttle is fitted into port P of the plus-1 plate.



Cartridge check valve

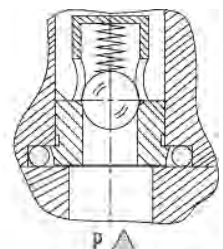
The cartridge check valve allows free flow from P to A and provides leak-free closure from A to P.

For examples, see page 11.

3/2-way poppet valve

The cartridge check valve is inserted into port P of the poppet valve. 4/2-way poppet valve (see next page)

The cartridge check valve is inserted into port P of the plus-1 plate.

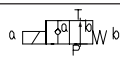
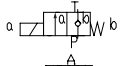
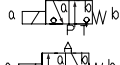
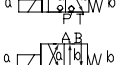
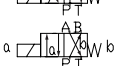
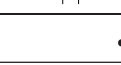


Ordering details

M	-	SEW	6		30	B	/	M						*
---	---	-----	---	--	----	---	---	---	--	--	--	--	--	---

2 service	= 2
3 service	= 3
4 service	= 4

Nominal size 6 = 6

Service	2	3	4	
	•	-	-	=P
	•	-	-	=N
	•	•	-	=U
	•	•	-	=C
	-	-	•	=D
	-	-	•	=Y

• = Available

Series 30 to 39 = 30
(30 to 39: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Operating pressure up to 42 MPa (fixing screws M5) = 420
Operating pressure up to 63 MPa (fixing screws M6) = 630

Further details
in clear text

No code = mineral oils
V = phosphate ester

No code = Without cartridge check valve,
without throttle insert
P = With cartridge check valve
B12 = Throttle ϕ 1.2 mm
B15 = Throttle ϕ 1.5 mm
B18 = Throttle ϕ 1.8 mm
B20 = Throttle ϕ 2.0 mm
B22 = Throttle ϕ 2.2 mm

Electrical connection
K4¹⁾ = Individual connection; with
component

N9 = With protected manual override
No Code = Without manual override

G24 = 24VDC
G205²⁾ = 205VDC

M = Solenoid (air gap) with removable coil

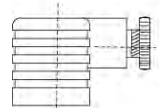
AC supply (permissible voltage tolerance \pm 10%)	Nominal voltage of the DC solenoid when used with an AC voltage	Order detail
110V-50/60Hz	96V	G96
120V-60Hz		
230V-50/60Hz	205V	G205

Note: Other types of actuators e.g.pneumatic,hydraulic,
rotary knob,rotary knob with lock,plunger,lever,roller
lever) on request!

1) Plug-in connectors have to be ordered separately (see below).
2) For the connection to an AC supply a DC solenoid must be used
which is controlled via a rectifier (see table on the left).

For individual connections a large plug-in connector with integrated
rectifier can be used (separate order, see below).

Ordering details: plug-in connector

		Plug-in connections DIN 43 650 ISO 4400	large-size connector			
			Without indicator light	With indicator light	Without rectifier	With indicator light and Z-diode protective circuit
a grey	Material no.	074 683	008 616	313 923/24V 313 926/180-240V	313 932	310 994

Performance limits (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

	Symbol	Comments	Operating pressure in MPa				Flow L/min
			P	A	B	T	
2-way circuit	"P"	Pressure to $P \geq T$	42/63			10	25
	"N"		42/63			10	25
3-way circuit	"U"	Pressure to $P \geq A \geq T$	42/63	42/63		10	25
	"C"		42/63	42/63		10	25
2-way circuit (only for unloading function)	"U"	Before switching from the initial position to the switched position, pressure must be present in port A. Pressure at $A \geq T$		42/63		10	25
	"C"	Pressure at $A \geq T$		42/63		10	25
4-way circuit	"D"	Single ball valve (symbol "U") in conjunction with a plus-1 plate $P \geq A \geq B \geq T$	42/63	42/63	42/63	10	25
	"Y"	Two ball valve (symbol "C") in conjunction with a plus-1 plate $P \geq A \geq B \geq T$	42/63	42/63	42/63	10	25

General guidelines

- In order to operate the valve safely and to hold it safely in the switched position, the pressure in P must be $\geq A \geq T$ (for design reasons).
- The ports P, A and T (3/2-way poppet valve) as well as P, A, B and T (4/2-way poppet valve) are positively assigned to their individual functions. They must not be interchanged or plugged. Flow is only permitted in the direction of the arrow.
- When using the plus-1 plate (4/2-way function) the following lower operating values must be taken into account: $p_{\min} = 0.8 \text{ MPa}$; $q_v > 3 \text{ L/min}$.
- The specified maximum flow must not be exceeded.

The performance limit was determined with the solenoids at operating temperature, 10% under voltage and with the tank not pressurized.

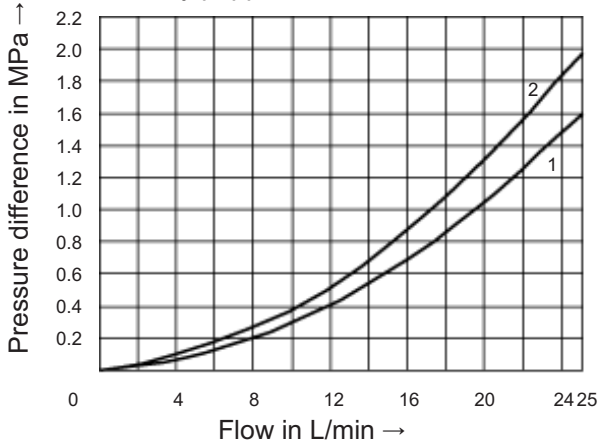
Suggestible type (Could Supplied in short time)

Ordering Type:
M-3SEW6 C 30/ 420 MG24 N9 K4
M-3SEW6 C 30/ 630 MG24 N9 K4
M-3SEW6 U 30/ 420 MG24 N9 K4
M-3SEW6 U 30/ 630 MG24 N9 K4

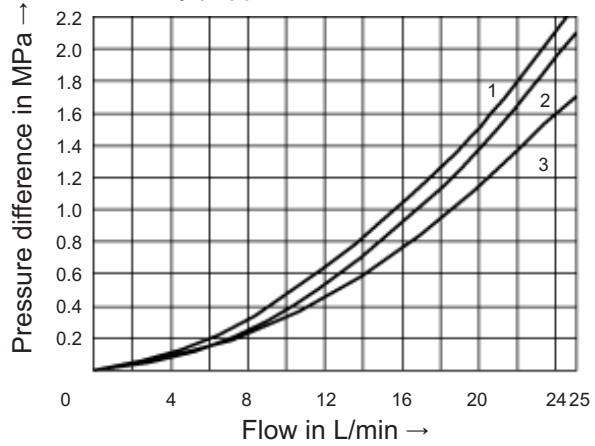
Technical data (For applications outside these parameters, please consult us!)													
General													
Installation							optional						
Max. ambient temperature (°C)							50						
Weight		2/2-way poppet valve (kg)					1.5						
		3/2-way poppet valve (kg)					1.5						
		4/2-way poppet valve (kg)					2.3						
Hydraulic data													
Max. operating pressure (MPa)							see table on page 140						
Max. flow (L/min)							25						
Pressure fluid							Mineral oil or Phosphate ester						
Pressure fluid temperature range (°C)							- 30 to + 80						
Viscosity range (mm ² /s)							2.8 to 500						
Degree of contamination μ m							≤ 20 (We recommend 10)						
Electrical data													
Type of voltage							DC				AC		
Available voltages ¹⁾ (V)							12, 24, 42, 96, 110, 205, 220				only possible via rectifier		
Voltage tolerance (nominal voltage) (%)							± 10						
Power consumption (W)							30						
Duty							100%						
Switching time to ISO 6403							see table below						
Switching frequency (cycle s/h)							15000						
Protection to DIN 40 050							IP65						
Max. coil temperature (°C)							to150						
1) Special voltages on request							When connecting the electrics, the protective conductor (PE $\frac{1}{2}$) must be connected according to the relevant regulations.						
Switching time in ms (installation: solenoid vertical)													
Pressure in MPa	Flow q_v in L/min	DC solenoid						DC solenoid + rectifier					
		Symbols U, C, D, Y						Symbols U, C, D, Y					
		t_{on}				t_{off}		t_{on}				t_{off}	
		Without tank pressure				U	D	Without tank pressure				U	D
		U	C	D	Y	C	Y	U	C	D	Y	C	Y
14	25	25	30	25	30	10	10	30	40	30	40	35	35
28								35	45	35	45	40	40
32								50	50	50	50	50	
42								40	55	40	55	50	50
50								55	55	55	55	55	55
60								55	55	55	55	55	55

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

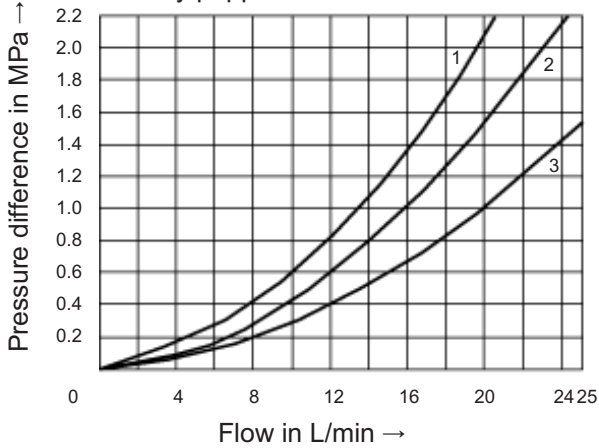
$\Delta p - q_v$ -characteristic curves
2/2-way poppet valve



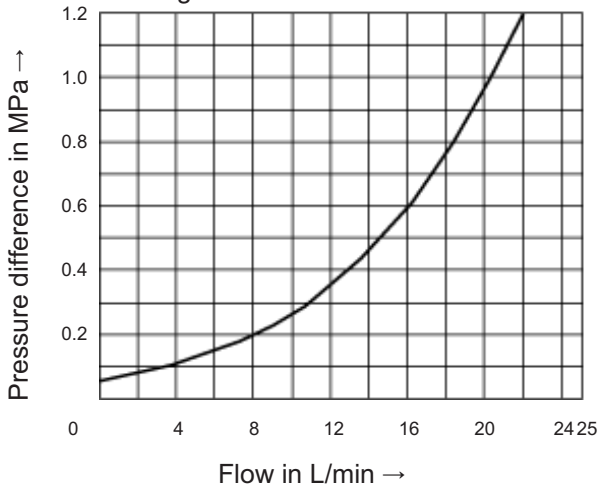
$\Delta p - q_v$ -characteristic curves
3/2-way poppet valve



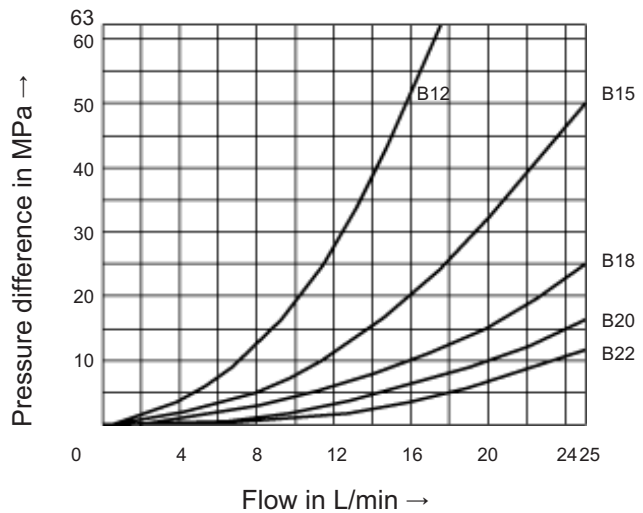
$\Delta p - q_v$ -characteristic curves
4/2-way poppet valve

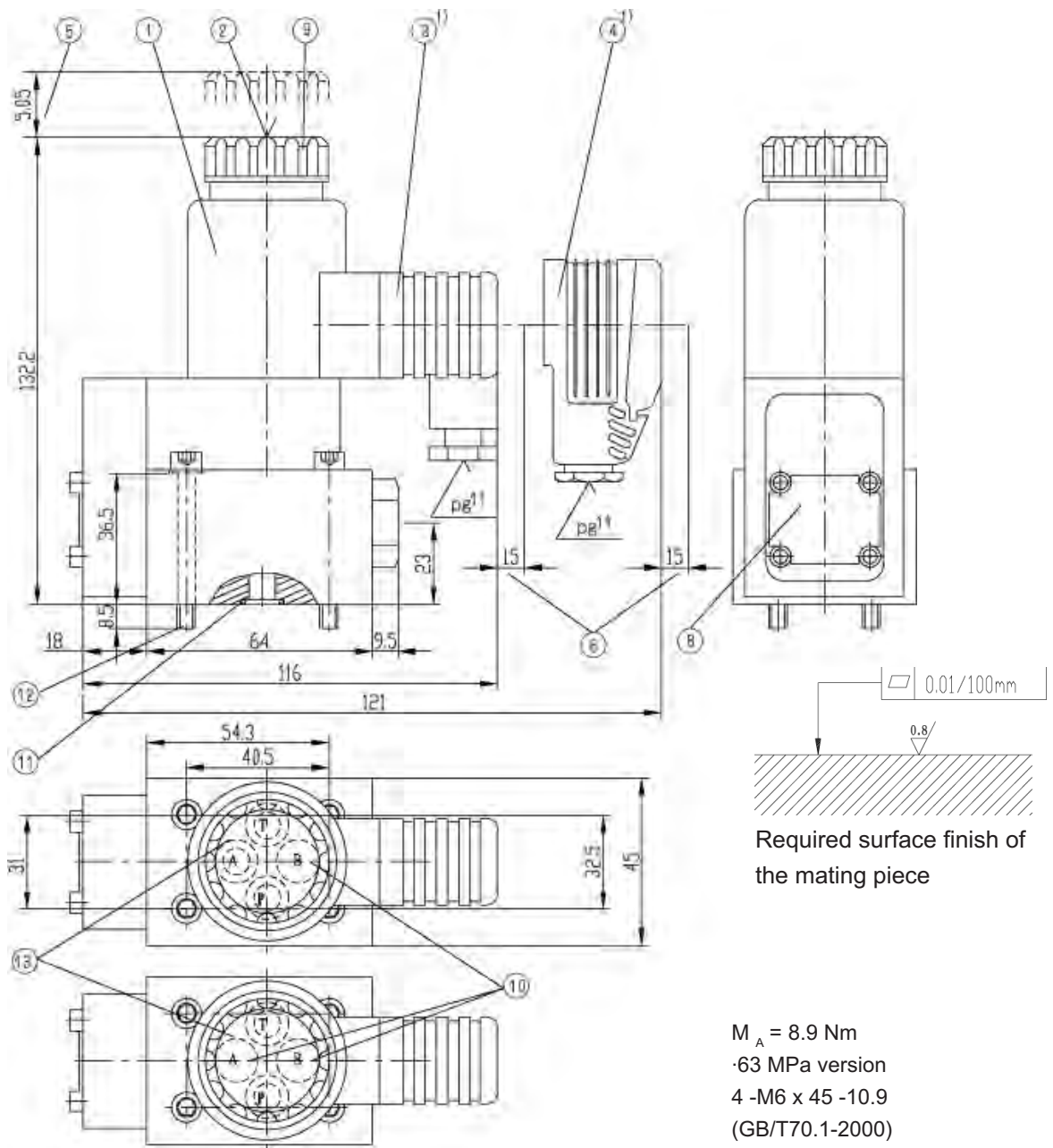


$\Delta p - q_v$ -characteristic curve
Cartridge check valve



$\Delta p - q_v$ -characteristic curves
Throttle insert





Required surface finish of the mating piece

$M_A = 8.9 \text{ Nm}$
 ·63 MPa version
 4 -M6 x 45 -10.9
 (GB/T70.1-2000)

$M_A = 15.5 \text{ Nm}$
 are included within the scope of supply.

13 Porting pattern to DIN 24 340 form A,ISO 4401 and CETOP-RP 121 H

Subplates:(see page 205)

42 MPa version
 G341/01(G1/4")
 G342/01(G3/8")
 G502/01(G1/2")
 63 MPa version
 G576/01(G1/4")
 G577/01(G3/8")
 must be ordered separately.

- 1 Solenoid "a" (plug-in connector colour grey)
- 2 Protected hand override "N9"
- 3 Plug-in connector to DIN 43 650 ¹⁾ (may be rotated by 90°)
- 4 Large plug-in connector to DIN 43650 ¹⁾ (may be rotated by 90°)
- 5 Space required to remove the coil
- 6 Space required to remove the plug-in connector
- 8 Nameplate
- 9 Fixing nut,tightening torque $M_A = 4 \text{ Nm}$
- 1) Must be ordered separately, see page 141.

10 Attention!

On 3/2-way poppet valves (42 MPa version), port B is a blind counter bore.

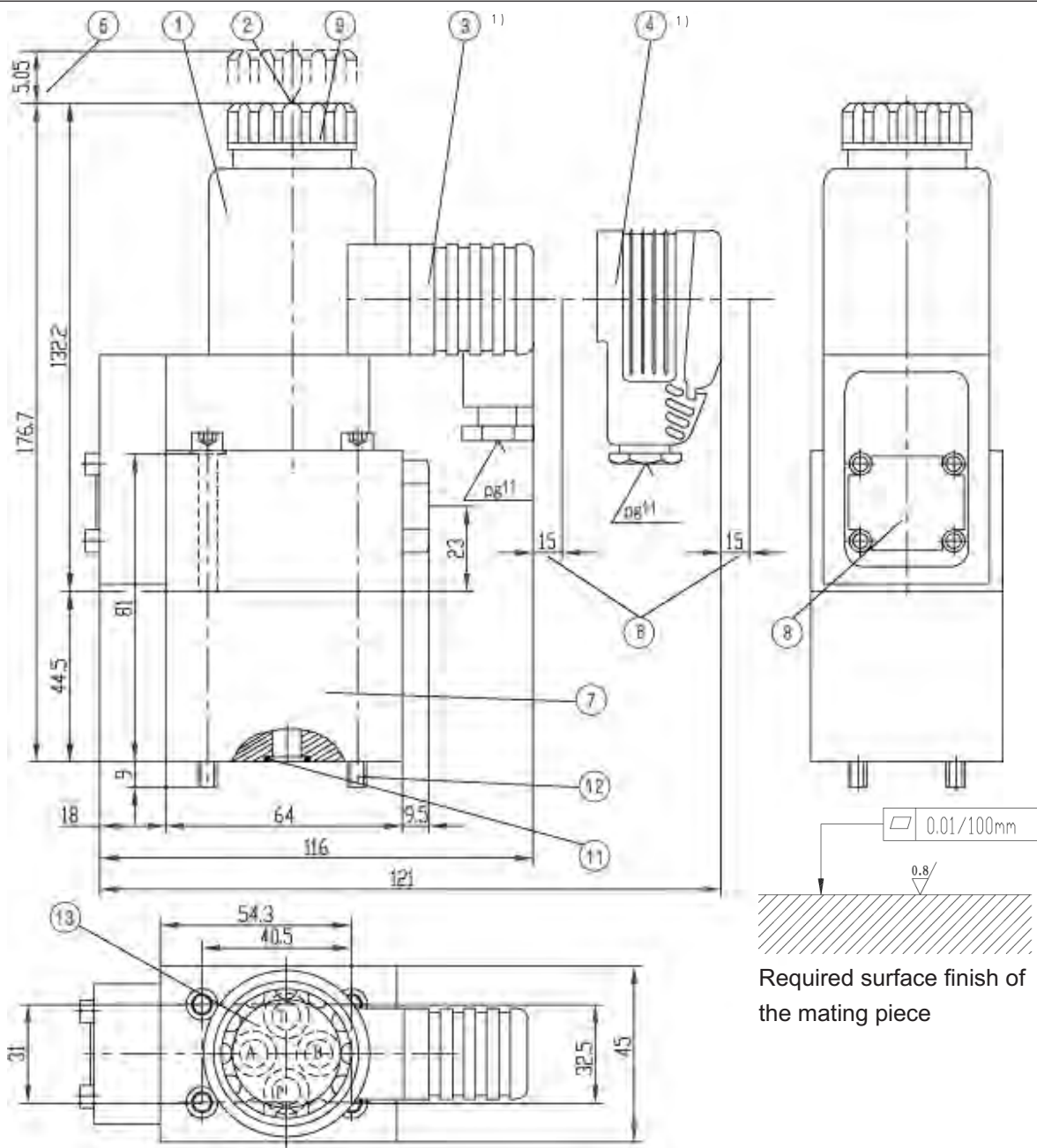
On 2/2-way poppet valves (42 MPa version) ports A and B are blind counter bores.

11 O-rings 9.25 x1.78 for ports A, B and T
 O-ring 10.82 x1.78 for port P

12 Valve fixing screws
 -42 MPa version
 4 - M5 x 45 -10.9 (GB/T70.1-2000)

Unit dimensions: 4/2-way poppet valve

(Dimensions in mm)

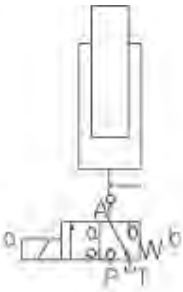
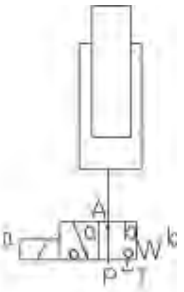
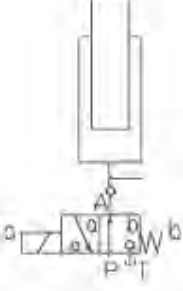
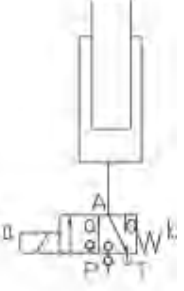
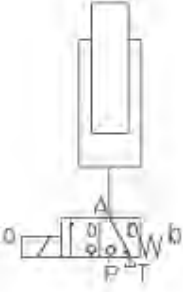
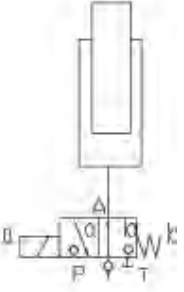
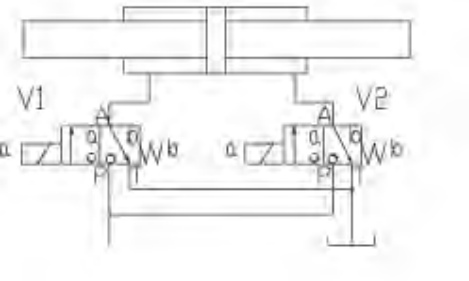
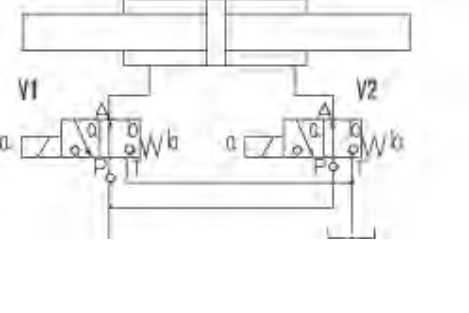


Required surface finish of the mating piece

- | | | |
|--|--|--|
| 1 Solenoid "a" (plug-in connector colour grey) | $M_A = 4 \text{ Nm}$ | are included within the scope of supply. |
| 2 Protected hand override "N9" | 11 O-rings 9.25x 1.78 for ports A, B and T | 13 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H |
| 3 Plug-in connector to DIN 43 650 1) (may be rotated by 90°) | O-ring 10.82 x 1.78 for port P | Subplates (see page 205) |
| 4 Large plug-in connector to DIN 43650 1) (may be rotated by 90°) | 12 Valve fixing screws | · 42 MPa version |
| 5 Space required to remove the coil | 4 -M5 x 90 -10.9 (GB/T70.1-2000), | G341/01(G1/4") |
| 6 Space required to remove the plug-in connector | $M_A = 8.9 \text{ Nm}$ | G342/01(G3/8") |
| 7 Plus-1 plate | · 63 MPa version | G502/01(G1/2") |
| 8 Name plate | 4 -M6 x 90 -10.9 (GB/T70.1-2000), | 63 MPa version |
| 9 Fixing nut, tightening torque | $M_A = 15.5 \text{ Nm}$ | G576/01(G1/4") |
| | | G577/01(G3/8") |
| | | must be ordered separately. |
- 1) must be ordered separately, see page 141

Application examples

These examples serve only to explain the possibilities offered by the poppet valve. They do not include the complete function.

<p>Symbol "C"</p> 	<p>2/2-way circuit with a two poppet valve and check valve at port A</p> <p>The check valve must be installed in the pipe work.</p> <p>Initial position: Flow blocked, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A.</p> <p>Switched position: Free-flow, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.</p>	<p>Symbol "C"</p> 	<p>3/2-way circuit with a single poppet valve</p> <p>Initial position: Lifting Holding only due to limitation of travel and pressure in port P.</p> <p>Switched position: Lowering</p>
<p>Symbol "U"</p> 	<p>2/2-way circuit with a single poppet valve and check valve at port A</p> <p>The check valve must be fitted in the pipe work.</p> <p>Initial position: Free-flow, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A.</p> <p>Switched position: Flow blocked, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.</p>	<p>Symbol "C"</p> 	<p>3/2-way circuit with a two poppet valve and cartridge check valve in port P</p> <p>The check valve is fitted in the P port of the 3/2-way poppet valve.</p> <p>Initial position: Lowering</p> <p>Switched position: Lifting</p> <p>The load can be held in any position while the pump is switched off and the solenoid energized.</p>
<p>Symbol "C"</p> 	<p>3/2-way circuit with a two poppet valve</p> <p>Initial position: Lowering</p> <p>Switched position: Lifting</p> <p>Holding only due to limitation of travel and pressure in port P.</p>	<p>Symbol "U"</p> 	<p>3/2-way circuit with a single poppet valve and cartridge check valve in port P</p> <p>The check valve is fitted into the P port of the 3/2-way poppet valve.</p> <p>Initial position: Lifting</p> <p>The load can be held in any position while the pump is switched off.</p> <p>Switched position: Lowering</p>
<p>Symbol "C"</p> 	<p>4/3- (4/4-) way circuit with a 2 two poppet valves</p> <p>V1 and V2 in the initial position: Both cylinder sides are connected to the tank port.</p> <p>V2 in the switched position: The piston moves to the left</p> <p>V1 in the switched position: The piston moves to the right</p> <p>V1 and V2 in the switched position: Both cylinders sides are connected to the pump port.</p> <p>Rapid traverse is possible when a single rod cylinder with an area ratio of 2 : 1, is used.</p> <p>Attention!</p> <p>When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account.</p>		
<p>Symbol "U"</p> 	<p>4/3- (4/4-) way circuit with a 2 two poppet valves and cartridge check valve in port P of the 3/2-way poppet valves</p> <p>V1 and V2 in the initial position: The piston is locked externally to prevent movement.</p> <p>V2 in the switched position: The piston moves to the right</p> <p>V1 in the switched position: The piston moves to the left</p> <p>V1 and V2 in the switched position: Both cylinder sides are connected to the tank port.</p> <p>Attention!</p> <p>When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account!</p>		

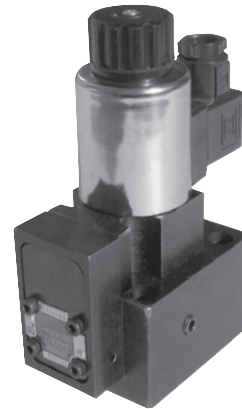
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	3/2- and 4/2-way poppet directional valves, solenoid actuated Type M-.SEW 10			RE 22059/12.2004
	Size 10	up to 42/63MPa	up to 40L/min	

Features:

- Direct actuated directional poppet valve, solenoid actuated
- Closed port is leak-free
- Switching is ensured even after long periods of being under pressure
- Air gap DC solenoids with removable coil (AC volt-ages possible via rectifier)
- Solenoid coil can be rotated by 90°
- Individual electrical connection
- With protected hand override, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function,section

General:

The 2 type M-.SEW directional valve is a solenoid actuated directional poppet valve. They control the start, stop and direction of a flow. They basically consist of a housing (1), the solenoids (2), the hardened valve system (3) and the ball(s) (4) as the closing element.

Basic principle:

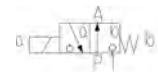
In the initial position the ball (4) is pressed onto the seat by the spring (9), and in the switched position by the solenoid (2). The solenoid (2) force acts via the lever (6) and the ball (7) on the actuator pin (8), which is sealed on two sides. The chamber between the two sealing elements is connected with port P. The valve system (3) is thereby pressure balanced with regard to the actuating forces (solenoid or return spring). The valves can, therefore, be used up to a pressure of 63 MPa.

Note:

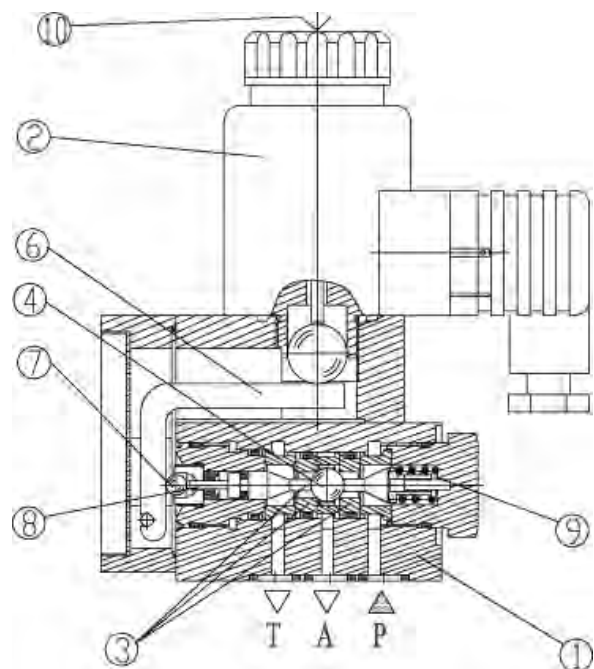
The 3/2-way poppet valves have a "negative switching overlap". Therefore, port T must always be connected. This means that during the switching process - from the start of opening one valve seat to the closing of the other seat - all of the ports P-A-T are connected with each other. This, however, takes place in such a short space of time that in most applications it is irrelevant. The hand override (10) makes it possible to switch the valve without energizing the solenoids. Care has to be taken to ensure that the stated maximum flows are not exceeded! If necessary a cartridge throttle for flow limitation has to be fitted (see below).

The following possibilities are obtainable via the seat orientation:

Symbol " U "



Symbol " C "



Type M-3SEW10U...

Illustration: 4/2-way poppet valve

In conjunction with a sandwich plate, a plus-1 plate, under the 3/2-way poppet valve this valve can be used as 4/2-way poppet valve.

Function of the plus-1 plate:

Initial position:

The main valve is not actuated. The spring (9) holds the ball (4.1) on the seat (11). Port P is closed and A is connected to T. In addition, a control line runs from A to the large area of the control spool (12), which is thus unloaded to tank. The pressure applied via P now moves the ball (13) onto seat (14). Thus, P is connected to B and A with T.

Transition position:

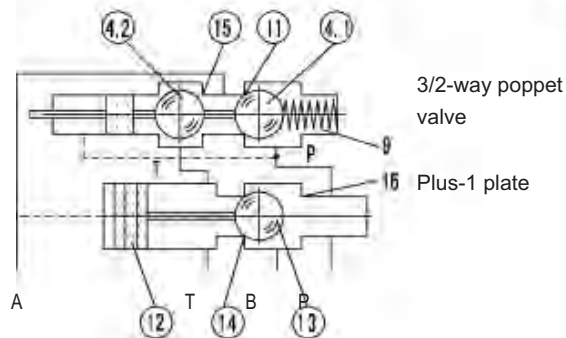
When the main valve is operated, the ball (4.2) is pushed against the spring (9) and then pressed onto the seat (15). Port T is then blocked, P, A and B are connected to each other for a short time.

Switched position:

P is connected to A. As the pump pressure acts via A on the large area of the control spool (12), the ball (13) is pushed onto seat (16). Thus, B is connected to T and P to A. Ball (13) in the plus-1 plate has a "positive switching overlap".

In order to avoid pressure intensification when single rod cylinders are used, the annulus area of the cylinder must be connected to A.

Schematic illustration: initial position

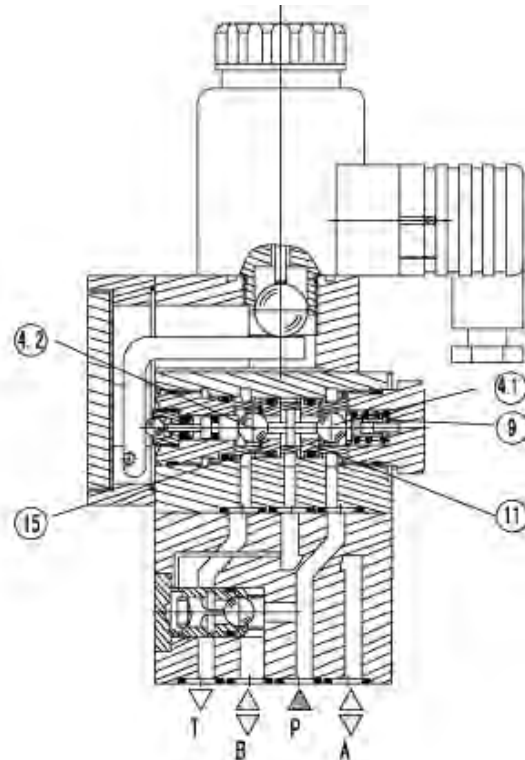


Due to the use of the plus-1 plate and the arrangement of the seats, the following combinations are possible:

Symbol "D"



Symbol "Y"



Type M-4SEW10Y...

Cartridge throttle

The use of the cartridge throttle is necessary when, due to operational conditions during the switching process, flows can occur that exceed the valve performance limits.

Example:

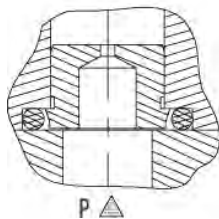
- Accumulator operation,
- Use as a pilot valve with internal pilot oil supply.

3/2-way poppet valve

The cartridge throttle is fitted into port P of the poppet valve.

4/2-way poppet valve

The cartridge throttle is fitted into port P of the plus-1 plate.



Cartridge check valve

The cartridge check valve allows free flow from P to A and provides leak-free closure from A to P.

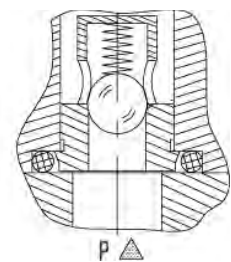
For examples.

3/2-way poppet valve

The cartridge check valve is inserted into port P of the poppet valve.

4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.



Ordering details

M -		SEW	10		10	B	/	M			K4	/		*
-----	--	-----	----	--	----	---	---	---	--	--	----	---	--	---

3 service ports = 3
4 service ports = 4

Nominal size 10 = 10

Service ports	3	4	
	•	–	=U
	•	–	=C
	–	•	=D
	–	•	=Y

• = available

Series 10 to 19 = 10
(10 to 19: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Operating pressure up to 42 MPa = 420
(fixing screws M6)
Operating pressure up to 63 MPa = 630
(fixing screws M8)

AC supply (permissible voltage tolerance ± P10%)	Nominal voltage of the DC solenoid when used with an AC voltage	Order detail
110V-50/60HZ	96V	G96
120V-60HZ	110V	
230V-50/60HZ	205V	G205

Further details
in clear text

No code = mineral oils
V = phosphate ester

No code = Without cartridge check valve, without throttle insert
P = With cartridge check valve
B12 = Throttle Φ 1.2 mm
B15 = Throttle Φ 1.5 mm
B18 = Throttle Φ 1.8 mm
B20 = Throttle Φ 2.0 mm
B22 = Throttle Φ 2.2 mm

Electrical connection

K4^{1,2)} = Individual connection; with component

N9 = With protected manual override
No Code = Without manual override

G24 = 24VDC
G205²⁾ = 205VDC

M = Solenoid (air gap) with removable coil

Note: Other types of actuators e.g. pneumatic, hydraulic, rotary knob, rotary knob with lock, plunger, lever, roller lever on request!

1) Plug-in connectors have to be ordered separately (see below).

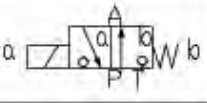
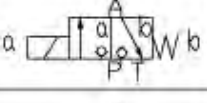
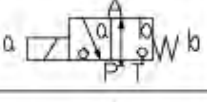
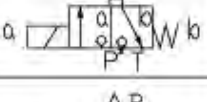
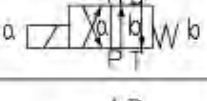
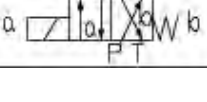
2) For the connection to an AC supply a DC solenoid must be used which is controlled via a rectifier (see table on the left).

For individual connections a large plug-in connector with integrated rectifier can be used (separate order, see below).

Ordering details: plug-in connector

		Plug-in connections DIN 43 650 ISO 4400 				
a grey	Material no.		Without indicator light	With indicator light	Without indicator light	With indicator light and Z-diode protective circuit
	074 683	008 616	313 923/24V 313 926/180-240V	313 932	310 994	

Performance limits (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

	Symbol	Comments	Operating pressure in MPa				Flow in L/min
			P	A	B	T	
3-way circuit		Pressure at $P \geq A \geq T$	42/63	42/63		10	40
			42/63	42/63		10	
2-way circuit (only for unloading function)		Before switching from the initial position to the switched position, pressure must be present in port A. Pressure at $A \geq T$		42/63		10	40
		Pressure at $A \geq T$		42/63		10	
4-way circuit		Single ball valve (symbol "U") in conjunction with a plus-1 plate $P > A \geq B > T$	42/63	42/63	42/63	10	40
		Two ball valve (symbol "C") in conjunction with a plus-1 plate $P \geq A \geq B > T$	42/63	42/63	42/63	10	

General guidelines

In order to operate the valve safely and to hold it safely in the switched position, the pressure in P must be $\geq A \geq T$ (for design reasons).

The ports P, A and T (3/2-way poppet valve) as well as P, A, B and T (4/2-way poppet valve) are positively assigned to their individual functions. They must not be interchanged or plugged. Flow is only permitted in the direction of the arrow.

When using the plus-1 plate (4/2-way function) the following lower operating values must be taken into account: $p_{\text{min}} = 0.8 \text{ MPa}$; $q_v > 3 \text{ L/min}$.

The specified maximum flow must not be exceeded.

The performance limit was determined with the solenoids at operating temperature, 10% under voltage and with the tank not pressurized.

Technical data (for applications outside these parameters, please consult us!)

Installation		optional
Max. ambient temperature	($^\circ\text{C}$)	-30 ~ +50
Weight	3/2-way poppet valve	(kg) 2.0
	4/2-way poppet valve	(kg) 3.5
Hydraulic data		
Max. operating pressure	(MPa)	see table above
Max. flow	(L/min)	40
Pressure fluid		Mineral oils (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid temperature range	($^\circ\text{C}$)	-30 to +80
Viscosity range	(mm^2/s)	2.8 to 500
Degree of contamination	(μm)	Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Technical data

Electrical data

Type of voltage		DC	AC
Available voltages ¹⁾	(V)	12, 24, 42, 96, 110, 205, 220	only possible via rectifier 205, 220 (see ordering details)
Voltage tolerance (nominal voltage)	(%)	± 10	
Power consumption	(W)	30	
Duty		100%	
Switching time to ISO 6403		see table below	
Switching frequency cycle	(s/h)	15000	
Protection to DIN 40 050		IP65	
Max. coil temperature	(°C)	t0150	

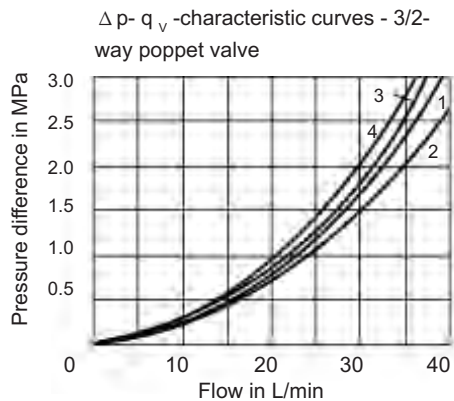
1) Special voltages on request

When connecting the electrics, the protective conductor (PE $\frac{1}{2}$) must be connected according to the relevant regulations.

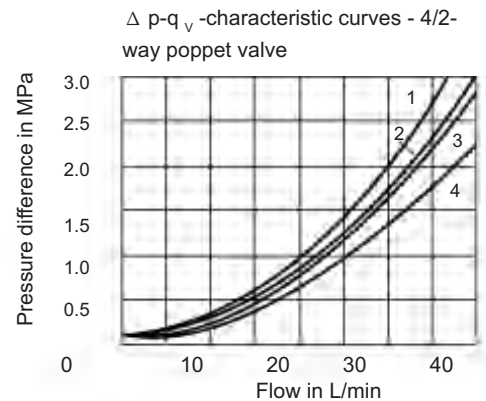
Switching time in ms (installation: solenoid vertical)

Pressure in MPa	Flow q_v L/min	DC solenoid								DC solenoid + rectifier							
		t_{ON} Without tank pressure				t_{OFF}				t_{OFF} Without tank pressure				t_{OFF}			
		U	C	D	Y	U, C	D, Y	U	C	D	Y	U	C	D	Y		
14	40	20	40	20	40	12	17	20	40	20	40	60	45	40	50		
28	40	25	45	20	45	12	17	20	45	25	45	60	45	45	55		
32	40	25	45	20	45	12	17	25	45	25	45	60	45	45	55		
42	40	30	45	20	50	12	17	25	45	25	50	60	45	45	55		
50	40	30	45	20	50	12	17	30	50	30	50	65	50	60	60		
60	40	30	50	20	50	12	17	30	50	30	50	65	50	60	60		

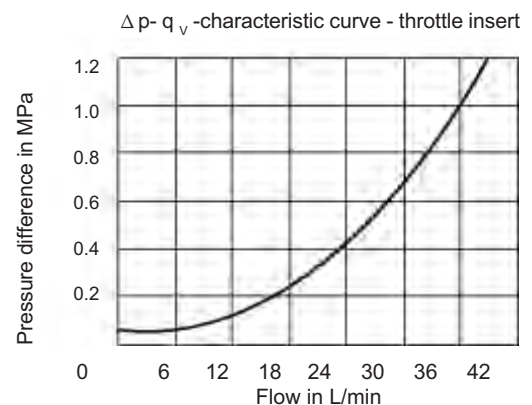
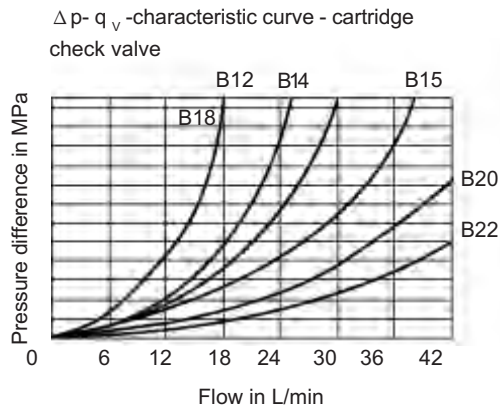
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

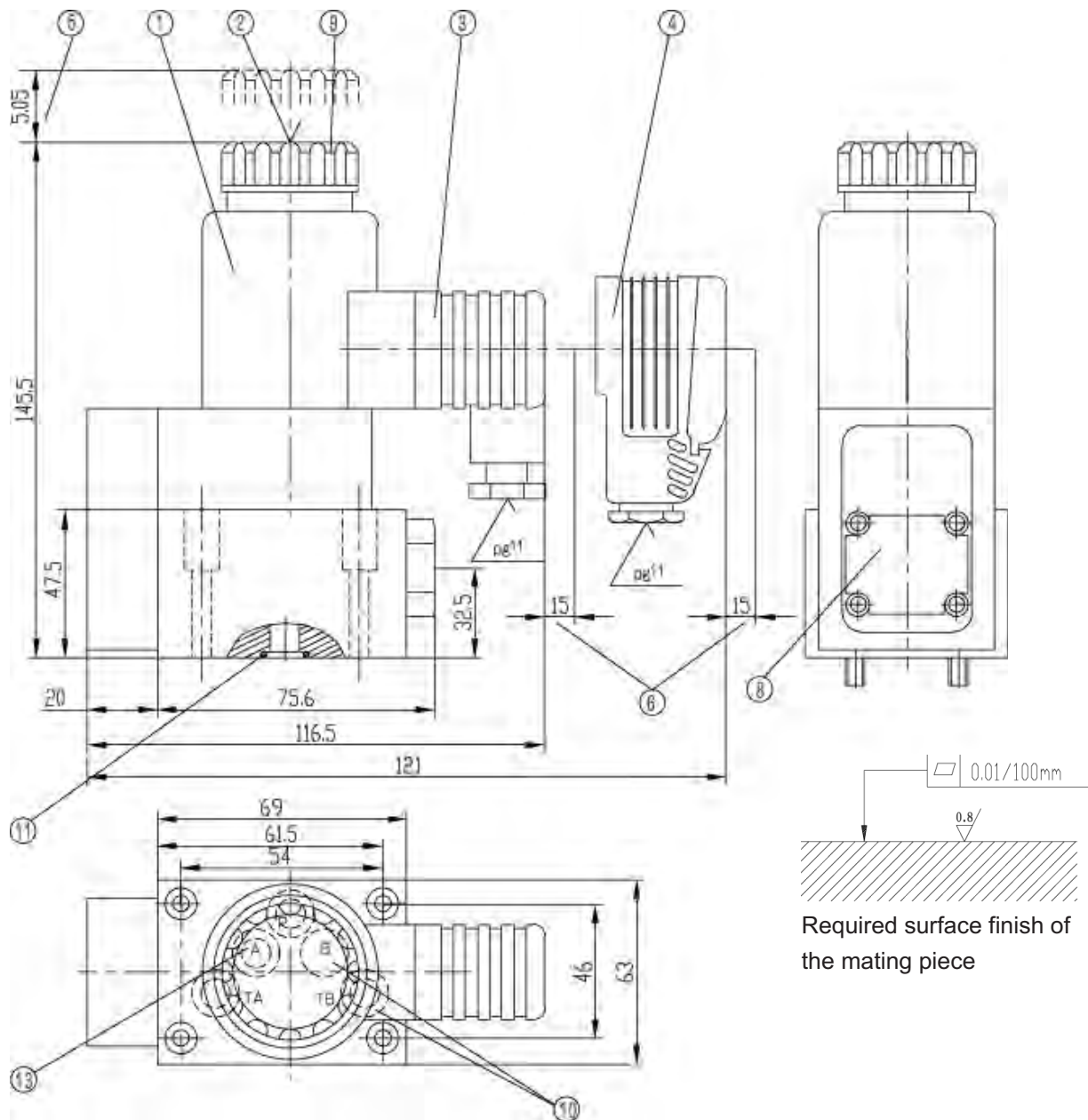


1 M-3SEW 10 C... P to A 3 M-3SEW 10 U... P to A
2 M-3SEW 10 C... A to T 4 M-3SEW 10 U... A to T



1 M-4SEW 10⁰... A to T 3 M-4SEW 10⁰... P to B
2 M-4SEW 10⁰... P to A 4 M-4SEW 10⁰... B to T



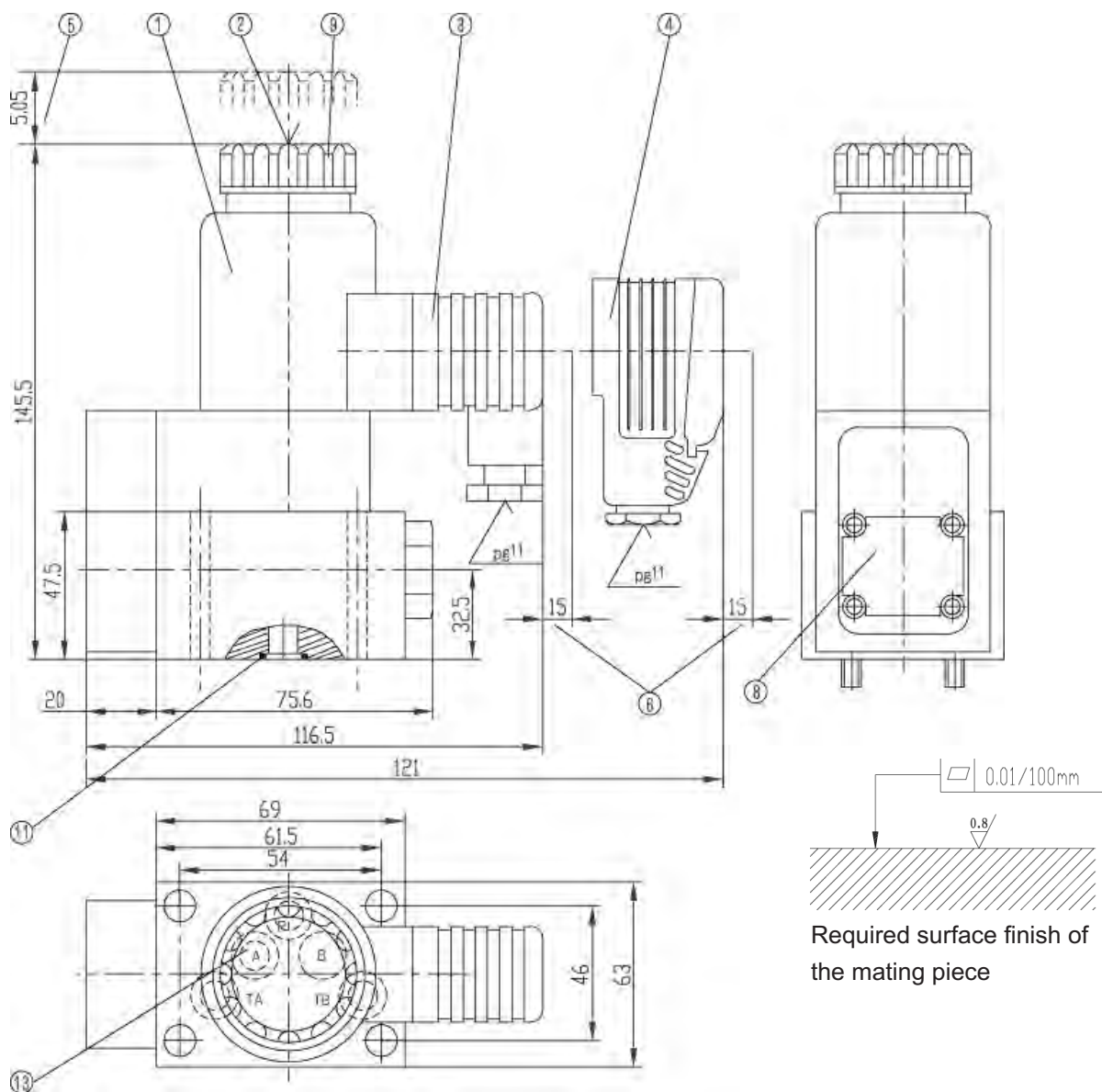


- 1 Solenoid "a" (plug-in connector colour grey)
- 2 Protected hand override "N9"
- 3 Plug-in connector to DIN 43 650 ¹⁾ (may be rotated by 90°)
- 4 Large plug-in connector to DIN 43650 ¹⁾ (may be rotated by 90°)
- 5 Space required to remove the coil
- 6 Space required to remove the plug-in connector
- 8 Nameplate

- 9 Fixing nut, tightening torque $M_A = 4 \text{ Nm}$
- 10 Attention!
On 3/2-way poppet valves ports B and TB for the 42MPa version are blind counter bores and are not present in the 63 MPa version.
- 11 O-rings 12 x 2
for ports A, B, TA and TB
- O-ring 14 x 1.78
for port P
- 12 Valve fixing screws

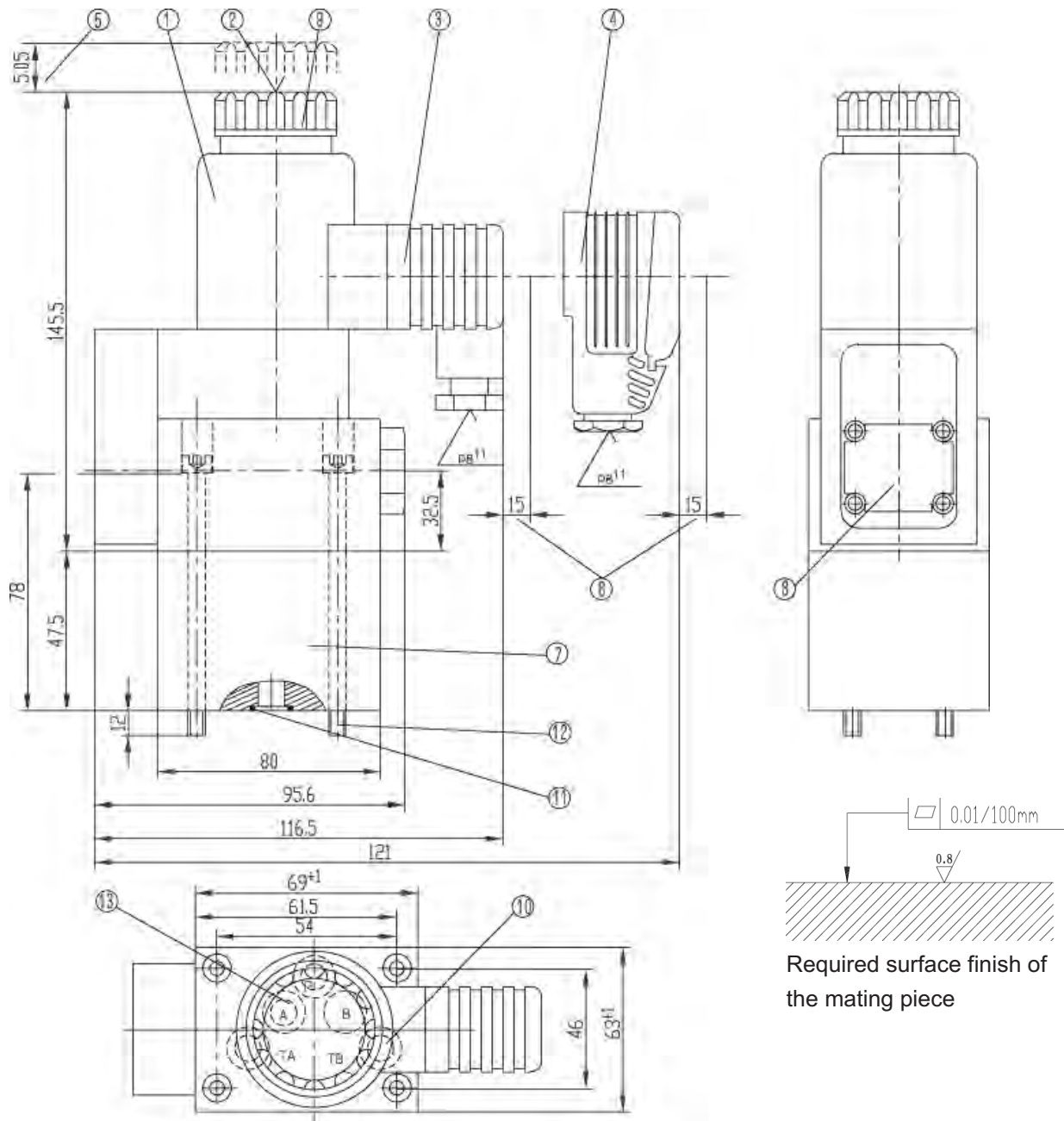
- 4 - M6 x 40 DIN 912-10.9 (GB/T70.1-2000), $M_A = 15.5 \text{ Nm}$
 - 13 Porting pattern to DIN 24 340 form A, must be ordered separately. ISO 4401 and CETOP-RP 121 H
- Subplates:(see page 206)
G66/01(G1/4")
G67/01(G3/8")
must be ordered separately.

1) must be ordered separately, see page 151.



- | | | |
|---|--|--|
| 1 Solenoid "a" (plug-in connector colour grey) | 8 Nameplate | $M_A = 37 \text{ Nm}$
are included within the scope of supply. |
| 2 Protected hand override "N9" | 9 Fixing nut, tightening torque $M_A = 4 \text{ Nm}$ | |
| 3 Plug-in connector to DIN 43 650 ¹⁾ (may be rotated by 90°) | 11 O-rings 12 x 2 for ports A and TA
O-ring 14x 1.78 for port P | 13 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H |
| 4 Large plug-in connector to DIN 43650 ¹⁾ (may be rotated by 90°) | 12 Valve fixing screws 4 - M8 × 60-10.9 (GB/T70.1-2000) ; | Subplates
G377/01(G3/8")
G378/01(G1/2")
must be ordered separately. |
| 5 Space required to remove the coil | | |
| 6 Space required to remove the plug-in connector | | |

1) must be ordered separately, see page 151.

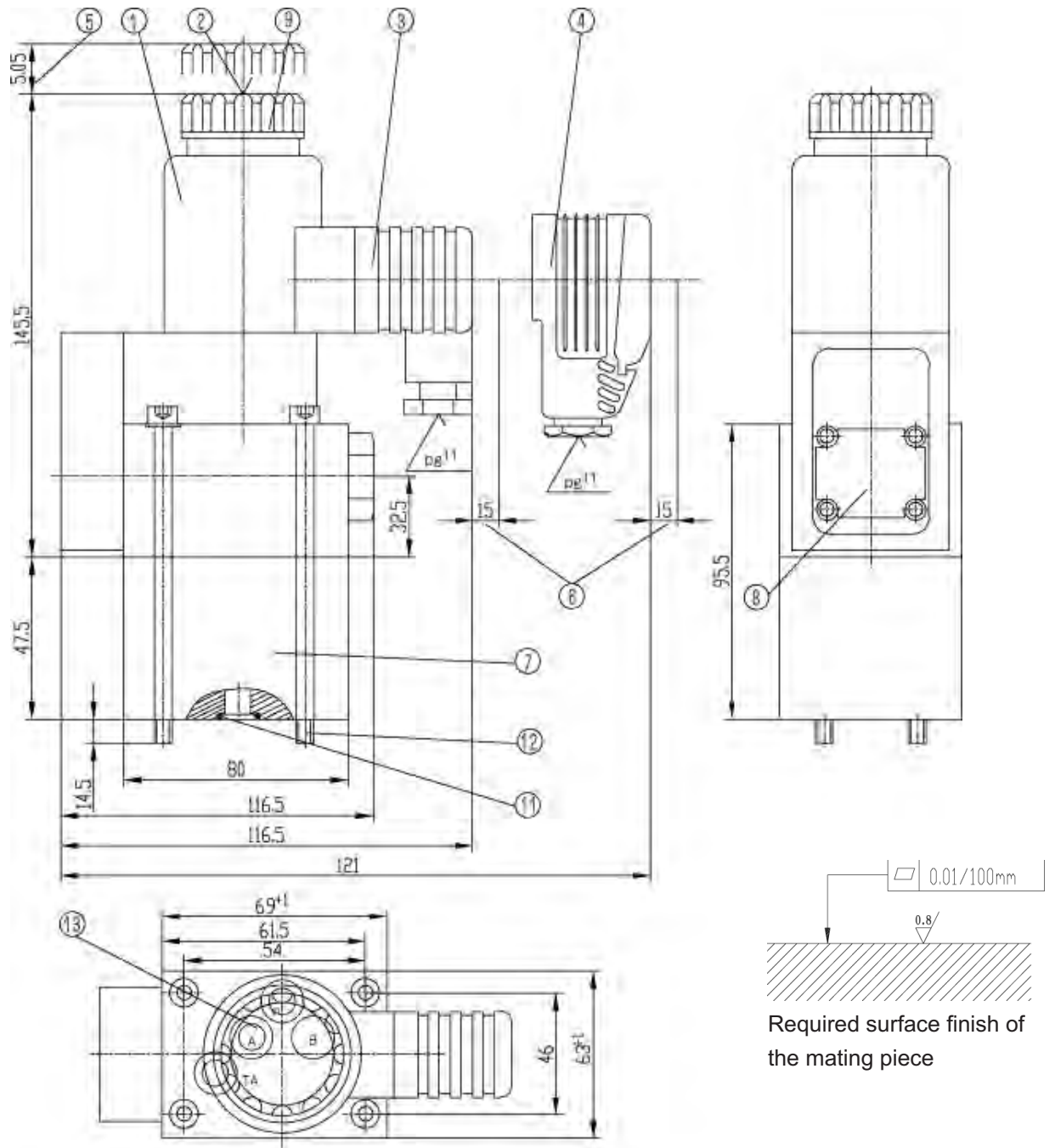


- | | | |
|--|--|---|
| 1 Solenoid "a" (plug-in connector colour grey) | 8 Nameplate | 4 - M6 x 90 -10.9 (GB/T70.1-2000), $M_A = 15.5$ Nm are included within the scope of supply. |
| 2 Protected hand override "N9" | 9 Fixing nut, tightening torque $M_A = 4$ Nm | |
| 3 Plug-in connector to DIN 43 650 ¹⁾ (may be rotated by 90°) | 10 Attention! On the 4/2-way poppet valves port TB is a blind counterbore. | 13 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H |
| 4 Large plug-in connector to DIN 43650 ¹⁾ (may be rotated by 90°) | 11 O-rings 12 x 2 for ports A, B, TA and TB | |
| 5 Space required to remove the coil | O-ring 14 x 1.78 for port P | |
| 6 Space required to remove the plug-in connector | 12 Valve fixing screws | Subplates G377/01(G3/8") G378/01(G1/2") must be ordered separately. |
| 7 Plus-1-Platte | | |

1) must be ordered separately, see page 151.

Unit dimensions: 4/2-way poppet valve (63 MPa version)

(Dimensions in mm)



- | | |
|--|---|
| 1 Solenoid "a" (plug-in connector colour grey) | 7 Plus-1 plate |
| 2 Protected hand override "N9" | 8 Nameplate |
| 3 Plug-in connector to DIN 43 650 ¹⁾ (may be rotated by 90°) | 9 Fixing nut, tightening torque $M_A = 4 \text{ Nm}$ |
| 4 Large plug-in connector to DIN 43650 ¹⁾ (may be rotated by 90°) | 11 O-rings 12 x 2 for ports A,B and TA
O-ring 14 x 1.78 for port P |
| 5 Space required to remove the coil | 12 Valve fixing screws 4 - M8 x 110-10.9 (GB/T70.1-2000), |
| 6 Space required to remove the plug-in connector | |

$M_A = 37 \text{ Nm}$
are included within the scope of supply.

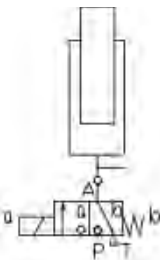
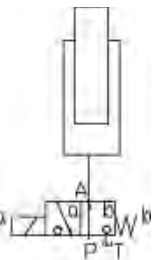
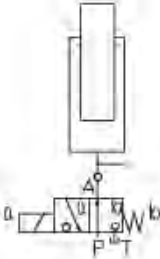
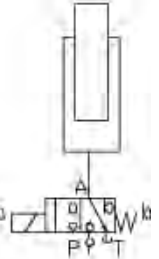
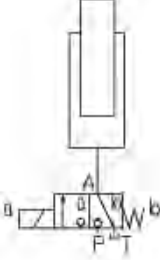
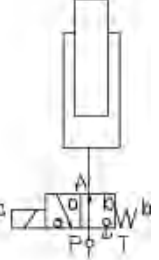
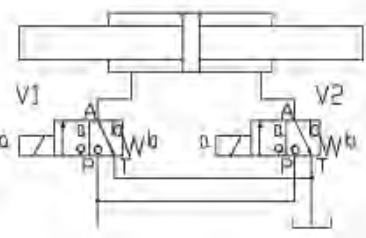
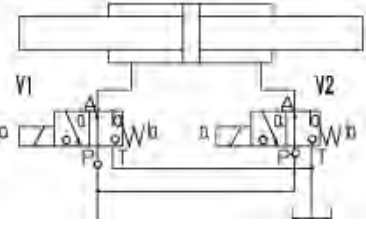
- 13 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H

Subplates
G 377/01 (G3/8")
G 378/01 (G1/2")
must be ordered separately.

1) must be ordered separately, see page 2.

Application examples

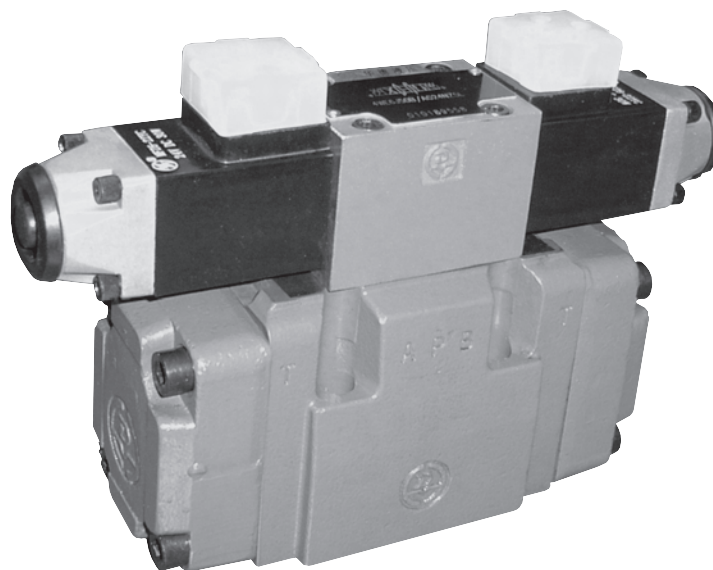
These examples serve only to explain the possibilities offered by the poppet valve. They do not include the complete function.

<p>Symbol "C"</p> 	<p>2/2-way circuit with a two poppet valve and check valve at port A</p> <p>The check valve must be installed in the pipe work.</p> <p>Initial position: Flow blocked, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A.</p> <p>Switched position: Free-flow, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.</p>	<p>Symbol "C"</p> 	<p>3/2-way circuit with a single poppet valve</p> <p>Initial position: Lifting Holding only due to limitation of travel and pressure in port P.</p> <p>Switched position: Lowering</p>
<p>Symbol "U"</p> 	<p>2/2-way circuit with a single poppet valve and check valve at port A</p> <p>The check valve must be fitted in the pipe work.</p> <p>Initial position: Free-flow, maximum pressure permissible. Pressure is held in the actuator, even when the pump is switched off, due to the check valve at port A.</p> <p>Switched position: Flow blocked, maximum pressure permissible. Leakage drained via port T. The only leakage occurring is that which flows to T during the switching process.</p>	<p>Symbol "C"</p> 	<p>3/2-way circuit with a two poppet valve and cartridge check valve in port P</p> <p>The check valve is fitted in the P port of the 3/2-way poppet valve.</p> <p>Initial position: Lowering Switched position: Lifting</p> <p>The load can be held in any position while the pump is switched off and the solenoid energized.</p>
<p>Symbol "C"</p> 	<p>3/2-way circuit with a two poppet valve</p> <p>Initial position: Lowering Switched position: Lifting</p> <p>Holding only due to limitation of travel and pressure in port P.</p>	<p>Symbol "U"</p> 	<p>3/2-way circuit with a single poppet valve and cartridge check valve in port P</p> <p>The check valve is fitted into the P port of the 3/2-way poppet valve.</p> <p>Initial position: Lifting Switched position: Lowering</p> <p>The load can be held in any position while the pump is switched off.</p>
<p>Symbol "C"</p> 	<p>4/3- (4/4-) way circuit with a 2 two poppet valves</p> <p>V1 and V2 in the initial position: Both cylinder sides are connected to the tank port.</p> <p>V2 in the switched position: The piston moves to the left</p> <p>V1 in the switched position: The piston moves to the right</p> <p>V1 and V2 in the switched position: Both cylinder sides are connected to the pump port. Rapid traverse is possible when a single rod cylinder with an area ratio of 2 : 1, is used.</p> <p>Attention!</p> <p>When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account.</p>		
<p>Symbol "U"</p> 	<p>4/3- (4/4-) way circuit with a 2 two poppet valves and cartridge check valve in port P of the 3/2-way poppet valves</p> <p>V1 and V2 in the initial position: The piston is locked externally to prevent movement.</p> <p>V2 in the switched position: The piston moves to the right</p> <p>V1 in the switched position: The piston moves to the left</p> <p>V1 and V2 in the switched position: Both cylinder sides are connected to the tank port.</p> <p>Attention!</p> <p>When using single rod cylinders, the performance limit (double flow) and the maximum permissible operating pressure (pressure intensification) of the valve must be taken into account!</p>		

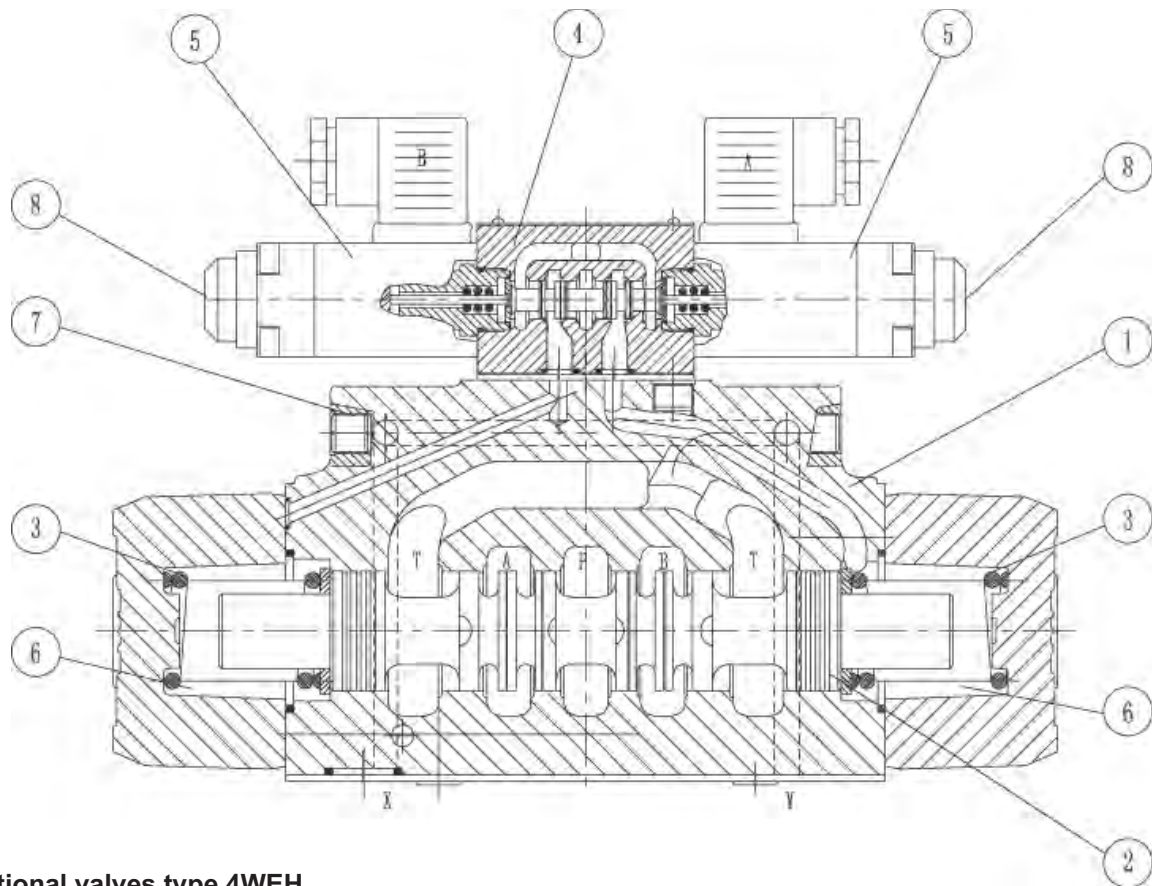
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional valves electro-hydraulically operated			RE24750/12.2004
	Size10 to 32	up to 28/35 MPa	up to 1100 L/min	Replaces: RE 24750/05.2001

Features:

- Valves used to control the start, stop and direction of a fluid flow
- Electro-hydraulic operation (WEH), hydraulic operation (WH)
- For subplate mounting
- Spring or pressure-centred, spring or hydraulic offset
- Wet-pin DC or AC solenoids, optional
- Manual override, optional
- Electrical connection as individual or central connection
- Shifting time adjustment, optional
- Pre-load valve in the P-channel of the main valve, optional
- Auxiliary equipment to data sheet
- Stroke adjustment at main spool, optional
- Stroke adjustment and/or end position indicator, optional
- Mechanical or inductive limit switch (proximity type) at the main spool, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Functional description, section



Directional valves type 4WEH...

Valves of type WEH are directional spool valves with electro-hydraulic operation.

The directional valves basically consist of the main valve with housing (1), main control spool (2), one or two return springs, and the pilot valve (4) with one or two solenoids.

The main control spool (2) in the main valve is held in the neutral or in the initial position either by the springs

or by means of pressure. The pilot oil supply can be either internal or external (external via port X). The pilot oil is expelled from the spring chamber via the pilot valve into the Y channel. The pilot oil supply and drain are internal or external (external via port Y).

4/3-way directional valve with spring centring of the control spool, type 4WEH...

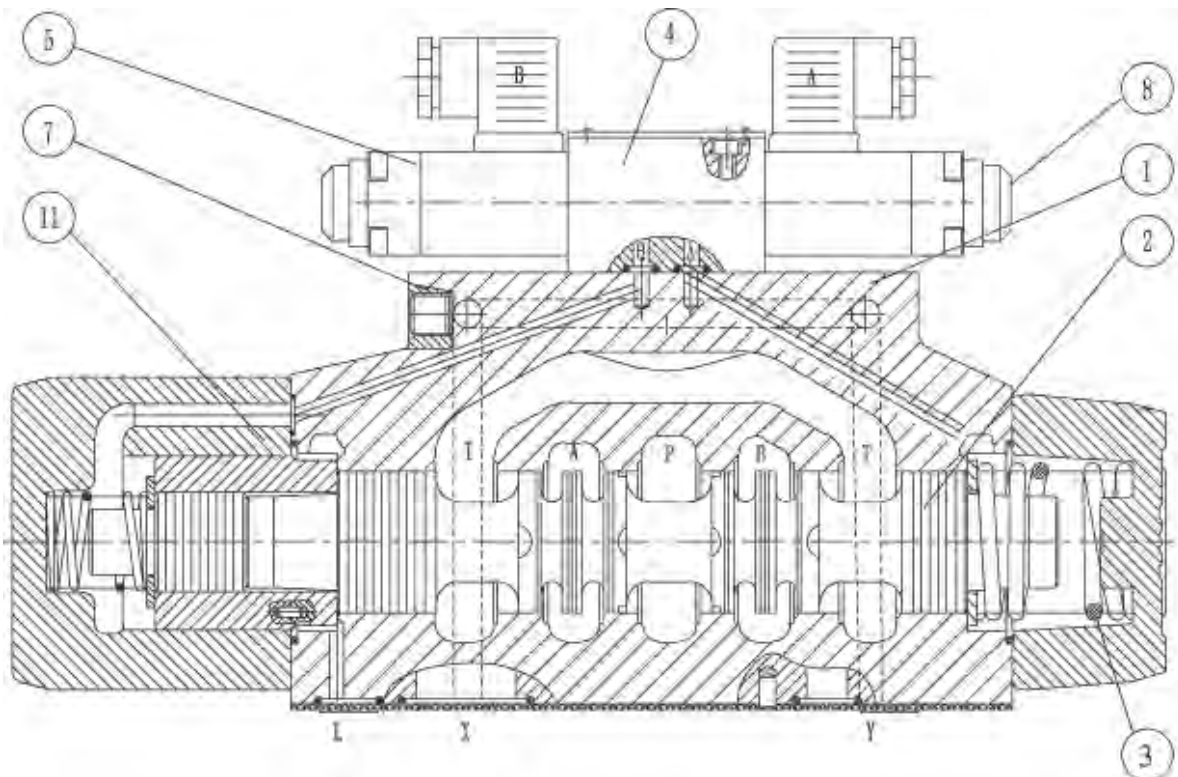
In this model, the main control spool (2) is held in the neutral position by two return springs. The two spring chambers (6) are connected to ports X and Y via the connector plate. When one of the two ends of the main control spool (2) is pressurized with pilot pressure, the

spool is moved to the shifted position. The required ports in the valve are then opened to flow. When the pilot pressure is removed, the spring on the opposite side to the pressurized spool area causes the spool to return to its neutral or initial position.

4/3-way directional valve with pressure centring of the main control spool, type 4WEH...H

The main control spool (2) in the main valve is held in the neutral position by pressurization of the two front faces. A centring sleeve is supported in the housing and holds the spool in position.

By removing the pressure from one of the spool ends, the main control spool (2) is moved to the shifted position. The unloaded spool area displaces the returning pilot oil via the pilot valve into the Y channel (external).



Type WEH...H.../...

Directional valves type 4WH...

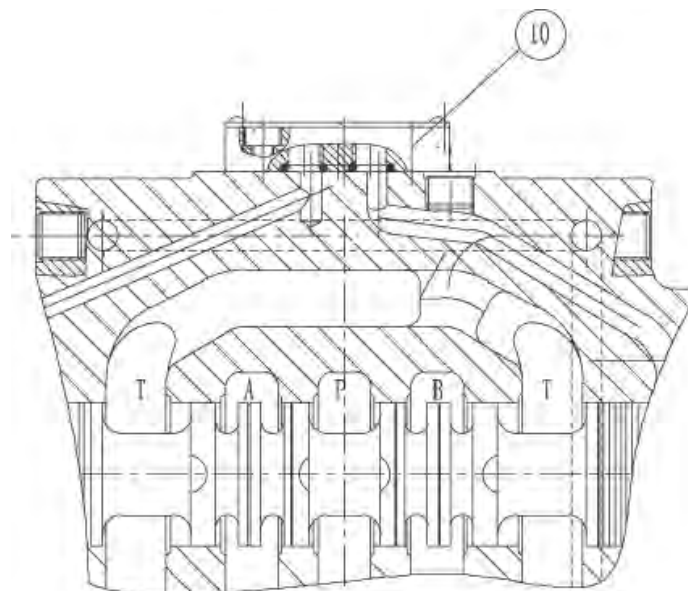
Valves of type WH are directional spool valves with hydraulic operation.

They control the start, stop and direction of a fluid flow. The directional valves basically consist of the valve housing(1),the main control spool(2), one or two return springs(3) and in the case of valves with spring return

or spring centring, and the pilot connecting plate .

The control spool(2) is operated directly by means hydraulic pressure.

The control spool(2) is held in the neutral or in the initial position either by springs or by means of pressure. Pilot oil supply and pilot oil drain are external .



Type WH...

Pilot oil supply

4WEH- ...and 4WH...

The pilot oil supply is sourced externally via channel X from a separate circuit.

The pilot oil drain is led externally via channel Y to tank.

4WEH...E...

The pilot oil supply is sourced internally from channel P of the main valve.

The pilot oil drain is led externally via channel Y to tank. Port X in the subplate is plugged.

Change over from external to internal or from internal to external pilot oil supply (size 16): Remove the cover on the solenoid side "a", remove the plugs and turn end-for-end, insert plugs and re-place the cover.

4WEH...ET...

The pilot oil supply is sourced internally from channel P of the main valve.

The pilot oil drain is led internally via channel T to tank. Ports X and Y in the subplate are plugged.

4WEH...T...

The pilot oil supply is sourced externally via channel X from a separate circuit. The pilot oil drain is led internally via channel T to tank. Port Y in the subplate is plugged.

1 Plug screw M6-8.8 pilot oil drain

2 Plug screws M6-8.8 pilot oil supply

3 Plug screws M8-8.8 for external sealing

Tightening torques M_A for cover fixing screws:

Size 16: 35 Nm

Size 25: 68 Nm

Tightening torque M_A for pilot valve fixing screws:

Sizes 10 to 32: 9 Nm

Size 10 main valve

Pilot oil supply

external: 2 plugged

internal: 2 open

Pilot oil drain

external: 1 plugged

internal: 1 open

Size 16

Pilot oil supply

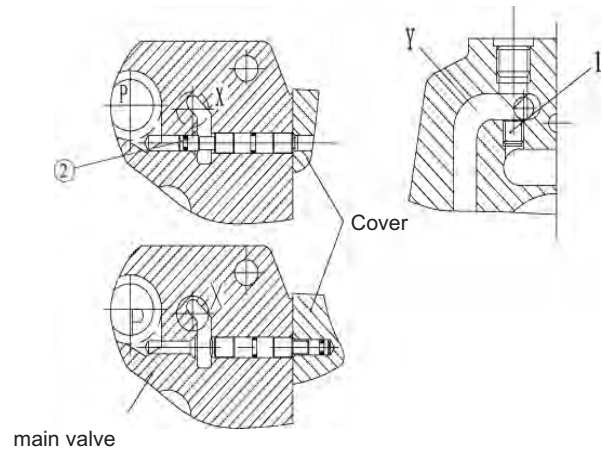
external: 2 plugged

internal: 2 open

Pilot oil drain

external 1 plugged

1 open



Size 25

Pilot oil supply

external: 2 plugged

internal: 2 open

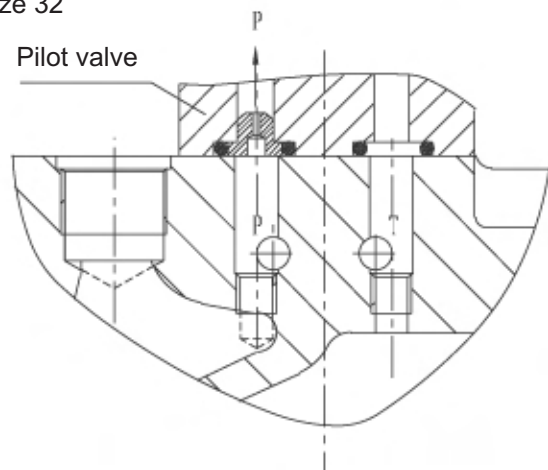
Pilot oil drain

external: 1 plugged

internal: 1 open

Size 32

Pilot valve



Pilot oil supply

external: 2 plugged

internal: 2 open

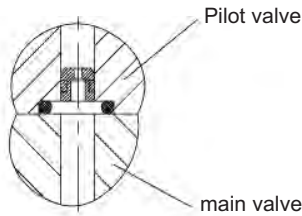
Pilot oil drain

external: 1 plugged

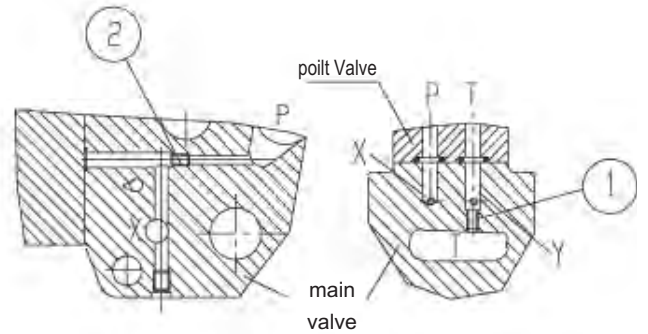
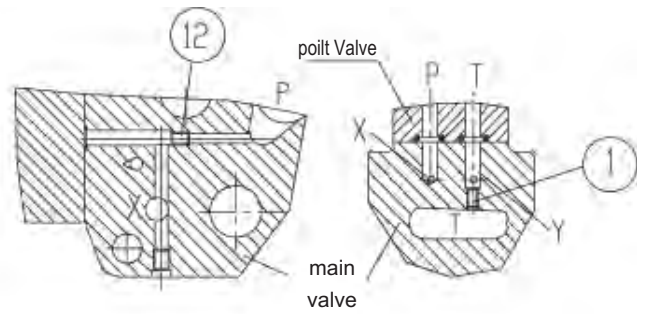
internal: 1 open

Throttle insert

The use of a throttle insert is required if the pilot oil supply in the P channel of the pilot valve is to be limited. This throttle is inserted in the P channel of the pilot valve.



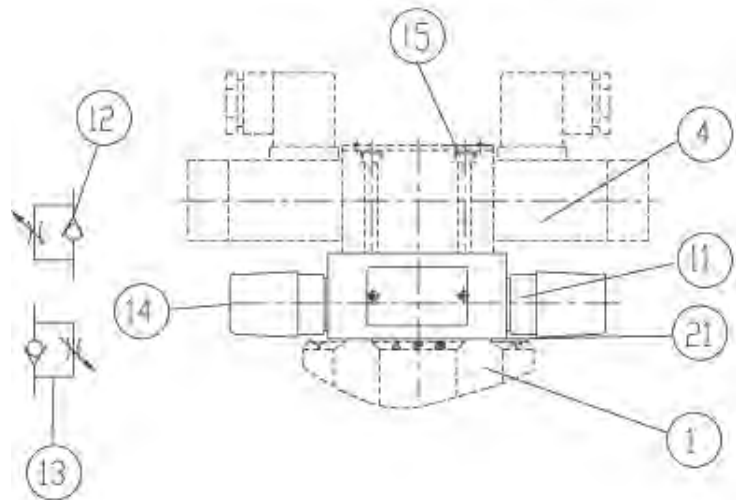
Throttle insert



Shifting time adjustment

In order to influence the shifting time of the main valve a double throttle check valve (type Z2 FS 6) is installed.

Change over from meter-in (13) to meter-out control (12): Remove the pilot valve (4) (leave the O-ring support plate (21) in place), rotate the throttle check valve (11) about its longitudinal axis and refit it, replace the pilot valve (4).



Type WEH.../...S

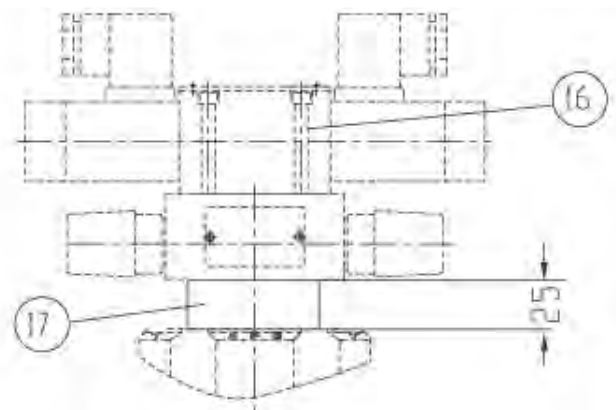
Pressure reducing valve "D3"

The pressure reducing valve (17) must be used if the pilot pressure is higher than 25 MPa.

Thus, the secondary pressure is held constant at 4.5 MPa.

Attention!

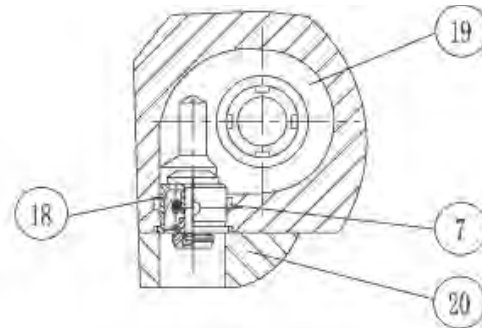
When using a pressure reducing valve "D3" (17), a throttle insert "B10" must be installed in the P channel of the pilot valve.



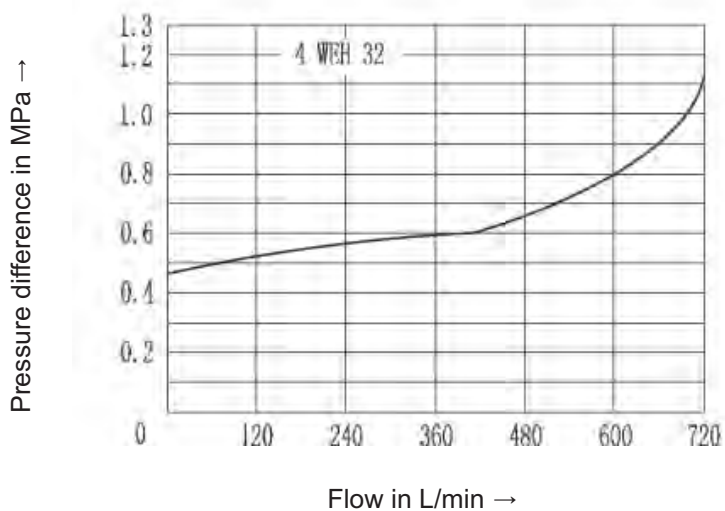
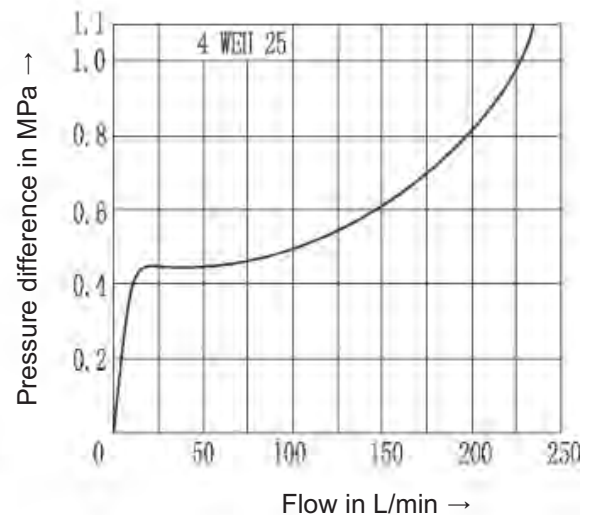
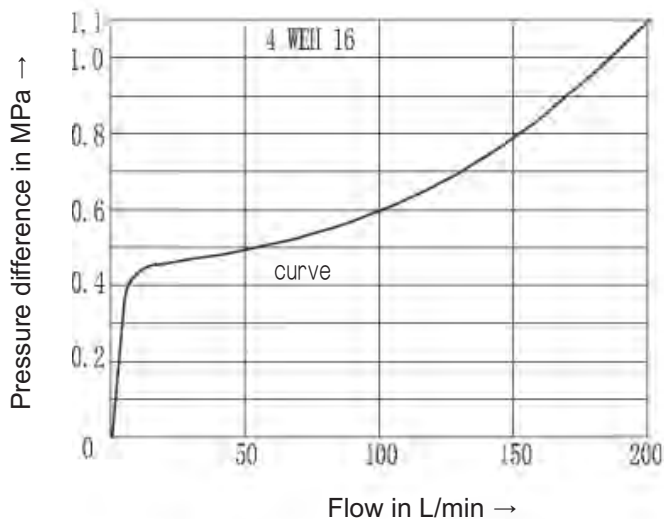
Type WEH.../...S..D3

Pre-load valve (not for size 10)

In valves with pressureless by-pass and internal pilot oil supply, a pre-load valve (18) must be installed in the P channel of the main valve to build up the minimum pilot pressure. The pressure difference of the pre-load valve must be added to the pressure difference of the main valve (see characteristic curve) in order to determine the actual value. The cracking pressure of this valve is approx. 0.45 MPa.



Dp/q_v characteristic curve



Ordering code

	4							B	/	6					/					*
--	---	--	--	--	--	--	--	---	---	---	--	--	--	--	---	--	--	--	--	---

Up to 28 MPa = No code
Up to 35 MPa = H

4-way design = 4

Electro-hydraulic = WEH
Hydraulic = WH

Size 10 = 10
Size 16 = 16
Size 25 = 25
Size 32 = 32

Spool return
By means of springs = No code
Hydraulic = H

For symbols, see next page

Series 20(NG10) = 20 (20 to 29 unchanged installation and connection dimensions)
Series 50(NG16、25、32) = 50 (50 to 59 unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Spool return in the pilot valve for 2-position valve and 2 solenoids only possible with spools C, D, K, Z and hydraulic spool return in the main valve:

Without spring return = O
Without spring return with detent = OF

Pilot valve with wet-pin solenoids
Standard valve = A
High-performance valve = E

DC 24V = G24
AC 220V; frequency 50Hz = W220-50
Used DC solenoids which are noting with frequency:
AC: 110V = W110R
220V = W220R

(* :use plug Z5 only)

see the other volts in Electric date,please.

Further details in clear text

No code= mineral oils
V= phosphate ester

No code = Without pressure reducing valve
D3 = With pressure reducing valve

No code = Without pre-load valve
P 4,5 = With pre-load valve
($P_{crack} = 0.45 \text{ MPa}$)

No code= Without throttle insert
B08 = Throttle Φ 0.8 mm
B10 = Throttle Φ 1.0 mm
B12 = Throttle Φ 1.2 mm
B15 = Throttle Φ 1.5 mm

Additional equipment NO.
(see Additional equipment)

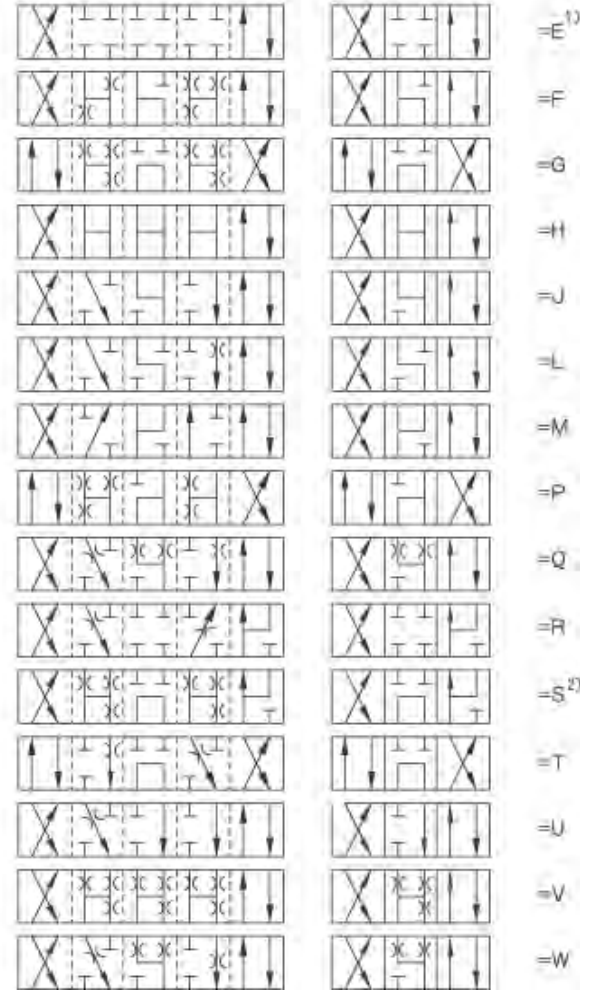
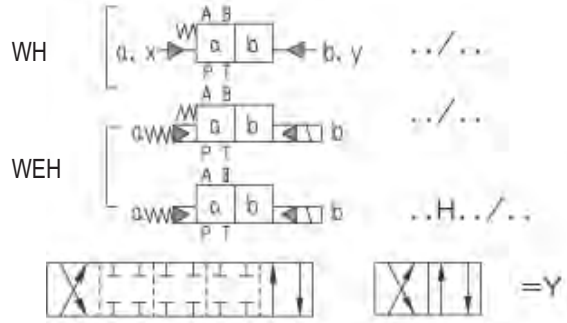
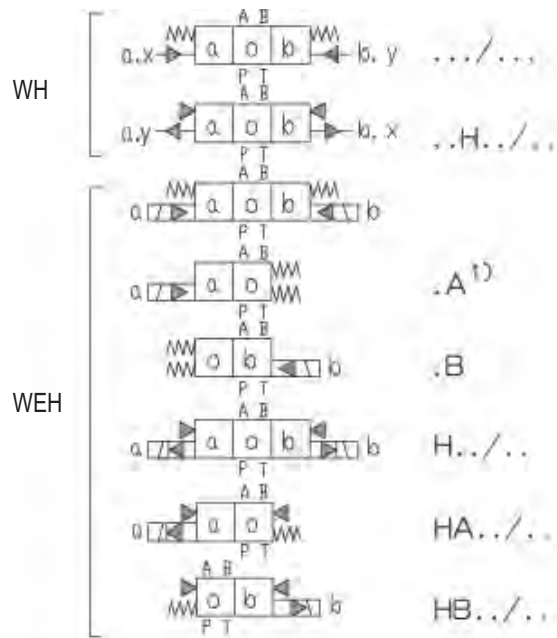
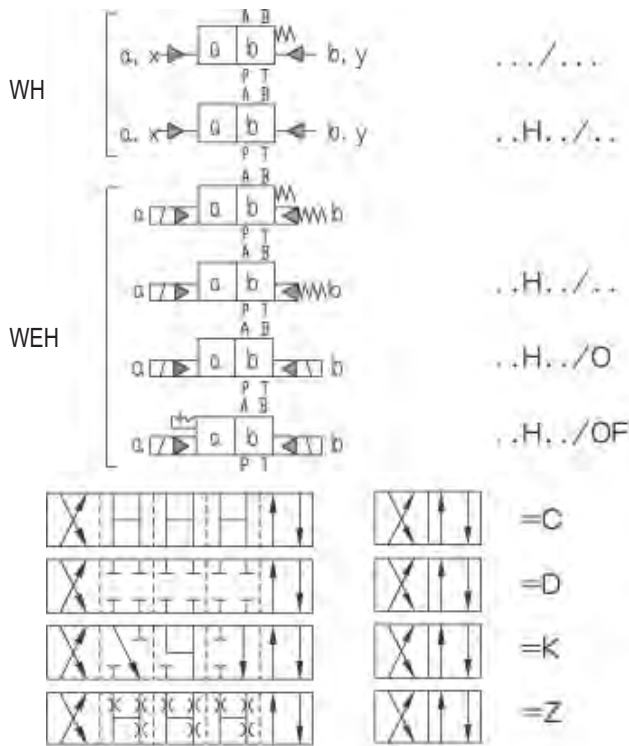
Type of Electrical connection (see type of Electrical connection dimensions)

No code = Without shifting time adjustment
S = Shifting time adjustment as meter-in control
S₂ = Shifting time adjustment as meter-out control

No code= Pilot oil supply external, drain external
E= Pilot oil supply internal, drain external
ET= Pilot oil supply internal, drain internal
T= Pilot oil supply external, drain internal
Type 4WH...only available as No code!
Versions ET and T as 3-position valve with pressure centring only possible if $p_{pilot} \geq 2 \times p_{tank} + p_{pilot \text{ min}}$!

No code = Without manual override
N= With manual override

Symbols

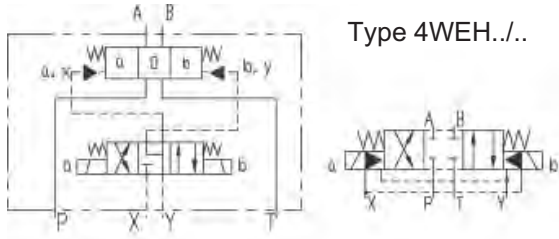
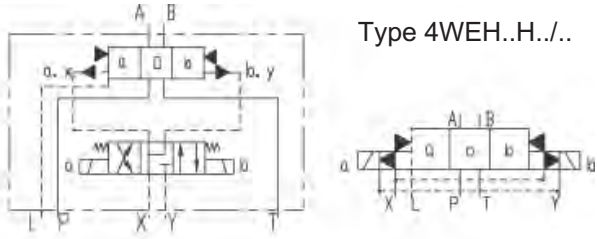
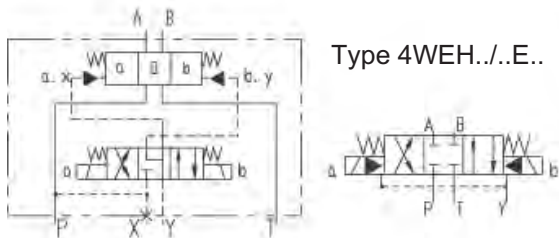
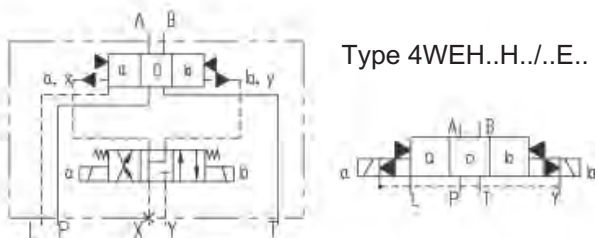
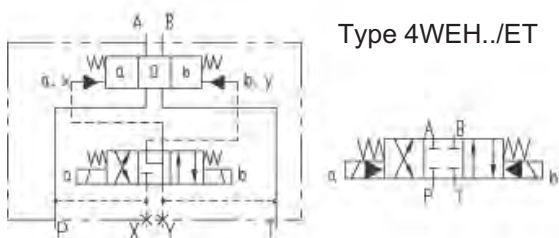
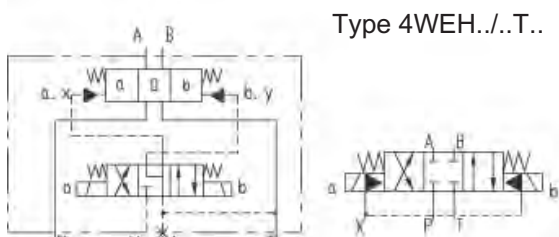


- 1) Example: Spool E, solenoid on side "a" Order example:
H-4WEH 16 HEA6X/6AG24N9ETSK4..B10..V..
- 2) Spool S only used for size 16

Valve opening in neutral position for spools Q, V and W

Spool	Size	Valve opening in neutral position (Size in mm ²)			
		10	16	25 (type 4W.H 25.50B/)	32
Q	P-A	-	-	-	-
	P-B	-	-	-	-
	A-T	13	32	83	78
	B-T	13	32	83	78
V	P-A	13	32	83	73
	P-B	13	32	83	73
	A-T	13	32	83	84
	B-T	13	32	83	84
W	P-A	-	-	-	-
	P-B	-	-	-	-
	A-T	2.4	6	14	20
	B-T	2.4	6	14	20

Detailed and simplified symbols for 3-position valves

	Valve with spring-centred neutral position	Valve with spring-centred neutral position {only sizes 16, 25 (type 4W.H 25 .50B/... and 32}
X = external; Y = external	 <p>Type 4WEH.../..</p>	 <p>Type 4WEH...H.../..</p>
X = internal; Y = external	 <p>Type 4WEH.../..E..</p>	 <p>Type 4WEH...H.../..E..</p>
X = internal; Y = internal	 <p>Type 4WEH.../ET</p>	<p>3-position valves, pressure-centred, preferably with external pilot oil supply and/or drain (No code, E)</p> <p>For the preconditions for internal pilot oil supply and/or drain (ET, T) see page 6 or 10.</p>
X = external; Y = internal	 <p>Type 4WEH.../..T..</p>	

Detailed and simplified symbols for 2-position valves

		Valves with hydraulic offset				
Valves with spring offset		Valves with hydraulic offset				
X = external; Y = external	Type 4WEH.../... 	Type 4WEH..H.../... 	Type 4WEH..H/O... 	Type 4WEH..H/OF... 		
	X = internal; Y = external	Type 4WEH.../...E... 	Type 4WEH..H.../...E... 	Type 4WEH..H/O...E... 	Type 4WEH..H/OF...E... 	
		X = internal; Y = internal	Type 4WEH.../...ET... 	Type 4WEH..H.../...ET... 	Type 4WEH..H/O...ET... 	Type 4WEH..H/OF...ET...
			X = external; Y = internal	Type 4WEH.../...T... 	Type 4WEH..H.../...T... 	Type 4WEH..H/O...T...

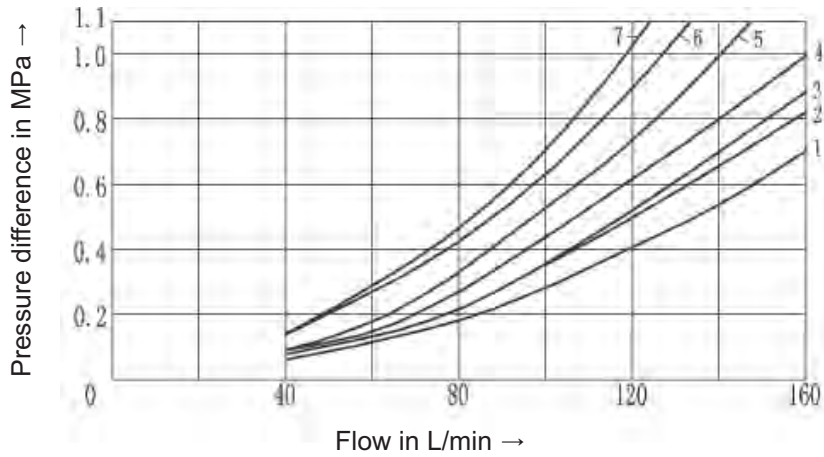
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Type WEH10:

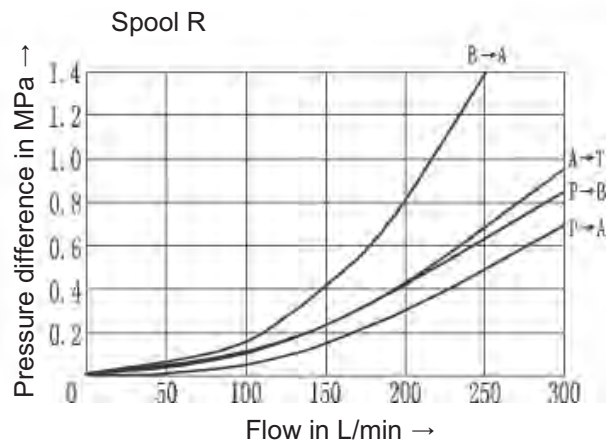
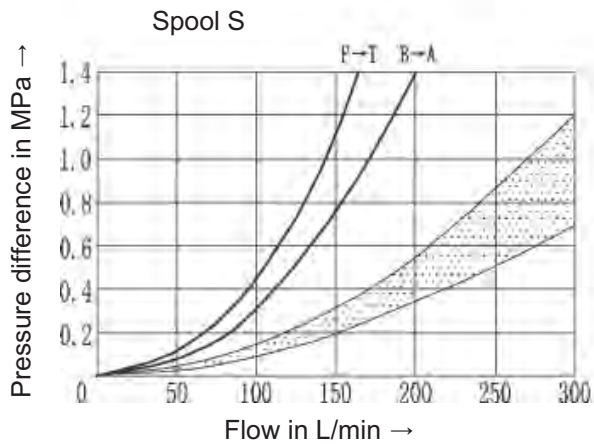
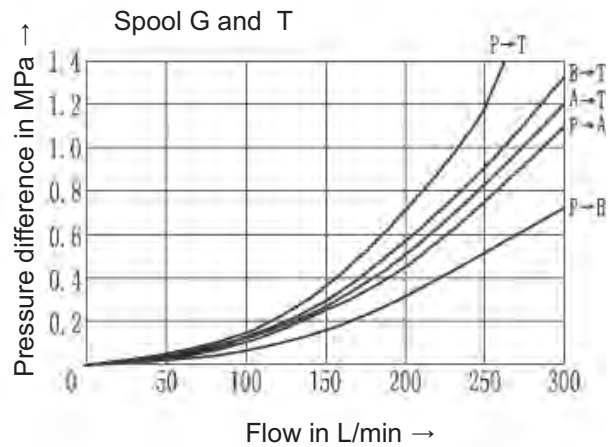
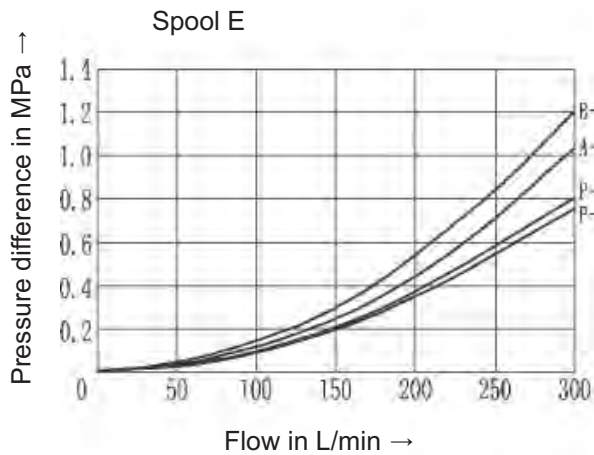
Spool	Neutral position		
	A → T	B → T	P → T
F	3	-	6
G	-	-	7
H	1	3	5
P	-	7	5

Spool	Neutral position		
	A → T	B → T	P → T
T	-	-	7
L	3	-	-
U	-	4	-

Spool	Shifted position			
	P → A	P → B	A → T	B → T
E	1	2	4	5
F	1	4	1	4
G	4	2	2	6
H	4	4	1	4
J	1	2	1	3
L	2	3	1	4
M	4	4	3	4
P	4	1	3	4
Q	2	2	3	5
R	2	3	3	5
U	3	3	3	4
V	2	2	3	5
W	2	2	3	5
T	4	2	2	6



Type WEH16:

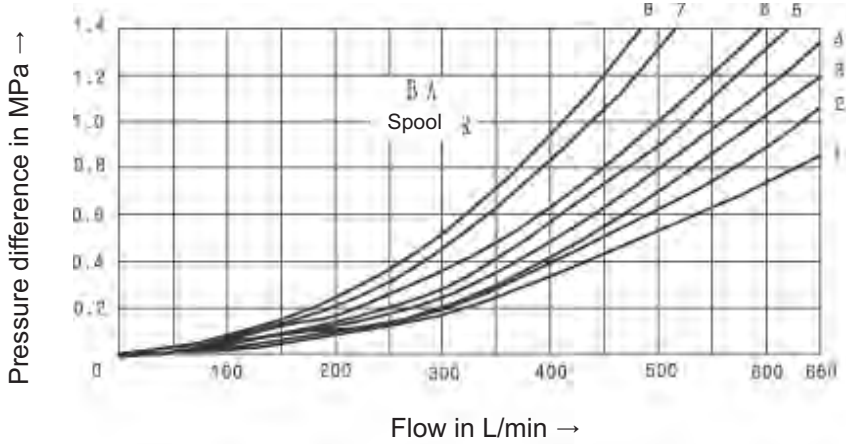


Type WEH25:

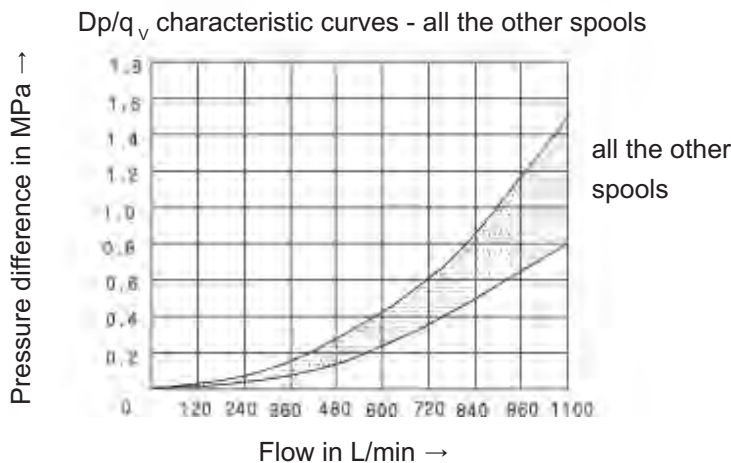
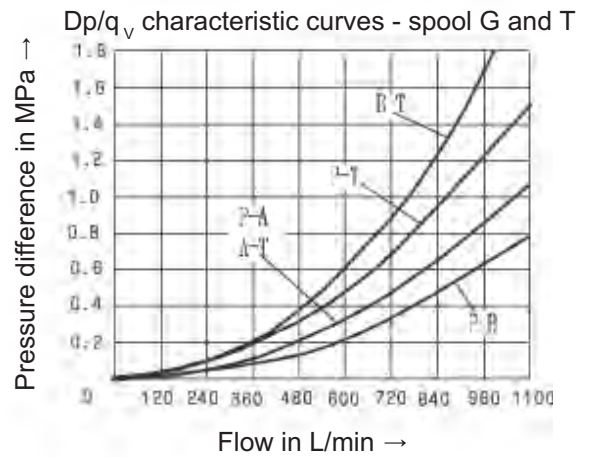
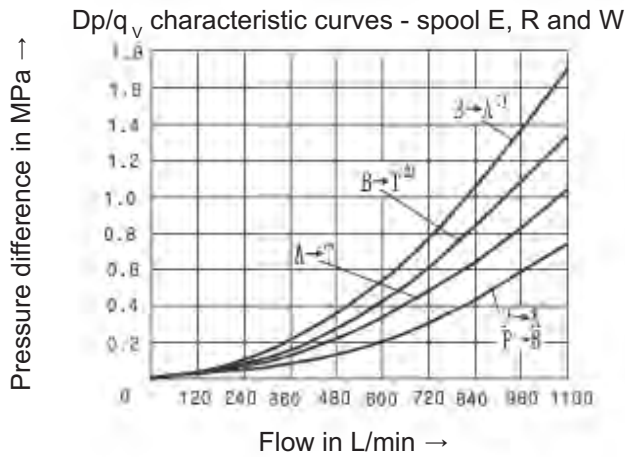
7 spool G central position P - T

8 spool T central position P - T

Spool	Shifted position			
	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	2	2	3	5
L	2	2	3	3
M	4	4	1	4
P	4	1	1	5
Q	2	2	3	5
R	2	1	1	-
U	2	1	1	6
V	4	4	3	6
W	1	1	1	3
T	3	1	2	4



Type WEH32:



- 1) only with spool R
- 2) not with spool R

Technical data (For applications outside these parameters, please consult us!)										
Hydraulic data 1、 Type 4WEH10										
Operating pressure, max. (MPa)			H- 4WEH10			4WEH10				
- Port P、 A、 B			to 35			to 28				
- Port T	Pilot oil drain internal (MPa)		to 16 (DC)			to 10 (AC)				
- Port Y	Pilot oil drain external (MPa)		to 16 (DC)			to 10 (AC)				
Pilot pressure, min.	Pilot oil drain external (MPa)		1.0 2-position valve, 3-position valve,with spring offset							
	Pilot oil supply internal (MPa)		0.7 2-position valve with hydraulic offset (not with spools: C、 Z、 F、 G、 H、 P、 T、 V)							
	Pilot oil supply internal (MPa) (with spools:C、 Z、 F、 G、 H、 P、 T、 V)		0.65 { if the flow from P to T in the neutral position (in a 3-position valve) or when the valve is moving through the neutral position (in a 2-position valve) is large enough to ensure a minimum pressure difference of 0.65 MPa from P to T.							
Operating pressure, max. (MPa)			to 25							
Hydraulic fluid			Mineral oil ; Phosphate ester							
Viscosity range (mm ² /s)			2.8 ~ 500							
Fluid temperature range (°C)			-30 ~ +80							
Pilot oil volume for shifting operation										
- 3-position valve, spring-centred (cm ³)			2.04							
- 2-position valve (cm ³)			4.08							
from "O" position to shifted position (AC and DC solenoid) :										
at pilot pressure (MPa)			~ 7=		~ 14=		~ 21=		~ 28=	
- 3-position valve, spring-centred (ms)			30	65	25	60	20	55	15	50
- 2-position valve (ms)			30	80	30	75	25	70	20	65
from shifted position to "O" position (AC and DC solenoid) :										
- 3-position valve, spring-centred			30							
- 2-position valve (ms)			35	40	30	35	25	30	20	25
Pilot oil flow for shortest shifting time (L/min)			approx.35							
Installation position			optional; valve with hydraulic spool return "H"(spools C, D, K, Z, Y) horizontal							
Weight (Kg)	Valve with one solenoid		6.4							
	Valve with two solenoids		6.8							
	Shifting time adjustment		0.8							
	Pressure reducing valve		0.5							

2、 Type 4WEH16										
Operating pressure, max. (MPa)		H - 4WEH16			4WEH16					
- Port P、 A、 B		to 35			to 28					
- Port T	Pilot oil drain external (MPa)	to 25			to 25					
	Pilot oil drain internal (MPa)	solenoid (DC) –			solenoid (AC) ~					
		to 16			to 10					
- Port Y		Pilot oil drain external (MPa)			= 16			~ 10		
Pilot pressure, min.	Pilot oil drain external (MPa)	3-position valve,1.2								
	Pilot oil supply internal (MPa)	2-position valve,with spring offset 1.2								
	Pilot oil supply internal (MPa)	2-position valve with hydraulic offset 1.2								
Operating pressure, max. (MPa)		For spools C, F, G, H, P, T, V, Z, S (by means of a pre-load valve or a sufficiently large flow) 0.45								
Operating pressure, max. (MPa)		to 25								
Hydraulic fluid		Mineral oil ; Phospate ester								
Fluid temperature range (°C)		- 30 ~ + 80								
Viscosity range (mm ² /s)		2.8 ~ 500								
Pilot oil volume for shifting operation										
- 3-position valve, spring-centred (cm ³)		5.72								
- 2-position valve (cm ³)		11.45								
- 3-position valve, pressure-centred		WH			WEH					
from "O" position to shifted position "a" (cm ³)		2.83			2.83					
from shifted position "a" to "O" position (cm ³)		2.9			5.73					
from "O" position to shifted position "b" (cm ³)		5.72			5.73					
from shifted position "b" to "O" position (cm ³)		2.83			8.55					
from "O" position to shifted position (AC and DC solenoid) :										
at pilot pressure (MPa)		~ 5 =		~ 15 =			~ 25 =			
- 3-position valve, spring-centred (ms)		35	65	30	60	30	58			
- 2-position valve (ms)		45	65	35	55	30	50			
- 3-position valve, pressure-centred (ms)		a	b	a	b	a	b	a	b	
		30	65	25	55	63	20	25	55	60
from shifted position to "O" position :										
- 3-position valve, spring-centred		30...45 for ~ ; 30 for =								
- 2-position valve (ms)		45...60	45	35...50	35	30...45	30			
- 3-position valve, pressure-centred (ms)		a	b	a	b	a	b	a	b	
		20...30	20	20...35	20	20...35	20			
Installation position		optional; valve with hydraulic spool return (spools C, D, K, Z, Y) horizontal								
Pilot oil flow for shortest shifting time (L/min)		approx.35								
Weight		approx.8.6 WH approx.7.3								
*Shifting time = Contacting at the pilot valve up to start of opening of the control land in the main valve										

3、 Type 4WEH 25 :															
Operating pressure, max.- Port P, A, B (MPa)			to 35 (H-4WHE25) ; to 28 (4WEH25)												
- Port T	Pilot oil drain external (MPa)		t0 25												
	Pilot oil drain internal (MPa)	solenoid (DC) –					solenoid (AC) ~								
		t0 16					t0 10								
It's impossible for pressure centred 3-position valve to pilot oil drain internal															
- Port Y	Pilot oil drain external solenoid (DC) – (MPa)		16												
	solenoid (AC) ~ (MPa)		10												
	for Type 4WH (MPa)		25												
Pilot pressure, min.	Pilot oil supply external (MPa)		3-position valve, spring-centred 1.3												
	Pilot oil supply internal (MPa)		3-position valve, pressure-centred 1.8												
	Pilot oil supply internal (MPa)		2-position valve, with spring offset 1.3												
	Pilot oil supply internal (MPa)		2-position valve, with hydraulic offset 0.8												
Operating pressure, max. (MPa)			to 25												
Hydraulic fluid			Mineral oil ; Phospate ester												
Viscosity range (°C)			- 30 ~ + 80												
Fluid temperature range (mm ² /s)			2.8 ~ 500												
Pilot oil volume for shifting operation															
- 3-position valve, spring-centred (cm ³)			14.2												
- 2-position valve, with spring offset (cm ³)			28.4												
- 3-position valve, pressure-centred			WH					WEH							
from "O" position to shifted position "a" (cm ³)			7.15					7.15							
from shifted position "a" to "O" position (cm ³)			14.18					7.0							
from "O" position to shifted position "b" (cm ³)			14.18					14.15							
from shifted position "b" to "O" position (cm ³)			19.88					5.73							
from "O" position to shifted position (AC and DC solenoid) :															
at pilot pressure (MPa)			~ 7 =		~ 14 =		~ 21 =		~ 25 =						
- 3-position valve, spring-centred (ms)			50	85	40	75	35	70	30	65					
- 2-position valve, with spring offset (ms)			120	160	100	130	85	120	70	105					
- 3-position valve, pressure-centred (ms)			a	b	a	b	a	b	a	b	a	b	a	b	
			30	35	55	65	30	35	55	65	25	30	50	60	25
from shifted position to "O" position :															
- 3-position valve, spring-centred			40...55 for ~ ; 40 for =												
- 2-position valve, with spring offset (ms)			120	125	95	100	85	90	75	80					
- 3-position valve, pressure-centred (ms)			a	b	a	b	a	b	a	b	a	b	a	b	
			30...35	30	35	30...35	30	35	30...35	30	35	30...35	30	35	
Installation position			optional; valve with hydraulic spool return (spools C, D, K, Z, Y) horizontal												
Pilot oil flow for shortest shifting time (L/min)			approx. 35												
Weight (Kg)			the whole valve approx. 18 WH approx. 17.6												
* Shifting time = Contacting at the pilot valve up to start of opening of the control land in the main valve															

4、 Type 4WEH32 :															
Operating pressure, max.		(MPa)		H-4WHE25				4WEH25							
- Port P、 A、 B				to 35				to 28							
- Port T	Pilot oil drain external		(MPa)		to 25										
	Pilot oil drain internal		(MPa)		solenoid (DC) –				solenoid (AC) ~						
					to 16				to 10						
It's impossible for pressure centred 3-position valve to pilot oil drain internal															
- Port Y		Pilot oil drain external (MPa)		solenoid (DC) – : 16; solenoid (AC) = : 10											
Pilot pressure, min.	Pilot oil supply external (MPa)		3-position valve, 0.8												
	Pilot oil supply internal (MPa)		2-position valve, with spring offset 1												
	pilot oil supply internal (MPa)		2-position valve with hydraulic offset 0.5												
For spools F, G, H, P, T, V, C and Z (by means of a pre-load valve or a sufficiently large flow) 0.45															
Operating pressure, max.		(MPa)		to 25											
Hydraulic fluid		Mineral oil ; Phosphate ester													
Fluid temperature range		(°C)		- 30 ~ + 80											
Viscosity range		(mm ² /s)		2.8 ~ 500											
Pilot oil volume for shifting operation															
- 3-position valve, spring-centred		(cm ³)		29.4											
- 2-position valve, spring-centred		(cm ³)		58.8											
- 3-position valve, pressure-centred															
from "O" position to shifted position "a"		(cm ³)		14.4											
from shifted position "a" to "O" position		(cm ³)		15.1											
from "O" position to shifted position "b"		(cm ³)		29.4											
from shifted position "b" to "O" position		(cm ³)		14.4											
from "O" position to shifted position (AC and DC solenoid) :															
at pilot pressure		(MPa)		~ 5 =				~ 15 =				~ 25 =			
- 3-position valve, spring-centred		(ms)		75		105		55		90		45		80	
- 2-position valve, spring-centred		(ms)		120		155		100		135		90		125	
- 3-position valve, pressure-centred		(ms)		a	b	a	b	a	b	a	b	a	b	a	b
				50	60	100	105	40	45	85	95	35	40	85	95
*from shifted position to "O" position :															
- 3-position valve, spring-centred		60...75 for ~ ; 50 for =													
- 2-position valve, spring-centred		(ms)		115...130		90		85...100		70		65...80		65	
- 3-position valve, pressure-centred		(ms)		a	b	a	b	a	b	a	b	a	b	a	b
				35...65		30	40	60...90		30		105...185		50	
Installation position		optional; valve with hydraulic spool return (spools C, D, K, Z, Y) horizontal													
Pilot oil flow for shortest shifting time		(L/min)		approx. 50											
Weight (kg)		Valve with one solenoid		approx. 40.5											
		Valve with two solenoids		approx. 41 WH approx. 39.5											
* Shifting time = Contacting at the pilot valve up to start of opening of the control land in the main valve															

Electric date

kinds of volt		DC	AC
Volt (V)		12、24、42、60、96、110、180、 195、220	42、110、127、220/50Hz 110、120、220/60Hz
Consume power (W)		26	-
Absorb power (VA)		-	46
Starup power (VA)		-	130
Duty		Continuous	
Circumstance temperature (°C)		+50	
Coil temperature (°C)		+50	
Protective setting		IP65	

Performance limits: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

The shifting performance limits down are valid for applications with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).As a result of the flow forces ccurring within the valve with only one direction of flow (e.g. from P to A with port B blocked)the permissible performance limits may be considerably lower!(In the case of applications of this kind, please consult us.)

The performance limits were determined with the solenoid at operating temperature, 10% undervoltage and with no tank pre-loading.

Type WEH 10

Way	Kinds of spring keeping	spool	Operating pressure in MPa		
			20	25	32
4/2-way	main valve	HC-HD-HK-HZ-HY	160		
		HC../O-HD../O HK../O../-HZ.O	160		
	without spring	HC../OF-HD../OF.. HK../OF../-HZ.O.F	160		
		spring offset	C.D.K.Z.Y	160	
4/3-way	spring-centred	E.J.L.M.Q.U.W.R.V	160		
		H	160	150	120
		G.T	160		140
		F.P	160	160	160

Type WEH 16

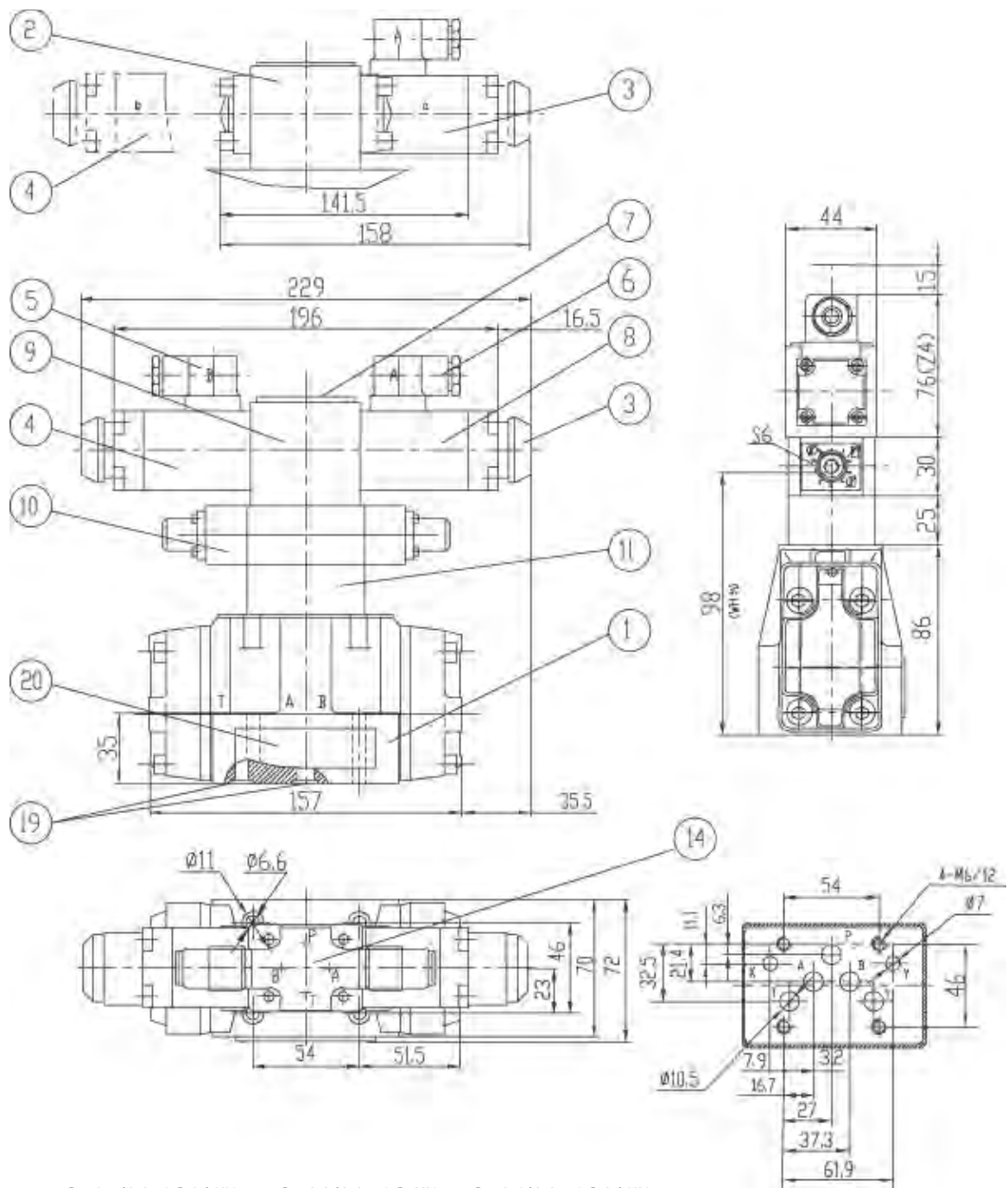
Way	Kinds of spring keeping	spool	Operating pressure in Mpa					description
			7	14	21	28	35	
4/2-way	spring offset	C	300	300	300	300	300	Spool H .F .P .G .S, Pre-load valve, required for X = internal
		D.Y	300	270	260	250	230	
		K	300	250	240	230	210	
		Z	300	260	190	180	160	
	spring offset	for all spools	300	300	300	300	300	at pilot pressure of 1.2 MPa
4/3-way	spring-centred	D.H.J.L.M. Q.U.W.R	300	300	300	300	300	at pilot pressure of 1.6 MPa
		F.P	300	250	180	170	150	
		G.T	300	300	240	210	190	
		S	300	300	300	250	220	
	V	300	250	210	200	180		
pressure-centred	for all spools	300	300	300	300	300		

Type WEH 25

Way	Kinds of spring keeping	spool	Operating pressure in Mpa					description
			7	14	21	28	35	
4/2-way	spring offset	C	650	650	650	650	650	Spools C, Z in general, Pre-load valve, required for X=inter, flow up to approx. 180 L/min
		D.Y	650	650	400	350	300	
		K	650	650	420	370	320	
		Z	650	650	650	480	400	
	spring offset	for all spools	650	650	650	650	650	min. at pilot pressure of 1.3 MPa
	without spring	C.D.K.Y	650	650	650	650	650	Spools C, Z in general, Pre-load valve, required for X=inter, flow up to approx. 180 L/min
detent	C.D.K.Y	650	650	650	650	650		
4/3-way	spring-centred	E.L.M.Q.U.W	650	650	650	650	650	Spools C, T, F, P, H in general, Pre-load valve, required for X=inter flow up to approx. 180 L/min
		H.	650	650	550	400	360	
		F.	650	550	430	330	300	
		G.T	400	400	400	400	400	
		P	650	550	430	330	300	
		J	650	650	650	600	520	
		R	650	650	650	650	580	
		V	650	500	400	350	310	
	pressure-centred	E.F.H.J.L.M P.Q.R.U.V.W	650	650	650	650	650	at pilot pressure of 1.8 MPa
		G.T	400	400	400	400	400	at pilot pressure of 3 MPa
G.T		650	650	650	650	650		

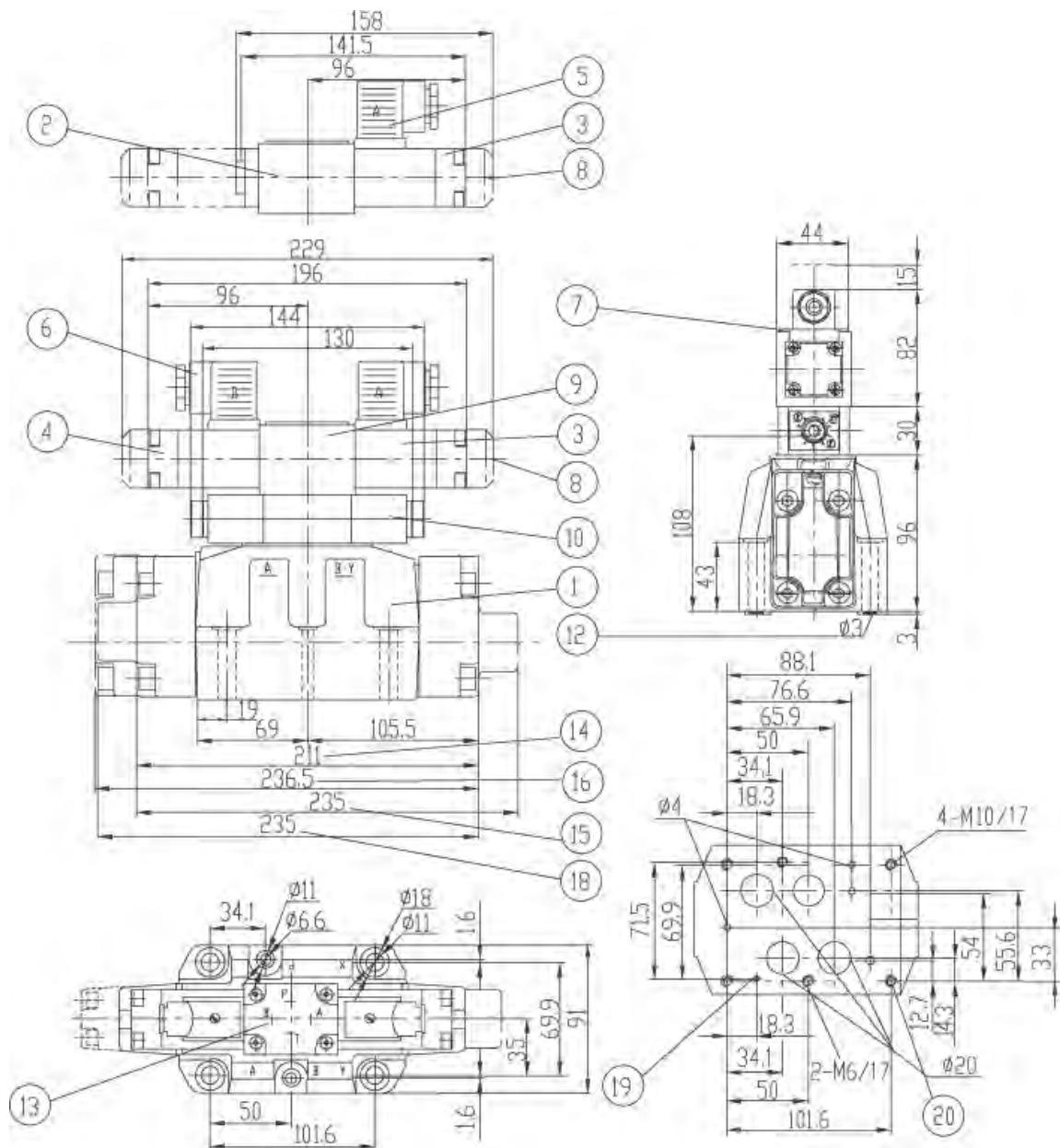
Type WEH 32

Way	Kinds of spring keeping	spool	Operating pressure in MPa					description
			7	14	21	28	35	
4/2-way	spring offset	D.Y	1100	1040	540	480	420	
		C	1100	1040	860	800	700	
		Z	1100	1040	860	700	650	
		K	1100	1040	860	500	450	
	hydraulic offset	for all spools	1100	1040	860	750	680	at pilot pressure of 1 MPa
4/3-way	spring-centred	E.J.L.M.Q.R.U.W	1100	1040	860	750	680	Spools C, T, F, P, H in general, Pre-load valve, required for X=inter flow up to approx. 180 L/min
		H.G.F.T.P.	900	900	800	650	450	
		V	1000	1000	680	500	450	
	pressure-centred	for all spools (at pilot pressure of 0.85 MPa)	1100	1040	860	750	680	



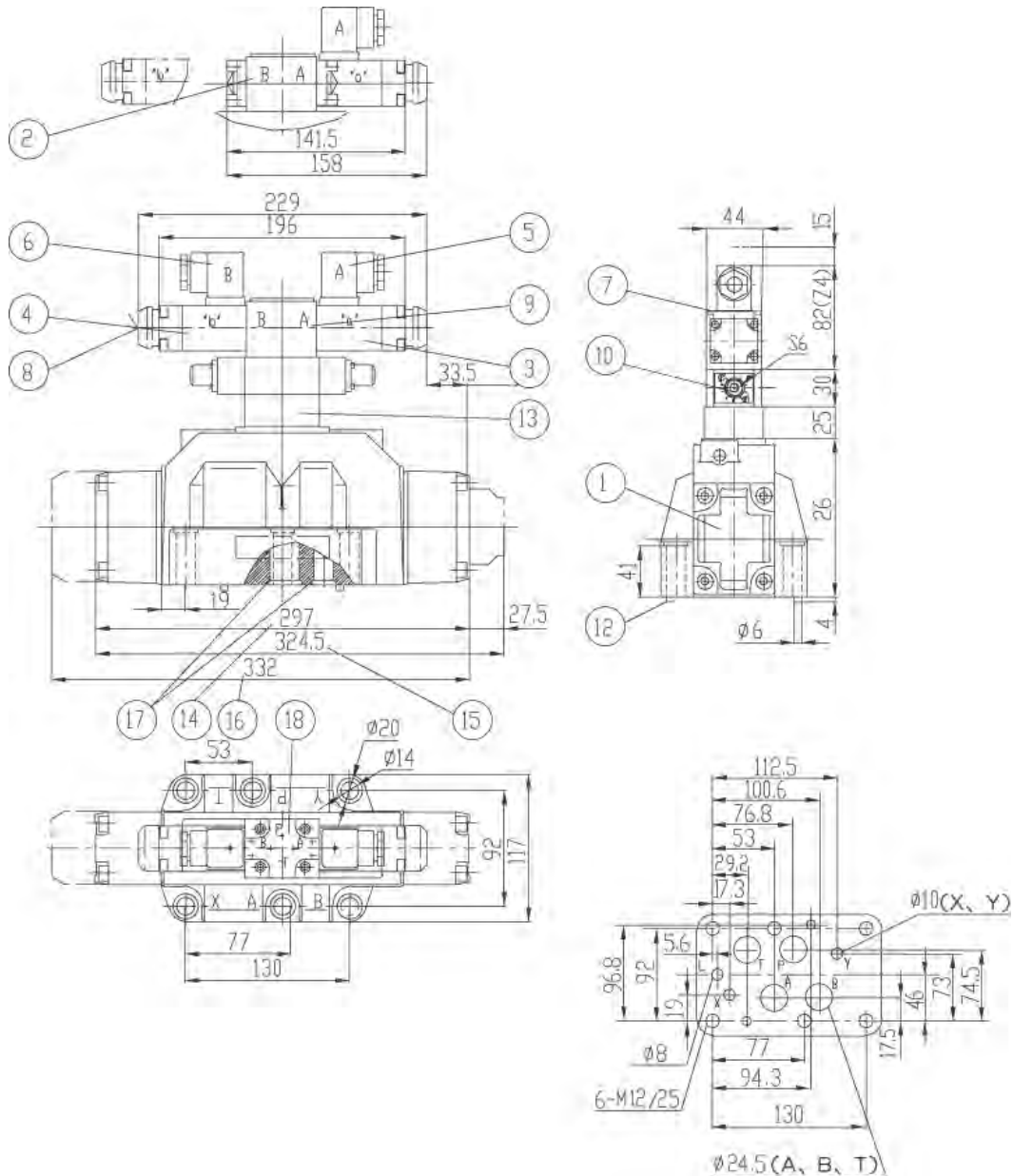
Subplates G535/01 (G3/4") ; G536/01 (G1"); G534/01 (G3/4");
 G535/02 (M27x2) ; G536/02 (M33x2); G534/02 (M27x2) see Page 206, 207

- | | |
|---|---|
| 1 Main valve | 10 Double throttle/check valve |
| 2 2-position valve with one solenoid and plug-in Z4 | 11 Reducing valve |
| 3 Solenoid "a" | 14 The position for port A, B, P and T of pilot valve |
| 4 Solenoid "b" | 19 O-Ring 12 x 2 for port A, B, P and T; O-Ring 10.82 x 1.78 for port X and Y |
| 5 Plug-in connector colour grey | 20 Nameplate |
| 6 Plug-in connector colour black | valves fixing screws |
| 7 Nameplate | 4 - M6 x 45 - 10.9 |
| 8 Manual override "N", optional | (GB/T70.1-2000) |
| 9 2 positions (2 solenoids) and plug-in Z4 | |
| 3 positions (2 solenoids) and plug-in Z4 | |



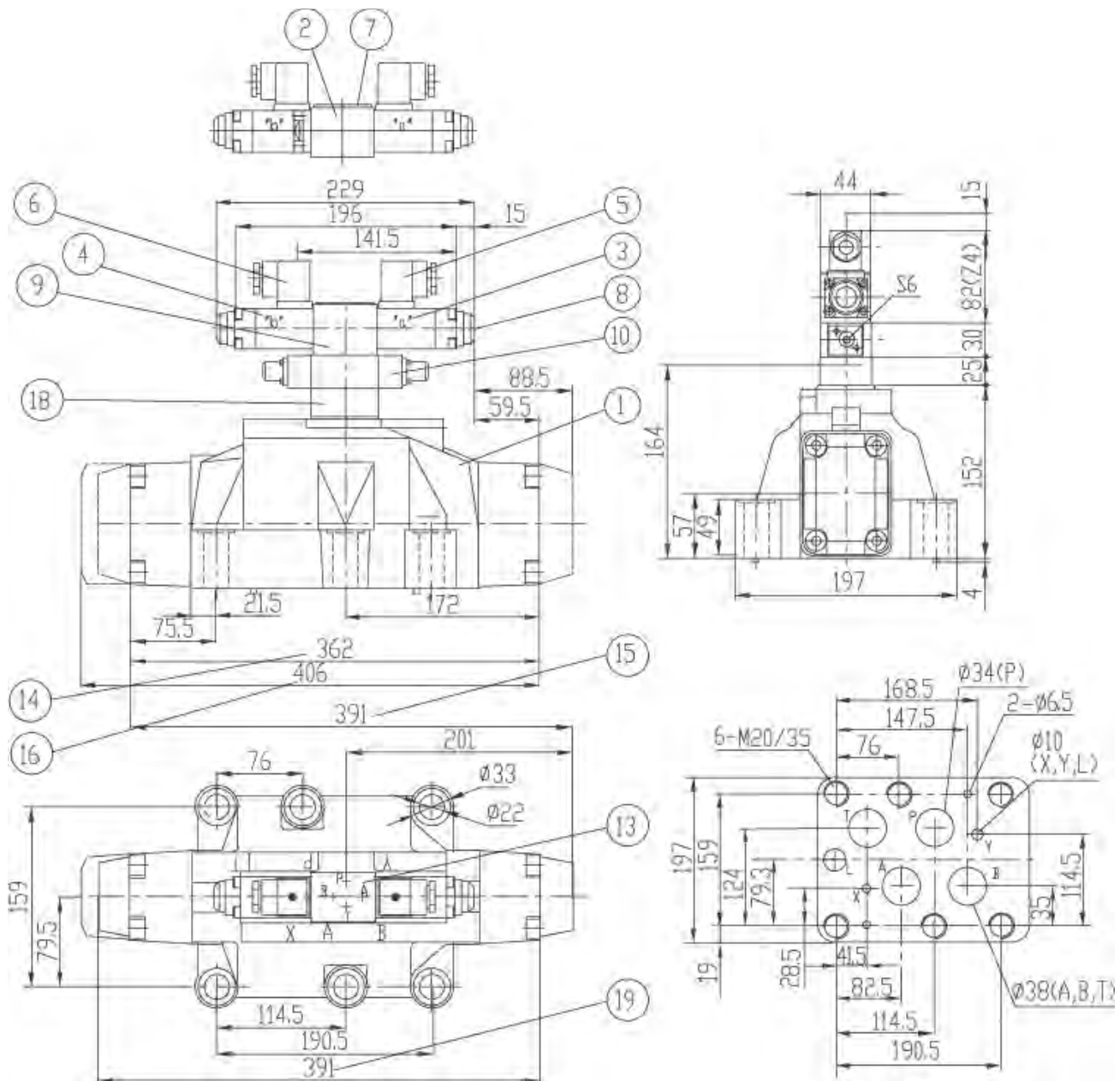
Subplates G172 / 01 (G3/4"); G172 / 02 (M27x2); G174 / 01 (G1");
 G174 / 02 (M33x2); G174 / 08 see Page 206, 207

- | | |
|--|---|
| 1 Main valve | 12 Two fixing pins |
| 2 2-position valve with one solenoid | 13 The position for port A, B, P and T of pilot valve |
| 3 Solenoid "a" | 14 3-position valve, spring-centred
2-position valve, pressure-centred |
| 4 Solenoid "b" | 15 2-position valve, with spring offset (C .D .K .Z) |
| 5 Plug-in connector colour grey | 16 3-position valve, pressure-centred |
| 6 Plug-in connector colour black | 18 2-position valve, with spring offset(Y) |
| 7 Nameplate for the pilot valve | 19 Fixing pin hole (ϕ 4H12 depth 8) |
| 8 Manual override "N", optional | 20 Tightening screws for valves
4 - M10 x 60 -10.9 (GB/T70.1-2000)
2 - M 6 x 60 -10.9 (GB/T70.1-2000) |
| 9 2-position valve with two solenoids and plug Z4
3-position valve with two solenoids and plug Z4 | |
| 10 Double throttle/check valve | |



Subplates G151/01 (G1") ; G153/01 (G1"); G154/01 (G11/4");
 G151/02 (M33x2); G153/02 (M33x2); G154/02 (M42x2);
 G156/01 (G11/2"); G156/02 (M48x2); see Page 209

- | | |
|--|--|
| 1 Main valve | 13 Reducing valve |
| 2 2-position valve with one solenoid and plug Z4 | 14 3-position valve, spring-centred
2-position valve, hydraulic offset |
| 3 Solenoid "a" | 15 2-position valve, spring-centred
spring offset (C, D, K, Z) |
| 4 Solenoid "b" | 16 3-position valve, pressure-centred |
| 5 Plug-in connector colour grey | 17 O-Ring 27 x 3 for port A, B, P and T; O-Ring
19 x 3 for port X and Y |
| 6 Plug-in connector colour black | 18 The position for port A, B, P of pilot valve
fixing screws |
| 7 Nameplate for the pilot valve | 6 - M 12 x 60 -10.9 (GB/T70.1-2000) |
| 8 Manual override "N", optional | |
| 9 2 positions (2 solenoids)
3 positions (2 solenoids) | |
| 10 Double throttle/check valve | |
| 12 Two fixing pins | |



Subplates G157/01 (G1/2") ; G157/02 (M48x2); G158/10); see Page 210, 211

- | | |
|--|---|
| 1 Main valve | 13 The position for port A, B, P and T of pilot valve |
| 2 2-position valve with one solenoid and plug Z4 | 14 3-position valve, spring-centred
2-position valve, hydraulic offset |
| 3 Solenoid "a" | 15 2-position valve, spring offset (C, D, K, Z) |
| 4 Solenoid "b" | 16 3-position valve, pressure-centred |
| 5 Plug-in connector colour grey | 18 Reducing valve |
| 6 Plug-in connector colour black | 19 2-position valve, with spring offset |
| 7 Nameplate for the pilot valve | O-Ring 42 x 3 for port A, B, P and T; O-Ring
19 x 3 for port X and Y |
| 8 Manual override "N", optional | fixing screws |
| 9 2 positions (2 solenoids)
3 positions (2 solenoids) | 6 - M 20 x 80 -10.9 (GB/T70.1-2000) |
| 10 Double throttle/check valve | |
| 12 Two fixing pins | |

Pilot valve:

WEH used 4WE6 as pilot valve, the control spool is held in the neutral or initial position by means of return spring, is held in the working position by solenoids or detent.

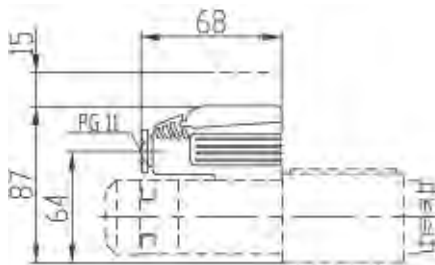
All spool of pilot valve see below table.

Main valve	Polit valve	
3-position valve, spring-centred	spool J ,3-position valve	
3-position valve, pressure-centred	spool M ,3-position valve	
2-position valve Y / and HY /	spool Y ,2-position valve (with spring offset)	
2-position valve	spool D ,2-position valve	
C、 D、 K、 Z and HC、 HD、 HK、 HZ	Type of polit valve : with spring offset	
	without spring offset	
	without spring offset, but with detent	

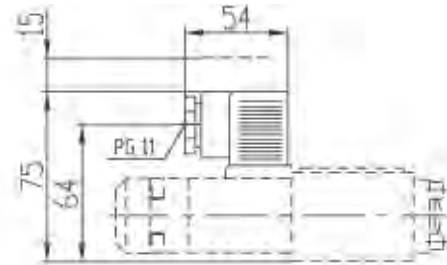
Connection dimensions:

(Dimensions in mm)

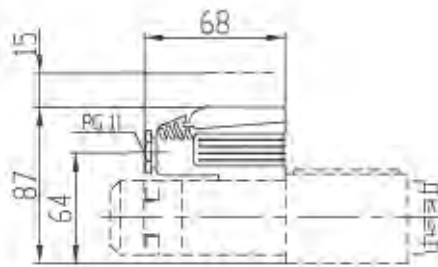
Z5
large plug-in
connector



Z4
plug-in
connector

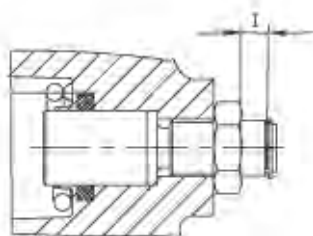


Z5 L
plug-in connector
with indicator
lamp



Additional equipment : The stroke limiter

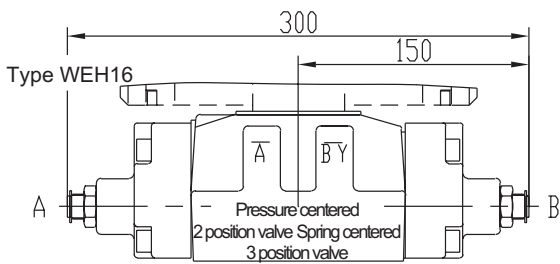
The stroke limiter limits the stroke of the control spool installed in the cover of main valve, change the moment time of form or spool by adjusting yard of valve orifice, must be without pressure.



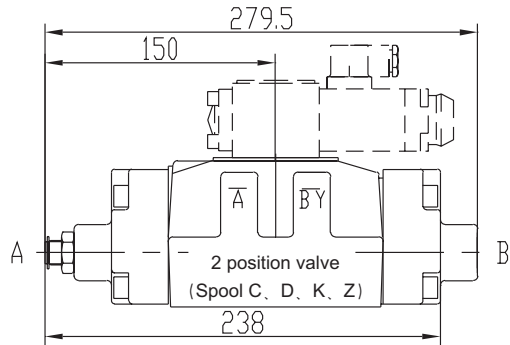
Adjustment range

(Dimensions in mm)

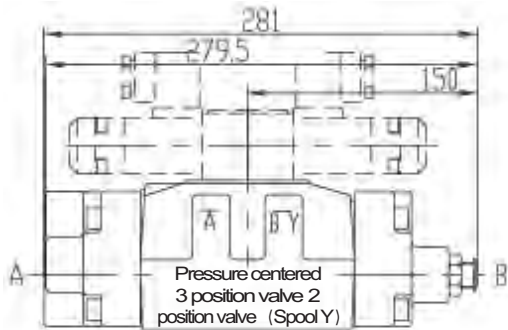
Size	Adjustment range	
WEH16	10	1 turn = 1.5 mm adjustment travel
WEH25	12	
WEH32	13	



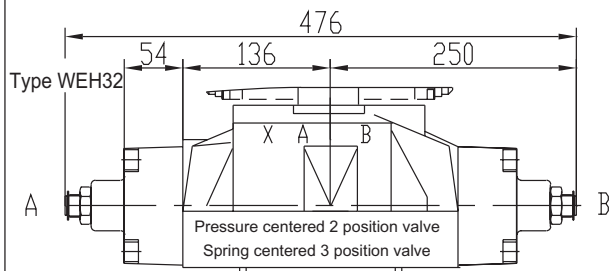
Stroke limiter on sides A and B end of main valve
 Stroke limiter on valve side A
 Stroke limiter on valve side B



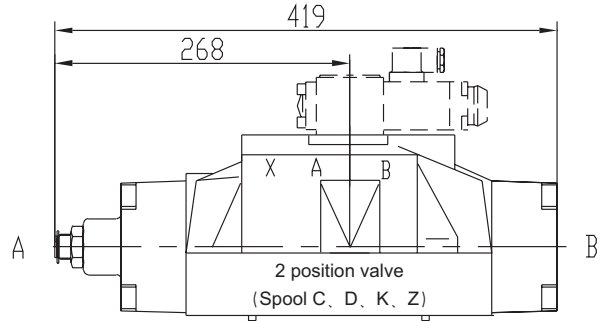
Stroke limiter on side A of valve



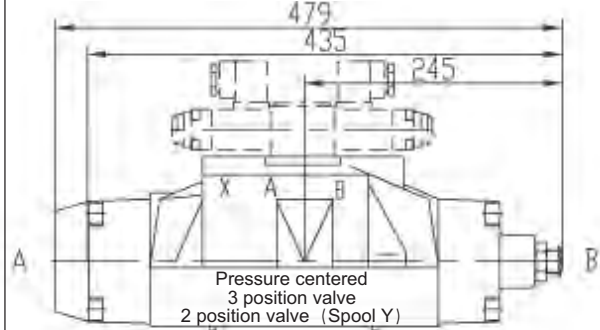
Stroke limiter on side B of valve



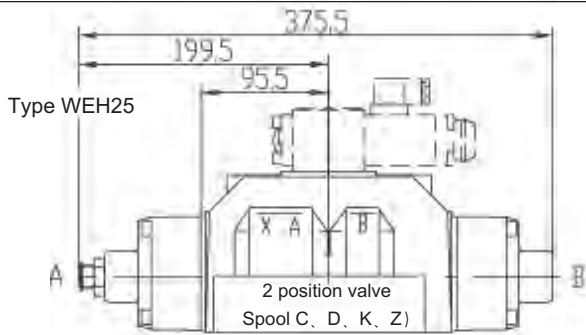
Stroke limiter on sides A and B end of main valve
 Stroke limiter on valve side A
 Stroke limiter on valve side B



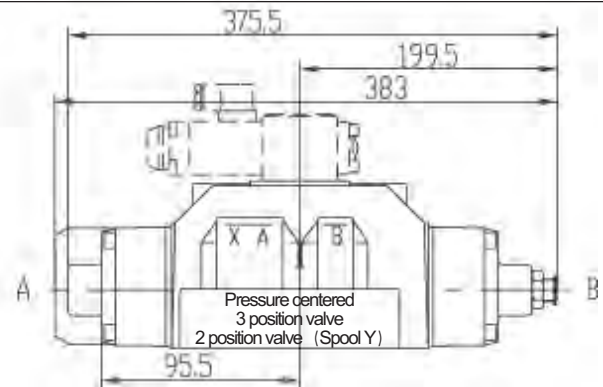
Stroke limiter on side A of valve



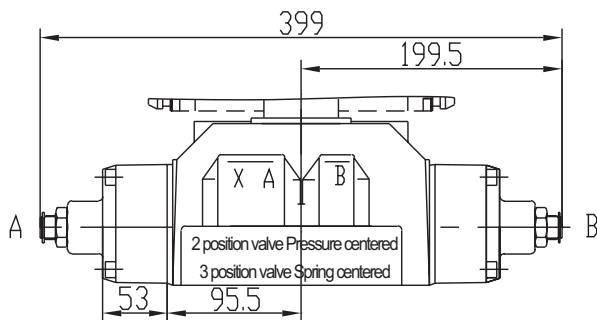
Stroke limiter on side B of valve



Stroke limiter on valve side A



Stroke limiter on valve side B

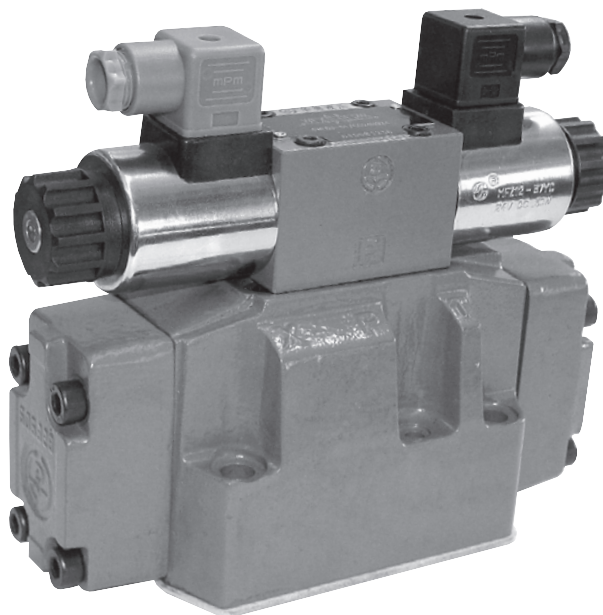


Stroke limiter on sides A and B end of main valve
 Stroke limiter on valve side A
 Stroke limiter on valve side B

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Directional valves electro-hydraulically operated (new series)			RE 24751/12.2004
	Size 10 to 32	up to 35 MPa	up to 1100 L/min	

Features:

- Valves used to control the start, stop and direction of a fluid flow
- Electro-hydraulic operation (WEH), hydraulic operation (WH)
- For subplate mounting
- Spring or pressure-centred, spring or hydraulic offset
- Wet-pin DC or AC solenoids, optional
- Manual override, optional
- Electrical connection as individual or central connection
- Shifting time adjustment, optional
- Pre-load valve in the P-channel of the main valve, optional
- Auxiliary equipment:
 - Stroke adjustment at main spool, optional
 - Stroke adjustment and/or end position indicator, optional
 - Mechanical or inductive limit switch (proximity type) at the main spool, optional
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Pilot oil supply

4WEH . . . and 4WH . . .

The pilot oil supply is sourced externally via channel X from a separate circuit.

The pilot oil drain is led externally via channel Y to tank.

4WEH . . . E . . .

The pilot oil supply is sourced internally from channel P of the main valve.

The pilot oil drain is led externally via channel Y to tank. Port X in the subplate is plugged.

Change over from external to internal or from internal to external pilot oil supply (size 16): Remove the cover on the solenoid side "a", remove the plugs and turn end-for-end, insert plugs and re-place the cover.

4WEH . . . ET . . .

The pilot oil supply is sourced internally from channel P of the main valve.

The pilot oil drain is led internally via channel T to tank. Ports X and Y in the subplate are plugged.

4WEH . . . T . . .

The pilot oil supply is sourced externally via channel X from a separate circuit. The pilot oil drain is led internally via channel T to tank. Port Y in the subplate is plugged.

1 Plug screw M6-8.8 - pilot oil drain

2 Plug screws M6-8.8 - pilot oil supply

3 Plug screws M8-8.8 - for external sealing

Tightening torques M_A for cover fixing screws:

Size 16: 35 Nm

Size 25: 68 Nm

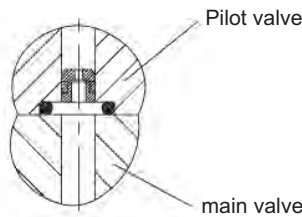
Tightening torque M_A for pilot valve fixing screws:

Sizes 10 to 32: 9 Nm

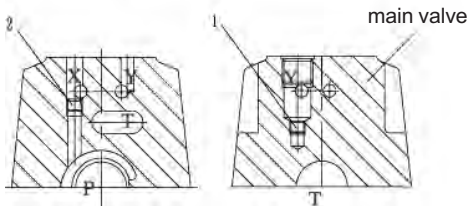
Throttle insert

The use of a throttle insert is required if the pilot oil supply in the P channel of the pilot valve is to be limited (see page 188).

This throttle is inserted in the P channel of the pilot valve.



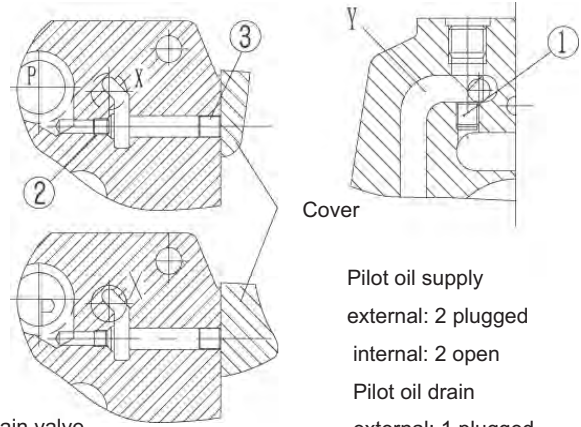
Size 10



Pilot oil supply
external: 2 plugged
internal: 2 open

Pilot oil drain
external: 1 plugged
internal: 1 open

Size 16

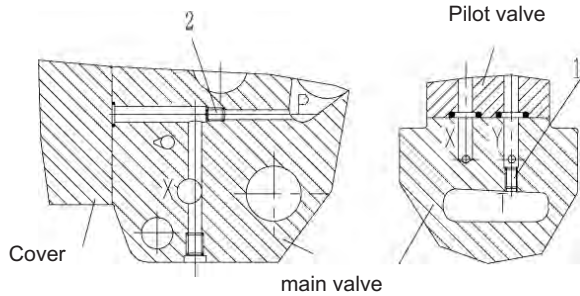


main valve

Cover

Pilot oil supply
external: 2 plugged
internal: 2 open
Pilot oil drain
external: 1 plugged
internal: 1 open

Size 25

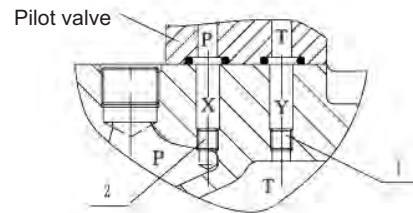


Cover

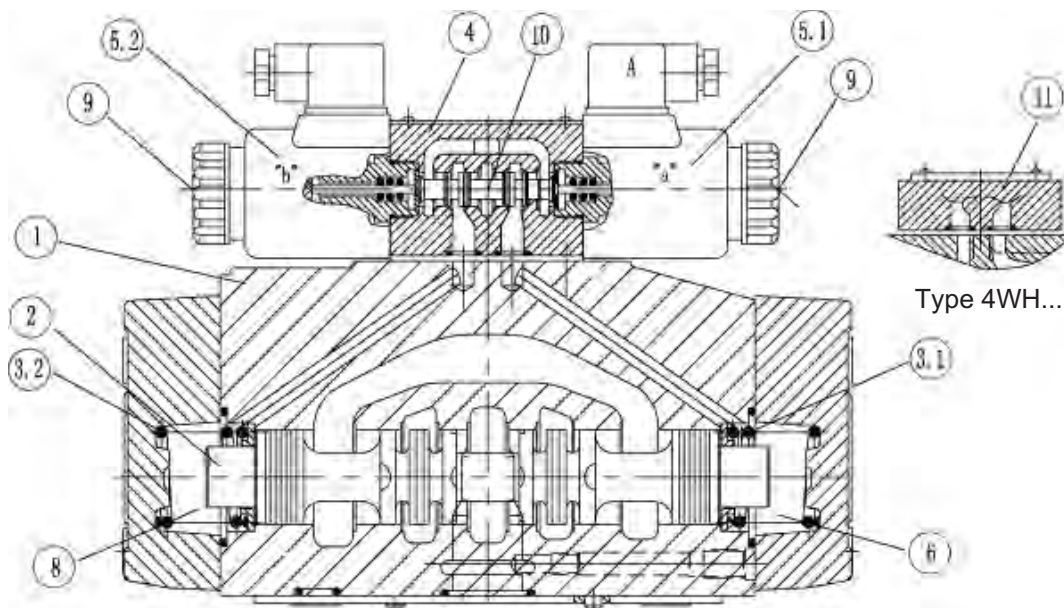
main valve

Pilot oil supply	Pilot oil drain
external: 2 plugged	external: 1 plugged
internal: 2 open	internal: 1 open

Size 32



Pilot oil supply	Pilot oil drain
external: 2 plugged	external: 1 plugged
internal: 2 open	internal: 1 open



Type 4WEH 16 ...

Directional valves type 4WEH...

Valves of type WEH are directional spool valves with electro-hydraulic operation.

They control the start, stop and direction of a fluid flow.

The directional valves basically consist of the main valve with housing (1), main control spool (2), one or two return springs (3.1) and (3.2), and the pilot valve (4) with one or two solenoids "a" (5.1) and/or "b" (5.2).

The main control spool (2) in the main valve is held in the neutral or in the initial position either by the springs or by means of pressure.

In the initial position, the two spring chambers (6) and (8) are connected to the tank without pressure via the pilot valve (4). The pilot valve is supplied with pilot fluid via the pilot line. The pilot oil supply can be either internal or external (external via port X).

When the pilot valve is operated, e.g. solenoid "a", the pilot spool (10) is shifted to the left and thus spring chamber (8) is pressurized with pilot pressure. Spring chamber (6) remains un-pressurized.

The pilot pressure acts on the left side of the main control spool (2) and pushes it against the spring (3.1). As a consequence, the ports P to B and A to T are connected in the main valve.

When the solenoid is de-energized, the pilot spool returns to its initial position (exception: detented spool). The spring chamber (8) is unloaded to tank.

The pilot oil is expelled from the spring chamber via the pilot valve into the Y channel.

The pilot oil supply and drain are internal or external (external via port Y).

An optional manual override (9) permits pilot spool (10) to be operated without energizing the solenoid.

Directional valves type 4WH...

Valves of type WH are directional spool valves with hydraulic operation.

They control the start, stop and direction of a fluid flow.

The directional valves basically consist of the valve housing (1), the main control spool (2), one or two return springs (3.1) and (3.2) in the case of valves with spring return or spring centring, and the pilot connecting plate (11).

The control spool (2) is operated directly by means hydraulic pressure.

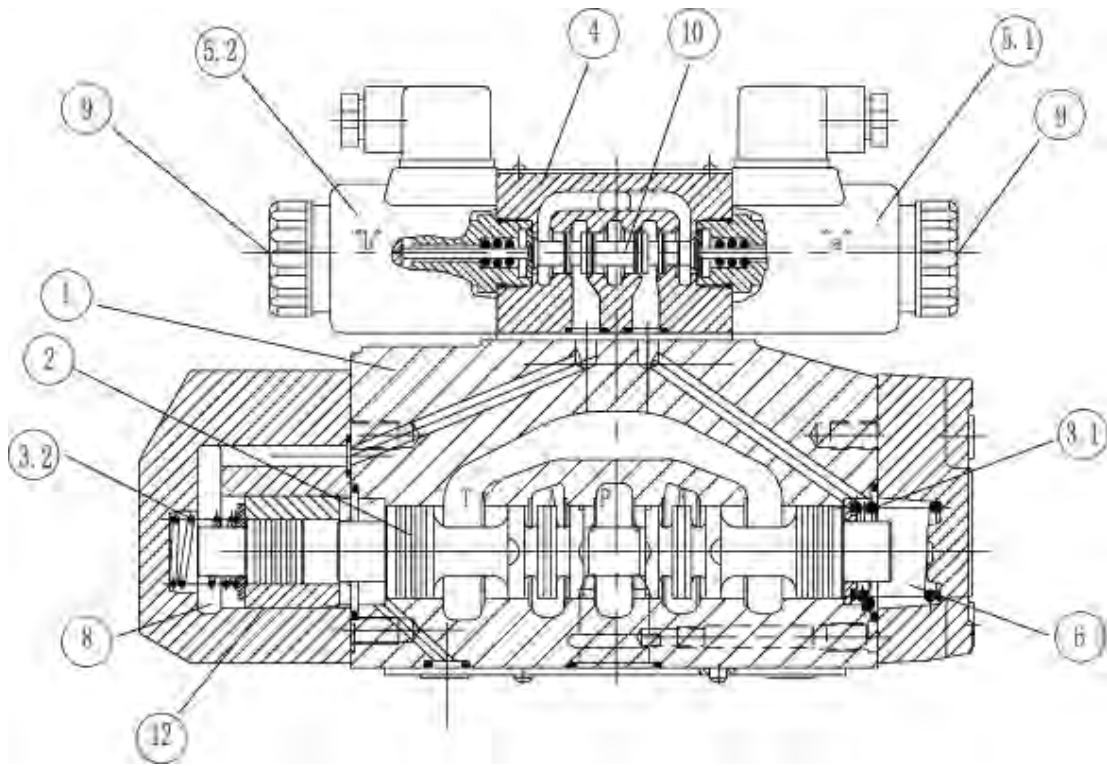
The control spool (2) is held in the neutral or in the initial position either by springs or by means of pressure. Pilot oil supply and pilot oil drain are external (see page 2).

4/3-way directional valve with spring centring of the control spool

In this model, the main control spool (2) is held in the neutral position by two return springs (3.1) and (3.2). The two spring chambers (6) and (8) are connected to ports X and Y via the connector plate (11).

When one of the two ends of the main control spool (2) is pressurized with pilot pressure, the spool is moved to the shifted position. The required ports in the valve are then opened to flow.

When the pilot pressure is removed, the spring on the opposite side to the pressurized spool area causes the spool to return to its neutral or initial position.



Type 4WEH 16 H...

4/3-way directional valve with pressure centring of the main control spool, type 4WEH...H

The main control spool (2) in the main valve is held in the neutral position by pressurization of the two front faces. A centring sleeve (12) is supported in the housing and holds the spool in position.

By removing the pressure from one of the spool ends, the main control spool (2) is moved to the shifted position.

The unloaded spool area displaces the returning pilot oil via the pilot valve into the Y channel (external).

Shifting time adjustment, pressure reducing valve, pre-load valve

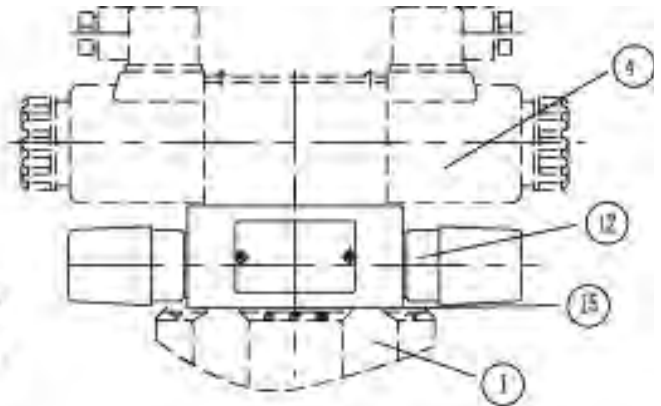
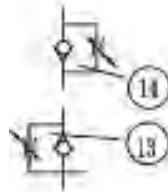
Shifting time adjustment

In order to influence the shifting time of the main valve (1) a double throttle check valve (12) is installed.

Change over from meter-in (13) to meter-out control (14): Remove the pilot valve 4 (leave the O-ring support plate (15) in place), rotate the throttle check valve (12) about its longitudinal axis and refit it, replace the pilot valve (4).

Tightening torque for screws (16)

$$M_A = 9 \text{ Nm.}$$

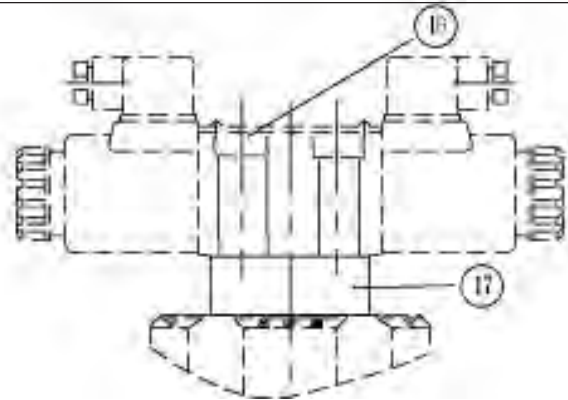


Type 4WEH..60/...S or S2

Pressure reducing valve "D3"

The pressure reducing valve (17) must be used if the pilot pressure is higher than 25 MPa. Thus, the secondary pressure is held constant at 4.5 MPa. When using a pressure reducing valve "D3" (17), a throttle insert "B10" must be installed in the P channel of the pilot valve.

Tightening torque for screws (16) $M_A = 9 \text{ Nm.}$



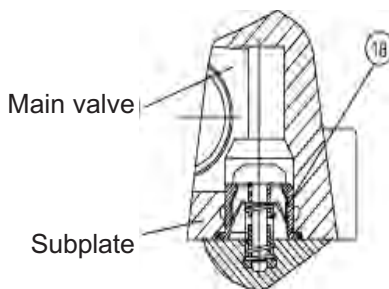
Type 4WEH..60/.../..D3

Pre-load valve (not for size 10)

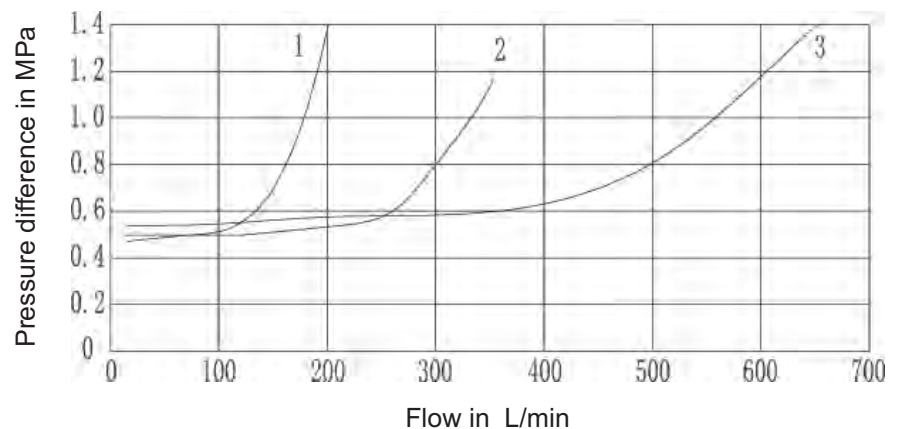
In valves with pressureless by-pass and internal pilot oil supply, a pre-load valve (18) must be installed in the P channel of the main valve to build up the minimum pilot pressure.

The pressure difference of the pre-load valve must be added to the pressure difference of the main valve (see characteristic curve) in order to determine the actual value.

The cracking pressure of this valve is approx. 0.45 MPa.



$\Delta p/q_v$ characteristic curve (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



1 Size 16

2 Size 25

3 Size 32.

Ordering code

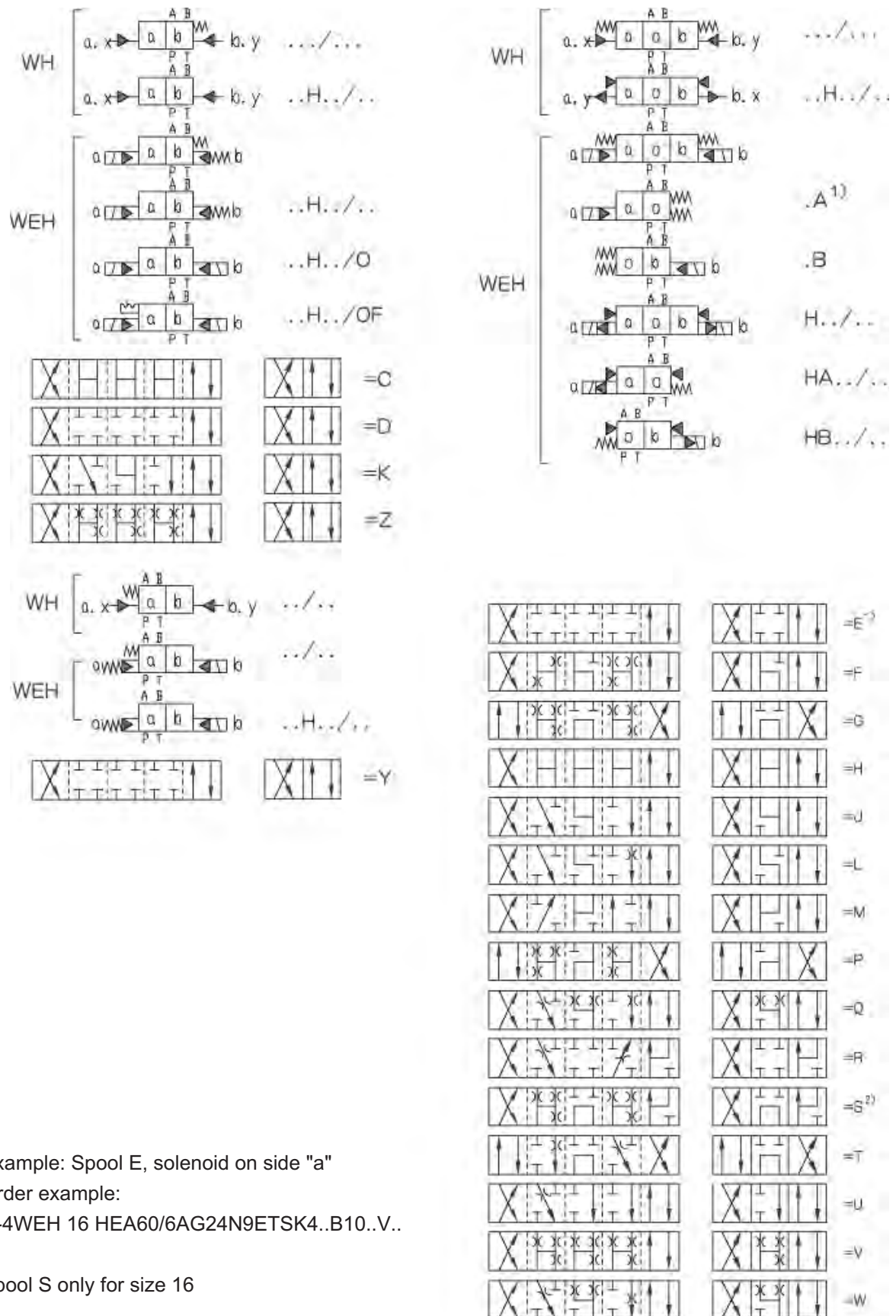
4 B / / *

<p>pressure of operation Up to 28 MPa = No code Up to 35 MPa = H -</p>	<p>Further details in clear text</p>
<p>4-way design = 4</p>	<p>No code = mineral oils V = phosphate ester</p>
<p>Types of operation Electro-hydraulic = WEH Hydraulic = WH</p>	<p>No code = Without pressure reducing valve D3²⁾ = With pressure reducing valve</p>
<p>Size Size 10 = 10 Size 16 = 16 Size 25 = 25 Size 32 = 32</p>	<p>Pre-load valve (not for size 10) No code = Without pre-load valve P 4.5 = With pre-load valve</p>
<p>Spool return By means of springs = No code Hydraulic = H</p>	<p>No code = Without throttle insert B08 = Throttle Φ 0.8 mm B10 = Throttle Φ 1.0 mm B12 = Throttle Φ 1.2 mm B15 = Throttle Φ 1.5 mm</p>
<p>For symbols, see page 189</p>	<p>Additional equipment NO. (see Additional equipment)</p>
<p>Series 40 to 49 (size 10)¹⁾ = 40 Series 60 to 69 (sizes 16.25.32)¹⁾ = 60</p>	<p>Electrical connections K4⁴⁾ = with component plug</p>
<p>Technology of Beijing Huade Hydraulic = B</p>	<p>No code = Without shifting time adjustment S = Shifting time adjustment as meter-in control S2 = Shifting time adjustment as meter-out control</p>
<p>Spool return in the pilot valve for 2-position valve and 2 solenoids only possible with spools C, D, K, Z and hydraulic spool return in the main valve: Without spring return = O Without spring return with detent = OF</p>	<p>No code = Pilot oil supply external, drain external E = Pilot oil supply internal, drain external ET³⁾ = Pilot oil supply internal, drain internal T = Pilot oil supply external, drain internal Type 4WH...only available as No code! Versions ET and T as 3-position valve with pressure centring only possible if $p_{pilot} \geq 2 \times p_{tank} + p_{pilot min}$!</p>
<p>Pilot valve with wet-pin solenoids Standard valve = A High-performance valve = E</p>	<p>No code = Without manual override N = With manual override N9 = With protected manual override</p>
<p>12 V DC = G12 220 V AC 50 Hz = W220-50 24 V DC = G24 DC solenoid commuting automatically = W220R</p>	

- 1) Unchanged installation and connection dimensions
- 2) Only in conjunction with throttle insert "B10"
- 3) With internal pilot oil supply:
Minimum pilot pressure: Please note page 192!

- In order to avoid excessive pressure peaks, a throttle insert (B10) should be provided in the P port of the pilot valve .
- 4) Plug-in onnectors have to be ordered separately

Symbols





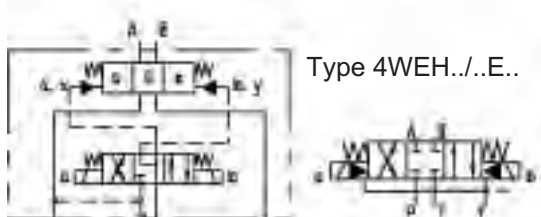
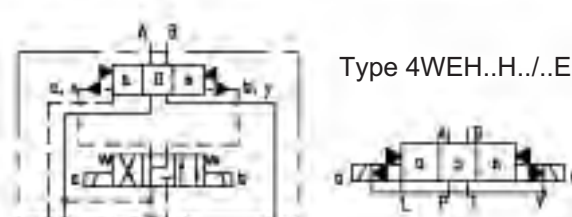
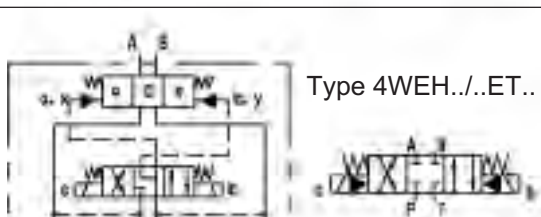
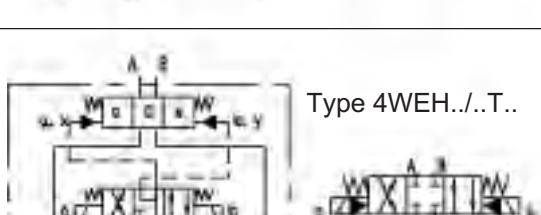
1) Example: Spool E, solenoid on side "a"
 Order example:
 H-4WEH 16 HEA60/6AG24N9ETSK4..B10..V..

2) Spool S only for size 16

Valve opening in neutral position for spools Q, V and W

Spool	Size	Valve opening in neutral position (in mm ²)			
		10	16	25 (type 4W.H 25.60B/...)	32
Q	P-A	-	-	-	-
	P-B	-	-	-	-
	A-T	13	32	83	78
	B-T	13	32	83	78
V	P-A	13	32	83	73
	P-B	13	32	83	73
	A-T	13	32	83	84
	B-T	13	32	83	84
W	P-A	-	-	-	-
	P-B	-	-	-	-
	A-T	2.4	6	14	20
	B-T	2.4	6	14	20

Detailed and simplified symbols for 3-position valves

	Valve with spring-centred neutral position	Valve with pressure-centred neutral position only sizes 16, 25 (type 4W.H 25 .60/... and 32)
X = external; Y = external	 <p>Type 4WEH.../...</p>	 <p>Type 4WEH..H.../...</p>
X = internal; Y = external	 <p>Type 4WEH.../...E..</p>	 <p>Type 4WEH..H.../...E..</p>
X = internal; Y = internal	 <p>Type 4WEH.../...ET..</p>	<p>3-position valves, pressure-centred, preferably with external pilot oil supply and/or drain (No code, E) For the preconditions for internal pilot oil supply and/or drain (ET, T) see page 188 or 192.</p>
X = external; Y = internal	 <p>Type 4WEH.../...T..</p>	

Detailed and simplified symbols for 2-position valves

Valves with spring offset		Valves with hydraulic offset				
X = external; Y = external	Type 4WEH.../... 	Type 4WEH...H.../... 	Type 4WEH...H/O... 	Type 4WEH...H/OF... 		
	X = internal; Y = external	Type 4WEH.../...E... 	Type 4WEH...H.../...E... 	Type 4WEH...H/O...E... 	Type 4WEH...H/OF...E... 	
		X = internal; Y = internal	Type 4WEH.../...ET... 	Type 4WEH...H.../...ET... 	Type 4WEH...H/O...ET... 	Type 4WEH...H/OF...ET...
			X = external; Y = internal	Type 4WEH.../...T... 	Type 4WEH...H.../...T... 	Type 4WEH...H/O...T...

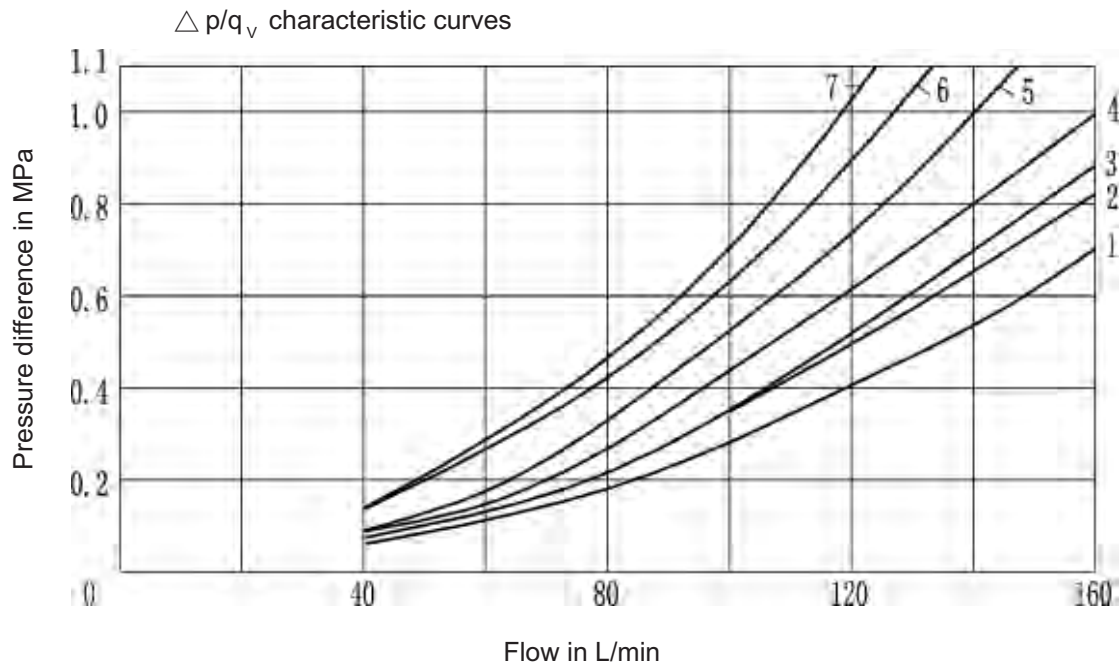
Technical data (For applications outside these parameters, please consult us!)							
Sizes (ordering code)		10	16	25	32		
Operating pressure, max. Type 4WEH (MPa)		28	28	28	28		
- Port P, A, B	Type H-4WEH (MPa)	35	35	35	35		
- Port T	Pilot oil drain Y external (MPa)	31.5 ⁵⁾	25	25	25		
	Pilot oil drain Y internal ¹⁾	16 ⁶⁾ /21 ⁷⁾ DC 10 ⁶⁾ /16 ⁷⁾ AC					
- Port Y - DC (MPa)		16 ⁶⁾ /21 ⁷⁾ DC					
Pilot oil drain external: - AC (MPa)		10 ⁶⁾ /16 ⁷⁾ AC					
with version 4WH (MPa)		25					
Pilot pressure, max. (MPa) (With higher pilot pressures, a pressure reducing valve is required.)		25					
Pilot pressure, min. - Pilot oil supply X external, pilot oil supply X internal (not with spools: C, F, G, H, P, T, V, Z, S ²⁾)		H-4W....					
3-position valve, spring-centred (MPa)		1.0	1.4	1.3	0.85		
3-position valve, pressure-centred (MPa)		-	1.4	1.8	0.85		
2-position valve, with spring offset (MPa)		1.0	1.4	1.3	1.0		
2-position valve, with hydraulic offset (MPa)		0.7	1.4	0.8	0.5		
- pilot oil supply X internal (with spools C, F, G, H, P, T, V, Z, S ²⁾) (MPa)		4.5 ³⁾	4.5 ⁴⁾	4.5 ⁴⁾	4.5 ⁴⁾		
1) As 3-position valve with spring-centring only possible if $p_{pilot} \geq 2 \times p_{tank} + p_{pilot\ min}$		minimum pressure difference of 0.65 MPa from P to T.					
2) Spool S only for size 16		4) For spools C, F, G, H, P, T, V, Z, S (by means of a pre-load valve or a sufficiently large flow)					
3) For symbols C, F, G, H, P, T, V, Z internal pilot oil supply is only possible, if the flow from P to T in the neutral position (in a 3-position valve) or when the valve is moving through the neutral position (in a 2-position valve) is large enough to ensure a		5) Type 4WEH 10...: 28 MPa Type H-4WEH 10...: 31.5 MPa					
		6) Standard valve "6A"					
		7) High-performance valve "6E"					
Hydraulic fluid		Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)					
Fluid temperature range (°C)		- 30 to + 80					
Viscosity range (mm ² /s)		2.8 to 500					
Cleanliness		Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.					
Pilot oil volume for shifting operation :							
- 3-position valve, spring-centred (cm ³)		2.04	5.72	14.2	29.4		
- 2-position valve (cm ³)		4.08	11.75	28.4	58.8		
- 3-position valve, pressure-centred			WH	WEH	WH	WEH	WH
From neutral position to shifted position "a" (cm ³)		2.83	2.83	7.15	7.15	14.4	14.4
From shifted position "a" to neutral position (cm ³)		2.9	5.73	14.18	7.0	29.4	15.1
From neutral position to shifted position "b" (cm ³)		5.72	5.73	14.18	14.15	29.4	29.4
From shifted position "b" to neutral position (cm ³)		2.83	8.55	19.88	5.73	43.8	14.4
Pilot oil flow for shortest shifting time (L/min)		approx.35	approx.35	approx.35	approx.45.0		
weight	Valve with one solenoid (kg)	approx.6.4	approx.8.5	approx.17.6	approx.41.0		
	Valve with two solenoids, spring-centred (kg)	approx.6.8	approx.8.9	approx.18.0	approx.41.0		
	Valve with two solenoids, pressure-centred (kg)	approx.6.8	approx.8.9	approx.19.0	approx.41.0		
	Valve with hydraulic operation (4WH...)	approx.5.5	approx.7.3	approx.16.5	approx.39.5		
	Shifting time adjustment (kg)	approx.0.8					
	Pressure reducing valve (kg)	approx.0.4					
Installation position		optional; valve with hydraulic spool return "H"(spools C, D, K, Z, Y) horizontal					

Shifting times

Shifting time = Contacting at the pilot valve up to start of opening of the control land in the main valve

Size 10 Pilot valve series 50/A	Shifting time of the valve from neutral position to shifted position with AC (~) and DC (=) operation																	
	at pilot pressure (MPa)		~7=				~14=				~21=				~25=			
	- 3-position valve (ms)		30	65	25	60	20	55	15	50								
	- 2-position valve (ms)		35	80	30	75	25	70	20	65								
	Shifting time of the valve from shifted position to neutral position																	
	- 3-position valve (ms)		30															
	- 2-position valve (ms)		35	40	30	75	25	30	20	25								
Size 16 Pilot valve series 60/E	Shifting time of the valve from neutral position to shifted position with AC (~) and DC (=) operation																	
	at pilot pressure (MPa)		~7=				~14=				~21=				~25=			
	- 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 Solenoid operated		a	b	a	b	a	b	a	b	a	b	a	b	a	b		
	pressure-centred (ms)		30	30	40	40	30	30	40	40	30	30	35	40	30	30	35	40
	Shifting time of the valve from shifted position to neutral position																	
	- 3-position valve (ms)		20 to 35 for ~ ; 30 for =															
	- 2-position valve (ms)		35...50	45	35...50	45	30...45	40	30...45	35								
	- 3-position valve from -		a	b	a	b	a	b	a	b	a	b	a	b	a	b		
pressure-centred (ms)		20...35	20	20...35	20	20...35	20	20...35	20									
Size 25 (4W, H 25, 60)	Shifting time of the valve from neutral position to shifted position with AC (~) and DC (=) operation																	
	at pilot pressure (MPa)		~7=				~14=				~21=				~25=			
	- 3-position valve, spring-centred (ms)		50	85	40	75	35	70	30	65								
	- 2-position valve (ms)		120	160	100	130	85	120	70	105								
	- 3-position valve Solenoid operated		a	b	a	b	a	b	a	b	a	b	a	b	a	b		
	pressure-centred (ms)		30	35	55	65	30	35	55	65	25	30	50	60	25	30	50	60
	Shifting time of the valve from shifted position to neutral position																	
	- 3-position valve (ms)		40 to 55 for ~ ; 40 for =															
	- 2-position valve (ms)		120	125	85	100	85	90	75	80								
	- 3-position valve from -		a	b	a	b	a	b	a	b	a	b	a	b	a	b		
pressure-centred (ms)		30...50	30	35	30...50	30	50	30...50	30	35	30...50	30	35	30...50	30	35		
Size 32 Pilot valve series 50/A	Shifting time of the valve from neutral position to shifted position with AC (~) and DC (=) operation																	
	at pilot pressure (MPa)		~5=				~15=				~25=							
	- 3-position valve, spring-centred (ms)		65	80	50	90	35	105										
	- 2-position valve (ms)		100	130	75	100	60	115										
	- 3-position valve Solenoid operated		a	b	a	b	a	b	a	b	a	b	a	b				
	pressure-centred (ms)		55	60	100	105	40	45	85	95	35	40	85	95				
	Shifting time of the valve from shifted position to neutral position																	
	- 3-position valve (ms)		60 to 75 for ~ ; 50 for =															
	- 2-position valve (ms)		115...130	90	85...100	70	65...80	65										
	- 3-position valve from -		a	b	a	b	a	b	a	b	a	b	a	b				
pressure-centred (ms)		30...65	30	40	60...90	30	30	105...155	50	50								

Characteristic curves: Type 4WEH 10...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Spool	Shifted position				Spool	Neutral position		
	P-A	P-B	A-T	B-T		A-T	B-T	P-T
E,D,Y2	2	4	5	F	3	-	6	
F	1	4	1	4	G,T	-	-	7
G,T	4	2	2	6	H	1	3	5
H,C	4	4	1	4	L	L	3	- -
J,K	1	2	1	3	P	-	7	5
L	2		3	1	U	-	4	-
M	4	4	3	4				
Q,V,W,Z	2	2	3	5				
R	2	2	3	-				
U	3	3	3	4				
P	4	1	3	4				

Shifting performance limits: Type 4WEH 10...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

2 and 3-position valves (Permissible flow q_v in L/min)			
Spool	Operating pressure p_{max} in MPa		
	20	25	31.5
E, J, L, M, Q, R, U, V, W, C, D, K, Z, Y	160		
H	160	150	120
G, T	160	160	140
F, P	160	140	120

General:

Attention!

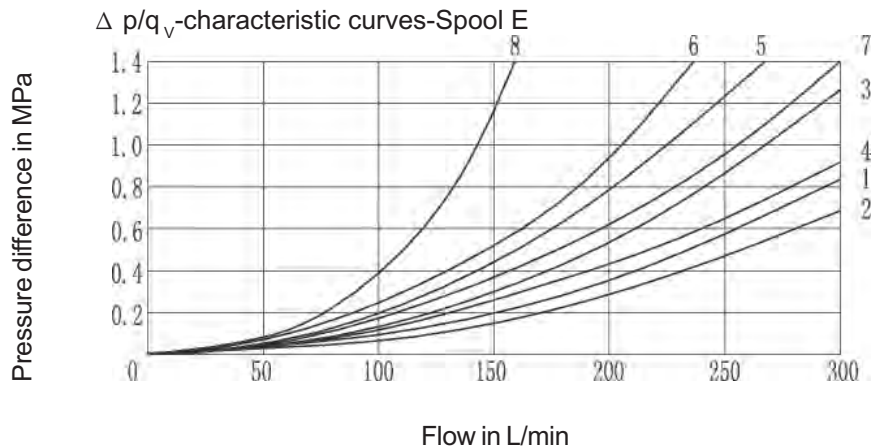
The shifting performance limits shown are valid for applications with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).

As a result of the flow forces occurring within the valve with only one direction of flow (e.g. from P to A with port B blocked) the permissible performance limits may be considerably lower!

(In the case of applications of this kind, please consult us.)

The performance limits were determined with the solenoid at operating temperature, 10% undervoltage and with no tank pre-loading.

Characteristic curves: Type 4WEH 16...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Spool	Shift position				
	P-A	P-B	A-T	B-T	P-T
E,D,Y	1	1	1	3	-
F,P	2	2	3	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	-
S	4	4	4	-	8

Performance limits: Type 4WEH 16...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

2-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure p_{\max} in MPa					
	7	14	21	28	35	
with spring offset in the main valve ¹⁾						Spool C and Z up to approx. 160L/min
C, D, K, Z, Y	300	300	300	300	300	
with spring offset in the main valve ²⁾						
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	
with hydraulic offset in the main valve						Spool HC and HZ up to approx. 160L/min
HC, HD, HK	300	300	300	300	300	
HZ, HY	300	300	300	300	300	

3-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure p_{\max} in MPa					
	7	14	21	28	35	
spring-centred						Spools F, G, H, P and S in general
E, H, J, L, M, QUWR	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	
V	300	250	210	200	180	
pressure-centred (at min. pilot pressure of 1.6 MPa)						Spool V up to ca. 160 L/min
for all spools	300	300	300	300	300	

1) The flow values given are achieved when the minimum pilot pressure of 1.2 MPa is present.

2) The flow values given are limiting values at which the return spring can return the valve when the pilot pressure fails.

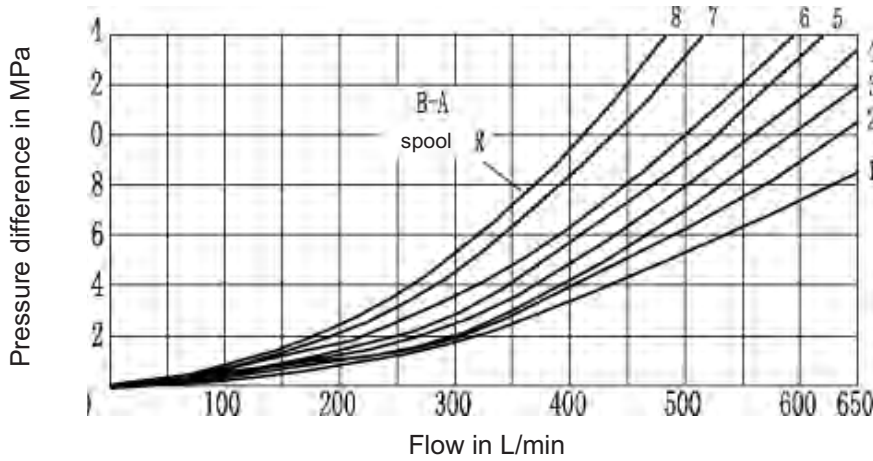
Attention!

When using 4/3-way directional valves with spring-centring of the control spool in the main valve, which exceeds the given performance limits, a higher pilot pressure is required.

Example: At an operating pressure of $p_{\max} = 35 \text{ MPa}$ and a flow of $q_v = 300 \text{ L/min}$, a pilot pressure of 1.6 MPa is required.

The maximum flow for those valves is therefore only dependent on the Δp value which is acceptable for the system.

Characteristic curves: Type 4WEH 25...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



7) Spool G central position P-T

8) Spool T central position P-T

Spool	Shifted position				Spool	Neutral position			
	P-A	P-B	A-T	B-T		P-A	P-B	A-T	B-T
E	1	1	1	3	P	4	1	1	5
F	1	4	3	3	Q	2	2	3	5
G	3	1	2	4	R	2	1	1	-
H	4	4	3	4	U	2	1	1	6
J	2	2	3	5	V	4	4	3	6
L	2	2	3	3	W	1	1	1	3
M	4	4	1	4	T	3	1	2	4

Performance limits: Type 4WEH 25...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

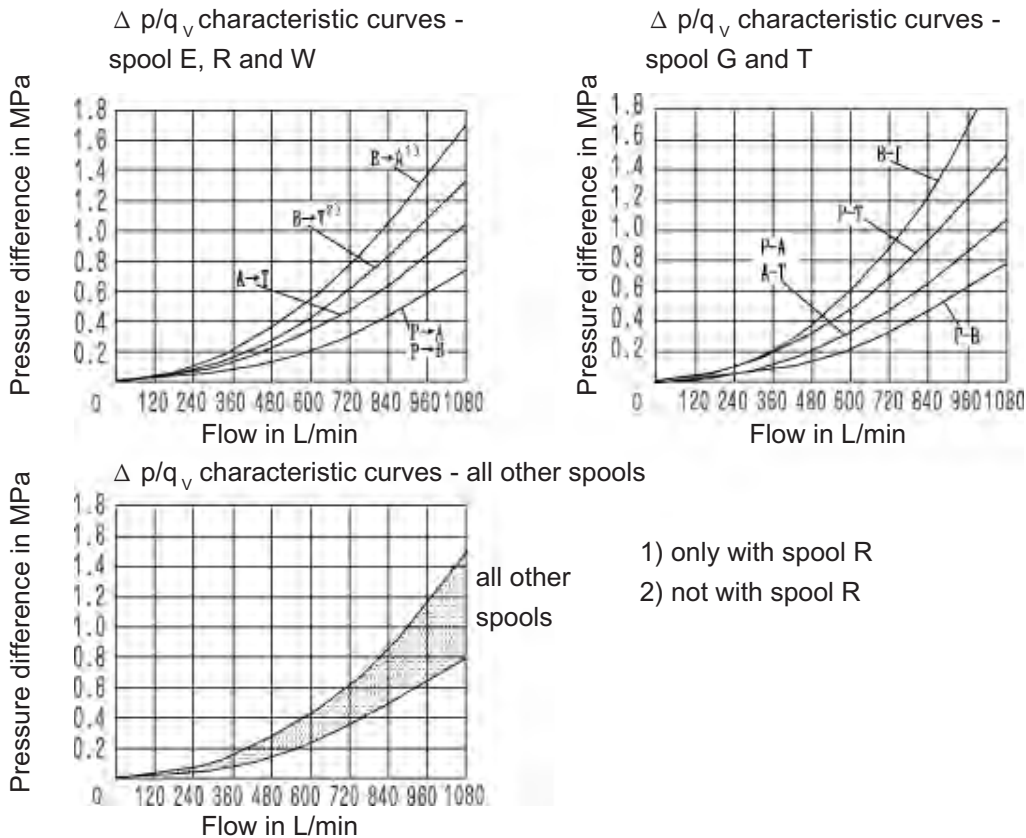
2-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure Δp in MPa					
	7	14	21	28	35	
with spring offset in the main valve ¹⁾						Spool C and Z up to approx. 180 L/min
C, D, K, Z, Y	700	700	700	700	650	
with spring offset in the main valve ²⁾						
C	700	700	700	700	700	
D, Y	700	650	400	350	300	
K	700	650	420	370	320	
Z	700	700	650	480	400	
with hydraulic offset in the main valve						Spool HC and HZ up to approx. 180 L/min
HC, HD, HK	700	700	700	700	700	
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	
HD.../OF	700	700	700	700	700	
HK.../OF	700	700	700	700	700	
HZ.../OF	700	700	700	700	700	

3-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure Δp in MPa					
	7	14	21	28	35	
spring-centred						Spools F, G, H, P and T in general, spool V up to approx. 180 L/min
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	
pressure-centred (at min. pilot pressure of 1.8MPa)						
E, F, H, J	700	700	700	700	650	
L, M, P, Q	700	700	700	700	650	
R, U, V, W	700	700	700	700	650	
G, T	700	700	700	700	400	
at > 3MPa pilot pressure						
G, T	700	700	700	700	700	

1) The flow values given are achieved when the minimum pilot pressure of 1.3 MPa is present.

2) The flow values given are limiting values at which the return spring can return the valve when the pilot pressure fails.

Characteristic curves: Type WEH 32...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Performance limits: Type WEH 32...(measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

2-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure p_{max} in MPa					
	7	14	21	28	35	
with spring offset in the main valve ¹⁾						spool C in general, spool Z up to approx. 180 L/min
C, D, K, Z, Y	1100	1040	860	750	680	
with spring offset in the main valve ²⁾						
C	1100	1040	860	800	700	
D, Y	1100	1040	540	480	420	
K	1100	1040	860	500	450	
Z	1100	1040	860	700	650	
with hydraulic offset in the main valve						spool C in general, spool Z up to approx. 180 L/min
HC, HD, HK	1100	1040	860	750	680	
HZ, HY	1100	1040	860	750	680	

3-position valves Permissible flow q_v in L/min						Pre-load valve, required for X = internal
Spool	Operating pressure p_{max} in MPa					
	7	14	21	28	35	
spring-centred ¹⁾						Spools F, G, H, P and T in general, spool V up to 180 L/min
E, J, L, M, Q, U, W, R	1100	1040	860	750	680	
G, T, H, F, P	900	900	800	650	450	
V	1100	1000	680	500	450	
pressure-centred (at min. pilot pressure of 0.85MPa)						
for all spools	1100	1040	860	750	680	

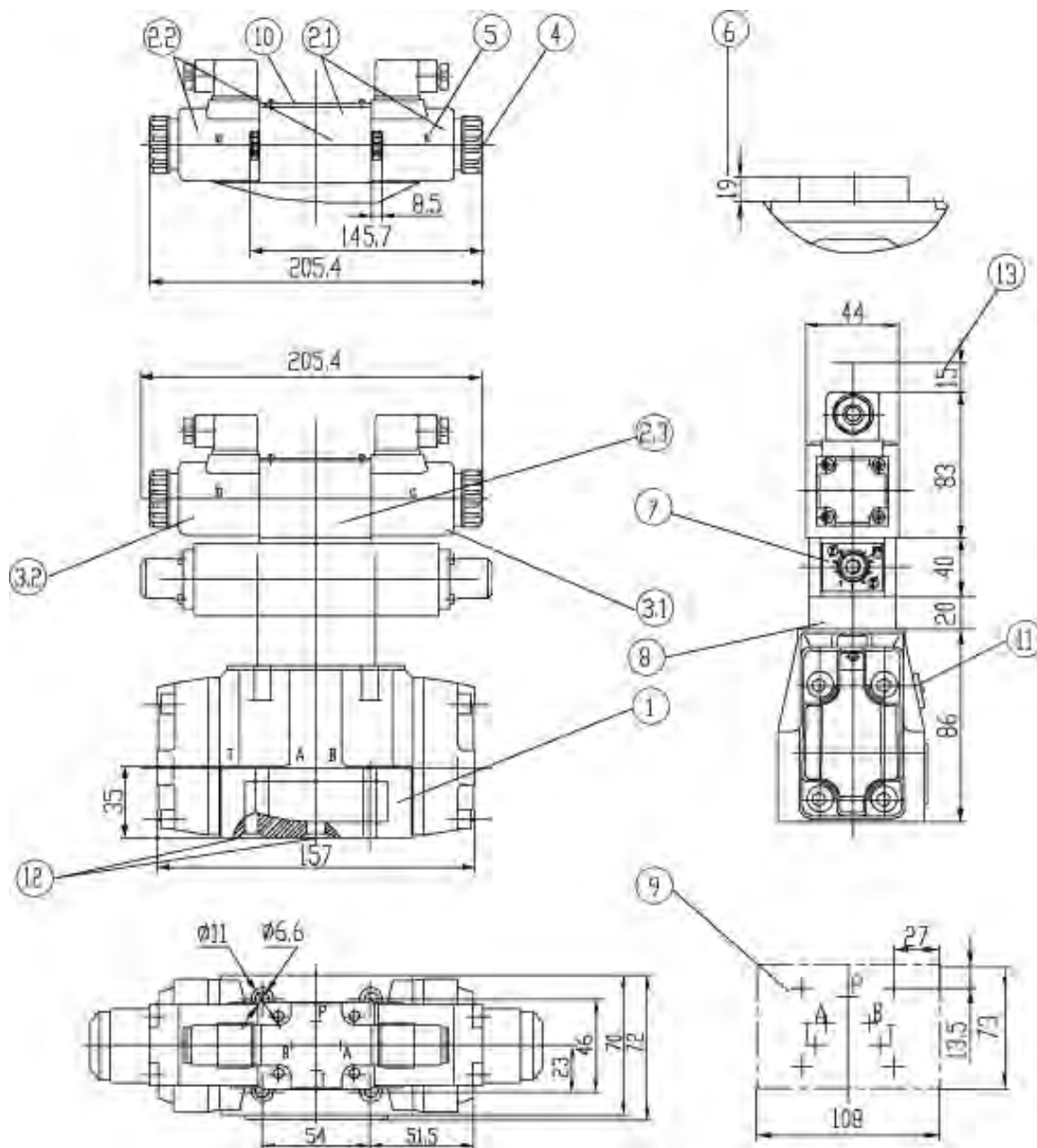
Attention!

When using 4/3-way directional valves with spring-centring of the control spool in the main valve, which exceeds the given performance limits, a higher pilot pressure is required.

Example: At an operating pressure of $p_{max} = 35 \text{ MPa}$ and a flow of $q_v = 1100 \text{ L/min}$, a pilot pressure of 1.5 MPa is required.

The maximum flow for those valves is therefore only dependent on the Δp value which is acceptable for the system.

- 1) The flow values given are achieved when the minimum pilot pressure of 1MPa is present.
- 2) The flow values given are limiting values at which the return spring can return the valve when the pilot pressure Spools.



Subplate

G 534/01 (G 3/4"), — without port X, Y

G 535/01 (G 3/4"), > with port X, Y

G 536/01 (G 1")

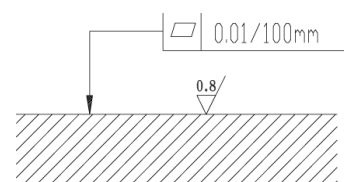
Valve fixing screws 4- M6 × 45 -10.9

(GB/T70.1-2000)

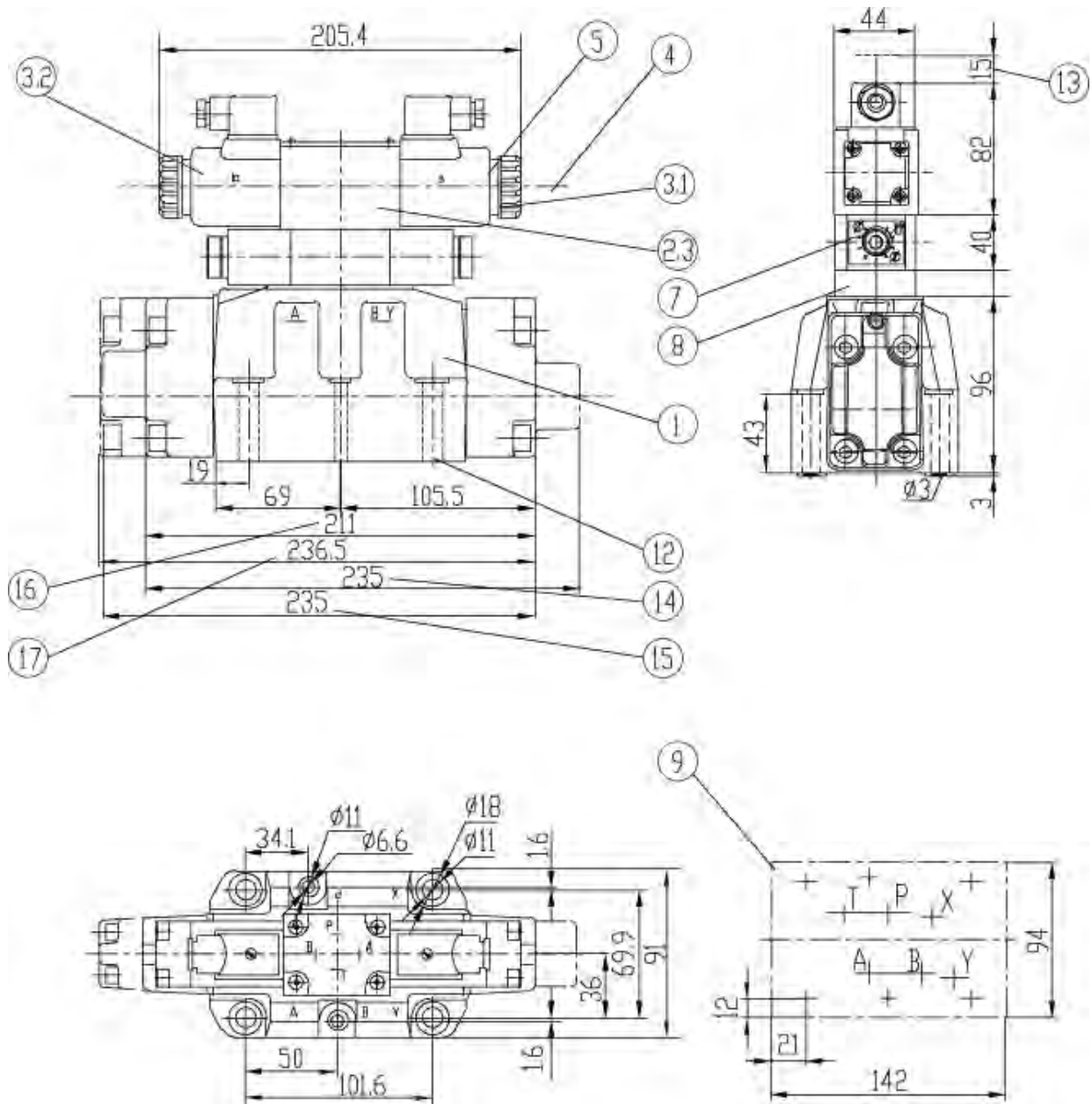
$M_A = 15.5 \text{ Nm}$

must be ordered separately.

For items lists see page 202



Required surface finish of the mating piece



Subplates

G 172/01 (G 3/4"), G 172/02 (M27 x 2),
 G 174/01 (G 1"), G 174/02 (M33 x 2), G 174/08 (flange)

Valve fixing screws

4 - M10 x 60-10.9 (GB/T70.1-2000)

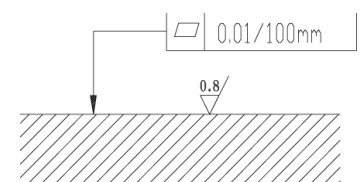
$M_A = 75 \text{ Nm}$

2 - M6 x 60-10.9 (GB/T70.1-2000)

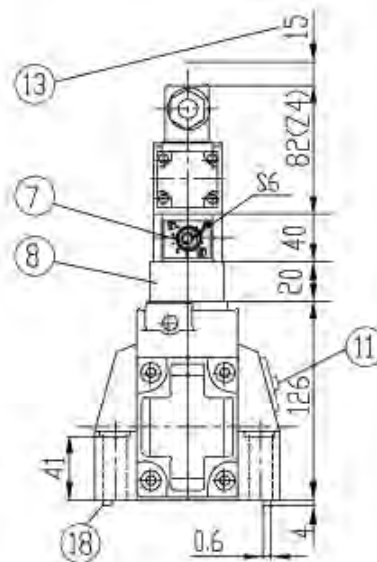
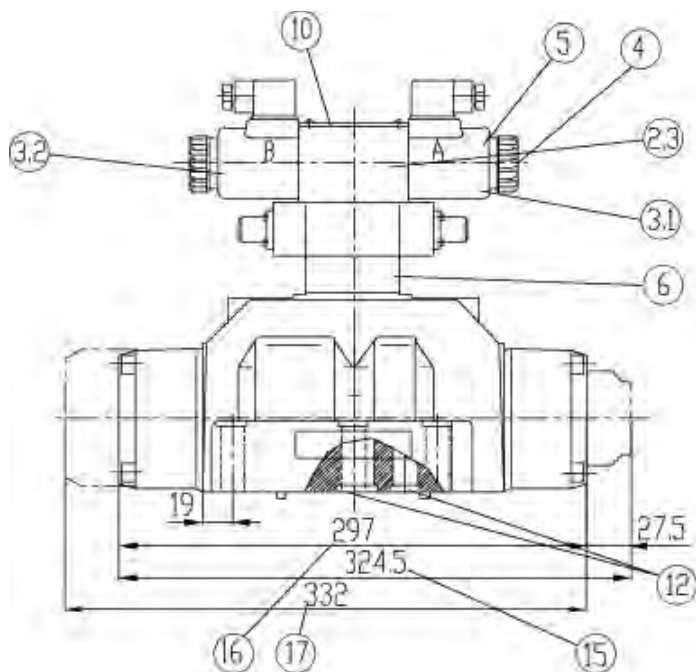
$M_A = 15.5 \text{ Nm}$

must be ordered separately.

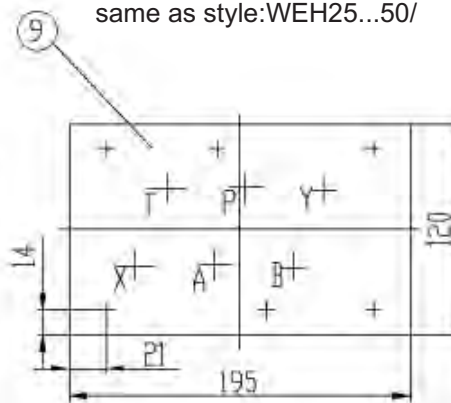
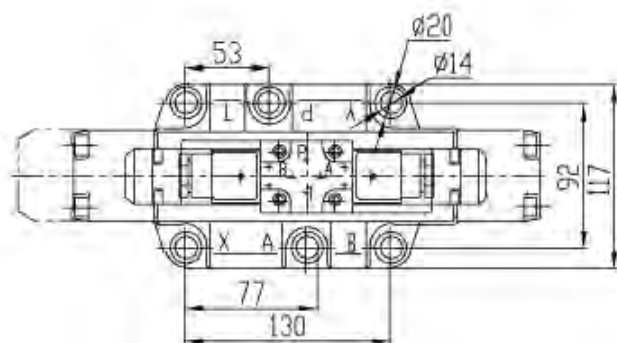
For items list, see page202



Required surface finish of the mating piece



dimension of ports connective flate is the same as style:WEH25...50/



Subplates

G 151/01 (G 1"),

G 153/01 (G 1"), for valves with pressure-centred neutral position

G 154/01 (G 1 1/4"), G 154/08 (flange)

G 156/01 (G 1 1/2")

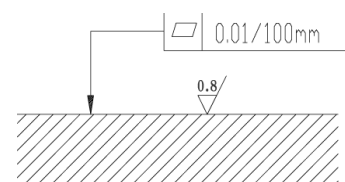
Valve fixing screws

6 - M12 x 60 -10.9 (GB/T70.1-2000)

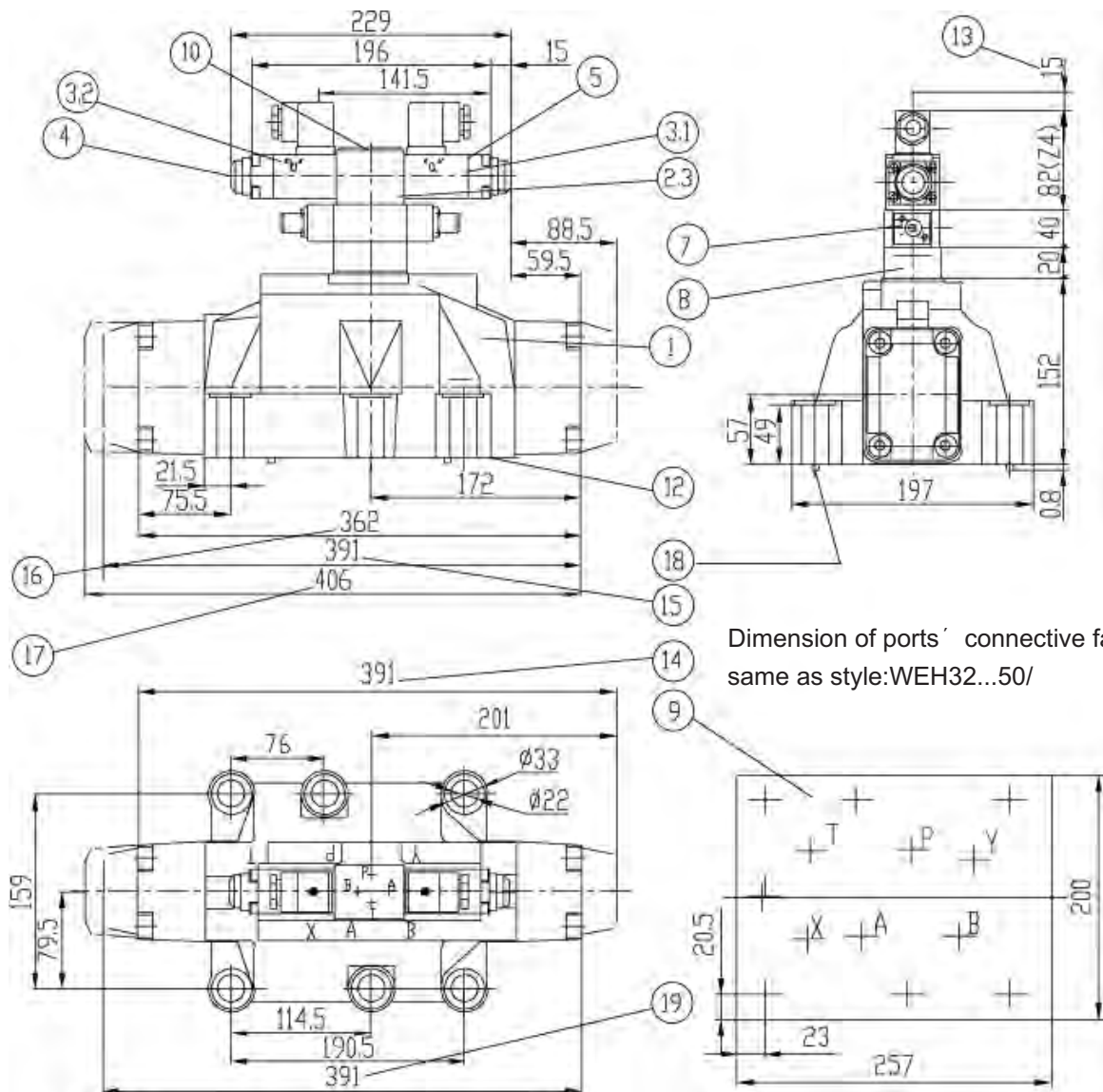
$M_A = 130 \text{ Nm}$

must be ordered separately.

For items list, see page 202



Required surface finish of the mating piece



Dimension of ports' connective face is same as style:WEH32...50/

Subplates

G 157/01 (G 1 1/2"),

G 157/02 (M48 x 2),

G 158/10 (flange)

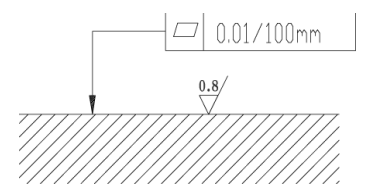
Valve fixing screws

6 - M20 x 80-10.9 (GB/T70.1-2000)

$M_A = 430 \text{ Nm}$

must be ordered separately.

For items list, see page 202



Required surface finish of the mating piece

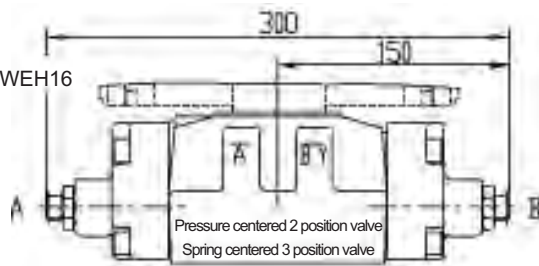
List of items:

- | | |
|---|--|
| <p>1 Main valve</p> <p>2 Pilot valve type 4WE 6 ...</p> <p>2.1 · Pilot valve type 4WE 6 D(1 solenoid) for main valves with spools C, D, K, Z
spools HC, HD, HK, HZ</p> <p>· Pilot valve type 4WE 6 J...(1 solenoid "a") for main valves with spools EA, FA, etc., spring return</p> <p>· Pilot valve type 4WE 6 M...(1 solenoid "a") for main valves with spools HEA, HFA, etc., hydraulic spool return</p> <p>2.2 · Pilot valve type 4WE 6 Y...(1 solenoid) for main valves with spool Y spool HY</p> <p>· Pilot valve type 4WE 6 J...(1 solenoid "b") for main valves with spools EB, FB, etc.,spring return</p> <p>· Pilot valve type 4WE 6 M...(1 solenoid "b") for main valves with spools HEB, HFB, etc., hydraulic spool return</p> <p>2.3 · Pilot valve type 4WE 6 J...(2 solenoids) for main valves with 3 positions, spring-centred</p> <p>· Pilot valve type 4WE 6 M...(2 solenoids) for main valves with 3 positions, pressure-centred</p> <p>3.1 Solenoid "a" (grey plug-in connector)</p> <p>3.2 Solenoid "b" (black plug-in connector)</p> <p>4 Manual override "N", optional</p> <p>- The manual override can only be operated up to a tank pressure of up to approx. 5MPa.
Take care not to damage the manual override bore!</p> <p>5 Solenoid without manual override</p> <p>6 Height of the connector plate for hydraulic operation (type 4WH...)</p> <p>7 Shifting time adjustment (A/F 6), optional</p> <p>8 Pressure reducing valve, optional</p> | <p>9 Machined valve mounting surface, position of ports</p> <p>10 Nameplate for the pilot valve</p> <p>11 Nameplate for the entire valve</p> <p>12 O-rings</p> <p>13 Space required to remove the plug-in connector</p> <p>14 2-position valves with spring offset in the main valve (C, D, K, Z)</p> <p>15 2-position valves with spring offset in the main valve (Y)</p> <p>16 3-position valves, spring-centred;
2-position valves with hydraulic offset in the main valve</p> <p>17 3-position valves, pressure-centred</p> <p>18 Locating pin</p> |
|---|--|

O-Ring used at the bottom of the housing:

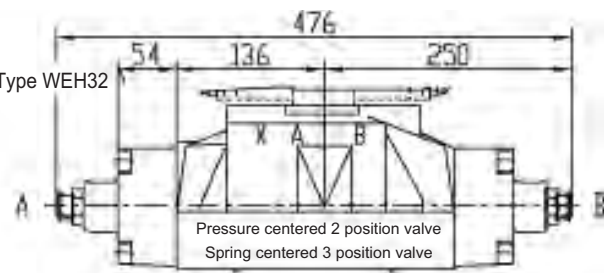
Order no.	A, B, P, T	X, Y, L
10	12 × 2	10.82 × 1.78
16	22 × 2.5	10 × 2
25	27 × 3	19 × 3
32	42 × 2	12 × 2

Type WEH16

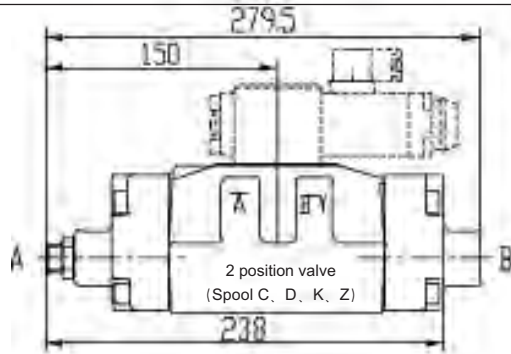


Stroke limiter on main valve sides A and B
Stroke limiter on valve side A
Stroke limiter on valve side B

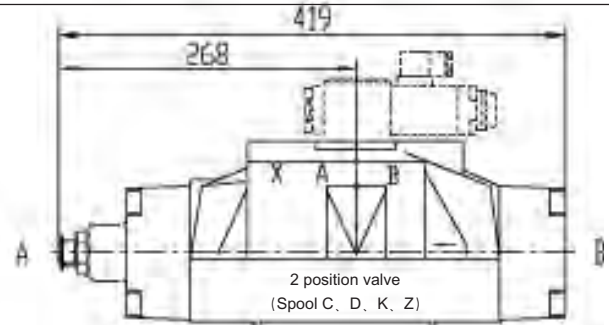
Type WEH32



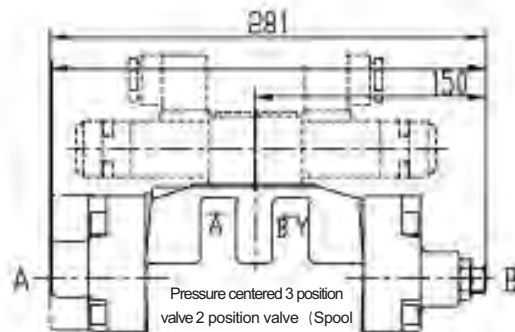
Stroke limiter on main valve sides A and B
Stroke limiter on valve side A
Stroke limiter on valve side B



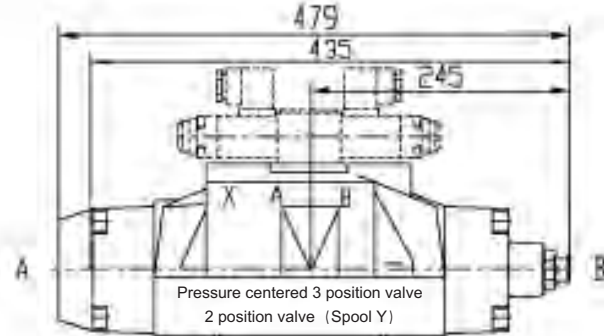
Stroke limiter on valve side A



Stroke limiter on valve side A

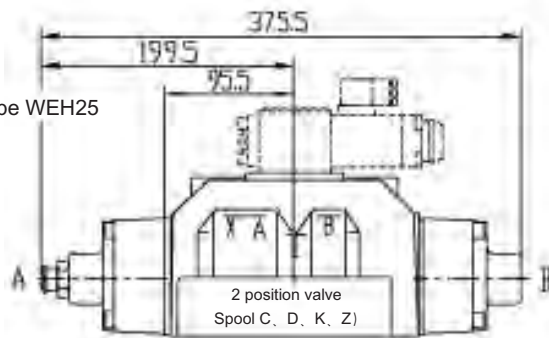


Stroke limiter on valve side B

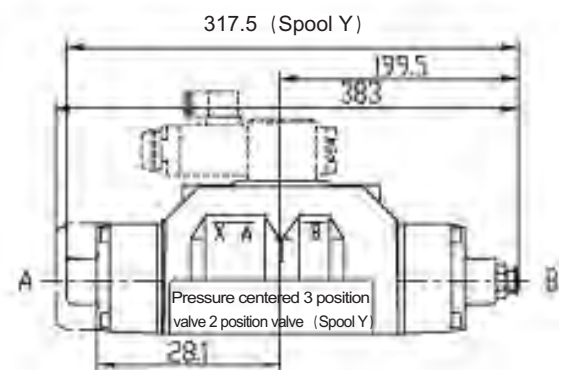


Stroke limiter on valve side B

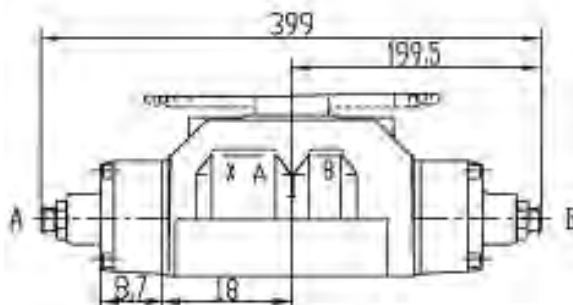
Type WEH25



Stroke limiter on valve side A

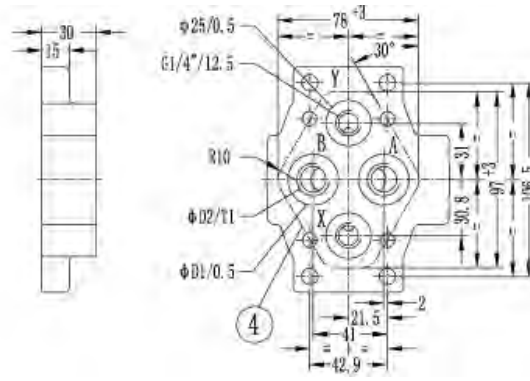
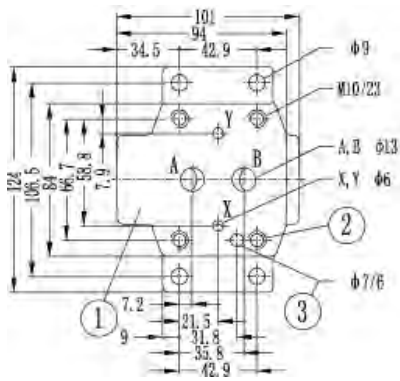


Stroke limiter on valve side B

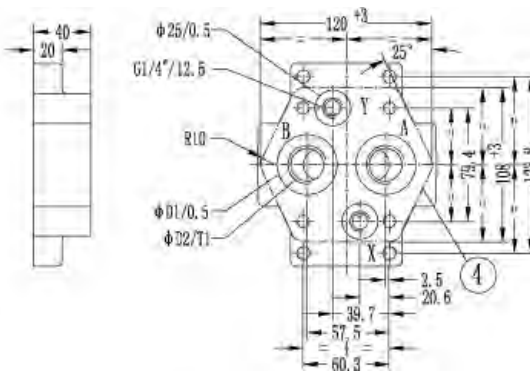
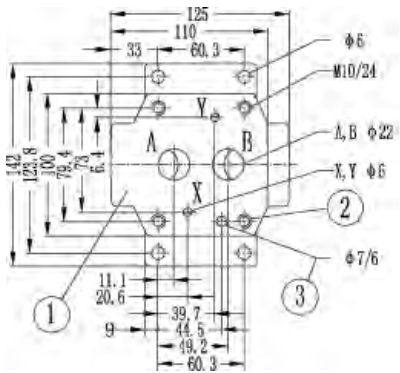


Stroke limiter on main valve sides A and B
Stroke limiter on valve side A
Stroke limiter on valve side B

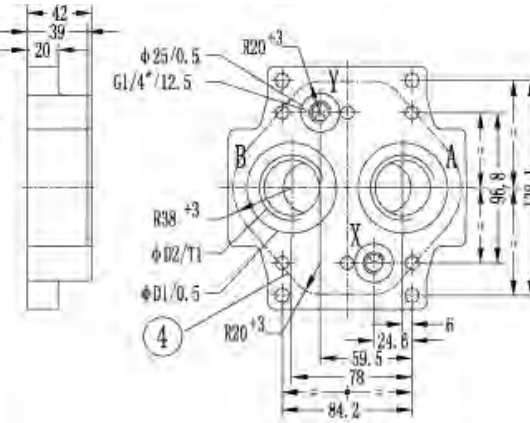
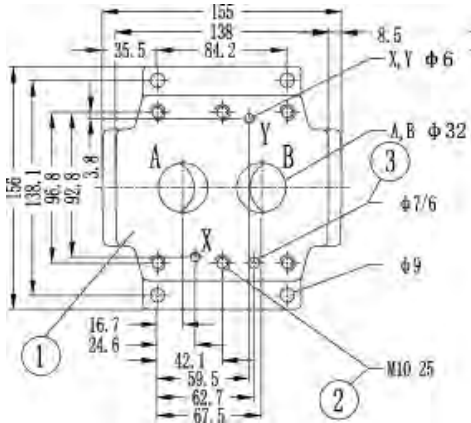
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG10	G460/01	28	G3/8"	13	4 - M10 × 40 -10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02		M18 × 1.5				
	G461/01	34	G1/2"	16			
	G461/02		M22 × 1.5				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG25	G412/01	42	G3/4"	17	4 - M10 × 50 -10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02		M27 × 2				
	G413/01	47	G1"	20			
	G413/02		M33 × 2				



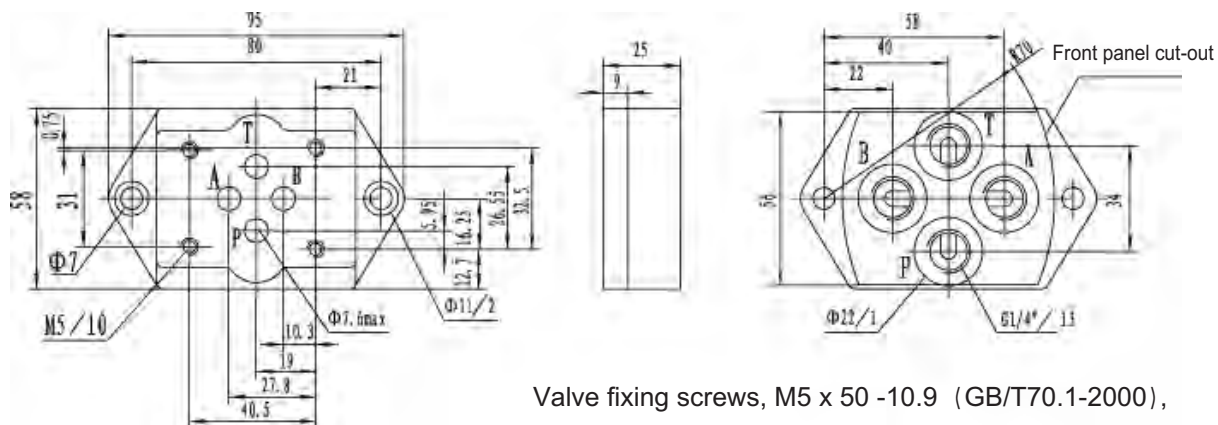
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG32	G414/01	56	G1 1/4"	20.5	6 - M10 × 60 -10.9 (GB/T70.1-2000)	69Nm	5kg
	G414/02		M42 × 2				
	G415/01	61	G1 1/2"	22.5			
	G415/02		M48 × 2				

1 mating piece of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

Subplates

G341/01 (G1/4") G341/02 (M14x1.5) Weight ≈ 0.6kg

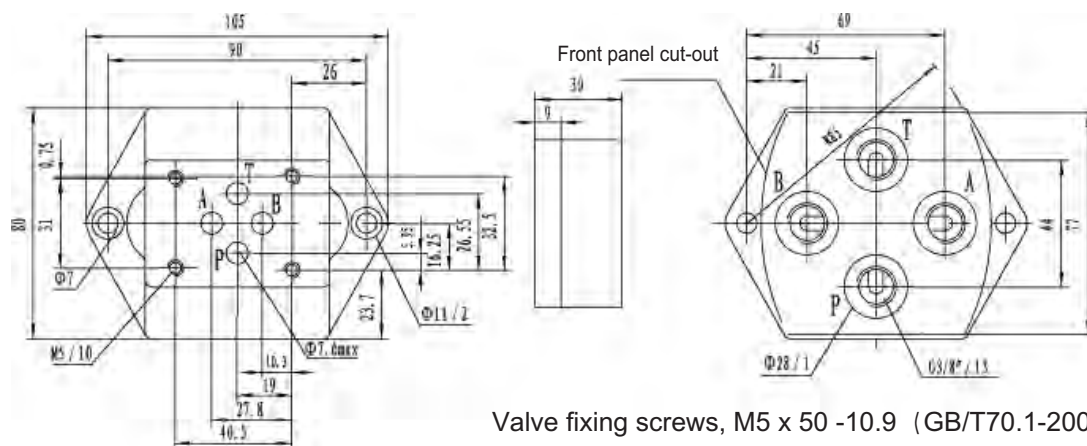
(Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

G342/01 (G3/8") G342/02 (M18x1.5) Weight ≈ 1.1kg

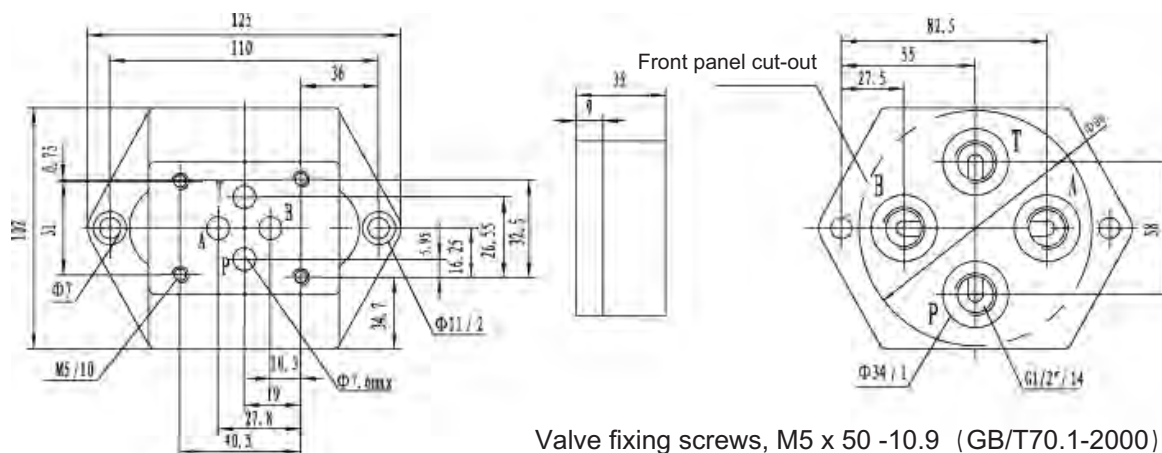
(Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

G502/01 (G1/2") G502/02 (M22x1.5) Weight ≈ 1.9kg

(Dimensions in mm)

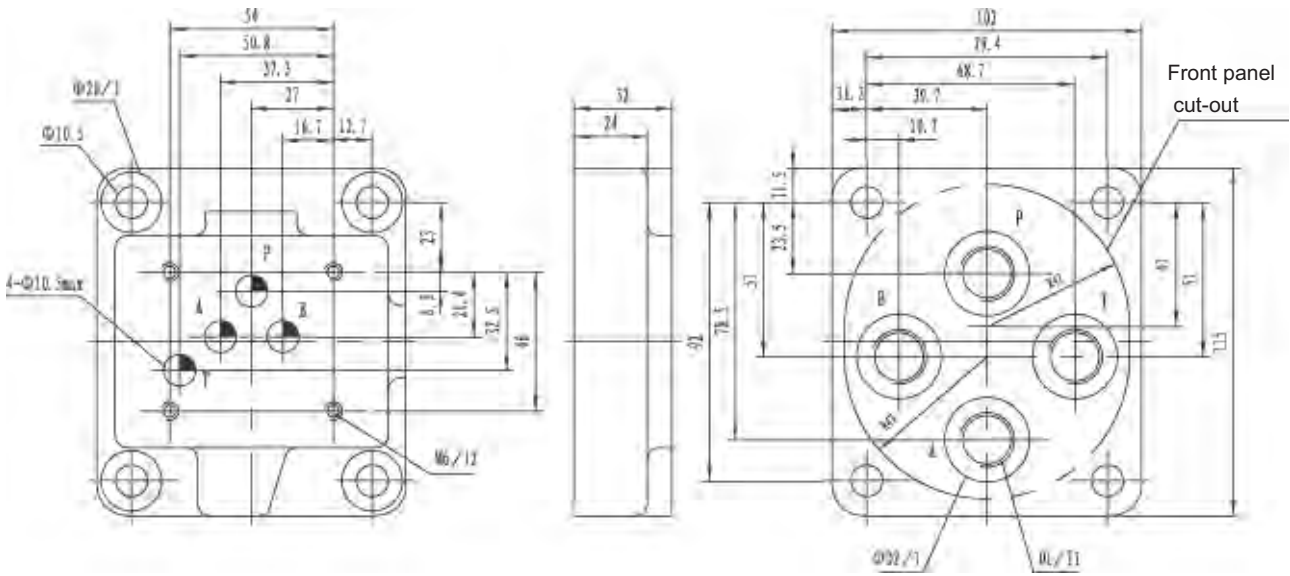


Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

Subplates

G66/01 G66/02 G67/01 G67/02

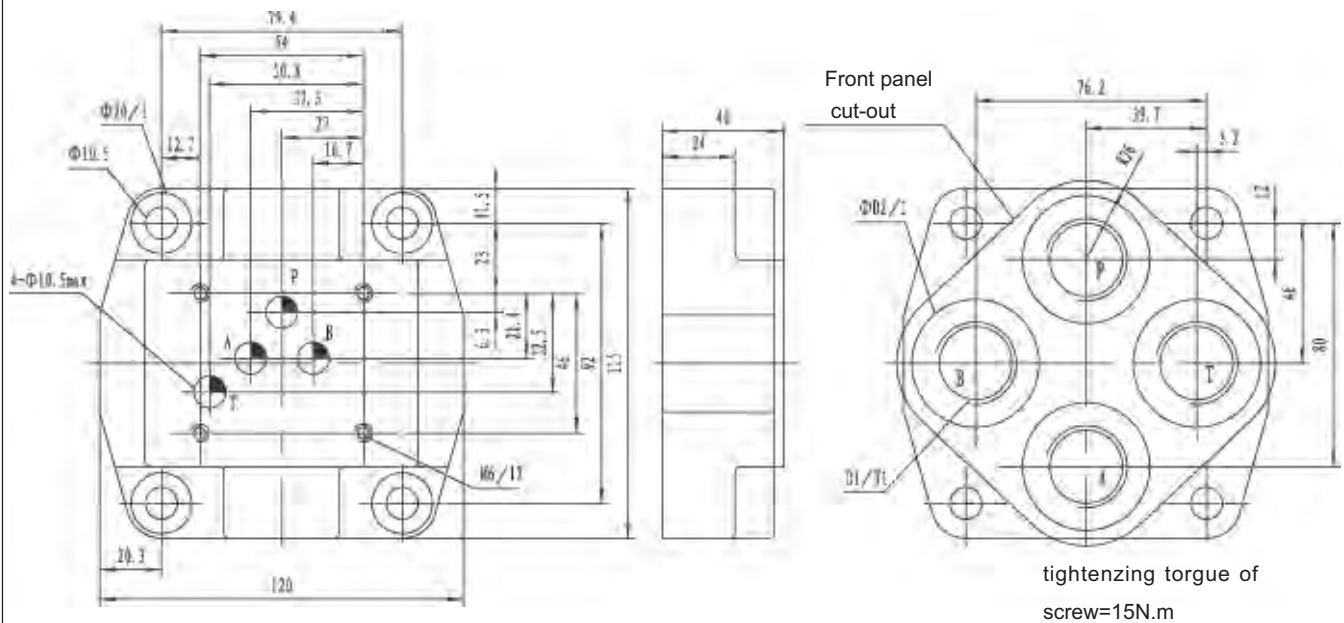
(Dimensions in mm)



Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G66/01	G3/8"	12	28	approx.	4 - M6 × 50 -10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G66/02	M18x1.5					
G67/01	G1/2"	14	34	2.3Kg		
G67/02	M22x1.5					

G534/01 G534/02

(Dimensions in mm)

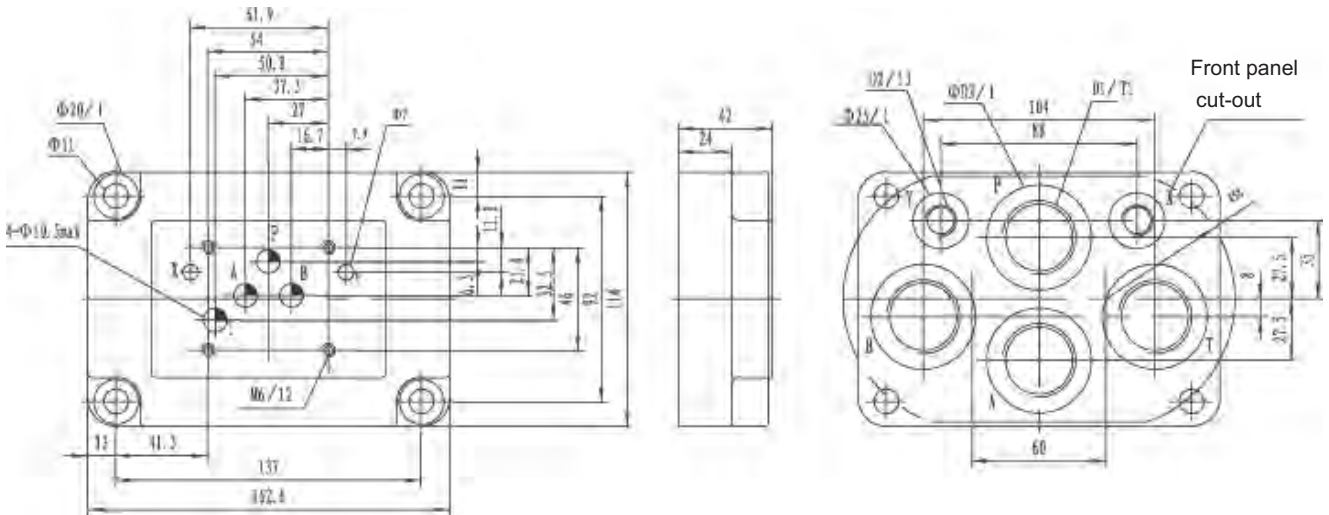


Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G534/01	G3/4"	17	42	approx.	4 - M6 × 50-10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G534/02	M27x2					

Subplates

G535/01 G535/02 G536/01 G536/02

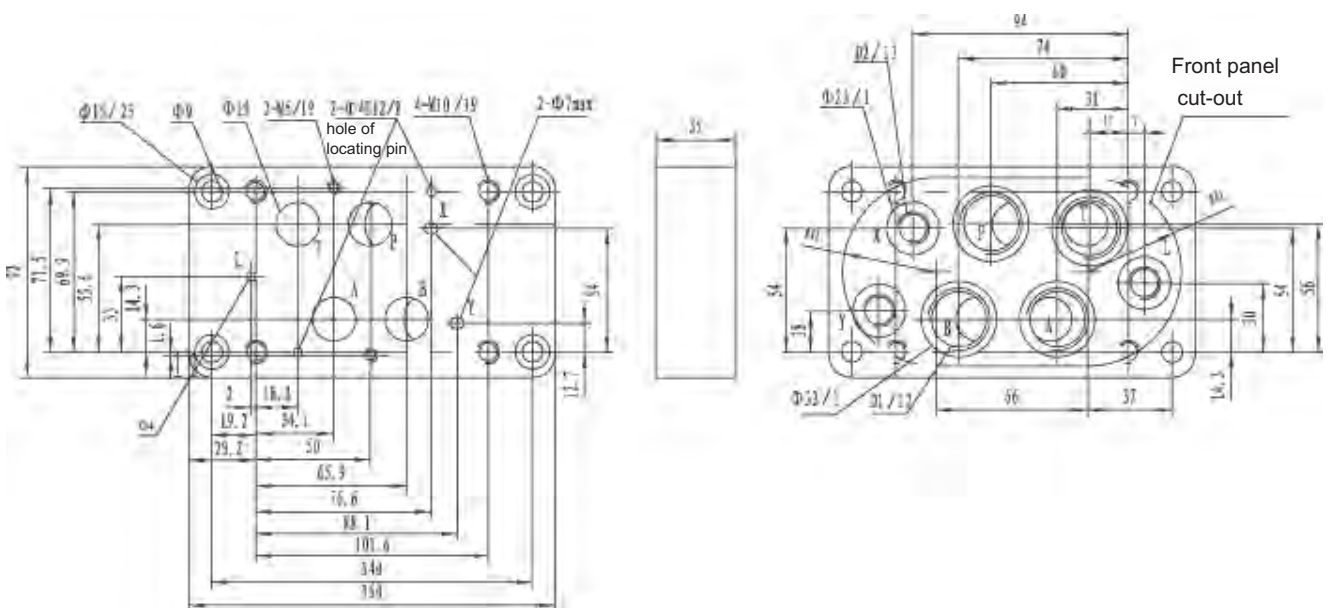
(Dimensions in mm)



Type	D1	T1	D2	ϕ D3	Weight	Valve fixing screws	Tightening torque for screws
G535/01	G3/4"	16	G1/4"	42	approx. 3.6Kg	4 - M6 × 45-10.9 (GB/T70.1-2000) Should be ordered separately.	15N.m
G535/02	M27x2		M14x1.5				
G536/01	G1"	18	G1/4"	47			
G536/02	M33x2		M14x1.5				

G172/01 G172/02

(Dimensions in mm)

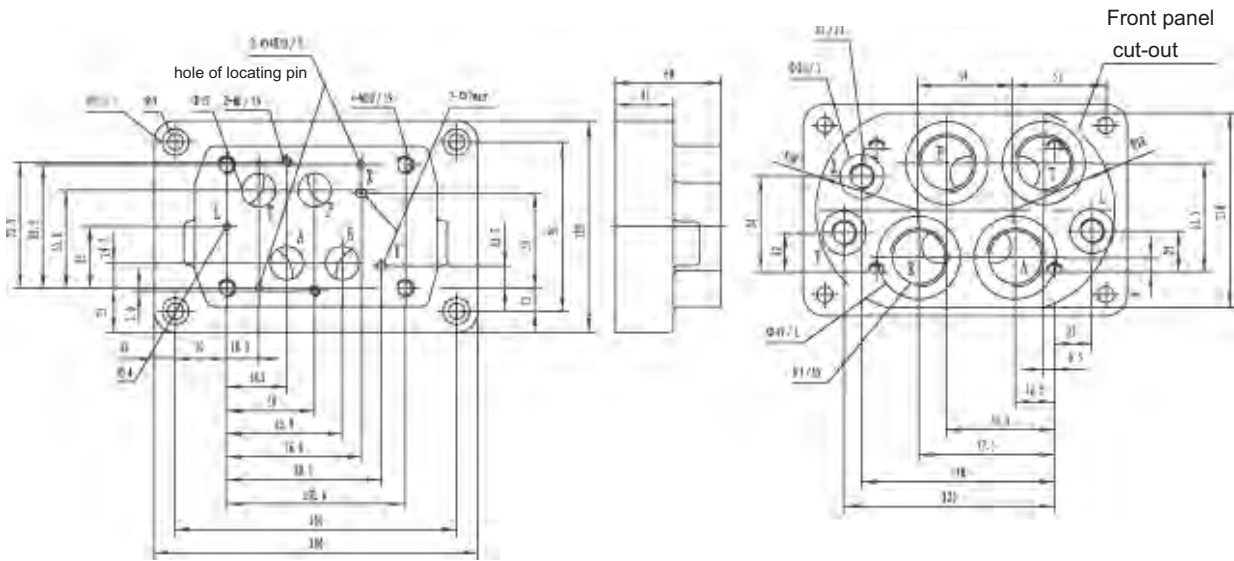


Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G172/01	G3/4"	G1/4"	approx.	4 - M10 × 60 -10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
G172/02	M27x2	M14x1.5	2.8kg	2 - M6 × 60 --10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

Subplates

G174/01 G174/02

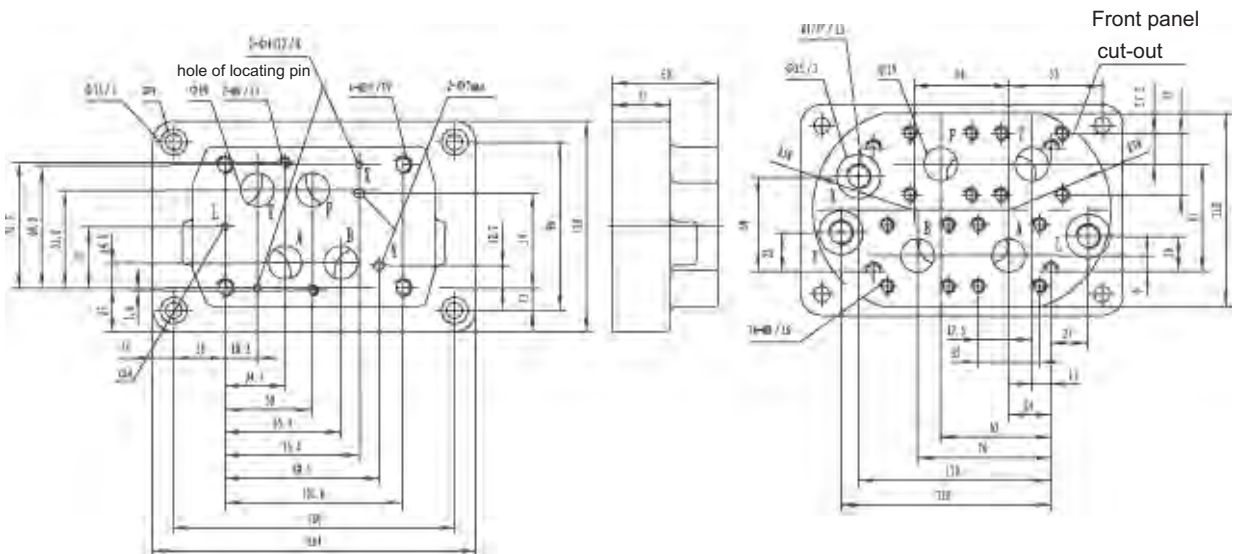
(Dimensions in mm)



Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G174/01	G1"	G1/4"	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
G174/02	M33x2	M14x1.5	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

G174/08

(Dimensions in mm)

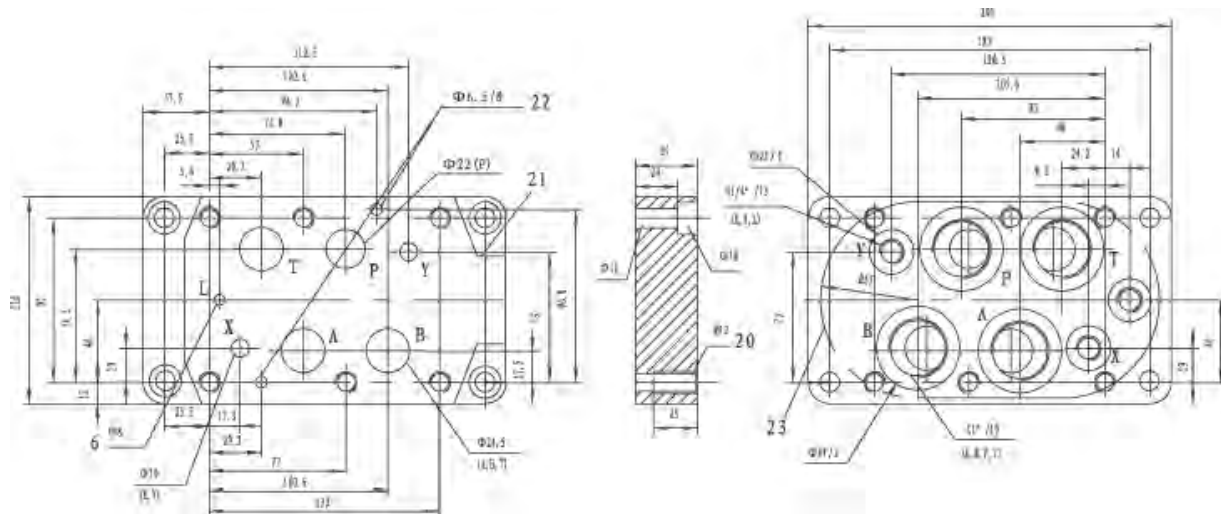


Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G174/08	25MPa	009 271	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
	40MPa	009 272	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

Subplates

G151/01(G1")G151/02(M33x2):G153/01(G1") G153/02(M33x2)

(Dimensions in mm)

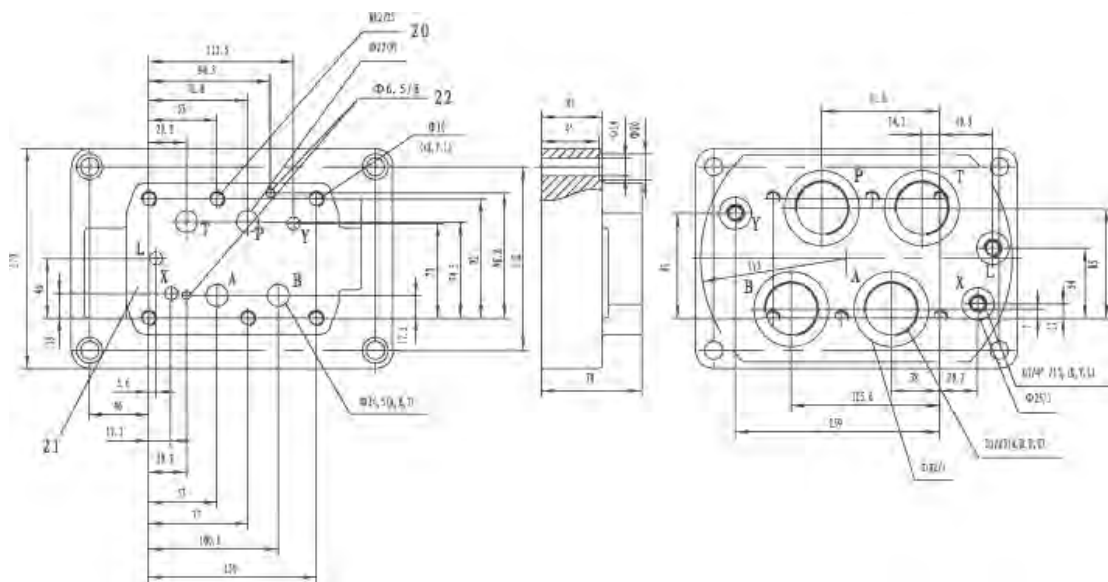


L of ϕ 8 only used on G153/01

Size	Type	Weight	Valve fixing screws	Tightening torque for screws	1) Only used on valves which are pressure-centred
NG25	G151/01	5kg	6 - M12x60-10.9 (GB/T70.1-2000),	105Nm	
	G151/02				
	G153/01				
	G153/02				

G154/01(G1 1/4");G154/02(M42x2):G156/01 G156/02(M48x2)

(Dimensions in mm)



L only used on valves which are pressure-centred

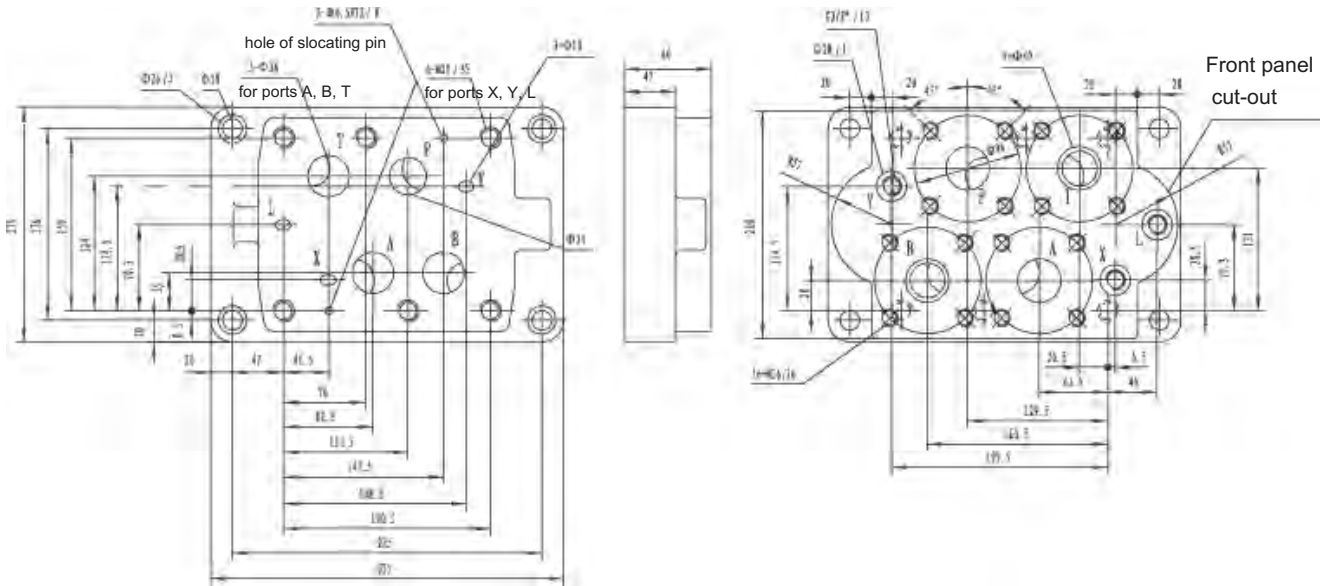
Size	Type	Weight	D1	D2	Valve fixing screws	Tightening torque for screws
NG25	G154/01	5kg	G1 1/4"	58	6 - M12x60 -10.9 (GB/T70.1-2000)	105Nm
	G154/02		M42x2			
	G156/01		G1 1/2"	65		
	G156/02		M48x2			

20 Valve fixing screws 21 mating piece of valve 22 locating pin 23 Front panel cut-out

Subplates

G158/10 flange connection

(Dimensions in mm)



“L” only used on valves which are pressure-centred

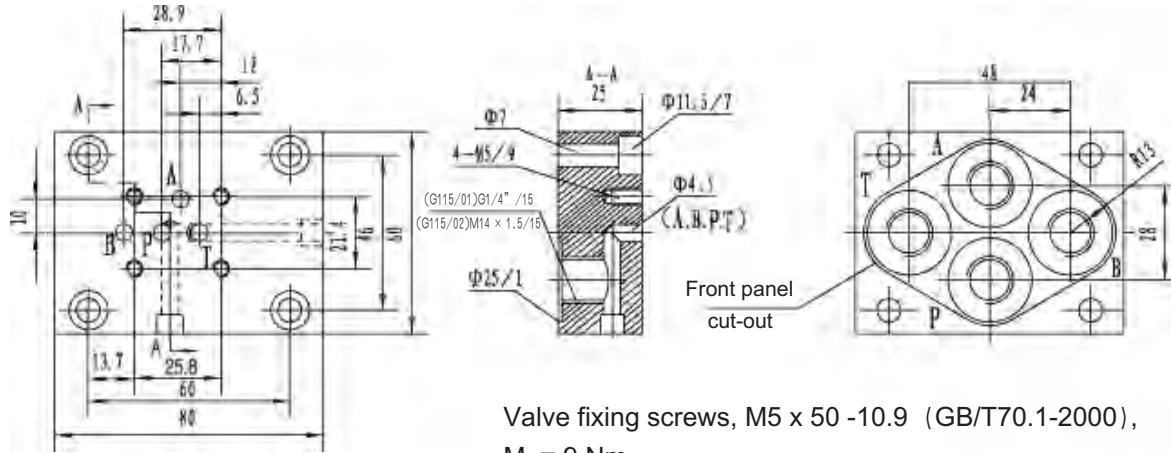
Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G158/10	165MPa	303 901	approx. 30.5kg	6 - M20 × 80 -10.9 (GB/T70.1-2000), Should be ordered separately.	580N.m
	to 25MPa	303 902			
	to 40MPa	303 903			

Subplates

For applications outside these parameters, please consult us!

G115/01 (G1/4") G115/02 (M14x1.5)

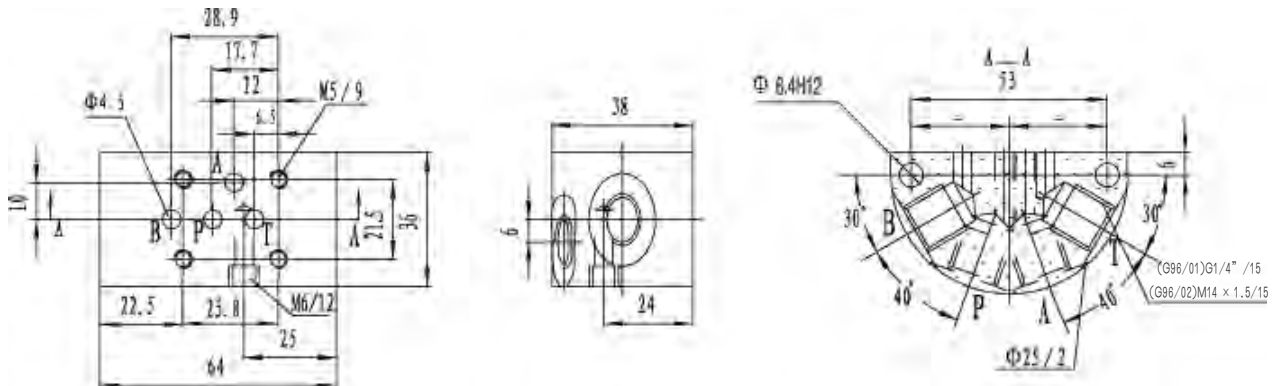
(Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

G96/01 (G1/4") G96/02 (M14x1.5)

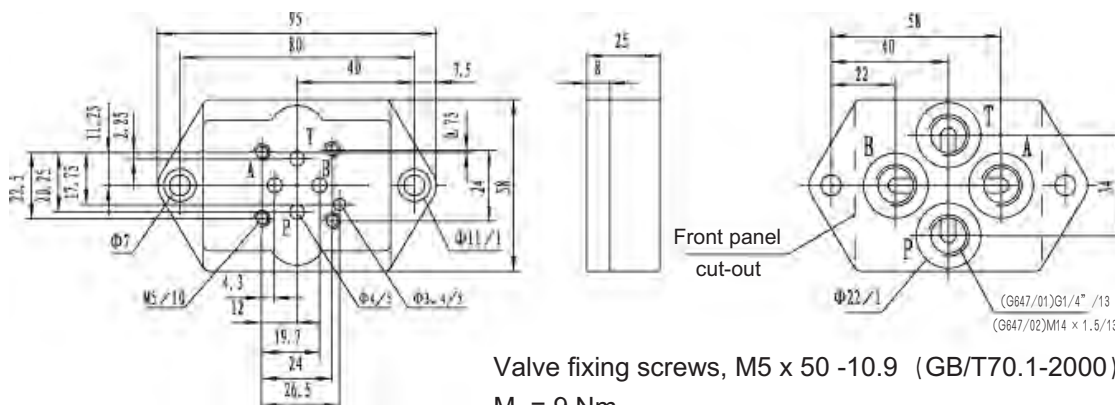
(Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

G647/01 (G1/4") G647/02 (M14x1.5)

(Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
 $M_A = 9 \text{ Nm}$

Hydraulic Valves

Catalogue

Pressure Valves

Directional Valves
Flow Control Accessories
Proportional Valves
2-way Cartridge Valves



CONTENTS

Pressure Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	Pressure remote relief valve	DBT/DBWT		31.5	1
2	Pressure relief valve , direct operated	DBD	6~30	63	5
3	Direct operated pressure relief valve,sandwich plate	Z2DBD6	6	31.5	11
4	*Pilot operated pressure relief Valve,sandwich plate	ZDB/Z2DB	6	31.5	15
5	Pilot operated pressure relief valve,sandwich plate	ZDB/Z2DB	10	31.5	21
6	Pilot operated pressure relief valve,cartridge connection	DB...K	6、10、20	31.5	27
7	Pressure relief valve	DB/DBW...30B/...	10~30	31.5	37
	Pressure relief valve(New series)	DB/DBW...50B/ ...	10~32	35	43
8	Pressure relief valves	DB3U	10~30	31.5	53
9	*Check-Q-meter	DC	10~30	31.5	61
10	Pressure reducing valve direct operated,sandwich plate	ZDR6D...30B	6	21	67
	*Pressure reducing valve direct operated,sandwich plate (New series)	ZDR6D...40B	6	21	71
11	*Pressure reducing valve	ZDR6DP0...40B/40YM	6	4.0	75
12	Direct operated pressure reducing valve,sandwich plate	ZDR10D...40B/	10	21	79
13	*Direct operated pressure reducing valve,sandwich plate(New series)	ZDR10D-50B/	10	21	83
14	*Pressure reducing valve direct operated	DR5DP	5	31.5	87
	*Pressure reducing valve direct operated	DR6DP	6	21	91
	*Pressure reducing valve direct operated	DR10DP	10	21	95



CONTENTS

Pressure Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
15	Pilot operated pressure reducing Valve	DR...30B/...	10、20、30	31.5	99
	*Pilot operated pressure reducing Valve (New series)	DR...50B/	10~25	31.5	105
16	*Direct operated pressure sequence Valve	DZ5DP	5	31.5	111
	*Direct operated pressure sequence valve	DZ6DP	6	31.5	115
	*Direct operated pressure sequence valve	DZ10DP	10	21	119
17	Pressure sequence valve pilot operated	DZ...30B/	10~30	21	123
	*Pressure sequence valve pilot operated (New series)	DZ...-50B/	10、20、30	31.5	129
18	Pressure shut-off valve pilot operated	DA/DAW...-30B/	10、20、30	31.5	135
	*Pressure shut-off valve pilot operated (New series)	DA/DAW...-50B/	10、20、30	31.5	141
19	Subplate	—	—	—	148

“*”: New products, for ordering, please consult us, telephone:+86-10-69083290



Other Huade Hydraulics Catalogues for Valves

- Directional Valves
- Flow Control Valves
- Proportional Valves
- Cartridge Valves

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure remote relief valve, types DBT/DBWT		RE 25833/12.2004
	up to 31.5 MPa	up to 3L/min	Replaces: RE 25833/05.2001

Features:

- long distance remote control
- subplate mounting
- three adjustment elements:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale



Function, section, symbols

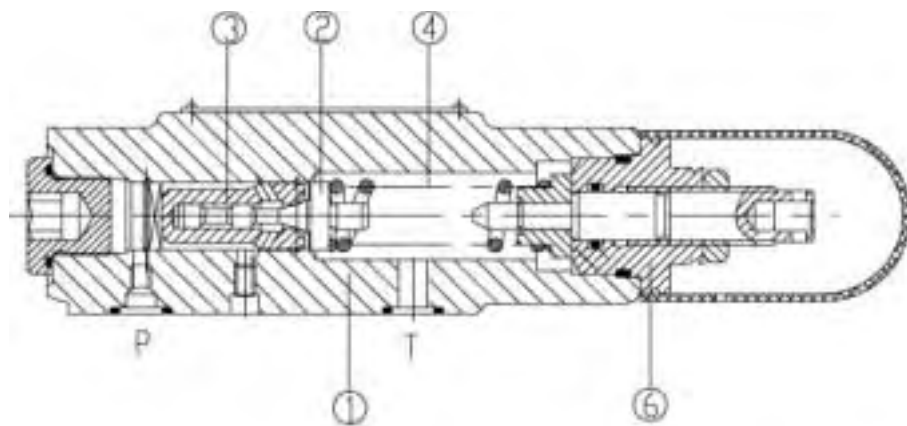
Types DBT and DBWT remote control pressure valves are pilot operated pressure relief valves.

Type DBT is apply to remote control the pressure of system.

Type DBT :

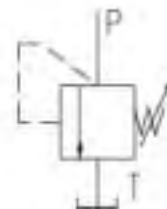
Type DBT consist mainly of the main valve (1), main spool (2), valve seat (3), and adjustment (6).

The pressure of system acts on the spool(2) via orifice. If the pressure exceeds the valve set at the spring, the pressure fluid drain to tank from port T(or drain external).



Type DBT...30/...

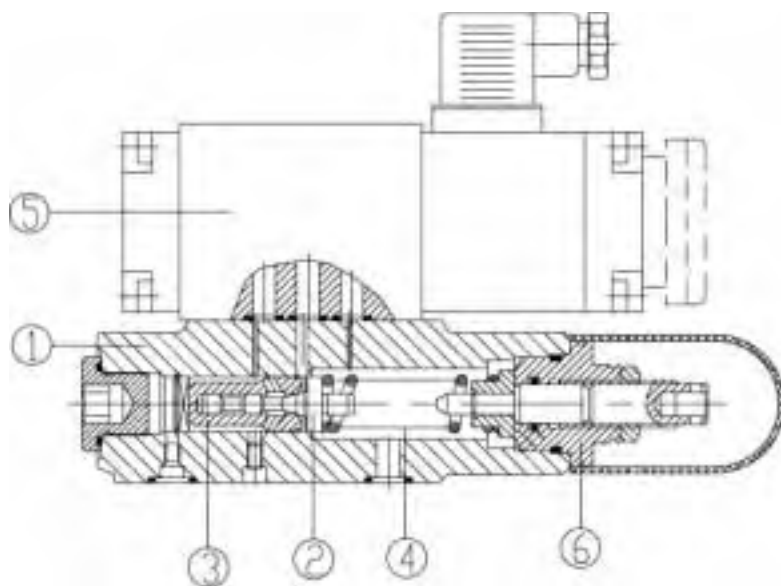
Symbol



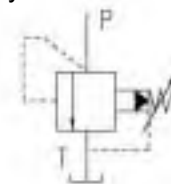
Type DBWT:

Type DBWT consist mainly of the main valve (1), main spool (2), valve seat (3), electrically operated valve (5), and adjustment (6).

Type DBWT is apply to remote control the pressure of system and drain by actuating the electrically operated valve.



symbol



Type DBWT

ordering details

DB T - 30 B / / / *

Without electrically operated valve =No code
With electrically operated valve =W

Further details in clear text

Normally closed = A
Normally open = B

No code = mineral oils
V = phosphate ester

Rotary knob = 1
Sleeve with hexagon and protective cap = 2
Lockable rotary knob with scale = 3

No code = British
2 = Metric

Series 30 to 39 (30 to 39:
unchanged installation and connection dimensions) =30

Z4 = Plug-in connector
Z5 = Large Plug-in connector
Z5L = Large Plug-in connector with light

Technology of Beijing Huade Hydraulic = B

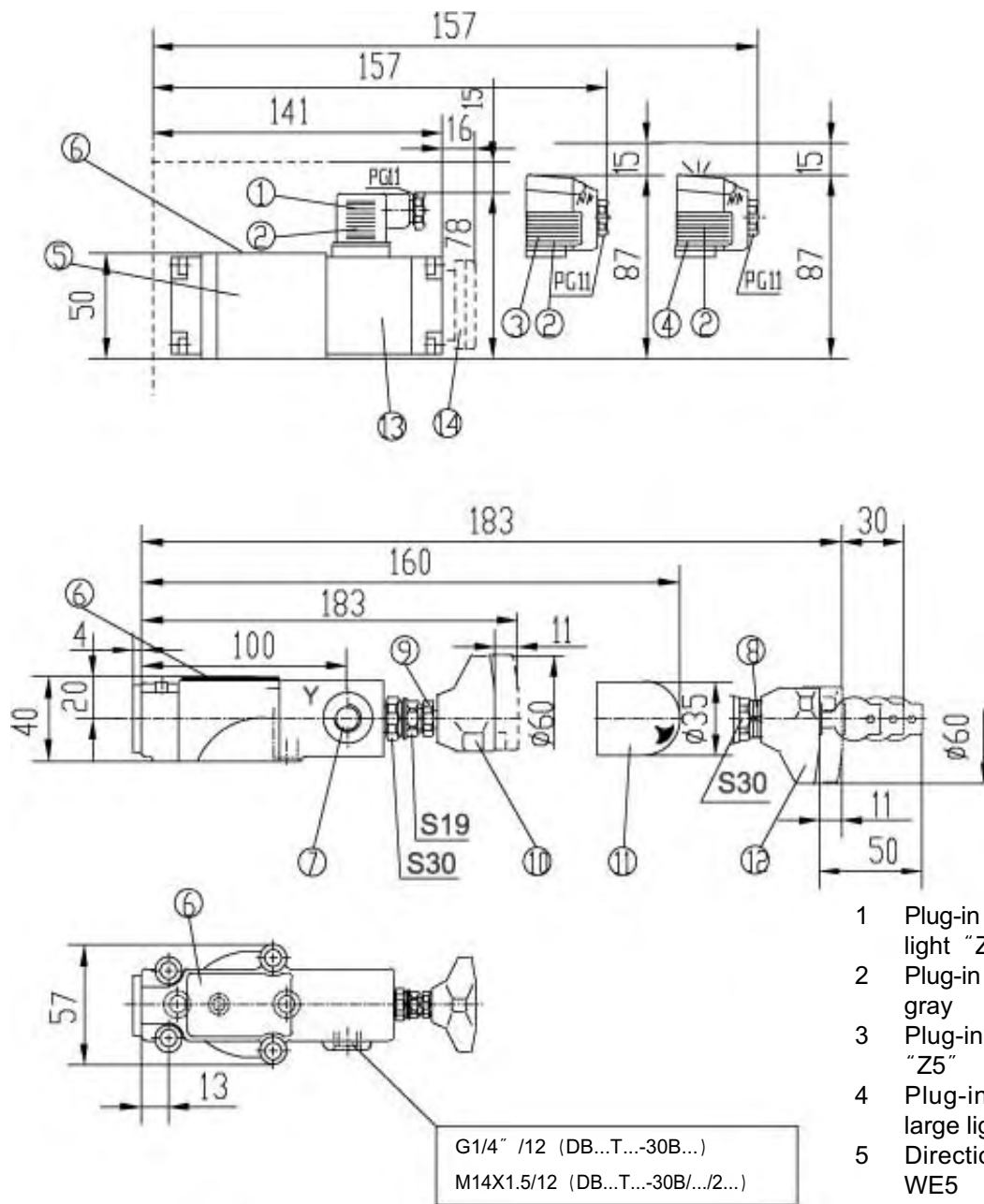
No code = Without hand override
N = With hand override

Settable pressure up to 10 MPa = 100
Settable pressure up to 31.5 MPa = 315

W220-50 = 220V 50Hz AC
G24 = 24 V DC
W220R = Solinoid commuting automatically 220V AC

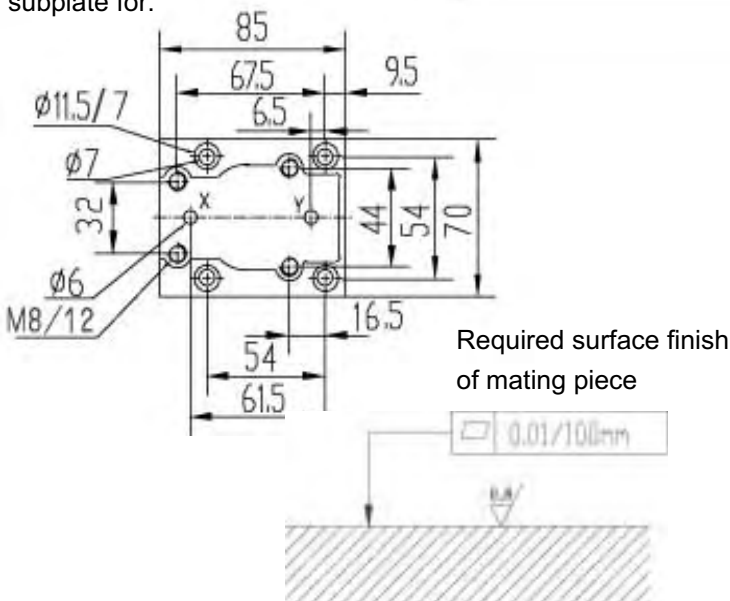
Technical data

Pressure fluid	Mineral oil (for NBR seal), or phosphate ester (for FPM seal)	
Temperature range	(°C)	-30 ~ +80
Viscosity range	(mm ² /S)	10 ~ 800
max. flow	(L/min)	3
max. operating pressure	(MPa)	31.5
max. Setting pressure	(MPa)	up to 10 or 31.5
Back pressure	DBT (MPa)	up to 31.5
	DBWT (MPa)	up to 10 (AC) ; up to 16 (DC)
Pilot valve	see directional valve WE5	




- 1 Plug-in connector without light "Z4"
- 2 Plug-in connector: colour gray
- 3 Plug-in connector large "Z5"
- 4 Plug-in connector with large light "Z5L"
- 5 Directional valves, type WE5
- 6 Nameplate
- 7 Port Y for drain external
- 8 Repeat adjusting scale
- 9 Only apply to 31.5 MPa
- 10 Adjustment element "1"
- 11 Adjustment element "2"
- 12 Adjustment element "3"
- 13 Solenoid "a"
- 14 Hand override, optional

subplate for:



Subplate G51/01, G51/02, see page 148
 O-ring 9.25X1.78
 Valve fixing screw (GB/T-70.1-2000)
 4-M8X40-10.9

NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure relief valve, direct operated, type DBD			RE 25402/12.2004
	Size 6 to 30	up to 63 MPa	up to 330L/min	Replaces: RE25402/05.2001

Features:

- As cartridge valve
- For threaded connections
- for subplate mounting
- 3 pressure adjustment elements, optional:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale



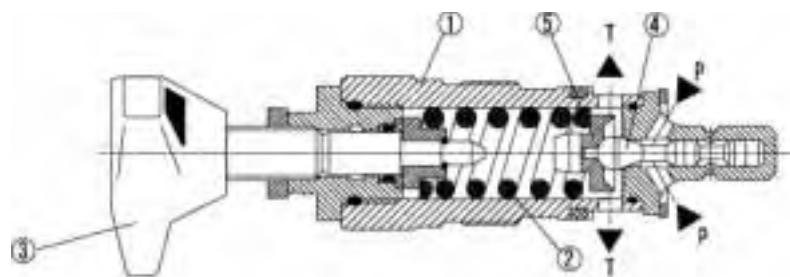
Function, section

The DBD pressure relief valves are direct operated poppet valves.

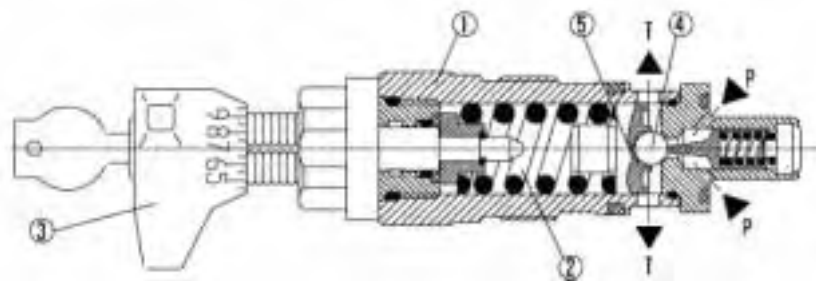
They are used to limit the pressure in a hydraulic system.

The valves mainly consist of sleeve (1), spring (2), poppet with damping spool (4) (pressure stages 2.5 to 40 MPa) or ball (4) (pressure stage 63 MPa) and adjustment element (3). The setting of the system pressure is infinitely variable via the adjustment element (3). The spring (2) pushes the poppet (4) onto the seat. The P channel is connected to the system. The pressure present in the system is applied to the poppet area (or ball).

If the pressure in channel P rises above the valve set at the spring (2), the poppet (4) opens against the spring (2). Now pressure fluid flows from channel P into channel T. The stroke of the poppet (4) is limited by a pin. In order to maintain a good pressure settings over the entire pressure range the pressure range is split into 7 pressure stages. One pressure stage corresponds to a certain spring for a maximum operating pressure which may be set with it.



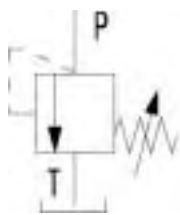
DBDH...K...10B/...(poppet valve)



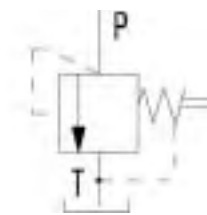
DBDA...K...10B/...(ball valve)

Type DBD ,direct operated pressure relief valve

Symbols



Simplified



Detailed

Ordering details

DBD				10	B	/	/	/	*
-----	--	--	--	----	---	---	---	---	---

Pressure relief valve direct operated = DBD

Further details in clear text

Adjustment element

Grub screw with hexagon and protective cap = S

Rotary knob = H

Lockable rotary knob (only to size 6.8 and 10) = A

No code = mineral oils

V = phosphate ester

Size

Nominal size	G	K	P
6=	6	6	6
8=	8	-	-
10=	10	10	10
15=	15	-	-
20=	20	20	20
25=	25	-	-
30=	30	30	30

No code= British
2= metric

Pressure stage

NG10	NG 6 to 20	NG 25 to 30
25	25	25
50	50	50
100	100	100
200	200	200
315	315	315
400	400	-
630	-	-

Type of connection

As cartridge valve (cartridge) = K

For threaded connections = G

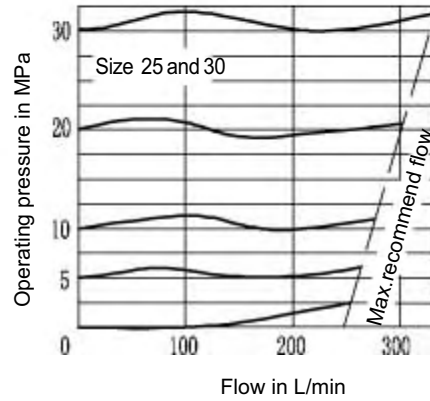
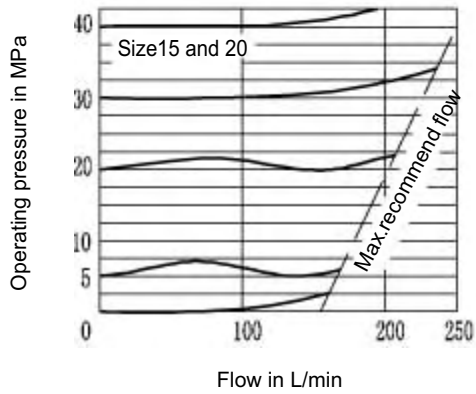
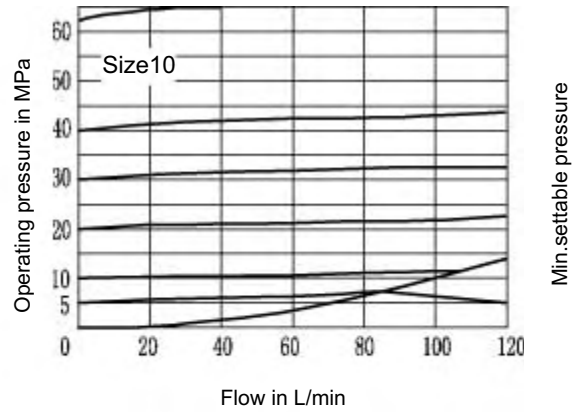
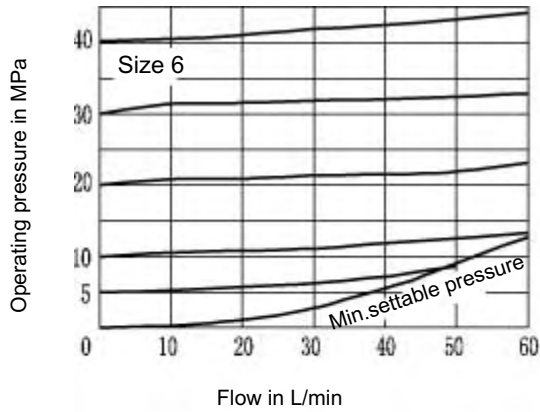
For subplate mounting = P

B= Technology of Beijing Huade Hydraulic

Series 10 = 10

(10 to 19: unchanged installation and connection dimensions)

Characteristic curves (measured at $v = 41\text{mm}^2/\text{s}$, $t=50^\circ\text{C}$)

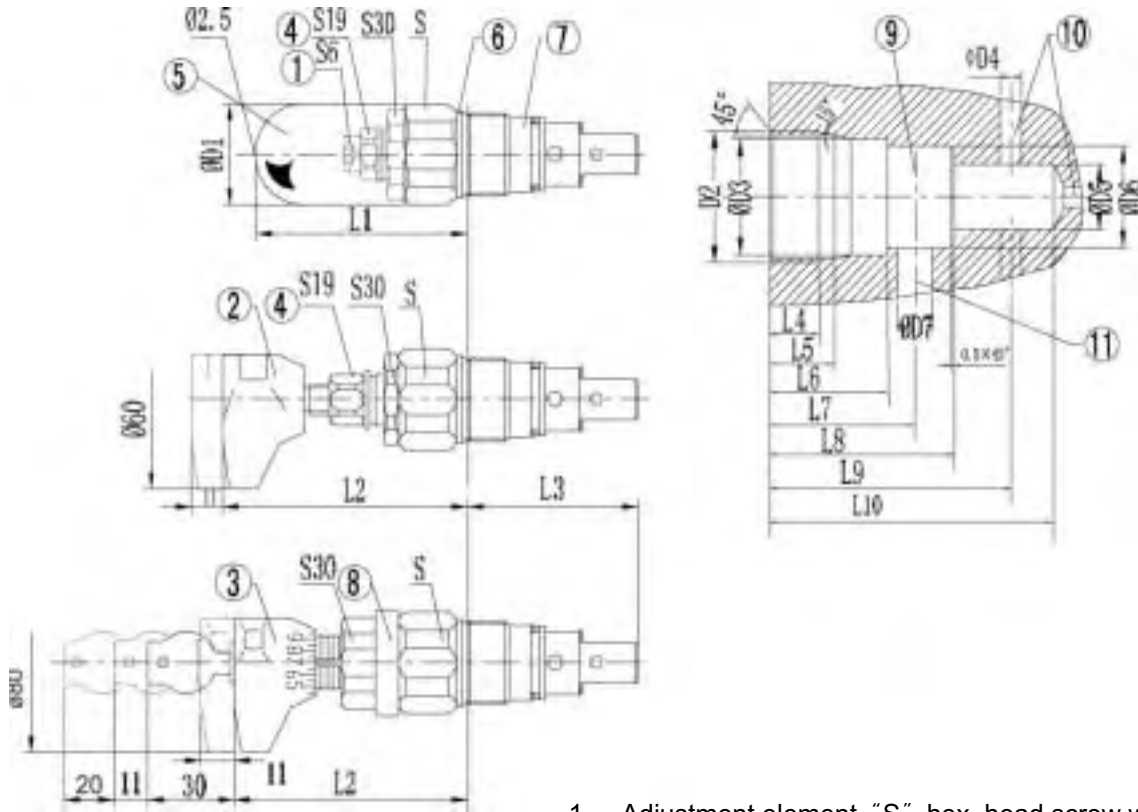


Hydraulic technical data

Size		6	8, 10	15, 20	25, 30
Operating pressure (MPa)	Port P	40	63	40	31.5
	Port T	31.5			
flow	(L/min)	50	120	250	350
Pressure fluid		Mineral oil (for NBR seal), or phosphate ester (for FPM seal)			
Pressure fluid temperature range	($^\circ\text{C}$)	-30 ~ +80			
Viscosity range	(mm^2/s)	10 ~ 800			

Unit dimensions: cartridge valve

(Dimensions in mm)



1. Adjustment element "S" hex. head screw with protective cap
2. Adjustment element "H" rotary knob
3. Adjustment element "A" lockable rotary knob (only to size 6, 8, 10)
4. Lock nut
5. Protective cap
6. Type code
7. Pressure rating (stamped on)
8. Marking (adjustment of zero position after the valve has been screwed in; subsequent fixing of the ring by a horizontal movement until it locks into place on the 6 A/F plug)
9. Fitting depth
10. Connection port P, optional
11. Connection port T, optional

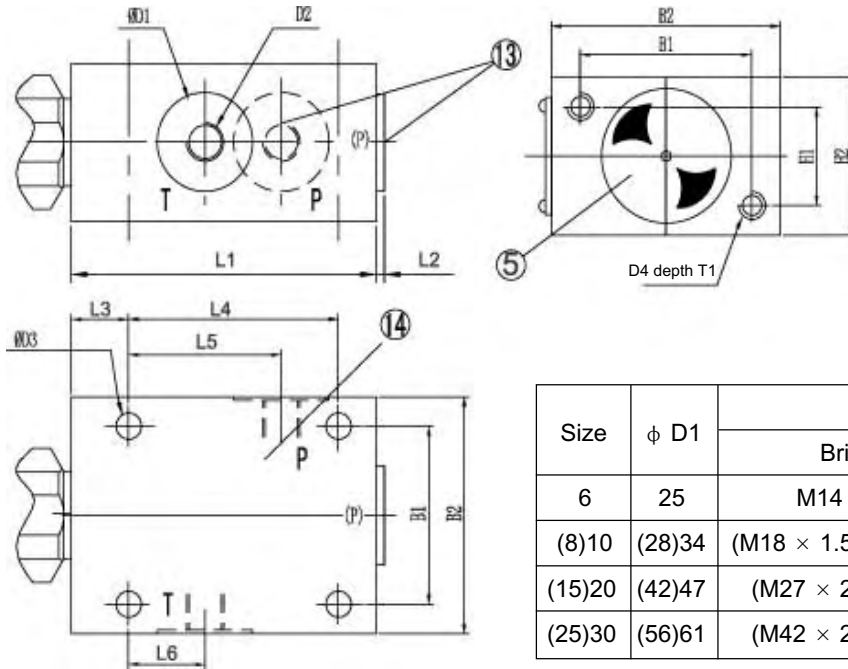
Size	φ D1	D2	φ D3H9	φ D4
6	34	M28 × 1.5	25	6
10	38	M35 × 1.5	32	10
20	48	M45 × 1.5	40	20
30	63	M60 × 1.5	55	30

Size	φ D5	φ D6H9	φ D7	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	S	Light (kg)
6	15	24.9	6	72	83	64.5	15	19	30	35	45	56.5	65	32	approx.0.4
10	18.5	31.5	10	68	79	75	18	23	35	41	52	67.5	80	36	approx.0.5
20	24	39.9	20	65	77	106	21	27	45	54	70	91.5	110	46	approx.1
30	38.75	54.9	30	83	-	131	23	29	45	60	84	113.5	140	60	approx.2.2

Unit dimensions: for pipe mounting

(Dimensions in mm)

Adjustment element see front page



Size	$\phi D1$	D2	
		British	Metric
6	25	M14 × 1.5	G1/4"
(8)10	(28)34	(M18 × 1.5)M22 × 1.5	(G3/8")G1/2"
(15)20	(42)47	(M27 × 2)M33 × 2	(G3/4")G1"
(25)30	(56)61	(M42 × 2)M48 × 2	(G1 1/4")G1 1/2"

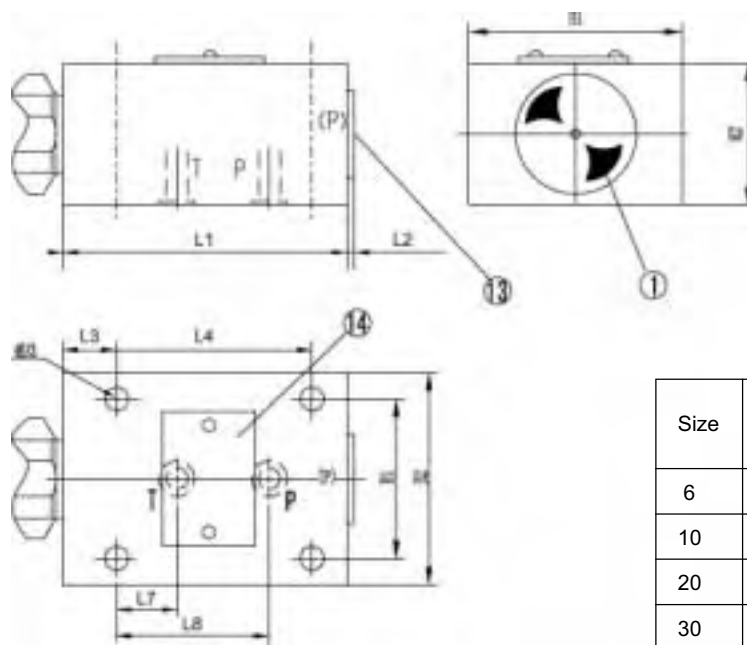
Size	$\phi D3$	D4	B1	B2	H1	H2	L3	L4	L5	L6	L7	L8	T1	Weight (Kg)
6	6.6	M6	45	60	25	40	80	4	15	55	40	20	10	approx. 1.5
(8)10	9	M8	60	80	40	60	100	4	20	70	49	21	20	approx. 3.7
(15)20	9	M8	70	100	50	70	135	5.5	20	100	65	34	20	approx. 6.4
(25)30	11	M10	100	130	60	90	180	5.5	25	130	85	35	25	approx. 13.9

Unit dimensions: for pipe mounting

(Dimensions in mm)

Adjustment element see front page


Rest dimension see the pipe mounting



- Adjustment element "S" hex. head screw with protective cap
 - Connection port "P", optional (e.g. for pressure measuring)
 - Nameplate
- Subplate see page 148

Size	L7	L8	Subplate	Valve fixing screws GB/T 70.1-2000
6	20	40	G300/1	M6 × 50-10.9
10	21	45	G302/1	M8 × 70-10.9
20	34	65	G304/1	M8 × 90-10.9
30	35	85	G306/1	M10 × 110-10.9

NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Direct operated pressure relief valve, sandwich plate,type Z2DBD6			RE 25410/12.2004
	Size 6	up to 31.5 MPa	up to 35 L/min	

Features:

- Sandwich plate valve
- With one or two pressure relief cartridges



Functional, section,symbol

Pressure relief valve type Z2DBD6 is pilot operated and is of sandwich plate design.

They are used to limit the pressure within a hydraulic system.

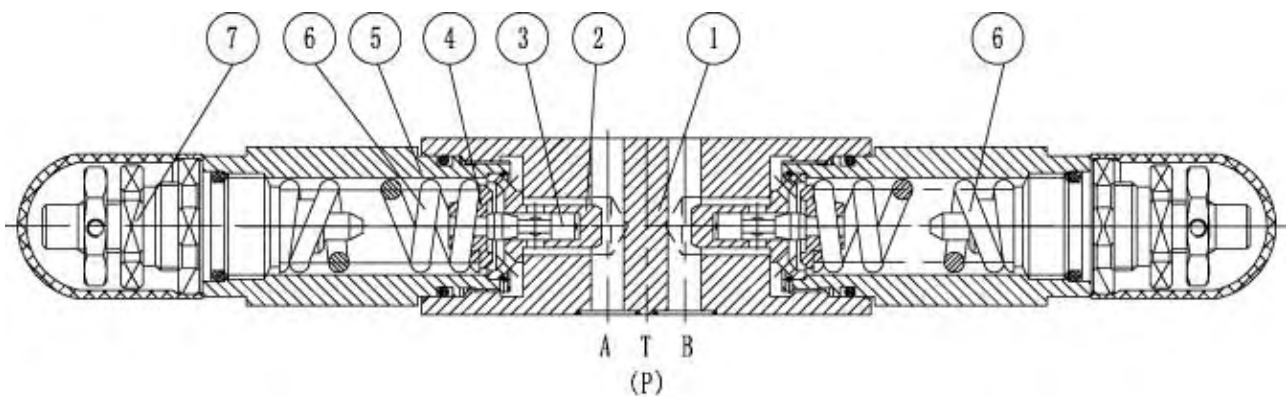
They basically consist of the housing (1), together with two pressure relief valve cartridges.

The system pressure is set by means of adjustment element (7).

At rest, the valve is closed. Pressure in port A (or B) acts on the spool (3).

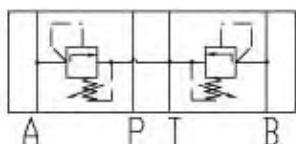
If the pressure in port A rises above the pressure set on spring (6), the spool (3) opens, fluid can now flows from a channel into port T.

Similarly,the mode is apply to port B.



Type Z2DBD6

Symbol



Ordering code

Z 2 DBD 6 VC- -10 B / / *

Sandwich plate = Z

Further details in clear text

With 2 pressure relief valve cartridges = 2

No code = mineral oils
V = phosphate ester

Pressure relief valve, direct operated = DBD

Nominal size 6 = 6

100 = Pressure adjustable up to 10 MPa
200 = Pressure adjustable up to 20 MPa
315 = Pressure adjustable up to 31.5 MPa

Relief function form:
A - T and B - T = VC

B = Technology of Beijing Huade Hydraulic

Adjustment element
Rotary knob =1
Sleeve with hexagon and protective cap =2
Lockable rotary knob with scale =3

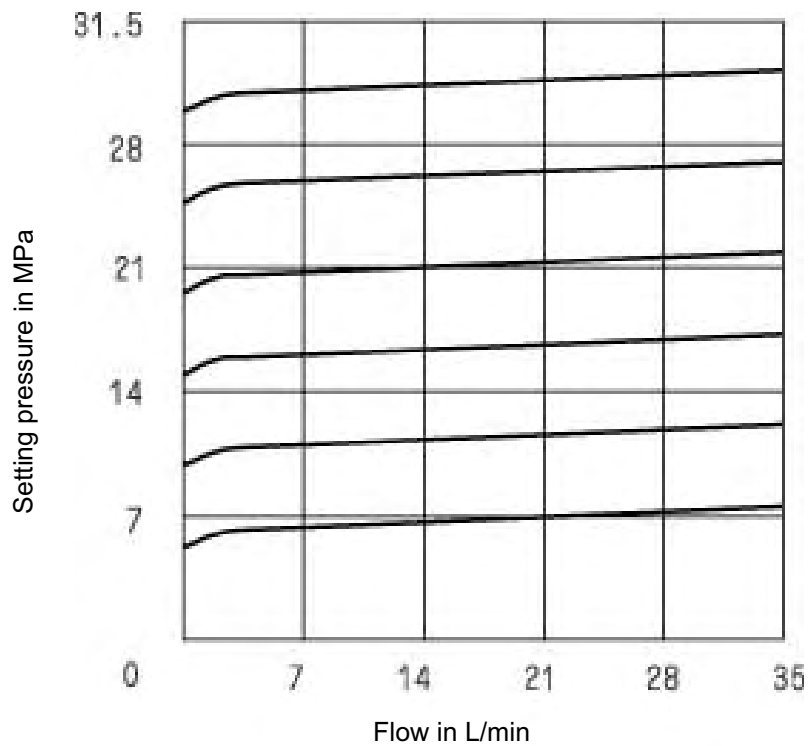
Series 10 to 19 = 10
(10 to 19 = unchanged installation and connection dimensions)

Technical data (for applications outside these parameters, please consult us!)

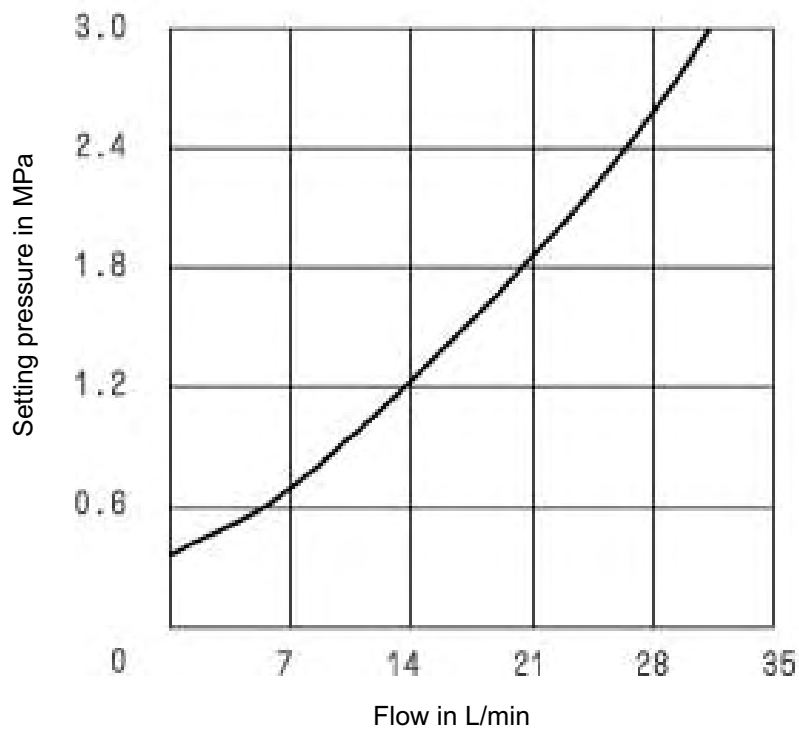
Operating pressure, max.	(MPa)	up to 31.5
Viscosity range	(mm ² /s)	10-800
Flow, max.	(L/min)	up to 35
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid temperature range	(°C)	-30 to +80
Degree of fluid contamination		Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

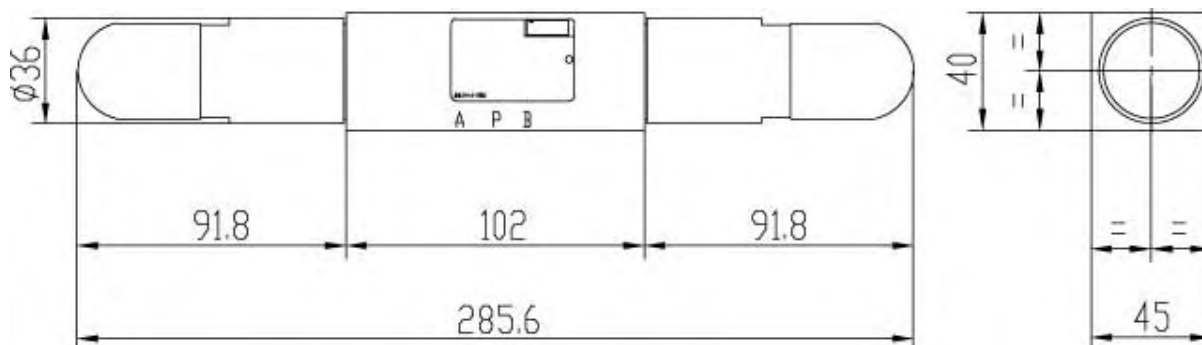
Pressure-flow characteristic curve



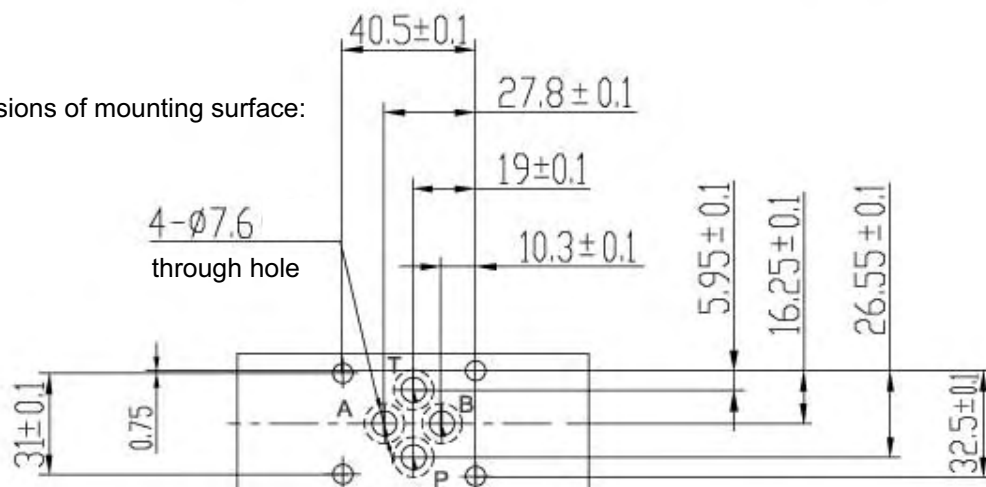
Min.pressure-flow characteristic curve



Type Z2DBD6VC-2-10B/..



Dimensions of mounting surface:



Size	O-rings for port A, B, P, T
6	9.25X1.78

Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated pressure relief valve sandwich plate,type ZDB/Z2DB6			RE25750/12.2004
	Size 6	up to 31.5 MPa	up to 60 L/min	Replaces: RE25750/05.2001

Features:

- Sandwich plate valve
- 4 pressure ranges
- 5 circuit options
- With one or two pressure relief cartridges
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Lockable rotary knob
- Porting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H



Functional, section

Pressure relief valve types ZDB and Z2DB are pilot operated and are of sandwich plate design.

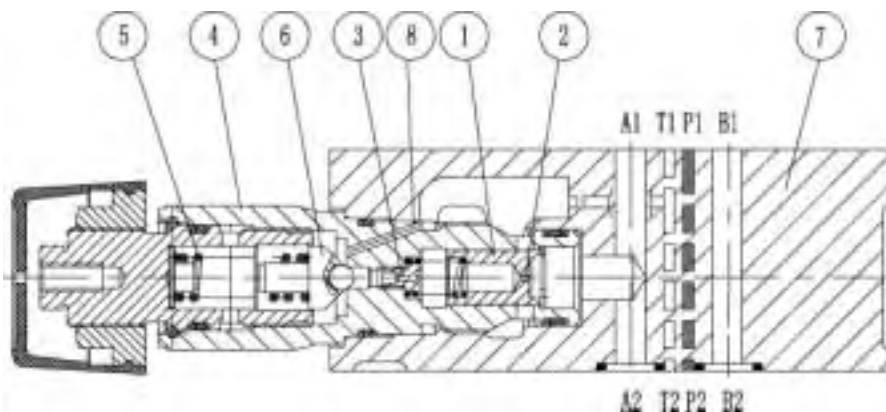
They are used to limit the pressure within a hydraulic system.

They basically consist of the housing (7), together with one or two pressure relief valve cartridges.

The system pressure is set by means of adjustment element (4).

At rest, the valve is closed. Pressure in port A acts on the spool (1). At the same time pressure passes through orifice (2) on to the spring loaded side of spool (1) and via orifice (3) to the pilot poppet (6). If the pressure in port A rises above the value set on spring (5), the pilot poppet (6) opens. Fluid can now flow from the spring loaded side of spool (1), orifice (3), and channel (8) into port T. The resulting pressure drop then moves spool (1), causing this to open connection A to T, while the pressure set at spring (5) is maintained.

Pilot oil from the two spring chambers return externally to tank via port T.



Type ZDB 6 VA2 - 40B/..

Ordering code

Z DB 6 40 B *

Sandwich plate = Z

Further details in clear text

Only applies to models VC and VD:

With 1 pressure relief valve cartridges = no code

With 2 pressure relief valve cartridges = 2

No code = mineral oils

V = phosphate ester

50 = Pressure adjustable up to 5 MPa

100 = Pressure adjustable up to 10 MPa

200 = Pressure adjustable up to 20 MPa

315 = Pressure adjustable up to 31.5 MPa

Pressure relief valve = DB

B= Technology of Beijing Huade Hydraulic

Nominal size 6 = 6

40= Series 40 to 49

(40 to 49 = unchanged installation and connection dimensions)

Relief function form:

A → T = VA

P → T = VP

B → T = VB

A → T and B → T = VC

A → B and B → A = VD

Adjustment element

1 = Rotary knob

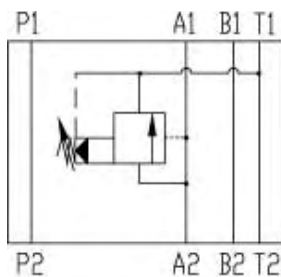
2 = Sleeve with hexagon and protective cap

3 = Lockable rotary knob with scale

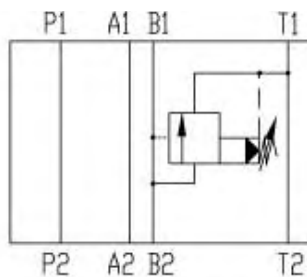
7 = Rotary knob with scale

Symbols

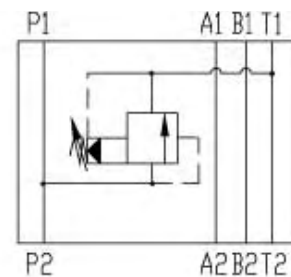
Type ZDB 6 VA ..



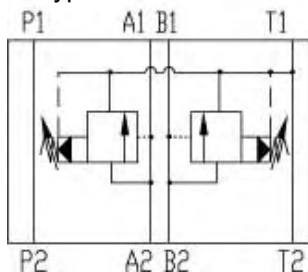
Type ZDB 6 VB ..



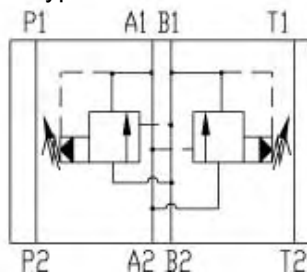
Type ZDB 6 VP ..



Type Z2DB 6 VC ..



Type Z2DB 6 VD ..

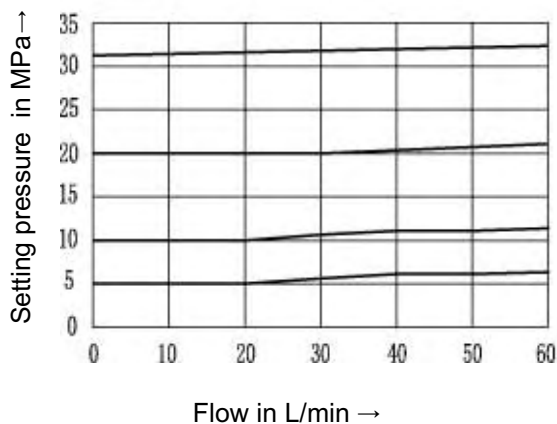


Technical data (For applications outside these parameters, please consult us!)

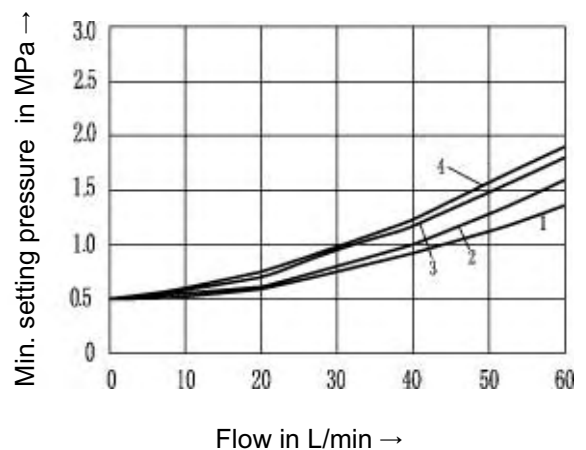
Pressure fluid	Mineral oil (for NBR seal), or phosphate ester (for FPM seal)	
Pressure fluid - temperature range (°C)	-30~ +80	
Viscosity range (mm ² /s)	10~ 800	
Degree of fluid contamination	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$	
Operating pressure, max. (MPa)	up to 31.5	
Pressure adjustable, max. setting (MPa)	up to 5, to 10, to 20, to 31.5	
Flow, max. (L/min)	up to 60	
Weight	Type ZDB 6 (Kg)	approx. 1
	Type Z2DB 6 (Kg)	approx. 1.2

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

P_E - Q characteristic curve

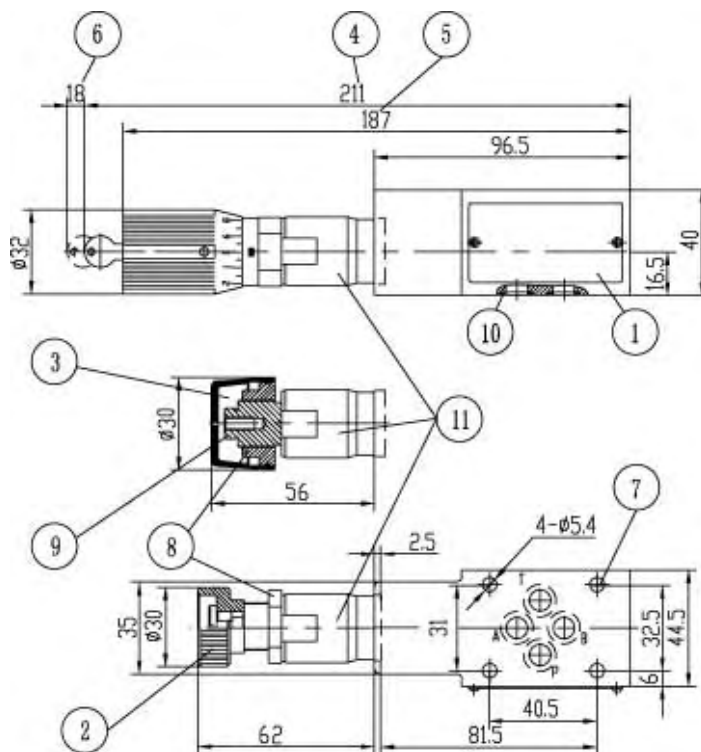


P_{Emin} - Q characteristic

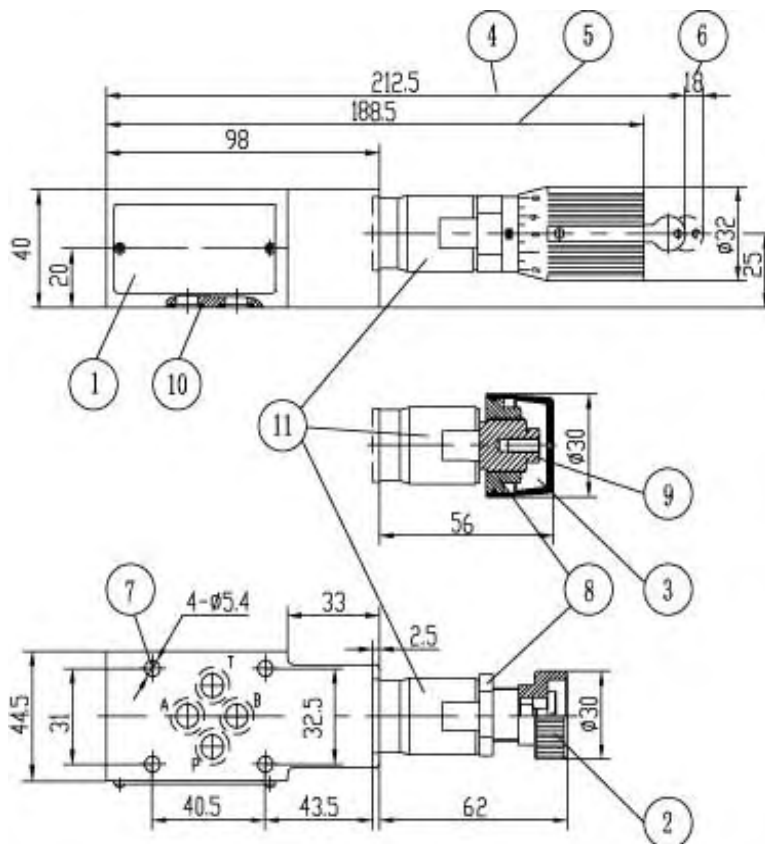


- 1 VD (A to B)
- 2 VA
- 3 VB, VC
- 4 VP, VD (B to A)

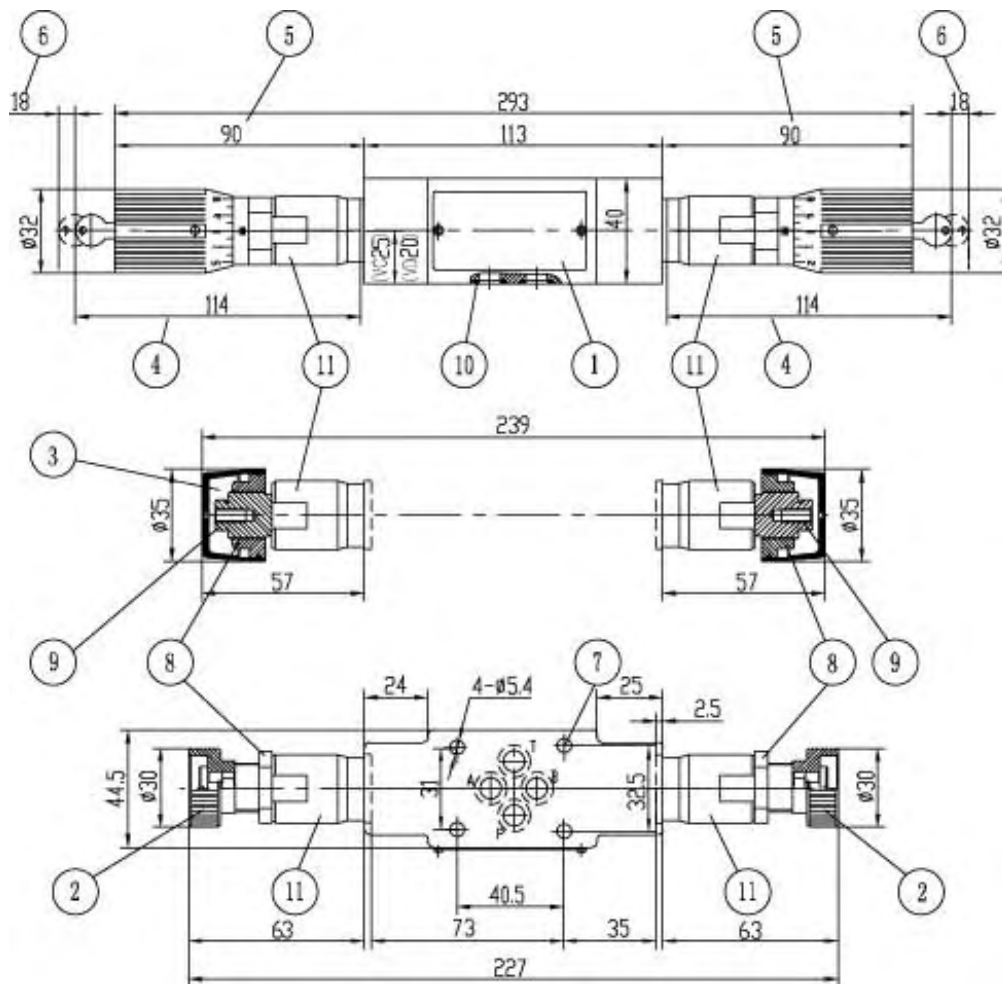
Type ZDB6 VA..



Type ZDB6 VB.. and ZDB6 VP..



Type Z2DB6 VC..and Z2DB6 VD..




- 1 Nameplate
 - 2 Adjustment element 1
 - 3 Adjustment element 2
 - 4 Adjustment element 3
 - 5 Adjustment element 7
 - 6 Space required to remove key
 - 7 Valve fixing screw holes
 - 8 Lock nut 24 A/F
 - 9 Hexagon 10 A/F
 - 10 O-ring 9.25 x 1.78 for ports A2, B2, P2, T2
 - 11 Hexagon 24 A/F
- Tightening torque $M_A = 50 \text{ Nm}$

Required surface finish of mating piece



NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYADRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated pressure relief valve, sandwich plate,type ZDB/Z2DB10			RE 25761/12.2004
	Size10	up to 31.5 MPa	up to 100 L/min	Replaces: RE25750/05.2001

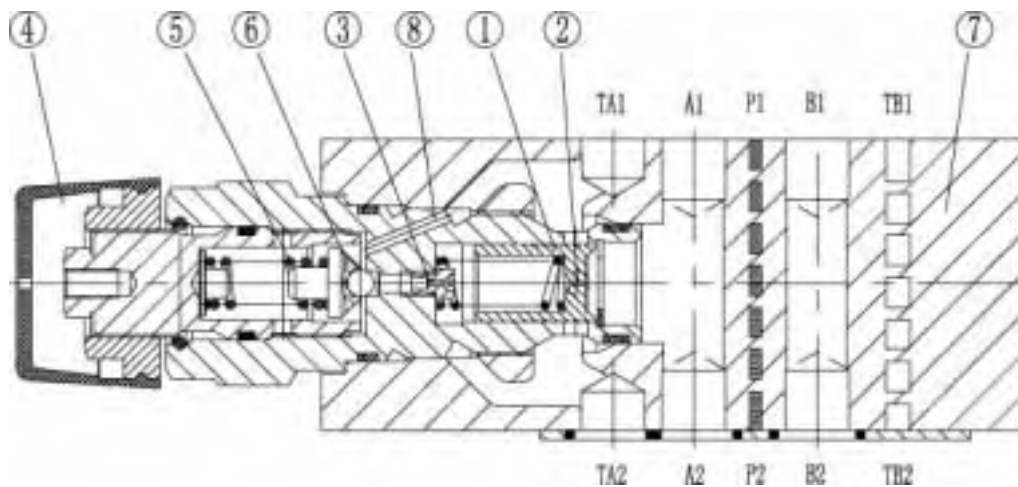
Features:

- Sandwich plate valve
- 4 pressure ranges
- 5 circuit options
- With one or two pressure relief cartridges
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Lockable rotary knob
- Porting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H



Functional, section

Pressure relief valve types ZDB and Z2DB are pilot operated and are of sandwich plate design. They are used to limit the pressure within a hydraulic system, together with one or two pressure relief valve cartridges. The system pressure is set by means of adjustment element (4). At rest, the valve is closed. Pressure in port A acts on the spool (1). At the same time pressure passes through orifice (2) on to the spring loaded side of spool (1) and via orifice (3) to the pilot poppet (6). If the pressure in port A rises above the value set on spring (5), the pilot poppet (6) opens. Fluid can now flow from the spring loaded side of spool (1), orifice (3), and channel (8) into port T. The resulting pressure drop then moves spool (1), causing this to open connection A to T, while the pressure set at spring (5) is maintained. Pilot oil return from the two spring chambers is taken externally via port T.



Type ZDB 6 VA2 - 40B/..

Ordering code



Sandwich plate = Z

Only applies to models VC and VD:
 With 1 pressure relief valve cartridges = No code
 With 2 pressure relief valve cartridges = 2

Pressure relief valve = DB

Nominal size 10 = 10

Relief function from to:

A	→	T	= VA	
B	→	T	= VB	
P	→	T	= VP	
A	→	T and B	→ T	= VC
A	→	B and B	→ A	= VD
TB1	→	TA2	= VT	

Further details in clear text

No code = mineral oils
 V = phosphate ester

50 = Pressure adjustable up to 5 MPa
 100 = Pressure adjustable up to 10 MPa
 200 = Pressure adjustable up to 20 MPa
 315 = Pressure adjustable up to 31.5 MPa

B= Technology of Beijing Huade Hydraulic

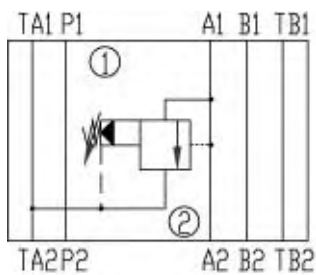
40 = Series 40 to 49
 (40 to 49 = unchanged installation and connection dimensions)

Adjustment element

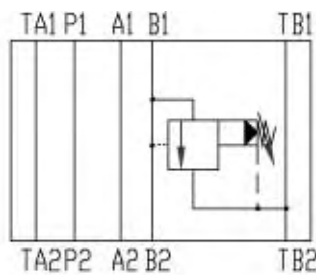
1 =	Rotary knob
2 =	Sleeve with hexagon and protective cap
3 =	Lockable rotary knob with scale
7 =	Rotary knob with scale

Symbols

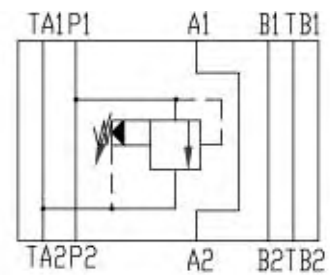
Type ZDB 10 VA ..



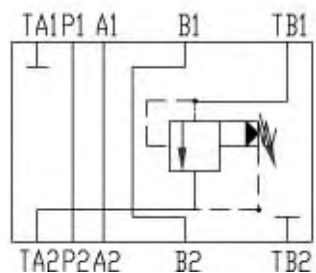
Type ZDB 10 VB ..



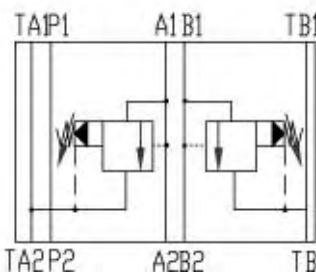
Type ZDB 10 VP ..



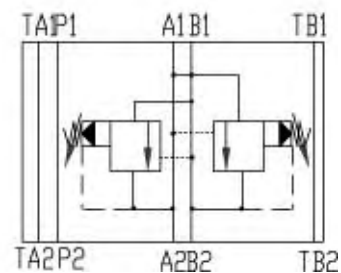
Type ZDB 10 VT ..



Type Z2DB 10 VC ..



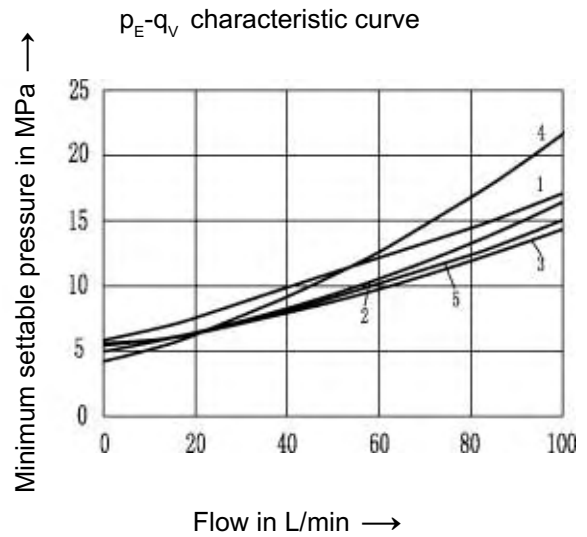
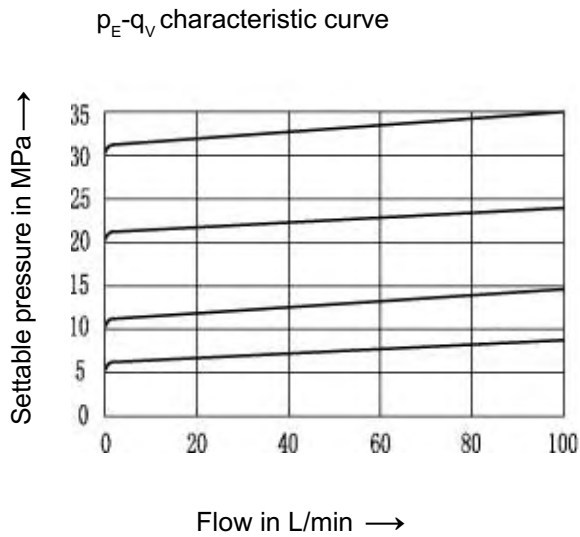
Type Z2DB 10 VD ..



Technical data (for applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil (for NBR seal), or phosphate ester (for FPM seal)	
Pressure fluid - temperature range (°C)	-30 to +80	
Viscosity range (mm ² /s)	10-800	
Degree of fluid contamination	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$	
Operating pressure, max. (MPa)	up to 31.5	
Pressure adjustable, max. setting (MPa)	up to 5, up to 10, up to 20, up to 31.5	
Flow, max. (L/min)	up to 100	
Weight (Kg)	Type ZDB 10	approx. 2.4
	Type Z2DB 10	approx. 2.6

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)



- 1 VA , VB
- 2 VP
- 3 VC
- 4 VD (A to B)
- 5 VD (B to A)

Type ZDB10 VA...
 Type ZDB10 VT...
 Type ZDB10 VP...

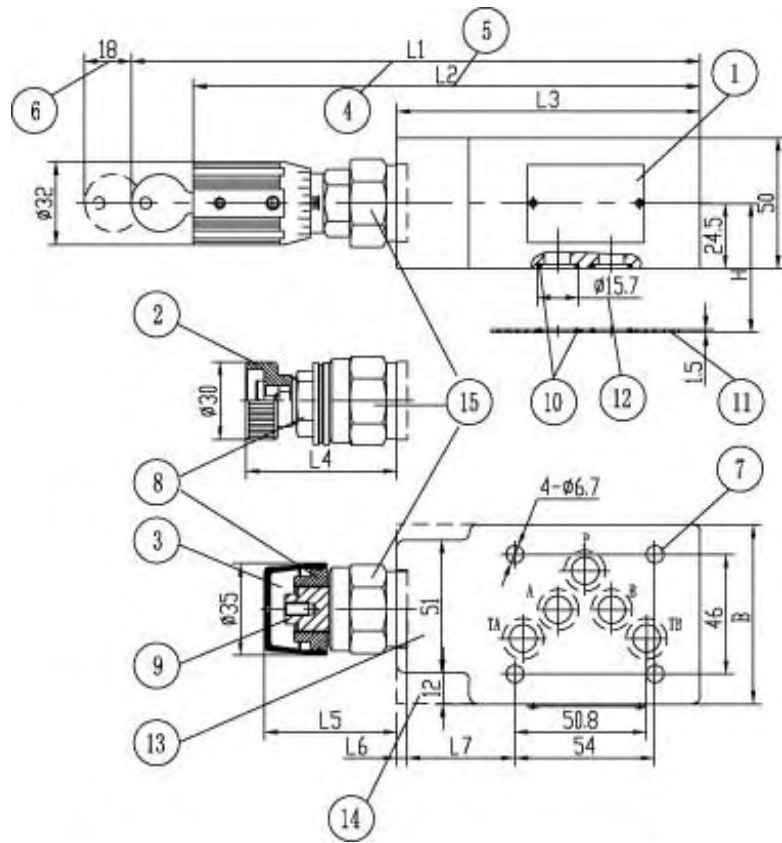
Dimensions	ZDB10	
	VA VP	VT
B	69	70
H	26	25
L1	227	218
L2	203	194
L3	117	105
L4	57.6	60.9
L5	50.3	53.6
L6	4	0.7
L7	41.5	31.8

- 1 Nameplate
- 2 Adjustment element 1
- 3 Adjustment element 2
- 4 Adjustment element 3
- 5 Adjustment element 7
- 6 Space required to remove key
- 7 Valve fixing screw holes
- 8 Lock nut 24 A/F
- 9 Hexagon 10 A/F
- 10 O-rings 12 x 2 for ports A2, B2, P2, TA2, TB2
- 11 O-ring plate 72 x 60 x 1.5 (only for models VA, VB and VP)
- 12 Counter bores only for models VC, VD and VT
- 13 Models ZDB 10 VA and VP
- 14 Model ZDB 10 VT
- 15 Hexagon 30 A/F, Tightening torque $M_A = 50 \text{ Nm}$

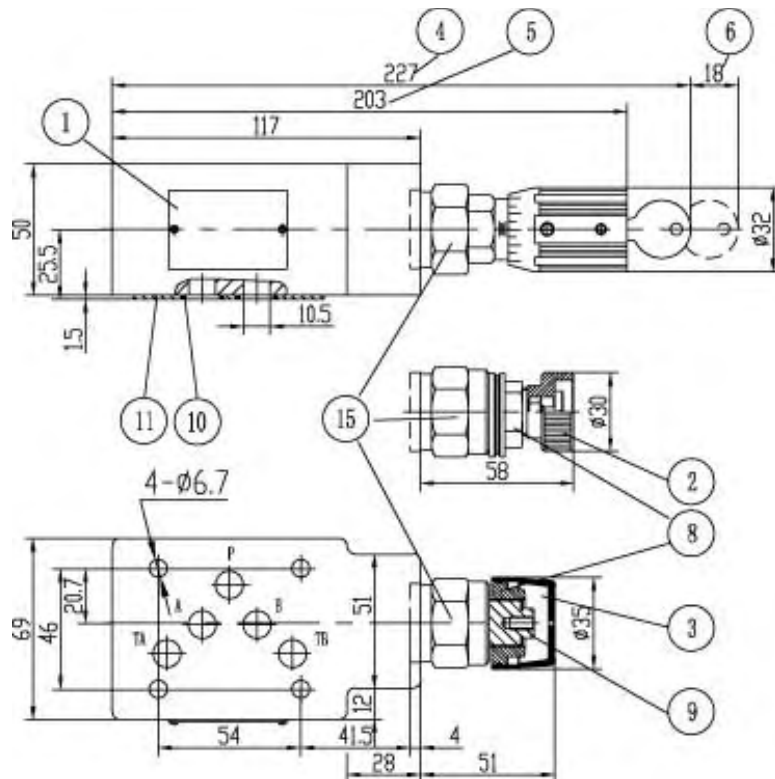
Valve fixing screws M6
 Tightening torque $M_A = 15.5 \text{ Nm}$



Required surface finish of mating piece

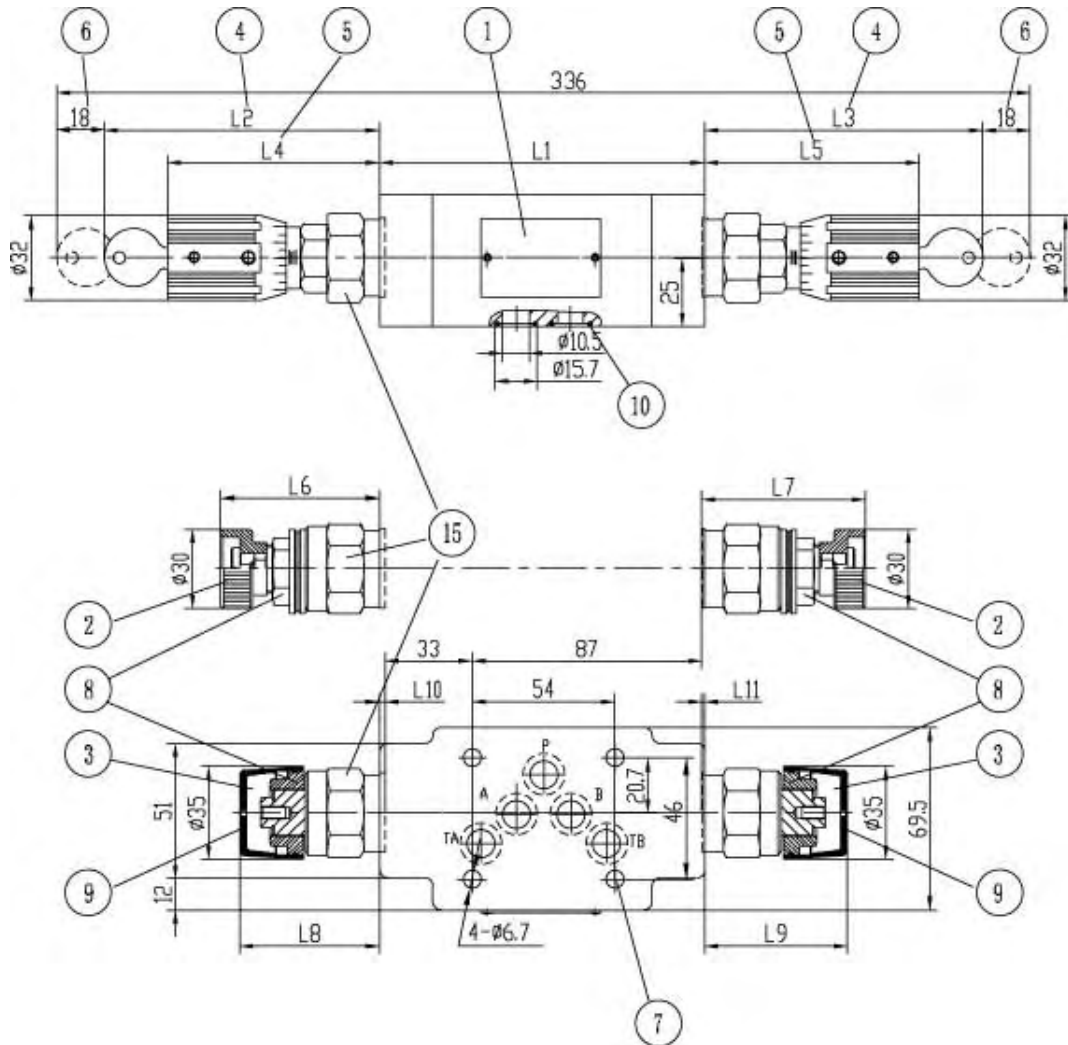


Type ZDB10 VB...



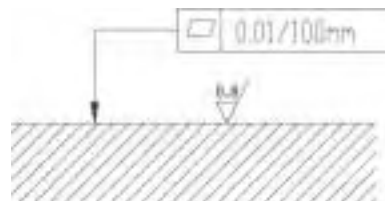
Type Z2DB10 VC...

Type Z2DB10 VD...



- 1 Nameplate
- 2 Adjustment element 1
- 3 Adjustment element 2
- 4 Adjustment element 3
- 5 Adjustment element 7
- 6 Space required to remove key
- 7 Valve fixing screw holes
- 8 Lock nut 24 A/F
- 9 Hexagon 10 A/F
- 10 O-rings 12 x 2 for ports A2, B2, P2, TA2, TB2
- 15 Hexagon 30 A/F, Tightening torque $M_A = 50 \text{ Nm}$


Required surface finish of mating piece



Valve fixing screws M6
Tightening torque $M_A = 15.5 \text{ Nm}$,

dimensions	Z2DB10	
	VC	VD
L1	123	132
L2	111	107
L3	112	112
L4	89	85
L5	90	90
L6	59	56
L7	60	56
L8	52	49
L9	53	49
L10	2	6
L11	1	6

NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated pressure relief valve, cartridge connection,type DB..K			RE 25730/12.2004
	Size 6、 10、 20	up to 31.5MPa	up to 330L/min	Replaces: RE25730/05.2001

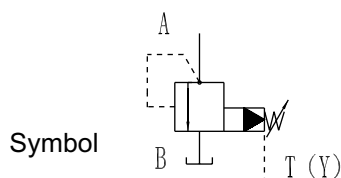
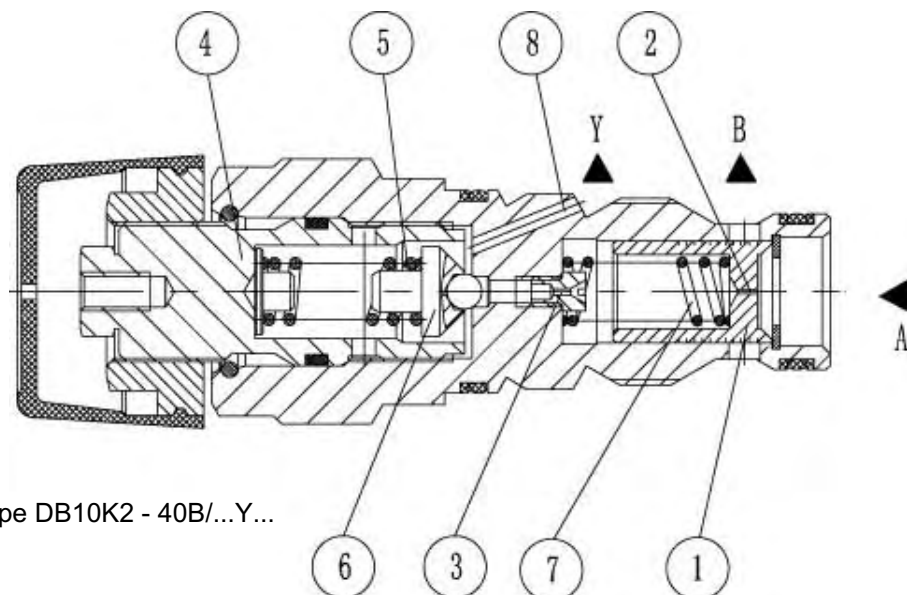
Features:

- Cartridge valve
- 4 pressure ranges
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale

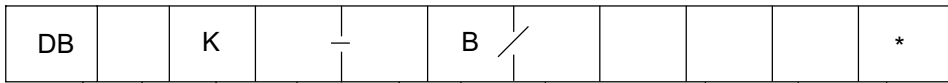


Functional, section, symbol

Pressure relief valves type DB..K.. are pilot operated pressure relief valves for installation in cartridge. They are used to limit the pressure in a hydraulic system. Setting of the system pressure is via adjustment element (4). At rest, the valves are closed. Pressure in port A acts on the spool (1). At the same time, pressure is passed through orifice (2) on to the spring loaded side of the spool (1) and through orifice (3) to the pilot poppet (6). If the pressure in port A rises above the value set at spring (5), the pilot poppet (6) opens. Fluid can now flow from the spring loaded side of spool (1), orifice (3), and channel (8) into port Y. The resulting pressure drop moves spool(1) causing this to open the connection from A to B, while the pressure set at spring (5) is maintained. Pilot oil return from the two spring chambers is taken externally via port Y.



Ordering code



Pressure relief valve = DB

Further details in clear text

Nominal size 6 = 6
 Nominal size 10 = 10
 Nominal size 20 = 20

No code = mineral oils
 V = phosphate ester

Y = Pilot oil supply internal, drain external
 XY = Pilot oil supply external, drain external
 (only to DB20K)

Cartridge valve = K

Adjustment element

Rotary knob = 1
 Sleeve with hexagon and protective cap = 2
 Lockable rotary knob with scale = 3
 Rotary knob with scale = 7

50 = Pressure adjustable up to 5 MPa
 100 = Pressure adjustable up to 10 MPa
 200 = Pressure adjustable up to 20 MPa
 315 = Pressure adjustable up to 31.5 MPa

B= Technology of Beijing Huade Hydraulic

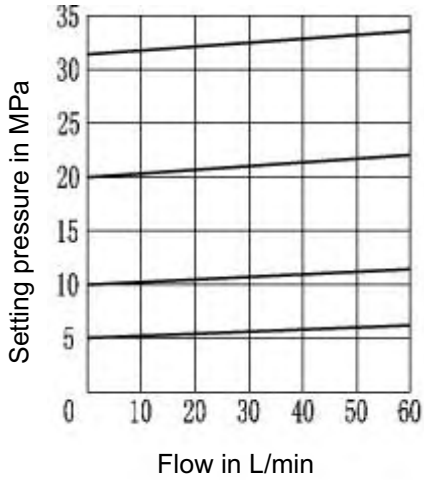
Series 40 to 49 = 40(size 6 and 10)
 (40 to 49: unchanged installation and connection dimensions)
 Series 10 to 19 = 10 (size 20)
 (10 to 19: unchanged installation and connection dimensions)

Technical data

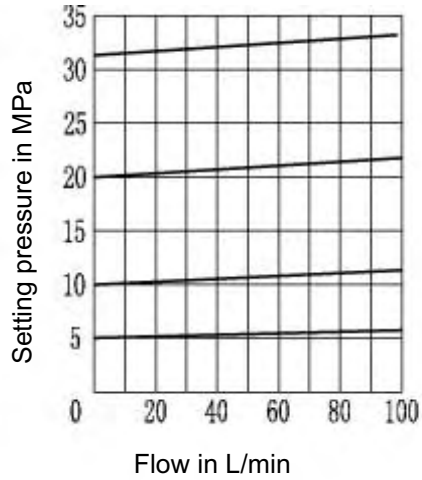
Nominal size	6	10	20
Pressure fluid	Mineral oil (for NBR seal), or phosphate ester (for FPM seal)		
Pressure fluid - temperature range (°C)	-30 to +80		
Viscosity range (mm ² /s)	10 to 800		
Degree of fluid contamination	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9.		
Operating pressure, max. (MPa)	up to 31.5		
Pressure adjustable, max. (MPa)	up to 5, up to 10, up to 20, up to 31.5		
Flow, max. (L/min)	up to 60	up to 100	up to 300
Weight (Kg)	approx.0.15	approx.0.2	approx.0.35

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

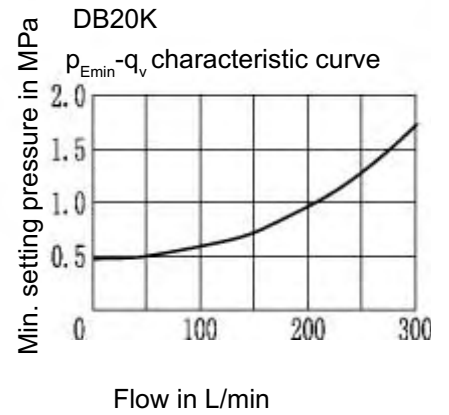
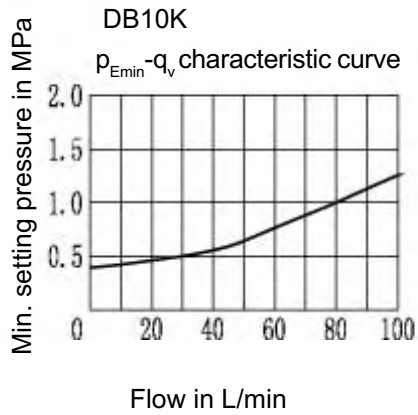
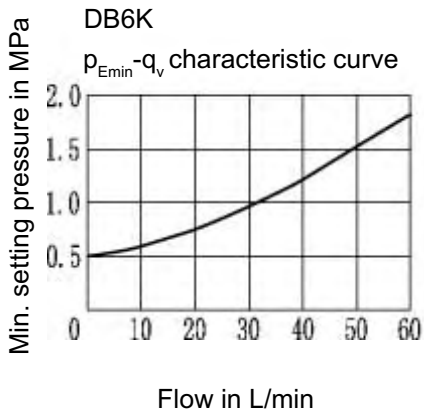
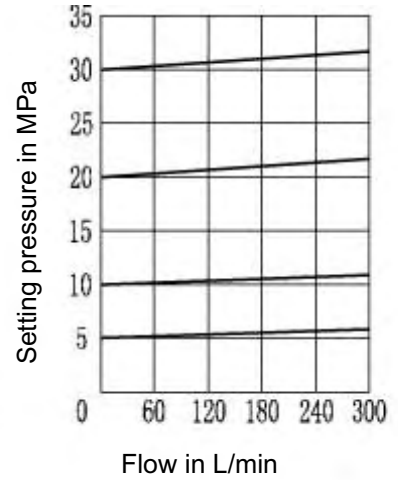
DB6K
 p_E - q_v characteristic curve



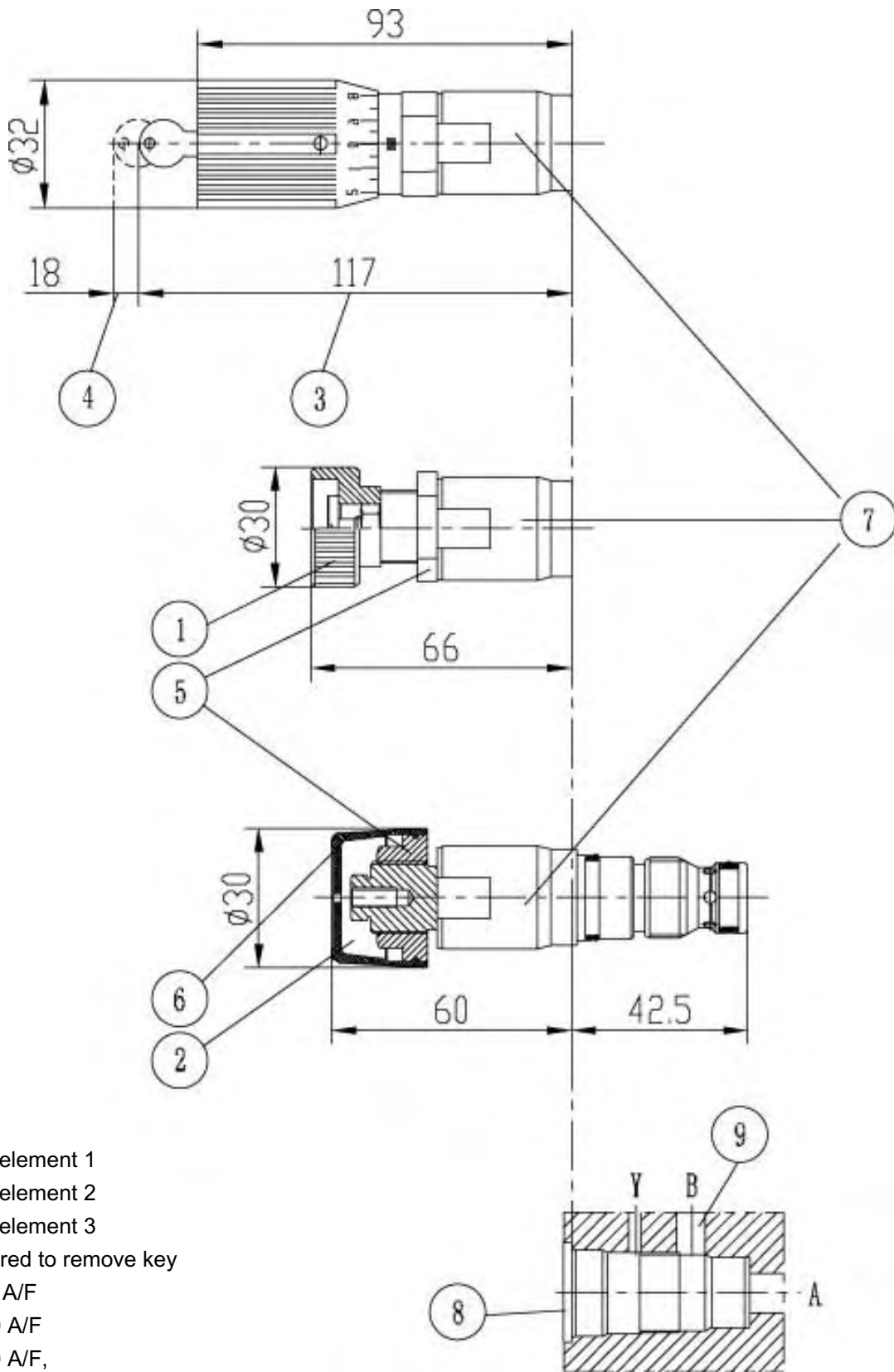
DB10K
 p_E - q_v characteristic curve



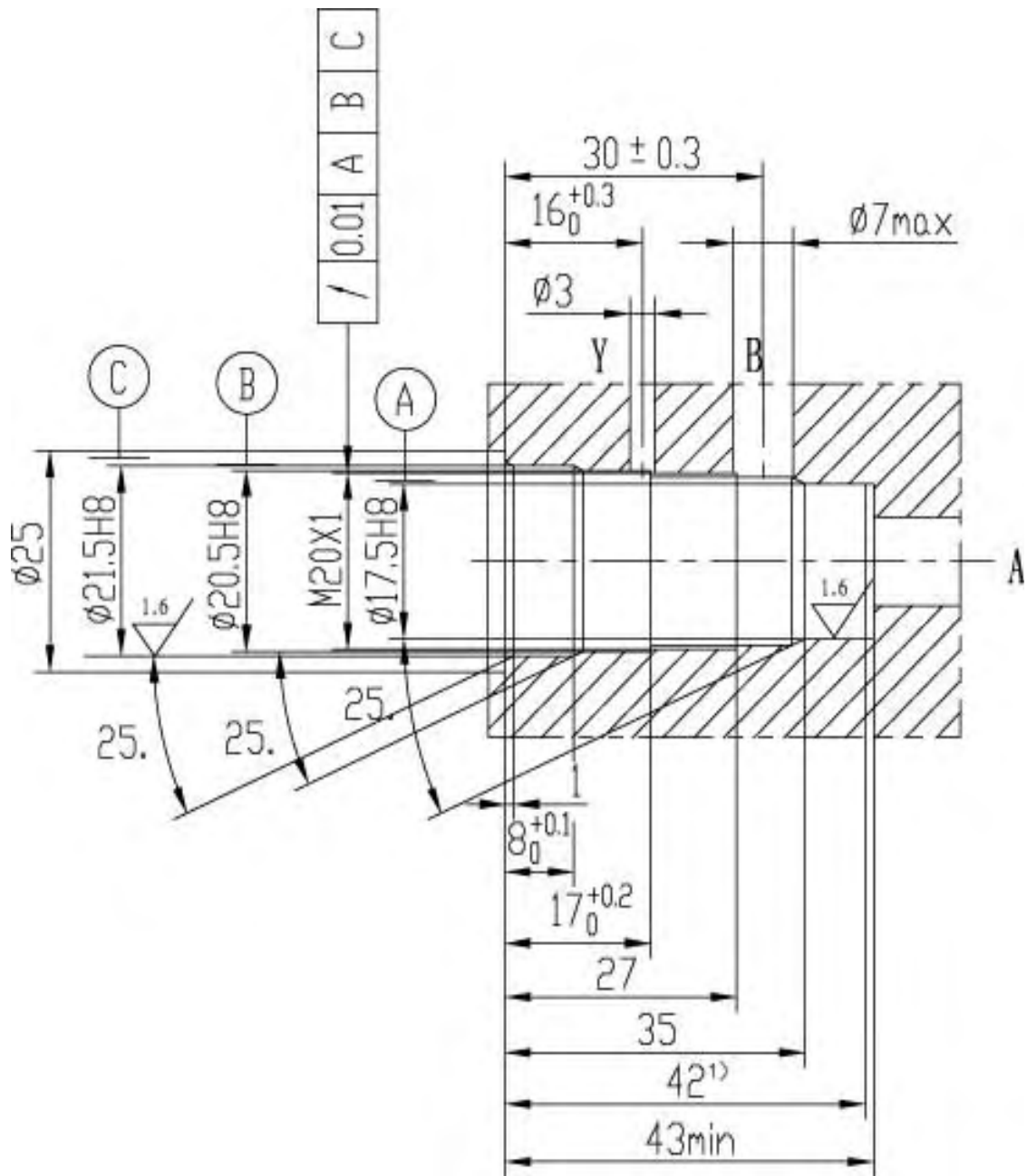
DB20K
 p_E - q_v characteristic curve



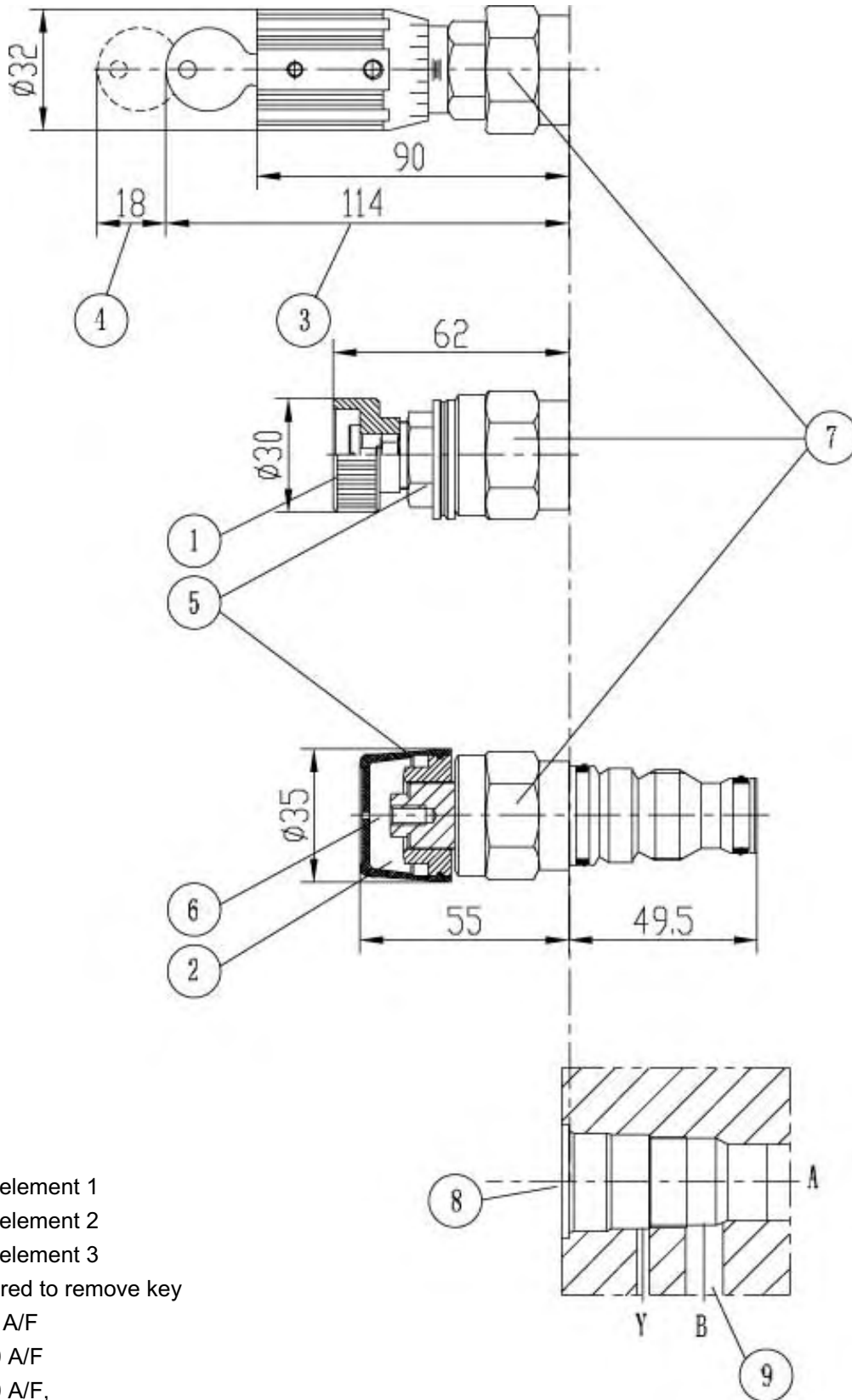
The characteristic curves are valid for an initial outlet pressure of zero over the entire flow range!



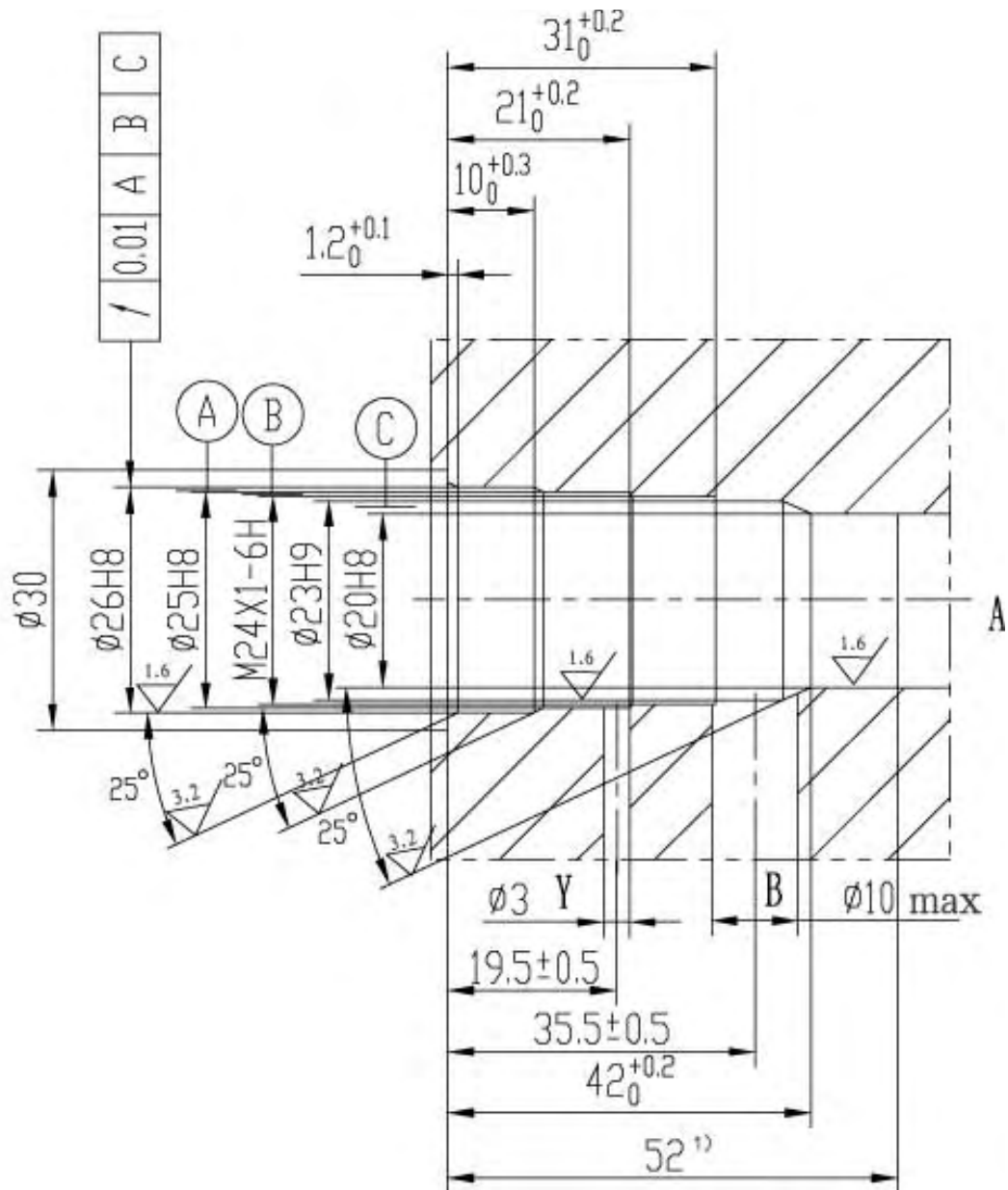
- 1. Adjustment element 1
- 2. Adjustment element 2
- 3. Adjustment element 3
- 4. Space required to remove key
- 5. Lock nut 24 A/F
- 6. Hexagon 10 A/F
- 7. Hexagon 30 A/F,
Tightening torque $M_A=50Nm$
- 8. Fixing hole
- 9. Port B arranged as required around periphery



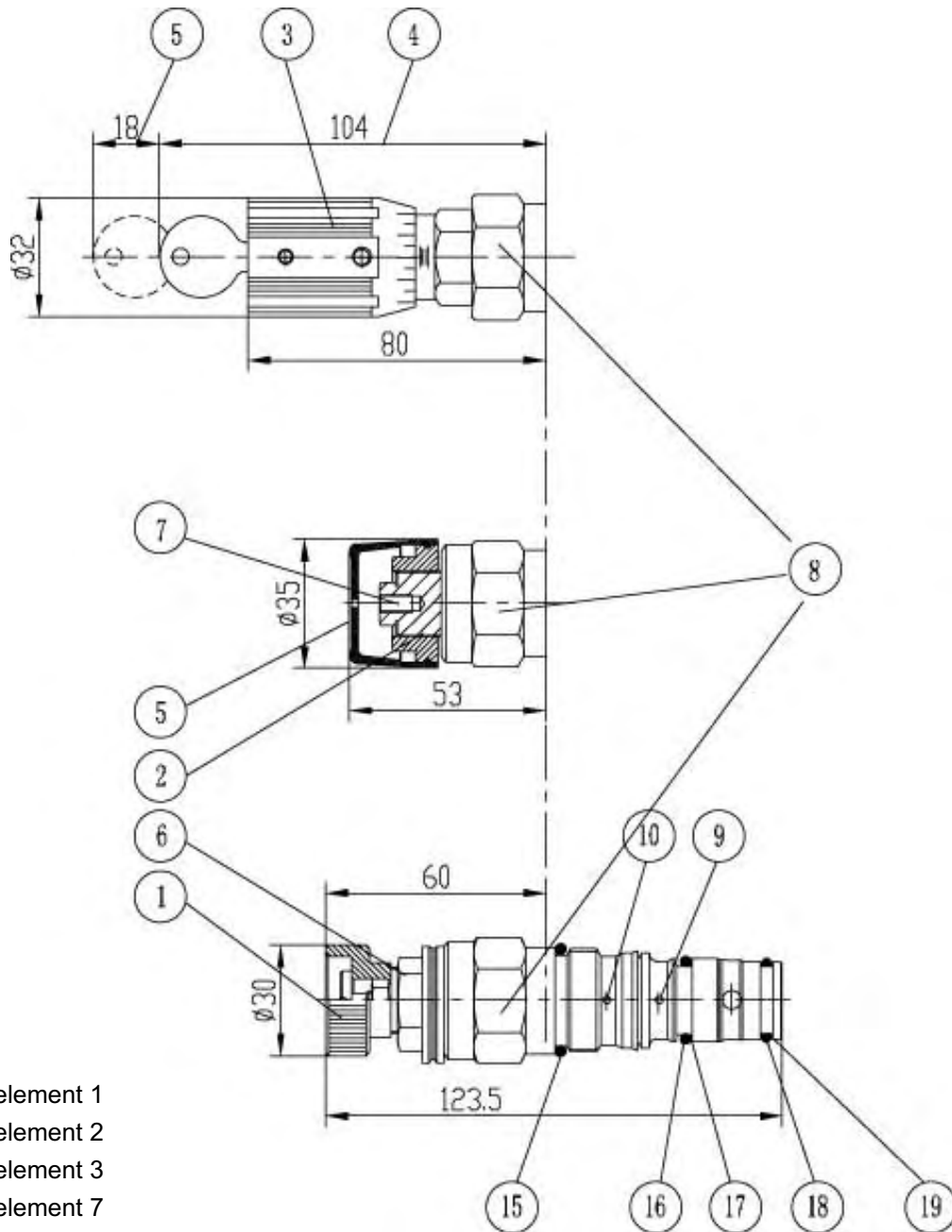
1) Depth of fit



- 1. Adjustment element 1
- 2. Adjustment element 2
- 3. Adjustment element 3
- 4. Space required to remove key
- 5. Lock nut 24 A/F
- 6. Hexagon 10 A/F
- 7. Hexagon 30 A/F,
Tightening torque $M_A=50Nm$
- 8. Fixing hole
- 9. Port B arranged as required around periphery



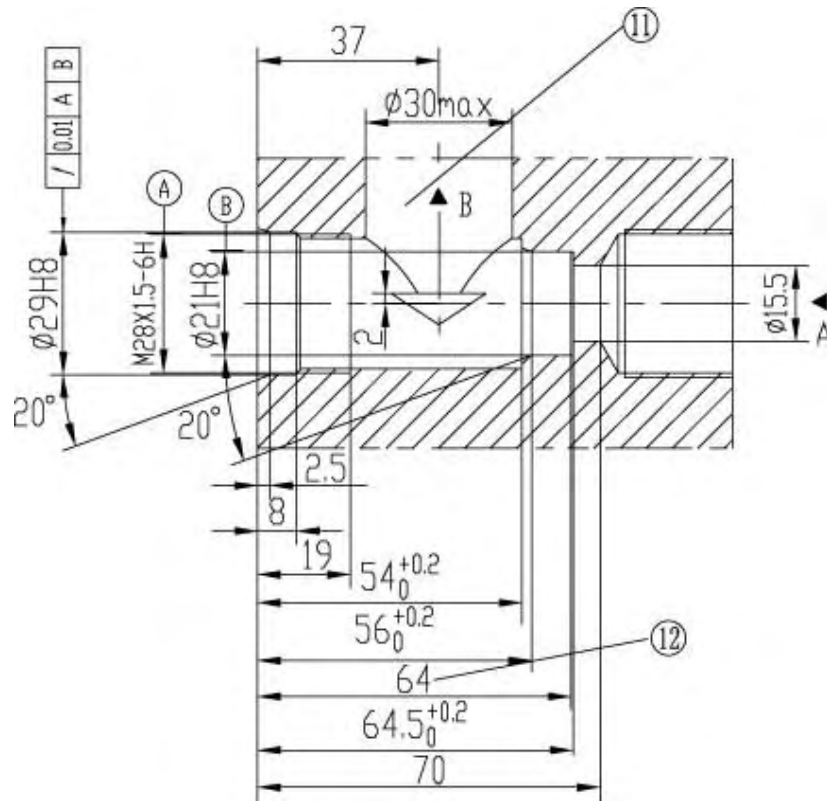
1) Depth of fit



1. Adjustment element 1
2. Adjustment element 2
3. Adjustment element 3
4. Adjustment element 7
5. Space required to remove key
6. Lock nut 22 A/F
7. Hexagon 10 A/F
8. Hexagon 30 A/F
Tightening torque $M_A=50Nm$
9. Port B arranged as required around periphery
10. Hole is used for port Y of DB20K...-10/...XY and DB20K...-10/...Y...
11. The collocation of hole B, as follows:DB...K...-10/... Y... X、Y and the collocation of hole B, as follows drawing (=) DB...K...-10/...XY...
12. Fit for depth
13. Drilling hole $\phi 2.5$ as required (type X and Y)
14. Hole A ,optional
15. O-ring 23.47X2.62
16. O-ring 17.12X2.62
17. Retainer ring 18.4X22.6X0.6
18. O-ring 17.17X1.78
19. Retainer ring 18.2X21.1X0.6

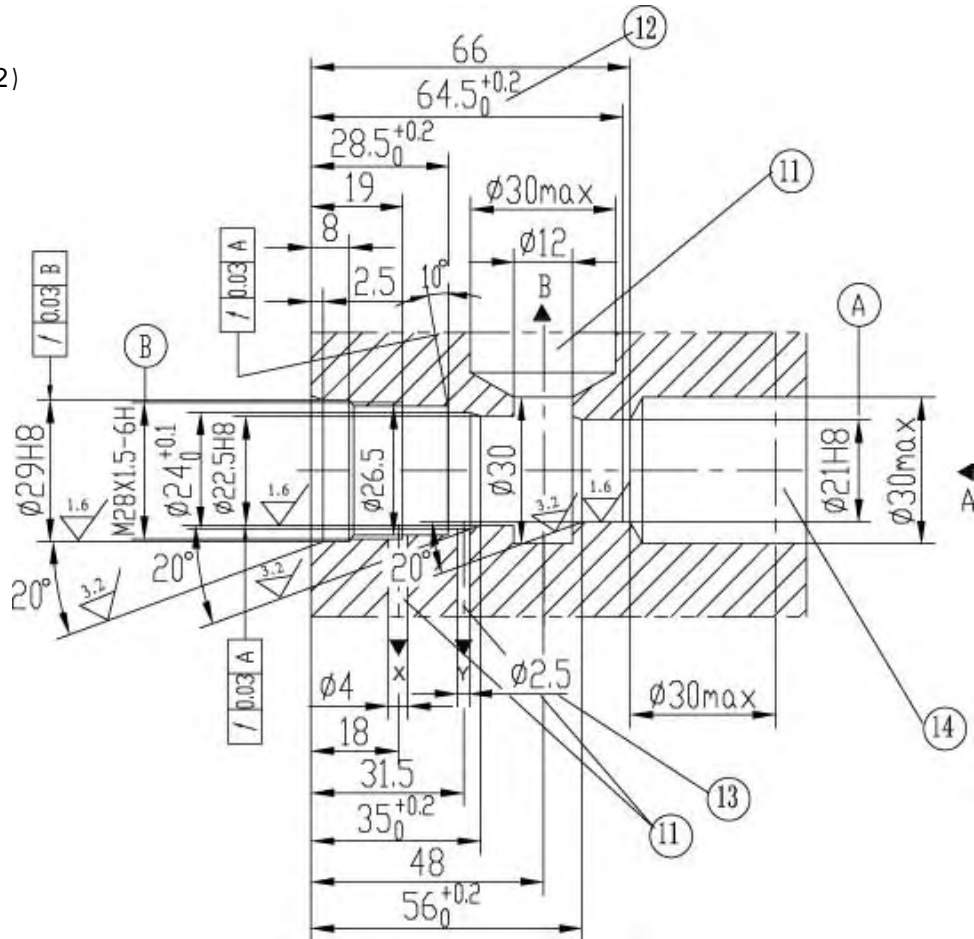
Type DB20K-10B/...Y...

drawing (1)




Type DB20K-10B/...XY...

drawing (2)



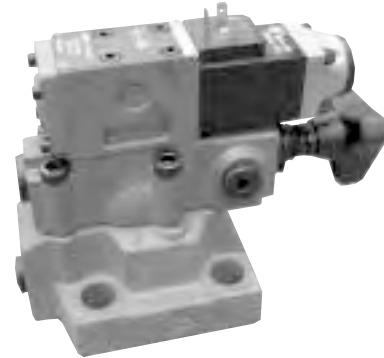
NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure relief valve, type DB/DBW...30B/			RE 25863/12.2004
	Size 10 to 30	up to 31.5 MPa	up to 600 L/min	Replaces: RE25803/05.2001

Features:

- Subplate mounting
- Pipe connection
- Insert connection
- Three adjustment elements:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale
- Solenoid operated unloading via a built-in directional spool valve



Function, section

General

Types DB and DBW pressure valves are pilot operated pressure relief valves.

They are used for the limitation (DB) or limitation and solenoid actuated unloading (DBW) of the control pressure.

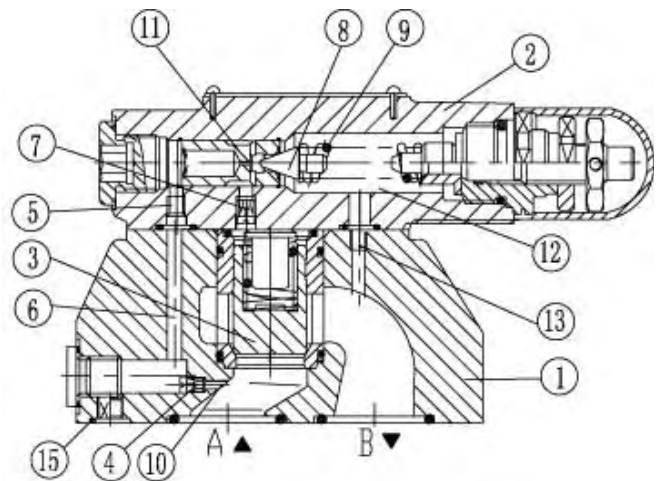
The pressure relief valves (DB) consist mainly of the main valve (1) with main spool assembly (3) and pilot operated valve (2) with pressure adjustment element.

Pressure relief valve type DB:

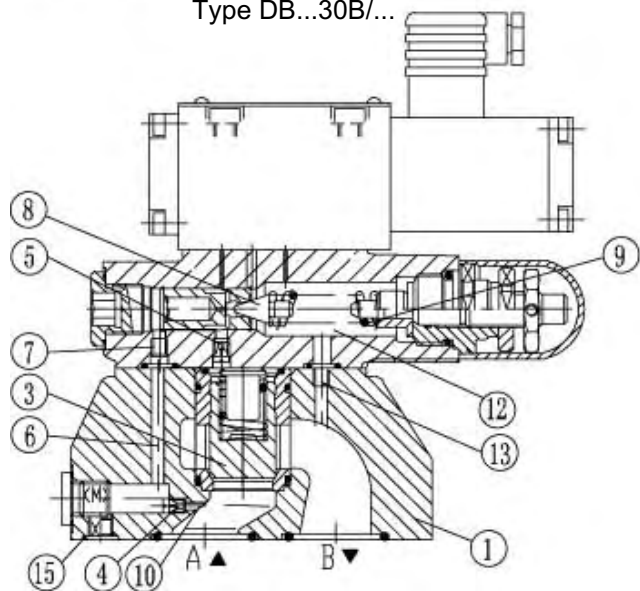
The pressure present in port A acts on the main spool (3). At the same time pressure is applied via the control lines (6) and (7), which are fitted with orifices (4) and (5), on the spring loaded side of the main spool (3) and at the poppet (8) in the pilot control valve (2). If the pressure in port A exceeds the value set at the spring (9), the poppet (8) opens against the spring (9).

The signal for this comes internally via the control lines (10) and (6) from port A. The pressure fluid on the spring loaded side of the main spool (3) now flows via the control line (7), orifice bore (11) and poppet (8) into the spring chamber (12). In type DB...30/... it flows internally via the control line (13) to tank, or in type DB..30/..Y.. externally via the port Y. Due to the orifices (4) and (5) a pressure drop occurs at the main spool (3), the connection from port A to port B is open. Now the pressure fluid flows from port A to port B while maintaining the valve set operating pressure.

The pressure relief valve may be unloaded or switched over to a different pressure (second pressure stage) via port "X" (15).



Type DB...30B/...



Type DBW...30B/...

Symbols and Technical data

symbols

DB...30B/...	DB...30B/...X...	DB...30B/...Y...	DB...30B/...XY...
DBW...30B/...	DBW...30B/...X...	DBW...30B/...Y...	DBW...30B/...XY...
Normally closed 	Normally closed 	Normally closed 	Normally closed
Normally open 	Normally open 	Normally open 	Normally open

Ordering details

DB / - 30 B / / *

Without directional valve = No code
With built-in directional spool valve = W

Pilot operated valve (complete) = No code
Pilot operated valve without main spool assembly (do not enter nom. size) = C
Pilot operated valve with main spool assembly (enter valve size 10 or 30) = C
* C without main valve

Nominal Size	Ordering details	
	Subplate mounting	Pipe connection
8	—	8 (M18 × 1.5 or G3/8")
10	10	10 (M22 × 1.5 or G1/2")
15	—	15 (M27 × 2 or G3/4")
20	20	20 (M33 × 2 or G1")
25	—	25 (M42 × 2 or G1 1/4")
32	30	30 (M48 × 2 or G1 1/2")

Normally closed = A
Normally open = B

For subplate mounting = No code
For threaded connection = G

Adjustment elements
Rotary knob = 1
Sleeve with hexagon and protective cap = 2
Lockable rotary knob with scale = 3

Series 30 to 39 (30 to 39: unchanged installation and connection dimensions) = 30

Further details in clear text

No code = mineral oils
V = phosphate ester

No code = British
2 = metric

Z4 = Plug-in connector
Z5 = Large Plug-in connector
Z5L = Large Plug-in connector with light

No code = Without hand override
N = With hand override

W220-50 = 220V 50Hz AC
G24 = 24 V DC
W220R = Solenoid commouting automatically 220V AC

No code = Valve for minimum cracking pressure 0.5MPa
U = Valve for minimum cracking pressure 0.25MPa

No code = Pilot fluid feed internal, return internal
X = Poilt fluid feed external, return internal
Y = Poilt fluid feed internal, return external
XY = Poilt fluid feed external, return external

100 = Settable pressure up to 10.0 MPa
315 = Settable pressure up to 31.5 MPa

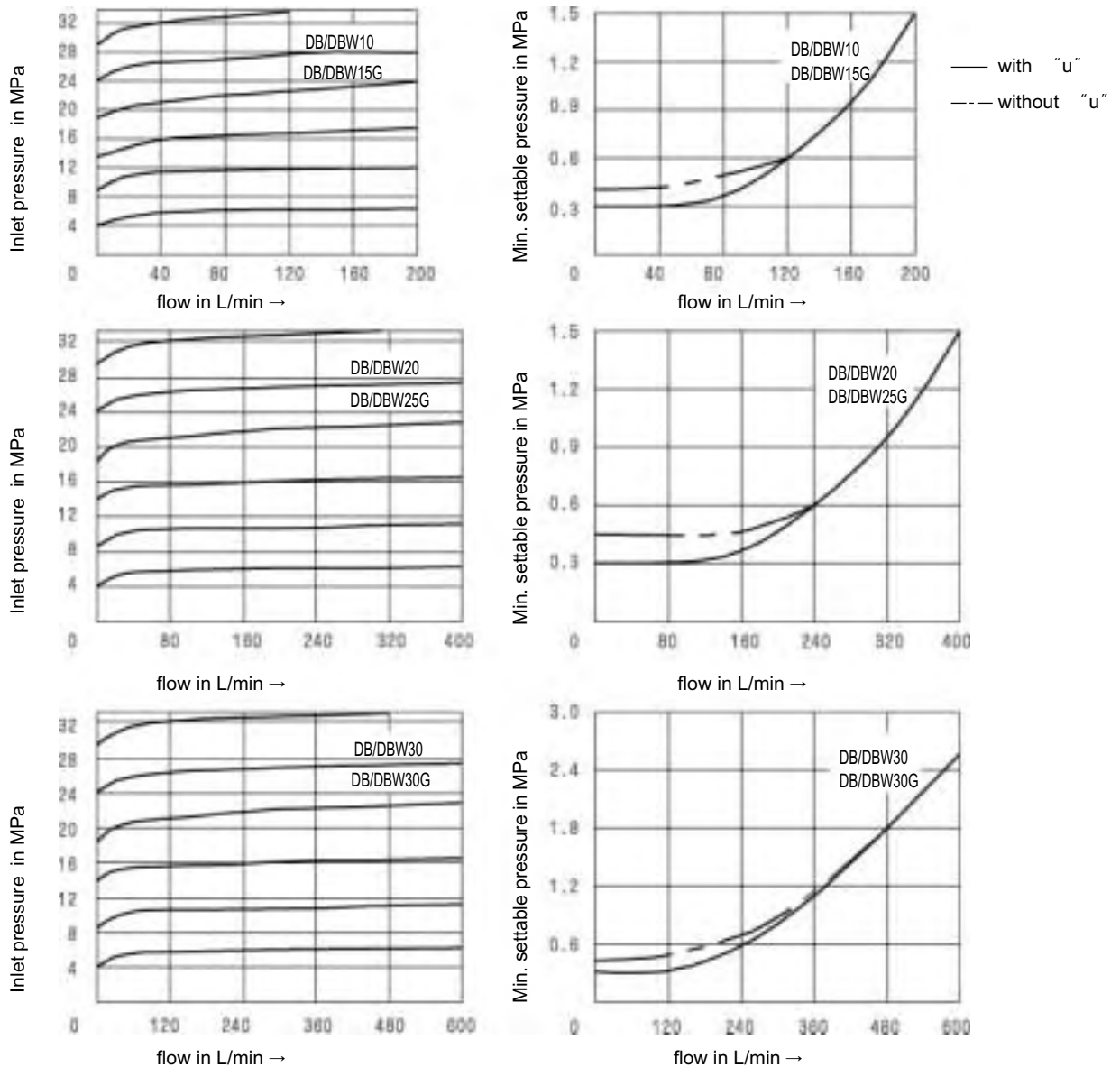
B = Technology of Beijing Huade Hydraulic

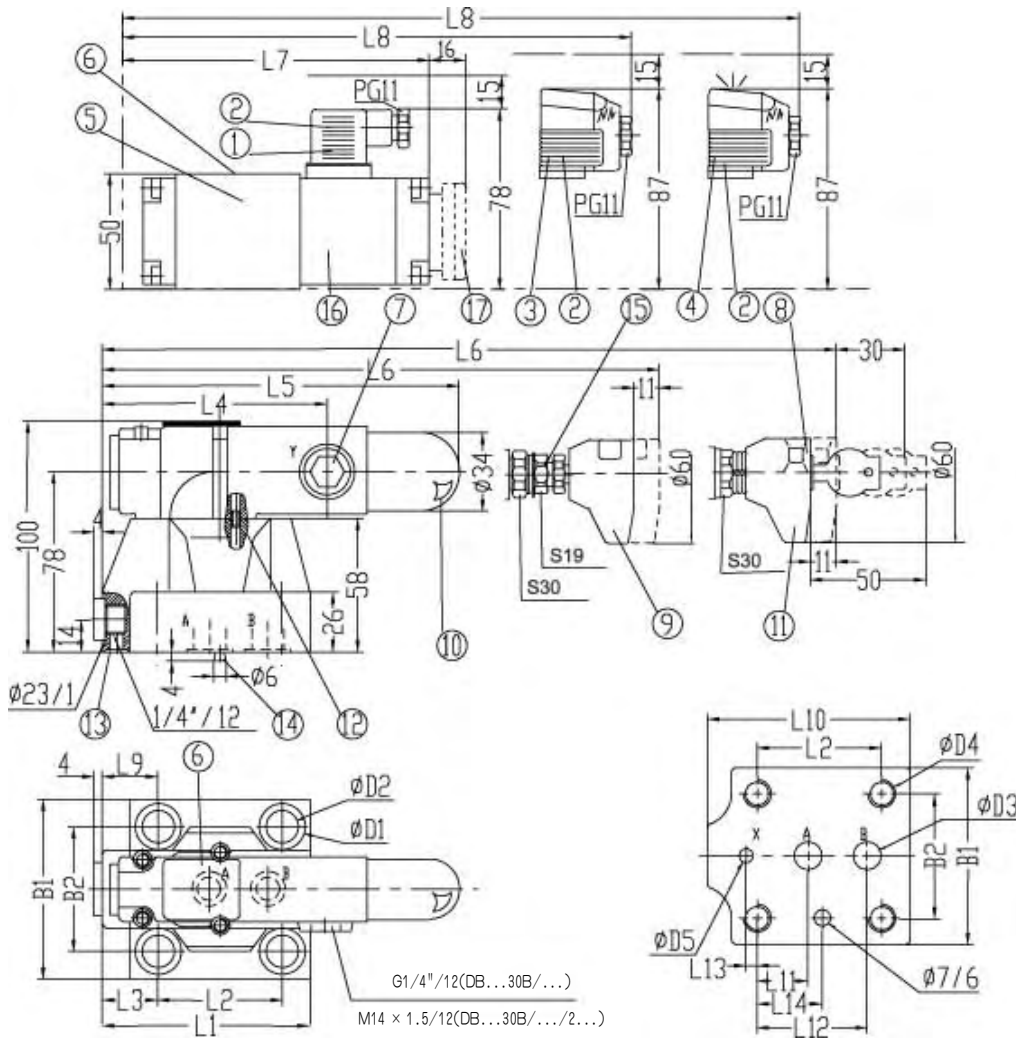
Hydraulic technical data

Size		8	10	15	20	25	30
Maximum flow (L/min)	Threaded connections	100	200	200	400	400	600
	Subplate mounting	-	200	-	400	-	600
Maximum operating pressure at ports A, B, X (MPa)		up to 31.5					
Maximum back pressure at port Y	DB (MPa)	up to 31.5					
	DBW (MPa)	up to 6					
Settable pressure	Min. (MPa)	flow dependent (see characteristic curves)					
	Max. (MPa)	to 10.0 or 31.5					
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)					
Viscosity range (mm ² /s)		10 to 800					
Pressure fluid temperature range (°C)		-30 to +80					
the characteristic of solenoid		See directional valves, type WE5					

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

The characteristic curves were measured with external, at zero pressure, pilot oil drain.
With internal pilot oil drain the inlet pressure increases by the outlet pressure present at port B.



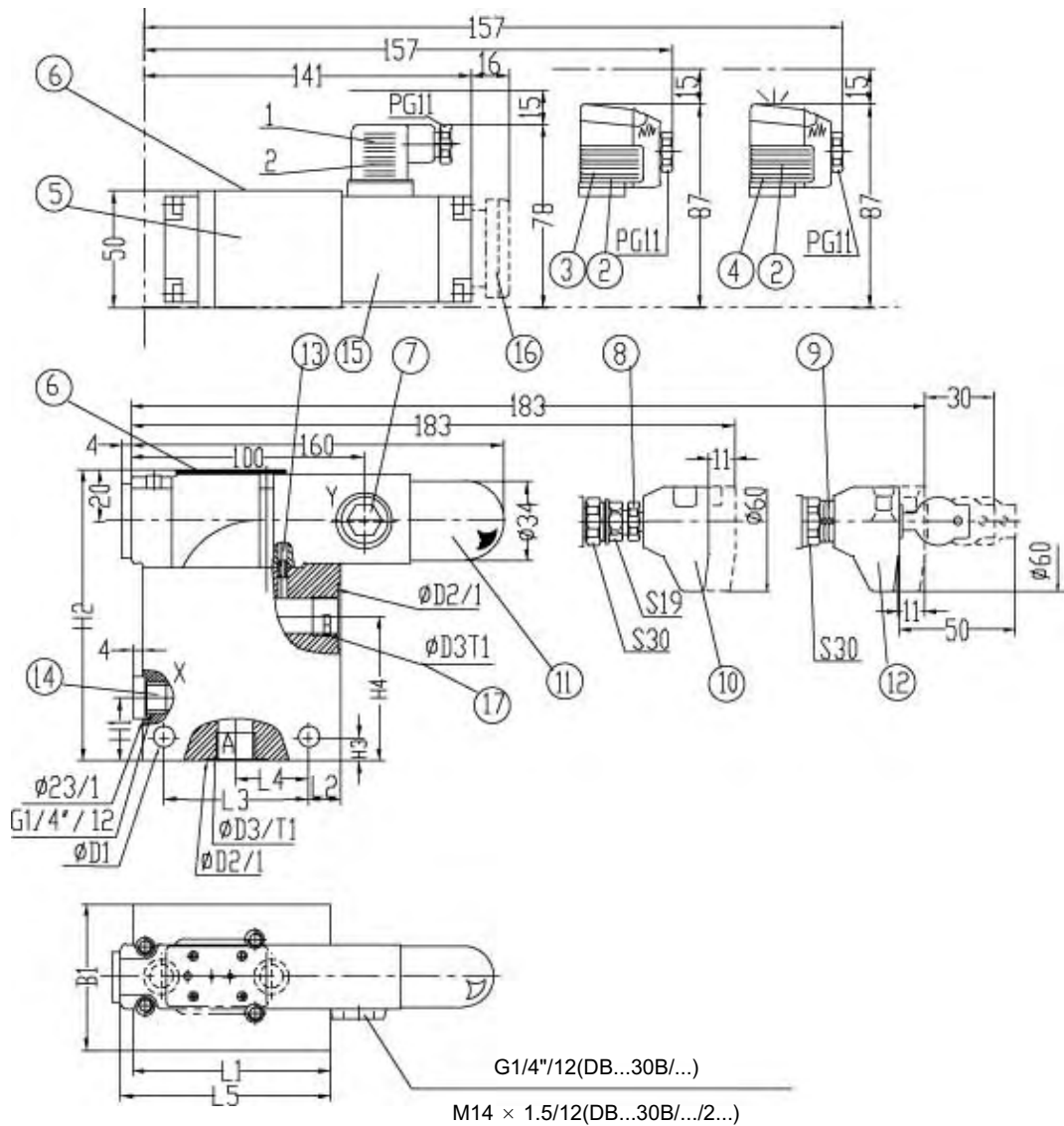


- 1 Plug-in connector "Z4"
- 2 Plug-in connector: colour gray
- 3 Large plug-in connector "Z5"
- 4 Large plug-in connector with light "Z5L"
- 5 Directional valves, type WE5
- 6 Nameplate
- 7 Port Y for external pilot oil drain
- 8 Repeat adjusting scale
- 9 Adjustment element 1
- 10 Adjustment element 2
- 11 Adjustment element 3
- 12 Inside pilot oil drain is not need
- 13 Port X for pilot oil drain
- 14 Locating pin
- 15 Only apply to up to 31.5MPa
- 16 Solenoid "a"
- 17 Hand override

Subplates for: G545/01 G545/02 G408/01 G408/02 G410/01 G410/02
 G546/01 G546/02(NG10); G409/01 G409/02(NG20); G411/01 G411/02(NG30), see page149

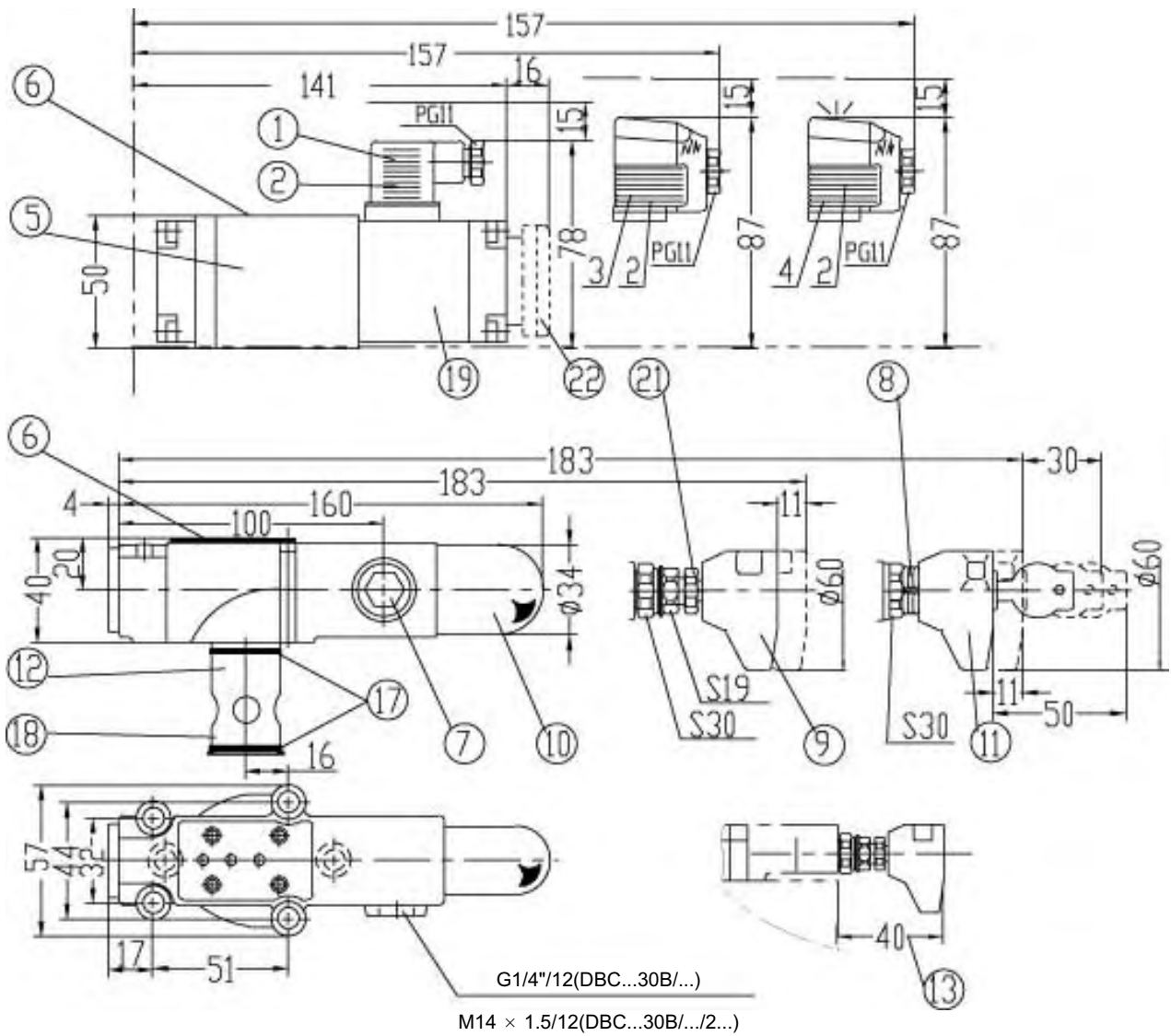
Size	B1	B2	φD1	φD2	φD3	D4	φD5	L1	L2	L3	L4	L5	L6	L7
10	78	54	20	14	12	M12 depth 25	6	90	54	23.5	97.5	155.5	179	133.5
20	100	69.8	26	18	25	M16 depth 26	6	117	66.7	34	111	168	193	147
30	115	82.5	30	20	32	M18 depth 26	7	148	88.7	41.5	121	179	203	157

Size	L8	L9	L10	L11	L12	L13	L14	O-ring		Valve fixing screw (GB/T70.1-2000)	weight (kg)	
								Port X	Ports A, B		DB	DBW
10	139.5	27	88	22.2	47.6	0	22.2	9.25 × 1.78	17.12 × 2.63	4-M12 × 50-10.9	2.6	3.7
20	153	24.3	116	11.1	55.6	23.8	33.3	9.25 × 1.78	28.17 × 3.53	4-M16 × 50-10.9	3.5	4.6
30	163	21.6	146	12.7	76.2	31.7	44.4	9.25 × 1.78	34.52 × 3.53	4-M18 × 50-10.9	4.4	5.5



- 1 Plug-in connector " Z4"
- 2 Plug-in connector: colour gray
- 3 Large plug-in connector " Z5"
- 4 Large plug-in connector with light " Z5L"
- 5 Directional valves, type WE5
- 6 Nameplate
- 7 Port Y for external pilot oil drain
- 8 Only apply to 31.5 MPa
- 9 Repeat adjusting scale
- 10 Adjustment element 1
- 11 Adjustment element 2
- 12 Adjustment element 3
- 13 Inside pilot oil drain is not need
- 14 Port X for pilot oil drain
- 15 Solenoid "a"
- 16 Hand override, optional
- 17 When use adjustment element 1 or 3, connect with B, must need elbow

Size	B1	φD1	φD2	D3		H1	H2	H3	H4	L1	L2	L3	L4	L5	T1	Weight (kg)		
				Metric	British											DB	DBW	
8	63	9		M18 × 1.5	G3/8"	27	125	10	62	85	14	62	31	90	14	4.8	5.9	
10			34	M22 × 1.5	G1/2"													
15			42	M27 × 2	G3/4"													57
20			47	M33 × 2	G1"													
25	70	11	56	M42 × 2	G1 1/4"	42	138	13	66	100	18	72	36	99	20	5.6	6.7	
30			61	M48 × 2	G1 1/2"										22	5.3	6.4	



- | | | | |
|---------------------------------------|---------------------------------|---------------------------------------|-------------------------------|
| 1 Plug-in connector | 9 Adjustment element 1 | bore at any position. | screw and main spool assembly |
| 2 Plug-in connector: colour gray | 10 Adjustment element 2 | However, care must be taken that X | 17 O-ring 27.3X2.4 |
| 3 Large plug-in connector | 11 Adjustment element 3 | port and the fixing screw holes do | 18 Retainer ring 32x28.4x0.8 |
| 4 Large plug-in connector with light | 12 Main spool assembly | not intersect. | 19 Solenoid "a" |
| 5 Directional valves, type WE5 | 13 Min. distance when use ad- | 15 Back-up ring and O ring must be | 21 Only apply to 31.5 MPa |
| 6 Nameplate | justment element 1 or 3 fixing | fitted into the main bore before as- | 22 Hand override, optional |
| 7 Port Y for external pilot oil drain | the integration block | sembling the main spool. | |
| 8 Repeat adjusting scale | 14 The D3 bore may enter the D2 | 16 Cartridge assembly contain orifice | |

Size	φD1	φD2	φD3	Fixing screw		Weight (Kg)	
				(GB/T70.1-2000)		DBC	DBWC
10	10	40	10	4-M8 × 40-10.9	1.4	2.5	
20	25	45	25				
30	32		32				

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure relief valve, type DB/DBW...50B/ (New Series)			RE25805 /12.2004
	Size 10 to 32	up to 35 MPa	up to 650 L/min	Replaces: RE25805/05.2001

Features:

- Subplate mounting
- Porting pattern to DIN 24 340, form E,ISO 6264 and CETOP-RP 121H
- Pipe connection
- Insert connection
- Three adjustment elements:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale
- Solenoid operated unloading via built-in directional spool valve



Function, section: type DB...

General

Types DB and DBW pressure valves are pilot operated pressure relief valves.

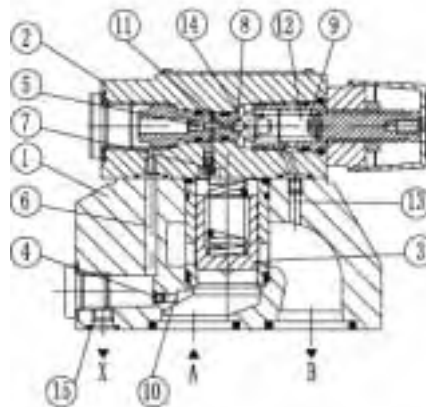
They are used for the limitation (DB) or limitation and solenoid actuated unloading (DBW) of the control pressure. The pressure relief valves (DB) consist mainly of the main valve (1) with main spool assembly (3) and pilot operated valve (2) with pressure adjustment element.

Pressure relief valve type DB:

The pressure present in port A acts on the main spool (3). At the same time pressure is applied via the control lines (6) and (7), which are fitted with orifices (4) and (5), on the spring loaded side of the main spool (3) and at the ball (8) in the pilot control valve (2). If the pressure in port A exceeds the valve set at the spring (9), the ball (8) opens against the spring (9).

The signal for this comes internally via the control lines (10) and (6) from port A. The pressure fluid on the spring loaded side of the main spool (3) now flows via the control line (7), orifice bore (11) and ball (8) into the spring chamber (12). In type DB...50B/... it flows internally via the control line (13) to tank, or in type DB..50/..Y.. externally via the control line (14). Due to the orifices (4) and (5) a pressure drop occurs at the main spool (3), the connection from port A to port B is open, Now the pressure fluid flows from port A to port B whilst maintaining the set operating pressure.

The pressure relief valve may be unloaded or switched over to a different pressure (second pressure stage) via port "X" (15).

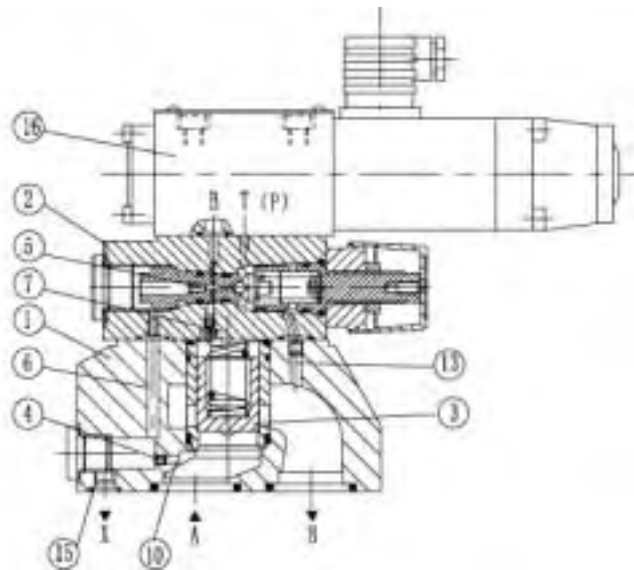


Type DBW...50B/...

Pressure relief valve type DBW

The function of this valve is basically same as the valve type DB.

The unloading at the main spool(3),however,is achieved by actuating the built-in directional valve(16).



Type DBW...50B/...

symbols

<p>DB ...-50B/..</p>	<p>DB ..-50B/..X.</p>	<p>DB ...-50B/..Y..</p>	<p>DB ...-50B/..XY..</p>
<p>DBW ...-50B/..</p> <p>Normally closed</p> <p>Normally open</p>	<p>DBW ...-50B/..X..</p> <p>Normally closed</p> <p>Normally open</p>	<p>DBW ...-50B/..Y..</p> <p>Normally closed</p> <p>Normally open</p>	<p>DBW ...-50B/..XY..</p> <p>Normally closed</p> <p>Normally open</p>

Technical data

General

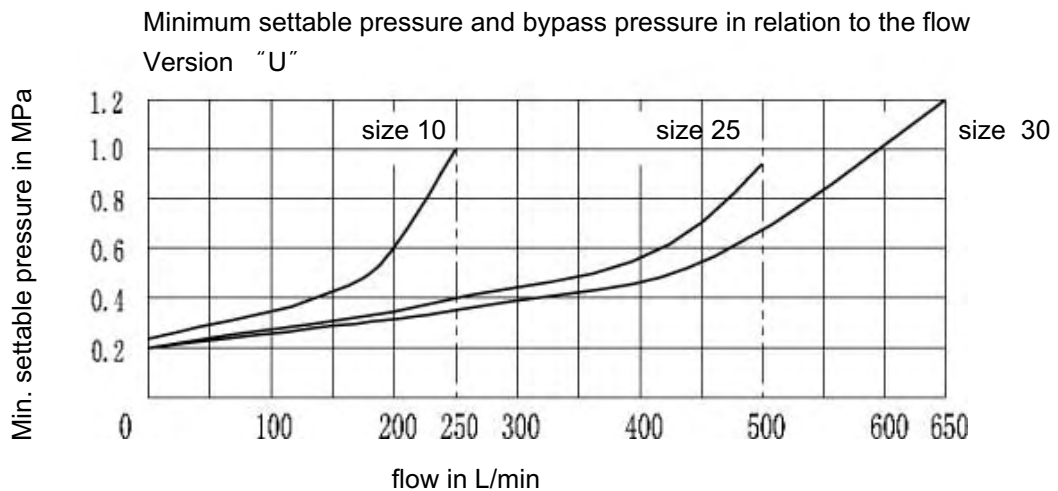
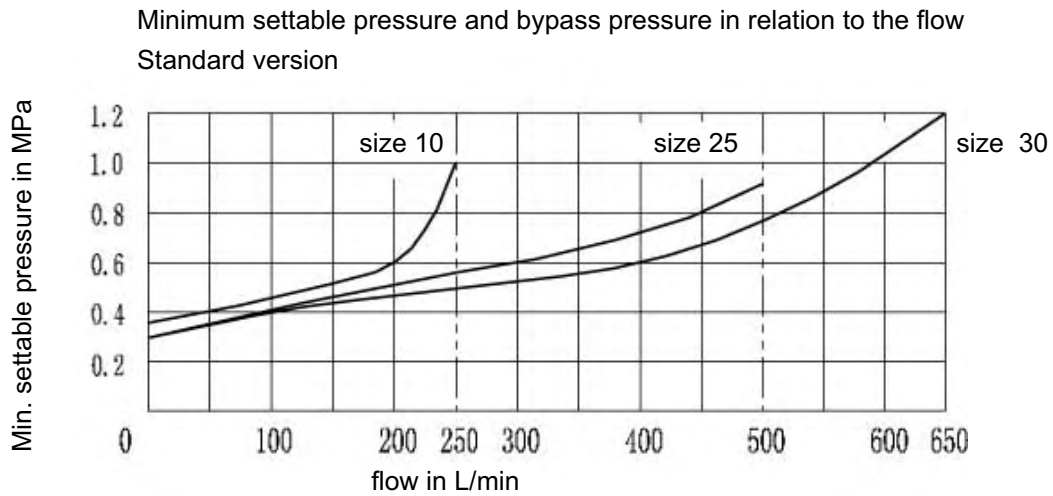
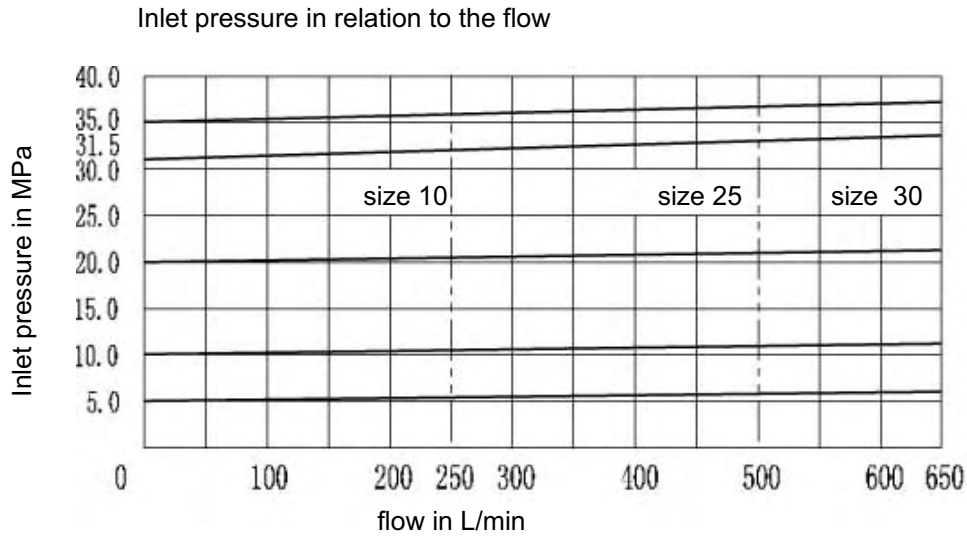
Installation			optional				
Weight	Subplate mounting	DB (Kg)	2.6	-	3.5	-	4.4
		DBW (Kg)	3.8	-	4.7	-	5.6
		DBC (Kg)	1.2 (type DBWC add 1.2Kg)				
		DBC10 or 30 (Kg)	1.5 (DBWC10 or 30 add 1.2Kg)				
	Threading connection	DB..G.. (Kg)	5.3	5.2	5.1	5.0	4.8
		DBW..G.. (Kg)	6.5	6.4	6.3	6.2	6.0
Technical data for the directional valves			see WE6.../...				

Hydraulic technical data

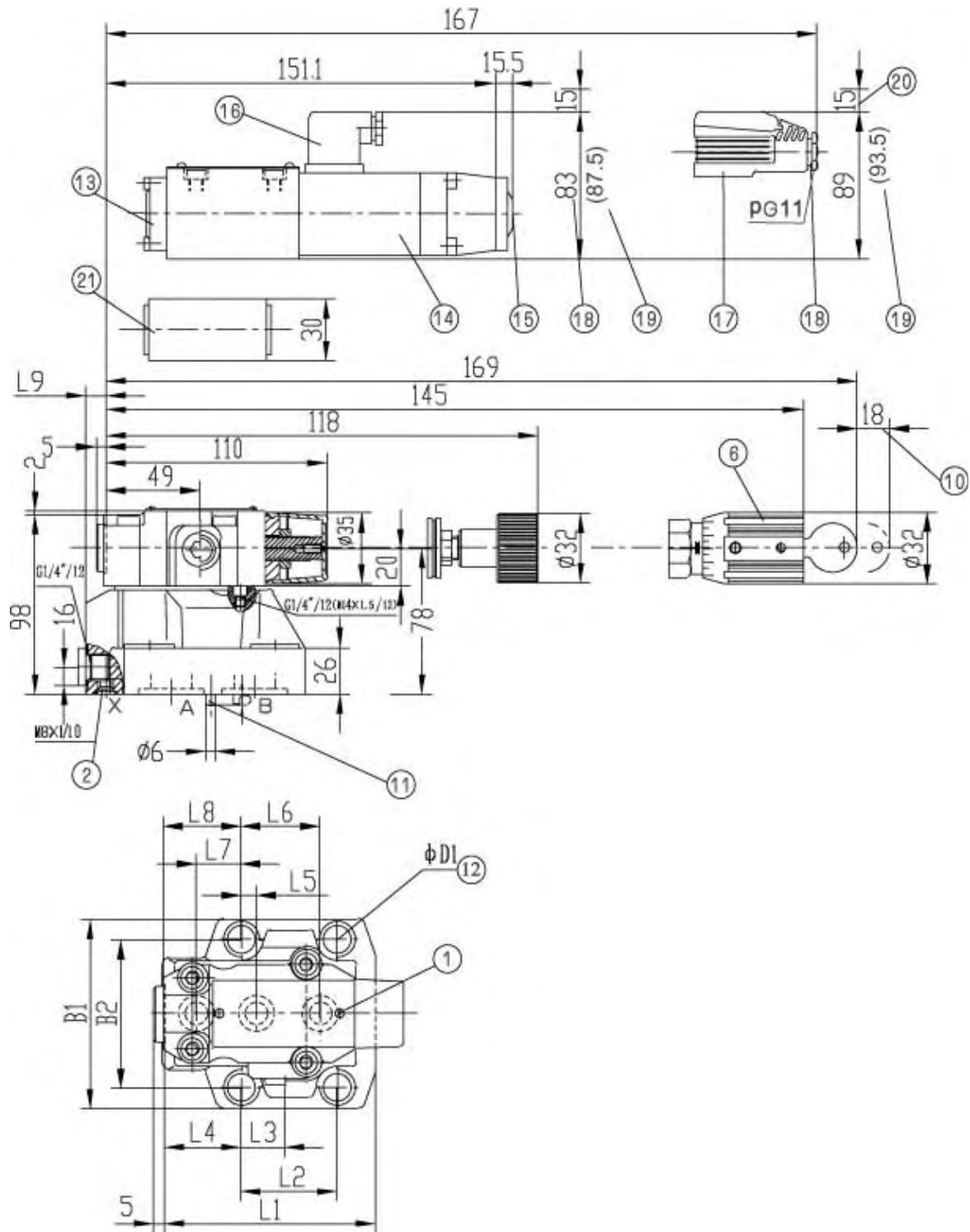
Maximum operating pressure at ports A, B, X (MPa)		up to 35.0				
Maximum back pressure at port Y	DB (MPa)	up to 31.5				
	DBW.6A. (standard solenoids) (MPa)	AC(DC) 10.0 AC(DC) 16.0				
	DBW.6B. (high-power solenoids) (MPa)	AC(DC) 16.0				
Settable pressure	Minimum (MPa)	flow dependent (see characteristic curves)				
	Maximum (MPa)	Maximum 5.0, 10.0, 20.0, 31.5, 35.0				
Maximum flow		DB10	DB15	DB20	DB25	DB30
	Subplate mounting (L/min)	250	-	500	-	650
	Threaded connections (L/min)	250	500	500	500	650
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)				
Pressure fluid temperature range (°C)		-30 to + 80				
Viscosity range (mm ² /s)		10 to 800				
Degree of contamination		NAS 1638 class 9.				

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

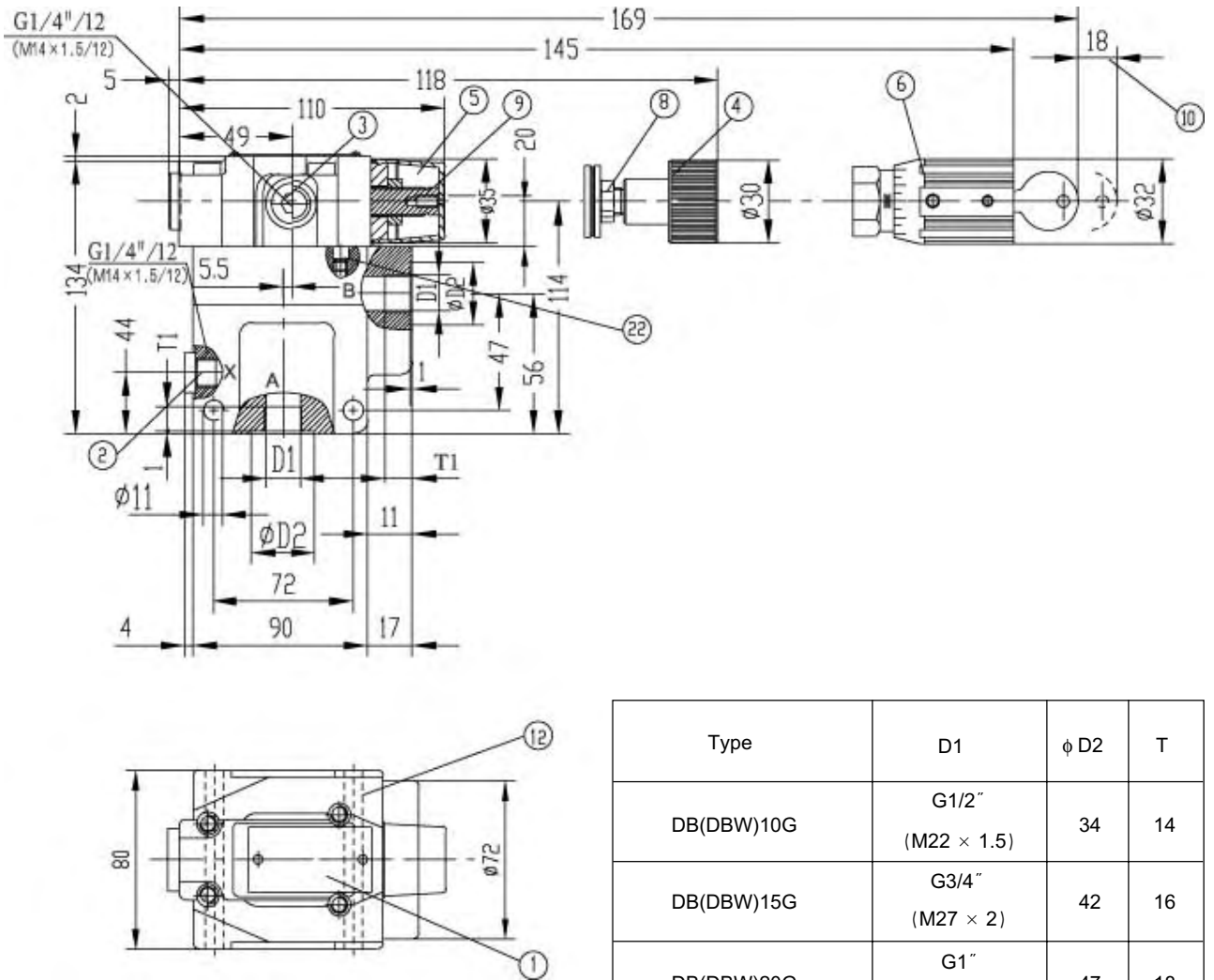
The characteristic curves were measured with external, at zero pressure, drain pilot oil.
 With internal pilot oil drain the inlet pressure increases by the outlet pressure present at port B.



The characteristic curves are valid for outlet pressure $B = 0$ over the entire flow range!

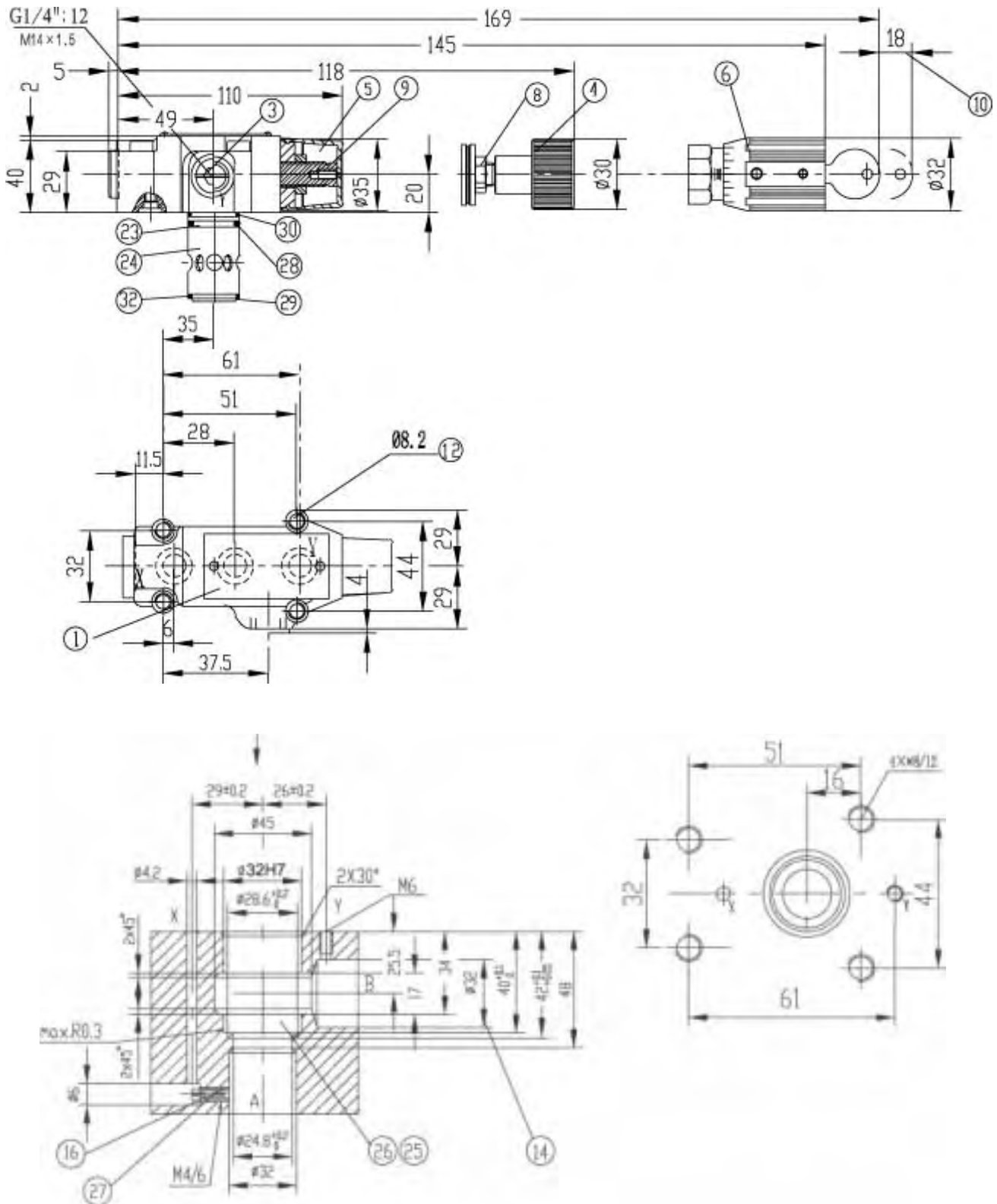


Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2	φD1	Ports A,B	Port Y
DB/DBW10	91	53.8	22.1	27.5	22.1	47.5	0	25.5	2	78	53.8	14	17.12 × 2.62	9.25 × 1.78
DB/DBW20	116	66.7	33.4	33.3	11.1	55.6	23.8	22.8	10.5	100	70	18	28.17 × 3.53	9.25 × 1.78
DB/DBW30	147.5	88.9	44.5	41	12.7	76.2	31.8	20	21	115	82.6	20	34.52 × 3.53	9.25 × 1.78



Type	D1	φ D2	T
DB(DBW)10G	G1/2" (M22 × 1.5)	34	14
DB(DBW)15G	G3/4" (M27 × 2)	42	16
DB(DBW)20G	G1" (M33 × 2)	47	18
DB(DBW)25G	G1 1/4" (M42 × 2)	58	20
DB(DBW)30G	G1 1/4" (M48 × 2)	65	22

Pilot control valves with cartridge element (DBC 30) or without cartridge element (DBC).



Item explanations

- | | |
|---|---|
| 1 Nameplate | 19 The dimension of the high-power solenoid "B" |
| 2 Port X for external pilot oil supply | 20 Space required to remove plug-in connector |
| 3 Port Y for external pilot oil drain | 21 Switching shock damping valve, optional |
| 4 Adjustment element 1 | 22 Omitted with internal pilot oil drain |
| 5 Adjustment element 2 | 23 O-ring 9.25X1.78 |
| 6 Adjustment element 3 | 24 Main spool assembly |
| 8 Lock nut 22 A/F | 25 The Φ 32 bore may connect the Φ 45 bore at any position. Please take care that the connection hole X and the fixing holes are not damaged. |
| 9 Hexagon 10 A/F | 26 Back-up ring and O-ring must be inserted into this bore before assembling the main spool. |
| 10 Space required to remove key | 27 Cartridge element include orifice and main spool assembly |
| 11 Locating pin | 28 O-ring 28x 1.8 |
| 12 Valve fixing holes | 29 O-ring 27.3 x 2.4 |
| 13 Directional spool valve WE6 | 30 O-ring 28 x 2.65 |
| 14 Solenoid "a" | 32 Back-up ring 28.4X32X0.8 |
| 15 Hand override, optional | |
| 16 Plug-in connector "Z4" | |
| 17 Large plug-in connector "Z5" and "Z5L" | |
| 18 The dimension of the standard solenoid "A" | |

Subplates for:

DB/DBW10	DB/DBW20	DB/DBW30	DBC/DBWC
G545/01 (G3/8")	G408/01 (G3/4")	G410/01 (G11/4")	G51/01 (G1/4")
G545/02 (M18 × 1.5)	G408/02 (M27 × 2)	G410/02 (M42 × 2)	G51/02 (M14 × 1.5)
G546/01 (G1/2")	G409/01 (G1")	G411/01 (G11/2")	
G546/02 (M22 × 1.5)	G409/02 (M33 × 2)	G411/02 (M48 × 2)	

See page 148、149

Valve fixing screws for:

Types DB/DBW 10

4-M12 x 50 -10.9(GB/T70.1-2000); $M_A = 130$ Nm

Types DB/DBW 20

4-M16 x 50 -10.9(GB/T70.1-2000); $M_A = 310$ Nm

Types DB/DBW 30

4-M18 x 50 -10.9(GB/T70.1-2000); $M_A = 430$ Nm

Types DBC/DBWC, DBT/DBWT


Types DBC 10/DBWC 10 and types DBC 30/DBWC 30

4-M8 x 40 -10.9(GB/T70.1-2000); $M_A = 37$ Nm

Required surface finish
of mating piece



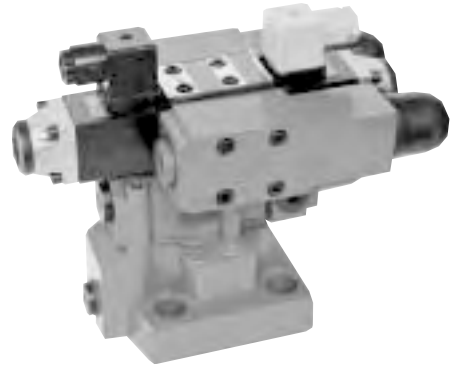
NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure relief valves,type DB3U			RE 25825/12.2004
	Size 10 to 30	up to 31.5 MPa	up to 600 L/min	Replaces: RE25825/05.2001

Features:

- Subplate mounting
- Threaded connection
- Installation in manifolds
- 3 adjustment elements:
 - Rotary knob
 - Screw with internal hexagon and protective cap
 - Rotary knob with scale
- Solenoid operated control via mounted directional valve



Functional description, section

Types DB3U pressure valves are pilot operated pressure relief valves.

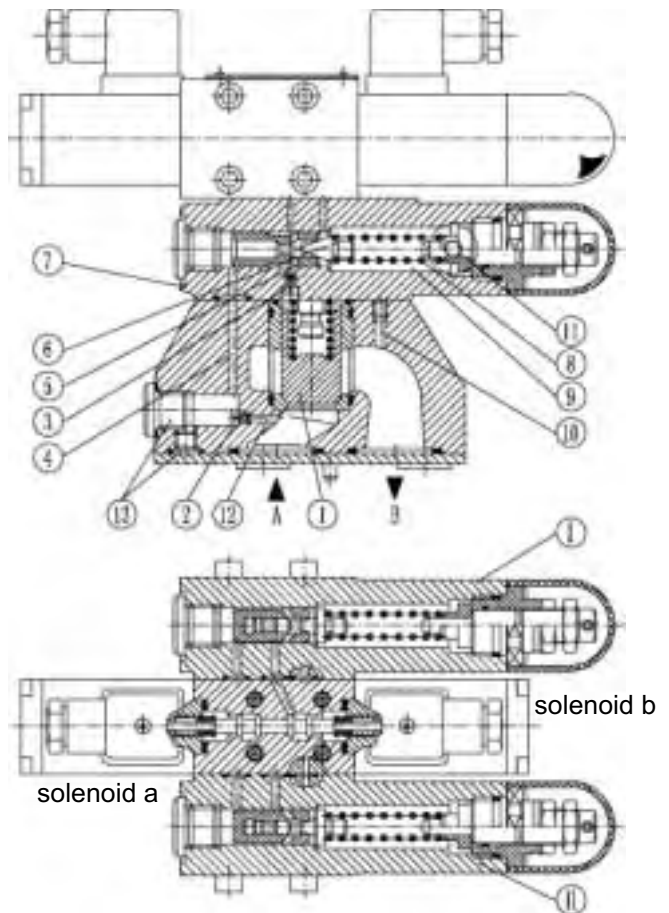
They are used for the limitation of the operating pressure, and they may be switched over to different(2 or 3 pressure stage)by solenoids actuated.

The pressure relief valves consist mainly of the main valve, 4/3,4/1-Directional control valve(Type WE5...)and three pilot valves.

In the de-energised condition the pressure in port A is set by pilot valve(7).

The pressure present in port A acts on the main spool(1). At the same time pressure is applied via the control lines (12) and (4),which are fitted with orifices (2) and (3),on the spring loaded side of the main spool(1) and at the poppet(6) in the pilot control valve (7).If the pressure in port A exceeds the value set at the spring (8),the poppet (6) opens against the spring (8).

The signal for this comes internally via the control lines (12) and (4) from port A.The pressure fluid on the spring loaded side of the main spool(1) now flows via the control line (3),poppet (6) into the spring chamber(9).In type DB3U...30/...it flows internally via the control line (10) to tank,or in type DB3U..30/..Y..externally via the port Y. Due to the orifices (2) and (3) a pressure drop occurs at the main spool(1),the connection from port A to port B is open. Now the pressure fluid flows from port A to port B while maintaining the valve set operating pressure.



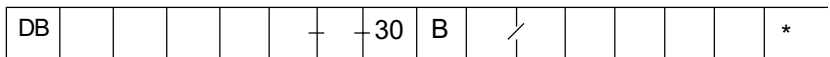
When solenoid "a" is energised:
 The pressure in port A is set by pilot valve II .
 When solenoid " b " is energised:
 The pressure in port A is set by pilot valve I .

The setting pressure of pilot valve(7) should be higher than the setting pressure of the pilot I and II .

Type DB2U:

Type DB2U pressure valves consist mainly of a directional control valve (Type WE5...) and three pilot valves. The function of this valve is basically the same as the valve type DB3U.

Ordering code

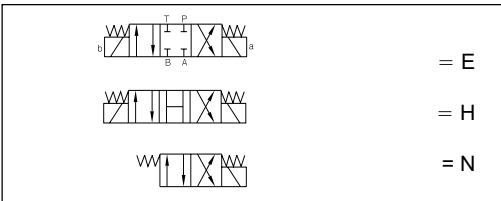


Pilot operated valve (complete) = No Code
 Pilot operated valve: with main spool assembly = C
 (Size is stated 10 or 32)
 remote control valve = T

apply to DB and DBC = 3U
 apply to DBT = 2U

Size	Ordering Code	
	Subplate mounting	Threaded connection
8	-	8(M18 x 1.5 or G3/8")
10	10	10(M22 x 2 or G1/2")
15	-	15(M27 x 2 or G3/4")
20	20	20(M33 x 2 or G1")
25	-	25(M42 x 2 or G1 1/4")
32	30	30(M48 x 2 or G1 1/2")

Subplate mounting = No code
 Threaded connection = G



Rotary knob = 1
 Screw with internal hexagon and protective cap = 2
 Rotary knob with scale = 3

Further details in clear text

No Code = mineral oils
 V = phosphate ester

Z4 = Plug-in connector
 Z5 = Large plug-in connector
 Z5L = Large plug-in connector with light

No Code = Without hand override
 N = With hand override

W220-50 = 220V 50Hz AC
 G24 = 24 V DC
 W220R = Solinoid commuting automatically 220V AC

No code = Poilt fluid feed internal ,return internal
 X = Poilt fluid feed external,return internal
 Y = Poilt fluid feed internal,return external
 XY = Poilt fluid feed external,return external

100 = Pressure setting up to 10 MPa
 315 = Pressure setting up to 31.5 MPa

B = Technology of Beijing Huade Hydraulic

30 = Series 30 to 39 (30 to 39: unchanged installation and connection dimensions)

Symbols

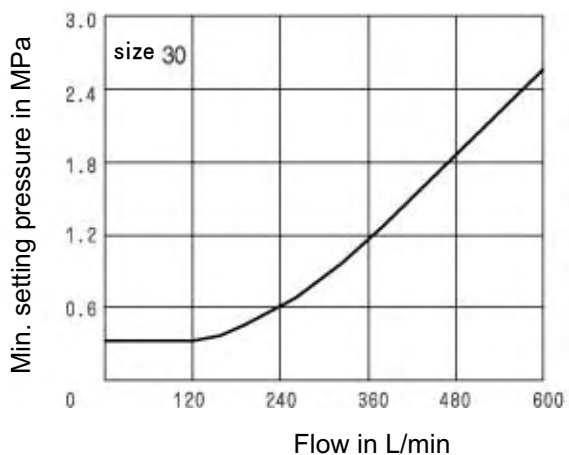
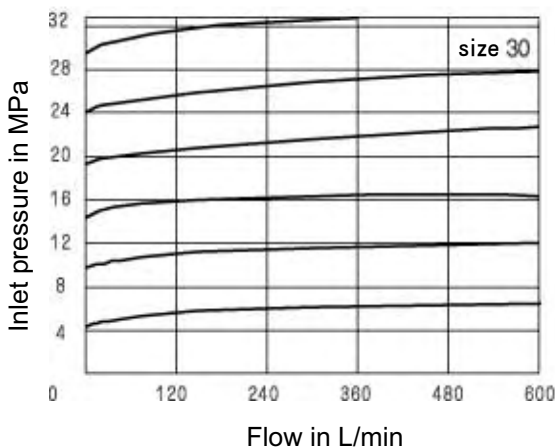
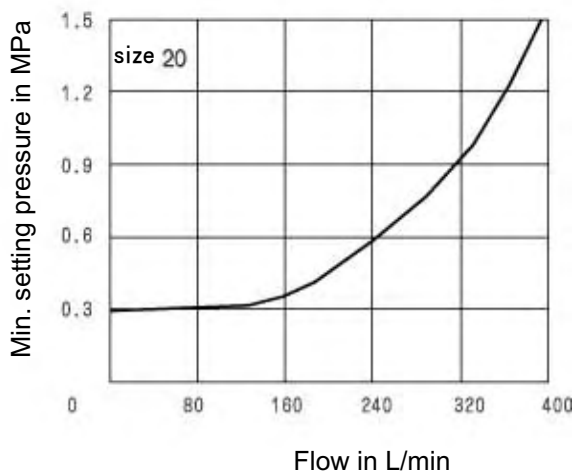
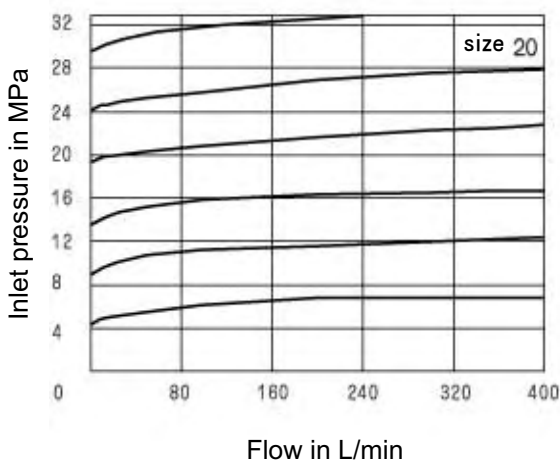
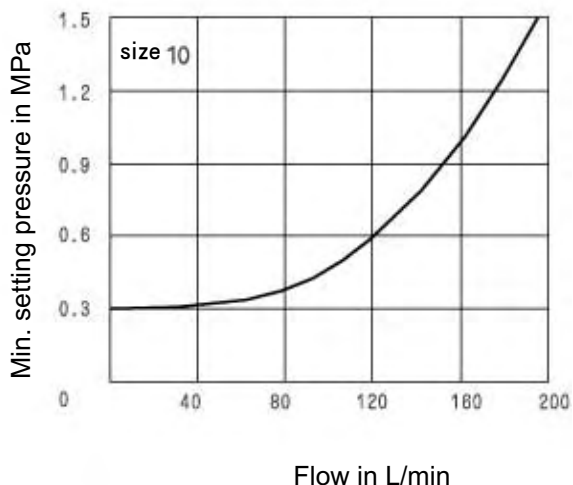
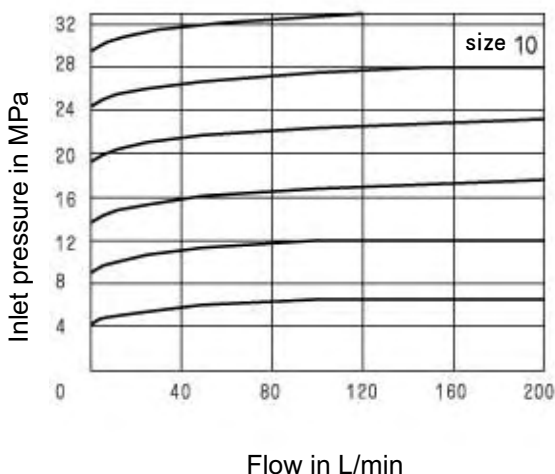
No Code			
Model "X"			
Model "Y"			
Model "XY"			

Technical data

Size		8	10	15	20	25	30
Flow (L/min)	Threaded connection	100	200		400		600
	Subplate mounting	-	200	-	400	-	600
Operating pressure	(MPa)	ports A, B, X, up to 31.5					
Back pressure (port Y)	(MPa)	up to 31.5					
Min. Setting pressure	(MPa)	see operating curves					
Max. Setting pressure	(MPa)	up to 10 or 31.5					
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)					
Viscosity range	(mm ² /s)	10 to 800					
Temperature range	(°C)	-30 to +80					
Size of directional valve		see directional valve 4WE5					

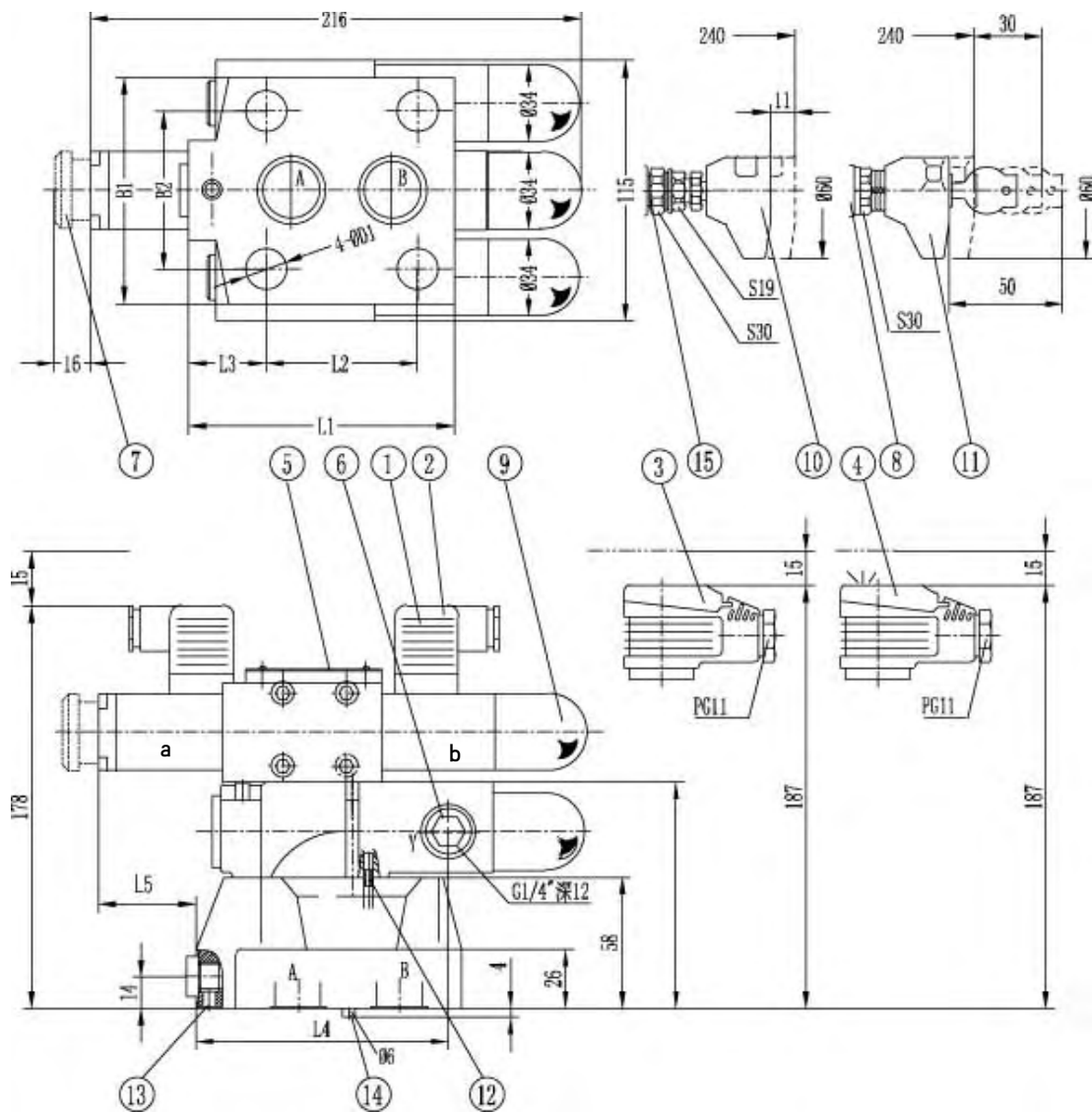
Operating Curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

The operating curves were measured with an external pilot oil, zero pressure return.
 With internal pilot oil return the input pressure is increased by the output pressure present at port B.



Unit dimensions: For subplate mounting

(Dimensions in mm)



Subplate: see page149

G545/01 G545/02

G546/01 G546/02(NG10)

G408/01 G408/02

G409/01 G409/02(NG20)

G410/01 (G1/4 ")G410/02

G411/01 (M14X1.5)G411/02

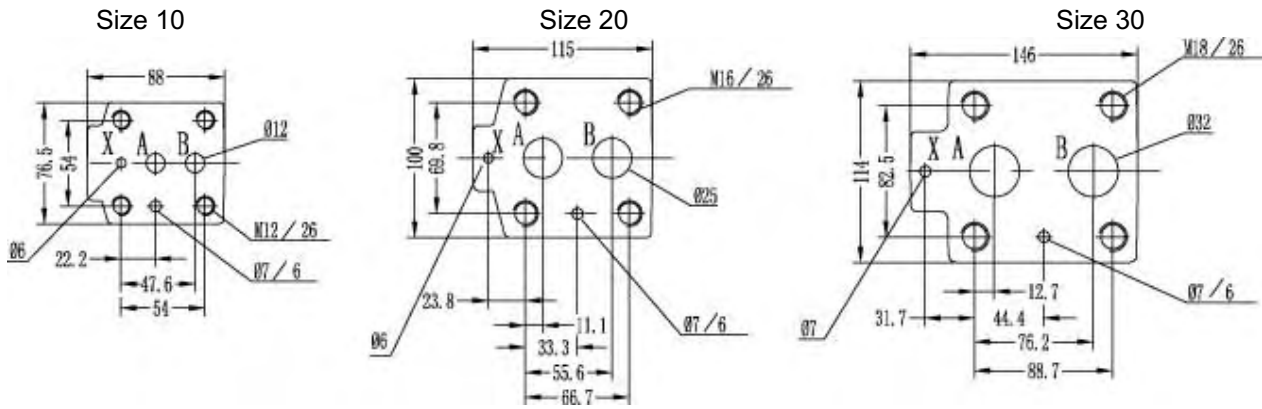
- 1 Plug-in connector " Z4 "
- 2 Plug-in connector: color gray
- 3 Large plug-in connector " Z5 "
- 4 Large plug-in connector with light " Z5L "

5 Nameplate

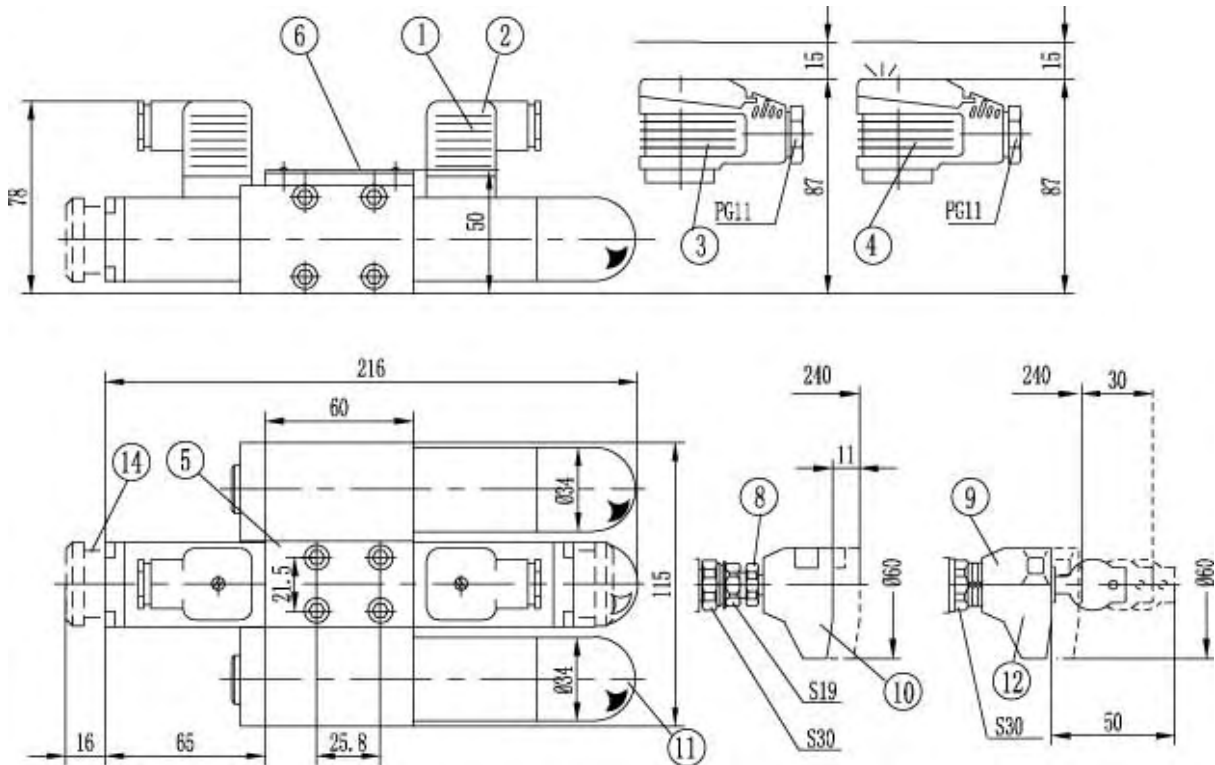
- 6 Port Y for external pilot oil drain
- 7 Hand override, optional
- 8 repeat adjusting scale
- 9 Adjustment element 1
- 10 Adjustment element 2
- 11 Adjustment element 3
- 12 inside pilot oil drain is not need
- 13 Port X for pilot oil drain
- 14 Locating pin
- 15 only apply to up to 31.5MPa

NG	D1	B1	B2	L1	L2	L3	L4	L5	Weight	Port X, O-ring	Ports A, B, O-ring
10	14	78	54	90	54	23.5	97.5	59.5	7.8kg	9.25 × 1.78	17.12 × 2.62
20	18	100	69.8	117	66.7	34	111	46	8.5Kg	9.25 × 1.78	28.17 × 3.53
30	20	115	82.5	148	89	41.5	121	36	9.8Kg	9.25 × 1.78	34.52 × 3.53

DB3U unit dimensions of ports



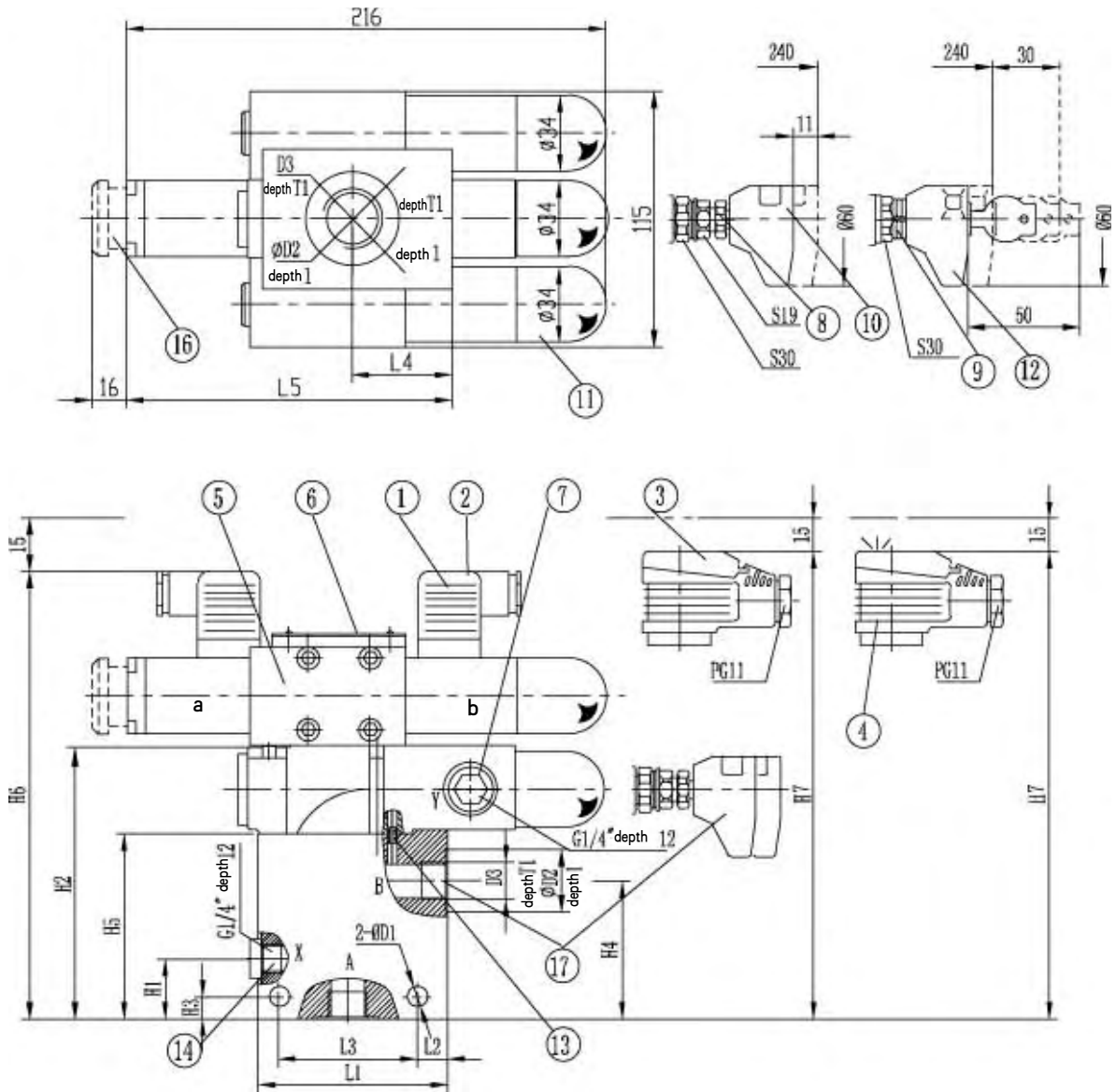
Remote control valve DBT2U, unit dimensions:



- 1. Plu-in connector "Z4"
- 2. Plug-in connector:colour gray
- 3. Large plug-in connector "Z5"
- 4. Large plug-in connector with light "Z5L"
- 5 Directional valves, type WE5

- 6. Nameplate
- 8. Only apply to up to 31.5MPa
- 9. Repeat adjusting scale
- 10. Adjustment element 1
- 11. Adjustment element 2
- 12. Adjustment element 3
- 14. Hand override optional

Subplate:
G51/01
G51/02
see page 148

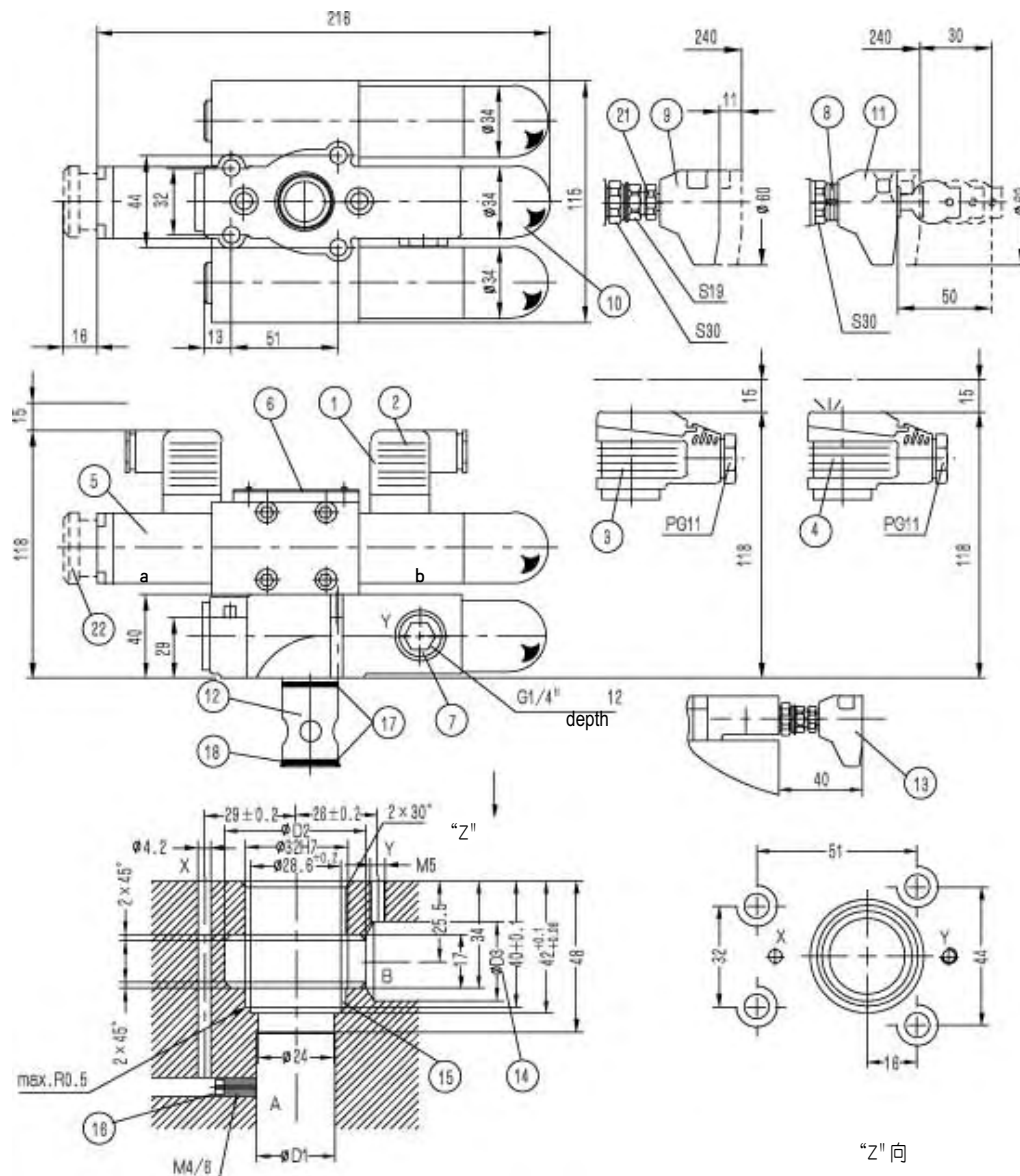


- 1. Plug-in connector without circuitry
- 2. Plug-in connector: colour gray
- 3. Large plug-in connector
- 4. Large plug-in connector with light
- 5. Directional valves, type WE5
- 6. Nameplate
- 7. Port Y for external pilot oil drain
- 8. Only apply to up to 31.5MPa
- 9. Repeat adjusting scale
- 10. Adjustment element 1
- 11. Adjustment element 2
- 12. Adjustment element 3
- 13. When internal pilot oil drain, is not need
- 14. Pilot oil drain X
- 16. Hand override, optional
- 17. When use adjustment element 1 or 3, connect with B, must need right angle elbow

NC	B1	$\phi D1$	$\phi D2$	D3	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4	L5	L6	T1	Weight(Kg)
8	63	9	28	G3/8"(M18 × 1.5)	27	125	10	62	85	203	212	85	14	62	45	146	10	12	8.5
10			34	G1/2"(M22 × 1.5)														14	8.5
15			42	G3/4"(M27 × 2)														16	8.7
20			47	G1"(M33 × 2)														18	8.7
25	70	11	56	G11/4"(M42 × 2)	42	138	13	66	98	216	225	100	18	72	54	155	1	20	9.4
30			61	G11/2"(M48 × 2)														22	9.4

Unit dimensions: for cartridge connection

(Dimensions in mm)



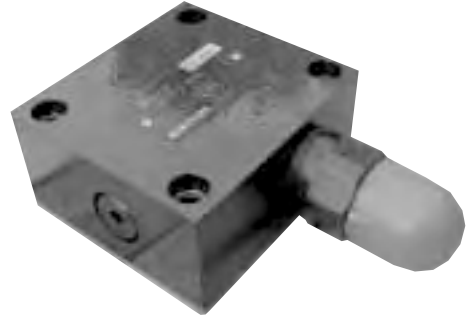
- | | | |
|---|------------------------------------|--|
| 1. Plug-in connector "Z4" | 10. Adjustment element 2 | and the fixing screw holes do not intersect. |
| 2. Plug-in connector: colour gray | 11. Adjustment element 3 | 15. Back-up ring and O-ring must be fitted |
| 3. Large plug-in connector "Z5" | 12. Main spool assembly | into the main bore before assembling |
| 4. Large plug-in connector with light "Z5L" | 13. Min. distance when use adjust- | the main spool. |
| 5. Directional valves, type WE5 | ment element 1 or 3 fixing the | 16. Orifice |
| 6. Nameplate | integration block | 17. O-ring 27.3X2.4 |
| 7. Port Y for external pilot oil drain | 14. The D3 bore may enter the D2 | 18. Retainer ring 32x28.4x0.8 |
| 8. Repeat adjusting scale | bore at any position. However, | 21. Only apply to 31.5 MPa |
| 9. Adjustment element 1 | care must be taken that X port | 22. Hand override, optional |

NC	Φ D1	Φ D2	Φ D3	Weight DB3UC	Fixing screw (GB/T70.1-2000)	Torque
10	10	40	10		6 Kg	4-M8 × 40 -10.9
20	25	50	25			
30	32		32			

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check-Q-meter, type DC			RE 25810/12.2004
	Size 10 to 30	up to 31.5 MPa	up to 330 L/min	Replaces: RE25810/05.2001

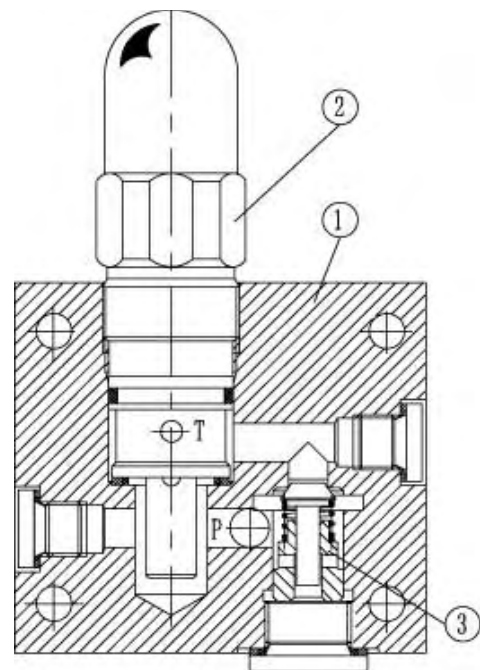
Features:

- For subplate mounting
- For pipe connections
- 5 pressure ranges
- 3 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale



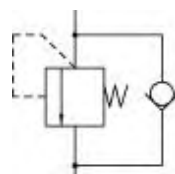
Functional,section

The valves consist basically of the housing(1), direct operated poppet valve(2), and check valve(3).
Check-Q-meters are used in hydraulic systems to prevent negative loads causing hydraulic cylinders or motors "running away", They may also act as anti-burst valves.



Type DC...10B/...

Symbols



Type DC...10/...

Ordering Code

DC 10 B *

Size	Subplate mounting	Pipe connections
6	-	M14X1.5: G1/4"
10	10	M22X1.5: G1/2"
15	-	M27X2: G3/4"
20	20	M33X2: G1"
25	-	M42X2: G1 1/4"
30	30	M48X2: G1 1/2"

Subplate mounting	=P
Pipe connections	=G

Rotary knob	=1
Sleeve with hexagon and protective cap	=2
Lockable rotary knob with scale	=3

Further details in clear text

No code = mineral oils
V = phosphate ester

25 = Pressure adjustable up to 2.5 MPa
50 = Pressure adjustable up to 5 MPa
100 = Pressure adjustable up to 10 MPa
200 = Pressure adjustable up to 20 MPa
315 = Pressure adjustable up to 31.5 MPa

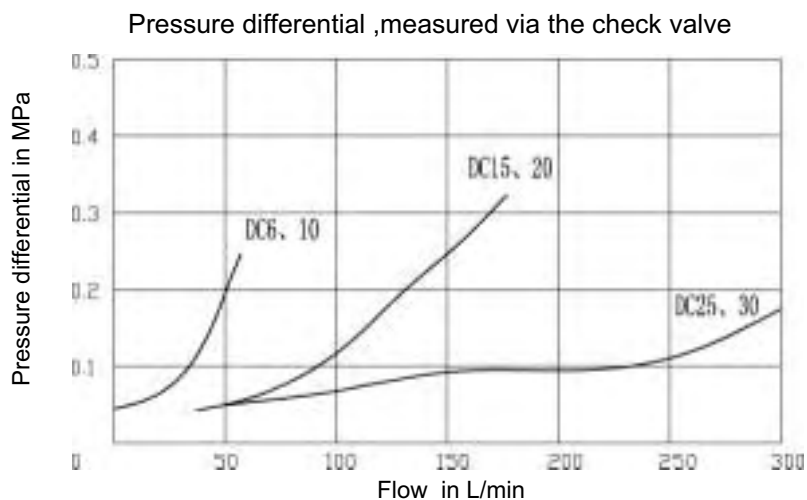
B= Technology of Beijing Huade Hydraulic

10 = Series 10 to 19
(10 to 19 = unchanged installation and connection dimensions)

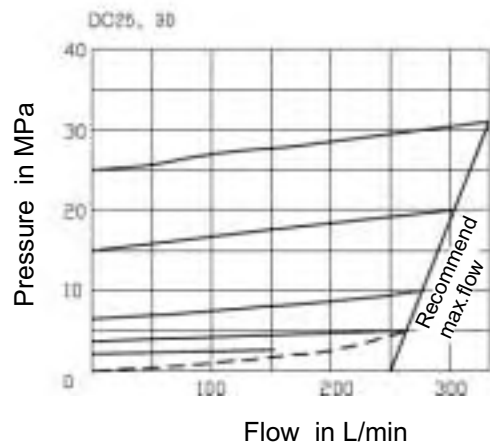
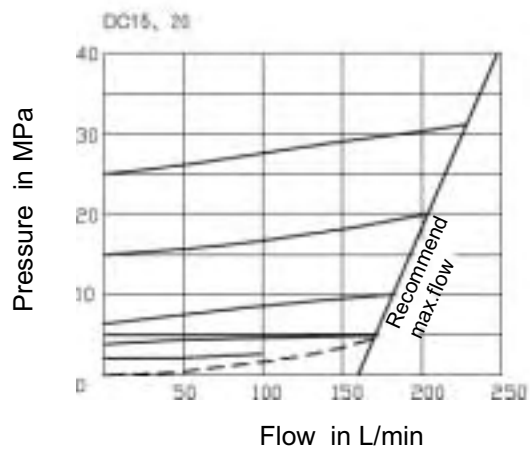
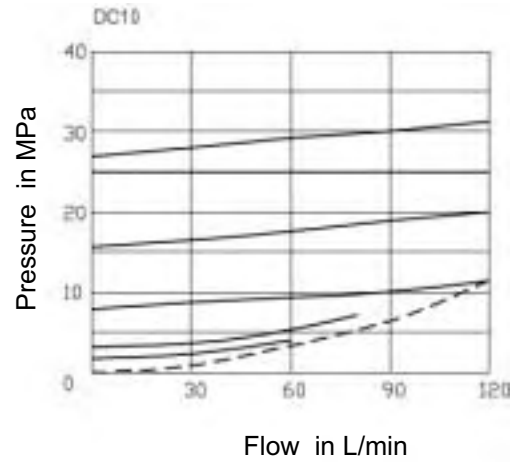
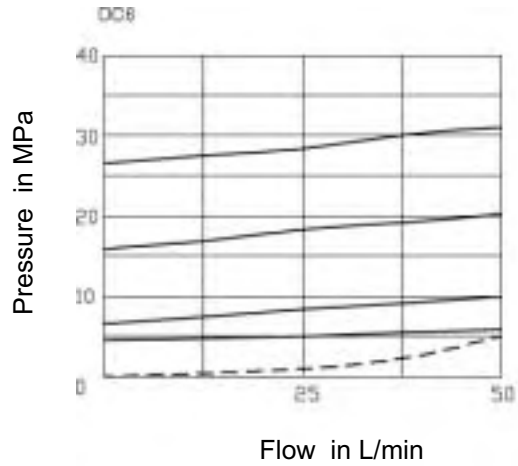
Technical data (For applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil (for NBR seal) or phosphate ester (for FPM seal)					
Pressure fluid - temperature range (°C)	-30 to +80					
Viscosity range (mm ² /s)	10 ~ 800					
Size	6	10	15	20	25	30
Operating pressure: ports A and B (MPa)	up to 31.5					
Cracking pressure (MPa)	up to 0.05					
Flow, max. (L/min)	45	110	230	330		
Degree of fluid contamination (µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$					

Characteristic curves (measured at V = 41 mm²/s and t = 50°C)



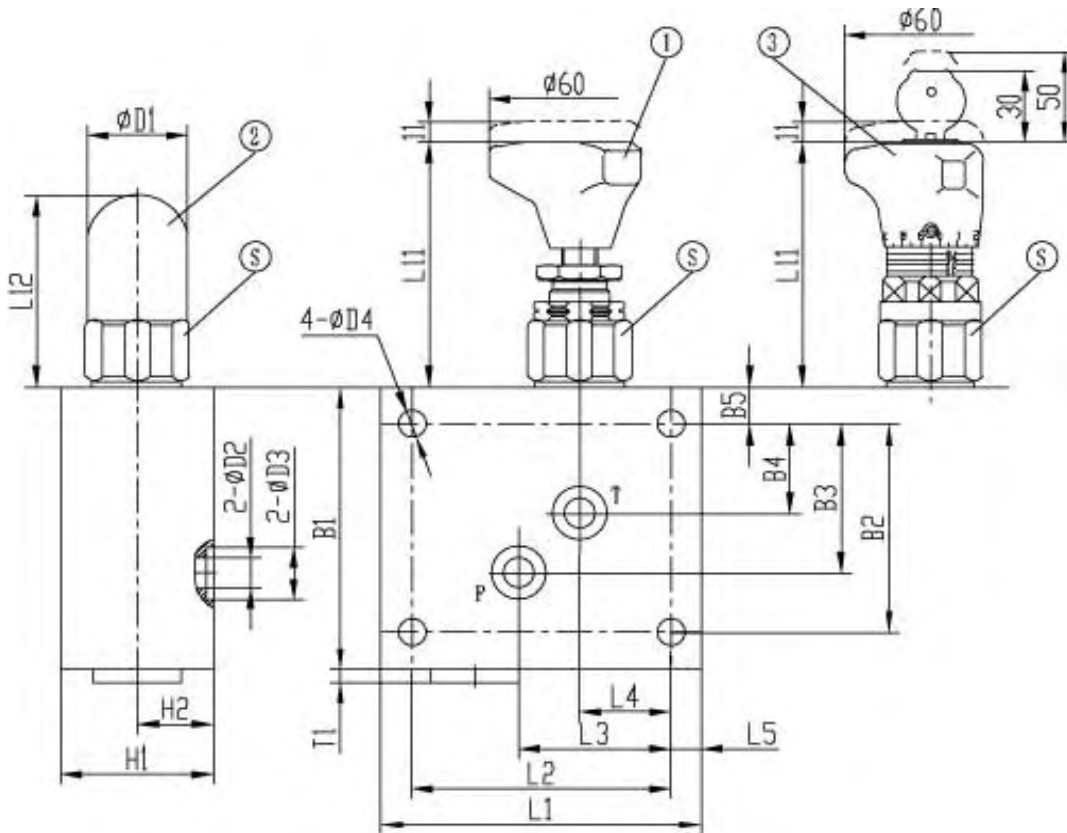
Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



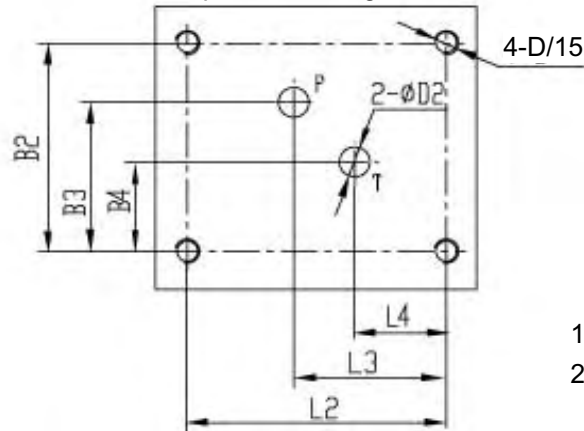
-----Min.adjusting pressure

Unit dimensions:Subplate mounting

(Dimensions in mm)



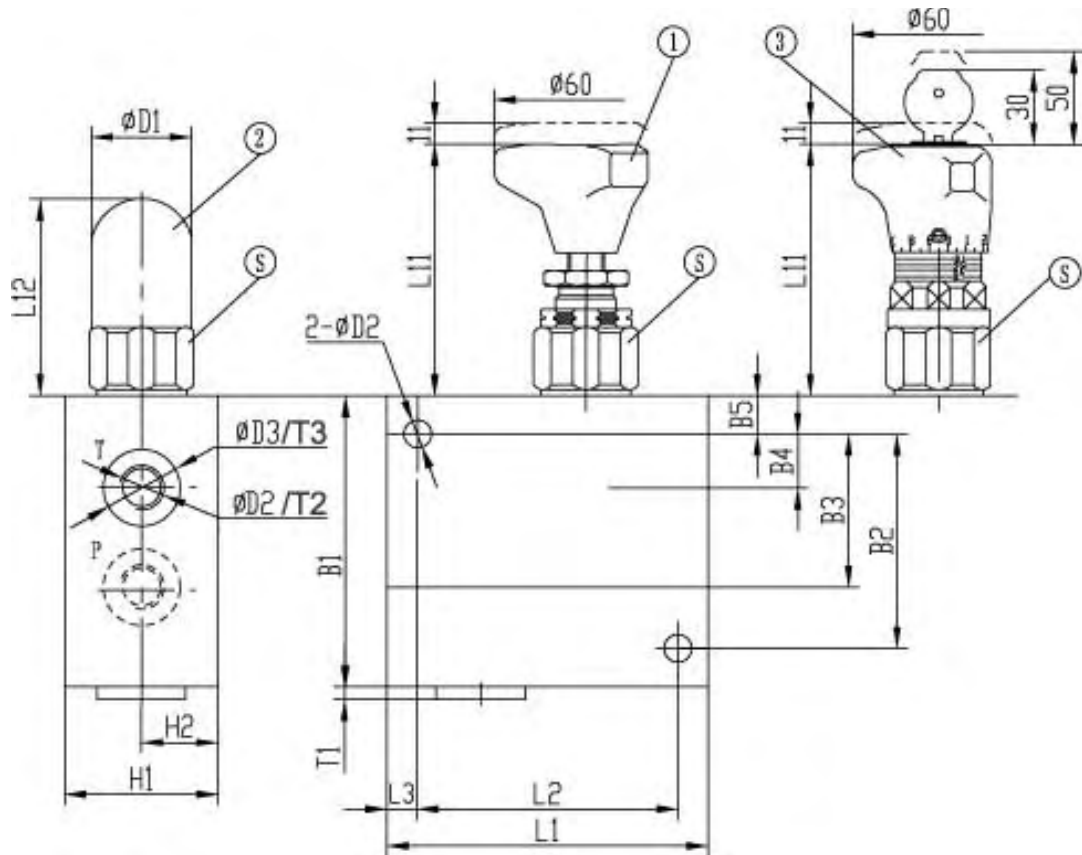
subplate mounting dimensions:



- 1.Rotary knob
- 2.Sleeve with hexagon and protective cap
- 3.Lockable rotary knob with scale

Size	L1	L2	L3	L4	L5	L11	L12	B1	B2	B3	B4	B5	H1	H2
10	105	85	50	30	10	79	68	95	70	50	30	12.5	50	25
20	145	115	65	35	15	77	65	135	85	63	29	25	60	30
30	180	150	75	45	15	-	83	175	125	82	35	25	80	40

Size	φ D1	φ D2	φ D3	φ D4	S	T1	D	O-ring	Fixed screw (GB/T70.1-2000)	Weight (Kg)
10	38	10	17.8	9	36	4	4-M8	12.3 × 2.4	4-M8 × 50-10.9	4
20	46	20	27.7	13	46	8	4-M12	22 × 3	4-M12 × 80-10.9	9
30	63	30	41.6	17	60	5	4-M16	34 × 3	4-M16 × 120-10.9	20




- 1.Rotary knob
- 2.Sleeve with hexagon and protective cap
- 3.Lockable rotary knob with scale

Size	L1	L2	L3	L11	L12	B1	B2	B3	B4	B5	H1	H2	φ D1
6	105	85	10	83	72	95	70	50	30	12.5	50	25	34
10				79	68								38
15	140	110	15	77	65	135	85	63	29	25	60	30	48
20													
25	180	150	15	-	83	175	125	82	35	25	80	40	63
30													

Size	φ D2	φ D3	D	S	T1	T2	T3	Weight (Kg)
6	9	25	M14 × 1.5(G1/4 ")	32	4	16	1	4
10		38	M22 × 1.5(G1/2 ")	33		15		
15	14	45	M27 × 2(G3/4 ")	16	7	18	1	9
20		52	M33 × 2(G1 ")			20		
25	18	63	M42 × 2(G1 1/4 ")	60	8	23	1	20
30		65	M48 × 2(G1 1/2 ")					

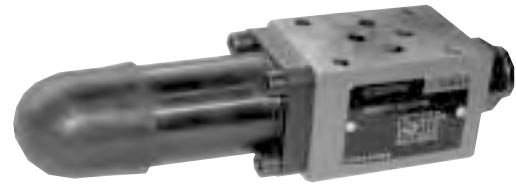
NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, direct operated, sandwich plate,type ZDR6D...30B/			RE 26569/12.2004
	Size 6	up to 21 MPa	up to 30L/min	Replaces: RE26569/05.2001

Features:

- Sandwich plate design
- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- 4 pressure ratings
- 3 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
- Pressure reduction in ports A,P,B
- Check valve, optional



Functional description, section

Pressure reducing valves type ZDR 6 D.. are 3-way direct operated pressure reducing valves of sandwich plate design with a pressure relief function on the secondary side. It is used to reduce the system pressure. The pressure reducing valve basically consists of the housing (1), the control spool (2), a compression spring (3) and the adjustment element (4) as well as with an optional check valve.

The secondary pressure is set by the pressure adjustment element (4). Model "DA"

At rest, the valve is normally open, and fluid can flow unhindered from port A to port A1. The pressure in port A1 is at the same time via the control line (5) present at the spool area opposite to the compression spring (3). When the pressure in port A1 exceeds the pressure level set at the compression spring (3) the control spool (2) moves into the control position against the compression spring (3) and holds the set pressure in port A1 constant. The control pressure and pilot oil are taken from port A1 via control line (5).

If the pressure in port A1 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (3). This causes a flow path to be opened at port A through line(6) on the control spool (2) to tank. Sufficient fluid then flows to tank to prevent any further rise in pressure. The spring chamber (7) is always drained to tank externally via drilling (6) to port T (Y).

A pressure gauge connection (8) permits the secondary pressure at the valve to be monitored.

It is only possible to fit a check valve for free flow in ports A1 to A in version "DA".

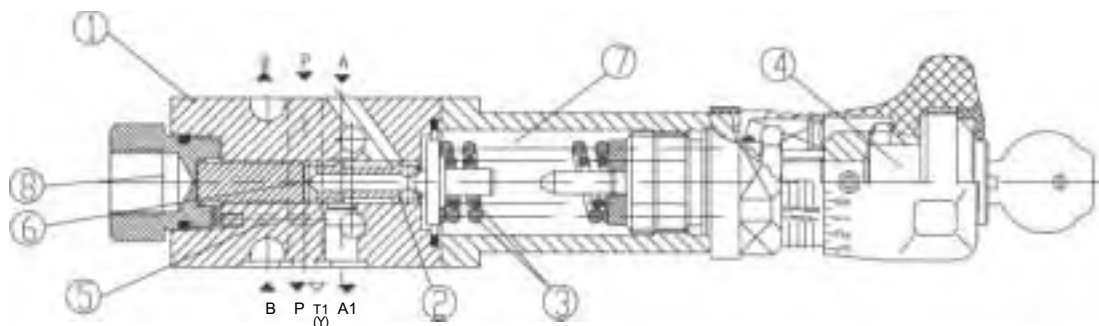
Models "DP" and "DB"

In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1.

In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

Attention!

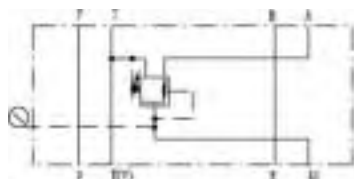
In model DB, it must be ensured, that the pressure in port B is not higher than the set pressure when the directional valve is in position P to A. Otherwise, pressure in port A will be reduced.



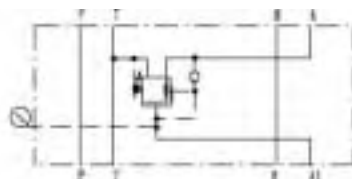
Type ZDR6DA...30B/...YM

Symbols

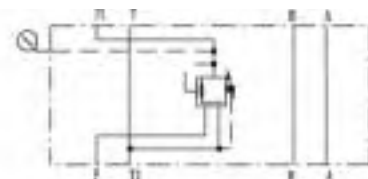
ZDR6DA...-30B/...YM...



ZDR6DA...-30B/...Y...



ZDR6DP...-30B/...YM...



Ordering details

Z DR 6 D - 30 B / Y *

Sandwich plate design = Z

Pressure reducing valve = DR

Nominal Size 6 = 6

Direct operated = D

Pressure reduction in port A = A

Pressure reduction in port P = P

Adjustment element

Rotary knob = 1

Hex. head screw with protective cap = 2

Lockable rotary knob with scale = 3

Series 30 to 39 = 30

(30 to 39 = unchanged installation and connection dimensions)

Further details in clear text

no code. = mineral oils
V = phosphate ester

no code. = with check valve
(not possible for pressure reduction in port A)
M = without check valve

Y= Pilot oil feed internal, drain external

25 = max. secondary pressure 2.5 MPa

75 = max. secondary pressure 7.5 MPa

150 = max. secondary pressure 15.0 MPa

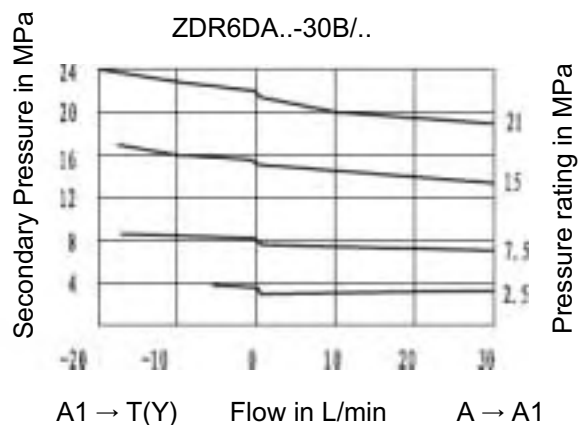
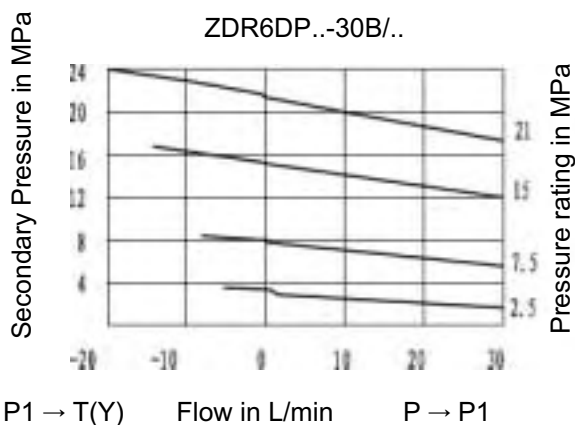
210 = max. secondary pressure 21.0 MPa

B= Technology of Beijing Huade Hydraulic

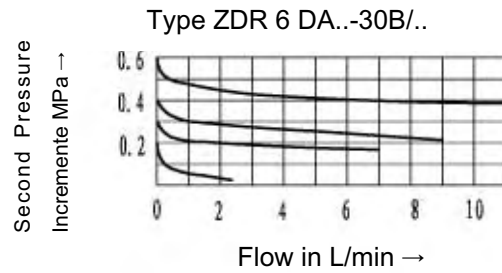
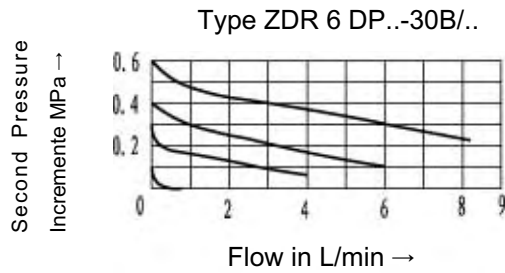
Technical data (For applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid-temperature range (°C)	-30 to +80
Viscosity range (mm ² /s)	10 to 800
Degree of fluid contamination (µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$
Max. operating Pressure (inlet) (MPa)	up to 31.5
Secondary pressure (output) (MPa)	up to 21
Back pressure port (MPa)	up to 6
Max. flow (L/min)	up to 30
Weight (kg)	approx. 1.2

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

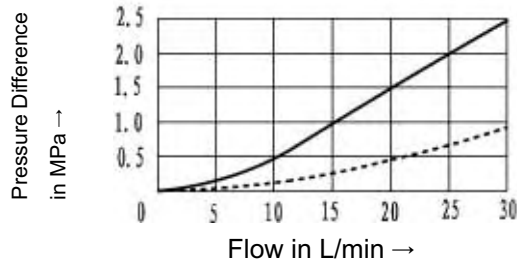


Characteristic curves (measured at $v = 41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



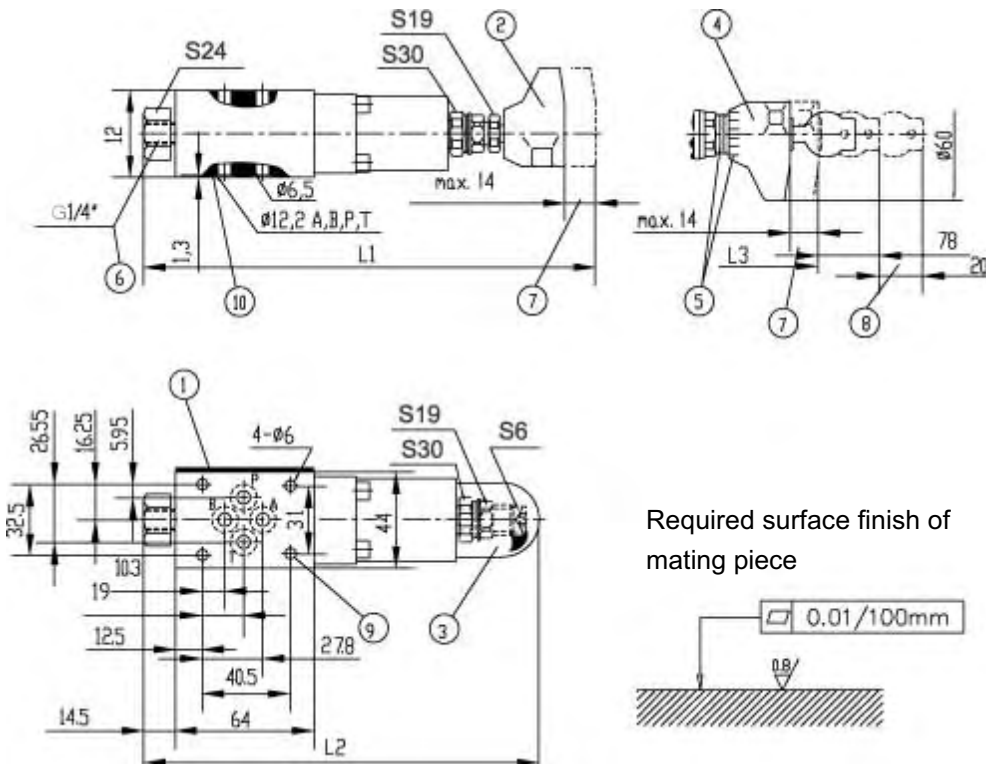
Settable pressure: <1MPa >1MPa

Check valve chacteristic curves ΔP -Q

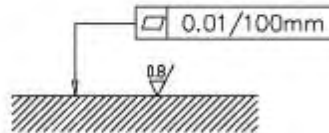


Unit dimensions

(Dimensions in mm)




Required surface finish of mating piece



1. Nameplate
2. Adjustment1
3. Adjustment2
4. Adjustment3
5. Adjusting scale set
6. Pressure gauge connection
7. Stroke
8. Space required to remove key
9. Fixing screw hole
10. O-ring 9.25X1.78, for ports A, B, P, T.

type	L1 max.	L2	L3 max.
ZDR6DA...30B/...	208	182	203
ZDR6DP...30B/...	196	170	191

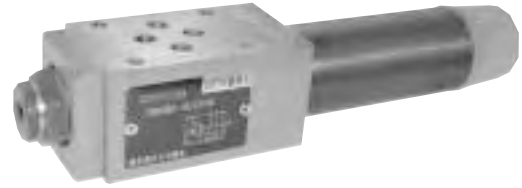
NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, direct operated, sandwich plate,type ZDR6D...40B/(New Series)			RE26550/12.2004
	Size 6	up to 21 MPa	up to 50L/min	

Features:

- Sandwich plate design
- 4 pressure ratings
- 3 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
- Pressure reduction in ports A, B or P
- Check valve, optional
- Porting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H



Functional, section

Pressure reducing valves type ZDR 6 D.. are 3-way direct operated pressure reducing valves of sandwich plate design with a pressure relief function on the secondary side. It is used to reduce the system pressure. The pressure reducing valve basically consists of the housing (1), the control spool (2), a compression spring (3) and the adjustment element (4) as well as with an optional check valve.

The secondary pressure is set by the pressure adjustment element (4).

Model "ZDR6DA"

At rest, the valve is normally open, and fluid can flow unhindered from port A to port A1. The pressure in port A1 is at the same time via the control line present at the spool area opposite to the compression spring (3). When the pressure in port A1 exceeds the pressure level set at the compression spring (3) the control spool (2) moves into the control position against the compression spring (3) and holds the set pressure in port A1 constant.

The control pressure and pilot oil are taken from port A1 via control line.

If the pressure in port A1 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (3).

This causes a flow path to be opened at port A1 through control land (9) on the control spool (2) to tank. Sufficient fluid then flows to tank to prevent any further rise in pressure. The spring chamber (7) is always drained to tank externally via drilling (6) to port T (Y).

A pressure gauge connection (8) permits the secondary pressure at the valve to be monitored.

It is only possible to fit a check valve for free flow in ports A1 to A in version "DA".

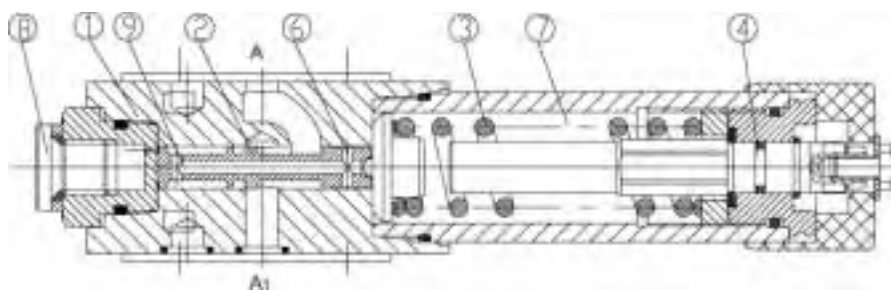
Models "DP" and "DB"

In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1.

In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

Attention!

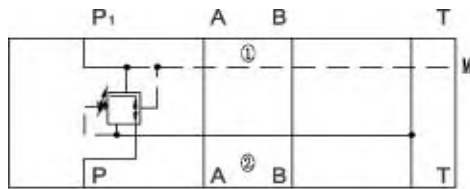
In model DB, it must be ensured, that the pressure in port B is not higher than the set pressure when the directional valve is in position P to A. Otherwise, pressure in port A will be reduced.



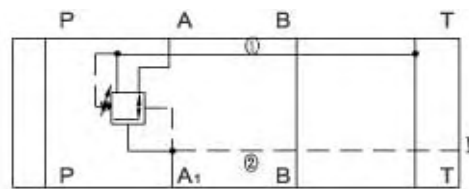
Type ZDR6DA1-40B/...YM...

Symbols (① =valve side, ② =subplate side)

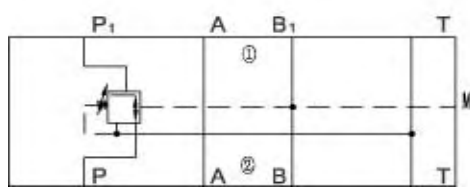
ZDR6DP...-40B/...YM...



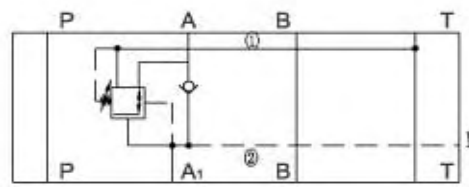
ZDR6DA...-40B/...YM...



ZDR6DB...-40B/...YM...



ZDR6DA...-40B/...Y...



Ordering details

Z DR 6 D - 40 B / Y *

Sandwich plate design = Z

Pressure reducing valve = DR

Nominal Size 6 = 6

Direct operated = D

Pressure reduction in port A = A
 Pressure reduction in port B = B
 (Pilot oil from port B)
 Pressure reduction in port P = P

Adjustment element
 Rotary knob = 1
 Hex. head screw with protective cap = 2
 Lockable rotary knob with scale = 3

Series 40 to 49 = 40
 (40 to 49 = unchanged installation and connection dimensions)

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code. = with check valve
 (only possible for pressure reduction in port A)
 M = without check valve

Y= Pilot oil feed internal, drain external

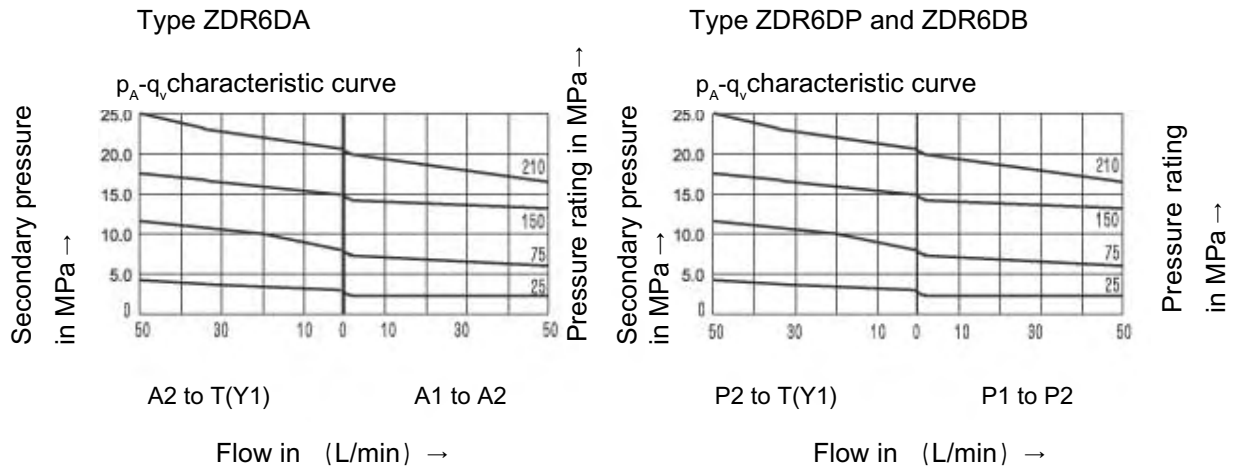
25= max. secondary pressure 2.5 MPa
 75= max. secondary pressure 7.5 MPa
 150= max. secondary pressure 15 MPa
 210= max. secondary pressure 21 MPa

B= Technology of Beijing Huade Hydraulic

Technical data (For applications outside these parameters, please consult us!)

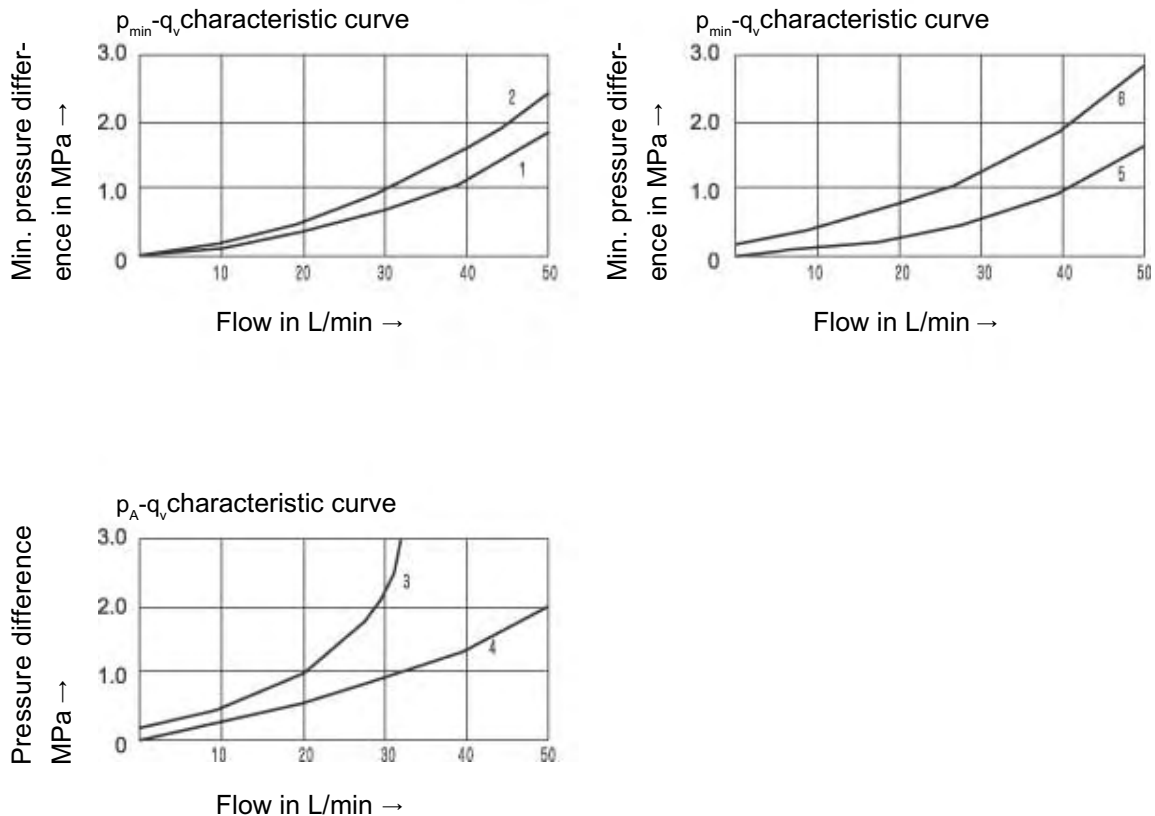
Pressure fluid	Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid-temperature range (°C)	-30 to +80
Viscosity range (mm ² /s)	10 to 800
Degree of fluid contamination (µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638, class 9. $\beta_{10} \geq 75$
Max. operating Pressure (inlet) (MPa)	up to 31.5
Secondary pressure (output) (MPa)	up to 2.5, up to 7.5, up to 15.0, up to 21.0
Back pressure port (MPa)	up to 16.0
max. flow (L/min)	up to 50.0
weight (kg)	approx. 1.2

Characteristic curves (measured at $v = 41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Note:

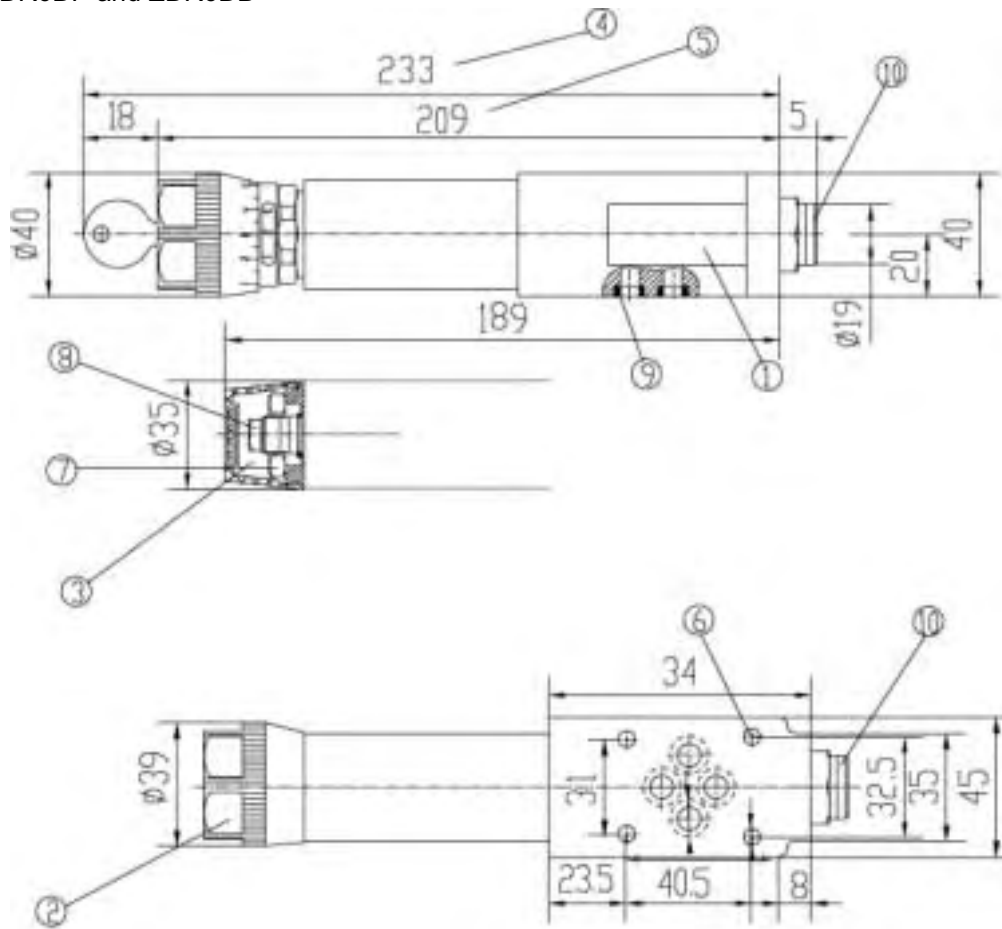
The curve characteristics remain, with low set pressures, the same in relation to the pressure rating



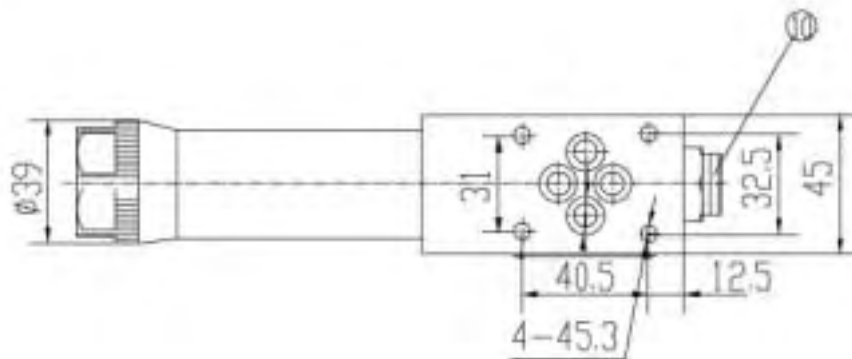
1. A to A1
2. A1 to TB (third. flow path)
3. A1 to A (flow via check valve only)
4. A1 to A (check valve and fully open control cross section)
5. P1 to TB
6. P1 to T(Y) (third. flow path)

The characteristic curves for the pressure relief function are valid for the outlet pressure = zero over the entire flow range!

Type ZDR6DP and ZDR6DB



Type ZDR6DA



1. Nameplate
2. Adjustment1
3. Adjustment2
4. Adjustment3
5. Adjustment7
6. Valve fixing screw holes
7. Lock nut 24 A/F
8. Hexagon 10A/F
9. O-ring 9.25X1.78 for ports A2,B2,P2,T2(Y)
10. Pressure gauge port G1/4";depth12,internal hex.6A/F



Required surface finish of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, type ZDR6DP0...40B/40YM			RE 26700/12.2004
	Size 6	up to 4.0 MPa	up to 7L/min	

Features:

- Sandwich plate design



Functional description,section

Pressure reducing valves type ZDR 6 DP0...40B/40YM are pressure reducing valves of sandwich plate design. It is used to reduce the system pressure.

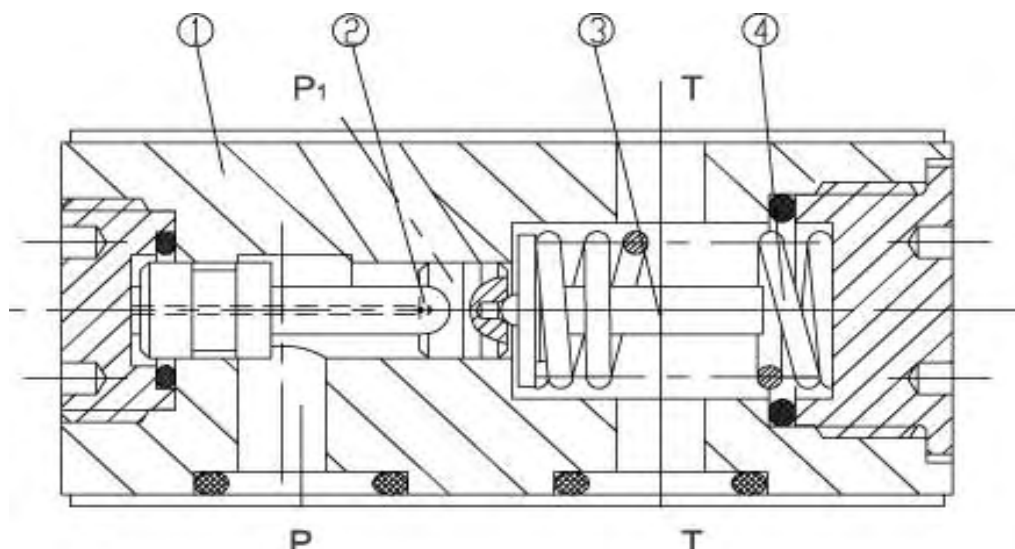
The pressure reducing basically valve consists of the housing (1), the control spool (2), a compression spring seating (3) and a compression spring (4).

At rest, the valve is normally open, and fluid can flow unhindered from port P to port P1. The pressure in port P1 is at the same time present at the spool area opposite to the compression spring (4). When the pres-

sure in port P1 exceeds the pressure level set at the compression spring (4) the control spool (2) moves into the control position against the compression spring (4) and holds the set pressure in port P1 constant.

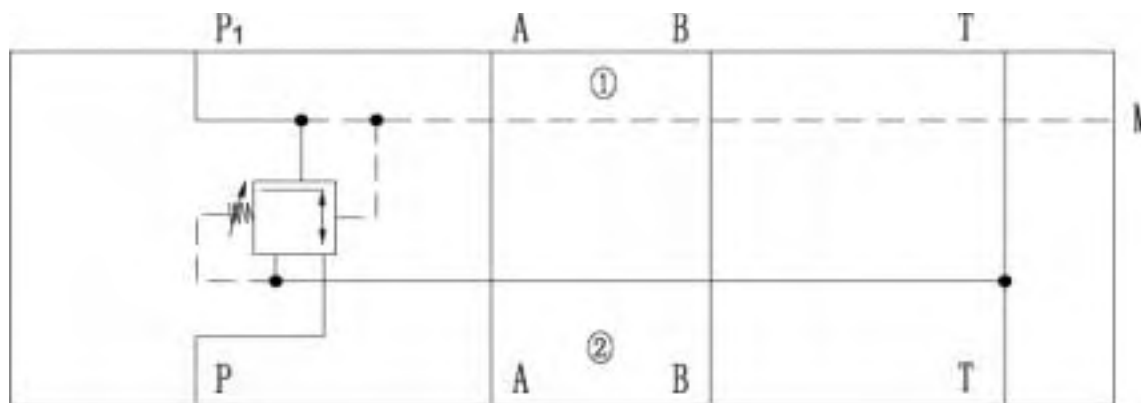
If the pressure in port P1 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (4).

Sufficient fluid then flows to tank to prevent any further rise in pressure. The spring chamber is always drained to tank externally via drilling to port T (Y).



Symbols (① =valve side, ② =subplate side)

ZDR6DPO...-40B/...YM...



Ordering details

Z DR 6 D P O -40 B/ 40 Y M *

Sandwich plate design = Z

Further details in clear text

Pressure redcing valve = DR

Nominal Size 6 = 6

Direct operated = D

Pressure reduction in port P1 = P

Outlet pressure fixed = O

Series 40 to 49 = 40
(40 to 49 = unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

No code. = mineral oils
V = phosphate ester

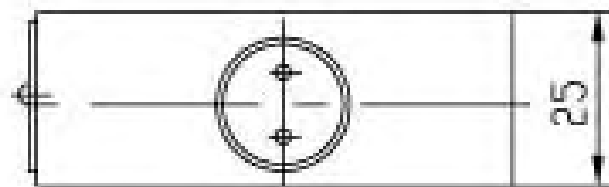
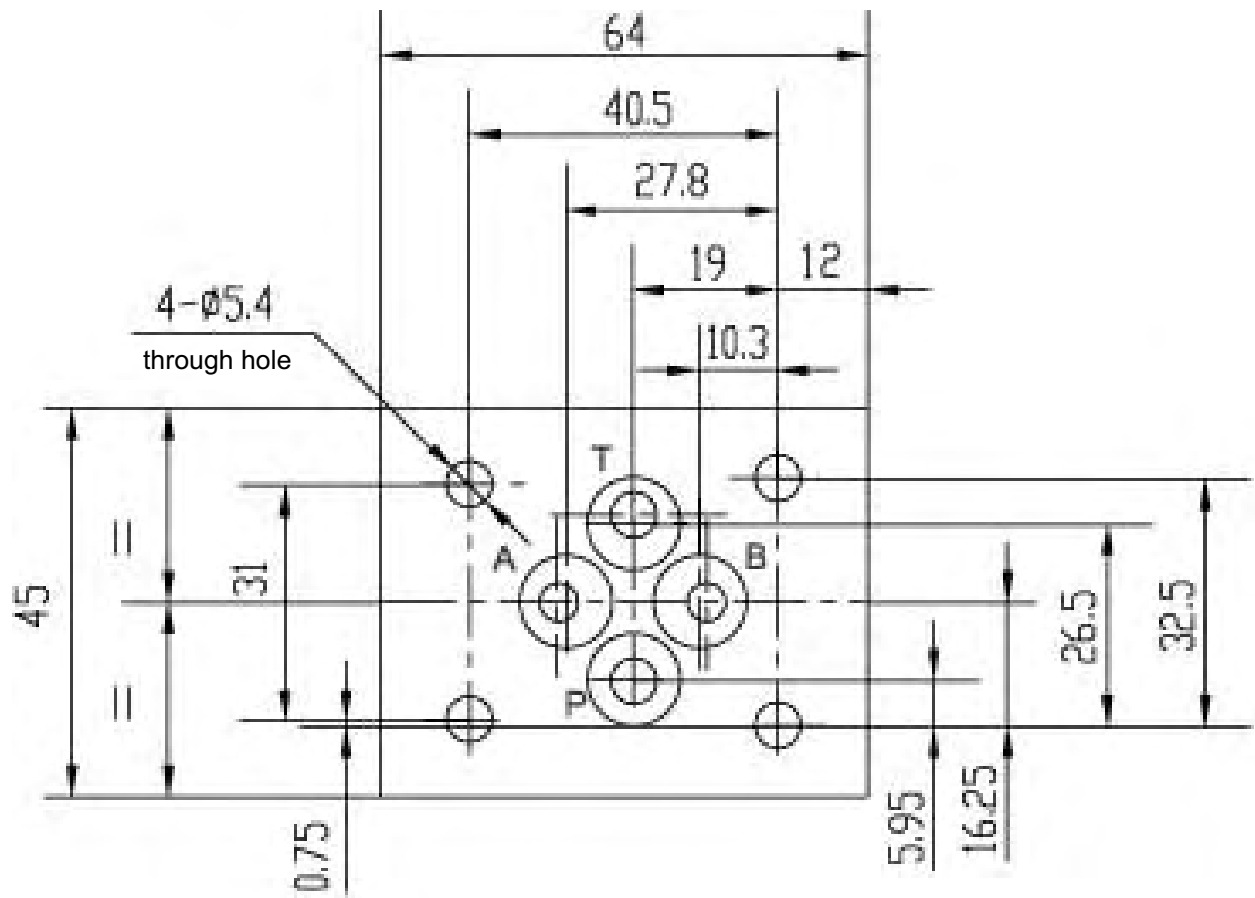
M = without check valve

Y = Pilot oil feed internal, drain external


40 = max. secondary pressure 4 MPa

Technical data (For applications outside these paramters, please consult us!)

Pressure fluid	Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid - temperature range (°C)	-30 to +80
Viscosity range (mm ² /s)	10 to 800
Degree of fluid contamination	recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$
Max. operating pressure Port P (MPa)	up to 30
Secondary pressure (output) (MPa)	up to 4
Back pressure Ports T (Y) (MPa)	up to 16
Max. flow (L/min)	up to 7



NOTICE

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ording specially.
4. Vavle fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  .
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Direct operated pressure reducing valve sandwich plate,type ZDR 10 D...40B/			RE26584 /12.2004
	Size10	up to 21 MPa	up to 50L/min	Replaces: RE26584/05.2001

Features:

- Sandwich plate design
- Porting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H
- Pressure reduction in ports A, B or p
- 3 adjustment elements:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale
- 4 pressure ratings
- optional check valve

Functional, section

The pressure reducing valve type ZDR 10 D.. is a 3-way direct operated valve of sandwich plate design with a pressure relief function on the secondary side. It is used to reduce the system pressure.

The pressure reducing valve basically consists of the housing (1), the control spool (2), a compression spring (3),and the adjustment (4) as well as an optional check valve.

The secondary pressure is set by the pressure adjustment element (4).

Model "DA"

At rest, the valve is normally open, and fluid can flow unhindered from port A to port A1. The pressure in port A1 is at the same time via the control line (5) present at the spool area opposite to the compression spring (3). When the pressure in port A1 exceeds the pressure level set at the compression spring (3), the control spool (2) moves into the control position against the compression spring (3) and holds the set pressure in port A1 constant.

The control pressure and pilot oil are taken from port A1 via control line (5).

If the pressure in port A1 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (3).

This causes a flow path to be opened at port A1 via control land (6) on the control spool (2) and housing (1) to tank (port TB). Sufficient fluid then flows to tank to prevent any further rise in pressure.

The spring chamber (7) is always drained to tank externally via port TA .

A pressure gauge connection (8) permits the secondary pressure at the valve to be monitored.

It is only possible to fit a check valve for free flow in ports A1 to A in version "DA".

Models "DP" and "DB"

In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1.

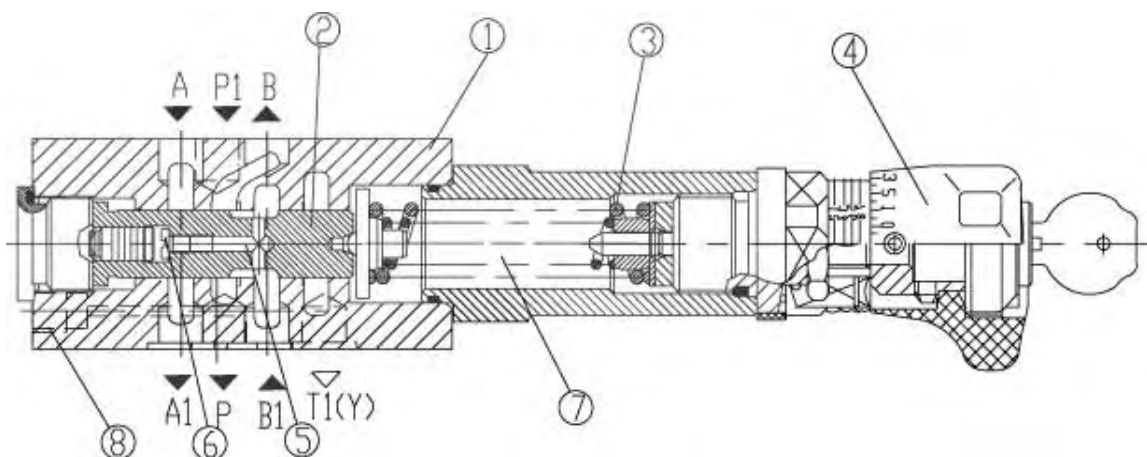
In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

Attention!

When the directional valve is in the switched position P to A, pressure in port B must not exceed the set secondary pressure.

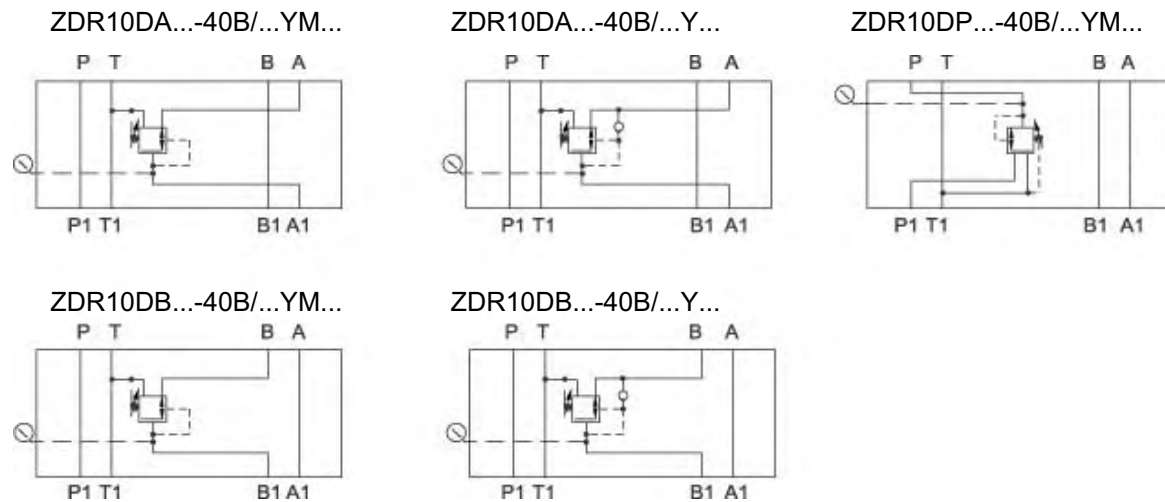
Otherwise, pressure in port A will be reduced.

If used without a directional valve, TA and TB must be interconnected (e.g. in the cover plate).



ZDR10D...40B/...YM

Symbols



Ordering details

Z	DR	10	D				-	40	B	/	Y			*
---	----	----	---	--	--	--	---	----	---	---	---	--	--	---

Sandwich plate design = Z

Pressure reducing valve = DR

Size 10 = 10

Direct operated = D

Pressure reduction in port A = A
 Pressure reduction in port B = B
 Pressure reduction in port P = P

Setting elements

Rotary knob = 1

Hex. head screw with protective cap = 2

Lockable rotary knob with scale = 3

Series 40 to 49 = 40

(40 to 49 = unchanged installation and connection dimensions)

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code. = with check valve
 (only possible for pressure reduction in port A,B)
 M = without check valve

Y= Pilot oil feed internal, drain external

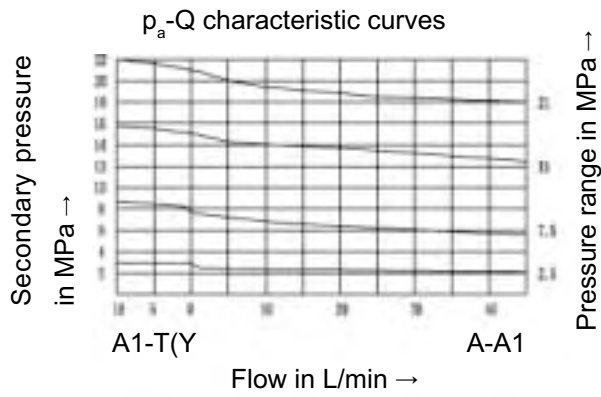
25= max. secondary pressure 2.5 MPa
 75= max. secondary pressure 7.5 MPa
 150= max. secondary pressure 15 MPa
 210= max. secondary pressure 21 MPa

B= Technology of Beijing Huade Hydraulic

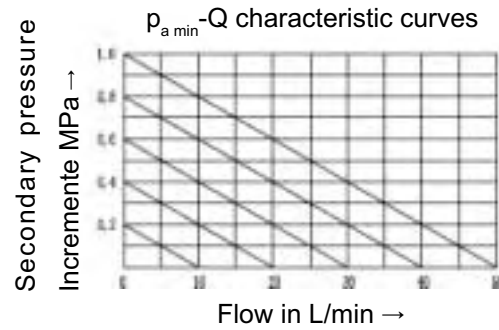
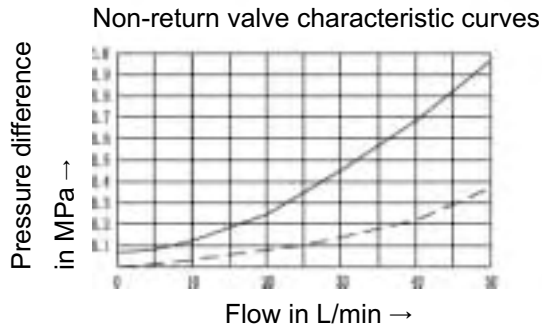
Technical data (For applications outside these parameters, please consult us!)

Weight	(Kg)	approx. 2.8
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid - temperature range	(°C)	-30 to +80
Viscosity range	(mm ² /s)	10 to 800
Degree of fluid contamination		recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$
Max. operating pressure Port P	(MPa)	up to 31.5
Secondary pressure (output)	(MPa)	up to 21
Back pressure Ports T (Y)	(MPa)	up to 15
Max. flow	(L/min)	50

Characteristic curves (measured at $\nu = 41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

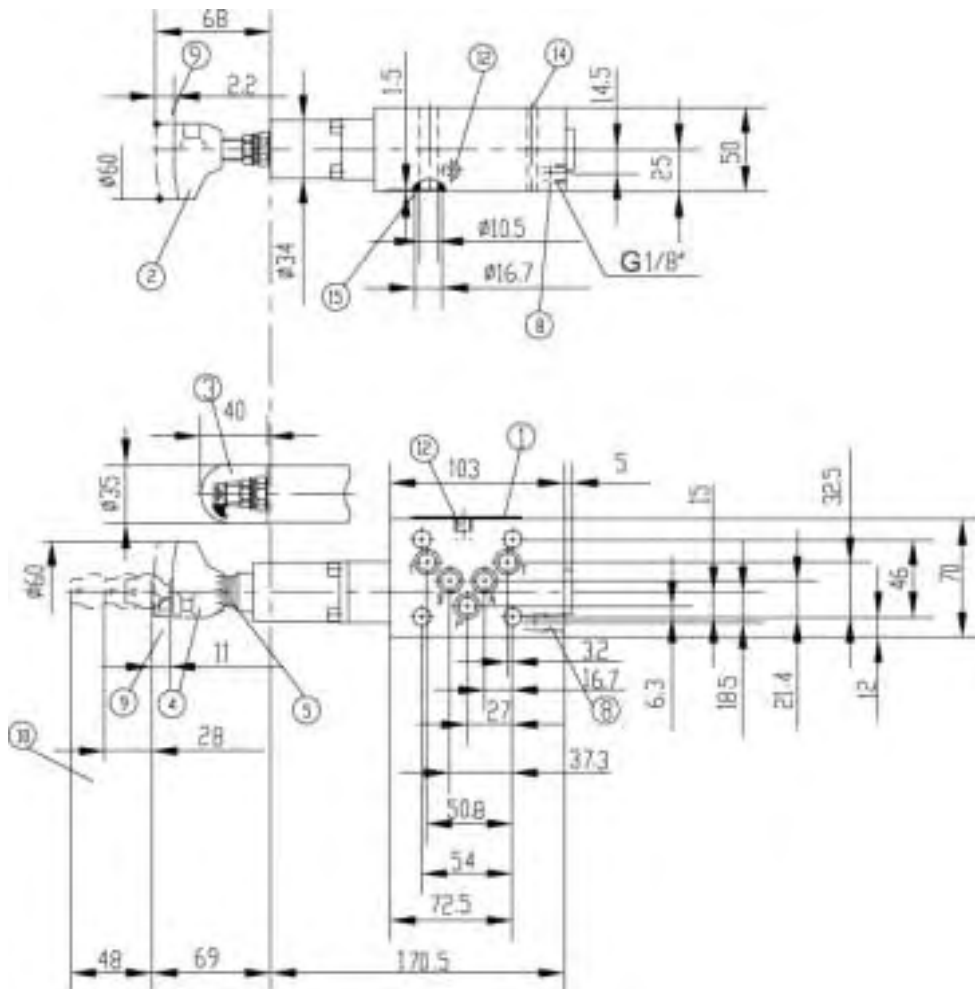


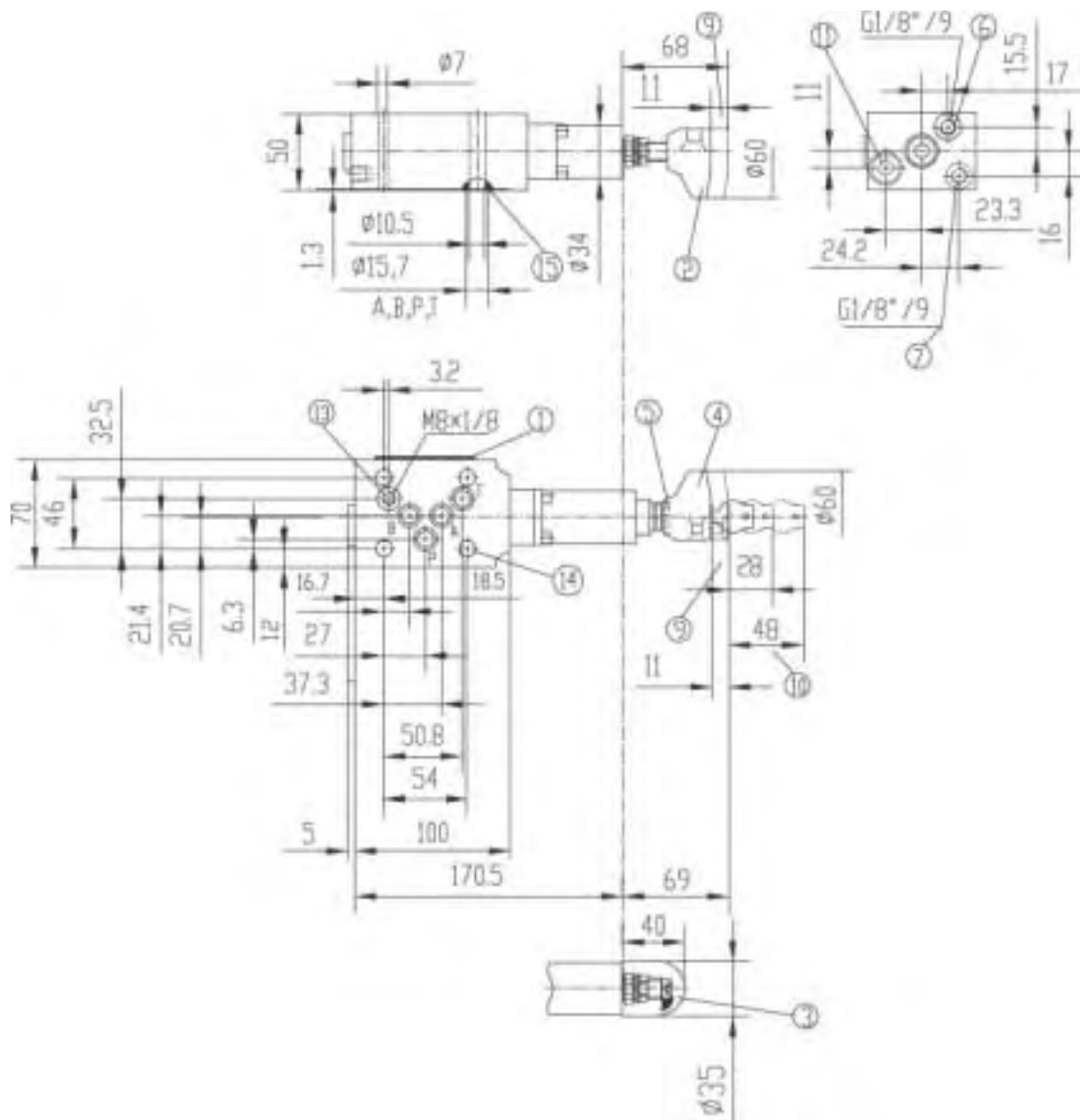
P_{amin} -Q characteristic curve, Maximum secondary pressure 2.5MPa. Min. adjusting pressure is related to A-A1, B-B1 and P-P1. When $P=3\text{MPa}$, flow of ports A1 and P1 are 20L/min. If pressure rises above $P=3.4\text{MPa}$, flow=0.



Unit dimensions: type ZDR10DB

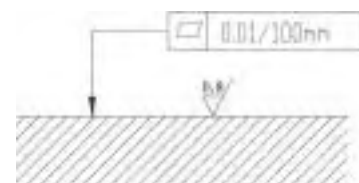
(Dimensions in mm)





- | | |
|---|---|
| 1. Nameplate | 11. Optional check valve for ZDR10DA |
| 2. Adjustment1 | 12. Optional check valve for ZDR10DB |
| 3. Adjustment2 | 13. Maximum secondary pressure is 2.5MPa, stem on this hole; When 7.5MPa,15MPa and 21MPa,use as a leakage hole;This hole can use as chamber "T",at the same time needn't use chamber "T"(right),must unload spool.Opposite hole with O-ring drilling a hole ,use as a leakage hole. |
| 4. Adjustment3 | |
| 5. Adjusting scale set | |
| 6. A pressure gauge connection for ZDR 10DP | |
| 7. A pressure gauge connection for ZDR 10DA | |
| 8. A pressure gauge connection for ZDR 10DB | 14. Fixed screw hole |
| 9. Max.distance of adjustment | 15. O-ring 12X2 for ports A , B , P , T |
| 10. Space required to remove key | |

Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Direct operated pressure reducing valve, sandwich plate,type ZDR 10D...50B/(New Series)			RE26585/12.2004
	Size 10	up to 21MPa	up to 80L/min	

Features:

- Sandwich plate design
- Pressure reduction in ports A, B or P
- 4 adjustment elements:
 - Rotary knob
 - Hex. head screw with protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 4 pressure ratings
- optional check valve
- Porting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H



Functional, section

The pressure reducing valve type ZDR 10 D.. is a 3-way direct operated valve of sandwich plate design with a pressure relief function on the secondary side. It is used to reduce the system pressure.

The pressure reducing valve basically consists of the housing (1), the control spool (2), a compression spring (3), and the adjustment (4) as well as an optional check valve.

The secondary pressure is set by the pressure adjustment element (4). Model "DA"

At rest, the valve is normally open, and fluid can flow unhindered from port A1 to port A2. The pressure in port A2 is at the same time via the control line (5) present at the spool area opposite to the compression spring (3). When the pressure in port A2 exceeds the pressure level set at the compression spring (3), the control spool (2) moves into the control position against the compression spring (3) and holds the set pressure in port A2 constant.

The control pressure and pilot oil are taken from port A2 via control line (5).

If the pressure in port A2 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (3).

This causes a flow path to be opened at port A2 via control land (5) on the control spool (2) and housing (1) to tank (port TB).

Sufficient fluid then flows to tank to prevent any further rise in pressure.

The spring chamber (7) is always drained to tank externally via port TA .

A pressure gauge connection (8) permits the secondary pressure at the valve to be monitored.

It is only possible to fit a check valve for free flow in ports A2 to A1 in version "DA".

Models "DP" and "DB"

In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1.

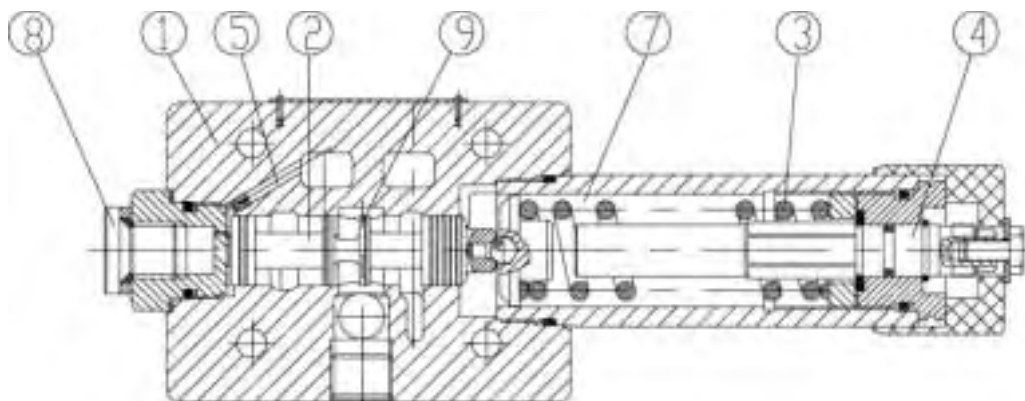
In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

Attention!

When the directional valve is in the switched position P to A, pressure in port B must not exceed the set secondary pressure.

Otherwise, pressure in port A will be reduced.

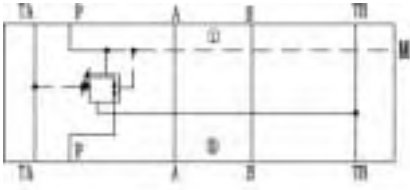
If used without a directional valve, TA and TB must be interconnected (e.g. in the cover plate).



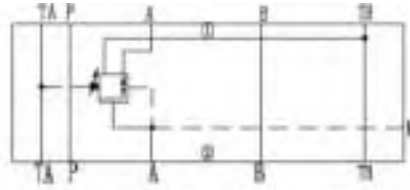
ZDR10DB1-50B/...YM

Symbols (① =valve side , ② =subplate side)

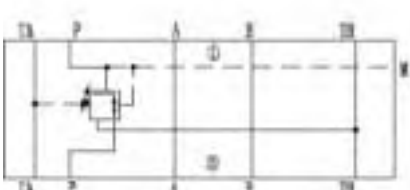
ZDR10DP...-50B/...YM...



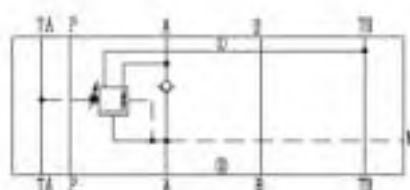
ZDR10DA...-50B/...YM...



ZDR10DB...-50B/...YM...



ZDR10DA...-50B/...Y...



Ordering details

Z	DR	10	D				- 50	B	/	Y			*
---	----	----	---	--	--	--	------	---	---	---	--	--	---

Sandwich plate design = Z

Pressure reducing valve = DR

Size 10 = 10

Direct operated = D

Pressure reduction in port A = A
 Pressure reduction in port B = B
 (Pilot oil from port B)
 Pressure reduction in port P = P

Setting elements
 Rotary knob = 1
 Hex. head screw with protective cap = 2
 Lockable rotary knob with scale = 3
 Rotary knob with scale = 7

Series 50 to 59 = 50
 (50 to 59 = unchanged installation and connection dimensions)

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code. = with check valve
 (only possible for pressure reduction in port A)
 M = without check valve

Y = Pilot oil feed internal, drain external

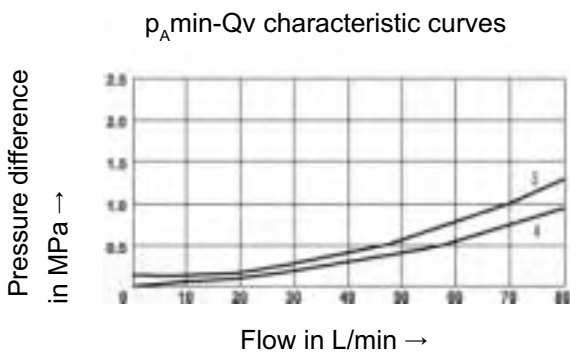
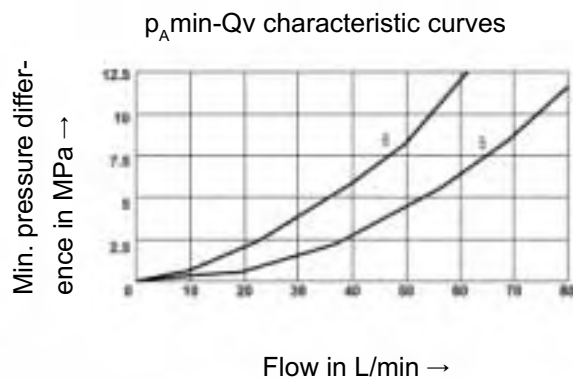
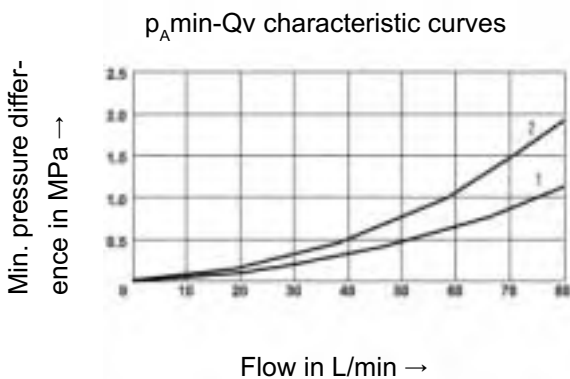
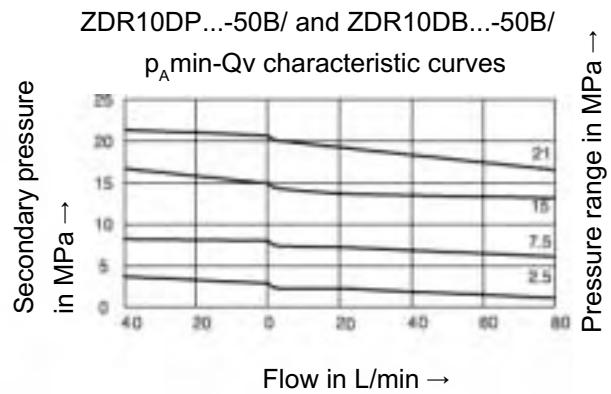
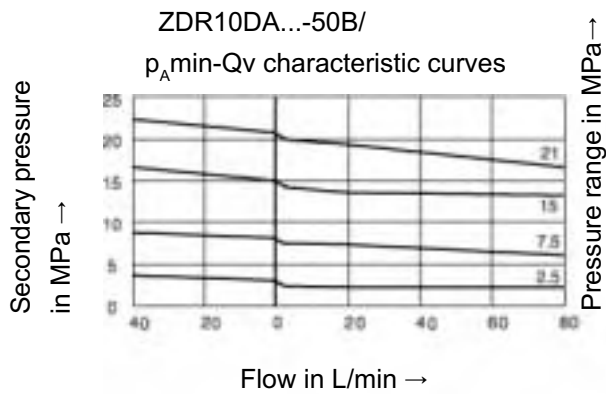
25= max. secondary pressure 2.5 MPa
 75= max. secondary pressure 7.5 MPa
 150= max. secondary pressure 15.0 MPa
 210= max. secondary pressure 21.0 MPa

B = Technology of Beijing Huade Hydraulic

Technical data

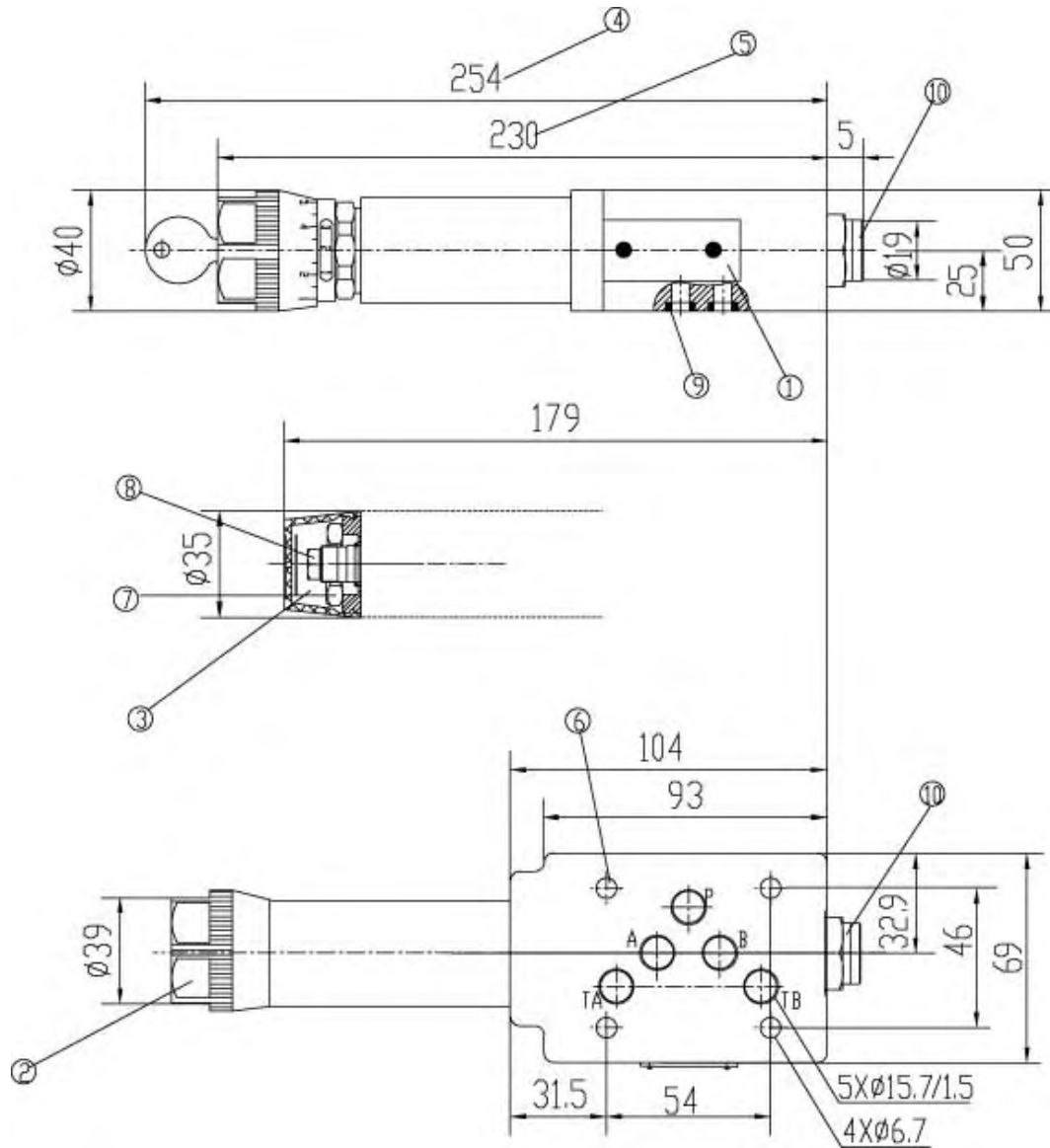
Weight	(kg)	approx. 2.8
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Pressure fluid-temperature range ³	(°C)	-30 to +80
Viscosity range	(mm ² /s)	10 to 800
Degree of fluid contamination		recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$
Max. operating Pressure (inlet)	(MPa)	up to 31.5
Secondary pressure (output)	(MPa)	up to 2.5, up to 7.5, up to 15.0, up to 21.0
Back pressure port	(MPa)	up to 16.0
Max. flow	(L/min)	80

Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



1. A1 to A2
2. A2 to TB (3rd. flow path)
3. A2 to A1 (flow via check valve only)
4. A2 to A1 (check valve and fully open control cross section)
5. P2 to TB
6. P1 to TB (3rd. flow path)

The characteristic curves for the pressure relief function are valid for the outlet pressure = zero over the entire flow range!



- 1. Nameplate
- 2. Adjustment1
- 3. Adjustment2
- 4. Adjustment3
- 5. Adjustment7
- 6. Fixed screw hole of valve
- 7. Lock nut 24 A/F
- 8. Hexagon 10 A/F
- 9. O-ring 12X2 apply to the oil orifice A2, B2, P2, T2 (Y)
- 10. Pressure gauge port G1/4"; 12 deep intend hexagon 6A/F

Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, direct operated, type DR 5 DP			RE 26580/12.2004
	Size 5	up to 31.5MPa	up to 15L/min	Replaces: RE26580/05.2001

Features:

- Subplate mounting
- 5 pressure ratings
- 4 adjustment elements:
 - Rotary knob,
 - Set screw with hexagon and protective cap,
 - Lockable rotary knob with scale,
 - Rotary knob with scale
- Check valve, optional
- Porting pattern to DIN 24 340, form D,ISO 5781 and CETOP-RP 121H



Functional,section

The valve type DR5 DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side.

It is used to reduce the system pressure. The secondary pressure is set by the pressure adjustment element (4). At rest, the valve is normally open and the pressure fluid can flow unhindered from port P to port A. The pressure in port A is at the same time, via the control line (6), present at the spool area opposite to the compression spring (3). When the pressure in port A exceeds the pressure level set at compression spring (3), the control spool (2) moves into the control position and holds the set pressure in port A constant.

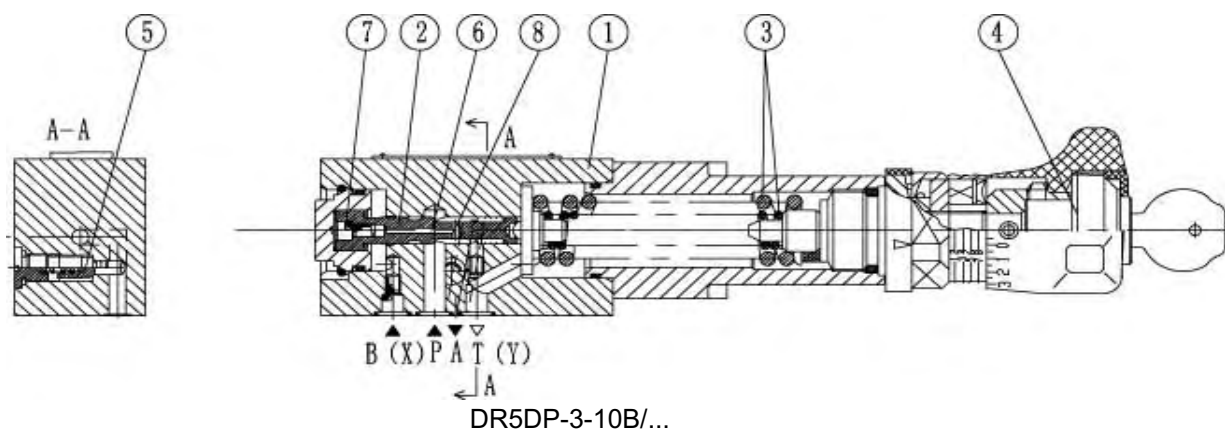
The control and pilot oil are taken from port A via control line (6).

If the pressure in port A still increases due to external forces on the actuator, the control spool(2) moves still further towards the compression spring(3).

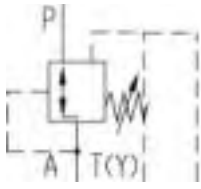
This causes a flow path to be opened at port A via control land (8) on the control spool (2) to the tank. Sufficient pressure fluid then flows to tank to prevent any further rise in pressure.

The spring chamber is always drained to tank externally via port T (Y).

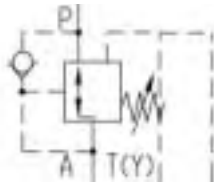
For free return flow from port A to port P an optional check valve (5) can be fitted.



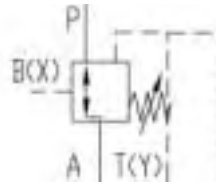
Symbol



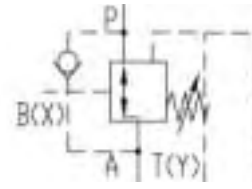
without non-return valve Type "YM"



with non-return valve Type "Y"



without non-return valve Type "XYM"



with non-return valve Type "XY"

Ordering code

DR 5 D P - 10 B / Y *

For subplate mounting = No code
For front flange mounting = F

Size 5 =5

Direct operated = D

Subplate mounting = P

Adjusting element
Rotary knob = 1
Head screw with hexagon and protective cap = 2
Lockable rotary knob with scale 1) = 3
Rotary knob with scale = 7

Series 10 to 19 = 10
(50 to 59 = unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

further details in clear text

No code. = mineral oils
V = phosphate ester

No code = with non-return valve
M = without non-return valve

Y = Pilot oil supply internal,
drain external
XY = Pilot oil supply internal,
drain external

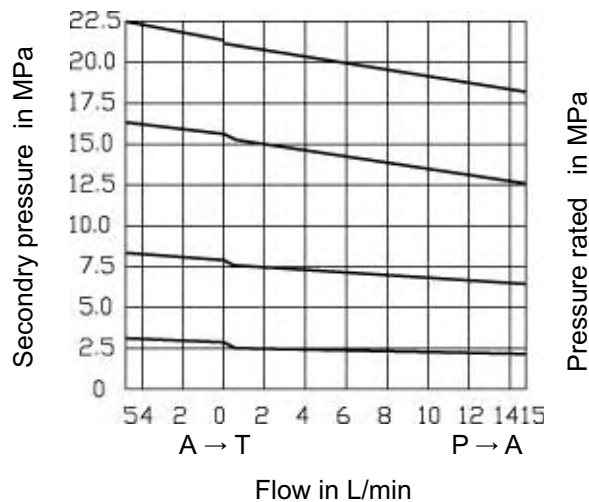
25 = Max. sequence pressure 2.5 MPa
75 = Max. sequence pressure 7.5 MPa
150 = Max. sequence pressure 15 MPa
210 = Max. sequence pressure 21 MPa
315 = Max. sequence pressure 31.5 MPa
(31.5 MPa unit only available without non-return valve)

Technical data

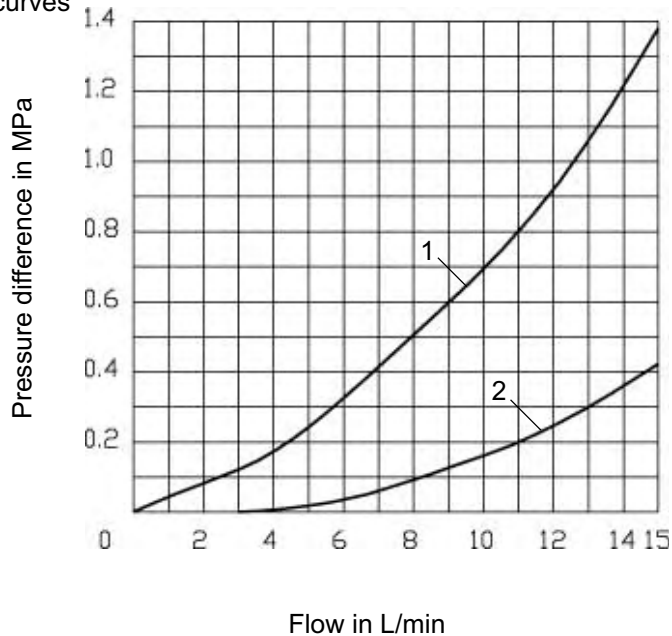
Max. operating pressure(Port P)	(MPa)	up to 31.5
Max. secondary pressure (Port A)	(MPa)	up to 21.0;without non-return valve up to 31.5
Max. back pressure(Ports T (Y))	(MPa)	up to 6.0
Max. flow	(L/min)	up to 15
Pressure fluid		Mineral oil (for NBR seal)or phosphate ester(for FPM seal)
Viscosity range	(mm ² /s)	-10~800
Pressure fluid - temperature range	(°C)	-30 to +80
Degree of contamination	(µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9.
Weight	(Kg)	approx. 1.0

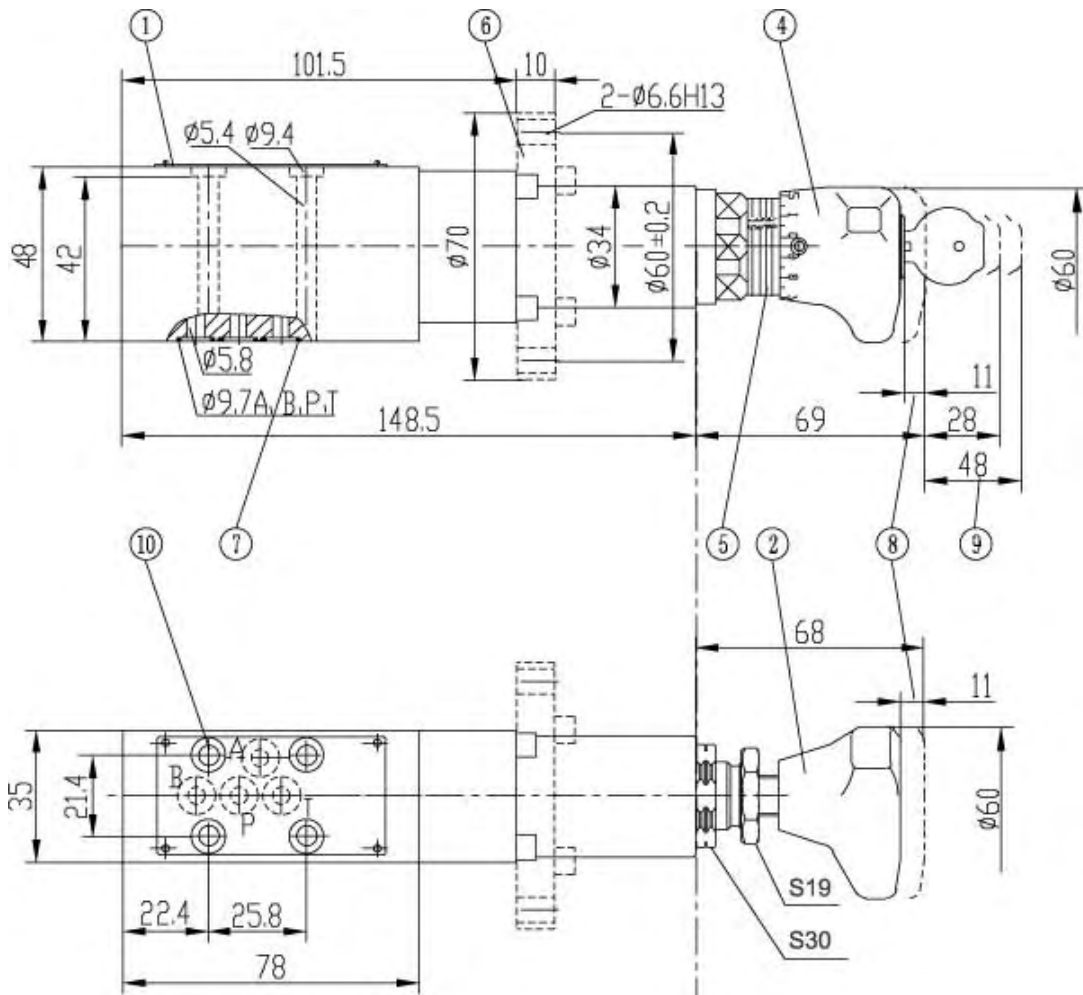
Characteristic curves (measured at n = 41 mm²/s and t = 50°C)

p_A - q_V characteristic curves



Δp - Qq characteristic curves





- 1 Nameplate
- 2 Adjustment type 1
- 3 Adjustment type 2
- 4 Adjustment type 3
- 5 Scale and ring marking for repeat setting
- 6 Panel mounting model
(type DZ 5 DP../..)
- 7 O-ring 7 x 1,5
for ports P, A, B(X) and T(Y)
- 8 Max. stroke
- 9 Space required to remove key
- 10 Valve fixing hole

Subplates: see page 153

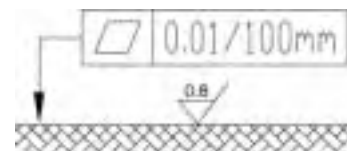
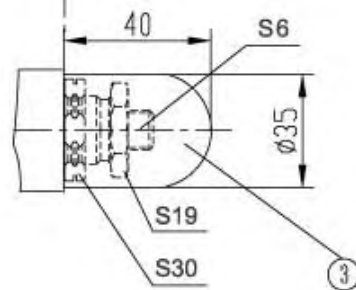
G115/01 (G1/4") G115/02 (M14 × 1.5)

G96/01 (G1/4") G96/02 (M14 × 1.5)

must be ordered separately

Valve fixing screws:

M5x50-10.9(GB/T70.1-2000); $M_A = 9.0 \text{ Nm}$



Required surface finish of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, direct operated, type DR 6 DP			RE 26896/12.2004
	Size 6	up to 21MPa	up to 60L/min	Replaces: RE26896/05.2001

Features:

- Subplate mounting
- 5 pressure ratings
- 4 adjustment elements:
 - Rotary knob,
 - Set screw with hexagon and protective cap,
 - Lockable rotary knob with scale,
 - Rotary knob with scale
- Check valve, optional
- Porting pattern to DIN 24 340, form D, ISO 5781 and CETOP-RP 121H



Functional,section

The valve type DR 6 DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side.

It is used to reduce the system pressure. The secondary pressure is set by the pressure adjustment element (4). At rest, the valve is normally open and the pressure fluid can flow unhindered from port P to port A. The pressure in port A is at the same time, via the control line (6), present at the spool area opposite to the compression spring (3). When the pressure in port A exceeds the pressure level set at compression spring (3), the control spool (2) moves into the control position and holds the set pressure in port A constant.

The control and pilot oil are taken from port A via control line (6).

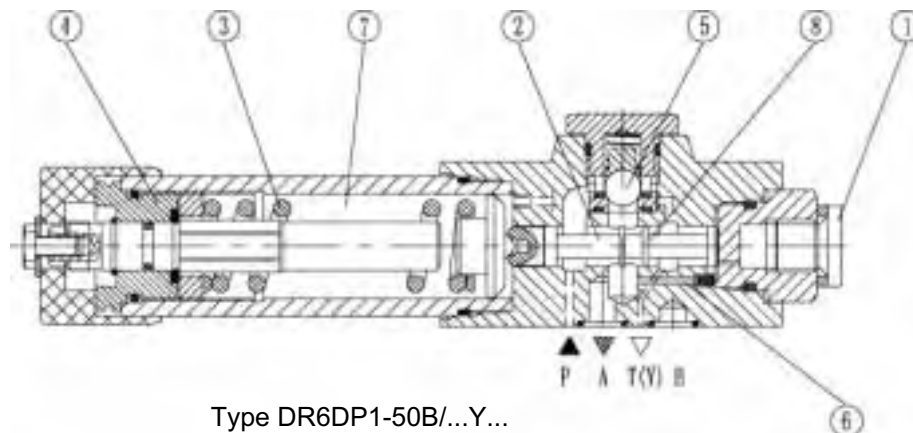
If the pressure in port A still increases due to external forces on the actuator, the control spool (2) moves still further towards the compression spring (3).

This causes a flow path to be opened at port A via control land (8) on the control spool (2) to the tank. Sufficient pressure fluid then flows to tank to prevent any further rise in pressure.

The spring chamber (7) is always drained to tank externally via port T (Y).

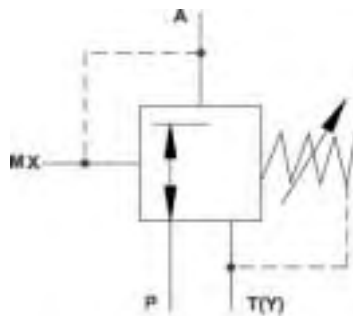
For free return flow from port A to port P an optional check valve (5) can be fitted.

A pressure gauge connection (1), permits the secondary pressure at the valve to be monitored.

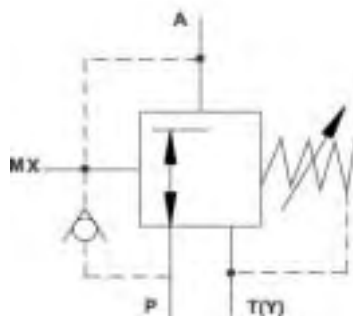


Type DR6DP1-50B/...Y...

Symbols



Version "YM"
Pilot oil supply internal
oil drain external
without check valve



Version "Y"
Pilot oil supply internal
oil drain external
with check valve

Ordering details

DR 6 D P - 50 B / Y *

Size 10 =10

Direct operated pressure reducing valve

Subplate mounting =P

Adjustment element

Rotary knob = 1
Set screw with hexagon and protective cap = 2
Lockable rotary knob with scale = 3
Rotary knob with scale = 7

Series 50 to 59 = 50
(50 to 59: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

Further details in clear text

No code. = mineral oils
V = phosphate ester

No code = With check valve
M = Without check valve

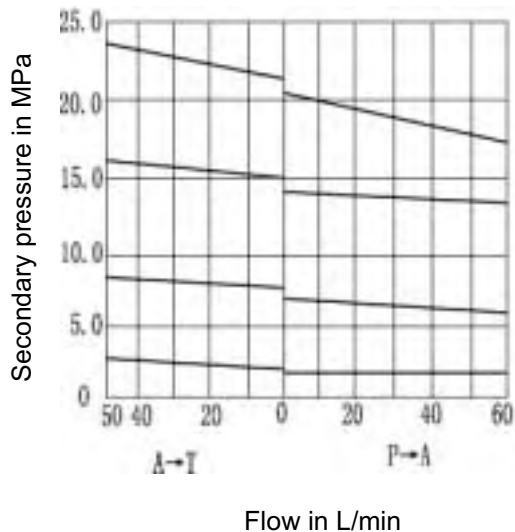
Y = Pilot oil supply internal,
drain external

25= Max. secondary pressure 2.5 MPa
75= Max. secondary pressure 7.5 MPa
150= Max. secondary pressure 15.0 MPa
210= Max. secondary pressure 21.0 MPa

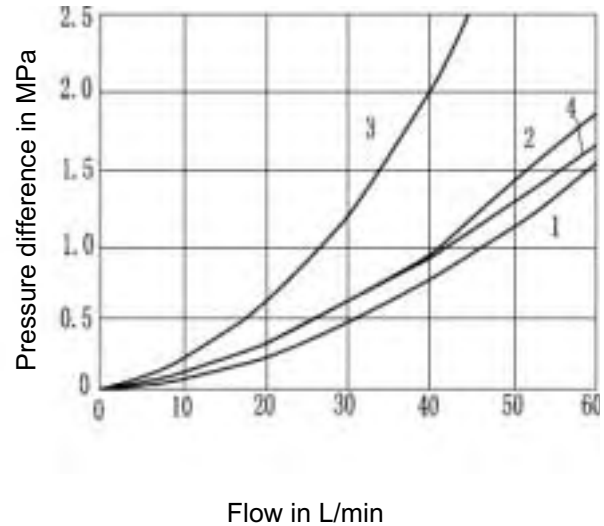
Technical data		
Max. operating pressure Port P	(MPa)	up to 315
Max. secondary pressure Port A	(MPa)	up to 2.5; up to 7.5; up to 15.0; up to 21.0; up to 31.5
Max. back pressure Ports T (Y)	(MPa)	up to 160
Max. flow	(L/min)	up to 60
Pressure fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)
Viscosity range	(mm ² /s)	10–800
Pressure fluid - temperature range	(°C)	-30 to +80
Degree of contamination	(µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9.
Weight	(Kg)	approx. 1.2

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

$p_A - q_V$ characteristic curves



$D_p - C_q$ characteristic curves

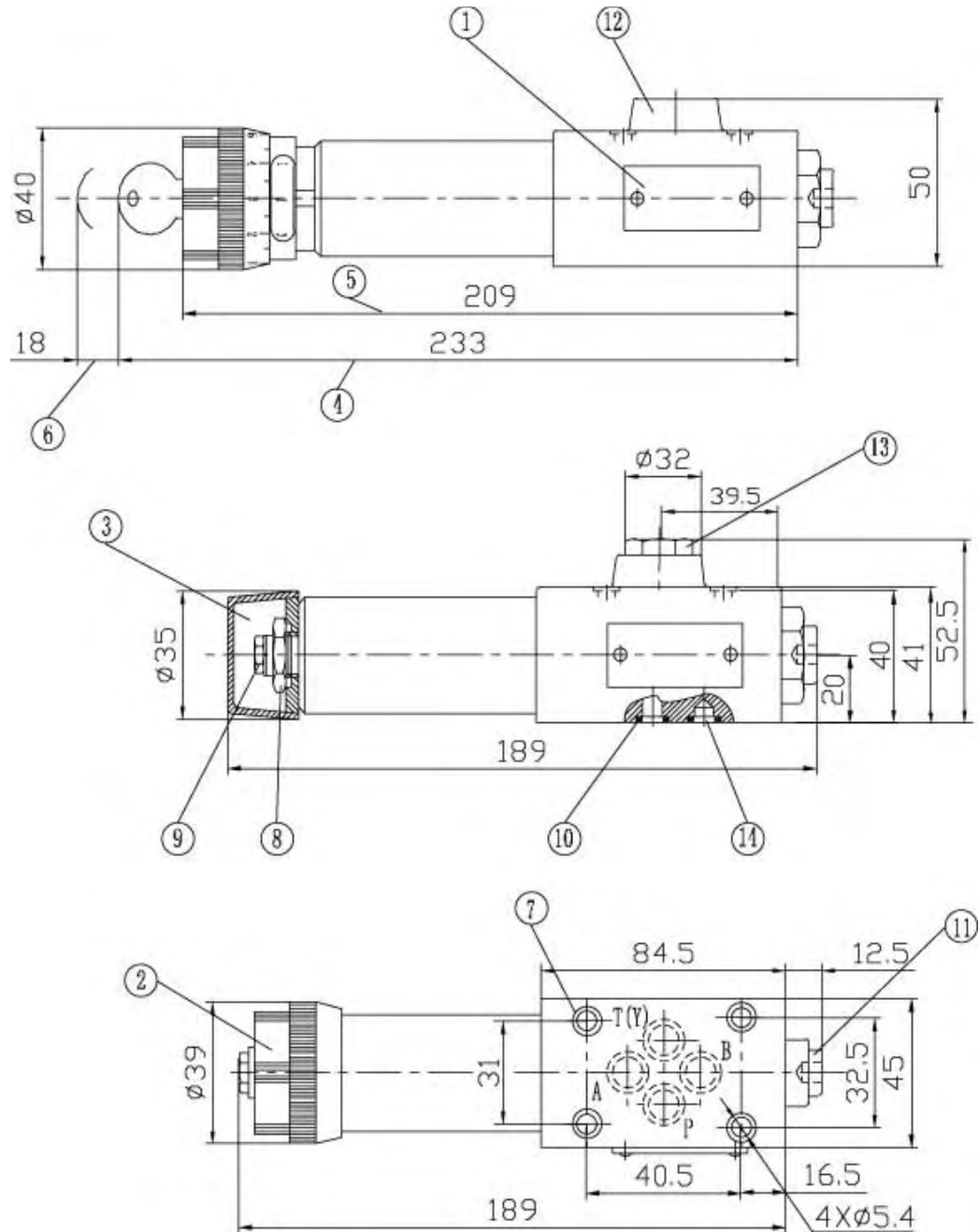


Note:

The curve characteristics remain, with a low set pressure, the same in relation to the pressure rating.

The characteristic curves for the pressure relief function are valid for the outlet pressure = zero over the entire flow range!

- 1 P to A (min. pressure differential)
- 2 A to T (Y) (min. pressure differential)
- 3 Δp only over the check valve
- 4 Δp over the check valve and fully open control cross section



- 1. Nameplate
- 2. Adjustment element 1
- 3. Adjustment element 2
- 4. Adjustment element 3
- 5. Adjustment element 7
- 6. Space required to remove key
- 7. Valve fixing holes
- 8. Lock nut 24 A/F
- 9. Hexagon 10 A/F
- 10. O-ring 9.25 x 1.78 for ports A, B, P, T(Y)
- 11. Pressure gauge connection G 1/4;
Deep12; internal hexagon 6 A/F
- 12. Without check valve
- 13. With check valve
- 14. Port B has no function

Subplates: see page 152

G341/01(G1/4")

G341/02(M14X1.5)

G342/01(G3/8")

G342/02(M18X1.5)

Valve fixing screws

M5 x 50 - 10.9(GB/T70.1-2000)

Tightening torque $M_A = 8.9 \text{ Nm}$



Required surface finish
of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure reducing valve, direct operated, type DR 10 DP			RE 26897/12.2004
	Size 10	up to 21MPa	up to 80L/min	Replaces: RE26897/05.2001

Features:

- For subplate mounting
- 4 pressure ranges
- 4 setting elements:
 - Rotary knob
 - Hex. head sleeve with protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- With pressure gauge port
- Optional non return valve
- Porting pattern to DIN 24 340, form D,ISO 5781 and CETOP-RP 121H



Functional, section

The valve type DR 10 DP is a direct operated valve of 3 way design, with a pressure relief function on the reduced pressure side.

Pressure setting is by means of the pressure setting element (1).

At rest, the valve is normally open, and fluid can flow unhindered from port B to port A. Pressure in port A is also present on the end of the spool (2), via control line (4), opposing the compression spring (3). When the pressure in port A reaches the pressure level set at spring (3), spool (2) moves to the control position and holds the pressure in port A constant.

Fluid to control the valve is taken from port A via control drilling

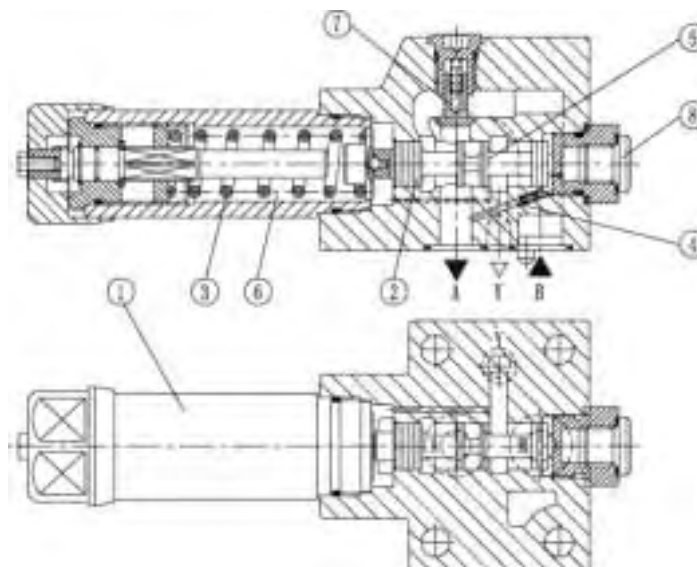
If the pressure in port A rises still further due external forces, the spool (2) is moved still further towards the compression spring (3).

This causes a flow path to be opened over control land (5) in the control spool (2) to tank (port Y) . Sufficient fluid then flows to tank to prevent any further rise in pressure.

The spring chamber (6) is drained to tank externally via port Y.

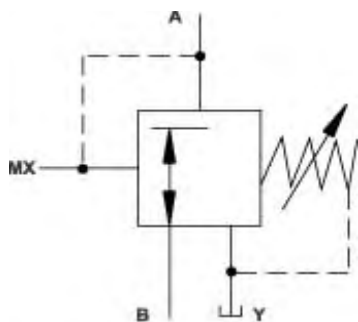
An optional non return valve (7) is available to allow free flow from port A to port B.

A pressure gauge connection (8), permits the secondary pressure to be monitored.

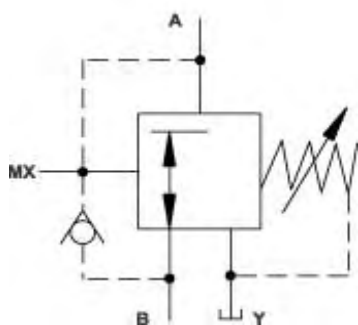


DR 10 DP 1-40B/...Y...

Symbols



Type "YM"
Pilot oil supply internal
drain external
without check valve



Type "Y"
Pilot oil supply internal
drain external
with check valve

Ordering details

DR 10 D P - 40 B / Y *

Size 10 =10

Direct operated pressure reducing valve size 6

Subplate mounting =P

Adjustment element

Rotary knob = 1
Set screw with hexagon and protective cap = 2
Lockable rotary knob with scale = 3

Series 40 to 49 = 40
(40 to 49: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code. = mineral oils
V = phosphate ester

No code = With check valve
M = Without check valve

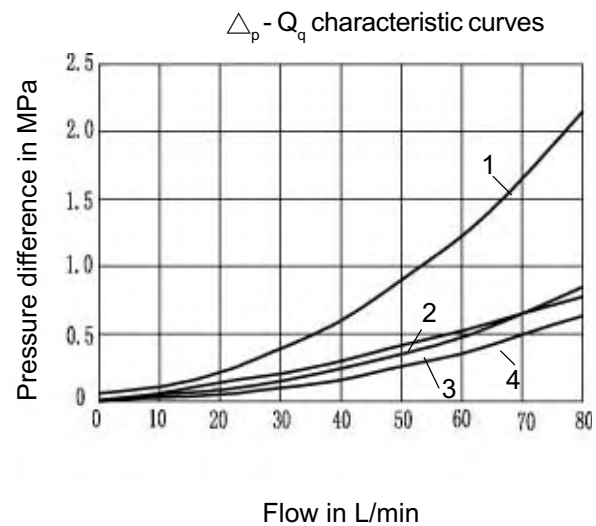
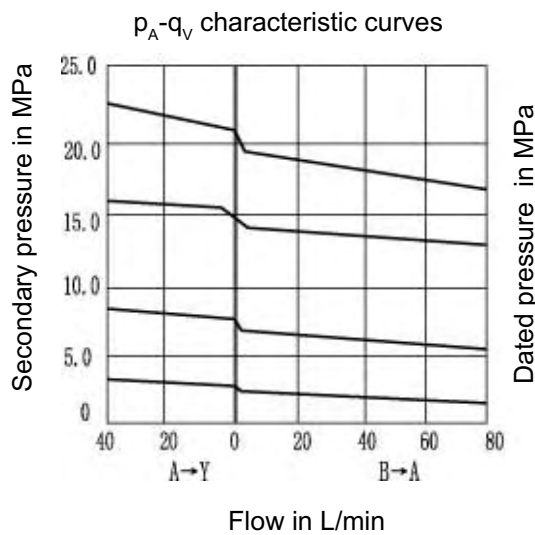
Y = Pilot oil supply internal,
drain external

25 = Max. secondary pressure 2.5 MPa
75 = Max. secondary pressure 7.5 MPa
150 = Max. secondary pressure 15 MPa
210 = Max. secondary pressure 21 MPa

Technical data

Max. operating pressure(Port P)	(MPa)	up to 31.5
Max. secondary pressure(Port A)	(MPa)	up to 2.5、 up to 7.5、 up to 15.0、 up to 21.0、 up to 31.5
Max. back pressure(Ports T (Y))	(MPa)	up to 16.0
Max. flow	(L/min)	up to 80
Pressure fluid		Mineral oil (for NBR seal)or phosphate ester(for FPM seal)
Viscosity range	(mm ² /s)	10–800
Pressure fluid - temperature range	(°C)	-30 to +80
Degree of contamination	(µm)	Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9.
Weight	(Kg)	approx. 3

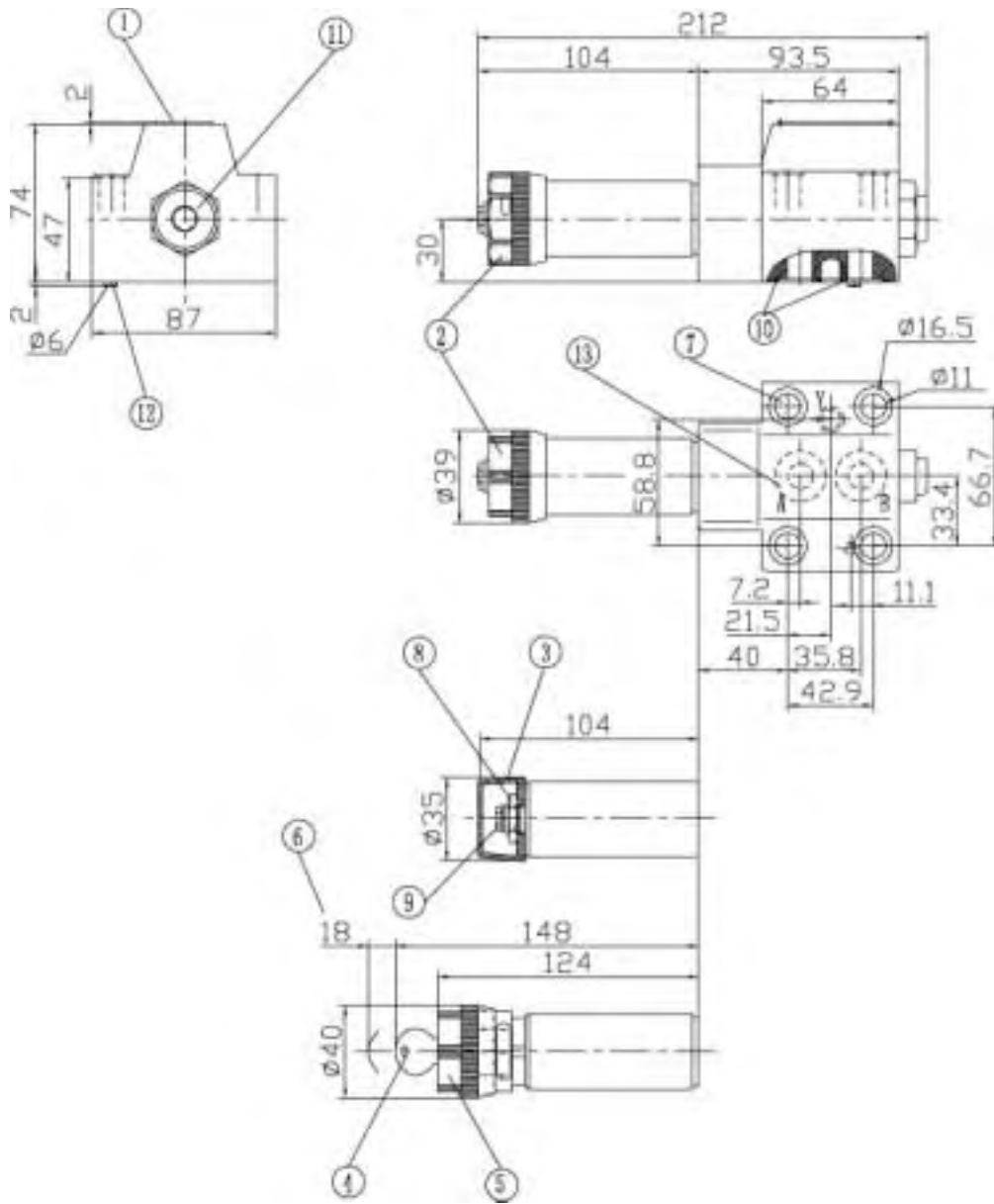
Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Note:

For any particular setting range (spring selection) all flow curves at pressure settings lower than the maximum remain parallel to the maximum setting curve of that range.

- 1 Pressure drop / flow curve A to Y via non-return valve
- 2 Pressure drop / flow curve B to A
- 3 Pressure drop via check valve only
- 4 Δp over the check valve and fully open control cross section



- 1. Nameplate
- 2. Adjustment element 1
- 3. Adjustment element 2
- 4. Adjustment element 3
- 5. Adjustment element 7
- 6. Space required to remove key
- 7. Valve fixing holes
- 8. Lock nut 24 A/F
- 9. Hexagon 10 A/F
- 10. O-ring 17.12 x 2.62 for ports A, B,
9.25 x 1.78 for ports Y
- 11. Pressure gauge connection port G 1/4;
- 12. Locating pin
- 13. Subplates see page 150
G460/01(G3/8")
G460/02(M18X1.5)
G461/01(G1/2")
G461/02(M22X1.5)
Valve fixing screws (GB/T70.1-2000):
M10X60-10.9 M_A =75Nm



Required surface finish of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated pressure reducing valve, type DR... 30B/			RE 26891/12.2004
	Size10,20,30	up to 31.5MPa	up to 320L/min	Replaces: RE26891/05.2001

Features:

- For subplate mounting
- For threaded connections
- For cartridge connection
- 4 adjustment elements:
 - Rotary knob,
 - Sleeve with hexagon and protective cap,
 - Lockable rotary knob with scale,
 - Rotary knob with scale
- 4 pressure settings
- Optional check valve (only for valve for subplate mounting)
- Mounting pattern to DIN 24 340, form D,ISO 5781 and CETOP-RP 121H



Functional, section

Pressure valves type DR are pilot operated pressure reducing valves, which are controlled from the secondary circuit.

They basically consist of main valve (1) with main spool insert (3) and pilot valve (2) with pressure adjustment element (9).

At rest, the valves are open, fluid can freely pass from port B to port A via the main spool (3).

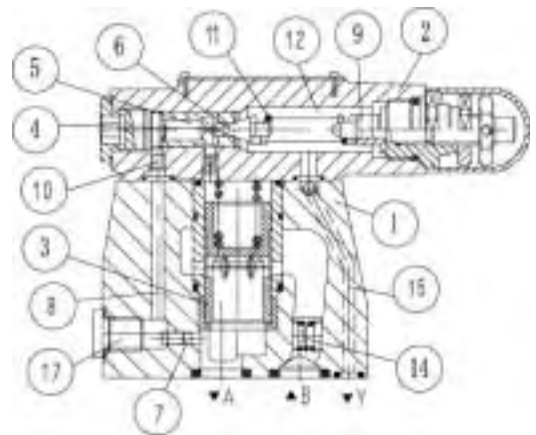
Pressure present in port A acts upon the bottom side of the main spool(3). At the same time there is pressure acting on the poppet (6) in the pilot valve (2) via the orifice (4) on the spring-loaded side of the main piston (3) and via the port (5). Same it is acting on the poppet (6) via the orifice (7), control line (8), and orifice (10). According to setting of spring (11), pressure builds up in front of the poppet (6), in port (5) and in spring chamber (12), holding the control spool (3) in the open position. Fluid can freely flow from port B to port A via main spool (3), until the pressure in port A exceeds the value set at spring (11) and opens the poppet (6). The control piston (3) moves to closing position.

The desired reduced pressure is achieved, when a balance between the pressure in port A and the pressure set at spring (11) is reached.

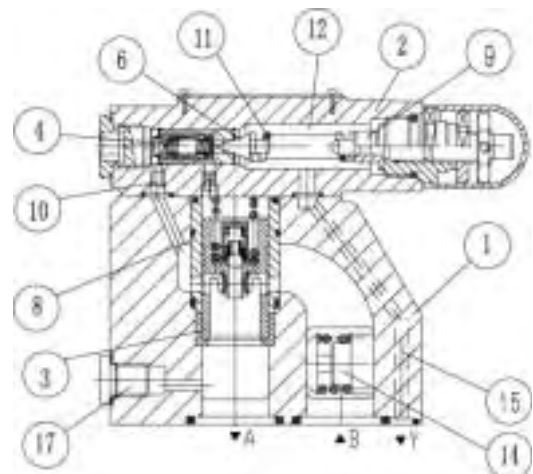
Pilot oil drain from spring chamber (12) to tank takes place externally via line (15).

Free return flow from port A to B can be achieved by installing an optional check valve (14).

A pressure gauge connection (17) allows the reduced pressure in port A to be monitored.



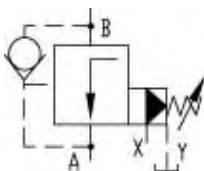
DR10-5-30B/...Y...



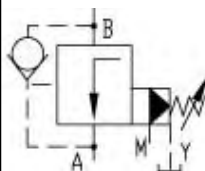
Type DR20, 30-5-30B/...Y...

Symbols

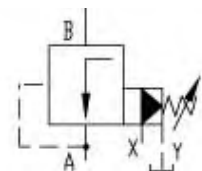
For subplate mounting



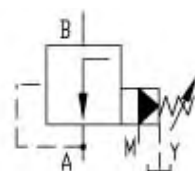
DR10...-30B/...Y...



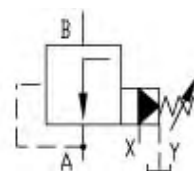
DR²⁰₃₀...-30B/...Y...



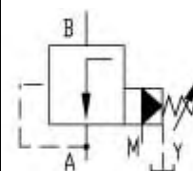
DR10...-30B/...YM...



DR²⁰₃₀...-30B/...YM...



DR⁸₁₀...-30B/...Y...



DR¹⁵₃₀...-30B/...Y...

Ordering Code

- 30 B / Y / / *

Pilot operated valve = DR
 Pilot valve = DRC
 without main spool insert
 (do not state size)
 Pilot valve = DRC
 with main spool insert
 (state valve size 30)

Size	Valve	
	Subplate mounting	Threaded connections
	Ordering Code	
10	10	10 (M22x1.5 or G1/2 ")
15	-	15 (M27x2 or G3/4 ")
20	20	20 (M33x2 or G1 ")
25	-	25 (M42x2 or G1 1/2 ")
32	30	30 (M48x2 or G1 1/2 ")

For subplate mounting = No code
 For threaded connections = G

Further details in clear text

No code = mineral oils
 V = phosphate ester

No code = external connect port : British
 2= external connect port : metric
 (A pressure gauge connection port G1/4")

No code = with check valve
 M = without check valve
 (Without check valve ,but no code)

50= pressure setting up to 5.0 MPa
 100= pressure setting up to 10.0 MPa
 200= pressure setting up to 20.0 MPa
 315= pressure setting up to 31.5 MPa

B = Technology of Beijing Huade Hydraulic

30 = Series 30 to39
 (30 to 39: unchanged installation and connection dimensions)

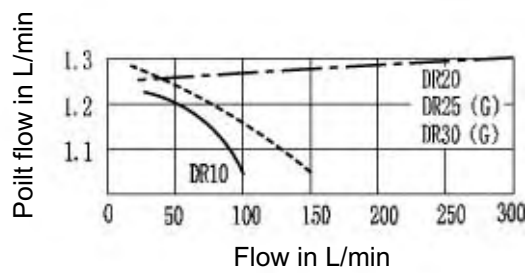
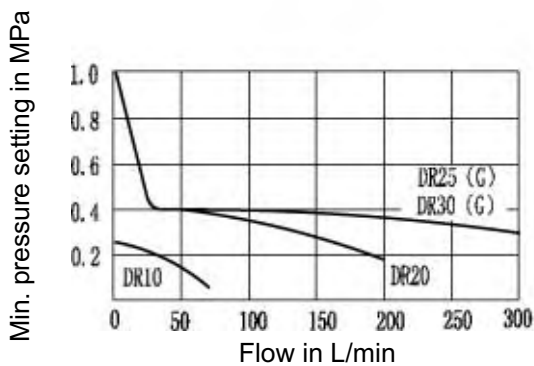
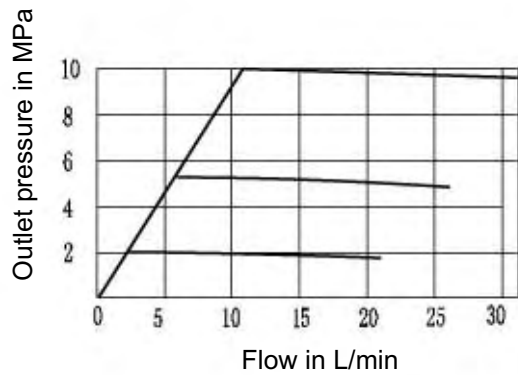
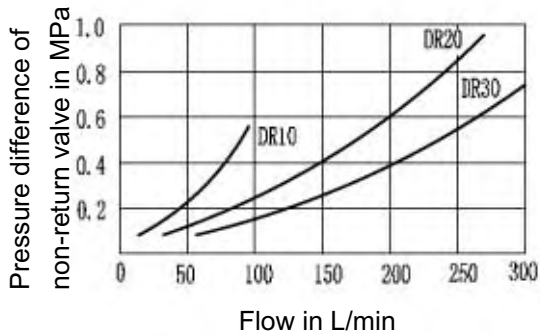
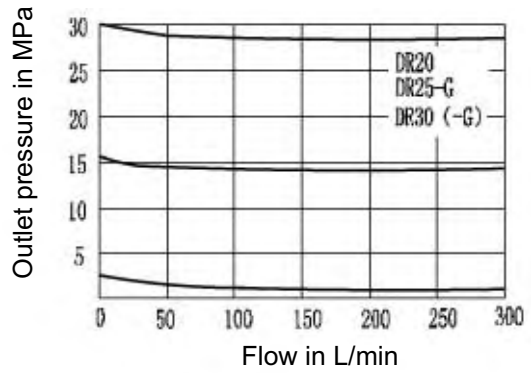
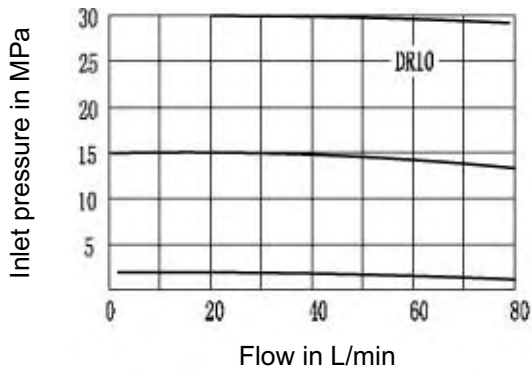
Adjustment element

4= Rotary knob
 5= Sleeve with hexagon and protective cap
 6= Lockable rotary knob with scale
 7= Rotary knob with scale

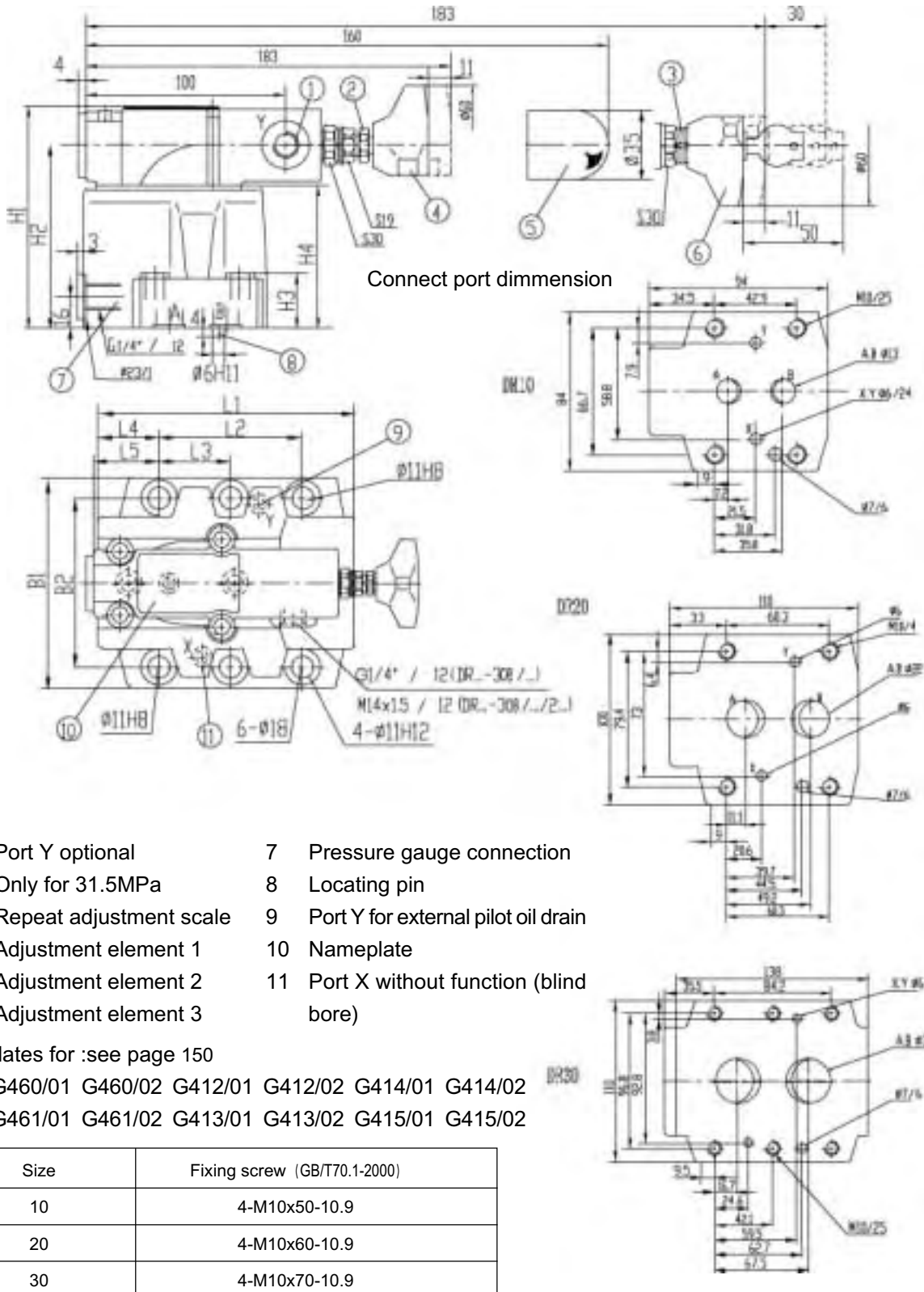
Technical Date

Size	8	10	15	20	25	30
Flow (L/min)	Threaded connections	-	80	-	200	300
	Subplate mounting	80	80	200	200	300
Operating pressure (MPa)	up to 10 or 31.5					
Inter pressure ,port B (MPa)	up to 31.5					
Outlet pressure ,port A (MPa)	0.3~31.5		1~31.5			
Back pressure ,port Y (MPa)	up to 31.5					
Fluid	Mineral oil (for NBR seal)or phosphate ester(for FPM seal)					
Viscosity range (mm ² /s)	10~800					
Fluid temperature range (°C)	-30~+80					

Characteristic Curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)



- = 2MPa Δ PDR10
- = 10MPa Δ PDR10
- = 2MPa and 10MP Δ P DR20 and DR30



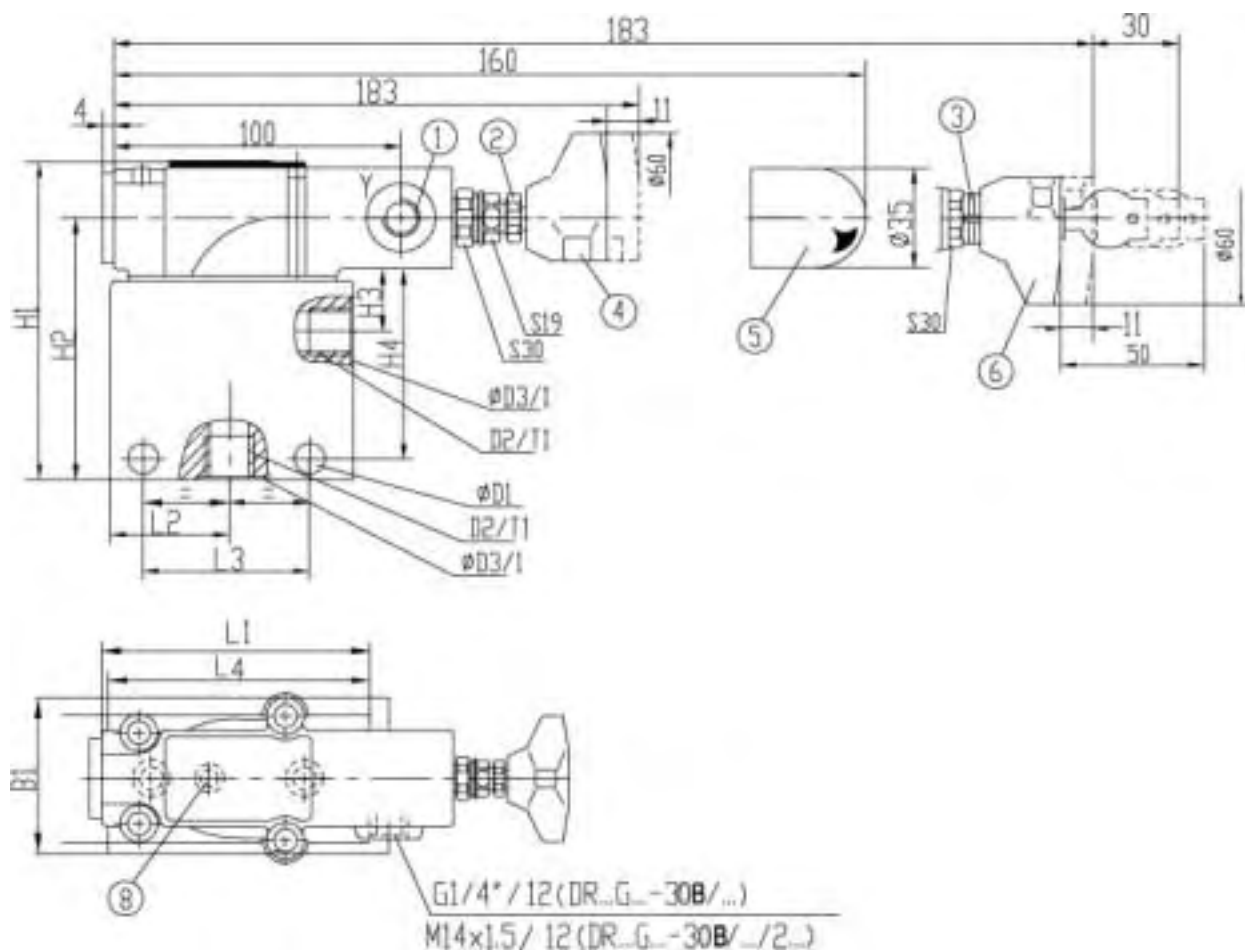
Connect port dimension

- | | |
|---------------------------|---|
| 1 Port Y optional | 7 Pressure gauge connection |
| 2 Only for 31.5MPa | 8 Locating pin |
| 3 Repeat adjustment scale | 9 Port Y for external pilot oil drain |
| 4 Adjustment element 1 | 10 Nameplate |
| Adjustment element 2 | 11 Port X without function (blind bore) |
| Adjustment element 3 | |

Subplates for :see page 150
 G460/01 G460/02 G412/01 G412/02 G414/01 G414/02
 G461/01 G461/02 G413/01 G413/02 G415/01 G415/02

Size	Fixing screw (GB/T70.1-2000)
10	4-M10x50-10.9
20	4-M10x60-10.9
30	4-M10x70-10.9

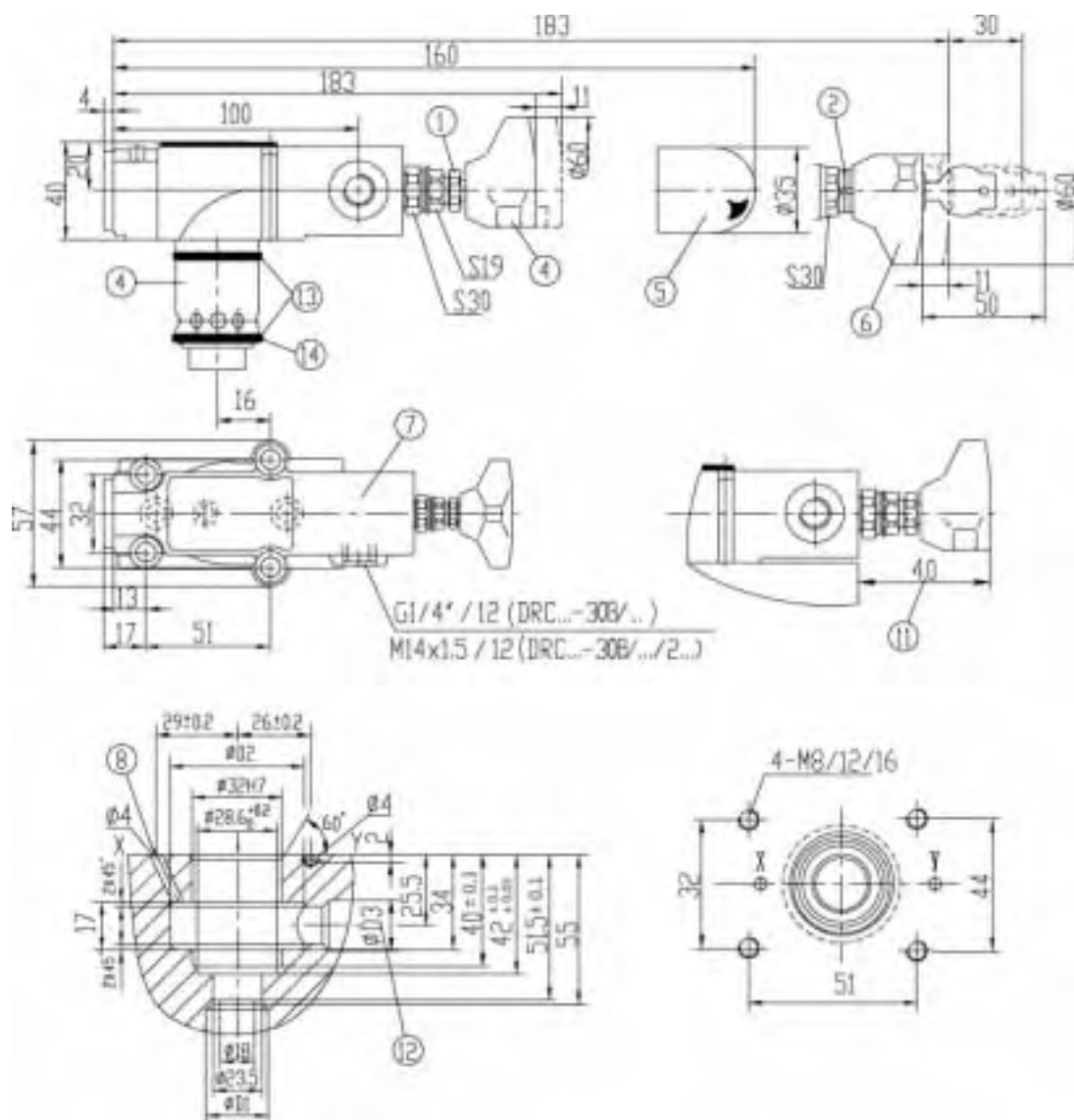
Size	B1	B2	H1	H2	H3	H4	L1	L2	L3	L4	L5	O-ring	
												for ports X、 Y	for ports A、 B
10	85	66.7	112	92	28	72	90	42.9	-	35.5	34.5	9.25 × 1.78	17.12 × 2.62
20	102	79.4	122	102	38	82	112	60.3	-	33.5	37	9.25 × 1.78	28.17 × 3.53
30	120	96.8	130	110	46	90	140	84.2	42.1	28	31.3	9.25 × 1.78	34.52 × 3.53



- 1. Port Y optional
- 2. Only for 31.5MPa
- 3. Repeat adjustment scale
- 4. Adjustment element 1
- 5. Adjustment element 2
- 6. Adjustment element 3
- 7. Pressure gauge connection port

Warning: pipe mounting without non-return valve,can not flow reverse

Size	B1	φ D1	D2		φ D3	H1	H2	H3	H4	L1	L2	L3	L4	T1	Weight (kg)
			Metric	British											
10	63	9	M22 × 1.5	G1/2"	34	125	105	28	75	90	40	62	85	14	6.8
15			M27 × 2	G3/4"	42									16	
20			M33 × 2	G1"	47									18	
25	70	11	M42 × 2	G1 1/4"	58	138	118	34	85	100	46	72	99	20	10.2
30			M48 × 2	G1 1/2"	65									22	



- 1. Only for 31.5MPa
- 2. Repeat adjustment scale
- 3. Main spool assembly
- 4. Adjustment element 1
- 5. Adjustment element 2
- 6. Adjustment element 3
- 7. Nameplate
- 8. Pilot control oil supply
- 11. Min. distance when adjustment element "1" or "3" insert integration block
- 12. Hole D3 can meet hole D2 at any location, but can't meet port 'X' and fixed screw.
- 13 O-ring 27.3X2.4
- 14 Retainer ring 32X28.4X0.8

Size	φ D1	φ D2	φ D3	locating screw (GBT70.1-2000)	Weight (kg)
10	10	40	10	4-M8 × 40-10.9	1.4
20	25	40	25		
30	32	45	32		

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pilot operated pressure reducing valve, type DR...50B/(New Series)			RE 26892/12.2004
	Size 10 to 25	up to 31.5MPa	up to 400L/min	Replaces: RE26892/05.2001

Features:

- Subplate mounting
- For threaded connections
- For manifold mounting
- 4 adjustment elements:
 - Rotary knob,
 - Sleeve with hexagon and protective cap,
 - Lockable rotary knob with scale,
 - Rotary knob with scale
- 4 pressure settings
optional check valve (only for valve for subplate mounting)
- Porting pattern to DIN 24 340, form D,ISO 5781 and CETOP-RP 121H



Functional, Section

Pressure valves type DR are pilot operated pressure reducing valves, which are controlled from the secondary circuit. They basically consist of main valve (1) with main spool insert (3) and pilot valve (2) with pressure adjustment element ..

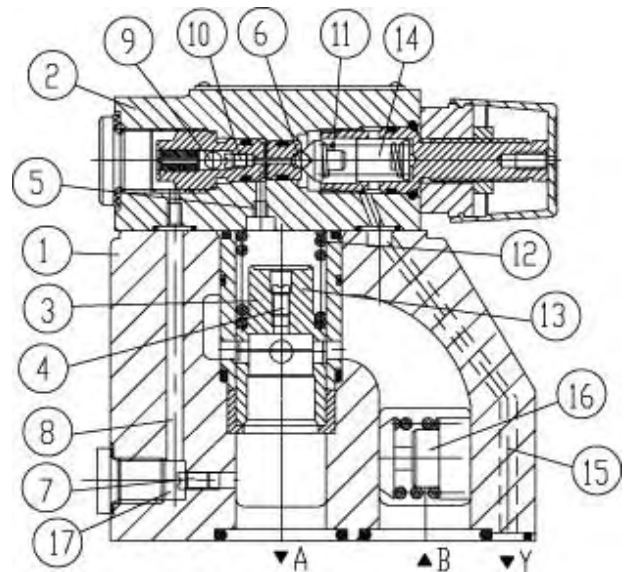
At rest, the valves are open, fluid can freely pass from port B to port A via the main spool insert (3).

Pressure present in port A acts upon the bottom side of the main spool. At the same time there is pressure acting on the ball(6) in the pilot valve (2) via the orifice (4) on the spring-loaded side of the main piston (3) and via the port (5). Same it is acting on the ball (6) via the orifice (7), control line (8), check valve(9)and orifice (10). According to setting of spring (11), pressure builds up in front of the ball (6), in port (5) and in spring chamber (12), holding the control piston (13) in the open position. Fluid can freely flow from port B to port A via main spool insert (3), until the pressure in port A exceeds the value set at spring (11) and opens the ball (6). The control piston (13) moves to closing position.

The desired reduced pressure is achieved, when a balance between the pressure in port A and the pressure set at spring (11) is reached. Pilot oil drain from spring chamber (14) to tank takes place externally via control line (15).

Free return flow from port A to B can be achieved by installing an optional check valve (16).

A pressure gauge connection (17) allows the reduced pressure in port A to be monitored.



Ordering Code

- 50 B / Y / / *

Pilot operated valve =DR
 Pilot valve = DRC
 without main spool insert
 (do not state size)
 Pilot valve = DRC
 with main spool insert
 (state valve size 30)

Further details in clear text

No code = mineral oils
 V = phosphate ester

No code = external connect with port:metre
 2= external connect with port:inch
 (A pressure gauge connection G1/4")

No code = with check valve
 M = without check valve
 (Without check valve ,but no code)

50 = pressure setting up to 5.0 MPa
 100 = pressure setting up to 10.0 MPa
 200 = pressure setting up to 20.0 MPa
 315 = pressure setting up to 31.5 MPa

B = Technology of Beijing Huade Hydraulic

50= Series 50 to 59
 (50 to 59: unchanged installation and connection dimensions)

Adjustment element

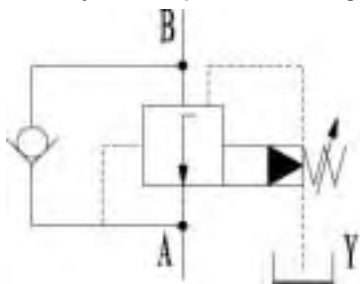
4 = Rotary knob
 5 = Sleeve with hexagon and protective cap
 6 = Lockable rotary knob with scale
 7 = Rotary knob with scale

Size	Valve	
	Subplate mounting	Threaded connections G
	Ordering code	
10	10	10 (M22x1.5 or G1/2``)
15	-	15 (M27x2 or G3/4``)
20	20	20 (M33x2 or G1``)
25	-	25 (M42x2 or G1 1/2``)

For subplate mounting = No code
 For threaded connections = G

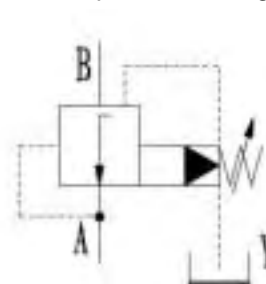
Symbols

only for subplate mounting



DR...50B...Y...

only for subplate mounting

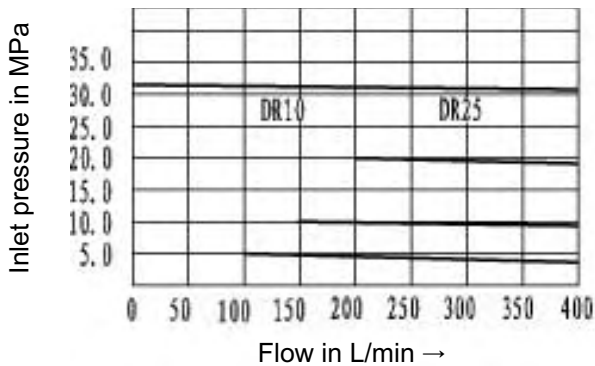


DR...50B...YM...

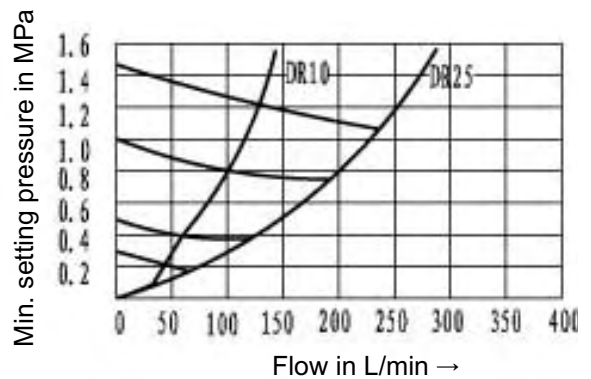
Technical Data			
Inlet pressure, port B	(MPa)	up to 31.5	
Outlet pressure, port A	(MPa)	up to 5.0, 10.0, 20.0, 31.5	
Backpressure, port Y	(MPa)	up to 31.5	
Max. flow (Subplate mounting)	(L/min)	DR10	
		DR20	
Max. flow (Threaded connections)	(L/min)	150	
		300	
Max. flow (Threaded connections)	(L/min)	DR10	DR15
		DR20	DR25
Fluid		Mineral oil (for NBR seal) or phosphate ester (for FPM seal)	
Fluid temperature range	(°C)	-30 up to + 80	
Viscosity range	(mm ² /s)	10 up to 800	
Degree of contamination		Maximum permissible degree of contamination of the fluid to NAS 1638, class 9.	

Characteristic Curves (measured at $v=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

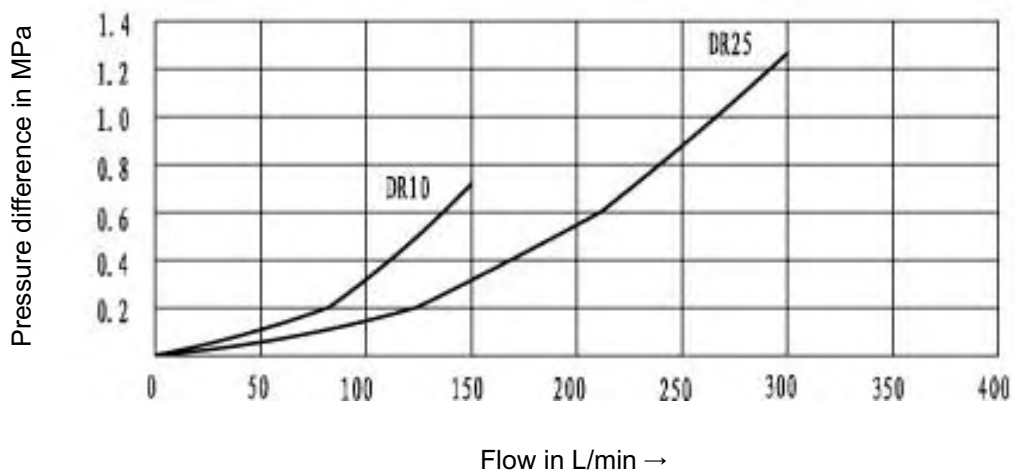
Outlet pressure p_A related to flow Q (B-A)



min. setting pressure p_A min related to flow Q (B-A)

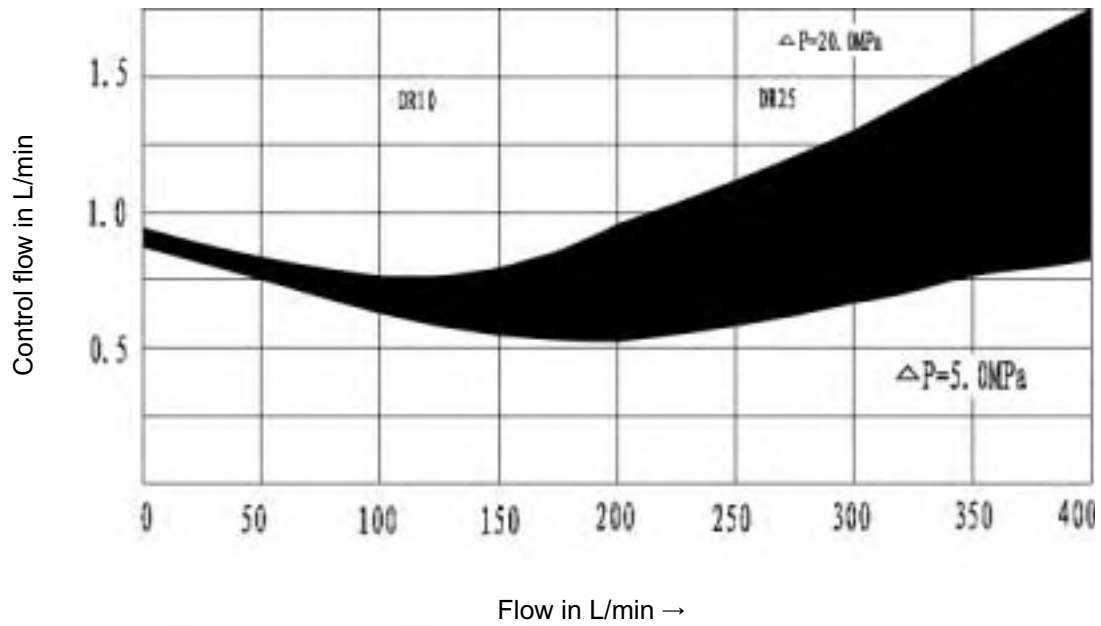


Δ p-Q-curves (B- A) (lowest settable pressure difference)

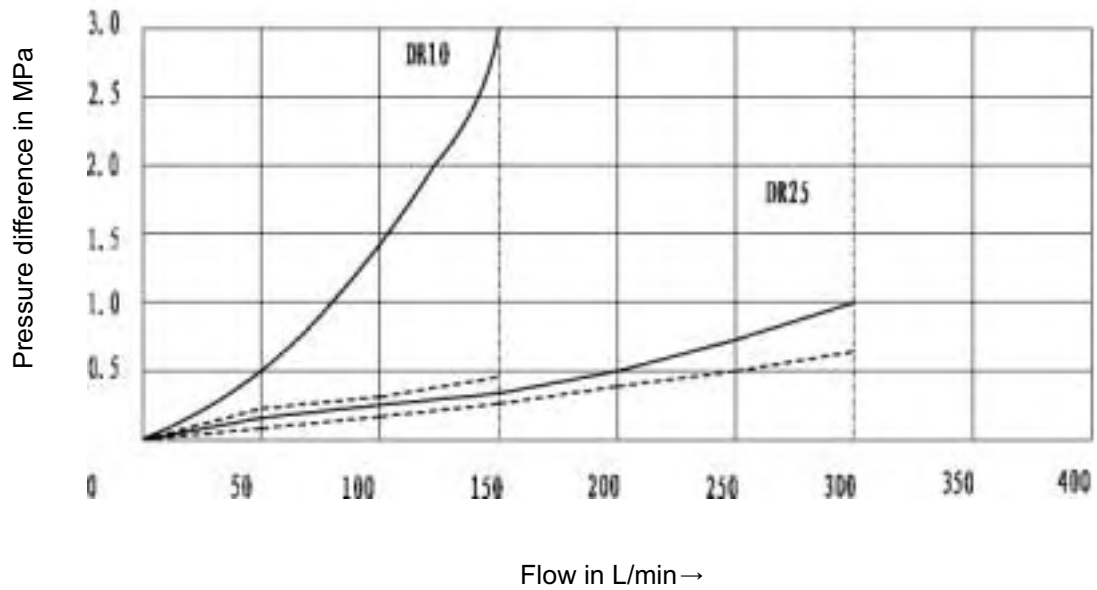


Characteristic Curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Control flow related to flow (B-A) and to pressure difference



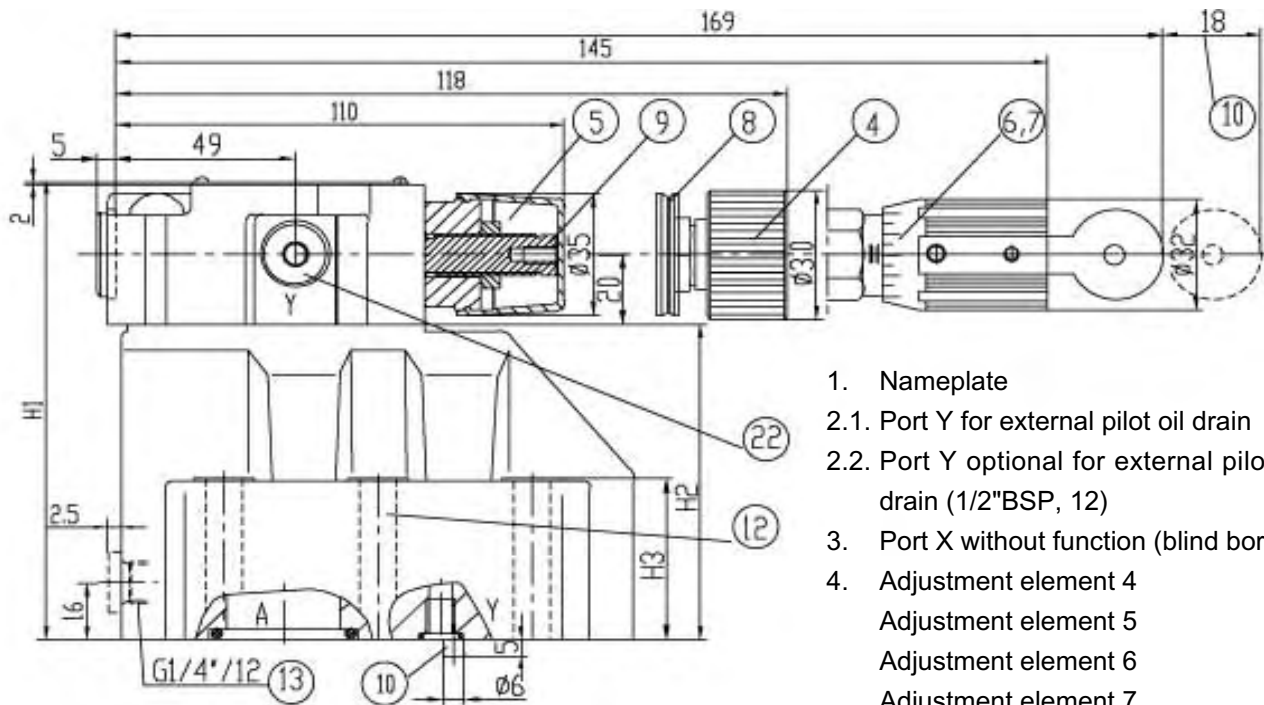
Δp -Q-curves via the check valve (A-B)



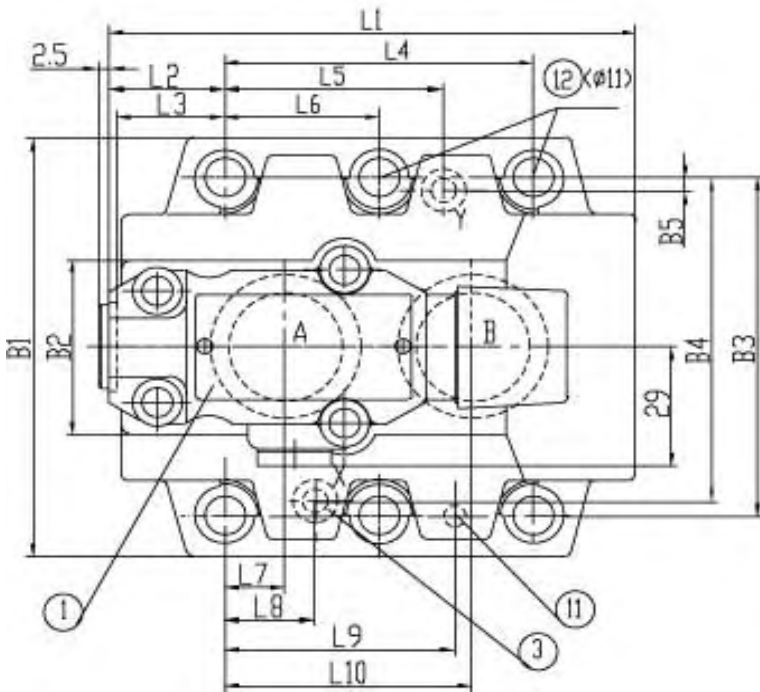
- Flow resistance via check valve, main stage closed
- - - Flow resistance via check valve at fully opened main stage

Unit Dimensions: Valve for Subplate Mounting

(Dimensions in mm)



- 1. Nameplate
- 2.1. Port Y for external pilot oil drain
- 2.2. Port Y optional for external pilot oil drain (1/2" BSP, 12)
- 3. Port X without function (blind bore)
- 4. Adjustment element 4
- Adjustment element 5
- Adjustment element 6
- Adjustment element 7
- Hexagon 22 A/F
- 9. Hexagon 10 A/F
- 10. Space required for removal of key
- 11. Locating pin
- 12. Valve fixing holes
- 13. Pressure gauge connection port

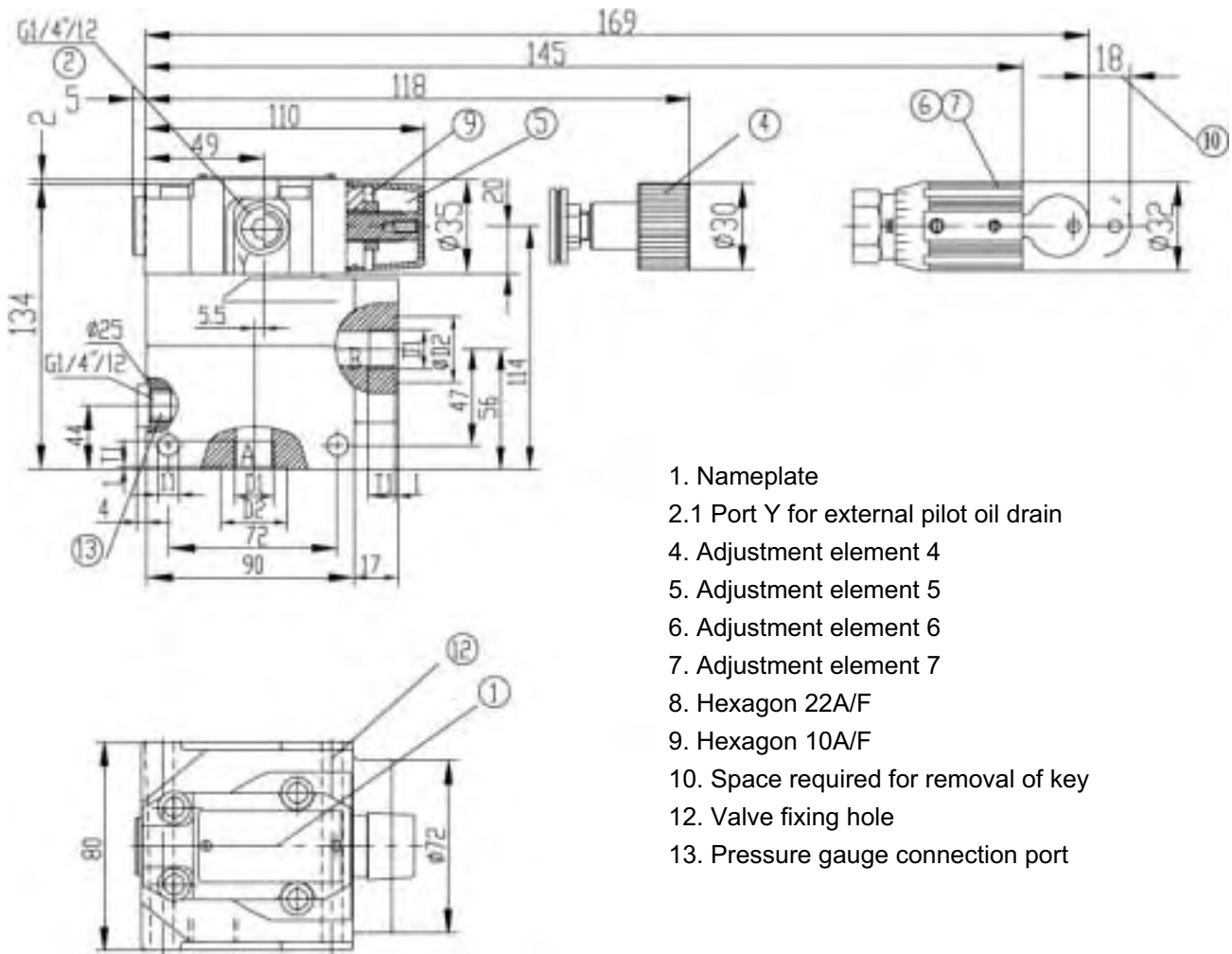


Subplates for: see page 150
 DR 10 G 460/01 (3/8" BSP)
 G 461/01 (1/2" BSP)
 DR 20 G 412/01 (3/4" BSP)
 G 413/01 (1" BSP)
 DR 30 G 414/01 (1 1/4" BSP)
 G 415/01 (1 1/2" BSP)
 Valve fixing screws: GB/T70.1-2000
 DR 10: 4-M10 x 50-10.9; tightening torque = 75 Nm
 DR 20: 4-M10 x 60-10.9; tightening torque = 75 Nm
 DR 30: 6-M10 x 70-10.9 tightening torque = 75 Nm



Required surface finish of mating piece

Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2	B3	B4	B5	H1	H2	H3	O-ring(ports A,B)	O-ring(ports X,Y)
10	96	35.5	33	42.9	21.5	-	7.2	31.5	21.8	35.8	85	50	66.7	58.8	7.9	112	92	28	17.2 × 262	9.25 × 1.78
20	116	37.5	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	102	59.5	79.4	73	6.4	122	102	38	28.17 × 3.53	



Type	D1	φ D2	T
DR10G	G1/2" (M22 × 1.5)	34	14
DR15G	G3/4" (M27 × 2)	42	16
DR20G	G1" (M33 × 2)	47	18
DR25G	G1 1/4" (M42 × 2)	58	20

Warning: pipe mounting without non-return valve, can not flow reverse

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Direct operated pressure sequence valve, type DZ 5 DP			RE 20392/12.2004
	Size 5	up to 31.5MPa	up to 30L/min	Replaces: RE20392/05.2001

Features:

- For subplate mounting
- Front flange mounting
- 5 pressure ranges
- 4 different setting elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- Optional non return valve
- Mounting pattern to DIN 24 340, form C for subplates



Functional,Section

Valves type DZ 5 DP are direct operated sequence valves. They are used to direct oil to a second system at a set pressure.

Valves of this type consist basically of the housing (1), control spool (2), springs (3) and pressure setting element (4), and additionally non-return valve (5) if required.

The pressure at which the valve passes oil is set at the pressure setting element (4). The springs (3) hold the control spool (2) in the starting position, and the valve remains closed. The pressure in port P passes via drilling (6) and jet (7) on to the spool operating area at the opposite end to the control springs (3).

When pressure in port P reaches the set value, the spool moves against the spring to connect port P to port A.

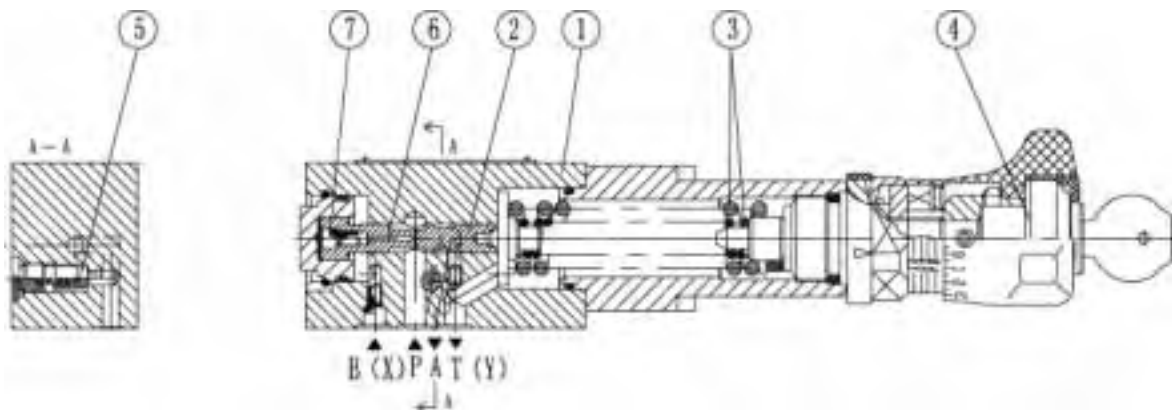
The signal for this passes internally via drilling (6) from port P.

Oil now passes to the system connected to port A, but the pressure in port P does not fall.

The pilot oil may also be fed externally via port B(X).

Depending on the application of the valve, the pilot oil return may be externally via port T(Y) or internally.

In order to allow free return flow of the oil from port A to port P, non-return valve (5) may be included if required.



Type DZ5DP-3-10B/...

Symbols

with non-return valve	DZ5DP.,-10B/...	DZ5DP.,-10B/...X...	DZ5DP.,-10B/...Y..	DZ5DP.,-10B/...XY..
without non-return valve	DZ5DP.,-10B/...M..	DZ5DP.,-10B/...XM..	DZ5DP.,-10B/...YM...	DZ5DP.,-10B/...XYM..

Ordering code

DZ 5 D P - 10 B / / / / / *

For subplate mounting= No code
For front flange mounting = F

Size 5 =5

Direct operated = D

Subplate ports = P

Adjusting element
Rotary knob = 1
Head screw with hexagon and protective cap = 2
Lockable rotary knob with scale 1) = 3
Rotary knob with scale = 7

Series 10 to 19 = 10
(10 to 19, installation and connection dimensions remain unchanged)

Technology of Beijing Huade Hydraulic =B

further details in clear text

No code. = mineral oils
V = phosphate ester

No code= with non-return valve
M= without non-return valve

No code = pilot oil supply internal,
drain internal
X = pilot oil supply external,
drain internal
Y = pilot oil supply internal,
drain external
XY = pilot oil supply external,
drain external

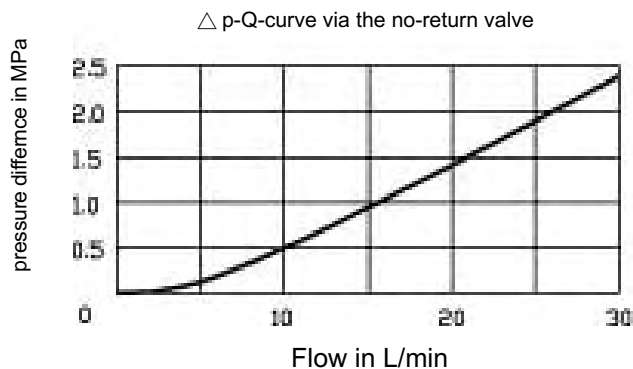
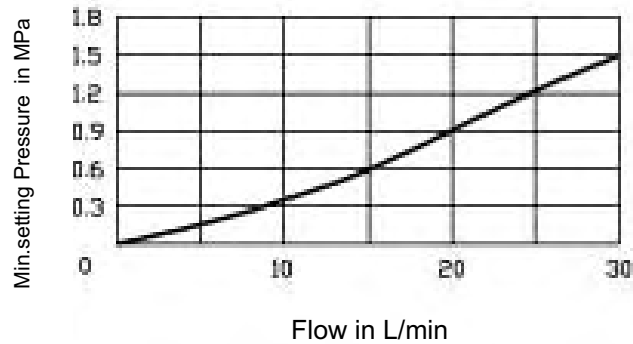
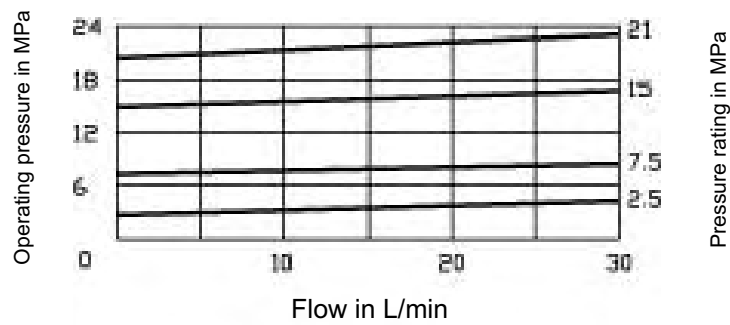
25= Max. sequence pressure 2.5 MPa
75= Max. sequence pressure 7.5 MPa
150= Max. sequence pressure 15.0 MPa
210= Max. sequence pressure 21.0 MPa
315= Max. sequence pressure 31.5 MPa
(31.5 MPa unit only available without non-return valve)

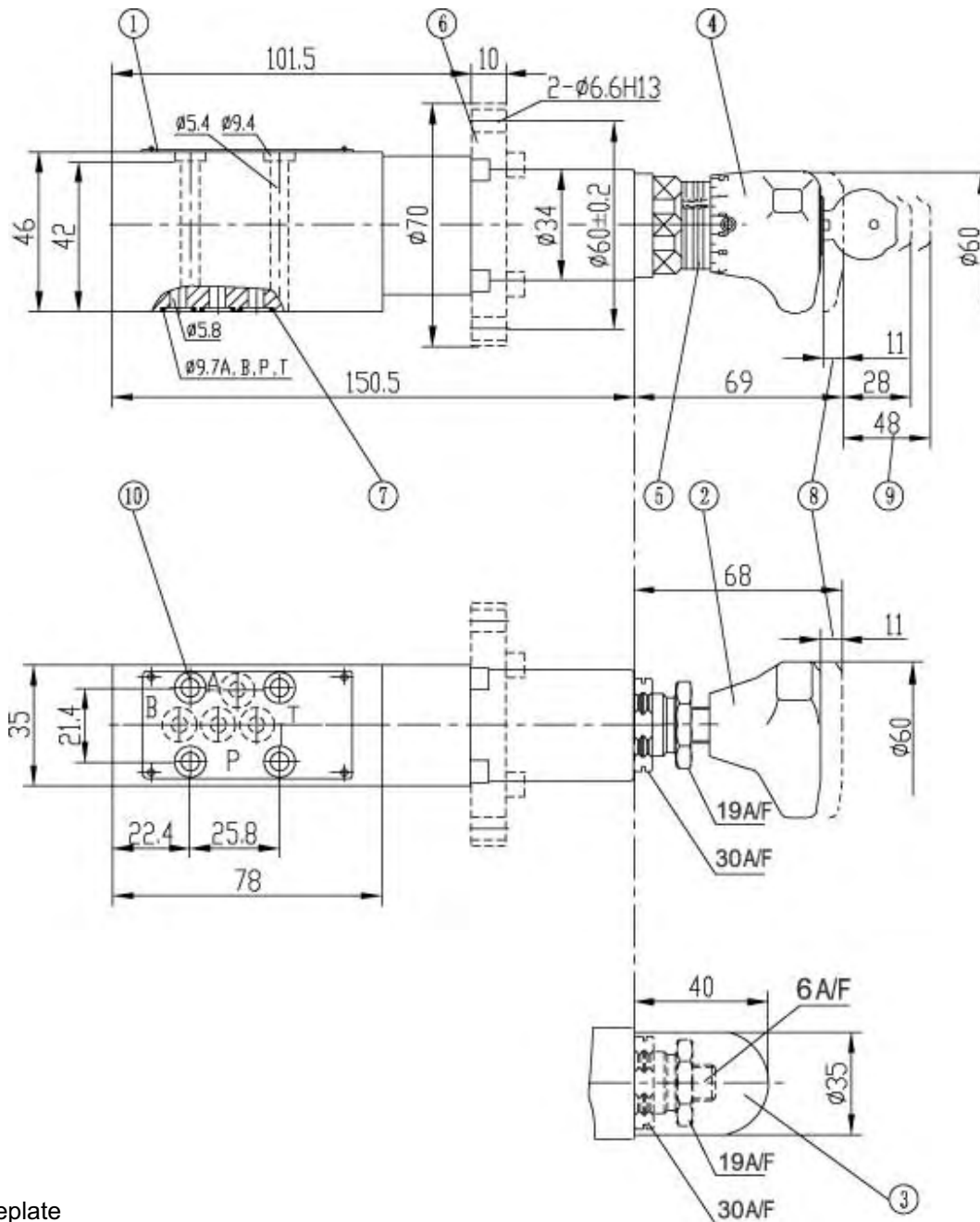
Technical Data		
Inlet pressure, port P, B (X)	(MPa)	up to 210; without non-return valve up to 31.5
Outlet pressure, port A	(MPa)	to 31.5
Back pressure, port T (Y)	(MPa)	to 6.0
Max. permissible flow	(L/min)	to 30
Fluids		Mineral oil (for NBR seal), or phosphate ester (for FPM seal)
Viscosity range	(mm ² /s)	10~800
Fluid temperature range	(°C)	-30~+80
Fluid cleanliness	(μm)	Fluid cleanliness Maximum permissible degree of contamination of the fluid to NAS 1638 Class 9

Operating curves (measured at $v=41\text{mm}^2/\text{S}$ and $t=50^\circ\text{C}$)

Pe- Q-curve

Inlet pressure related to flow





- | | |
|---|--|
| 1. Nameplate | |
| 2. Adjustment element 1 | |
| 3. Adjustment element 2 | |
| 4. Adjustment element 3 | Subplates and valve fixing screws |
| 5. Scale and ring marking for repeat setting | must be ordered separately |
| 6. Panel mounting model (type DZ 5 DP../..) | Subplates :see page153 |
| 7. O-ring 7 x 1.5 for ports P, A, B(X) and T(Y) | G115/01 (G1/4")
G115/02 (M14X1.5)
G96/01 (G1/4")
G96/02 (M14X1.5) |
| 8. Max. stroke | Valve fixing screws:(GB/T70.1-2000) |
| 9. Space required to remove key | M5x50-10.9; M _A = 8,9 Nm |
| 10. Valve fixing holes | |



Required surface finish of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Direct operated pressure sequence valve, type DZ 6 DP			RE 26393/12.2004
	Size 6	up to 21MPa	up to 60L/min	Replaces: RE26393/05.2001

Features:

- For subplate mounting
- 5 pressure stages
- 4 Adjusting elements:
 - Rotary knob,
 - Head screw with hexagon and protective cap,
 - Lockable rotary knob with scale,
 - Rotary knob with scale
- Check valve, optional
- Mounting pattern to DIN 24 340, form A,ISO 4401 and CETOP-RP 121H



Function, section

The valve type DZ 6 DP is a direct operated pressure sequence valve.

It is used for the pressure dependent connection of a second system.

The setting of the sequence pressure is via the adjusting element(4).

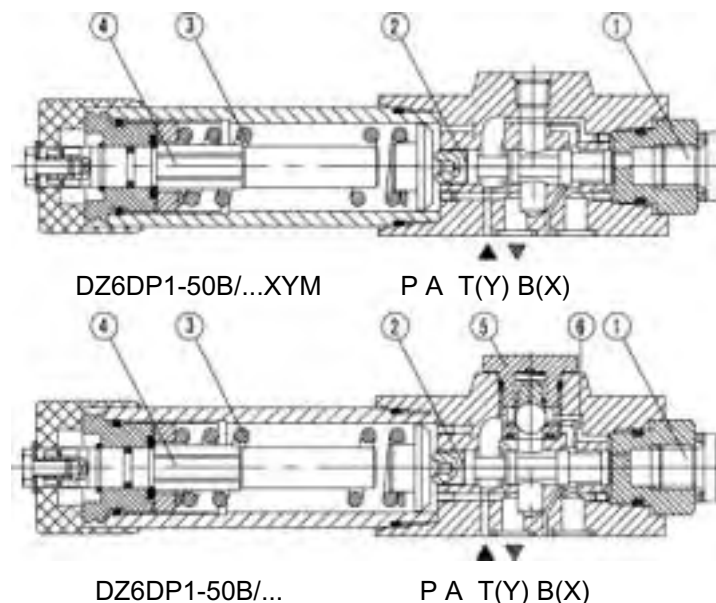
The spring (3) holds the control spool (2) in the neutral position, the valve is blocked. The pressure in channel P is present at the spool surface of the control spool (2) opposite the spring (3) via the control line (6).

If the pressure in channel P reaches the set value of the spring (3) the control spool (2) is moved to the left and the connection

P to A is opened. The system at channel A is connected without a pressure decrease falling in channel P.

The control signal originates internally via the control line (6) from channel P or externally via port B (X).

Depending on the use of the valve the leakage oil drain is externally via port T (Y) or internally via A.



Symbols

with non-return valve	DZ6DP.-10B/... 	DZ6DP.-10B/...X.. 	DZ6DP.-10B/...Y.. 	DZ6DP.-10B/...XY..
without non-return valve	DZ6DP.-10B/...M... 	DZ6DP.-10B/...XM... 	DZ6DP.-10B/...YM... 	DZ6DP.-10B/...XYM...

Ordering code

DZ 6 D P - 50 B / / / / / / / *

Size 6 =6

Direct operated = D

Subplate ports = P

Adjusting element
 Rotary knob = 1
 Head screw with hexagon and protective cap = 2
 Lockable rotary knob with scale 1) = 3
 Rotary knob with scale = 7

Series 50 to 59 = 50
 (50 to 59, installation and connection dimensions remain unchanged)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code = with non-return valve
 M = without non-return valve

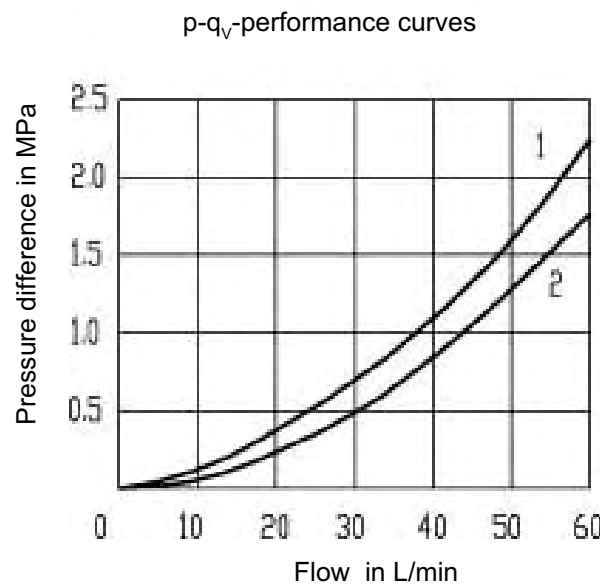
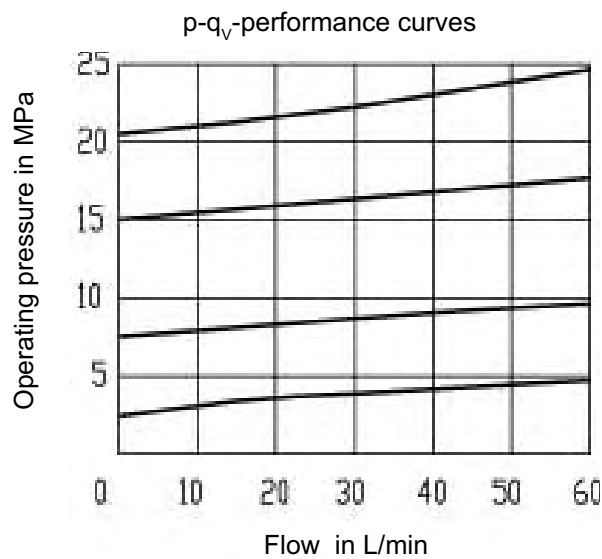
No code = pilot oil supply internal, drain internal
 X = pilot oil supply external, drain internal
 Y = pilot oil supply internal, drain external
 XY = pilot oil supply external, drain external

25= Max. sequence pressure 2.5 Mpa
 75= Max. sequence pressure 7.5 Mpa
 150= Max. sequence pressure 15.0 Mpa
 210= Max. sequence pressure 21.0 Mpa

Technical Data

Inlet pressure, port P, B (X)	(MPa)	up to 31.5
Outlet pressure, port A	(MPa)	up to 21.0
Back pressure, port T (Y)	(MPa)	up to 16.0
Max. permissible flow	(L/min)	up to 60
Fluid		Mineral oil (for NBR seal), or phosphate ester (for FPM seal)
Viscosity range	(mm ² /s)	10~800
Fluid temperature rang	(°C)	-30 to +80
Fluid cleanliness	(µm)	Fluid cleanliness Maximum permissible degree of contamination of the fluid to NAS 1638 Class 9.
Max. flow	L/min	up to 60

Operating curves (measured at $v=41\text{mm}^2/\text{S}$ and $t=50^\circ\text{C}$)

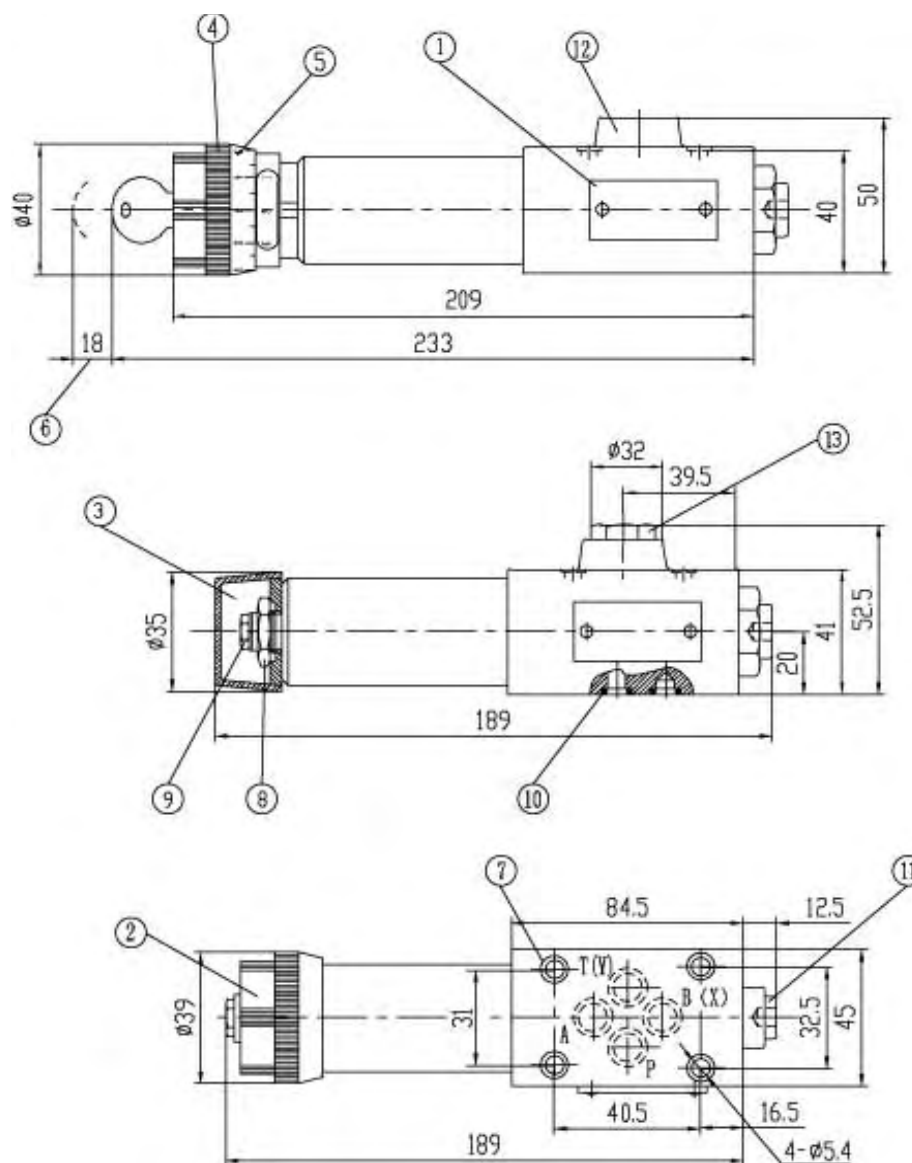


1 Δ p-q_v-performance curve via check valve A to P

2 Δ p-q_v-performance curve P to A

Unit dimensions:

(Dimensions in mm)



- 1 Nameplate
- 2 Adjustment element 1
- 3 Adjustment element 2
- 4 Adjustment element 3
- 5 Adjustment element 7
- 6 Space required to remove key
- 7 Valve fixing screw holes
- 8 Lock nut 24 A/F
- 9 Hexagon 10 A/F
- 10 O-ring 9.25 x 1.78 for ports A, B (X), P, T(Y)
- 11 Pressure gauge port G 1/4; 12 deep; Hexagonal recess A/F 6
- 12 Without check valve
- 13 With check valve

Subplates: see page 152

G 341/01 (G 1/4")

G 341/02 (M14X1.5)

G 342/01 (G 3/8")

G 342/02 (M18X1.5)

Valve fixing screws

4-M5 x 50-10.9

(GB/T70.1-2000)

Tightening torque $M_A = 8,9 \text{ Nm}$, must be ordered separately.

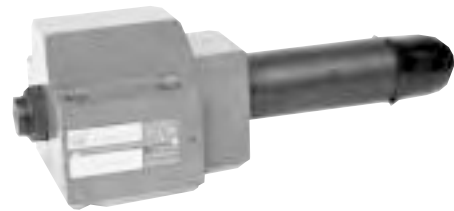


Required surface finish of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure sequence valve, direct operated, type DZ 10 DP			RE 26394/12.2004
	Size 10	up to 21MPa	up to 80L/min	Replaces: RE26394/05.2001

Features:

- For subplate mounting
- 4 pressure ratings
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- With pressure gauge connection
- Check valve, optional
- mounting pattern to DIN 24 340, form D,ISO 5781 and CETOP-RP 121H



Function, section

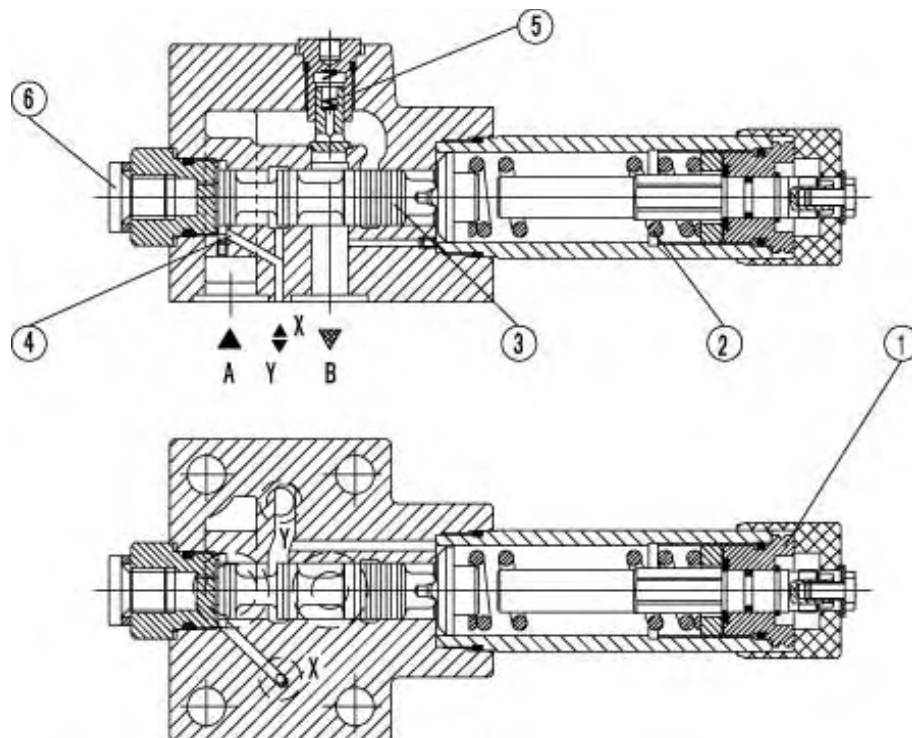
The valve type DZ 10 DP is a direct operated pressure sequence valve.

It is used for pressure dependent sequencing of a second system.

The sequence pressure is set via the adjusting element (1).

The compression spring (2) holds the control spool (3) in the start position, the valve is closed. The pressure in port A is present at the piston area of the control spool (3) opposite to the compression spring (2) via the control line (4). When the pressure reaches the value set on compression spring (2), the control spool (3) is moved and opens the connection A to B. The system which is connected to port B is sequenced without the pressure in channel A falling. The control signal is obtained via the control line (4) from port A or externally via connection X.

Depending on the valve application the leakage drain oil can be passed externally via connection Y or internally via B.



Type DZ10DP1-40B/...XY..

Symbols

with non-return valve	DZ10DP.-10B/... 	DZ10DP.-10B/...X.. 	DZ10DP.-10B/...Y.. 	DZ10DP.-10B/...XY..
without non-return valve	DZ10DP.-10B/...M... 	DZ10DP.-10B/...XM... 	DZ10DP.-10B/...YM... 	DZ10DP.-10B/...XYM...

Ordering code

DZ 10 D P - 50 B / / / / / *

Size 10 =10

Direct operated = D

Subplate ports = P

Adjusting element

Rotary knob = 1
 Head screw with hexagon and protective cap = 2
 Lockable rotary knob with scale = 3
 Rotary knob with scale = 7

Series 40 to 49 = 40
 (40 to 49, installation and connection dimensions remain unchanged)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code = with non-return valve
 M = without non-return valve

No code = pilot oil supply internal, drain internal
 X = pilot oil supply external, drain internal
 Y = pilot oil supply internal, drain external
 XY = pilot oil supply external, drain external

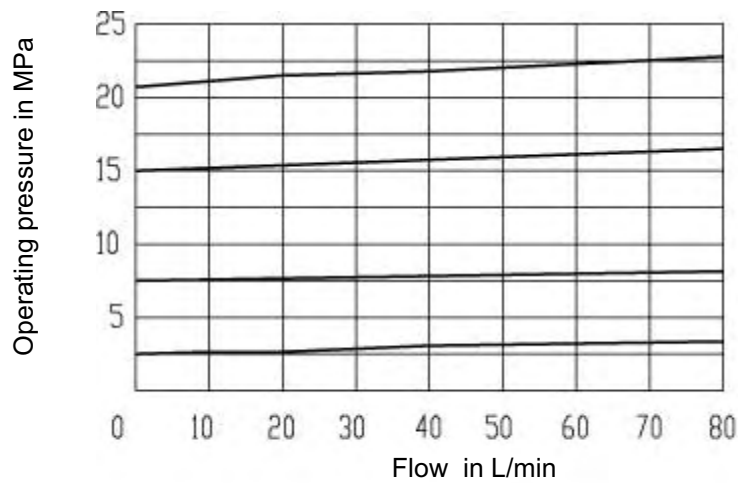
25= Max. sequence pressure 2.5 Mpa
 75= Max. sequence pressure 7.5 Mpa
 150= Max. sequence pressure 15.0 Mpa
 210= Max. sequence pressure 21.0 Mpa
 315= Max. sequence pressure 31.5 Mpa

Technical Data

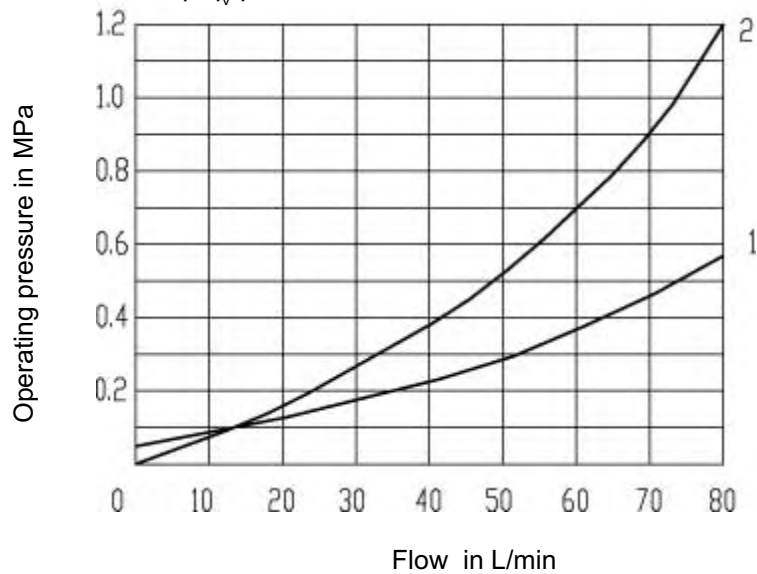
Inlet pressure, port P, A (X)	(MPa)	up to 31.5
Outlet pressure, port B	(MPa)	up to 21.0
Back pressure, port T (Y)	(MPa)	up to 16.0
Max. permissible flow	(L/min)	up to 60
Fluid		Mineral oil (for NBR seal), or phosphate ester (for FPM seal)
Viscosity range	(mm ² /s)	10~800
Fluid temperature rang	(°C)	-30 to +80
Fluid cleanliness	(µm)	Fluid cleanliness Maximum permissible degree of contamination of the fluid to NAS 1638 Class 9.
Max. flow	(L/min)	up to 80

Operating curves (measured at $v=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

p-q_v-performance curves

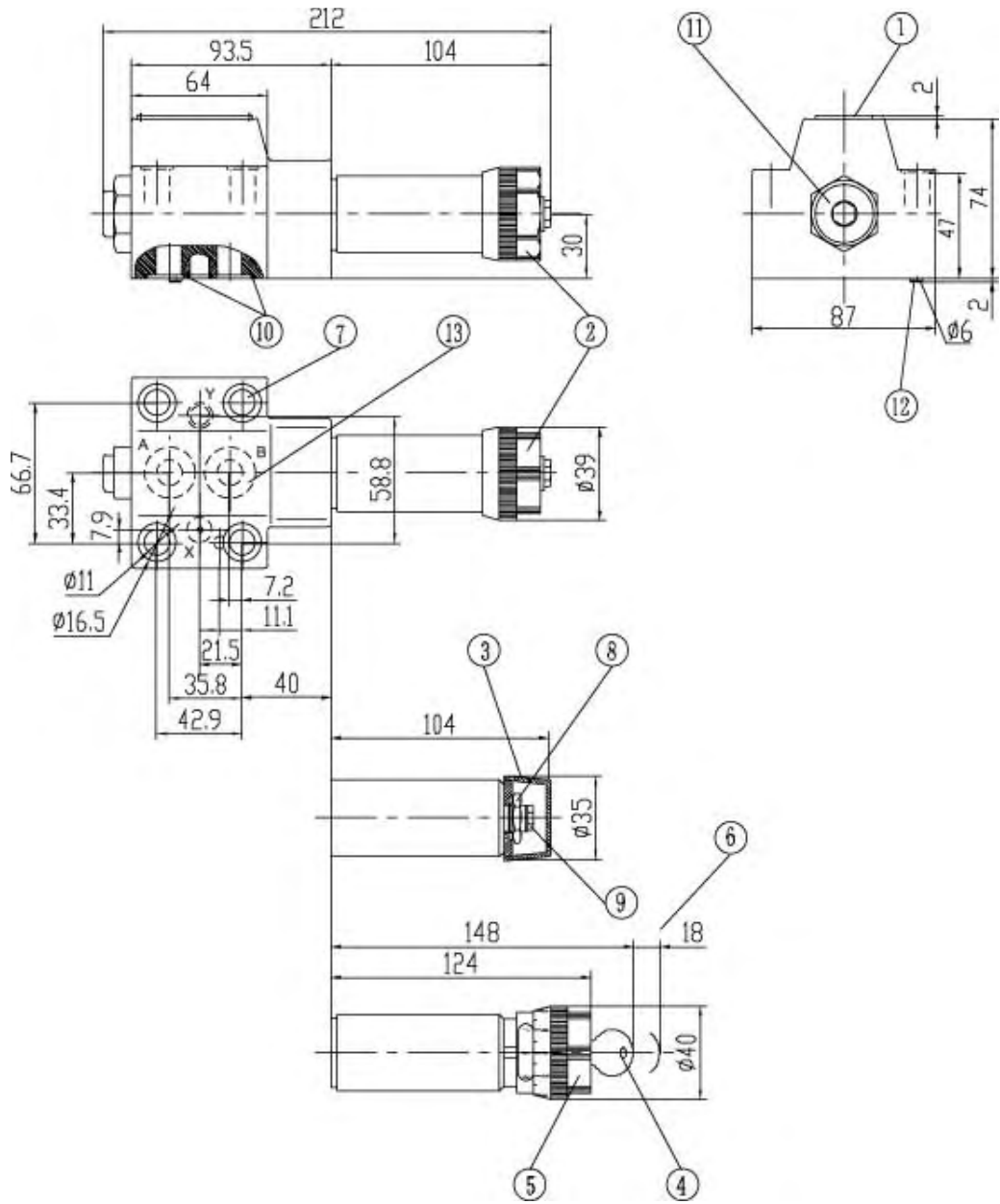


p-q_v-performance curves



1 Δ p-q_v-performance curve via check valve B to A

2 Δ p-q_v-performance curve A to B



- 1. Nameplate
- 2. Adjustment element 1
- 3. Adjustment element 2
- 4. Adjustment element 3
- 5. Adjustment element 7
- 6. Space required to remove key
- 7. Valve fixing screw holes
- 8. Lock nut 24 A/F
- 9. Hexagon 10 A/F
- 10. O-ring 17.12 x 2.62 for ports A and B
O-ring 9.25 x 1.78 for ports X and Y
- 11. Pressure gauge port G 1/4";
deep12; allen key A/F 6
- 12. Locating pin

Subplates:see page150

- G460/01(G3/8")
- G460/02(M18X1.5)
- G461/01(G1/2")
- G461/02(M22X1.5)

Valve fixing screws

- M10 x 60-10.9
- (GB/T70.1-2000);
- Tightening torque $M_A = 75 \text{ Nm}$

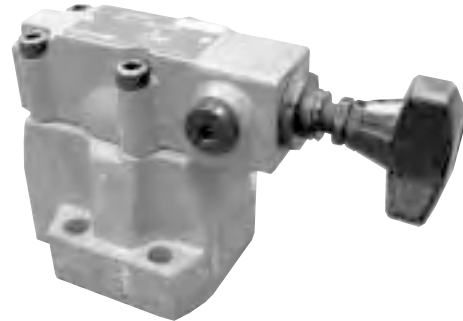


Required surface finish
of mating piece

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure sequence valve pilot operated, type DZ...30B/			RE 26390/12.2004
	Size 10,20,30	up to 21MPa	up to 450L/min	Replaces: RE26390/05.2001

Features:

- Suitable for use as a relief, sequence and bypass valve
- For subplate mounting
- For manifold block mounting
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 4 pressure ratings
- Check valve, optional



Functional, section

Pressure valves type DZ are pilot operated pressure sequence valves. They are used for pressure dependent sequence switching of a second circuit.

The pressure sequence valves basically consist of main valve (1) with main spool (6) and pilot valve (2) with pressure adjustment element and check valve (11), optional.

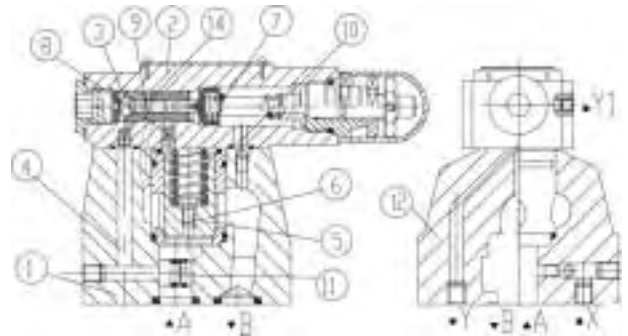
The valve function varies according to pilot oil drain configuration:

Type DZ...-30B/210.

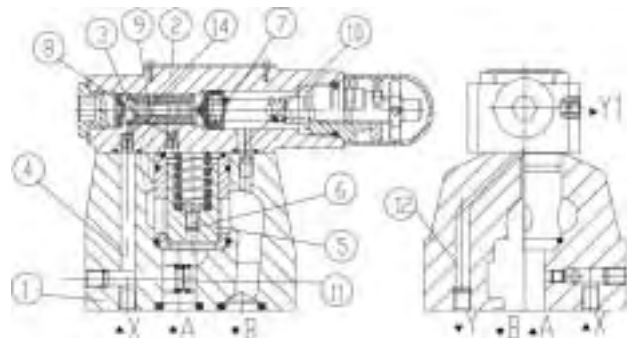
The pressure in port A acts on the pilot spool (6) in the pilot valve (2) via the control line (4). At the same time it acts on the spring loaded side of the main spool (6) via orifice (8). When the pressure exceeds the value set at spring (7), the pilot piston (3) is moved against the spring (7). The signal is obtained internally from port A via control line (4). The fluid on the spring loaded side of the main spool (6) now flows to port B via orifice (9), control land (14) and lines (10). There is now a pressure drop at main spool (6), the connection from port A to port B is open maintaining the pressure set at spring (7). The leakage oil at pilot piston (3) is led to port B internally via line (10). An optional check valve (11) can be fitted for free return flow from port B to A.

Type DZ...-30B/210X

The function of this valve is principally the same as for valve DZ...30B/210. However, on pressure sequence valve type DZ...30B/...X.. the signal is given externally by means of port X.



Type DZ...30B/210



Type DZ...30B/210X

Type DZ...30B/210Y..

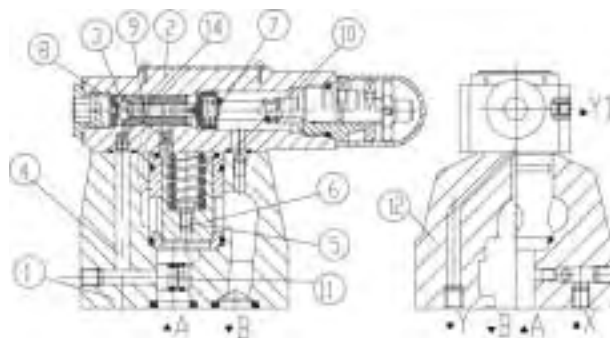
The function of this valve is principally the same as for valve type DZ...30B/....However, for type DZ...30B/...Y.. leakage at pilot piston (3) must be drained to tank.

Type DZ...30B/....XY...

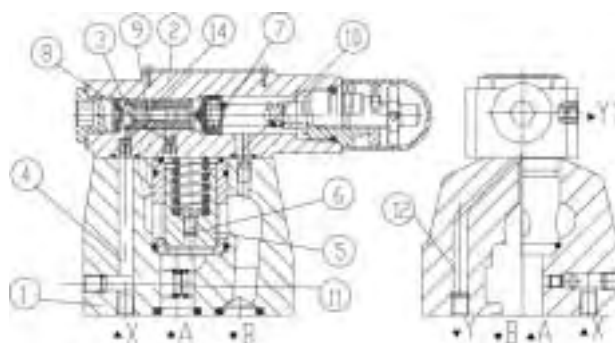
Pressure in port X acts on the pilot piston (3) in the pilot valve (2) via control line (4). At the same time pressure in port A acts on the spring loaded side of the main spool (6) via orifice (5). When the pressure in port X exceeds the value set at the spring (7), the pilot piston (3) is moved against the spring (7). When pilot piston (3) is moved against spring (7), fluid can pass from the spring loaded side of the main spool (6) into the spring chamber of the pilot valve (2) via orifice (9) and line (16) and pressure breaks down on the spring loaded side of the main spool (6).

The fluid can, therefore, pass from port A to B with minimum loss of pressure. The pilot oil in spring chamber (17) should be drained to tank via line(14) or port Y.

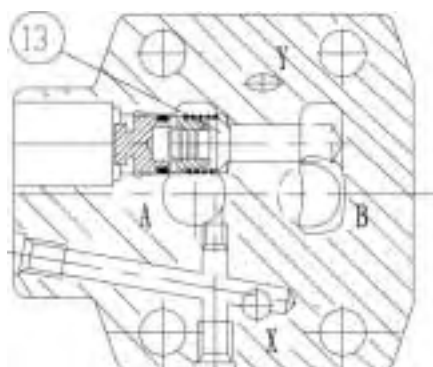
Optional check valve (11) can be fitted for free return flow from port B to A.



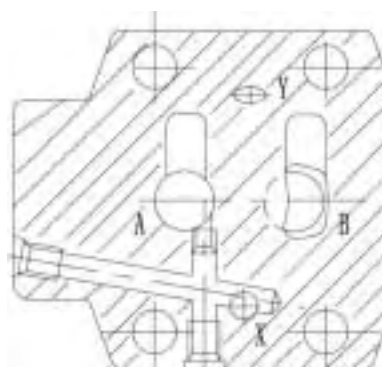
Type DZ...30B/210Y



Type DZ...30B/210X Y

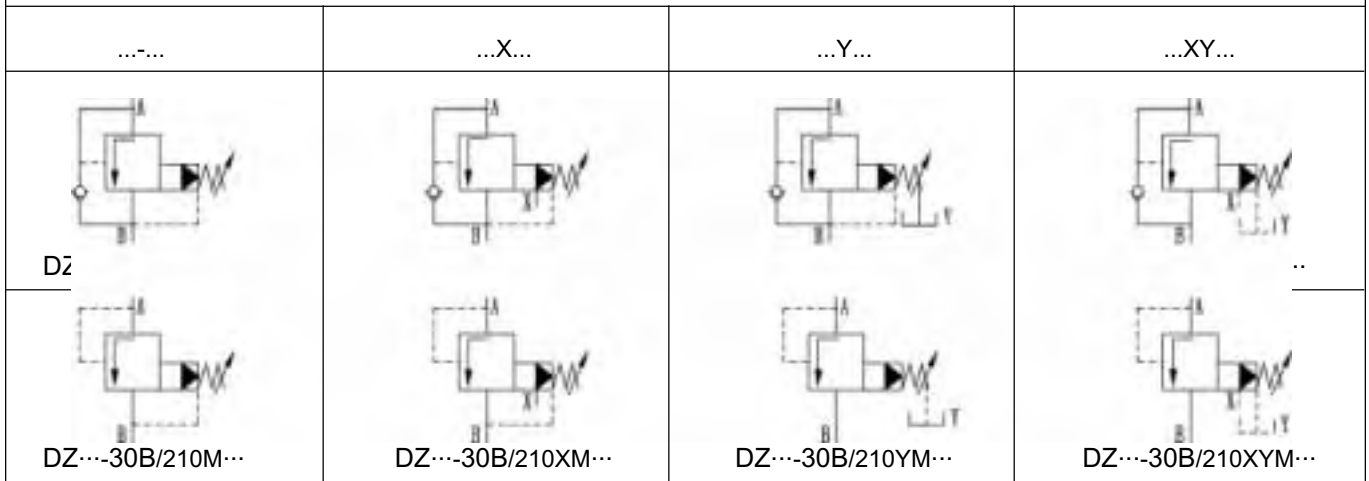


With non-return valve
(Type DZ...30B/210)

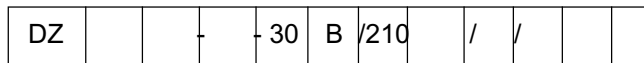


Without non-return valve
(Type DZ...30B/210 M)

Symbols of control oil



Ordering details



Pilot operated valve =No code
 Pilot operated valve without main spool insert (do not state nominal size) = C
 Pilot operated valve with main spool insert (state valve size 30) = C

Nominal size 10 = 10
 Nominal size 25 = 20
 Nominal size 32 = 30

Adjustment element

Rotary knob = 1
 Sleeve with hexagon and protective cap = 2
 Lockable rotary knob with scale = 3

Series 30 to 39 =30
 (30 to 39: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code= pilot port, G1/4"
 2= pilot port, M14X1.5

No code = With check valve
 M = Without check valve Pilot oil supply

No code = Poilt fluid feed internal ,return internal
 X= Poilt fluid feed external,return internal
 Y= Poilt fluid feed internal,return external
 XY= Poilt fluid feed external,return external

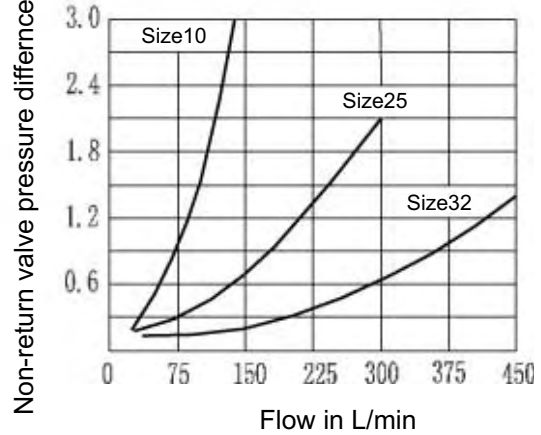
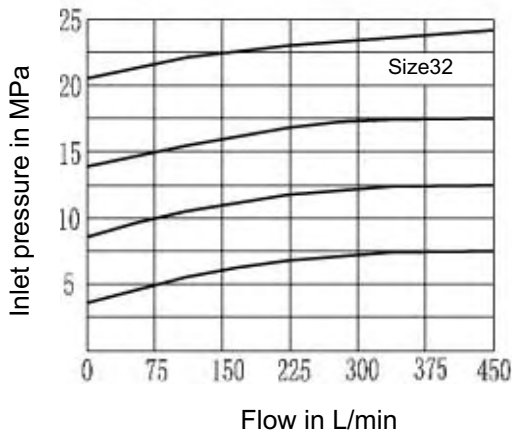
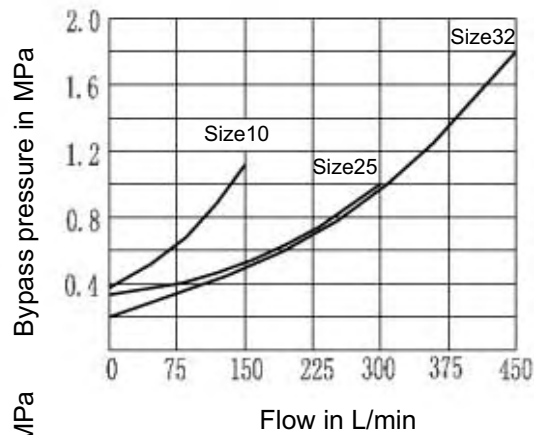
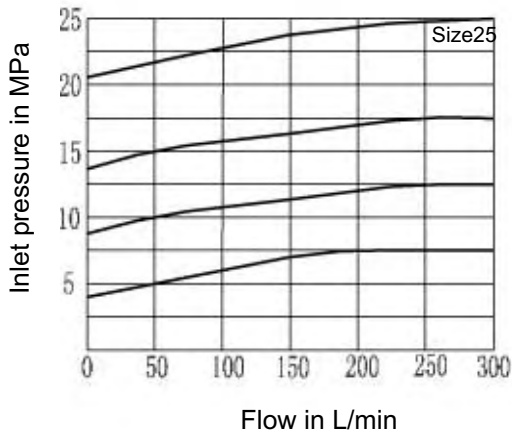
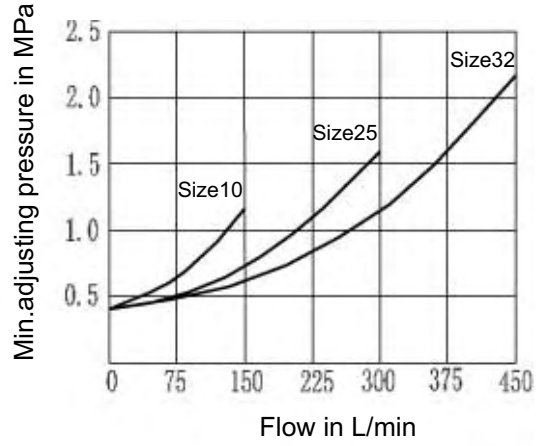
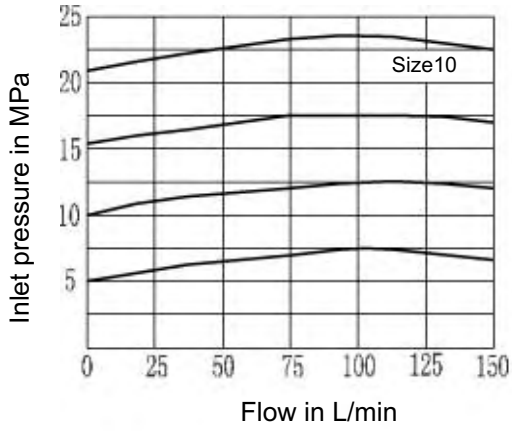
210 = Max. settable pressure up to 21MPa

Technical data

Size	10	20	30
Flow (L/min)	150	300	450
Operating pressure (MPa)	up to 31.5, for A、 B、 X		
Backpressure, port Y (MPa)	up to 31.5		
Adjust pressure (MPa)	0.3 (in related to Q) ~21		
Fluid	Mineral oil (for NBR seal),or phosphate ester (for FPM seal)		
Viscosity range (mm ² /s)	10~800		
Fluid temperature range (°C)	-30~+80		

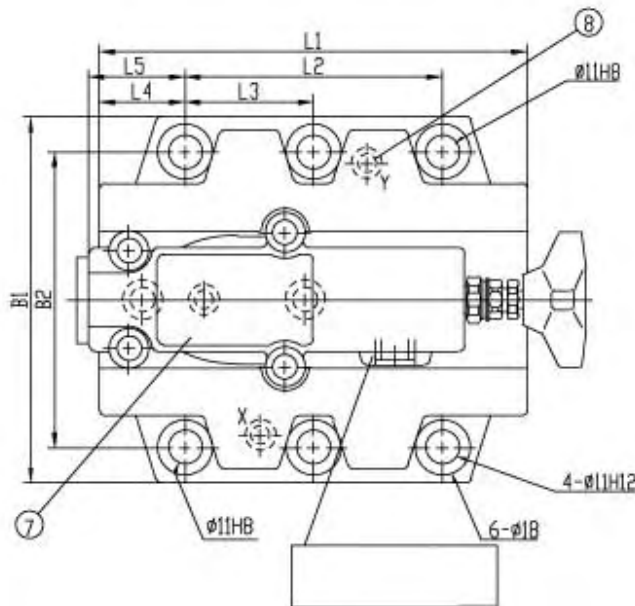
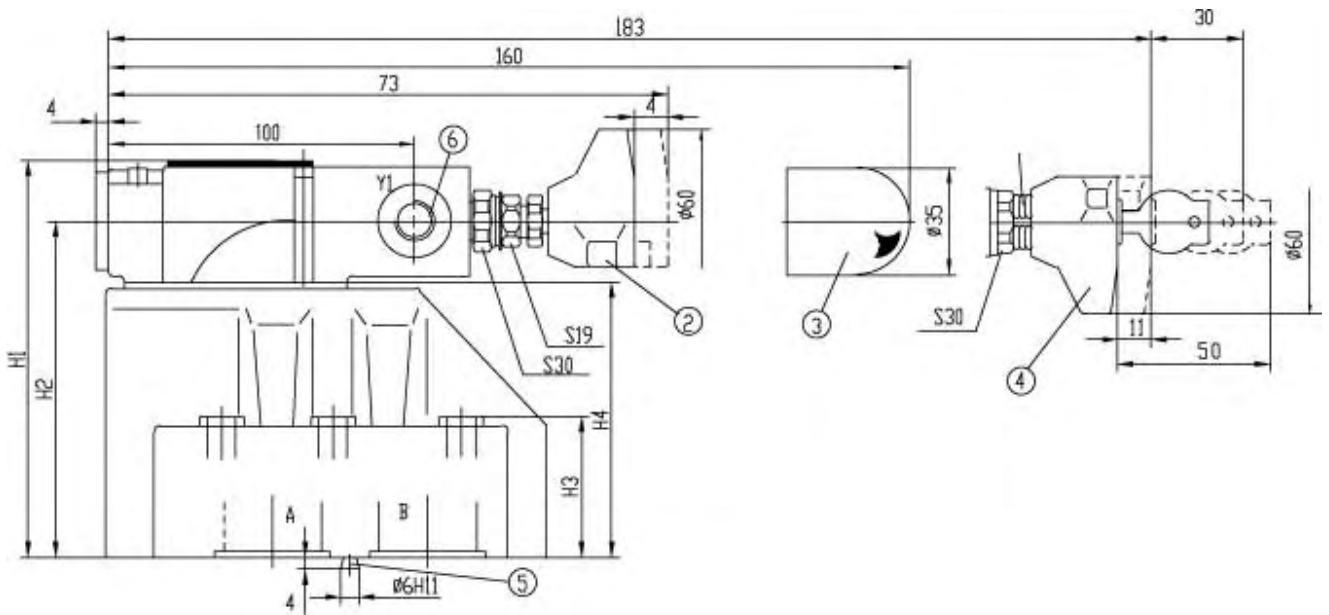
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50$)

The characteristic curves are valid for outlet pressure $P_b = 0$ for the complete flow range



Unit dimensions: pilot operated valve

(Dimensions in mm)

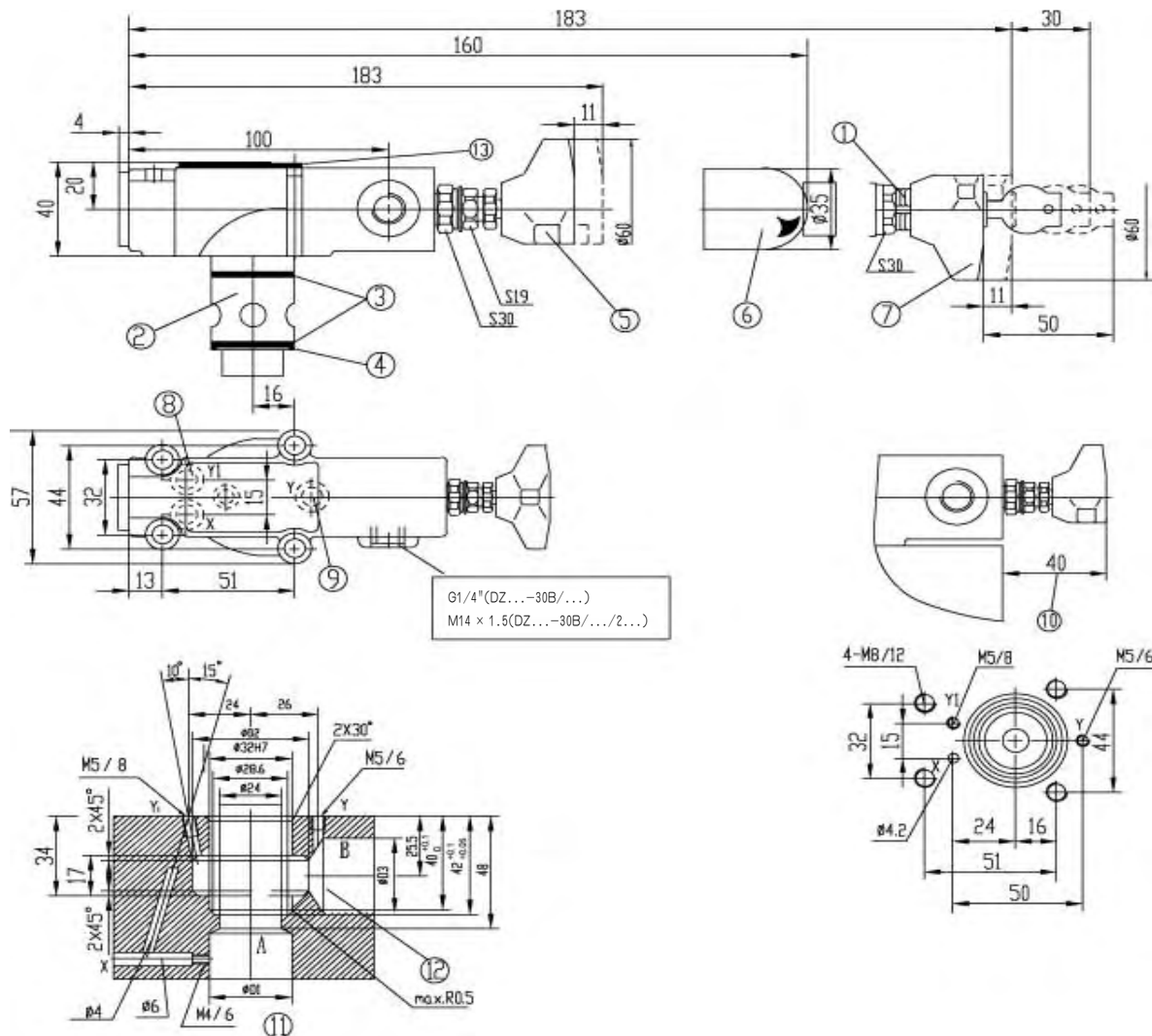


1. Repeat adjusting scale
2. Adjustment element 1
3. Adjustment element 2
4. Adjustment element 3
5. Locating pin
6. Port Y1 (G 1/4; 12) for external pilot oil drain when used as a bypass valve, unloading of spring chamber when used as sequence valve
7. Nameplate
8. Port Y for external point oil drain when used as a unloading valve

Subplates: see page 150

- G412/01 G412/02
- G413/01 G413/02
- G414/01 G414/02
- G415/01 G415/02
- G460/01 G460/02
- G461/01 G461/02

Size	B1	B2	H1	H2	H3	H4	L1	L2	L3	L4	L5	O-ring		Fixing screws (GB/T70.1-2000)	Weight (Kg)
												Port X,Y	Port A,B		
10	85	66.7	112	92	28	72	90	42.9	-	35.5	34.5	9.25 × 1.78	17.12 × 2.62	4-M10 × 50	3.6
20	102	79.4	122	102	38	82	112	60.3	-	33.5	36.5		28.17 × 3.53	4-M10 × 60	5.5
30	120	96.8	130	110	46	90	140	84.2	42.1	28	31.3		34.52 × 3.53	6-M10 × 70	8.2



- 1. Repeat adjusting scale
- 2. Main spool insert
- 3. O-ring 27.3 x 2.4
- 4. Back-up ring 32/28.4X0.8
- 5. Adjustment element 1
- 6. Adjustment element 2
- 7. Adjustment element 3
- 8. Port Y1
pilot oil drain when used as reduce or sequence valve
- 9. Port Y
pilot oil drain when used as bypass valve; unloading of spring chamber when used as sequence valve
- 10. Min.distance when use the adjustment element"1"or"3"
- 11. This drilling is not required when used as unloading valve
- 13. Hole D3 can meet hole D2 at any location.
Care has to be taken that connection hole X and the fixing hole are not damaged.
- 14. Nameplate

Size	φ D1	φ D2	φ D3	Fixing screws (GB/T70.1-2000)	Weight (Kg)
10	10	40	10	4-M8 × 40-10.9	1.4
20	25	40	25		
30	32	45	32		

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure sequence valve pilot operated, type DZ ...50B/(New series)			RE26350/12.2004
	Size 10, 20, 30	up to 31.5 MPa	up to 600 L/min	

Features:

- For subplate mounting
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 4 pressure ratings
- Check valve, optional
- Mounting pattern to DIN 24 340, form D, ISO 5781 and CETOP-RP 121H



Functional, section

Pressure valves type DZ are pilot operated pressure sequence valves. They are used for pressure dependent sequence switching of a second circuit.

The pressure sequence valves basically consist of main valve (1) with main spool insert (7) and pilot valve (2) with pressure adjustment element and check valve (3), optional.

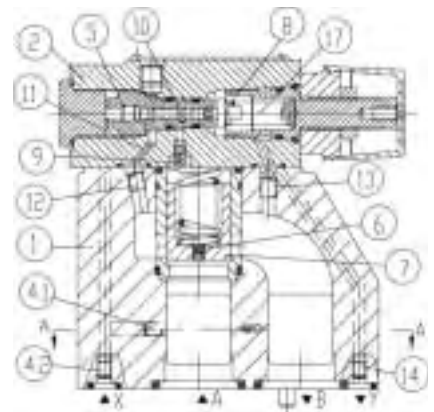
The valve function varies according to pilot oil drain configuration:

Sequence valve type DZ...50B/... .

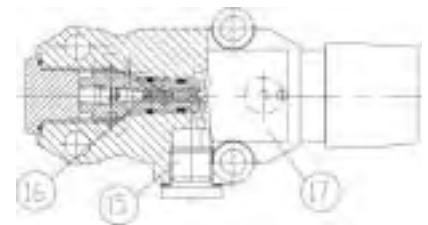
(Control lines 4.1, 12 and 13 open; control lines 4.2, 14 and 15 plugged)

The pressure in line A acts on the pilot spool (5) in the pilot valve (2) via the control line (4.1). At the same time it acts on the spring loaded side of the main spool (7) via orifice (6). When the pressure exceeds the value set at spring (8), the pilot piston (5) is moved against the spring (8). The signal is obtained internally from port A via control line (4.1).

The fluid on the spring loaded side of the main piston (7) now flows to port B via orifice (9), control land (10) and control lines (11) and (12). There is now a pressure drop at main spool (7), the connection from port A to port B is open maintaining the pressure set at spring (8). The leakage oil at pilot piston (5) is led to port B internally via control line (13). An optional check valve (3) can be fitted for free return flow from port B to A.



Type DZ...50B/210...



Sequence valve type DZ...50B/...X...

(Control lines 4.2, 12 and 13 open; control lines 4.1, 14 and 15 plugged)

The function of this valve is principally the same as for valve DZ...-50B/....

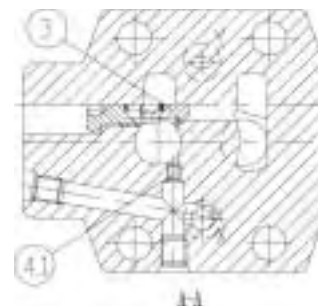
However, on pressure sequence valve type DZ...50B/...X... the signal is given externally by means of control line (4.2).

Sequence valve type DZ...50B/...Y...

(Control lines 4.1, 12 and 14 or 15 open; control lines 4.2, and 13 plugged)

The function of this valve is principally the same as for valve type DZ...50B/....

However, for type DZ...50B/...Y... leakage at pilot piston (5) must be drained to tank without pressure via line (14) or (15). Pilot oil is fed to port B via line (12).



No check valve
With check valve

Sequence valve type DZ...50B/...XY...

(Control lines 4.2, 14 or 15 open; control lines 4.1, 12 and 13 plugged)

Pressure in port X acts on the pilot piston (5) in the pilot valve (2) via control line (4.2). At the same time pressure in port A acts on the spring loaded side of the main spool (7) via orifice (6). When the pressure in port X exceeds the value set at the spring (8), the pilot piston (5) is moved against the spring (8). When pilot piston (5) is moved against spring (8), fluid can pass from the spring loaded side of the main spool (7) into the spring chamber (17) of the pilot valve (2) via orifice (9) and line (16) and pressure breaks down on the spring loaded side of the main spool (7).

The fluid can, therefore, pass from port A to B with minimum loss of pressure. The pilot oil in spring chamber (17) should be drained to tank without pressure via line (14) or (15). An optional check valve (3) can be fitted for free return flow from port B to A.

Ordering details

DZ 50 B *

Pilot operated valve = No code
 Pilot operated valve without main spool insert
 (do not state nominal size) = C
 Pilot operated valve with main spool insert
 (state valve size 30) = C

Nominal size 10 = 10
 Nominal size 25 = 20
 Nominal size 32 = 30

Adjustment element

Rotary knob = 1
 Sleeve with hexagon and protective cap = 2
 Lockable rotary knob with scale = 3
 Rotary knob with scale = 7

Series 50 to 59 = 50
 (50 to 59: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code. = mineral oils
 V = phosphate ester

No code = pilot port, G1/4"
 2 = pilot port, M14X1.5

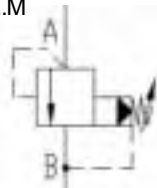
No code = With check valve
 M = Without check valve

No code = Poilt fluid feed internal ,return internal
 X= Poilt fluid feed external,return internal
 Y= Poilt fluid feed internal,return external
 XY= Poilt fluid feed external,return external

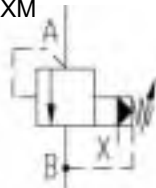
50 = Settable pressure up to 5.0 Mpa
 100 = Settable pressure up to 10.0 Mpa
 200 = Settable pressure up to 20.0 Mpa
 315 = Settable pressure up to 31.5 Mpa

Smbosl:

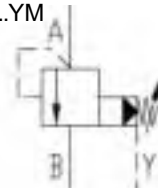
DZ...50B/...M
 DZC...50B/...M



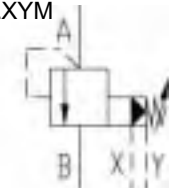
DZ...50B/...XM
 DZC...50B/...XM



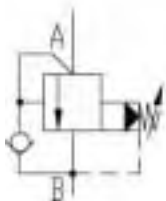
DZ...50B/...YM
 DZC...50B/...YM



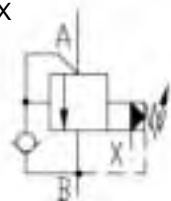
DZ...50B/...XYM
 DZC...50B/...XYM



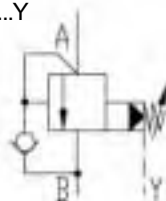
DZ...50B/...



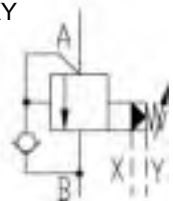
DZ...50B/...X



DZ...50B/...Y

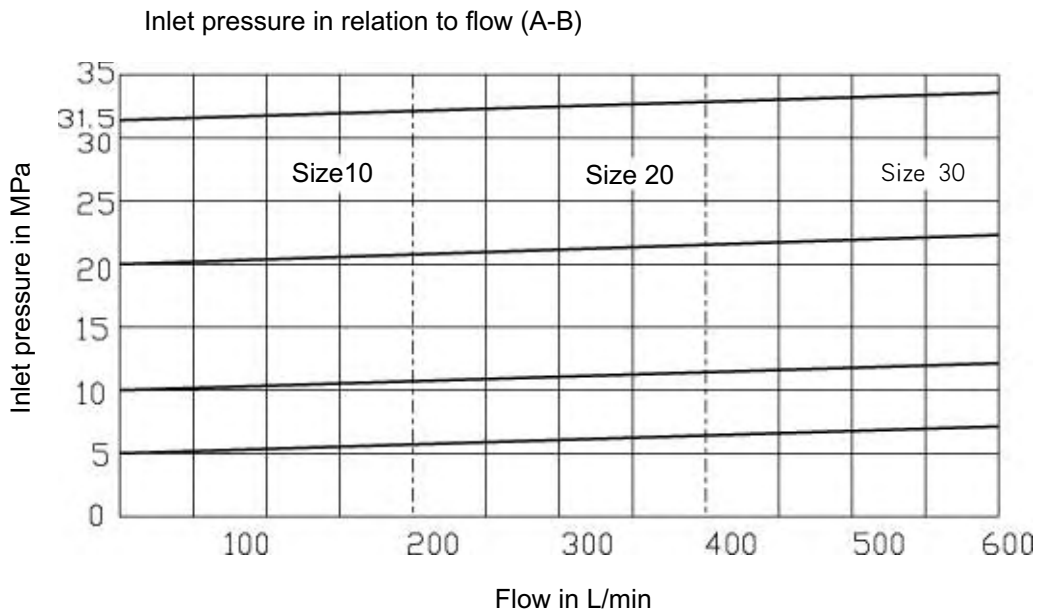


DZ...50B/...XY



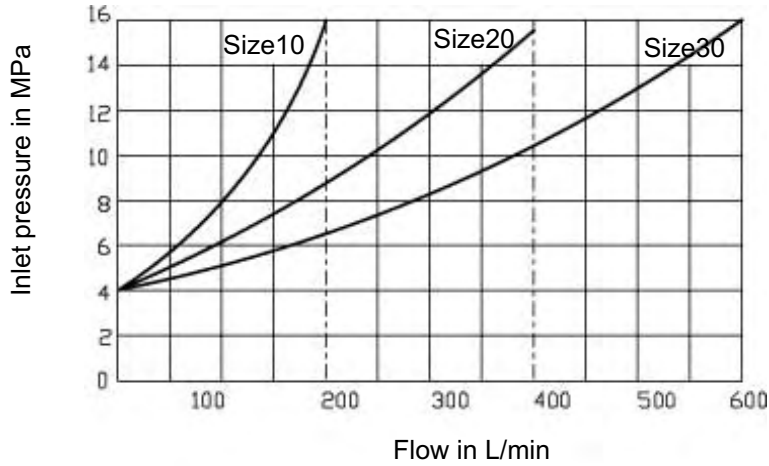
Technical data					
Operating pressure, port A,B,X		(MPa)	up to 31.5		
Backpressure, port Y		(MPa)	up to 31.5		
Fluid pressure	min.	(MPa)	Not related to flow, see characteristic curves		
	max.	(MPa)	to 5, to 10, to 20, to 31.5		
Max. flow		(L/min)	Size10	Size20	Size30
			200	400	600
Fluid		Mineral oil (for NBR seal), or phosphate ester (for FPM seal)			
Viscosity range		(mm ² /s)	10~800		
Fluid temperature range		(°C)	-30~+80		
Degree of contamination		(µm)	Maximum permissible degree of contamination of the fluid to NAS 1638, class 9.		
Weight			Size10	Size20	Size30
	DZ	(Kg)	3.4	5.3	8
	DZC	(Kg)	1.2		
	DZC30	(Kg)	1.5		

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



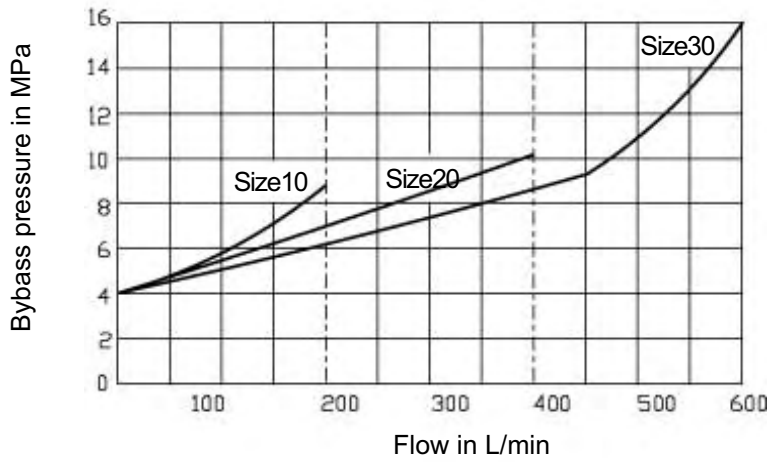
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

Minimum settable pressure in relation to flow (A-B)
 (= bypass pressure model ...X...)



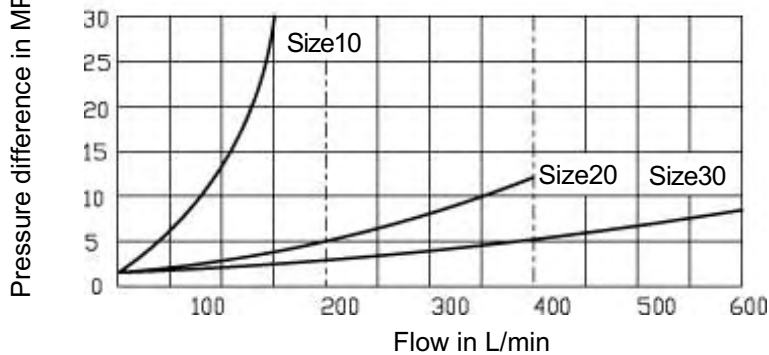
The characteristic curves are valid for outlet pressure $P_B = 0$ for the complete flow range

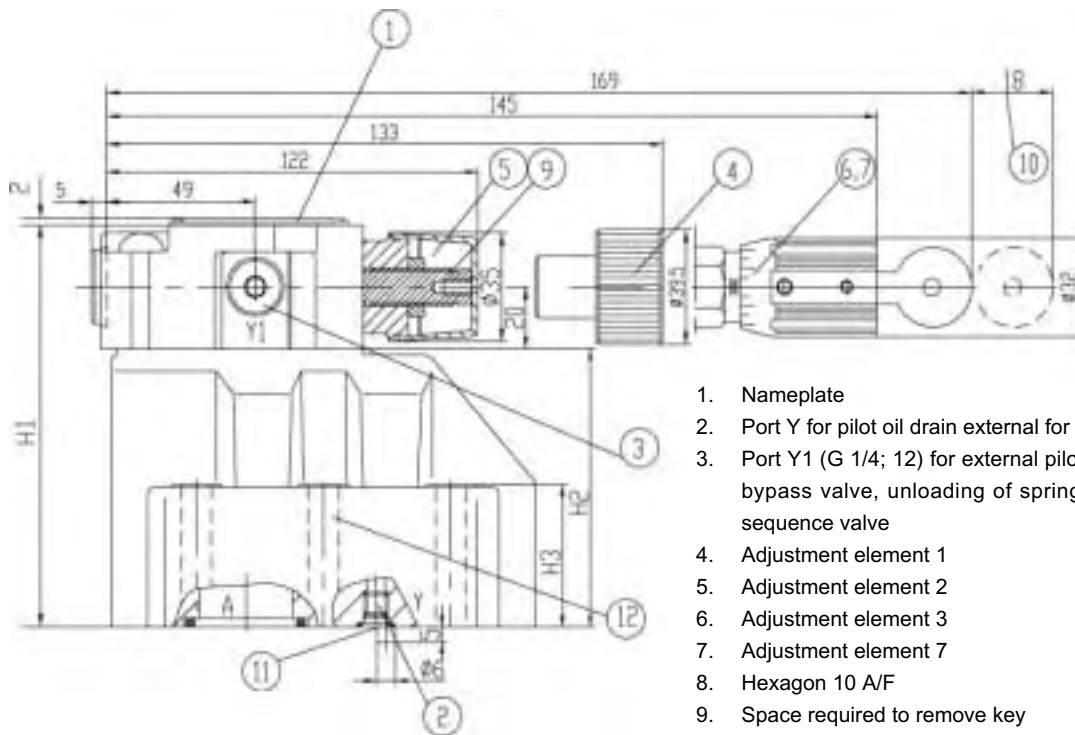
Bypass pressure in relation to flow (A → B) (model ...XY...only)



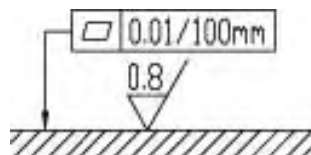
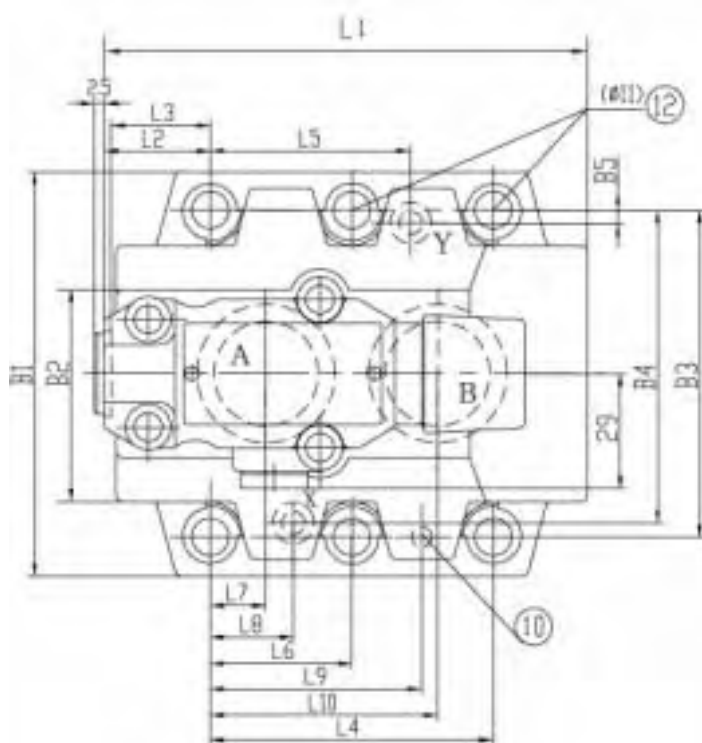
The characteristic curves are valid for outlet pressure $P_B = 0$ for the complete flow range

Δp_{q_v} Characteristic curves across the check valve (A → B)





1. Nameplate
2. Port Y for pilot oil drain external for use as bypass valve
3. Port Y1 (G 1/4; 12) for external pilot oil drain when used as a bypass valve, unloading of spring chamber when used as sequence valve
4. Adjustment element 1
5. Adjustment element 2
6. Adjustment element 3
7. Adjustment element 7
8. Hexagon 10 A/F
9. Space required to remove key
10. Locating pin
11. 4 valve fixing holes for sizes 10 and 25
6 valve fixing holes for size 32 valve fixing screws must be ordered separately.



Required surface finish of mating piece

Subplates: see page150

Size 10:G460/01(G3/8");G460/02(M18X1.5)
G461/01(G1/2");G461/02(M22X1.5)

Size 20:G412/01(G3/4");G412/02(M27X2)
G413/01(G1"); G413/02(M33X2)

Size 30:G414/01(G1 /4");G414/02(M42X2)
G415/01(G1 /2"); G415/02(M48X2)

Valve fixing screws

Size10: 4-M10x50-10.9
(GB/T70.1-2000); $M_A=75$ Nm

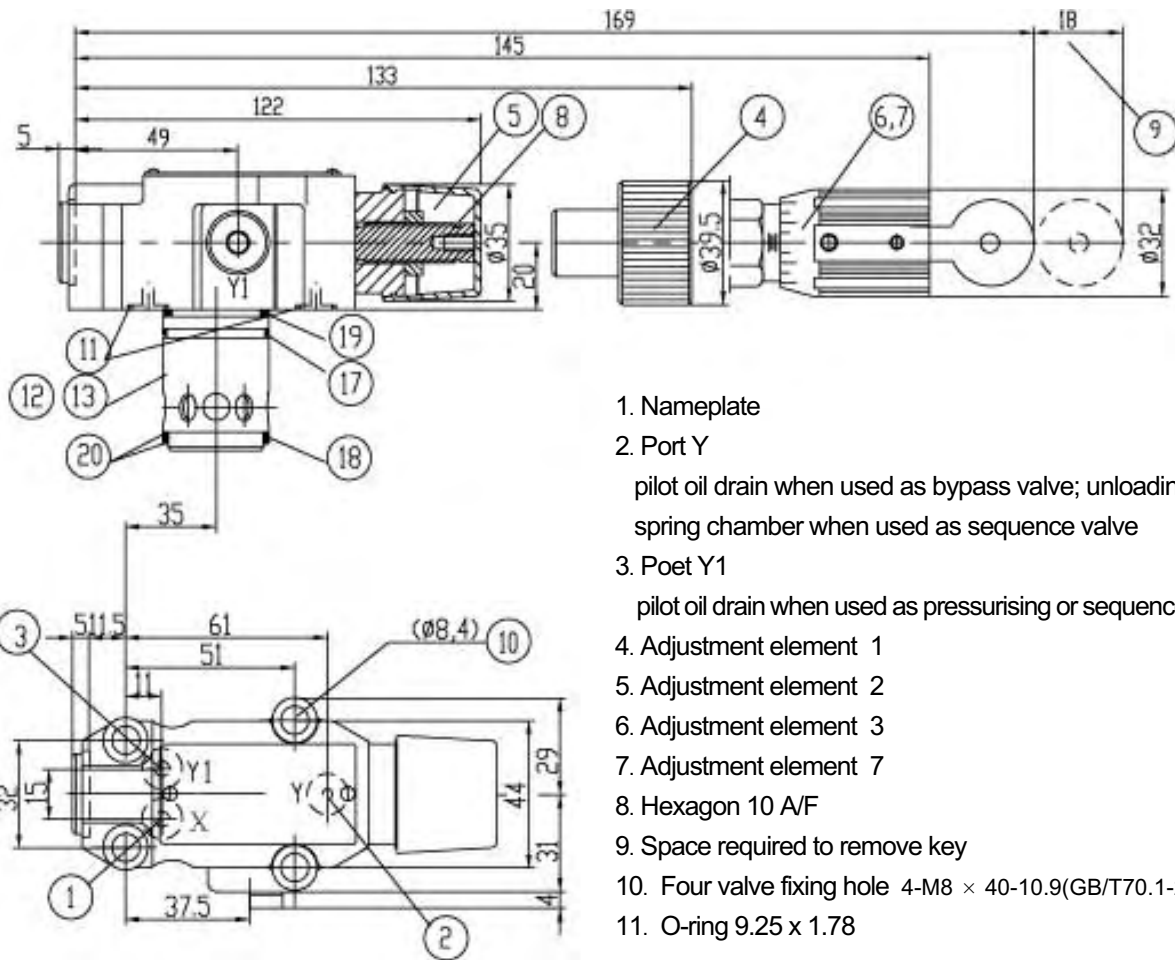
Size25: 4-M10x60-10.9
(GB/T70.1-2000); $M_A=75$ Nm

Size32: 6-M10x70-10.9
(GB/T70.1-2000); $M_A=75$ Nm

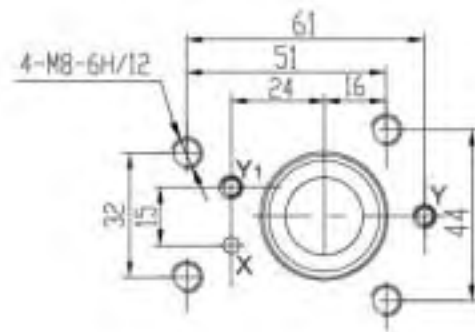
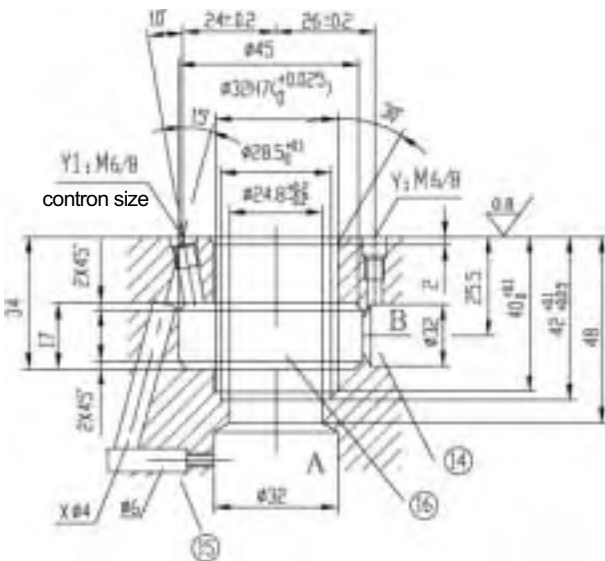
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2	B3	B4	B5	H1	H2	H3	O-rings(portA.B)	O-rings(port X.Y)
10	96	35.5	33	42.9	21.5	-	7.2	21.5	31.8	35.8	85	50	66.7	58.8	7.9	112	92	28	17.12 × 2.62	9.25 × 1.78
20	116	37.5	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	102	59.5	79.4	73	6.4	122	102	38	28.17 × 3.53	9.25 × 1.78
30	145	33	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	120	76	96.8	92.8	3.8	130	110	46	34.52 × 3.53	9.25 × 1.78

Unit dimensions: pilot operated valve

(Dimensions in mm)



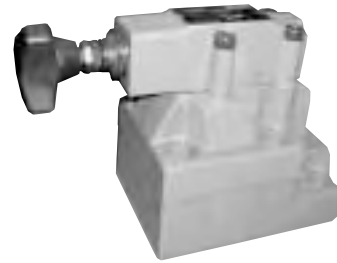
1. Nameplate
2. Port Y
pilot oil drain when used as bypass valve; unloading of spring chamber when used as sequence valve
3. Port Y1
pilot oil drain when used as pressurising or sequence valve
4. Adjustment element 1
5. Adjustment element 2
6. Adjustment element 3
7. Adjustment element 7
8. Hexagon 10 A/F
9. Space required to remove key
10. Four valve fixing hole 4-M8 × 40-10.9(GB/T70.1-2000)
11. O-ring 9.25 x 1.78
12. Main spool insert
13. Cartridge assembly includes main spool insert with jet
14. Hole $\Phi 32$ can meet hole $\Phi 45$ at any location.
Care has to be taken that connection hole X and the fixing hole are not damaged.
15. This drilling is not required when used as bypass valve
16. Back-up ring and O-ring to be inserted into this hole before fitting the main spool
17. O-ring 28.3 x 1.8
18. O-ring 27.3 x 2.4
19. O-ring 28 x 2.65
20. Retainer ring 32 x 28.4 x 0.8



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure shut-off valve, pilot operated, type DA/DAW...-30B/			RE 26410/12.2004
	Size 10, 20, 30	up to 31.5 MPa	up to 250 L/min	Replaces: RE26410/05.2001

Features:

- For subplate mounting:
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with internal hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 3 pressure ratings
- Solenoid actuated unloading via a built-in directional valve



Function, section:

Pressure control valves type DA/DAW are pilot operated pressure shut-off valves.

They are used to switch a pump flow over to unpressurised by-pass as soon as the accumulator loading pressure is reached. Further applications for the valve are in systems that have high and low pressure pumps. In this case the low pressure pump is switched to unpressurised by-pass as soon as the set high pressure is reached.

Pressure shut-off valves basically consist of the main valve with the main spool assembly, pilot valve with pressure adjustment element and check valve. In size 10 valves, the check valve is built into the main valve. In valve sizes 25 and 32 the check valve is built into a separate plate installed under the main valve.

Pressure shut-off valve type DA

Diverting pump flow from P to A or P to T.

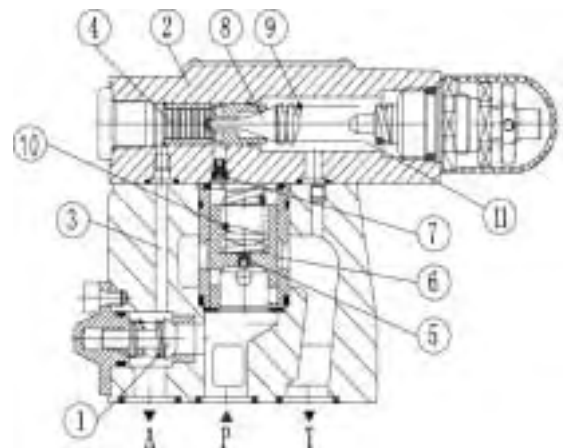
The pump delivers flow via check valve (1) into the hydraulic system (P to A). Pressure in port A acts via pilot line (3) on the pilot control spool (4). At the same time, pressure in port P passes via orifices (5) and (7) to the spring loaded side of the main spool (6) and poppet (8) in the pilot valve (2). As soon as the set cut-off pressure in the hydraulic system is reached, the poppet (8) lifts off against spring (9). Pressure fluid now flows via orifices (5) and (7) into spring chamber (11). From here, the fluid is returned to tank either internally via control line in valve type DA..30B/... or externally via control line in valve type DA..30B/..Y... Due to orifices (5) and (7), a pressure drop is now present at the main spool (6). The main spool (6) now lifts off its seat and opens the connection from P to T. The check valve (1) now closes the connection from A to P. The poppet (8) is now held open by the system pressure via pilot spool (4).

Diverting pump flow from P to T or P to A.

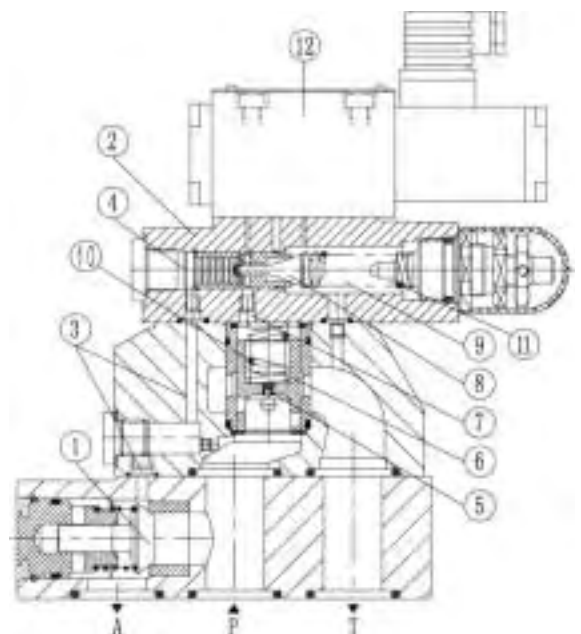
The area of the pilot spool (4) is 17% greater than effective area of the poppet(8). The effective force on the pilot spool (4) is, therefore, 17% greater than the effective force on the poppet (8). When the actuator pressure falls in relation to the cut-off pressure by a valve which corresponds to the switching pressure differential, spring (9) pushes poppet(8) on to its seat. Pressure is then built up on the spring loaded side of the main spool(6). In conjunction with spring (10), this closes the main spool(6) and isolates the connection from P to T. The pump flow passes once more via the check valve (1) into the hydraulic system(P to A).

Pressure shut-off valve type DAW

The function of this valve is principally the same as the DA valve. A solenoid actuated directional valve(12) can, however switch the set cut-off pressure which is under the pilot valve (2) either from P to T or from P to A.

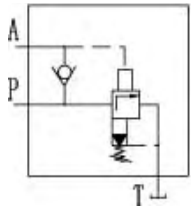


DA10...-30B/

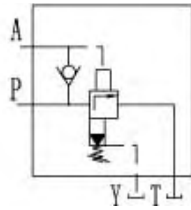


DAW20,30...-30B/

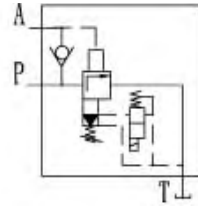
symbols



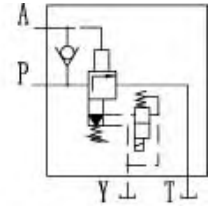
DA...-30B/...



DA...-30B/...Y...



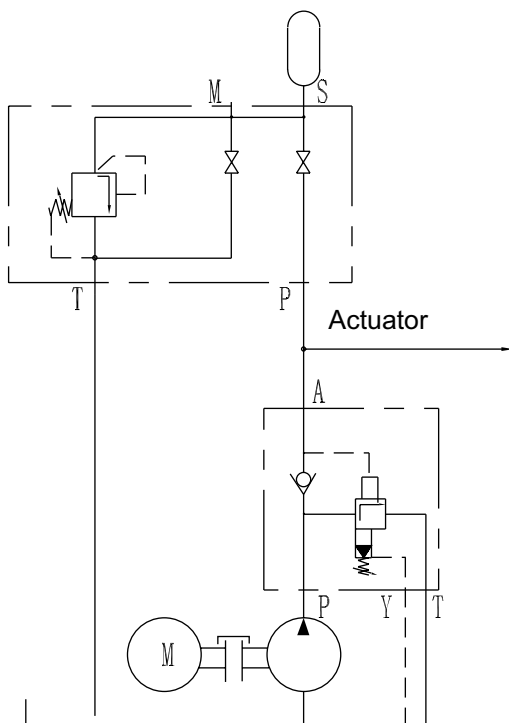
DAW...-30B/...



DAW...-30B/...Y...

Circuit examples

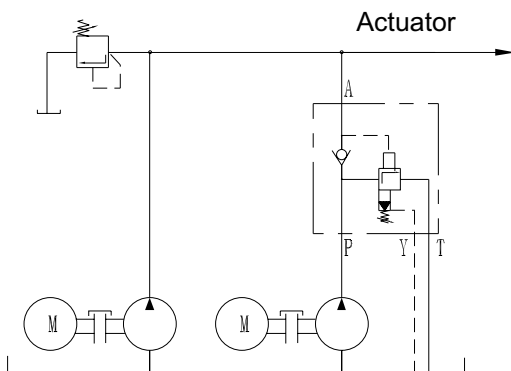
Hydraulic system with accumulator



Application guidelines:

The connection between the DA valve and the hydraulic accumulator should be as short as possible and with a low pressure drop!

Hydraulic system with high and low pressure pumps



ordering details

DA / - - 30 B / / / *

Without directional valve = No code
With built-on directional spool valve = W

Further details in clear text

Pilot operated valve (complete) = No code
Pilot operated valve without main spool assembly (do not enter nom. size) = C
Pilot operated valve with main spool assembly (enter valve size 10 or 30) = C

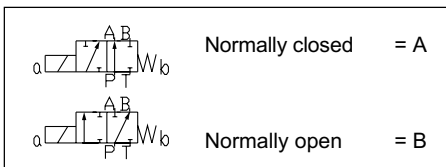
No code. = mineral oils
V = phosphate ester

No code. = port Y G1/4"
2 = port Y M14X1.5

Nominal size 10 = 10
Nominal size 25 = 20
Nominal size 32 = 30

Z4 = Plug-in connector DIN 43 650
Z5 = Large plug-in connector
Z5L = Large plug-in connector with light

No code = Without hand override
N = With hand override



W220-50 = 220V 50Hz AC
G24 = 24 V DC
W220R = DC solenoid with built-in rectifier (only with "Z5" plug)

Adjustment elements
Rotary knob = 1
Sleeve with hexagon and protective cap = 2
Lockable rotary knob with scale = 3

No code = Poilt fluid feed internal ,return internal
Y= Poilt fluid feed internal,return external

Series 30 to 39 (30 to 39: unchanged installation and connection dimensions) =30

Settable pressure range

80 = 2~8 Mpa
160 = 8~16 Mpa
315 = 16~31.5 Mpa

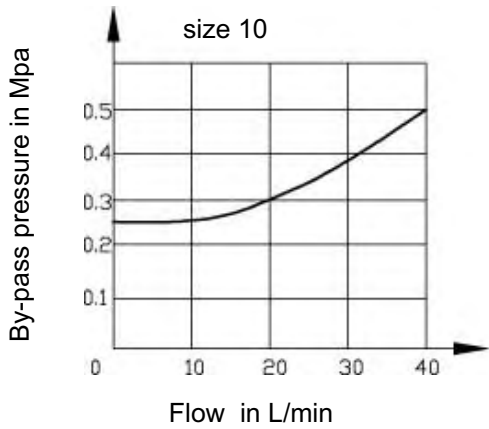
Technology of Beijing Huade Hydraulic =B

Hydraulic technical data

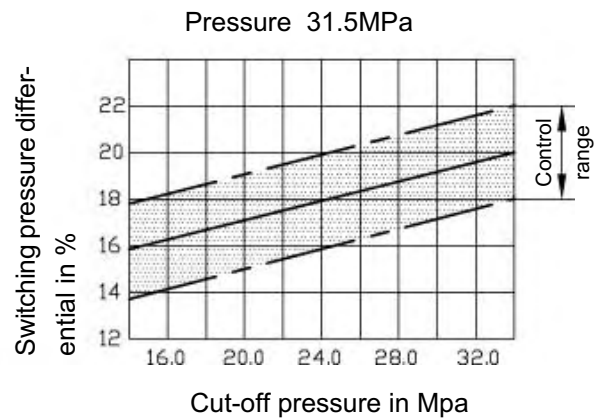
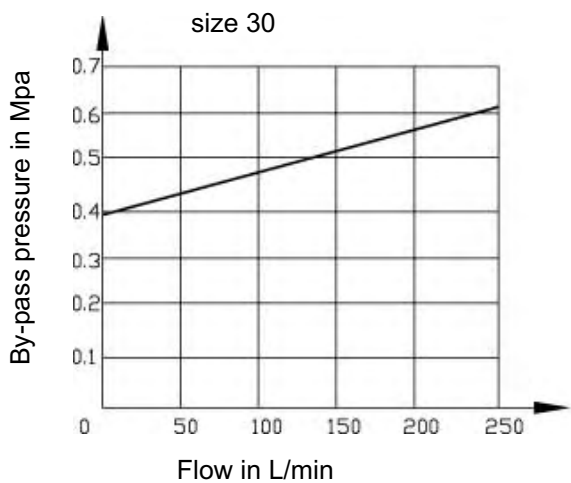
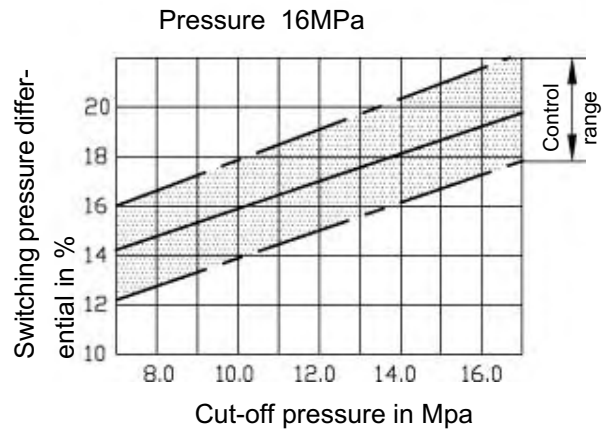
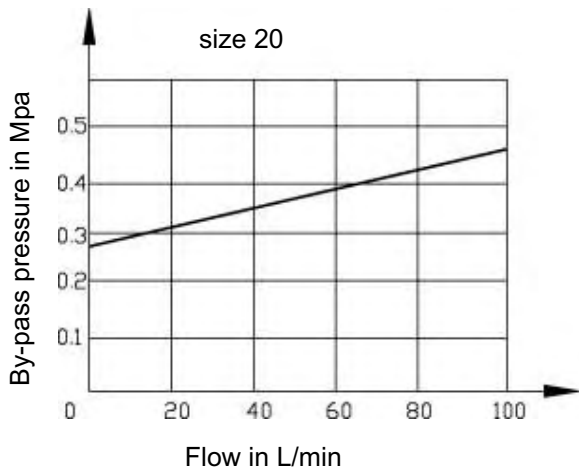
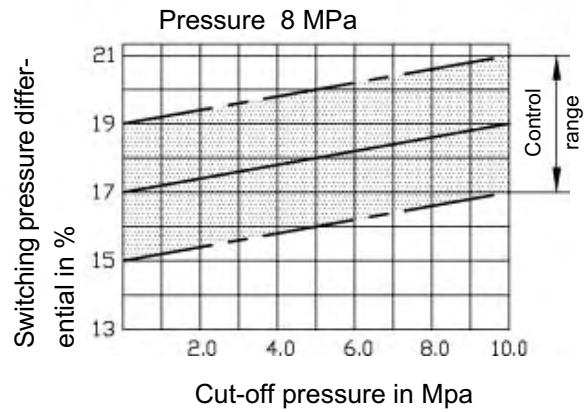
Size		10	20	30
Max. flow (L/min)		40	100	250
pressure rang		See chracteristic curse		
Operating pressure,port A (MPa)		up to 31.5		
Max.settable pressure (MPa)		up to 8、 up to 16、 up to 31.5		
Pressure fluid		Mineral oil (for NBR seal),or phosphate ester (for FPM seal)		
Viscosity range (mm ² /s)		10~800		
Pressure fluid temperature range (°C)		-30 to + 80		
Degree of contamination (µm)		Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$		
Weight (Kg)	DA	3.8	7.7	13.4
	DAW	4.9	8.8	14.5

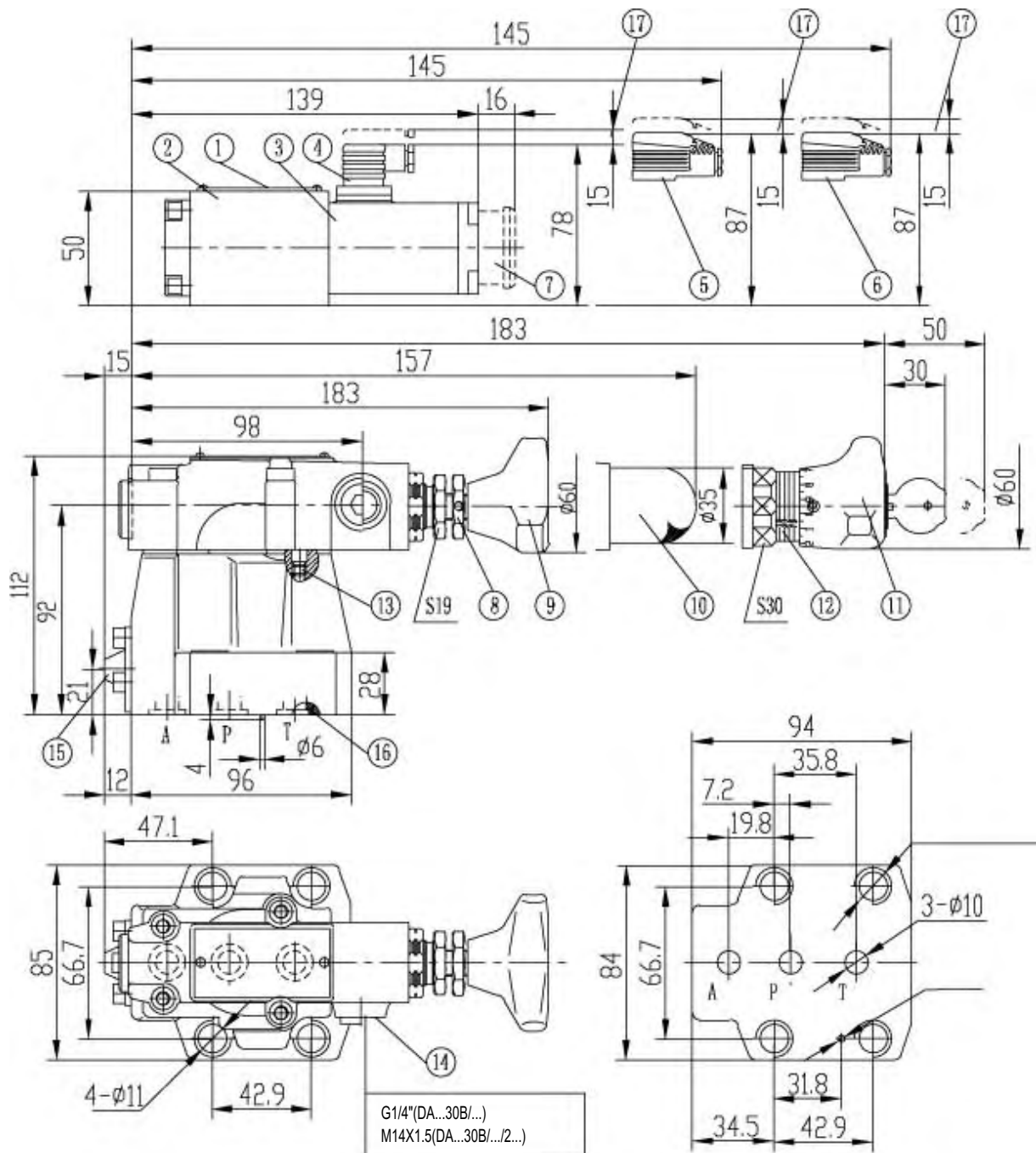
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

By-pass pressure in relation to the pump flow q_{vp} P (P → T)



Switching pressure differential in relation to the cut-off pressure (P → A)





- 1. Nameplate
- 2. Directional valves, type WE5
- 3. Solenoid
- 4. Plug-in connector Z4
- 5. Large plug-in connector Z5
- 6. Large plug-in connector with light Z5L
- 7. Hand override, optional
- 8. Locknut(only apply to up to 31.5 Mpa)
- 9. Adjustment element 1
- 10. Adjustment element 2
- 11. Adjustment element 3

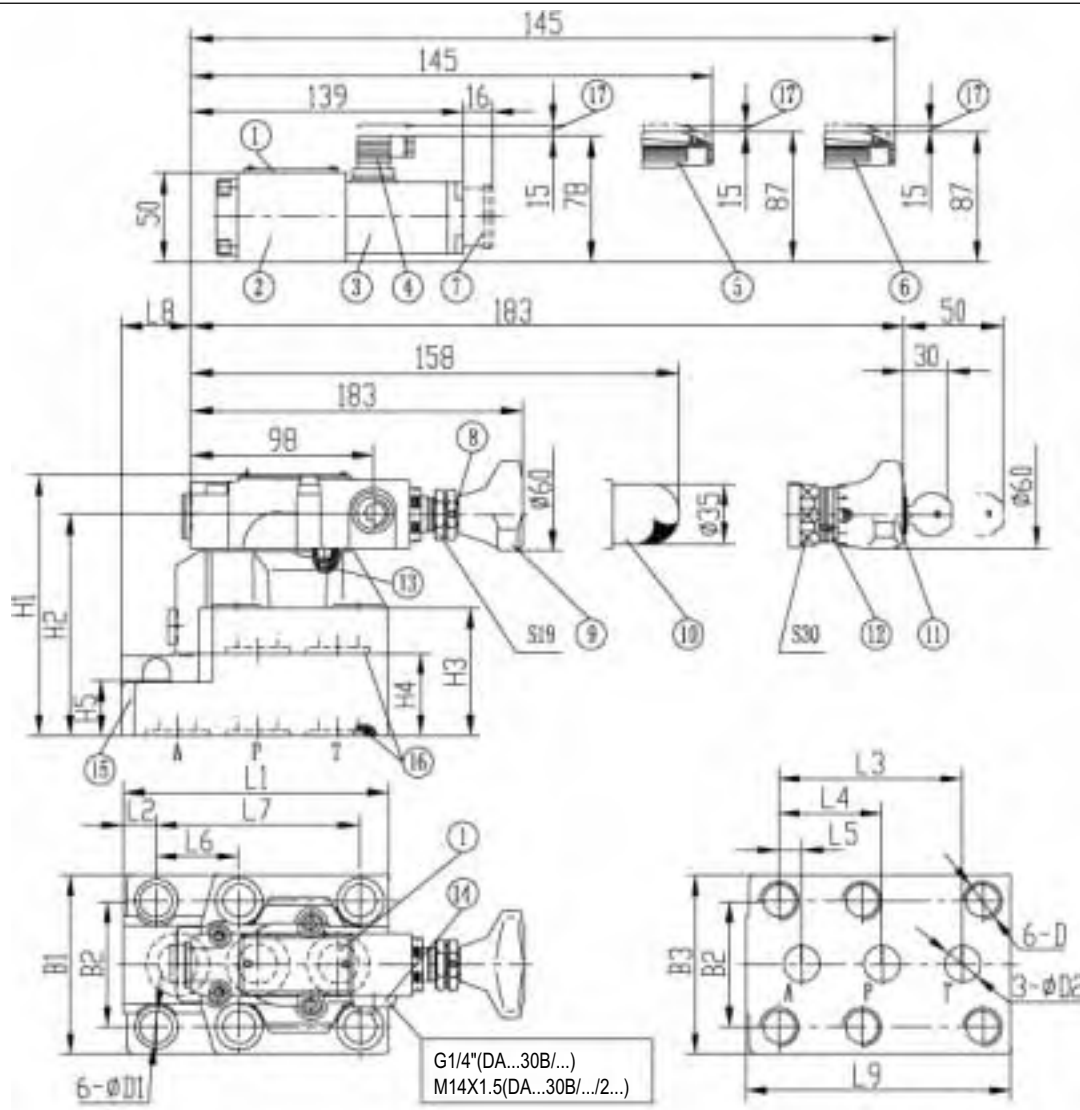
- 12. Repeat adjusting scale
- 13. Locating pin
- 14. Port Y for external pilot oil drain
- 15. Integrated check valve
- 16. O-ring 27.3X2.4
- 17. Space required to remove key fixing screw :
4-M10X50-10.9(GB/T70.1-2000)

Subplate for: see page 151

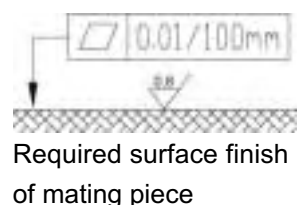
- G467/1 (G3/8") 12 (M18 × 1.5)
- G468/1 (G1/2") 12 (M22 × 1.5)



Required surface finish of mating piece



- | | | |
|---|---|-----------------|
| 1. Name plate | 13. Locating pin | 4-M16X100-10.9 |
| 2. Directional valves, type WE6 | 14. Port Y for external pilot oil drain | 2-M16X60-10.9 |
| 3. Solenoid | 15. Integrated check valve | (GB/T70.1-2000) |
| 4. Plug-in connector Z4 | 16. O-ring 27.3X2.4 | 4-M18X120-10.9 |
| 5. Large plug-in connector Z5 | DA/DAW20...30B/...:28.17X3.53 | |
| 6. Large plug-in connector with light Z5L | DA/DAW30...30B/...:34.52X3.53 | |
| 7. Hand override, optional | 17. Space required to remove key | |
| 8. Lock nut(only apply to up to 31.5MPa) | | |
| 9. Adjustment element 1 | DA/DAW20 DA/DAW30 | |
| 10. Adjustment element 2 | | |
| 11. Adjustment element 3 | | |
| 12. Repeat adjusting scale | | |



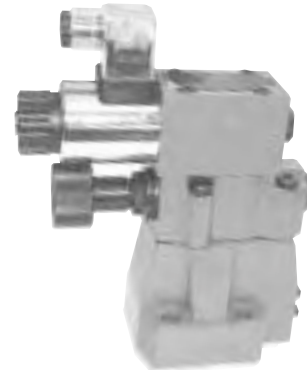
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2
20	154	25	101.6	57.1	12.7	46	112.7	49	156	101	69.9
30	199	42	127	63.5	12.7	50.8	139.7	73	229	116	82.5
Size	B3	H1	H2	H3	H4	H5	ΦD1	ΦD2	D		
20	103	144	124	72	46	28	18	25	M16 depth 34		
30	118.5	165	145	93	67	45	20	32	M18 depth 37		

	DA/DAW20	DA/DAW30
Fixing screw	4-M16X100-10.9	4-M18X120-10.9
	2-M16X60-10.9 (GB/T70.1-2000)	2-M18X80-10.9 (GB/T70.1-2000)
Subplate for see page 142	G469/1 (G3/4")	G471/1 (G11/4")
	G469/02 (M27 × 2)	G471/02 (M42 × 2)
	G470/1 (G1")	G472/1 (G11/2")
	G470/02 (M33 × 2)	G472/02 (M48 × 2)

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure shut-off valve pilot operated, type DA/DAW...50B/(New Series)			RE 26420/12.2004
	Size 10, 20, 30	up to 31.5 MPa	up to 240 L/min	Replaces: RE26420/05.2001

Features:

- For subplate mounting:
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with internal hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 4 pressure ratings, optional
- Solenoid actuated unloading via a built-on directional valve



Function, section

Pressure control valves type DA/DAW are pilot operated pressure shut-off valves. They are used to switch a pump flow over to unpressurised by-pass as soon as the accumulator loading pressure is reached. Further applications for the valve are in systems that have high and low pressure pumps. In this case the low pressure pump is switched to unpressurised by-pass as soon as the set high pressure is reached. Pressure shut-off valves basically consist of the main valve with the main spool assembly, pilot valve with pressure adjustment element and check valve. In size 10 valves, the check valve is built into the main valve. In valve sizes 25 and 32 the check valve is built into a separate plate installed under the main valve.

Pressure shut-off valve type DA

Diverting pump flow from P to A or P to T.

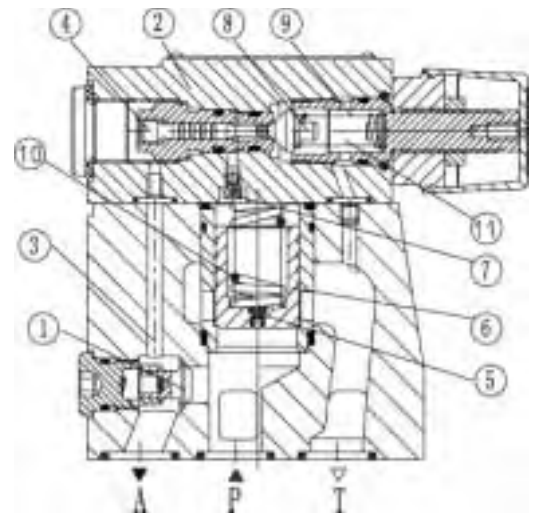
The pump delivers flow via check valve (1) into the hydraulic system (P to A). Pressure in port A acts via pilot line (3) on the pilot control spool (4). At the same time, pressure in port P passes via orifices (5) and (7) to the spring loaded side of the main spool (6) ball poppet (8) in the pilot valve (2). As soon as the set cut-off pressure in the hydraulic system is reached, the poppet (8) lifts off against spring (9). Pressure fluid now flows via orifices (5) and (7) into spring chamber (11). From here, the fluid is returned to tank either internally via control line in valve type DA..50B/... or externally via control line in valve type DA..50B/..Y... Due to orifices (5) and (7), a pressure drop is now present at the main spool (6). The main spool (6) now lifts off its seat and opens the connection from P to T. The check valve (1) now closes the connection from A to P. The ball (8) is now held open by the system pressure via pilot spool (4).

Diverting pump flow from P to T or P to A.

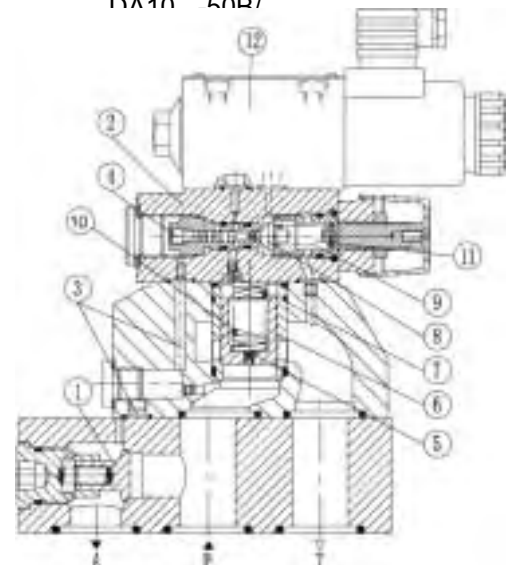
The area of the pilot spool (4) is 10% or optionally 17% greater than effective area of the ball (8). The effective force on the pilot spool (4) is, therefore, 10 or 17% greater than the effective force on the ball (8). When the actuator pressure falls in relation to the cut-off pressure by a valve which corresponds to the switching pressure differential, spring (9) pushes ball (8) on to its seat. Pressure is then built up on the spring loaded side of the main spool (6). In conjunction with spring (10), this closes the main spool (6) and isolates the connection from P to T. The pump flow passes once more via the check valve (1) into the hydraulic system (P to A).

Pressure shut-off valve type DAW

The function of this valve is basically the same as the DA valve. A solenoid actuated directional valve (12) can, however switch the set cut-off pressure which is under the pilot valve (2) either from P to T or from P to A.

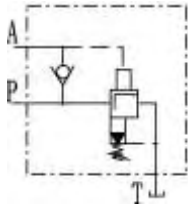


DA10 50B/

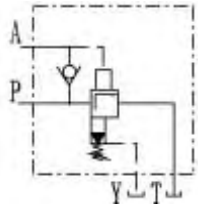


DAW20,30...-50B/

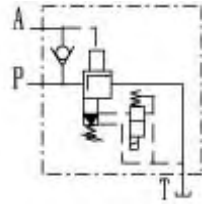
symbol



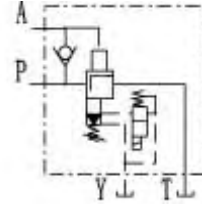
DA...-50B/...



DA...-50B/...Y...



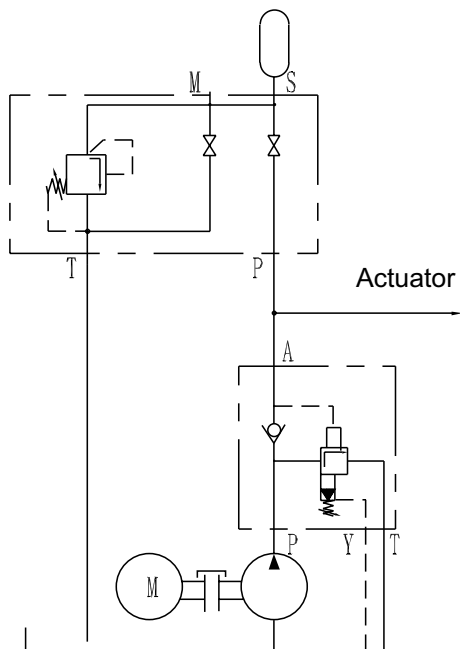
DAW...-50B/...



DAW...-50B/...Y...

Circuit examples

Hydraulic system with accumulator

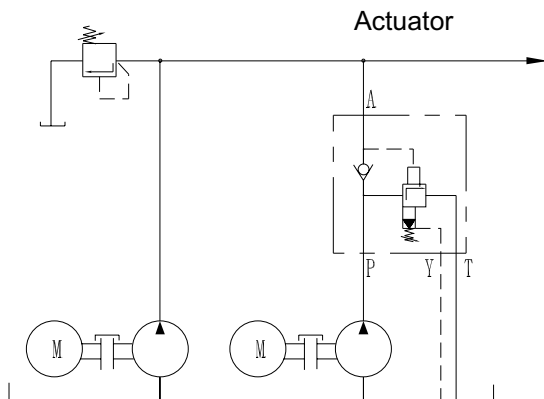


Application guidelines:

The connection between the DA valve and the hydraulic accumulator should be as short as possible and with a low pressure drop!

With high pump flows as well as small switching differentials (10%) then preferably the "Y" version should be used.

Hydraulic system with high and low pressure pumps



Ordering details

DA - - 50 B / / *

Without directional valve = No code
With built-on directional spool valve = W

Further details in clear text

Pilot operated valve (complete) = No code
Pilot operated valve without main spool assembly (do not enter nom. size) = C
Pilot operated valve with main spool assembly (enter valve size 10 or 30) = C

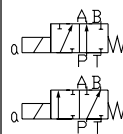
No code. = mineral oils
V = phosphate ester

No code. = Metric
2 = British

Nominal size 10 = 10
Nominal size 25 = 20
Nominal size 32 = 30

Z4 = Plug-in connector
Z5 = Large plug-in connector
Z5L = Large plug-in connector with light

No code = Without hand override
N = With hand override



Normally closed = A
Normally open = B

W220-50 = 220V 50Hz AC
G24 = 24 V DC
W220R = DC solenoid with built-in rectifier (only with "Z5" plug)

Adjustment elements
Rotary knob = 1
Sleeve with hexagon and protective cap = 2
Lockable rotary knob with scale = 3

No code = Without directional valve
6B = With directional valve

Series 50 to 59 (50 to 59: unchanged installation and connection dimensions) = 50

No code = Poilt fluid feed internal ,return internal
Y = Poilt fluid feed internal,return external

Technology of Beijing Huade Hydraulic = B

Switching pressure differential (P → A)

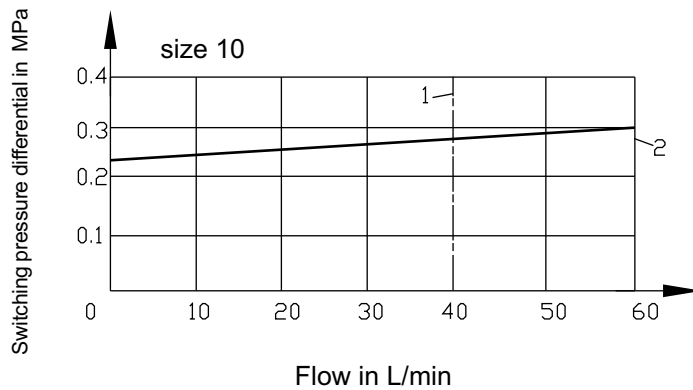
Settable pressure range
0 to 5 MPa = 50
5 to 10 MPa = 100
10 to 20 MPa = 200
20 to 31.5 MPa = 315

10 = In the mid range 10
17 = In the mid range 17

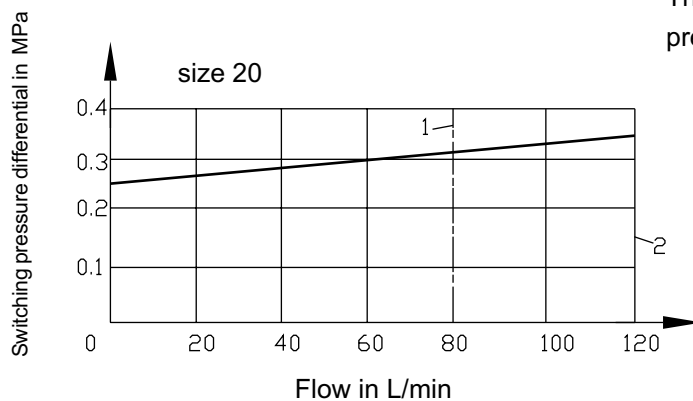
Hydraulic technical data				
Size		10	20	30
Max. flow L/min	10%	40	80	120
	17%	60	120	240
Pressure range	10%	See characteristic curve		
	17%			
Operating pressure, port A (MPa)	up to 31.5			
Max. settable pressure (MPa)	up to 5, up to 10, up to 20, up to 31.5			
Pressure fluid	Mineral oil (for NBR seal), or phosphate ester (for FPM seal)			
Viscosity range (mm ² /s)	10~800			
Pressure fluid temperature range (°C)	-30 to + 80			
Weight (Kg)	DA	2.6	6.6	12.3
	DAW	3.8	7.8	13.5
	DAC	1.2(DAWC add to 1.2Kg)		
	DAC30	1.5(DAWC30 add to 1.2Kg)		
Direction valve characteristic	see WE6			

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

By-pass pressure in relation to the pump flow $q_v P$ (P - T)



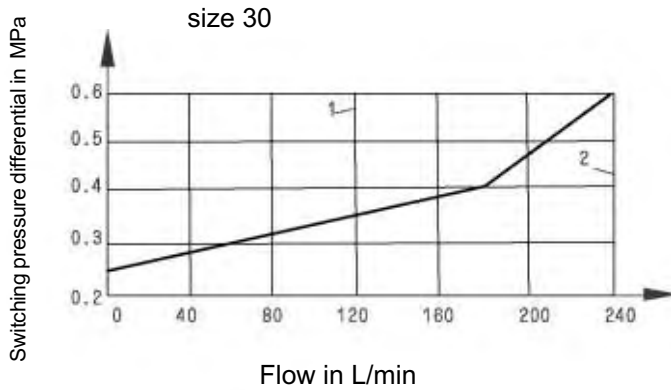
1 $q_{v \max}$ for 10% version
 2 $q_{v \max}$ for 17% version



These characteristic curves are valid for an outlet pressure (T) = zero over the entire flow range.

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

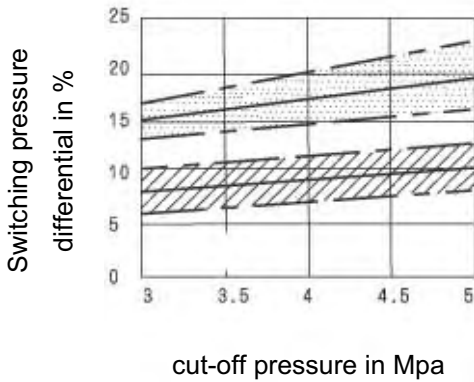
By-pass pressure in relation to the pump flow q_v P (P → T)



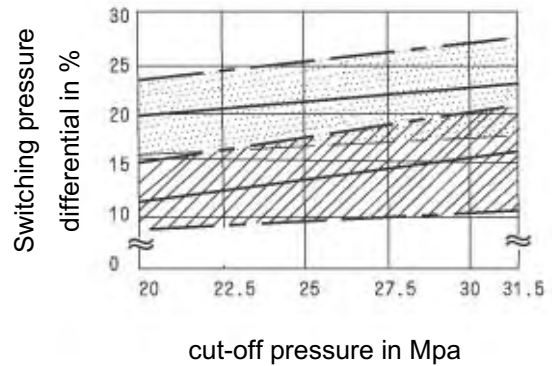
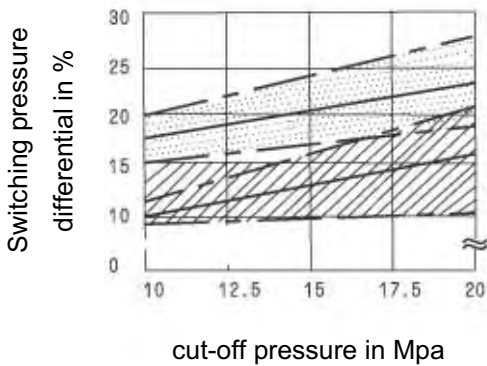
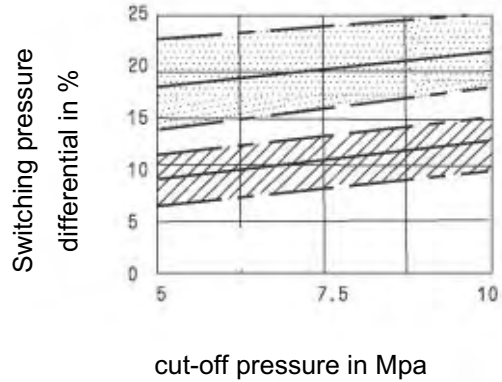
- 1 $q_{v \max}$ for 10% version
- 2 $q_{v \max}$ for 17% version

These characteristic curves are valid for an outlet pressure (T) = zero over the entire flow range.

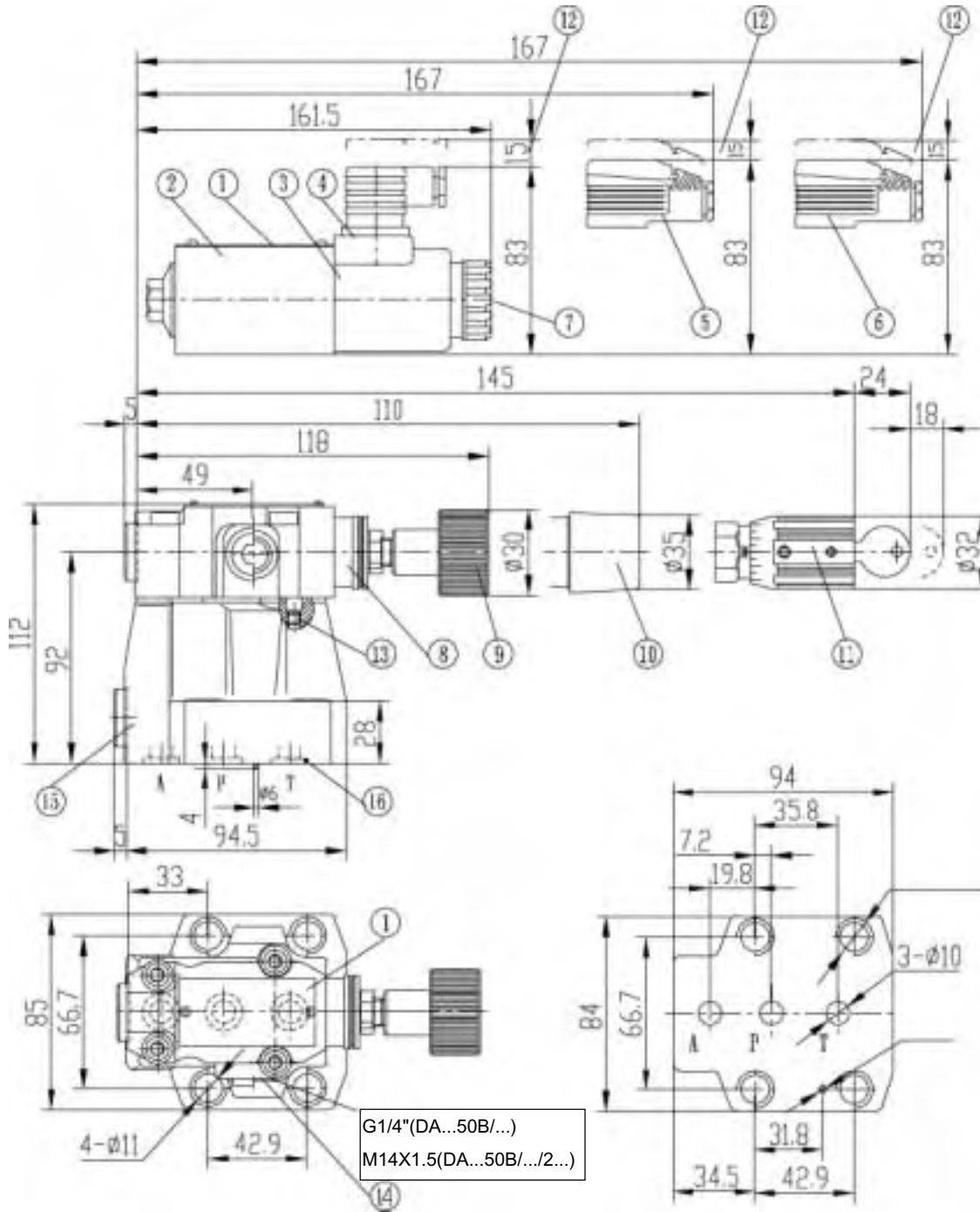
Switching pressure differential in relation to the cut-off pressure (P → A)



16MPa pressure range

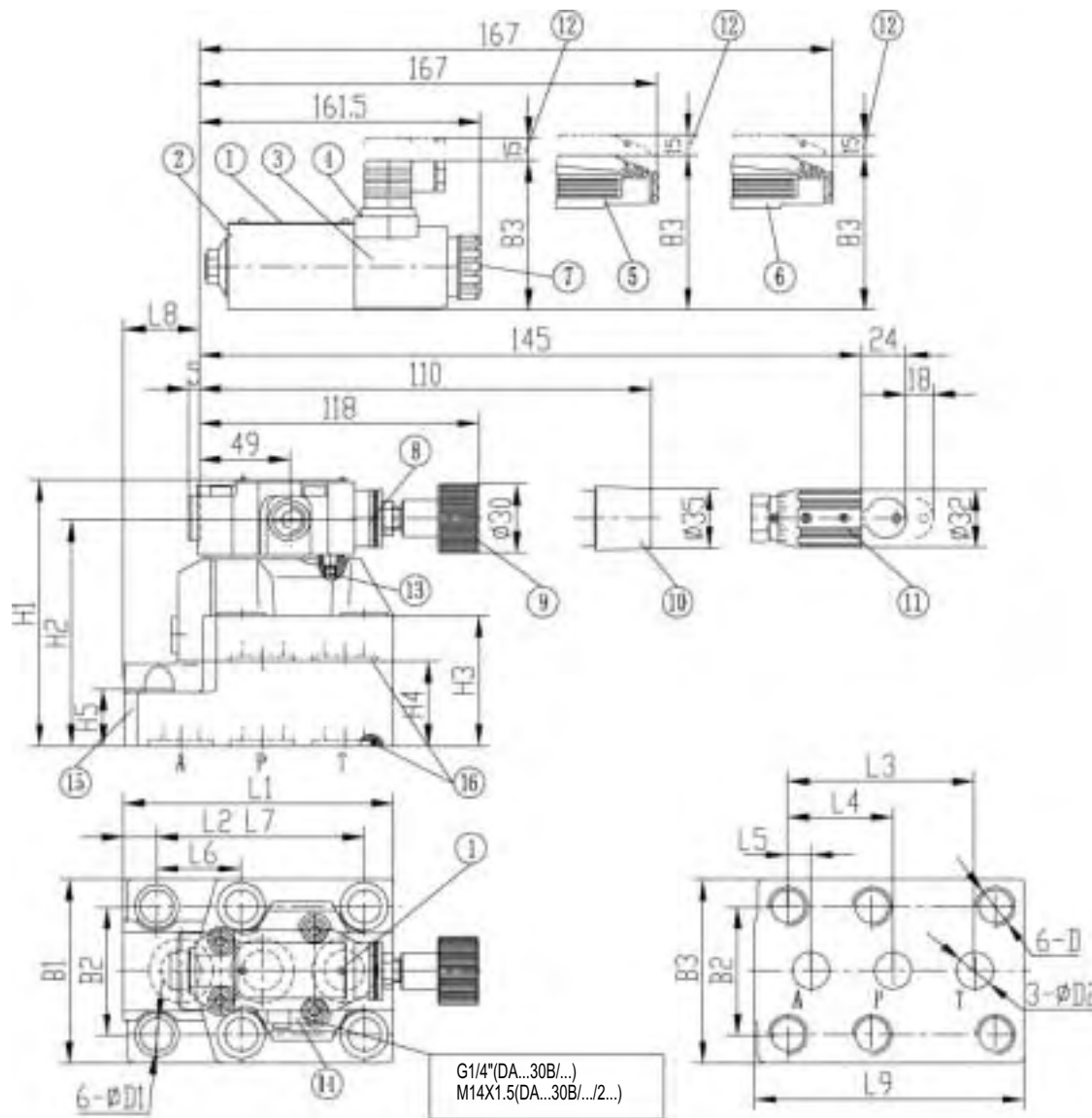


- =Deviation range for the 17% version
- =Deviation range for the 10% version

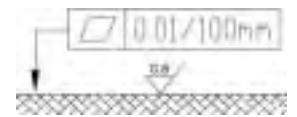


Required surface finish of mating piece

- | | | |
|--|--|---|
| 1.Nameplate | 9.Adjustment element 1 | Fixing screw :
4-M10X50-10.9 (GB/T70.1-2000) |
| 2.Directional valves, type WE6 | 10.Adjustment element 2 | |
| 3.Solenoid | 11.Adjustment element 3 | Subplates: see page151 |
| 4.Plug-in connector Z4 | 12.Space required to remove key | G467/1 (G3/8") |
| 5.Large plug-in connector Z5 | 13.Locating pin | G468/1 (G1/2") |
| 6.Large plug-in connector with light Z5L | 14.Port Y for external pilot oil drain | |
| 7.Hand override, optional | 15.Integrated check valve | |
| 8.Lock nut(only apply to up to 31.5 Mpa) | 16.O-ring 17.12X2.62 | |



- | | |
|---|---|
| 1. Nameplate | 11. Adjustment element 3 |
| 2. Directional valves, type WE6 | 12. Space required to remove key |
| 3. Solenoid | 13. Locating pin |
| 4. Plug-in connector Z4 | 14. Port Y for external pilot oil drain |
| 5. Large plug-in connector Z5 | 15. Integrated check valve |
| 6. Large plug-in connector with light Z5L | 16. O-ring 27.3X2.4 |
| 7. Hand override, optional | DA/DAW20...50B/...:28.17X3.53 |
| 8. Lock nut | DA/DAW30...50B/...:34.52X3.53 |
| 9. Adjustment element 1 | 17. Space required to remove key |
| 10. Adjustment element 2 | |



Required surface finish of mating piece

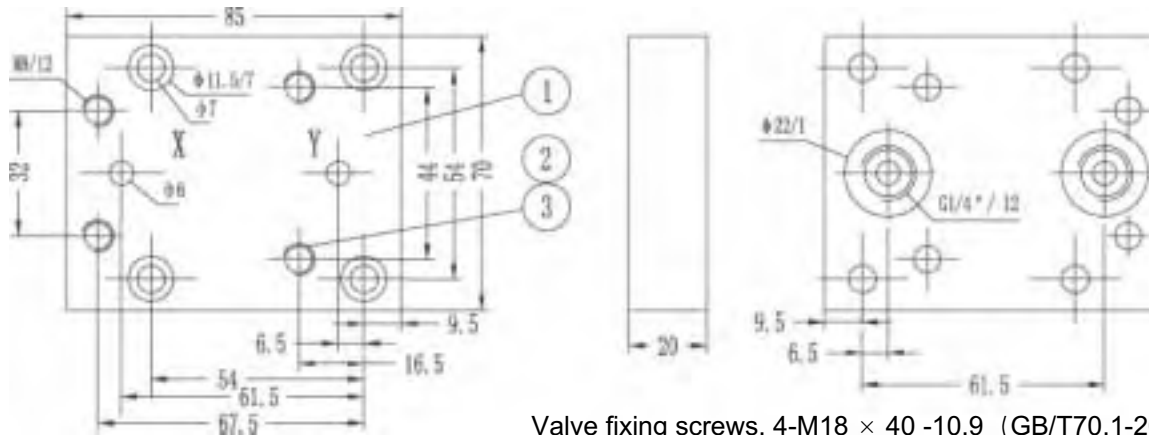
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2
20	154	25	101.6	57.1	12.7	46	112.7	48.2	156	101	69.9
30	199	42	127	63.5	12.7	50.8	139.7	69.8	229	118.5	82.5
Size	B3	H1	H2	H3	H4	H5	ΦD1	ΦD2		D	
20	103	144	124	72	46	28	18	25	M16 depth 34		
30	118.5	165	145	93	67	45	20	32	M18 depth 37		

	DA/DAW20	DA/DAW30
Fixing screw	4-M16X100-10.9	4-M18X120-10.9
	2-M16X60-10.9 (GB/T70.1-2000)	2-M18X80-10.9 (GB/T70.1-2000)
Subplate for see page 151	G469/1 (G3/4) G470/1 (G1")	G471/1 (G11/4") G472/1 (G11/2")

Subplates

G51/01 (G1/4 ") G51/02 (M14 × 1.5) Weight: 1kg

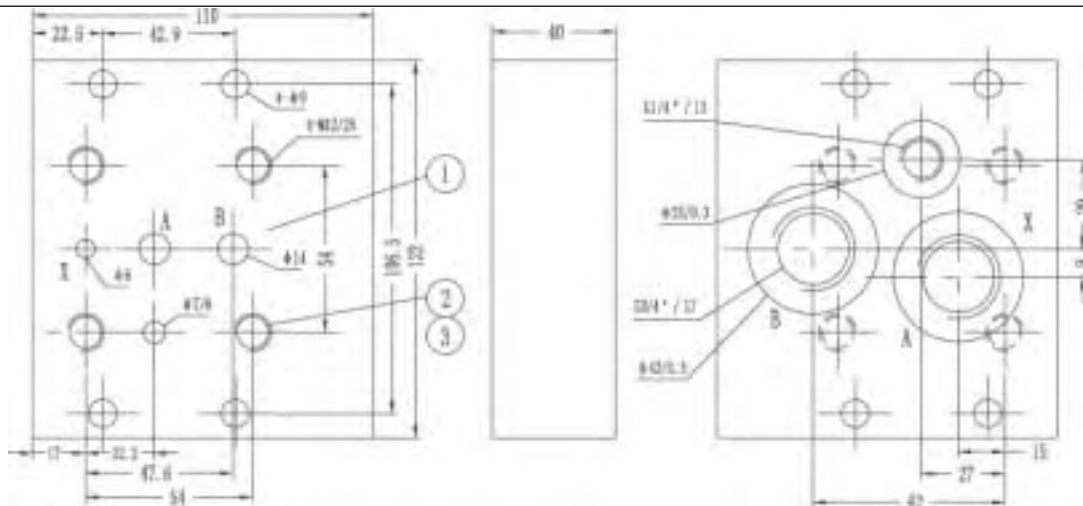
(Dimensions in mm)



Valve fixing screws, 4-M18 × 40 -10.9 (GB/T70.1-2000)

G565/01 (G3/4 ") G565/02 (M27 × 2) Weight: 1kg

(Dimensions in mm)

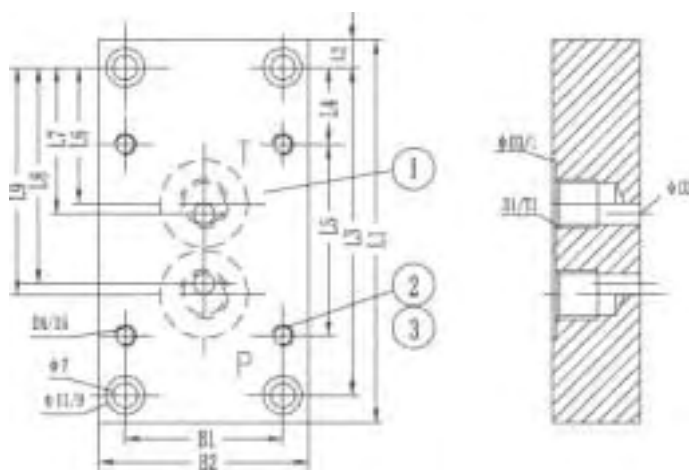


Valve fixing screws, 4-M18 × 40 -10.9 (GB/T70.1-2000)

G300/01(G1/4 ") G302/01(G1/2 ") G304/01(G1 ") G306/01(G1 1/2 ")

(Dimensions in mm)

G300/02(M14 × 1.5) G302/02(M22 × 1.5) G304/02(M33 × 2) G306/02(M48 × 2)

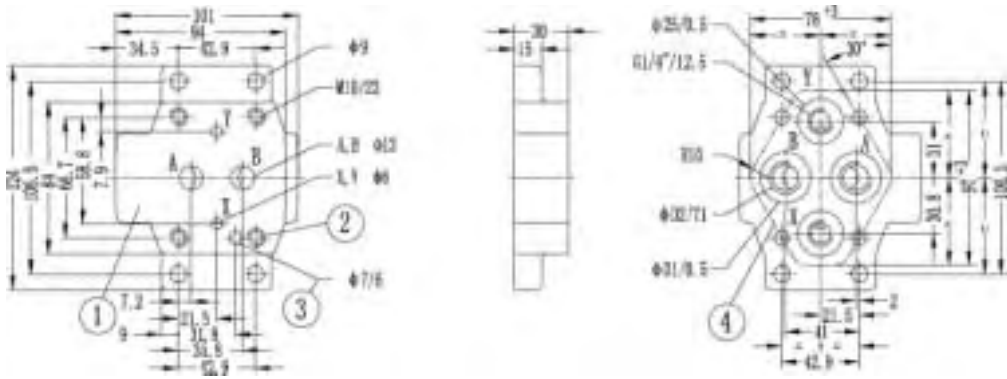


Valve fixing screws		Weight
NG6:M6 × 50	GB70	1.5
NG10:M8 × 70	-85	2.5
NG20:M8 × 90	-10.9	2.5
NG30:M10 × 110		5

- ① mating piece of valve
- ② Valve fixing pin
- ③ Valve fixing screws

Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2	ϕ D2	ϕ D3	D4	T1	S	D1
6	110	8	94	22	55	39	42	62	65	45	60	6	25	M6	15	25	1/4"(M14 × 1.5)
10	135	10	115	27.5	70	40.5	48.5	72.5	80.5	60	80	10	34	M8	16	25	1/2"(M22 × 1.5)
20	170	15	140	20	100	42	55	86	97	70	100	20	47	M8	20	40	1"(M33 × 2)
30	190	12.5	165	17.5	130	42	62.5	112.5	123	100	130	30	61	M10	24	40	1 1/2"(M48 × 2)

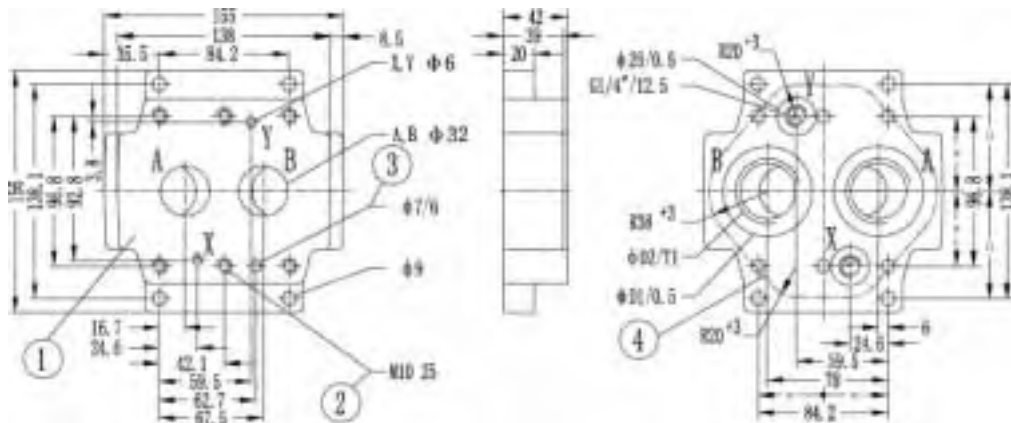
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC10	G460/01	28	G3/8"	13	4-M10 × 40 -10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02		M18 × 1.5				
	G461/01	34	G1/2"	16			
	G461/02		M22 × 1.5				



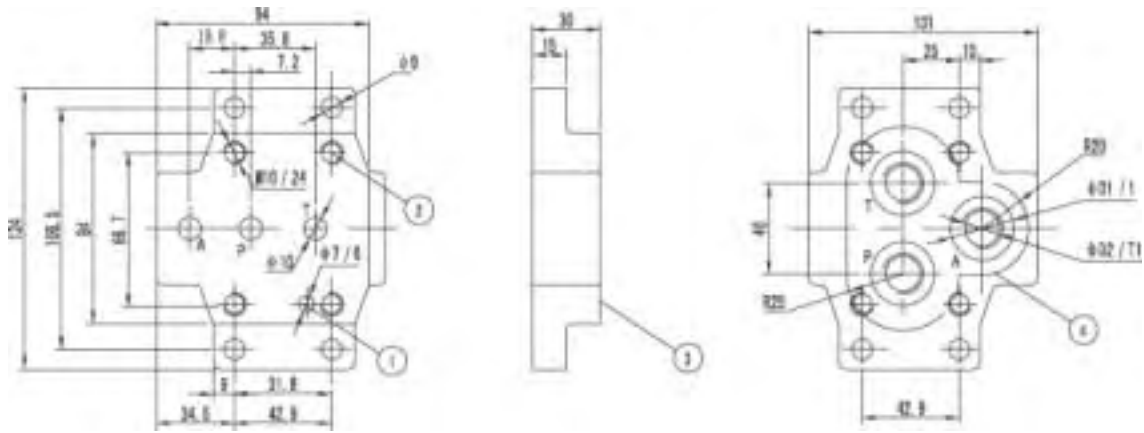
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC25	G412/01	42	G3/4"	17	4-M10 × 50 -10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02		M27 × 2				
	G413/01	47	G1"	20			
	G413/02		M33 × 2				



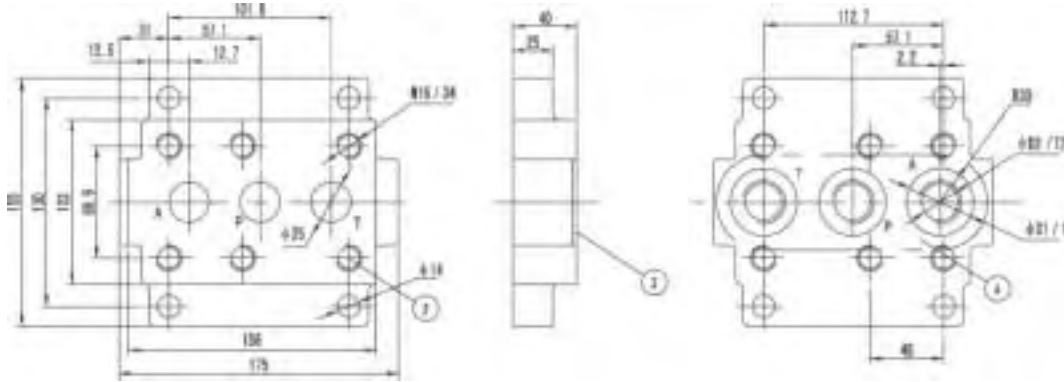
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC32	G414/01	56	G1 1/4"	20.5	6-M10 × 60-10.9 (GB/T70.1-2000)	69Nm	5kg
	G414/02		M42 × 2				
	G415/01	61	G1 1/2"	22.5			
	G415/02		M48 × 2				

1 mating piee of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

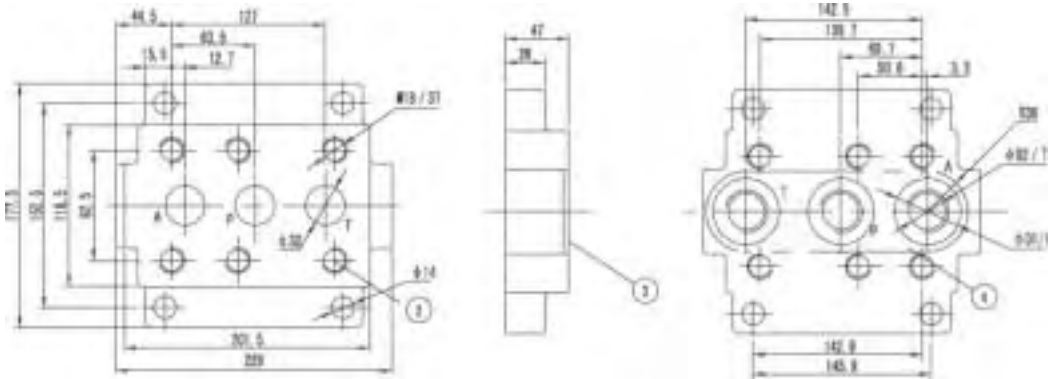
Subplates



Size	Type	Weight	D1	D2	T1	Valve fixing screws	Tightening torque
NC10	G467/01	1.7kg	G3/8"	28	12	4-M10 × 80-10.9 (GB/T70.1-2000)	
	G467/02		M18 × 1.5				
	G488/01		G1/2"	34	14		
	G488/02		M22 × 1.5				



Size	Type	Weight	D1	D2	T1	Valve fixing screws	Tightening torque
NC20	G469/01	5.2kg	G3/4"	42	16	4-M16 × 100-10.9 (GB/T70.1-2000) 4-M16 × 60-10.9 (GB/T70.1-2000)	
	G469/02		M27 × 2				
	G470/01		G1"	47	18		
	G470/02		M33 × 2				



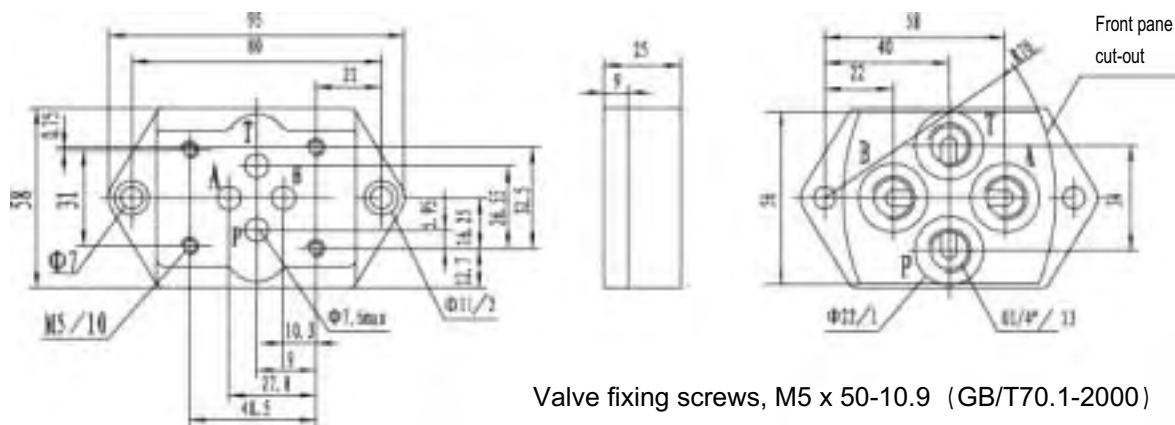
Size	Type	Weight	D1	D2	T1	Valve fixing screws	Tightening torque
NC32	G471/01	8.2kg	G1 1/4"	42	16	4-M18 × 120-10.9 (GB/T70.1-2000) 4-M18 × 80-10.9 (GB/T70.1-2000)	
	G471/02		M42 × 2				
	G472/01		G1 1/2"	47	18		
	G472/02		M48 × 2				

1, locating pin 2, Valve fixing screws 3, mating piece of valve 4, Front panel cut-out

Subplates

G341/01 (G1/4") G341/02 (M14x1.5) Weight ≈ 1kg

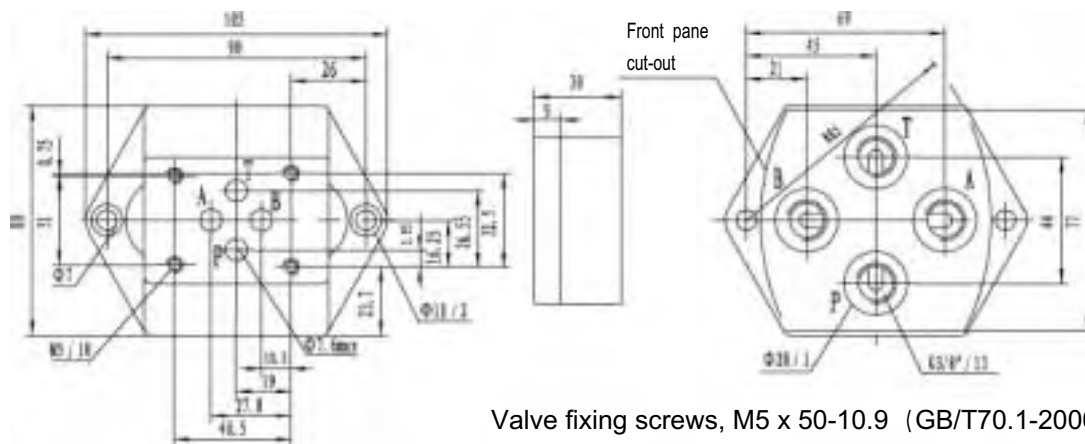
(Dimensions in mm)



Valve fixing screws, M5 x 50-10.9 (GB/T70.1-2000)
 $M_A = 9 \text{ Nm}$

G342/01 (G3/8") G342/02 (M18x1.5) Weight ≈ 1kg

(Dimensions in mm)



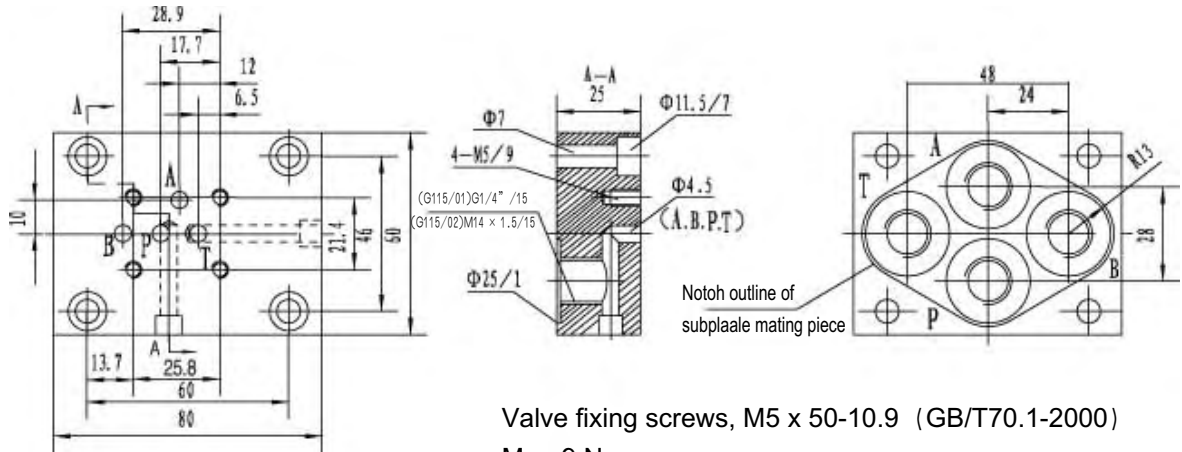
Valve fixing screws, M5 x 50-10.9 (GB/T70.1-2000)
 $M_A = 9 \text{ Nm}$

Subplates

For applications outside these parameters, please consult us!

G115/01 (G1/4") G115/02 (M14x1.5)

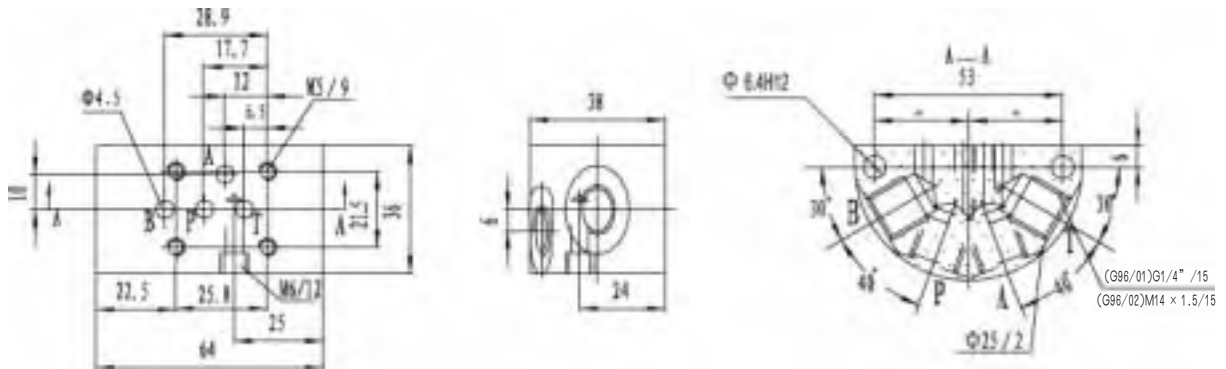
(Dimensions in mm)



Valve fixing screws, M5 x 50-10.9 (GB/T70.1-2000)
 $M_A = 9 \text{ Nm}$

G96/01 (G1/4") G96/02 (M14x1.5)

(Dimensions in mm)



Valve fixing screws, M5 x 50-10.9 (GB/T70.1-2000)
 $M_A = 9 \text{ Nm}$

Hydraulic Valves

Catalogue

Flow Control Accessores

Directional Valves

Pressure Valves

Proportional Valves

2-way Cartridge Valves



Huade



CONTENTS

Flow Control Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	Throttle and throttle check valve	MG/MK	6~30	31.5	1
2	Double throttle/check valve	Z2FS	6、16、22	31.5	3
	Double throttle/check valve	Z2FS	10	31.5	9
	* Double throttle/check valve(New Series)	Z2FS6...- 40B/...	6	31.5	13
	* Double throttle/check valve(New Series)	Z2FS10... - 30B/...	10	31.5	19
3	Throttle/Isolating and Throttle/Check Valves	DV/DRV	6~40	35	27
4	2-way flow control valve	2FRM	5	21	33
	2-way flow control valve	2FRM	6	31.5	37
	2-way flow control valve	2FRM	10,16	31.5	43
5	Check-Q-meter	FD	12, 16, 25, 32	31.5	49

Accessories

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	Pressure gauge - Isolator valve	AF6E...30B/	6	21.5	57
2	Multi-Circuit Gauge Isolator	MS2A	2	31.5	59
3	Piston Type Pressure Switch	HED1	-	50	61
	Piston Type Pressure Switch	HED4	-	35	65
4	Subplates	-	-	-	68

~*~: New products, for ordering, please consult us, telephone: +86-10-69083290



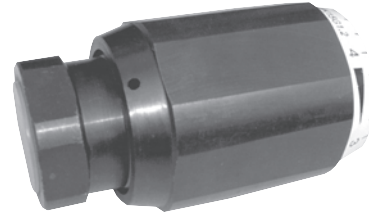
Other Huade Hydraulics Catalogues for Valves

- Directional Valves
- Pressure Valves
- Proportional Valves
- Cartridge Valves

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Throttle and throttle check valve type MG/MK			RE:27219/12.2004
	Sizes 6 to 30	up to 31.5MPa	up to 400 L/min	Replaces: RE27219/5.2001

Features:

- Suitable for direct in-line mounting
- Pressure and viscosity dependent



Functional description

Functional description

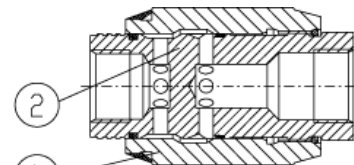
Valve types MG and Mk are pressure and viscosity dependent throttle and throttle check valves.

Type MG (throttle valve)

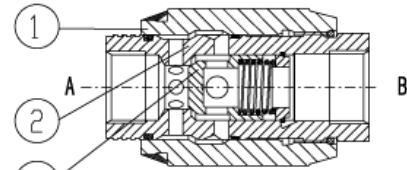
This valve throttles in both flow directions. Fluid flows through side drillings to the throttling point. This is formed between the housing (2) and the adjustable sleeve (1). The throttle cross-section may be steplessly varied by rotating the adjustable sleeve (1).

Type MK (throttle check valve)

With flow passing through the valve in throttling direction, the spring and the fluid presses the poppet onto its seat, thus blocking the flow. Fluid flows via the side drillings to the throttling point, which is formed between the housing (2) and the adjustable sleeve (1). In the opposite direction, fluid pressure acts on the face of the poppet, thus lifting it from its seat and allowing fluid to flow freely, unthrottled, through the valve. At the same time, part of the fluid flowing through the annular clearance produces the desired self-cleaning effect.

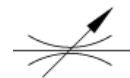


Type MK

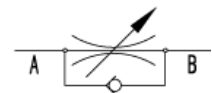


Type MK

Symbols



Type MG



Type Mk

Ordering details

			G	1.2	B	/		*
--	--	--	---	-----	---	---	--	---

Throttle valve = MG
Throttle check valve = MK

Size	
Nominal size 6	= 6
Nominal size 8	= 8
Nominal size 10	= 10
Nominal size 15	= 15
Nominal size 20	= 20
Nominal size 25	= 25
Nominal size 30	= 30

Further details in clear text

No code= Mineral oil
V= Phosphate ester

No code= British
2 = Metric

B = Technology of Beijing Huade Hydraulic

1.2= Series 1.2
(1.0 to 1.9: unchanged installation and connection dimensions)

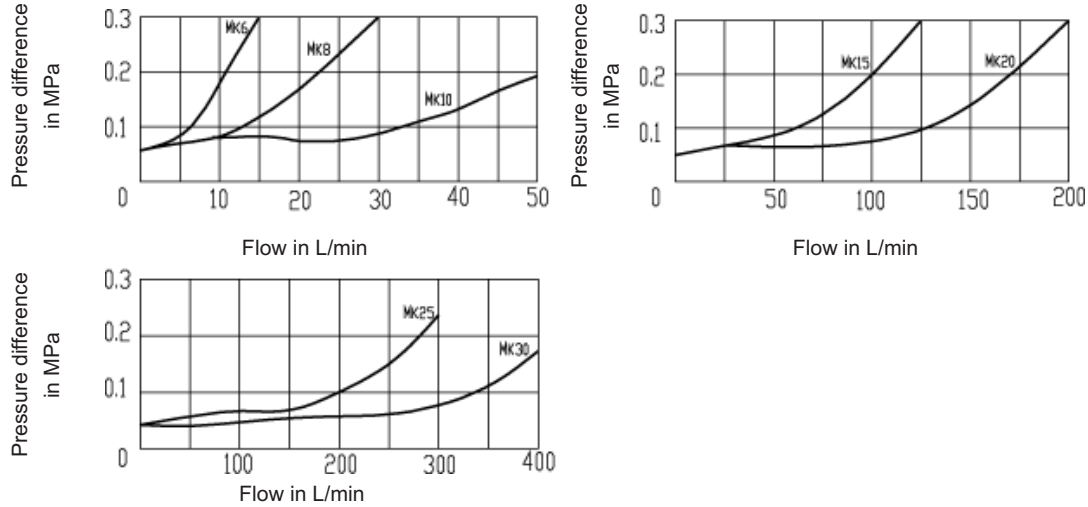
G = For threaded connections

Technical data (for applications outside these parameters, please consult us!)

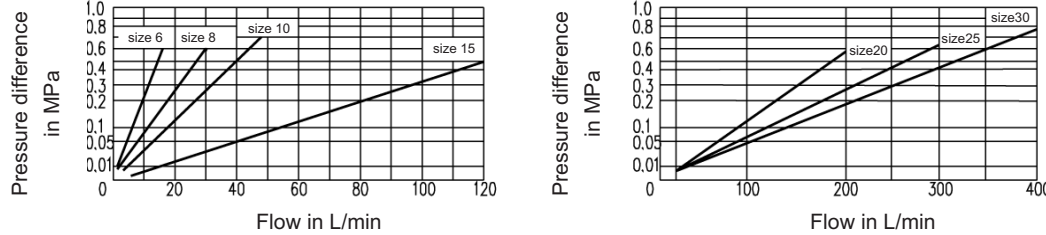
Size		6	8	10	15	20	25	30
Maximum flow (L/min)		15	30	50	140	200	300	400
Pressure (MPa)		up to 31.5						
Cracking pressure (MPa)		0.05 (Type MK)						
Pressure fluid		Mineral oil or Phosphate ester						
Viscosity range (mm ² /s)		10 to 800						
Pressure fluid temperature range (°C)		-30 to +80						

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ °C}$)

△ p-q_v Characteristic curves via open check valve with closed throttle (type MK)

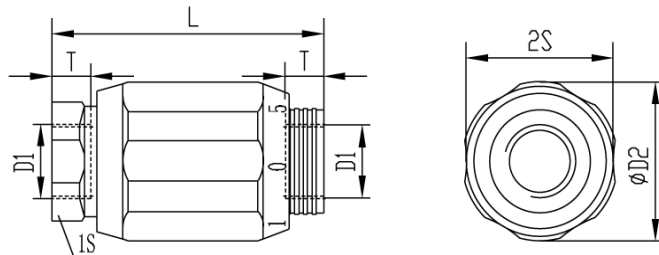


△ p-q_v Characteristic curves via open throttle (types MG and MK)



Unit dimensions

(Dimensions in mm)

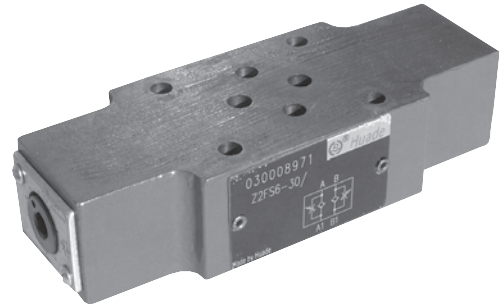


Size	D1		Φ D2	L	1S	2S	T	Weight (kg)
6	M14x1.5	G1/4"	34	65	22	32	12	0.3
8	M18x1.5	G3/8"	38	65	24	36	12	0.4
10	M22x1.5	G1/2"	48	80	30	46	14	0.7
15	M27x2	G3/4"	58	100	41	55	16	1.1
20	M33x2	G1"	72	110	46	70	18	1.9
25	M42x2	G1 1/4"	87	130	55	85	20	3.2
30	M48x2	G1 1/2"	93	150	60	90	22	4.1

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS Series 30			RE:27505/12.2004
	Sizes 6、 16、 22	up to 31.5MPa	up to 350 L/min	Replaces: RE27505/5.2001

Features:

- Sandwich plate design
- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Limiting of main or pilot flow with two service ports,
- Meter-in or meter-out control.



Functional , Section

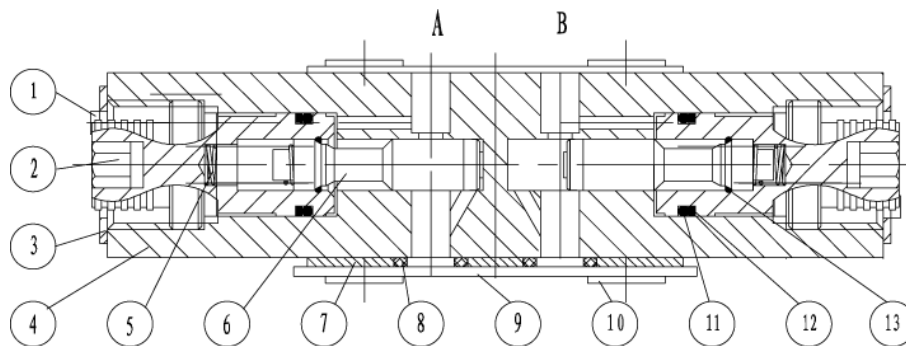
Valves type Z 2 FS are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return flow in the other direction.

Main flow limiting

The double throttle/check valve is fitted between the directional valve and the subplate to change the speed of an actuator (main flow limiting).

Pilot flow limiting

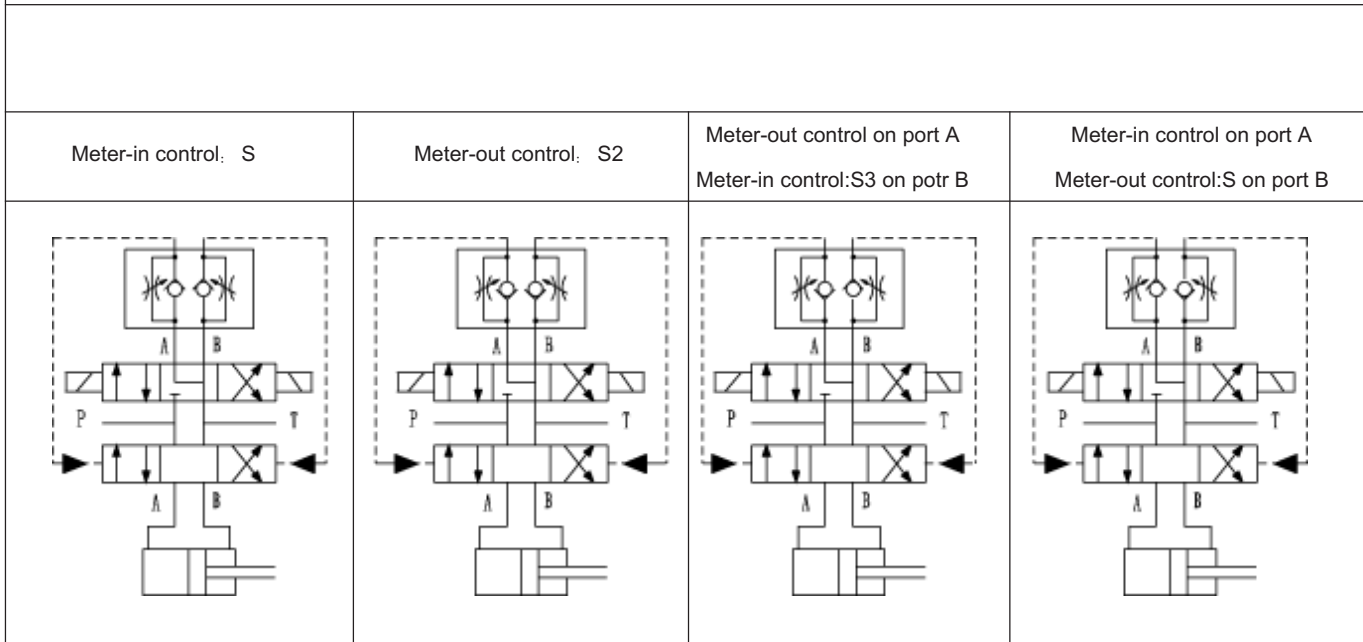
In the case of pilot operated directional valves, the double throttle/check valve may be used as a pilot choke adjustment (pilot flow limiting). In this case, it is fitted between the main valve and the pilot valve.



Double throttle/check valve, Type Z2FS6

Meter-in control: S	Meter-out control: S2	A Meter-out control B Meter-in control:S3	A Meter-in control B Meter-out control:S4

Principle of Hydraulic systems



Ordering details

Z2FS -30 B / *

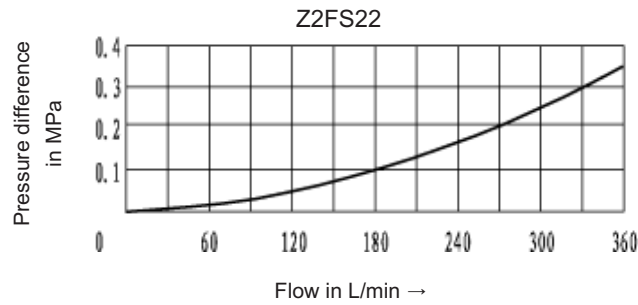
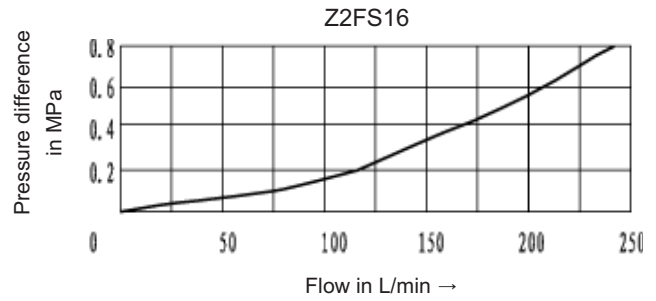
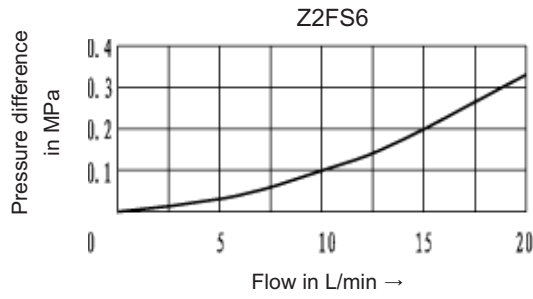
Double throttle/check valve				Further details in clear text
Nominal size 6	= 6			No code= Mineral oil
Nominal size 16	= 16			V= Phosphate ester
Nominal size 22	= 22			
Series 30 to 39 (30 to 39: unchanged installation and connection dimensions)	=30			No code = (With two throttle/check valves)
				S = Meter-in
				S2 = Meter-out
				S3 = Meter-out on port A, meter-in on port B
				S4 = Meter-in on port A, meter-out on port B
Technology of Beijing Huade Hydraulic	=B			

Technical data (for applications outside these parameters, please consult us!)

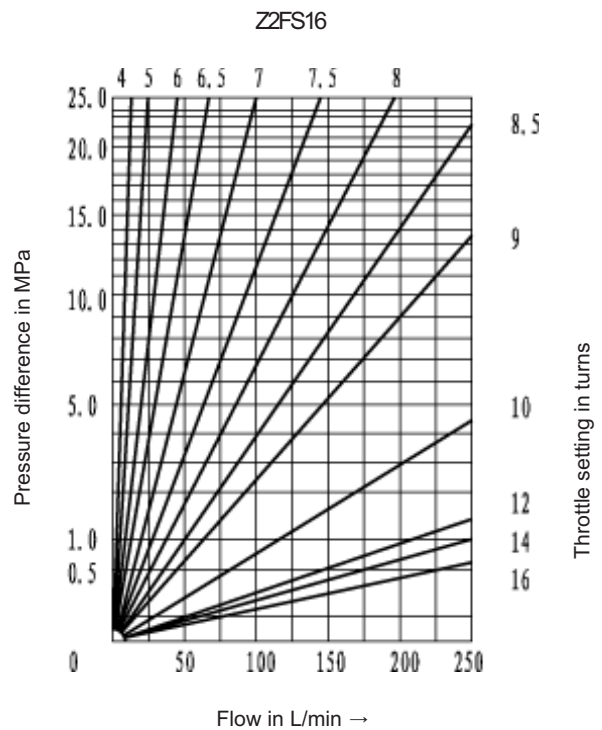
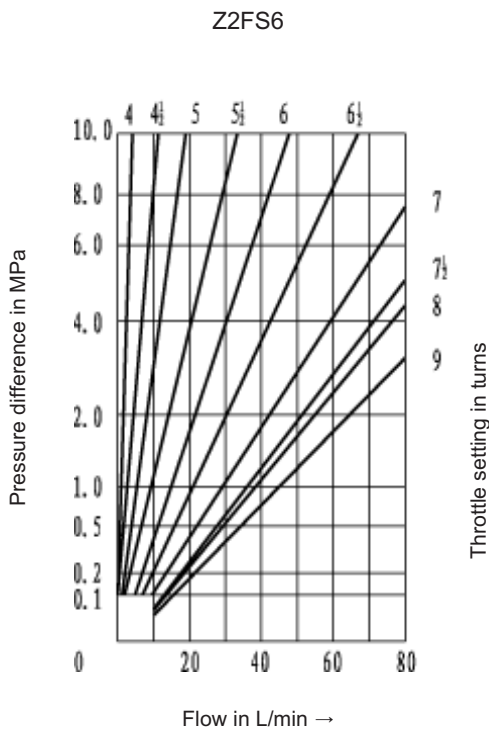
Size		6	16	22
Maximum flow (L/min)		80	250	350
Maximum working pressure (MPa)		31.5	35	
Pressure fluid		Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)		
Viscosity range (mm ² /s)		10 to 800		
Fluid temperature range (°C)		-30 to +80		

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Pressure difference Δp in relationship to the flow q_v via the check valve (throttle closed)



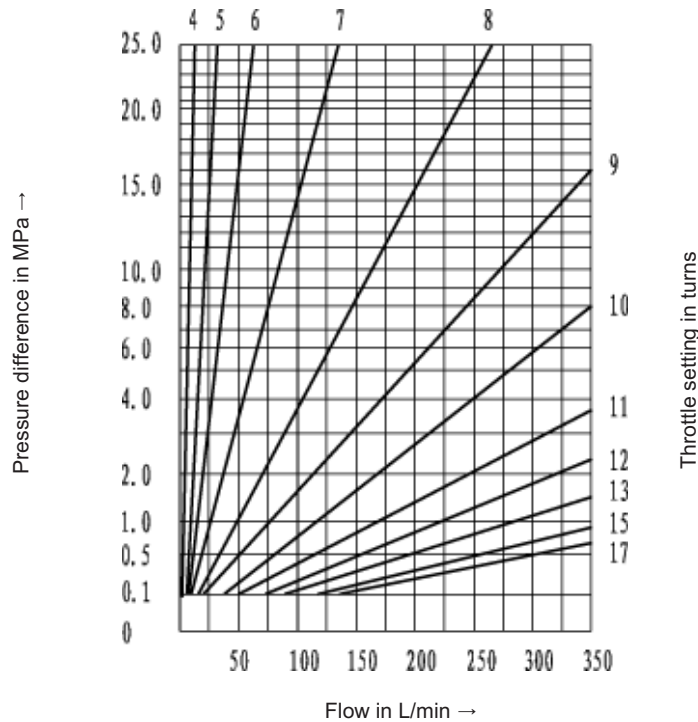
Pressure difference Δp in relationship to the flow q_v at a constant throttle setting.



Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Pressure difference Δp in relation to the flow q_v at constant throttle setting

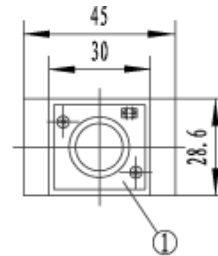
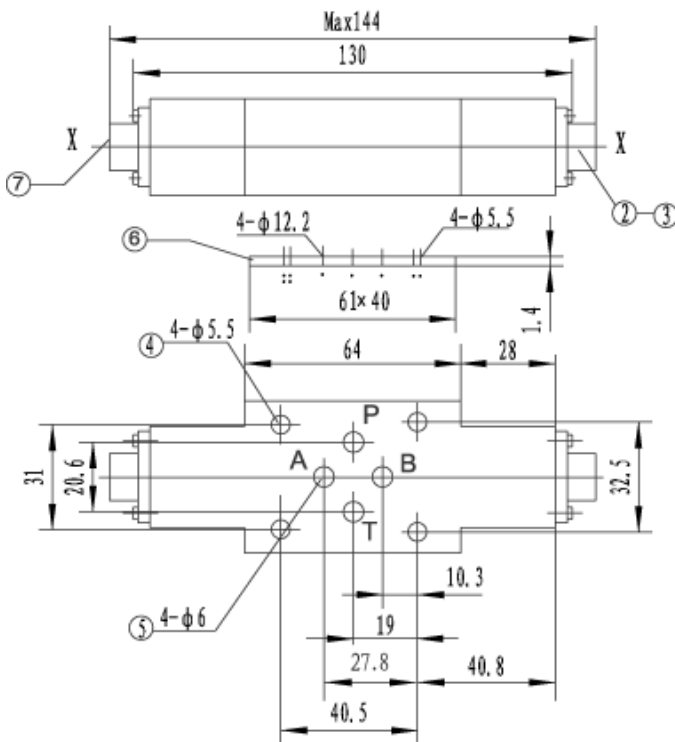
Z2FS22



Unit dimensions

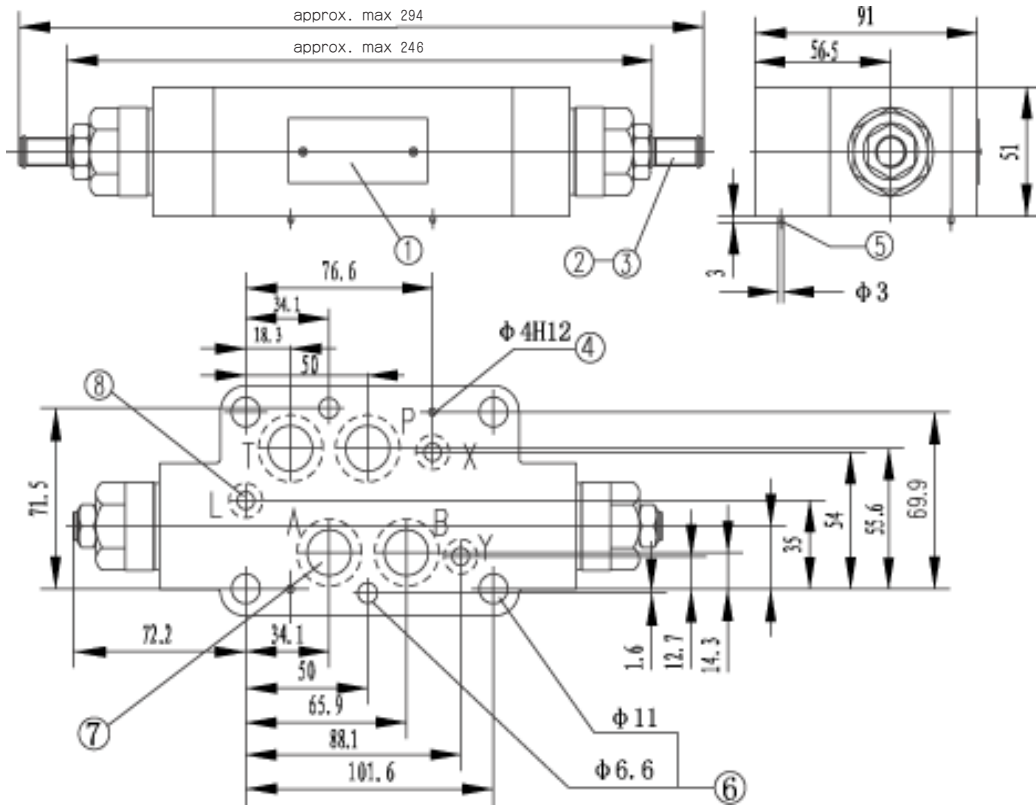
(Dimensions in mm)

Type Z2FS6:

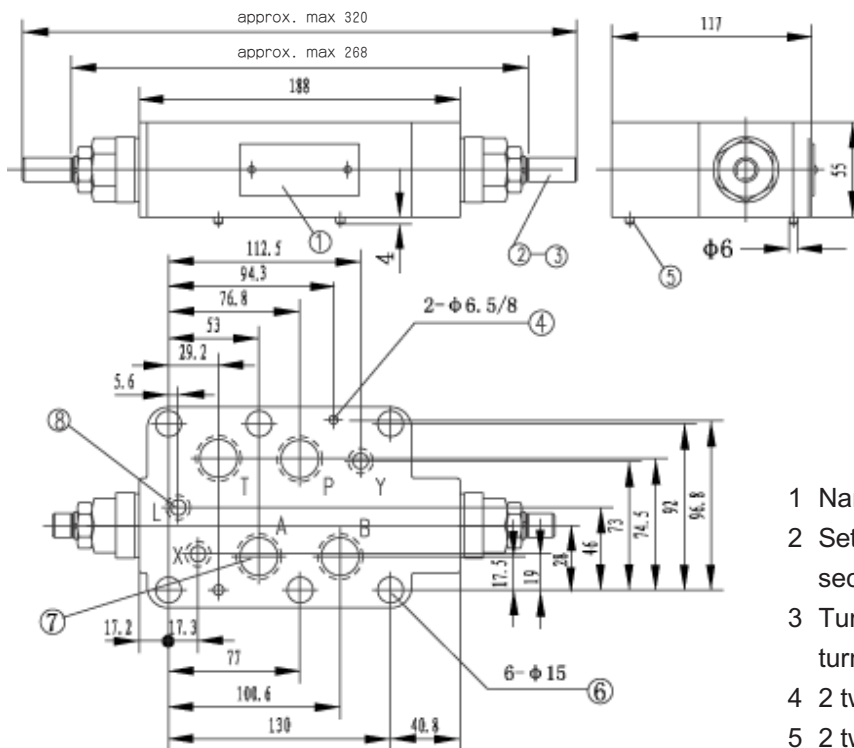


- 1 Name plate
- 2 Setting screw for alteration of flow cross section
- 3 Turn anti-clockwise = increases flow
turn clockwise = decreases flow
- 4 Valve fixing holes
- 5 Ports A, B, P, T
- 6 O-ring plate
- 7 To change from meter-in to meter-out, rotate the unit about the "X"- "X" axis

Type Z2FS16:



Type Z2FS22



- 1 Name plate
- 2 Setting screw for alteration of flow cross section
- 3 Turn anti-clockwise = increases flow
turn clockwise = decreases flow
- 4 2 two locating pins
- 5 2 two locating pins holes
- 6 6 Valve fixing holes
- 7 O-ring for ports A, B, P, T
- 8 O-ring for ports X, Y, L

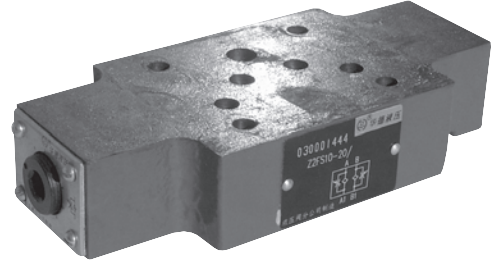
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS 10 Series 20			RE:27510/12.2004
	Size 10	up to 31.5MPa	up to 350L/min	Replaces: RE27510/5.2001

Features:

- Sandwich plate design
- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Limiting of main or pilot flow of two service ports,
- Meter-in or meter-out control.



Functional , section

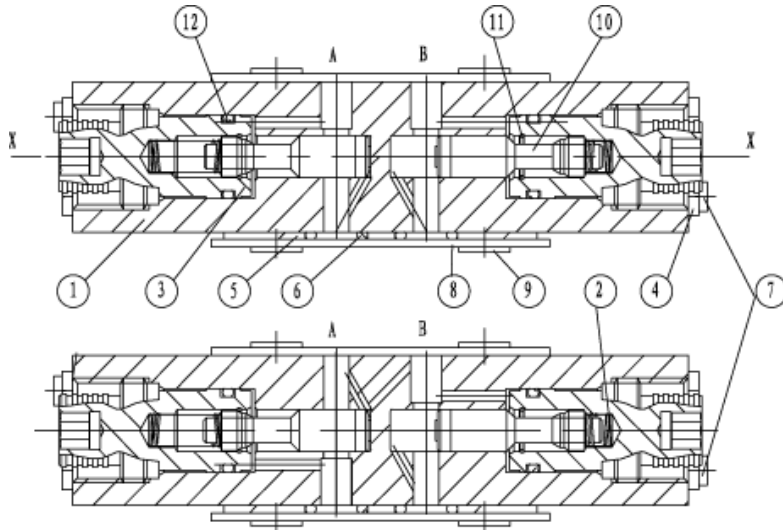
Valves type Z 2 FS...20B/... are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return flow in the other direction.

Main flow limiting

The double throttle/check valve is fitted between the directional valve and the subplate to change the speed of an actuator (main flow limiting).

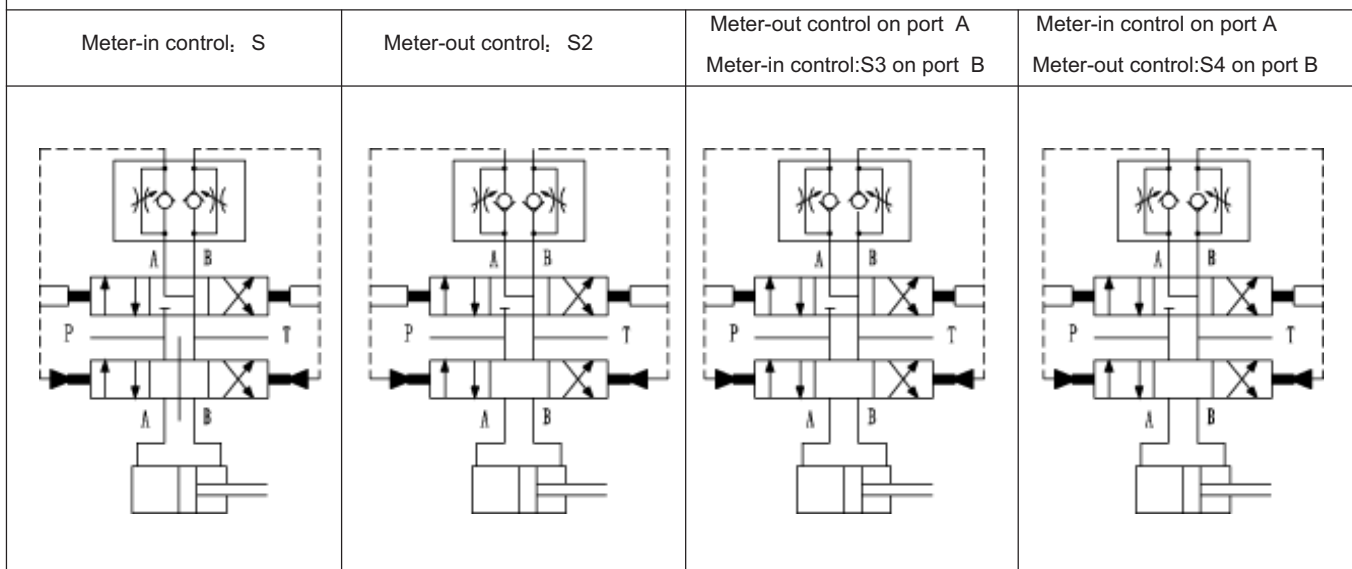
Pilot flow limiting

In the case of pilot operated directional valves, the double throttle/check valve may be used as a pilot choke adjustment (pilot flow limiting). In this case, it is fitted between the main valve and the pilot valve.



Meter-in control: S	Meter-out control: S2	A Meter-out control B Meter-in control:S3	A Meter-in control B Meter-out control:S4

Principle of Hydraulic system



Ordering details

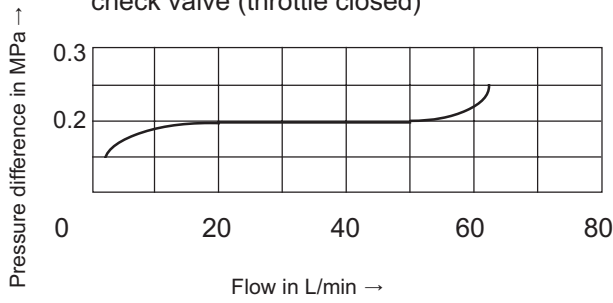
Z2FS	-	20	B	/		*
Double throttle/ check valve						Further details in clear text
Nominal size 10		= 10				No code = Mineral oil V = Phosphate ester
Series 20 to 29 (20 to 29: unchanged installation and connection dimensions)		=20				No code = (With two throttle/check valves) Meter-in /meter-out throttling, (this valve can be turned)
Technology of Beijing Huade Hydraulic		=B				S = Meter-in S2 = Meter-out S3 = Meter-out on port A, meter-in on port B S4 = Meter-in on port A, meter-out on port B

Technical data (for applications outside these parameters, please consult us!)

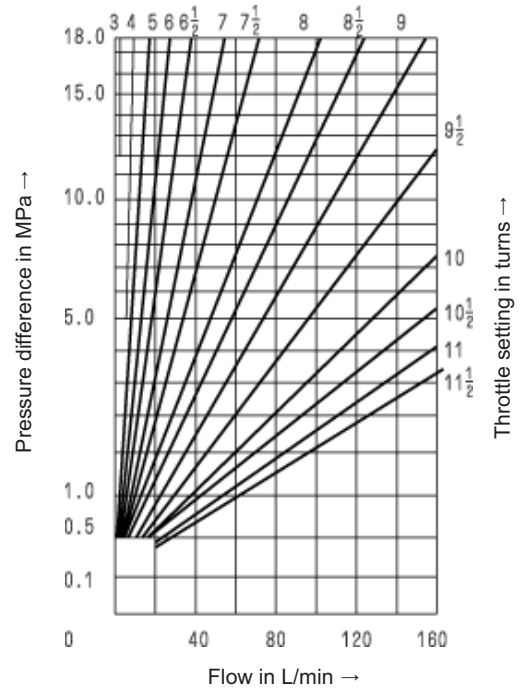
Size		10
Maximum flow	(L/min)	160
Maximum working pressure	(MPa)	31.5
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Viscosity range	(mm ² /s)	10 to 800
Fluid temperature range	(°C)	-20 to +70

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

$\Delta p - q_v$ -characteristic curve across check valve (throttle closed)

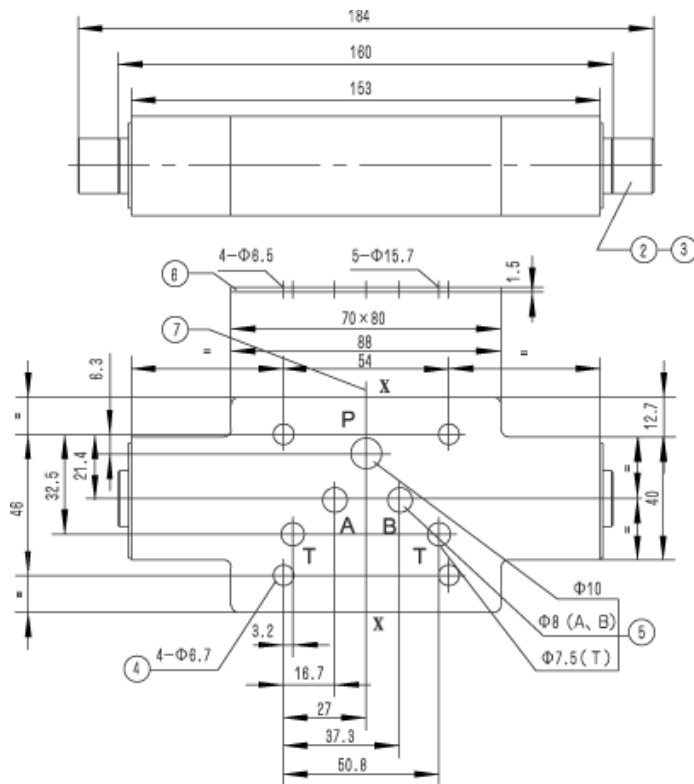


Pressure difference Δp in relation to the flow q_v at constant throttle setting



Unit dimensions

(Dimensions in mm)



- 1 Name plate
- 2 Setting screw for alteration of flow cross section
- 3 Turn anti-clockwise = increases flow
turn clockwise = decreases flow
- 4 Valve fixing holes
- 5 Ports A, B, P, T
- 6 O-ring plate
- 7 To change from meter-in to meter-out, rotate the unit about the "X"- "X" axis

ral oil (for NBR
Phosphate es-
FPM seal)

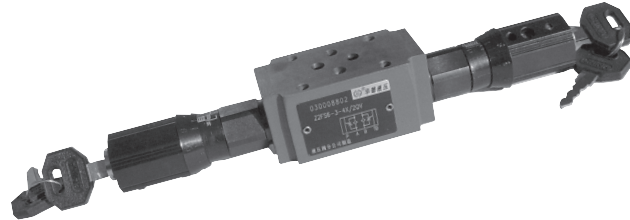
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS 6 Series 40 (New Series)			RE:27500/12.2004
	Size 6	up to 31.5MPa	up to 80 L/min	

Features:

- Sandwich plate valve
- Parting pattern to DIN 24340, from A, ISO 4401 and CETOP-RP 121H
- 4 adjustment elements :
 - Screw with locknut and protective cap
 - Lockable rotary knob with scale
 - Spindle with internal hexagon and scale
 - Rotary knob with scale
- For limiting the main or pilot fluid flow of 2 service ports
- For meter-in or meter-out control



Function , section

Valve type Z2FS 6 ...-40B/... is a double throttle/check valve in sandwich plate design.

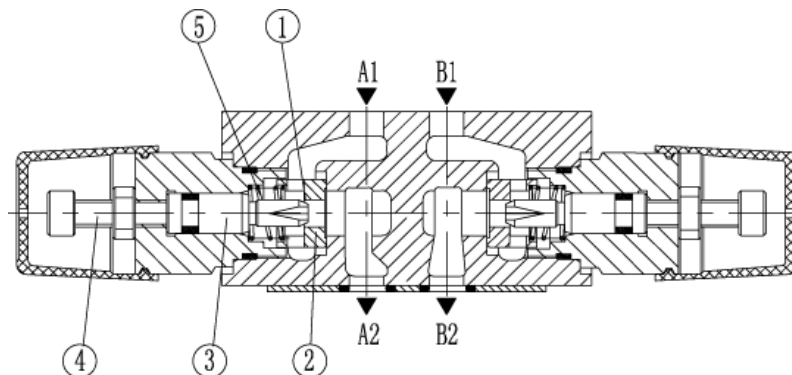
They are used to limit the main or pilot flow of one or two service ports. Two symmetrically arranged throttle/check valves limit the flow in one direction and allow free-flow in the opposite direction. For meter-in control fluid passes from port A1 to port A2 via the throttling point (1), which is made up to the valve seat (2) and the throttling spool (3). The throttling spool (3) is axially adjustable via the adjustment screw (4), thus allowing the throttling point (1) to be adjusted. Flow flowing back from the service port A2 moves the valve seat (2) against spring (5) in the direction of the throttling spool (3), causing the valve to act as a check valve and allowing free-flow. Depending upon the way in which the valve is installed, the throttling effect can be arranged as a meter-in or a meter-out control.

Limiting the main fluid flow (style ..2Q..)

In order to change the velocity of an actuator (main fluid flow), the double throttle/check valve is installed between the directional valve and the sub-plate.

Limiting the pilot fluid flow (style ..1Q..)

In pilot operated directional control valves, the double/throttle check valve is installed as a pilot choke adjustment (pilot fluid flow). It is fitted between the main valve and the pilot valve.



Type Z2FS6-2-40B/...

Ordering details

Z2FS 6 - 40 B / *

Double throttle/check valve

Further details in clear text

Nominal size 6 = 6

No code= Mineral oil
V= Phosphate ester

Throttle/check valve ports A and B = -
Throttle/check valve port A = A
Throttle/check valve port B = B

1Q = With fine control
2Q = Standard version

Adjustment element
Screw with locknut = 2
Lockable rotary knob with scale = 3
Spindle with internal hexagon and scale = 5
Rotary knob with scale = 7

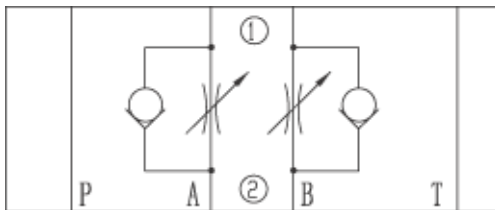
Series 40 to 49 = 40
(40 to 49: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

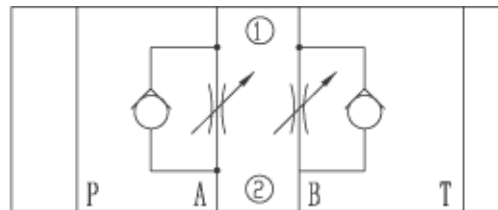
Note: Type Z2FS 6-...-40B/...has the same adjustment elements on ports A and B

Symbols (① = valve side, ② = sub-plate)

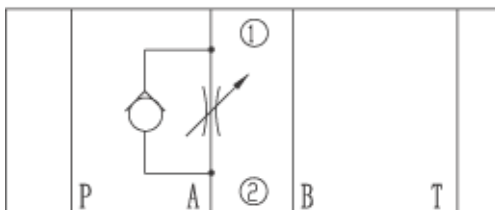
Z2FS6-...-40B/...(meter-in)



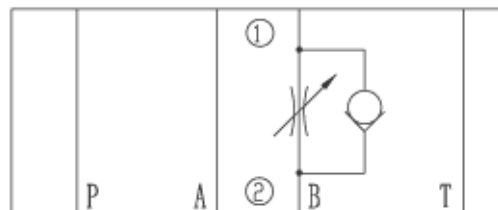
Z2FS6-...-40B/...(meter-out)



Z2FS 6A-...-40B/...(meter-out)



Z2FS 6B-...-40B/...(meter-in)

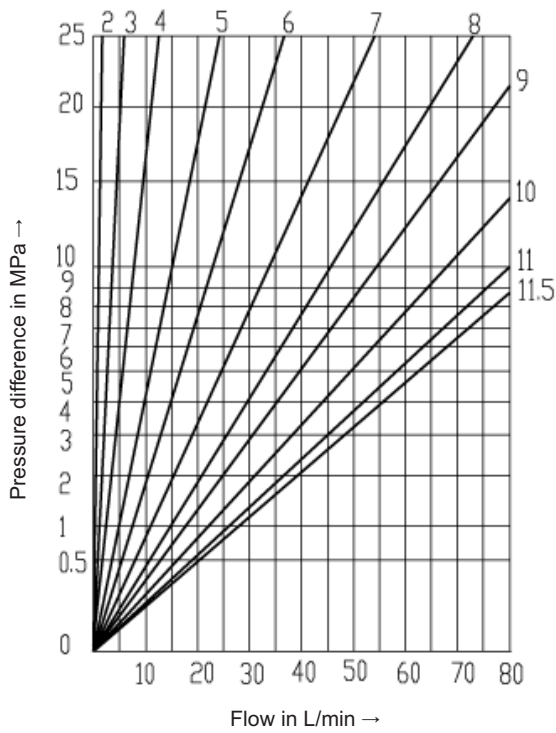


Technical data (for applications outside these parameters, please consult us!)

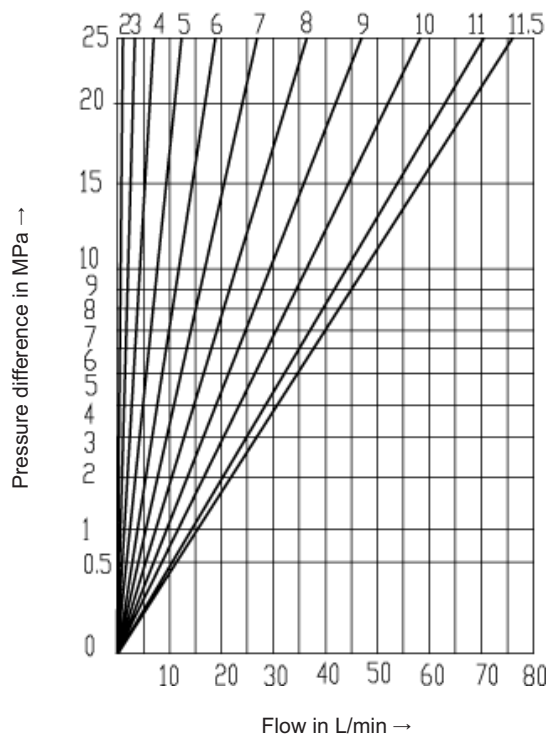
Pressure fluid	Mineral oil
	Phosphate ester
Pressure fluid temperature range	(°C) - 30 to + 80
Viscosity range	(mm ² /s) 10 to 800
Degree of contamination	Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.
Maximum working pressure	(MPa) up to 31.5
Maximum flow	(L/min) up to 80
Weight	(Kg) approx. 0.8

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

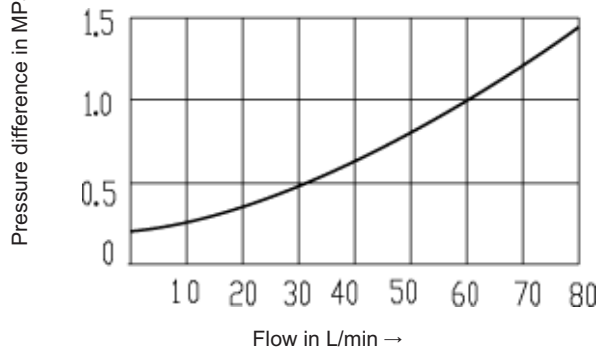
Δp - q_v -characteristic curves - types Z2FS 6 ...-40/2QV
Throttle setting in turns



Δp - q_v -characteristic curves - type Z2FS 6 ...-40/1QV
Throttle setting in turns



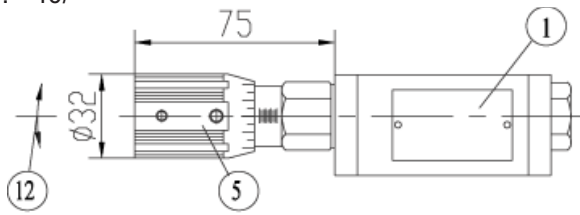
Δp - q_v -characteristic curve across check valve
(throttle closed)



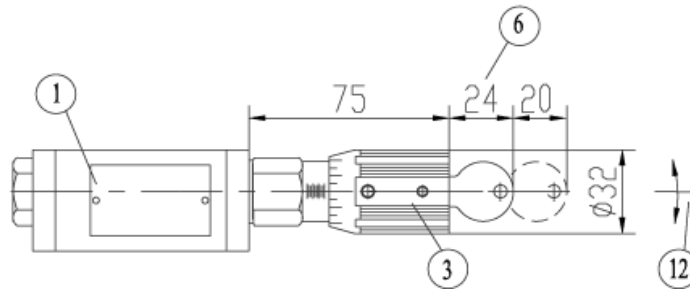
Unit dimensions

(Dimensions in mm)

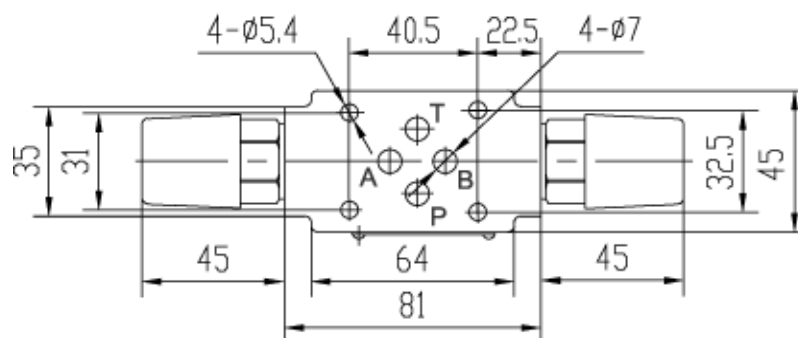
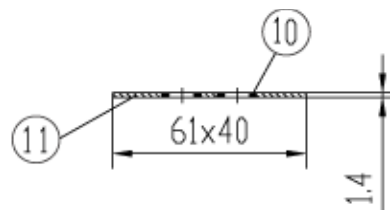
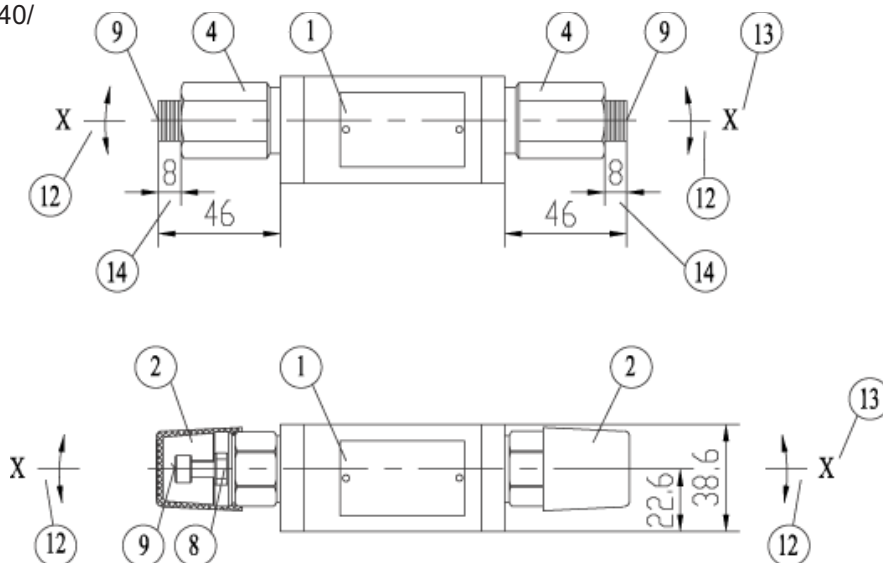
Type Z2FS 6 A.. - 40/



Type Z2FS 6 B.. - 40/



Type Z2FS 6- ... - 40/



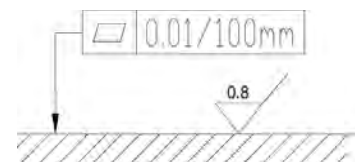
- 1 Name plate
- 2 Adjustment element "2"
- 3 Adjustment element "3"
- 4 Adjustment element "4"
- 5 Adjustment element "7"
- 6 Space required to remove key
- 7 Valve fixing holes
- 8 Locknut 10 A/F
- 9 Adjustment screw/spindle to set flow
cross-section (internal hexagon 5 A/F)
- 10 O-ring 9.25 x 1.78 for ports A, B, P, T
- 11 O-ring plate
- 12 For all adjustment elements:
turn anti-clockwise = increases flow
turn clockwise = decreases flow
- 13 To change from meter-in to meter-out,
rotate the unit about the "X" - "X" axis
- 14 Stroke

Valve fixing screws

M5 --10.9 (GB/T70.1-2000)

Tightening torque $M_A = 8.9 \text{ Nm}$,

Required surface finish of
mating piece



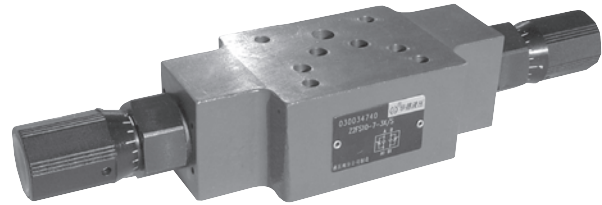
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve , Type Z2FS 10...-30B/ (New Series)			RE:27501/12.2004
	Size 10	up to 31.5MPa	up to 160 L/min	

Features:

- Sandwich plate valve
- Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H
- For limiting the main or pilot fluid flow of 2 service ports
- 3 adjustment elements:
 - Lockable rotary knob with scale
 - Spindle with internal hexagon and scale
 - Rotary knob with scale
- For meter-in or meter-out control



Function , section

Valve type Z2FS 10...-30B/...is a double throttle/check valve in sandwich plate design.

It is used to limit the main or pilot flow of one or two service ports.Two symmetrically arranged throttle/check valves limit the flow in one direction and allow free-flow in the opposite direction.For meter-in control fluid passes from port A1 to port A2 via the throttling point (1), which is made up to the valve seat (2) and the throttling spool (3.1). The throttling spool (3.1) is axially adjustable via the spindle (4), thus allowing the throttling point (1) to be adjusted.At the same time the fluid in port A1 reaches spool side (6) via bore(5). The pressure present in addition to the spring force holds the throttle spool (3.1) in its throttling position.Flow flowing back from the service port B2 moves the throttle spool(3.2) against the spring (7) causing the valve to act as a check valve and allowing free-flow. Depending upon the way in which the valve is installed, the throttling effect can be arranged as a meter-in or meter-out control.

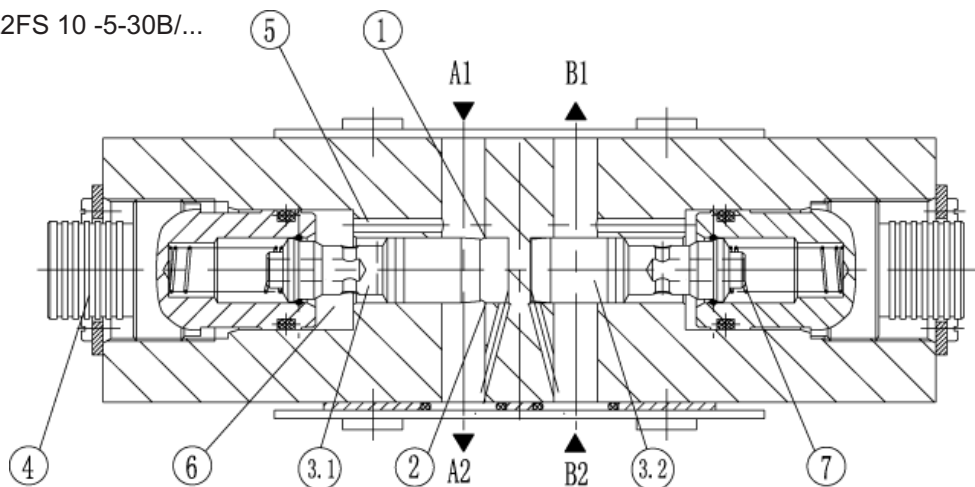
Limiting the main fluid flow

In order to change the velocity of an actuator (main fluid flow), the double throttle/check valve is installed between the directional valve and the sub-plate.

Limiting the pilot fluid flow

In pilot operated directional control valves, the double/throttle check valve is installed as a pilot choke adjustment (pilot fluid flow). It is fitted between the main valve and the pilot valve.

Type Z2FS 10 -5-30B/...



Ordering details

Z2FS 10 30 B *

Double throttle/check valve

Further details in clear text

Nominal size 10 = 10

No code = Mineral oil
V = Phosphate ester

Throttle/check valve ports A and B = -
Throttle/check valve port A = A
Throttle/check valve port B = B

Adjustment element
Lockable rotary knob with scale = 3
Spindle with internal hexagon and scale = 5
Rotary knob with scale = 7

No code = (With two throttle/check valves) Meter-in /meter-out throttling, (this valve can be turned)
S = (...A.-30B/S) meter-in on port A (...B.-30/S) meter-in on port B
S2 = (...A.-30B/S2) meter-out on port A (...B.-30/S2) meter-out on port B
S3 = (...A.-30B/S3) meter-out on port A (...B.-30/S3) meter-in on port B
S4 = (...A.-30B/S4) meter-in on port A (...B.-30/S4) meter-in out port B

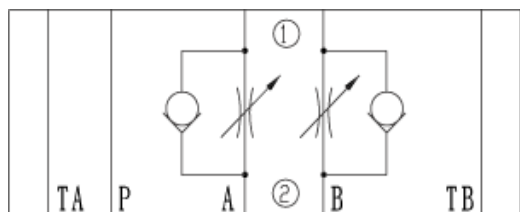
Series 30 to 39 =30
(30 to 39: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

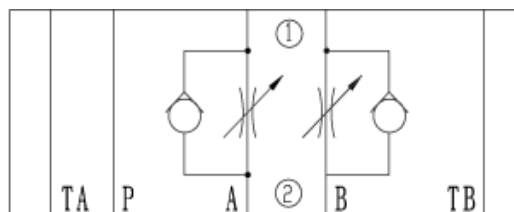
Note: Type Z2FS 10-...-30B/..has the same adjustment elements on ports A and B!

Symbols (① = valve side, ② = sub-plate)

Z2FS10-...-30B/..(meter-in)

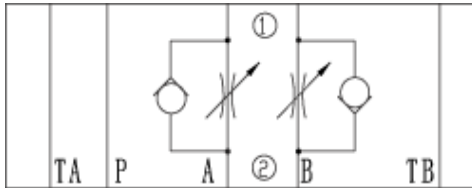


Z2FS10-...-30B/..(meter-out)

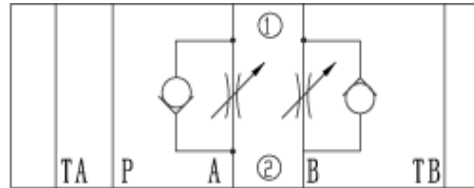


Symbols (① = valve side, ② = sub-plate)

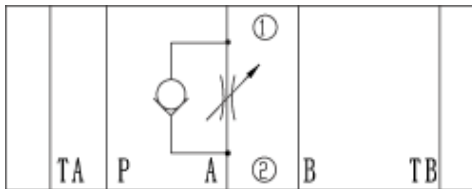
Z2FS10-...-30B/S3..(port A meter- out,
port B meter-in)



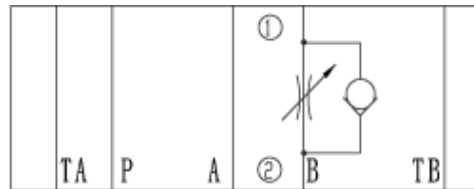
Z2FS10-...-30B/S4..(port A meter-in, port B
meter-out)



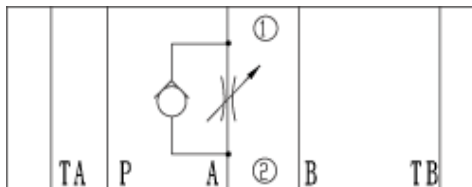
Z2FS10A-...-30B/S..(port A meter-in)



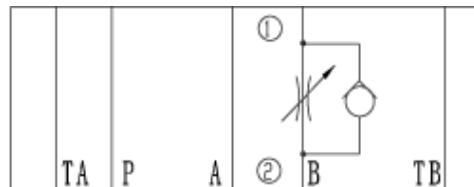
Z2FS10B-...-30B/S..(port B meter-in)



Z2FS10A-...-30B/S2..(port A meter-out)



Z2FS10B-...-30B/S2..(port B meter-out)

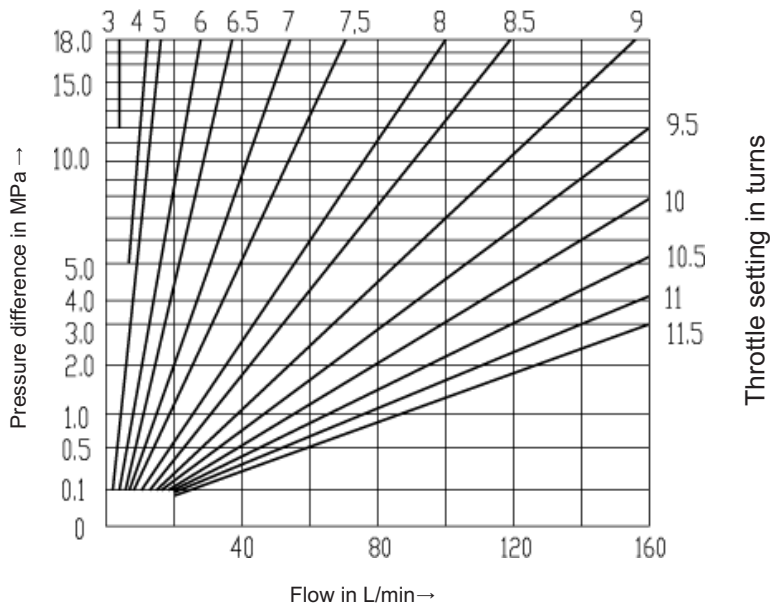


Technical data (for applications outside these parameters, please consult us!)

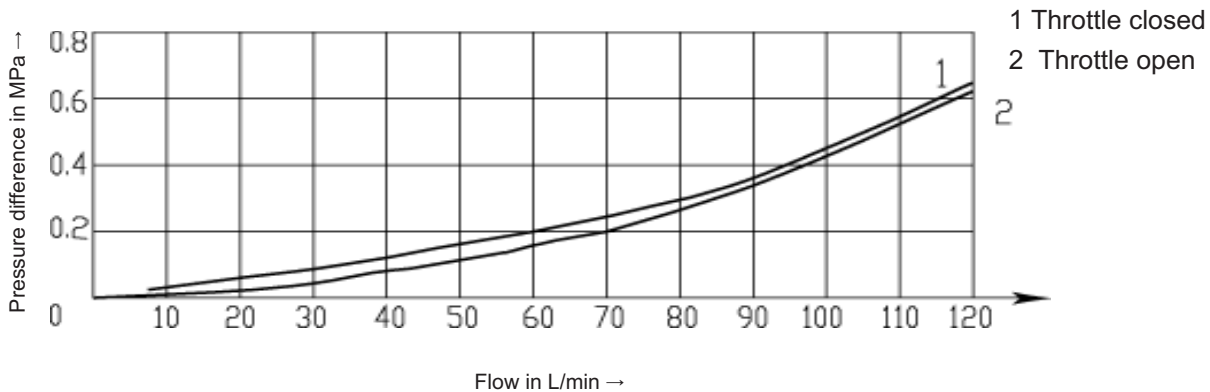
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Pressure fluid temperature range	(°C)	- 30 to + 80
Viscosity range	(mm ² / s)	10 to 800
Degree of contamination		Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.
Maximum working pressure	(MPa)	up to 31.5
Maximum flow	(L/min)	up to 160
Weight	(kg)	approx.3.1

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

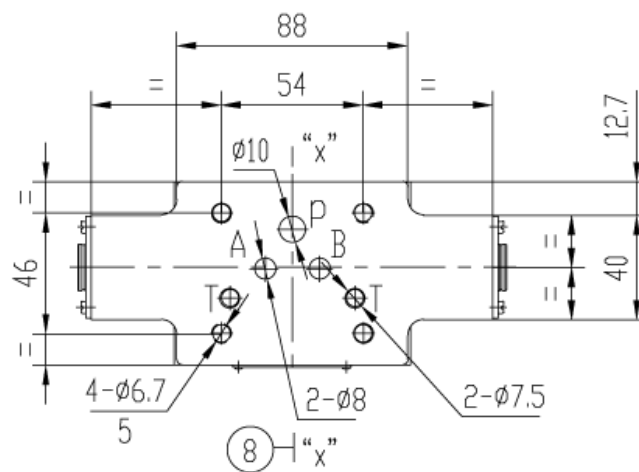
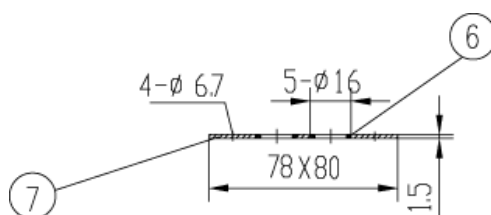
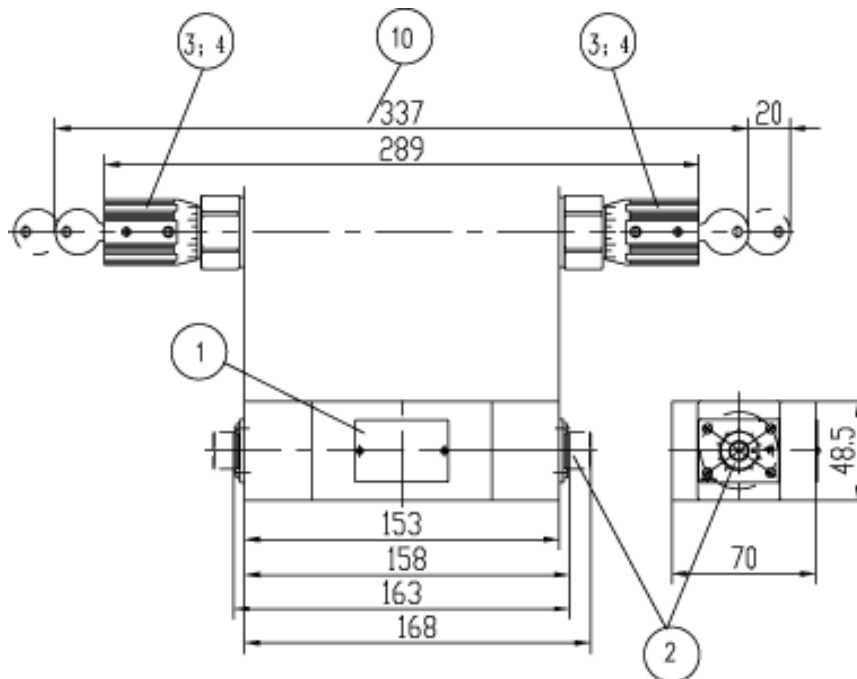
Pressure difference Δp in relation to the flow q_v at constant throttle setting



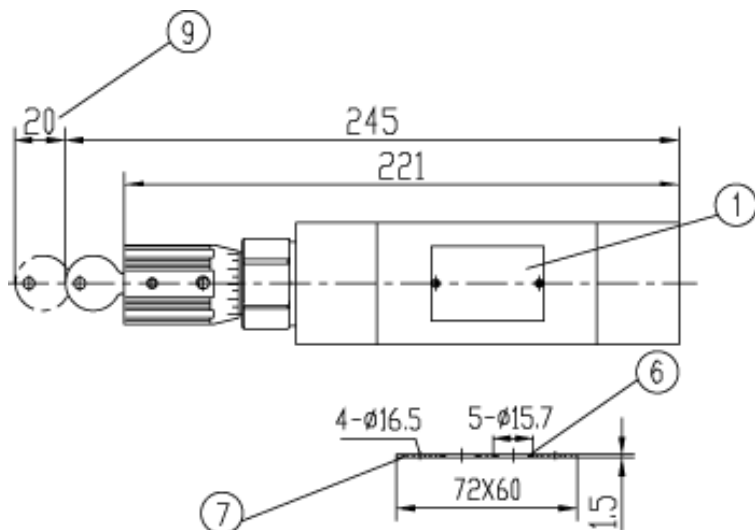
Pressure difference Δp in relation to the flow q_v across the check valve



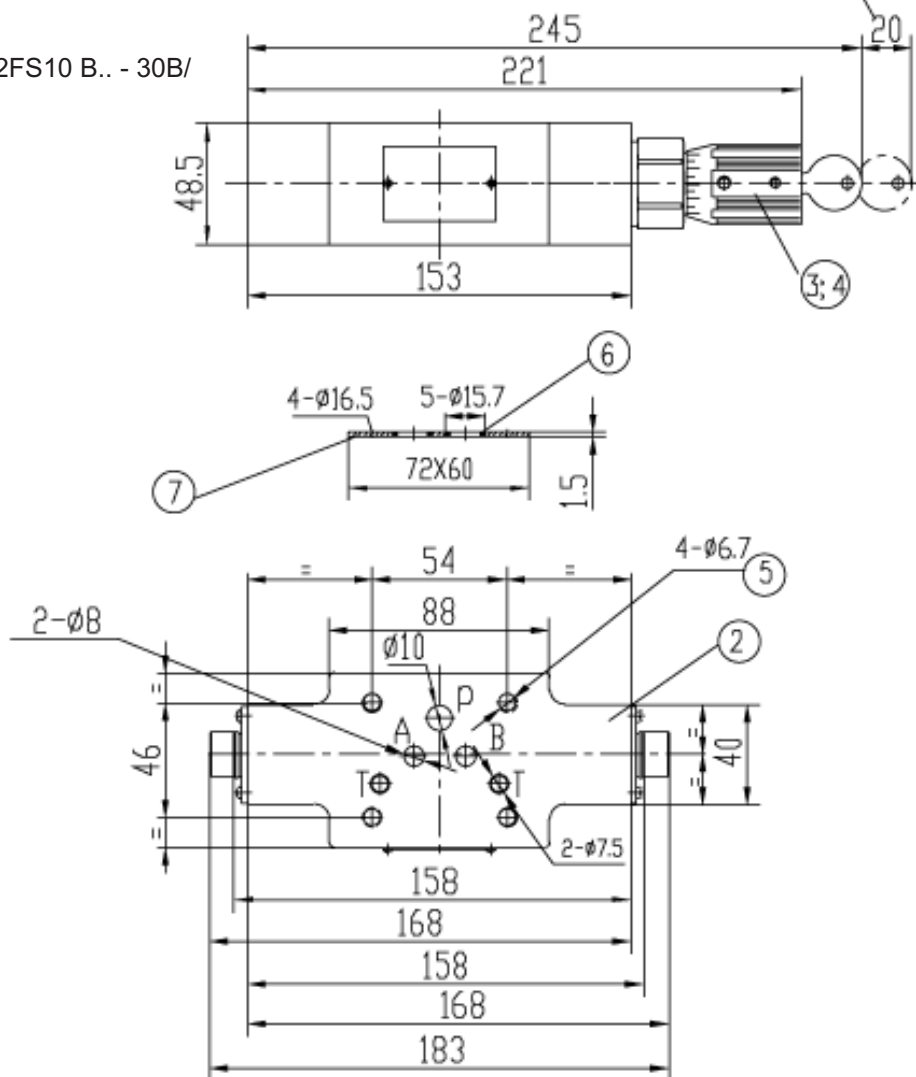
Type Z2FS 10..-30B/



Type Z2FS10 A.. - 30B/



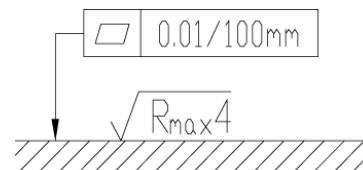
Type Z2FS10 B.. - 30B/



- 1 Nameplate
- 2 Adjustment "5"
- 3 Adjustment "3"
- 4 Adjustment "7"
- 5 4 through holes for valve fixing screws
- 6 O-ring 9.25x1.78 for ports A, B, P, TA, TB
- 7 O-ring plate
- 8 To change from meter-in to meter-out,
rotate the unit about the "X"- "X" axis
- 9 Space required to remove key
- 10 Only for adjustment "7"

Valve fixing screws
M5 -10.9 (GB/T70.1-2000)
Tightening torque $M_A = 15.5 \text{ Nm}$.

Required surface finish of
mating piece



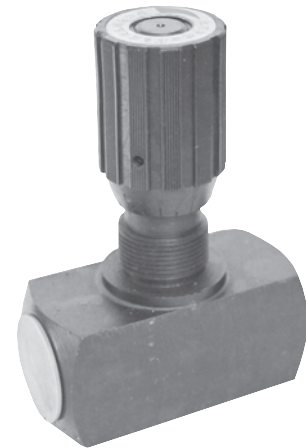
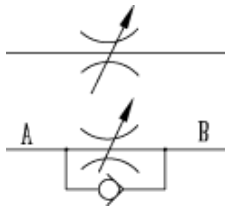
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Throttle/Isolating and Throttle/Check Valves Type DV/DRV			RE32502/12.2004
	Size 6 to 40	up to 35MPa	up to 375 L/min	Replaces: RE32502/5.2001

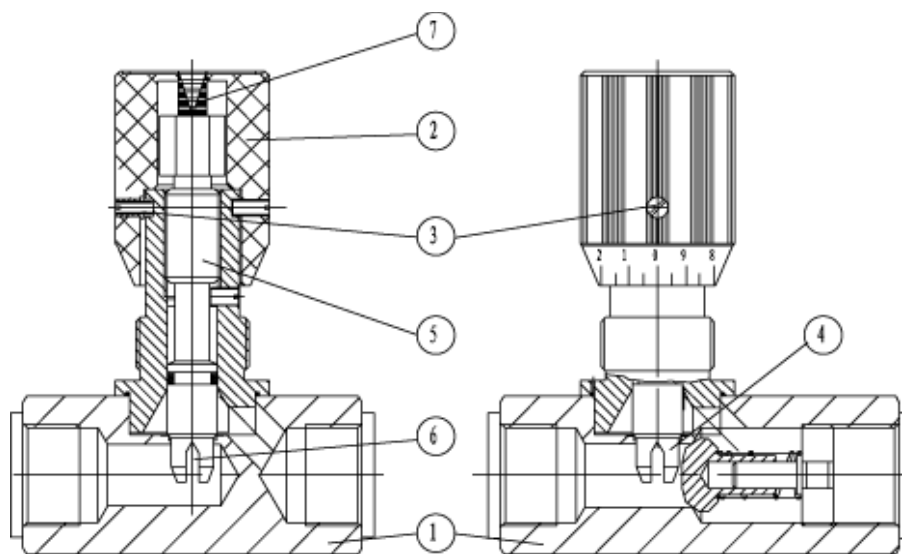
Features:

- threaded connection
- Subplate mounting



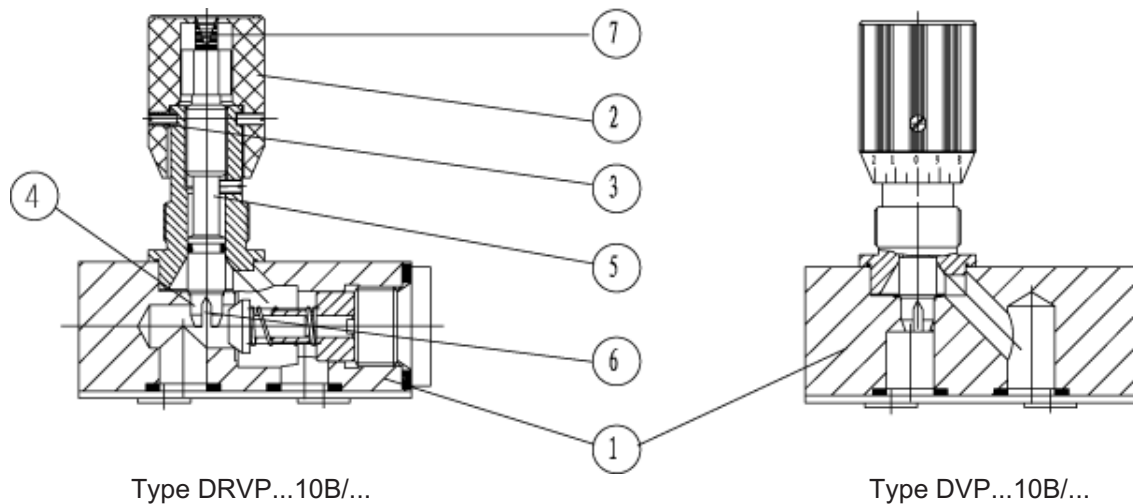
Function, Section

The throttle/isolating valves type DV serve to set an exact oil flow, and can be used for shut-off function, too. The throttle/check valves type DRV serve to set an exact oil flow in one direction, and to allow free return flow in the opposite direction. They consist basically of a housing (1), adjustment knob (2) with locking device (3). By turning the adjustment knob (2) to the left, the spindle (4) with throttle pin (5) increases the flow section (6) to maximum. By turning the adjustment knob (2) to the right, the spindle (4) with throttle pin (5) decreases the flow section (6) until fully closed without leakage. For repeat setting, a colour scale (7) is provided on the top end of the spindle (4). The area of coloured triangle (8) showing indicates how far the valve is open (the larger the coloured triangle the greater the opening). The flow setting is locked by means of locking device (3).

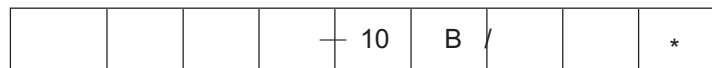


Type DV...10B/...

Type DRV...10B/...



Ordering Code



Throttle/Isolating valves (threaded connection) = DV
 Throttle/check valves (threaded connection) = DR
 Throttle/Isolating valves (subplate mounting) = DVP
 Throttle/check valves (subplate mounting) = DRVP

Further details in clear text

Size	
6	=6
8	=8
10	=10
12	=12
16	=16
20	=20
25	=25
30	=30
40	=40

No code = British
 2 = Metric

V = Phosphate ester
 No code = Mineral oil

B = Technology of Beijing Huade Hydraulic

10 = Series 10 to 19 (10 to 19: unchanged installation and connection dimensions)

For direct thread connection = -
 For subplate mounting = S

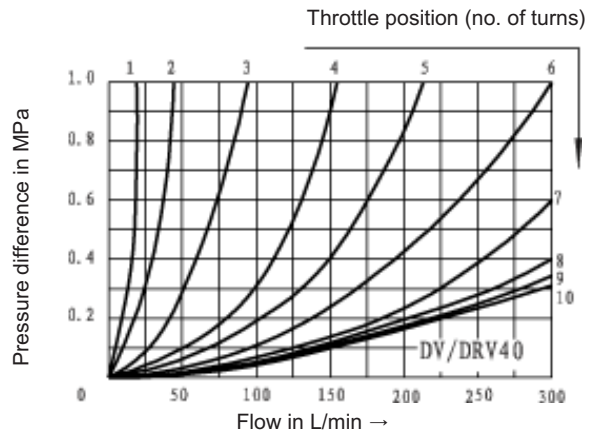
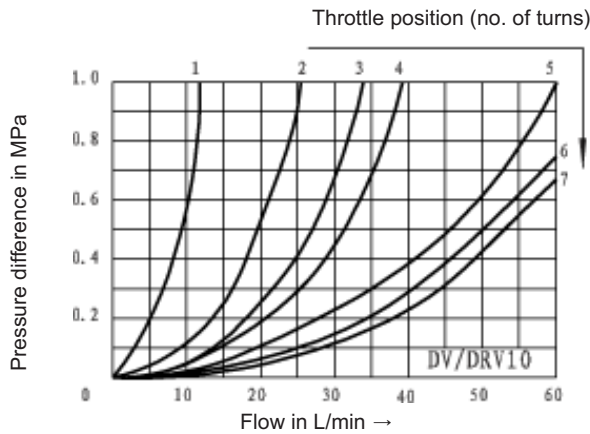
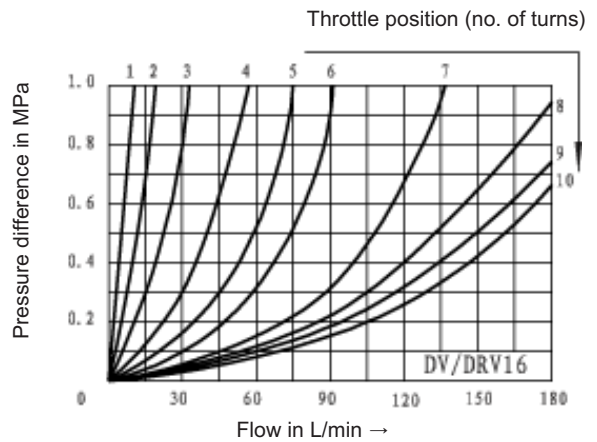
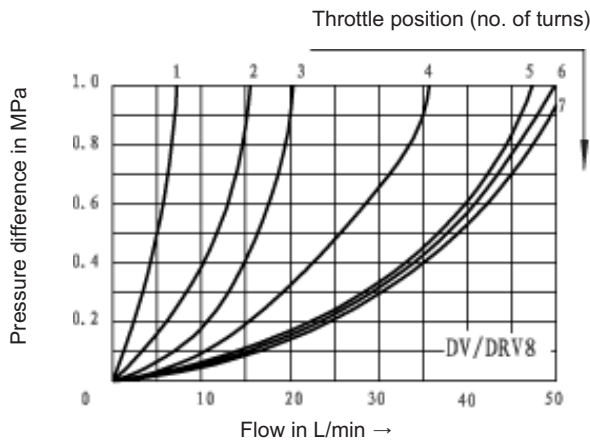
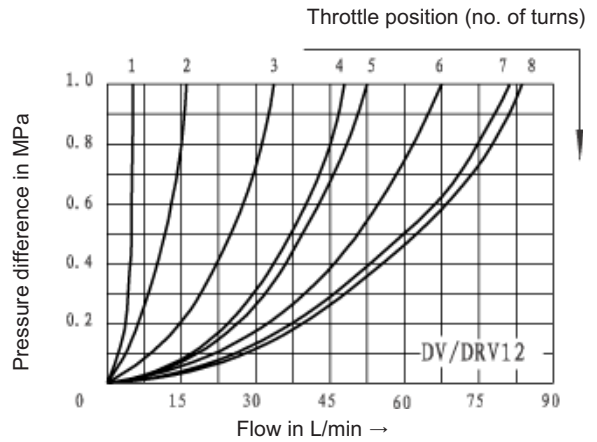
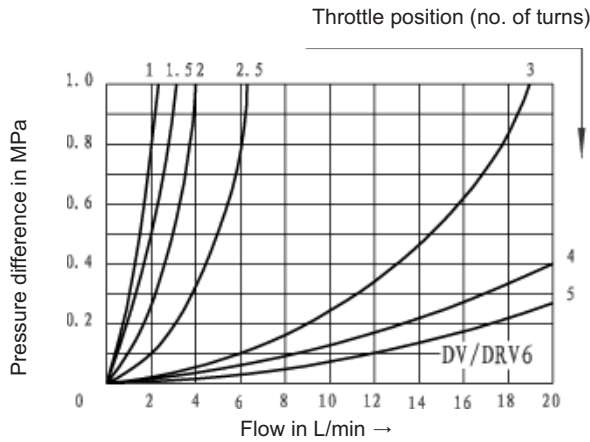
1 = Steel
 2 = Brass
 3 = Stainless steel

Technical Data (For applications outside these parameters, please consult us!)

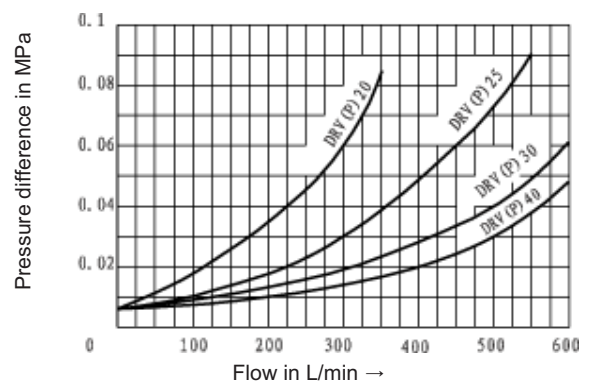
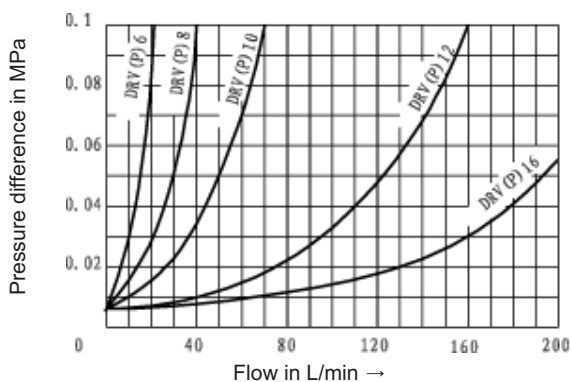
Material	Steel	Brass	Stainless steel
Max. permissible operating pressure (MPa)	to 35	to 15	to 35
Cracking pressure of check valve (type DRV)	0.05 (cracking pressures available if required)		
Fluid	Mineral oil or Phosphate ester		
Fluid temperature range (°C)	-30 to +80		
Viscosity range (mm ² /s)	10 to 800		
Installation position	optional		

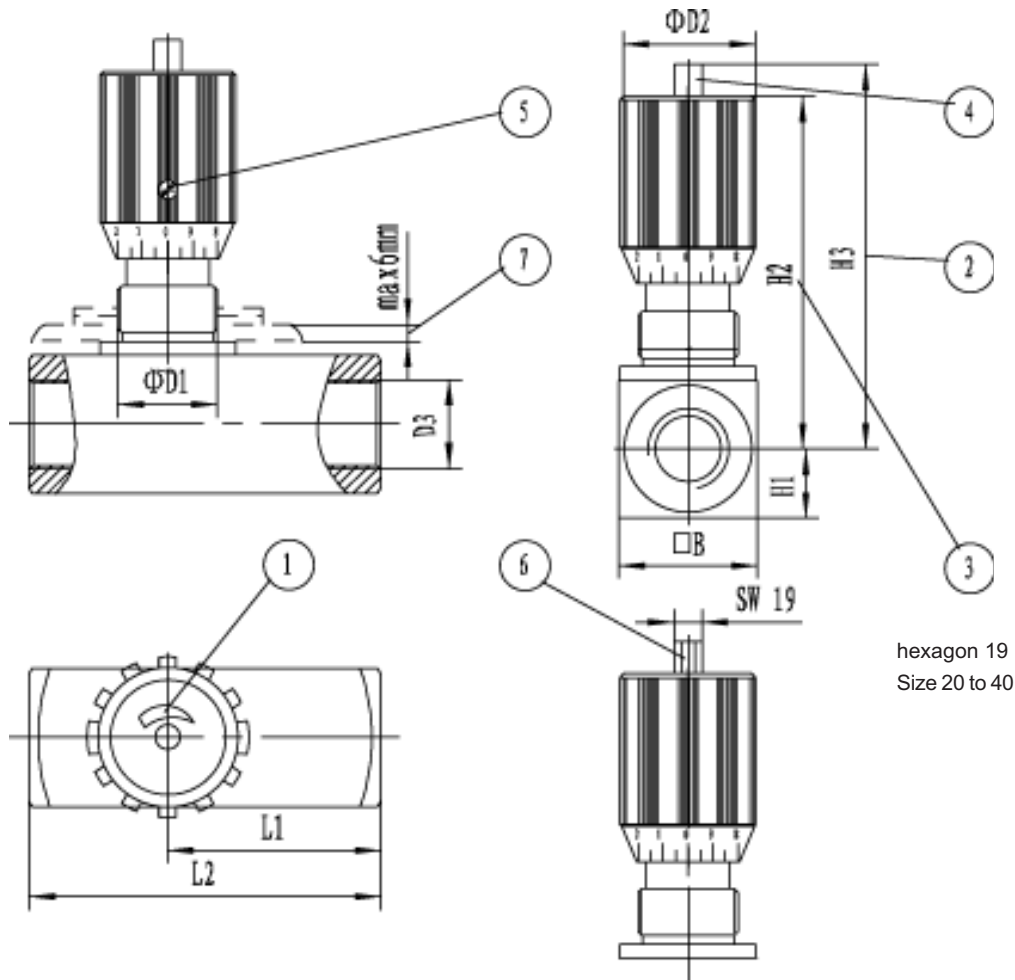
Operating Curves: (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50^\circ\text{C}$)

$\Delta p - q_v$ -operating curves for free return flow via open check valve; direction of flow: A \rightarrow B



$\Delta p - q_v$ -operating curves for free return flow via open check valve; direction of flow: B \rightarrow A





hexagon 19
Size 20 to 40

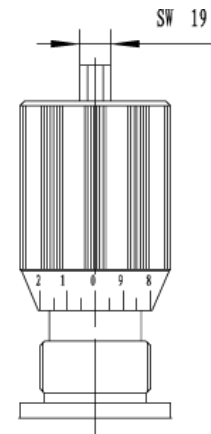
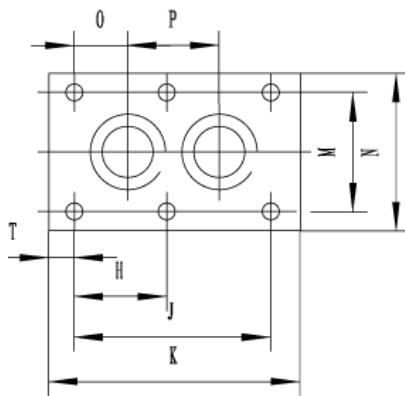
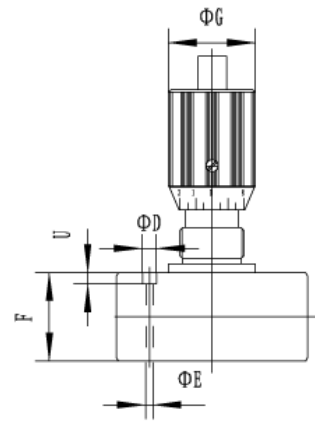
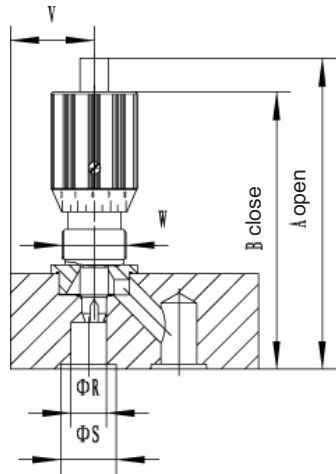
Size	$\square B$	$\Phi D1$	$\Phi D2$	D3		D4	H1	H2	H3	L1		L2	
6	16	16	24	G1/8"	M10X1	M14X1.5	8	54	59	19	26	38	45
8	25	19	29	G1/4"	M14X1.5	M18X1.5	12.5	66	73	24	33.5	48	55
10	30	19	29	G3/8"	M18X1.5	M18X1.5	15	68	75	29	41	58	65
12	35	23	38	G1/2"	M22X1.5	M22X1.5	17.5	82	92	34	44	68	73
16	45	23	38	G3/4"	M27X2	M22X1.5	22.5	97	107	39	57	78	88
20	50	35	49	G1"	M33X2	M33X2	25	128	145	54	77	108	127
25	60	35	49	G1 1/4"	M42X2	M33X2	30	133	150	54	93	108	143
30	70	35	49	G1 1/2"	M48X2	M33X2	35	138	155	54	108	108	143
40	90	35	49	G2"	M60X2	M33X2	45	148	165	54	130	108	165

1 Anti-clockwise rotation increases flow
Clockwise rotation reduces flow
2 Throttle fully open
3 Throttle closed

4 Multi color for repeat setting
5 Screw to lock flow setting
6 Hexagon 19 A/F
7 Panel thickness

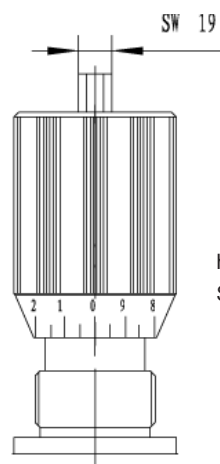
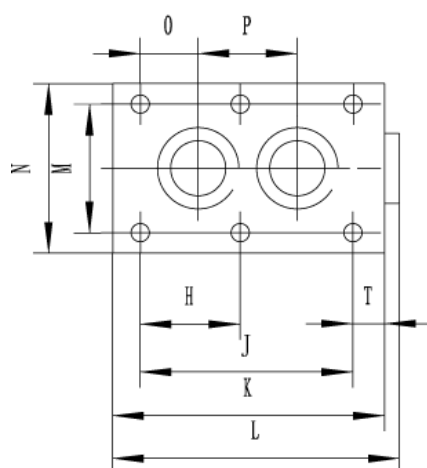
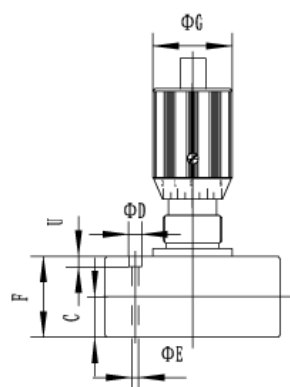
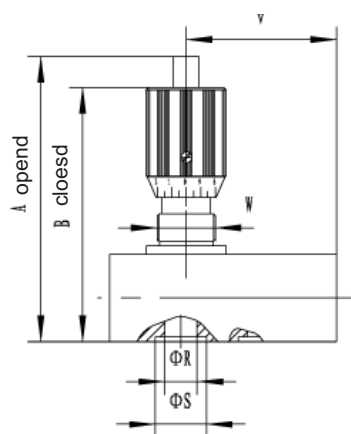
Unit Dimensions: type DVP

(dimensions in mm)



hexagon 19
Size 20 to 40

Size	A	B	D	E	F	G	H	J	K	M
6	69	64	11	6.6	18	24	-	19	35	28.5
8	80	73	11	6.6	20	24	-	35	47.5	33.5
10	85	78	11	6.6	25	29	-	33.5	51	38
12	99	89	11	6.6	25	29	-	38	75	44.5
16	114	104	14	9	30	38	38	76	93.5	54
20	165	148	14	9	45	38	47.5	95	111	60
25	165	148	18	11.5	45	49	60	120	143	76
30	170	153	20	14	50	49	71.5	143	171	92
40	170	153	20	14	50	49	67	133.5	192	111
Size	N	O	P	R	S	T	U	V	W	Weight(kg)
6	41.5	1.6	16	5	12.2	8	7	11	M14X1.5	0.2
8	46	4.5	25.5	7	13.7	6.5	7	13.5	M18X1.5	0.4
10	51	4	25.5	10	15.7	8.5	7	16	M18X1.5	0.6
12	57.5	4	30	13	21.8	18.5	7	26	M22X1.5	1.00
16	70	11.4	54	16	24.5	8.5	9	23.5	M22X1.5	1.70
20	76.5	19	57	22	31.5	8	9	34	M33X2	3.60
25	100	20.6	79.5	28.5	39.2	11	11	45	M33X2	5.50
30	115	23.8	95	31	41	15	13	39	M33X2	7.50
40	140	25.5	89	45	54	16	13	60	M33X2	8.20

Unit Dimensions: type DRVP
(dimensions in mm)

 hexagon 19
 Size 20 to 40

Size	A	B	C	D	E	F	G	H	J	K	L
6	74	69	11.5	11	6.6	23	24	-	19	41.5	45.5
8	84	77	13	11	6.6	24	24	-	35	63.5	67
10	87	80	13.5	11	6.6	27	29	-	33.5	70	74
12	106	96	16	11	6.6	32	29	-	38	80	84
16	129	119	22.5	14	9	45	38	38	76	104	109
20	170	153	26	14	9	50	38	47.5	95	127	132
25	178	161	29	18	11	58	49	60	120	165	170
30	195	178	37.5	20	14	75	49	71.5	143	186	192
40	220	203	50	20	14	100	49	67	133.5	192	198
Size	M	N	O	P	R	S	T	U	V	W	Weight(kg)
6	28.5	41.5	1.6	16	6	12.2	16.1	8	29.5	M14X1.5	0.26
8	33.5	46	4.5	25.5	8	13.7	14.3	10	42.5	M18X1.5	0.50
10	38	51	4	25.5	10	15.7	18.5	7	45	M18X1.5	0.80
12	44.5	57.5	4	30	13	21.8	21	7	45.5	M22X1.5	1.10
16	54	70	11.4	54	17	24.5	16	12	54	M22X1.5	2.50
20	60	76.5	19	57	22	31.5	16	12	70	M33X2	3.90
25	76	100	20.6	79.5	28.5	39.2	30	13	83	M33X2	6.70
30	92	115	23.8	95	31	41	28	13	87.5	M33X2	11.00
40	111	140	25.5	89	45	54	42.5	18	116	M33X2	17.50

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	2-way flow control valve,Type 2FRM			RE:28138/12.2004
	Size 5	up to 21MPa	up to 15 L/min	Replaces: RE28138/05.2001

Features:

- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Pressure compensator stroke limiter, optional
- Decrease of start-up jump
- Flow control in both directions using a rectifier sandwich plate
- Lockable rotary knob



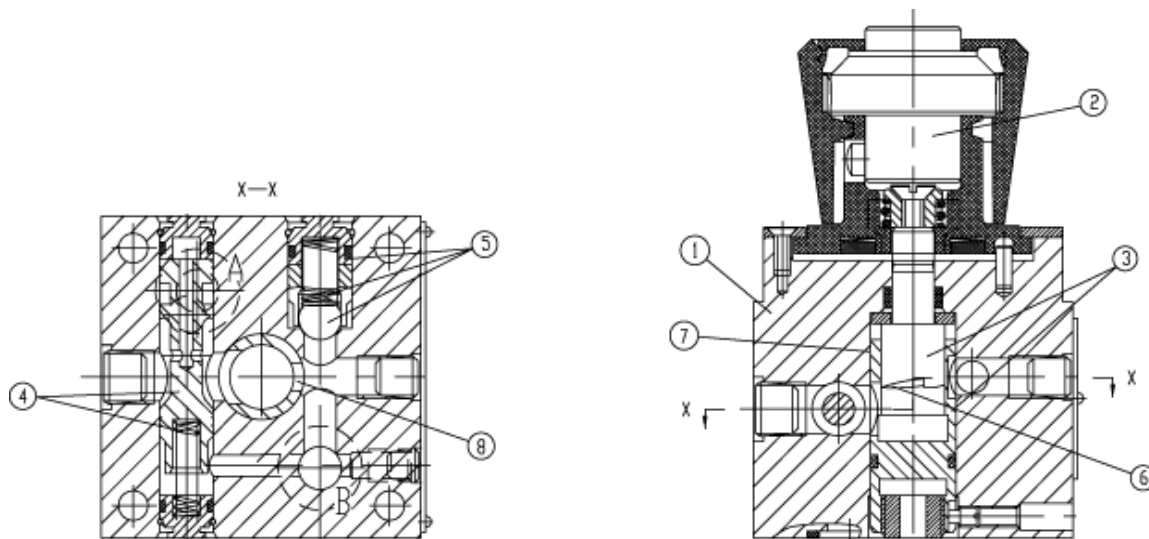
Function , section

The 2FRM flow valve is a 2-way flow control valve.It mainly consists of housing(1),setting element(2),orifice(3), pressure compensator(4)optionally with stroke limiter as well as check valve(5) and is used for the throttling of a flow at low pressure and temperature dependency.

The throttling cross section is set by the rotation of the curve bolt(7).To keep the flow constant independent from the pressure at the throttling point(8) a pressure compensator (4)is connected.The temperation indepdance is the result of the throttling point being constructed as an orifice.

The free flow return from B to A is via the check valve(5).

In order to reach a controlled through flow of the valve in either direction there is the possibility to install a rectifier sandwich plate type Z4S below the flow control valve.



Ordering code: 2-way flow control valves

2FRM5-30 B / / / *

Series 30 (30 to 39: unchanged installation and connection dimensions) =30

Further details in clear text

Technology of Beijing Huade Hydraulic = B

No code = Mineral oil
V = Phosphate ester
(other seals on enquiry)

Progressive	Progressive	flow direction A → B
0.2L/min=0.2Q	10L/min=10Q	
0.6L/min=0.6Q	15L/min=15Q	
1.2L/min=1.2Q		
3L/min=3Q		
6L/min=6Q		

No code = without pressure compensator stroke limiter
B = with pressure compensator stroke limiter

Technical data: (for applications outside these parameters, please consult us!)

General

Hydraulic fluid	Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)
Temperature range (°C)	-30 ~ + 80
Viscosity range (mm ² /s)	10 ~ 800

Rectifier sandwich plate

Flow, max (L/min)	15
Operating pressure (MPa)	up to 21
Cracking pressure (MPa)	0.1
Weight (Kg)	0.6

2-way flow control valve

Flow q_v max (L/min)	0.2	0.6	1.2	3.0	6.0	10.0	15.0
Δp with free return flow B → A, q_v -dependent (MPa)	0.05	0.05	0.06	0.09	0.18	0.36	0.67
Flow control	temperature-stable	± 5%	± 3%	± 2%			
	pressure-stable (up to $\Delta p = 21.0$ MPa)	± 2%				± 4%	
Operating pressure, max. - port A (MPa)	to 21						
Minimum pressure difference range (MPa)	0.3 to 0.5					0.6 ~ 0.8	
Degree of contamination (μm)	25 (Q < 5L/min)			10 (Q < 0.5L/min)			
Weight (Kg)	1.6						

Ordering code: Rectifier sandwich plate

Z4S5-10 B / / *

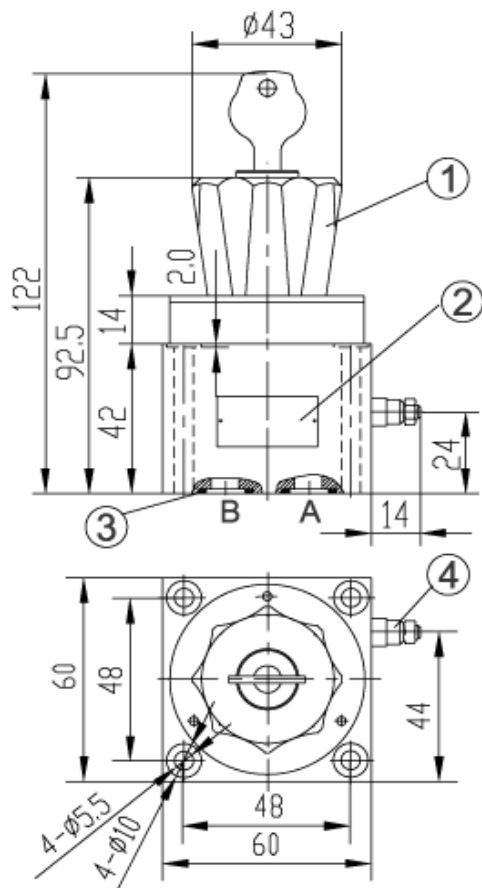
Series 10 (10 to 19: unchanged installation and connection dimensions) = 10

Further details in clear text

Technology of Beijing Huade Hydraulic = B

No code = Mineral oil
V = Phosphate ester

Ordering code: 2-way flow control valve



1. Adjustment element, lockable rotary knob (may be locked in any position)

Turning range $300^\circ = 10$ scale divisions

Tightening torque $M_A = 0.5$ Nm

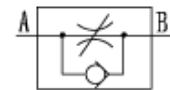
2. Nameplate

3. O-ring 12 x 2

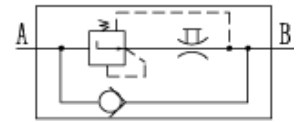
4. Pressure compensator stroke limiter

Symbols

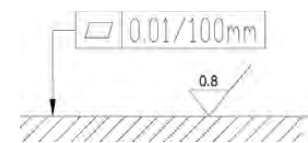
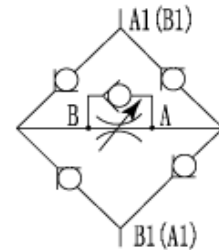
Flow control valve
simplified



Flow control valve
detailed



Rectifier sandwich plate



Required surface finish
of the mating piece

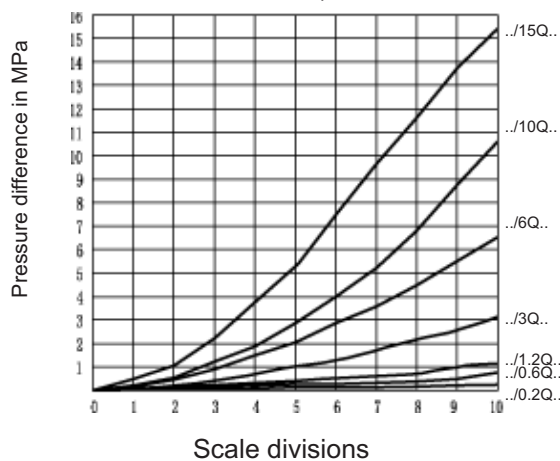
Subplates for: see page 69

G 44/01 (G 1/4") G 44/02 (M14 x 1.5)

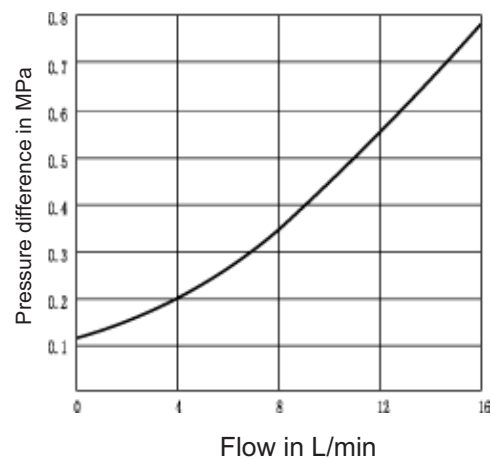
G 45/01 (G 1/2") G 45/02 (M22 x 1.5)

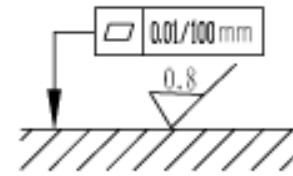
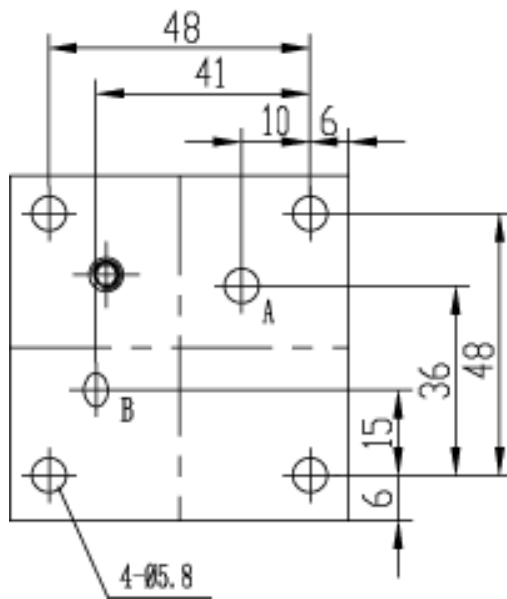
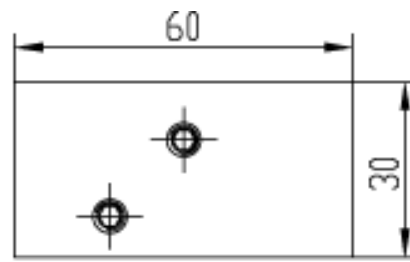
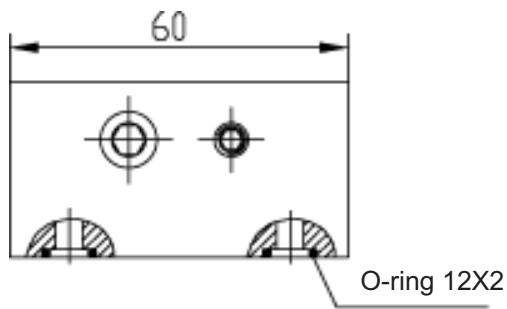
Characteristic curves: 2-way flow control valve (measured at $v = 41$ mm²/s and $t = 50^\circ\text{C}$)

Flow q_v dependent on scale (flow
control from A to B):



Operating curve of rectifier sandwich plate





Required surface finish of the mating piece

BEIJING HUADE HYDRAULICS INDUSTRIAL GROUP CO.,LTD.	2-way flow control valve Type 2FRM 6			RC:28160/12.2004
	Size 6	up to 31.5MPa ¹⁾	up to 25 L/min	Replaces: RC28160/05.2001

Features:

- External closing of the pressure compensator, optional
- Check valve, optional
- Rotary knob with scale
- Lockable, optional

1) When used in conjunction with a rectifier plate up to 21 MPa



Function, section:

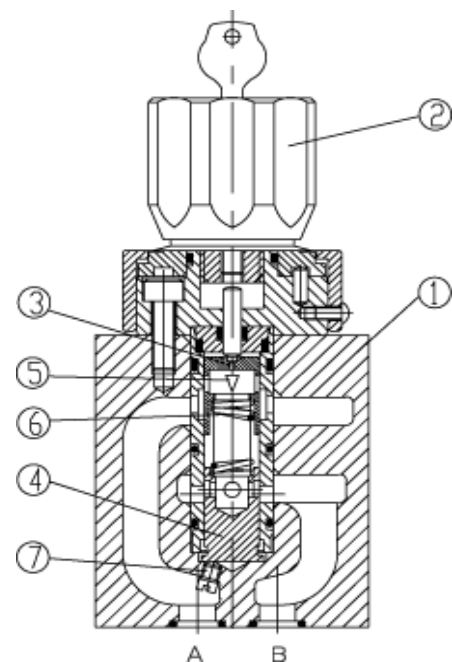
General:

The flow control valve type 2 FRM is a 2-way flow control valve. It is used for maintaining a constant flow, independent of pressure and temperature. The valve basically comprises of housing (1), rotary knob (2), orifice (3), pressure compensator (4) and an optional check valve.

Flow control valve type 2FRM 6 B..-20B/M

(without external closing, without check valve)

Flow from port A to B is throttled at throttle position (5). The throttle cross-section is varied by turning rotary knob (2). In order to keep the flow constant, independent of pressure, a pressure compensator (4) is fitted in port B downstream of the throttle position (5). The compression spring (6) presses orifice (3) and pressure compensator (4) outwards against their respective stops and thus keeps pressure compensator (4) in the open position when there is no flow through the valve. When fluid flows through the valve, the pressure acting in port A applies a force to pressure compensator (4) via orifice (7). The pressure compensator (4) moves into the compensating position until the forces balance. If the pressure in port A rises, pressure compensator (4) moves in the closing direction, until a balance of forces is once more attained. Due to this continuous compensating action of the pressure compensator, a constant flow is obtained. In order to control a flow through the valve in both directions, a rectifier sandwich plate type Z4S 6 may be fitted below this flow control valve.



Type 2FRM6B36-20B/...M...

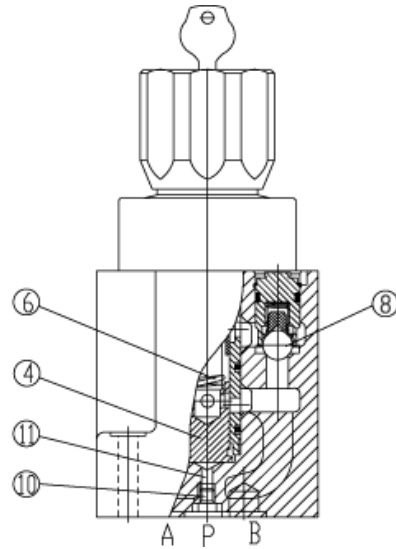
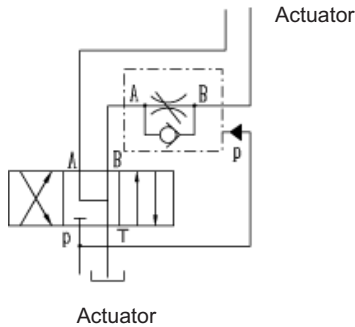
Type 2FRM 6 A..-20B/..R

The function of this valve is basically the same as that of valve type 2FRM 6 B..-20B/..M.

However, this type of flow control valve is provided with an external port permitting the pressure compensator (4) to be connected to via port P(11) . The external pressure acting in port P(11) via orifice (10) holds pressure compensator (4) closed against the force of compression spring (6). When the connected directional valve (9) is actuated to permit flow from P to B, closed loop control is achieved as with type 2 FRM 6 B. Thus a jump on start-up is avoided.

This version with external closing of the compensator may only be used for meter-in control.

Free return flow from port B to A is via check valve (8).



Symbols: 2-way flow control valves (simplified, detailed)

<p>Flow control valve: simplified (without check valve; without external closing)</p> <p>Type 2FRM6B..-20B/..M</p>	<p>Flow control valve: simplified (with check valve; without external closing)</p> <p>Type 2FRM6B..-20B/..R</p>	<p>Flow control valve: simplified (without check valve; with external closing)</p> <p>Type 2FRM6B..-20B/..M</p>	<p>Flow control valve: simplified (with check valve; with external closing)</p> <p>Type 2FRM6A..-20B/..R</p>
<p>Flow control valve: detailed (without check valve; without external closing)</p> <p>Type 2FRM6B..-20B/..M</p>	<p>Flow control valve: detailed (without check valve; with external closing)</p> <p>Type 2FRM6A..-20B/..M</p>		
<p>Flow control valve: detailed (with check valve; without external closing)</p> <p>Type 2FRM6B..-20B/..R</p>	<p>Flow control valve: detailed (with check valve; with external closing)</p> <p>Type 2FRM6A..-20B/..R</p>		

Ordering details: 2-way flow control valve

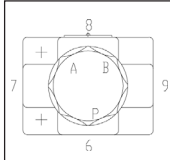
2FRM6 -20 B / *

With external closing of the pressure compensator (repression of jump at start) = A
Without external closing of the pressure compensator = B

Further details in clear text

Lockable rotary knob with scale = 3
Rotary knob with scale = 7

No code = Mineral oil
V = Phosphate ester (other seals on request)



Zero position labels at port P=6
Zero position labels at port A=7
Zero position labels at port T=8
Zero position labels at port B=9

R = with check valve
M = without check valve

Series 20 to 29(20 to 29: unchanged installation and connection dimensions) = 20

Flow (A to B)
0.2 Q = up to 0.2 L/min
0.6 Q = up to 0.6 L/min
1.5 Q = up to 1.5 L/min
3 Q = up to 3.0 L/min
6 Q = up to 6.0 L/min
10 Q = up to 10.0 L/min
16 Q = up to 16.0 L/min
25 Q = up to 25.0 L/min

Technology of Beijing Huade Hydraulic =B

Technical data: 2-way flow control valve (for applications outside these parameters, please consult us!)

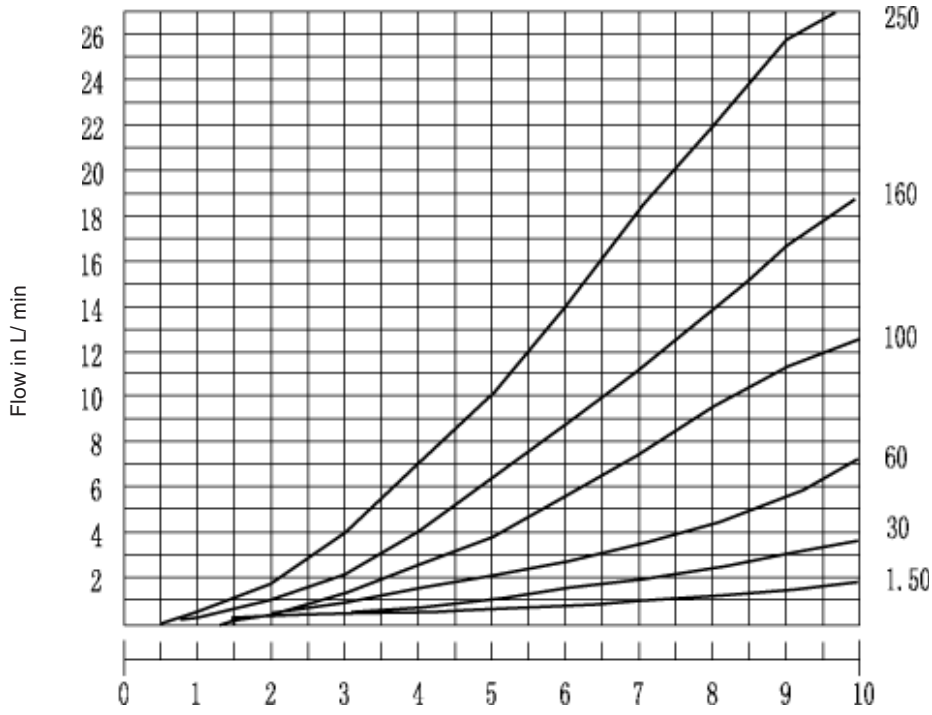
Pressure fluid	Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)						
Pressure fluid temperature range (°C)	-30 to +80						
Viscosity range (mm ² /s)	10 to 800						
Flow q _v max (L/min)	1.5	3.0	6.0	10.0	16.0	25.0	
Flow q _v min to 10MPa (L/min)	0.015	0.015	0.025	0.05	0.07	0.1	
Flow q _v min to 31.5MPa (L/min)	0.025	0.025	0.025	0.05	0.07	0.1	
Pressure difference Δp for free return flow B → A (MPa)	0.1	0.12	0.17	0.25	0.38	0.66	
Minimum pressure difference (MPa)	0.6 to 1.2						
Pressure stability up to Δp = 31.5 MPa (%)	± 2 (Qmax)						
Maximum operating pressure at port A (MPa)	to 31.5						
Contamination (μm)	25 (Q < 5L/min) 10 (Q < 0.5L/min)						
Weight (Kg)	approx 1.3						

Attention!

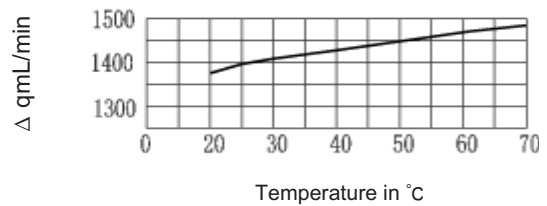
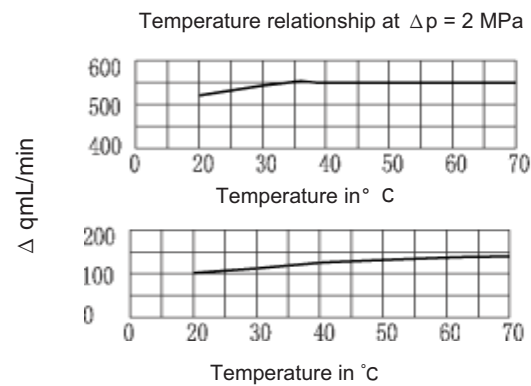
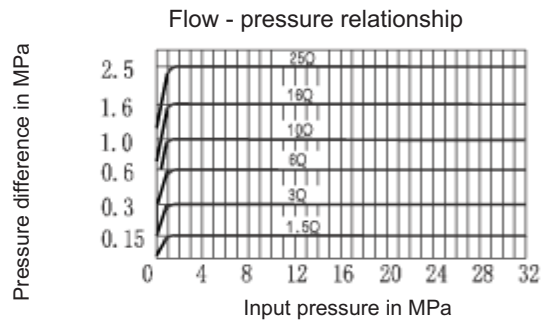
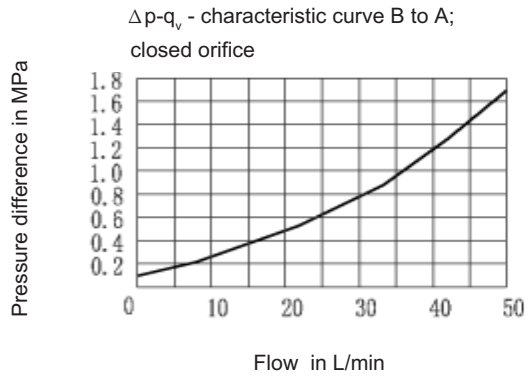
The pressure loss from P (at the inlet of the directional valve) to A (at the inlet of the flow control valve) is noticeable at low flows.

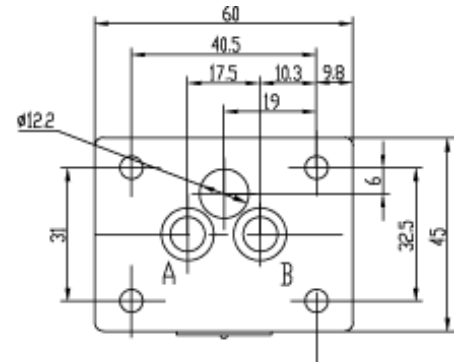
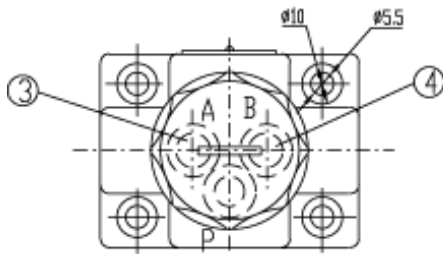
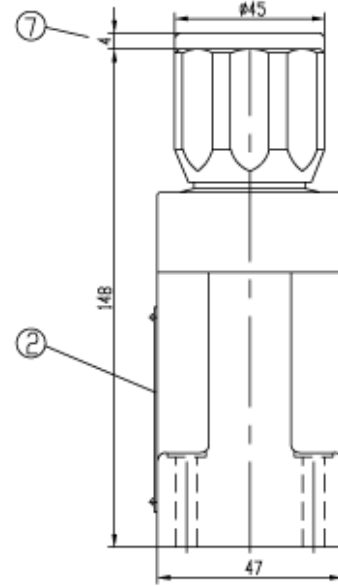
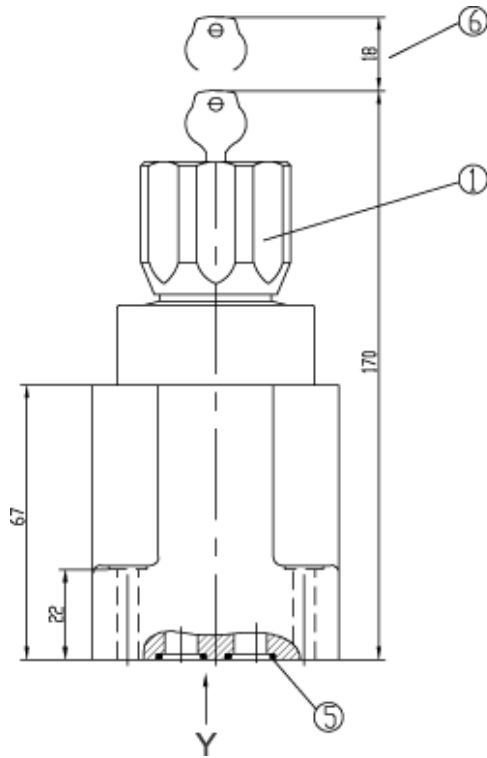
Characteristic curves:(measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50^\circ\text{C}$)

Flow in relationship to the scale setting (flow control from A to B)

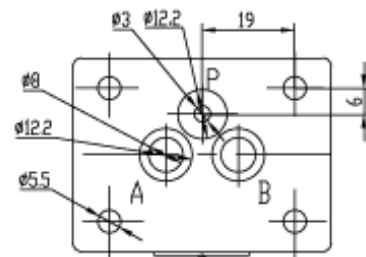


Scale divisions





View"Y" Type 2FRM6B



View"Y" Type 2FRM6A

- 1 Lockable rotary knob with scale
- 2 Nameplate
- 3 Inlet "A"
- 4 Outlet "B"
- 5 O-ring 9.25 x 1.78 for ports A, B, P and T
- 6 Space required to remove key
- 7 Rotary knob with scale (adjustment element "7")

Subplates: see page 68

G341/01 (G1/4")	G341/02 (M14x1.5)
G342/01 (G3/8")	G342/02 (M18x1.5)
G502/01 (G1/2")	G502/02 (M22x1.5)

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	2-way flow control valve,Type 2FRM			RE:28383/12.2004
	Size 10 and 16	up to 31.5MPa	up to 160 L/min	Replaces: RE28383/05.2001

Features:

- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Pressure compensator stroke limiter, optional
- Mechanical operation
- Start-up jump reduction
- Flow control in both directions using a rectifier sandwich plate

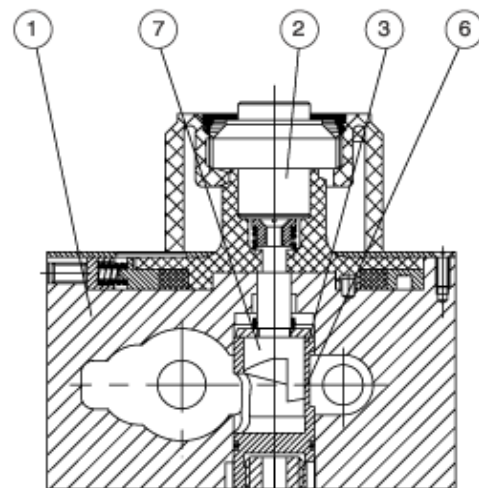
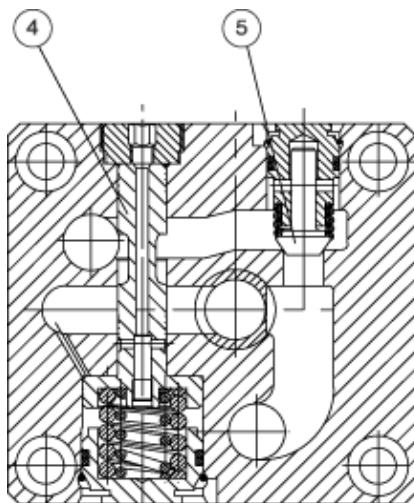


Functional, section

Flow control valves are 2-way flow control valves. They are used to maintain a flow constant independently of pressure and temperature.

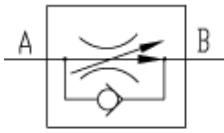
The valves basically consist of the housing (1), orifice bushing(3), pressure compensator (4) with optional stroke limiter,check valve(5), adjustment element (2).

The flow from channel A to channel B is throttle at the orifice (6).In order to maintain the flow across the orifice constant, a pressure compensator is connected upstream of the orifice (6). The flow is maintained largely independent of temperature due to the orifice design.Free return flow from channel B to channel A is directed via the check valve (5). The flow is only controlled from A to B. In order to control the flows in both directions a rectifier sandwich plate type Z4S can be installed below the flow control valve.

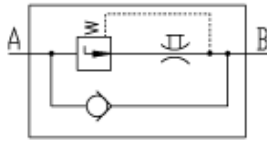


Symbols: 2-way flow control valve

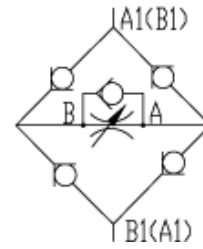
Simplified



Detailed



Rectifier sandwich plate



Ordering code: 2-way flow control valve

2FRM -20 B / *

Size10 =10
Size16 =16

Series 20 to 29(20 to 29: unchanged installation and connection dimensions) = 20

Technology of Beijing Huade Hydraulic =B

Size 10, linearity	to 2L/min	=2L	Flow range A → B
	to 5L/min	=5L	
	to 10L/min	=10L	
	to 16L/min	=16L	
	to 25L/min	=25L	
	to 35L/min	=35L	
Size 16, linearity	to 50L/min	=50L	
	to 40L/min	=40L	
	to 60L/min	=60L	
	to 80L/min	=80L	
	to 100L/min	=100L	
	to 125L/min	=125L	
	to 160L/min	=160L	

Further details in clear text

No code = Mineral oil
V = Phosphate ester

No code= Without pressure compensator stroke limiter
B = With pressure compensator stroke limiter

Ordering code: Rectifier sandwich plate

Z4S -13 B / *

Size 10 = 10
Size 16 = 16

Series 10 to 19(10 to 19: unchanged installation and connection dimensions) = 13

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code= Without pressure compensator stroke limiter
B = With pressure compensator stroke limiter

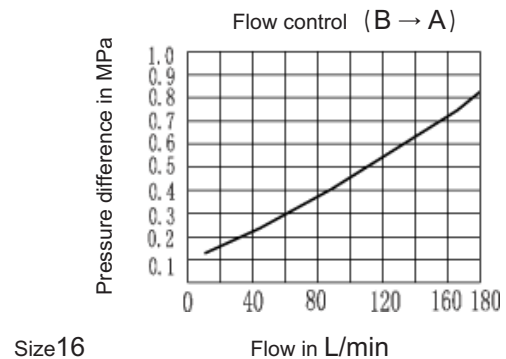
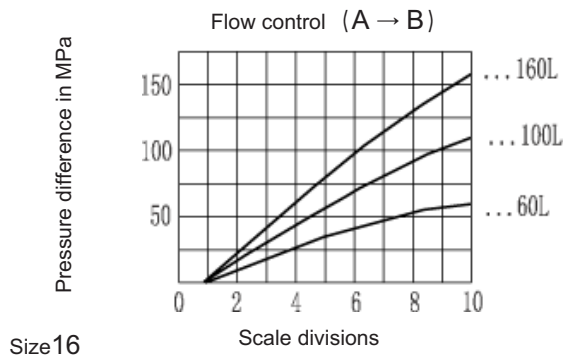
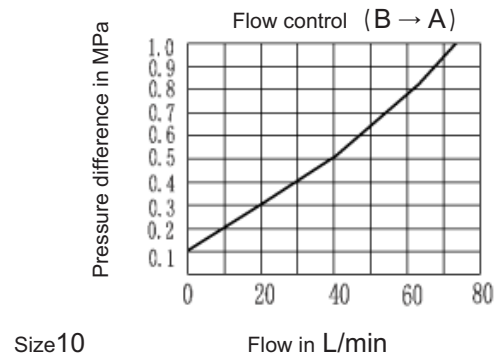
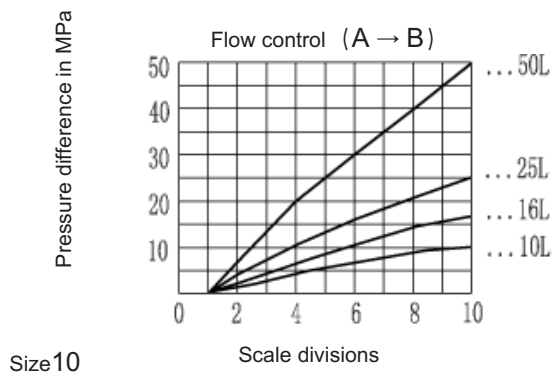
Technical data (For applications outside these parameters, please consult us !)

General	
Hydraulic fluid	Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Temperature range (°C)	-30 to +80
Viscosity range (mm ² /s)	10 to 800

Rectifier sandwich plate		
Flow, max (L/min)	Size 10	Size 16
	up to 50	up to 160
Operating pressure (MPa)	up to 31.5	
Cracking pressure (MPa)	0.15	
Weight (Kg)	Size10	Size16
	3.2	9.3

Flow q_v max (L/min)	Size10	Size16
	10 16 25 50	60 100 160
Δp with free return flow B → A q_v -dependent (MPa)	Size10	Size16
	0.2 0.25 0.35 0.6	0.28 0.43 0.73
Flow control	temperature-stable (-20 to +80°C)	± 2% (q_v max)
	pressure-stable (up to $\Delta p = 31.5$ MPa)	± 2% (q_v max) ± 5% (q_v max)
Operating pressure, max. - port A (MPa)	up to 31.5	
Minimum pressure differential range (MPa)	Size10	Size16
	0.3...0.7	0.5...1.2
Degree of contamination (μ m)	25 ($q_v < 5$ L/min) 10 ($q_v < 0.5$ L/min)	
Weight (Kg)	Size10	Size16
	5.6	11.3

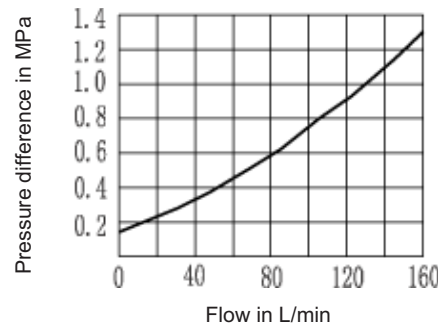
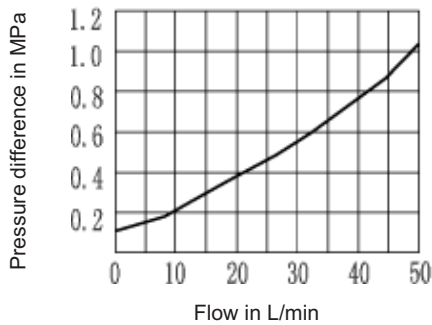
Characteristic curves: 2-way flow control valve (measured at $v = 41$ mm²/s and $t = 50$ °C)



Characteristic curves: Rectifier sandwich plate (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

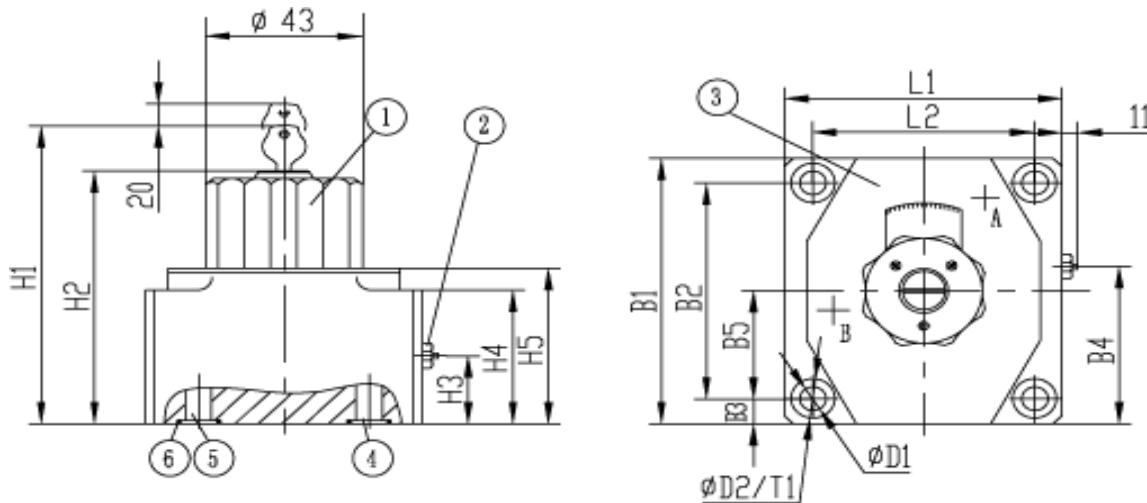
Pressure difference Δp is the same for both directions of flow

Flow q_v from A \rightarrow B (B \rightarrow A)



Unit dimensions: 2-way flow control valve type 2FRM

(Dimensions in mm)



1. Adjustment element, lockable rotary knob (may be locked in any position) Turning range $300^\circ = 10$ scale divisions

$M A = 0.7 \text{ Nm}$

2. Pressure compensator stroke limiter, optional

3. Nameplate

4. Input "A"

5. Output "B"

6. O-ring 18.66 x 3.53 (size 10)

O-ring 26 x 3 (size 16)

Subplates for: see page 69

Size 10: G279/01 (G1/2") G279/02 (M22X1.5)

G280/01 (G3/4") G280/02 (M27X1.5)

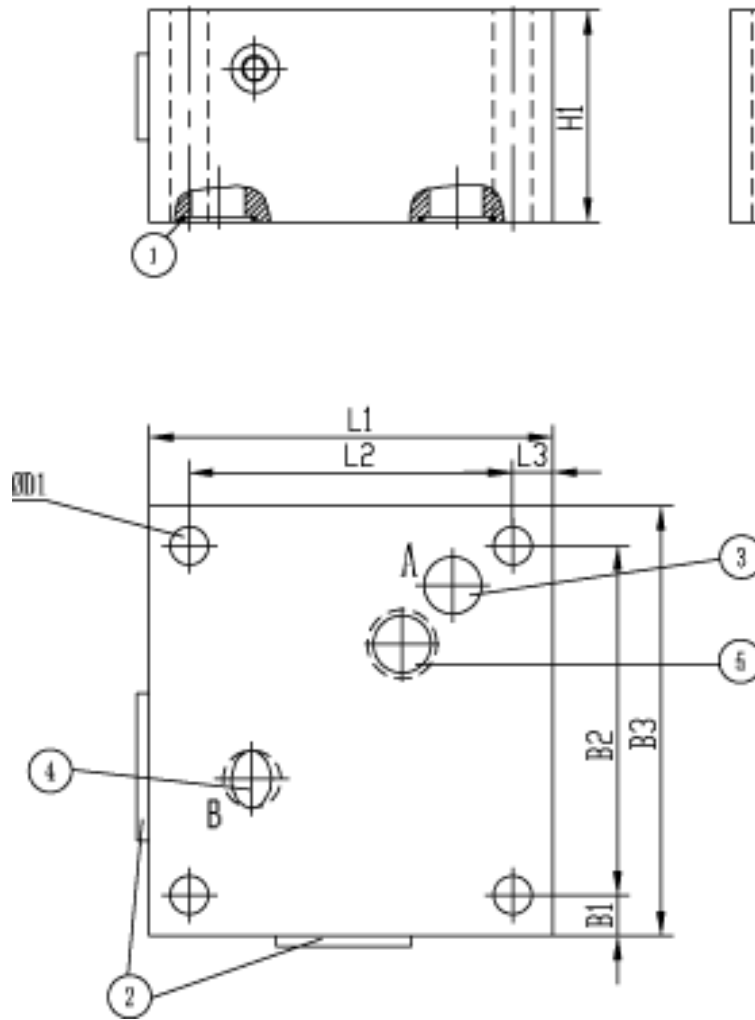
Size 16: G281/01 (G1") G281/02 (M33X2)

G282/01 (G1 1/4") G282/02 (M42X1.5)

Size	B1	B2	B3	B4	B5	D1	D2	H1
10	101.5	82.5	9.5	68	35.5	9	15	125
16	123.5	101.5	11.0	81.5	41.5	11	18	147
Size	H2	H3	H4	H5	L1	L2	T1	
10	95	26	51	60	95	76	13	
16	117	34	72	82	123.5	101.5	12	

Unit dimensions: Rectifier sandwich plate

(Dimensions in mm)



- 1. O-ring 18.66 x 3.53 (size 10)
O-ring 26 x 3 (size 16)
- 2 Nameplate
- 3. Input "A"
- 4. Output "B"
- 5 only for size16,the orifice is sealed by o-ring,thus, fitting element doesn't drilling it.

Valve fixing screws for:	Size10	4-M8x50-10.9 (GB/T70.1-2000)						
	Size16	4-M8x80-10.9 (GB/T70.1-2000)						
Valve fixing screws for inserting a rectifier sandwich plate between the flow control valve and subplate have to be ordered separately.		M8x100-10.9 (GB/T70.1-2000)						
	Size 10	4 fixing screws						
	Size 16	4 fixing screws M10x160-10.9 (GB/T70.1-2000)						
Size	B1	B2	B3	φ D1	H1	L1	L2	L3
10	9.5	82.5	101.5	9	50	95	76	9.5
16	11	101.5	123.5	11	85	123.5	101.5	11

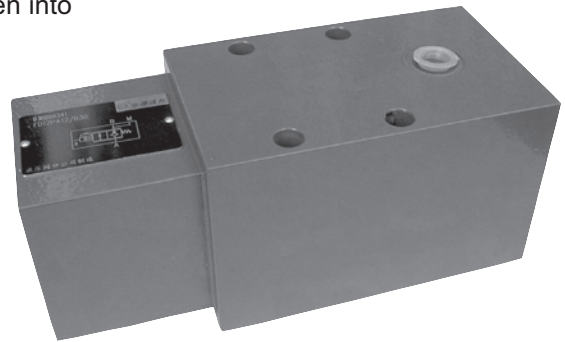
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check-Q-meter type FD			RE27551/12.2004
	Size 12 ,16,25,32	up to 31.5MPa	up to 560 L/min	Replaces: RE27551/05.2001

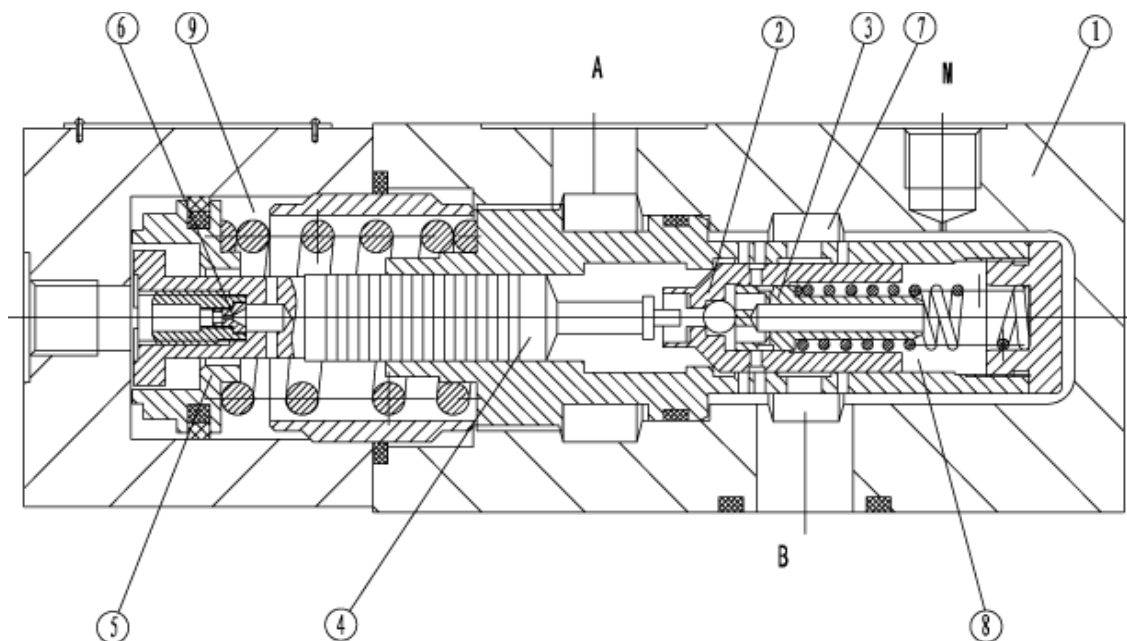
Features:

- Porting pattern to DIN 24 340, from D,ISO 5781 and CETOP-RP 121H
- Pilot operated check valve, leak-free,- The check-Q-meter controls the returning flow q_{v2} in relation to the flow being directed into the opposite side of the actuator q_{v1} . With cylinders the area ratio($q_{v2} = q_{v1} \varphi$) has to be taken into account,
- By-pass valve, free-flow in opposite direction,
- Optional built-in secondary pressure relief valve (only for valve with flange connections).



Functional, section

Check-Q-meters are used in hydraulic systems to influence the speeds of hydraulic motors and cylinders independent of the load (prevents running away). In addition there is an isolator function for pipe burst safety. The check-Q-meter comprises basically of the housing (1), main poppet (2), pilot part (3), pilot spool (4), damping spool (5) and pilot damping (6).



Ordering Code

FD					B	/		*
----	--	--	--	--	---	---	--	---

Nominal size 12	= 12
Nominal size 16	= 16
Nominal size 25	= 25
Nominal size 32	= 32

For manifold mounting (cartridge valve)	= K
For sub-plate mounting	= P
For SAE flange connections DBV	= F

without secondary pressure relief valve	= A
with secondary pressure relief valve (only for valve with flange connections)	= B

Series 12 (nominal size 12, 16, 25)	= 12
Series 11 (nominal size 32) (10 to 19: unchanged installation and connection dimensions)	= 11

Operation pressure of secondary pressure relief valve

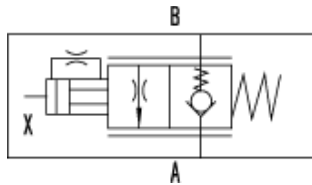
No code= Mineral oil
V= Phosphate ester

B00 = Without orifice
B30 = Orifice Φ 0.30 mm (sizes 12 and 16)
B40 = Orifice Φ 0.40 mm (size 25)
B60 = Orifice Φ 0.60 mm (size 32)
(other orifice diameters on request)

B = Technology of Beijing Huade Hydraulic

Symbols

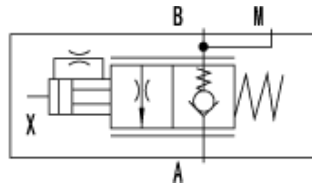
Without secondary pressure relief valve



Valve type:

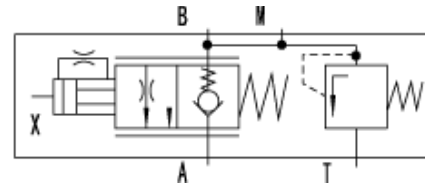
FD 12 KA 12/B30..
FD 16 KA 12/B30..
FD 25 KA 12/B40..
FD 32 KA 11/B60..

With secondary pressure relief valve



Valve type:

FD 12 PA 12/B30..
FD 16 PA 12/B30..
FD 25 PA 12/B40..
FD 32 PA 11/B60..
FD 12 FA 12/B30..
FD 16 FA 12/B30..
FD 25 FA 12/B40..
FD 32 FA 11/B60..



Valve type:

FD 12 FB 12/B30..
FD 16 FB 12/B30..
FD 25 FB 12/B40..
FD 32 FB 11/B60..

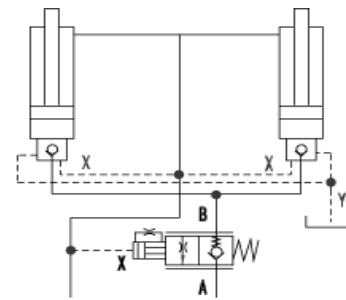
Circuit examples

Note:

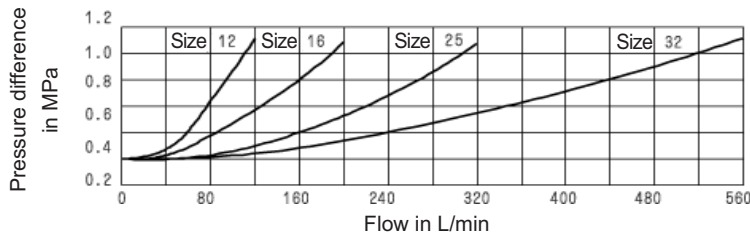
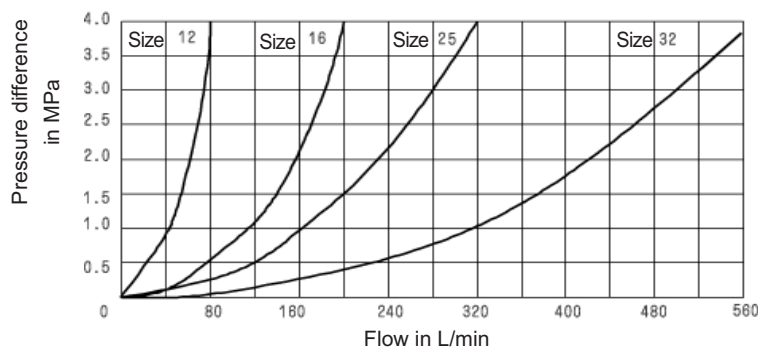
Two check-Q-meters cannot be used to control two cylinders which are forced mechanically to move together, as synchronisation and the same pressure cannot be guaranteed in each cylinder.

Therefore, the cylinders have to be equipped with two pilot operated check valves, type SL. The check-Q-meter is fitted in a common line.

In this case, the load pressure must not exceed 20MPa !



Characteristic curves (measured at $v = 41 \text{ mm}^2$ and $t = 50^\circ\text{C}$)



Pressure difference Δp in relation to flow q_v , measured at throttle position:
Throttle fully open
($P_x = 6 \text{ MPa}$)
B to A

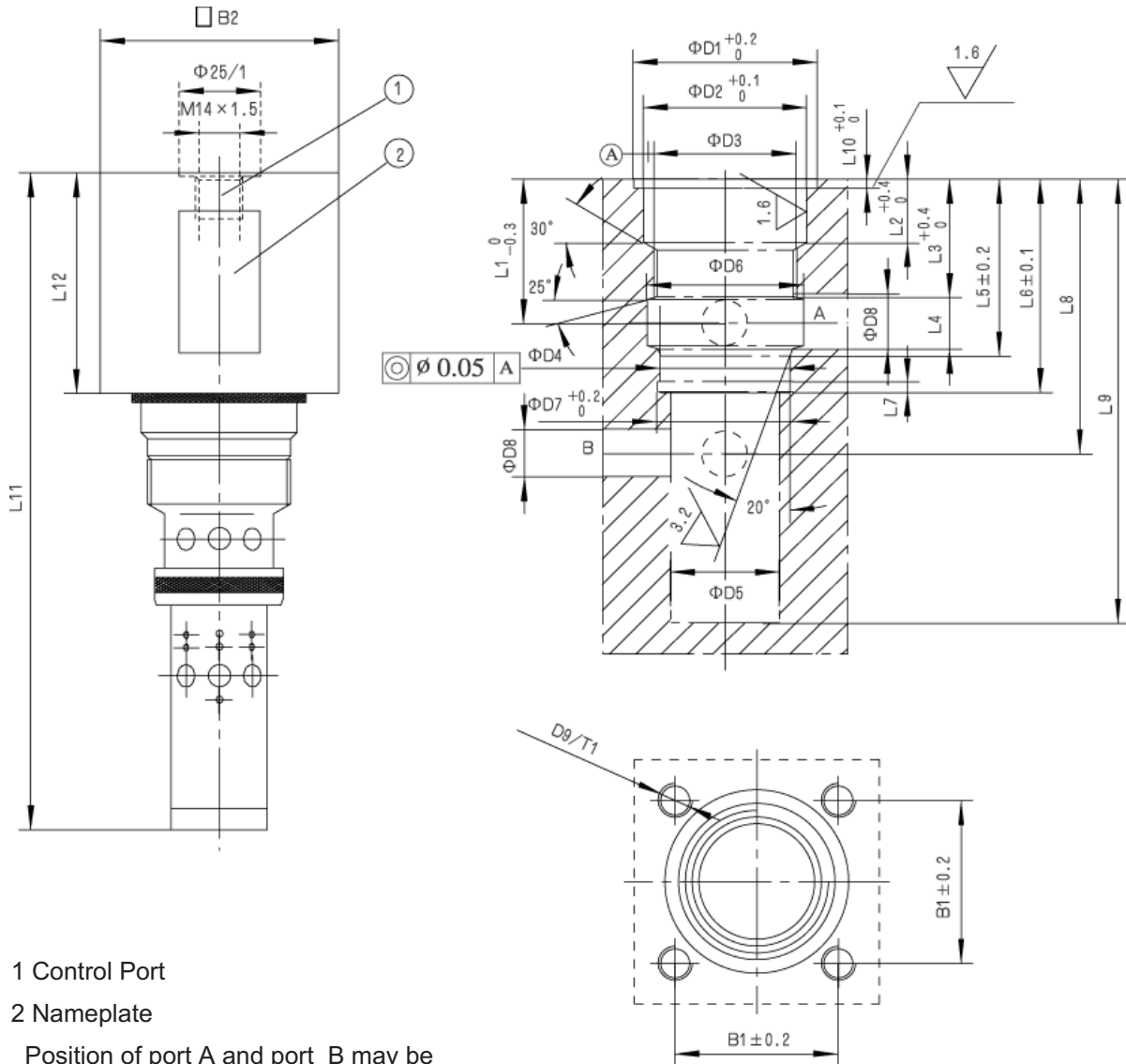
Pressure difference in MPa
Flow in L/min
Pressure difference Δp in relation to flow q_v , measured over the check valve
A to B

Technical data (for applications outside these parameters, please consult us!)

Operating pressure, ports A, X	(MPa)	to 31.5
Operating pressure, port B	(MPa)	to 42
Pilot pressure, port X (flow control range)	(MPa)	min. 2 to 3.5, max. 31.5
Cracking pressure, A to B	(MPa)	0.2
Setting pressure for secondary pressure relief valve	(MPa)	to 40
Flow	(L/min)	80 (size12), 200 (size16) 320 (size25), 560 (size32)
Area ratio of the pre-opening		$\frac{\text{poppet seat area}}{\text{area of pilot spool}} = \frac{1}{20}$
Pressure fluid temperature range	($^\circ\text{C}$)	-30 to +80
Viscosity range	(mm^2/s)	10 to 800
Pressure fluid		Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)

Unit dimensions: for SAE flange connections, without secondary pressure relief valve

(Dimensions in mm)



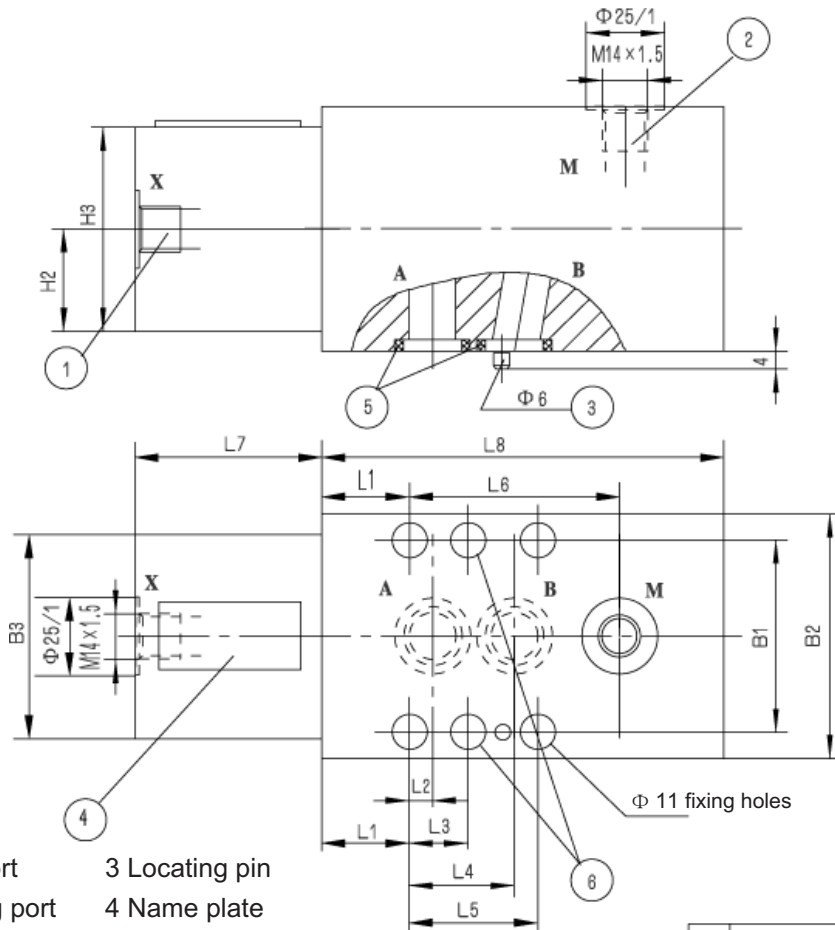
1 Control Port

2 Nameplate

Position of port A and port B may be arranged as desired, but do not occupy the position of the fixing screw holes

Type	B1	B2	D1	D2	D3	D4	D5	D6	D7	D8	D9	T1	L1	L2	L3	L4	L5	L6
FD12KA10	48	70	54	46	M42X2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
FD16KA10	48	70	54	46	M42X2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
FD25KA10	56	80	60	54	M52X2	48	40	60	48.6	25	M12	19	50	19	39	22	65	80
FD32KA10	66	95	72	65	M64X2	58	52	74	58.6	30	M16	23	52	19	40	25	71	85

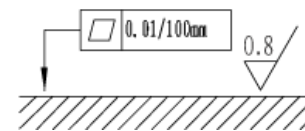
Type	L7	L8	L9	L10	L11	L12	Size	Valve fixing screws/tighting torque M_A (Nm)	Weight	
FD12KA12	3	78	128	2.75	191	65	12	4-M10 × 70-10.9	69	2.8kg
RD16KA12	3	78	128	2.75	191	65	12	4-M10 × 70-10.9	69	2.8kg
RD25KA12	4	105	182	2.3	253	75	25	4-M12 × 80-10.9	120	2.8kg
RD32KA11	4	115	198	2.3	289	94	32	4-M16 × 100-10.9	295	7.5kg



- 1 Control port
- 2 Measuring port
- 3 Locating pin
- 4 Name plate
- 5 O-ring
- 6 Valve fixing holes(for size 32,6,the other 4)

Subplates for:see page 70

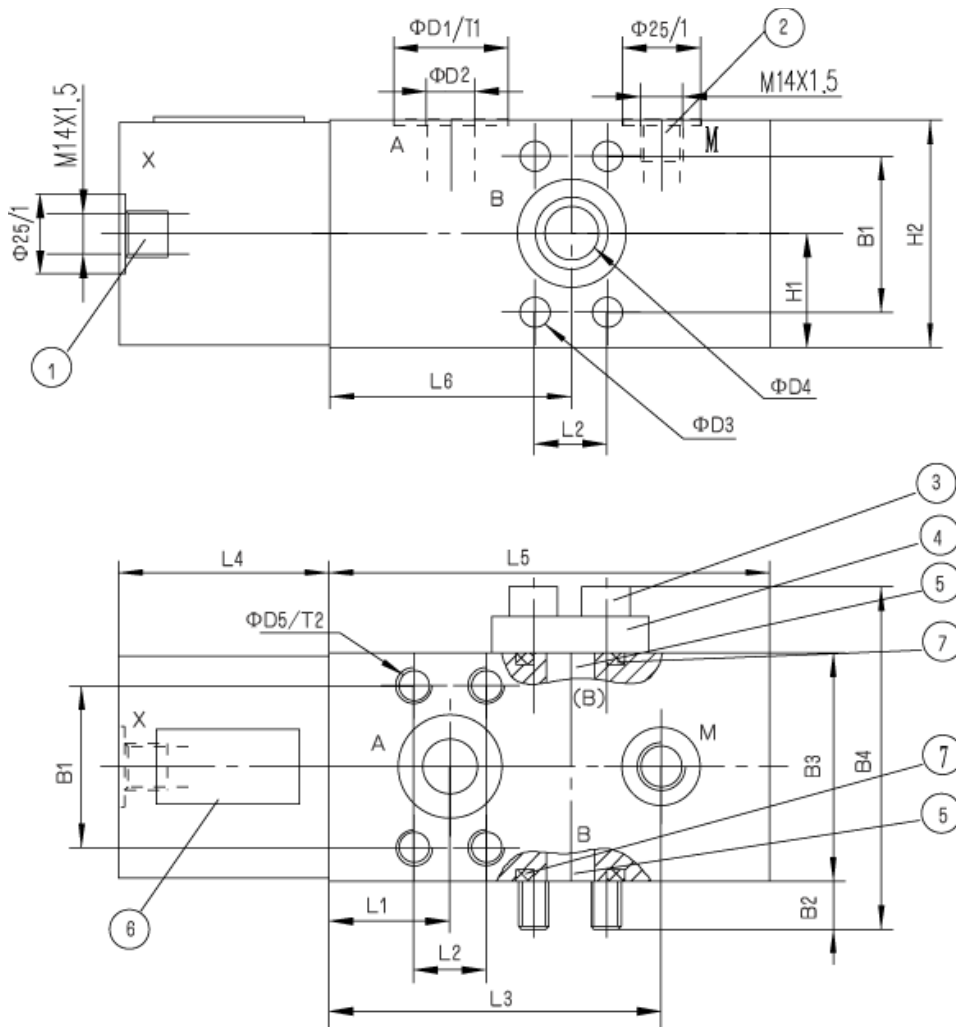
- NG12、 16: G460/01 G460/02 NG25: G412/01 G412/02
- G461/01 G461/02 G413/01 G413/02
- NG32: G414/01 G414/02
- G415/01 G415/02



Required surface finish of mating piece

Type	B1	B2	B3	H1	H2	H3	L1	L2
FD 12 PA12	66.5	85	70	85	42.5	70	32	7
FD 16 PA12	66.5	85	70	85	42.5	70	32	7
FD 25 PA12	79.5	100	80	100	50	80	39	11
FD 32 PA11	97	120	95	120	60	95	35.5	16.5

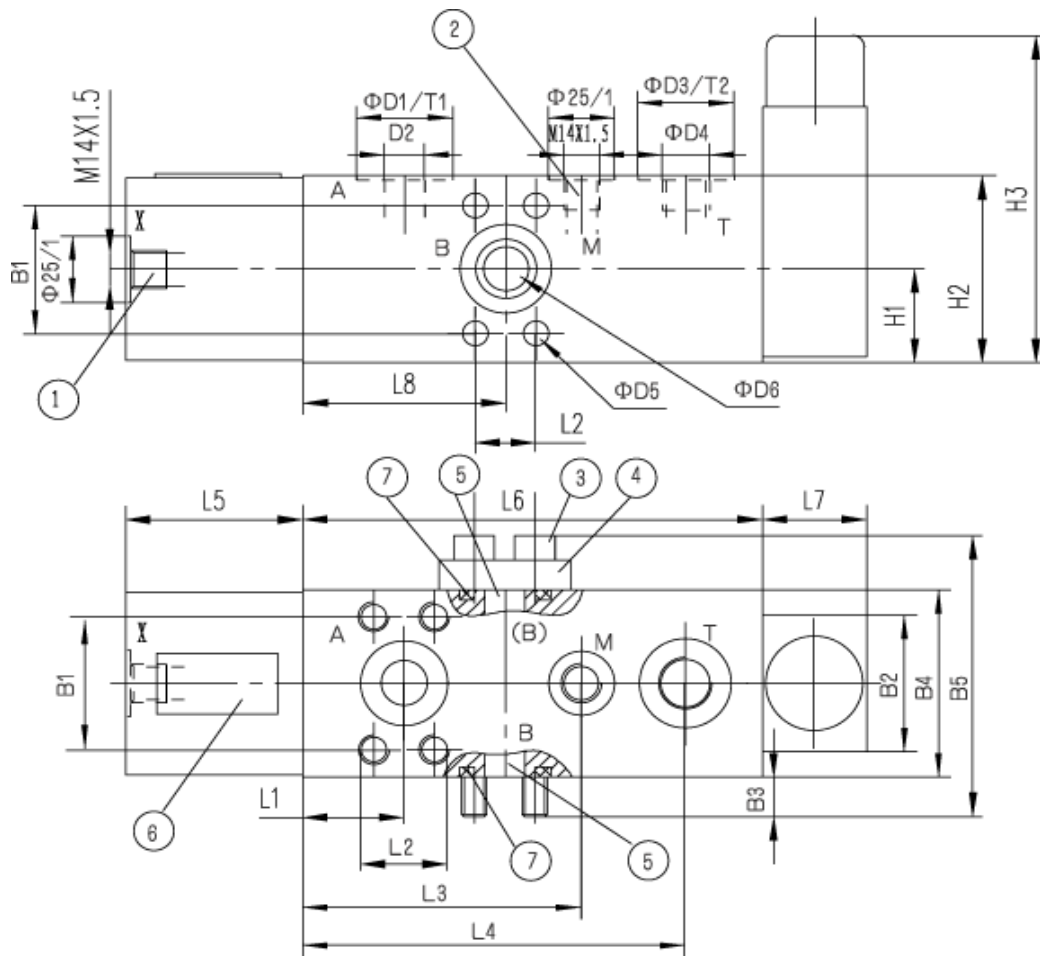
Type	L3	L4	L5	L6	L7	L8	Weight	O-Ring
FD 12 PA12	-	35.5	43	73	65	140	9kg	21.3x2.4
FD 16 PA12	-	35.5	43	73	65	140	9kg	21.3x2.4
FD 25 PA12	-	49	60.5	109	75	200	18kg	29.82x2.62
FD 32 PA11	42	67.5	84	119.5	94	215	24kg	38x3



- 1 Control port 3 Flange fixing screws 5 Optional port B
- 2 Measuring port 4 Blanking flange 6 Nameplate
- 7 O-ring

Type	B1	B2	B3	B4	D1	D2	D3	D4	D5	H1	H2
FD12FA12	50.85	16.5	72	110	42	18	10.5	18	M10	36	72
RD16FA12	50.85	16.5	72	110	42	18	10.5	18	M10	36	72
RD25FA12	57.2	14.5	90	132	50	25	13.5	25	M12	45	90
RD32FA11	66.7	20	105	154	56	30	15	30	M14	50	105

Type	L1	L2	L3	L4	L5	L6	T1	T2	Weight	O-Ring
FD12FA10	39	23.8	105	65	140	78	0.2	15	7kg	25x3.5
FD16FA10	39	23.8	105	65	140	78	0.2	15	7kg	25x3.5
FD25FA10	50	27.8	148	75	200	105	0.2	18	16kg	32.92x3.53
FD32FA10	52	31.6	155	94	215	115	0.2	21	21kg	37.7x3.53



- 1 Control port 3 Flange fixing screws 5 Optional port B 7 O-ring
- 2 Measuring port 4 Blanking flange 6 Nameplate

Type	B1	B2	B3	B4	B5	D1	D2	D3	D4	D5	D6	D7	H1	H2
FD12 FB12	50.8	49	16.5	72	110	42	18	34	M22x1.5	10.5	18	M10	36	72
FD16 FB12	50.8	49	16.5	72	110	42	18	34	M22x1.5	10.5	18	M10	36	72
FD25 FB12	57.2	78	14.5	90	132	50	25	42	M27x2	13.5	25	M12	45	90
FD32 FB11	66.7	78	20	105	154	56	30	42	M27x2	15	30	M14	50	105

Type	H1	L1	L2	L3	L4	L5	L6	L7	L8	T1	T2	T3	Weight	O-Ring
FD12 FB12	118	39	23.8	105	141.5	65	162	38	78	0.2	1	15	9Kg	25x3.5
FD16 FB12	118	39	23.8	105	141.5	65	162	38	78	0.2	1	15	9Kg	25x3.5
FD25 FB12	145	50	27.8	148	198	75	225	50	105	0.2	1	18	18Kg	32.92x3.353
FD32 FB11	145	52	31.6	155	215	94	240	50	115	0.2	1	21	24Kg	37.7x3.53

Notice

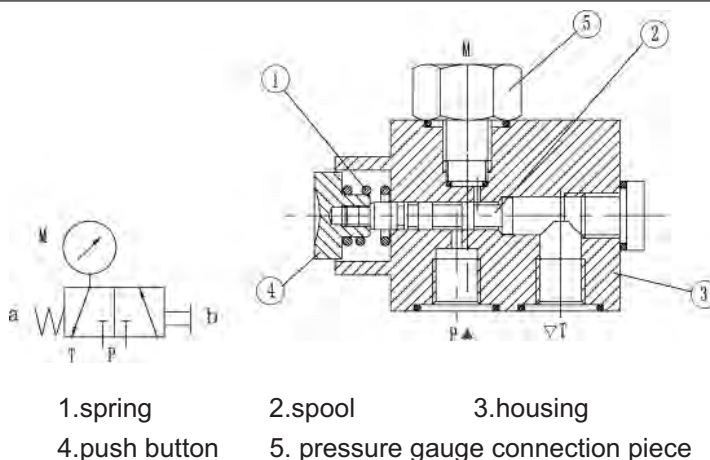
1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Pressure gauge - Isolator valve, Type AF 6		RE30060/12.2004
	Size 6	up to 31.5MPa	Replaces: RE30060/05.2001

Pressure gauge isolator valves type AF 6 are 3-way longitudinal valves for manual operation. They serve to check the prevailing operating pressure from time to time. In the initial position, flow from P to the pressure gauge via the spool (2) is blocked and the pressure gauge is connected with T. When the button (4) is pushed, the spool (2) is moved into the switched position, giving free flow from P to the pressure gauge and the connection to T is blocked. By rotating the push button (4), the spool (2) can be locked in place via a detent. After operation, the spool (2) is pushed back into the initial position by the pressure spring (1) and thereby unloads the pressure gauge. The pressure gauge can be directly screwed in to the valve housing or fitted separately (see installation examples on page 58).



Symbols



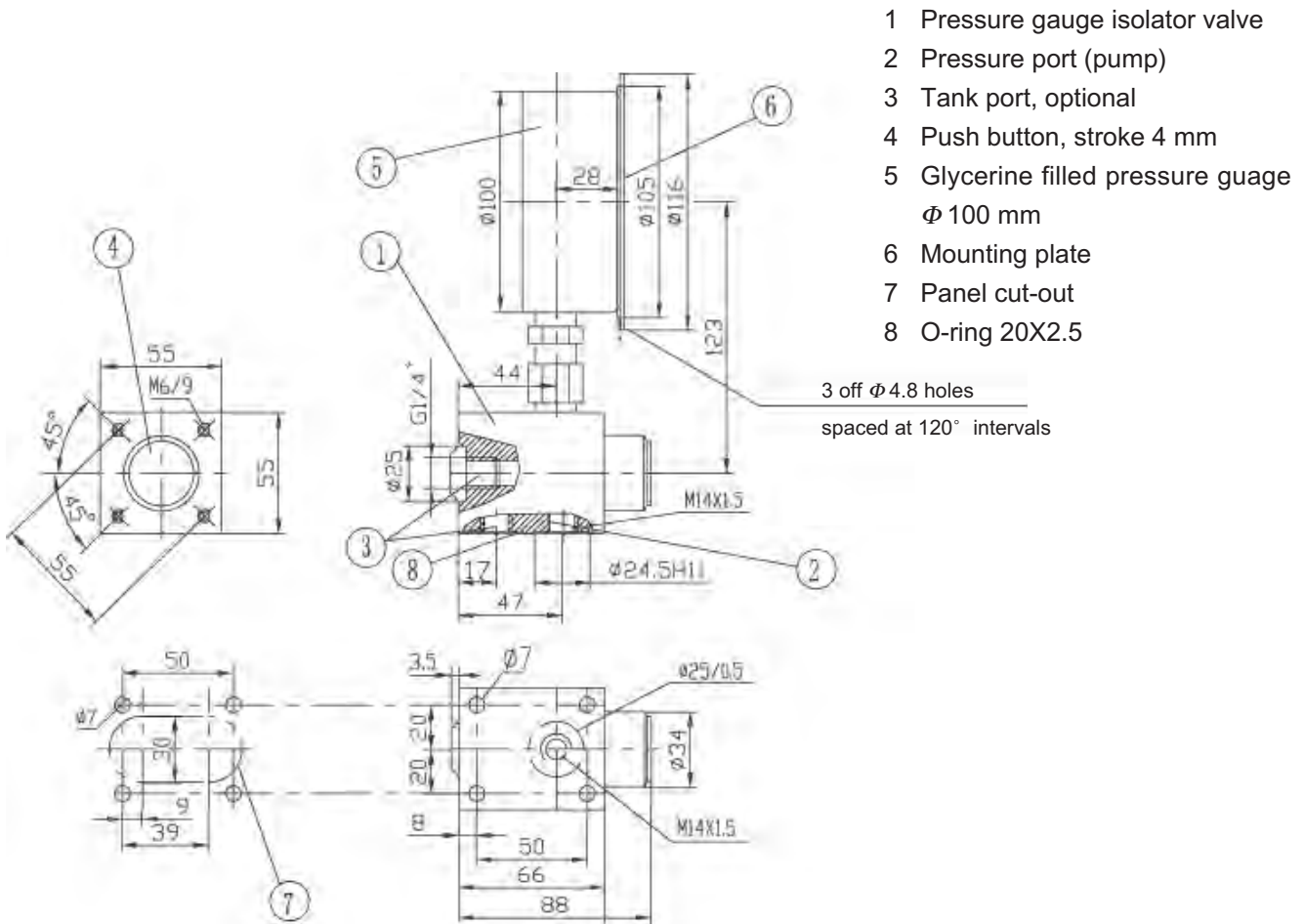
Ordering details

A	F	6	E		30	B	/	/	*
---	---	---	---	--	----	---	---	---	---

Isolator valve	= A	Further details in clear text
Spring return	= F	
Nominal size 6	= 6	
Single valve	= E	
For threaded connections	= A	
For subplate mounting	= P	No code= Mineral oil V= Phosphate ester
Series 30 to 39 (30 to 39: unchanged installation and connection dimensions)	= 30	63 = Indication range up to 6.3 MPa 100 = Indication range up to 10 MPa 160 = Indication range up to 16 MPa 250 = Indication range up to 25 MPa 400 = Indication range up to 40 MPa
		X = Without accessories Y = With accessories (connection piece, 2 seal rings and pressure gauge) Z = Complete with accessories (as Y with mounting plate)
		B = Technology of Beijing Huade Hydraulic

Unit dimensions

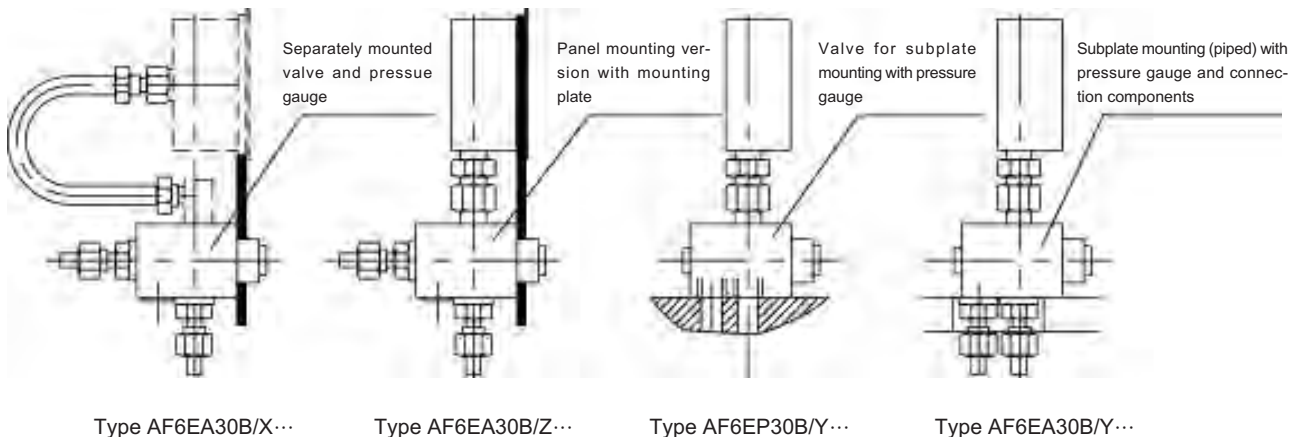
(Dimensions in mm)



Technical data (for applications outside these parameters, please consult us!)

Max. operating pressure	to 31.5MPa	Pressure gauge indicating range	Up to 6.3, 10,16, 25, 40 (the indicating range should be approx. 30% above the max.operating pressure).
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Installation examples



BEIJING HUADE HYDRULIC INDUSTRIAL GROUP CO.,LTD.	Multi-Circuit Gauge Isolator Type MS, Series 20		RE30075/12.2004
	Model 2	up to 31.5 MPa	Replaces: RE30075/05.2001

Features:

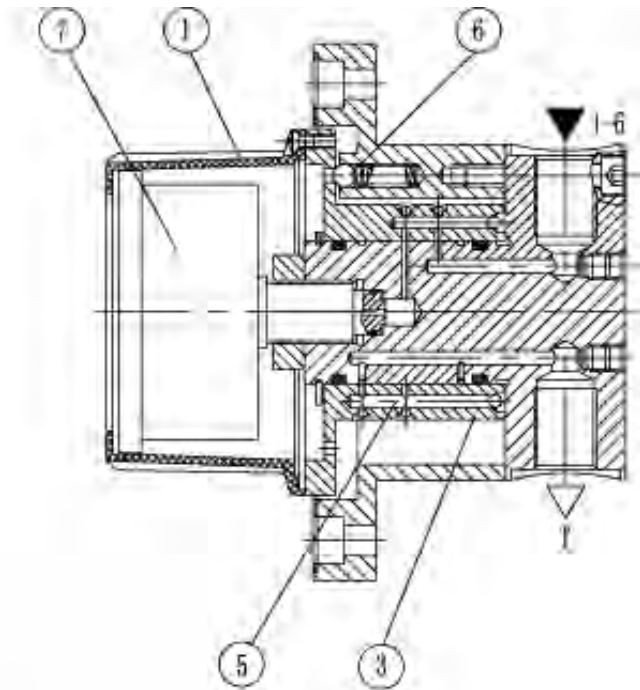
- Valve housing with threaded connections
- Flange mounting
- with built-in pressure gauge



Functional, section

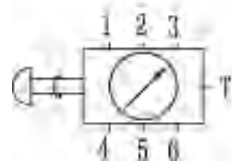
Multi-circuit gauge isolators type MS 2 with built-in pressure gauge (6 measuring points)

With this valve, the rotary knob (1) has a glycerin damped pressure gauge (7) fitted. By turning the rotary knob (1) and the sleeve (3) which is connected to it, until the indicator on the rotary knob (1) points to one of the 6 measuring points, 1 measuring point is connected to the pressure gauge (7). In order to unload the pressure gauge (7) there are zero points between each measuring point. In this way the pressure gauge (7) is connected to the tank (connection T) via the drilling (5) in sleeve (3) and is thereby unloaded. A built-in detent (6) holds each selected position. Which measuring point is connected to the pressure gauge, is indicated by the arrow which is situated on the rim of the rotary knob.



Type MS 2 A20B/...

Symbols



Ordering code

MS		A	20	B	/			*
----	--	---	----	---	---	--	--	---

With built-in pressure gauge = 2
(6 measuring connections)

Threaded connections = A

Series 20 to 29 = 20
(20 to 29: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

Further details in clear text

No code = Threaded connections G 1/4"
2 = Threaded connections M14 × 1.5

No code = Mineral oil
V = Phosphate ester

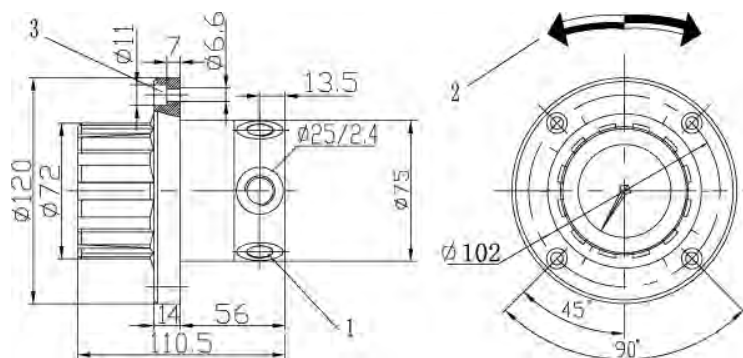
16 = max. usable indication range 1.6MPa
25 = max. usable indication range 2.5 MPa
60 = max. usable indication range 6.0MPa
100 = max. usable indication range 10MPa
160 = max. usable indication range 16MPa
250 = max. usable indication range 25MPa
400 = max. usable indication range 40MPa

Technical data (for applications outside these parameters, please consult us!)

Operating pressure, max. (MPa)	31.5	The maximum permissible working pressure is dependent on the scale value of the built-in pressure gauge. The area between the maximum permissible value (pressure gauge) and the scale value is marked in red.
Back pressure on the tank connection, max. (MPa)	1	
Indication accuracy of the built-in pressure gauge (types MS 2)		The indication accuracy of the built-in pressure gauge is 1.6% of the red scale value at 20°C. The indication error for each 10°C increase in temp. is + 0.3 %, and , 0.3% per 10°C reduction in temp. of the red scale value.
Hydraulic fluid		Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)
Viscosity (mm ² /s)	10 to 800	
Fluid temperature range (°C)	-30 to +80	
Weight (kg)	1.7	

Unit dimensions: Type MS 2

(Dimensions in mm)



Type MS 2

- 6 measuring connections and 1 tank port are equally spaced around the circumference
- Readings are obtained by turning the rotary knob to the left or right. Zero points are arranged between the indicating points
- 4 fixing screw holes

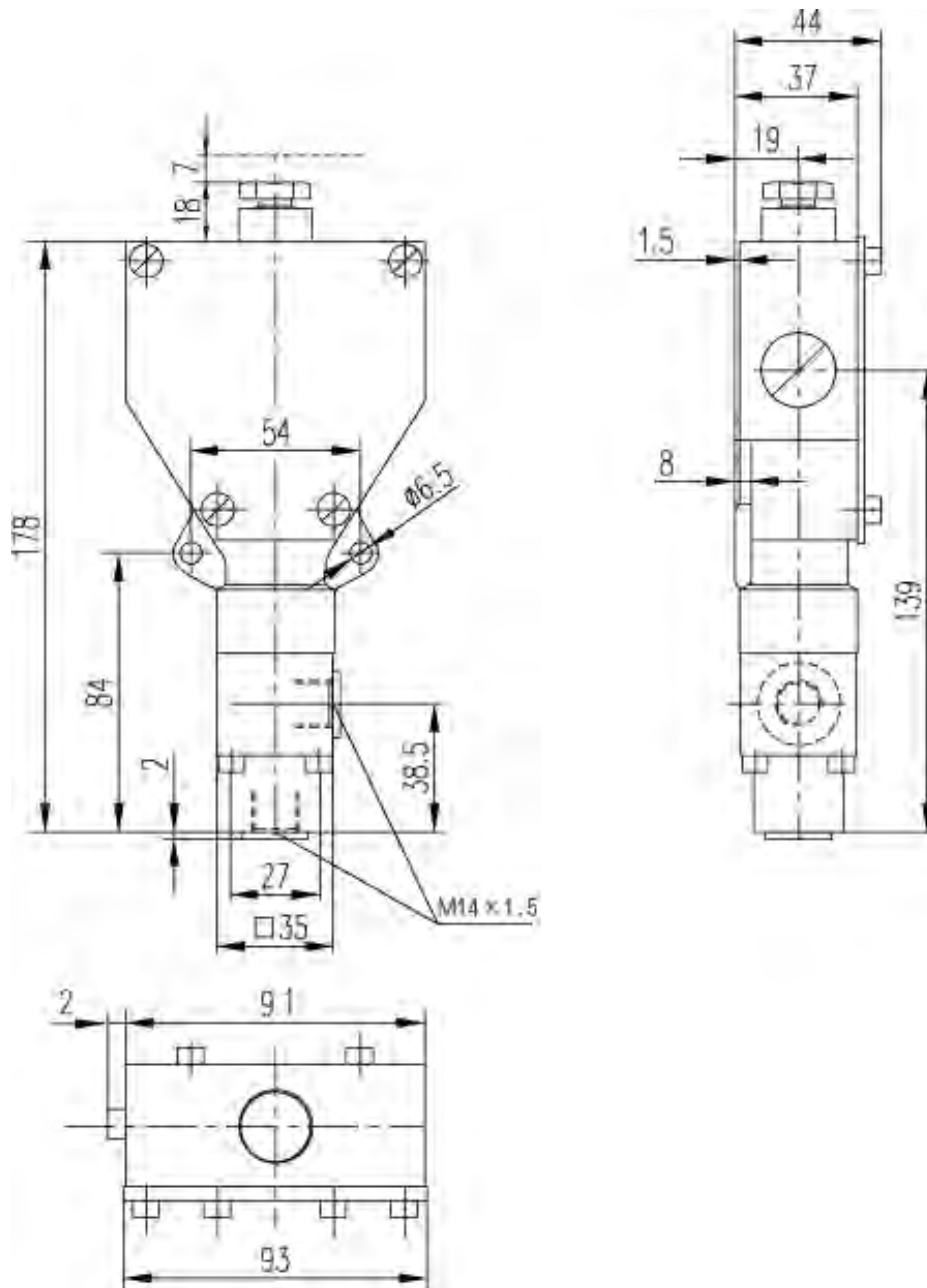
Hydro-electric pressure switches type HED 1 are piston pressure switches. Type HED 1 pressure switches have the task of switching on or off an electrical circuit dependent on pressure. The live electrical terminals are covered by an isolating strip.

Adjustment of the switching pressure

To adjust the switching pressure, the name plate must first be removed and the locking screw loosened. The switching pressure is set by rotating the adjustment screw. Finally, the adjustment screw must be secured by the locking screw and the name plate refitted.



illuminate



Ordering code

HEDI		A	40	B /						*
------	--	---	----	-----	--	--	--	--	--	---

With drain port = K
Without drain port = O

Series 40 to 49 = 40 (40 to 49: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

HED 1 K	max. adjustable pressure 10 MPa = 100 max. adjustable pressure 35 MPa = 350 max. adjustable pressure 50 MPa = 500
---------	---

HED 1 O	max. adjustable pressure 5 MPa = 50 max. adjustable pressure 10 MPa = 100 max. adjustable pressure 35 MPa = 350
---------	---

Further details in clear text

No code = Mineral oil
V = Phosphate ester

No code = Standard model without intrinsically safe circuit

No code = Without lamp
L 24 = Lamp for 24 V (20 V to 35 V)
L 110 = Lamp for 110 V (90 V to 130 V)
L 220 = Lamp for 220 V (180 V to 240 V)

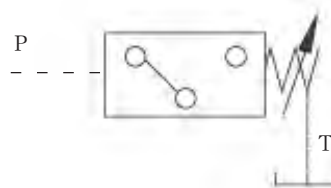
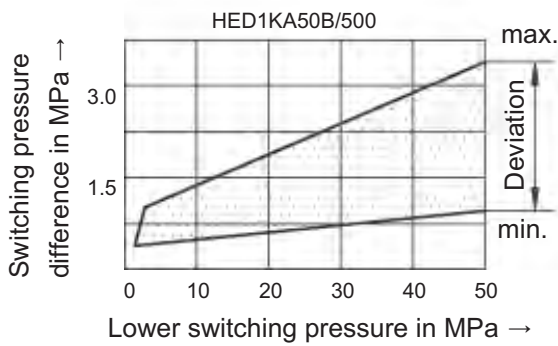
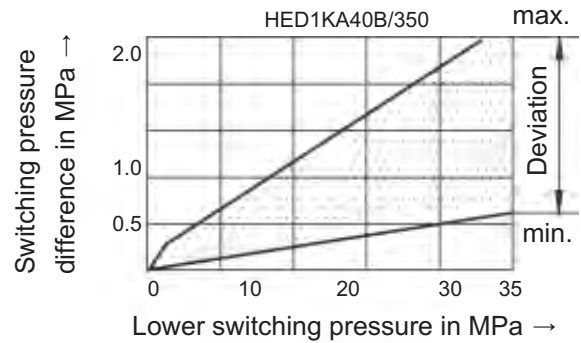
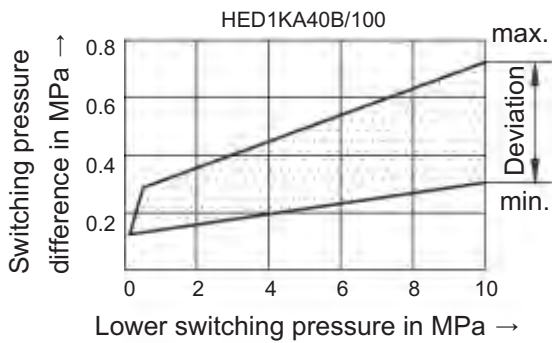
No code = Cable gland

Technical data (for applications outside these parameters, please consult us!)

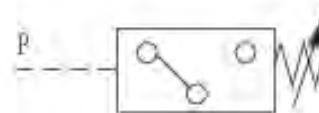
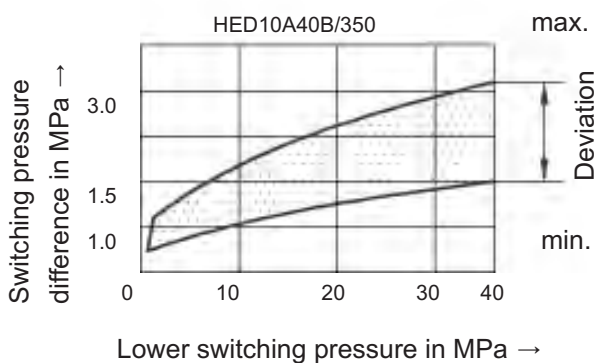
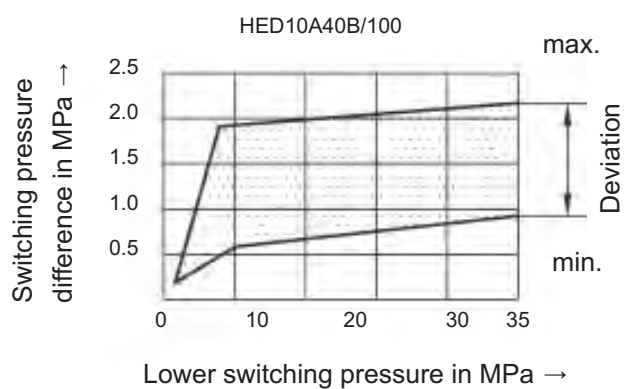
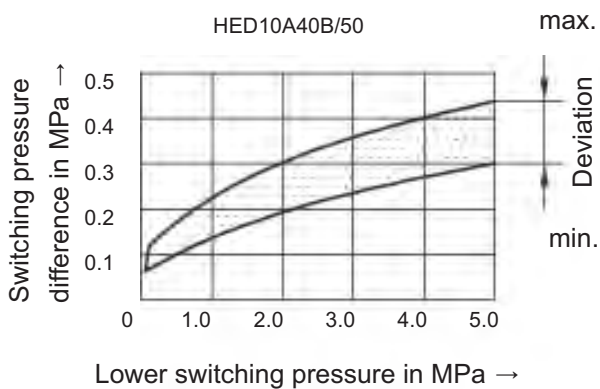
Pressure fluid	Mineral oil or Phosphate ester				
temperature range	(°C)	-30 to +80			
Viscosity range	(mm ² /s)	10 to 800			
Switching accuracy (repeatability)	< ± 2 % of set pressure				
Switching frequency	HED1KA40B/..	up to 300 cycles/min			
	HED10A40B/..	up to 50 cycles/min(briefly also... 100cycles/min)			
Pressure at drain port	(MPa)	up to 2			
Settable ranges for HED 1 KA 40B/..	(MPa)				
Pressure rating	Max. operating pressure briefly	Recovering pressure		Action pressure	
		min.	max.	min.	max.
10	60	0.3	9.2	0.6	10
35	60	0.6	32.5	1.0	35
50	60	1.0	46.5	2.0	50
Settable ranges for HED10A40B/..					
Pressure rating	Max. operating pressure briefly	Recovering pressure		Action pressure	
		min.	max.	min.	max.
5	8	0.2	4.5	0.35	5
10	35	0.3	8.2	0.8	10
35	35	0.6	29.5	2.0	35
Electrical connection	cable gland				
Contact loading	- AC voltage	460V; 15A			
	- DC voltage	40V; 1.0A / 125V; 0.4A / 250V; 0.2A			
Insulation to DIN 40 050					
Weight	(kg)	1.2			

Switching pressure difference - pressure switches with or without drain port

With drain port



Without drain port



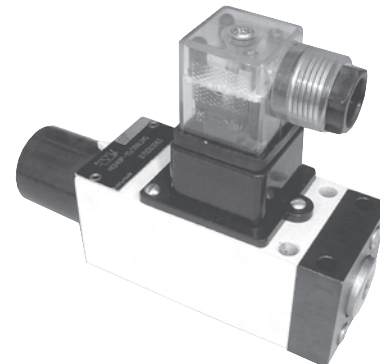
Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to $\frac{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Piston Type Pressure Switch Type HED 4 ,Series 40	RE30180/12.2004
	up to 35 MPa	Replaces: RE30180/05.2001

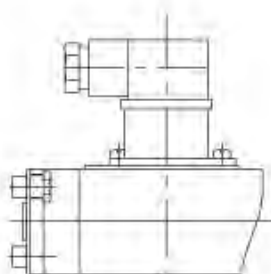
Features:

- For subplate mounting
- For pipe installation
- 3 pressure stages
- Plug-in connector with circuit (indicator lamp)
(separate order)

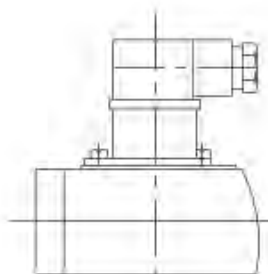


Features

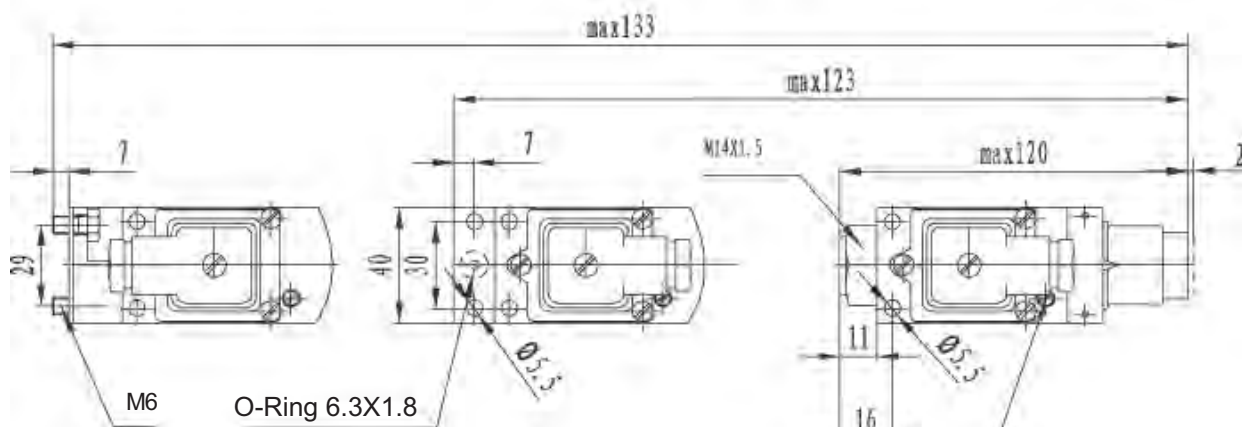
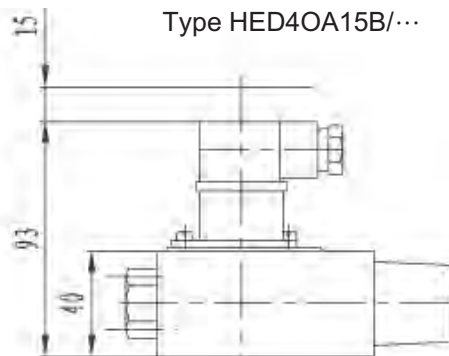
Vertical stacking systems
Type HED4OH15B/...



Subplate mounting
Type HED4OP15B/...



Pipe installation
Type HED4OA15B/...



screw is loosened before adjusting pressure
screw is screwed down after adjusting pressure



Ordering details

HED40		15	B	/			S		*
-------	--	----	---	---	--	--	---	--	---

Vertical stacking systems = H
 Subplate mounting = P
 Pipe installation = A

Further details in clear text

Series 15(10 to 19: unchanged installation and connection dimensions) =15

Technology of Beijing Huade Hydraulic = B

Max. settable pressure 5 MPa = 50
 Max. settable pressure 10 MPa = 100
 Max. settable pressure 35 MPa = 350

connected by small plug =Z14

Lamp for 24 V (25 V to 35 V) = L 24
 Lamp for 110 V (90 V to 130 V) = L110
 Lamp for 220 V (180 V to 240 V) = L220

with protective cap =S

Mineral oil = No code
 Phosphate ester (other seals on request) = V

*Should be orderd separately for horizontal stacking

Technical data (for applications outside these parameters, please consult us!)

Pressure setting range (MPa)

Pressure stage	Max. operating pressure	Recover pressure		Action pressure	
		min.	max.	min.	max.
5	10	0.2	4.6	0.4	5
10	35	0.3	8.9	0.8	10
35	35	0.6	32.2	2	35

Viscosity range 10 to 800mm² /s

Switching accuracy (repeatability) < ± 1% of set pressure

Switching frequency 120/min

Max. connection cross sectional area 1.5mm²

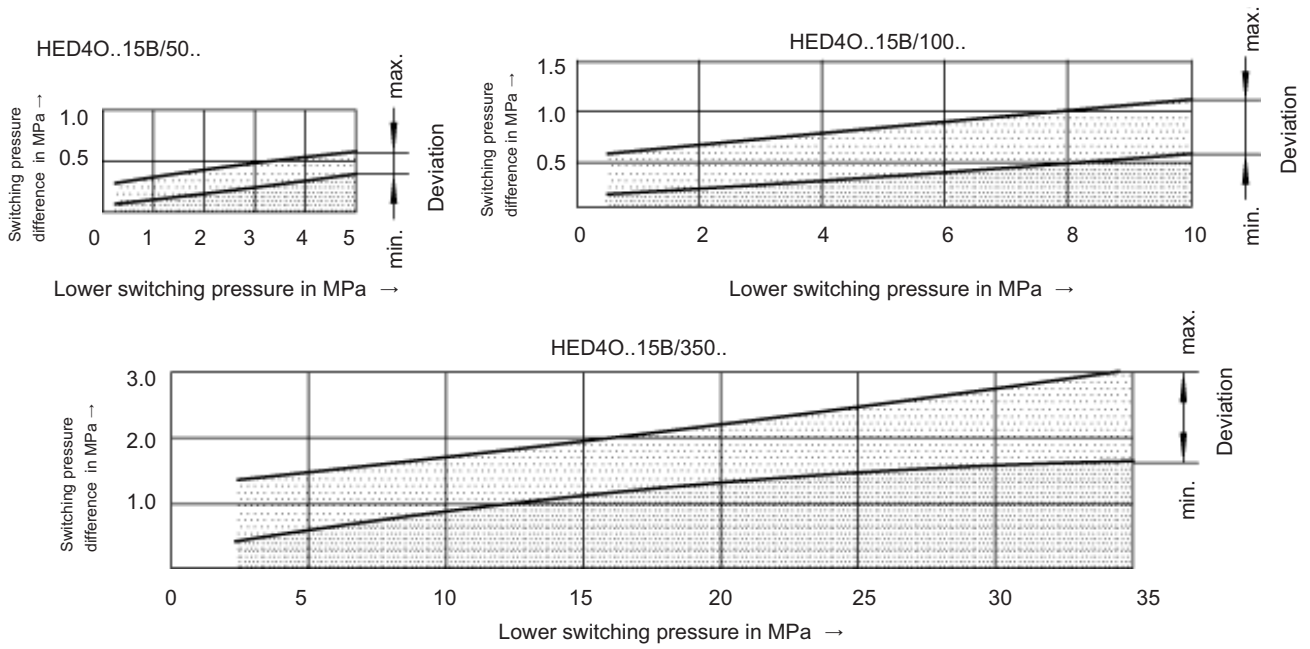
Contact loading- AC250V;5A

- DC50V,1A or 250V,0.2A

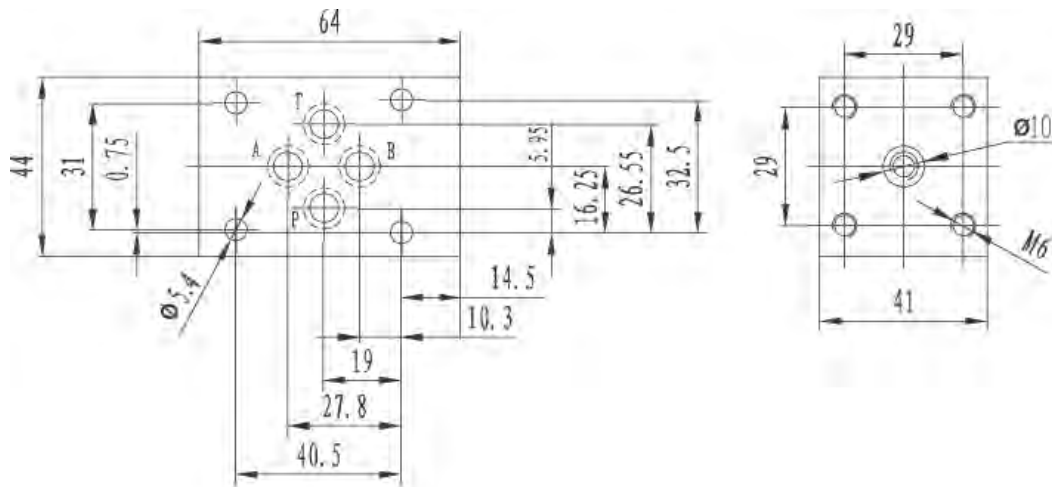
Weight - Hydro-electric pressure switches 0.6Kg

- Sandwich plate for vertical stacking assemblies
 0.8kg (Size 6), 1.9kg (Size 10)

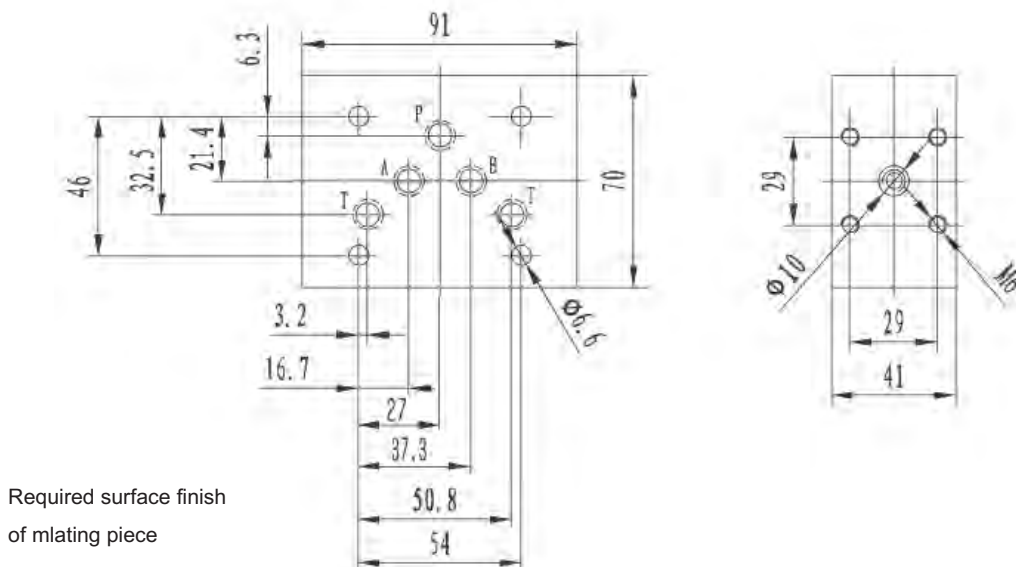
Switching pressure difference - pressure switches with or without drain port



Installation guidelines: for applying the pressure switch HED 4...in stacking assemblies size 6 **(Dimensions in mm)**



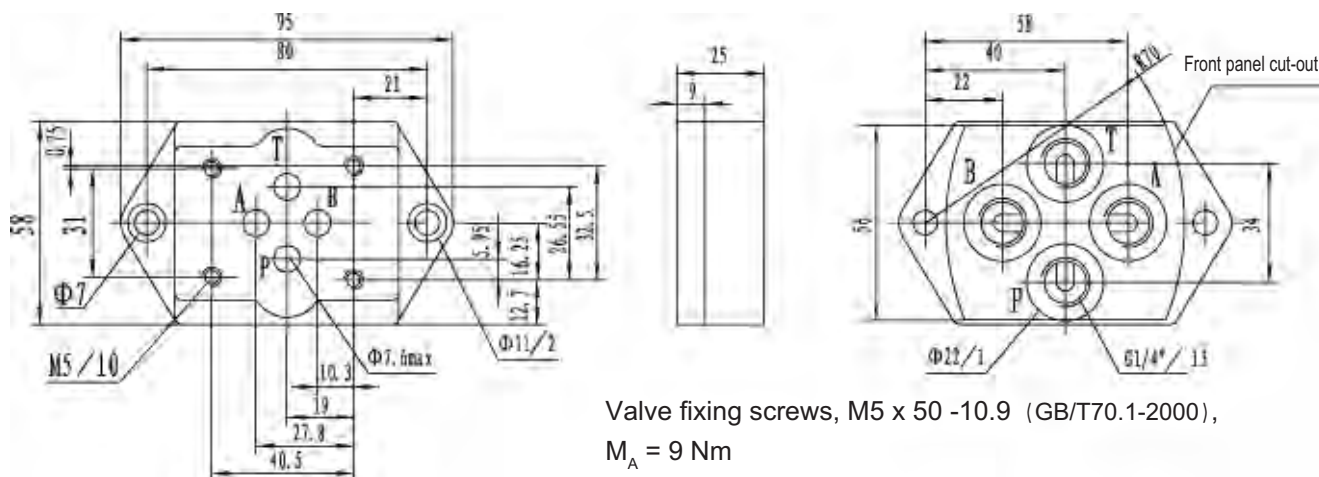
Installation guidelines: for applying the pressure switch HED 4...in stacking assemblies size 10 **(Dimensions in mm)**



Subplates

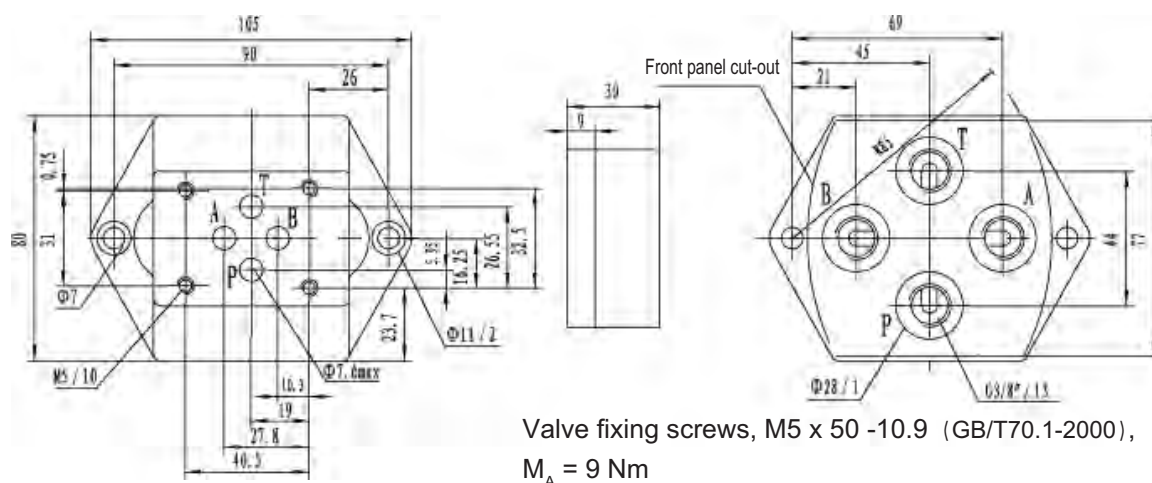
G341/01 (G1/4") G341/02 (M14x1.5) Weight ≈ 0.6kg

(Dimensions in mm)



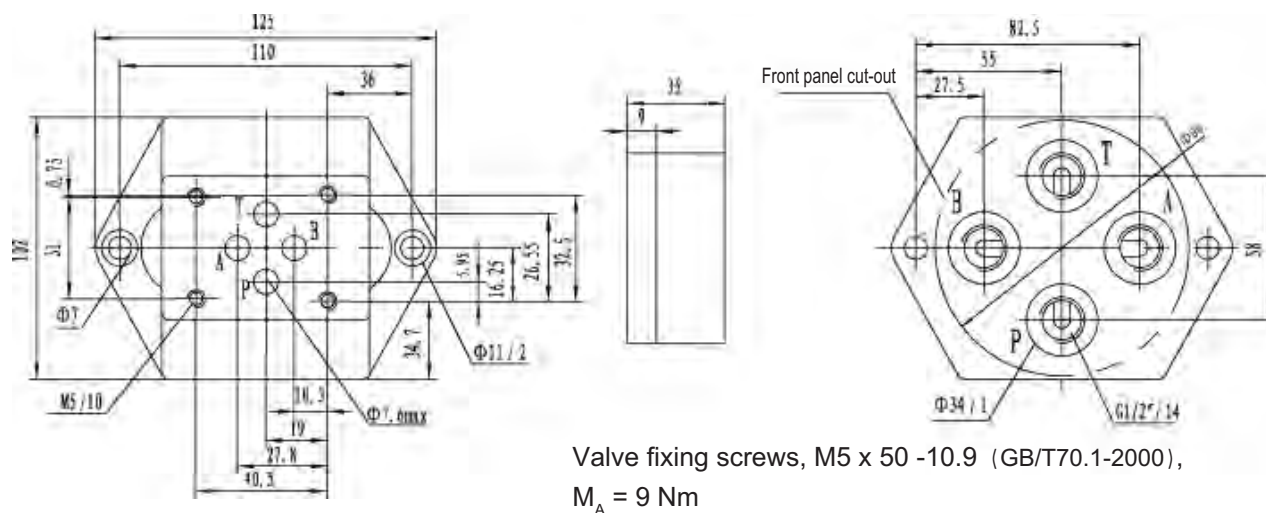
G342/01 (G3/8") G342/02 (M18x1.5) Weight ≈ 1.1kg

(Dimensions in mm)



G502/01 (G1/2") G502/02 (M22x1.5) Weight ≈ 1.9kg

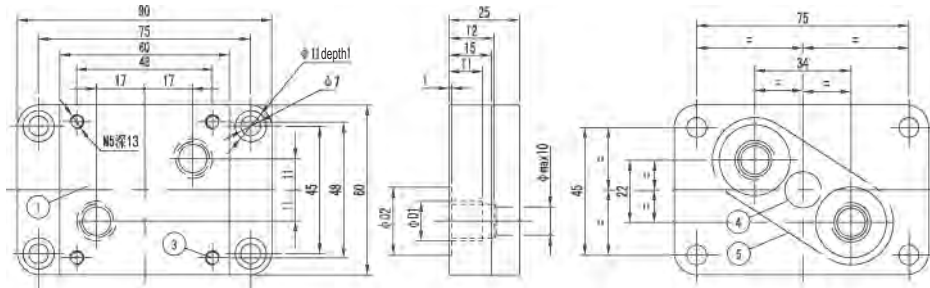
(Dimensions in mm)



Subplates

G44/01(G1/4) G44/02(M14 × 1.5) G45/01(G1/2) G45/02(M22 × 1.5)

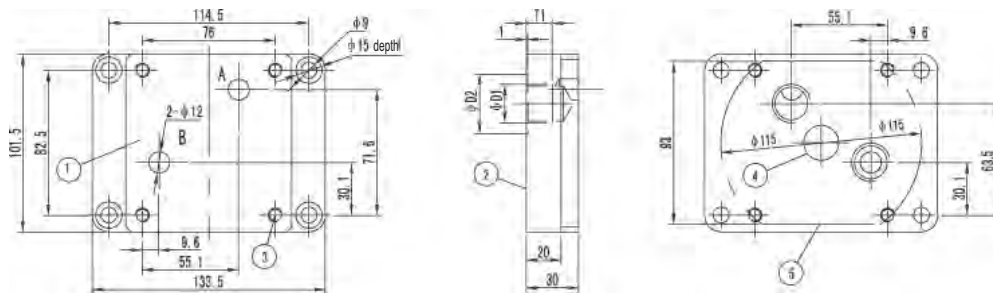
(Dimensions in mm)



Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC25	G44/01	0.9kg	G1/4"	25	12	17	4-M5 × 50 -10.9 (GB/T70.1-2000)	6.1N.m
	G44/02		M14 × 1.5					
	G45/01		G1/2"	34	14	20		
	G45/02		M22 × 1.5					

G279/01(G1/2) G279/02(M22 × 1.5) G280/01 (G3/4) G280/02(M27 × 2)

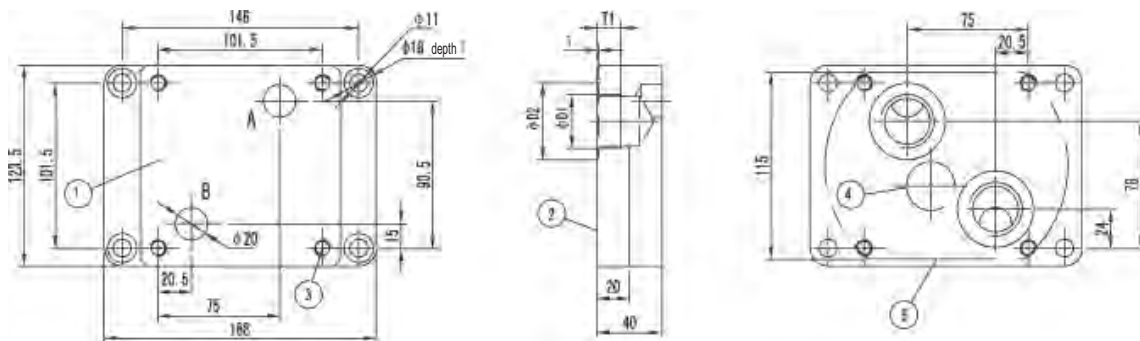
(Dimensions in mm)



Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC10	G279/01	2.3kg	G1/2"	34	15	17	4-M8 × 50 -10.9 (GB/T70.1-2000)	
	G279/02		M22 × 1.5					
	G280/01		G3/4"	42	17	20		
	G280/02		M27 × 1.5					

G281/01(G1/2) G281/02(M23 × 2) G282/01(G1/4) G282/02(M42 × 1.5)

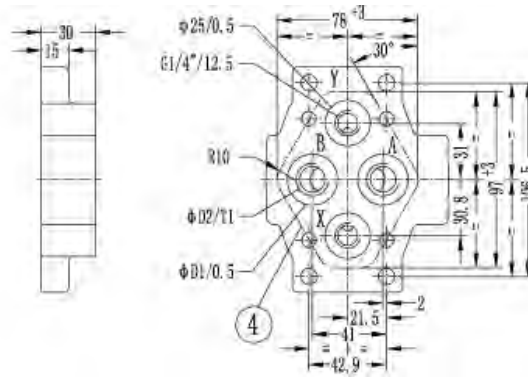
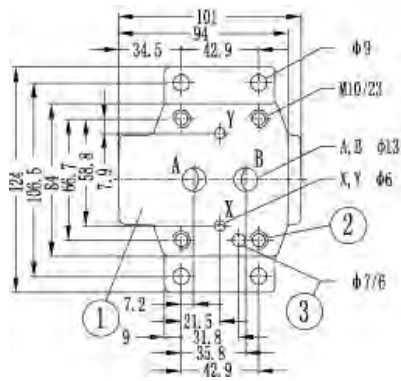
(Dimensions in mm)



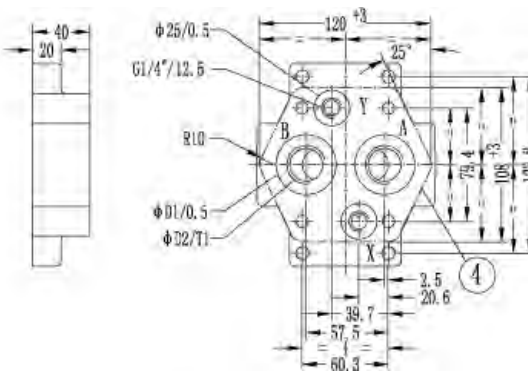
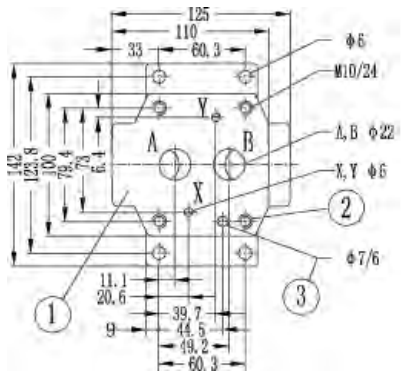
Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC18	G281/01	4kg	G1"	47	19		4-M10 × 80 -10.9 (GB/T70.1-2000)	
	G281/02		M33 × 2					
	G282/01		G1 1/4"	56	21			
	G282/02		M42 × 1.5					

1, mating piece of valve 2, underside 3, Valve fixing screws 4, φ 20 for size 10 φ 30 for size 16 keep free from drillings used for orifice support 5, Valve panel cut-out

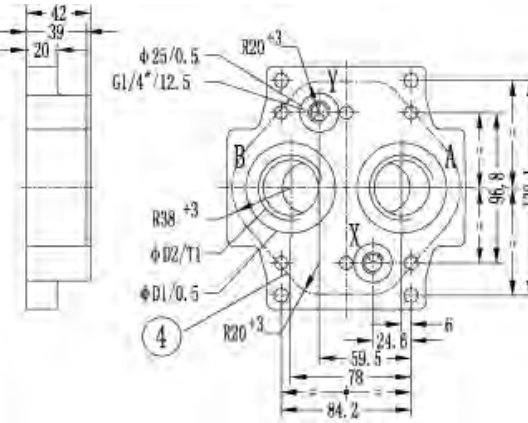
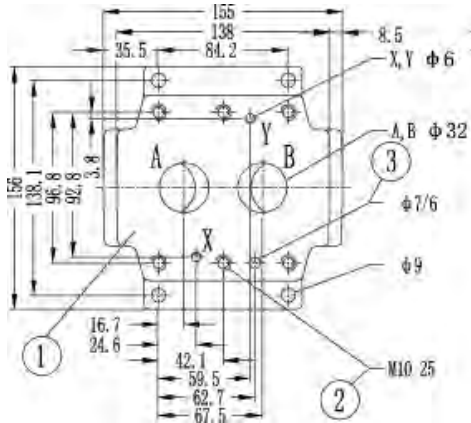
Scaleboard



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC10	G460/01	28	G3/8"	13	4 - M10 × 40 -10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02		M18 × 1.5				
	G461/01	34	G1/2"	16			
	G461/02		M22 × 1.5				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC25	G412/01	42	G3/4"	17	4 - M10 × 50 -10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02		M27 × 2				
	G413/01	47	G1"	20			
	G413/02		M33 × 2				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC32	G414/01	56	G1 1/4"	20.5	6 - M10 × 60 -10.9 (GB/T70.1-2000)	69Nm	5kg
	G414/02		M42 × 2				
	G415/01	61	G1 1/2"	22.5			
	G415/02		M48 × 2				

1 mating piece of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

Hydraulic Valves

Catalogue

Proportional Valves

Directional Valves

Pressure Valves

Flow Control Accessores

2-way Cartridge Valves



CONTENTS

Proportional Directional Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	proportional directional valves, direct actuated,without electrical feedback	4WRA	6、 10	31.5	1
2	Proportional Directional Valves Direct Control (with electrical feedback)	4WRE	6、 10	31.5	11
3	Proportional Directional Valves pilot operated ,external pilot operated	4WR ^Z _H	10、 16、 25、 32	35	23

Proportional Pressure Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	Proportional Pressure Relief Valve (with electrical feedback)	DBETR	6	31.5	37
2	Proportional pressure relief valve Proportional pressure reducing	DBE/DBEM	10、 25、 32	31.5	41
3	valve of 3-way design	3DREP	6	10	49
4	Proportional pressure reducing valve	DRE/DREM	10、 25、 32	31.5	53
5	*Meter-in pressure compensator, direct operated	ZDC	10、 16、 25	35	59

Proportional Flow Valves

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	Proportional flow control valve 2-way version	2FRE	6	21	65
2	*Proportional flow control valve 2-way version	2FRE	10、 16	21	71



CONTENTS

Proportional Electro-Hydraulic Pressure and Flow Control Valves

No.	Name	Type	NS	Pressure max.(MPa)	Page
1	*Proportional Electro-Hydraulic Pressure and Flow Control Valves	PQ	10	14	77

Subplates

No.	Name	Type	NS	Pressure max.(MPa)	Page
1	Subplates				80

“*” : New products, for ordering, please consult us, telephone: +86-10-69083290

Other Huade Hydraulics Catalogues for Valves

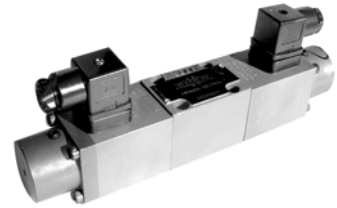
- Directional Valves
- Pressure Valves
- Flow Valves
- Cartridge Valves



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/2- and 4/3-way proportional directional valves, direct actuated,without electrical feedback, Type 4WRA			RE 29053/08.00
	Size 6, 10	up to 31.5 MPa	up to 95 L/min	Replaces:

Features:

- Direct actuated proportional valve for controlling the direction and volume flow of a hydraulic fluid
- For subplate mounting
- For the open loop control of both direction and flow of a hydraulic fluid
- Spring centred control spool
- Low pressure drop across the control lands
- Both valve and electronic control from one supplier
- Mounting pattern to DIN 24 340 form A,Iso4401



Type 4WRA 10B/24Z4/ . . .

Function,section

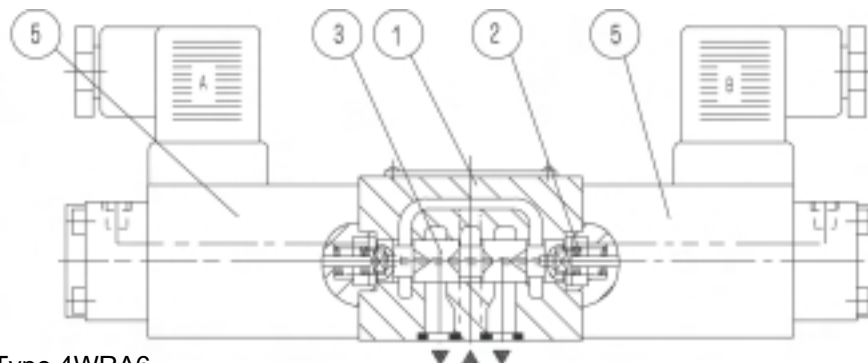
Type 4WRA directional control valves are direct-operated via proportional solenoids and are used to control the direction and quantity of a flow.

They consist basically of the housing (1), the control spool (3),one or two return springs (2),and in addition one or two proportional solenoids (5)

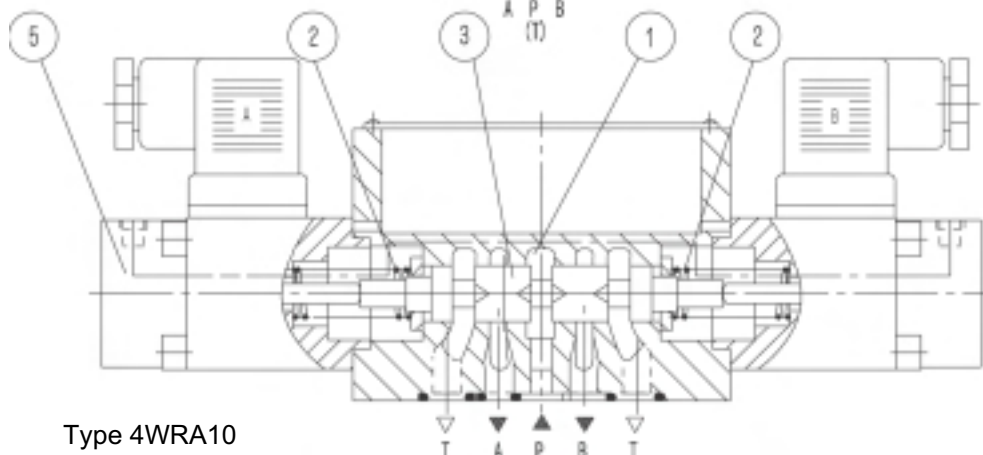
Type 4WRA₁₀.....10B/.....(3-position valve)

If the solenoids are not activated the control spool (3) is maintained in the neutral position by means of the return springs (2).Actuation of the control spool (3) is directly via the proportional solenoid (5). If, for instance, solenoid "A" is energised, it will push the control spool (3) to the right in proportion to the electrical signal.Connections are then made from P to B and A to T.

In this way,the control spool(3)causes the V-shaped grooves to open progressively to flow.When the propotional solenoid (5) is de-energised,the control spool(3) is returned to the center position by the return spring(2).



Type 4WRA6



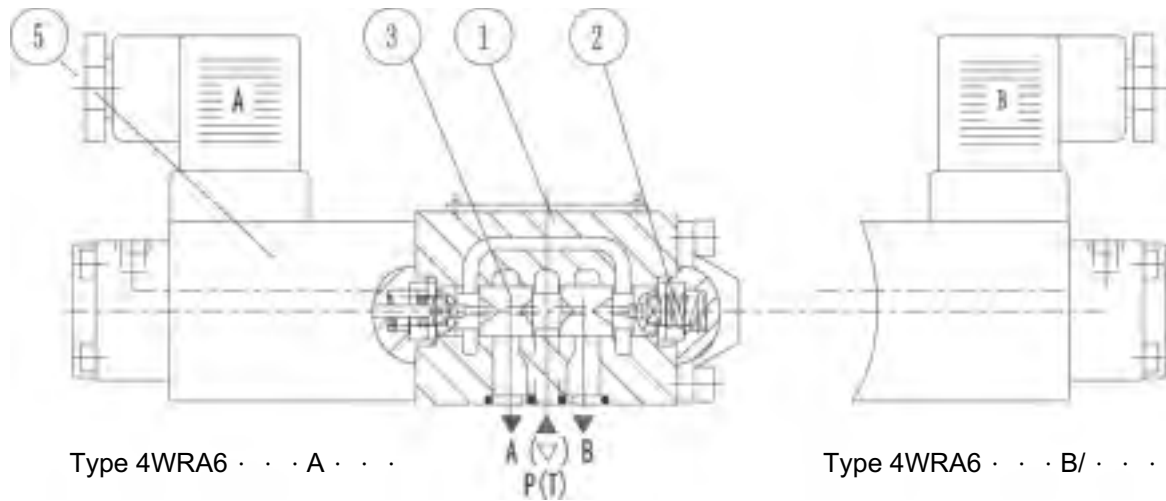
Type 4WRA10

4WRA⁶₁₀ ... A^A ... 10 (2-position valve)

The function of this valve is the same as that for valve type 4WRA. But it's 2-position directional valve with only one proportional solenoid.

Type 4WRA adopts subplate mounting, spring center and low pressure drop acrossing the control lands.

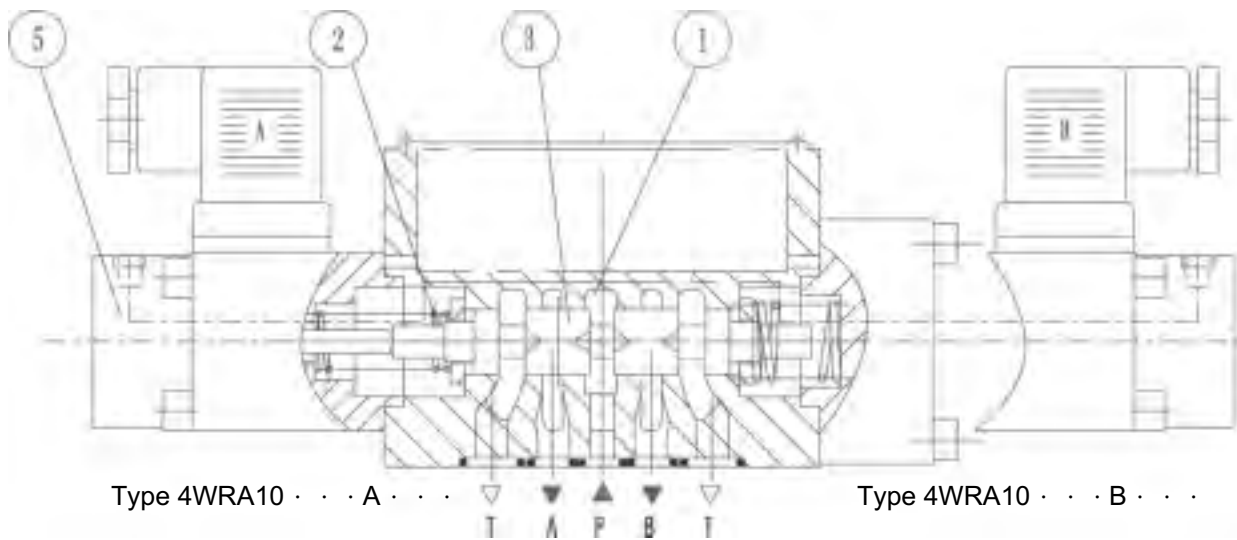
They often used in machine, light industry, metallurgy, mine, space flight and other fields.



Type 4WRA6 . . . A . . .

Type 4WRA6 . . . B/ . . .

Type 4WRA6^A_B . . . 10B/ . . .



Type 4WRA10 . . . A . . .

Type 4WRA10 . . . B . . .

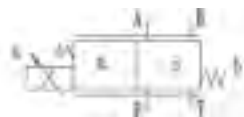
Type 4WRA10^A_B . . . 10B/ . . .

Symbols

Type 4WRA . . . 10B/ . . .
Proportional valve (3-positions)



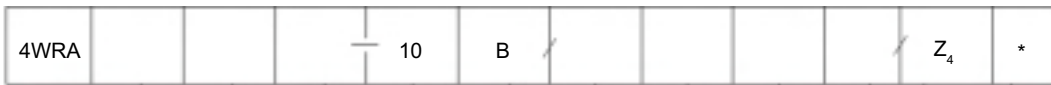
Type 4WRA . . . A . . . 10B/ . . .
Proportional valve (2-positions)



Type 4WRA . . . B . . . 10B/ . . .
Proportional valve (2-positions)



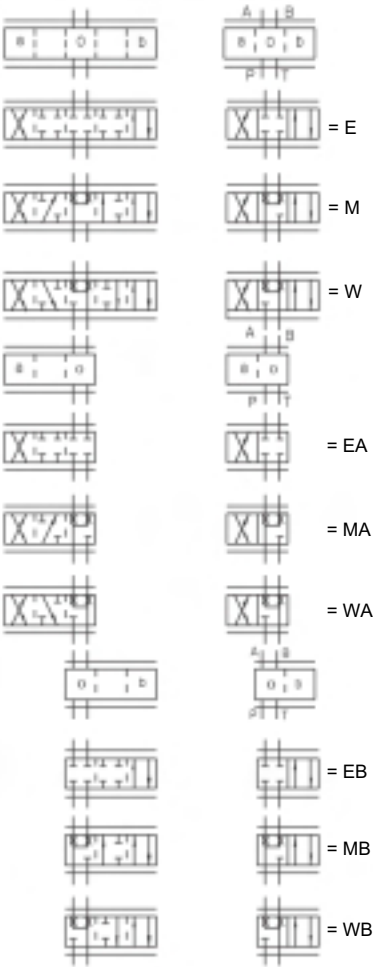
Ordering Code



Size 6 = 6
Size 10 = 10

Further details
in clear text

Symbols



M = mineral oils
V = phosphate ester

Z₄ = Plug-in to DIN 43 650

No code = Without special insulation
J = Seawater resistant

no code = Without emergency operator
N = with emergency operator

G24 = 24 VDC

B = Technology of Beijing Huade Hydraulic

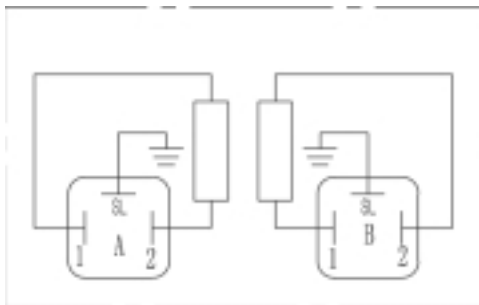
10 = Series 10 to 19
(10 to 19: unchanged installation and connection dimensions)

Nominal flow at 1Mpa valve pressure difference

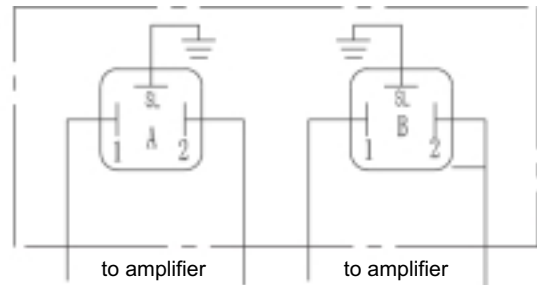
Size	Code	Nominal flow (L/min)
Size 6	5 =	8L/min
	10 =	13L/min
	20 =	17L/min
Size 10	10 =	18L/min
	20 =	27L/min
	40 =	50L/min

Electrical connection with type 4WRA

Coil connection



plug-in connection



Technical data (For application outside these parameters, Please consult us!)

Hydraulic data

size		6	10
Operating pressure (MPa)	port A,B,P	31.5	31.5
	port T	16	16
Flow	(L/min)	43	95
Degree of contamination		≤ 20(recommend ≤ 10)	
Hysteresis	(%)	< 6	< 5
Repeatability	(%)	< 3	< 2
Frequency response(-3dB,signal ± 100%)	(Hz)	6	4
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)	
Viscosity range	(mm ² /s)	3.8 to 380	
Pressure fluid temperature range		(°C) -30 to +80	
Weight (Kg)	Valve with one solenoid	1.75	5.9
	Valve with two solenoids	2.5	7.5

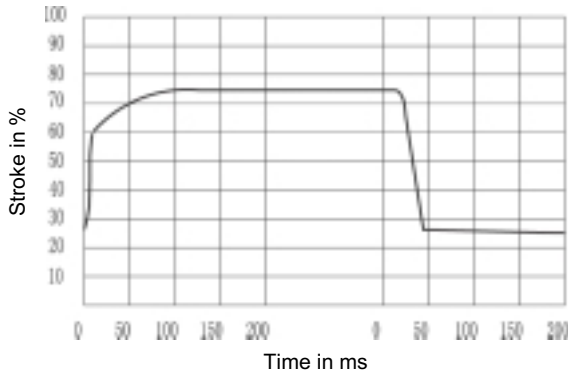
Electrical data

size		6	10
Voltage type		Direct voltage	Direct voltage
Nominal voltage (V)		24	
Max. current per solenoid (A)		1.5	
Solenoid coil resistance (Ω)	Cold value at 20°C	5.4	10
	Max. warm value	8.1	15
Environment temperature (°C)		up to +50	
Coil temperature (°C)		up to +150	
Insulation of valve to DIN 40 050		IP65	
Associated amplifier (24 V rectifier of bridge type)		VT-3013 S30	VT-3014S30
		VT-3017 S30	VT-3018S30

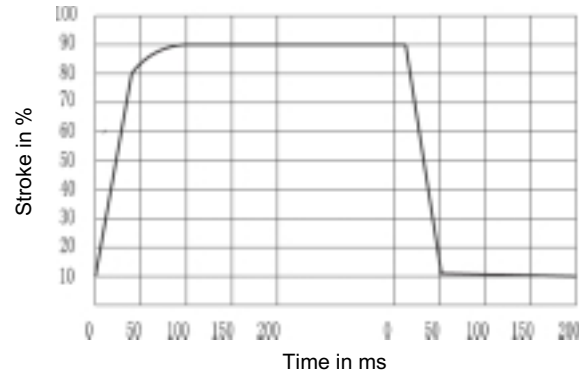
Characteristic curves:(measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$ $t=50^\circ\text{C}$)

Type 4WRA6

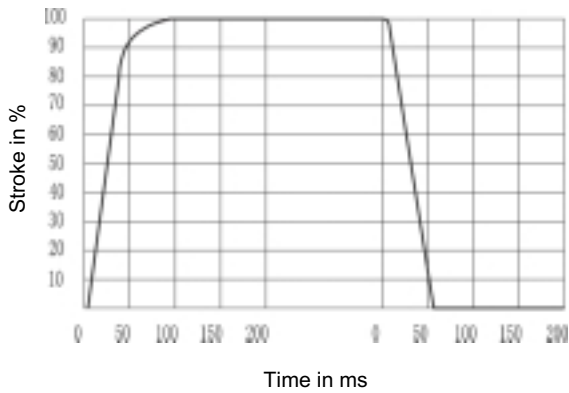
Signal change in 25 → 75%



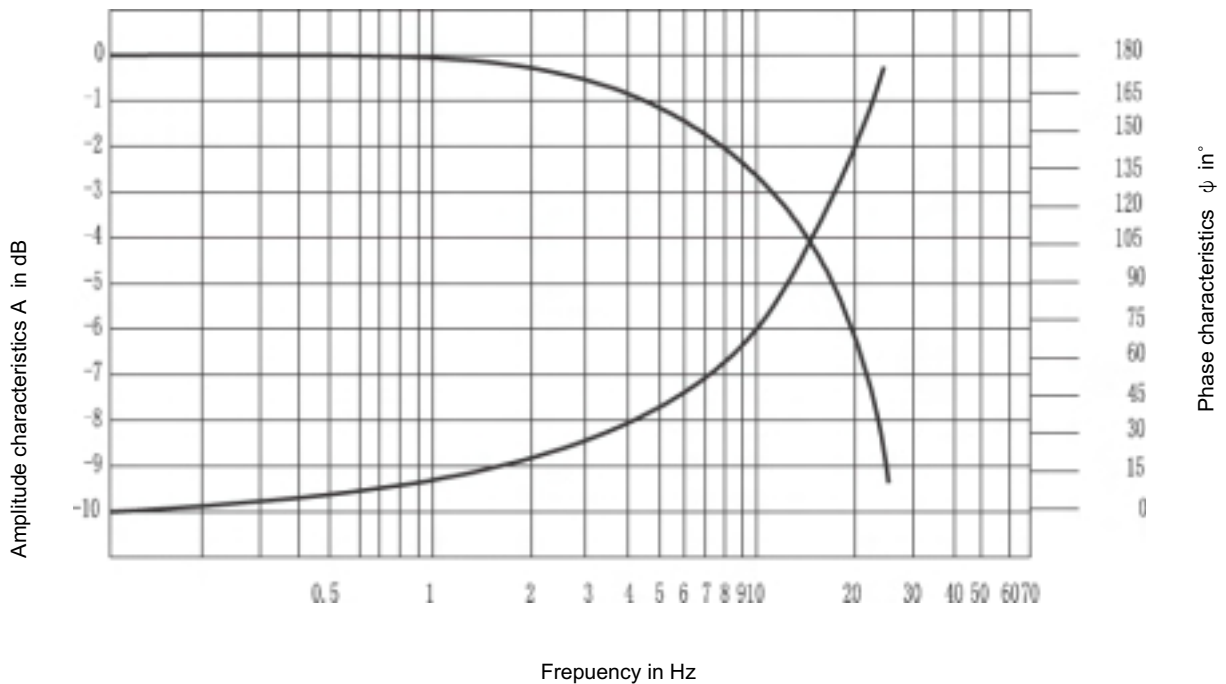
Signal change in 10 → 90%



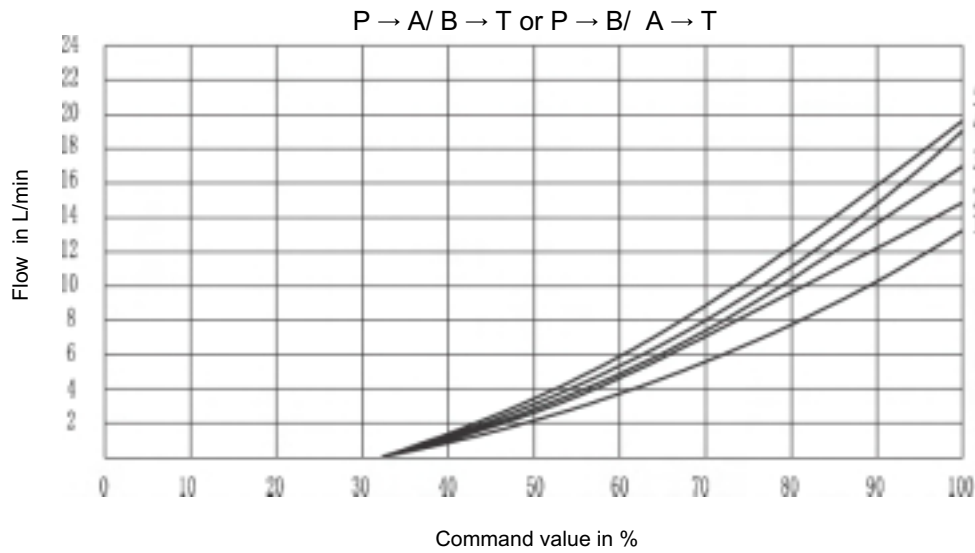
Signal change in 0 → 100%



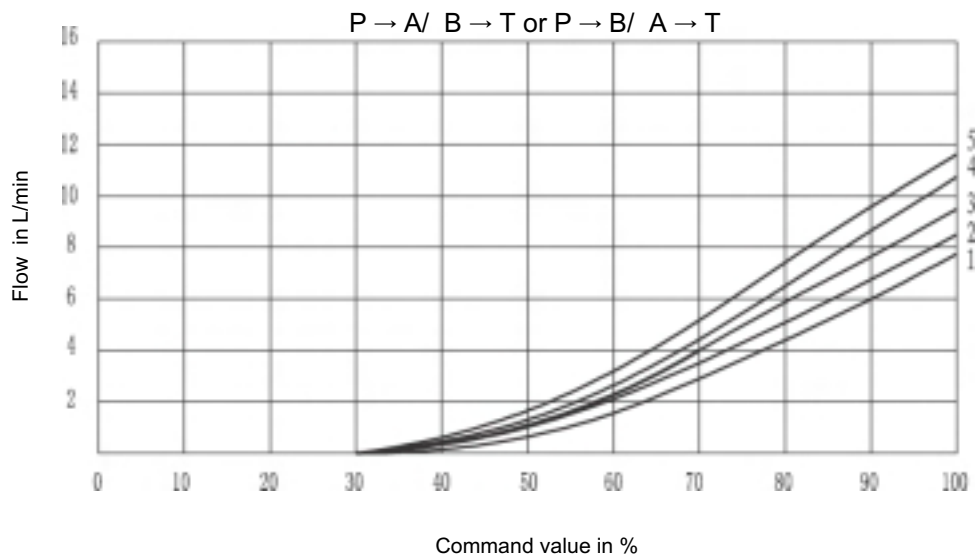
Signal change in $50 \pm 25\%$



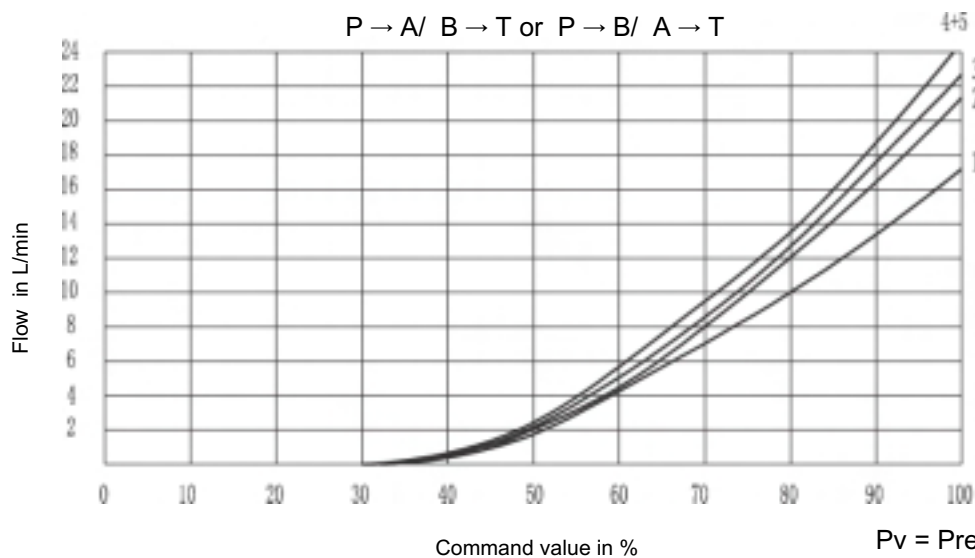
Characteristic curves: (measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$ and $t=50^\circ\text{C}$)



13L/min Nominal flow at
1MPa valve pressure dif-
ference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



8L/min Nominal flow at
1MPa valve pressure dif-
ference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

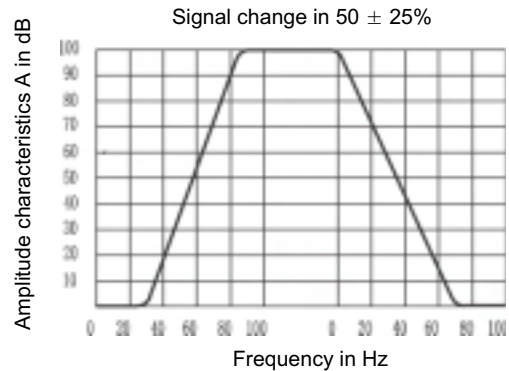
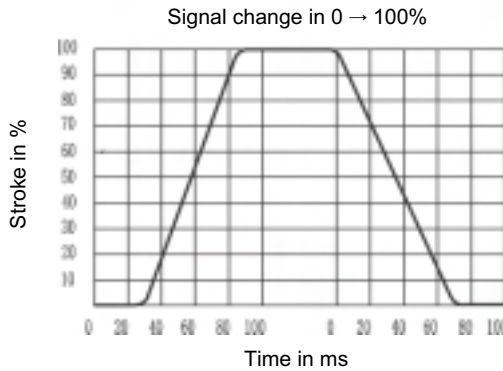
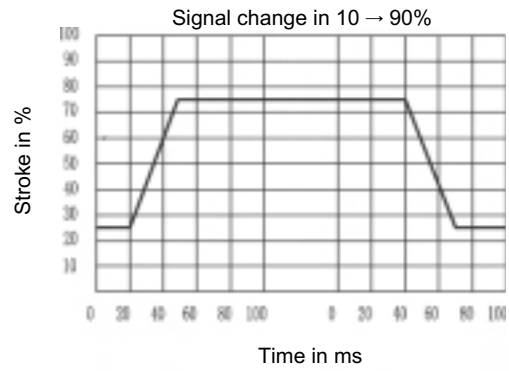
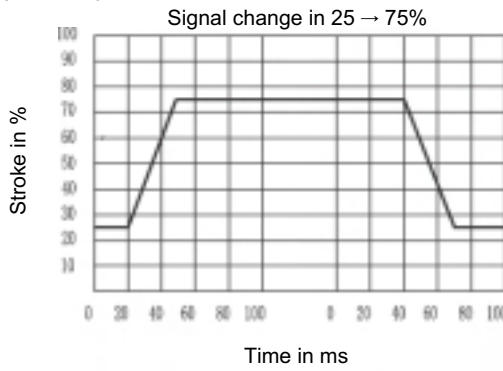


17L/min Nominal flow at
1MPa valve pressure dif-
ference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

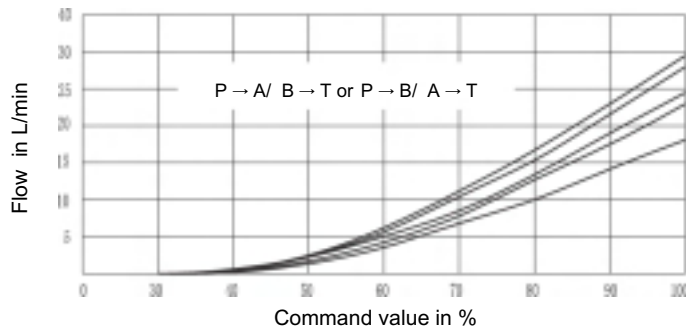
Pv = Pressure drop across valve
(Input pressure minus load pressure
and return pressure)

Characteristic curves: (measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$ and $t = 50^\circ\text{C}$)

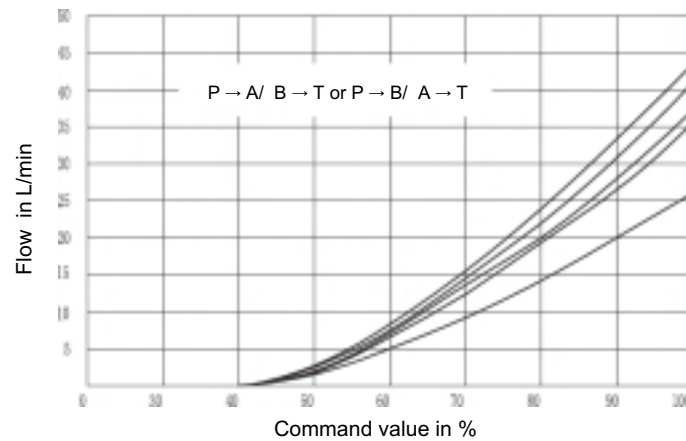
Type 4WRA10



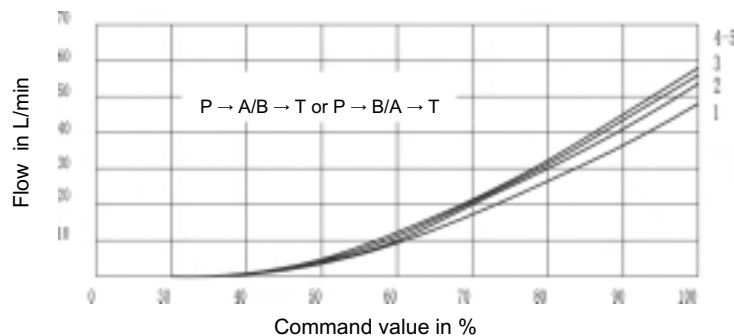
Phase characteristics ψ in °



- 18L/min Nominal flow at
1MPa valve pressure difference
1 $P_v = 1\text{MPa}$ constant
2 $P_v = 2\text{MPa}$ constant
3 $P_v = 3\text{MPa}$ constant
4 $P_v = 5\text{MPa}$ constant
5 $P_v = 10\text{MPa}$ constant



- 27L/min Nominal flow at
1MPa valve pressure difference
1 $P_v = 1\text{MPa}$ constant
2 $P_v = 2\text{MPa}$ constant
3 $P_v = 3\text{MPa}$ constant
4 $P_v = 5\text{MPa}$ constant
5 $P_v = 10\text{MPa}$ constant



- 50 L/min Nominal flow at
1MPa valve pressure difference
1 $P_v = 1\text{MPa}$ constant
2 $P_v = 2\text{MPa}$ constant
3 $P_v = 3\text{MPa}$ constant
4 $P_v = 5\text{MPa}$ constant
5 $P_v = 10\text{MPa}$ constant

$P_v =$ Pressure drop across valve
(Input pressure minus load pressure and return pressure)

Power Limits:

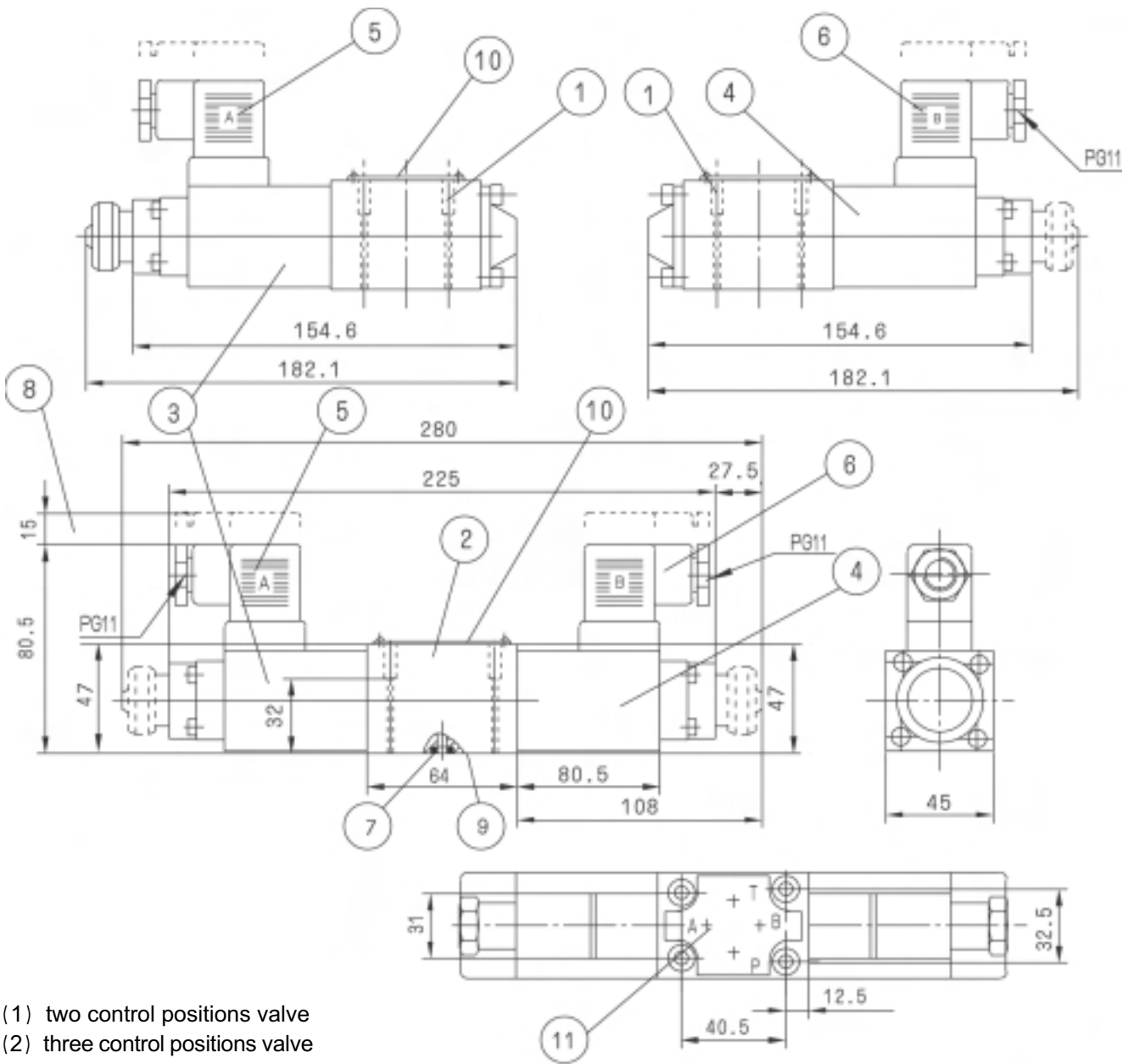
Type 4WRA6 power limits of

Flow (L/min) Symbol	Pressure (MPa)				
	6	12	16	24	31.5
E.M.W5	13	14	14	14	14
EA.MA.WA5	(27)	(27)	(27)	(26)	(*)
EB.MB.WB5					
E.M.W10	20	20	19	17	16
EA.MA.WA10	(40)	(37)	(34)	(31)	(*)
EB.MB.WB10					
E.M.W20	22	22	20	19	18
EA.MA.WA20	(43)	(37)	(34)	(32)	(*)
EB.MB.WB20					

Type 4WRA10 Power limits of

Flow (L/min) Symbols	Pressure (MPa)				
	6	12	16	24	31.5
E.M.W10	22	24	24	24	24
EA.MA.WA10	(52)	(48)	(47)	(45)	(*)
EB.MB.WB10					
E.M.W20	36	36	34	33	31
EA.MA.WA20	(67)	(61)	(58)	(53)	(*)
EB.MB.WB20					
E.M.W40	50	46	42	38	34
EA.MA.WA40	(95)	(83)	(77)	(73)	(*)
EB.MB.WB40					

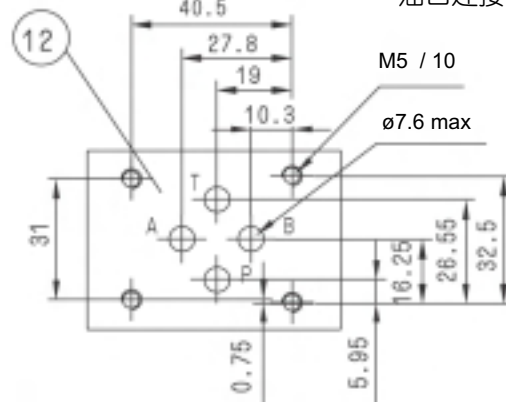
Note:()Valves in brackets are applicable for double flow through the valve
 (*)Because of the max.tank pressure of 24MPa double flow through the valve is in possible.



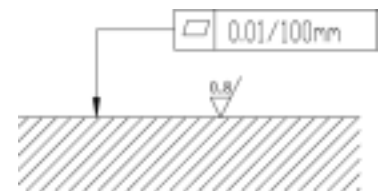
- (1) two control positions valve
- (2) three control positions valve
- (3) Proportional solenoid "a"
- (4) Proportional solenoid "b"
- (5) Plug(grey)
- (6) Plug(black)
- (7) O-ring 9.25X1.78
- (8) Space required to remove the plug
- (9) Valve mounting face with ports positions
- (10) Nameplate
- (11) Ports positions
- (12) Dimensions of valve mounting face

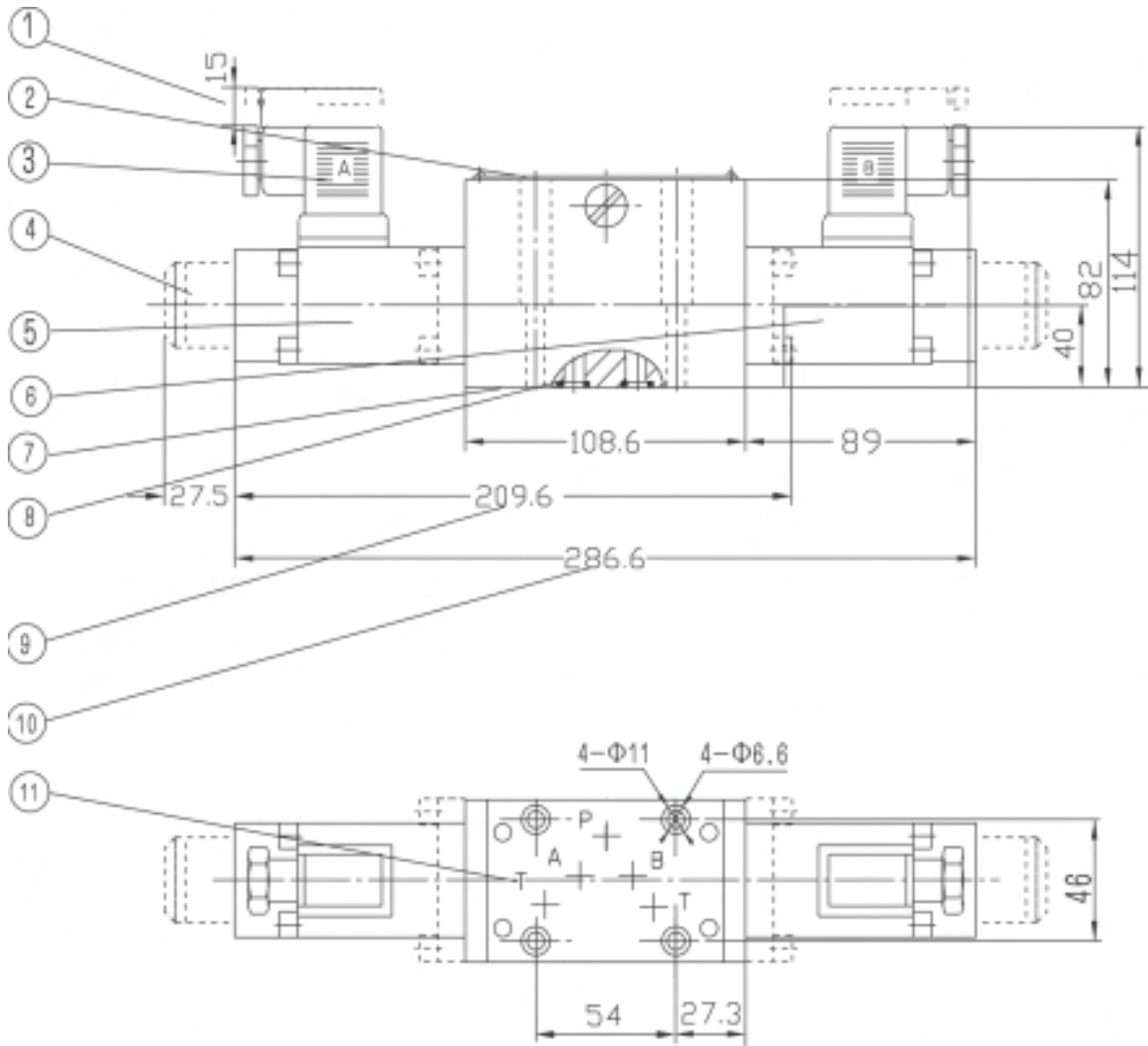
Subplates :G341/01;G342/01;
G502/01
see Page 80

油口连接面尺寸

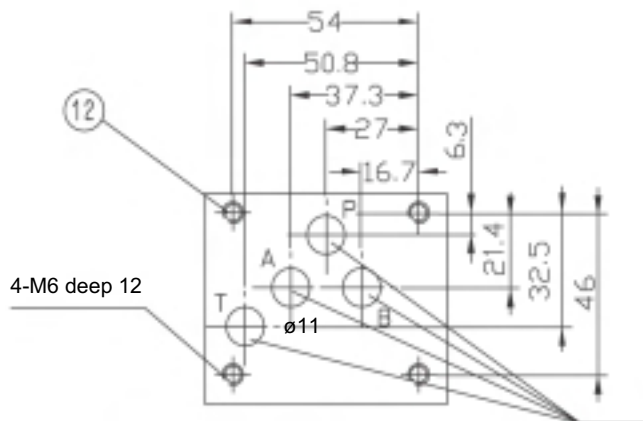


Required surface finish of mating piece





- (1) Space required to remove the plug
- (2) Nameplate
- (3) plug:(A)grey,(B)black
- (4) Emergency hand operators
- (5)Proportional solenoid "a"
- (6)Proportional solenoid "b"
- (7) Valve mounting face with ports positions
- (8) O-ring 12X2
- (9)Dimension of 2-position valve
- (10) Dimension of 3-position valve
- (11) Ports positions
- (12) Dimensions of valve mounting face
Subplates:G66/01;G67/01;G534/01
See Page 81



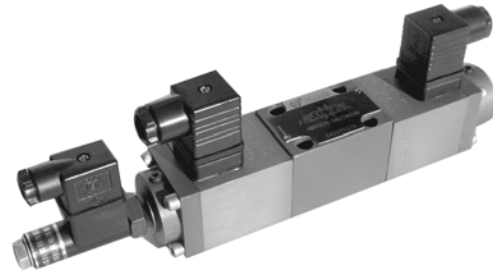
Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/2 and 4/3 Proportional Directional Valves Direct Control, Type 4WRE, Series 1X,with electrical feedback			RE24750/06.2004
	Size 6 and10	up to 31.5MPa	up to 260L/min	Replaces:

Features:

- Valve for controlling both direction and flow of a hydraulic fluid
- For subplate mounting
- Electrical position feedback
- Spring centred control spool
- Low pressure drop across the control lands
- Both valve and electronic control from one supplier
- Mounting pattern to DIN 24 340 form A,ISO4401 and CETOP-RP121H.



Type 4WRE6 . . . 10B/24Z4/ . . .

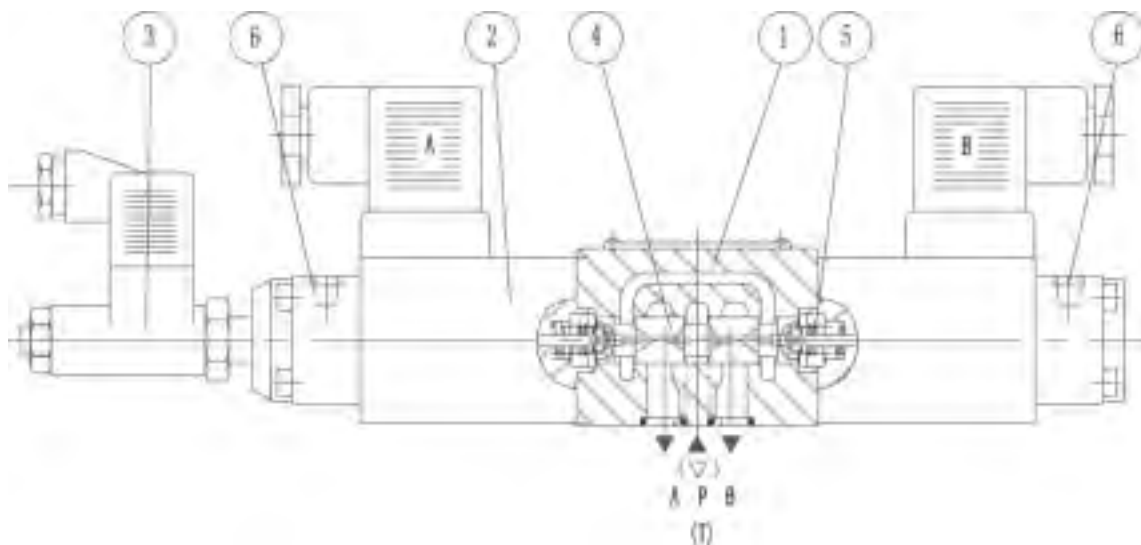
Function ,Section

Type 4WRE directional valves are direct operated by means of proportional solenoids and are used to control the direction and volume of a flow.

They consist basically of housing (1), control spool (4), two return springs (5), two proportional solenoids (2) and a positional transducer (3).

Type 4WRE $\frac{6}{10}$. . . 10B/ . . . (3-position)

If the solenoid "a" (2) is energised, the spool is moved to the right, the travel being proportional to the electrical input signal. The control spool (4) causes the V-shaped grooves to open progressively to flow. The position of the control spool (4) is monitored by the positional transducer (3). In the electronic control the actual position of the control spool is compared with the pre-set value. Here we have a position control circuit which recognizes existing differences between the pre-set value (command value) and the feedback value (actual value) and corrected by appropriate signals on the relevant solenoids. Once solenoid "a" (2) is de-energised the control spool is returned to its centre position by the return springs (5).



Type 4WRE6

Control cover with stroke limiter and remote control connection: type...H... (Dimensions in mm)

NS 80 to 160

1 2 3 4²⁾ 10 16 18 19



Further details in clear text

size				Type	Remote control port	Orifice in port + diameter in 1/10 mm
80	100	125	160			
X	X	X	X	H2	F	[Pattern]
X	X	X	X	H2	F	[Pattern]
X	X	X	X	H2	F	[Pattern]

Technology of Beijing Huade Hydraulic

No code =

Mineral oils

V =

Phosphate ester

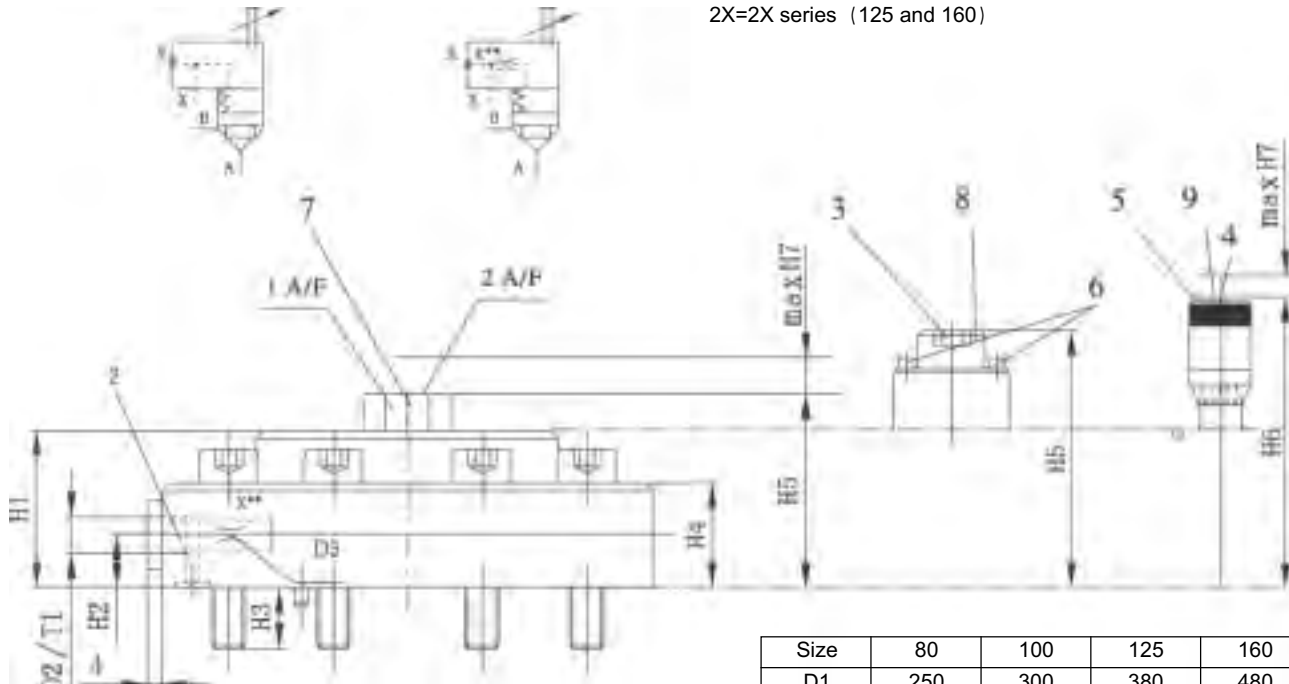
Orifice possible, if required state details

²⁾ 6X=6X series (80 and 100)

2X=2X series (125 and 160)

LFA.H-.../F..

LFA.H-.../FX**



Size	80	100	125	160
D1	250	300	380	480
D2	G3/4"	G1"	G1 1/4"	G1 1/4"
D3 ¹⁾	G3/8"	G1/2"	G1"	G1"
H1	114	132	170	225
H2	25 24 ³⁾	35	50	70
H3	45	52.5	61	74
H4	76	88.5	100	147
H5	137	157	195	340
H6	229	247	-	-
H7	30	38	48	-
T1	16	18	20	20
SW1	75	75	95	-
SW2 ⁴⁾	24	27	27	-

¹⁾ For orifice ordering details, see page 7.

³⁾ Only applicable to adjustment "H4"

⁴⁾ Internal thread

1 Nameplate

2 Port X optionally as a threaded connection

3 Internal thread, 32 wide of opposite side

4 Internal thread, 14 wide of opposite side

5 Internal thread, 5 wide of opposite side

6 Internal thread, 8 wide of opposite side

7 Control "H2"(size 80 to 125)

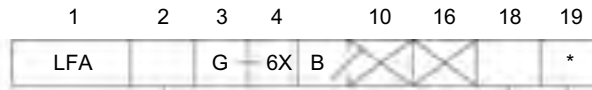
8 Control "H2"(size 160)

9 Control "H4"(size 80 and 100)

Control cover with built-in shuttle valve: type ...G...

(Dimensions in mm)

NS 16 to 63



Further details in clear text

Size	Orifice in port	
	X	Z1
16	Φ 1.2	Φ 1.2
25	Φ 1.5	Φ 1.5
32	Φ 2.0	Φ 2.0
40	X12	Z1-12
50	X15	Z1-15
63	X18	Z1-18

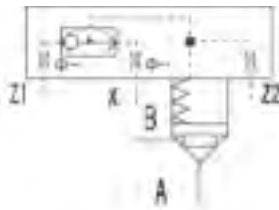
Technology of Beijing Huade Hydraulic

No code =
V =

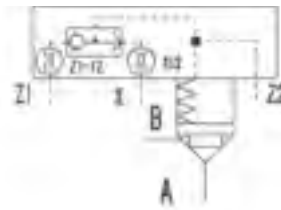
Mineral oils
Phosphate ester

▲ Drilled orifice (diameter in mm)
● Standard orifice (diameter in 1/10 mm) } does not appear in the type code

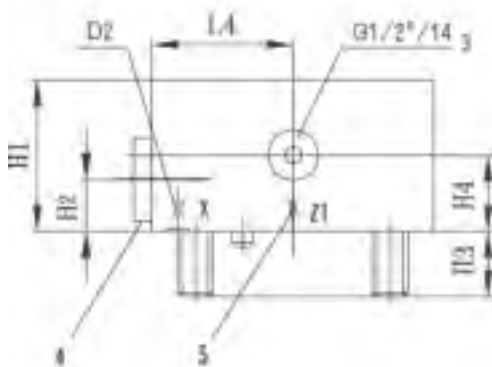
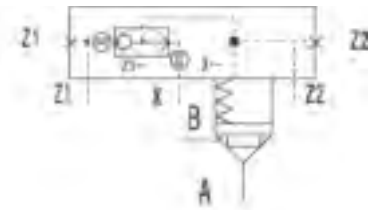
LFA.G 6XB/
NS 16 to 32



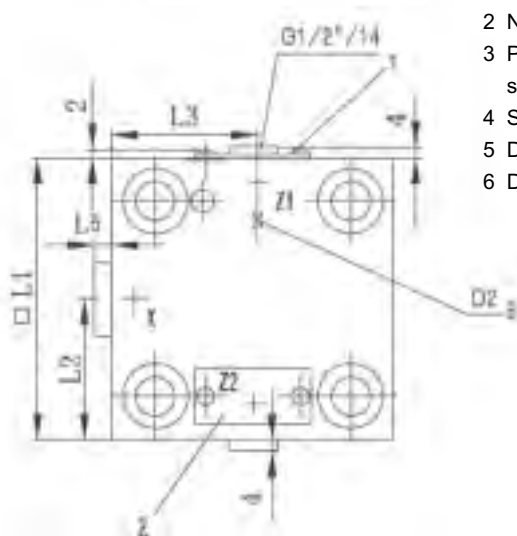
LFA.G 6XB/
NS 40



LFA.G 6XB/
NS 50 to 63



Size	16	25	30	40	50	63
D1	Φ 1.2	Φ 1.5	Φ 2.0	M6	M8 × 1	M8 × 1
D2	Φ 1.2	Φ 1.5	Φ 2.0	M6	M8 × 1	M8 × 1
H1	35	40	50	60	68	82
H2	17	17	21.5	30	32	40
H3	15	24	28	32	34	50
H4	-	-	-	-	32	40
L1	65	85	100	125	140	180
L2	36.5	45.5	50	62.5	74	90
L3	-	-	-	-	72	79
L4	-	-	-	-	72	90
L5	2.5	2	-	-	6	2



- 1 Nameplate for size 16, 25, 32
- 2 Nameplate for size 40, 50, 63
- 3 Ports Z1 and Z2 optionally as a threaded connection for size 50 and 63
- 4 Shuttle valve
- 5 D2 for size 16 to 40
- 6 D2 for size 50 to 63

Technical data (For application outside these parameters, Please consult us!)

Hydraulic

size		6	10
Max. flow (L/min)		65	260
Operating pressure (MPa)	Port A,B,P	31.5	31.5
	Port T	16	16
Hysteresis (%)		< 1	< 1
Repeatability (%)		< 1	< 1
Response sensitivity (%)		≤ 0.5 of nominal signal	≤ 0.5 of nominal signal
Frequency response (-3dB) (Hz)		6	4
Hydraulic fluid		Mineral oil(for NBR seal), Phosphate ester(for FPM seal)	
Viscosity range (mm ² /s)		2.8 to 380	
Hydraulic fluid temperature range (°C)		-20 to +70	
Degree of contamination (μ m)		≤ 20(recommcend 10)	
Mounting position		Optional	
Weight (Kg)	Valve with 1 solenoid	1.91	5.65
	Valve with 2 solenoids	2.66	7.65

Electrical

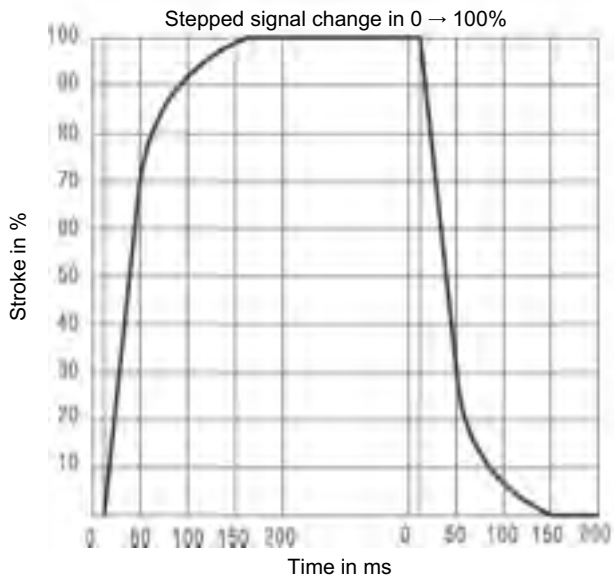
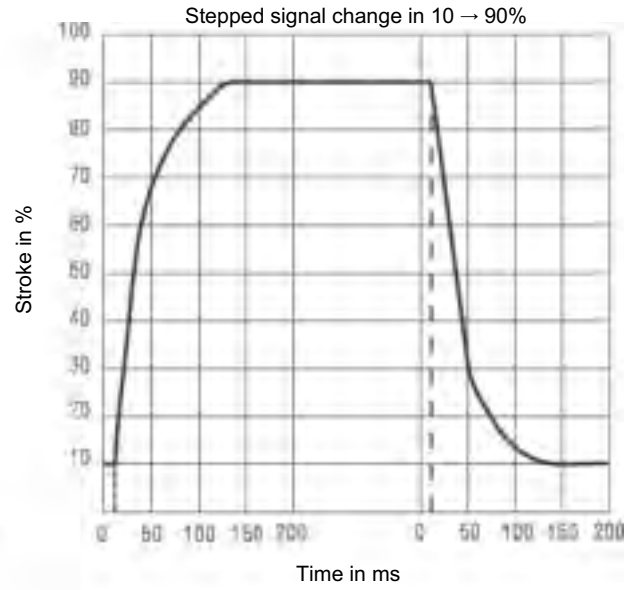
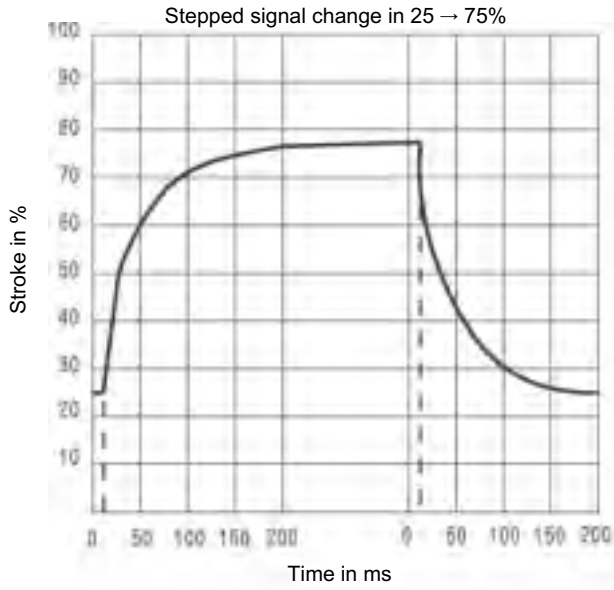
Type of voltage		Direct voltage 24V or 12V	
Max. current per solenoid (A)		1.5	1.5
coil resistance (Ω)	Cold value at 20 °C	5.4	10
	Max. warm value	8.1	15
Duty		Continuous	
Coil temperature (°C)		+150	
Environment temperature (°C)		+50	
Valve insulation		IP65	
Associated amplifier	with 2 ramp times	VT-5001S20 (for 2-positions)	VT-5002S20 (for 2-positions)
	with 1 ramp time	VT-5005S10(for 3-positions)	VT-5006S10(for 3-positions)

Inductive positional transducer

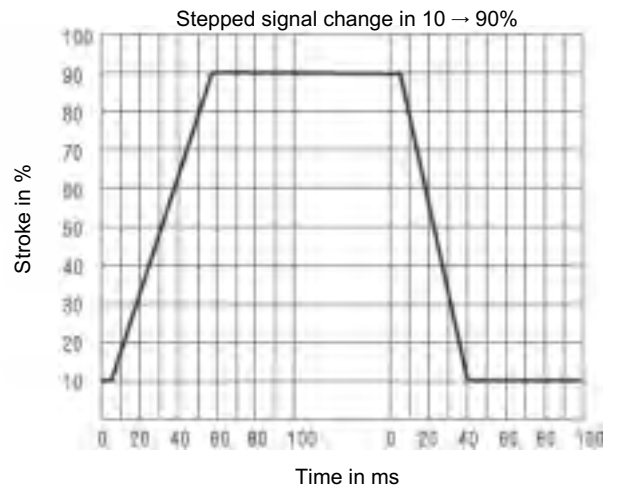
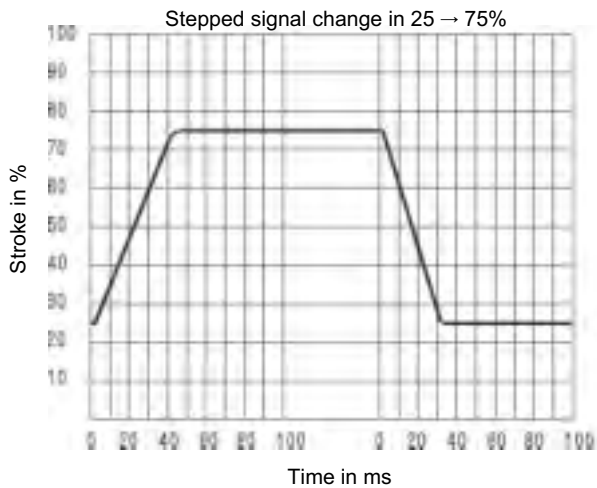
Electrical measuring system		LVDT	
Control stroke (mm)		± 4.5 linear	
Linearity tolerance (%)		1	
Coil resistance(Ω)	I R20	56	
	II R20	56	
	III R20	112	
Inductivity (mH)		6 to 8	
Oscillator frequency (KHz)		2.5	
Valve insulation		IP65	

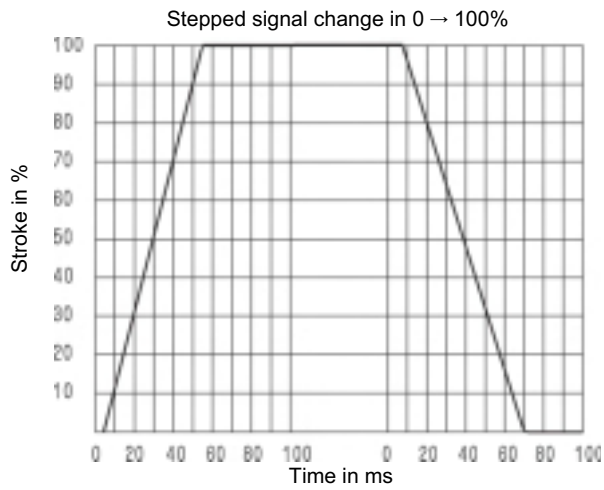
Transient functions with stepped electrical input signals

Type 4WRE6



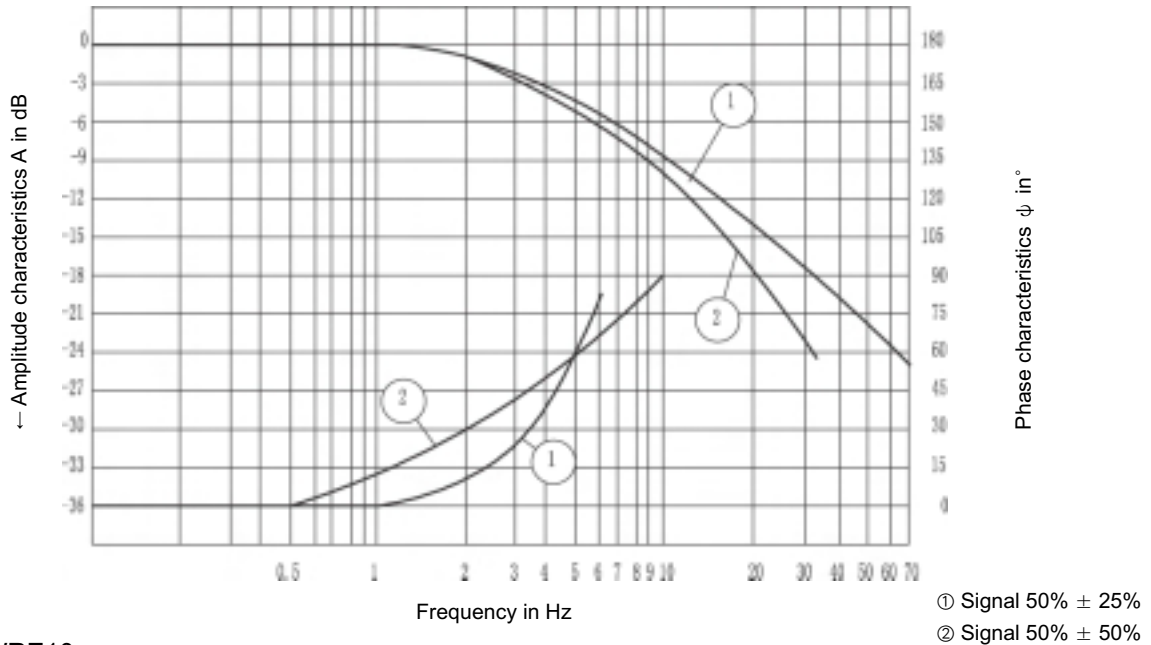
Type 4WRE10



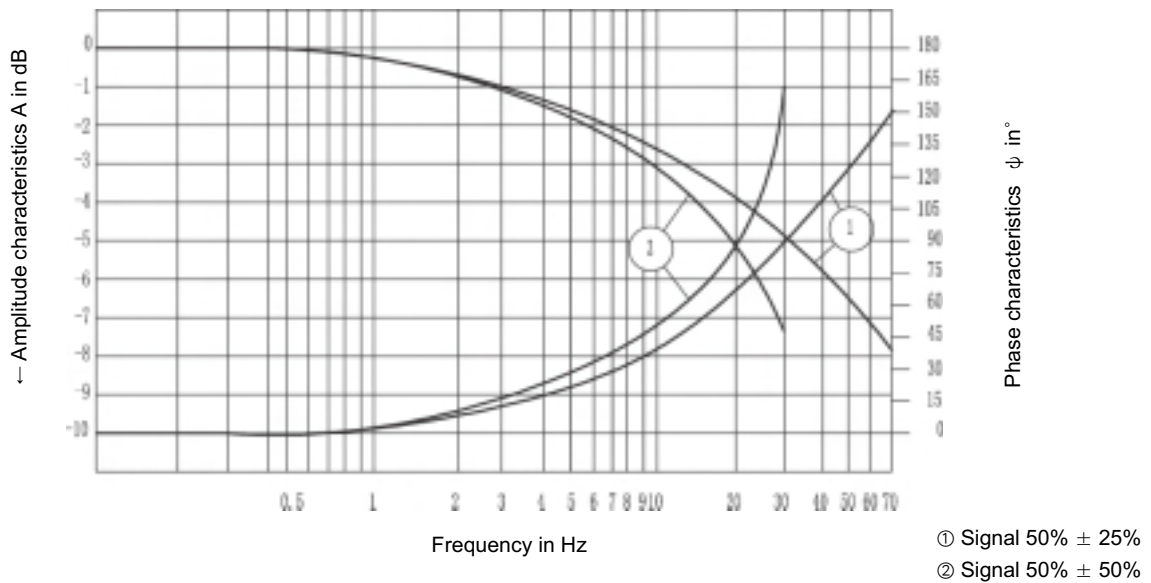


Characteristic curves: (measured at $v=36 \times 10^{-6}m^2/S$ and $t=50^\circ C$)

Type 4WRE6

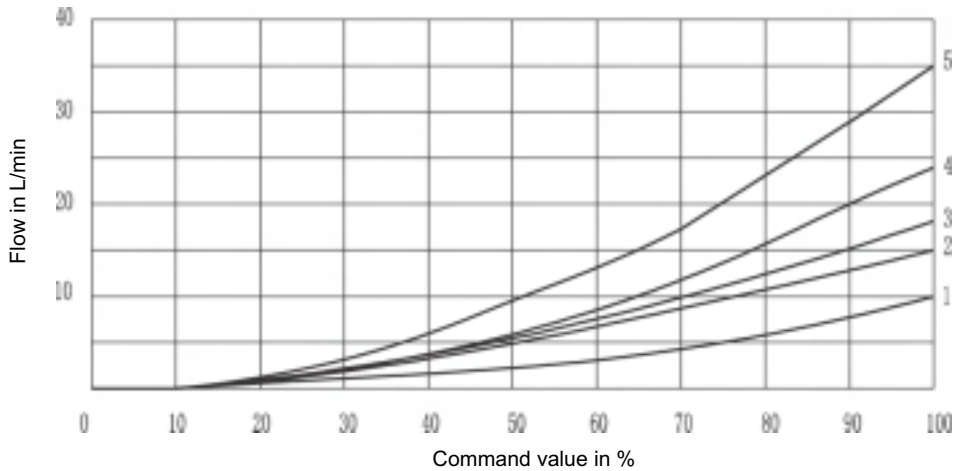


Type 4WRE10

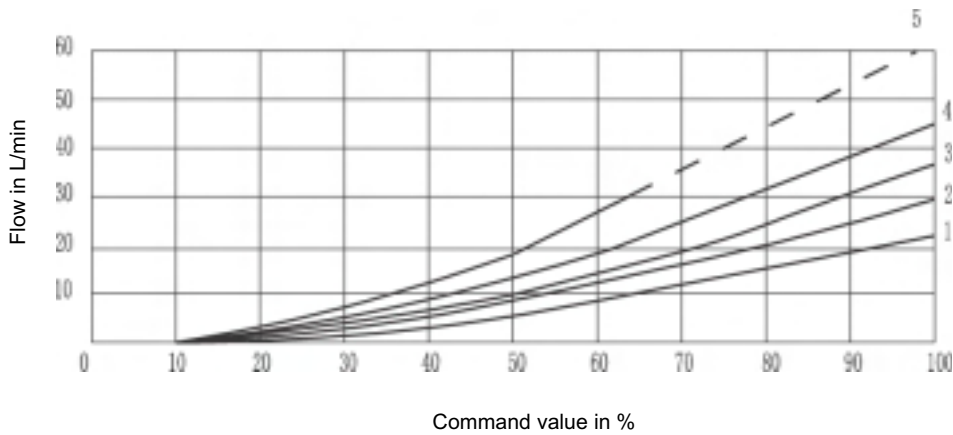


Characteristic curves: (measured at $v=36 \times 10^{-6}m^2/S$ $t=50^{\circ}C$)

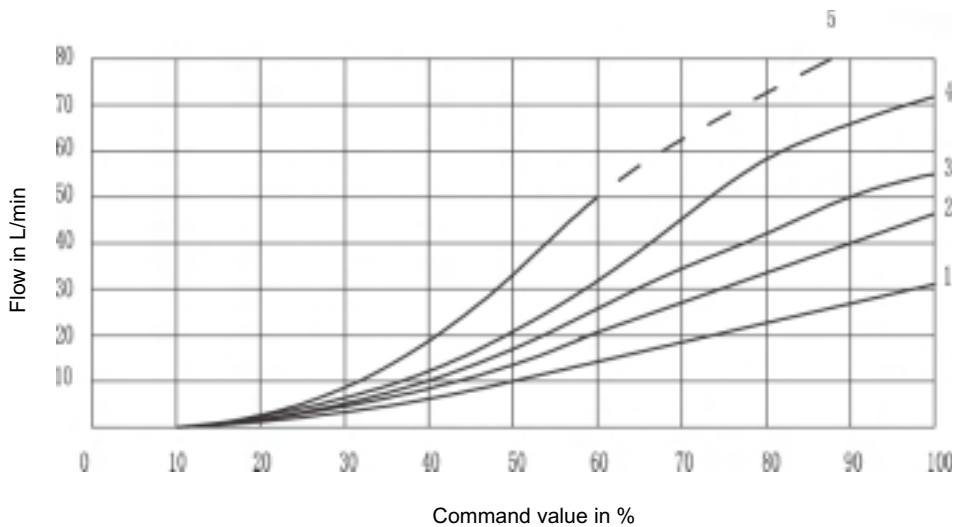
Type 4WRE6



10L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant



21L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant



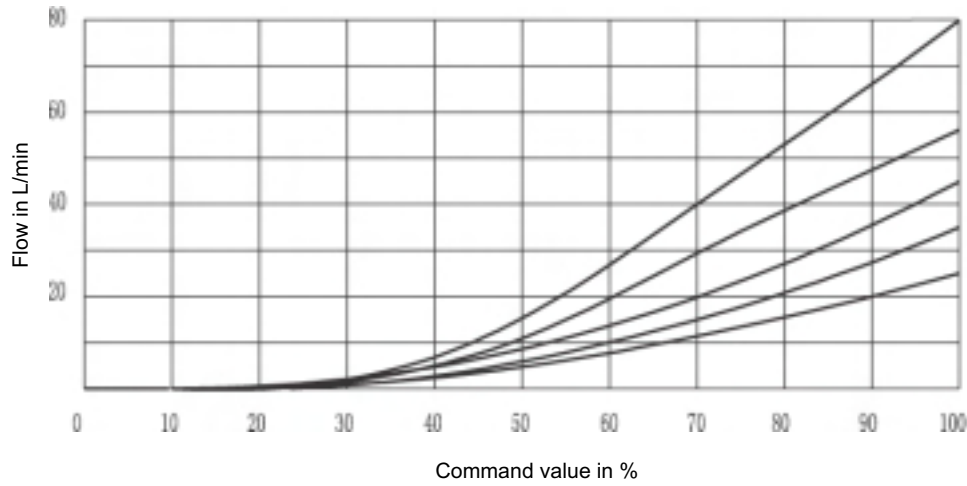
32L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant

Warning : Please note the power limits

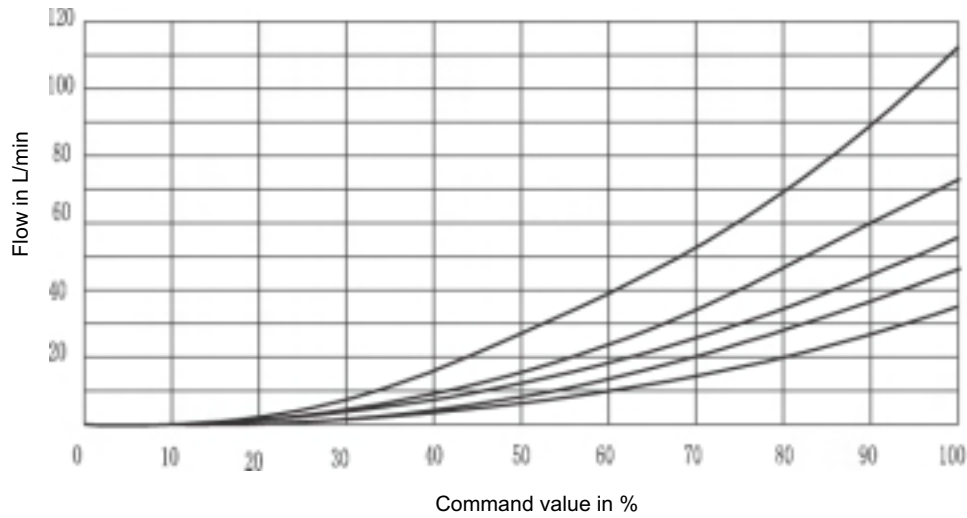
Pv = Valve pressure difference
 (Input pressure minus load pressure and return pressure)

Characteristic curves: (measured at $v=36 \times 10^{-6}m^2/s$ $t=50^\circ C$)

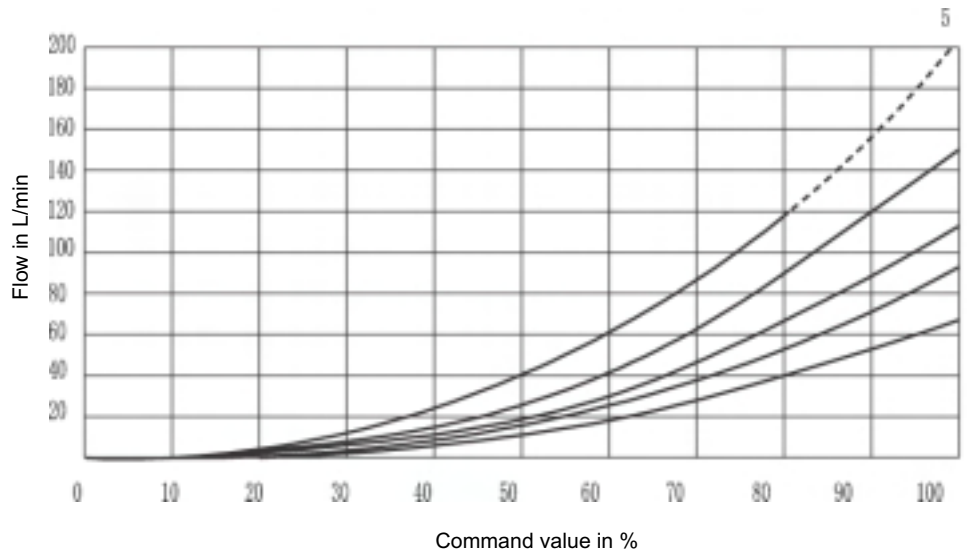
Type 4WRE10 :



27L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant



42L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant



64L/min Nominal flow at 1MPa valve pressure difference
 1 Pv = 1MPa constant
 2 Pv = 2MPa constant
 3 Pv = 3MPa constant
 4 Pv = 5MPa constant
 5 Pv = 10MPa constant

Warning : Please note the power limits

Pv = Valve pressure difference
 (Input pressure minus load pressure and return pressure)

Power limit:

Type 4WRE6

Flow (L/min) Symbol	Pressure (MPa)				
	6	12	16	24	32
E.M.W8	27	25	23	22	20
EA.MA.WA8	(48)	(40)	*	*	*
E.M.W16	38	34	29	25	23
EA.MA.WA16	(65)	(51)	*	*	*
E.M.W32	52	41	36	34	32
EA.MA.WA32*	(65)	(58)	*	*	*

() Values in brackets apply for double flow through the valve

* Because of the max.tank pressure of 16 MPa double flow through the valve is impossible

Type 4WRE10

Flow (L/min) Symbol	Pressure (MPa)				
	6	12	16	24	32
E.M.W16	49	80	65	60	60
EA.MA.WA16	(98)	(115)	(****)	(****)	(****)
E.M.W32	130	110	100	95	90
EA.MA.WA32	(180)	(150)	(****)	(****)	(****)
E;M;W64					
EA;MA;WA64	180	130	110	100	90
E E1;W164(*)	(260)	(180)	(****)	(****)	(****)
EA E2;W264(**)					
EB E3;W364(***)					

() Values in brackets apply for double flow through the valve

(*) For spools E1 and W1:

$$P \rightarrow A = \rightarrow Q_{\max} / B \rightarrow T = \frac{Q}{2}$$

$$P \rightarrow B = \frac{Q}{2} / A \rightarrow T = Q_{\max}$$

(**) For spools E2 and W2

$$P \rightarrow A = \frac{Q}{2} / B \rightarrow T = Q_{\max}$$

$$P \rightarrow B = \rightarrow Q_{\max} / A \rightarrow T = \frac{Q}{2}$$

(***) For spools E3 and W3

$$P \rightarrow A = Q_{\max} / B \rightarrow T = \text{blocked}$$

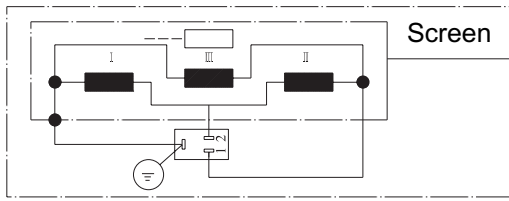
$$P \rightarrow B / A \rightarrow T = Q_{\max}$$

(****) Because of the max.tank pressure of 16 MPa, double flow through the valve is impossible

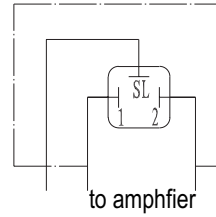
Electrical connections

Inductive positional transducer

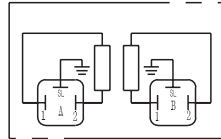
Coil connections



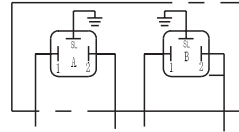
Plug-in connection



Coil connections

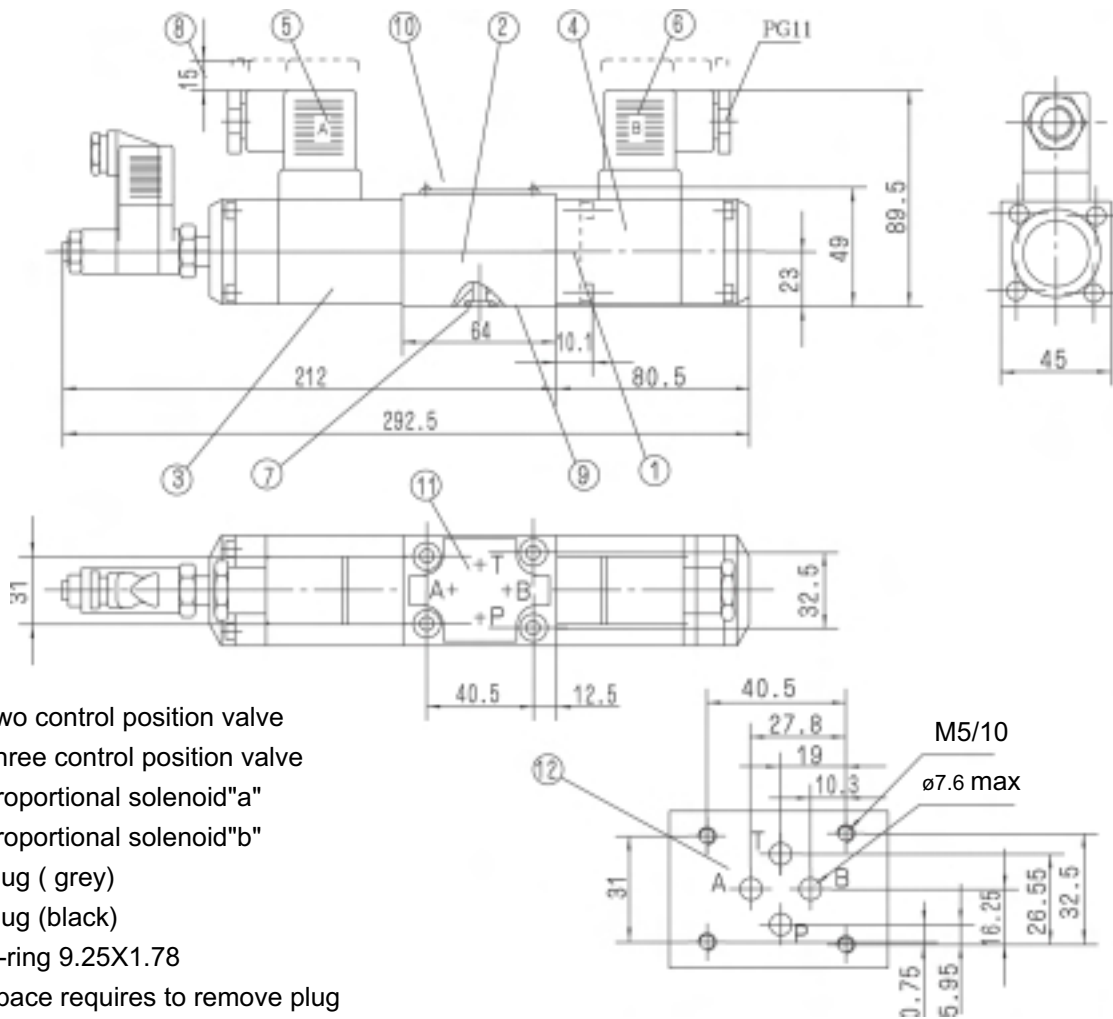


Plug-in connection



Unit dimensions: Type 4WRE6

(Dimensions in mm)



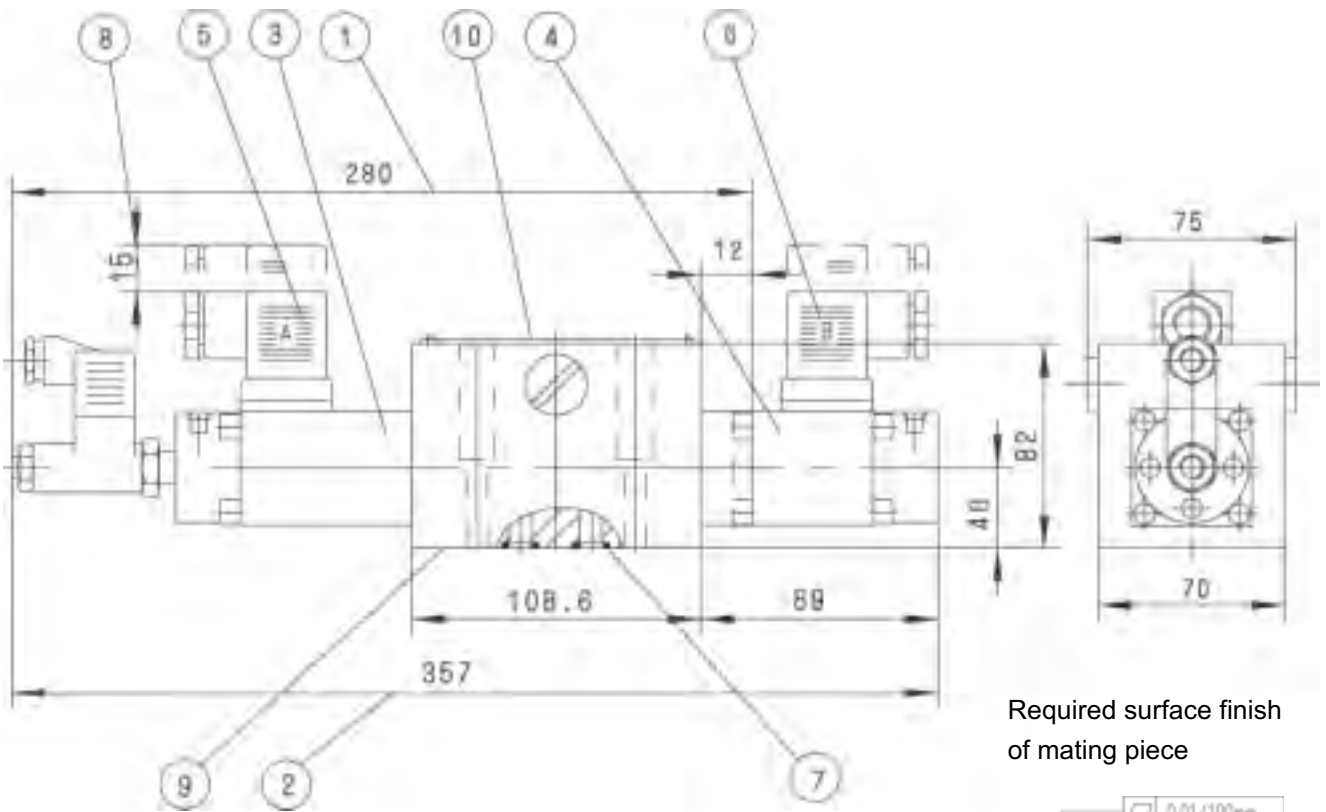
- (1) Two control position valve
- (2) Three control position valve
- (3) Proportional solenoid "a"
- (4) Proportional solenoid "b"
- (5) Plug (grey)
- (6) Plug (black)
- (7) O-ring 9.25X1.78
- (8) Space requires to remove plug
- (9) Valve mounting surface
- (10) Nameplate
- (11) Position of ports
- (12) Dimensions of valve mounting surface

Subplates: G341/01;G342/01;G502/01

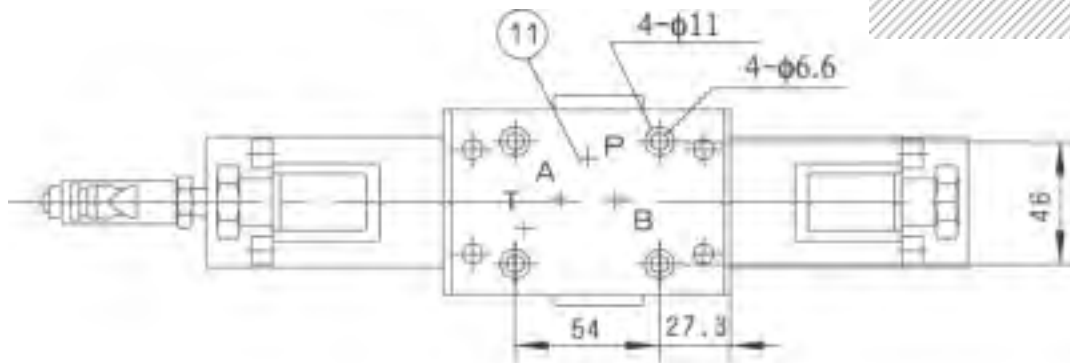
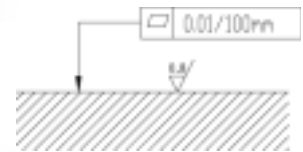
See page 80

Required surface finish
of mating piece

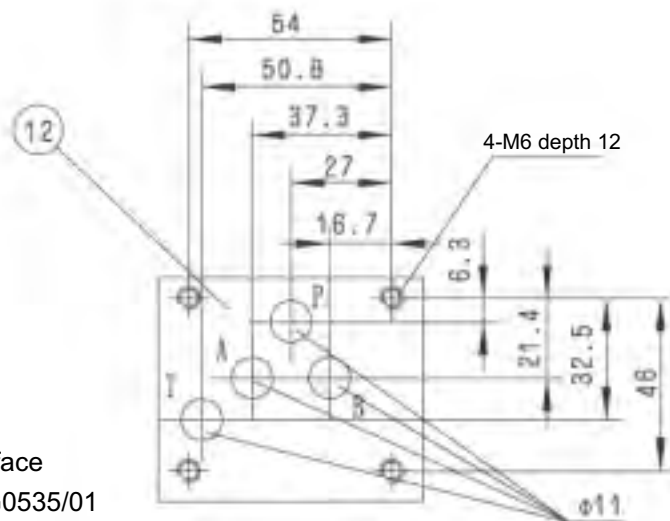




Required surface finish of mating piece



- (1) Dimension of 2-position valve
- (2) Dimension of 3-position valve
- (3) Proportional solenoid "a"
- (4) Proportional solenoid "b"
- (5) Plug (grey)
- (6) Plug (black)
- (7) O-ring 12X2
- (8) Space required to remove plug
- (9) Valve mounting surface
- (10) Nameplate
- (11) position of ports
- (12) Dimensions of valve mounting surface



Subplates: G66/01;G67/01;G534/01 G0535/01

See page 81 and 82

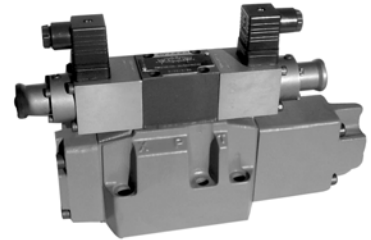
注 意 事 项

- 1 液压系统用的介质必须过滤；过滤精度至少 20 μm 。
- 2 液压系统用的油箱必须密封；并加空气过滤器。
- 3 本厂产品出厂时不带底板。（如需用请订货）。
- 4 固定螺栓请按样本中列的参数选用。
- 5 与阀连接的表面粗糙度要求 $\sqrt{0.8}$ 。
- 6 与阀连接的平面度要求 0.01/100mm。

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Directional Valves pilot operated type 4WRZ, external pilot operated type 4WRH			RE24750/06.2004
	Size 10 to 32	up to 35 MPa	up to 1600 L/min	Replaces:

Features:

- Pilot (WRZ) and direction (WRH) proportional valve
- For subplate mounting
- For the control of both direction and flow rate of a hydraulic fluid
- Spring centred ,no spool drift
- Low pressure drop across control lands
- Valve and electronic control from one source
- Proportional solenoid operation
- Porting pattern to DIN 24 340 form A,ISO4401 and CETOP-RP121H.

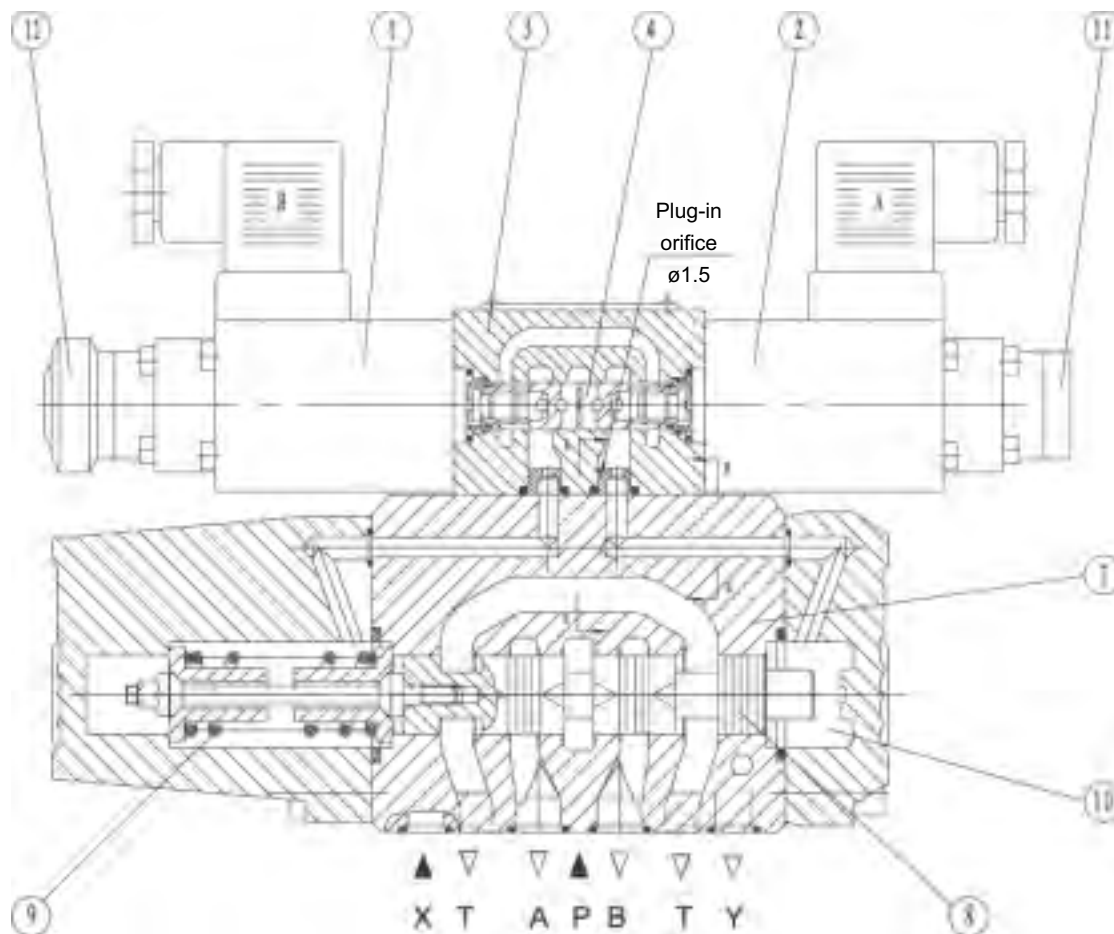


Function,section

Valve types 4WRZ... are 4- way valves operated by means of proportional solenoids.They control the direction and flow rate of hydraulic fluid.

They basically consist of the pilot valve (3) ,the main valve (7) with the main spool (8),and the centering spring (9). If solenoid "B" is energised, pilot spool (4) is moved to the right.Pilot oil is then either fed internally from port P ,or "externally" from port X via the pilot valve (3) into the pressure chamber (10) and moves the main spool (8) a distance proportional to the strength of the electrical current.The throttling grooves in the main spool open progressively with increasing current, thus controlling the flow of hydraulic fluid to the actuator ports.

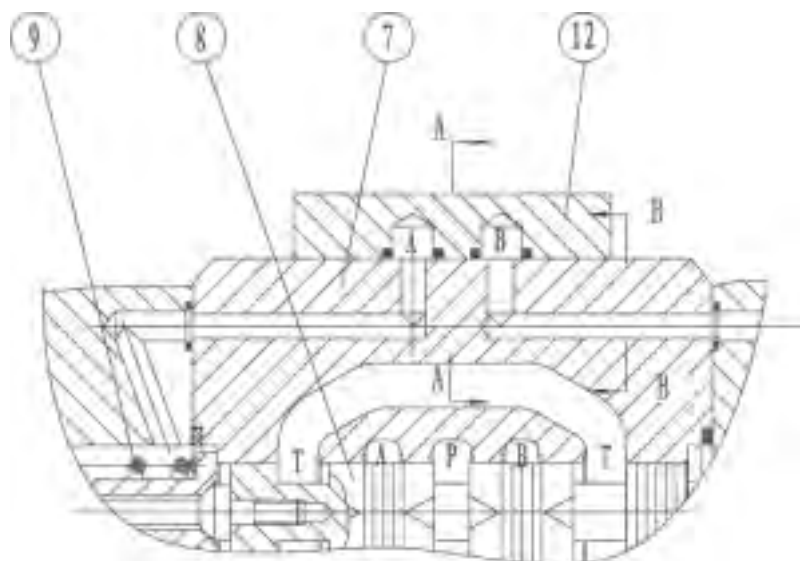
When the electrical signal is switched off, both the pilot spool (4) ,and the main spool (8) return to neutral independent of the control pressure supply.An emergency hand operator permits movement of the pilot spool position without energising the solenoids.



Proportional valve of type 4WRZ

Type 4WRH:

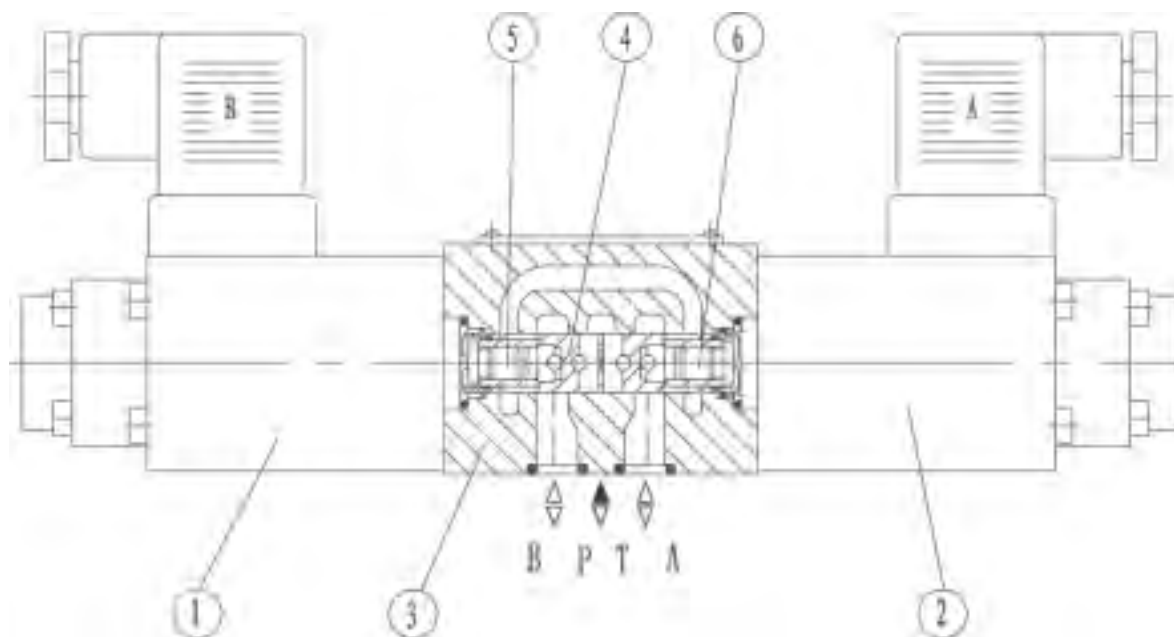
The type 4WRH valves are pilot operated proportional directional valves for external operation via pressure control valves. The function and principle is the same as that for valve type 4WRA. The inter-connecting plate (12) connects the pilot connection A with connection T(Y) and pilot connection B with P(X). The pilot pressure at the main valve must be from 0.4 MPa to 2.5 MPa, so flow is either from P to A and B to T or P to B and A to T.



proportional valve of type 4WRH

Pilot valve:

The pilot valve is a proportional solenoid operated 3-way pressure reducing valve (type 3DREP6). Throttle insert are installed in port A and B, further details see the text of 3DREP6.

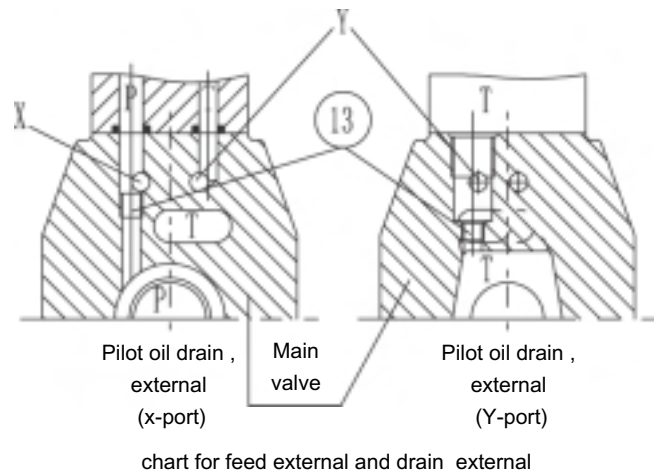


Pilot valve type 3DREP6

Pilot Oil Supply

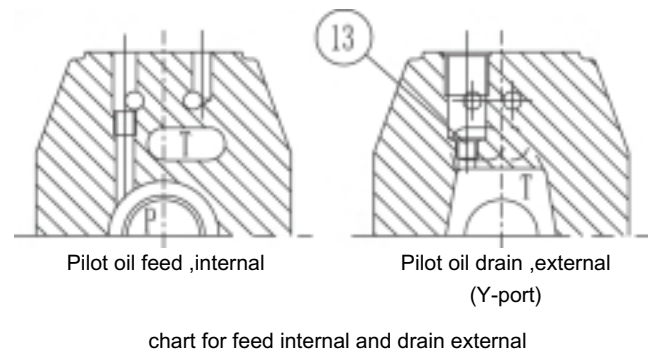
1. Pilot oil feed , external ; drain , external。
On this model,the pilot oil feed via the port "X" , return is not directed into the T-port of main valve, but is led separately via port Y to tank(externaily)

13. Plug M6

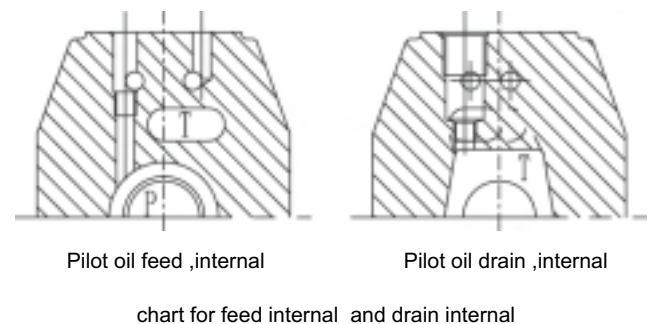


2. Pilot oil feed , internal ; drain , external。
On this model,the pilot oil inlet is supplied from the P-port of the main valve(internaliy).The polit oil return is not directed into the T-port of main valve, but is led separately via port Y to tank(externaily)

13. Plug M6

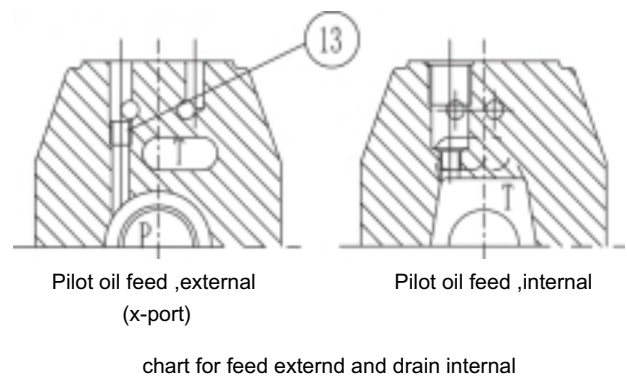


3. Pilot oil feed , internal ; drain , internal。
On this model,the pilot oil inlet is supplied from the P-port of the main valve(internaliy).The polit oil return is taken directly into the T-port of the main valve (internaliy).Ports "X" and "Y" in the subplate are both plugged.

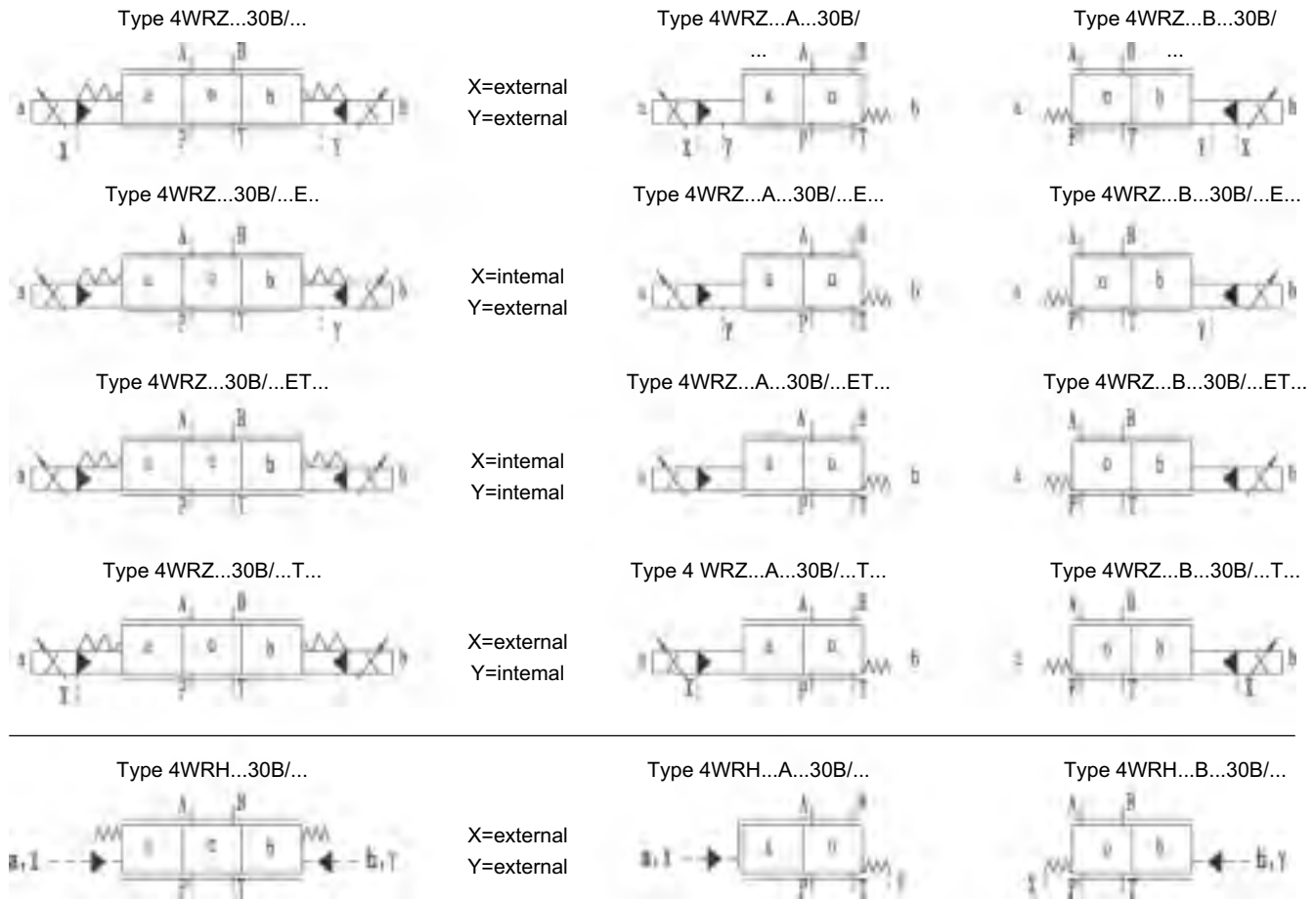


4. Pilot oil feed , external ; drain , internal。
On this model,the pilot oil inlet is feed from port "X", The polit oil return is taken directly into the T-port of the main valve (internaliy).Port "Y" in the subplate is plugged.

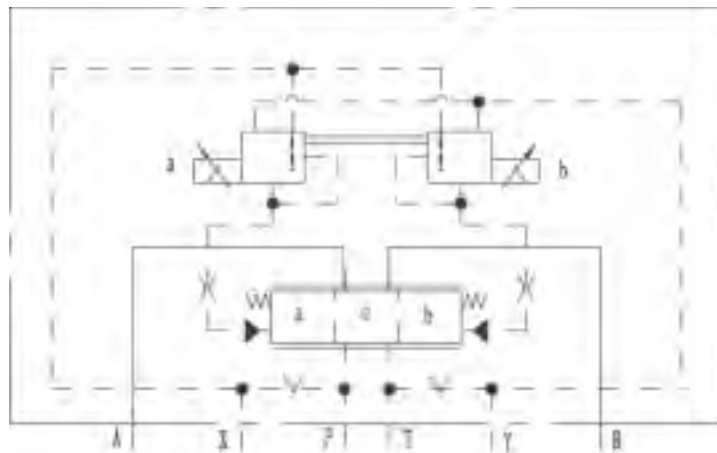
13. Plug M6



Symbols(simplified)

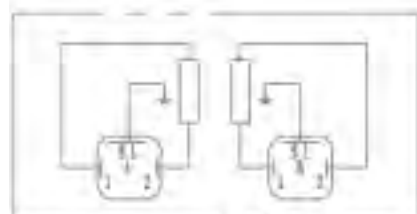


Symbols(detailed):

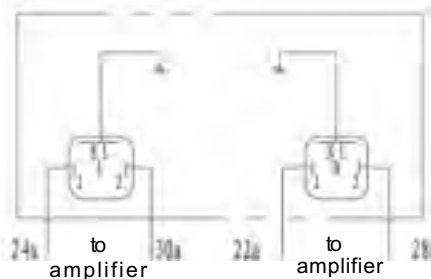


Example: 4WRZ...
 Polit oil feed,external
 polit oil drain,external

Coil connections



Plug connections



Ordering code

4WR 30 B *

Hydraulic operation =H
 Electro-hydraulic operation =Z

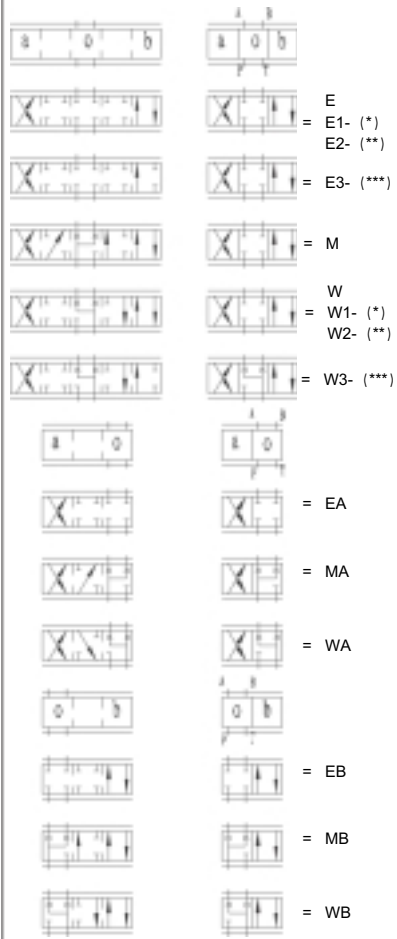
Further details in clear text

size 10 =10
 16 =16
 25 =25
 32 =32

M= mineral oils
 V= Phosphateester

no code= without press.reducing valve
 D 2= with press.reducing valve
 ZDR6DP2-30/75 YM(not for 4WRH
 or 4WRZ without pilot valve)

Spools



Z4=Pulg-in connector (not for 4WRH
 or 4WRZ without pilot or type J)

No code = Pilot oil supply external,
 drain external
 E= Pilot oil supply internal,
 drain external
 ET = Pilot oil supply internal,
 drain interna
 T= Pilot oil supply external,
 drain internal
 (type 4WRH without E,ET,T)

No code = Without special protection
 J = Sea water resistant

No code = Without hand override
 N = With hand override
 (not for 4WRH or 4WRZ without pilot
 valve)

24 = 24V DC (standard version)
 (not for 4WRH or 4WRZ without pilot
 valve)

6A= Pilot control valve size 6
 (not for 4WRH or 4WRZ without pilot
 valve)

B=Technology of Beijing Huade Hydraulic

30=Series 30 (30 to 39 unchanged
 installation and connection dimensions)

Nominal flow at 1MPa pressure drop accross valve

Size 10	25 L/min	=25
	50 L/min	=50
	85 L/min	=85
E1、 E2、 E3、 W1、 W2、 W3 only 85L/min		
Size 16	100 L/min	=100
	150 L/min	=150
E1、 E2、 E3、 W1、 W2、 W3 Only 150L/min		
Size 25	270 L/min	=270
	325 L/min	=325
E1、 E2、 E3、 W1、 W2、 W3 only 325L/min		
Size 32	360 L/min	=360
	520 L/min	=520
E1、 E2、 E3、 W1、 W2、 W3 only 520L/min		

(for regenerative control, connect full bore of cyl.to port A)

Technical data

Hydraulic data

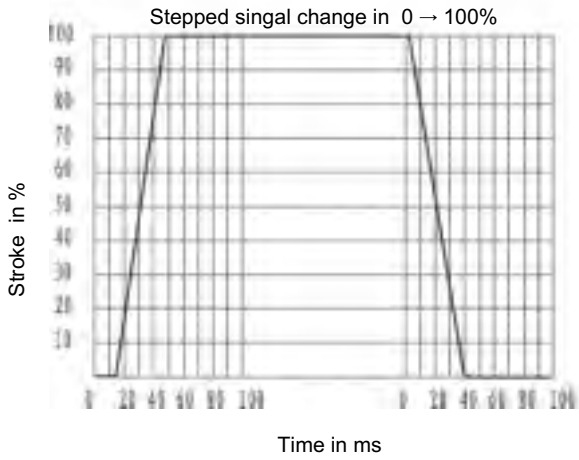
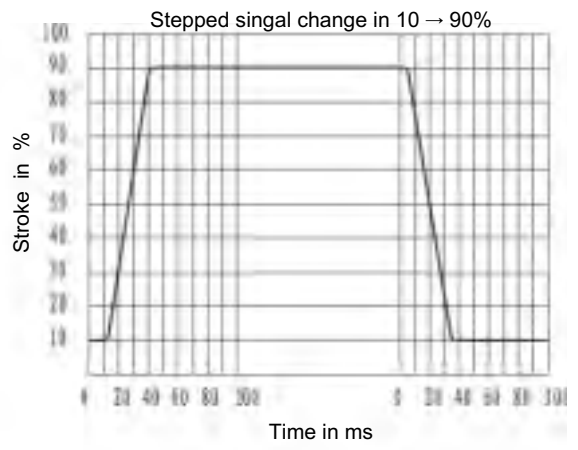
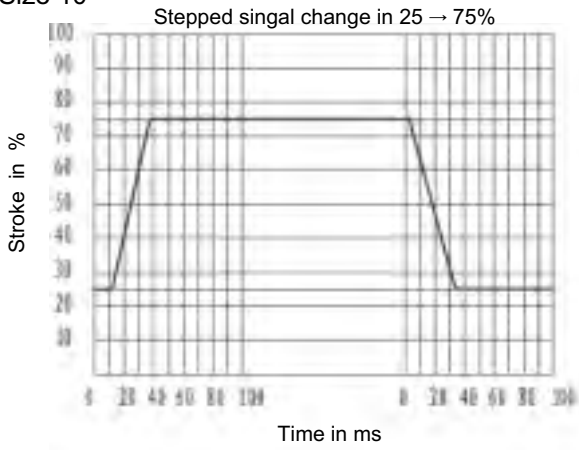
size		10	16	25	32
pilot valve pressure (MPa)	external pilot oil supply	3 to 10			
	internal pilot oil supply	Up to 10 (over 10 must installate ZDR6DP ₂ -30B/75YM)			
Main valve pressure (MPa)		31.5	35		
Return pressure (MPa)	port T(external pilot oil return)	31.5	25		15
	port T(internal pilot oil return)	3			
	port Y	3			
Pilot oil volume (cm ³) or spool movement 0~100%		1.7	4.6	10	26.5
Pilot oil flow at port X or Y (L/min) for spool movement 0~100%		3.5	5.5	7	15.9
Flow throught main valve (L/min)		270	460	877	1600
Hysteresis (L/min)		6			
Repeatability (%)		3			
degree of contamination (μm)		≤ 20			
Fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range (mm ² /s)		2.8 to 380			
Fluid temperature range (°C)		-20 to +70			
mounting position		optional			
Weight (Kg)	valve with one solenoid	7.4	12.7	17.5	41.8
	valve with two solenoids	7.8	13.4	18.2	42.2

Electrical data

Type of supply		DC
Norminal current of solenoid (A)		0.8
Coil resistance (Ω)		cold (at20°C) 19.5;max.valve,hot 28.8
Enviornment temperature (°C)		+50
Coil temperature (°C)		+150
Duty cycle		Continuous
Pilot current (A)		≤ 0.02
Insulation		IP65
Associated amplifier	With 1 ramp time	VT-3000S30
	With 5 ramp times	VT-3006S30
Electrical connection		Plug connection

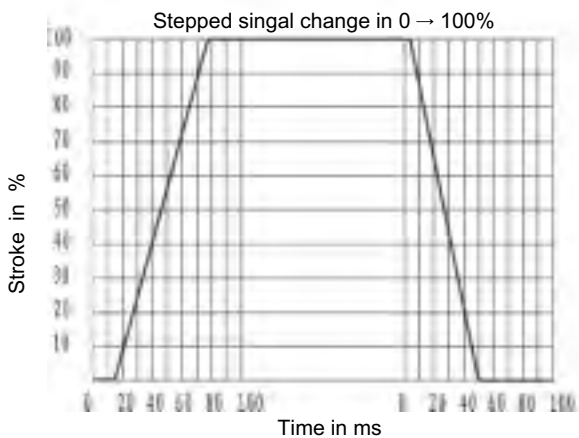
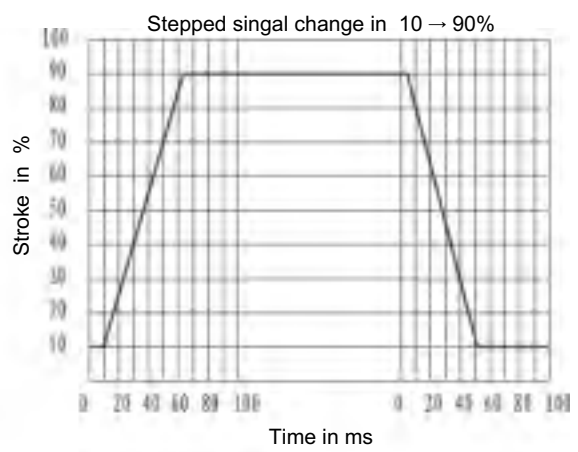
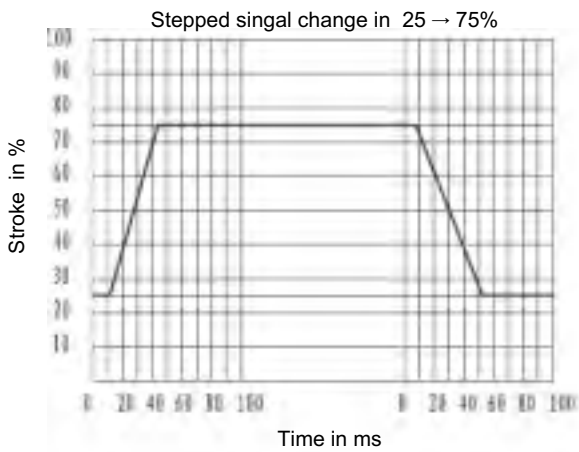
Valve Movement with Stepped Electrical Input Singal

Size 10



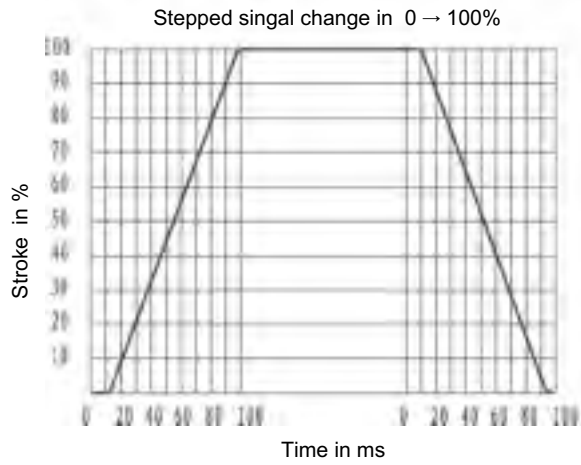
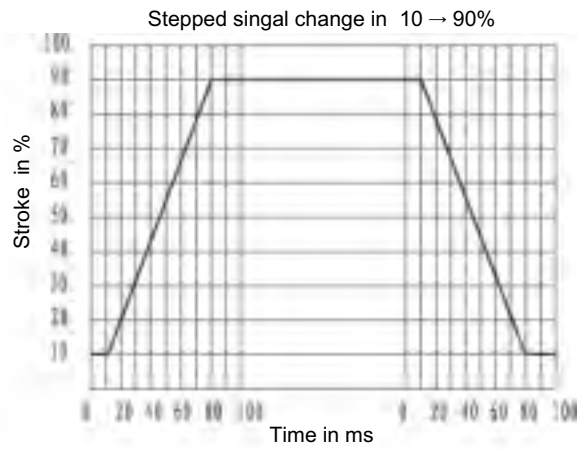
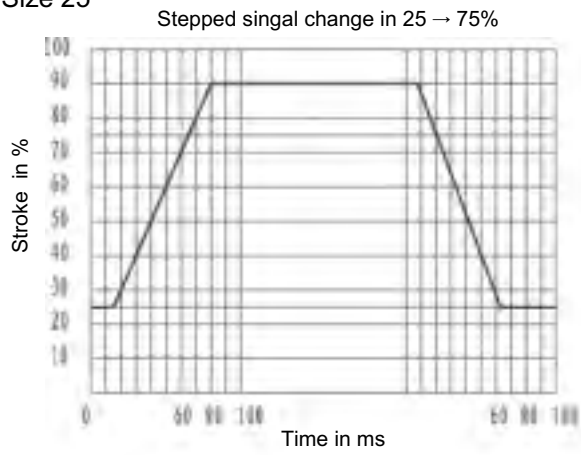
Pilot pressure at 5MPa

Size 16



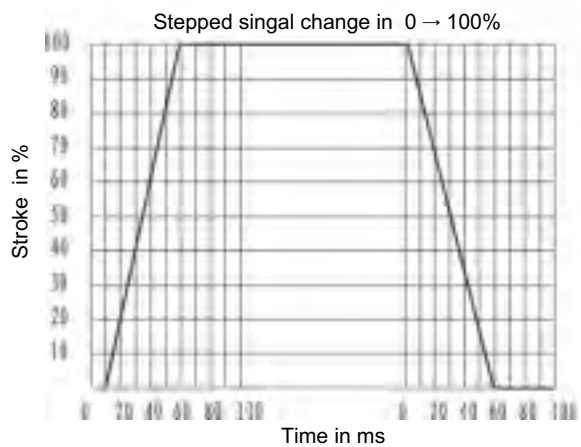
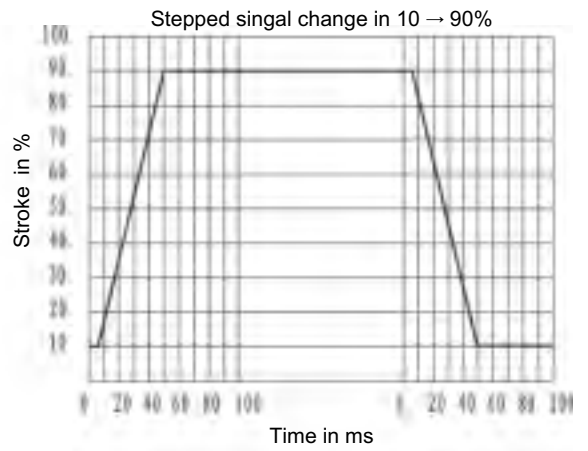
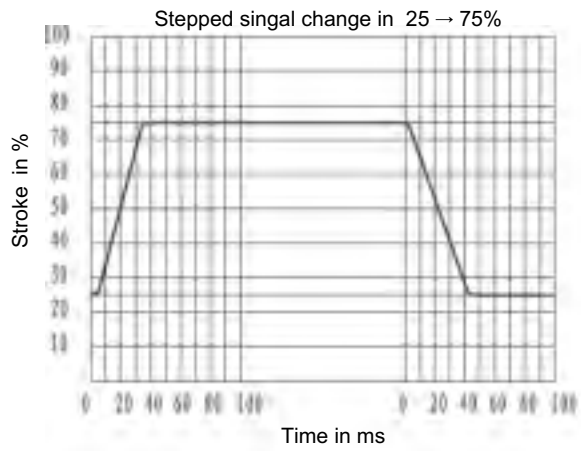
Pilot pressure at 5MPa

Size 25



Pilot pressure at 5MPa

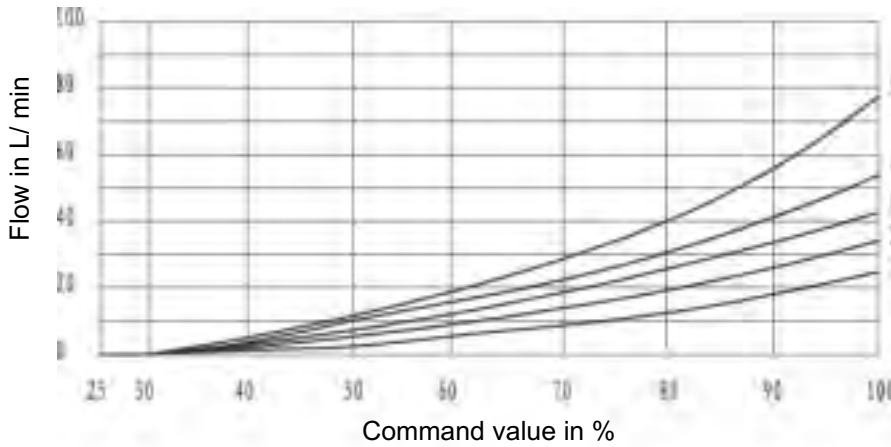
Size 32



Pilot pressure at 5MPa

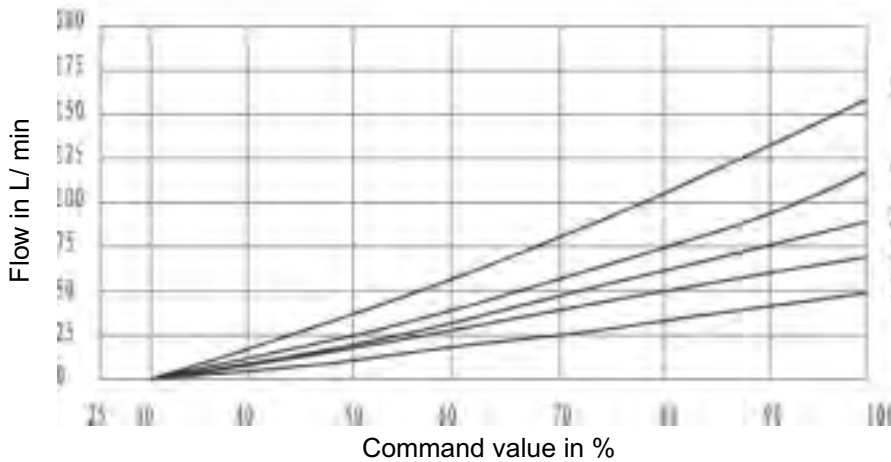
Characteristic curves:(measured at $v=36 \times 10^{-6}m^2/S$ $t=50^{\circ}C$)

Size 10



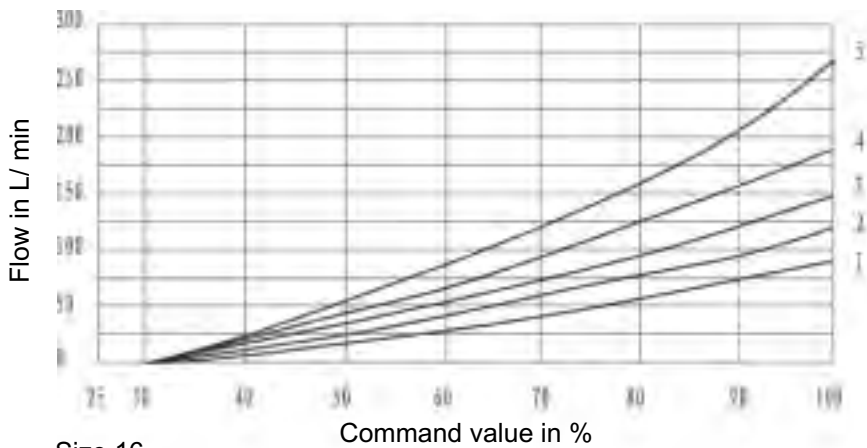
25L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant



50L/min Nominal flow at 1MPa valve pressure difference

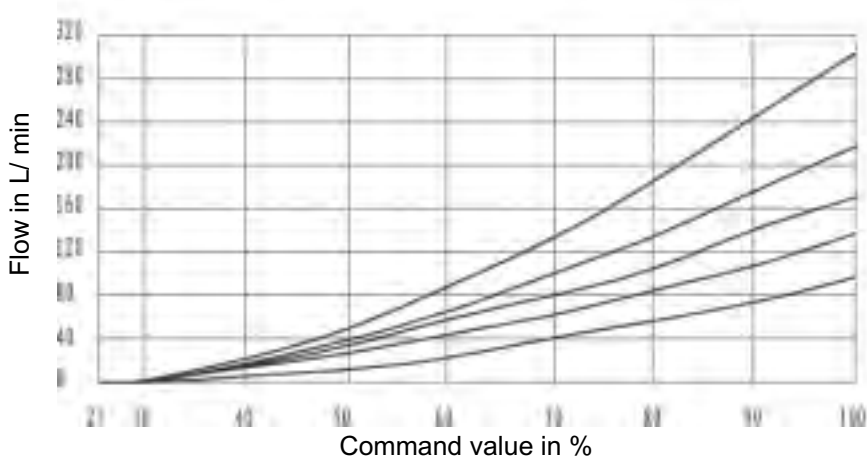
- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant



85L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant

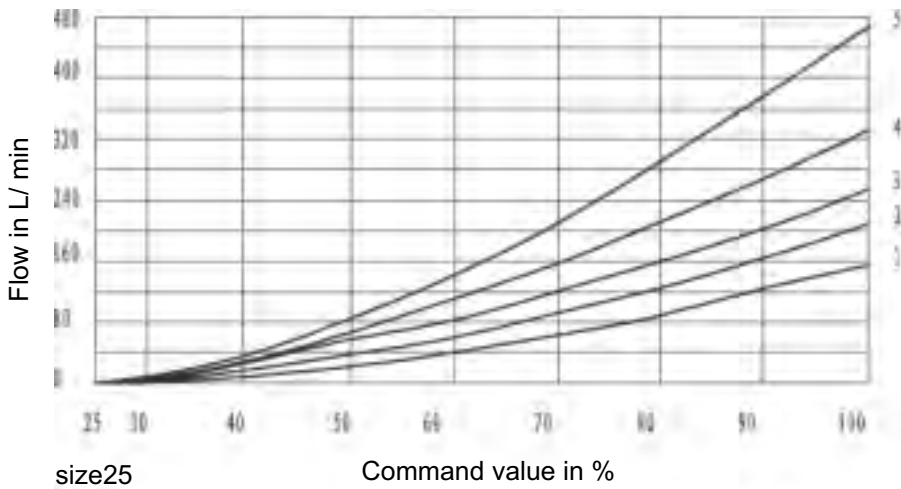
Size 16



100L/min Nominal flow at 1MPa valve pressure difference

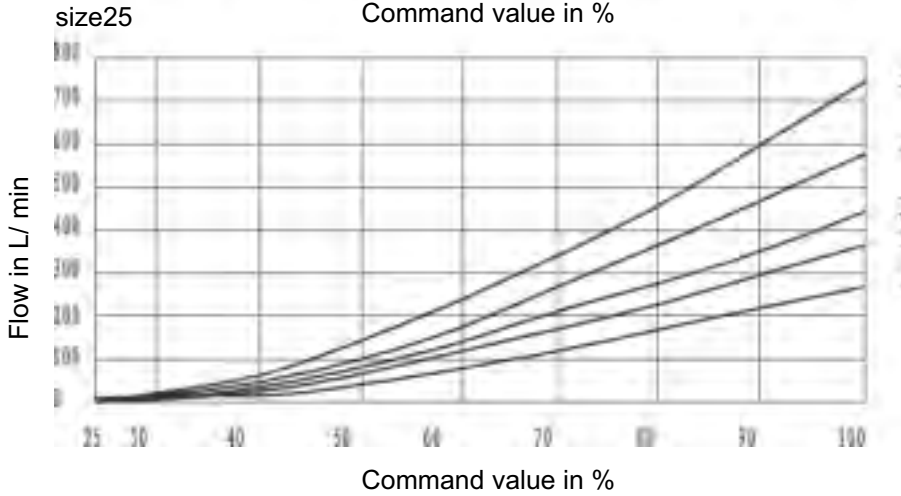
- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant

Please note power limit!



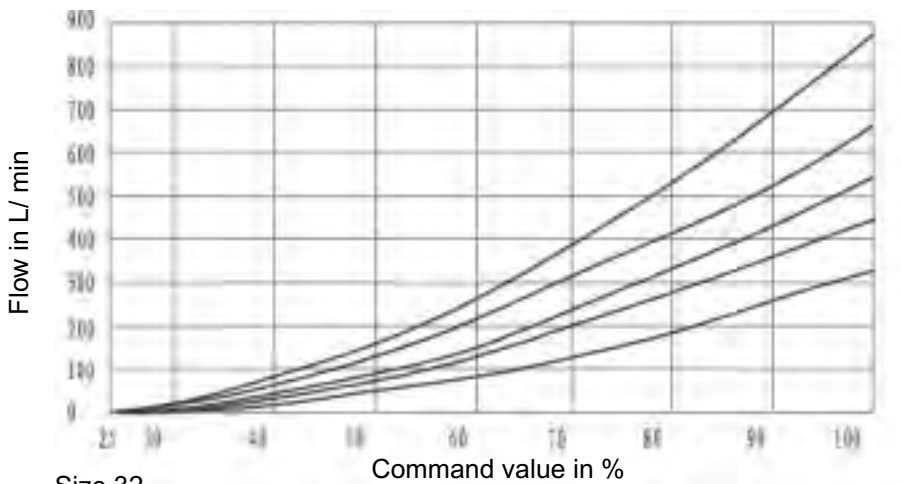
150L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant



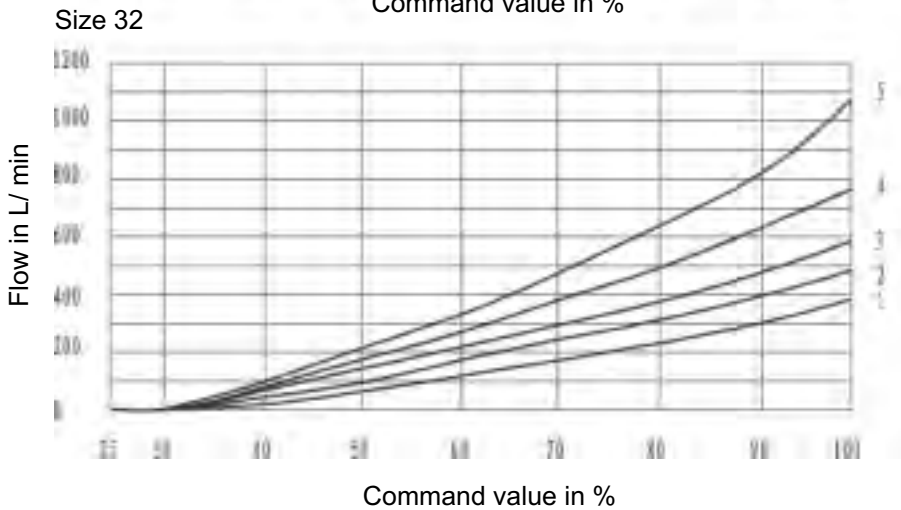
270L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant



325L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant

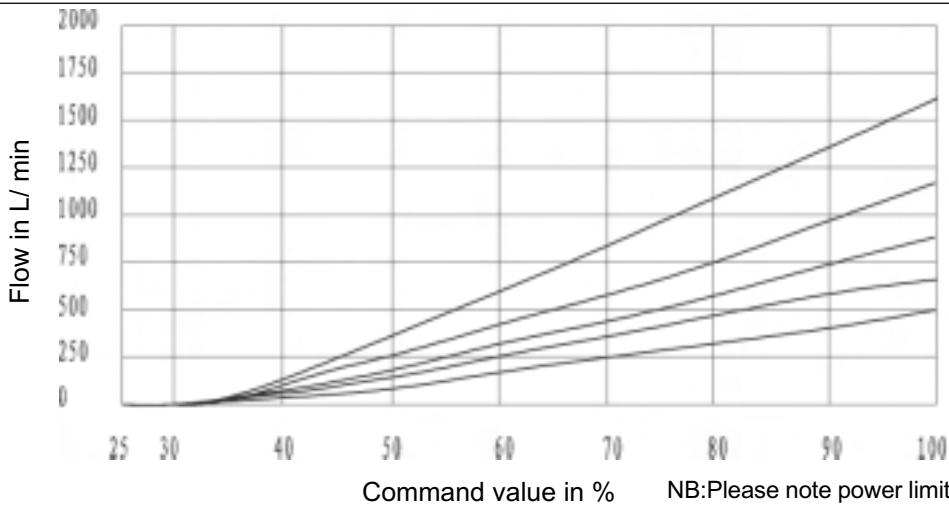


360L/min Nominal flow at 1MPa valve pressure difference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant

Pv=Pressure drop across valve (inlet pressure minus load pressure and return line pressure)

Characteristic curves:(measured at $v=36 \times 10^{-6}m^2/S$ $t=50^{\circ}C$)



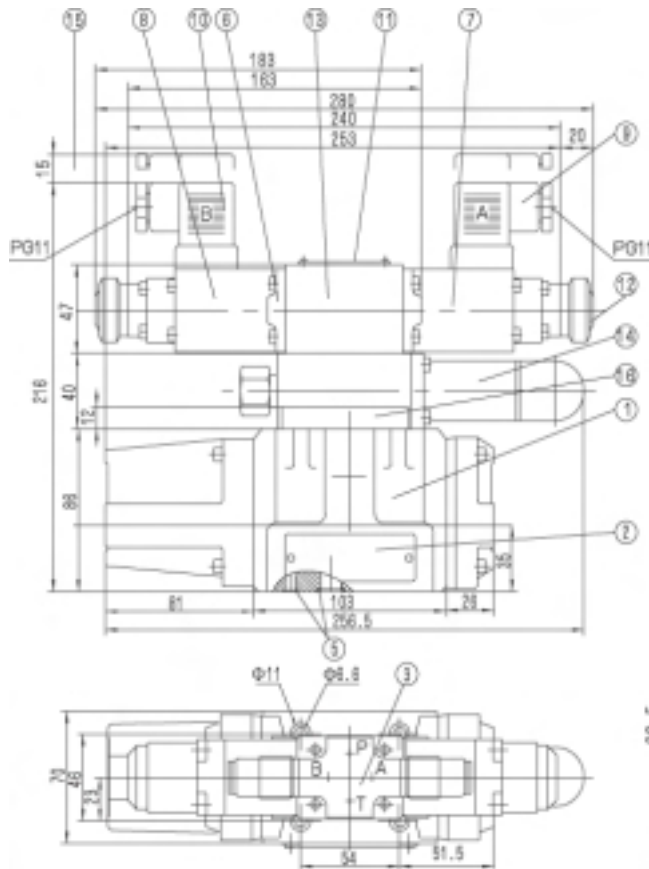
520L/min Nominal flow at
1MPa valve pressure dif-
ference

- 1 Pv = 1MPa constant
- 2 Pv = 2MPa constant
- 3 Pv = 3MPa constant
- 4 Pv = 5MPa constant
- 5 Pv = 10MPa constant

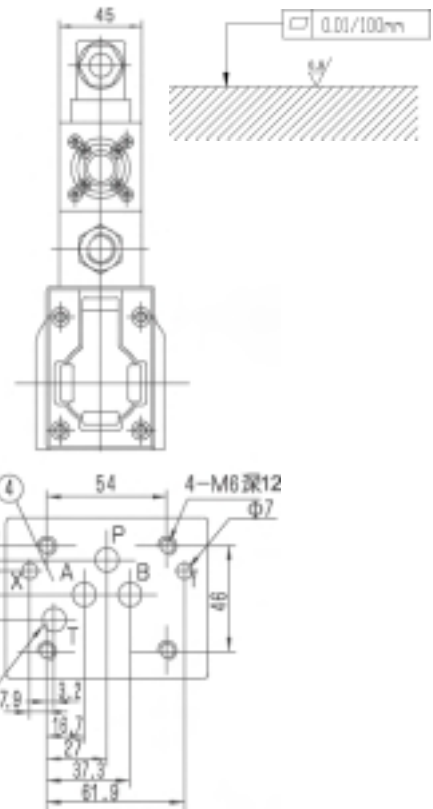
Pv = Pressure drop across valve
(Input pressure minus load pres-
sure and return pressure)

Unit Dimensions Type 4WRZ10

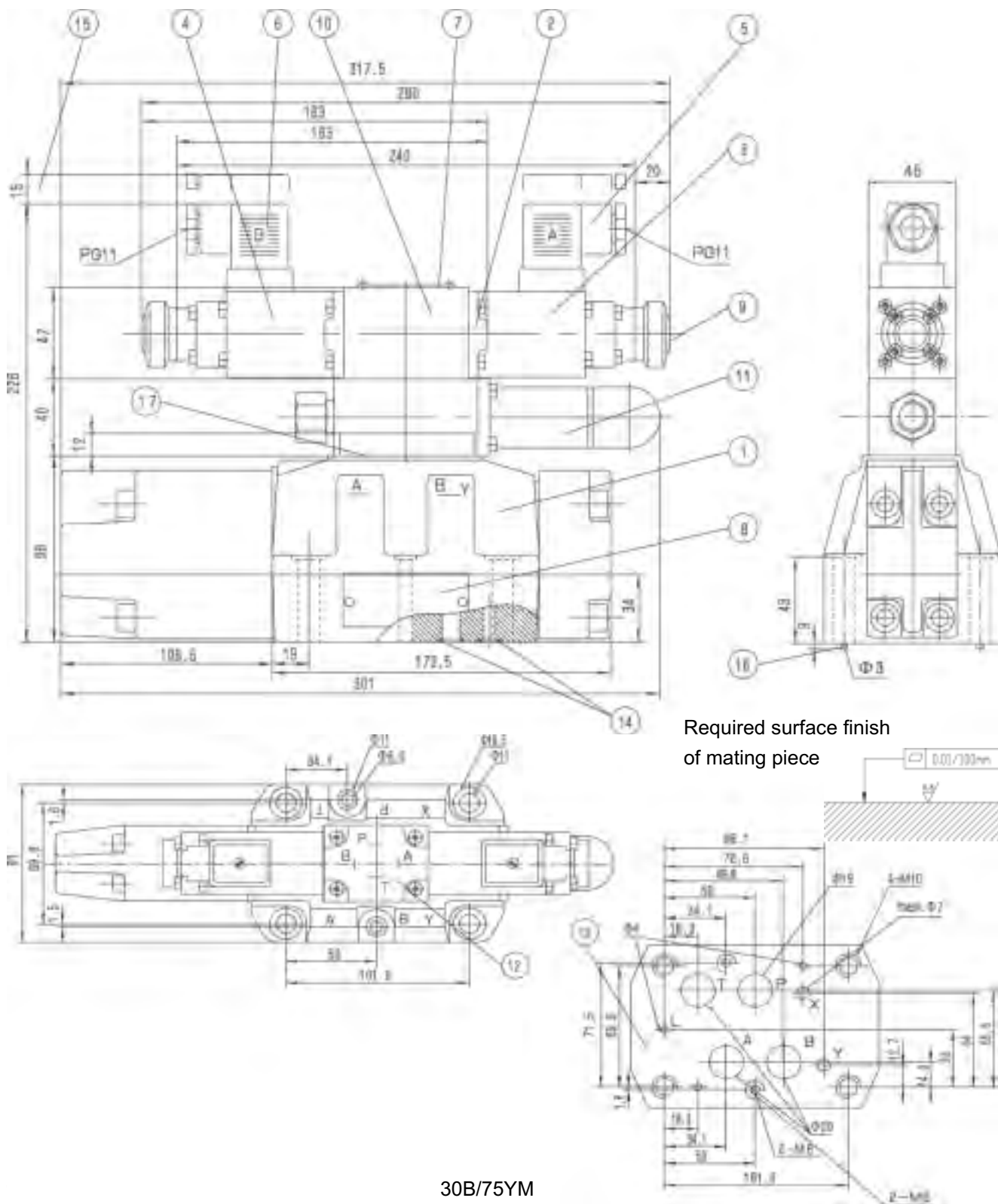
(Dimensions in mm)



Required surface finish
of mating piece



- | | | |
|--|---|---|
| 1 Main valve | 7 Proportional solenoid "a" | 14 Pressure reducing valve
ZDR6DP2-30/75YM |
| 2 Nameplate for main valve | 8 Proportional solenoid "b" | 15 Space required to remove plug |
| 3 Ports position of poilt valve | 9 Plug "A",coloured grey | 16 Connector plate(type WRH) |
| 4 Machined mounting
surface and position of ports | 10 Plug "B",coloured black | |
| 5 O-ring 12X2(Ports A,B,P,T)
O-ring 10.82X1.78(Ports X,Y) | 11 Nameplate of pilot valve | Subplates G534/01
G535/01
G536/01 |
| 6 Pilot valve for 2-position valve
(Type A and B) | 12 Emergency hand operator | see page 81and 82 |
| | 13 Poilt valve for 3-position valve
with two solenoids and plug Z4 | |

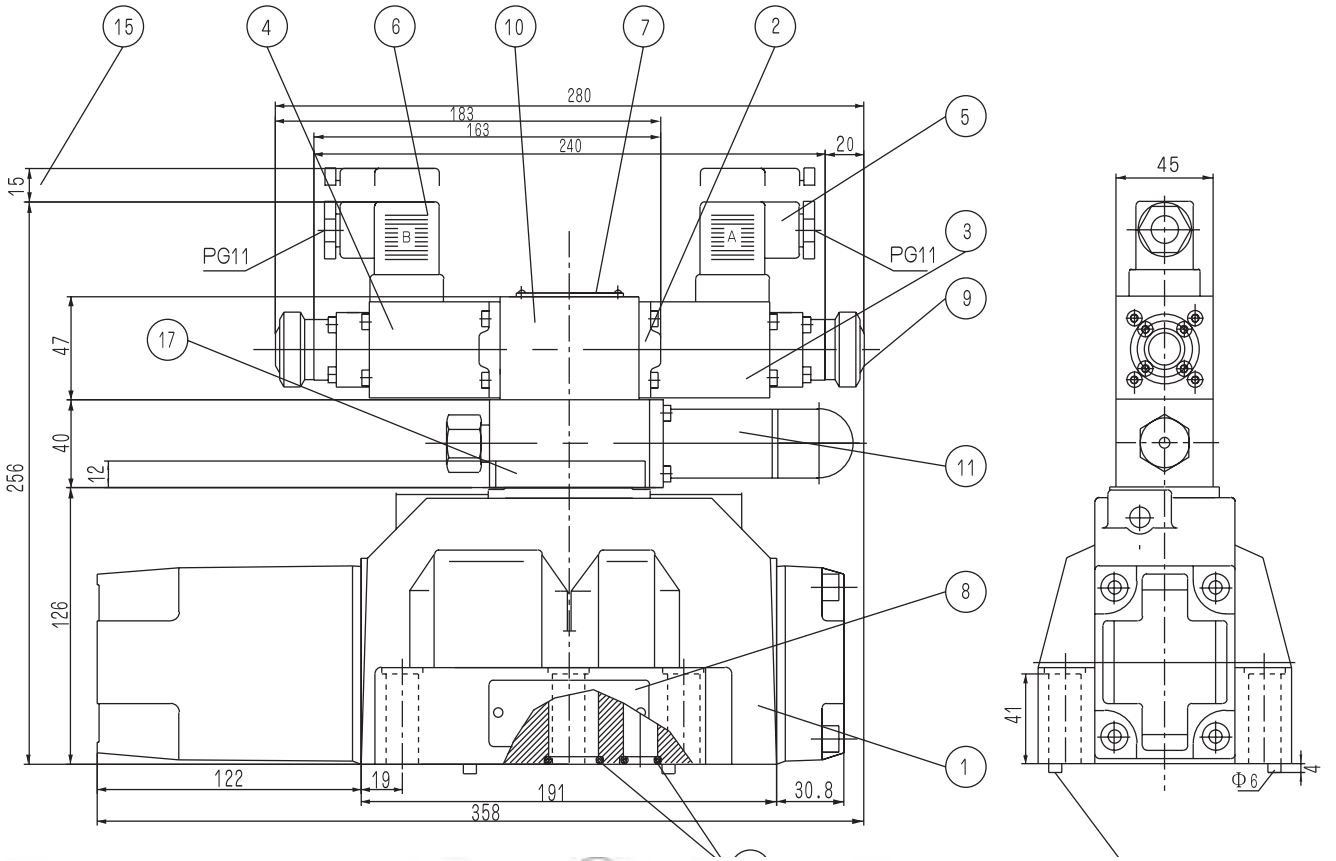


Required surface finish of mating piece

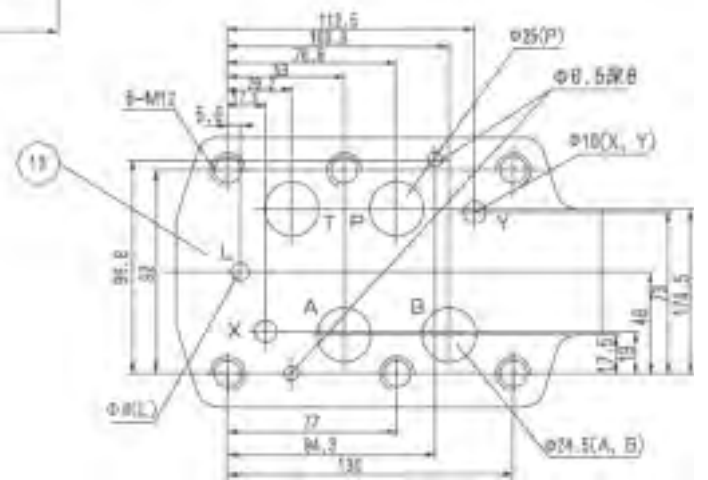
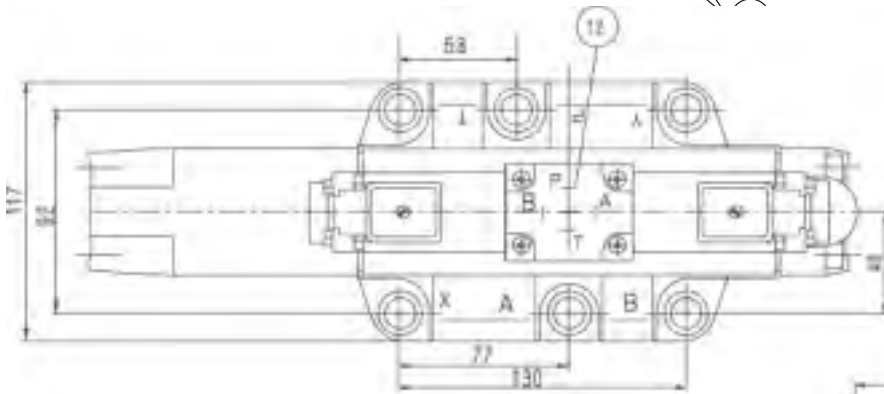
5	Plug "A", coloured grey	12	Ports position of pilot valve	
6	Plug "B", coloured black	13	Machined mounting surface and position of ports	Subplates
7	Nameplate for pilot valve			G172/01
8	Nameplate for wain valve	14	O-ring 22X2.5 (for Ports A,B,P,T)	G172/01
9	Emergency hand operator		O-ring 10X2 (for Ports X,Y)	G174/01
10	Pilot valve for 3-position with two solenoid and plug "Z4"	15	Space required to remove plug	G174/02
11	Pressure reducing valve ZDR6DP2-	16	Locating pin	G174/08
		17	Connector plate(type WRH)	See page 82 and 83

Unit Dimensions Type 4WRZ25

(Dimensions in mm)



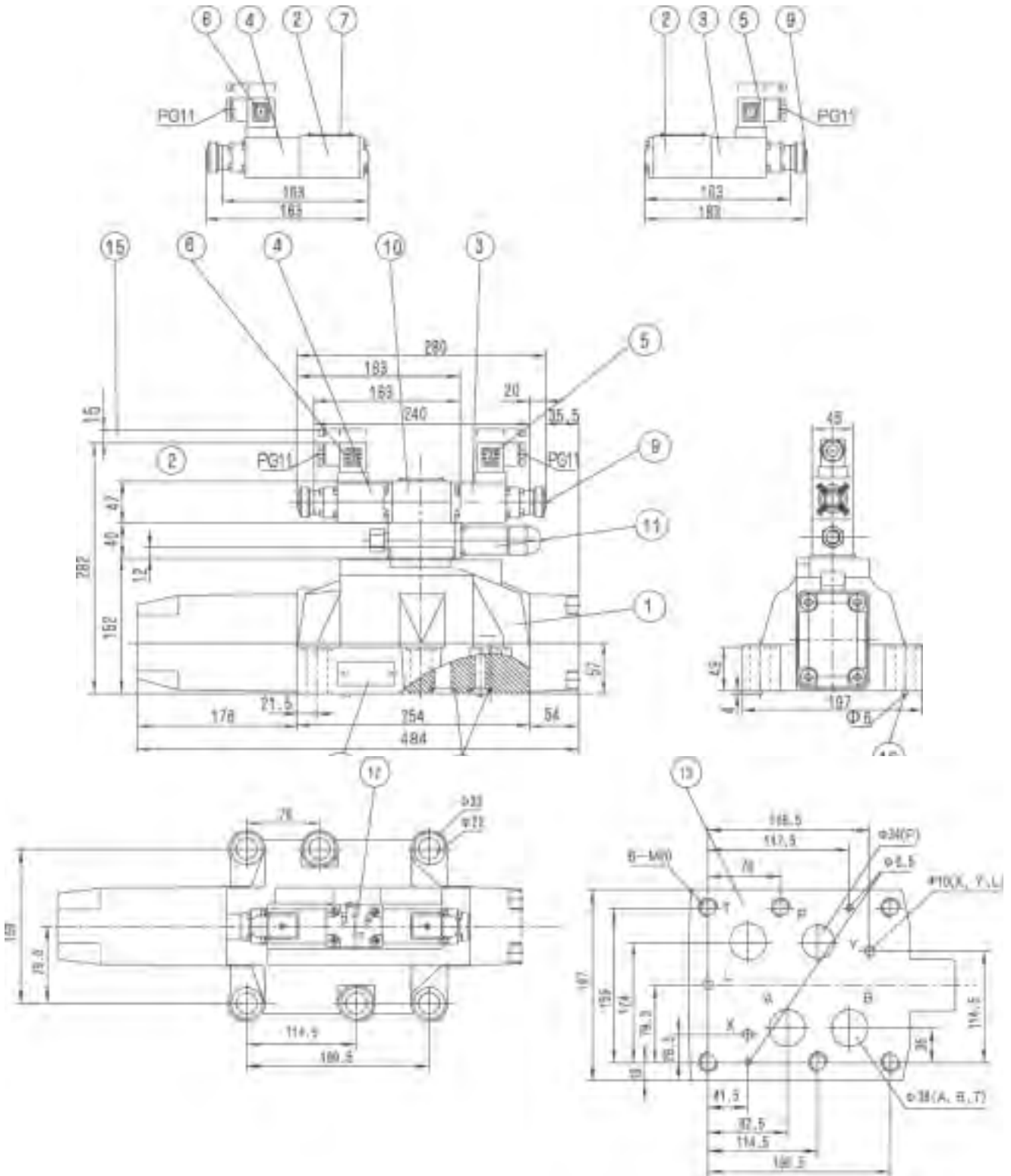
Required surface finish of mating piece



- 10 Pilot valve for 3-position valve with two solenoid and plug "Z4"
- 11 Pressure reducing valve ZDR6DP 2-30B/75YM
- 12 Ports Position of pilot valve
- 13 Machined mounting surface

- 14 O-ring 27X3 (for Ports A,B,P,T)
- 14 O-ring 19X3 (for Ports X,Y)
- 15 Space required to remove plug
- 16 Locating pin
- 17 Connector plate(type WRH)

Subplates G151/01 G153/01
G154/01 G156/01
see page 84



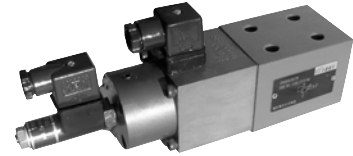
- | | | | |
|------------------|----------------------------------|----------|--|
| (models A and B) | | 30B/75YM | |
| 3 | Proportional solenoid "a" | 12 | Ports position of pilot valve |
| 4 | Proportional solenoid "b" | 13 | Maachined mounting surface and position of ports |
| 5 | Plug "A", coloured grey | | Required surface finish of mating piece |
| 6 | Plug "B", coloured black | 14 | O-ring 42X3(Ports A,B,P,T)
O-ring 19X3(Ports X,Y) |
| 7 | Nameplate for pilot valve | | Subplates |
| 8 | Nameplate for wain valve | 15 | Space required to remove plug |
| 9 | Emergency hand operator | 16 | Locating pin |
| 10 | Pilot valve for 3-position valve | 17 | Connector plate(type WRH) |
| | | | G157/01 |
| | | | G157/02 |
| | | | See page 85 |



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Pressure Relief Valve Type DBETR			RE 24750/06.2004
	Size 6	up to 31.5 MPa	up to 10 L/min	Replaces:

Features:

- Low hysteresis
- Good repeatability
- Electrical closed loop position control of spring pre-tension,
- Proportional solenoid actuation with inductive position transducer (pressure balanced)
- Valve and electronic control from one source



Function, section, symbol

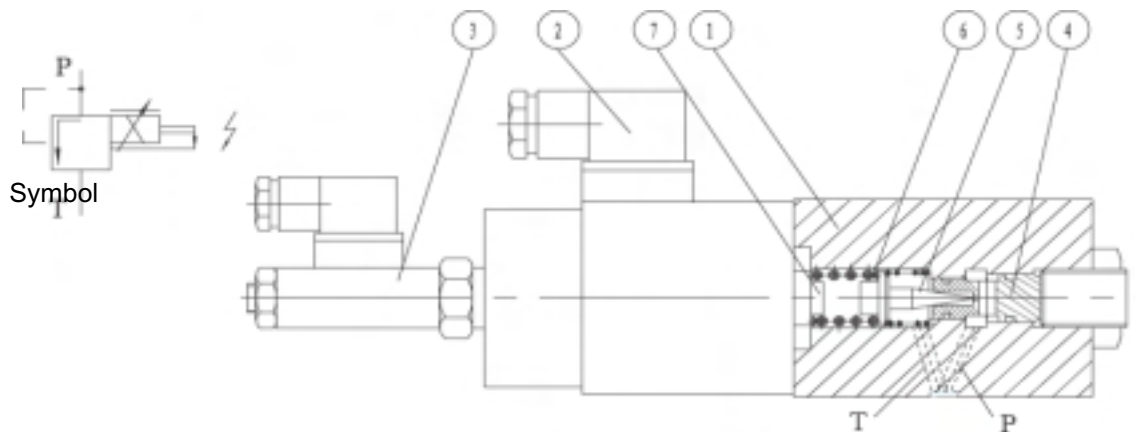
This valve regulates pressure in proportion to the electrical command value.

The valve consists basically of a housing (1), proportional solenoid (2) with inductive positional transducer (3), valve seat (4) and valve poppet (5).

Pressure is set by adjusting the command value potentiometer (0 to 9 V). Adjusting the command value causes tensioning of the compression spring via the electronic controls and the proportional solenoid (2). Tensioning of the compression spring (6), i.e. the position of the spring plate (7), is determined by the inductive positional transducer (3). Any deviations from the command value are corrected by the closed loop positional control.

The use of this principle eliminates the effect of solenoid friction.

- Advantages:
- Low hysteresis
 - Good repeatability



Ordering details

DBETR	+	10	B	/			*
Series 10 to 19 (10 to 19: unchanged installation and connection dimensions)	=	10					Further details in clear text
Technology of Beijing Huade Hydraulic	=	B					M= mineral oils V = phosphate ester
Pressure stage: up to 2.5MPa up to 8MPa up to 18MPa up to 31.5MPa	=	25 80 180 315					No code= let oil inside Y= let oil outside

Technical data

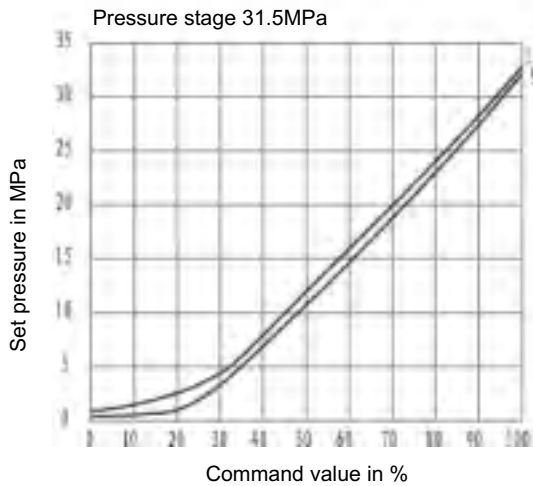
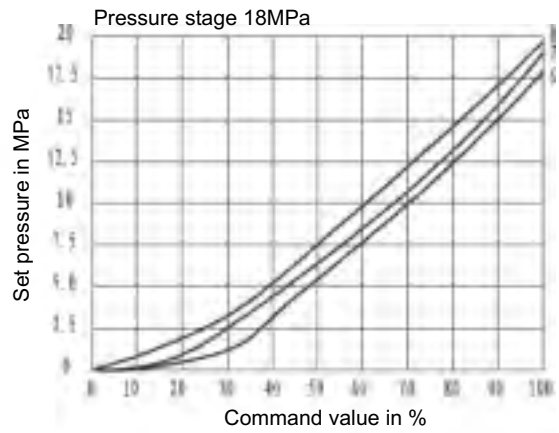
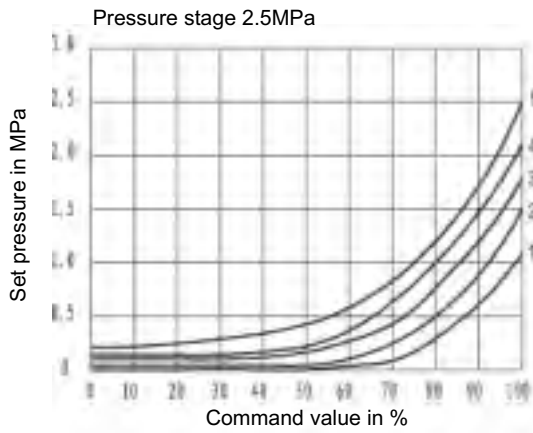
Hydraulic data

Max. settable pressure (MPa)	Pressure stage 2.5 MPa	2.5		
	Pressure stage 8.0 MPa	8		
	Pressure stage 18.0 MPa	18		
	Pressure stage 31.5 MPa	31.5		
Min. settable pressure (MPa)		(see $p_{min} - q_v$ characteristic curves)		
Max. Operating pressure (MPa)	port T (with pressure adjusting)	0.2		
	por T (without pressure adjusting)	10		
	port P	31.5		
Max. flow (L/min)	Pressure stage 25	10		
	Pressure stage 80	3		
	Pressure stage 180	3		
	Pressure stage 315	2		
Degree of contamination (μm)		≤ 20 (recommendation 10)		
Hysteresis (%)		< 1 of max. settable pressure		
Repeatability (%)		< 0.5 of max. settable pressure		
Linearity (%)	180; Pressure stage from 3 to 18 MPa	≤ 1.5 of max. settable pressure		
	315; Pressure stage from 6 to 31.5MPa			
Typical variation (%)	Valve	± 3 of max. settable pressure		
	Electrical control	< 0.5		
Stepped response 0 to 100%	(ms)	Response time (Pmin-Pmax)	Response time (Pmax-Pmin)	
	Pressure stage 2.5 and 18MPa	0 to100	100	50
	Pressure stage 31.5MPa	0 to100	150	100
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)		
Viscosity range (mm ² /s)		2.8 to 380		
Pressure fluid temperature range (°C)		-20 to +70		
Installation position		optional		
Weight (kg)		4		

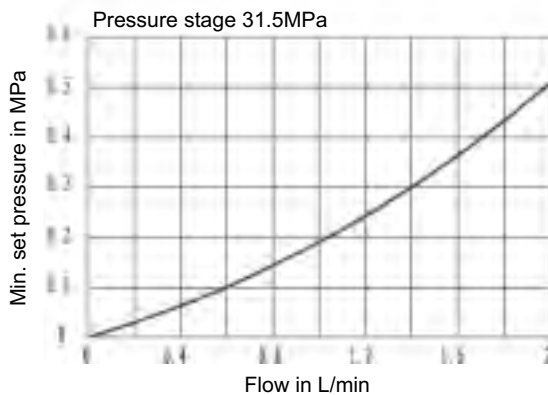
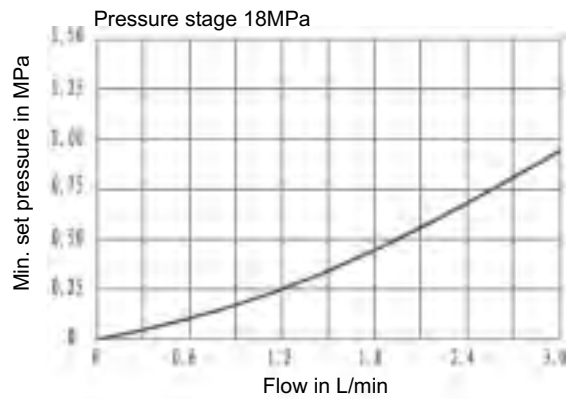
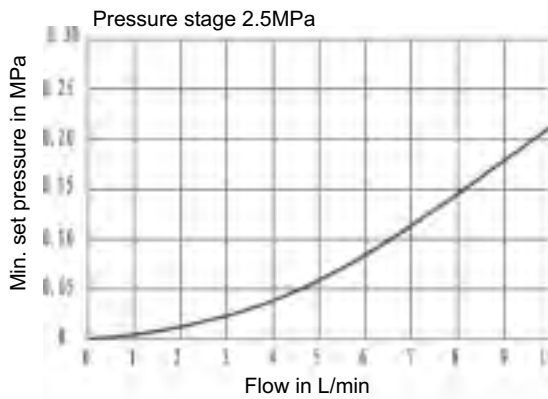
Electrical

Amplifier associated		VT-5003S30		
Supply voltage		DC		
Coil resistance (Ω)	Cold value at 20 °C	10		
	Max. warm value	13.9		
(Working state) Duty		Continuous		
Pressure fluid temperature (°C)		+50		
Amplifier voltage	commutate completely	24 \pm 10%		
	commute three electrical source	24 to 35		
Max. power consumption (VA)		50		
Coil resistance at 20 °C (Ω)	1	11	111	
	56	56	112	
Inductivity (transducer) (mH)		6 to 8		
Oscillator frequency (transducer) (KHz)		2.5		
Protection to DIN 40 050		IP65		

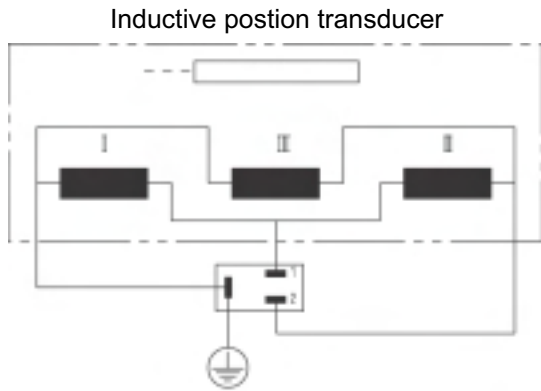
Characteristic curves:(measured at $v=36 \times 10^{-6}m^2/S$ $t=50^{\circ}C$)



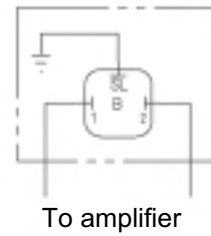
- Curve 1 - flow = 2 L/min
- Curve 2 - flow = 4 L/min
- Curve 3 - flow = 6 L/min
- Curve 4 - flow = 8 L/min
- Curve 5 - flow = 10 L/min
- Curve 6 - flow = 0.5 L/min
- Curve 7 - flow = 1.5 L/min
- Curve 8 - flow = 3L/min
- Curve 9 - flow = 1 L/min
- Curve 10 - flow = 2 L/min



Electrical connections (Inductive position transducer)

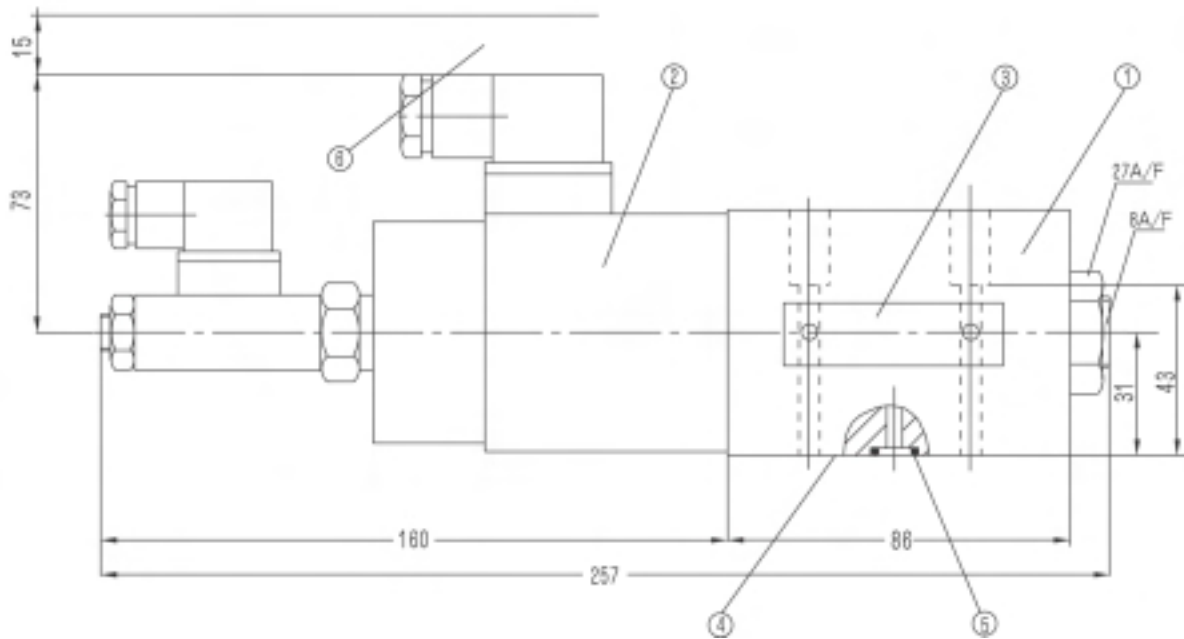


Type Connection of plug-in connector

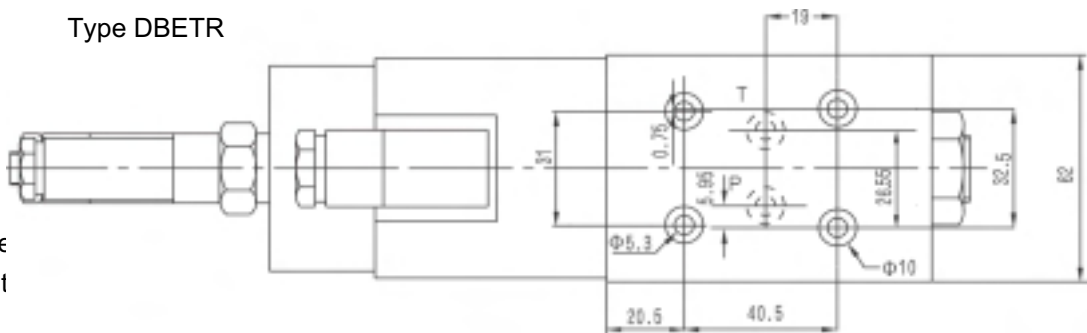


Unit dimensions

(Dimensions in mm)

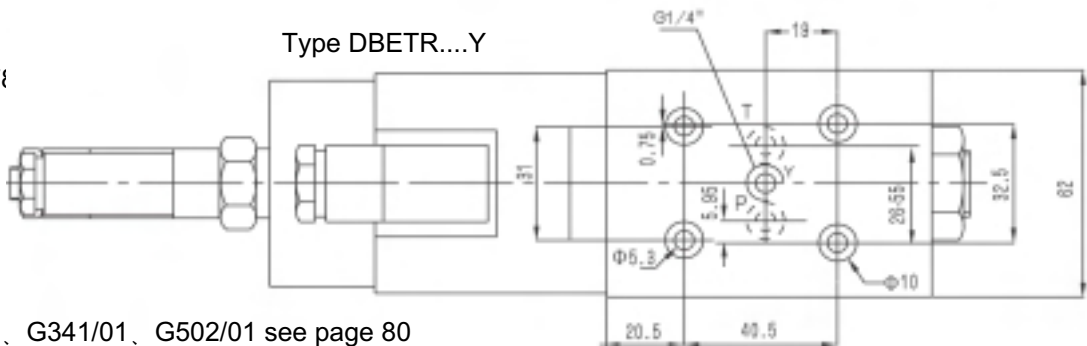


Type DBETR



- 1 Valve housing
- 2 Proportional solenoid inductive position transducer
- 3 Nameplate
- 4 Machined valve surface
- 5 O-ring 9.25 x 1.75
- 6 Space required to remove the plug-in connector

Type DBETR...Y

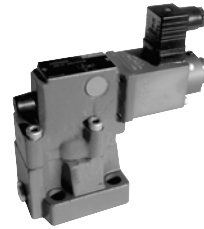


Subplates: G340/01, G341/01, G502/01 see page 80

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure relief valve Type DBE/DBEM			RE24750/06.2004
	Size 10 ,25 ,32	up to 31.5 MPa	up to 600 L/min	Replaces:

Features:

- For subplate mounting:
- Encased in block
- Optional additional maximum pressure limitation by means of a spring loaded pilot control valve
- Valve and electronic control form one source
- Portng pattern to DIN 24 340 form E



Functional , section

These valves basically consist of the pilot control valve (1) with proportional solenoid (2) and the main valve (3) with main spool insert (4).

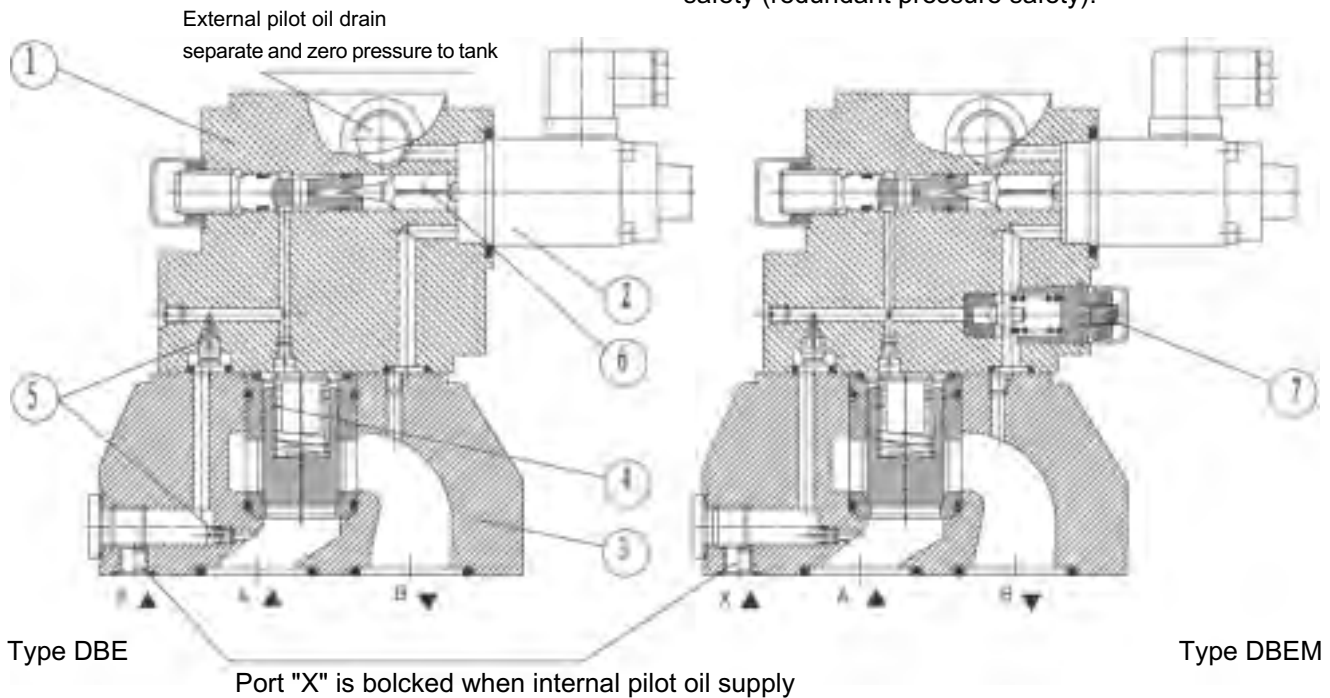
Type DBE:

The adjustment of the pressure is command value dependent via a proportional solenoid (2). The pressure present in port A acts on the underside of the main spool (4). At the same time this pressure acts on the spring loaded side of the main spool (4) via orificies (5). The hydraulic force acts on the pilot

poppet (6) When the hydraulic force over comes the solenoid force then the pilot poppet (6) opens. Due to the fact that the pilot oil can now flow to tank via port Y, a pressure drop occurs at the main spool (4) which acts on the main spool and lifts it against the force of the return spring . The connection from A to B is opened and there is no longer any increase in pressure.

Type DBEM:

Optionally the valve can be supplied with an additional spring loaded pilot control valve for maximum pressure safety (redundant pressure safety).



Symbols

10 DBE 20- ..Y 30 DBEC30- ..Y	10 DBE 20- ..XY 30	C T DBE C T DBEC- ..Y	10 DBE 20- ..Y 30 DBEMC30- ..Y	10 DBEM20- ..XY 30	C T DBE C T DBEMC- ..Y

Ordering details

DBE 30 B *

Without maximum Pressure limitation = No code
 With maximum pressure limitation = M

Pilot pressure relief valve =No code
 Insert pressure relief valve =C
 (sign size 10 or 30)
 Pilot pressure relief valve without the main spool (signless size) =C
 Pilot pressure relief valve use as remote control=T

Size 10 = 10
 Size 25 = 20
 Size 32 = 30

Series 30 to 39 = 30
 (30 to 39: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

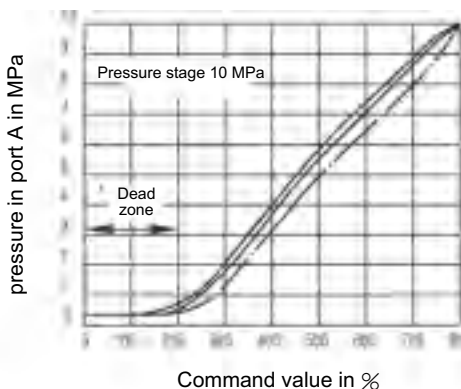
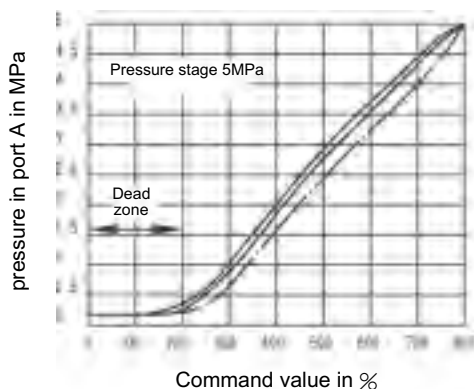
M= mineral oils
 V= phosphate ester

Y= pilot oil supply, internal drain external
 XY= pilot oil supply, external drain external

Pressure stage
 50= Up to 5.0 MPa
 100= Up to 10.0 MPa
 200= Up to 20.0 MPa
 315= Up to 31.5 MPa

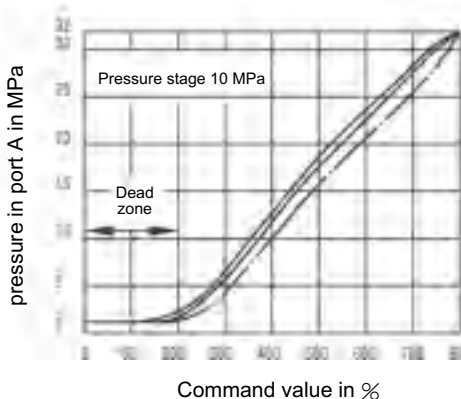
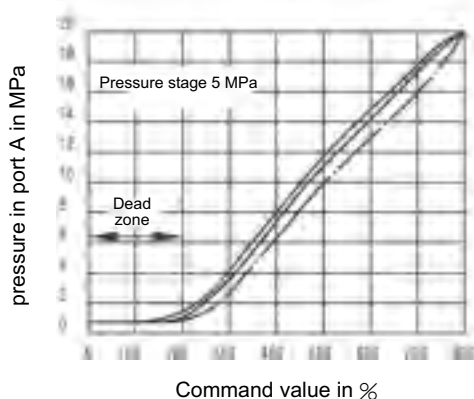
Characteristic curves:(measured at $v=36 \times 10^{-6}m^2/S$ $t=50^\circ C$)

Type DBE10、 20、 30/DBET input pressure/current curves



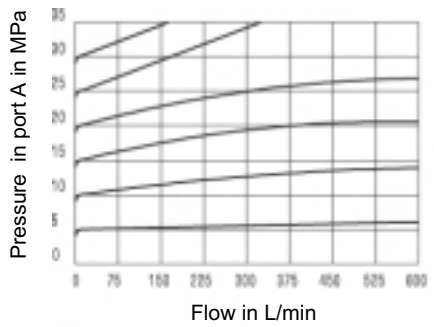
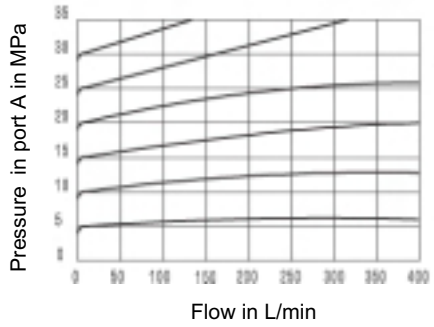
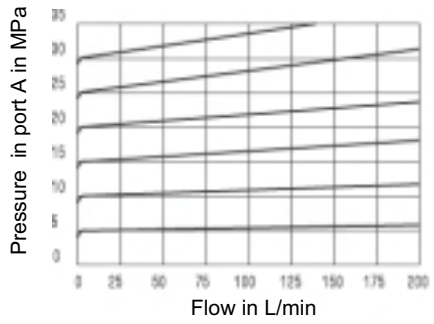
Type DBE10、 20 and 30 (measured at a flow of 27 L/min)
 Type DBET(measured at a flow of 0.8 L/min)

Hysteresis:
 With surge _____
 Without surge - - - - -

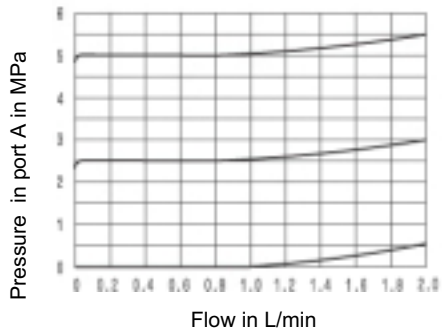


Note: So that the minimum settable pressure can be achieved the bias current must not exceed 100 mA.

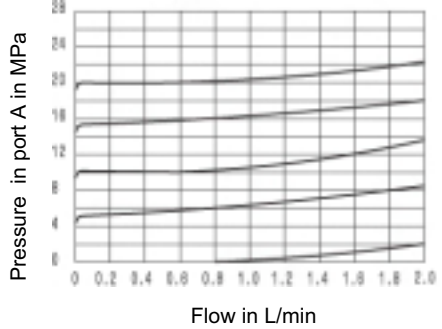
Settable Pressure in relation to the flow



DBET-30/50 and DBEMT-30/50

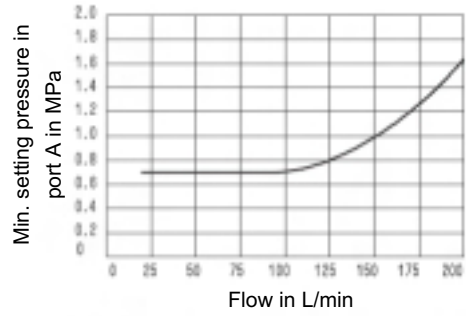


DBET-30/200 and DBEMT-30/200

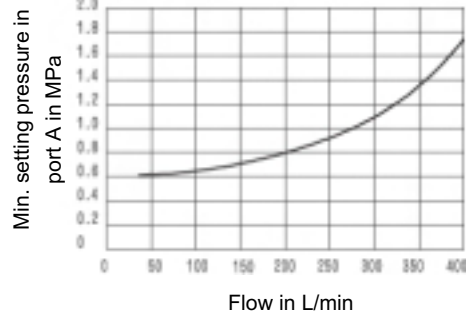


Min. settable pressure in relation to flow

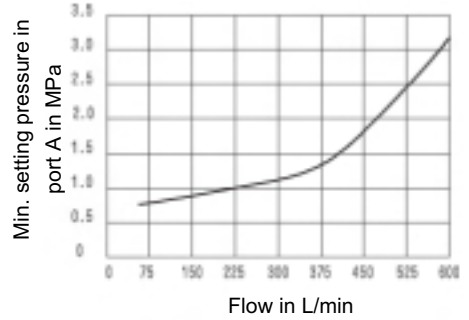
DBE10



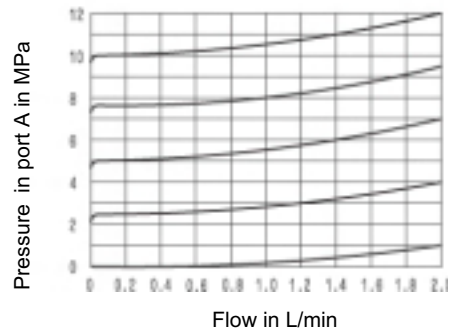
DBE20



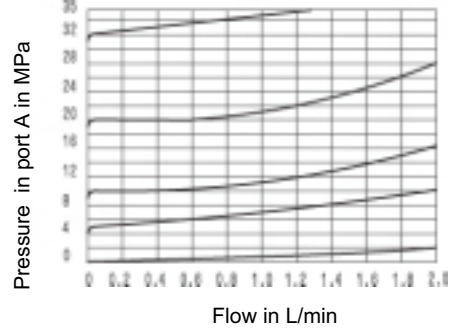
DBE30



DBET-30/100 and DBEMT-30/100



DBET-30/315 and DBEMT-30/315



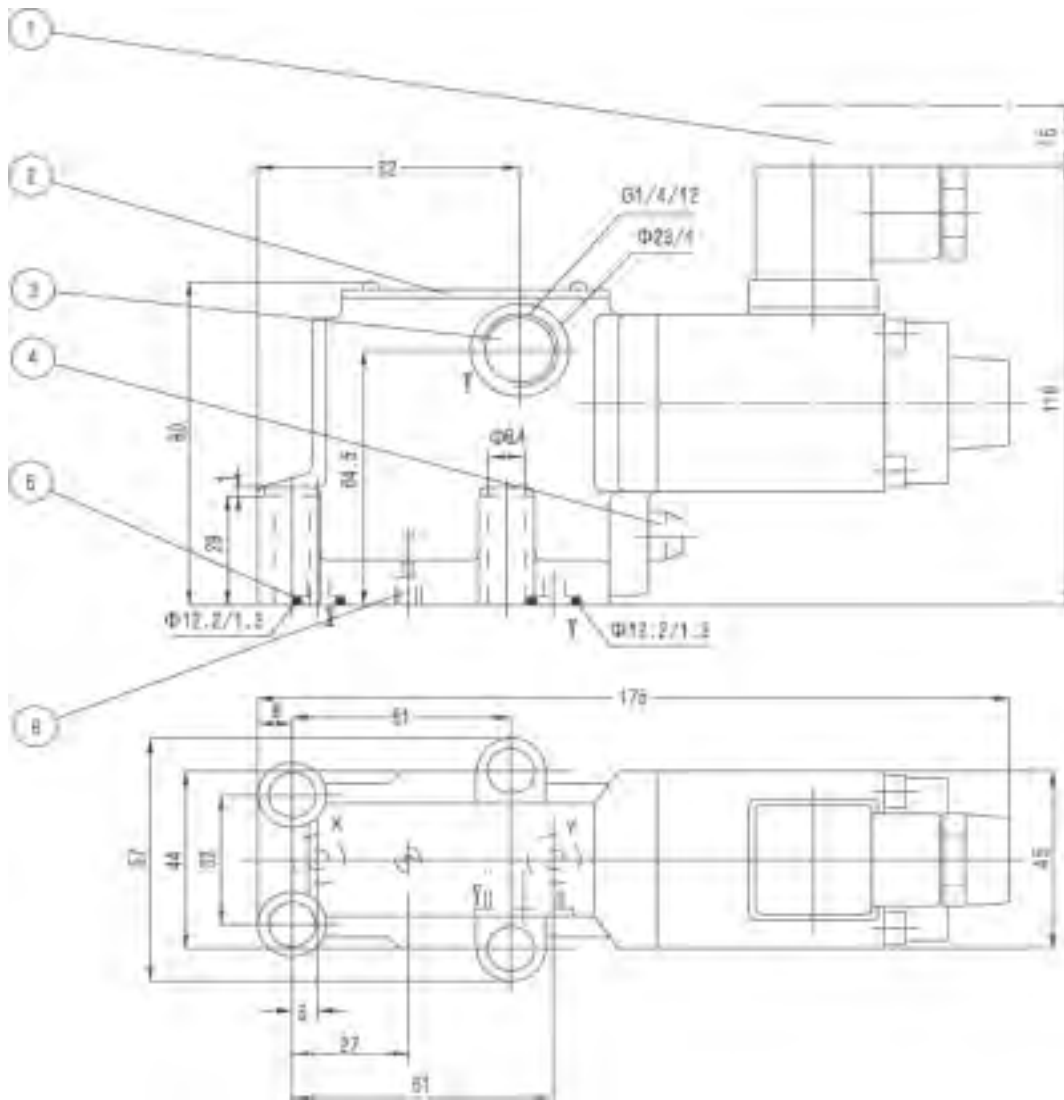
Technical data

Hydraulic data

Max. operating pressure	Ports A, B and X	(MPa)	31.5			
Return pressure		(MPa)	Port Y, separate and at zero pressure to tank			
Max. settable pressure		(MPa)	5, 10, 20, 31.5, same as pressure stage			
Min. settable pressure		(MPa)	see characteristic curves			
Max. pressure safety		(MPa)	settable pressure			
			5	10	20	31.5
			1 to 6 ⁺²	1 to 12 ⁺²	1 to 22 ⁺²	1 to 34 ⁺²
Max. pressure safety Adjustable pressure range		(MPa)	rated pressure			
			5	10	20	31.5
			6 to 8	12 to 14	22 to 24	34 to 36
Max. flow		(L/min)	10	20	30	
			200	400	600	
Pilot flow		(L/min)	0.7 to 2			
Linearity		(%)	± 3.5			
Repeatability		(%)	< ± 2			
Typical variation		(%)	< ± 2 Max. pressure			
Hysteresis		(%)	With surge ± 1.5 of Max.pressure, Without surge ± 4.5 of Max.pressure			
Switching time		(ms)	30 to 150			
Pressure fluid			Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range		(mm ² /s)	2.8 to 380			
Pressure fluid temperature range		(°C)	-20 to +70			
Degree of contamination		(μm)	≤ 20(recommendation 10)			

Electrical technical data

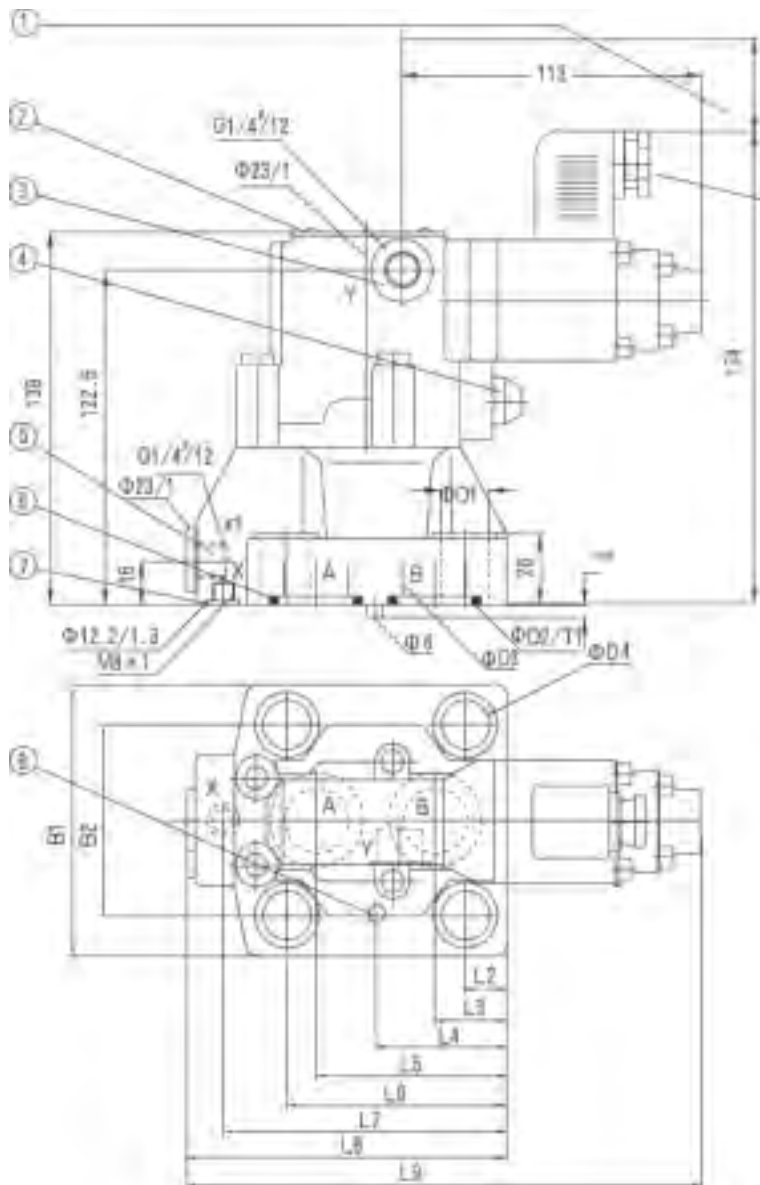
Amplifier			VT-200 _x ^s 40 supplied with valve together			
Supply voltage			DC			
Min. control current		(A)	0.1			
Max. control current		(A)	0.8			
Coil resistance		(Ω)	Cold value at 20°C is 19.5; Max. warm value is 28.8			
Pressure fluid temperature range		(°C)	+50			
Working state			Continue			
Valve protection			IP65			
Electrical connections			plug			



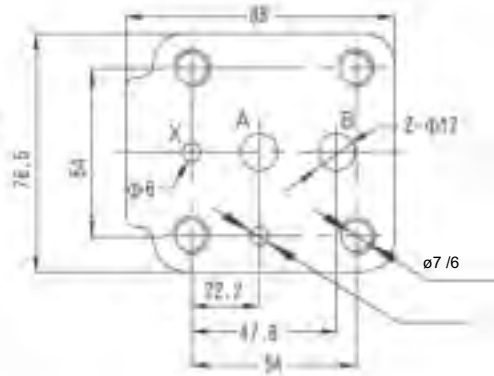
1. Space required to remove plug-in connector
2. Nameplate
3. Port for pilot oil drain external
4. Maximum pressure limitation
5. O-ring 9.25X1.78 (for ports X and Y)
6. The hole is blocked in DBET/DBEMT and fix throttle in DBEC/DBEMC
SubplateG51/01, see page 87

Unit dimensions (type DBE/DBEM)

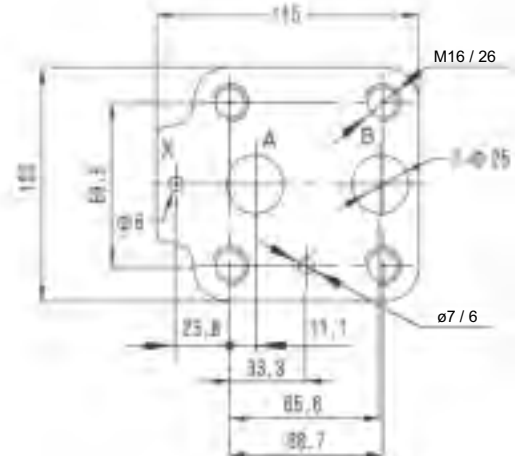
(Dimensions in mm)



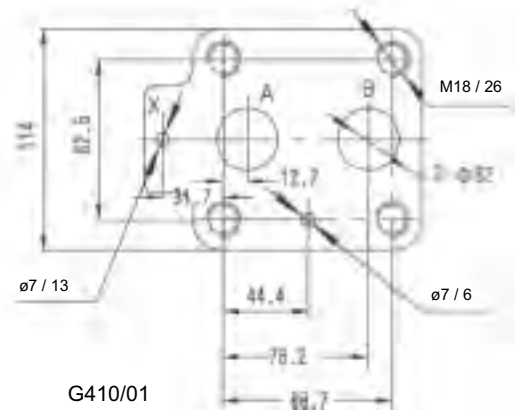
NG10



NG20



NG30



- 1. Space required to remove plug-in connector
- 2. Nameplate
- 3. Pilot oil drain, external
- 4. Maximum pressure limitation
- 5. Pilot oil supply external (optionally at port X or X1)
- 6. O-ring (for ports A, B)
- 7. O-ring 9.25X1.78 (for port X)
- 8. Locating pin

Subplates (see page 89):

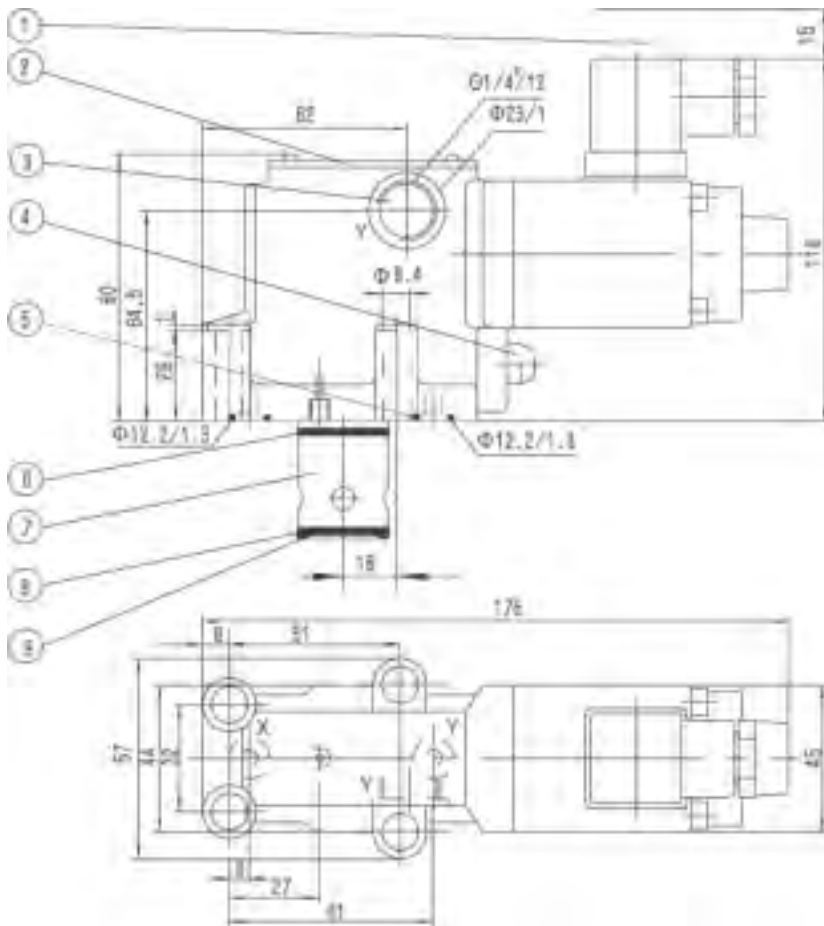
Size	NG10	NG20	NG30	G410/01	G411/01
10	G545/01	G408/01	G410/01	G410/01	G411/01
20	G546/02	G409/01	G411/01	G410/01	G411/01

Size	B1	B2	Φ D1	Φ D2	Φ D3	Φ D4	O-ring (ports A and B)	Valve fixing screws:
10	78	54	18	21.8	12	14	17.12 × 2.62	M12 × 50-10.9, M _A = 84Nm
20	100	70	24	34.8	24	18	28.17 × 3.53	M16 × 50-10.9, M _A = 206Nm
30	115	82.5	28	41	30	20	34.25 × 3.53	M18 × 50-10.9, M _A = 267Nm

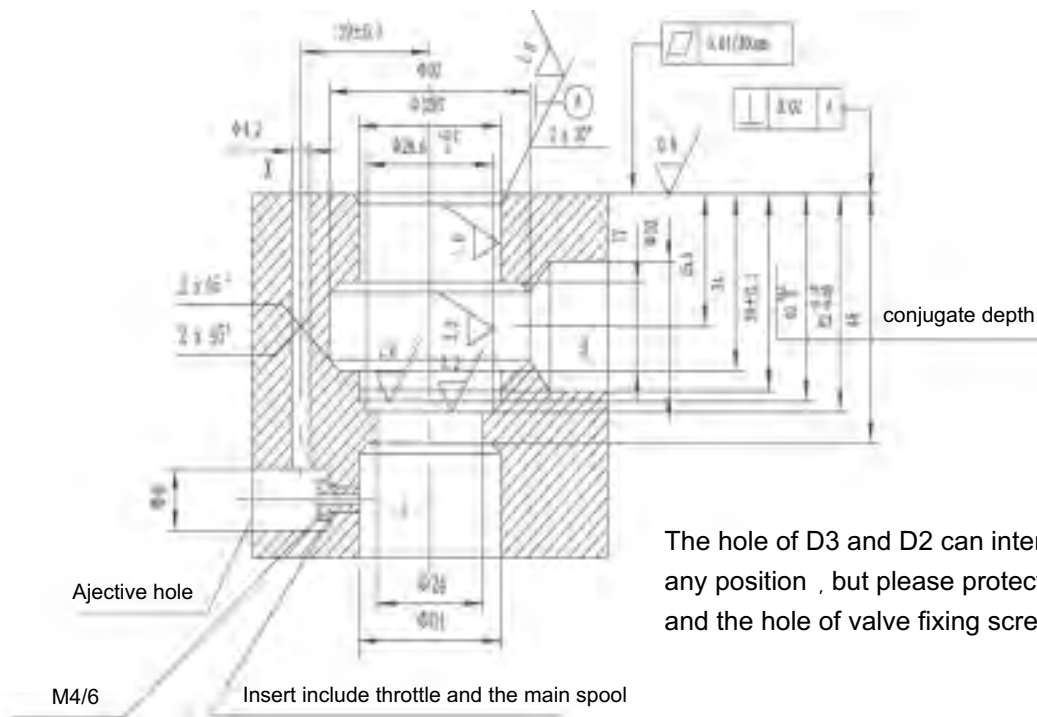
Size	L2	L3	L4	L5	L6	L7	L8	L9	T1	Weight (Kg)
10	12.5	18.9	44.3	44.3	66.5	66.5	90	176.5	2	4.1
20	16	27.1	49.4	71.6	82.5	106.5	117	190	2.9	4.5
30	17.5	61.9	30	93.7	106.4	138.2	148	200	2.9	6

Unit dimensions

(Dimensions in mm)



- 1. Space required to remove plug-in connector
 - 2. Nameplate
 - 3. Pilot oil drain external(port Y)
 - 4. Maximum pressure safety
 - 5. O-ring 9.25X1.78
 - 6. O-ring 27.3X2.4 (*)
 - 7. The main spool
 - 9. Retainer ring 32/28.4X0.8 (*)
- (*) This kind of ring should be installed before installing insert housing



The hole of D3 and D2 can intersect at any position, but please protect port X and the hole of valve fixing screw

Size	The ordering code of the main spool		Φ D1	Φ D2	Φ D3	Valve fixing screw	MA	Weight (kg)
10	207341 (NBR)	307342 (FPM)	25	40	10	M8 × 40-10.9 (GB/T70.1-2000) must be ordered separately	20Nm	1.5
20			32	45	25			
30			32	45	32			

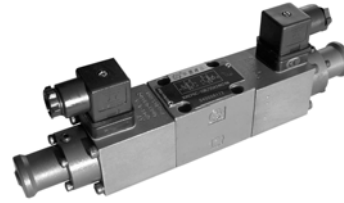
注 意 事 项

- 1 液压系统用的介质必须过滤；过滤精度至少 20 μ m。
- 2 液压系统用的油箱必须密封；并加空气过滤器。
- 3 本厂产品出厂时不带底板。（如需用请订货）。
- 4 固定螺栓请按样本中列的参数选用。
- 5 与阀连接的表面粗糙度要求 $\frac{0.8}{\sqrt{\quad}}$ 。
- 6 与阀连接的平面度要求 0.01/100mm。

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure reducing valve of 3-way design, Type 3DREP			RE 24750/06.2004
	Size 6	up to 10 MPa	up to 15 L/min	Replaces:

Features:

- Directly controlled proportional valves for the control of the pressure and direction of a flow
- Actuated via proportional solenoids with central thread and removable coil
- Spring centred control spool



Function, section

The 3-way pressure reducing valve type 3DREP 6.. is directly actuated by proportional solenoids. They convert an electrical input signal into a proportional pressure output signal.

The proportional solenoids are controllable wet pin DC solenoids with central thread and removable coil. The solenoids are controlled optionally via external control electronics .

Design:

The valve mainly comprises of:

- Housing (3) with mounting surface
- Control spool (5) and(6) and (4)
- Solenoids (1 and 2) with control thread

Function:

With the solenoids (1 and 2) de-energised the control spool (5) is held in its centre position by compression springs

The control spool (2) is directly actuated when one of the solenoids is energised

E.g. by energising solenoid "a" (1)

→ The pressure measuring spool (5) and control spool (4) move to the right in proportion to the electrical input signal

→ The connection from P to B and A to T is via orifice form cross-sections with progressive flow characteristics

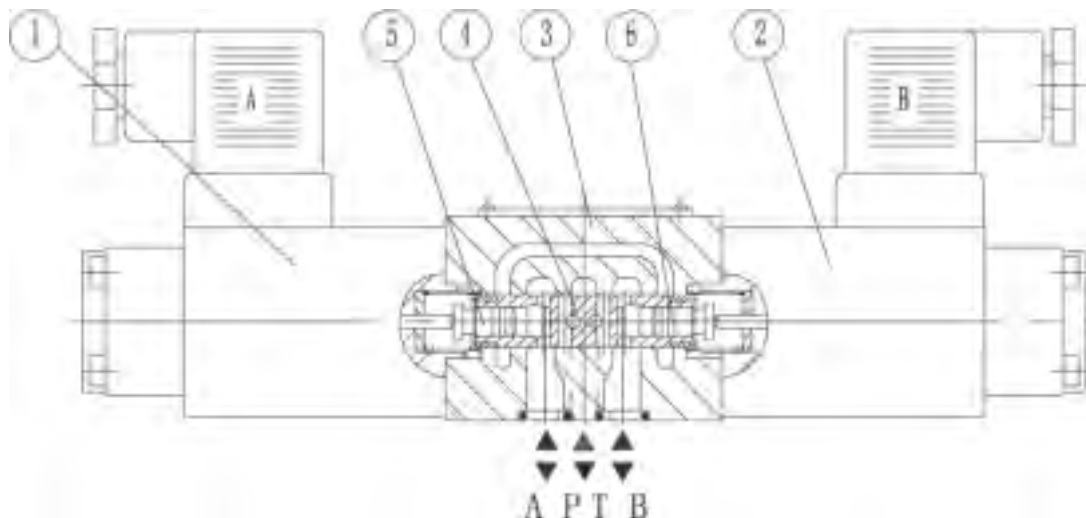
-De-energisation of the solenoid (1)

→The control spool (4) is returned to its centre position by the compression springs

In the middle position the connections A and B to T are open, therefore, the pressure fluid can freely flow to tank. An optional hand overrides makes is possible to move the control spool (4) without energising the solenoid.

Attention!

Unintended use of the hand override can cause uncontrolled machine movement!



Type 3DREP6...

Ordering details

3DREP6 10 B / A

Control form:

chamber A = A
 chamber B = B
 chambers A and B = C
 See symbols (detailed)

Series 10 = 10
 (10 to 19: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic = B

Pressure stage 1.6 MPa = 16
 Pressure stage 2.5 MPa = 25
 Pressure stage 4.5 MPa = 45

Further details in clear text

M = NBR seals
 V = FPM seals

Z4 = Small quadrate plug-in connector

No code = Without special protection
 J = Sea water resistant

No code = Without hand override
 N9 = With protected hand override

24 = DC supply voltage for the control electronics G24

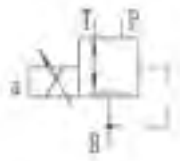
Symbols

Simplified

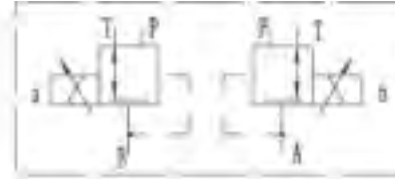
Type 3DREP6A-10B/...A...



Type 3DREP6B-10B/...A...

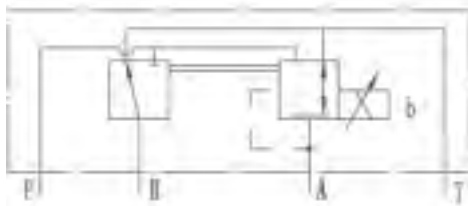


Type 3DREP6C-10B/...A...

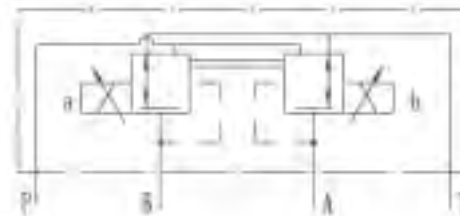


Detailed

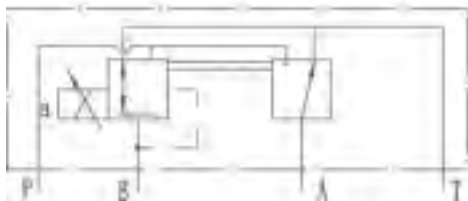
Type 3DREP6A-10B/...A...



Type 3DREP6C-10B/...A...



Type 3DREP6B-10B/...A...



Technical data

Hydraulic

Operating pressure (MPa)	Port P	10, If excess 10, then installate the valve, type ZDR6DP...-30B/...in input port
	Port T	3
Max. flow (L/min)		15 ($\Delta P=5\text{MPa}$)
Degree of contamination (μm)		Filter recommendation with a minimum retention rate of $\beta_{10} \geq 75$
Hysteresis (%)		≤ 3
Repeatability accuracy (%)		≤ 1
Response sensitivity (%)		≤ 1
Reversal span (%)		≤ 1
Pressure fluid		Mineral oil(for NBR seal), Phosphate ester (for FPM seal)
Viscosity range (mm^2/s)		2.8 to 380
Pressure fluid temperature range ($^{\circ}\text{C}$)		-20 to +70
Installation		optional, preferably horizontal
Weight (kg)		Type C: 2.6; type A,B: 1.5

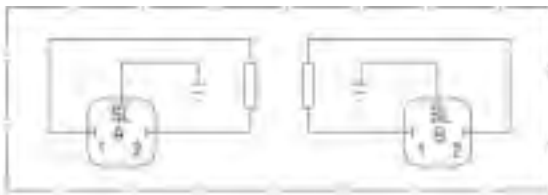
Electrical, solenoid

Supply voltage		DC24V
Nominal current per solenoid (A)		0.8
Max. current per solenoid (A)		≤ 0.02
Solenoid coil resistance (Ω)	Cold value at 20 $^{\circ}\text{C}$	19.5
	Max. warm value .	28.8
Working state		continuous
Condition temperature ($^{\circ}\text{C}$)		$\sim +50$
Coil temperature ($^{\circ}\text{C}$)		$\sim +150$
Protection to DIN 40 050		IP65
Electrical connections	3DREP	with component plug to DIN 43 650-AM2 plug-in connector to DIN 43 650-AF2/Pg11 1)
	3DREPE	with component plug to E DIN 43 563-AM6-3 plug-in connector E DIN 43 563-BF6-3/Pg11 1)

Electrical connections

(Dimensions in mm)

Connections at component plug

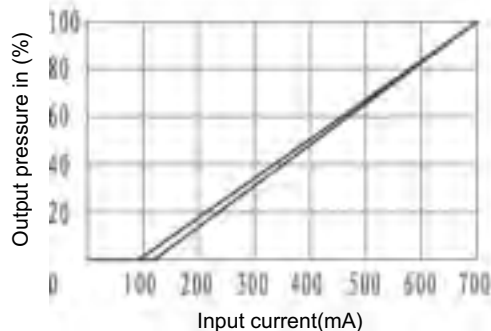


Connections at plug-in connector

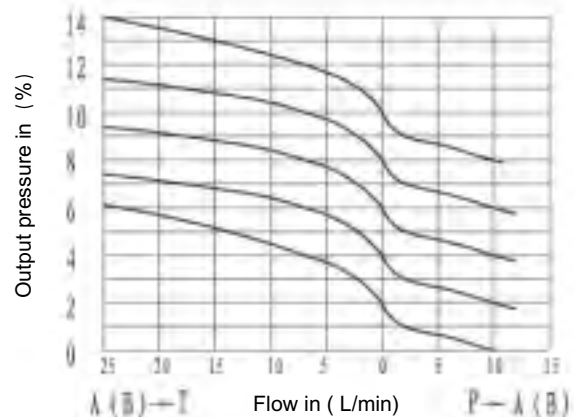


Char

Pressure stages 1.6, 2.5 and 4.5 MPa

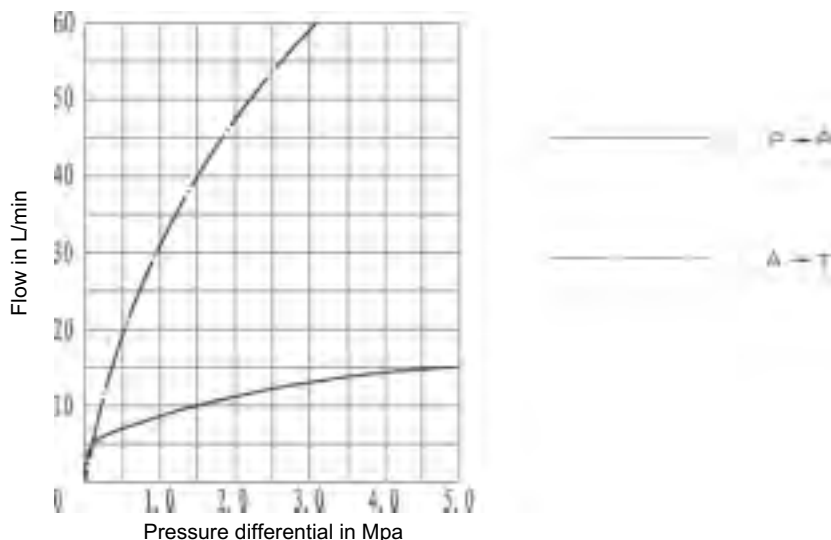


Pressure-flow relationship



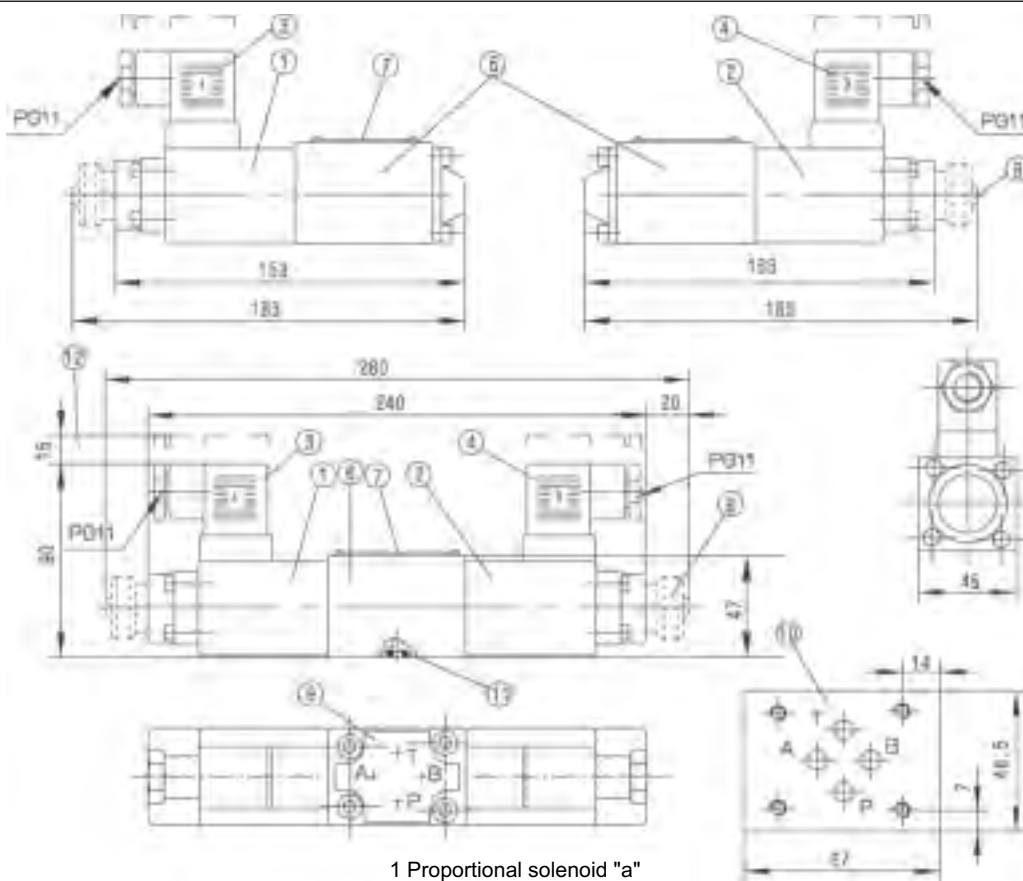
Characteristic curves

Pressure stages 1.6, 2.5 and 4.5Mpa



Unit dimensions: type 3DREP

(Dimensions in mm)



- 1 Proportional solenoid "a"
 - 2 Proportional solenoid "b"
 - 3 Plug-in connector coloured grey
 - 4 Plug-in connector coloured black
 - 5 2-Position valve
 - 6 3-Position valve
 - 7 Nameplate
 - 8 Protected hand override "N"
 - 9 Ports position
 - 10 Machined valve mounting face and position of the ports
 - 11 O-ring, 9.25 x 1.78 (for ports A, B, P, T)
 - 12 Space required to remove the plug-in connector
- Subplates G 340/01 (G 1/4) G 341/01 (G 3/8) G 502/01 (G 1/2)
 Valve fixing screws
 M5 x 50 DIN 912-10.9; M_A = 8.9 Nm see page 80

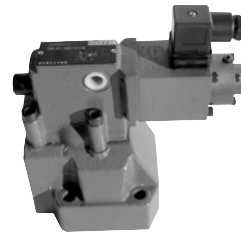
When used with a proportional directional valve type 4WRZ then the following throttle inserts are to be used for ports A and B:

NS	10	16	25	37
Hde (mm)	1.5	1.8	2.3	2.8
material no.	156476	158510	157511	157948

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure reducing valve Types DRE and DREM			RE 24750/06.2004
	Size 10.25.32	up to 31.5 MPa	up to 300 L/min	Replaces:

Features:

- Optional max.pressure protecting
- Optional check valve between A and B
- Valve used for reducing a working pressure
- For subplate mounting
- Valve and electronics from one source



Function, section

The valve types DRE and DREM are pilot operated pressure reducing valves. They are used for the reduction of a working pressure.

The valves basically consist of the pilot valve (1) with proportional solenoid (2), main valve (3) with main spool assembly (4), as well as an optional check valve (5).

Type DRE...

The setting of the pressure in port A is dependent on the voltage present at the proportional solenoids (2).

At rest, with no pressure in port B the spring holds the main spool (4) in its start position. The connection from B to A is closed. A start-up jump is, therefore avoided.

The pressure in port A acts via connection on the area of the main spool.

The pilot oil is taken from port A(NS 10) or port B(NS 20,30) and passes through the connection to the constant flow controller, which holds the pilot oil flow constant independent of pressure drops between ports A and B. From the constant

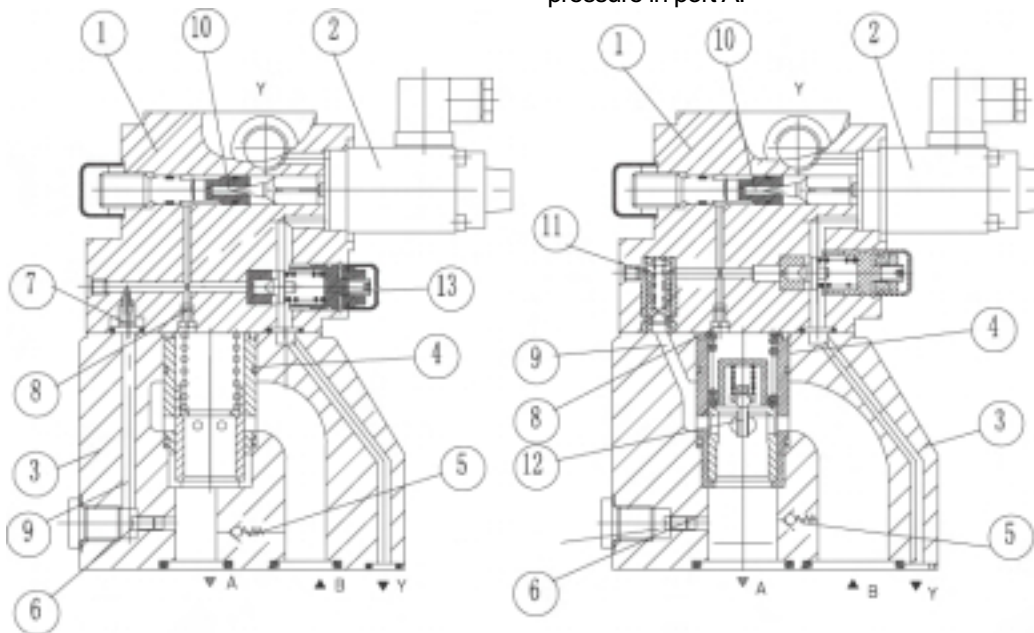
flow controller the pilot oil flow passes into the spring chamber, through two connections, via valve seat into the Y port and from there into the drain line.

The pressure required in port A is defined at the relevant amplifier.

Type DREM...

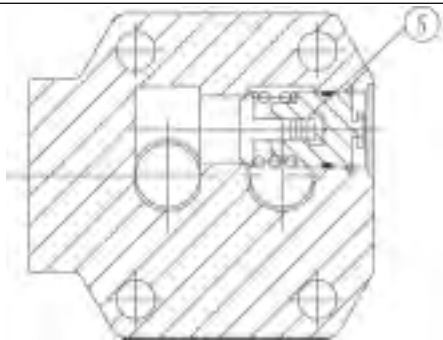
In order to ensure that excessive hydraulic pressures (hydraulic safety) do not occur due to unpermissibly high control currents at the proportional solenoid that automatically cause higher pressure in port A, a spring loaded maximum pressure relief valve, for maximum pressure safety, can be optionally installed if required.

Note: When the pressure fluid flow from port A to port B via the check valve (5), the parallel flow of oil via Y to tank affects the deceleration process of the actuator attached to port A if this is being decelerated by a throttle valve in port B (e.g. proportional directional valve). Under such circumstances, the third flow direction A to Y is not suitable for limiting the maximum pressure in port A.

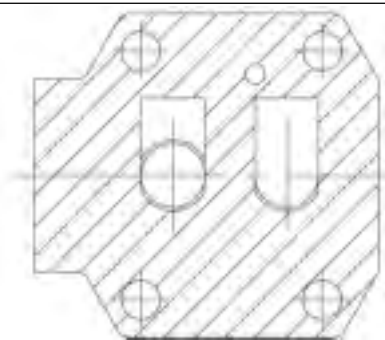


Type DRE/DREM

With check valve



Without check valve



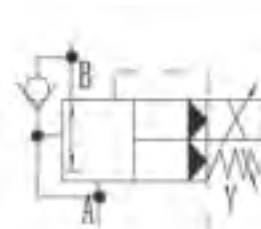
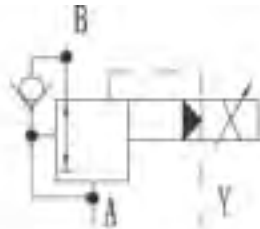
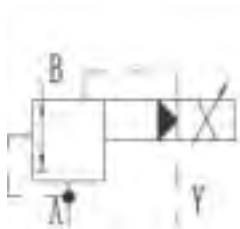
Type DRE, with check valve

10
DRE 20-30B...YM
30
DRE CN-30B...Y
DRE CH-30B...Y

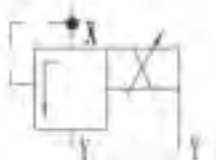
10
DREM 20-30B...YM
30
DREM CN-30B...Y
DREM CH-30B...Y

10
DRE 20-30B...Y
30

10
DREM 20-30B...Y
30

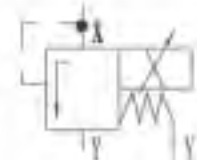


DREC $\frac{N}{H}$ -30B/...Y



DREC $\frac{N}{H}$ -30B

DREM C $\frac{N}{H}$ -30B/...Y



DREM C $\frac{N}{H}$ -30B

Ordering details

DRE [] [] [] [] [] 30 B [] Y [] [] *

Without maximum pressure limitation = No code
With maximum pressure limitation = M

Pilot operated pressure reducing valve = No code
Pilot valve, size 10 (do not state valve size) = CN
Pilot valve with main valve cartridge for installation in manifolds, size 10 (state valve size) = CN
Pilot valve, size 20,30 (do not state valve size) = CH
Pilot valve with main valve cartridge for installation in manifolds, size 20,30 (state valve size) = CH

10 =10
NS 25 =20
32 =30

Series 30 to 39 =30
(30 to 39: unchanged installation and connection dimensions)

Further details in clear text

M = for mineral oils
V = for phosphate ester

No code = With check valve between A and B
M = Without check valve

Y= Pilot oil drain external, separate and zero pressure to the tank

Pressure rating: 50= 5MPa
100= 10MPa
200= 20MPa
315= 31.5MPa

B= Technology of Beijing Huade Hydraulic

Technical data

Hydraulic

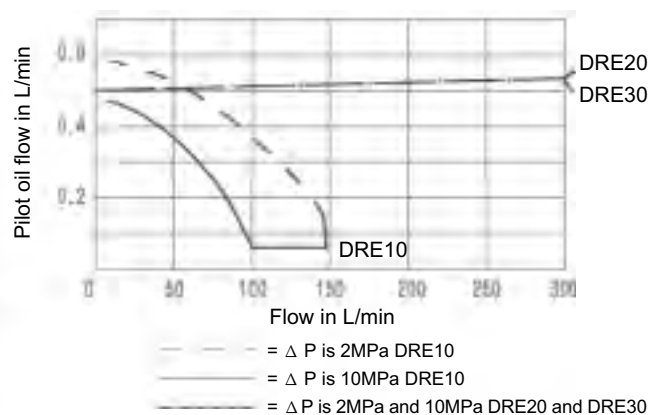
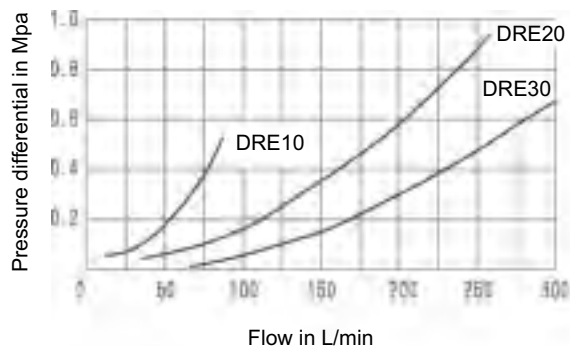
Max.setting pressure (MPa)	ports A and B	31.5		
	port Y	go to tank ,no pressure		
Max.setting pressure,for port A (MPa)		The same as pressure rating		
Min.setting pressure,for port A (MPa)		Be related to "Q". (see curves)		
Max.pressure limiter (steplessly settable)				
Setting pressure range set as delivered (MPa)	pressure rating			
	5	10	20	31.5
	1 to 6 ⁺²	1 to 12 ⁺²	1 to 22 ⁺²	1 to 34 ⁺²
Max.pressure limiter (assembly settable) (MPa)	6 to 8	12 to 14	22 to 24	34 to 36
Max. flow (L/min)	size	10	20	30
	flow	80	200	300
Pilot oil	See characteristic curves			
Linearity (%)	± 3.5			
Repeatability (%)	< ± 2			
Hysteresis	With quiver ± 2.5%Pmax,without quiver ± 4.5%Pmax			
Typical scatter	± 2.5Pmax See characteristic curves			
Operating time (ms)	100 to 300			
Fluids	Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range (mm ² /s)	2.8 to 380			
Fluid temperature range (°C)	-20 to +70			
Degree of the contamination (μm)	≤ 20(recommend 10)			

Electrical

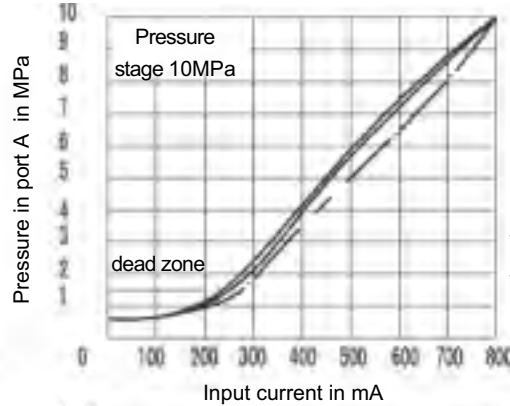
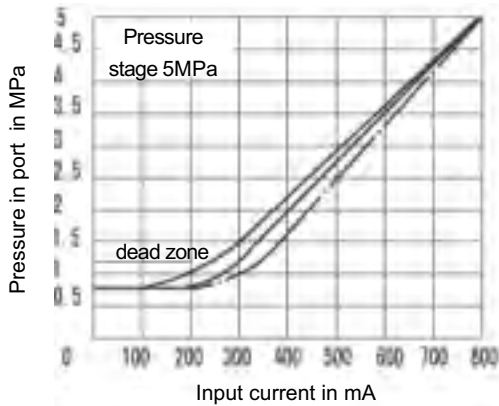
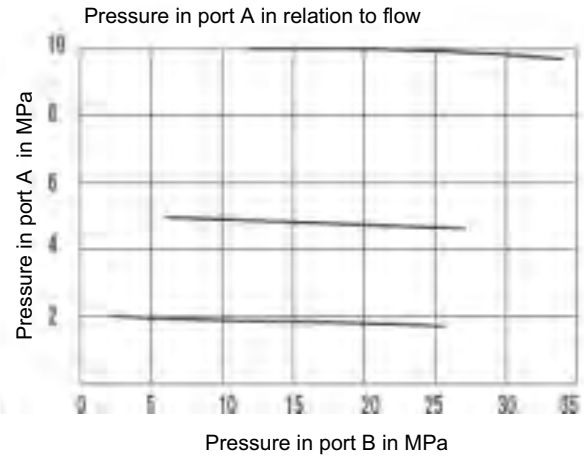
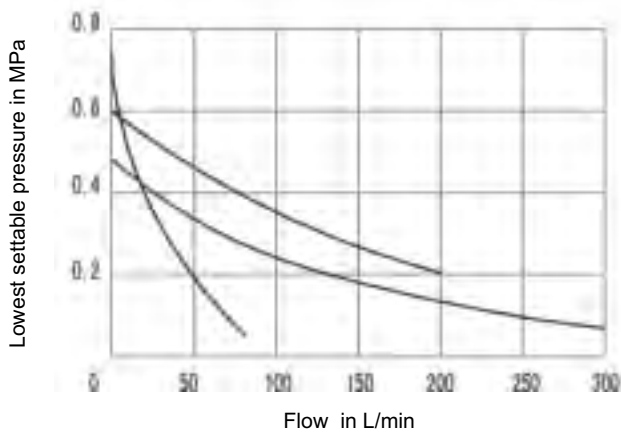
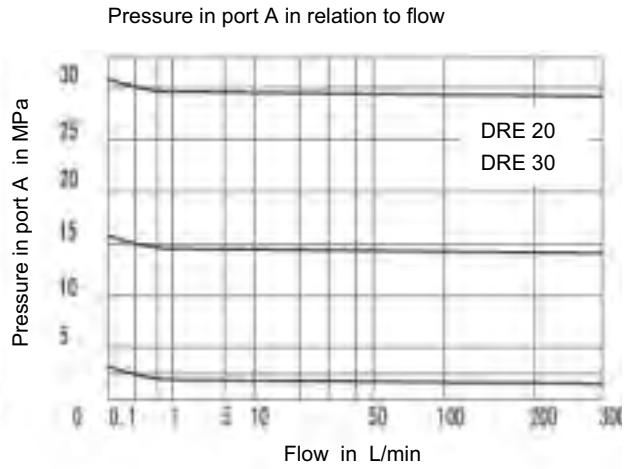
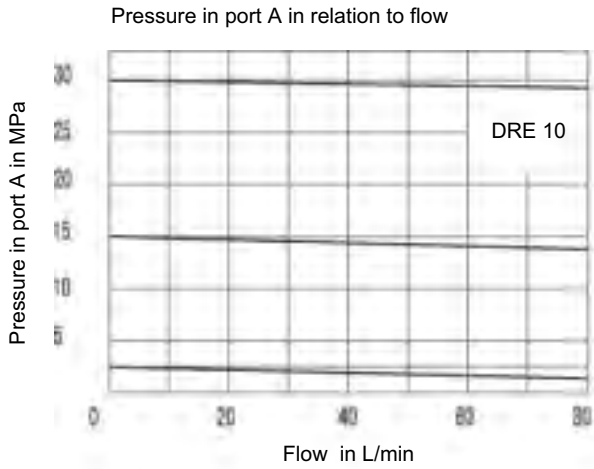
Supply voltage		DC
Min.control current (A)		0.1
Max.control current (A)		0.8
Coil resistance (Ω)		cold valve at 20°C is 19.5,Max.warm valve is 28.8
Duty		continuous
Max. condition temperature (°C)		+50
Insulation to DIN 40 050		IP65
Associated amplifier		Plug-in connector
Electrical applifier		VT-2000, 40(together provide)

Characteristic curves (measured at V = 41 mm²/s and t= 50°C)

Pressure difference from A to B, via check valve

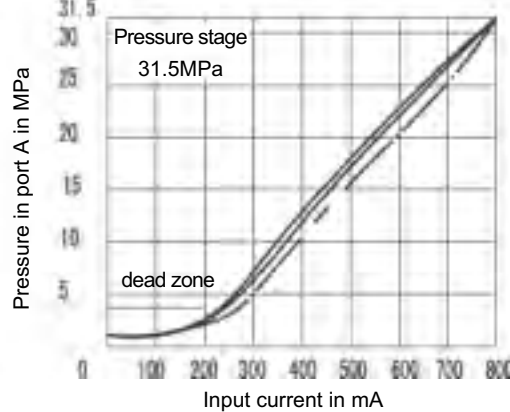
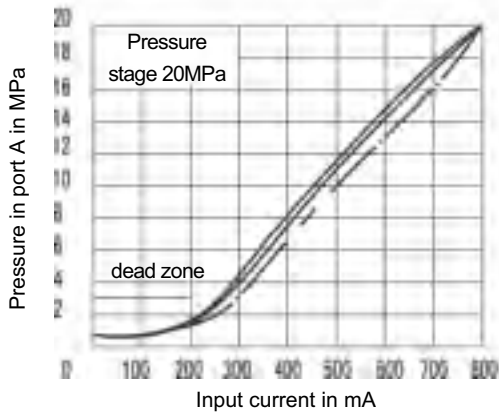


Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



DRE10.20 and 30, measured in flow 6L/min.

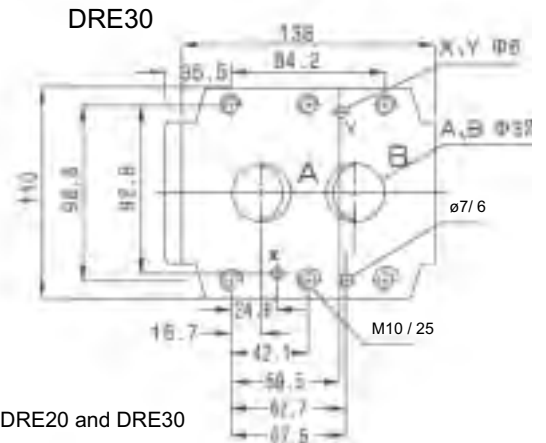
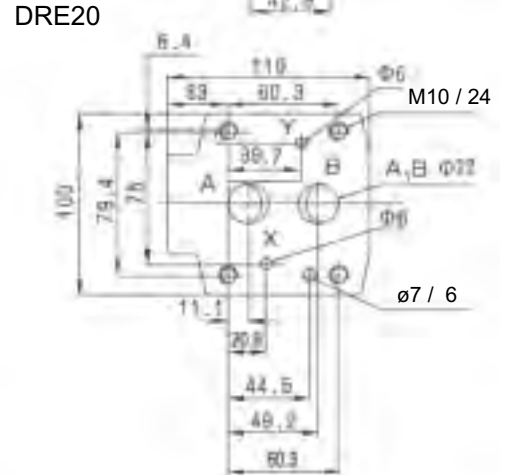
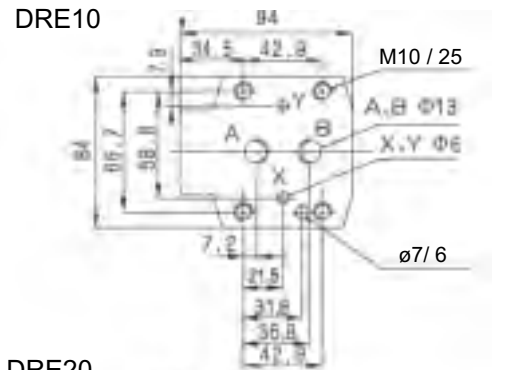
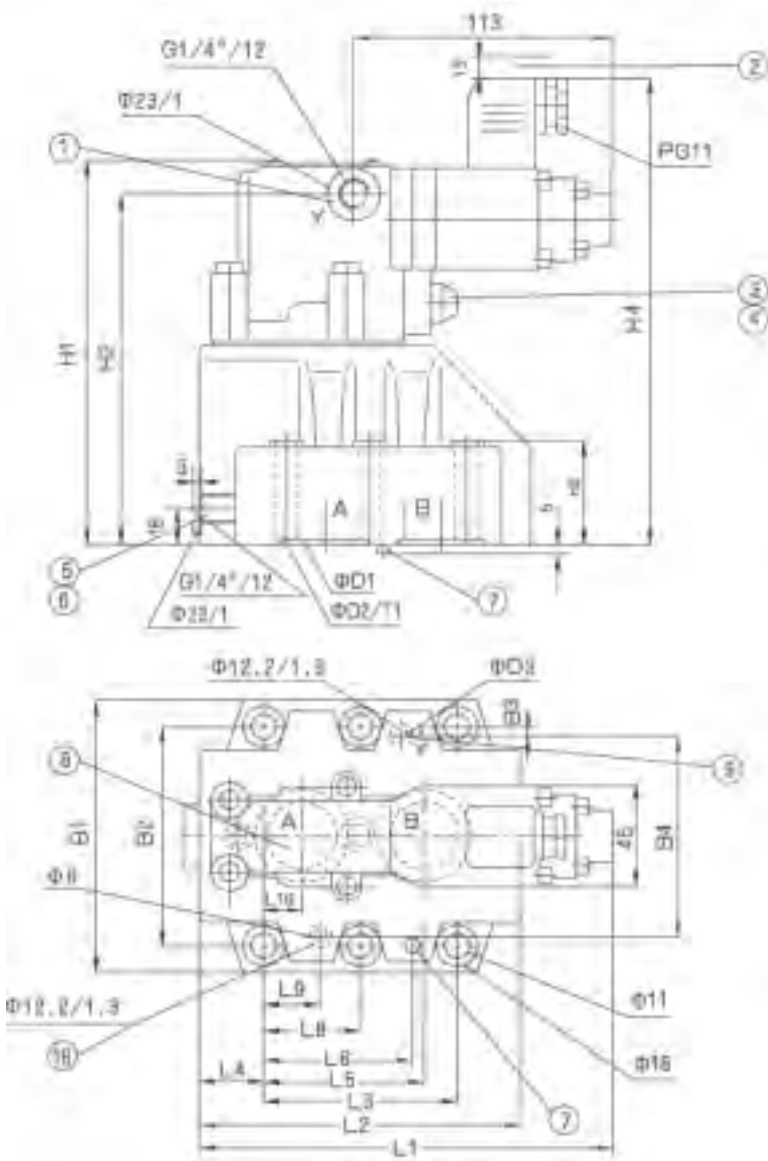
hysteresis:
with quiver ———
without quiver - - - - -



Note:
In order to achieve the minimum settable pressure the bias current must not exceed 100 mA

Unit dimensions

(Dimensions in mm)



- 1 As supplied, this port (G 1/4") is plugged. After removing the plug, this port may be used as an external pilot oil drain, separate and at zero pressure to tank.
- 2 Space required to remove plug-in connector
- 3 Maximum pressure limitation, type DREM
- 4 when using these valves, please take note of the guidelines
- 5 Port X for external control
- 6 Pressure gauge connecter for DRE20 and DRE30
- 7 Locating pin
- 8 Name plate
- 9 Pilot oil drain external at zero pressure to tank
- 10 Blind hole

Subplates
 G 460/01; G461/01
 G 412/01; G413/01
 G 414/01; G415/01
 valve fixing screws 6 M10 x 70
 DIN 912-10.9, MA = 75 Nm
 See page 88

NS	O-ring (A, B)	O-ring (X, Y)	B1	B2	B3	B4	D1	D2	D3
10	17.12 × 2.62	9.25 × 1.78	85	66.7	7.9	58.8	15	21.8	4.2
25	28.17 × 3.53	9.25 × 1.78	102	79.4	6.4	73	25	34.8	6
32	34.52 × 3.53	9.25 × 1.78	120	96.8	3.8	92.8	31	41	6

size	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	T1	Weight
10	152	136.5	28	188	181	96	42.9	35.5	35.8	31.8	21.5	-	21.5	7.2	2	4.5kg
25	162	146.5	38	198	177	112	60.3	33.5	49.2	44.5	39.7	-	20.6	11.1	2.9	6.3kg
32	170	154.5	46	206	176.5	140	84.2	28	67.5	62.7	59.5	42.1	24.6	16.7	2.9	8.6kg

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Meter-in pressure compensator, direct operated, Type ZDC			RE 24750/06.2004
	Size 10.16.32	up to 35 MPa	up to 325 L/min	Replaces:

Features:

- Load compensation in port P to A or P to B via a built-in shuttle valve
- 2-way version "P"
- 3-way version "P T" (NS10-25)
- Flow control when working together with a proportional directional valve

Function, section

The ZDC... valves are direct operated meter-in pressure compensators of 2 or 3-way design.

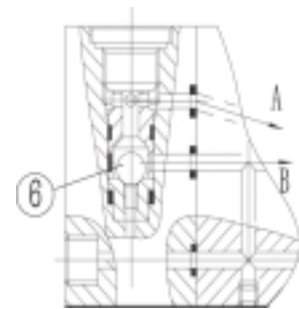
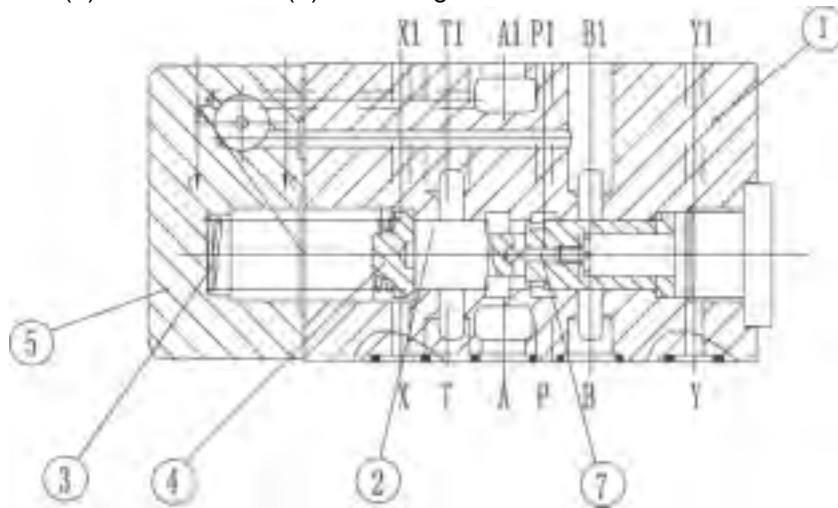
They are used for the load compensation as a meter-in pressure compensator in channel P.

These valves basically consist of the housing (1), the control spool (2), compression spring (3) with spring washer (4) and the cover (5) with integrated shuttle

valve (6).

The compression spring (3) holds the control spool (2) in the open position from P1 to P, when the pressure differential P1 to A1 or P1 to B1 is less than 1.0 MPa

If the pressure differential exceeds 1.0 MPa, then the control spool (2) is moved to the left until the pressure differential is restored.

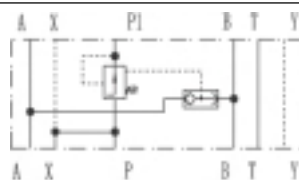


section C-C

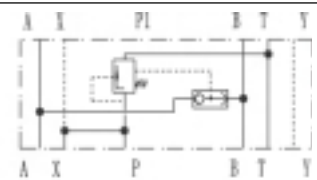
Type ZDC (NS 10)

Symbols

Pilot oil supply
"internal"

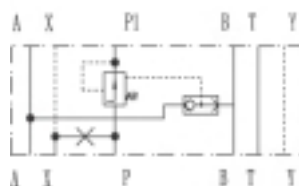


Type ZDC...P-20B/...

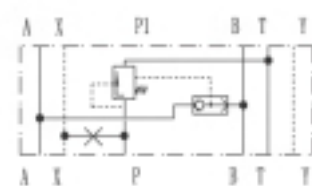


Type ZDC...PT-20B/...

Pilot oil supply "external", port X
is closed on the valve side(only
NS10)



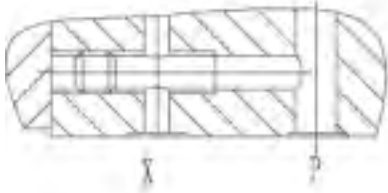
Type ZDC...P-20B/X...



Type ZDC...PT-20B/X...

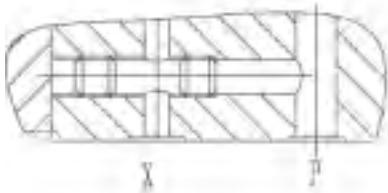
Pilot oil supply

For internal pilot oil supply for the proportional valve and the meter-in compensator, the oil is taken from the throttling point in the compensator. Port X is then plugged.

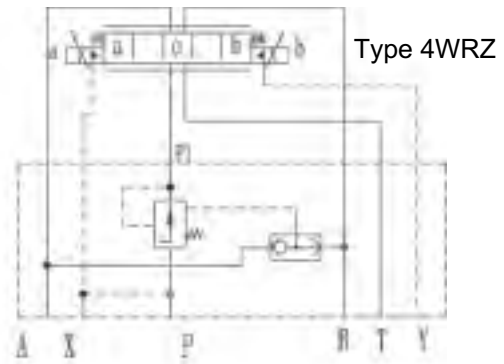


Pilot oil supply internal

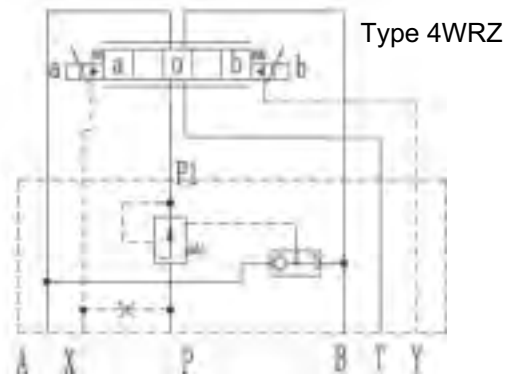
With external pilot oil supply, the connection in port p is closed. The pilot oil is supplied by a separate control circuit.



Pilot oil supply external

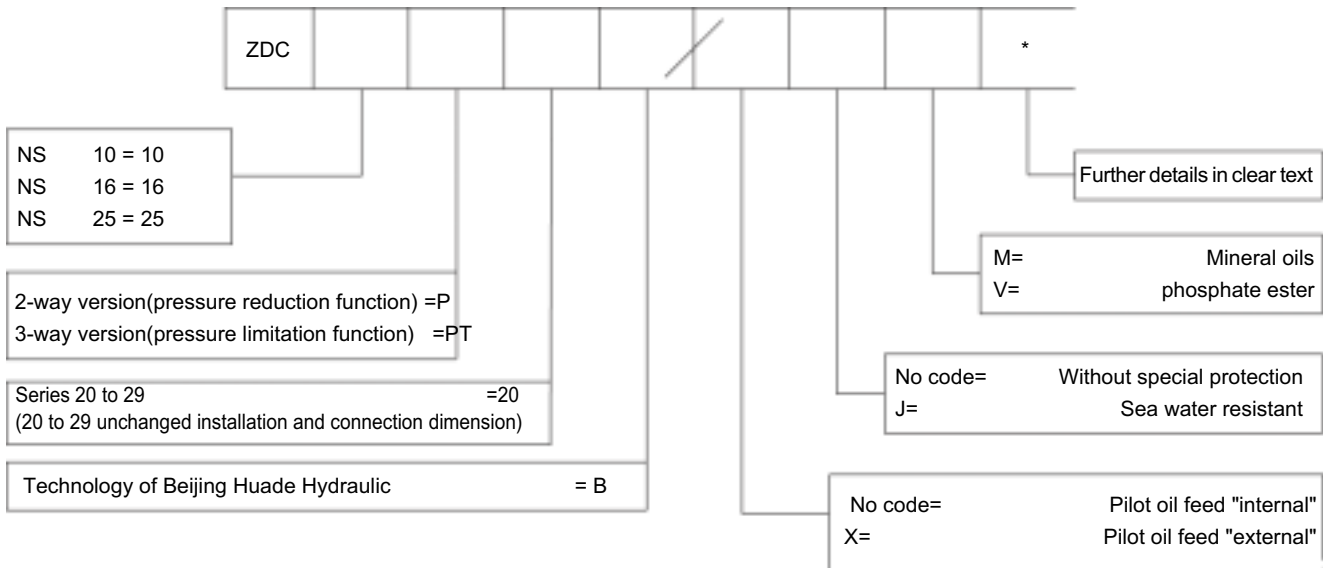


Type ZDC . . . P . . . 20B/ . . .



Type ZDC . . . P . . . 20B/X . . .

Ordering code

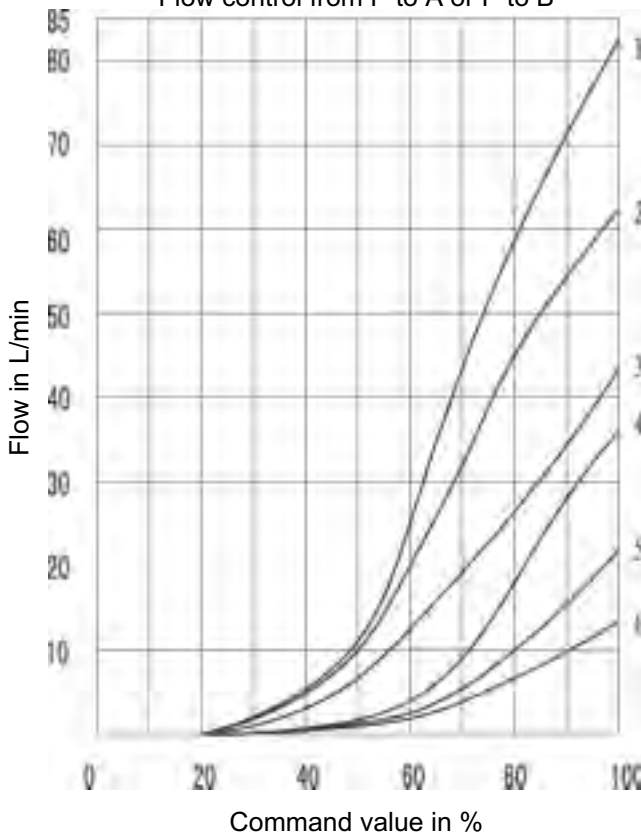


size		10	16	25	others is the same as the valves having same dimension
flow	(L/min)	85	150	325	
weight	(Kg)	3	3.5	8.9	
Operating pressure	A, B, P	35			
	T	25			
(MPa) P _{max}	X	3 to 10			
	Y	up to 3, (Only when be used with the port operated proportional direction valve, otherwise 15)			
Degree of containsnation	(μm)	≤ 20(recommend 10)			

Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

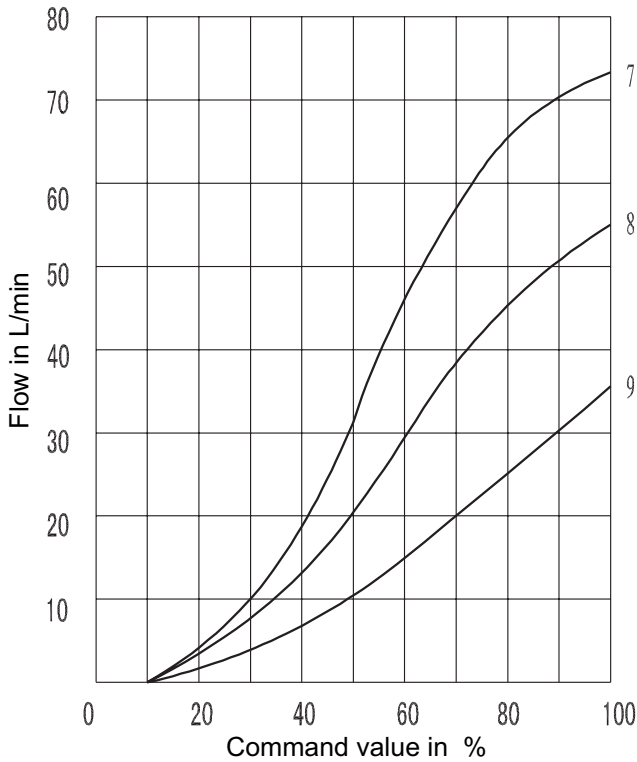
ZDC10:

Flow control from P to A or P to B



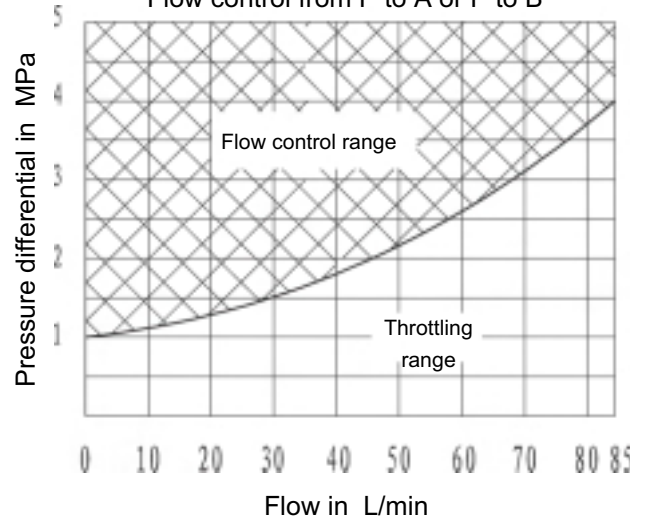
- 1= With valve type 4WRZ10...50-30B/6A.../...
- 2= With valve type 4WRZ10...50-30B/6A.../...
- 3= With valve type 4WRZ10...25-30B/6A.../...
- 4= With valve type 4WRA10...40-10B/...Z4/...
- 5= With valve type 4WRA10...20-10B/...Z4/...
- 6= With valve type 4WRA10...10-10B/...Z4/...

Flow control from P to A or P to B



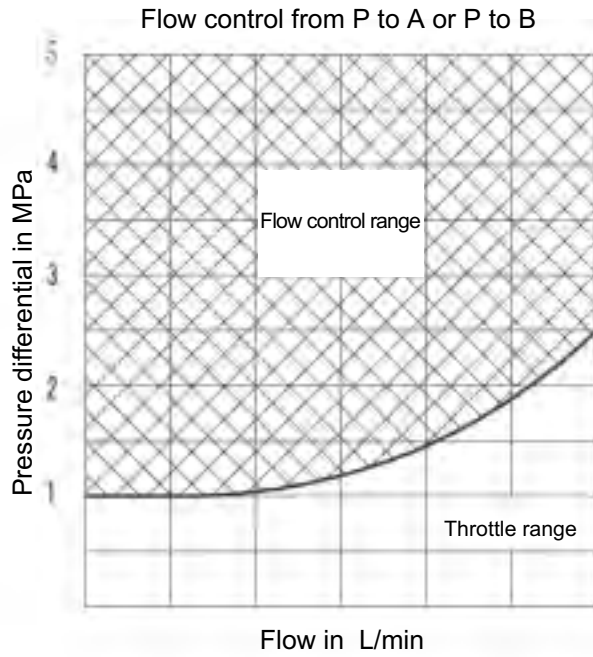
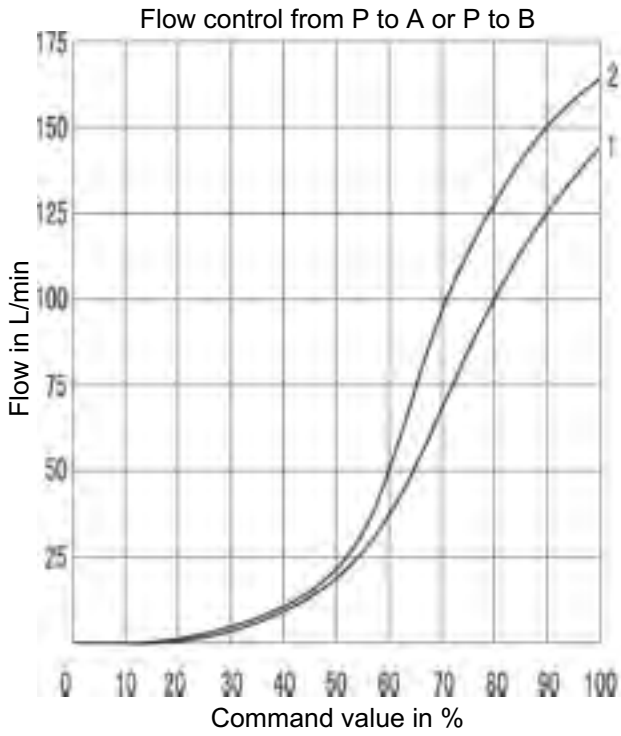
- 7= With valve type 4WRE10...64-10B/24Z4/...
- 8= With valve type 4WRE10...32-10B/24Z4/...
- 9= With valve type 4WRA10...16-10B/24Z4/...

Flow control from P to A or P to B

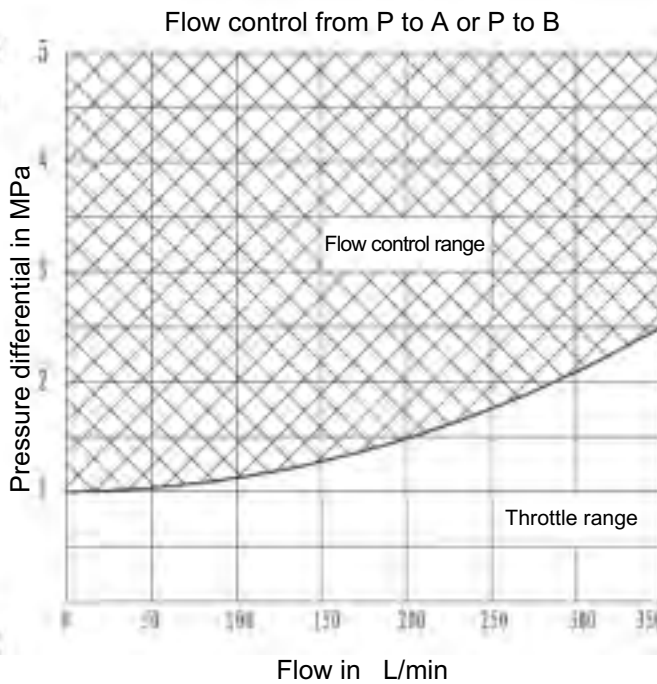
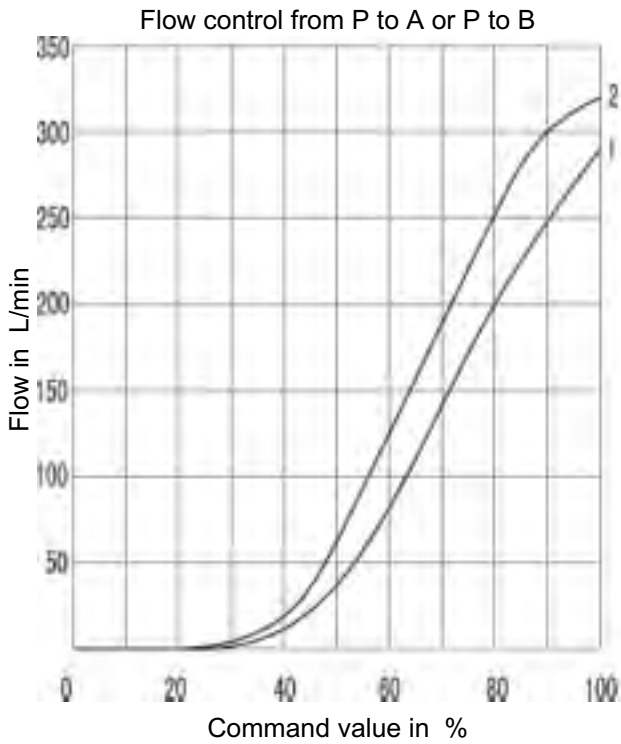


Characteristic curves (measured at $V = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

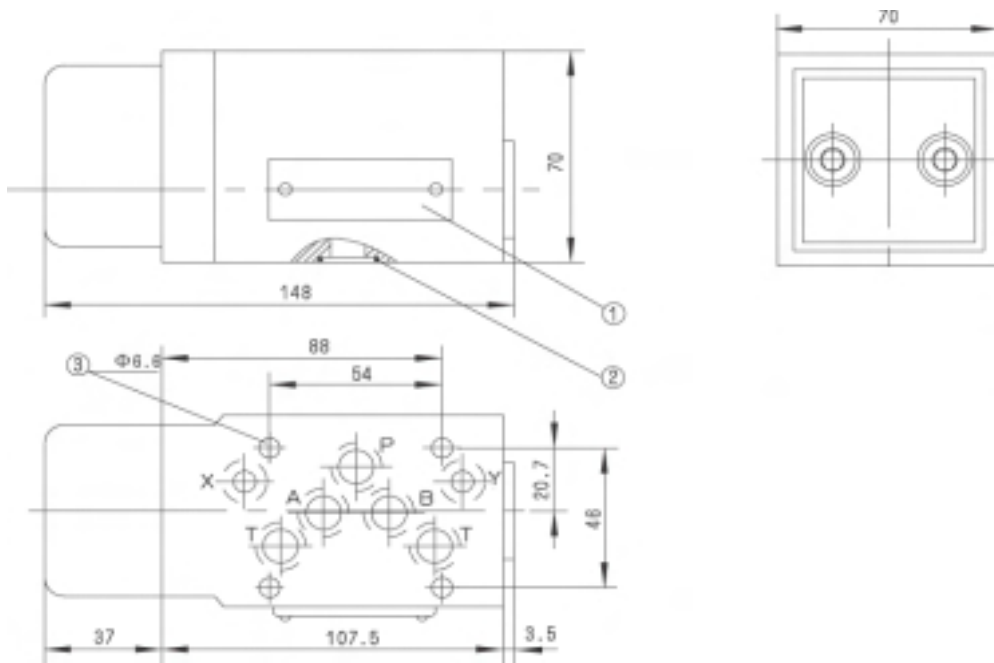
ZDC16: 1= with valve type 4WRZ16...100-30B/6A.../...
 2= with valve type 4WRZ16...150-30B/6A.../...



ZDC25: 1= with valve type 4WRZ25...270-30B/6A.../...
 2= with valve type 4WRZ25...325-30B/6A.../...

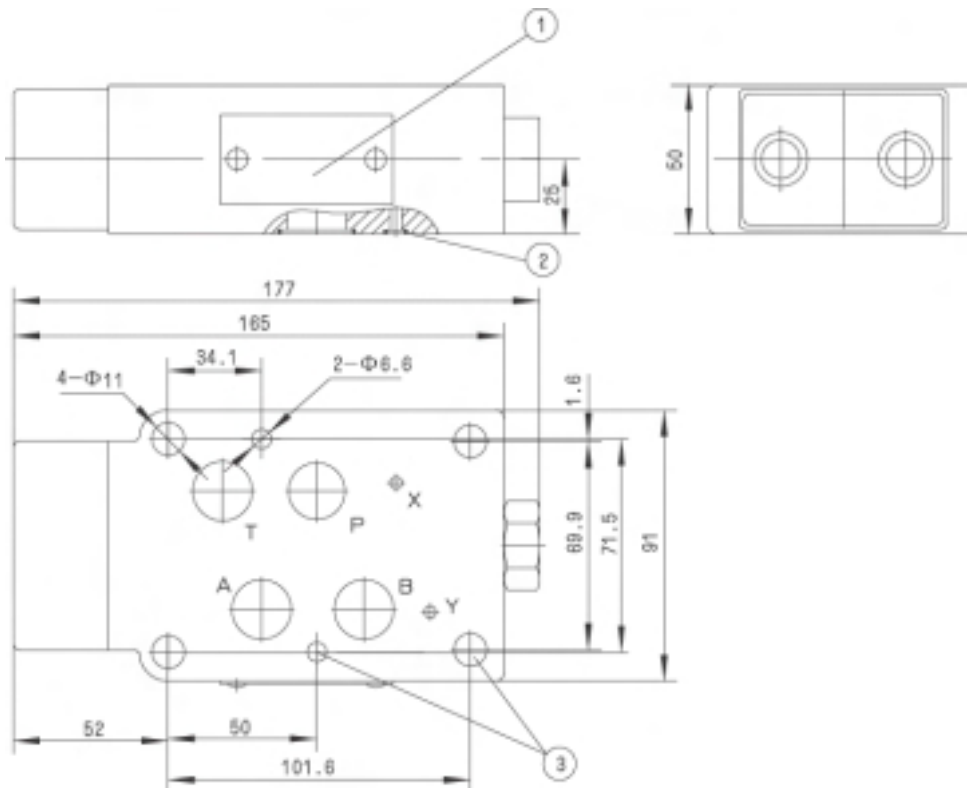


ZDC10:



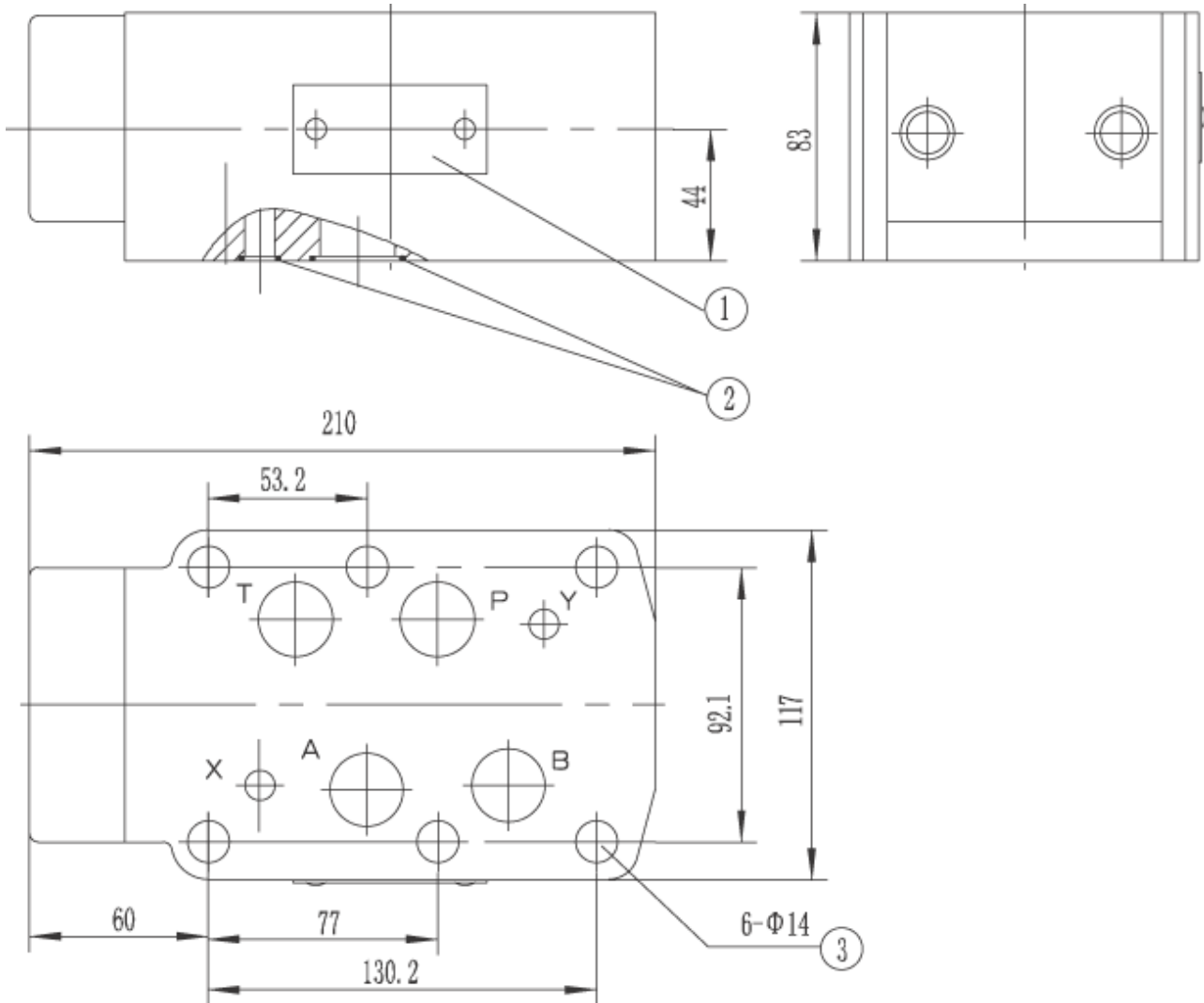
1. Nameplate
2. O-ring 12x2 for ports A,B,P,T
3. Valve fixing screw holes

ZDC16:



1. Nameplate
2. O-rings 22x2.5 for port A,B,P,T
3. Valve fixing screws

ZDC25:



1. Nameplate
2. O-rings 27x3 for ports A,B,P,T
O-rings 19X3 for ports X,Y
3. Valve fixing screws

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional flow control valve 2-way version, Type 2FRE 6...RC			RE
	Size 6	up to 21 MPa	up to 25 L/min	Replaces:

Features:

- Valve with a pressure compensator for the pressure compensated control of a flow
- Actuation via a proportional solenoid
- With electrical position feedback of the control orifice
- The position transducer coil can be axially moved making the zero point adjustment of the control orifice easy, without having to touch the electronics (electrical-hydraulic)
- Flow control is possible in both directions by using a rectifier sandwich plate



Functional , section , symbol

The type 2FRE ...proportional flow control valves have a 2-way function. They can, from a applied electrical command value, regulate flow which is pressure and temperature compensated.

They basically comprise of the housing (1), proportional solenoid with inductive position transducer (2), measuring orifice (3), pressure compensator (4) as well as the optional check valve (5).

Proportional flow control valve 2FRE 6 B:

The setting of the flow is determined (0 to 100 %) at the command value potentiometer. The applied command value adjusts, via the amplifier as well as the proportional solenoid, the measurement orifice(3). The position of the measurement orifice (3) is obtained by the inductive position transducer. Any deviations from the command value are compensated for by the feedback control.

The pressure compensator (4) holds the pressure drop at the measurement orifice (3) at a constant value. The flow is, therefore load compensated.

The small temperature drift is achieved due to the design of the measurement orifice.

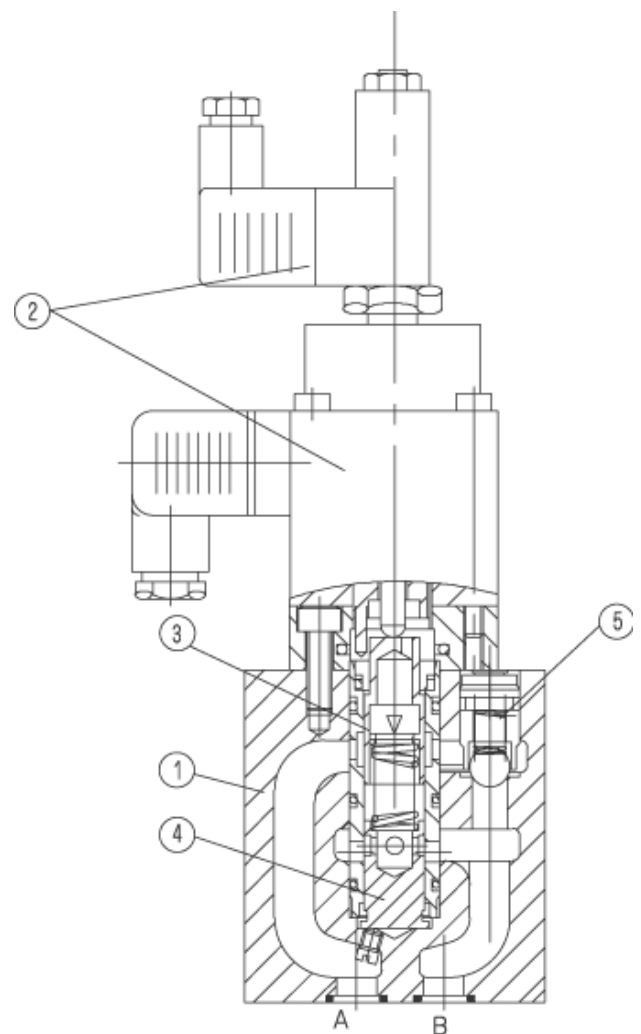
At a 0 % command value the measurement orifice is closed.

In the case of a loss of power or a cable break at the position transducer the measurement orifice closes.

From a 0 % command value a jump free start is possible.

Via two ramps within the electrical amplifier, it is possible to delay the opening and closing of the measurement orifice.

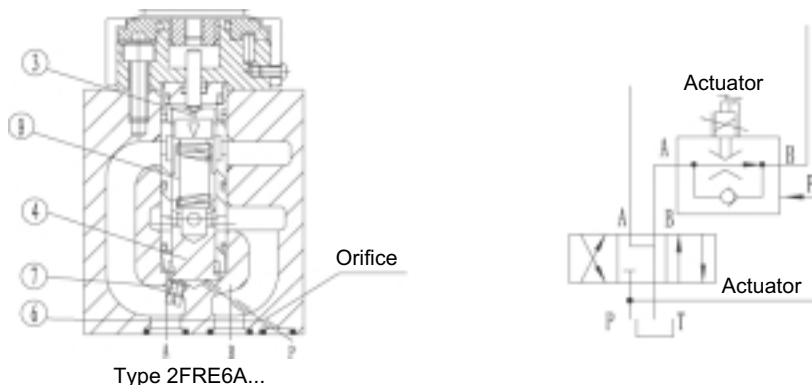
Via the check valve (5) a free flow is possible from B to A.



Proportional flow control valve type 2FRE 6 A:

The function of this valve is in principle the same as valve type 2FRE 6 B:

To suppress the start-up jump when the measurement orifice (3)(command value > 0 %) is open, there is provision for the pressure compensator (4) to be held closed via port P (6). The internal connection (7) between port A and the pressure compensator (4) is plugged. Via the external port P (6) the pressure in port P, before the directional valve (8) acts on the pressure compensator (4) and holds it against the spring force (9) in the closed position. If the directional valve (8) is switched over from P to B, then the pressure compensator(4) moves from the closed position into the regulating position and the start-up jump is thereby avoided.



Ordering details

2FRE6	20	B	/		*
-------	----	---	---	--	---

With external closing of the pressure compensator = A
 Without external closing of the pressure compensator = B

Series 20 to 29 = 20
 (20 to 29: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Flow range A → B

up to 3 L/min	= 3Q
up to 6 L/min	= 6Q
up to 10 L/min	= 10Q
up to 16 L/min	= 16Q
up to 25 L/min	= 25Q
Progressive with fast feed	
Fine control range up to 2 L/min	= 2QE

Further details in clear text

No code= Mineral oil
 V= Phosphate ester

R= with check valve
 M= without check valve

Rectifier sandwich plate

Z4S6	10	B	/		*
------	----	---	---	--	---

Rectifier sandwich plate
 Nominal size 6 = 6

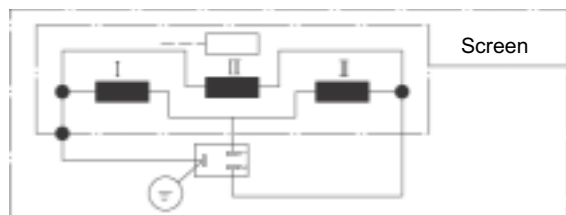
Further details in clear text

Electrical connections ---- Inductive position transducer

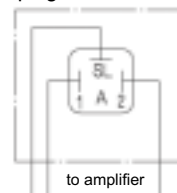
Technology of Beijing Huade Hydraulic =B

No code=Mineral oil
 V= Phosphate ester

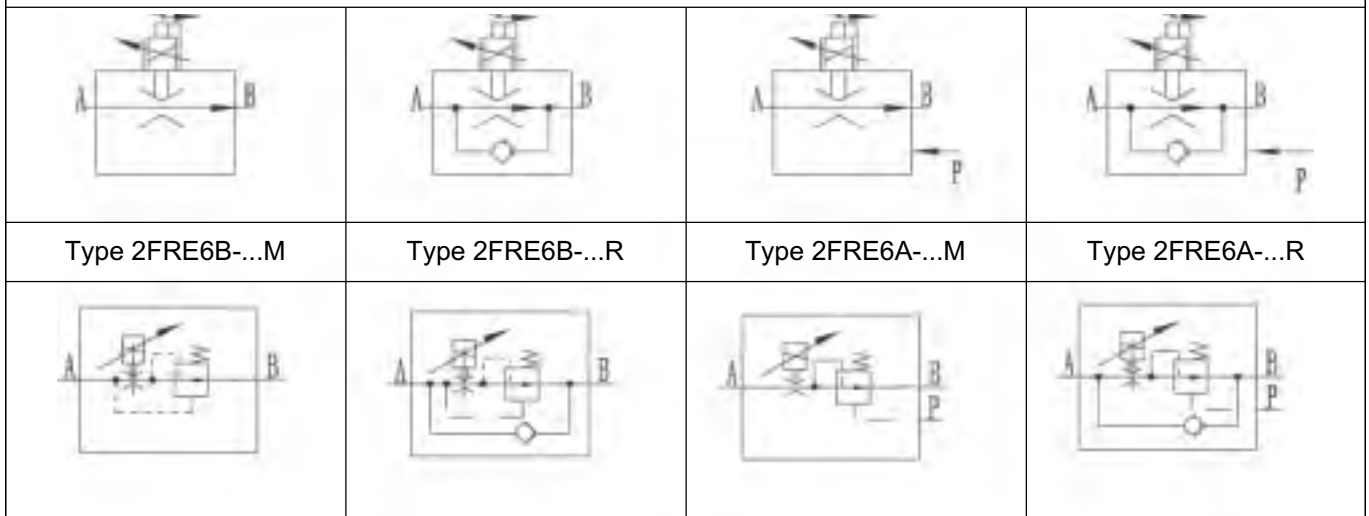
Connections on loops



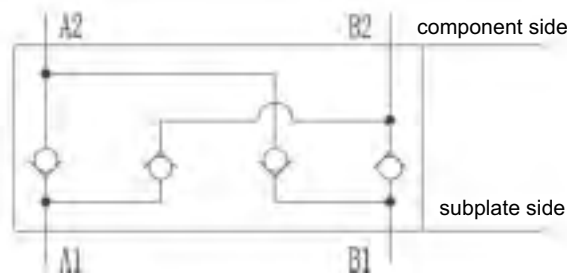
Connections on plug-in connector



Symbols: Proportional flow control valve (simplified, complete)



Rectifier sandwich plate:



Technical data (for applications outside these parameters, please consult us!)

Hydraulic

Max. permissible operating pressure, port A		21 (port A)						
Flow q_v max.	(L/min)	Type	2QE	3Q	6Q	10Q	16Q	25Q
			2	3	6	10	16	25
Flow q_v min.	(L/min)	to 10MPa	0.015	0.015	0.025	0.05	0.07	0.1
		to 21MPa	0.025	0.025	0.025	0.05	0.07	0.1
Max. leakage flow at command value 0%(L/min) (measured at $v = 36^{-6}$ $\times 10m^2/s$ and $t=50^\circ C$)	ΔP (A \rightarrow B)	5MPa	0.004	0.004	0.004	0.006	0.007	0.01
		10MPa	0.005	0.005	0.005	0.008	0.01	0.015
		21MPa	0.007	0.007	0.007	0.012	0.015	0.022
Minimum pressure differential		(MPa)	0.6 to 1					
Δp free return flow (B \rightarrow A)			see diagram on page 69					
Pressure flow relationship: inlet/outlet pressure			see diagram on page 69					
Flow stability			see diagram on page 69					
Hysteresis			$< \pm 1\%Q_{max}$					
Repeatability			$< 1\%Q_{max}$					
Degree of contamination		(μm)	≤ 20 (We recommend a filter with a minimum retention rate of 10)					
Pressure fluid			Mineral oil(for NBR seal),Phosphate ester (for FPM seal)					
Viscosity range		(mm^2/S)	2.8 to 380					
Pressure fluid temperature range		($^\circ C$)	-20 to +70					
Installation			optional					

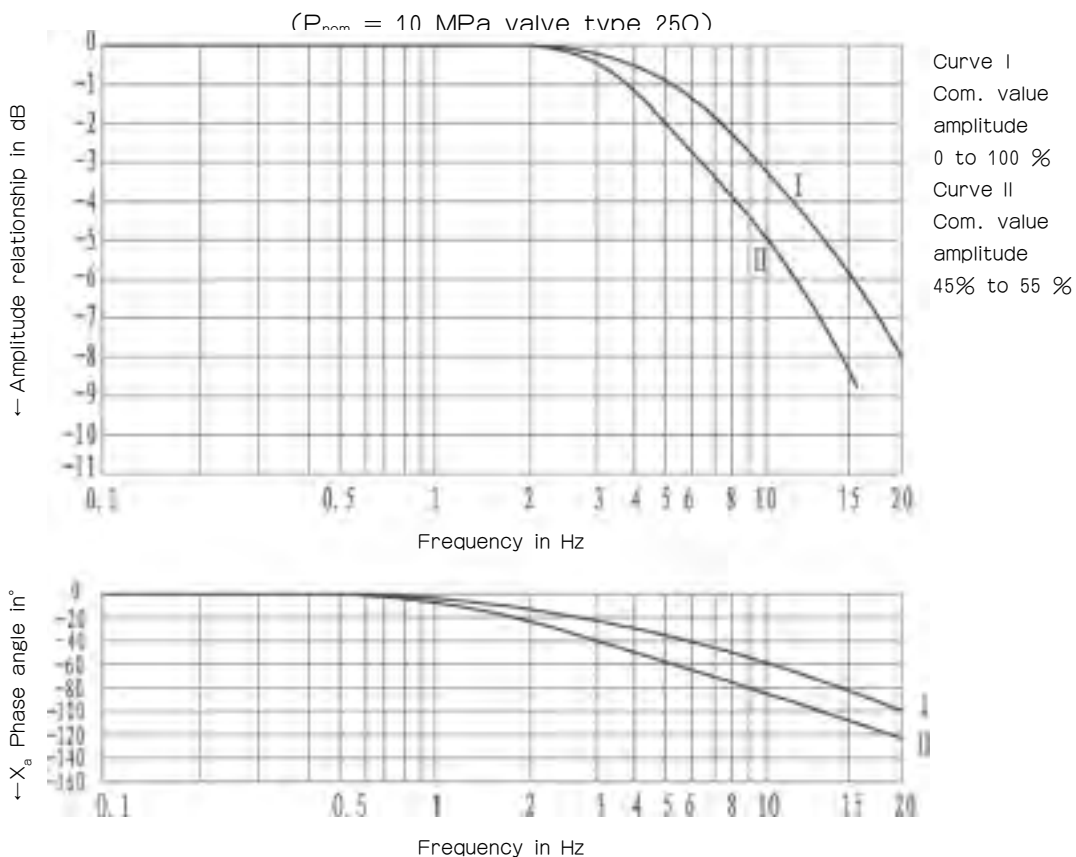
Electrical

Voltage type		DC
Coil resistance of solenoid	(Ω)	Cold value at $20^\circ C$ 5.4 , Max. warm value 8.2
Coil resistance of transducer	(Ω)	at $20^\circ C$ I -56, II -56, III -112
Max. Power	(VA)	50
Inductivity	(mH)	6 to 8
Oscillator frequency	(KHz)	2.5
Surroundubgs temperature	($^\circ C$)	Max.50
Amplifier		VT-5010S30 Demand of insulation IP65

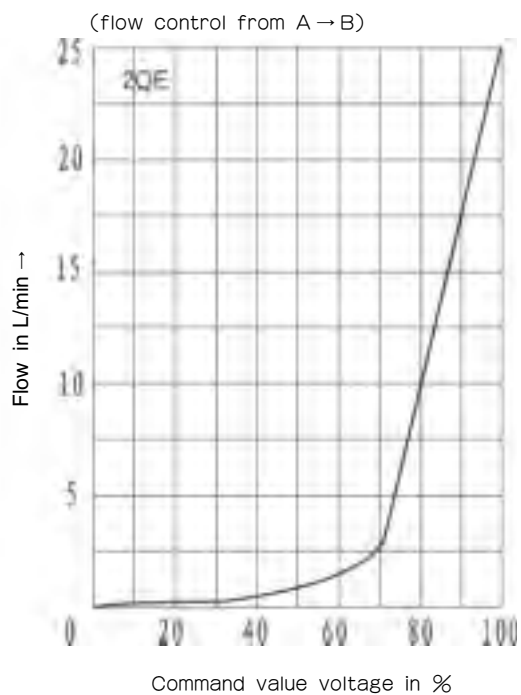
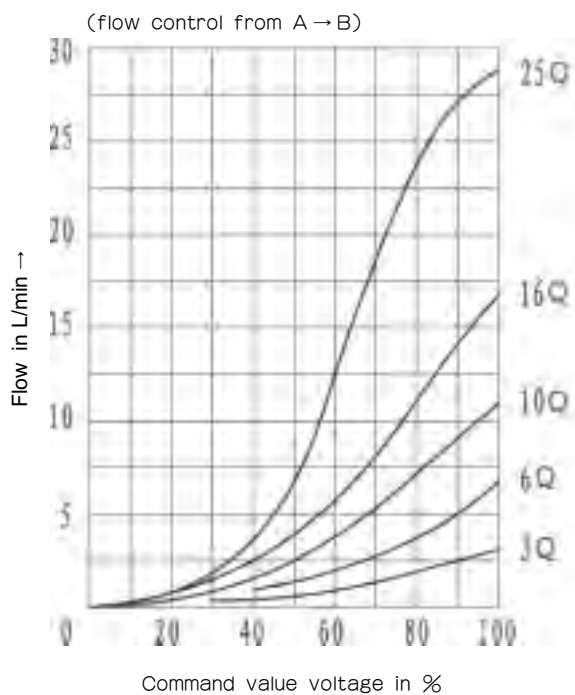
Characteristic curves (measured at $v=36 \times 10^{-6}m^2/S$; $t=50^\circ C$)

Frequency response characteristic curve

Input signals (%)	Qmin to Qmax Tu+Tg(ms)	Qmax to Qmin Tu+Tg(ms)
0-100	50	60
10-90	45	50
25-75	40	45

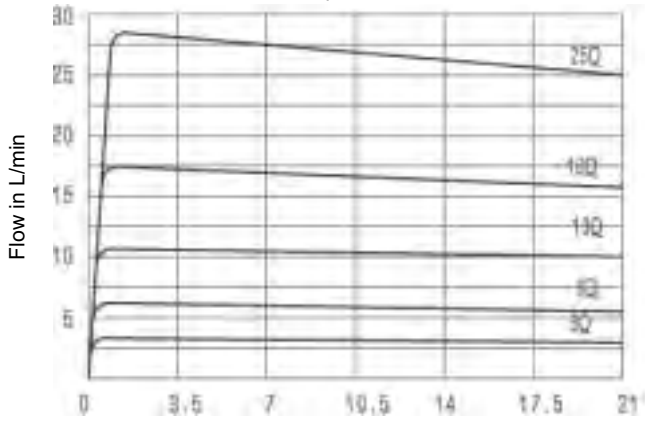


Relationship of the flow to the command value ($P_{nom} = 50 \text{ MPa}$)

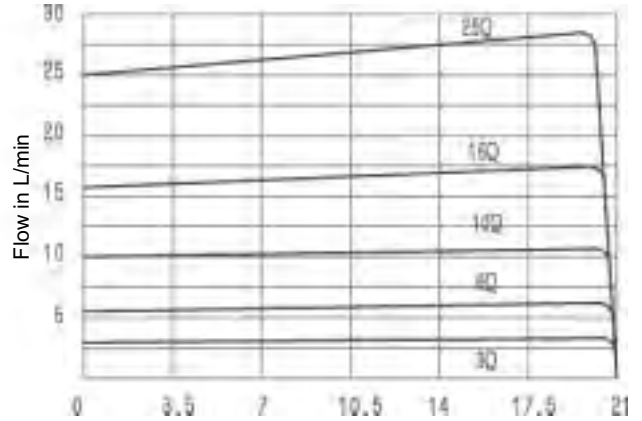


Proportional flow control valve

Pressure - flow relationship

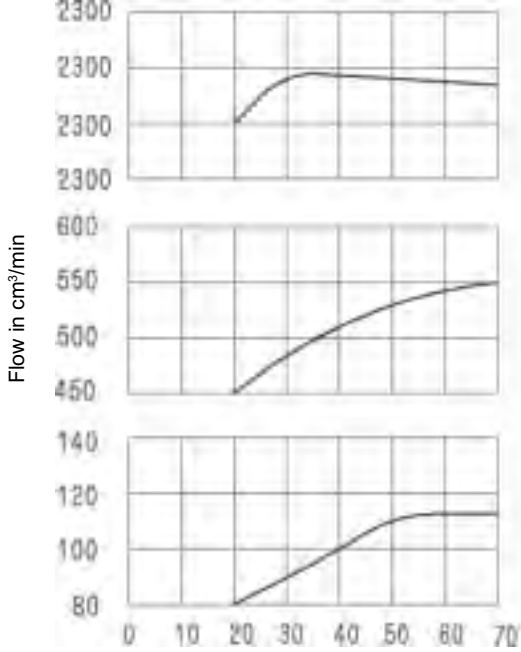


Inlet pressure P_{nom} (A) in MPa →
(pressure in B 0 MPa)



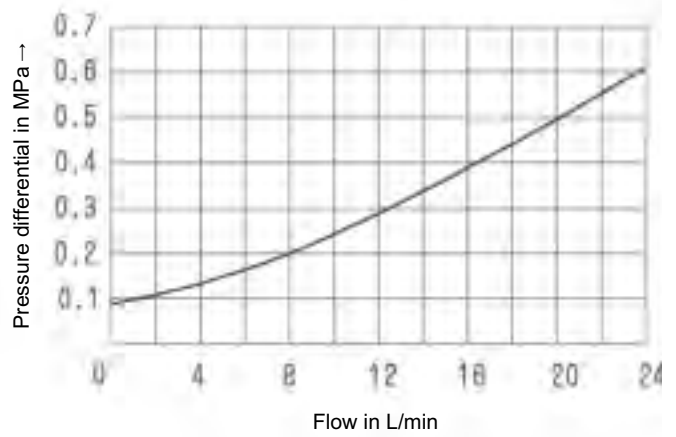
Outlet pressure p_A (B) in MPa →
(pressure in A 21 MPa)

Temperature relationship at $D_p = 3$ MPa



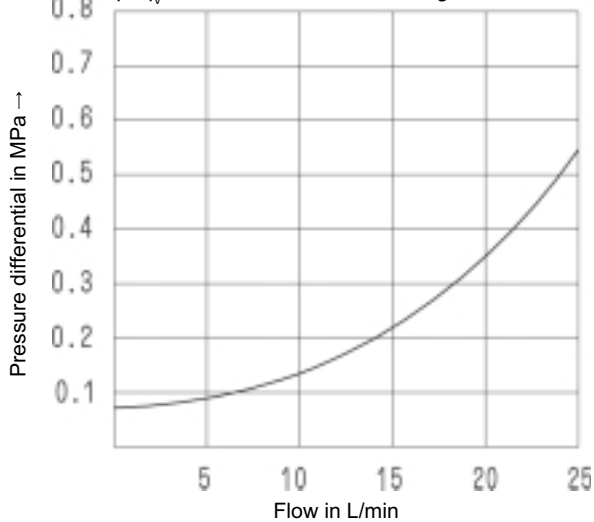
Temperature relationship in $^{\circ}C$

Pressure differential over check valve B → A
Orifice closed



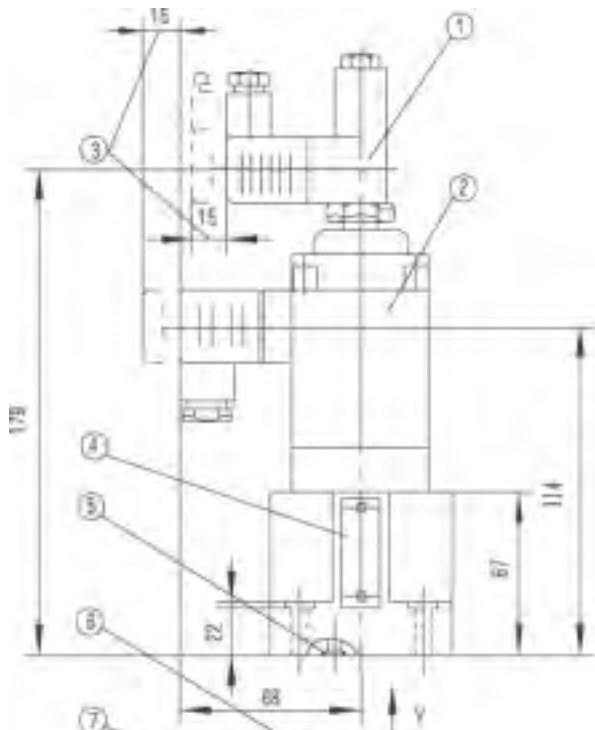
Rectifier sandwich plate

$\Delta p - q_v$ -characteristic curve - cartridge check valve



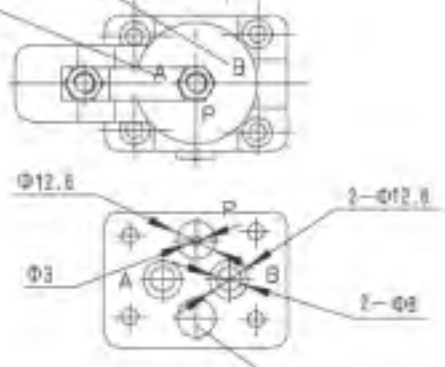
Unit dimensions:

(Dimensions in mm)



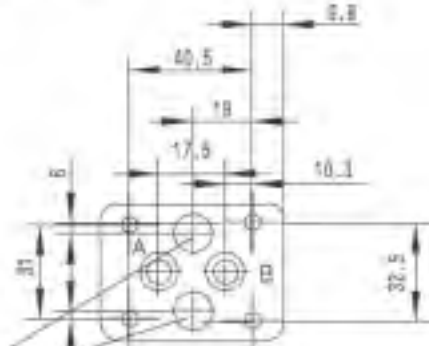
- 1 Inductive position transducer
- 2 Solenoid
- 3 Space required to remove plug-in connector
- 4 Nameplate
- 5 O-Ring 9.25 x 1.78 (for ports A, B, P, T and blind hole)
- 6 Port B
- 7 Port A

Subplates:
 G 341/01 (G 1/4")
 G 342/01 (G 3/8")
 G 502/01 (G 1/2")
 See page 80



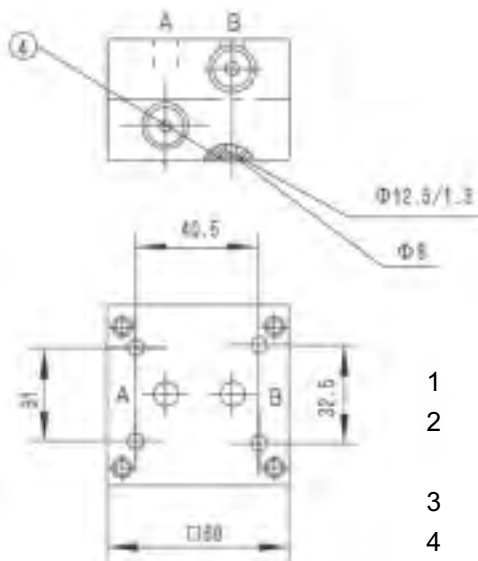
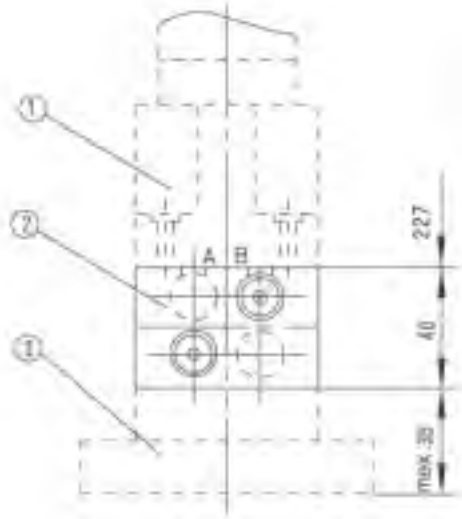
View "Y"
Type 2FRE6A...

Blind hole
 $\Phi 12.6$



View "Y"
Type 2FRE6B...

Rectifier sandwich plate



- 1 valve 2FRE6
- 2 Rectifier sandwich plate Z4S6
- 3 Subplates
- 4 O-ring 9.25 x 1.78

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional flow control valve 2-way version, Type 2FRE 10, 16...			RE 24750/06.2004
	Size 10, 16	up to 21 MPa	up to 160 L/min	Replaces:

Features:

- Valve with a pressure compensator for pressure compensated control of a flow
- Actuation via a proportional solenoid
- With electrical position feedback of the control orifice
- The position transducer coil can be axially moved making the zero point adjustment of the control orifice easy, without having to touch the electronics (electrical-hydraulic)
- Minimum sample variation of valve and electrical amplifier VT 5004 (separate order)



Functional , section

The type 2FRE.. proportional flow control valves have a 2-way function. They can, from an applied electrical command value, regulate a flow which is pressure and to a great extent temperature compensated.

They basically comprise of the housing (1), proportional solenoid with inductive position transducer (2), measuring orifice (3), pressure compensator (4), stroke limiter (5), as well as an optional check valve (6).

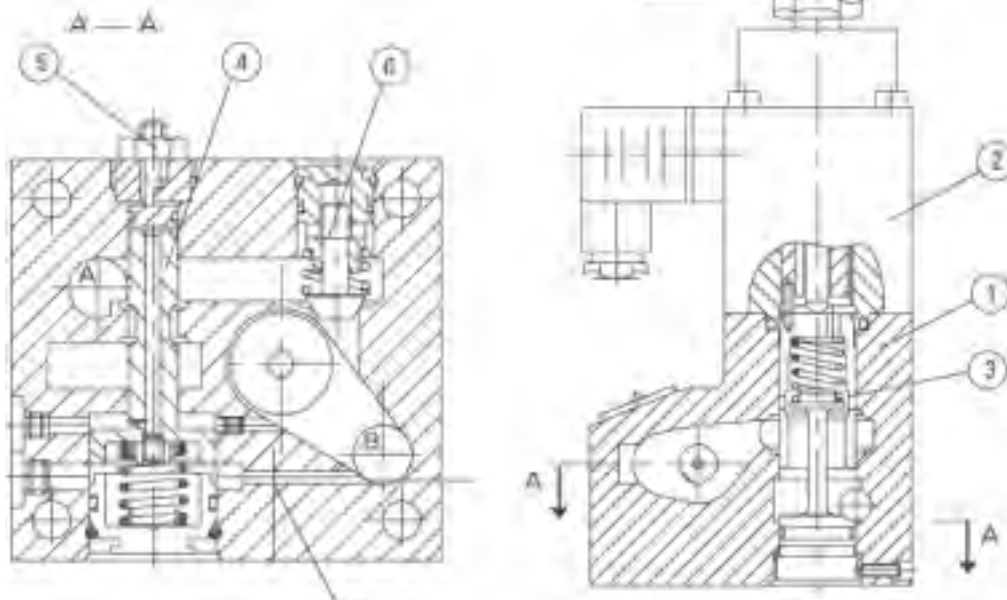
The setting of the flow is determined (0 bis 100 %) at the command value potentiometer. The applied command value, causes via the amplifier as well as the proportional solenoid, the adjustment of the measurement orifice (3). The position of the measurement orifice (3) is obtained by the position transducer. Any deviations from the command value are compensated for by the position feedback control.

The pressure compensator (4) holds the pressure drop at the measurement orifice (3) at a constant value. The flow is, therefore pressure compensated.

The small temperature drift is achieved due to the design of the measurement orifice. At a 0 % command value the measurement orifice is closed.

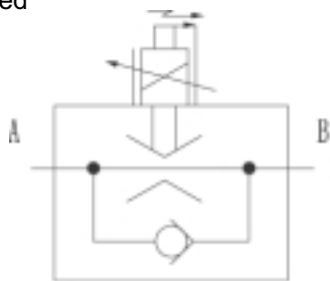
In the case of a loss of power or a cable break at the position transducer the measurement orifice closes. From a 0 % command value a jump free start is possible. Via two ramps within the electrical amplifier it is possible to delay the opening and closing of the measurement orifice.

Via the check valve (6) free flow is possible from B to A.

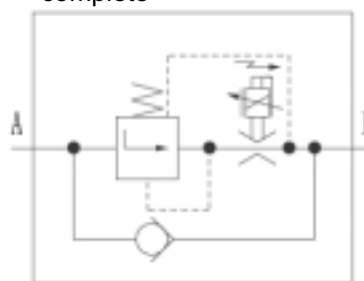


Symbols:

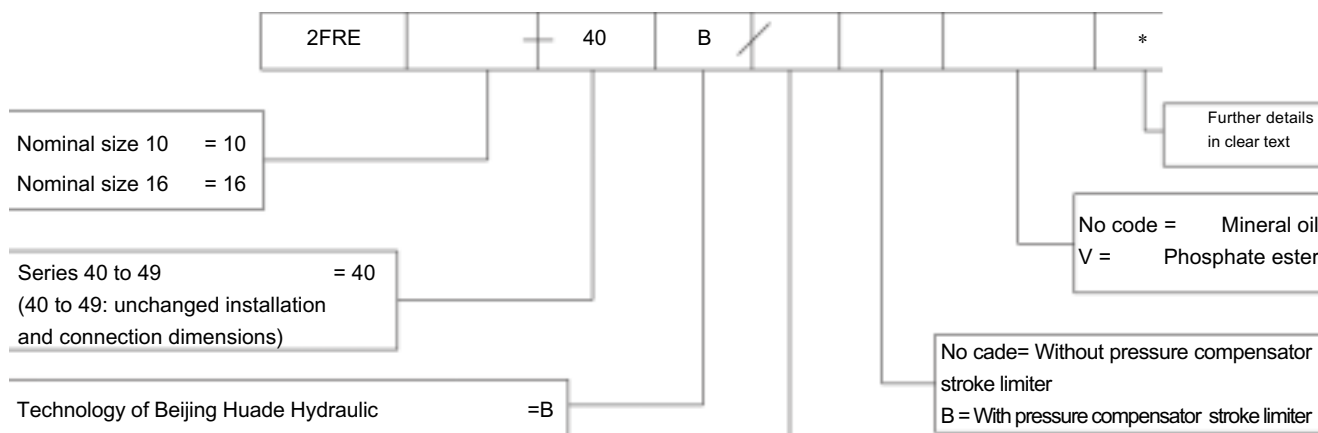
simplified



complete



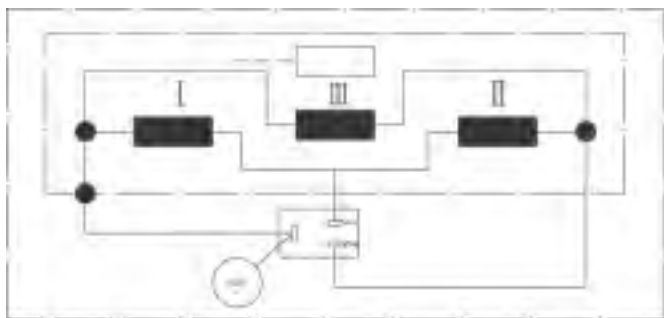
Ordering details



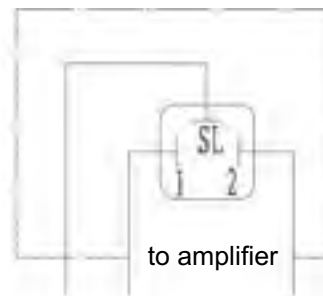
Flow control range A → B			
Nominal size 10		Nominal size 16	
Linear	Increase by degrees	Progressive with fast feed Linear (fine control range)	Linear
up to 5 L/min = 5L up to 10 L/min = 10L up to 16 L/min = 16L up to 25 L/min = 25L up to 50 L/min = 50L up to 60 L/min = 60L	up to 5 L/min=5 Q up to 10L/min=10Q up to 16L/min=16Q up to 25L/min=25Q	up to 2L/min=2QE up to 5L/min=5QE	up to 80 L/min = 80L up to 100 L/min = 100L up to 125 L/min = 125L up to 160 L/min = 160L

Electrical connections ---- Inductive position transducer

Connections on loops



Connections on plug-in connector



Technical data (for applications outside these parameters, please consult us!)

Hydraulic

Operating pressure (MPa)		31.5									
Minimum pressure differential (MPa)		Size 10					Size 16				
		0.3~0.8					0.6~1				
△ p free return flow B → A	Measurement orifice open(MPa)	0.1	0.12	0.15	0.2	0.3	0.35	0.16	0.19	0.24	0.31
	Measurement orifice closed(MPa)	0.17	0.2	0.25	0.3	0.5	0.6	0.3	0.35	0.45	0.6
Flow Q max. (L/min)		5	10	16	25	50	60	80	100	125	160
		40									
Flow Character	Temperature drift Hydraulic + electrical $\Delta Q/^{\circ}\text{C}$ (%)	0.1Q max									
	Pressure compensated up to $\Delta p = 31.5\text{MPa}$ (%)	$\pm 2Q_{\text{max}}$									
Degree of contamination (μM)		≤ 20 (We recommend a filter with a minimum retention rate of 10)									
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)									
Viscosity range (mm^2/s)		2.8 to 380									
Pressure fluid temperature range ($^{\circ}\text{C}$)		-20 to +70									
Hysteresis (%)		$< \pm 1Q_{\text{max}}$									
Repeatability (%)		$< 1Q_{\text{max}}$									
Sample spread (%)		$< \pm 2$									
Installation		optional									
Weight (Kg)		6					8.3				

Electrica

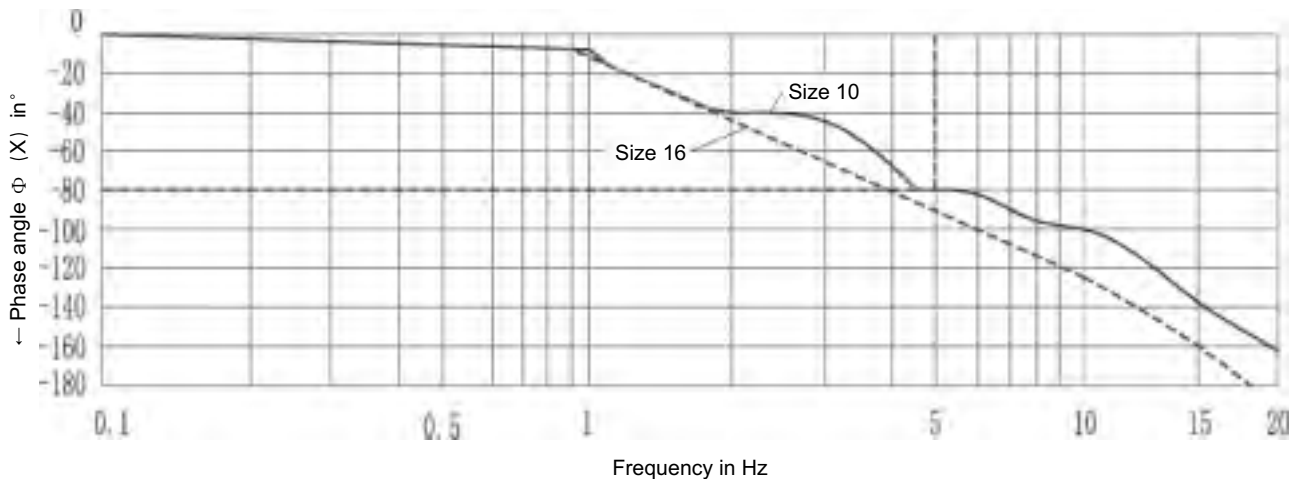
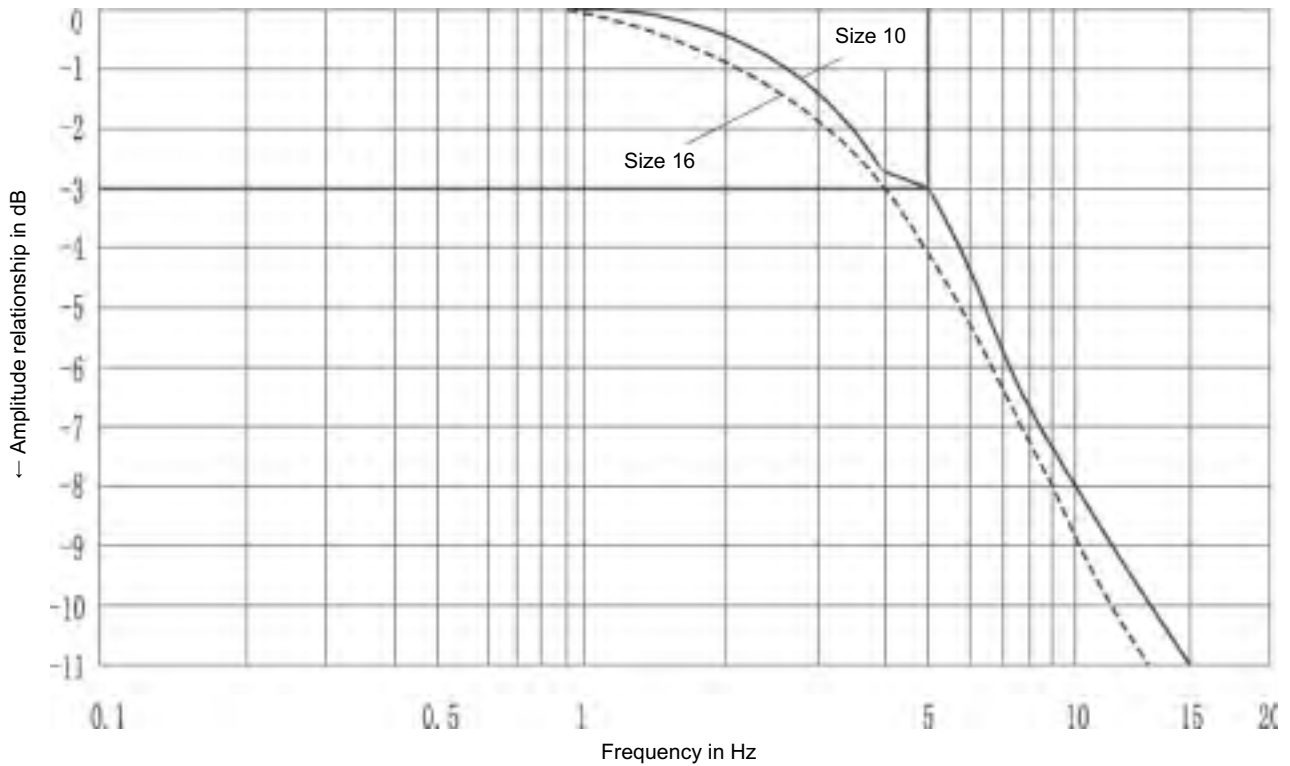
Voltage type	DC 24V
Coil resistatance (Ω)	Cold value at 20°C 10 , Max. warm value 13.9
Operation state	Continuous
Max.fluid temperature ($^{\circ}\text{C}$)	+50
Max. Power (VA)	50
Coil resistance of transducer (Ω)	at 20°C I -56、 II -56、 III -112
Inductivity (mH)	6~8
Oscillator frequency (KHz)	2.5
VT-5010S30 Demand of insulation IP65	IP65
Amplifier (Supplied with valves)	VT-5004 S30
Types of Electrical connections	see page 72

Characteristic curves (measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$; $t=50^\circ\text{C}$)

(measured at $t = 50^\circ\text{C}$; $P_{\text{nom}} = 5 \text{ MPa}$; amplitude 0 ~100 %; NS 10 / 60L ; NS 16 / 160L)

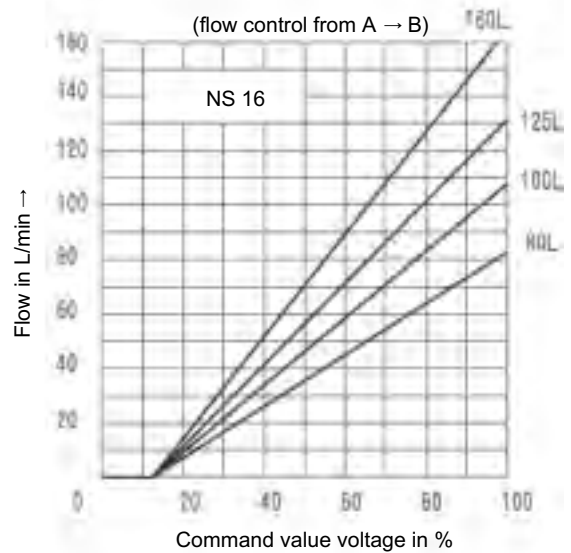
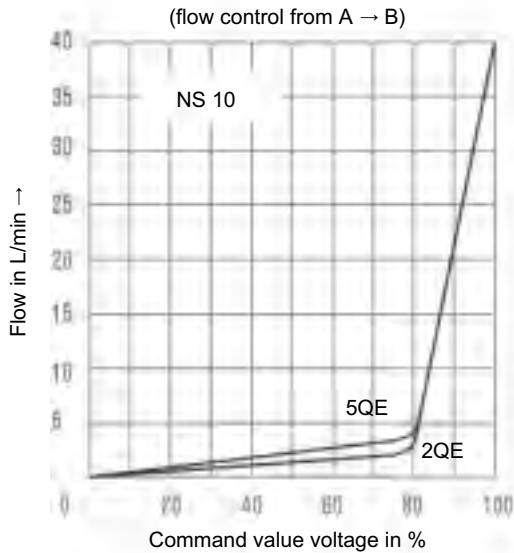
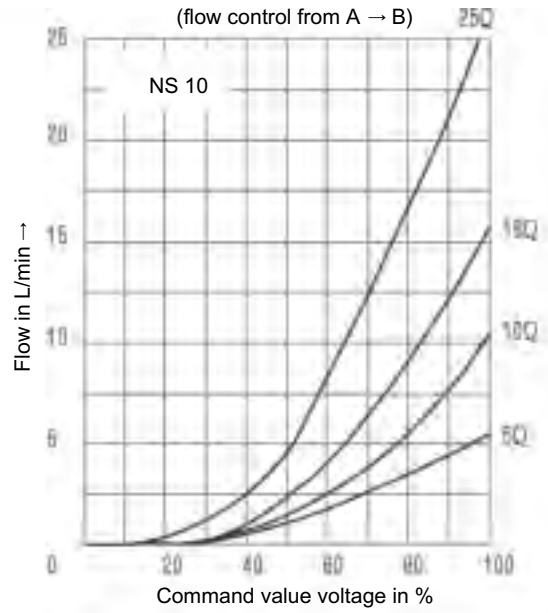
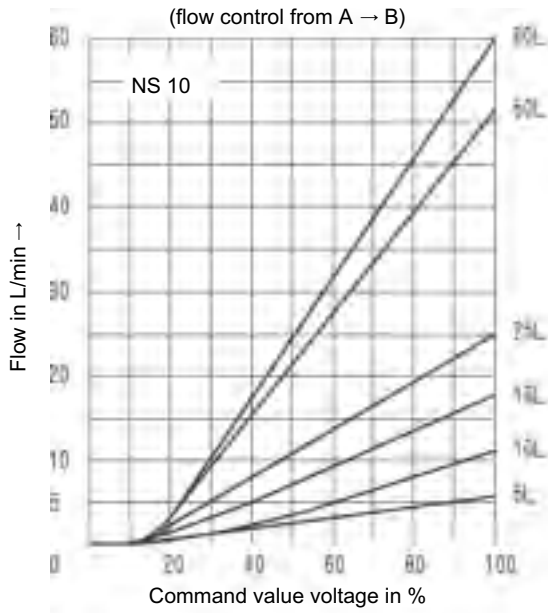
Transient function with a stepped form of command value change

Stroke	Time (from start to 100% amplitude) (ms)		Time (from start to Min. amplitude) (ms)	
	NS 10	NS 16	NS 10	NS 16
%				
0-100	100	110	80	110
10-90	90	100	85	100
25-75	85	95	80	95

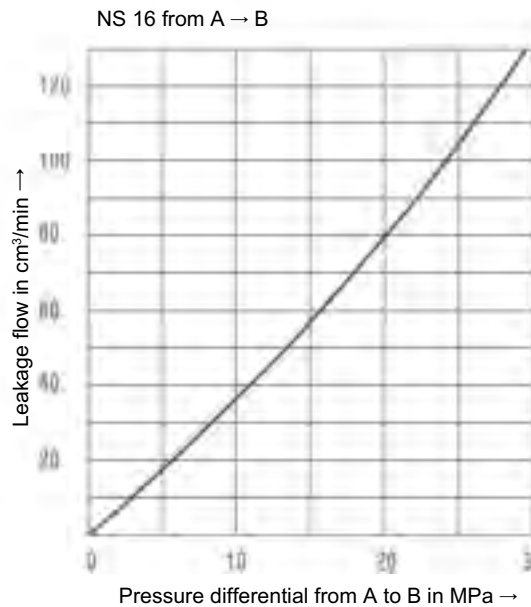
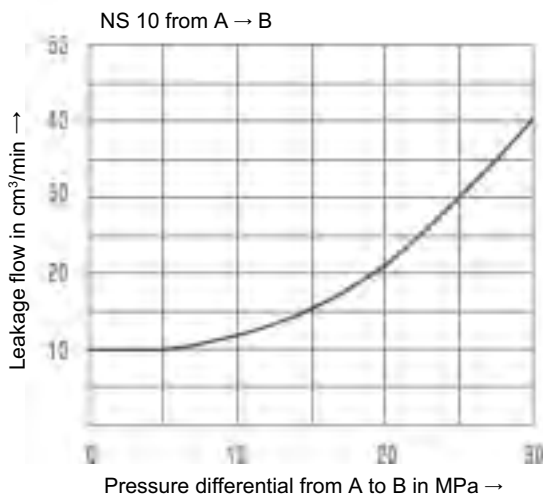


Characteristic curves (measured at $\nu = 36 \times 10^{-6} \text{m}^2/\text{S}$; $t=50^\circ\text{C}$)

Relationship of the flow to the command value voltage (flow control from A → B)



Leakage flow from A → B



Unit dimensions:

(Dimensions in mm)

- 1 Valve housing
- 2 Proportional solenoid with inductive position transducer
- 3 Nameplate
- 4 Pressure compensator stroke limiter
- 5 Port A
- 6 Port B
- 7 O-Ring for ports A, B
18.66 X 3.53(NS 10)
26.58 X 3.53(NS 16)

Subplates :

NS 10: G 279/01 (G 1/2") G 280/01 (G 3/4")

NS 16: G 281/01 (G 1") G 282/01 (G 1 1/4")

See page 90

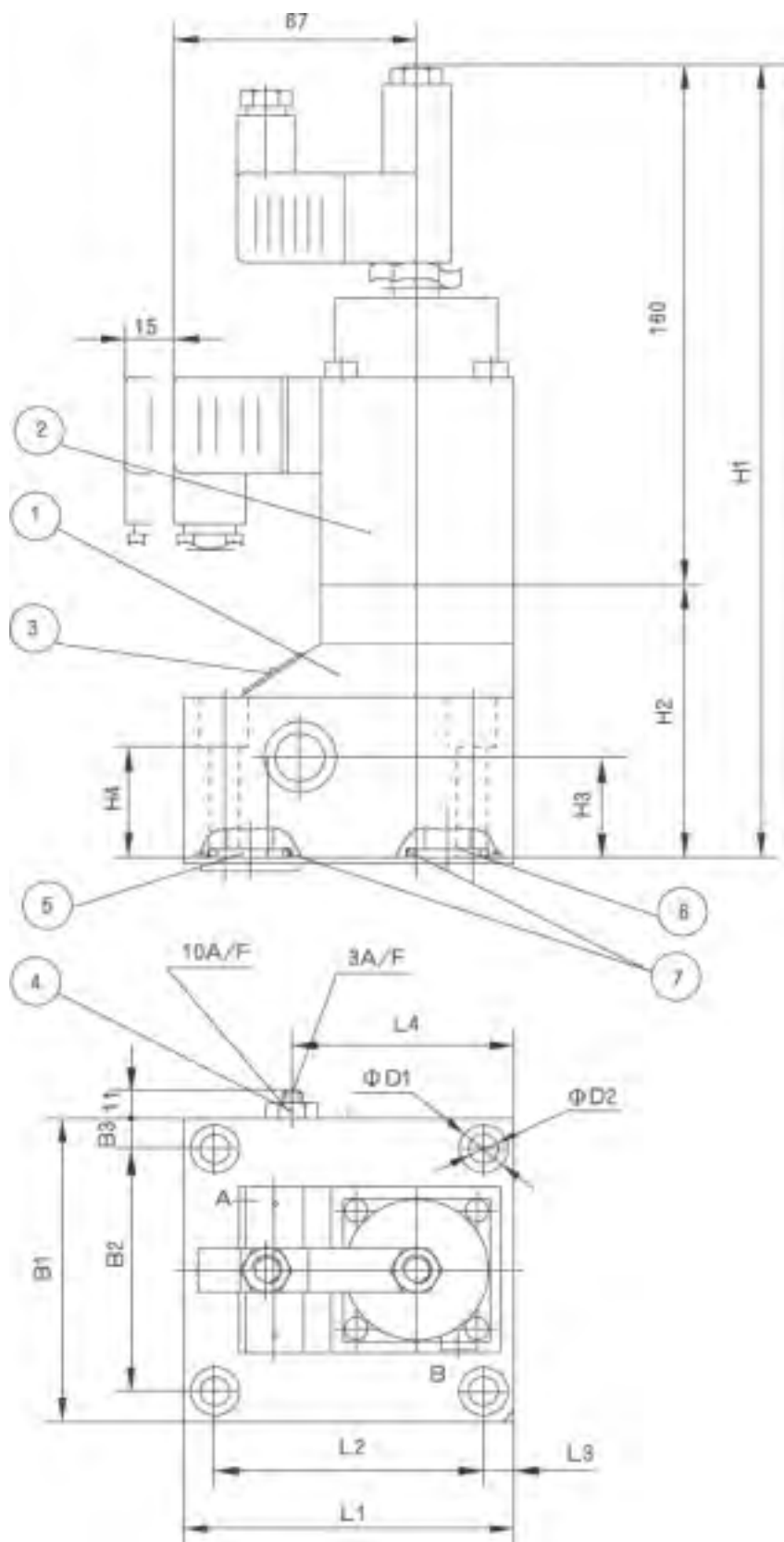
Valve fixing screws

NS 10: 4 -M8 x 60-10.9

(GB/T70.1-2000)

NS 16: 4 -M10 x 70-10.9

(GB/T70.1-2000)



NS	B1	B2	B3	∅D1	∅D2	H1	H2	H3	H4	L1	L2	L3	L4
10	95	76	9.5	15	9	245	85	38	48	102.5	82.5	10	68.5
16	123.5	101.5	11	18	11	255.5	95.5	31	51	123.5	101.5	11	81.5

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Electro-Hydraulic Relief and Flow Control Valves, Type PQ10-20/140-125			RE 24750/06.2004
	Size 10	up to 14 MPa	up to 125 L/min	Replaces:

Features:

- For subplate mounting
- Protected by high voltage
- Output flows scale by input elec-messages
- System Pressure could achieve the changes to scale

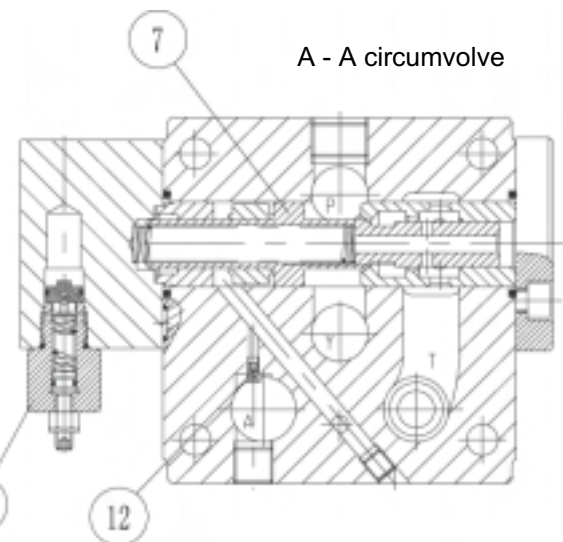
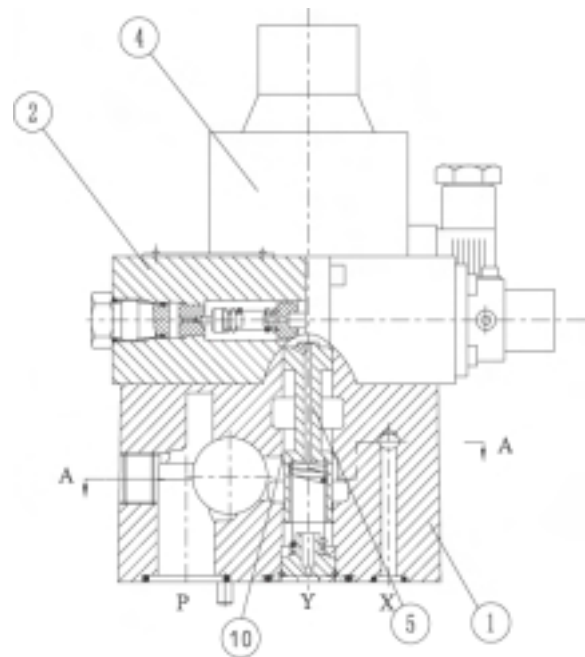


Function, section;Symbol

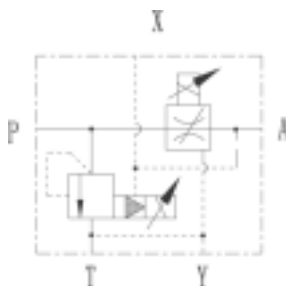
This pressure and flow control valve is an energy-saving valve that can adjust the pressure and flow of system proportional to electrical sign.

Since the valves controls the pump pressure by following the load pressure while keeping the differential pressure minimized, it serves as a low power-consumption energy-saving ,meter-in, controlled flow control valve.

Further, since a temperature compensation function is incorporated, this valve provides consistent flow control without respect to the fluid temperature.



Symbol:



Ordering details

PQ 10 - 20 B / 140 125 *

Proportional Electro-Hydraulic pressure and Flow Control Valves

Nominal size 10 = 10

20 = Series 20 to 29
(20 to 29: unchanged installation and connection dimensions)

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code = NBR seals
V = FPM seals

125 = Max. Flow 125 L/min

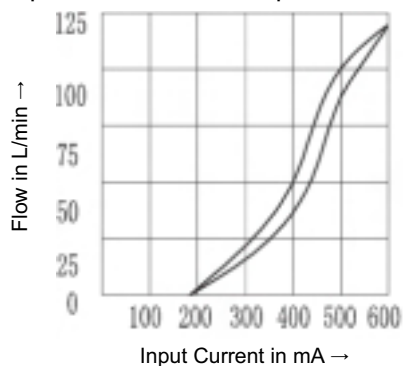
140 = Pressure stage 140

Technical data (for applications outside these parameters, please consult us!)

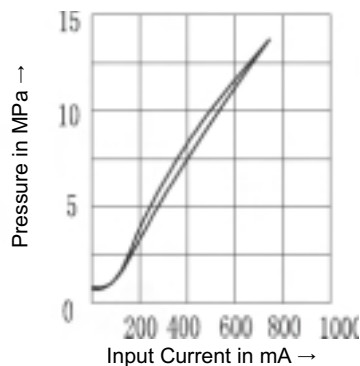
Pressure fluid	Mineral oil(for NBR seal), Phosphate ester (for FPM seal)	
Pressure fluid temperature range (°C)	- 30 to + 80 (with NBR seals) - 20 to + 80 (with FKM seals)	
Viscosity range (mm ² /s)	2.8 to 500	
Degree of contamination	Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.	
Max. operating pressure (MPa)	to 14	
Max. flow (L/min)	to 125	
Pressure fluid flow range (L/min)	1 ~ 125	
Flow Controls	Rated Current (L/min)	680
	Coil Resistance (Ω)	43.5
	Differential Pressure (MPa)	0.6
	Hysteresis	7%
	Repeatably	1%
Pressure Controls	Pressure Adjust Range (MPa)	0.8 ~ 14
	Rated Current	710
	Coil Resistance (Ω)	10
	Hysteresis	3%
	Repeatably	1%
Weight (Kg)	16	

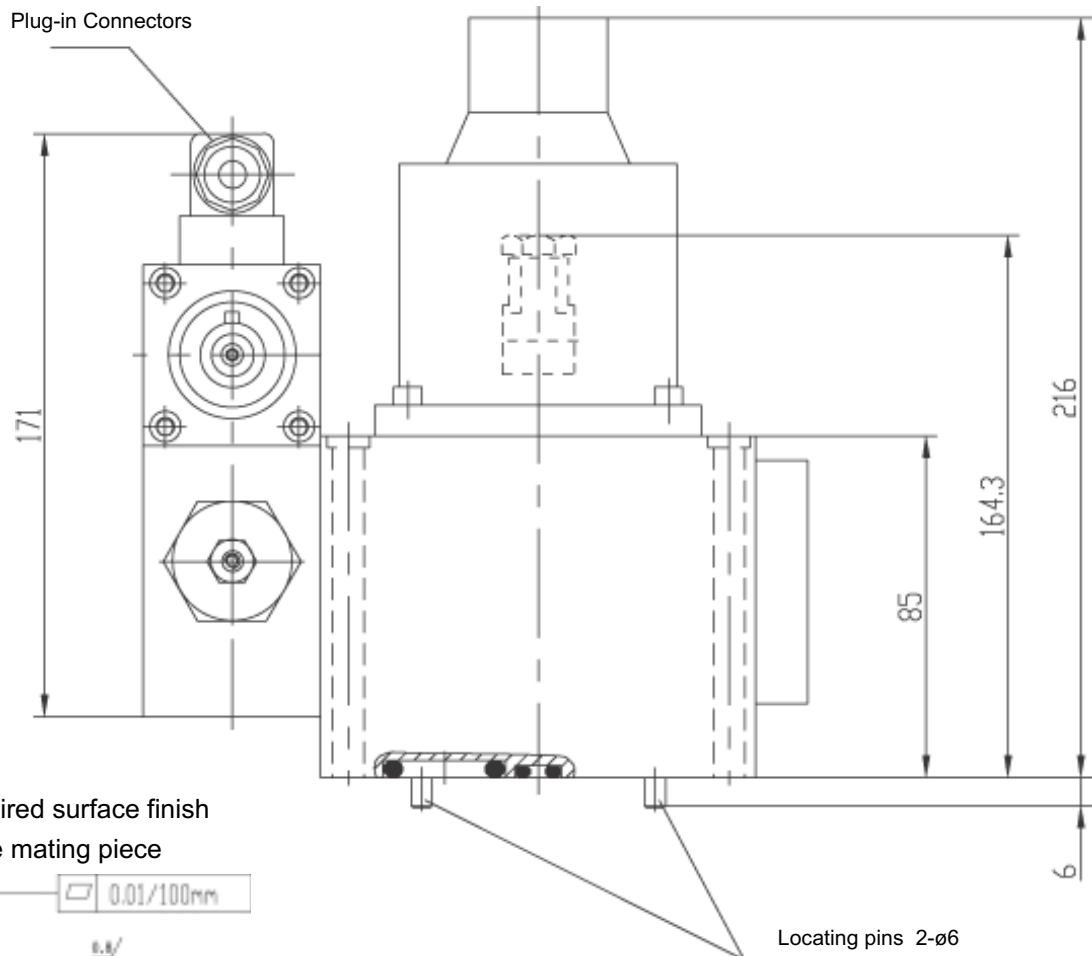
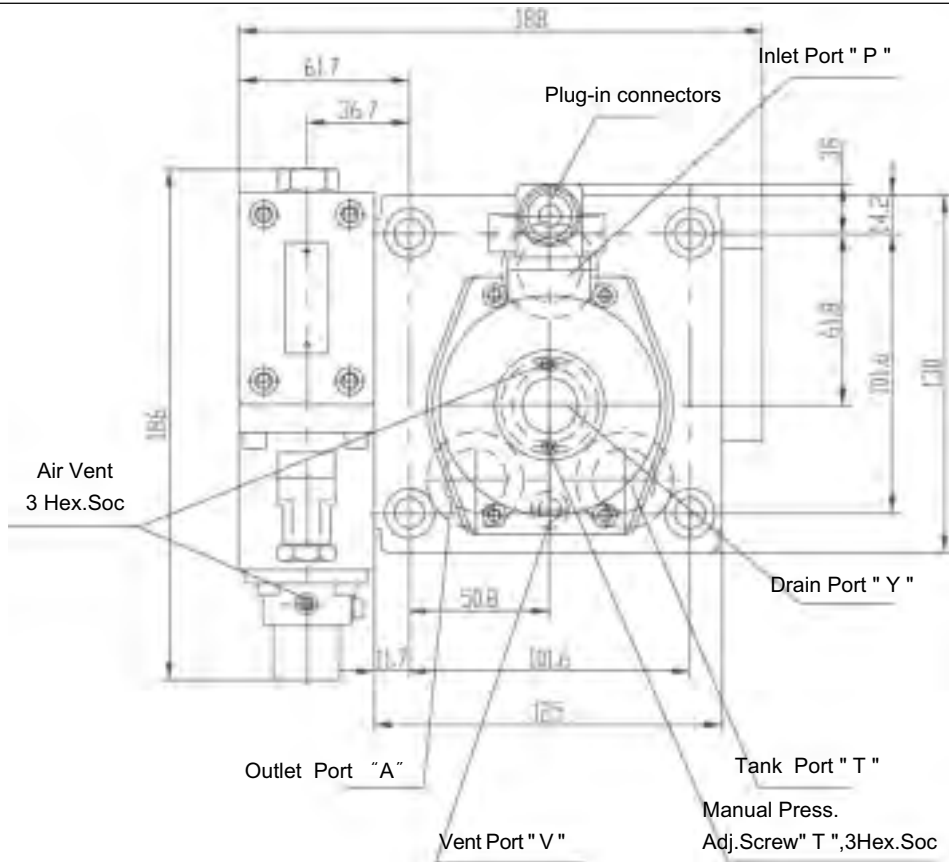
Operating Curves (measured at $v = 41 \times 10^{-6} \text{m}^2/\text{S}$ $t = 50^\circ \text{C}$)

Relationship of the flow to the input current



Relationship of the pressure to the input current





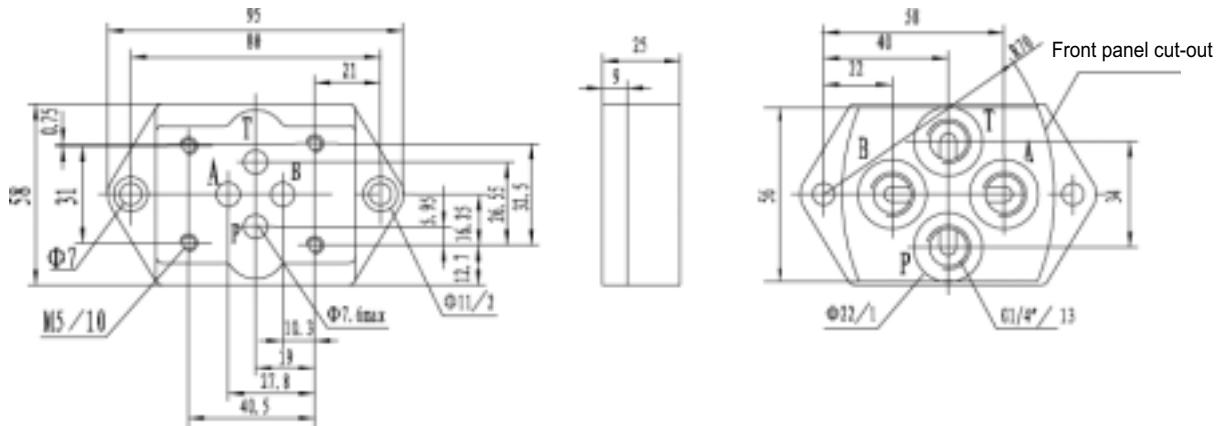
Required surface finish of the mating piece



Subplates

G341/01 (G1/4") G341/02 (M14x1.5) Weight ≈ 0.6kg

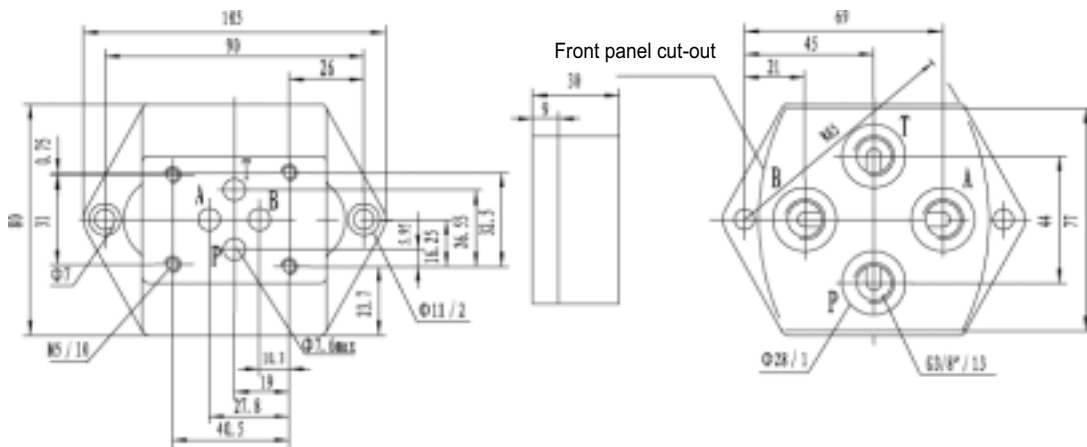
(Dimensions in mm)



$M_A = 9 \text{ Nm}$

G342/01 (G3/8") G342/02 (M18x1.5) Weight ≈ 1.1kg

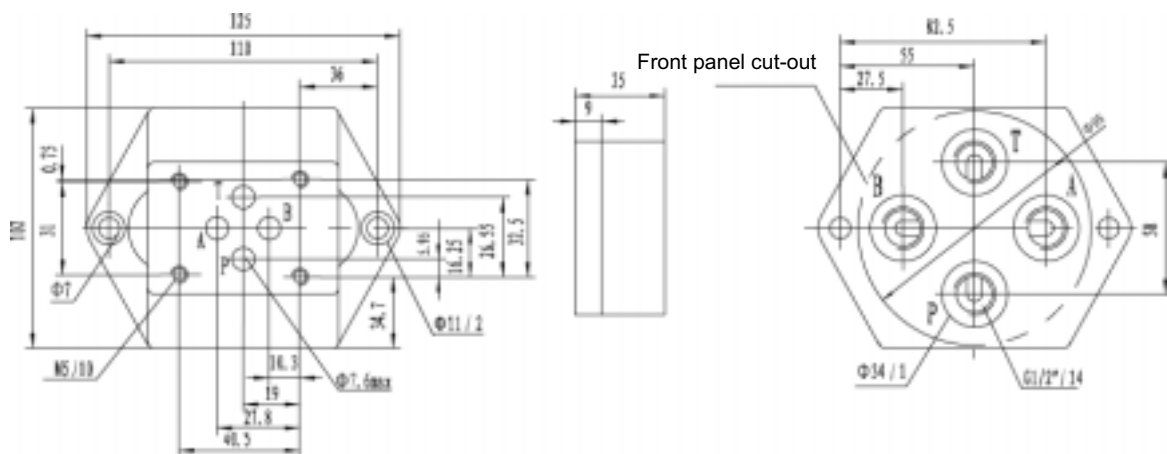
(Dimensions in mm)



$M_A = 9 \text{ Nm}$

G502/01 (G1/2") G502/02 (M22x1.5) Weight ≈ 1.9kg

(Dimensions in mm)

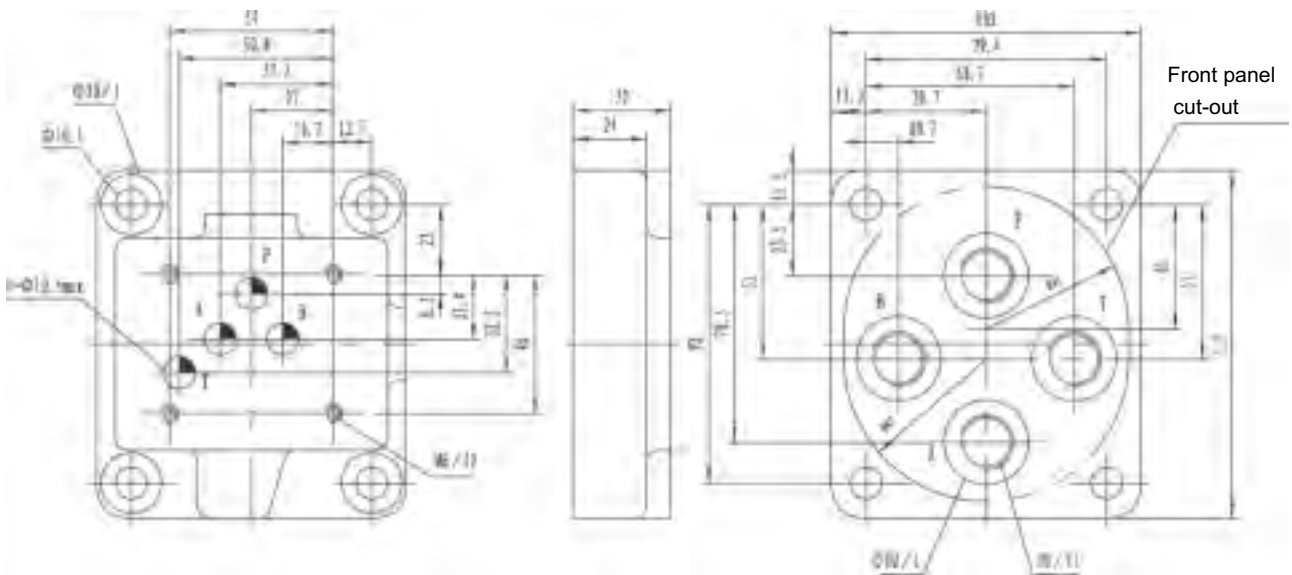


$M_A = 9 \text{ Nm}$

Subplates

G66/01 G66/02 G67/01 G67/02

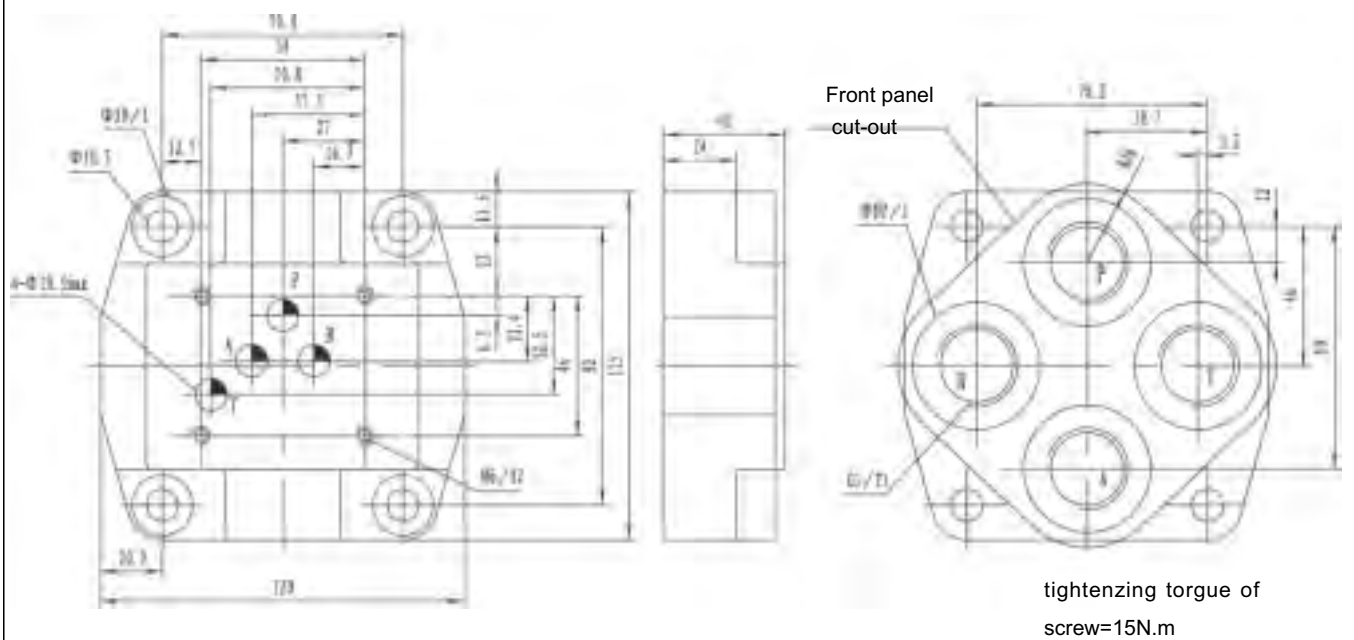
(Dimensions in mm)



Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G66/01	G3/8"	12	28	approx.	4 - M6 × 50 -10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G66/02	M18x1.5					
G67/01	G1/2"	14	34			
G67/02	M22x1.5					

G534/01 G534/02

(Dimensions in mm)

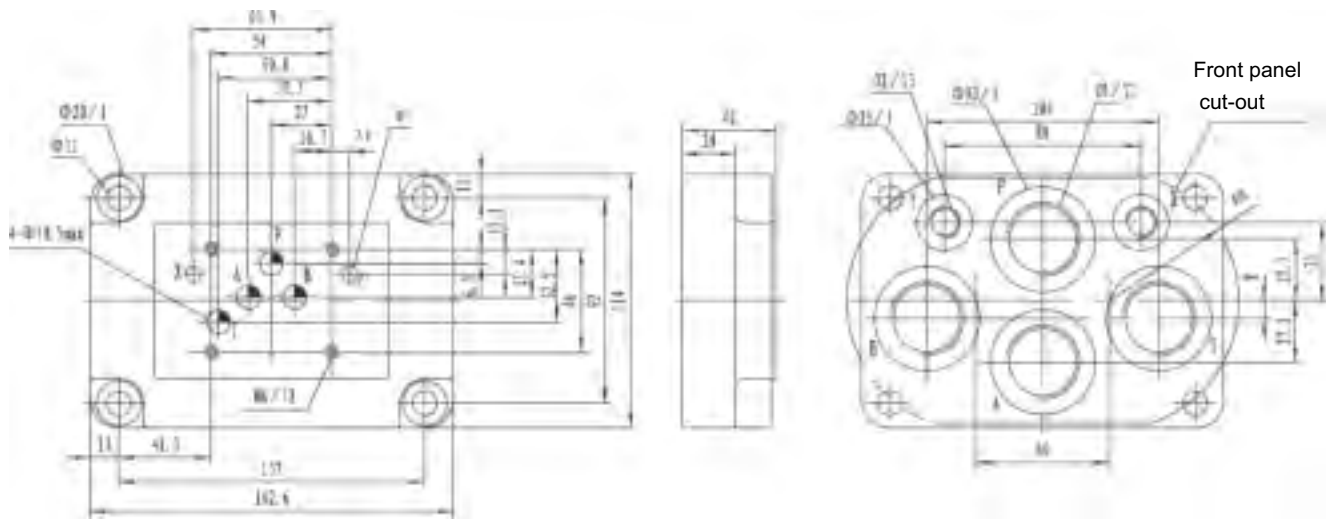


Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G534/01	G3/4"	17	42	approx. 2.5Kg	4 - M6 × 50-10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G534/02	M27x2					

Subplates

G535/01 G535/02 G536/01 G536/02

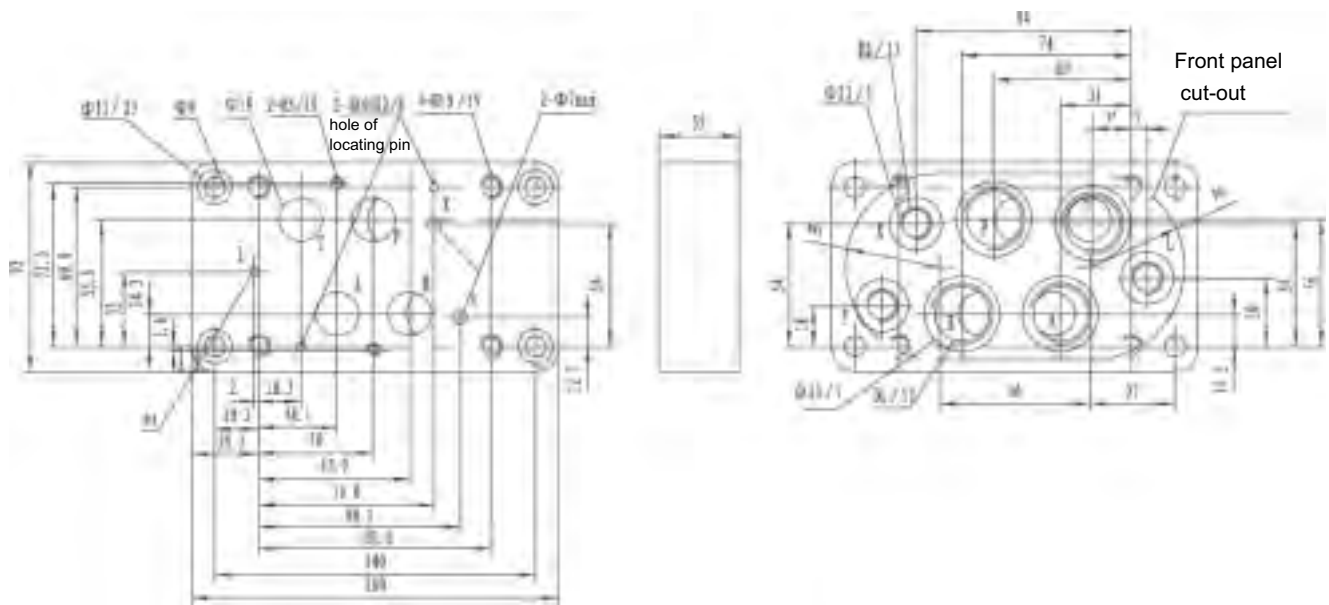
(Dimensions in mm)



Type	D1	T1	D2	φ D3	Weight	Valve fixing screws	Tightening torque for screws
G535/01	G3/4"	16	G1/4"	42	approx. 3.6Kg	4 - M6 × 45 -10.9 (GB/T70.1-2000) Should be ordered separately.	15N.m
G535/02	M27x2		M14x1.5				
G536/01	G1"	18	G1/4"				
G536/02	M33x2		M14x1.5				

G172/01 G172/02

(Dimensions in mm)

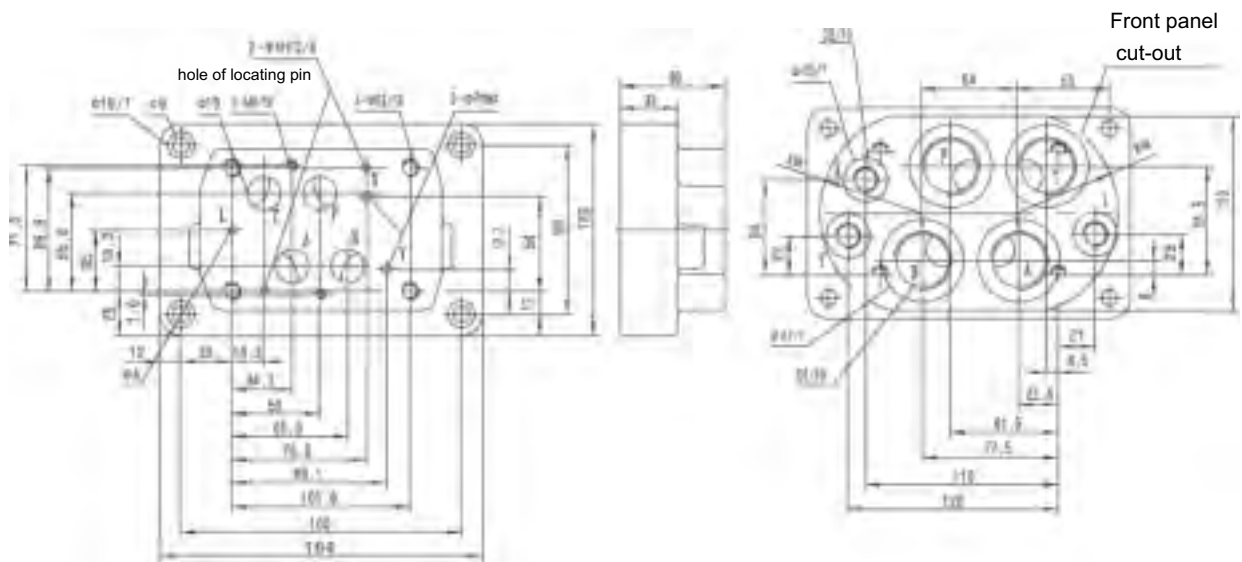


Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G172/01	G3/4"	G1/4"	approx.	4 - M10 × 60 -10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
G172/02	M27x2	M14x1.5	2.8kg	2 - M6 × 60 --10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

Subplates

G174/01 G174/02

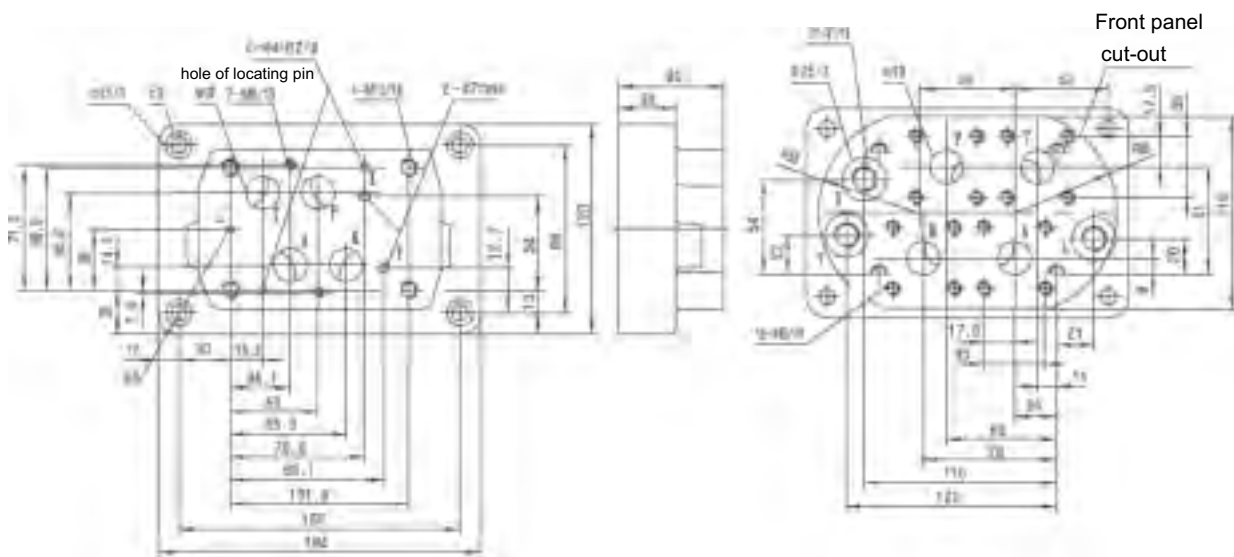
(Dimensions in mm)



Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G174/01	G1"	G1/4"	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
G174/02	M33x2	M14x1.5	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

G174/08

(Dimensions in mm)

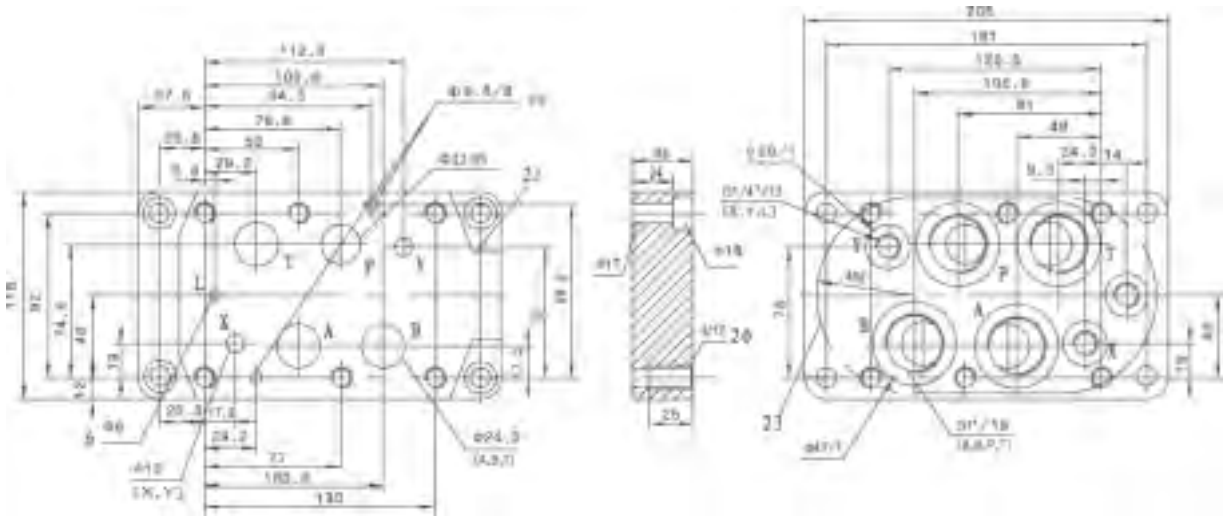


Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G174/08	25MPa	009 271	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	62N.m
	40MPa	009 272	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000), Should be ordered separately.	12.5N.m

Subplates

G151/01(G1")G151/02(M33x2):G153/01(G1") G153/02(M33x2)

(Dimensions in mm)

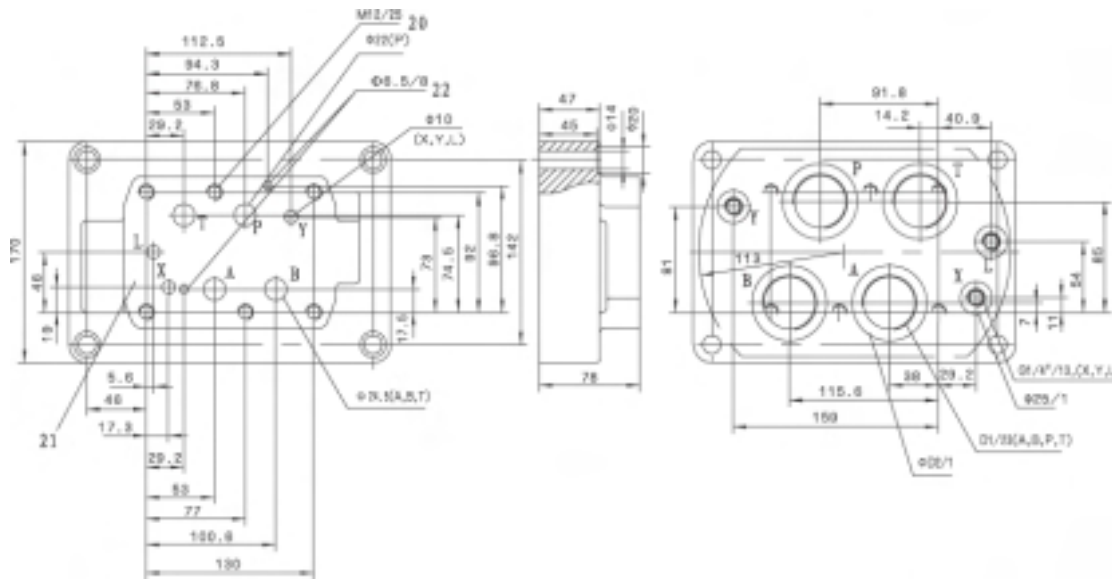


L of ϕ 8 only used on G153/01

Size	Type	Weight	Valve fixing screws	Tightening torque for screws	1) Only used on valves which are pressure-centred
NG25	G151/01	5kg	6 - M12x60-10.9 (GB/T70.1-2000),	105Nm	
	G151/02				
	G153/01				
	G153/02				

G154/01(G1 1/4");G154/02(M42x2):G156/01 G156/02(M48x2)

(Dimensions in mm)



L only used on valves which are pressure-centred

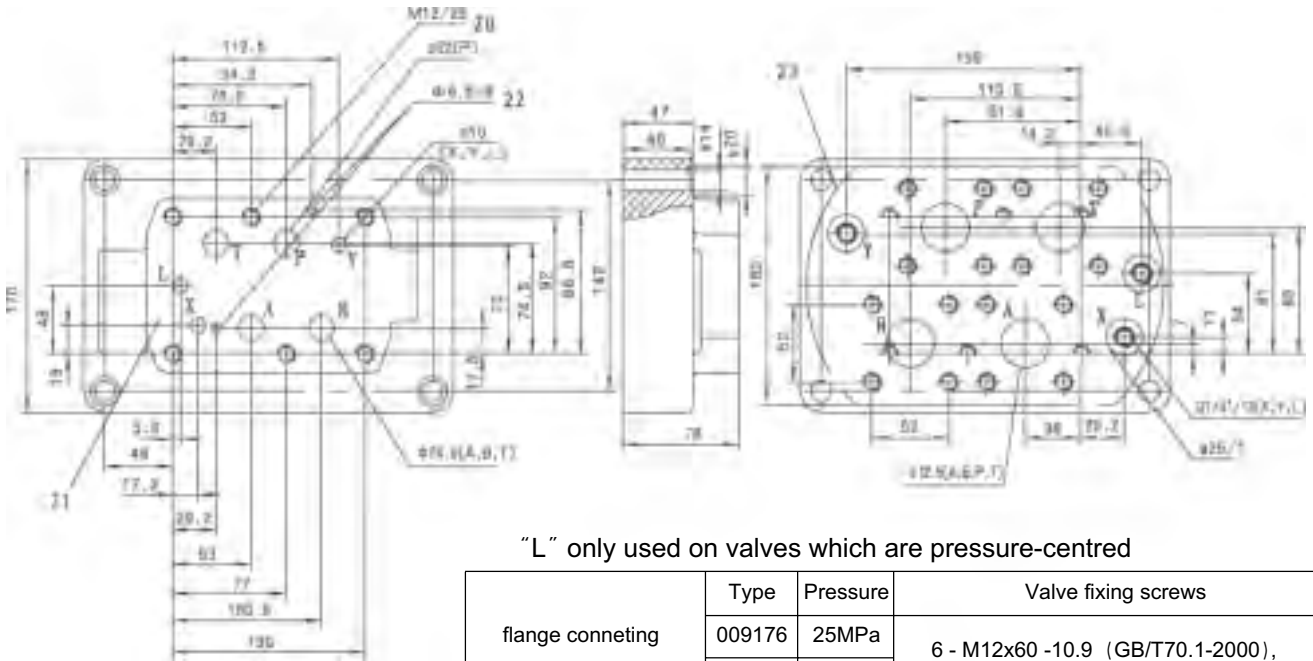
Size	Type	Weight	D1	D2	Valve fixing screws	Tightening torque for screws
NG25	G154/01	5kg	G1 1/4"	58	6 - M12x60 -10.9 (GB/T70.1-2000)	105Nm
	G154/02		M42x2			
	G156/01		G1 1/2"	65		
	G156/02		M48x2			

20 Valve fixing screws 21 mating piece of valve 22 locating pin 23 Front panel cut-out

Subplates

G154/08 flange connection

(Dimensions in mm)

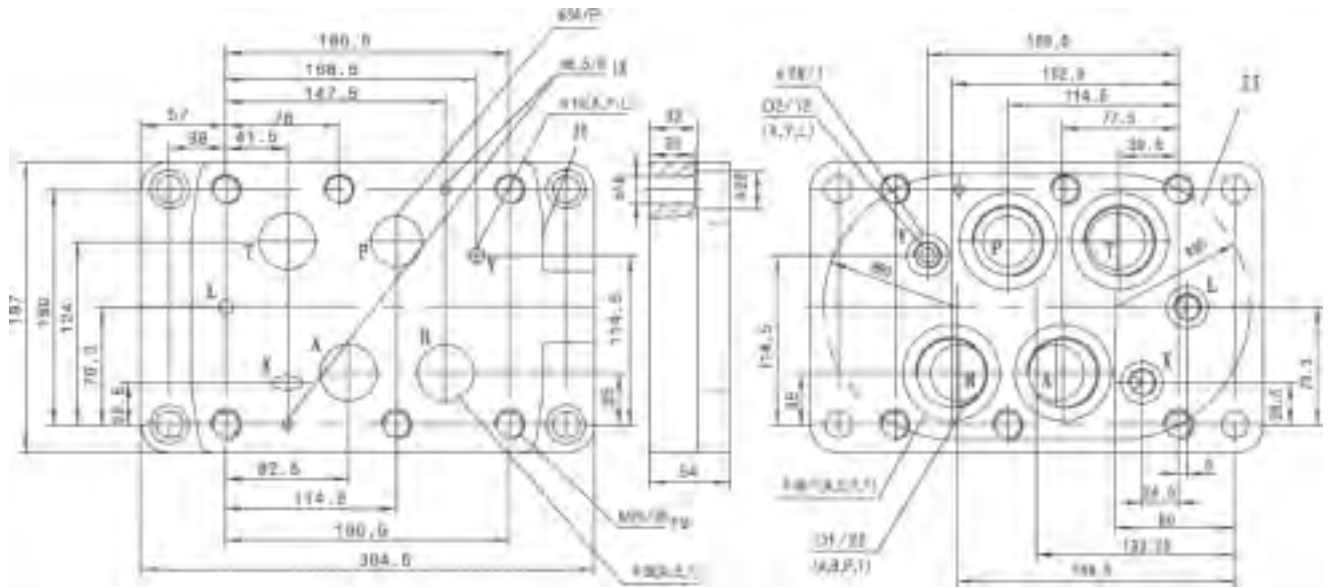


"L" only used on valves which are pressure-centred

20 Valve fixing screws 21 mating piece of valve 22 locating pin 23 Front panel cut-out

G157/01(G1 1/2");G157/02(M48 × 2)

(Dimensions in mm)



"L" only used on valves which are pressure-centred

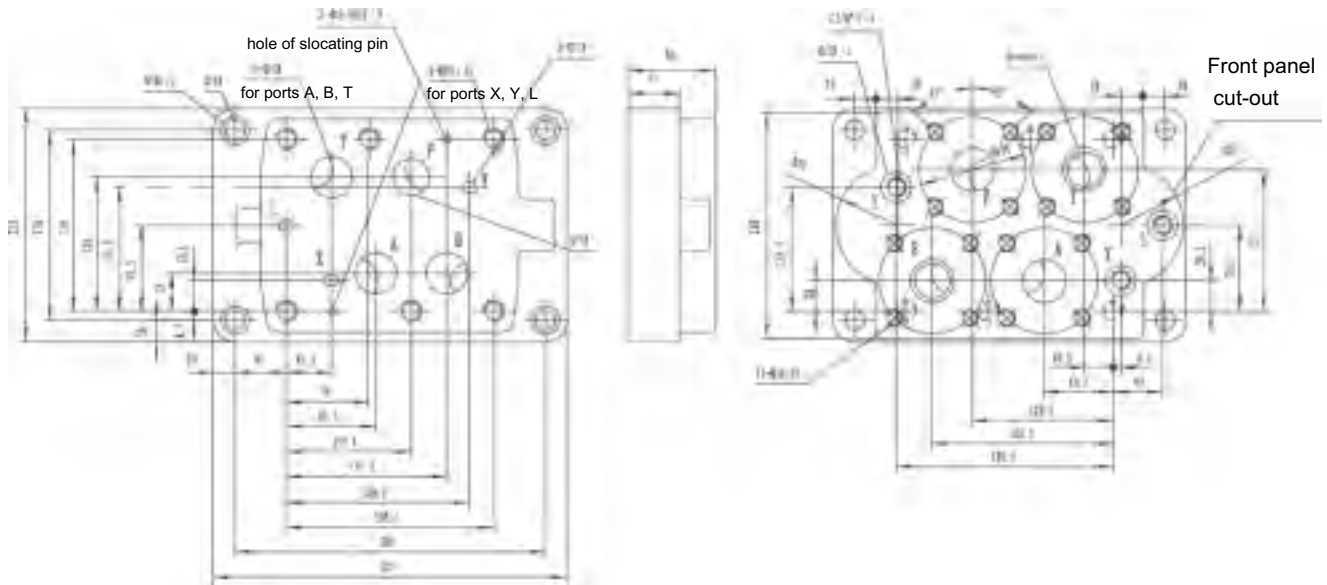
Type	Weight	D1	D2	Valve fixing screws	Tightening torque for screws
G157/01	18kg	G1 1/2"	G3/2"	6 - M12x60-10.9 (GB/T70.1-2000)	105Nm
G157/02		M48x2	M18x1.5		

18 locating pin 19 Valve fixing screws 20 mating piece of valve 21 Front panel cut-out

Subplates

G158/10 flange connection

(Dimensions in mm)



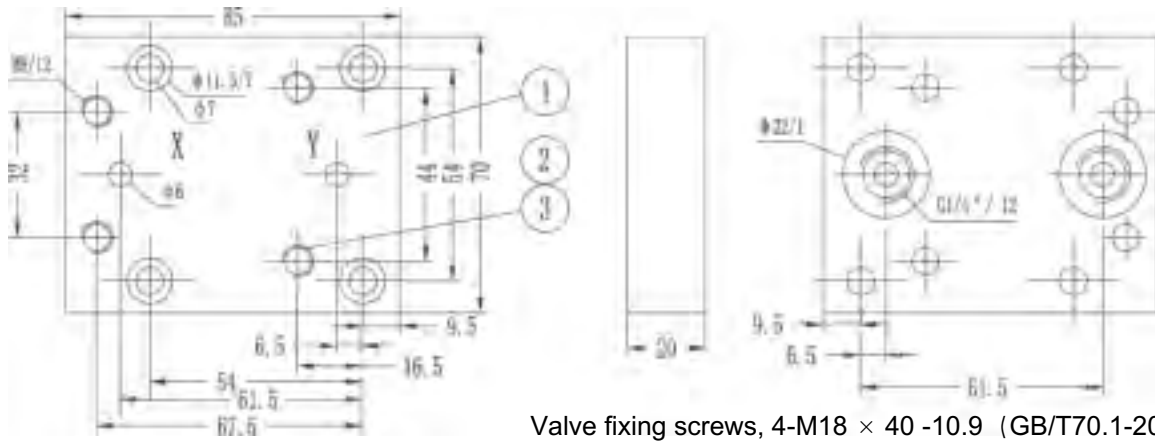
"L" only used on valves which are pressure-centred

Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G158/10	165MPa	303 901	approx. 30.5kg	6 - M20 × 80 -10.9 (GB/T70.1-2000), Should be ordered seperately.	580N.m
	to 25MPa	303 902			
	to 40MPa	303 903			

Subplates

G51/01 (G1/4 ") G51/02 (M14 × 1.5) Weight: 1kg

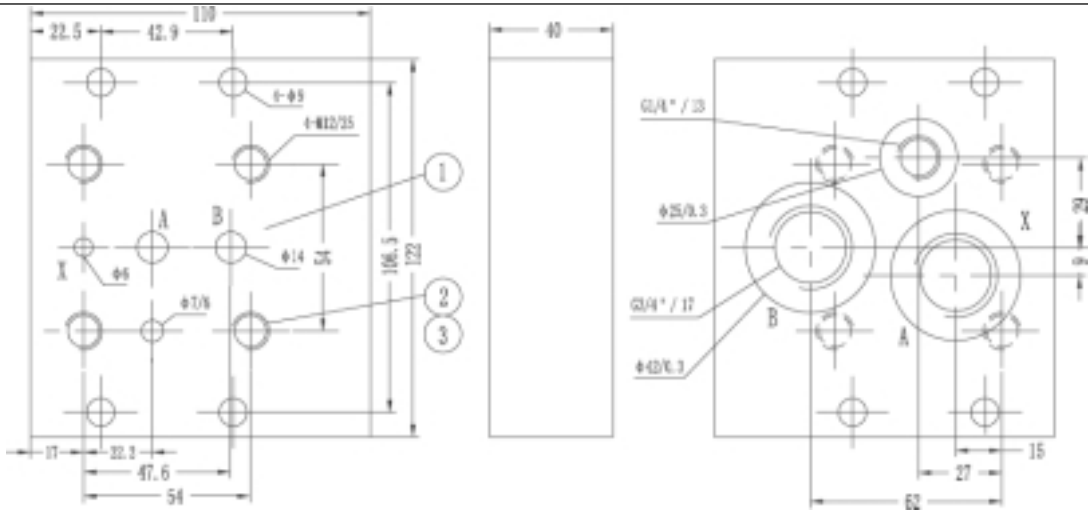
(Dimensions in mm)



Valve fixing screws, 4-M18 × 40 -10.9 (GB/T70.1-2000)

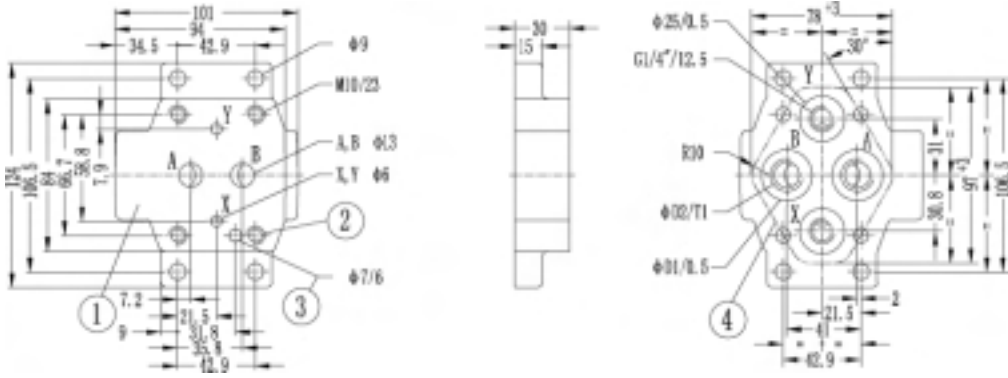
G565/01 (G3/4 ") G565/02 (M27 × 2) Weight: 1kg

(Dimensions in mm)

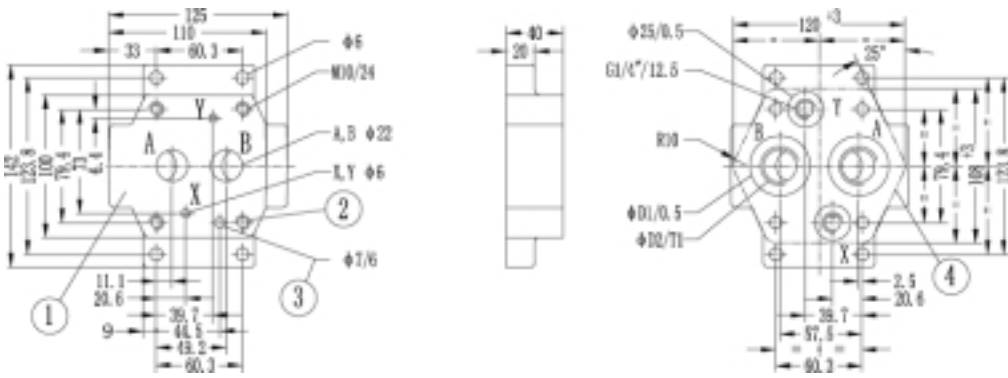


Valve fixing screws, 4-M12 × 50-10.9(GB/T70.1-2000)

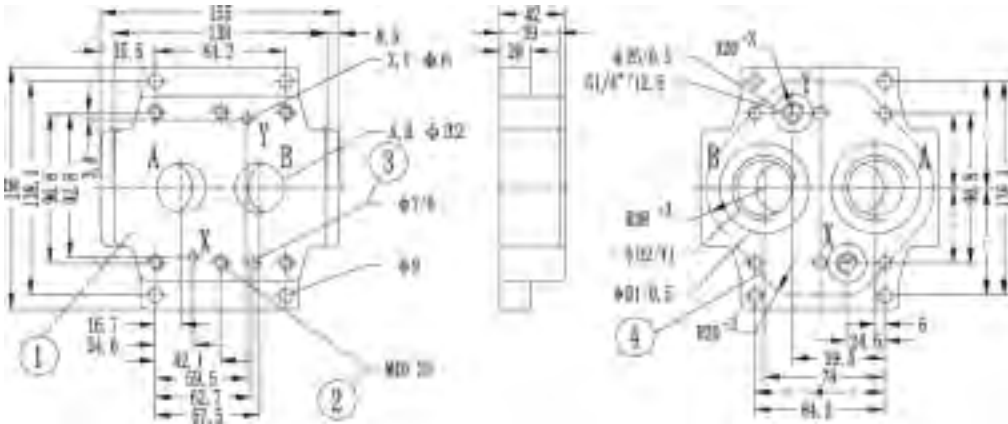
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG10	G460/01	28	G3/8"	13	4 - M10 × 40 -10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02		M18 × 1.5				
	G461/01	34	G1/2"	16			
	G461/02		M22 × 1.5				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG25	G412/01	42	G3/4"	17	4 - M10 × 50 -10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02		M27 × 2				
	G413/01	47	G1"	20			
	G413/02		M33 × 2				



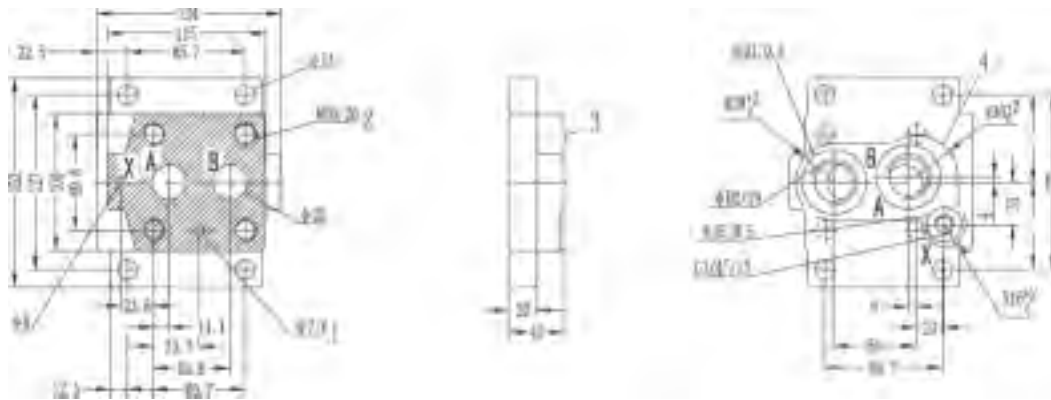
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG32	G414/01	56	G1 1/4"	20.5	6 - M10 × 60 -10.9 (GB/T70.1-2000)	69Nm	5kg
	G414/02		M42 × 2				
	G415/01	61	G1 1/2"	22.5			
	G415/02		M48 × 2				

1 mating piece of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

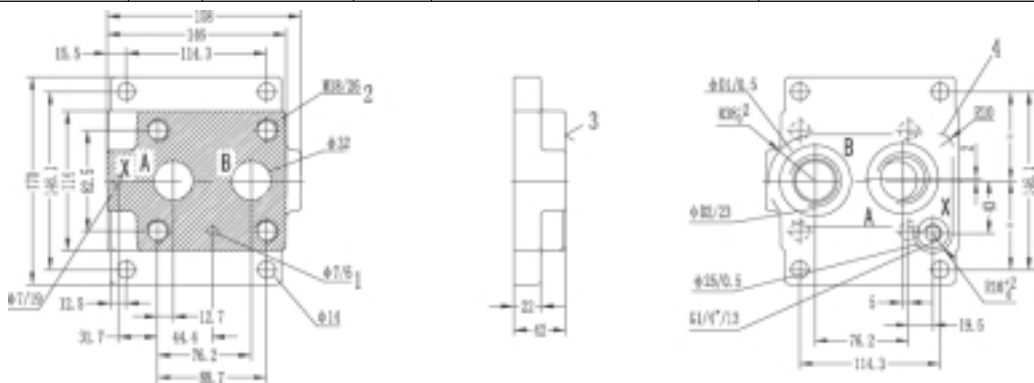
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC10	G545/01	28	G3/8"	13	4-M12 × 50 -10.9 (GB/T70.1-2000)	120Nm	1.5kg
	G545/02		M18 × 1.5				
	G546/01	34	G1/2"	16			
	G546/02		M22 × 1.5				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC25	G408/01	42	G3/4"	17	4-M16 × 50 -10.9 (GB/T70.1-2000)	295Nm	3.0kg
	G408/02		M27 × 2				
	G409/01	47	G1"	20			
	G409/02		M33 × 2				

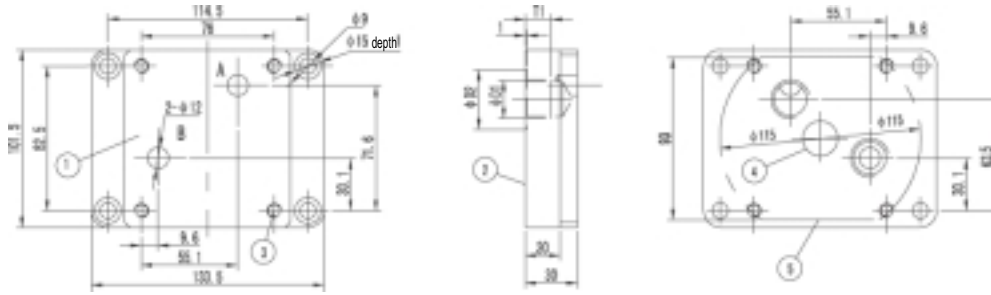


Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC32	G410/01	58	G1 1/4"	20.5	4-M18 × 50 -10.9 (GB/T70.1-2000)	405Nm	5.0kg
	G410/02		M42 × 2				
	G411/01	65	G1 1/2"	22.5			
	G411/02		M48 × 2				

1 mating piee of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

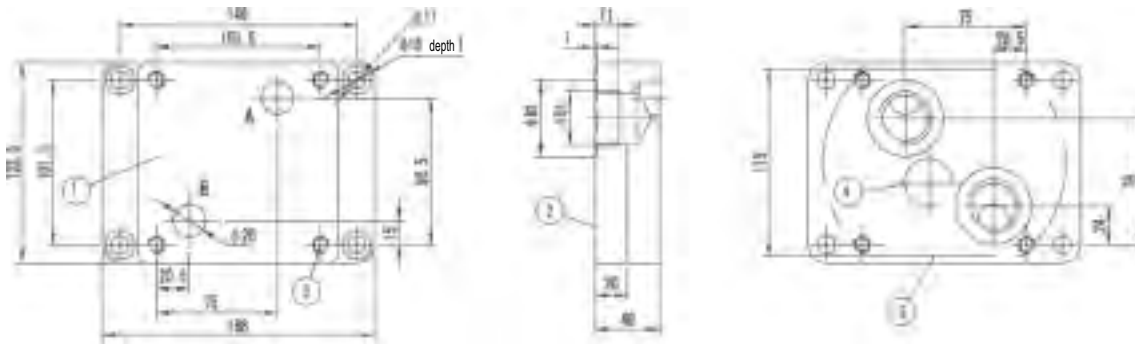
Subplates

G279/01(G1/2) G279/02(M22 × 1.5) G280/01 (G3/4) G280/02(M27 × 2) (Dimensions in mm)



Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC10	G279/01	2.3kg	G1/2"	34	15	17	4-M8 × 50 -10.9 (GB/T70.1-2000)	37N.m
	G279/02		M22 × 1.5					
	G280/01		G3/4"	42	17	20		
	G280/02		M27 × 1.5					

G281/01(G1/2) G281/02(M23 × 2) G282/01(G1/4) G282/02(M42 × 1.5) (Dimensions in mm)



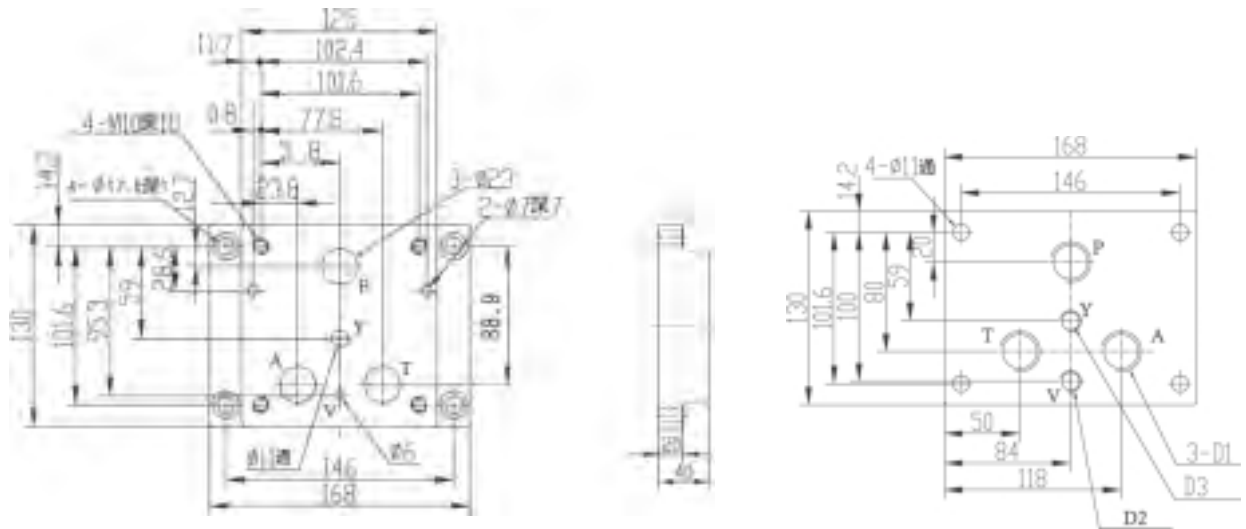
Size	Type	Weight	D1	D2	T1		Valve fixing screws	Tightening torque
NC16	G281/01	4kg	G1"	47	19		4-M10 × 80 -10.9 (GB/T70.1-2000)	75N.m
	G281/02		M33 × 2					
	G282/01		G1 1/4"	56	21			
	G282/02		M42 × 1.5					

1, mating piece of valve 2, underside 3, Valve fixing screws 4, φ 20 for size 10 φ 30 for size 16 keep free from drillings used for orifice support 5, Valve panel cut-out

Subplates

If have special request for dimensions of ports, please consult us when ordering!

G701/01(G3/4") G701/02(M27 × 2) G702/01 (G1") G702/02(M33 × 2) (Dimensions in mm)



Type	D1	D2	D3	Weight
G701/01	G3/4"	G1/4"	G1/4"	6Kg
G701/02	M27 × 2	M14 × 1.5	M14 × 1.5	
G702/01	G1"	G1/4"	G1/4"	
G702/02	M33 × 2	M14 × 1.5	M14 × 1.5	

Hydraulic Valves

Catalogue

2-way Cartridge Valves

Directional Valves

Pressure Valves

Flow Control Accessores

Proportional Valves



CONTENTS

2-way Cartridge Valves Directional Function

No.	Name	Type	Size	Pressure max.(MPa)	Page
1	2-way cartridge valves directional function	LC LFA	16,25,32 40,50,63 80,100,125 160	42	1

2-way Cartridge Valves Pressure Function

No.	Name	Type	Size	Pressure max.(MPa)	Page	
1	2-way cartridge valves-pressure function	LC...DB LFA...DB	16,25,32 40,50,63 80,100,125 160	42	29	
2	Control cover for pressure reducing function	Normally open	LC...DB LFA...DB	16,25,32 40,50,63	35	69
		Normally closed	LC...DB LFA...DR		75	
3	General information regarding control cover for pressure sequencing function	LC...DB	16,25,32 LFA...DZ	35 40,50	85	

“*”: New products, for ordering, please consult us, telephone:+86-10-69083290



Other Huade Hydraulics Catalogues for Valves

- Directional Valves
- Pressure Valves
- Flow Valves
- Proportional Valves

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.LTD.	2-way cartridge valves directional function Cartridge valves type LC... Control covers type LFA...			RE 81010/12.99
	Size 16 to 160	up to 42MPa	up to 25000L/min	Replaces:

Features:

- Valve poppet with or without damping nose
- 2 area ratios
- 4 different springs
- 2 stroke limiters
- Control cover with built-in poppet valve
- Control cover with built-in shuttle valve
- Control cover for mounting directional spool valves with or without built-in shuttle valve
- Control cover for mounting directional poppet valves with or without built-in shuttle valve



Function, section, symbol

2-way cartridge valves are designed as inserts for compact manifold control blocks. The main component with ports A and B fits into an installation cavity with dimensions to DIN 24342 and is built into the control block and sealed with a cover. In most cases, the cover also acts as a connection between the control side of the main component and the pilot valves. By controlling the main valve with suitable pilot valves, the main component can assume pressure, directional or throttling functions, or a combination of these. Particularly economic designs can be achieved by matching the valve sizes to the varying flows required by the individual paths of an actuator. When the element on the main valve is able to assume more than one function, a particularly economic design can be achieved.

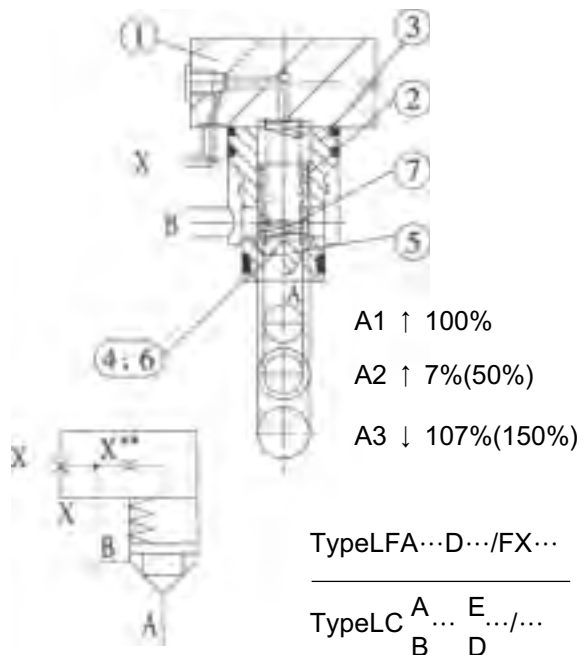
Directional function

2-way cartridge valves basically comprise of control cover (1) and cartridge element (2). The control cover contains the control drillings, and depending on the function required optionally a stroke limiter, a hydraulically controlled directional poppet valve or a shuttle valve. In addition, directional spool valves or directional poppet valves may be mounted onto the control cover. The cartridge element basically comprises of a bush (3), a ring (only up to NS32), optionally with damping nose (5), or without damping nose (6), and closing spring (7).

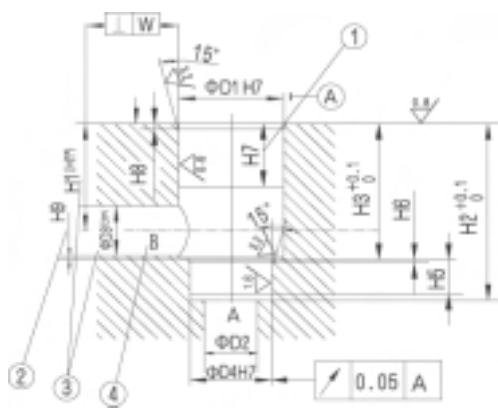
Basically the following applies:

Areas A1 and A2 operate to open the valve. Area A3 and the spring operates to close the valve. The effective direction of the resultant force (of opening and closing forces) determines the switched position of the 2-way cartridge valve.

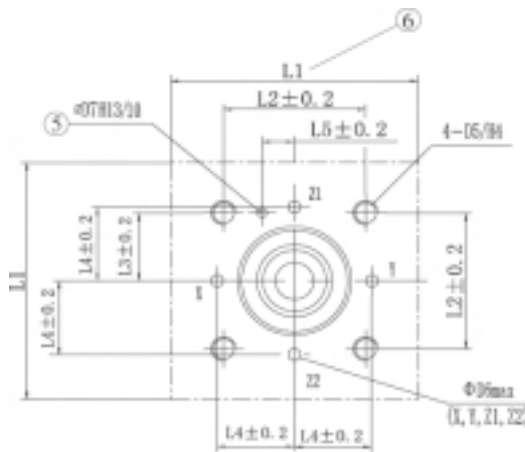
2-way cartridge valves may have flow passed from A to B or from B to A. When area A3 is pressurised by obtaining pilot oil from port B or by an external pilot oil supply, port A is closed, leak-free.



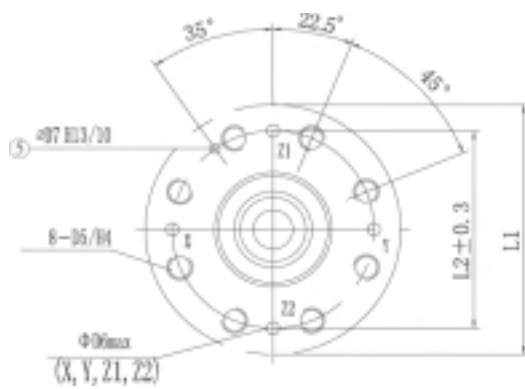
Installation cavity and porting pattern to DIN 24342 (with the exception of N6 125 and 160) (Dimensions in mm)



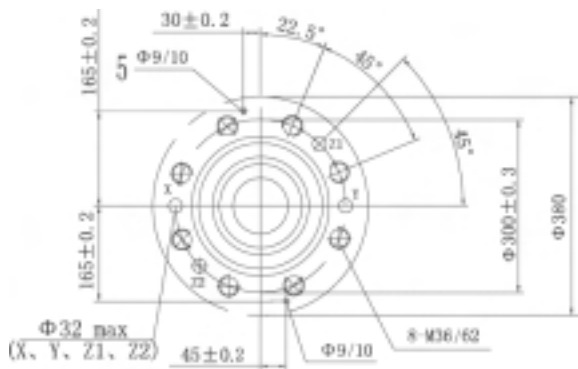
NS 16 to 63



NS 80, 100

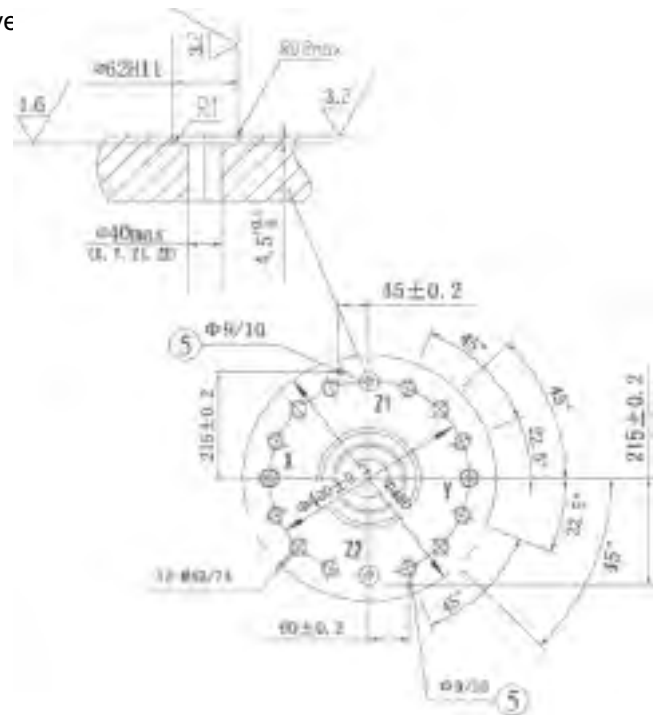


NS 125



NS	16	25	32	40	50	63	80	100	125	160
$\Phi D1^{H7}$	32	45	60	75	90	120	145	180	225	300
$\Phi D2^{H7}$	16	25	32	40	50	63	80	100	150 ¹⁾	200 ¹⁾
$\Phi D3^{H7}$	16	25	32	40	50	63	80	100	125	200
($\Phi D3^*$)	25	32	40	50	63	80	100	125	150	250 ¹⁾
$\Phi D4$	25	34	45	55	68	90	110	135	200	270
$\Phi D5$	M8	M12	M16	M20	M20	M30	M24	M30	-	-
$\Phi D6^{H7(1)}$	4	6	8	10	10	12	16	20	-	-
$\Phi D7$	4	6	6	6	8	8	10	10	-	-
H1	34	44	52	64	72	95	130	155	192	268
(H1')	29.5	40.5	48	59	65.5	86.5	120	142	180	243
H2	56	72	85	105	122	155	205	245	300 ^{0.15}	425 ^{0.15}
H3	43	58	70	87	100	130	175 ± 0.2	210 ± 0.2	257 ± 0.5	370 ± 0.5
H4	20	25	35	45	45	65	50	63	-	-
H5	11	12	13	15	17	20	25	29	31	45
H6	2	2.5	2.5	3	3	4	5	5	7 ± 0.5	8 ± 0.5
H7	20	30	30	30	35	40	40	50	40	50
H8	2	2.5	2.5	3	4	4	5	5	5.5 ± 0.2	5.5 ± 0.2
H9	0.5	1	1.5	2.5	2.5	3	4.5	4.5	2	2
L1	65/80	85	102	125	140	180	250	300	-	-
L2	46	58	70	85	100	125	200	245	-	-
L3	23	29	35	42.5	50	62.5	-	-	-	-
L4	25	33	41	50	58	75	-	-	-	-
L5	10.5	16	17	23	30	38	-	-	-	-
W	0.05	0.05	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2

- 1) Depth of fit
- 2) Reference dimension
- 3) For diameters of port B other than $\Phi D3$ or ($\Phi D3^*$), the distance from the cover mounting surface to centre of the port must be calculated.
- 4) Port B may be moved about the central axis of port A. However, care must be taken that the fixing holes and control holes are not damaged.
- 5) Locating pin holes
- 6) **Note on porting pattern NS 16:** Length L1 (holes on x-y axis) is 80 mm in control covers with built-on directional valve



Ordering details: cartridge valve (without control cover)

LC						/		*
----	--	--	--	--	--	---	--	---

Size 16 =16
 Size 25 =25
 Size 32 =32
 Size 40 =40
 Size 50 =50
 Size 63 =63
 Size 80 =80
 Size 100 =100

Series 6X

Size 125 =125
 Size 160 =160

Series 2X

Area ratio 2:1 (annulus area = 50%) = A
 Area ratio 14.3:1 (annulus area = 7%) = B

Cracking pressure approx. 0 Mpa (without spring) = 00
 Cracking pressure approx. 0.05 Mpa = 05
 Cracking pressure approx. 0.1 Mpa = 10
 Cracking pressure approx. 0.2 Mpa = 20
 Cracking pressure approx. 0.3 Mpa (only size 125) = 30
 Cracking pressure approx. 0.4Mpa = 40
 (For exact values, see page 4)

Further details in clear text

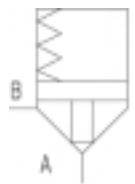
No code = Mineral oils
 V = Phosphate ester

B= Technology of Beijing Huade Hydraulic

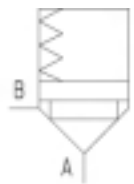
6X = (NS 16 and 100) Series 60 to 69
 (60 to 69: unchanged installation and connection dimensions)
 2X = (NS 125 and 160) Series 20 to 29
 (20 to 29: unchanged installation and connection dimensions)

E = Valve poppet without damping nose
 D = Valve poppet with damping nose

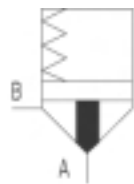
Symbols: cartridge valves (for details see ordering details)



Area ratio
2: 1
=...A..E../...



Area ratio
14.3: 1
=...B..E../...

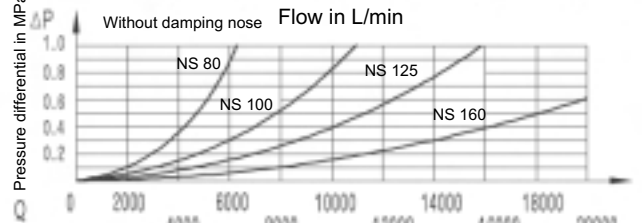
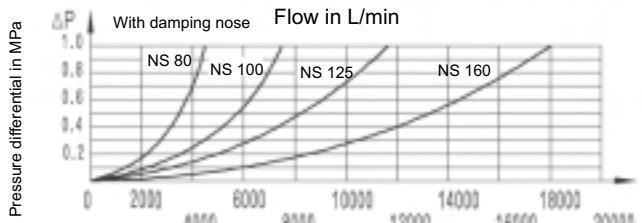
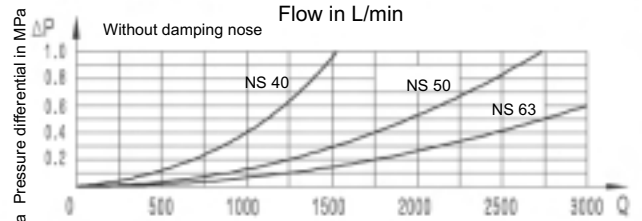
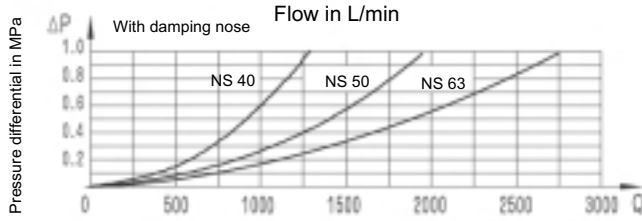
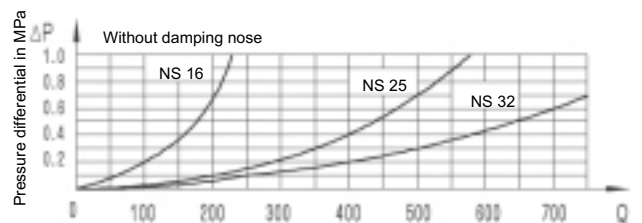
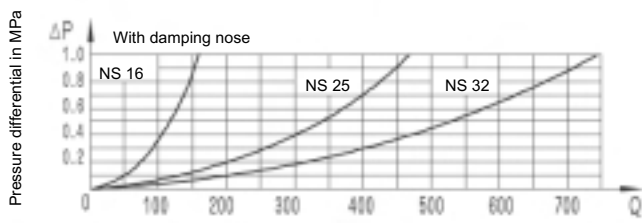


Area ratio
2: 1
=...A..D../...



Area ratio
14.3: 1
=...B..D../...

Characteristic curves (measured at $v = 41 \times 10^{-6} \text{ m}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Technical data (for applications outside these parameters, please consult us!)											
Pressure fluid		Mineral oils for NBR seals phosphate ester for FPM seals									
Pressure fluid temperature range (°C)		-20 to +80									
Viscosity range (mm ² /S)		2.8 to 380									
Degree of contamination		Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.									
Max. operating pressure (MPa) for Ports A, B, X, Z1, Z2		42.0(Without directional valve) 31.5/42.0 Pmax of mounting directional spool/ directional poppet valve									
Max. operating pressure for Port Y (MPa)		Corresponds to the tank pressure of the built-on valve									
2-way cartridge valve - directional function											
		Nominal size									
		16	25	32	40	50	63	80	100	125	160
Area A1 in CM ²	LC . . . A . . .	1.54	3.3	5.3	9.24	16.6	22.9	37.9	63.6	95	160.6
	LC . . . B . . .	2.14	4.6	7.55	12.95	22.9	32.2	52.8	89.1	133.7	244.8
Area A2 in CM ²	LC . . . A . . .	0.73	1.61	2.74	4.61	8.03	11.3	18.84	31.4	48	79.9
	LC . . . B . . .	0.13	0.31	0.49	0.9	1.73	2.0	3.94	5.9	9.3	15.7
Area A3 in CM ²	LC . . . A . . .	2.27	4.91	8.04	13.85	24.63	34.2	56.74	95	143	240.5
	LC . . . B . . .										
Stroke in CM	LC . . . E . . .	0.7	0.78	0.92	1.2	1.6	1.9	2.4	3.0	3.8	5.0
	LC . . . D . . .	0.7	1.0	1.22	1.6	2.0	2.4	3.0	3.8	4.8	6.5
Pilot volume in CM ³	LC . . . E . . .	1.6	3.8	7.4	16.6	39.4	65	136	285	544	1203
	LC . . . D . . .	1.6	4.9	9.8	22.2	49.3	82	170	361	687	1563
Theoretical pilot flow at a switching time of 10 ms in L/min	LC . . . E . . .	9.6	22.8	44	100	236	390	816	1710	3264	7218
	LC . . . D . . .	9.6	29.4	59	133	296	492	1020	2166	4122	9378
Weight in Kg	Cartridge valve	0.2	0.4	1.0	1.8	3.8	7.0	13.0	27.0	44.0	75.0
	Control cover	1.2	2.3	4.0	7.4	10.5	21.0	27.0	42.0	88.0	150.0
Cracking pressure in MPa											
Direction of flow A to B	LC...A 00...	0.002	0.0025	0.005	0.005	0.005	0.007	0.007	0.01	0.15	0.015
	LC...A 05...	0.043	0.045	0.046	0.043	0.045	0.042	0.044	0.043	0.043	0.045
	LC...A 10...	0.086	0.088	0.091	0.087	0.085	0.085	0.088	0.088	0.088	-
	LC...A 20...	0.176	0.177	0.185	0.173	0.174	0.17	0.175	0.175	0.176	0.194
	LC...A 30...	-	-	-	-	-	-	-	-	0.205	-
	LC...A 40...	0.34	0.345	0.334	0.349	0.335	0.332	0.313	0.304	-	-
	LC...B 00...	0.0014	0.002	0.0035	0.0035	0.0035	0.005	0.005	0.007	0.01	0.01
	LC...B 05...	0.031	0.032	0.032	0.031	0.032	0.03	0.031	0.031	0.031	0.032
	LC...B 10...	0.062	0.063	0.064	0.062	0.063	0.061	0.063	0.063	0.062	-
	LC...B 20...	0.127	0.127	0.13	0.124	0.126	0.121	0.126	0.125	0.125	0.14
	LC...B 30...	-	-	-	-	-	-	-	-	0.145	-
	LC...B 40...	0.245	0.247	0.235	0.25	0.243	0.236	0.225	0.217	-	-
Direction of flow B to A	LC...A 00...	0.004	0.005	0.01	0.01	0.01	0.014	0.014	0.02	0.030	0.033
	LC...A 05...	0.09	0.092	0.089	0.086	0.093	0.085	0.088	0.088	0.086	0.091
	LC...A 10...	0.18	0.18	0.177	0.174	0.18	0.173	0.177	0.178	0.173	-
	LC...A 20...	0.37	0.36	0.36	0.346	0.36	0.344	0.353	0.354	0.350	0.39
	LC...A 30...	-	-	-	-	-	-	-	-	0.40	-
	LC...A 40...	0.72	0.71	0.65	0.70	0.69	0.67	0.63	0.62	-	-
	LC...B 00...	0.024	0.025	0.05	0.05	0.05	0.08	0.07	0.10	0.15	0.15
	LC...B 05...	0.50	0.48	0.49	0.41	0.43	0.47	0.42	0.46	0.44	0.46
	LC...B 10...	1.00	0.94	0.98	0.82	0.84	0.96	0.84	0.94	0.89	-
	LC...B 20...	2.06	1.90	2.0	1.64	1.67	1.90	1.69	1.87	1.79	2.0
	LC...B 30...	-	-	-	-	-	-	-	-	2.07	-
	LC...B 40...	4.00	3.68	3.60	3.32	3.22	3.70	3.02	3.25		-

General notes on the ordering details for control covers

										1 2 3 4 ²⁾ 5 ³⁾ 6 ⁴⁾ 7 ⁵⁾ 8 ⁶⁾ 9 10 11 12 13 14 15 16 17 18 19																
										LFA							*									
X=available																										
Nominal size										Type	Series	nominal pressure MPa	Area ratio	cracking pressure	damping	Electrical monitoring of closed position	Remote control port	Orifices in ports						Seal material		
16	25	32	40	50	63	80	100	125	160									A	B	F	P	T	X		Z1	
-	-	-	-	-	-	-	-	X	X		2X															
X	X	X	X	X	X	X	X	-	-		6X															
X	X	X								D																
X	X	X	X	X	X	X	X	X ^D	X ^D	D							F								X	
	X	X								H1																
X	X	X	X							H1							F								X	
	X	X								H2																
X	X	X	X	X	X	X	X	X	X	H2							F								X	
X	X	X	X	X	X	X	X			H2							F								X	
	X	X								H3																
X	X	X	X							H3							F								X	
	X	X								H4																
X	X	X	X	X	X	X	X			H4							F								X	
X	X	X	X	X	X	X	X			G								X						X	X	
	X	X	X	X	X	X	X			R								X							X	
	X	X	X	X	X	X	X			R2								X							X	
X	X	X	X	X	X	X	X			WEA								X		X	X					
					X	X				WEA		63						X		X	X					
X	X	X	X	X	X	X	X			WEB								X		X	X					
X	X	X	X	X	X	X	X			WEA8								X	X	X	X					
X	X	X	X	X	X	X	X			WEA8								X	X	X	X					
X	X	X	X	X	X	X	X			WEA9								X	X	X	X					
X	X	X	X	X	X	X	X			GWA								X		X	X					
					X	X				GWA		63						X		X	X					
X	X	X	X	X	X	X	X			GWB								X		X	X					
X	X	X	X	X	X	X	X			KWA								X		X	X	X				
					X	X				KWA		63						X		X	X	X				
X	X	X	X	X	X	X	X			KWB								X		X	X	X				
X	X	X	X	X	X					E			X	X	D	QOG24	F								X	
X	X	X	X	X	X					EH2			X	X	D	QOG24	F								X	
X	X	X	X	X	X					EWA			X	X	D	QOG24		X		X	X					
X	X	X	X	X	X					EWB			X	X	D	QOG24		X		X	X					

Ordering details can be found on the pages covering the individual control cover variations

Further details in clear text

- 1) Orifices in port X is on request.
- 2) 6X = Series 60 to 69 and 2X = Series 20 to 29 : (unchanged installation and connection dimensions)
- 3) Operating pressure of popper valve os above 31.5MPa must write code 630 no code =operating pressure ≤ 31.5MPa
- 4) CA=2:1 (area ratio A1 : A2)
CB=14.3:1 (area ratio A1 : A2)
CD=0%
In control covers with electrical monitoring of the closed position (incl. limit switch) the type code includes the model of the control cover and that of the cartridge valve
- 5) 10 = 0.1 MPa cracking pressure
20 = 0.2 MPa cracking pressure
40 = 0.4 MPa cracking pressure
- 6) D = Valve poppet of cartridge element

- 7) with damping nose
Sequence of orifices when ordering and for representation in symbols and on circuits.
See pages on individual control covers and page 7 for further information (orifice characteristic curves).

Orifice Symbol	Symbol in ordering code
This orifice is designed as a drilled hole, no type is entered in the ordering code.(orifice diameter in mm)	

Orifice Symbol	Symbol in ordering code
This orifice is designed as a screwed orifice. It is a standard orifice, no type code is entered in the ordering code. (orifice diameter in 1/10 mm)	

Orifice Symbol	Symbol in ordering code
This orifice is designed as a screwed orifice. If this orifice is required, the correct type code must be entered together with the orifice diameter in 1/10 mm in the ordering code. Example: A12 = Orifice with diameter 1.2 mm in port A.	

General notes on the ordering details for control covers (pilot valves)

Directional spool valve	Size	Catalogue sheet no.	Control cover Type
4WE6 D5X/... (wet pin)	6		WE _B ^A , WE _B ^{A8} , GWA _B ^A KW _B ^A , EW
3WE6 A5X/... (wet pin)			WEA9
4WE10 D3X/... (wet pin)	10		WE _B ^A , GW _B ^A , KW _B ^A

Pilot valves must be ordered separately. For further details see relevant catalogue sheet.

Directional poppet valve	Size	Catalogue sheet no.	Control cover of type
M-3SEW6 U 2X/420... M-3SEW6 C 2X/420...	6		WEA, WEA8, GWA KWA, EWA
M-3SEW10 U 2X/315... M-3SEW10 C 2X/315...			WEA, GEA KWA
M-3SEW10 U 2X/630... M-3SEW10 C 2X/630...			WEA.../630, GWA.../630 KAW.../630

Note: By combining a 2-way cartridge valve with a pilot valve, various valve functions may be implemented. The following components, with porting pattern A6 (up to NS 63) and form A10 (NS 80 to 100) DIN 24 340 may be considered.

Symbols (basic symbols)

LFA . D.../F...

Control cover with remote control port
NS 16 to 160



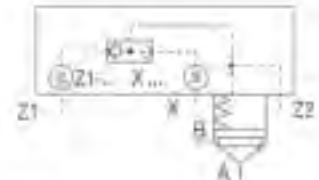
LFA . H2.../F...

Control cover with stroke limiter, with remote control port
NS 16 to 160



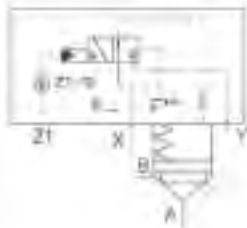
LFA . G.../...

Control cover with built-in shuttle valve
NS 16 to 100



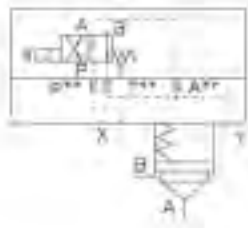
LFA . R.../...

Control cover with built-in hydraulically actuated pilot valve (directional poppet valve)
NS 25 to 100



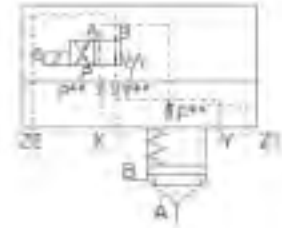
LFA . WEA.../...

Control cover for mounting a directional spool or poppet valve
NS 16 to 160



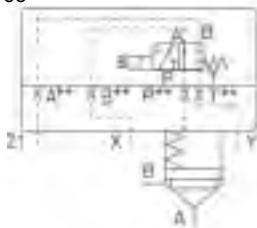
LFA...WEA8-60/...

Control cover for mounting a directional spool or poppet valve with control port for switching a 2nd valve
NS 16 to 63



LFA...WEA 9-60/...

Control cover for mounting a directional spool valve as a check valve circuit
NS 16 to 63



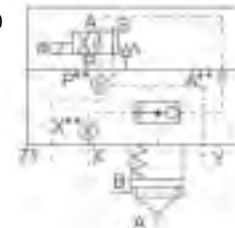
LFA . GWA.../...

Control cover for mounting a directional spool or poppet valve, with built-in shuttle valve
NS 16 to 100



LFA . KWA.../...

Control cover for mounting a directional spool or poppet valve, with built-in shuttle valve as a check valve circuit
NS 16 to 100



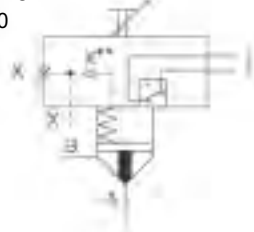
LFA...E60/...DQ.G24F

Control cover with electrical monitoring of closed position including cartridge element
NS 16 to 100



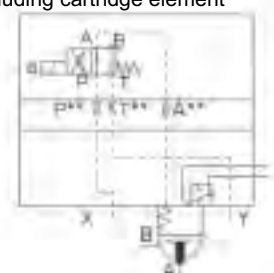
LFA...EH2-60/...DQ.G24F

Control cover with electrical monitoring of closed position and stroke limiter including cartridge element
NS 16 to 100

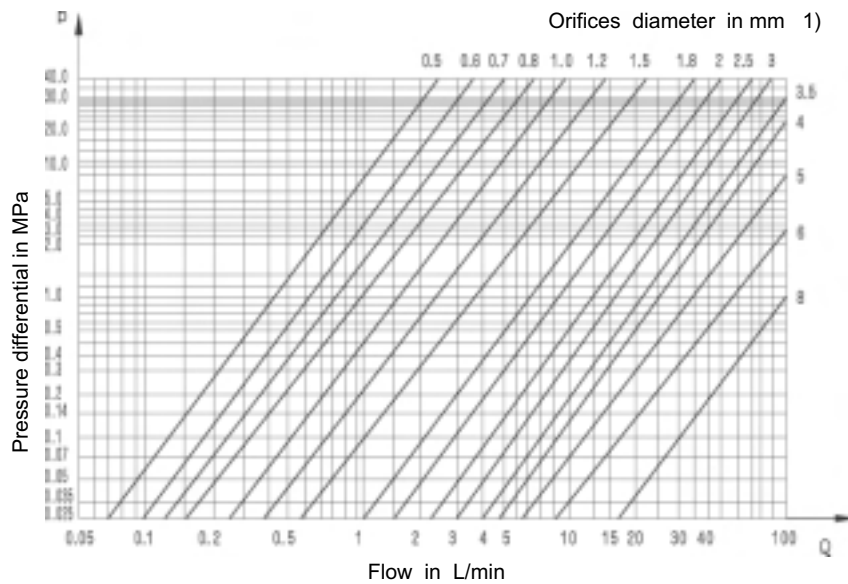


LFA...EWA60/...DQOG24.

Control cover with electrical monitoring of closed position, for mounting a directional spool valve including cartridge element
NS 16 to 63



Characteristic curves for the selection of orifices



1) Possible orifice diameter in relation to the thread size

Thread	Orifices diameter in mm
M6 taper	0.5 to 2.5
M8X1 taper	0.8 to 3.5
G3/8"	0.8 to 6.0
G1/2"	1.0 to 8.0

Material numbers for orifices and plugs

Standard orifice for nominal size	Orifice diameter in mm	Material number			
		ZM6	ZM8 × 1	G3/8"	G1/2"
	0.5	157 933	-	-	-
	0.5	157 934	-	-	-
16	0.7	157 931	-	-	-
25	0.8	152 276	136 843	159 043	-
32	1.0	149 335	136 842	159 033	139 115
40	1.2	152 286	139 101	159 032	150 714
50	1.5	148 823	133 712	159 031	139 117
63	1.8	157 932	150 953	159 030	159 026
80	2.0	156 650	137 299	159 029	148 352
100	2.5	157 929	137 445	146 259	148 353
	3.0	-	144 761	149 044	148 361
	3.5	-	136 079	146 258	159 027
	4.0	-	-	149 052	149 939
	5.0	-	-	152 287	143 775
	6.0	-	-	135 774	147 875
	8.0	-	-	-	159 028
Plug		008 702	003 443	006 325	006 445

Dimensions of O-rings for ports X, Y, Z1, Z2 (included within the scope of supply)

	Nominal size	Dimensions in mm	Material number	
			NBR seals	FPM seals
O-ring	16	7.65 × 1.78	004 491	006 585
	25	9.25 × 1.78	007 111	009 097
	32	10.82 × 1.78	008 937	008 941
	40, 50	12.37 × 2.62	004 489	008 949
	63	18.72 × 2.62	009 245	002 045
	80	26.58 × 3.53	004 490	008 944
	100	34.52 × 3.53	009 354	009 191
	125	40.87 × 3.53	009 376	009 505
	160	53.35 × 5.33	009 264	009 263

Seal kits, fixing screw for cartridge valves and control covers:

Seal kits for cartridge valves type LC.../...(NS 16 to 160)

Seal kits for	Material No.	
	NBR seals	FPM seals
LC16 to 60/...	314352	314353
LC25 to 60/...	314354	314355
LC32 to 60/...	314356	314357
LC40 to 60/...	314055	314064
LC50 to 60/...	314056	314065

Seal kits for	Material No.	
	NBR seals	FPM seals
LC63 to 60/...	314057	314066
LC80 to 60/...	314058	314067
LC100 to 60/...	314059	314068
LC125 to 60/...	314060	314069
LC160 to 60/...	314497	314388

Seal kits for control valves (NS 16 to 160)

Seal kits for	NS	Material No.							
		16		25		32		40	
		NBR seals	FPM seals	NBR seals	FPM seals	NBR seals	FPM seals	NBR seals	FPM seals
...D...D../F;..WE.; ..WE.8...;..WE.9.;		313758	313759	313760	313761	313762	313763	313863	31384
..H...;..H../F..		313951	313952	313953	313954	313800	313801	313867	313868
..G...;..GW...;..KW..		313961	313962	313804	313805	313808	313809	313873	313874
..R...R2-..				313996	313997	313998	313999	310836	310837
..E../F..		313830	313831	312829	312831	312838	313839	312005	312006
..EH2-..		313857	313858	313834	313835	313861	313862		
..EW..		312199		312194	312195	312196		311547	311548

Seal kits for	NS	Material No.							
		50		63		80		100	
		NBR seals	FPM seals	NBR seals	FPM seals	NBR seals	FPM seals	NBR seals	FPM seals
..D..						312785	312814	312786	312815
...D...D../F;..WE.; ..WE.8...;..WE.9.;		313863	313864	313865	313866				
WE./SE.						314824	314825	314836	314837
..H1-...;..H2-...(../F.)		313869	313870	313871	313872	314816	314817	314828	314829
..H3-...;..H4-...(../F.)		313869	313870	313871	313872	314818	314819	314830	314831
..G...;..GW...;..KW..		313875	313876	313877	313878	314826	314827	314838	314839
..R...R2-..		310836	310837	310840	310841	314822	314823	314834	314835
..E../F..		312007	312008						
..EH2-..		314422							
..EW..		312095		314423					

Seal kits for	NS	Material No.			
		125		160	
		NBR seals	FPM seals	NBR seals	FPM seals
..D../F..		314074	310850	310868	310869
..H2-..		314840	314841	314498	314499

Seal kits for control cover	Material No.	
	NBR seals	FPM seals
O-ring 9.25 × 1.78	320489	320490
	077111	009097

Fixing screws, porting pattern to GB/T70.1-2000 (included within the scope of supply)

NS	Control cover	Qty.	Dimensions	Tightening torque in Nm
16	WE _B ^A , GW _B ^A	4	M8 × 45	32
	..EH2-..		M8 × 80	
	EW _B ^A ..		M8 × 85	
	¹⁾		M8 × 40	
25	..EH2-...;..EW _B ^A ..	4	M12 × 90	110
	¹⁾		M12 × 50	
32	..EH2-...;..EW _B ^A ..	4	M16 × 110	270
	¹⁾		M16 × 60	
40	..E...;..EW _B ^A	4	M20 × 140	520
	..EH2-..		M20 × 150	
	H1-, H2-		M20 × 90	
	¹⁾		M20 × 70	

NS	Control cover	Qty.	Dimensions	Tightening torque in Nm
50	..H2-...;..H4-..	4	M20 × 120	520
	..E...;..EW _B ^A ..		M20 × 140	
	EH2-..		M20 × 160	
	¹⁾		M20 × 80	
63	..H2-...;..H4-..	4	M30 × 140	1800
	..E...;..EW _B ^A ..		M20 × 180	
	EH2-..		M20 × 180	
80	..H2-...;..H4-..	8	M30 × 100	900
	¹⁾		M24 × 120	
100	..H2-...;..H4-..	8	M24 × 100	1800
	¹⁾		M30 × 120	
125	All of attainable control cover	8	M36 × 160	3100
160	All of attainable control cover	12	M42 × 220	5000

¹⁾All of the other non-standard control cover.

Compression springs: type LC... A ... E ...

Size	Type	Spring dimensions in mm	Material NO.
16	LC16 05 6X	10.5/0.8 × 42/7	097 129
	LC16 10 6X	10.5/1 × 42/8.5	097 130
	LC16 20 6X	10.2/1.25 × 42/11	097 131
	LC16 40 6X	10/1.4 × 42/9.5	097 132
25	LC25 05 6X	16/1.4 × 61/10.5	097 133
	LC25 10 6X	15.8/1.6 × 61/9.5	097 134
	LC25 20 6X	15.5/1.8 × 61/8	097 135
	LC25 40 6X	15/2.25 × 58/9	097 136
32	LC32 05 6X	20.5/1.8 × 79/11.5	097 137
	LC32 10 6X	20/2 × 79/9.5	097 138
	LC32 20 6X	20/2.5 × 79/7.5	097 139
	LC32 40 6X	19/3.2 × 68/10	097 140
40	LC40 05 6X	27.5/2.5 × 108/13.5	097 141
	LC40 10 6X	27.5/2.8 × 108/10.5	097 144
	LC40 20 6X	27/3.2 × 108/9.5	097 147
	LC40 40 6X	26/4 × 104/11	097 150
50	LC50 05 6X	36/3.2 × 130/10.5	097 142
	LC50 10 6X	35.5/3.6 × 130/9	097 145
	LC50 20 6X	34.5/4.5 × 130/12	097 148
	LC50 40 6X	33.5/5.6 × 117/10	097 151

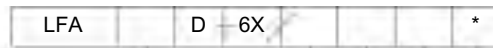
Size	Type	Spring dimensions in mm	Material NO.
63	LC63 05 6X	43.5/3.6 × 165/9	097 143
	LC63 10 6X	43/4 × 165/7	097 146
	LC63 20 6X	42/5 × 164/9	097 149
	LC63 40 6X	40.5/6.3 × 158/11	097 152
80	LC80 05 6X	57/5 × 200/10.5	002 357
	LC80 10 6X	56.5/5.6 × 200/8.5	002 359
	LC80 20 6X	55/7 × 201/11.5	002 362
	LC80 40 6X	53/9 × 176/10	002 365
100	LC100 05 6X	74/7 × 250/14	002 363
	LC100 10 6X	73/8 × 251/12.5	002 364
	LC100 20 6X	72/9 × 251/10.5	002 366
	LC100 40 6X	69/11.5 × 222/10	002 367
125	LC125 05 6X	86/8 × 308/12.5	011 090
	LC125 10 6X	85/9 × 310/10.5	002 649
	LC125 20 6X	83/11 × 310/12.5	002 454
	LC125 40 6X	80/14 × 255/10	002 650
160	LC160 05 6X	112.5/10 × 418/11.5	011 097
	LC160 10 6X	106/16 × 365/11	011 232

* A or B
** E or D

Control cover with or without remote control connection: types...D.../F (Dimensions in mm)

NS 16 to 63

1 2 3 4 10 16 18 19



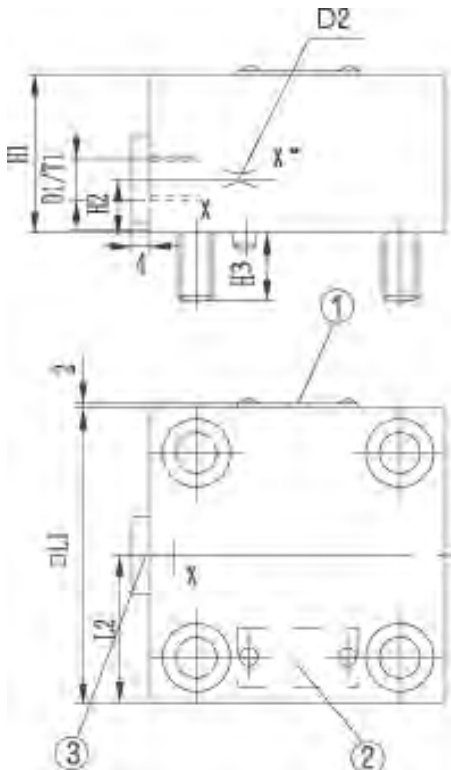
Size						Remote control port	Orifice in port + diameter in 1/10 mm
16	25	32	40	50	63		
X	X	X	X	X	X	F	X**

Further details in clear text

No code =
V =

Mineral oils
Phosphate ester

Orifice possible, if required state details



Size	16	25	30	40	50	63
D1	G1/8"	G1/4"	G1/4"	G1/2"	G1/2"	G3/4"
D2 ¹⁾	M6	M6	M6	M8 × 1	M8 × 1	M8 × 1
H1	35	40	50	60	68	82
H2	12	16	16	30	32	40
H3	15	24	28	32	34	50
L1	65	85	100	125	140	180
L2	32.5	42.5	50	72	80	90
T1	8	12	12	14	14	16

1) For orifice ordering details, see page 7.

1 Nameplate for sizes 16, 25, 32

2 Nameplate for sizes 40, 50, 63

3 Port X optionally as a threaded connection

Control cover with remote control connection: types...D/F...

(Dimensions in mm)

NS 80 to 160

1 2 3 4²⁾ 10 16 18 19



Further details in clear text

Size				Remote control port	Orifice in port + diameter in 1/10 mm
80	100	125	160		
X	X	X	X	F	[Pattern]
X	X	X	X		[Pattern]
X	X	X	X		[Pattern]

No code =

Mineral oils

V =

Phosphate ester

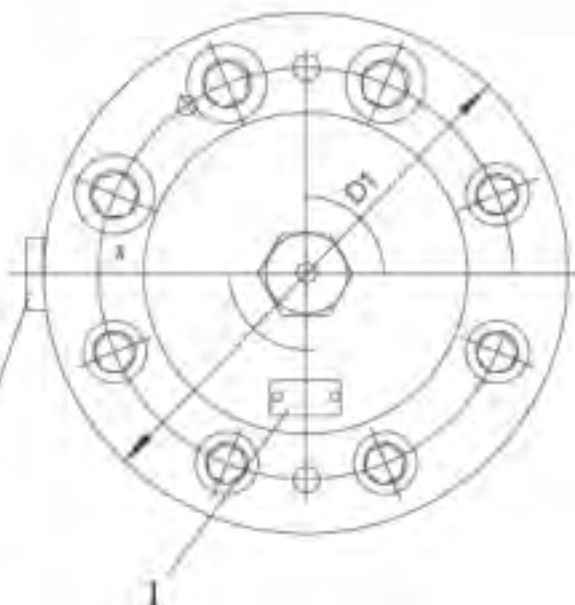
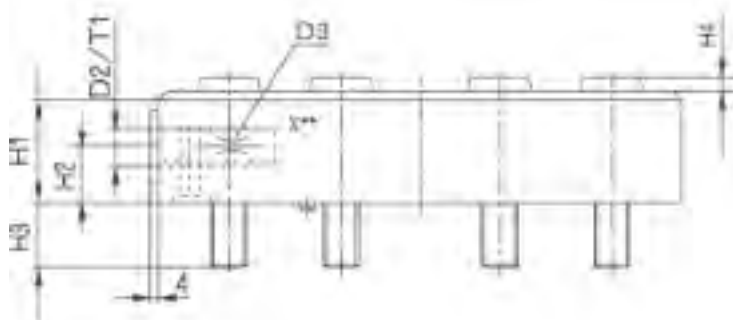
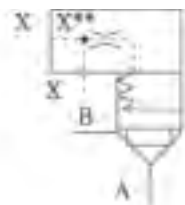
Orifice possible, if required state details

²⁾ 6X = Series 6X (NS 80, 100)

2X = Series 2X (NS 125, 160)

LFA.DX-.../F..

LFA.D-.../FX"...



Size	80	100	125	160
D1	250	300	380	480
D2	G3/4"	G1"	G1 1/4"	G1 1/4"
D3 ¹⁾	G3/8"	G1/2"	G1"	G1"
H1	70	75	105	147
H2	35	40	50	70
H3	45	52.5	61	74
H4	-	24	31	42
T1	16	18	20	20

¹⁾For orifice ordering details, see page 7.

1 Nameplate

2 Port X optionally as a threaded connection

Control cover with remote control connection: types...D/F... (Dimensions in mm)

NS 16 to 63

1 2 3 4 10 16 18 19

Size						Type	Remote control port	Orifice in port + diameter in 1/10 mm
16	25	32	40	50	63			
X	X	X	X	X	X	H1	F	X*
X	X	X	X	X	X	H2	F	X*
X	X	X	X	X	X	H3		

Further details in clear text

No code =
V =

Mineral oils
Phosphate ester

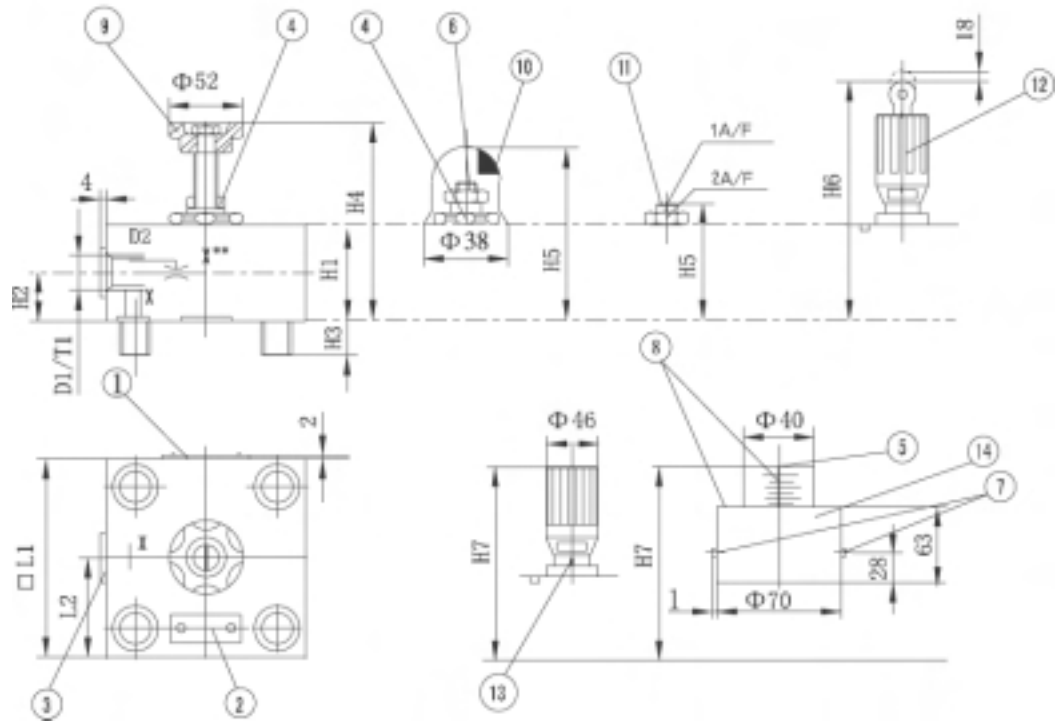
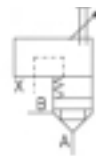
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Orifice possible, if required state details

LFA.H.6XB/...

LFA.H.6XB/F...

LFA..H.6XB/FX**



size	16	25	30	40	50	63
D1	G1/8"	G1/4"	G1/4"	G1/2"	G1/2"	G3/4"
D2 ¹⁾	M6	M6	M6	M8 × 1	M8 × 1	M8 × 1
H1	35	40	50	80 60 ³⁾	68	82
H2	12	16	16	30 22 ³⁾	32	40
H3	15	24	28	32	34	50
H4 _{max}	85	92	109	136	-	-
H5 _{max}	75	80	94	115	135	155
H6 _{max}	136	142	156	195	-	-
H7 _{max}	112	117	132	170	188	205
□ L1	65	85	100	125	140	180
L2	32.5	42.5	50	62.5 ³⁾ 72	80	90
T1	8	12	12	14	14	16
1 A/F	-	-	-	12	17	19
2 A/F	-	-	-	36	46	55

- 1 Nameplate for size 16, 25, 32
- 2 Nameplate for size 40,50,63
- 3 Port X optionally as a threaded connection
- 4 nut,19 wide of opposite side
- 5 internal thread,19 wide of opposite side
- 6 nut,6 wide of opposite side
- 7 lock nut,5 wide of opposite side
- 8 scale
- 9 control "H1"(size 16 to 40)
- 10 control "H2"(size 16 to 32)
- 11 control "H2"(size 40 to 63)
- 12 control "H3"(size 16 to 40)
- 13 control "H4"(size 16 to 40)
- 14 control "H2"(size 50 and 63)

¹⁾ For orifice ordering details, see page 7.

³⁾ Only applicable to adjustments "H3" and "H4"

Control cover with stroke limiter and remote control connection: type...H... (Dimensions in mm)

NS 80 to 160

1 2 3 4²⁾ 10 16 18 19



Further details in clear text

size				Type	Remote control port	Orifice in port + diameter in 1/10 mm
80	100	125	160			
X	X	X	X	H2	F	[Pattern]
X	X	X	X	H2	F	[Pattern]
X	X	X	X	H2	F	[Pattern]

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No code =

Mineral oils

V =

Phosphate ester

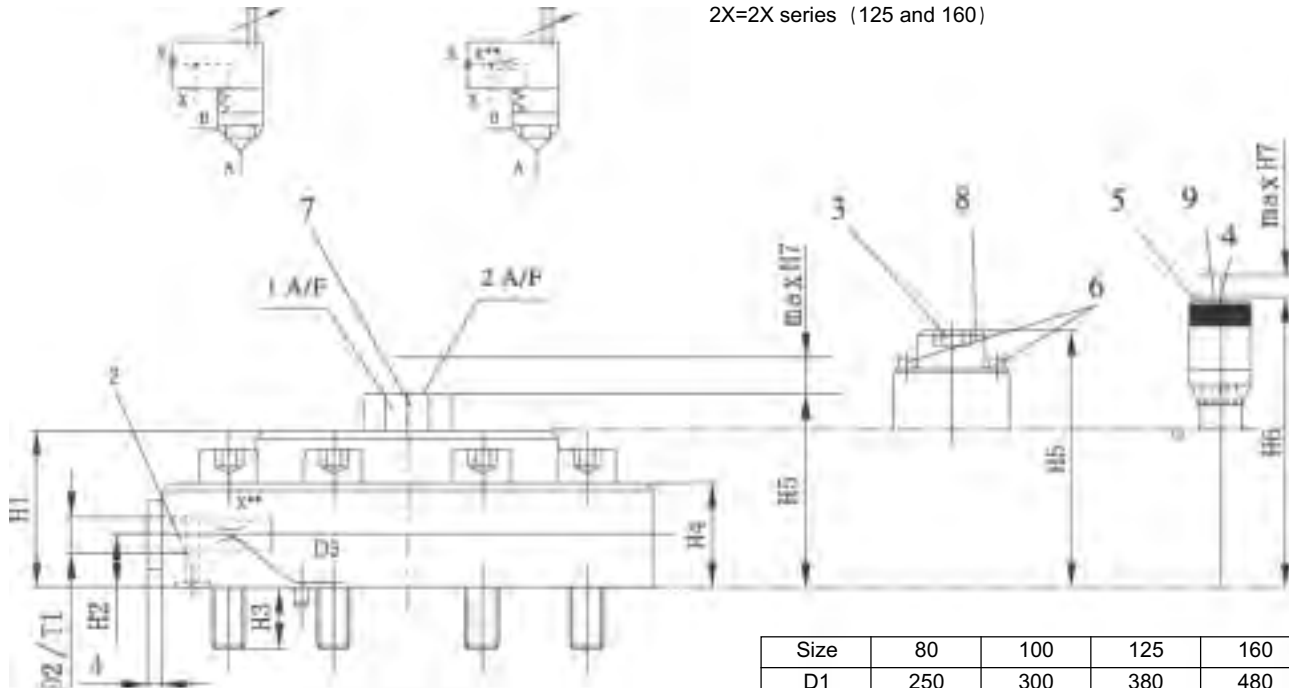
Orifice possible, if required state details

²⁾ 6X=6X series (80 and 100)

2X=2X series (125 and 160)

LFA.H-.../F..

LFA.H-.../FX**



Size	80	100	125	160
D1	250	300	380	480
D2	G3/4"	G1"	G1 1/4"	G1 1/4"
D3 ¹⁾	G3/8"	G1/2"	G1"	G1"
H1	114	132	170	225
H2	25 24 ³⁾	35	50	70
H3	45	52.5	61	74
H4	76	88.5	100	147
H5	137	157	195	340
H6	229	247	-	-
H7	30	38	48	-
T1	16	18	20	20
SW1	75	75	95	-
SW2 ⁴⁾	24	27	27	-

¹⁾ For orifice ordering details, see page 7.

³⁾ Only applicable to adjustment "H4"

⁴⁾ Internal thread

1 Nameplate

2 Port X optionally as a threaded connection

3 Internal thread, 32 wide of opposite side

4 Internal thread, 14 wide of opposite side

5 Internal thread, 5 wide of opposite side

6 Internal thread, 8 wide of opposite side

7 Control "H2"(size 80 to 125)

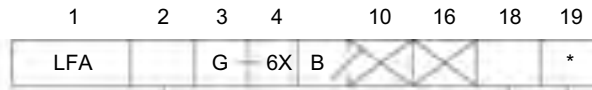
8 Control "H2"(size 160)

9 Control "H4"(size 80 and 100)

Control cover with built-in shuttle valve: type ...G...

(Dimensions in mm)

NS 16 to 63



Further details in clear text

Size	Orifice in port	
	X	Z1
16	Φ 1.2	Φ 1.2
25	Φ 1.5	Φ 1.5
32	Φ 2.0	Φ 2.0
40	X12	Z1-12
50	X15	Z1-15
63	X18	Z1-18

Technology of Beijing Huade Hydraulic

No code =

Mineral oils

V =

Phosphate ester

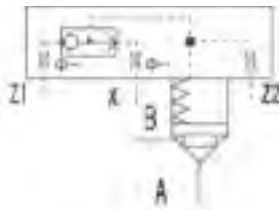
▲ Drilled orifice (diameter in mm)

● Standard orifice (diameter in 1/10 mm)

does not appear in the type code

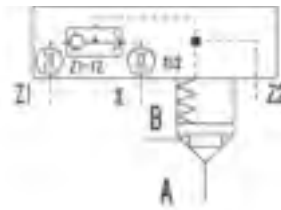
LFA.G 6XB/.

NS 16 to 32



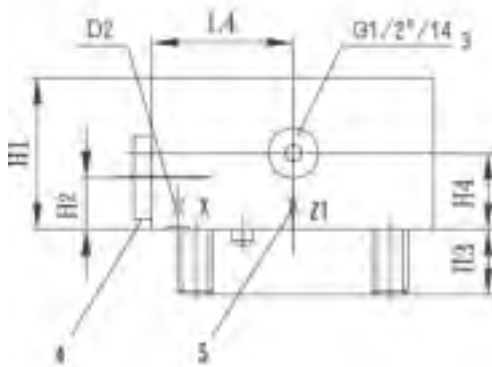
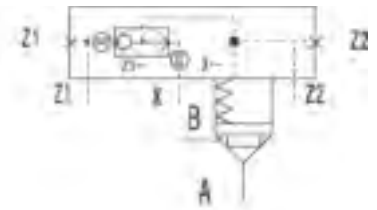
LFA.G 6XB/.

NS 40

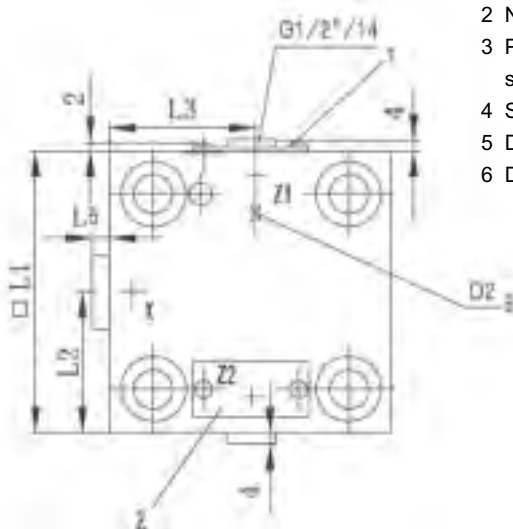


LFA.G 6XB/.

NS 50 to 63



Size	16	25	30	40	50	63
D1	Φ 1.2	Φ 1.5	Φ 2.0	M6	M8 × 1	M8 × 1
D2	Φ 1.2	Φ 1.5	Φ 2.0	M6	M8 × 1	M8 × 1
H1	35	40	50	60	68	82
H2	17	17	21.5	30	32	40
H3	15	24	28	32	34	50
H4	-	-	-	-	32	40
L1	65	85	100	125	140	180
L2	36.5	45.5	50	62.5	74	90
L3	-	-	-	-	72	79
L4	-	-	-	-	72	90
L5	2.5	2	-	-	6	2



1 Nameplate for size 16, 25, 32

2 Nameplate for size 40, 50, 63

3 Ports Z1 and Z2 optionally as a threaded connection for size 50 and 63

4 Shuttle valve

5 D2 for size 16 to 40

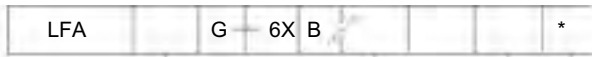
6 D2 for size 50 to 63

Control cover with built-in shuttle valve: type ...G...

(Dimensions in mm)

NS 80 and 100

1 2 3 4 10 16 18 19



Further details in clear text

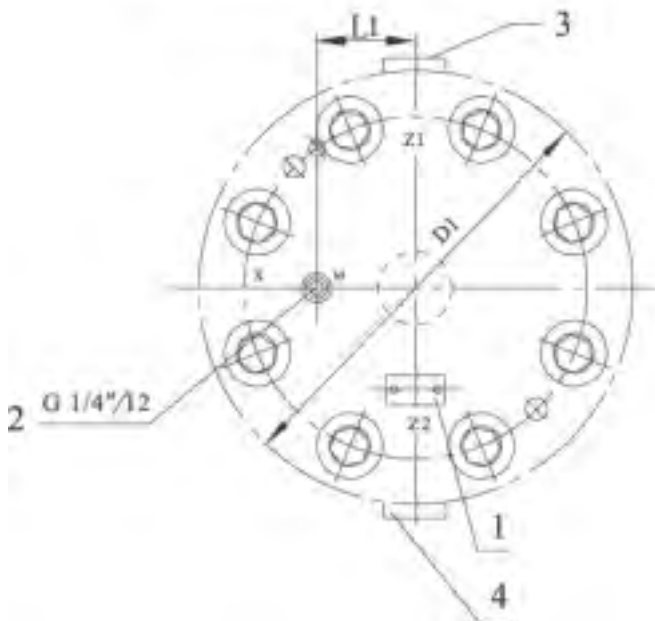
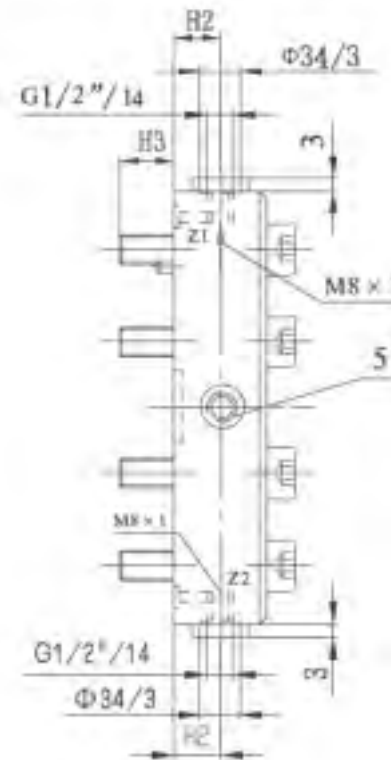
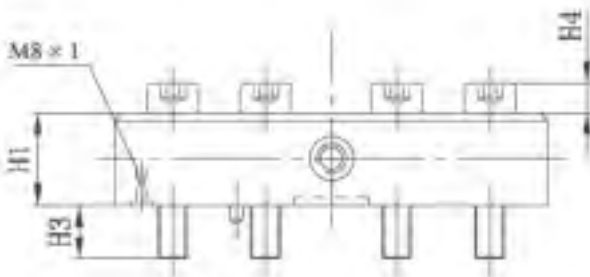
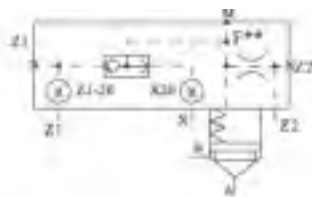
Size	Orifice in port (diameter in 1/10 mm)		
	F	X	Z1
80	F ^{..}	X20	Z1-20
100	F ^{..}	X20	Z1-20

No code =
V =

Mineral oils
Phosphate ester

- ▲ Standard orifice - does not appear in the type code
- ▲ Orifice possible, if required state details

LFA.G 6XB/.

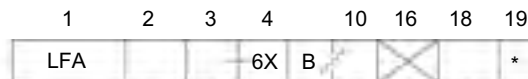


- 1 Nameplate
- 2 Test point
- 3 Port Z1 optionally as a threaded connection
- 4 Port Z2 optionally as a threaded connection
- 5 Shuttle valve

Size	80	100
D1	250	300
H1	80	75
H2	45	43
H3	45	52.5
H4	4	23.5
L1	73	96.5

Control cover with built-in directional poppet valve: types ,...R...,...R2... (Dimensions in mm)

NS 25 to 63



Further details in clear text

Size	Type	Orifice in port (diameter in 1/10 mm)		
		F	X	Z1
25	R	F''	X10	Z1-12
32		F''	X10	Z1-12
40		F''	X15	Z1-12
50		F''	X15	Z1-12
63		F''	X18	Z1-12
25	R2- ²⁾	F''	X10	Z1-12
32		F''	X10	Z1-12
40		F''	X15	Z1-12
50		F''	X15	Z1-12
63		F''	X18	Z1-12

No code =
V =

Mineral oils
Phosphate ester

- △ Standard orifice - does not appear in the type code
- △ Orifice possible, if required state details

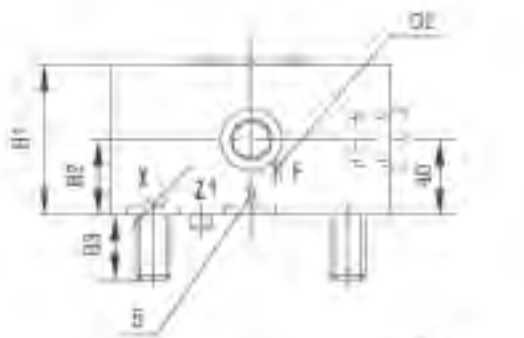
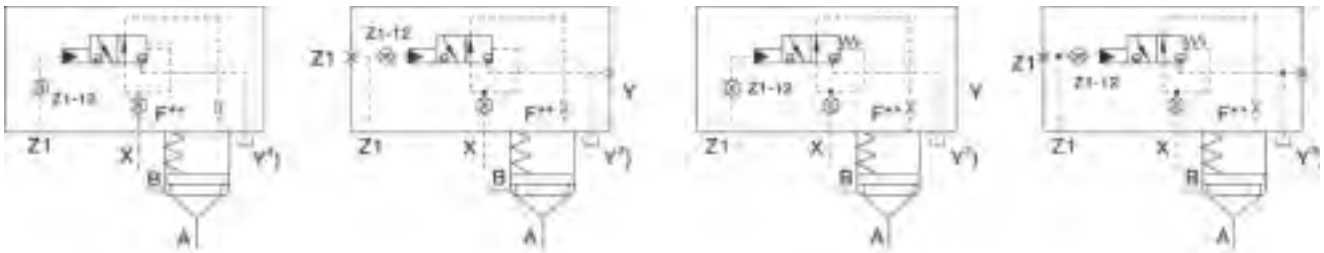
²⁾ Directional poppet valve with spring return

LFA.R 6XB/...
NS 25 to 50

LFA.R 6XB/...
NS 63

LFA.R2- 6XB/...
NS 25 to 50

LFA.R2- 6XB/...
NS 63



$$\text{Area relationship } \frac{A_{Z1}}{A_X} = \frac{3}{1}$$

NS	25	32	40	50	63
D1	M6	M6	M8 × 1	M8 × 1	M8 × 1
D2 ¹⁾	M6	M6	M8 × 1	M8 × 1	M8 × 1
H1	40	50	60	68	82
H2	17	22	33	32	40
H3	24	28	32	34	50
□ L1	85	100	125	140	180
L2	R	2	1	27	24
	R2-	18.5	17.5	27	24

¹⁾ For orifice ordering details, see page 7.

³⁾ Pressure in port Y max. 0.5MPa

1 Nameplate for size 25, 32

2 Nameplate for size 40, 50, 63

3 Port Z1 optionally as a threaded connection for size 63

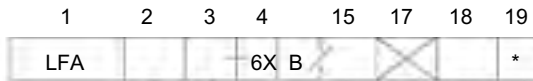
4 Port Y optionally as a threaded connection for size 63

5 D1 for size 16 to 50

6 D1 for size 63

Control cover with built-in directional poppet valve: types ,...R...,...R2... (Dimensions in mm)

NS 80 and 100



Further details in clear text

Size	Type	Orifice in port (diameter in 1/10 mm)		
		F	X	Z1
80	R	F ²	X20	Z1-12
100	R	F ²	X25	Z1-12
80	R2- ²⁾	F ²	X20	Z1-12
100	R2- ²⁾	F ²	X25	Z1-12

No code =
V =

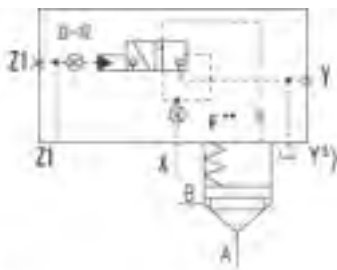
Mineral oils
Phosphate ester

△ Standard orifice - does not appear in the type code

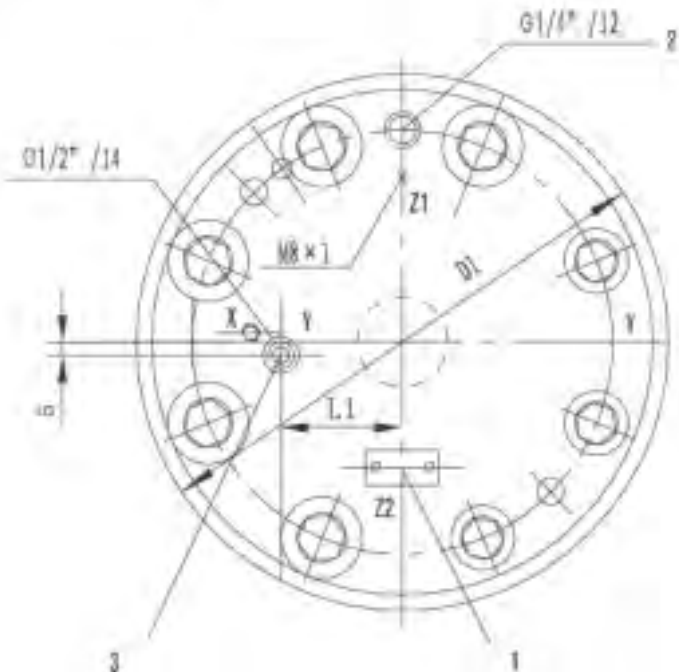
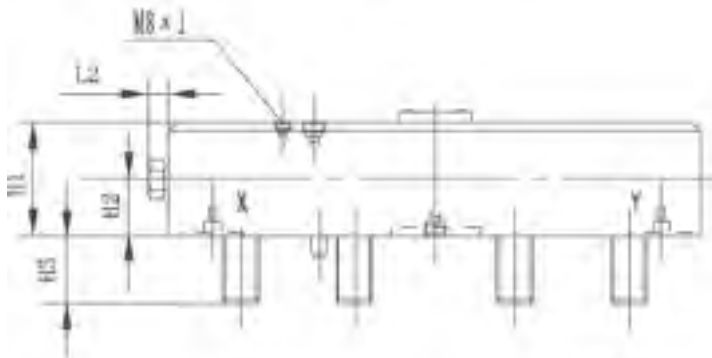
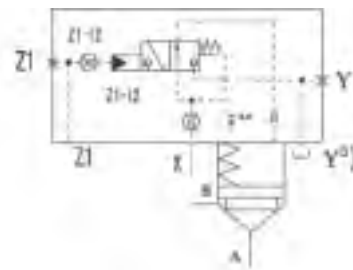
△ Orifice possible, if required state details

²⁾ Directional poppet valve with spring return

LFA.R 6XB/...
Size 80 and 100



LFA.R2- 6XB/...
Size 80 and 100



$$\text{Area relationship } \frac{A_{Z1}}{A_X} = \frac{3}{1}$$

Size	80	100
D1	250	300
H1	80	90
H2	40	45
H3	45	52.5
L1	51	74
L2	21	17

¹⁾ For orifice ordering details, see page 7.

³⁾ Pressure in port Y max. 0.5MPa

1 Nameplate

2 Port Z1 optionally as a threaded connection

3 Port X optionally as a threaded connection

Control cover for mounting a directional spool or directional poppet valve: types ...WE^A_B ... (Dimensions in mm)

NS 16 to 63

1 2 3 4 11 12 13 14 18 19



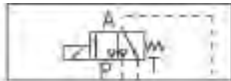
Further details in clear text

NS						Type	Orifice in port (diameter in 1/10 mm)			
16	25	32	40	50	63		A	B	P	T
X	X	X	X	X	X	WEA	A''		P''	T''
X	X	X	X	X	X	WEB		B''	P''	T''

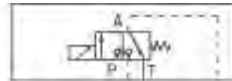
Technology of Beijing
Huade Hydraulic

No code = Mineral oils
V = Phosphate ester

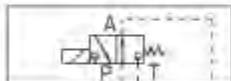
Orifice possible, if required state details



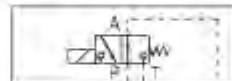
M—3SEW6C2XB/420L...



M—3SEW6C2XB/420L...



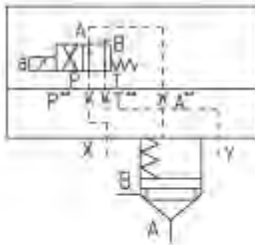
M—3SEW6U2XB/420L...



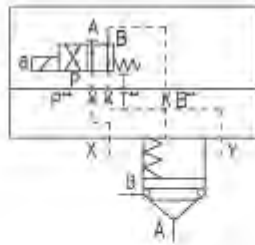
M—3SEW6U2XB/420L...

4WE6D5XB/...

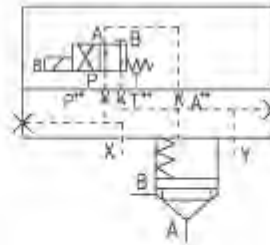
4WE6D5XB/...



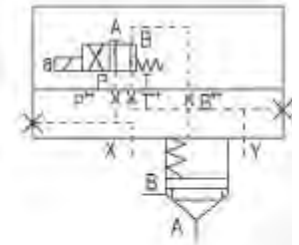
LFA.WEA6XB/...
Size 16 to 32



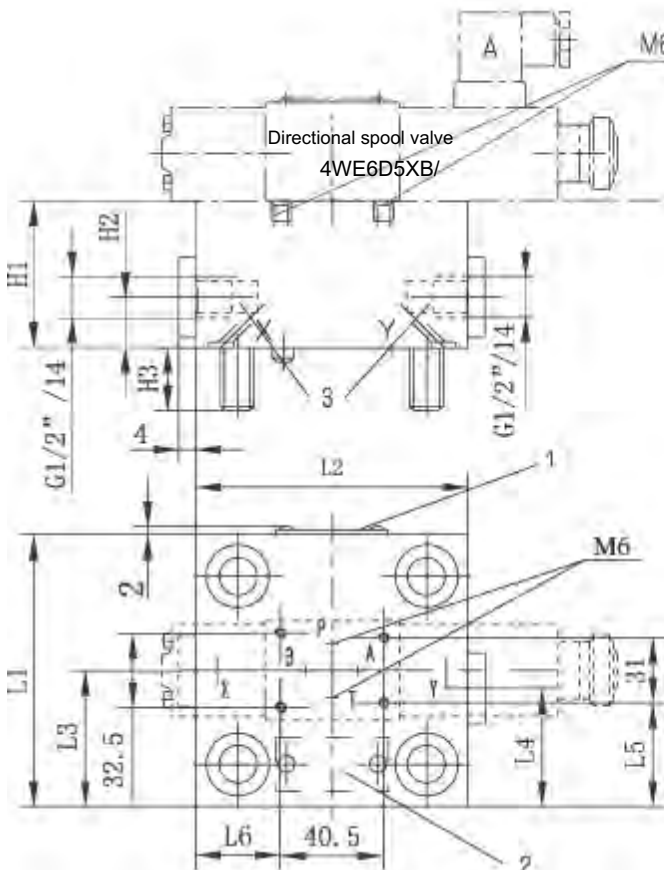
LFA.WEB6XB/...
Size 16 to 32



LFA.WEA6XB/...
Size 40 to 63



LFA.WEB6XB/...
Size 40 to 63



NS	16	25	30	40	50	63
H1	40	40	50	60	68	82
H2	-	-	-	30	32	40
H3	15	24	28	32	34	50
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	-	-	-	72	80	101
L4	-	-	-	53	60	79
L5	17	27	34.5	47	54	74.5
L6	7	22.5	30	43.5	51	71

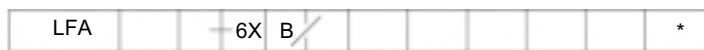
1) For orifice ordering details, see page 7.

- 1 Nameplate for size 16, 25, 32
- 2 Nameplate for size 40, 50, 63
- 3 Ports X and Y optionally as a threaded connection for size 40, 50 and 63

Control cover for mounting a directional spool or directional poppet valve: types ...WE_A ... (Dimensions in mm)

NS 80 and 100

1 2 3 4 5 11 12 13 14 18 19



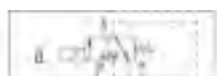
Further details in clear text

NS		Type	Orifice in port (diameter in 1/10 mm)	Orifice in port (diameter in 1/10 mm)			
50	63			A	B	P	T
X	X	WEA	A''	P''	T''		
X	X	WEA 630 ²⁾	A''	P''	T''		
X	X	WEB	B''	P''	T''		

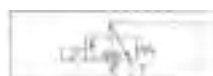
No code = Mineral oils
V = Phosphate ester

△ Orifice possible, if required state details

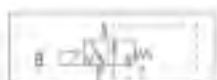
²⁾ for mounting a directional spool valve;
operating pressure >31.5 MPa



M—3SEW 10 C 2XB/315...

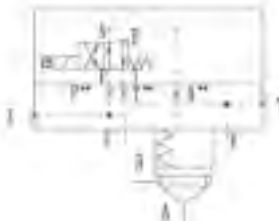


M—3SEW 10 C 2XB/630...

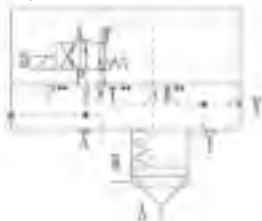


M—3SEW 10 U 2XB/315...

4WE 10 D 3XB/...



LFA.WEA.6XB/...
Size 80 and 100

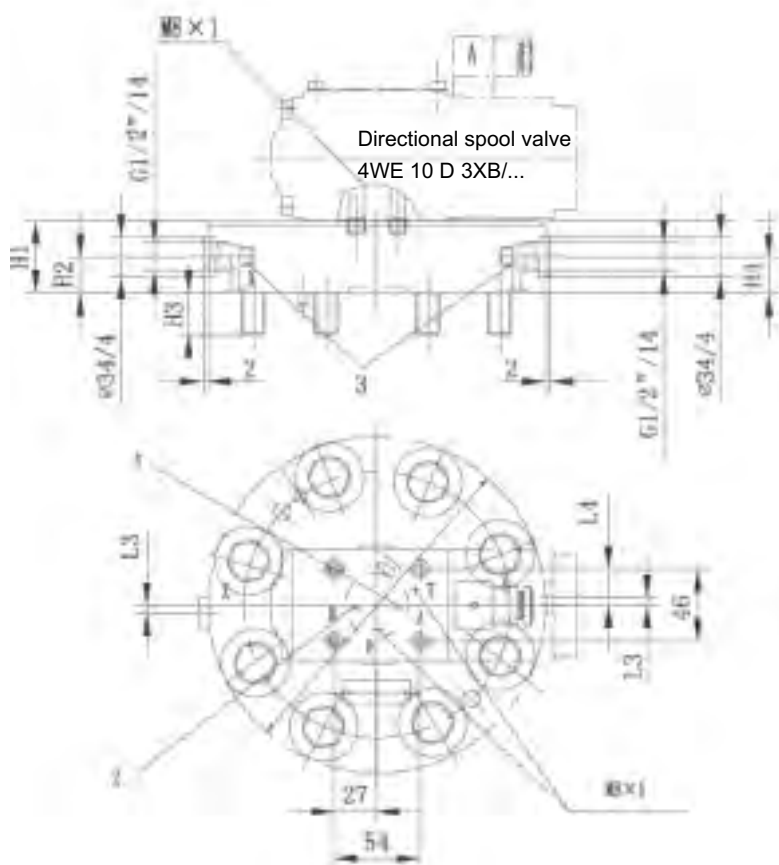


LFA.WEB.6XB/...
Size 80 and 100



LFA.WEA.6XB/630...
Size 80 and 100

M—3SEW 10 U 2XB/630...



Size	80	100
D1	250	300
H1	80	100
H2	30	24
H3	45	52.5
H4	45	55
L3	10	13
L4	30	28

For orifice ordering details, see page 7.

- 1 Plug for type .. WEB..
- 2 Plug for type .. WEA.
- 3 Ports X and Y optionally as a threaded connection

Control cover for mounting a directional spool or directional poppet valve: types ...WE^A_B 8 ... (Dimensions in mm)

NS 16 to 63 1 2 3 4 13 14 14 18 19

LFA — 6X B / *

Further details in clear text

Size						Type	Orifice in port (diameter in 1/10 mm)		
16	25	32	40	50	63		B	P	T
X	X	X	X	X	X	WEA8	F**	P**	T**
X	X	X	X	X	X	WEB8	F**	P**	T**

No code =

Mineral oils

V =

Phosphate ester

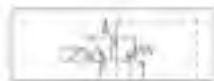
△ Orifice possible, if required state details



M — 3SEW6C2XB/420L...



M — 3SEW6C2XB/420L...



M — 3SEW6U2XB/420L...



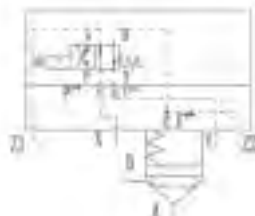
M — 3SEW6U2XB/420L...

4WE6D5XB/...

4WE6D5XB/...



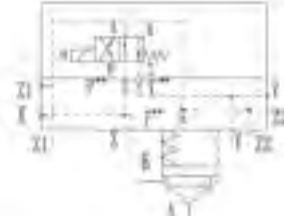
LFA.WEA 8-6XB/...
Size 16 to 32



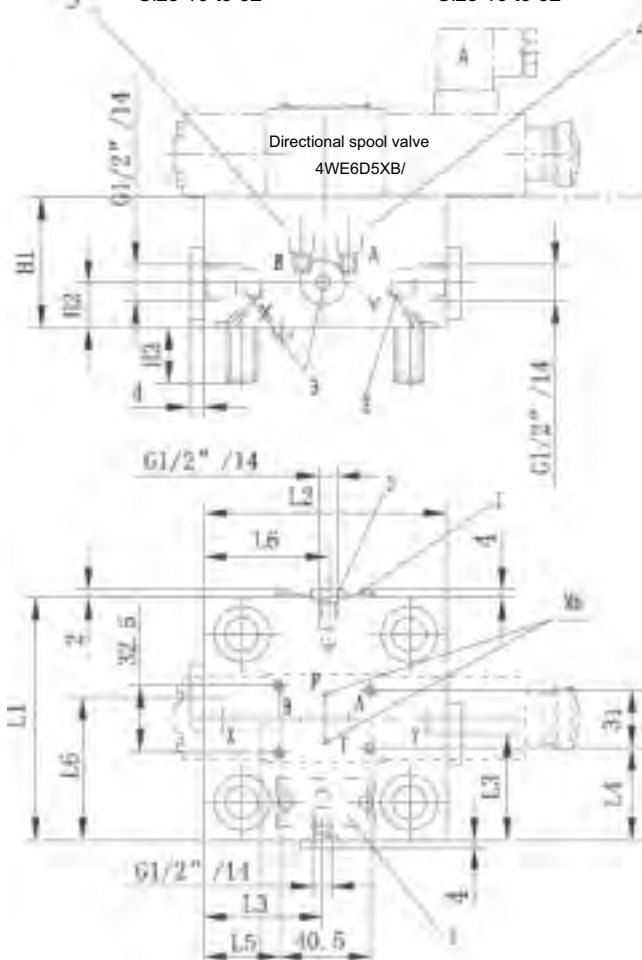
LFA.WEB 8-6XB/...
Size 16 to 32



LFA.WEA 8-6XB/...
Size 40 to 63



LFA.WEB 8-6XB/...
Size 40 to 63



Size	16	25	30	40	50	63
H1	65	40	50	60	68	82
H2	-	-	-	30	32	40
H3	15	24	28	32	34	50
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	-	-	-	53	60	79
L4	17	27	34.5	47	54.5	74.5
L5	7	22.5	30	43.5	51	71
L6	-	-	-	72	80	101

For orifice ordering details, see page 7.

- 1 Nameplate for size 16, 25, 32
- 2 Nameplate for size 40, 50, 63
- 3 Ports X, Y, Z1 and Z2 optionally as a threaded connection for size 40, 50 and 63.
- 4 Plug M6 for type ..WEB8...
- 5 Plug M6 for type ..WEA8...

Control cover for mounting a directional spool valve: type ..WEA9 (Dimensions in mm)

NS 16 to 63 1 2 3 4 11 12 13 14 18 19

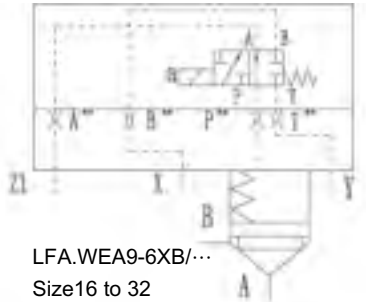


Further details in clear text

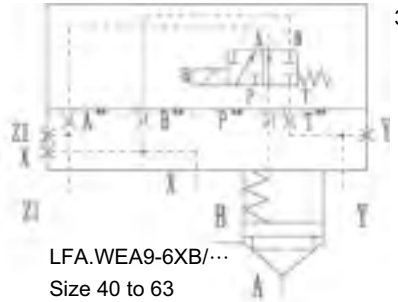
Size						Type	Orifice in port (diameter in 1/10 mm)			
16	25	32	40	50	63		A	B	P	T
X	X	X	X	X	X	WEA9	A"	B"	P"	T"

No code = Mineral oils
V = Phosphate ester

Orifice possible, if required state details

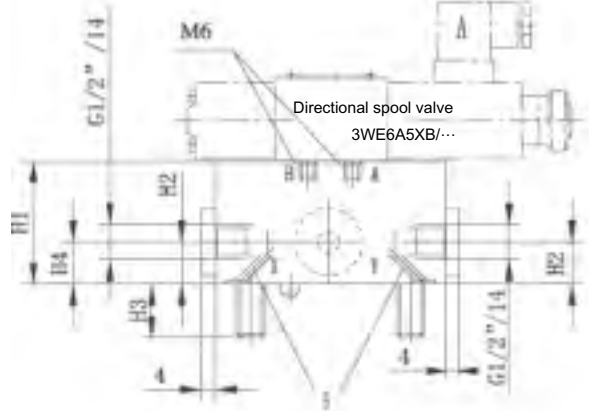


LFA.WEA9-6XB/...
Size 16 to 32

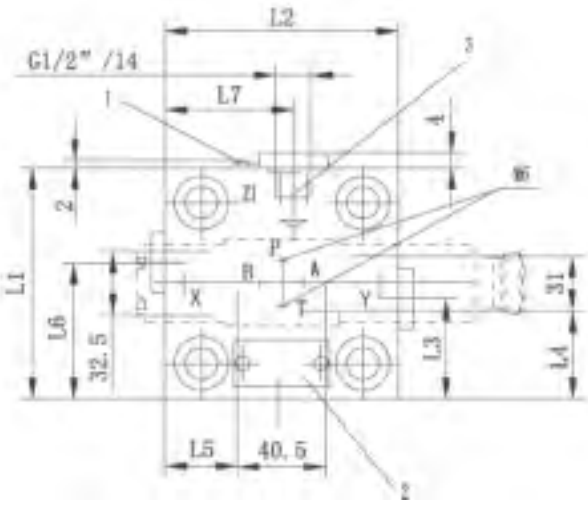


LFA.WEA9-6XB/...
Size 40 to 63

3 WE 6A 5XB/...



Directional spool valve
3WE6A5XB/...



NS	16	25	30	40	50	63
H1	40	40	50	60	68	82
H2	-	-	-	30	32	40
H3	15	24	28	32	34	50
H4	-	-	-	30	32	60
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	-	-	-	53	60	79
L4	17	27	34.5	47	54.5	74.5
L5	7	22.5	30	43.5	51	71
L6	-	-	-	62.5	70	90
L7	-	-	-	72	80	101

For orifice ordering details, see page 7.

1 Nameplate for size 16, 25, 32

2 Nameplate for size 40, 50, 63

3 Ports X, Y and Z1 optionally as a threaded connection for size 40, 50 and 63.

Control cover for mounting a directional spool or directional poppet valve: types ...GW^A_B ... (Dimensions in mm)

NS 16 to 63 1 2 3 4 11 12 13 14 18 19



Further details in clear text

Size						Type	Orifice in port (diameter in 1/10 mm)			
16	25	32	40	50	63		A	B	P	T
X	X	X	X	X	X	GWA	A''	B''	P''	T''
X	X	X	X	X	X	GWB	A''	B''	P''	T''

No code =
V =

Mineral oils
Phosphate ester

△ Orifice possible, if required state details



M—3SEW6C2XB/420L...



M—3SEW6C2XB/420L...



M—3SEW6U2XB/420L...



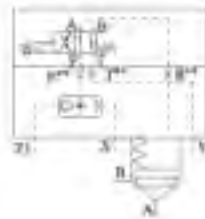
M—3SEW6U2XB/420L...

4WE6D5XB/...

4WE6D5XB/...



LFA.GWA 6XB/...
Size 16 to 32



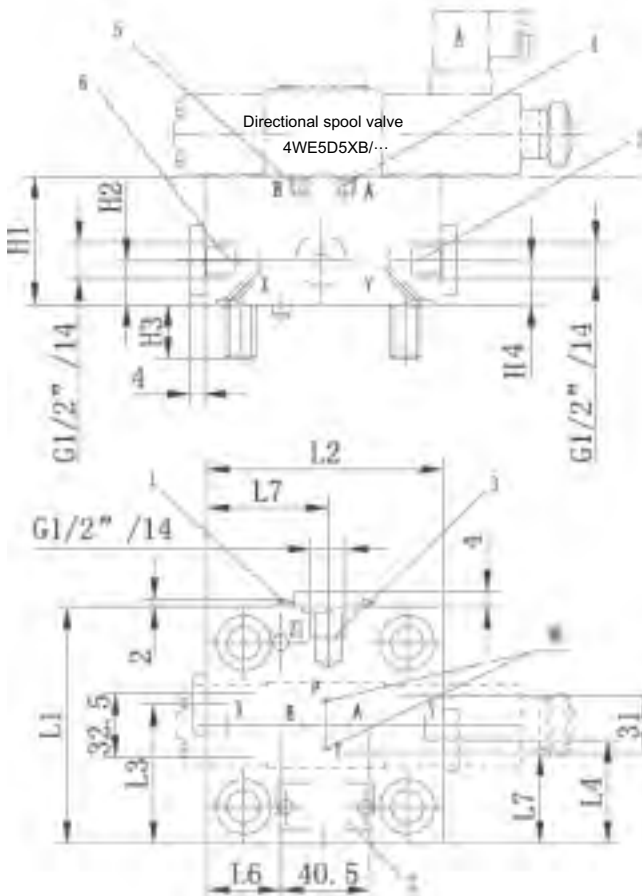
LFA.GWB 6XB/...
Size 16 to 32



LFA.GWA 6XB/...
Size 40 to 63



LFA.GWB 6XB/...
Size 40 to 63



Directional poppet valve

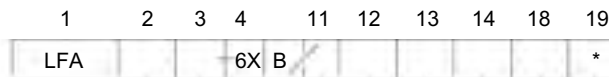
Size	16	25	30	40	50	63
H1	40	40	50	60	68	82
H2	-	-	-	30	32	40
H3	15	24	28	32	34	50
H4	17	17	21.5	30	32	42
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	36.5	45.5	50	62.5	70	90
L4	-	-	-	53	60	79
L5	-	-	-	62.5	70	90
L6	7	22.5	30	43.5	51	71
L7	17	27	34.5	47	54.5	74.5

For orifice ordering details, see page 7.

- 1 Nameplate for size 16, 25, 32
- 2 Nameplate for size 40, 50, 63
- 3 Ports Y and Z2 optionally as a threaded connection for size 40, 50 and 63.
- 4 Plug M6 for type ..WEB8...
- 5 Plug M6 for type ..WEA8...
- 6 Shuttle valve

Control cover for mounting a directional spool or directional poppet valve: types ...GW^A_B ... (Dimensions in mm)

NS 80 and 100



Size		Type		Orifice in port (diameter in 1/10 mm)			
16	25			A	B	P	T
X	X	GWA	630 ²⁾	A''		P''	T''
X	X	GWA		A''		P''	T''
X	X	GWB			B''	P''	T''

Further details in clear text

No code =
V =

Mineral oils
Phosphate ester

Orifice possible, if required state details

²⁾ For pressure >31.5MPa



M—3SE 10 C 2XB/315...



M—3 SE 10 U 2XB/315...

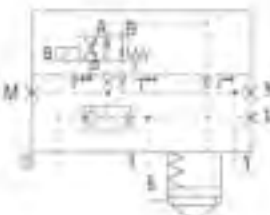
4WE 10 D 3XB/...



M—3 SE 10 C 2XB/630...



M—3SE 10 U 2XB/630...



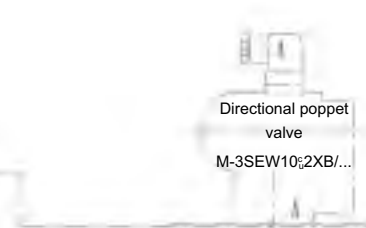
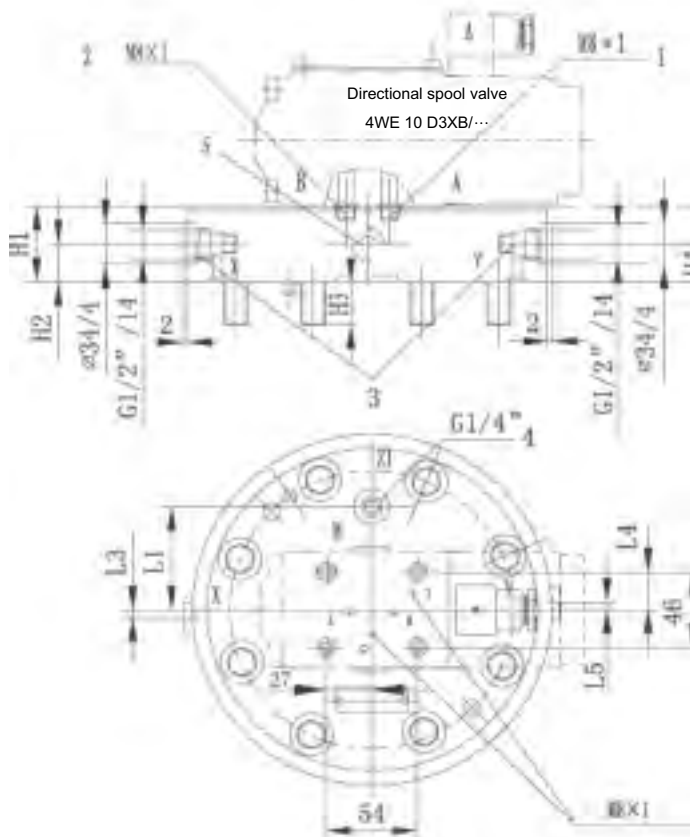
LFA.GWA .6XB/...
Size 80 and 100



LFA.GWB 6XB/...
Size 80 and 100



LFA.GWA 6XB/630...
Size 80 and 100



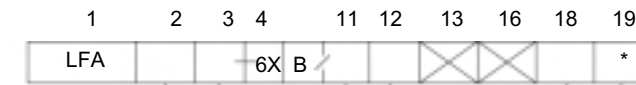
Size	80	100
D1	250	300
H1	80	100
H2	26	40
H3	45	52.5
H4	26	55
L1	74	96.5
L3	9.5	13
L4	29	28
L5	10.5	13

¹⁾ For orifice ordering details, see page 7.

- 1 Plug M6 for type ..WEB...
- 2 Plug M6 for type ..WEA...
- 3 Ports X and Y optionally as a threaded connection
- 4 Test point
- 5 Shuttle valve

Control cover for mounting a directional spool or directional poppet valve: types ...KW^A ... (Dimensions in mm)

NS16 to 63



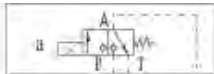
Further details in clear text

Size	Type	Orifice in port (diameter in 1/10 mm)			
		A	B	P	T
16	KWA	A''		P10	X12
25		A''		P10	ø1.5
32		A''		P10	ø2.0
40		A''		P12	X12
50		A''		P15	X15
63		A''		P18	X18
16	KWB	A''		P10	P10
25		A''		P10	P10
32		A''		P10	P10
40		A''		P12	P12
50		A''		P15	P15
63		A''		P18	P18

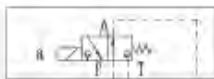
No code = Mineral oils
V = Phosphate ester

- ▲ Orifice drilled (diameter in mm) } Does not appear
- △ Standard orifice (diameter in 1/10 mm) } in the type code
- ◁ Orifice possible, if required state details(diameter in 1/10 mm)

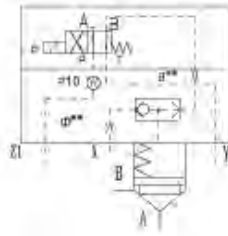
M—3SEW6C 2XB/420L



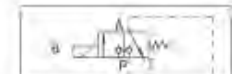
M—3SEW6C 2XB/420L



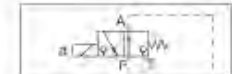
4WE 6 D 5XB/...



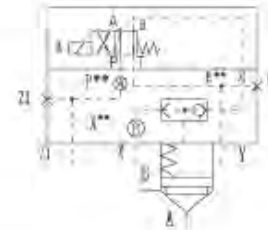
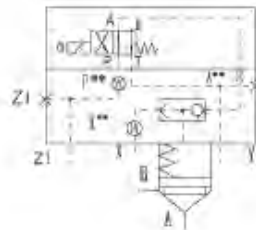
M—3SEW6C 2XB/420L



M—3SEW6C 2XB/420L



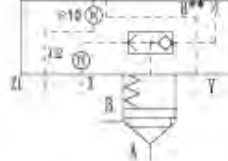
4WE 6 D 5XB/...



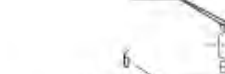
LFA.KWA .6XB/...
Size 25 to 32



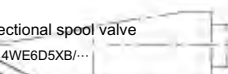
LFA.KWB .6XB/...
Size 25 to 32



LFA.KWA .6XB/...
Size 16



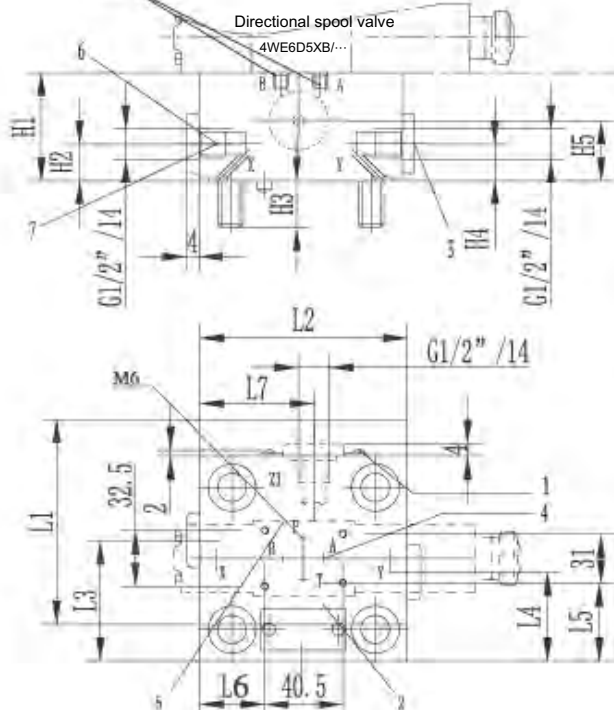
LFA.KWA .6XB/...
Size 16



LFA.KWA .6XB/...
Size 40 to 63



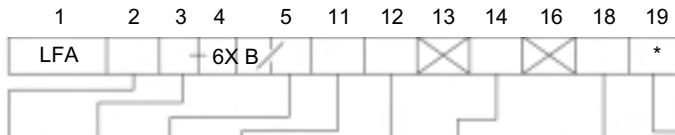
LFA.KWB 6XB/...
Size 40 to 63



Size	16	25	32	40	50	63
H1	40	40	50	60	68	82
H2	17	17	21.5	30	32	40
H3	15	24	28	32	34	50
H4	-	-	-	30	32	42
H5	-	-	-	30	50	60
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	36.5	45.5	50	62.5	72	90
L4	-	-	-	53	60	79
L5	17	27	34.5	47	54.5	74.5
L6	7	22.5	30	43.5	51	71
L7	-	-	-	62.5	70	90

Control cover for mounting a directional spool or directional poppet valve: types ...KW^A_B... (Dimensions in mm)

NS 80 and 100



Further details in clear text

Size	Type	Orifice in port (diameter in 1/10 mm)				
		A	B	P	T	X
80	100					
X	X	GWA	A	P20	T	X20
X	X	GWA 630 ²⁾	A	P20	T	X20
X	X	GWA	B	P20	T	X20

No code =

Mineral oils

V =

Phosphate ester

△ Standard orifice - does not appear in the type code

△ Orifice possible, if required state details

²⁾for mounting directional spool valve
operating pressure > 31.5MPa



M—3SE 10C 2XB/315...



M—3SE 10U 2XB/315...



M—3SE 10C 2XB/630...

4WE 10 D 3XB/...

M—3SE 10U 2XB/630...



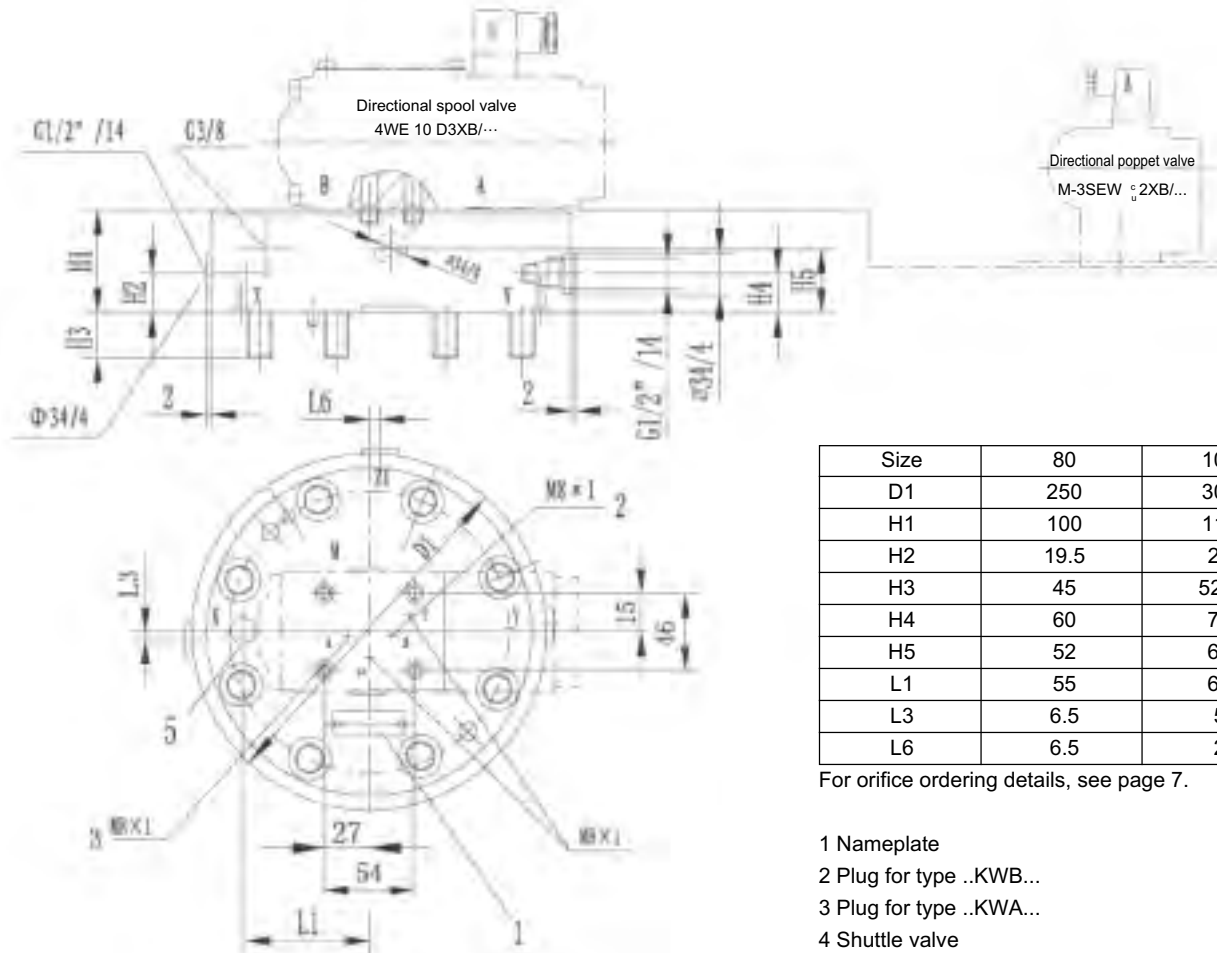
LFA.KWA.6XB/...
NS 25 and 32



LFA.KWB 6XB/...
NS 25 and 32



LFA.KWA.6XB/...
NS 40 and 63



Size	80	100
D1	250	300
H1	100	110
H2	19.5	27
H3	45	52.5
H4	60	70
H5	52	62
L1	55	62
L3	6.5	5
L6	6.5	2

For orifice ordering details, see page 7.

1 Nameplate

2 Plug for type ..KWB...

3 Plug for type ..KWA...

4 Shuttle valve

Control cover with electrical monitoring of the closed position: type ..E...

(monitoring of closed spool position)

(Dimensions in mm)

Technical data and notes are valid for all control cover with electrical monitoring (E..., EH2..., EWA... and EWB...)

The solid state limit switch with integral amplifier switches when the closed position is reached. This limit switch has the following advantages:

- No dynamic seals
- Direct monitoring of the closed switched position of the valve
- Long service life
- Control cover and cartridge valve completely included in the type code

- pmax = 40MPa.

connection:
24 V DC (residual ripple ≤ 10%)
Max. loading :0.4A(PNP output)

Function:

Normally closed:high resistance
Normally open :low resistance

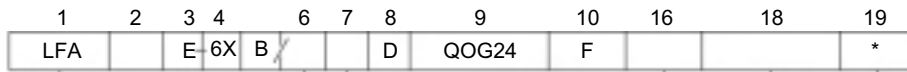
Pin allocation(in plug Z4):

4 = Normally open (high resistance to

low resistance)
3 = 24V +
2 = Normally closed (low resistance to high resistance)
1 = 0 V -

Temperature range:-10°C to 80°C
Insulation to DIN 40050 IP65

NS 16 to 63



Size					
16	25	32	40	50	63
X	X	X	X	X	X

Area ratio A1:A2	
CA=2:1	¹⁾
CB=14.3:1	²⁾

Cracking pressure Po	
10=0.1MPa	
20=0.2MPa	
40=0.4MPa	

Orifice in port X"	
X"	

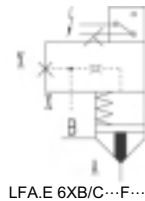
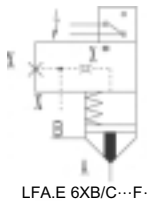
No code = Mineral oils
V = Phosphate ester

Orifice possible, if required state details (diameter in 1/10 mm)

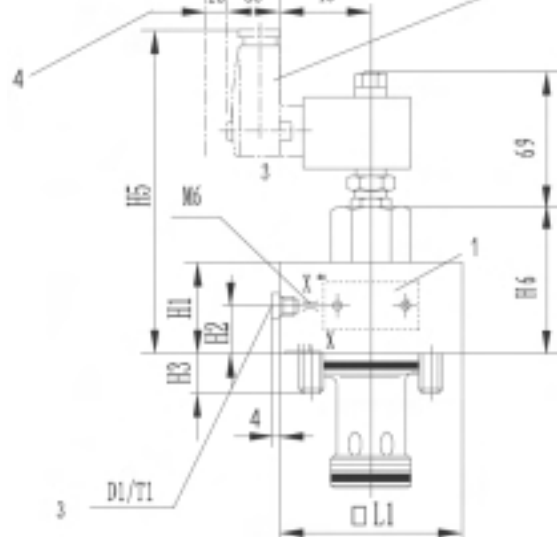
¹⁾ Annulus area = 50%

²⁾ Annulus area = 7%

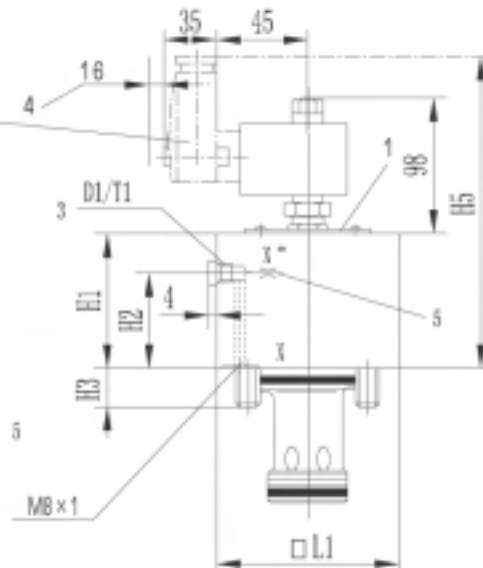
Technology of Beijing Huade Hydraulic



Size 16 to 32



Size 40 to 63



- 1 Nameplate
- 2 Plug-in connector (separate order)
- 3 Port X optionally as a threaded connection
- 4 Space required to remove plug-in connector
- 5 M8X1 for size 40 and 50, G3/8" for size 63

Size	16	25	32	40	50	63
D1	G1/8"	G1/4"	G1/4"	G1/2"	G1/2"	G3/4"
H1	35	40	50	120	130	150
H2	12	16	16	90	105	116
H3	15	24	28	32	34	50
H5	159	164	168	219	229	249
H6	70	75	79	-	-	-
□L1	65	85	100	125	140	180
L2	8	12	12	14	14	16

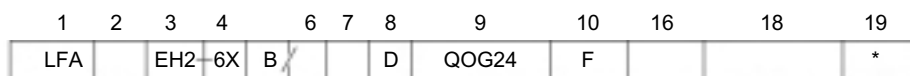
For orifice ordering details, see page 7.

Control cover with electrical monitoring of the closed position and stroke limiter: type...EH2...

(monitoring of closed spool position)

(Dimensions in mm)

NS 16 to 63



Further details in clear text

Size					
16	25	32	40	50	63
X	X	X	X	X	X

Area ratio A1:A2
CA=2:1 ¹⁾
CB=14.3:1 ²⁾

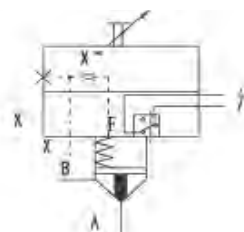
Cracking pressure Po
10=0.1MPa
20=0.2MPa
40=0.4MPa

Orifice in port A''

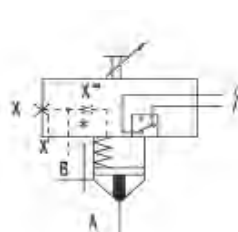
No code = Mineral oils
V = Phosphate ester

Orifice possible, if required state details

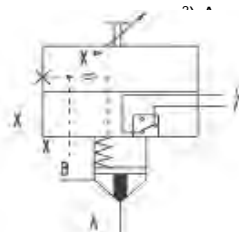
¹⁾ Annulus area = 50%



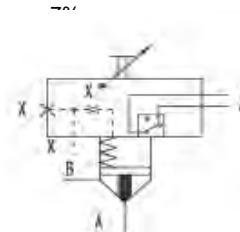
LFA.EH2- 6XB/CA...F...
size 16 to 32



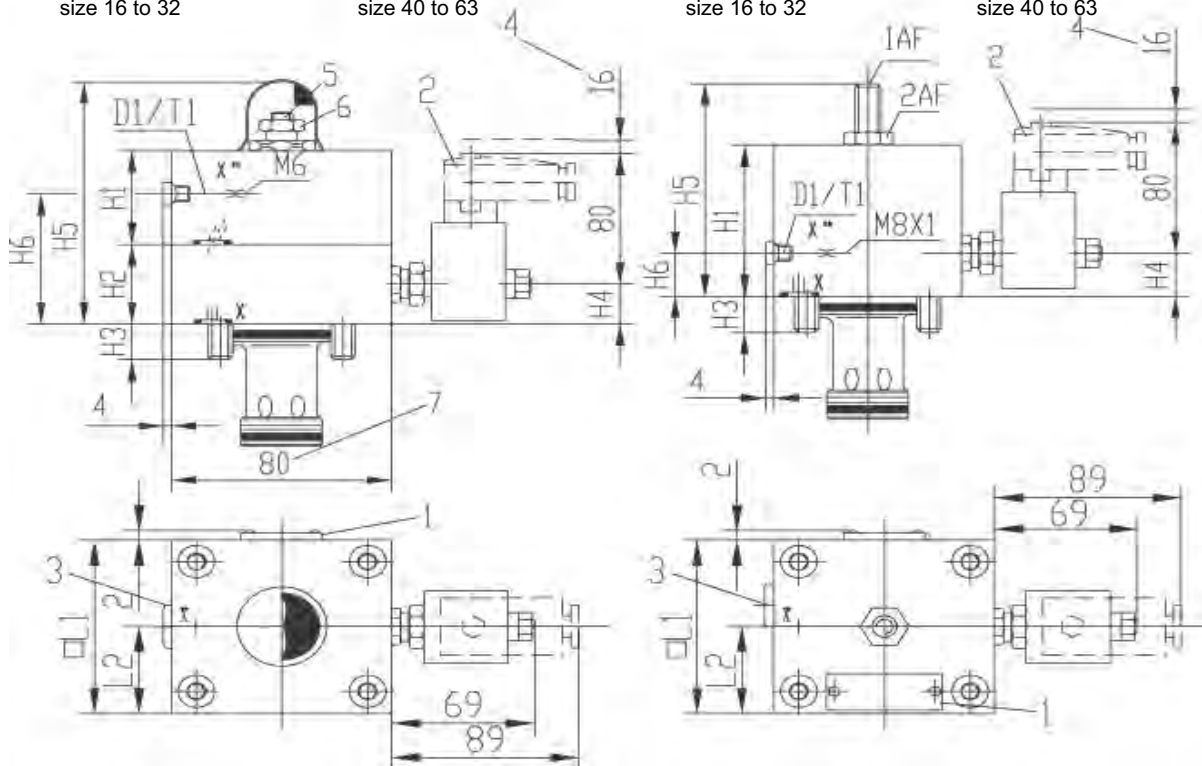
LFA.EH2- 6XB/CA...F...
size 40 to 63



LFA.EH2- 6XB/CB...F...
size 16 to 32



LFA.EH2- 6XB/CB...F...
size 40 to 63



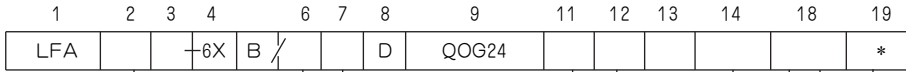
- 1 Nameplate
 - 2 Plug-in connector (separate order)
 - 3 Port X optionally as a threaded connection
 - 4 Space required to remove plug-in connector
 - 5 Nut 6A/F
 - 6 Nut 19A/F
 - 7 For size 16 (only lower cover)
- For orifice ordering details, see page 7

³⁾Max. dimension.

Size	16	25	32	40	50	63
D1	G1/8"	G1/4"	G1/4"	G1/2"	G1/2"	G3/4"
H1	35	40	50	140	150	170
H2	40	40	50	-	-	-
H3	15	24	28	32	34	50
H4	20	20	25	30	30	30
H5	115	120	144	165 ³⁾	195 ³⁾	235 ³⁾
L1	65	85	100	125	140	180
L2	32.5	42.5	50	72	80	90
T1	8	12	12	14	14	16
1A/F	-	-	-	12	17	19
2A/F	-	-	-	36	46	55

Control cover with electrical monitoring of the closed position for mounting a directional spool or poppet valve: types...EW_B^A ... (monitoring of closed spool position) (Dimensions in mm)

NS 16 to 63



Further details in clear text

Size						Type
16	25	32	40	50	63	
X	X	X	X	X	X	EWA
X	X	X	X	X	X	EWB

Area ratio A1:A2
CA=2:1 ¹⁾
CB=14.3:1 ²⁾

Cracking pressure Po
10=0.1MPa
20=0.2MPa
40=0.4MPa

Orifice in port			
A	B	P	T
A**		P**	T**
	B**		T**

No code = Mineral oils
V = Phosphate ester

- △ Orifice possible, if required state details
- 1) Annulus area = 50%
- 2) Annulus area = 7%



M—3SEW6C30B/420L...

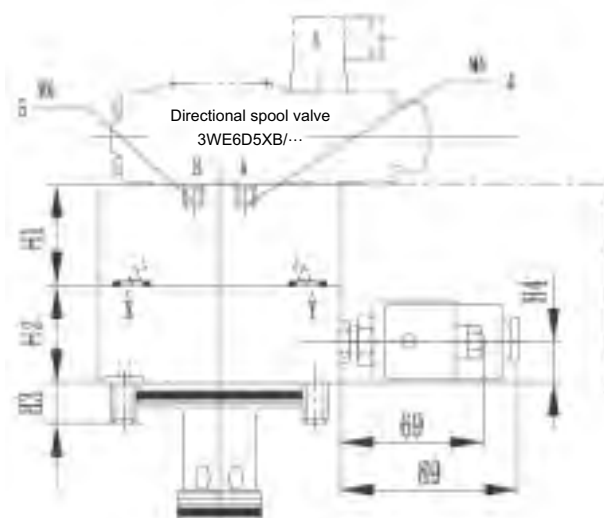


M—3SEW6U30B/420L...

4WE6D...



NS 16 to 32



LFA.EWA 6XB/...
Size 40 to 63

LFA.EWB 6XB/...
Size 40 to 63

Size	16	25	32
H1	40	40	50
H2	40	40	50
H3	15	24	28
H4	20	20	25
L1	65	85	100
L2	80	85	100
L3	7	22.5	30
L4	17	27	34.5

For orifice ordering details, see page 7.

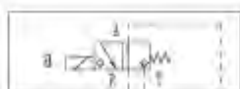
- 1 Nameplate
- 2 Plug-in connector (separate order)
- 3 Space required to rremove plug-in connector
- 4 Ports X and Y optionally as a threaded connection
- 5 Plug M6 for type ..EWB...
- 6 Plug M6 for type ..EWA...

Control cover with electrical monitoring of the closed position for mounting a directional spool or poppet valve: types...EW^A_B... (monitoring of closed spool position) (Dimensions in mm)

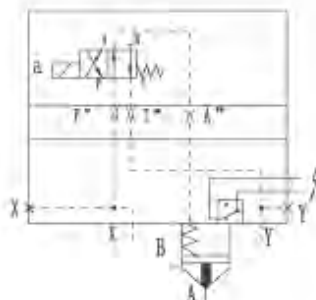
NS 40 to 63



M — 3SEW6C2XB/420L...

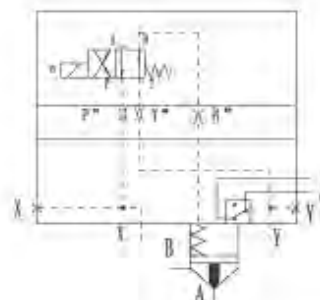


M — 3SEW6U2XB/420L...

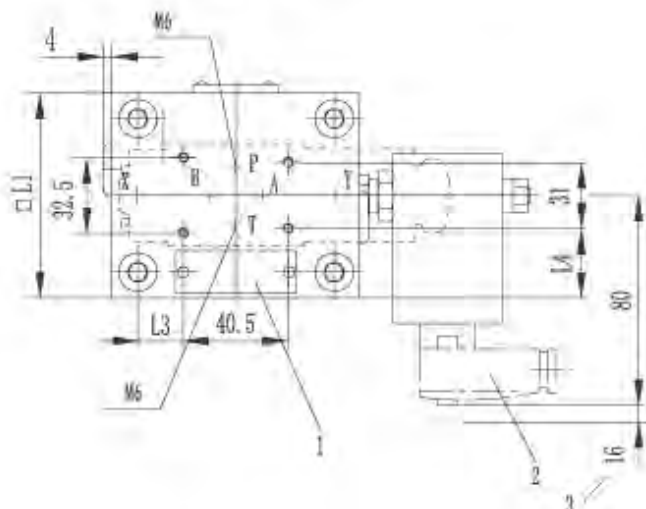
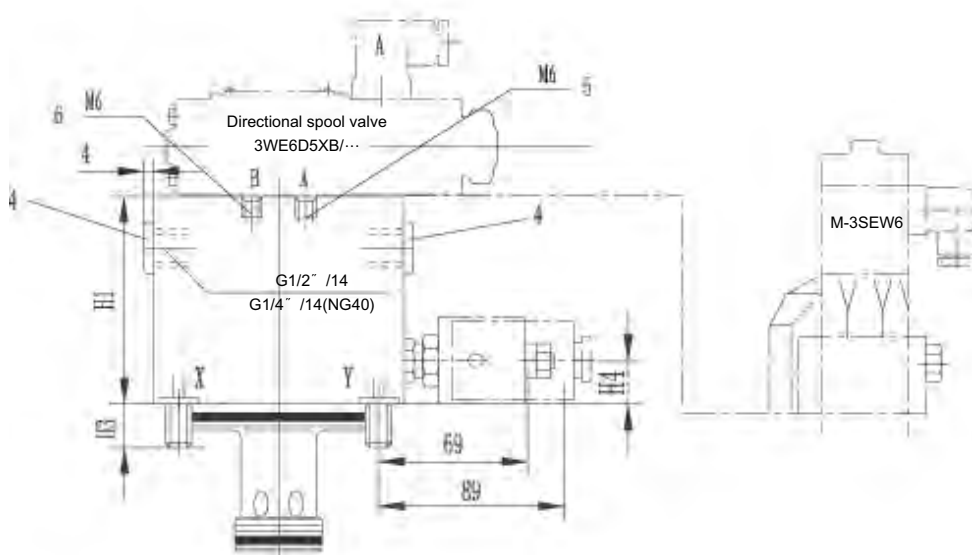


LFA.EWA 6XB/...
Size 40 to 63

4WE6D5XB/...



LFA.EWB 6XB/...
Size 40 to 63

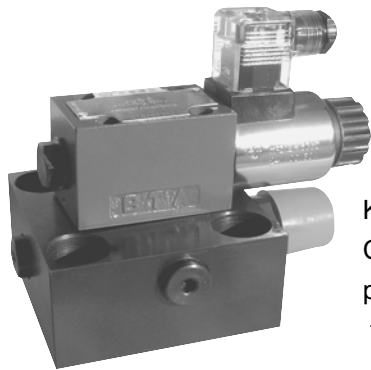


Size	40	50	63
H1	120	130	150
H3	32	34	50
H4	30	30	30
□ L1	125	140	180
L2	43.5	51	71
L3	47	54.5	74.5

For orifice ordering details, see page 7.

- 1 Nameplate
- 2 Plug-in connector (separate order)
- 3 Space required to rremove plug-in connector
- 4 Plug M6 for type ..EWB...
- 5 Plug M6 for type ..EWA...

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.LTD.	2-way cartridge valves-pressure functions			RE 81078/12.99
	Cartridge valves type LC...			
	Control covers type LFA...			
	Size 16 to 100	up to 40 MPa	up to 7000L/min	Replaces :



K3786/6
Control cover with manual pressure adjustment, type LFA ..DBW..



K3787/6
Cartridge valve type LC .. DB

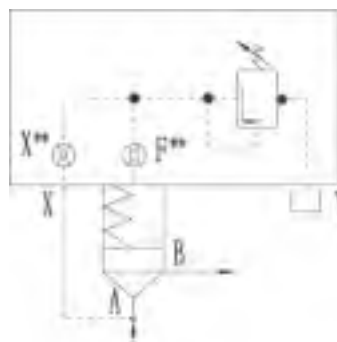
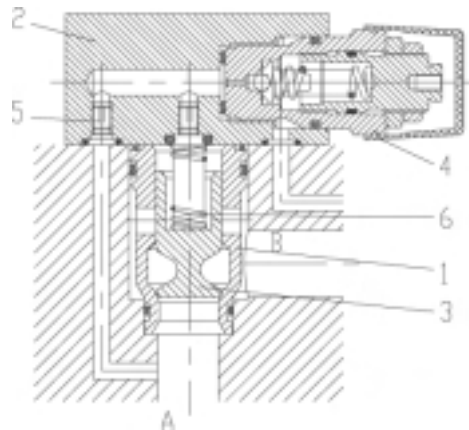
Function ,section,symbols

The 2-way cartridge valves for pressure control functions are pilot operated poppet or spool valves. The main component designed as a cartridge valve (1) is inserted in a cavity bore standardised to DIN 24342 and is sealed by control cover (2).

The pilot valve (4) for either manual or electrical proportional pressure control is integrated into the control cover (2) or mounted onto the control cover as a pilot valve with interface connections to DIN 24 340 .

Pressure relief function (Pages 32 to 71)

The cartridge valve (1) for the pressure relief function (type LC .DB..) is a poppet valve without an area differential (no effective area at port B). The pressure acting at port A is fed via the pilot oil supply orifice (5) to the spring side (6) of the element. At pressures below the setting of pilot valve (4) the forces on spool (3) are balanced and the spool remains closed due to the spring force. On reaching the set pressure, spool (3) opens and limits the pressure at port A in line with the pressure-flow characteristics.



type LFA.DB...
type LC..DB...

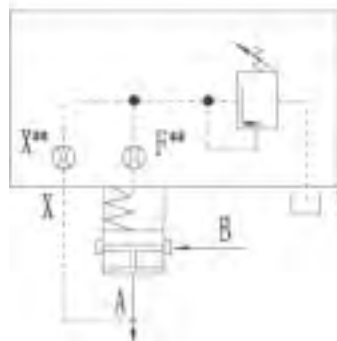
Pressure reducing function (Pages 69 to 84)

a) Normally open:

The cartridge valve for the pressure reducing function is a spool valve without an area differential (no effective area at port B). The same types of cover are used as pilot valves as are used for the pressure relief functions (type LFA..D...).

The pressure acting at port A is fed to the spring side of the spool via the pilot oil supply orifice. Below the performance limit and pressure set at the pilot valve, the spool is pressure balanced and is held open by the spring force, so that oil is free to flow from port B to port A.

On reaching the set pressure, the spool closes and reduces the pressure at port A in line with the pressure-flow characteristics.



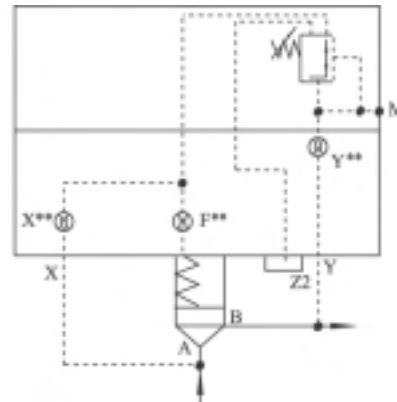
Pressure Reducing Valve
Normally open
eg.
type LFA..DB...
type LC..DR40...

Function, description

b) Normally closed:

For the pressure reducing function with a pressure reducing valve (type LFA..DR...) as the pilot valve are used. The pilot oil is fed from port A via the pilot supply orifice and the open pressure reducing pilot valve to side B.

The main spool opens and allows free flow from port A to port B. On reaching the set pressure, the spool closes and reduces the pressure at port B in line with the pressure-flow characteristics. Possible excess pressures occurring on the secondary side are led away to tank via the third port of the pilot valve. By fitting a directional valve, an additional isolating function can also be attained (type LFA..DRW...).



Pressure reducing valve
Normally closed

e.g.:
Type LFA..DB..
Type LC..DB 40D6XB

Pressure sequencing function

Control cover type LFA...DZ...

Control cover type LC...DB...

This function enables a pressure-dependent sequencing of a second system.

The required sequencing pressure is set by the pilot valve which is integrated into the control cover.

The pilot oil supply may be either external (pilot oil port X) or internal (from port A via pilot oil port X or Z2).

The spring chamber of the pilot control is drained at zero pressure via ports Y or Z1 to tank.

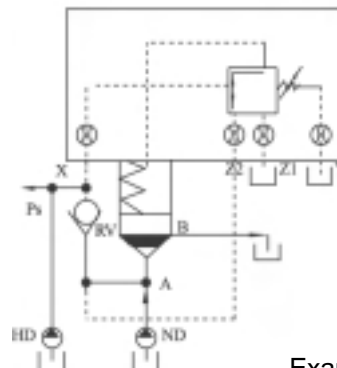
When the pressure set at the pilot control spring is reached, the pilot valve switches and unloads the spring chamber of the main valve to tank. The main spool opens and makes the connection from port A to B possible.

In model LFA..DZW..., the required spool position may be selected by means of an electrically operated pilot valve (not included within the supply of control cover) LFA..DZW...) in addition to the normal hydraulic control.

Typical circuits

Example 1:

In the circuit shown, the system is fed by a high pressure pump and a low pressure pump. The system pressure p_s acts externally from the high pressure side via the pilot oil port X on the pilot valve which, on reaching the set pressure, switches the low pressure side to give zero pressure circulation. The check valve RV (not included within the scope of supply) prevents the high pressure system from flowing into the low pressure system which is now at zero pressure.

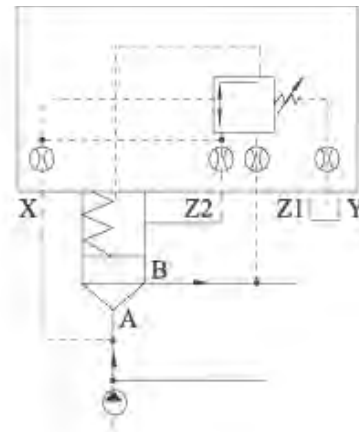


e.g.
Type LFA..DZ...6XB/...XY
Type LC..DB20D6XB

Example 1:
Circuit for the pressure dependent unloading of the low pressure system

Example 2:

With this circuit, oil is allowed to flow into system 2 when the pressure in system 1 has reached a pre-set value. The pilot oil supply is internal from port A of the main valve.



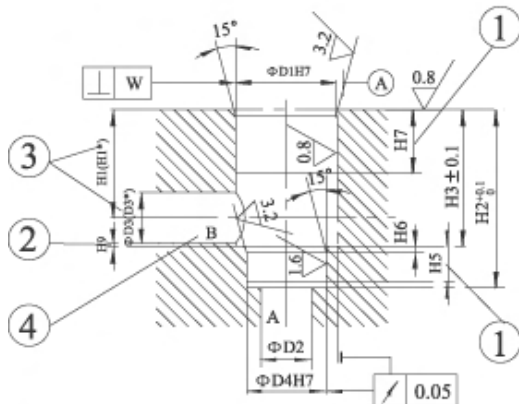
Type LFA..DZ...6XB/...Y
Type LC..DB20D6XB

Example 2:

(circuit for the pressure dependent sequencing of a 2nd system)

Installation cavity and porting pattern to DIN 24342

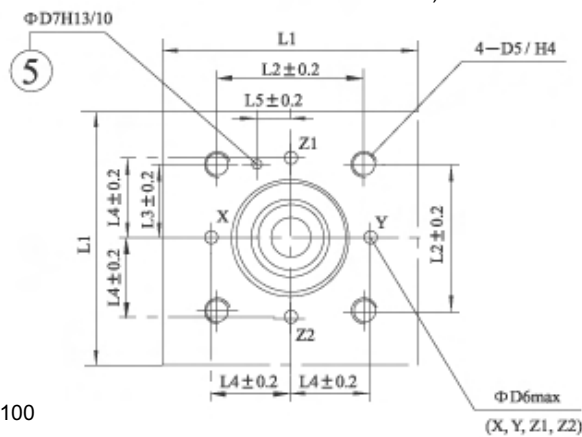
(Dimensions in mm)



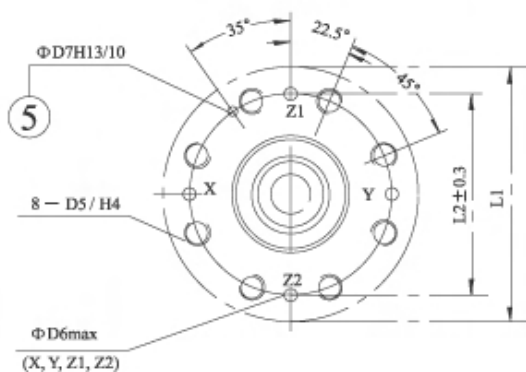
NS16...63

NS16 Note

Length L1 (It is 80mm from X to Y via the center of the hole)



NS80,100



Size	16	25	32	40	50	63	80	100
øD1	32	45	60	75	90	120	145	180
øD2	16	25	32	40	50	63	80	100
øD3	16	25	32	40	50	63	80	100
(øD3)'	25	32	40	50	63	80	100	125
øD4	25	34	45	55	68	90	110	135
øD5	M8	M12	M16	M20	M20	M30	M24	M30
øD6 ¹⁾	4	6	8	10	10	12	16	20
øD7	4	6	6	6	8	8	10	10
H1	34	44	52	64	72	95	130	155
(H1)'	29.5	40.5	48	59	65.5	86.5	120	142
H2	56	72	85	105	122	155	205	245
H3	43	58	70	87	100	130	175 ± 0.2	210 ± 0.2
H4	20	25	35	45	45	65	50	63
H5	11	12	13	15	17	20	25	29
H6	2	2.5	2.5	3	3	4	5	5
H7	20	30	30	30	35	40	40	50
H8	2	2.5	2.5	3	4	4	5	5
H9	0.5	1	1.5	2.5	2.5	3	4.5	4.5
L1	65/80	85	102	125	140	180	250	300
L2	46	58	70	85	100	125	200	245
L3	23	29	35	42.5	50	62.5	-	-
L4	25	33	41	50	58	75	-	-
L5	10.5	16	17	23	30	38	-	-
W	0.05	0.05	0.1	0.1	0.1	0.2	0.2	0.2

- 1) Max. dim.
- 1 Depth of fit
- 2 Reference dimension
- 3 For diameters of port B other than Φ D3 or (Φ D3)', the distance from the cover mounting surface to the centre of this hole must be calculated.
- 4 Port B may be moved about the central axis of port A. Care must however be taken to ensure that the fixing holes and control holes are not damaged.
- 5 Drilling for location pin

Pressure relief function

Ordering details: pressure relief cartridge valves (without control cover)

LC	DB	6X	B	*
Nominal size 16 = 16 Nominal size 25 = 25 Nominal size 32 = 32 Nominal size 40 = 40 Nominal size 50 = 50 Nominal size 63 = 63 Nominal size 80 = 80 Nominal size 100 = 100				Further details in clear text
Cracking pressure approx. 0 MPa (without spring) =00 Cracking pressure approx. 0.2 MPa =20 Cracking pressure approx. 0.4 MPa =40 **Cracking pressure 0.3 MPa only with NS16 for fitting a pilot operated pressure relief valve type DBC . -5X/				No code = Mineral oils V = Phosphate ester B= Technology of Beijing Huade Hydraulic 6X= Series 60 to 69 (60 to 69: unchanged installation and connection dimensions)
				E = Poppet valve without orifice (standard) D = Spool poppet valve without orifice (standard) A = Poppet valve with orifice B = Spool poppet valve with orifice

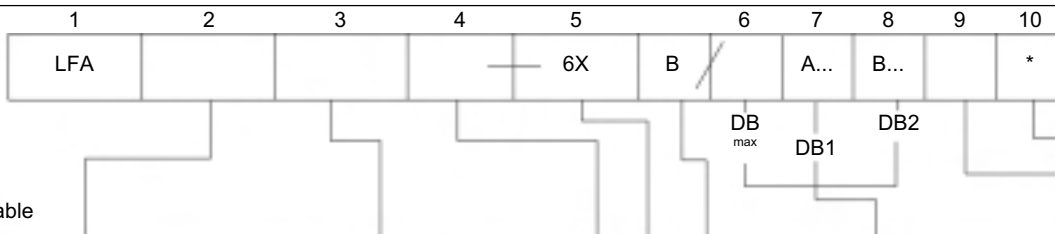
Symbols: cartridge valves (for versions see ordering details)

Poppet valve LC...DB...E6X	Spool poppet valve with orifice LC...DB...A6X	Spool poppet valve LC...DB...D6X	Spool poppet valve with orifice LC...DB...B6X

Technical data (for applications outside these parameters, please consult us!)

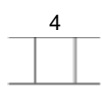
Pressure fluid		Mineral oil for NBR seals or Phosphate ester for FPM seals											
Pressure fluid temperature range		°C		-20 to +80									
Viscosity range		mm ² /s		2.8 to 380									
2-way cartridge valves													
Operating pressure at port A and B		up to 42MPa											
Size		16	25	32	40	50	63	80	100				
Max. Flow (recommend)		L/min											
Poppet valve cartridge		LC...DB..E 6X/.. LC...DB..A 6X/..		250	400	600	1000	1600	2500	4500	7000		
Spool valve cartridge		LC...DB..D 6X/.. LC...DB..B 6X/..		175	300	450	700	1400	1750	3200	4900		
Control Cover													
Max. operating pressure													
Type LFA NS	..DB.. 16..100	..DBW..			..DBS..		..DBU..		..DBE.. ..DBM..		..DBETR.. ..DBEMTR..		
		16 ...32	40...63	80,100	40...63	80,100	16..63	80,100	16...100	16...100			
Port	..X	40.0	40.0	31.5	31.5	40	31.5	35.0					
X, Y	When controlling pressure			zero pressure (up to 0.2 MPa)									
	Static state	31.5	10.0	16.0(DC) 10.0(AC)	16.0(DC) 10.0(AC)	16.0	10.0	5.0	16.0(=) 10.0(≈)	16.0	10.0	31.5	
Corresponds to the permissible tank pressure of the pilot valves	DBD...	Poppet valves, NS6	Spool valves, NS6	Spool valves, NS6	Spool valves, NS 10	Poppet valves, NS6	Poppet valves, NS6	Spool valves, NS6	Spool valves, NS 10	DBET	DBETR		

General notes on the ordering details for control covers

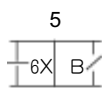


· = available

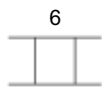
Nominal size								Type	Page	Control type	Series	Note	Pressure rating for nominal sizes		Fluid	others
16	25	32	40	50	63	80	100						16...32	40...100		
*	*	*	*	*	*	*	*	DB	47...49		6X= Series 60 to 69 Technology of Beijing Huade Hydraulic	50	025,050	For ordering details, see pages giving details of the individual cover variations		
*	*	*	*	*	*	*	*	DBW	50...54			100	100,200			
*	*	*	*	*	*	*	*	DBS	50...54			200	025,050			
*	*	*	*	*	*	*	*	DBWD	55...57			315	100,200			
*	*	*	*	*	*	*	*	DBU2A	58...61			420	315			
*	*	*	*	*	*	*	*	DBU2B								
*	*	*	*	*	*	*	*	DBU3D	62...66							
*	*	*	*	*	*	*	*	DBE	67							
*	*	*	*	*	*	*	*	DBETR								
*	*	*	*	*	*	*	*	DBEM	68...71							
*	*	*	*	*	*	*	*	DBEMTR								
												050,100	025,050			
												200,315	100,200			
												420	315,420			



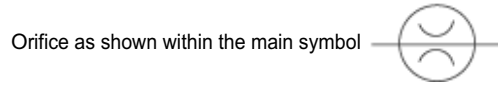
Pressure data for DB1, only required for types DBU2 and DBU3D



Pressure data for DB2, only required for types DBU3D
Ordering example for type DBU3D
.../315* A B 200 (DB max. /DB1/DB2)
*DB max. always first



The control covers are always fitted with a, optimised on our test rig, standard orifice. Orifice details are therefore not required in the type code. Deviating operating conditions could make it necessary to match the orifice size. The orifices are of the threaded type.



Orifice as shown within the main symbol

- 100 = 10.0 MPa
- 200 = 20.0 MPa
- 315 = 31.5 MPa
- 400 = 40.0 MPa
- 420 = 42.0 MPa

General notes on the ordering details for control covers

Note:

By combining a 2-way cartridge valve with a pilot valve, various valve functions may be implemented. The following components may be considered with porting pattern form A6 (up to NS63) and form A10 (NS 80 to 100) to DIN 24 340.

Valve fixing screws are included within the control cover scope of supply.

Directional spool valve

Directional spool valve	NS	Catalogue sheet no.	Control cover
3WE6 B9-5XB/...	6		DBW,DBWD
4WE6 D 5XB/...	6		DBW,DBU2 ^A ,DBU3D
4WE6 M 5XB/...	6		
4WE6 H 5XB/...	6		DBU2A,DBU3D
4WE6 E 5XB/...	6		DBU3D
4WE10 D...	10		DBW,DBU3D,DBU2 ^A
3WE10 B9...	10		DBW,DBWD
3WE10 A...	10		DBWD
4WE10 M...	10		
4WE10 H...	10		DBU2A,DBU3D
4WE10 E...	10		DBU3D

Directional poppet valve

Directional poppet valve	NS	Catalogue sheet no.	Control cover
M-3SEW6 C 2XB/...	6		DBW,DBS
M-3SEW6 U 2XB/...	6		DBW,DBS
M-3SE10 C 2XB/315...	10		DBS
M-3SE10 U 2XB/315...	10		DBS
M-3SE10 C 2XB/630...	10		DBS.../400
M-3SE10 U 2XB/630...	10		DBS.../400

Note: The pilot valve must be ordered separately, other details see relevant catalogue sheet. But valve fixing screws are included in supply.

Manual adjustment pressure relief cartridge valve

(Included within the scope of supply, need't to be orderd separately!)

pressure relief valve, direct operated	NS	Control cover
DBD.2K 1XB/...	2	16 to 32
DBD.6K 1XB/...	6	40 to 63
DBD.10K 1XB/...	10	80 to 100

Proportional pressure relief valve.

Proportional pressure relief valve				Control cover	
Type	NS	possible pressure grades (MPa)	Catalogue sheet no.	Type	NS
DBET-5XB/...G24-1	6	5.0		DBE***	16 to 32
DBET-5XB/...G24		10.0			40
DBET-5XB/...YG24-1		20.0		50 to 100	
DBET-5XB/...YG24-1		31.5		DBEM	50 to 100
DBET-5XB/...YG24-1		35.0			
DBET-1XB/...	6	2.5		DBETR***	16 to 40
DBET-1XB/...Y409		8.0			50 to 100
DBET-1XB/...		18.0			16 to 40
DBET-1XB/...		31.5			
DBETR-1XB/...Y409		35.0		50 to 100	

* * * Control cover of type DBE,DBETR only used in Nominal size max. to 63.

1 = G1/4" threaded port T, special spool

409 = G1/4" threaded port T.

Instead of type LFA16DB...and L FA16DBW control cover, may chose pressure relief valve in table.	Nominal Size
Polit control accoring to sheet RC 25802 (not follow DIN port dimension)	
DBC.-5X...SO187	
DBWC.-5X/...SO 187 (Used in direction valve unloading)	

Compression springs Note

Nominal size and Material no. of Compression springs, see sheet Page 73

Pilot control valves (selection table)

	Nom. size			Type	Pilot control valve	Manual pressure setting			Symbols			
	16to 32	40to 63	80to 100									
	●	●	●	DB		Without directional valve						
						With directional valve			1			
						Position "a"	Position "b"					
	● = available					Position "a"	Position "o"	Position "b"				
Directional valve unloading	●	●		DBW	3WE6B9-...	open	DB function		2,3			
					M-3SEW6C...							
	●	●			4WE6D ...	DB function	open					
					M-3SEW6U...							
	●		●		3WE10B9 ...	open	DB function			3		
					4WE10D...	DB function	open					
		●		DBS	M-3SEW6C...	open	DB function		4			
			●		M-3SEW6U...	DB function	open					
			●		M-3SE10C./..	open	DB function					
			●		M-3SE10U./..	DB function	open					
Isolating function	●	●		DBWD	3WE6B9-...	DB function	closed		5			
			●		3WE10B9-...							
	●	●			3WE6A-...	closed	DB function	open				
	●	●			4WE6M...			open				
			●		3WE10A-...							
			●		4WE10M...							
2 pressure stages	●	●		DBU2A	4WE6H...	DBmax function	open	DB1 Proportional	6			
			●		4WE10H...							
	●	●			4WE6D...		DB1 function	DBmax function				
			●		4WE10D...							
3 pressure stages	●	●		DBU2B	4WE6D...	DB1 function	DBmax function		-			
			●		4WE10D...							
	●	●			DBU3D	4WE6H...	DB2 function	open		DB1 Proportional	7	
			●			4WE10H...						
	●	●				4WE6E...		DBmax function		DB1 function		
			●			4WE10E...						
	●		4WE6D...									
		●	4WE10D...									
Proportional valves	●	●		DBE	DBET-5XB/...	Proportional pressure setting			8			
	●	●		DBETR	DBETR-1XB/...	Without max. pressure safety limitation						
	●	●	●	DBEM	DBET-5XB/...	With max. pressure safety limitation				9		
	●	●	●	DBEMTR	DBETR-1XB/...							

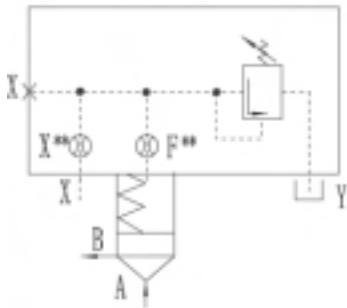
Open = bypass circuit
 Closed = cartridge valve is hydraulically blocked
 DB function = pressure relief function

Symbol overview (basic symbols), pressure relief function

Valid symbols are shown in the following type descriptions!

1

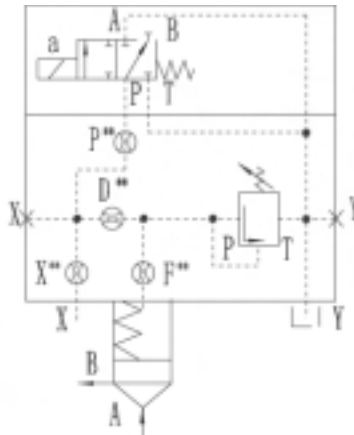
LFA...DBW-../.. NS 16 to 100



see pages 47 to 49

2

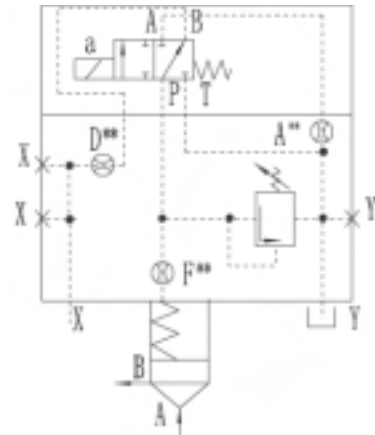
LFA...DBW-../.. NS 16 to 32



see pages 50 to 51

3

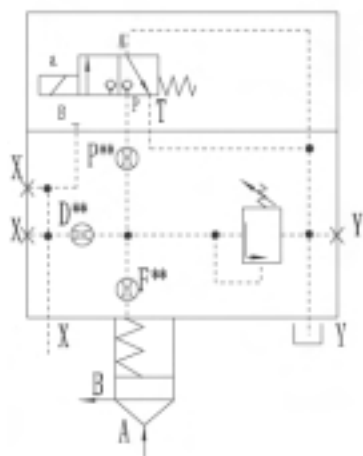
LFA...DB-../.. NS 10 to 100



see pages 50 to 54

4

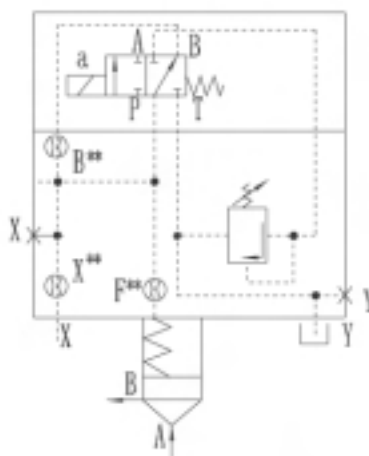
LFA...DBS-../..NS 40 to 100



see pages 50 to 54

5

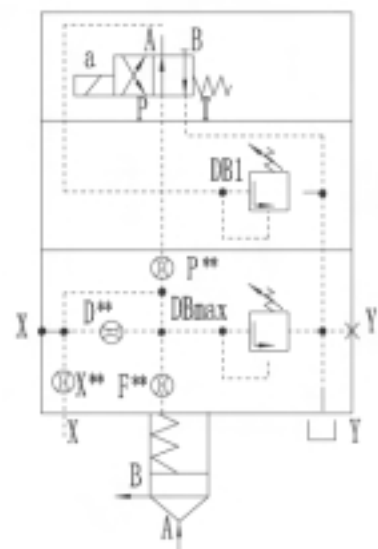
LFA...DBWD-../..NS 16 to 100



see pages 55 to 57

6

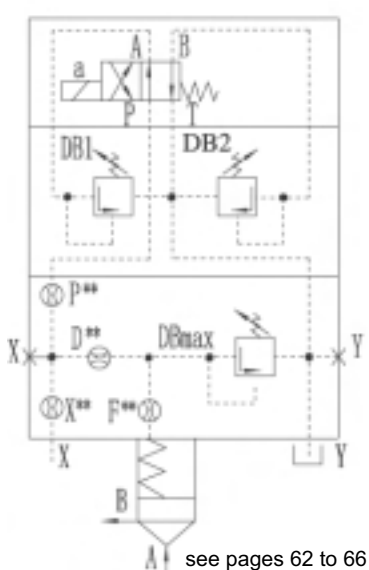
LFA...DBU 2A-../..NS 16 to 100



see pages 58 to 61

7

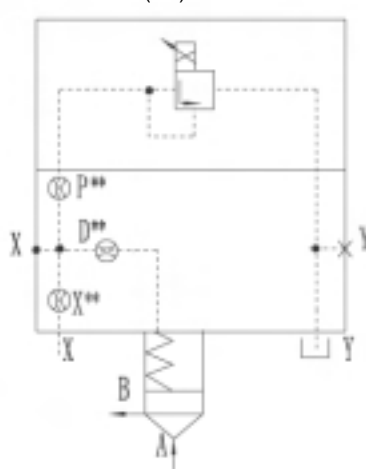
LFA...DBU 3D-../..NS 16 to 100



see pages 62 to 66

8

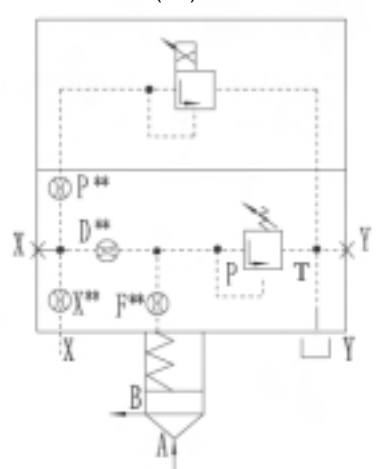
LFA...DBE(TR)-../..NS 16 to 63



see page 67

9

LFA...DBEM(TR)-../..NS 16 to 100



see pages 68 to 71

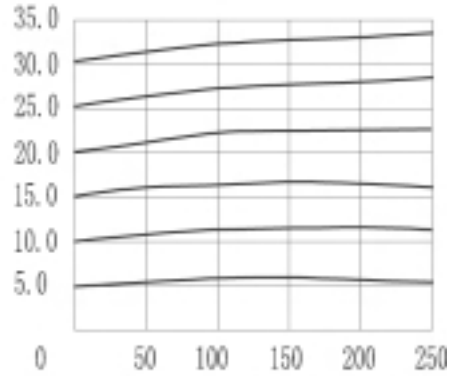
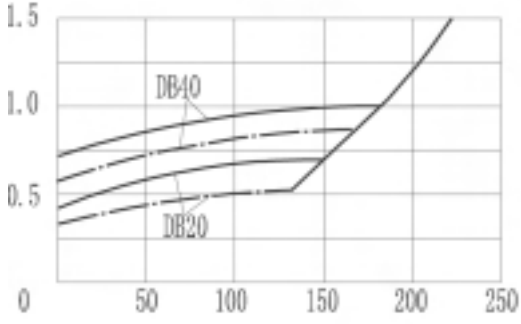
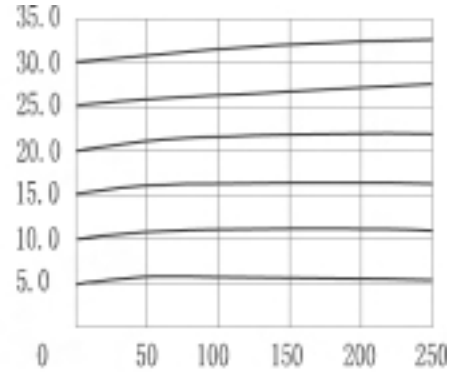
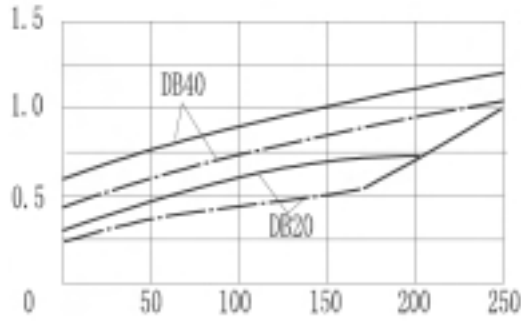
Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

NS 16 The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

Manual pressure adjustment, type LFA16 DB DBW...6XB/...

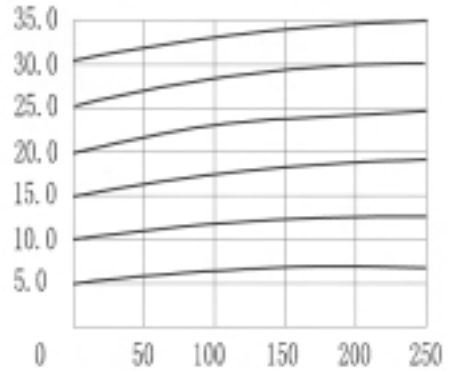
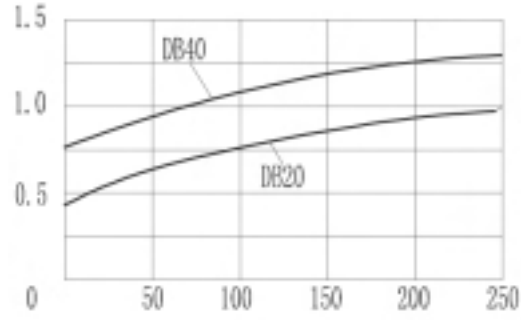
--- Bypass pressure in MPa
 - - - Lowest settable pressure in MPa

--- Bypass pressure in MPa
 - - - Lowest settable pressure in MPa

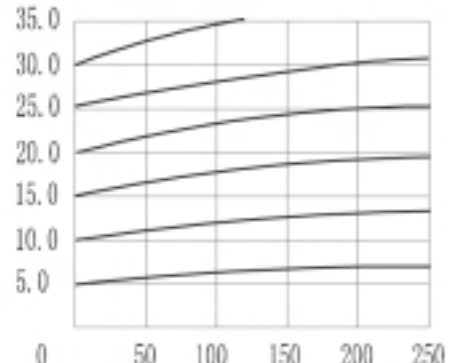
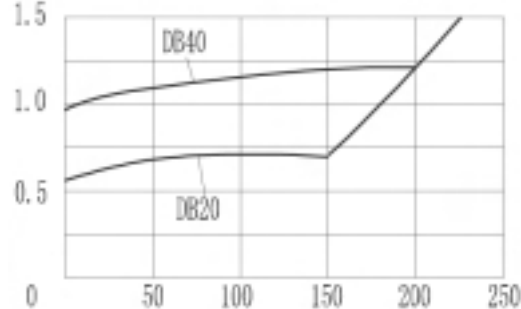


Electrical proportional pressure adjustment, type LFA16DBE...6XB/...

Lowest settable pressure in MPa



Lowest settable pressure in MPa



Flow in L/min

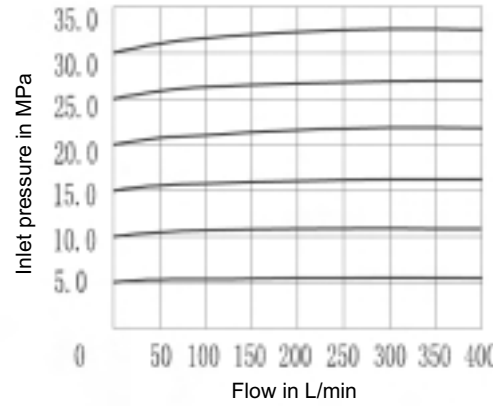
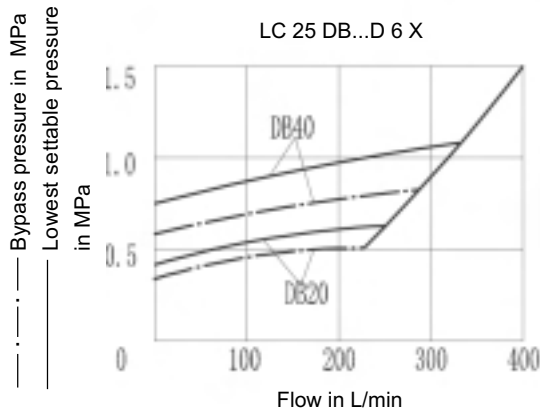
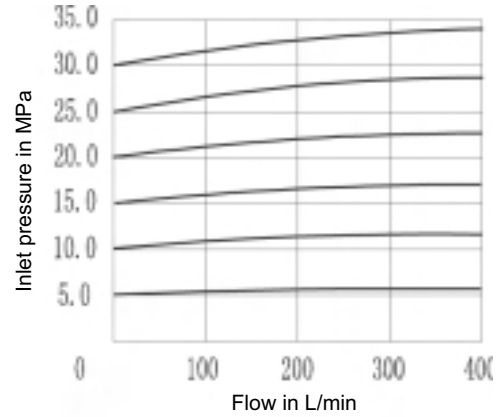
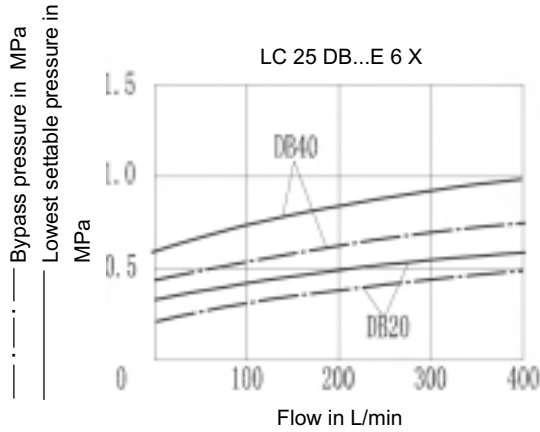
Flow in L/min

Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

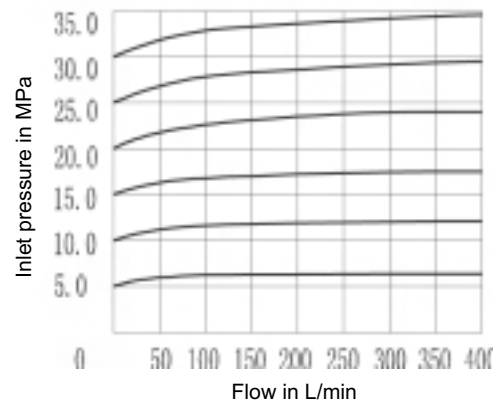
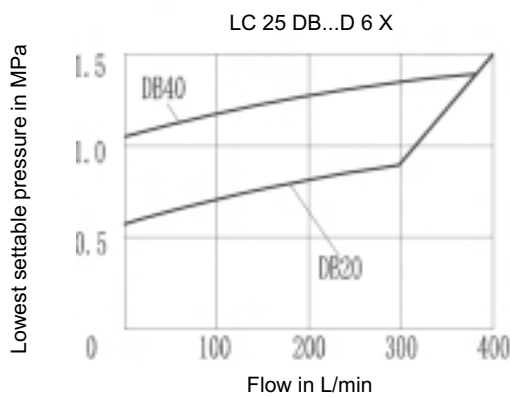
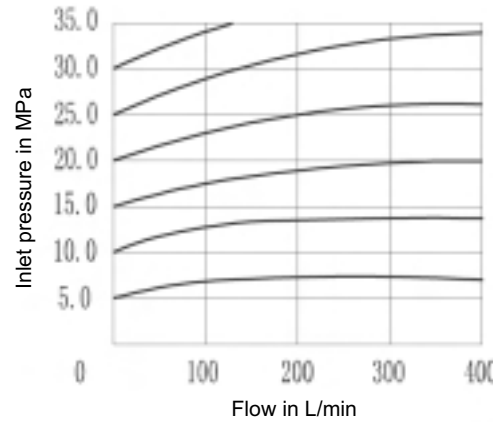
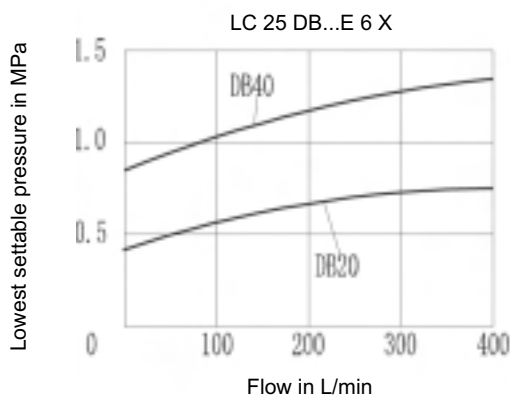
NS 25

The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

Manual pressure adjustment, LFA 25 DB DBW...6XB/...



Electrical proportional pressure adjustment, type LFA25DBE...6XB/...

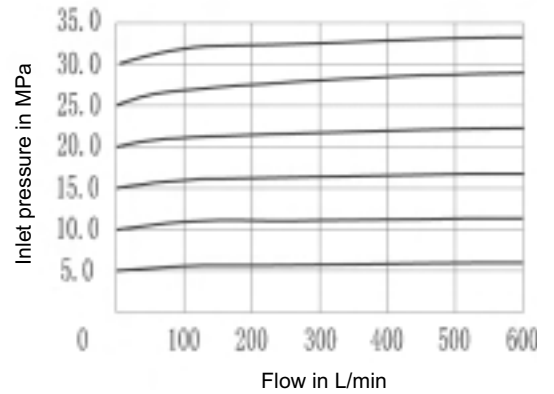
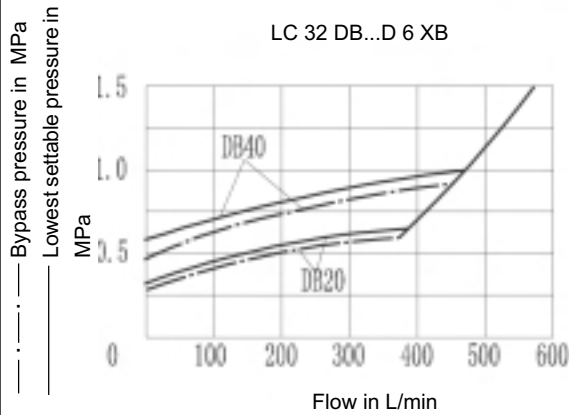
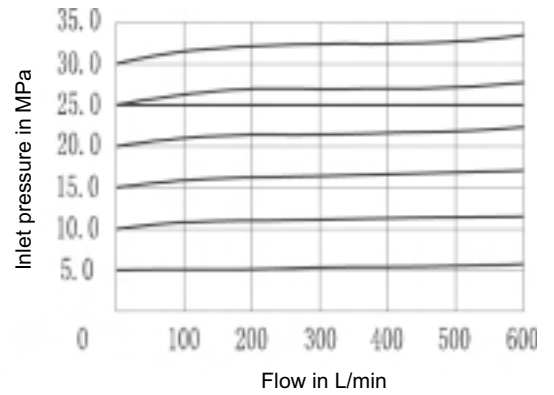
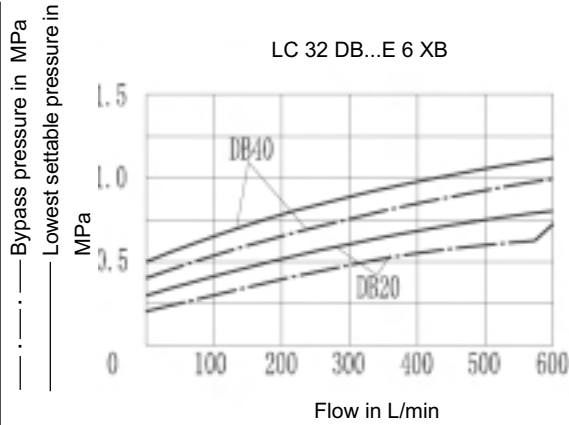


Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

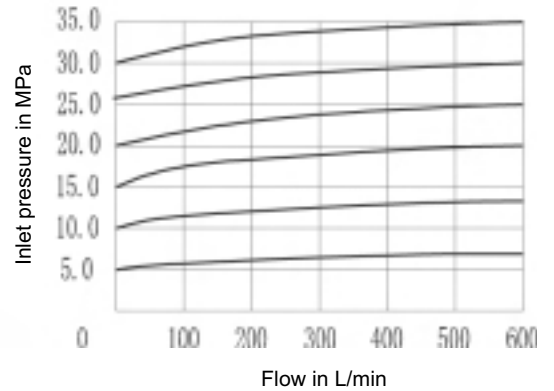
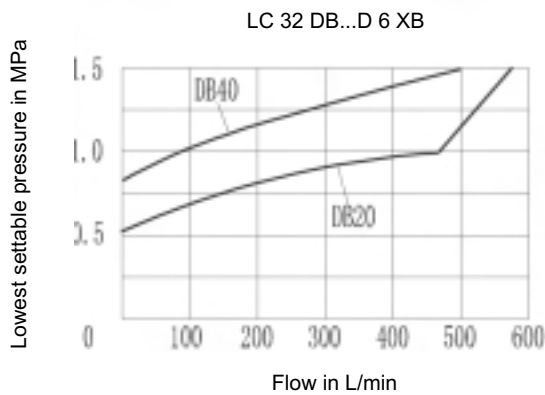
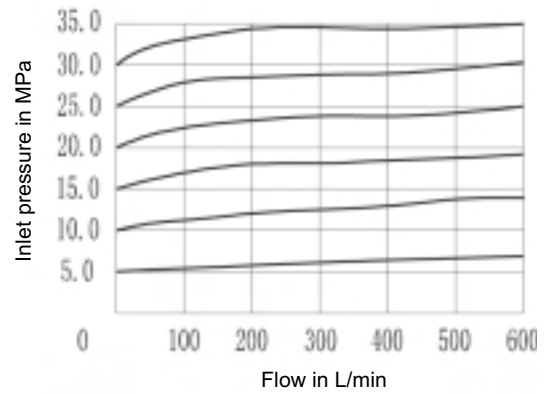
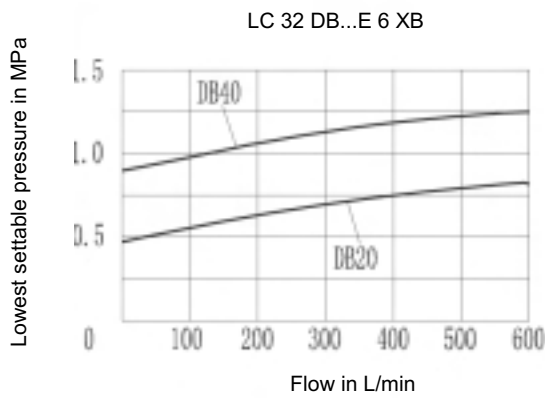
NS 32

The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

Manual pressure adjustment, type LFA 32 DB DBW...6XB/...



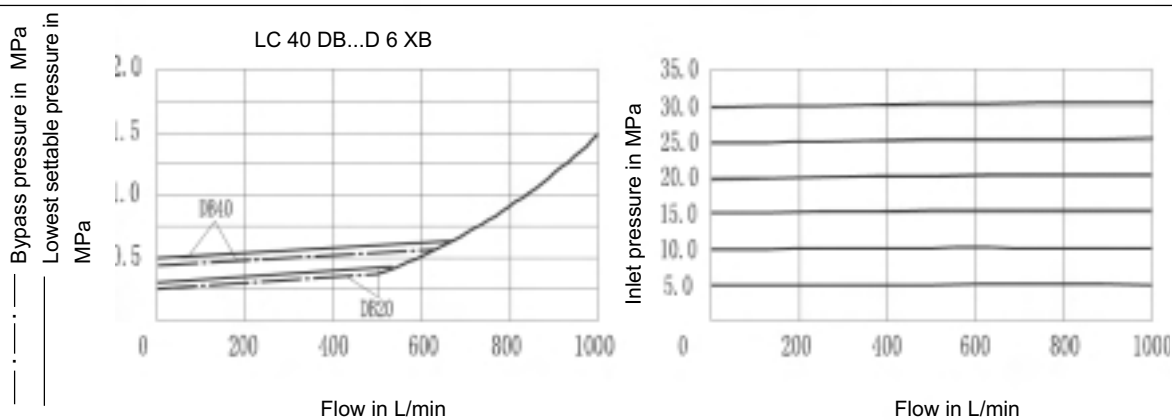
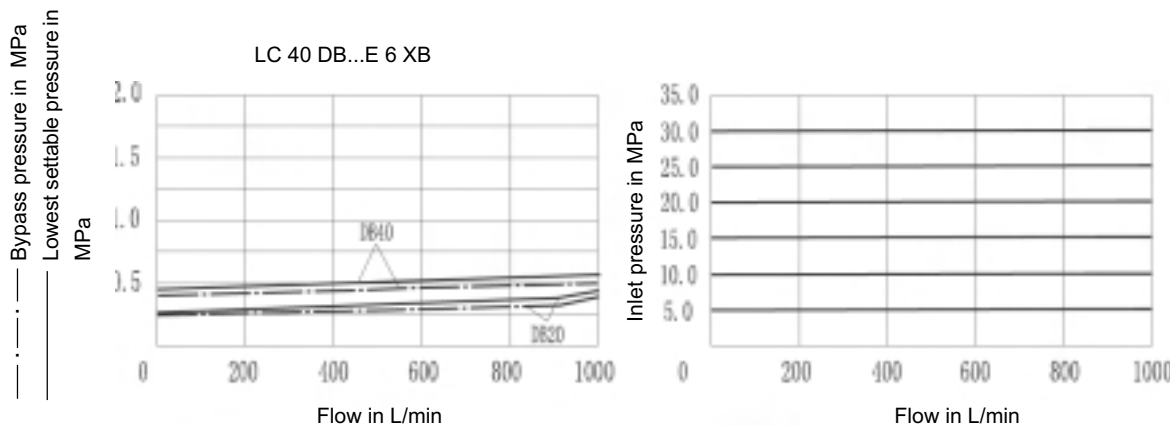
Electrical proportional pressure adjustment, type LFA16DBE...6XB/...



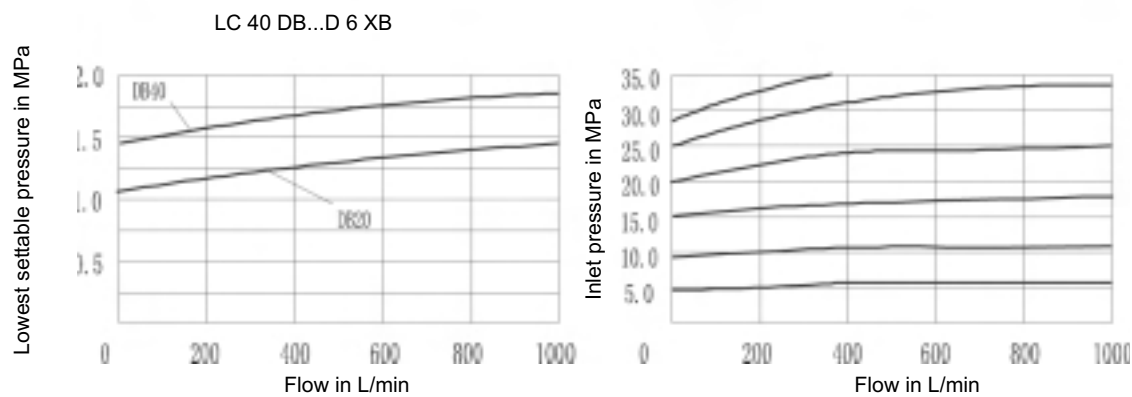
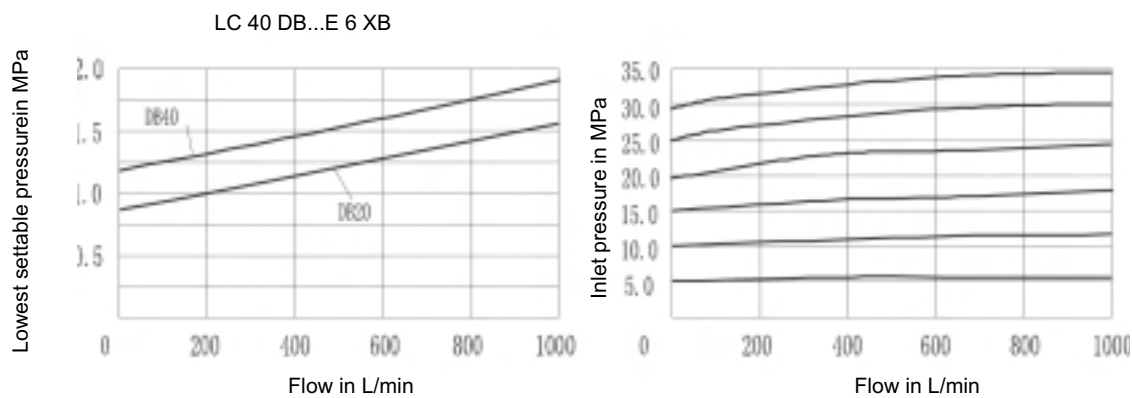
Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

NS 40 The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

Manual pressure adjustment, type LFA 40 DB DBW...6XB/...



Electrical proportional pressure adjustment, type LFA40DBE...6XB/...

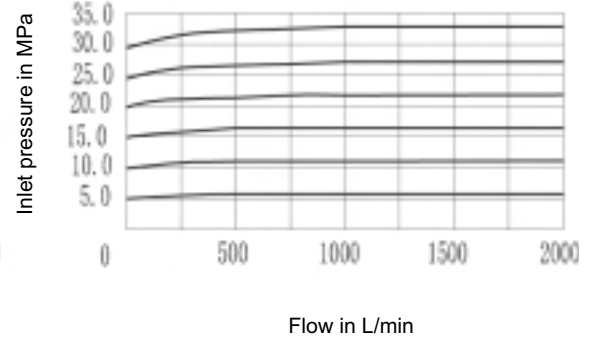
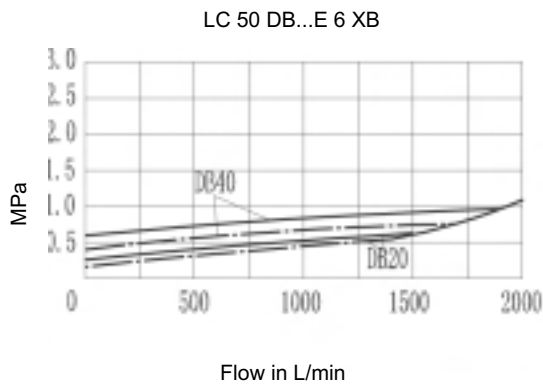


Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

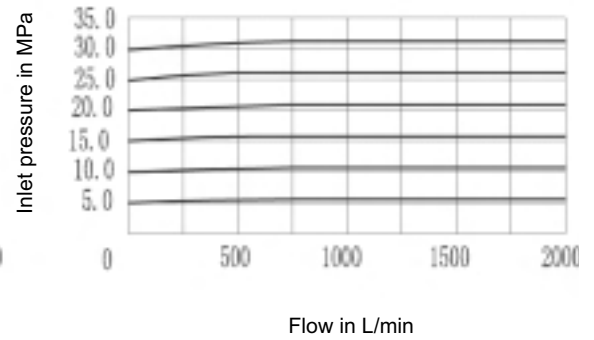
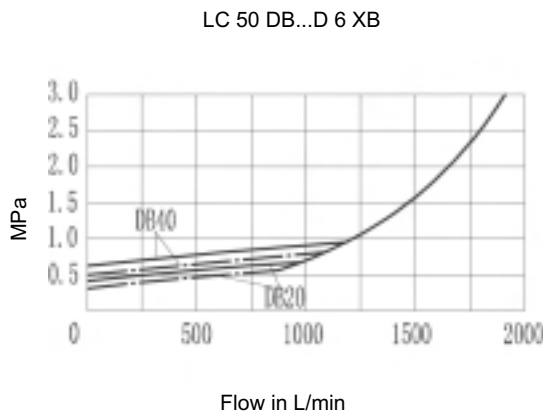
NS 50 The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

DB
Manual pressure adjustment, type LFA 50 DBW...6XB/...

— Bypass pressure in MPa
— Lowest settable pressure in MPa

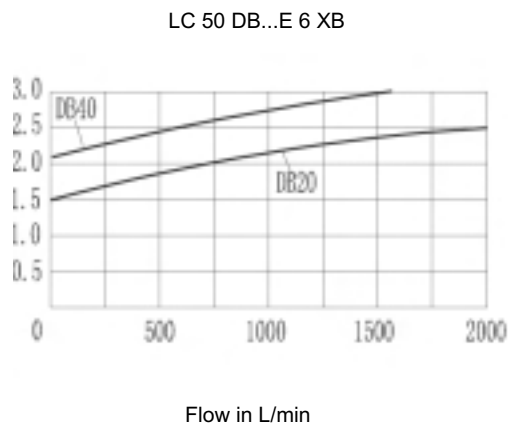


— Bypass pressure in MPa
— Lowest settable pressure in MPa

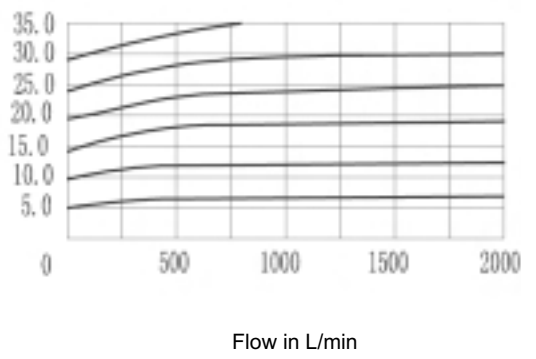


Electrical proportional pressure adjustment, type LFA50DBE...6XB/...

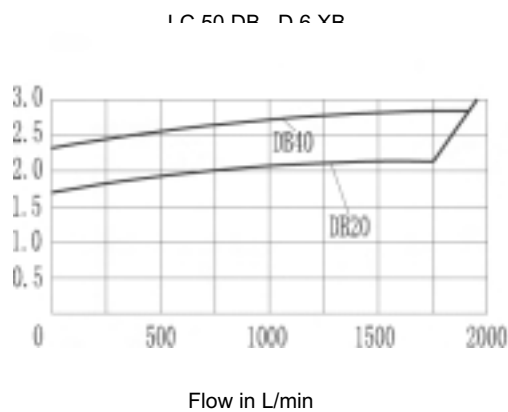
Lowest settable pressure in MPa



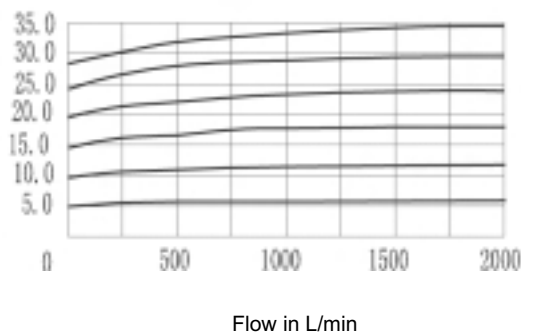
Inlet pressure in MPa



Lowest settable pressure in MPa



Inlet pressure in MPa

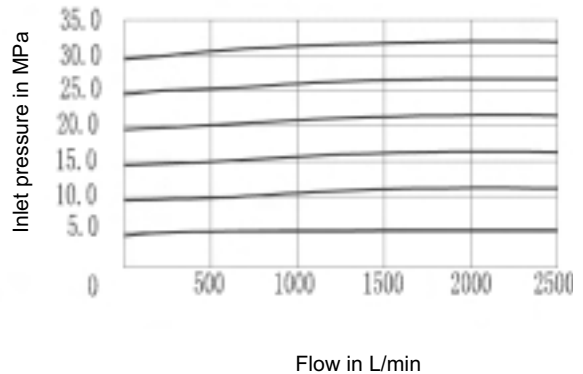
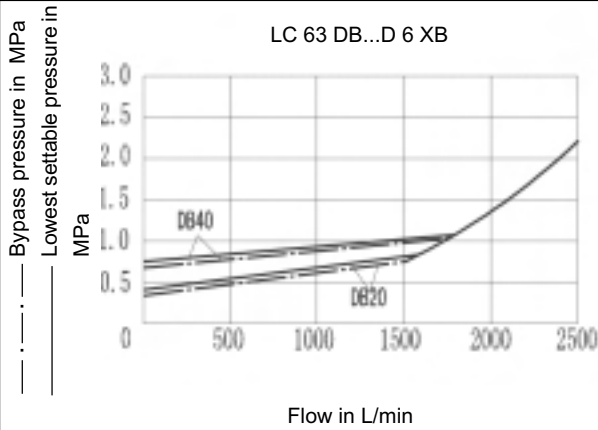
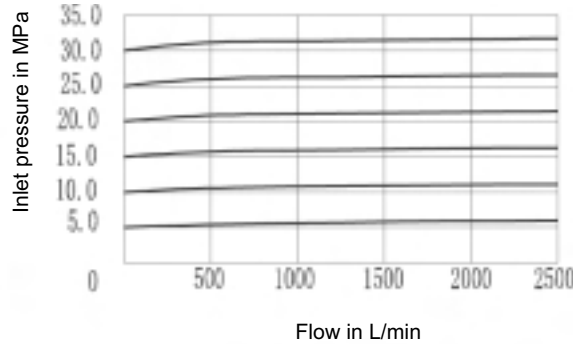
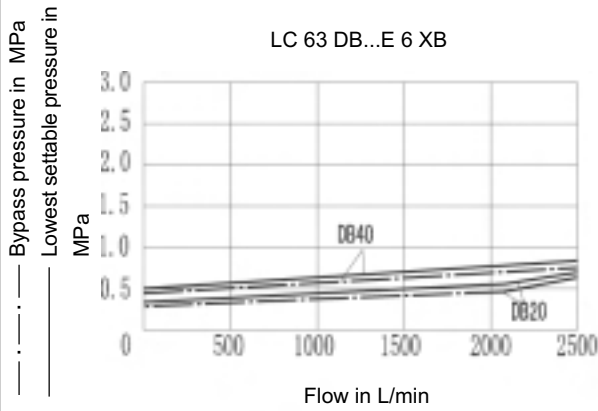


Characteristic curves: (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

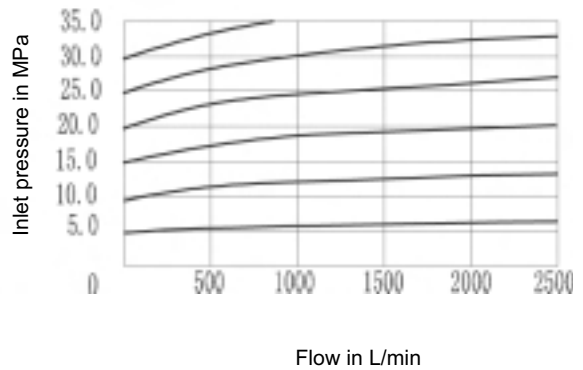
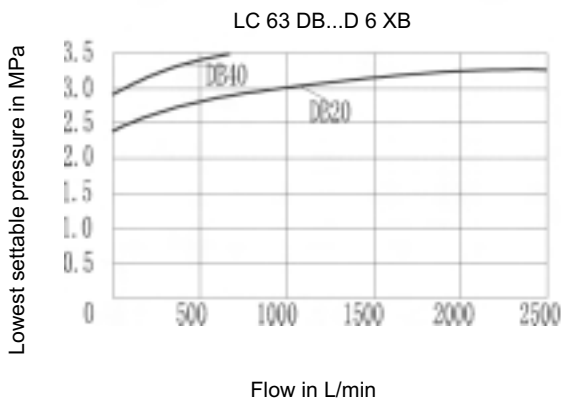
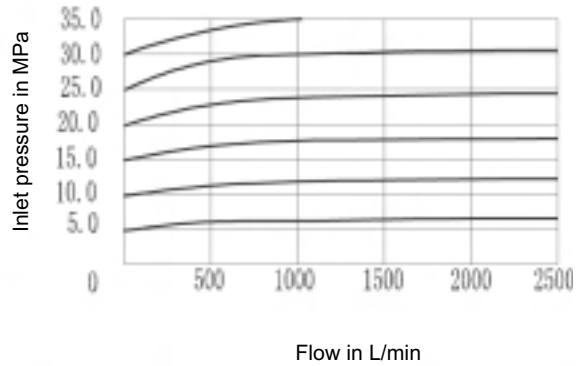
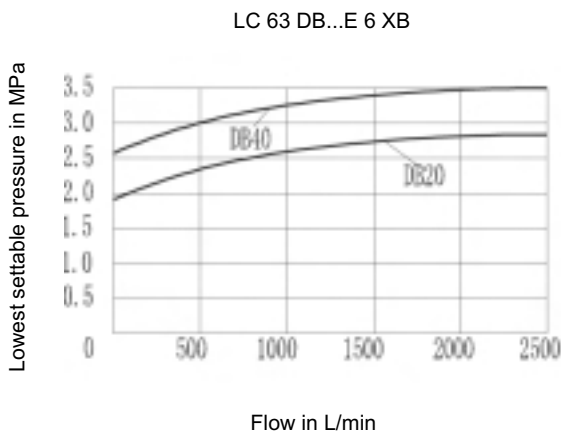
NS 63

The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased to the pressure being applied at port B.

DB
DBW ...6XB/...
Manual pressure adjustment, type LFA 63



Electrical proportional pressure adjustment, type LFA63DBE...6XB/...



O-rings dimensions for ports X, Y (included within the scope of supply)

NS	Dimensions (mm)	Material no.	
		NBR	FPM
16	7.65 × 1.78	004 491	006 585
25	9.25 × 1.78	007 111	009 097
32	10.82 × 1.78	008 937	008 941
40,50	12.37 × 2.62	004 489	008 949
63	18.72 × 2.62	009 245	002 045
80	26.58 × 3.53	004 490	008 944
100	34.52 × 3.53	009 354	009 191

Seal kits for control cover type LFA..

Seal kits for cartridge valves type LC...DB../ (NS 16 to 100)

Seal kit for	Material no.		Seal kit for	Ordering code	
	NBR	FPM		NBR	FPM
LC16DB..6XB/..	314352	314353	LC50DB..6XB/..	314056	314065
LC25DB..6XB/..	314354	314355	LC63DB..6XB/..	314057	314066
LC32DB..6XB/..	314356	314357	LC80DB..6XB/..	314058	314067
LC40DB..6XB/..	314055	314064	LC100DB..6XB/..	314059	314068

Seal kits for control cover type LF... (NS 16 to 100)

Material no. Seal kit for	Ordering no.							
	16		25		32		40	
	NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
..DB...DBW...DBS..								
..DBWD...DBWEM(TR)..	313955	313956	313957	313958	313802	313803	313722	313723
..DB..U2...DBU3..	313709	313710	313711	313712	313713	313714	313715	313716
DBE(TR)	313701	313702	313703	313704	313705	313706	313707	313708

Material no. Seal kit for	Ordering no.							
	50		63		80		100	
	NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
..DB...DBW...DBS..								
..DBWD...DBWEM(TR)..	313724	313725	313726	313727	310533			
..DB..U2...DBU3..	313717	313718	313719	313720				
DBE(TR)	313897	313898	313899	313700				
DBEM(TR)	313893	313894	313895	313896	311930			

Fixing screws (included within the scope of supply)

NS	Qty	Dimensions	Tightening torque in Nm	NS	Qty	Dimensions	Tightening torque in Nm	NS	Qty	Dimensions	Tightening torque in Nm
16	4	M8 × 45	32	40	4	M20 × 70	520	80	8	M24 × 120	900
25	4	M12 × 50	110	50	4	M30 × 80	520	100	8	M30 × 120	1800
32	4	M16 × 60	270	63	4	M30 × 100	1800				

Orifice thread size

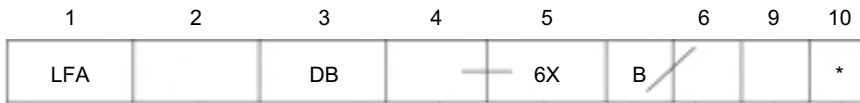
D-orifices for type ..DBE.. NS 25 to 63 M8 x 1 tapered
 Orifices for NS 80, 100 M8 x 1 tapered or G 1/4"
 Other built-in orifices M6 tapered

Compression springs Note

Nominal size and Material no. of Compression springs, see sheet Page 73

Control cover with manual pressure adjustment

NS 16 to 100



Further details in clear text

Nominal size 16	= 16
Nominal size 25	= 25
Nominal size 32	= 32
Nominal size 40	= 40
Nominal size 50	= 50
Nominal size 63	= 63
Nominal size 80	= 80
Nominal size 100	= 100

No code = Mineral oils
V = Phosphate ester

Pressure ratings

NS 16, 25, 32	NS 40, 50, 63, 80, 100
050 = 5.0 MPa	025 = 2.5 MPa
100 = 10.0 MPa	050 = 5.0 MPa
200 = 20.0 MPa	100 = 10.0 MPa
315 = 31.5 MPa	200 = 20.0 MPa
420 = 42.0 MPa	315 = 31.5 MPa
	400 = 40.0 MPa

Adjuster type

Rotary knob	= 1
Hexagon with protective cap	= 2
Lockable rotary knob with scale (H-lock to automotive industry standards)	= 3
Rotary knot with scale not lockable	= 4

B = Technology of Beijing Huade Hydraulic

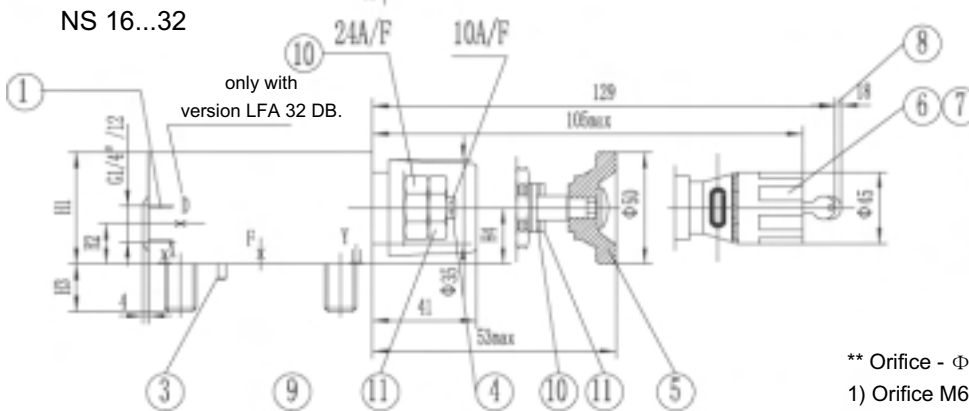
6X= Series 60 to 69 (60 to 69: unchanged installation and connection dimensions)

with NS 32



- 1 Port X optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space require to remove the key
- 9 Nameplate
- 10 Lock nut
- 11 Setting nut for max. pressure

NS 16...32



** Orifice - Φ

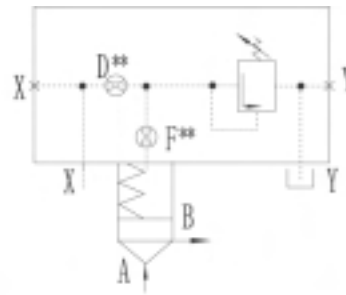
1) Orifice M6 tapered

NS	16	25	32
X"	0.8	0.8	-
F"	1.0	1.0	1.2
D"	-	-	0.8
H1	40	40	50
H2	17	19	26
H3	15	24	28
H4	19	19	26
L1	65	85	100
L2	80	85	100
L3	36.5	49	56.5
L4	32.5	45.5	53

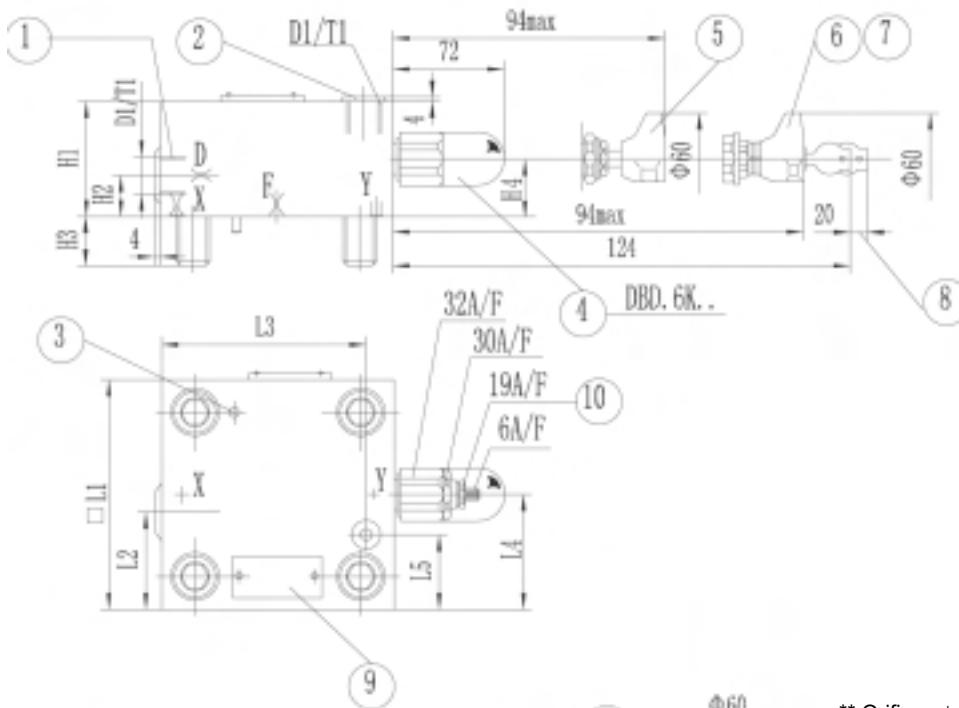
Control cover with manual pressure adjustment

(Dimensions in mm)

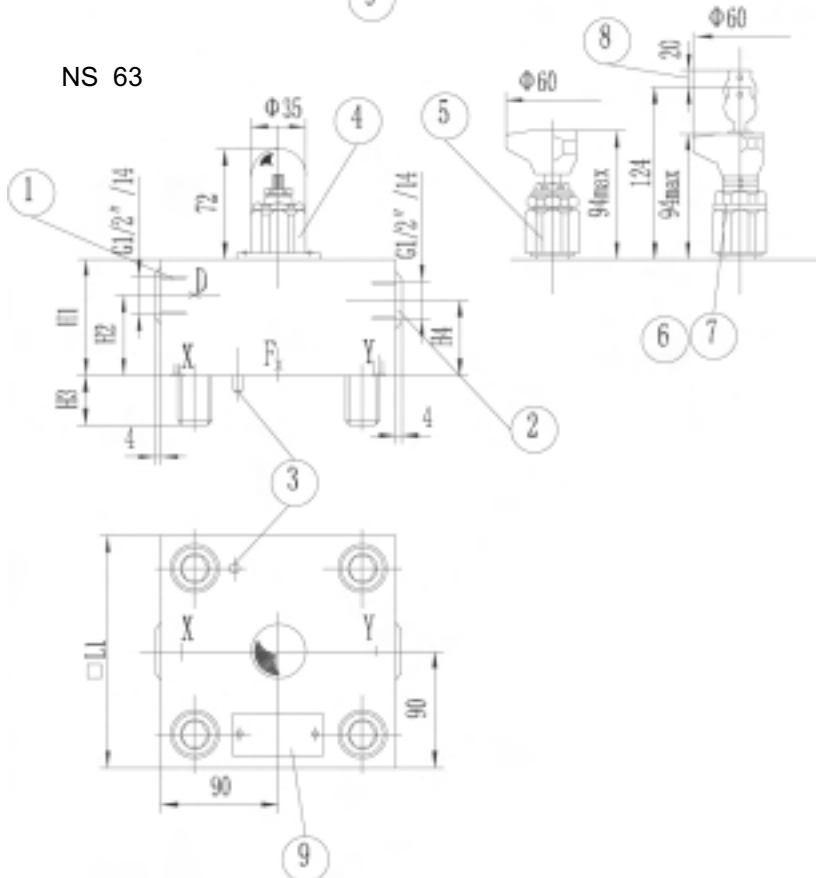
LFA..DB.-./...
NS 40, 50, 63



NS 40, 50



NS 63



** Orifice - ϕ
1) Orifice M6 tapered

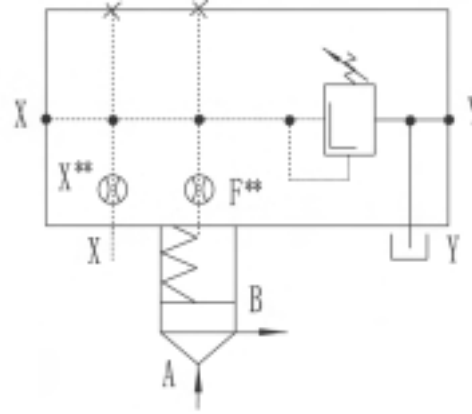
NS	40	50	63
F**	1.2	1.2	1.5
D**	1.0	1.2	1.5
D1	G1/4"	G1/2"	-
H1	60	68	82
H2	28	19.5	30
H3	32	34	50
H4	27	35	45.5
\square L1	125	140	180
L2	69	80	-
L3	89	105	-
L4	76	84	-
L5	60	70	-
T1	12	14	-

- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

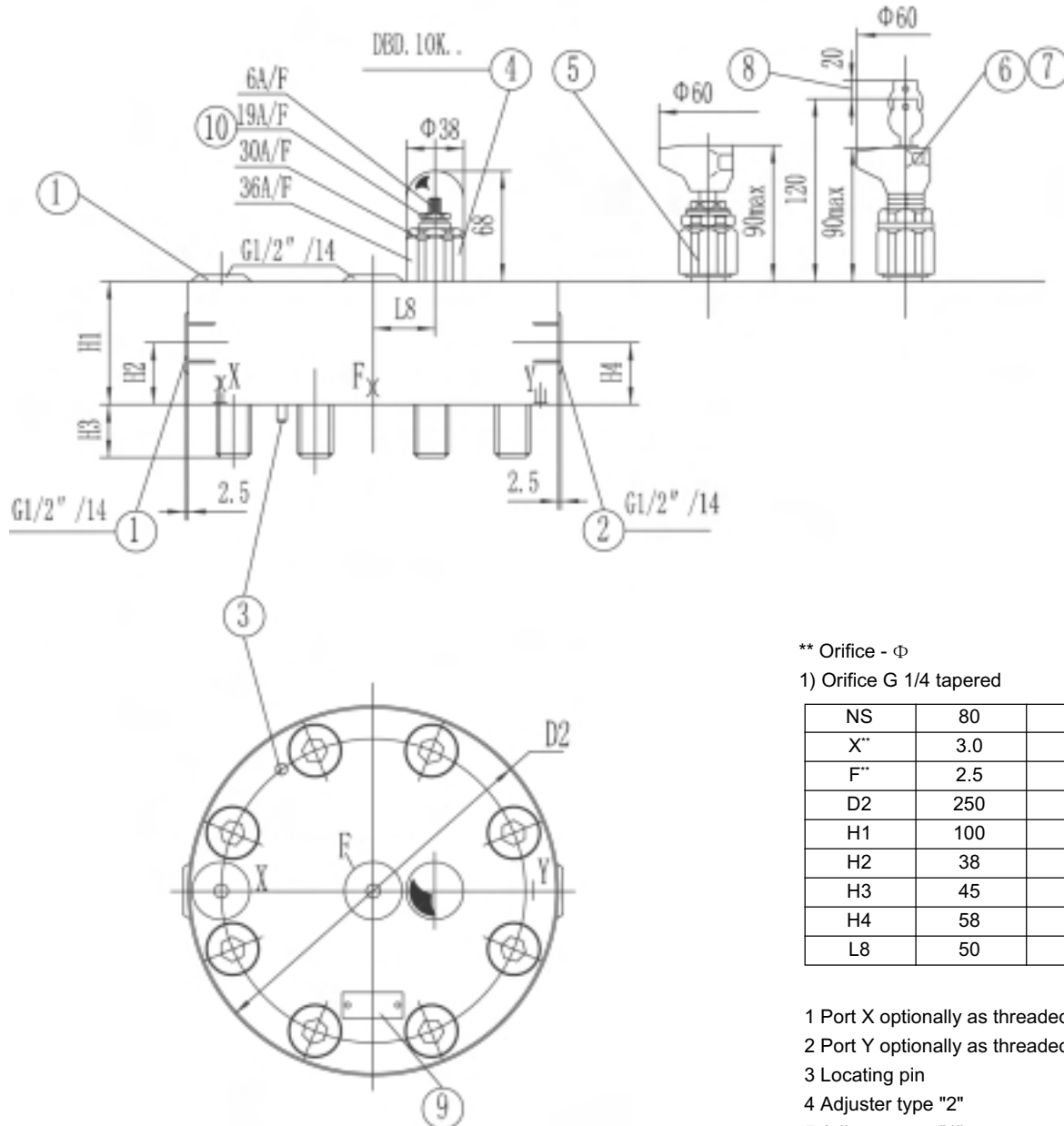
Control cover with manual pressure adjustment

(Dimensions in mm)

LFA..DB.-./...
NS 80, 100



NS 80, 100



** Orifice - Φ

1) Orifice G 1/4 tapered

NS	80	100
X"	3.0	3.0
F"	2.5	2.5
D2	250	300
H1	100	100
H2	38	38
H3	45	51
H4	58	58
L8	50	50

1 Port X optionally as threaded port

2 Port Y optionally as threaded port

3 Locating pin

4 Adjuster type "2"

5 Adjuster type "1"

6 Adjuster type "3"

7 Adjuster type "4"

8 Space required to remove key

9 Nameplate

10 Lock nut

Control cover with manual pressure adjustment, for electrical unloading

NS 16 to 100

1	2	3	4	5	6	9	10
LFA		DB		6X	B		*

Further details in clear text

NS 16 =16	NS 50 =50
NS 25 =25	NS 63 =63
NS 32 =32	NS 80 =80
NS 40 =40	NS 100 =100

Control cover type
 For mounting a directional spool
 or directional poppet valve (NS 16, 25, 32) =DBW
 For mounting a directional poppet valve
 (for NS 40, 50, 63, 80, 100) =DBS

Adjuster type

Rotary knot	= 1
Hexagon with protective cap	= 2
Lockable rotary knob with scale (H-lock to automotive industry standards)	= 3
Rotary knot with scale not lockable	= 4

No code = Mineral oils
 V = Phosphate ester

Pressure ratings

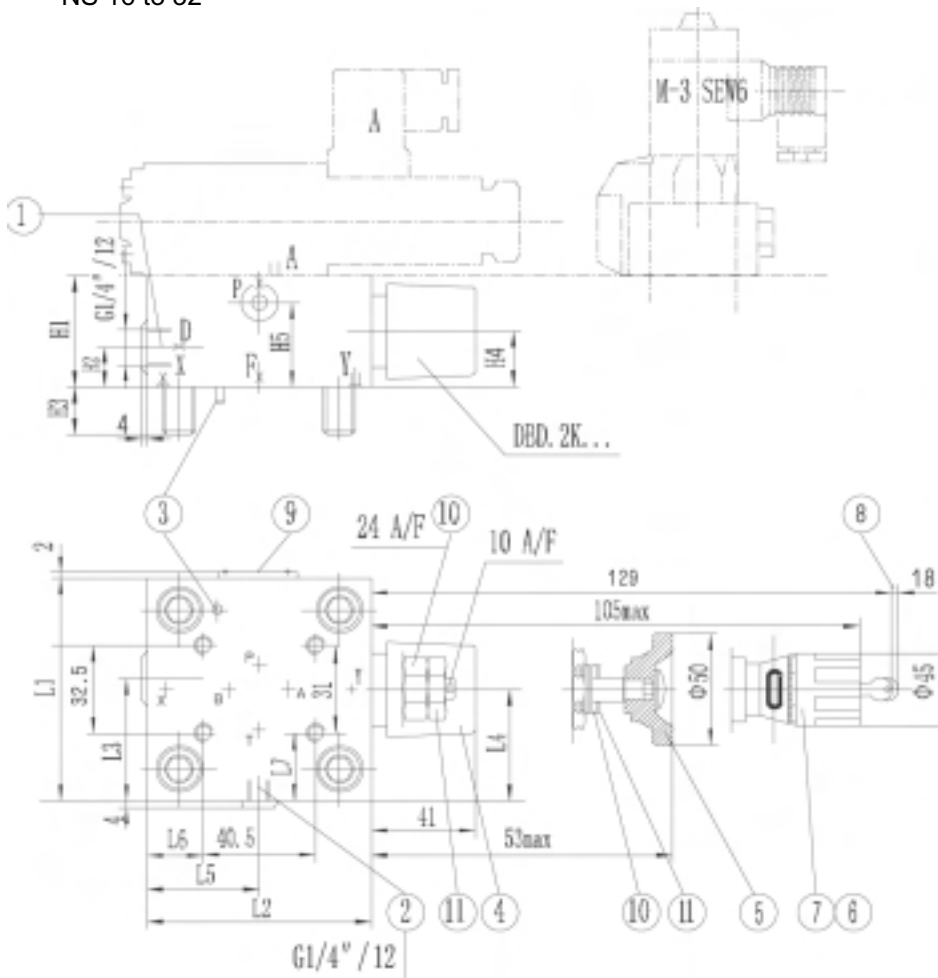
(take max. perm. pressure of pilot valve into account)

size 16, 25, 32	size 40, 50, 63, 80, 100
050=5.0MPa	025=2.5MPa
100=10.0MPa	050=5.0MPa
200=20.0MPa	100=10.0MPa
315=31.5MPa	200=20.0MPa
420=42.0MPa	315=31.5MPa
	400=40.0MPa

B = Technology of Beijing Huade Hydraulic

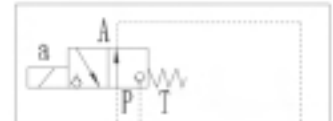
6X = Series 60 to 69(60 to 69 unchanged installation and connection dimensions)

NS 16 to 32



Parts and dimensions see page 48

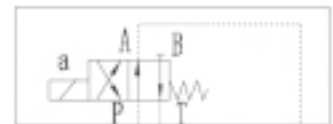
M-3 SEW 6 U 2XB/..



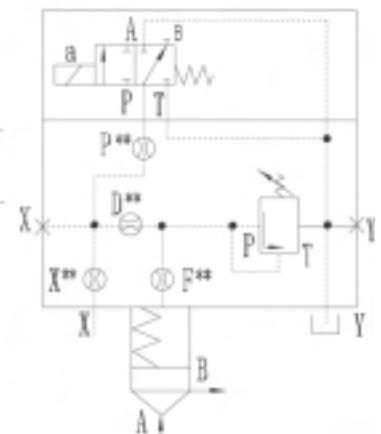
M-3 SEW 6 C 2XB/..



4 WE 6 D 5XB/..



3 WE 6 B9-5XB/..



LFA..DBW.-./..
 size 16, 25, 32

Control cover with manual pressure adjustment, for electrical unloading

(Dimensions in mm)

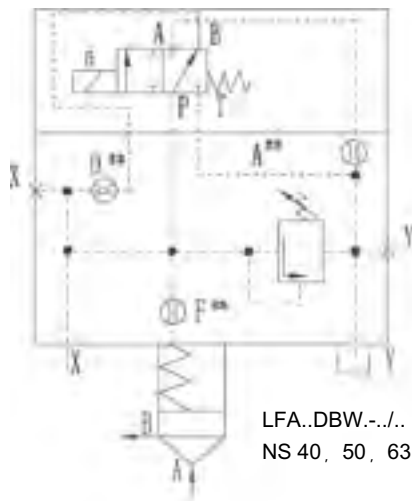
- | | | |
|--------------------------------------|---------------------|----------------------------------|
| 1 Port X optionally as threaded port | 4 Adjuster type "2" | 8 Space required to remove key |
| 2 Port Y optionally as threaded port | 5 Adjuster type "1" | 9 Nameplate |
| 3 Locating pin | 6 Adjuster type "3" | 10 Lock nut |
| | 7 Adjuster type "4" | 11 Setting nut for max. pressure |

** Orifice- ϕ

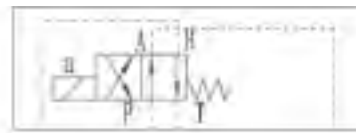
NS	X''	F''	D''	P''	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7
16	0.8	1.0	0.8	1.0	40	17	15	19	28	65	80	36.5	32.5	35	7	17
25	0.8	1.0	0.8	1.0	40	19	24	19	28	85	85	49	45.5	36	8	27
32	0.8	1.2	1.0	1.0	50	26	28	26	37	100	100	56.5	53	57	30	34.5

NS 40, 50, 63

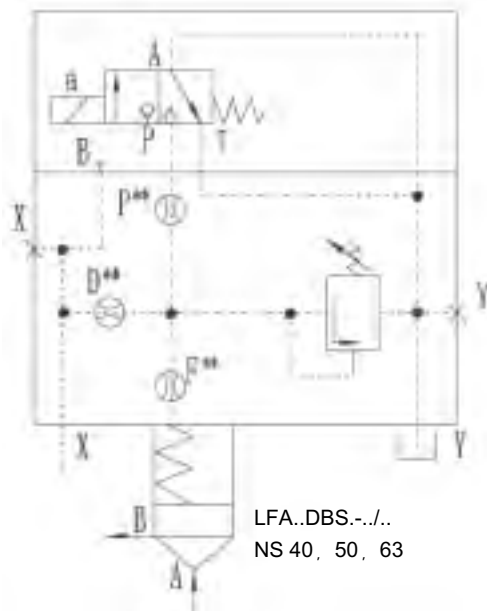
3 WE 6 B9-5XB/..



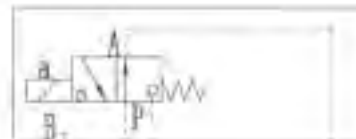
4WE 6 D5XB/..



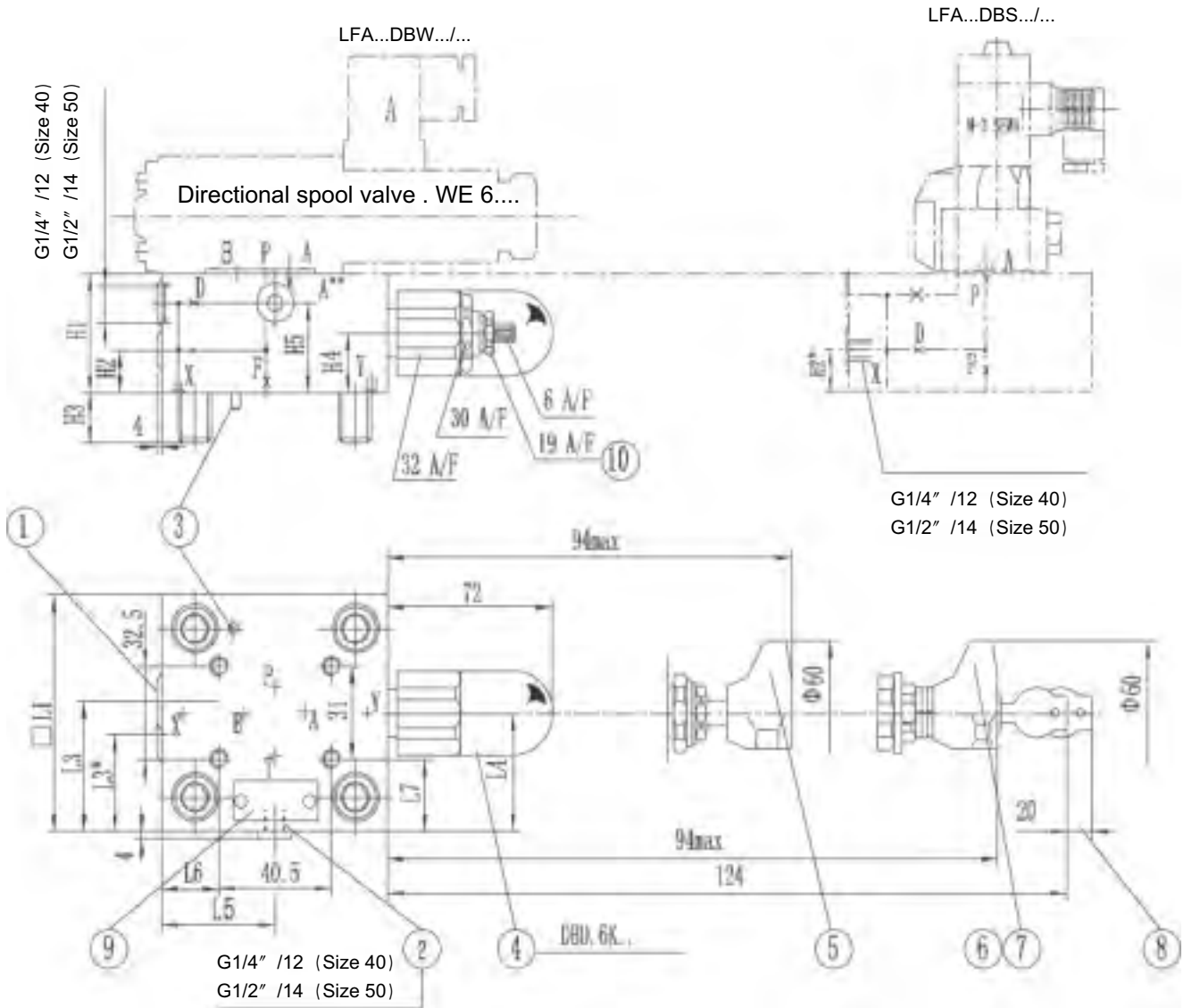
M-3 SEW 6 C 2XB/..



M-3 SEW 6 U 2XB/..



NS 40, 50

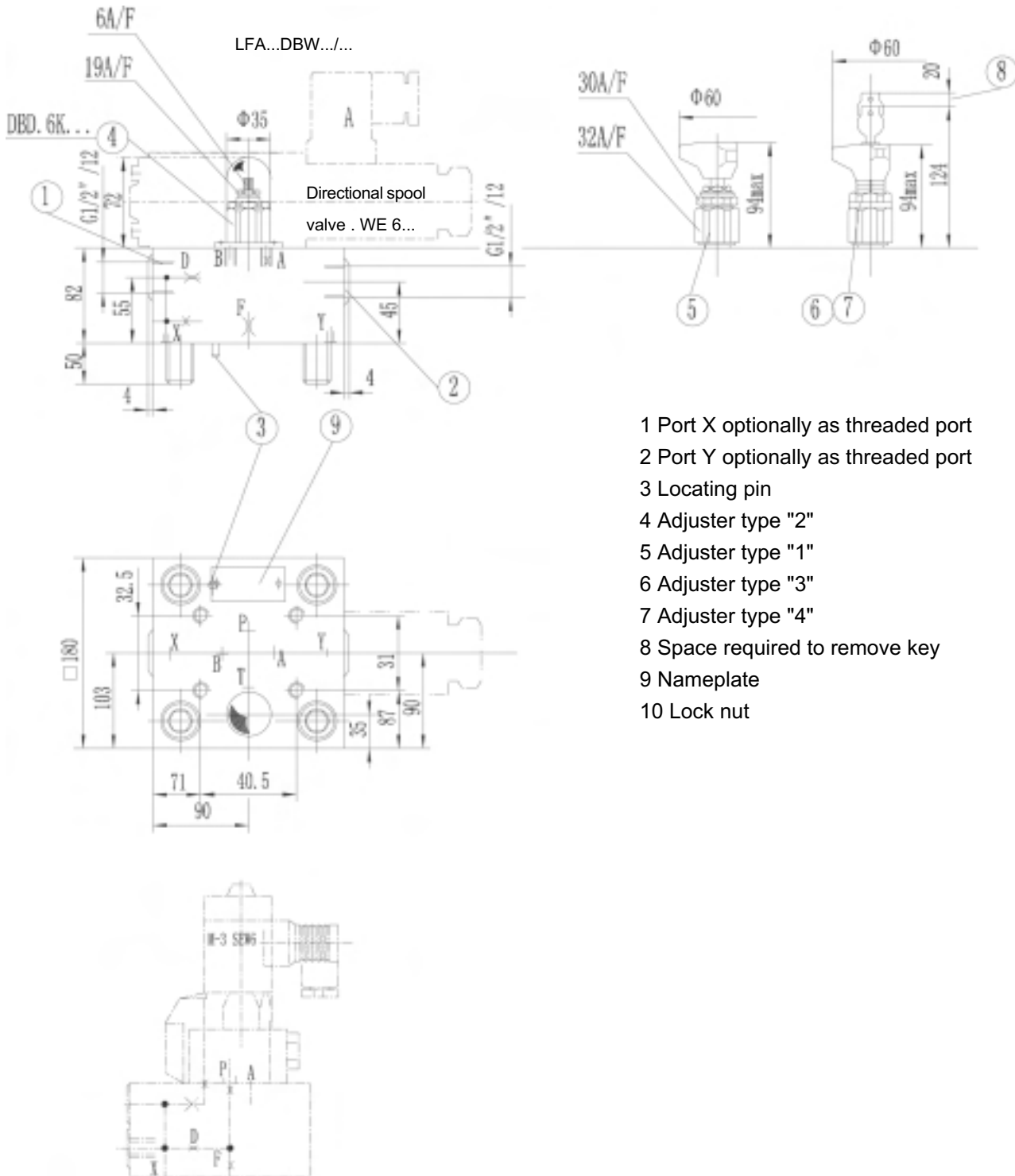


- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

*LFA...DBS control cover dimensions ** Orifice- ϕ

NS	X"	F"	D"	P"	H1	H2	H2'	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7
40	0.8	1.2	1.0	1.2	60	46	17	32	27	40	125	62.5	69	76	68	43.5	47
50	0.8	1.2	1.2	1.5	68	51	19.5	34	35	50	140	67.5	80	84	74.5	51	54.5

NS 63



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

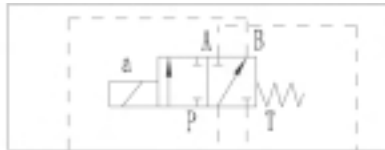
** Orifice-φ

NS	A"	F"	D"	P"
63	1.0	1.5	1.5	1.8

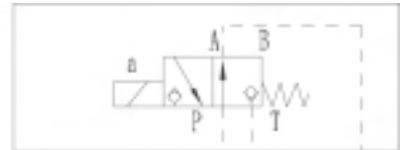
Control cover with manual pressure adjustment, for electrical unloading (Dimensions in mm)

NS 80,100

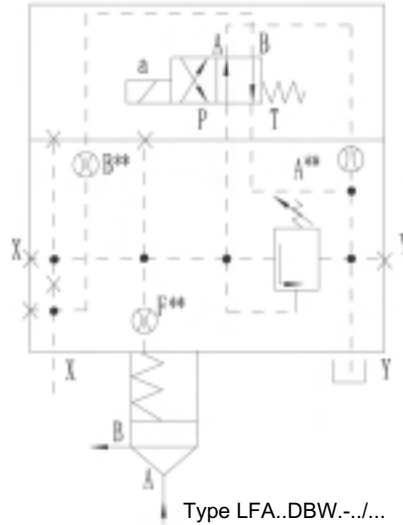
3 WE 10 B9...



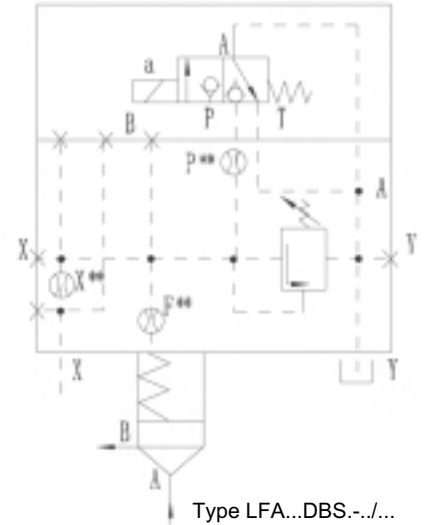
M-3SE 10 U2XB/...



4 WE 10 D...



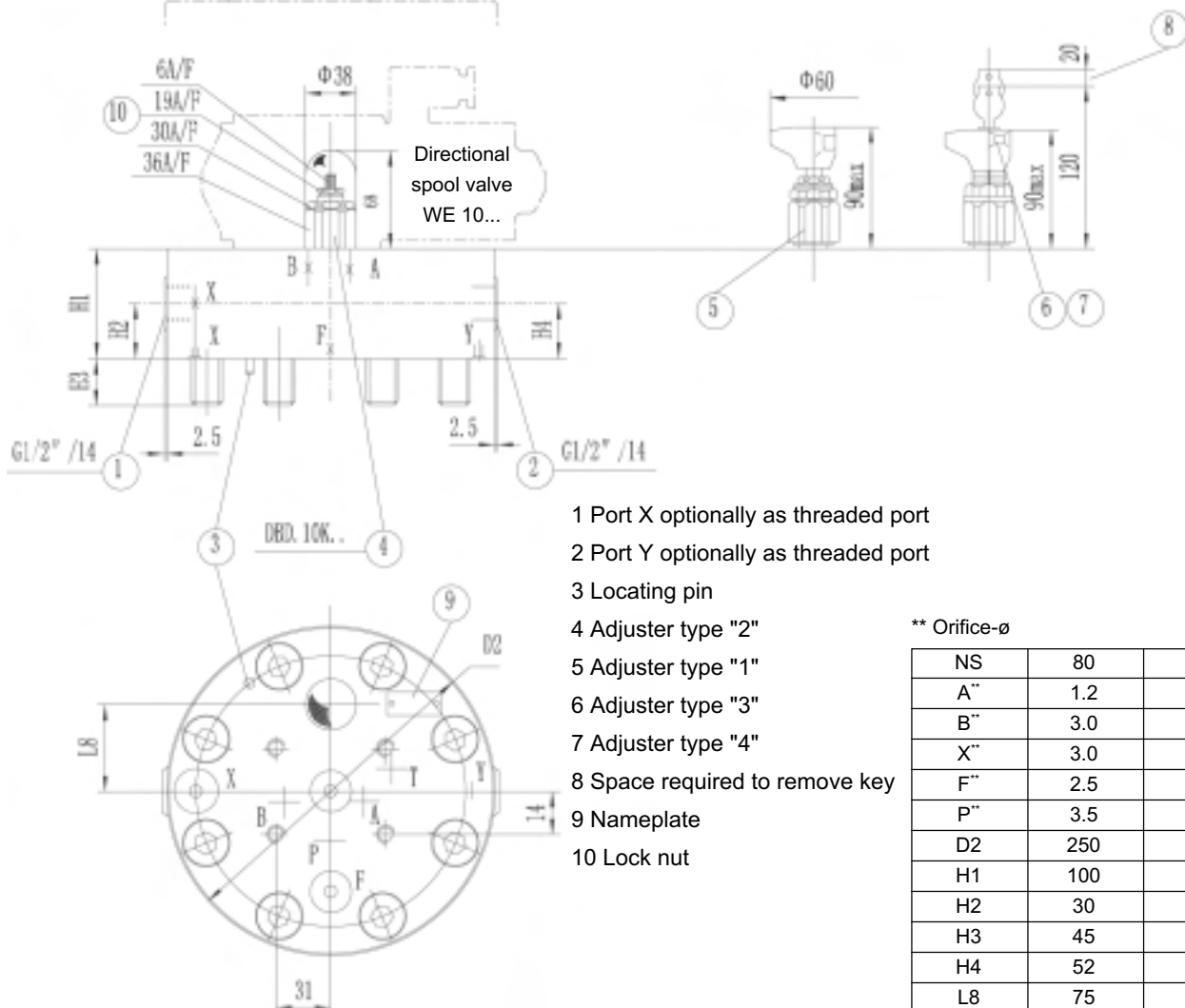
M-3SE 10 C2XB/...



Directional poppet valve
M-3 S E10..2XB/...

Type LFA..DBW.-./...

Type LFA...DBS.-./...



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

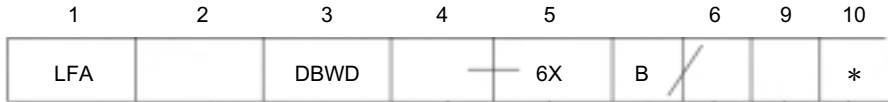
** Orifice- ϕ

NS	80	100
A**	1.2	1.5
B**	3.0	3.0
X**	3.0	3.0
F**	2.5	2.5
P**	3.5	3.5
D2	250	300
H1	100	100
H2	30	30
H3	45	51
H4	52	52
L8	75	85

Control cover with manual pressure adjustment, for isolation functions

(Dimensions in mm)

NS 16 to 100



Further details in clear text

- NS 16 =16 NS 50 =50
- NS 25 =25 NS 63 =63
- NS 32 =32 NS 80 =80
- NS 40 =40 NS 100=100

Adjuster type

- Rotary knob = 1
- Hexagon with protective cap = 2
- Lockable rotary knob with scale = 3
- (H-lock to automotive industry standards)
- Rotary knob with scale not lockable = 4

Series 60 to 69 = 6X(60 to 69 unchanged installation and connection dimentions)

No code = Mineral oils
V = Phosphate ester

Pressure ratings

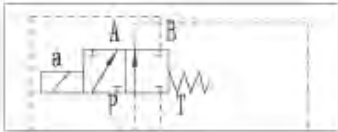
(take max. perm. pressure of pilot valve into account)

NS 16, 25, 32	NS 40, 50, 63, 80, 100
050=5.0MPa	025=2.5MPa
100=10.0MPa	050=5.0MPa
200=20.0MPa	100=10.0MPa
315=31.5MPa	200=20.0MPa
420=42.0MPa	315=31.5MPa
	400=40.0MPa

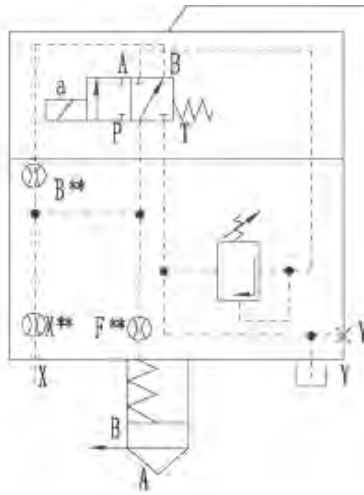
Technology of Beijing Huade Hydraulic

= B

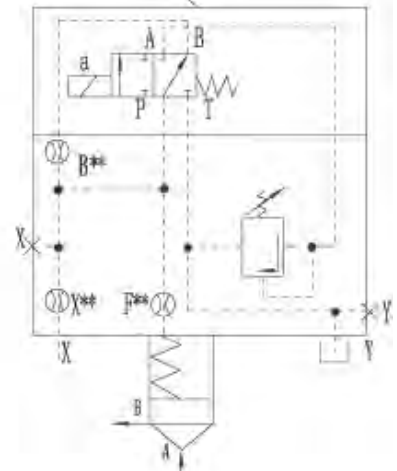
3 WE 6 A5XB/...



3WE 6 B9-5XB/...



LFA...DBWD-...
NS 16

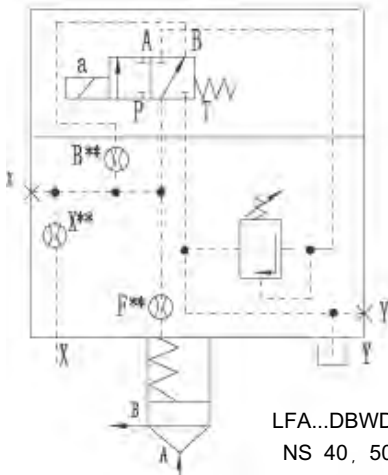


LFA...DBWD-...
NS 25,32

4WE 6 M5XB/



3WE 6 B9-5XB/...



LFA...DBWD-.../...
NS 40, 50, 63

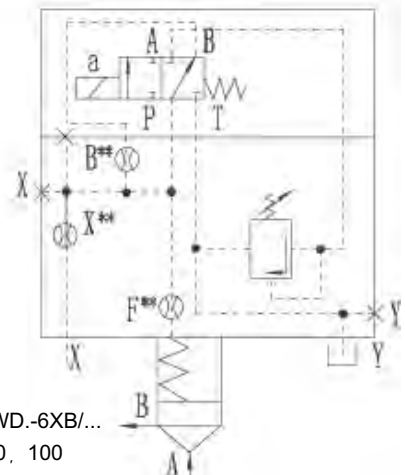
3 WE 10 A...



4 WE 10M...

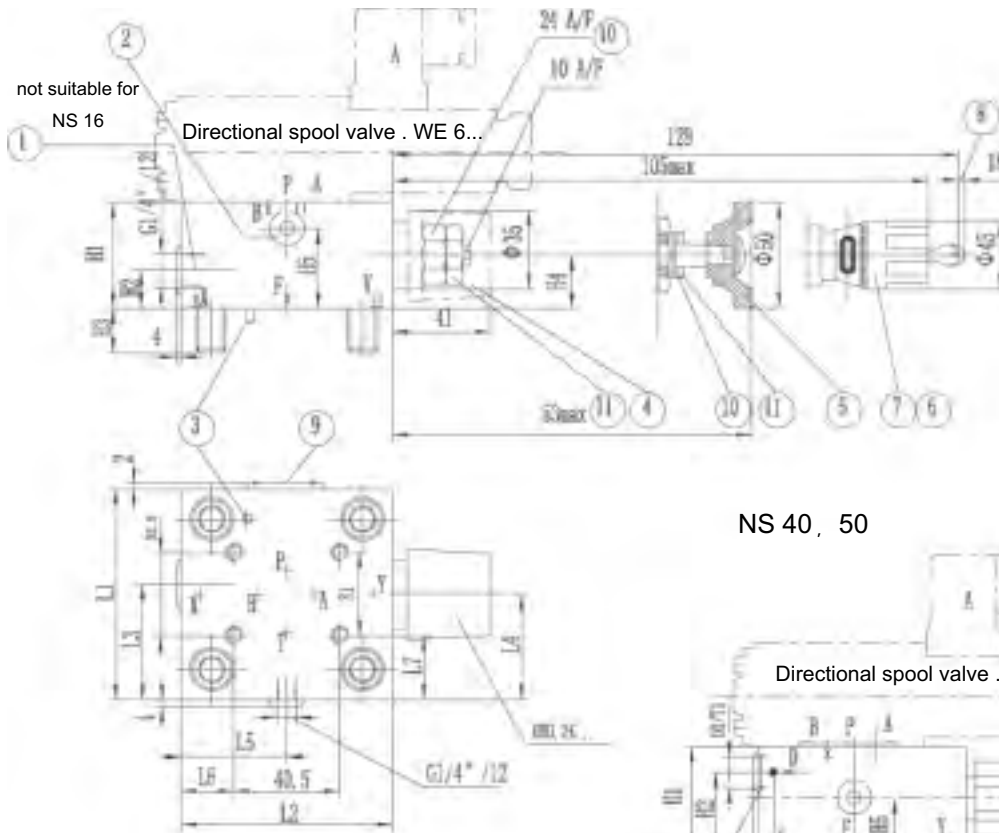


3 WE 10 B9...

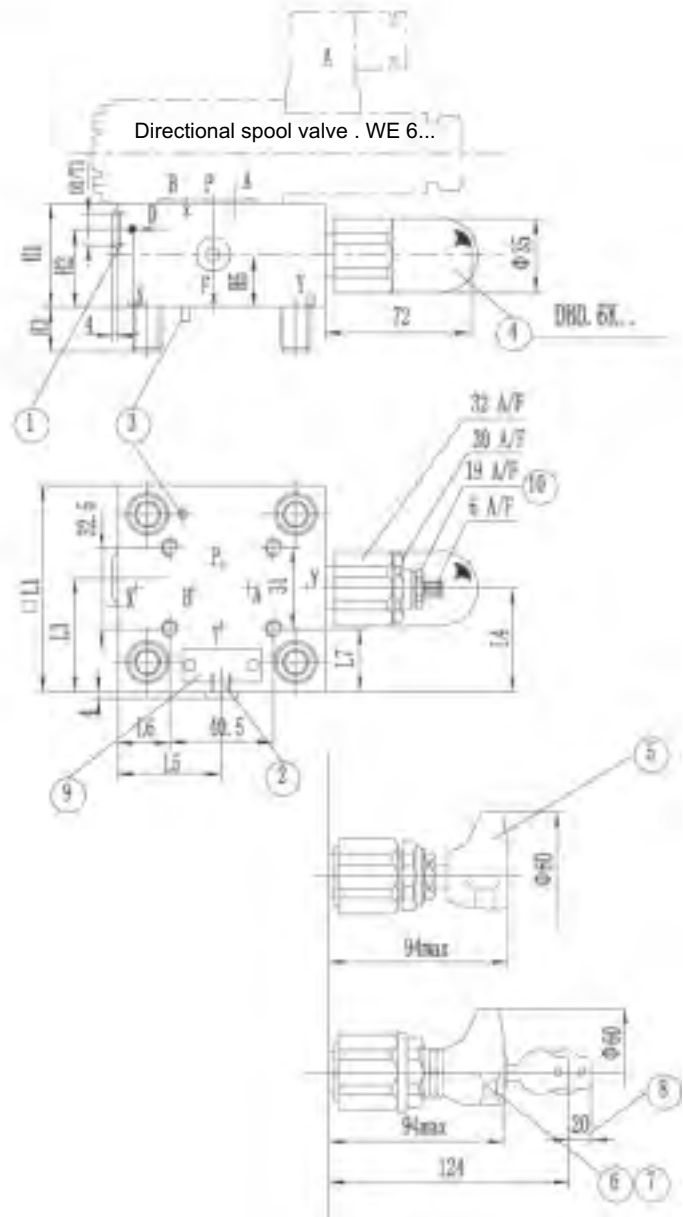


LFA...DBWD-6XB/...
NS 80, 100

NS 16 to 32



NS 40, 50



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut
- 11 Setting nut for max. pressure

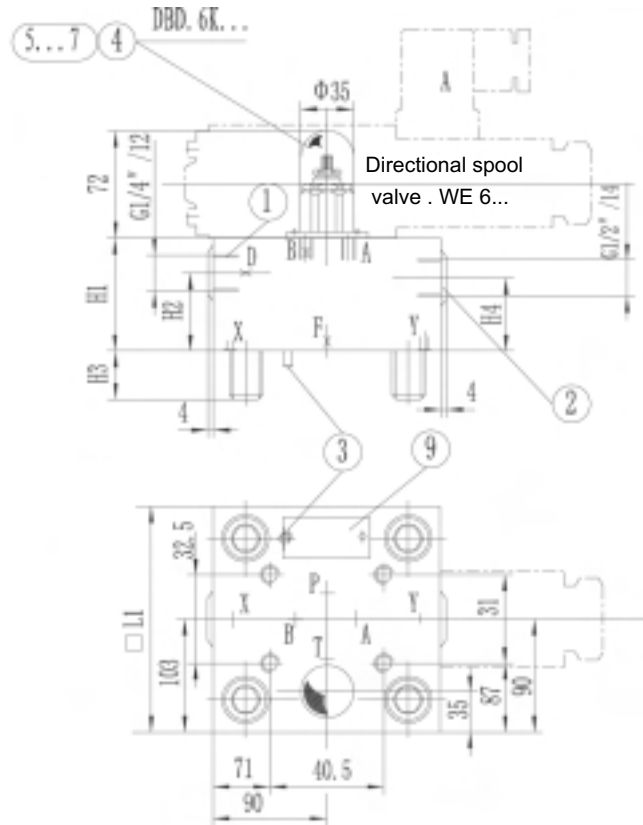
Dimensions see page 54

Control cover with manual pressure adjustment , for isolation functions (Dimensions in mm)

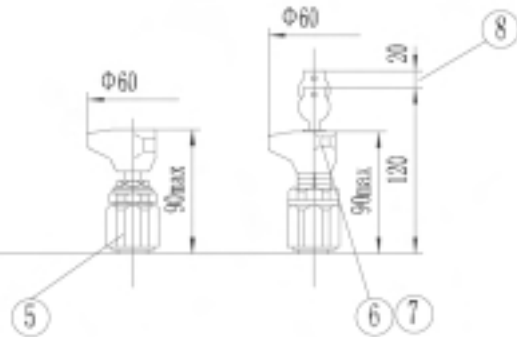
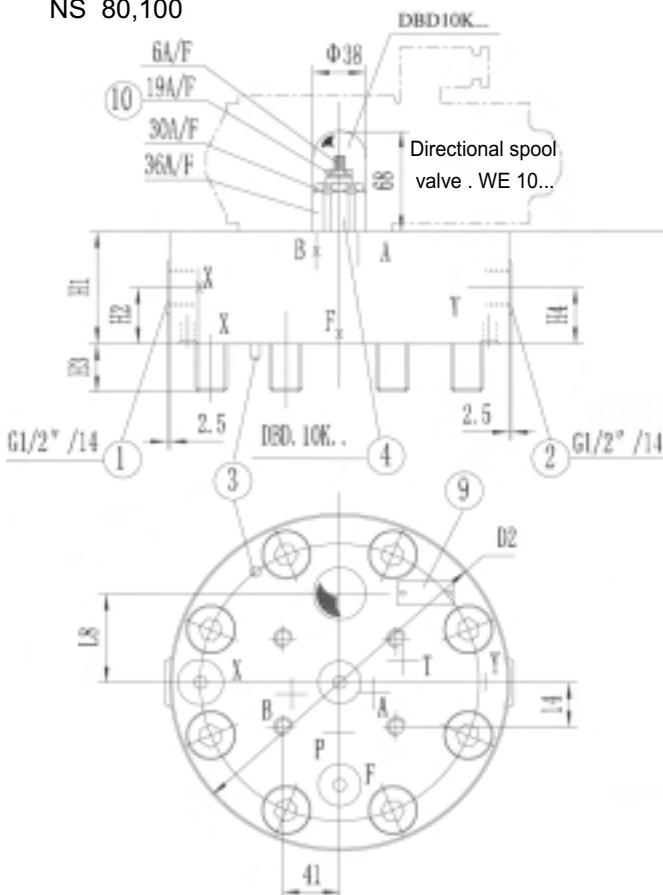
** Orifice-φ

NS	16	25	32	40	50	63	80	100
B"	1.0	1.0	1.0	1.2	1.5	1.8	3.5	3.5
X"	0.8	0.8	0.8	-	-	-	3.0	3.0
F"	1.0	1.0	1.2	1.2	1.2	1.5	2.5	2.5
D"	-	-	-	1.0	1.2	1.5	-	-
D1	-	-	-	G1/4"	G1/2"	-	-	-
D2	-	-	-	-	-	-	250	300
H1	40	40	50	60	68	82	100	100
H2	-	19	26	46	50	55	67	67
H3	15	24	28	32	34	50	45	51
H4	19	19	26	27	35	45	58	58
H5	28	28	37	16	20	-	-	-
L1	65	85	100	-	-	-	-	-
□L1	-	-	-	125	140	180	-	-
L2	80	85	100	-	-	-	-	-
L3	-	49	56.5	62.5	70	-	-	-
L4	32.5	45.5	53	76	84	-	-	-
L5	35	36	57	68	75	-	-	-
L6	7	8	30	43.5	51	-	-	-
L7	17	27	34.5	47	54.5	-	-	-
L8	-	-	-	-	-	-	75	85
T1	-	-	-	12	14	-	-	-

NS 63



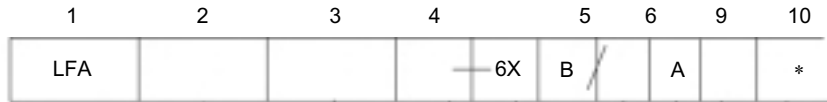
NS 80,100



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

Control cover with 2 manual pressure adjustments, electrically selectable

NS 16 to 100



NS 16 =16 NS 50 =50
 NS 25 =25 NS 63 =63
 NS 32 =32 NS 80 =80
 NS 40 =40 NS 100=100

Control cover type

De-energised - DB1 (4 WE.. D) } = DBU2A
 De-energised - open (4 WE.. H) }
 De-energised - DB max. (4 WE.. D) = DBU2B
 (see symbols)

Adjuster type

Rotary knob = 1
 Hexagon with protective cap = 2
 Lockable rotary knob with scale = 3
 (H-lock to automotive industry standards)
 Rotary knot with scale not lockable = 4

Further details in clear text

No code = Mineral oils
 V = Phosphate ester

Pressure ratings
 (take max. perm. pressure of pilot valve into account)

Size 16, 25, 32	Size 40, 50, 63, 80, 100
050=5.0MPa	025=2.5MPa
100=10.0MPa	050=5.0MPa
200=20.0MPa	100=10.0MPa
315=31.5MPa	200=20.0MPa
420=42.0MPa	315=31.5MPa
	400=40.0MPa

B = Technology of Beijing Huade Hydraulic

6X = Series 60 to 69 (60 to 69 unchanged installation and connection dimensions)

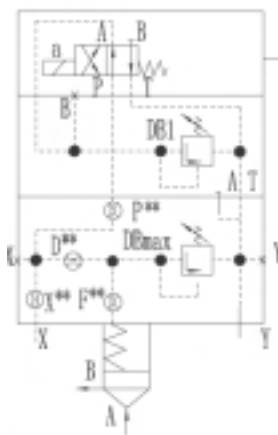


4 WE 6 H 5XB/....

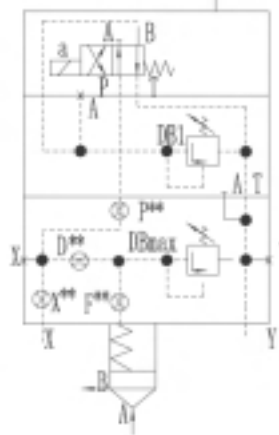


4 WE 6 H 5XB/....

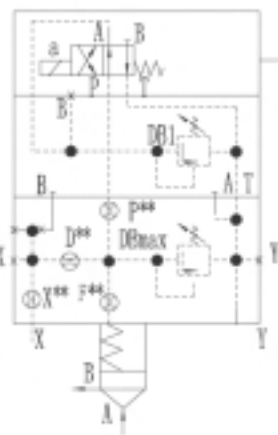
4 WE 6 D 5XB/....



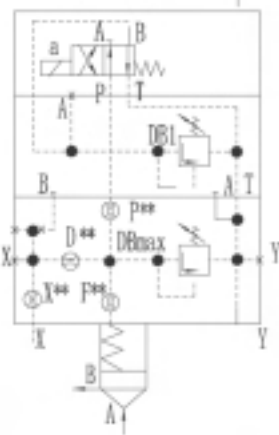
LFA..DBU 2A..-./...
Size 16 to 32



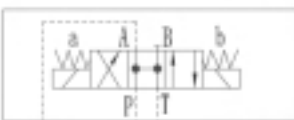
LFA..DBU 2B..-./...
Size 16 to 32



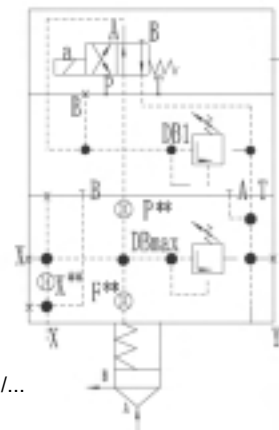
LFA..DBU 2A..-./...
Size 40 to 63



LFA..DBU 2B..-./...
Size 40 to 63

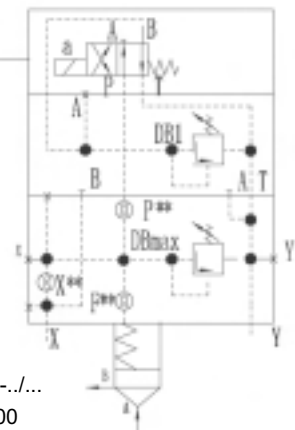


4 WE 10H./....



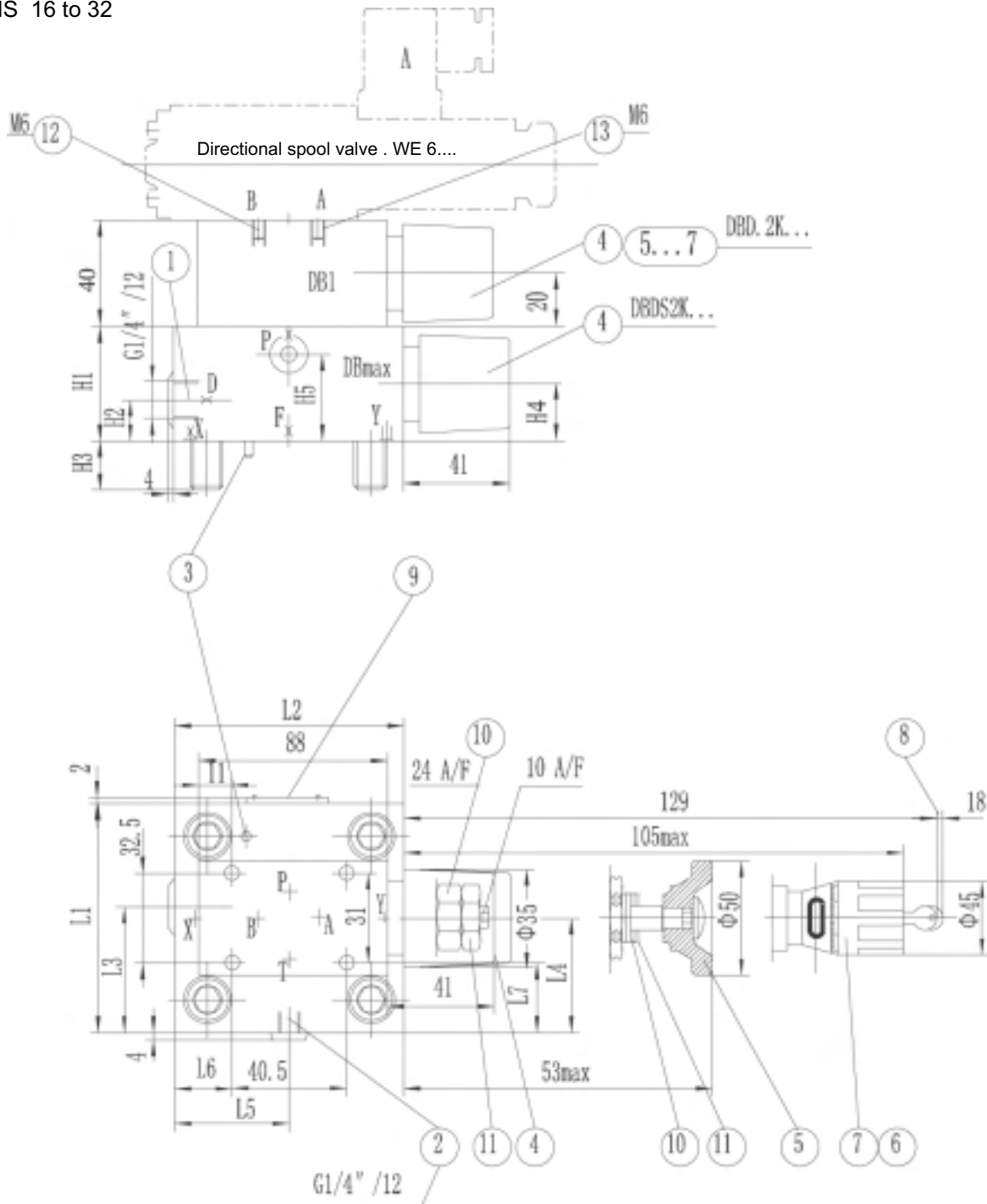
LFA..DBU 2A..-./...
Size 80, 100

4 WE 10D./....



LFA..DBU 2A..-./...
Size 80, 100

NS 16 to 32



** Orifice-φ

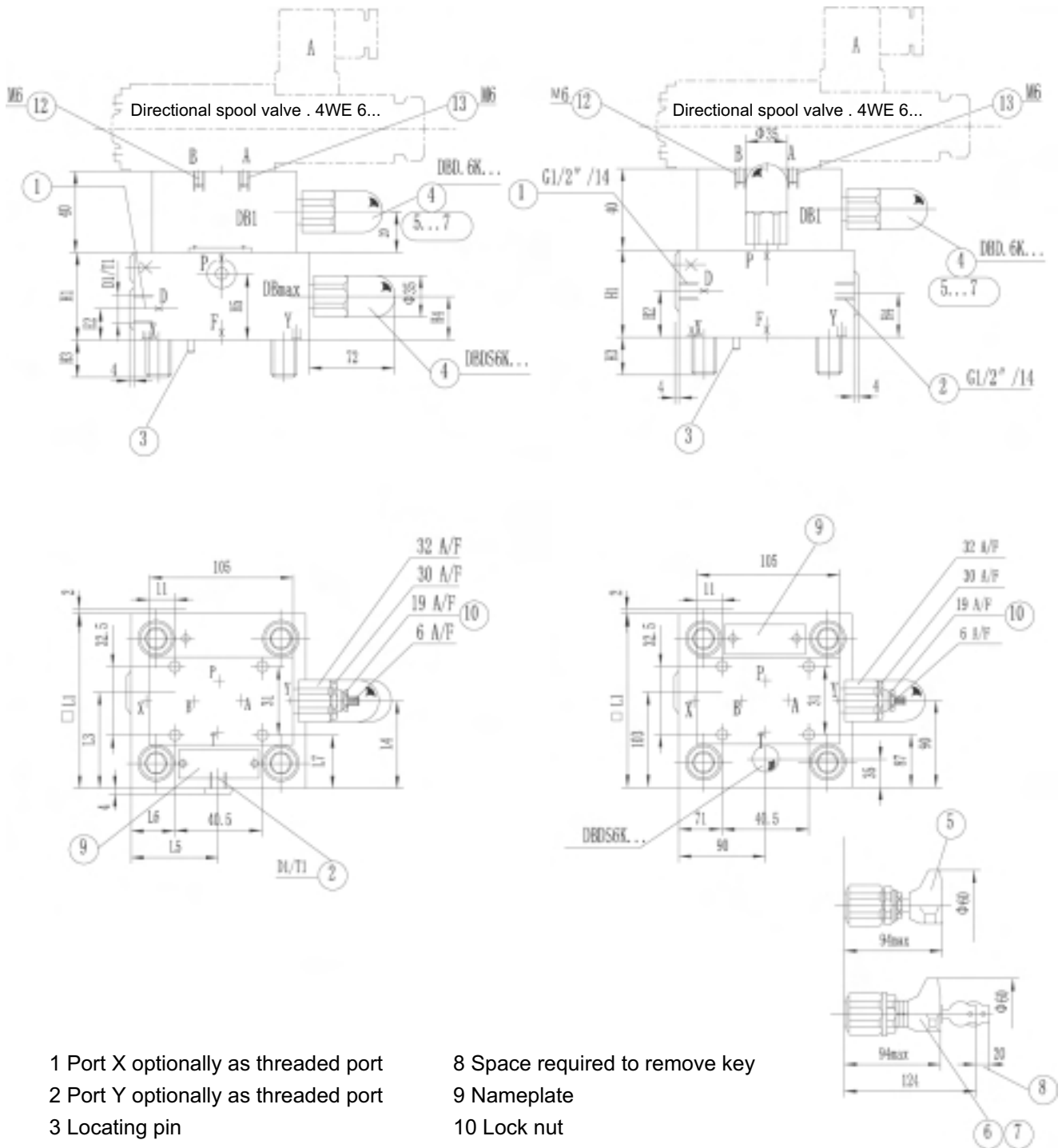
NS	X"	F"	D"	P"	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7
16	0.8	1.0	0.8	1.0	40	17	15	19	28	65	80	36.5	32.5	35	7	17
25	0.8	1.0	0.8	1.0	40	19	24	19	28	85	85	49	45.5	36	8	27
32	0.8	1.2	1.0	1.0	50	26	28	26	37	100	100	56.5	53	57	30	34.5

- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"

- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut
- 11 Setting nut for max. pressure
- 12 Plug M6 tapered for ..DBU 2A..
- 13 Plug M6 tapered for ..DBU 2B..

NS 40, 50

NS 63



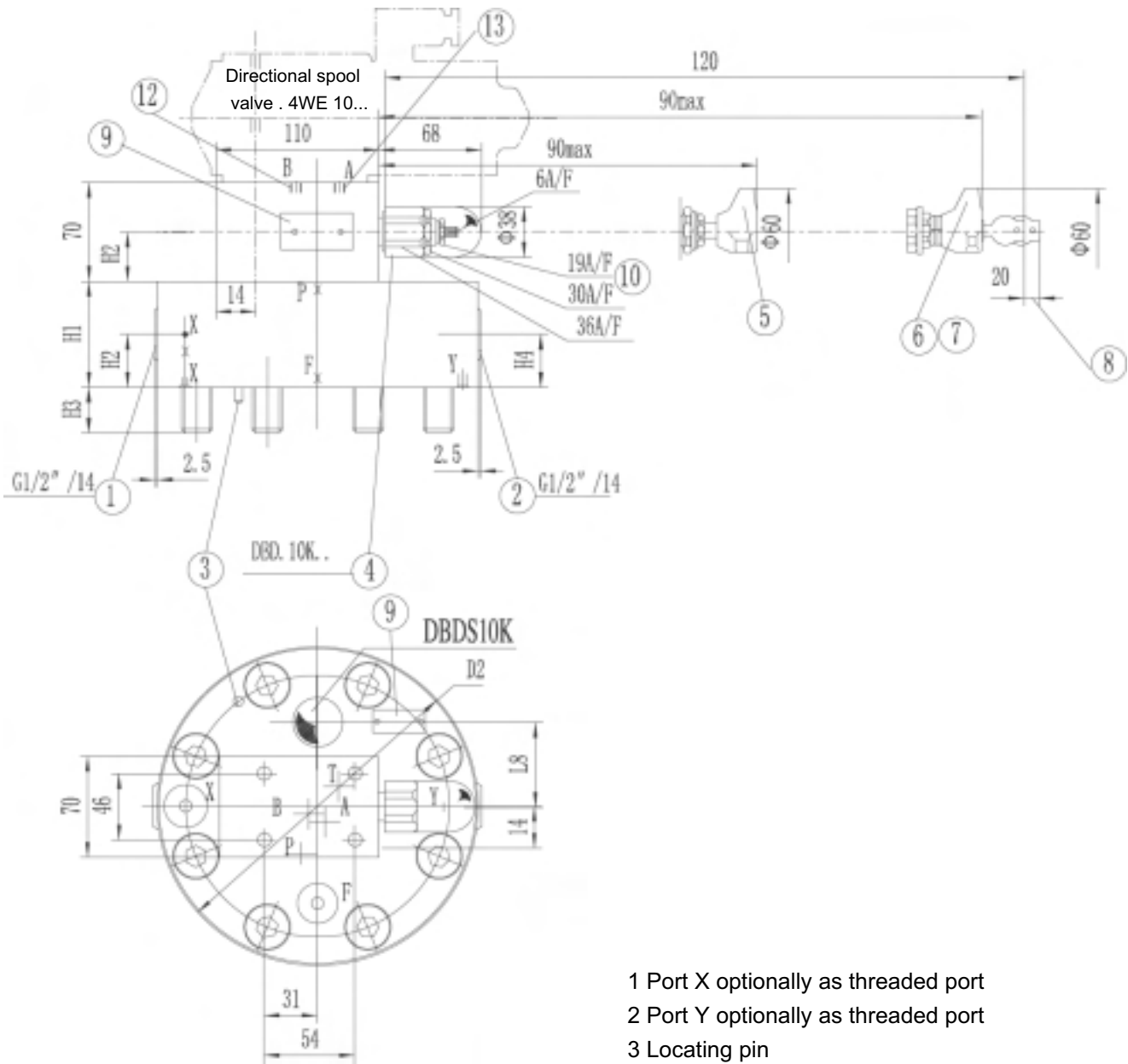
- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"

- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut
- 11 Setting nut for max. pressure
- 12 Plug M6 tapered for ..DBU 2A..
- 13 Plug M6 tapered for ..DBU 2B..

** Orifice-φ

NS	F"	D"	P"	D1	H1	H2	H3	H4	H5	□ L1	L3	L4	L5	L6	L7	T1
40	1.2	1.0	1.2	G1/4"	60	17	32	27	40	125	69	76	68	43.5	47	12
50	1.2	1.2	1.5	G1/2"	68	19.5	34	35	50	140	80	84	74.5	51	54.5	14
63	1.5	1.5	1.8	-	82	55	50	45	-	180	-	-	-	-	-	-

NS 80, 100



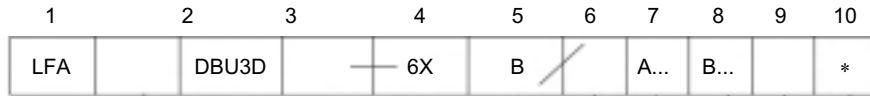
- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut
- 12 Plug M6 tapered for ..DBU 2A..
- 13 Plug M6 tapered for ..DBU 2B..

** Orifice-φ

NS	X"	F"	P"	D2	H1	H2	H3	H4	L8
80	3.0	2.5	3.5	250	100	30	45	52	75
100	3.0	2.5	3.5	300	100	30	51	52	85

Control cover with 3 manual pressure adjustments, electrically selectable

NS 16 to 100



NS 16 =16	NS 50 =50
NS 25 =25	NS 63 =63
NS 32 =32	NS 80 =80
NS 40 =40	NS 100 =100

Adjuster type(detail only for DB1 or DB2)*

Rotary knob	= 1
Hexagon with protective cap	= 2
Lockable rotary knob with scale (H-lock to automotive industry standards)	= 3
Rotary knot with scale not lockable	= 4

Series 60 to 69 = 6X
(60 to 69 unchanged installation and connection dimentions)

Technology of Beijing Huade Hydraulic

= B

Further details in clear text

No code = Mineral oils
V = Phosphate ester

Pressure ratings

(take max. perm. pressure of pilot valve into account)

NS 16, 25, 32	NS 40, 50, 63, 80, 100
050=5.0MPa	025=2.5MPa
100=10.0MPa	050=5.0MPa
200=20.0MPa	100=10.0MPa
315=31.5MPa	200=20.0MPa
420=42.0MPa	315=31.5MPa
	400=40.0MPa

*) For DB1 and DB2 select the same adjuster type



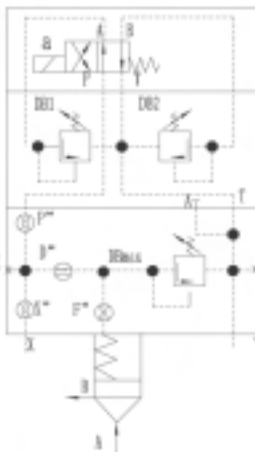
4 WE 6 H 5XB/...

4 WE 10 H.../...

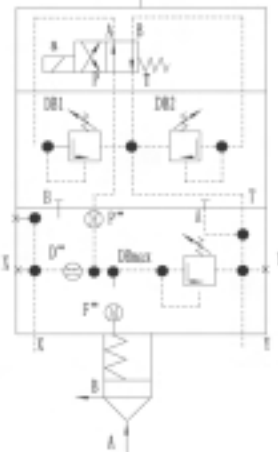


4 WE 6 E 5XB/...

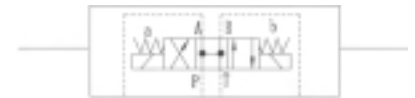
4 WE 10 E .../...



LFA..DBU 3D-.../...
Size 16, 25, 32

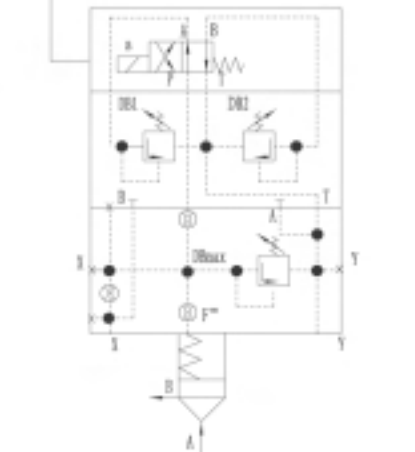


LFA..DBU 3D-.../...
Size 40, 50, 63



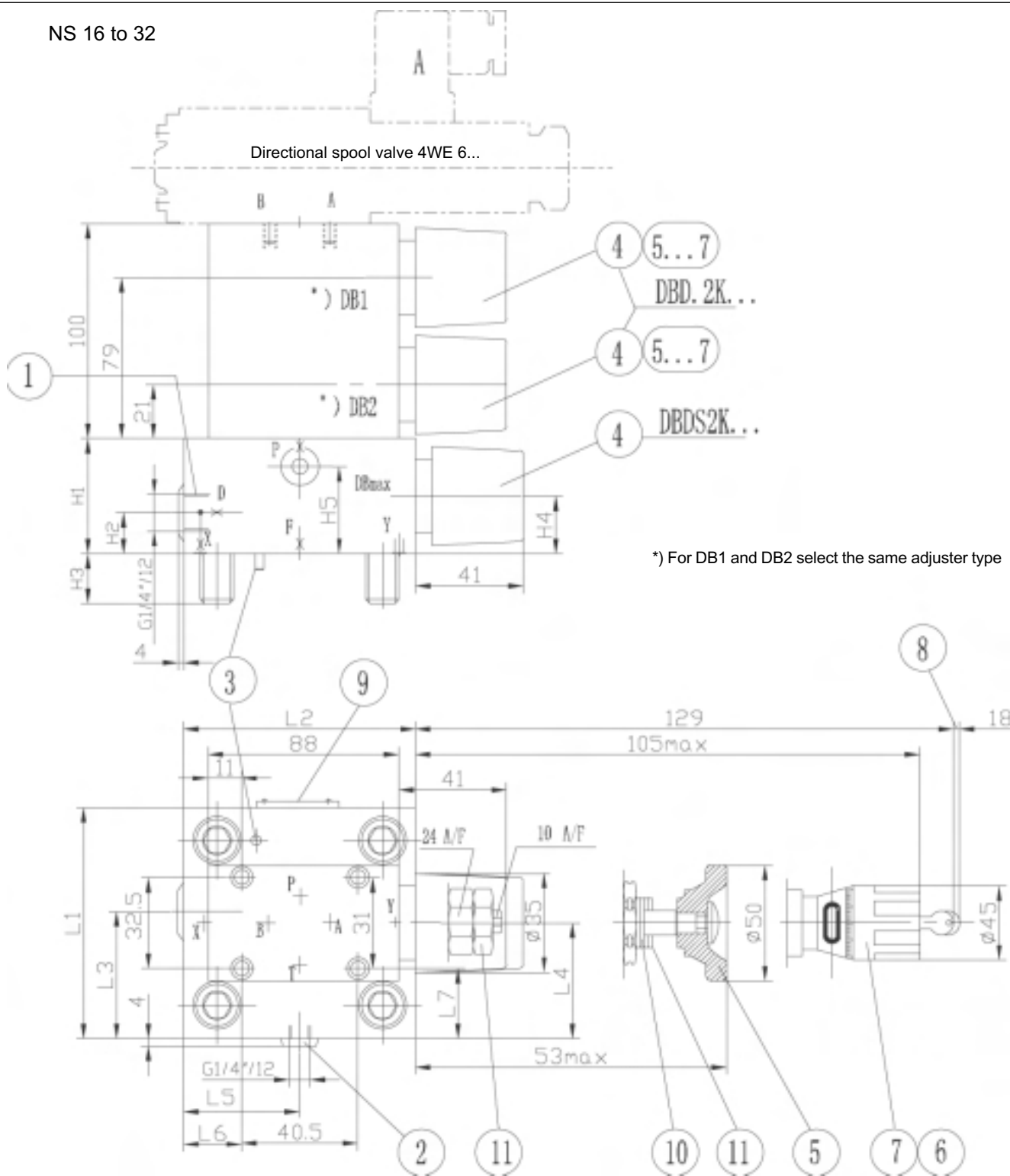
4 WE 6 D 5XB/...

4 WE 10 D .../...



LFA..DBU 3D-.../...
Size 80, 100

NS 16 to 32



*) For DB1 and DB2 select the same adjuster type

- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"

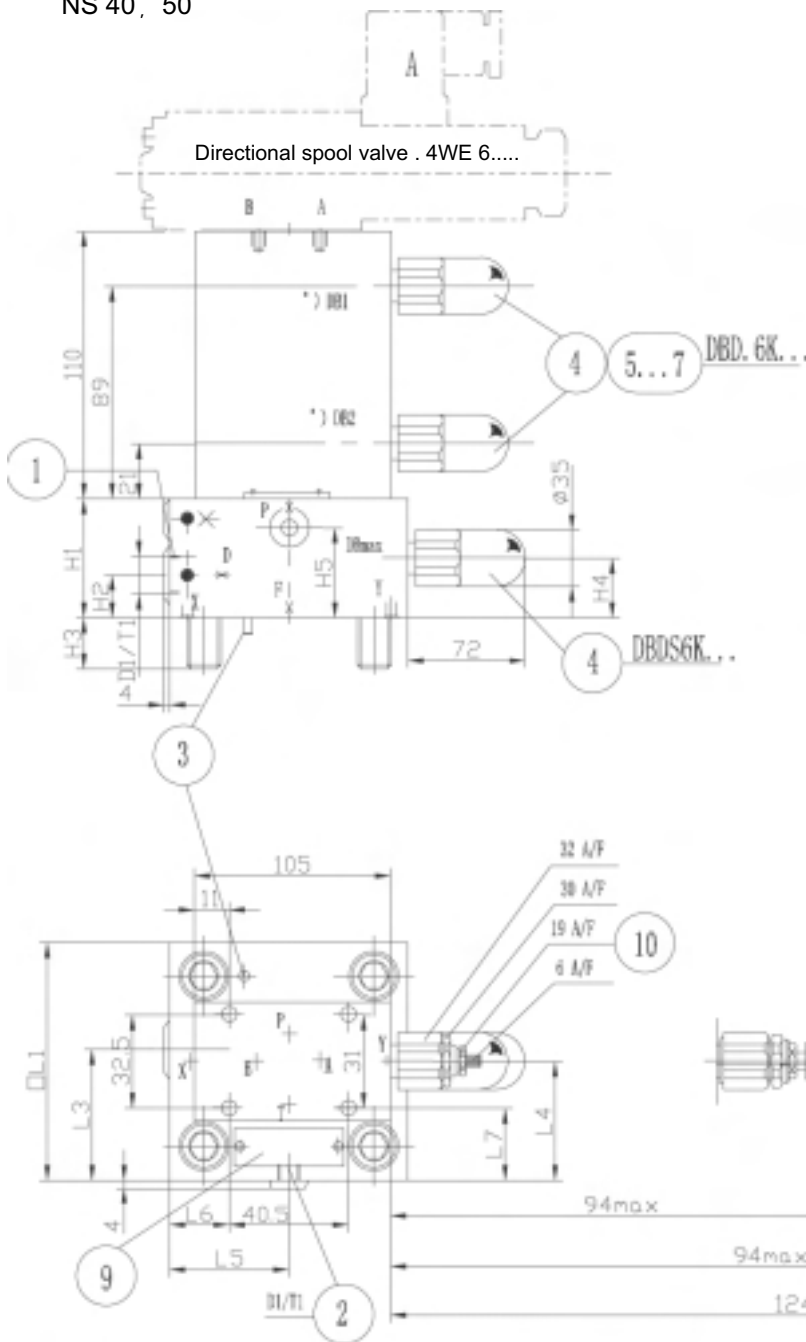
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut
- 11 Setting nut for max. pressure

** Orifice-φ

NS	X"	F"	D"	P"	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7
16	0.8	1.0	0.8	1.0	40	17	15	19	28	65	80	36.5	32.5	35	7	17
25	0.8	1.0	0.8	1.0	40	19	24	19	28	85	85	49	45.5	36	8	27
32	0.8	1.2	1.0	1.0	50	26	28	26	37	100	100	56.5	53	57	30	34.5

Control cover with 3 manual pressure adjustments, electrically selectable

NS 40, 50



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

*) For DB1 and DB2 select the same adjuster type

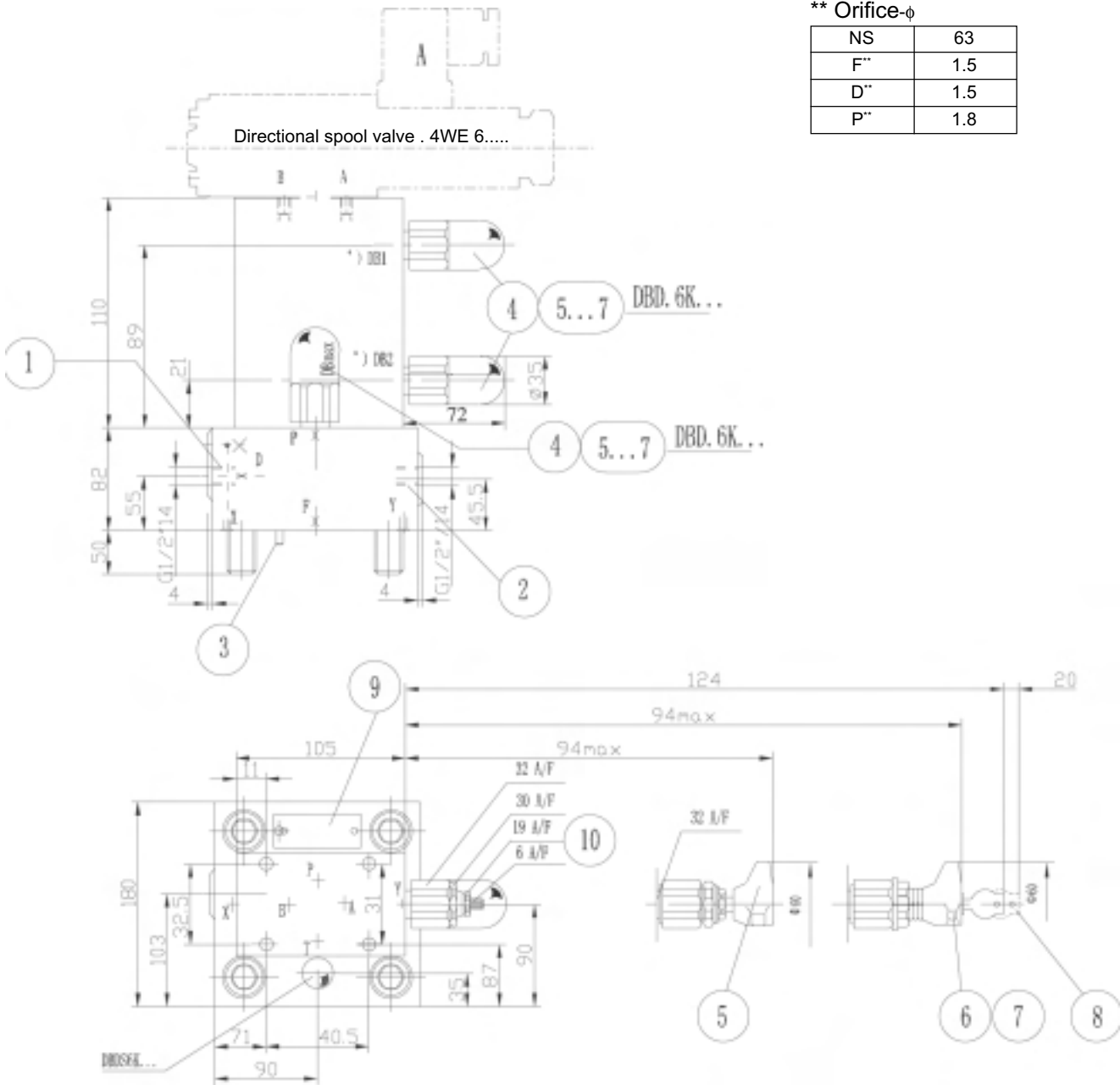
** Orifice- ϕ

NS	F"	D"	P"	D1	H1	H2	H3	H4	H5	\square L1	L3	L4	L5	L6	L7	T1
40	1.2	1.0	1.2	G1/4"	60	17	32	27	40	125	69	76	68	43.5	47	12
50	1.2	1.2	1.5	G1/2"	68	19.5	34	35	50	140	80	84	74.5	51	54.5	14

NS 63

** Orifice-φ

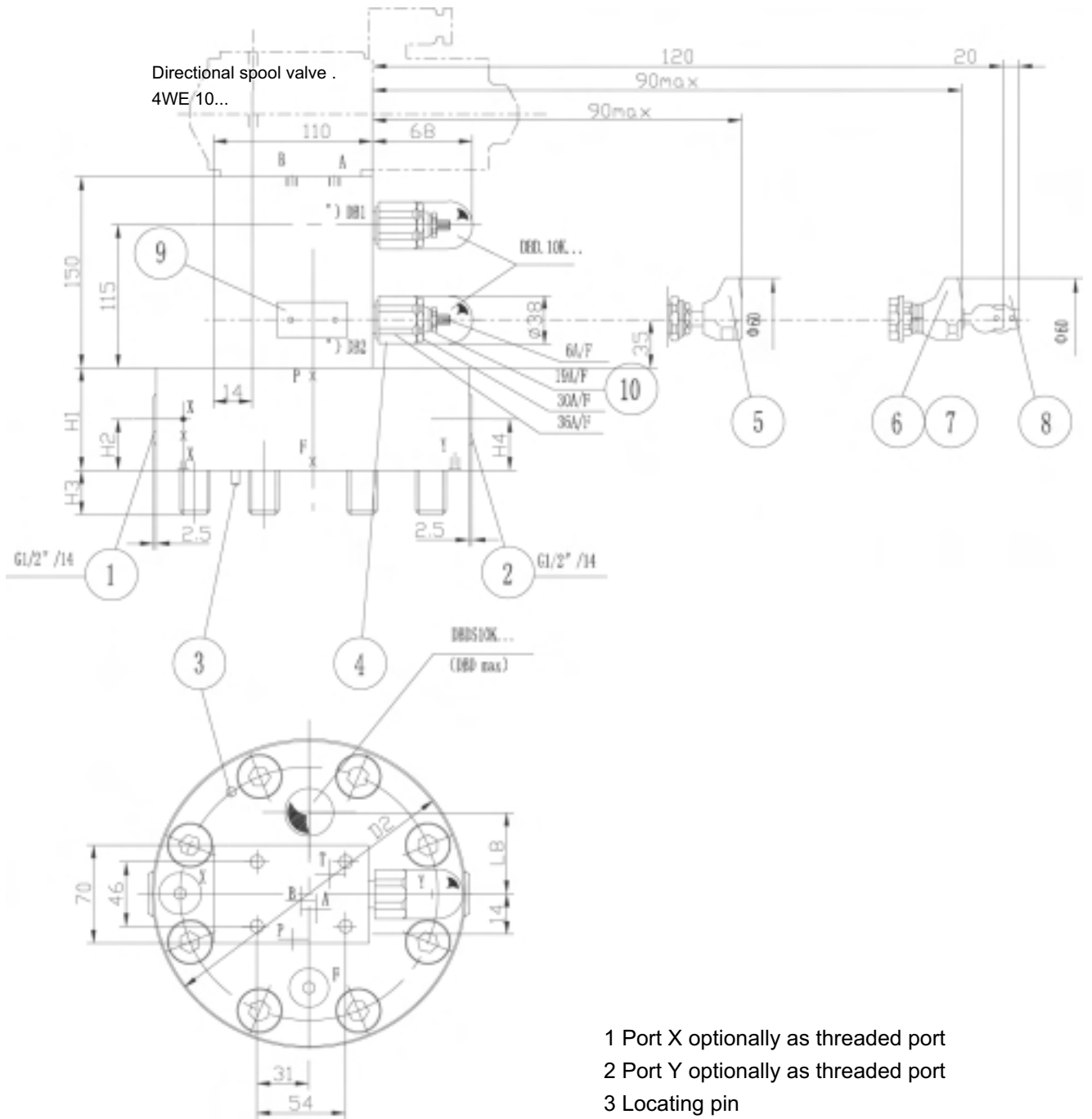
NS	63
F"	1.5
D"	1.5
P"	1.8



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

*) For DB1 and DB2 select the same adjuster type

NS 80, 100



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 5 Adjuster type "1"
- 6 Adjuster type "3"
- 7 Adjuster type "4"
- 8 Space required to remove key
- 9 Nameplate
- 10 Lock nut

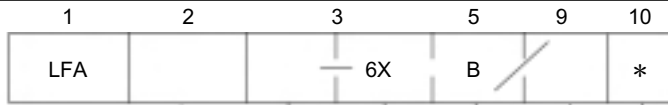
** Orifice-φ

NS	X"	F"	P"	D2	H1	H2	H3	H4	L8
80	3.0	2.5	3.5	250	100	30	45	52	75
100	3.0	2.5	3.5	300	100	30	51	52	85

*) For DB1 and DB2 select the same adjuster type

Control cover for electrical-proportional pressure adjustment, without maximum pressure limitation

NS16 to 63



NS 16 =16 NS 40 =40
 NS 25 =25 NS 50 =50
 NS 32 =32 NS 63 =63

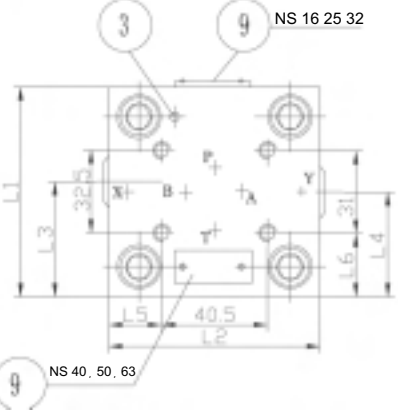
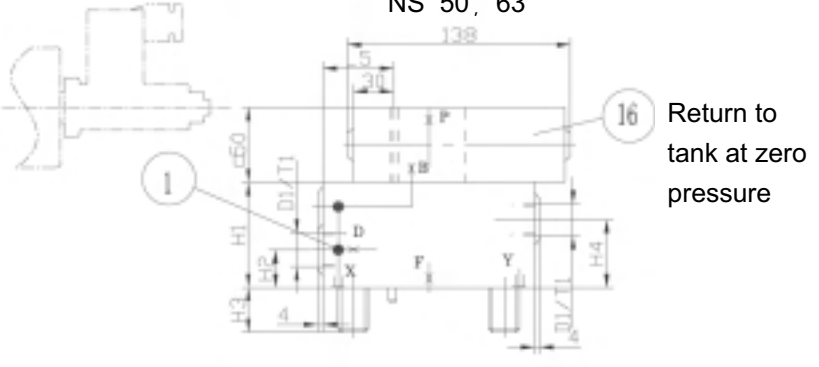
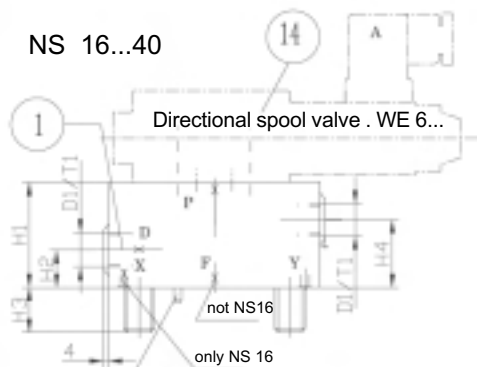
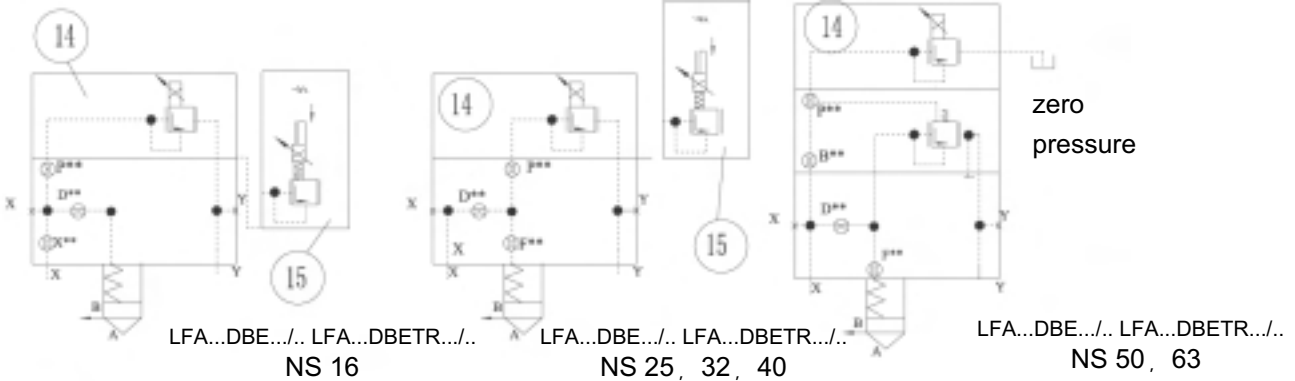
For mounting a proportional pressure relief valve
 without electrical feedback = DBE
 with electrical feedback = DBETR

Further details in clear text

No code = Mineral oils
 V = Phosphate ester

B = Technology of Beijing Huade Hydraulic

6X= Series 60 to 69
 (60 to 69 unchanged installation and connection dimentions)



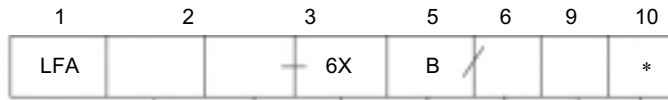
** Orifice-φ

NS	16	25	32	40	50	63
B''	-	-	-	-	0.8	0.8
D''	0.8	0.8	0.8	1.0	2.0	2.0
X''	0.8	-	-	-	-	-
F''	-	0.8	1.0	1.2	1.2	1.5
P''	1.0	1.0	1.0	1.5	1.0	1.0
D1	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"
H1	40	40	50	60	68	82
H2	17	19	26	30	32	30
H3	15	24	28	32	34	50
H4	20	19	26	30	32	40
L1	65	85	100	125	140	180
L2	80	85	100	125	140	180
L3	36.5	49	56.5	72	80	100
L4	23.5	36	43.5	53	50	80
L5	7	22.5	30	43.5	51	71
L6	17	27	34.5	47	54.5	74.5
T1	12	12	12	14	14	14

- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 9 Nameplate
- 14 Proportional pressure relief valve type DBET-5XB/...see page 35
- 15 Proportional pressure relief valve with feedback type DBETR-1XB/... (see page 35)
- 16 Pressure relief valve NS 6 (is included within the scope of supply)

Control cover for electrical-proportional pressure adjustment, with maximum pressure limitation

NS 16 to 100



Further details in clear text

NS 16=16 NS 50 =50
 NS 25=25 NS 63 =63
 NS 32=32 NS 80 =80
 NS 40=40 NS 100=100

No code = Mineral oils
 V = Phosphate ester

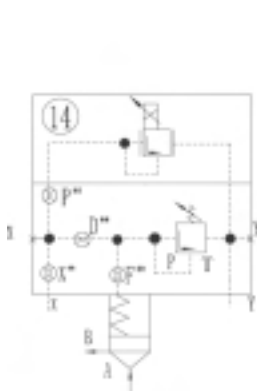
For mounting a proportional pressure relief valve
 without electrical feedback = DBE
 with electrical feedback = DBETR

Pressure ratings
 (take max. perm. pressure of pilot valve into account)

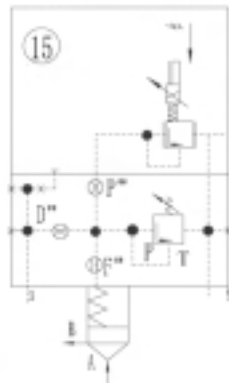
Series 60 to 69 = 6X
 (60 to 69 unchanged installation and connection dimentions)

NS 16, 25, 32	NS 40, 50, 63, 80, 100
050=5.0MPa	025=2.5MPa
100=10.0MPa	050=5.0MPa
200=20.0MPa	100=10.0MPa
315=31.5MPa	200=20.0MPa
420=42.0MPa	315=31.5MPa
	400=40.0MPa

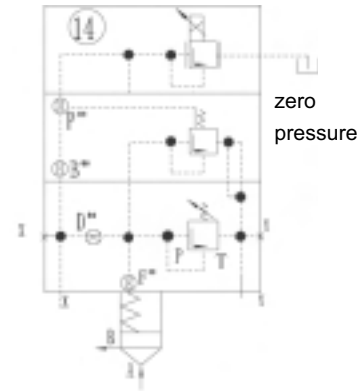
Technology of Beijing Huade Hydraulic = B



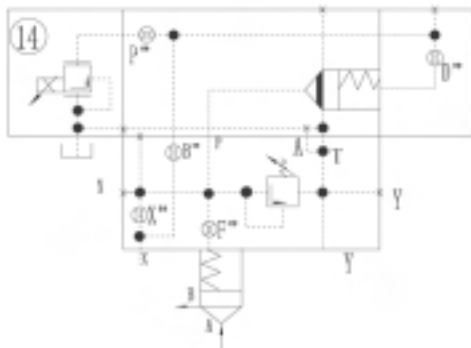
LFA...DBEM.../
 LFA...DBEMTR.../
 NS 16, 25, 32



LFA...DBEM.../
 LFA...DBEMTR.../
 NS 40

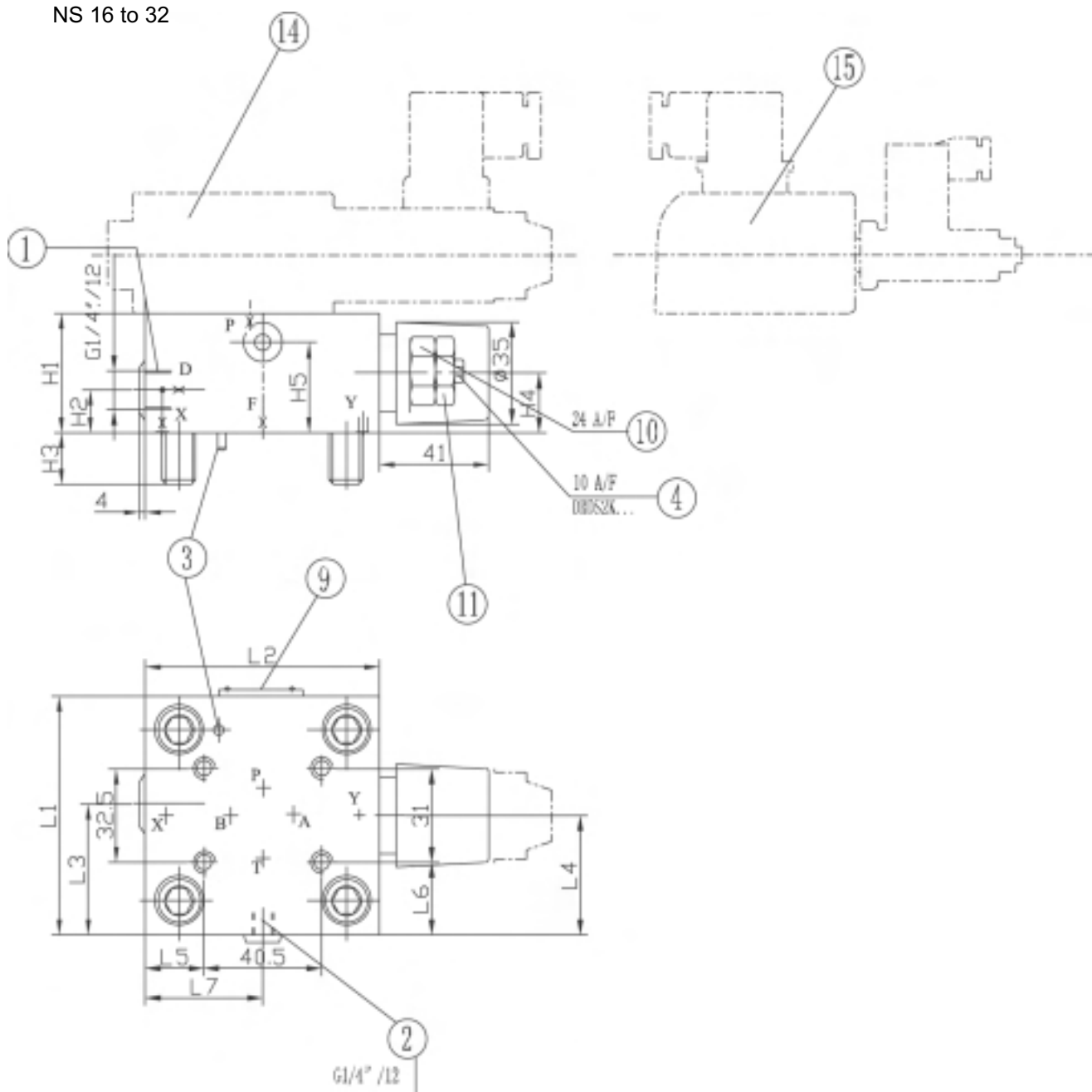


LFA...DBEM.../
 LFA...DBEMTR.../
 NS 50, 63



LFA...DBEM.../
 LFA...DBEMTR.../
 NS 80,100

NS 16 to 32



1) G 1/4 threaded port T,
special poppet

Ports T and Y - zero pressure

1 Port X optionally as threaded port

2 Port Y optionally as threaded port

3 Locating pin

4 Adjuster type "2"

9 Nameplate

10 Lock nut

11 The Max.settable pressure

14 Proportional pressure relief valve
type DBET-5XB/...see page 34

15 Proportional pressure relief valve with feed-
back

type DBETR-1XB/... (see page 34)

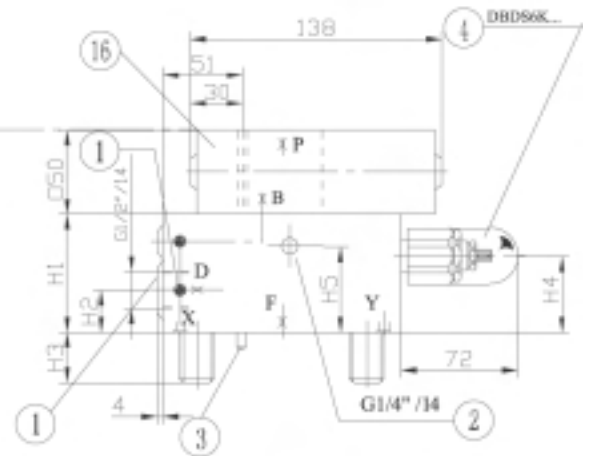
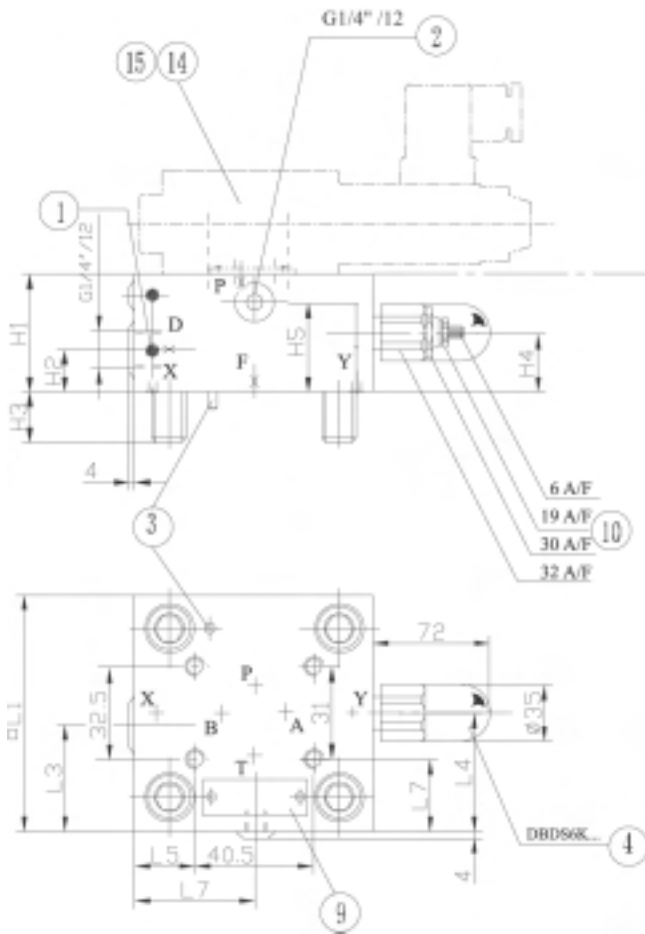
** Orifice-φ

NS	X"	F"	D"	P"	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7
16	0.8	1.0	0.8	1.0	40	17	15	19	28	65	80	36.5	32.5	7	17	35
25	0.8	1.0	0.8	1.0	40	19	24	19	28	85	85	49	45.5	8	27	36
32	0.8	1.2	1.0	1.0	50	26	28	26	37	100	100	56.5	53	30	34.5	57

Control cover for electrical-proportional pressure adjustment, with maximum pressure limitation

NS 40

NS 50



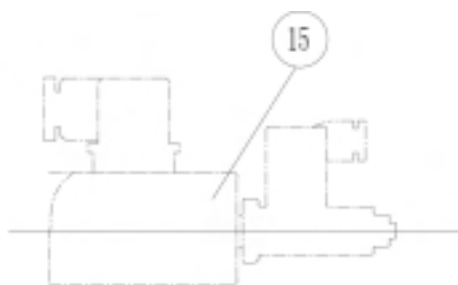
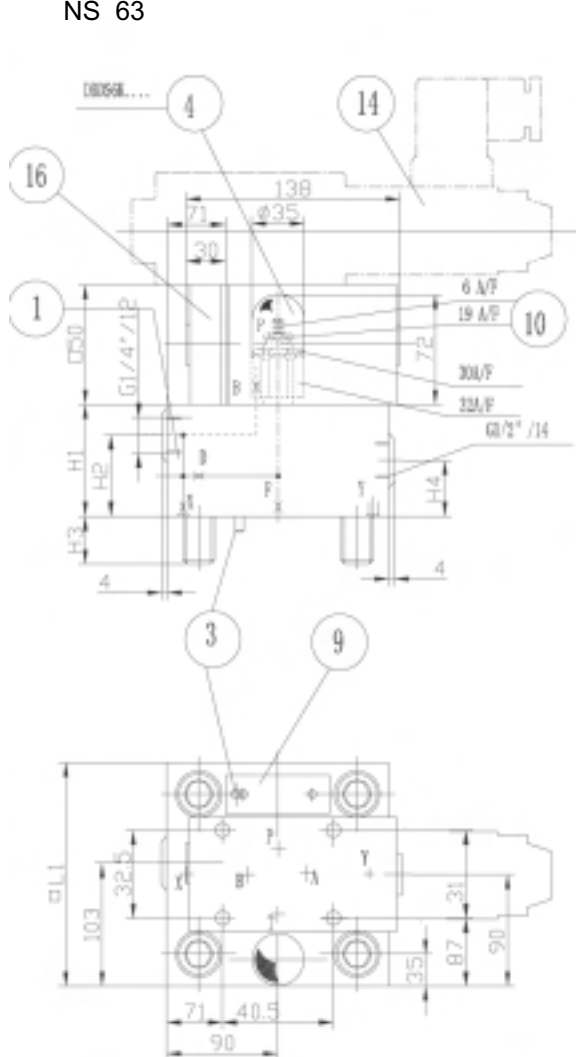
- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 9 Nameplate
- 10 Lock nut
- 14 Proportional pressure relief valve type DBET-5XB/G24 (NS 40) type DBET-5XB/Y G24-1 ¹⁾ (NS 50) (see page 34)
- 15 Proportional pressure relief valve with feedback type DBETR-1XB/... (see page 34) type DBETR-1XB/...409 ²⁾ (NS 50)
- 16 Pressure relief valve NS 6 (is included within the scope of supply)

** Orifice-φ

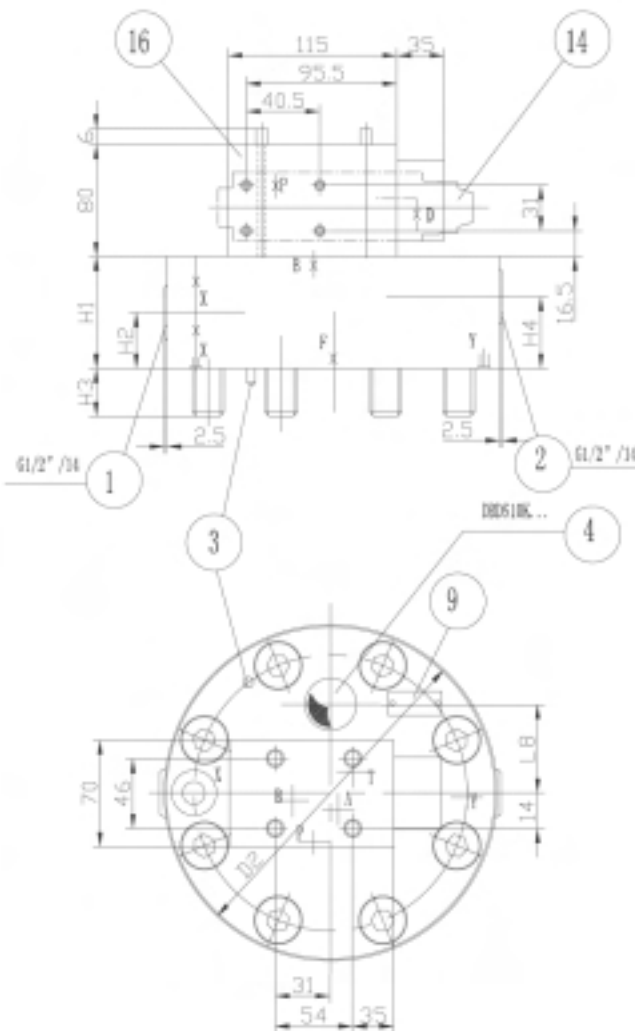
NS	40	50
B"	-	0.8
F"	1.2	1.2
D"	1.0	2.0
P"	1.5	1.0
H1	60	68
H2	20	19.5
H3	32	34
H4	27	35
H5	40	50
□ L1	125	140
L3	68	90
L4	76	84
L5	43.5	51
L6	47	54.5
L7	68	74.5

¹⁾ G 1/4" threaded port T, special poppet
²⁾ 409 = G 1/4" threaded port T,

NS 63



NS 80,100



- 1 Port X optionally as threaded port
- 2 Port Y optionally as threaded port
- 3 Locating pin
- 4 Adjuster type "2"
- 9 Nameplate
- 10 Lock nut
- 14 Proportional pressure relief valve
type DBET-5XB/G24 (NS 40)
type DBET-5XB/Y G24-1 3) (NS 50)
(see page 34)
- 15 Proportional pressure relief valve with feed-back
type DBETR-1XB/...(NS 40) (see page 34)
type DBETR-1XB/...409 ²⁾ (NS 50)
- 16 Pressure relief valve NS 6
(included within the scope of supply)

** Orifice-ø

NS	B**	X**	F**	D**	P**	H1	H2	H3	H4	D2	□ L1	L8
63	0.8	-	1.5	2.0	1.0	82	55	50	45	-	180	-
80	0.8	3.0	2.5	0.8	1.0	100	30	45	52	250	-	75
100	0.8	3.5	3.0	0.8	1.0	100	30	51	52	300	-	85

¹⁾ G 1/4" threaded port T, special poppet

²⁾ 409 = G 1/4" threaded port T

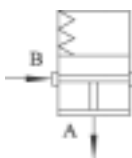
Pressure reducing function

Ordering details: pressure reducing cartridge valve (without associated control cover LFA..DB..)

NS 16 to 63

	LC		DR			6X	B	/	*
Nominal size 16	= 16								Further details in clear text
Nominal size 25	= 25								
Nominal size 32	= 32								
Nominal size 40	= 40								
Nominal size 50	= 50								
Nominal size 63	= 63								
Cracking pressure approx. 0 MPa (without spring)			= 00						No code = Mineral oils
Cracking pressure approx. 0.2 MPa			= 20						V = Phosphate ester
Cracking pressure approx. 0.3 MPa			= 30						
Cracking pressure approx. 0.4 MPa (standard spring)			= 40						B = Technology of Beijing Huade Hydraulic
Cracking pressure approx. 0.5 MPa			= 50						6X = Series 60 to 69 (60 to 69: unchanged installation and connection dimensions)
Cracking pressure approx. 0.8 MPa			= 80						E = Spool without fine control grooves(only for size 16~40)
									D = Spool with fine control grooves

Symbol: cartridge valves



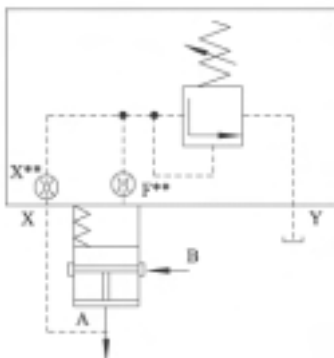
Type LC..DR..

Technical data (for applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil for NBR seals or phosphate ester for FPM seals							
Viscosity range	(mm ² /s)	2.8 to 380						
Pressure fluid temperature range	(°C)	-20 to +80						
Max. operating pressure for Ports A and B	(MPa)	up to 31.5						
Size		16	25	32	40	50	63	
Max. flow	L/min	LC...DR20.6XB/..	40	80	120	250	400	800
(recommeded)		LC...DR40.6XB/..	60	120	180	400	600	1000
Sandwich plate is required (for big compression spings) see page 76		LC...DR50.6XB/..	100	200	300	650	800	1300
		LC...DR80.6XB/..	150	270	450	900	1100	1700

Attention!

2-way cartridge valves
LC..DR... are combined with
control covers.

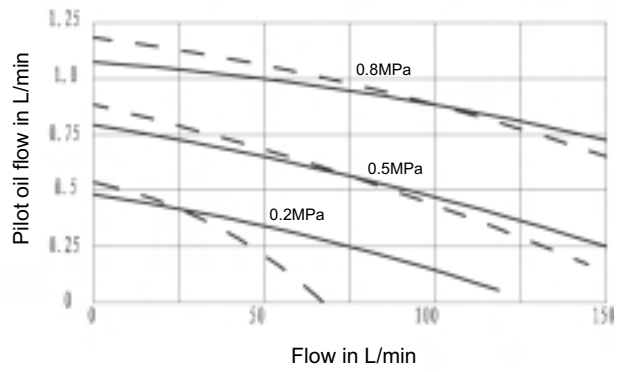
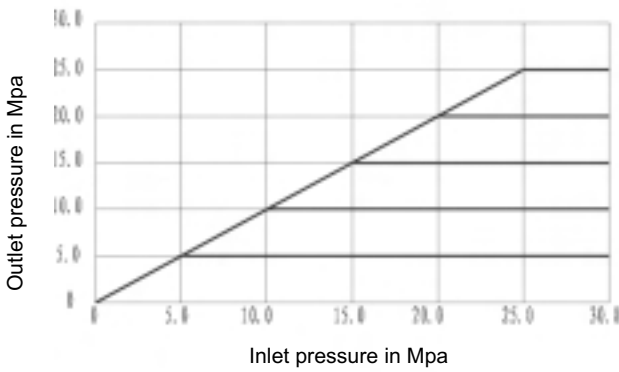
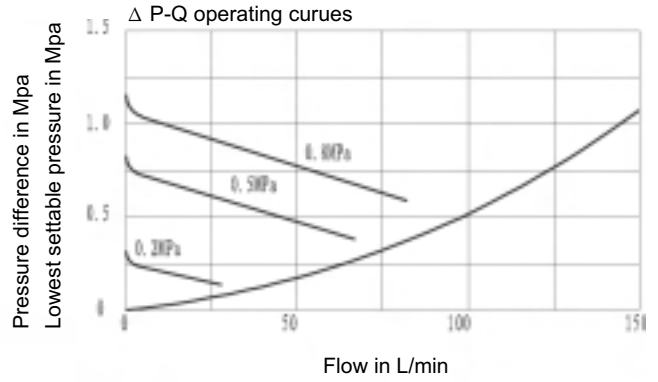
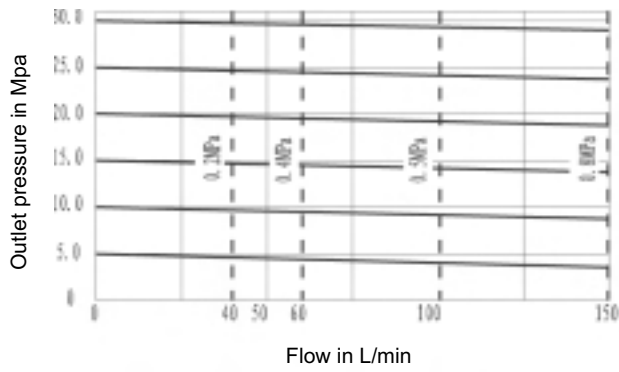


Pressure reducing function

Normally open
e.g.
Type LFA...DB...
Type LC..DR40...

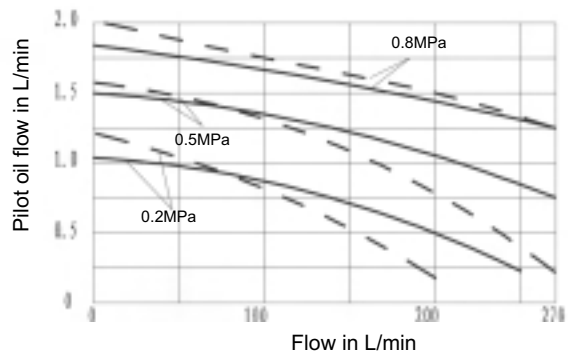
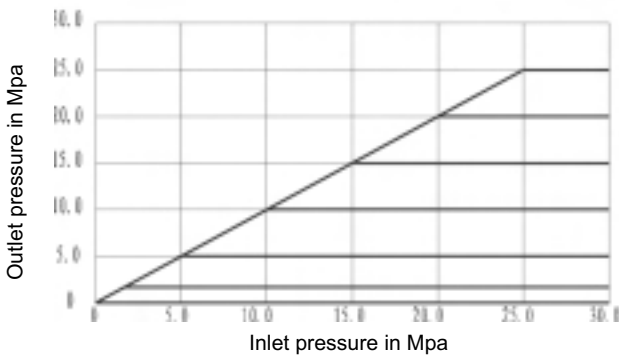
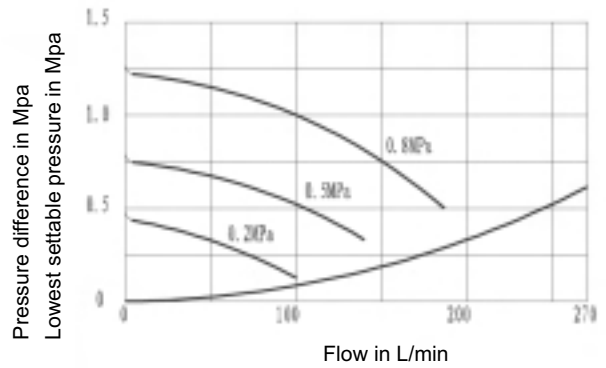
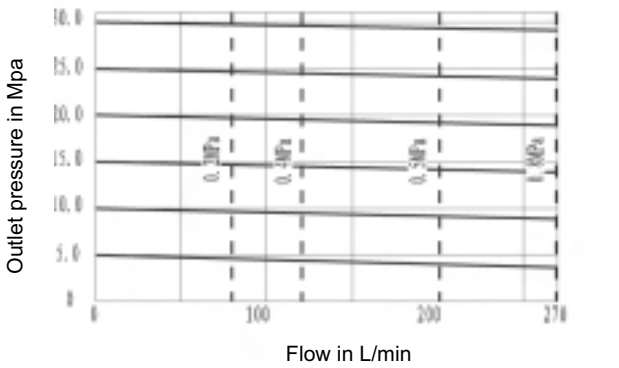
Characteristic curves (measured at $v = 41^2 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

LC16DR...6X



Measured at: $P_A = 3.0 \text{ MPa}$
 $P_E = 5.0 \text{ MPa}$ (solid line)
 $P_E = 13.0 \text{ MPa}$ (dashed line)

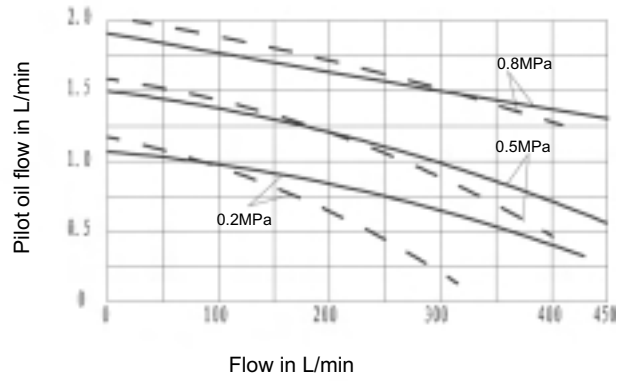
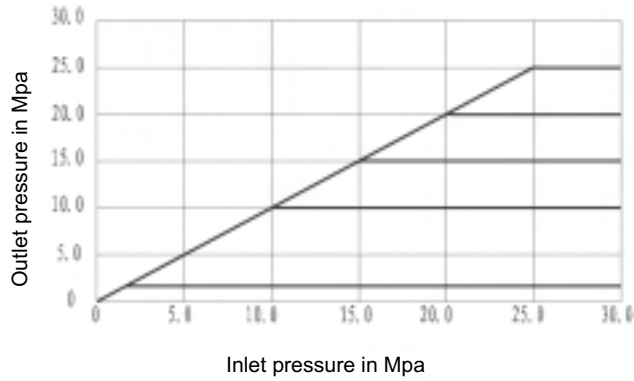
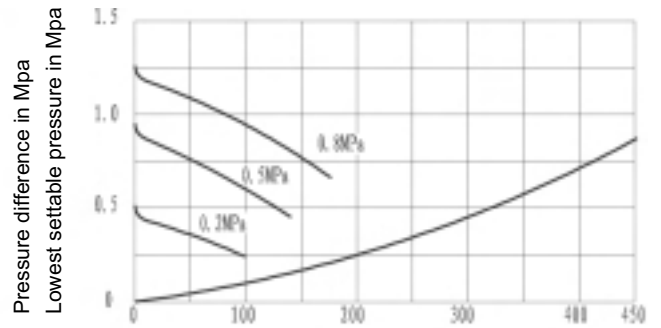
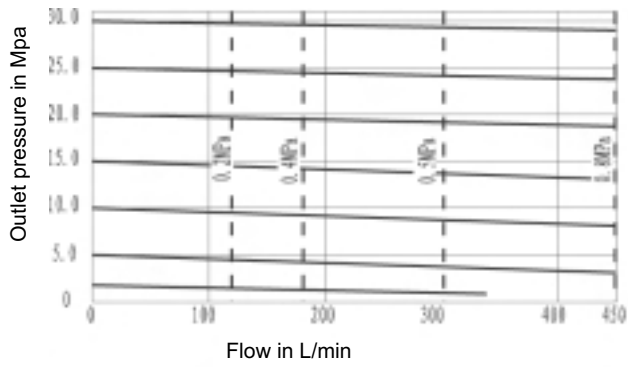
LC25DR...6X



Measured at: $P_A = 3.0 \text{ MPa}$
 $P_E = 5.0 \text{ MPa}$ (solid line)
 $P_E = 13.0 \text{ MPa}$ (dashed line)

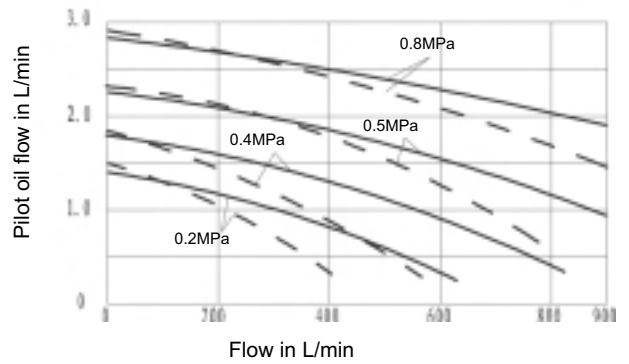
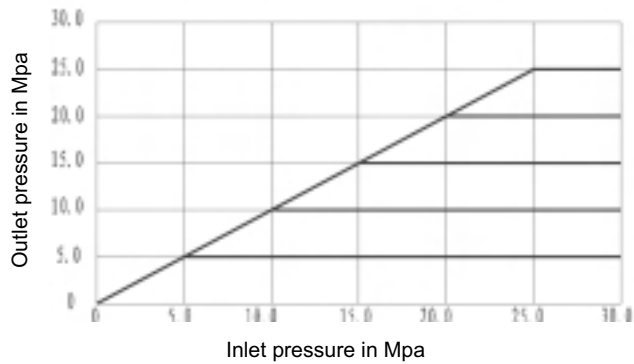
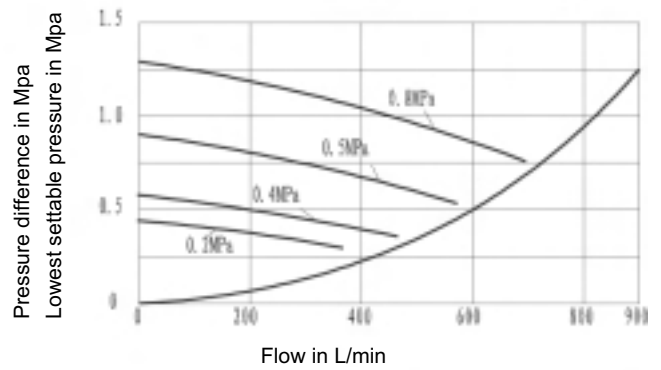
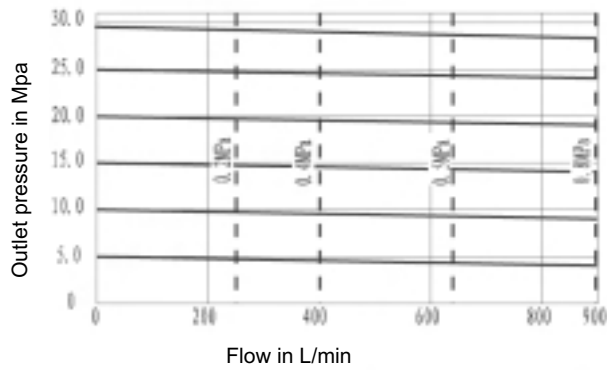
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{C}$)

LC32DR...6X



Measured at: $P_A = 3.0 \text{ MPa}$
 $P_E = 5.0 \text{ MPa}$
 $P_E = 13.0 \text{ MPa}$

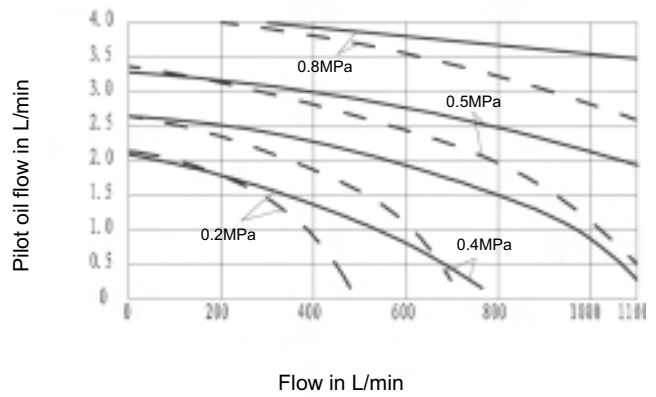
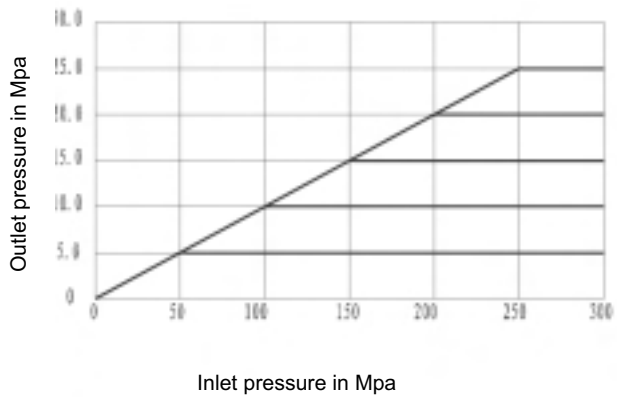
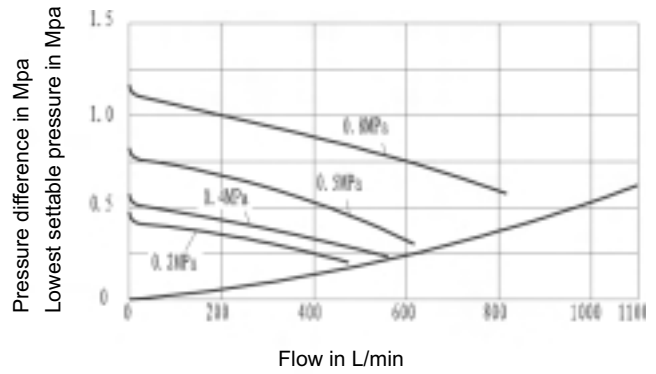
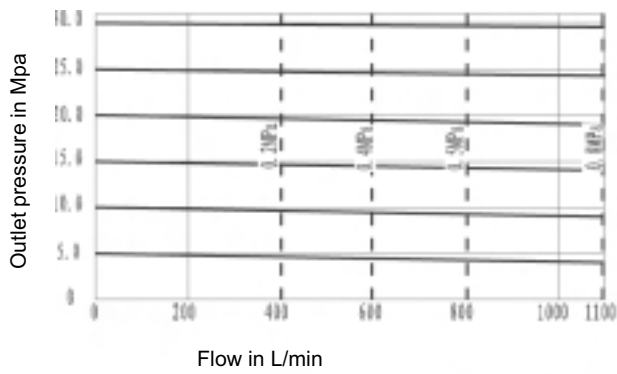
LC40DR...6X



Measured at: $P_A = 3.0 \text{ MPa}$
 $P_E = 5.0 \text{ MPa}$
 $P_E = 13.0 \text{ MPa}$

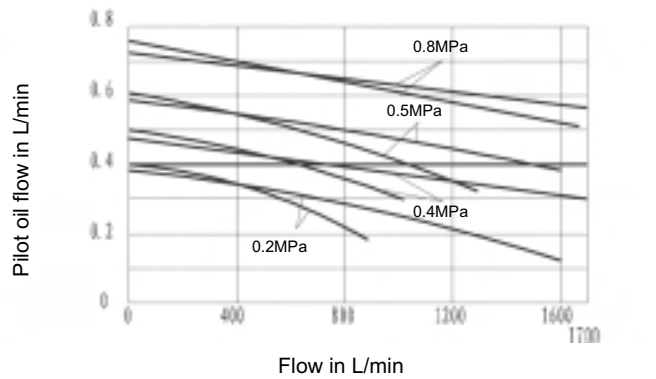
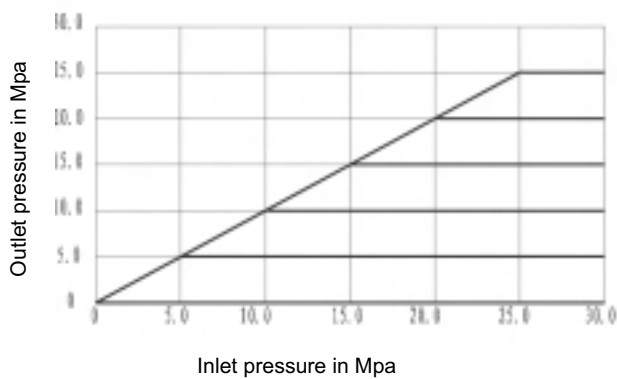
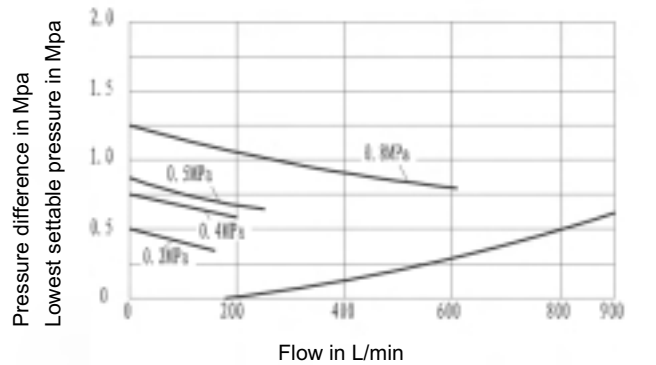
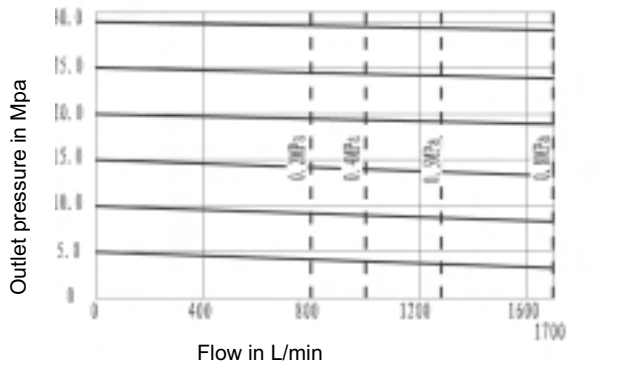
Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ \text{ C}$)

LC50DR...6X



Measured at: $P_A = 3.0\text{MPa}$
 $P_E = 5.0\text{MPa}$
 $P_E = 13.0\text{MPa}$

LC63DR...6X



Measured at: $P_A = 3.0\text{MPa}$
 $P_E = 5.0\text{MPa}$
 $P_E = 13.0\text{MPa}$

Compression springs type LC...16...100(series 6XB),for DB and DR

Ns	Material no.	Spring dimensions in mm	Type symbol
16	097 174	9.8/1.8 × 32/9	20
	097 175	9.9/1.7 × 34/9	30
	097 176	9.8/1.8 × 35/9	40
	012 871	9.2/2.1 × 60.5/15.5	50*
	012 871	9.2/2.1 × 60.5/15.5 (with washer 4.5)	80*
25	097 164	14.1/2.4 × 38.5/7	20
	097 165	14.1/2.4 × 45/8	40
	097 166	13.6/3 × 75.5/14.5	50*
	001 277	13.6/3 × 75.5/14.5 (with washer 6)	80*
32	097 177	17.4/3 × 45/7	20
	097 178	17.5/3 × 50/7	40
	001 455	16.5/4 × 98/15	50*
	001 455	16.5/4 × 98/15 (with washer 6)	80*
40	097 179	24.2/4 × 62.5/6.5	20
	097 180	24.1/4.25 × 68/7.5	40
	011 199	22.8/5.6 × 140/15.5	50*
	011 199	22.8/5.6 × 140/15.5 (with washer 7.5)	80*

Ns	Material no.	Spring dimensions in mm	Type symbol
50	097 181	29.2/5 × 76.5/7.5	20
	097 182	29.2/5 × 86.5/7.5	40
	015 962	28/3 × 200/16.5	50*
	015 962	28/3 × 200/16.5 (with washer 14)	80*
	097 177	37.6/6.5 × 102.5/8	20
63	097 178	37.6/6.5 × 115/8	40
	001 455	35.5/8.5 × 257/19.5	50*
	001 455	35.5/8.5 × 257/19.5 (with washer 14)	80*
80	012 353	48.5/8 × 138/7.5	20
100	012 385	52.3/9.5 × 176/9.5	20

1) These springs require an additional installation length.
When using standard control covers an additional sandwich plate type LFAS...D22-6XB must be used.

Exception:

Control cover type "D" can be replaced by type LFA . D8-6XB/F (no sandwich plate required).

O-rings dimensions for ports X, Y, Z2 (included within the scope of supply)

Nominal size	Dimensions in mm	Mineral oils(NBR)	Phosphate ester(FPM)
16	7.65 × 1.78	004 491	006 585
25	9.25 × 1.78	007 111	009 097
32	10.82 × 1.78	008 937	008 941
40、50	12.37 × 2.62	004 489	008 949
63	18.72 × 2.62	009 245	002 045

Seal kits for cartridge and control cover

Seal kits for control cover type LC...DR.../.. (NS 16 to 63)

Seal kit for	Material no.		Seal kit for	Material no.	
	NBR	FPM		NBR	FPM
LC16DR..6XB/..	314 352	314 353	LC40DR..6X/..	314 055	314 064
LC25DR..6XB/..	314 354	314 355	LC50DR..6X/..	314 056	314 065
LC32DR..6XB/..	314 356	314 357	LC63DR..6X/..	314 057	314 066

Seal kits for control cover type LFA.../... (NS 16 to 63)

Seal kit for		Material no.					
		16		25		32	
		NBR	FPM	NBR	FPM	NBR	FPM
..DR..*	Pilot ..DR6..	311273 (NBR) 311276 (FPM)					
	Control ..DR..	313 701	313 702	313 703	313 704	313 705	313 706
..DRW..*	cover LFA..DRW..	314298 (NBR) 314299 (FPM)					
	Pilot ..ZDR6..	314298 (NBR) 314299 (FPM)					
DREV.; ..DREWW.;..DREZ.; ..DREWZ..				313 885	313 886	313 887	313 888
Seal kit for		Material no.					
		40		50		63	
		NBR	FPM	NBR	FPM	NBR	FPM
..DR..*	Pilot ..DR6..	311273 (NBR) 311276 (FPM)					
	Control ..DR..	313 889	313 890	313 889	313 890	313 891	313 892
..DRW..*	cover LFA..DRW..	314298 (NBR) 314299 (FPM)					
	Pilot ..ZDR6..	314298 (NBR) 314299 (FPM)					
DREV.; ..DREWW.;..DREZ.; ..DREWZ..		313 881	313 882	313 881	313 882	313 883	313 884

*The seals for the pilot valves (DR6..., ZDR...) are not included within the scope of supply.

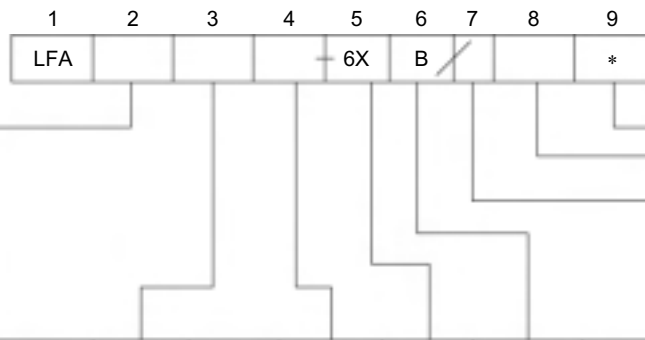
**For pilot valve seal kits see relevant catalogue sheet.

Fixing screws (Included within the scope of supply)

NS	Qty.	Dimensions	Tightening torque in Nm
16	4	M8 × 45	32
25		M12 × 50	110
32		M16 × 60	270
40		M20 × 70	520
50		M20 × 80	520
63		M30 × 100	1800

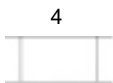
Control cover for pressure reducing function (Main spool normally closed - LC..DB 40 D.. - separate order)

General notes



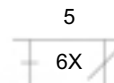
. = available

Nominal size						Type	Page	Adjuster type	Series	Note	Pressure ratings in bar for nominal size		Fluid	Other details
16	25	32	40	50	63						...DR... ...DRW...	...DRE...		
*	*	*	*	*	*	DR	79		6X	Technol- ogy of Beijing Huade Hydraulic	025	006 014	See page 80 to 84	
*	*	*	*	*	*	DRW	80				075			
—	*	*	*	*	*	DREV	81,82				150			
—	*	*	*	*	*	DREZ	81,82				210			
—	*	*	*	*	*	DREWV	83,84				315			
—	*	*	*	*	*	DREWZ	83,84				350			



Adjustment elements for pressure reducing valves

- 1 = Rotary knob
- 2 = Hexagon with protective cap
- 3 = Lockable rotary knob with scale (H-lock to automotive industry standard)
- 7 = Rotary knob with scale

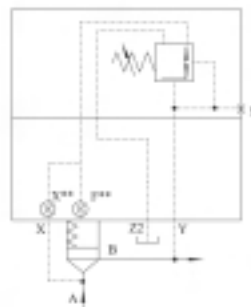


Series

6X = Series 60 to 69
(unchanged installation and connection dimensions)

Attention!

Control covers type LFA..DR... are combined with 2-way cartridge valves type LC..DB 40 D... (for ordering details see page 32)



Pressure reducing function

Normally closed

e.g.

Type LFA...DR...

Type LC...DB40D-6XB/...

Control cover for pressure reducing function(Main spool normally closed - LC..DB 40 D.. - separate order)**Technical data** (for applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil for NBR seals or phosphate ester for FPM seals	
Viscosity range (mm ² /s)	2.8 to 380	
Pressure fluid temperature range (°C)	-20 to +80	

Control cover

Max. perm. operating pressure at port ...	Type	LFA..DR.-6XB/... LFA..DRW.-6XB/...	LFA..DRE.-6XB/...
	...X (primary pressure)	31.5MPa	31.5/35.0MPa
...Y (secondary pressure = max. settable pressure)		31.5MPa	31.5/35.0MPa
...Z ₂	When controlling pressure	zero pressure (up to 0.2 Mpa)	
	Static	6.0MPa	31.5MPa
...T	When controlling pressure	zero pressure (up to 0.2 Mpa)	
	Static (corresponds to the permissible tank pressure of the pilot valves)	10.0MPa (DBET);31.5MPa (DBETR)	

Notes on pilot control valves**Directional spool valve (porting pattern form A 6 to DIN 24 340)**

Directional spool valve	Nominal size	Catalogue sheet no.	Control cover
3WE6A-5XB/...	6		DREWV,DREWZ
3WE6 B9-5XB/...	6		DRW

Proportional pressure relief valve

Directional spool valve	Nominal size	Catalogue sheet no.	Control cover
DBET-5XB/...*YG24-1	6		DREV,DREWV
DBETR-1XB/...*Y409	6		DREZ,DREWZ

* Possible pressure ratings 50, 100, 200, 315, 350

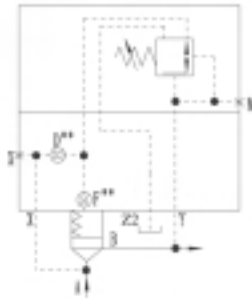
** Possible pressure ratings 25,80,180,315,350

Attention!

Valve fixing screws are included within the scope of the control cover supply.

Overview of symbols (basic symbols) - pressure reducing function

Valid symbols are shown in the following type descriptions !



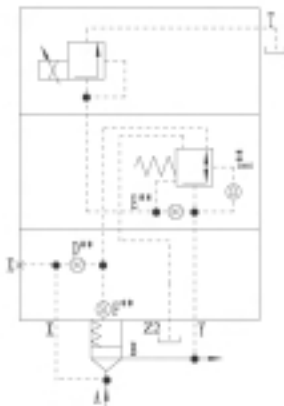
LFA..DR-.../...
NS 16 to 63
Control cover with
manual pressure
adjustment
Port T - zero pressure

See page 79



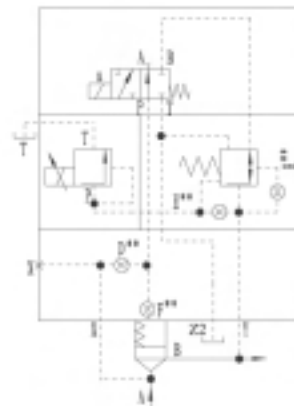
LFA..DRW-.../...
NS 16 to 63
Control cover with
manual pressure
adjustment and isolating
function
Port T - zero pressure
3WE 6 B9-.../...
Solenoid de-energised
-closed
Solenoid de-energised
-pressure reducing func-
tion

See page 80



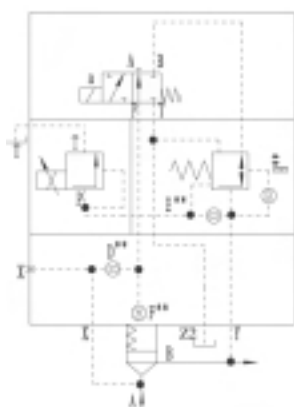
LFA..DREV-.../...
NS 25 to 63
Control cover for
electrical-proportional
pressure adjustment
Port T - zero pressure

See page 81,82



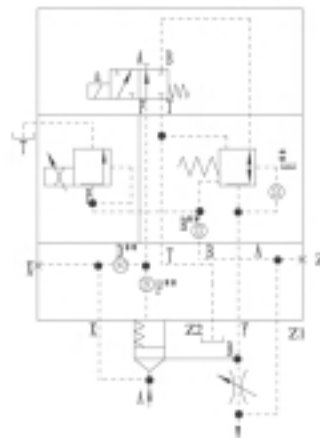
LFA..DREZ-.../...
NS 25 to 63
Control cover for
electrical-proportional
pressure adjustment
Port T - zero pressure

See page 81,82



LFA..DREWV-.../...
NS 25 to 63
Control cover for
electrical-proportional
pressure adjustment and
isolating function
Port T - zero pressure
3WE 6 A-.../...
Solenoid de-energised
-closed
Solenoid de-energised
-pressure reducing function


See page 83,84



LFA..DREWZ-.../...
NS 25 to 63
Control cover for
electrical-proportional
pressure adjustment and
isolating function
Port T - zero pressure
3WE 6 A-.../...
Solenoid de-energised
-closed
Solenoid de-energised
-pressure reducing func-
tion

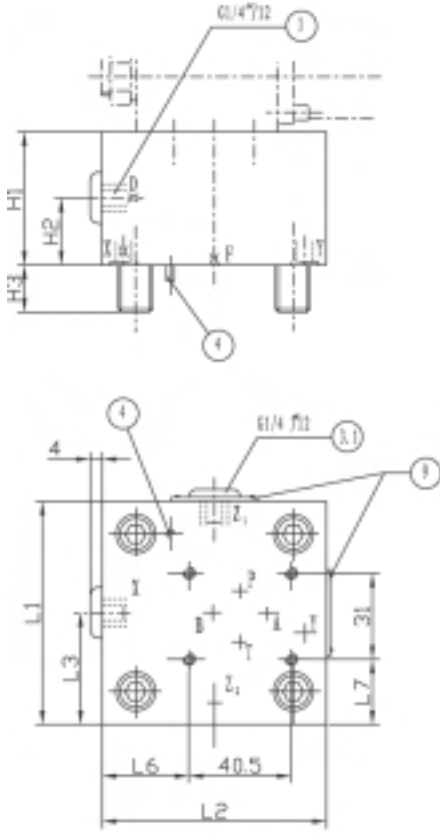
See page 83,84

The orifices built into the control covers are screwed type orifices.
These are standard orifices. **No** type is entered in the ordering detail.

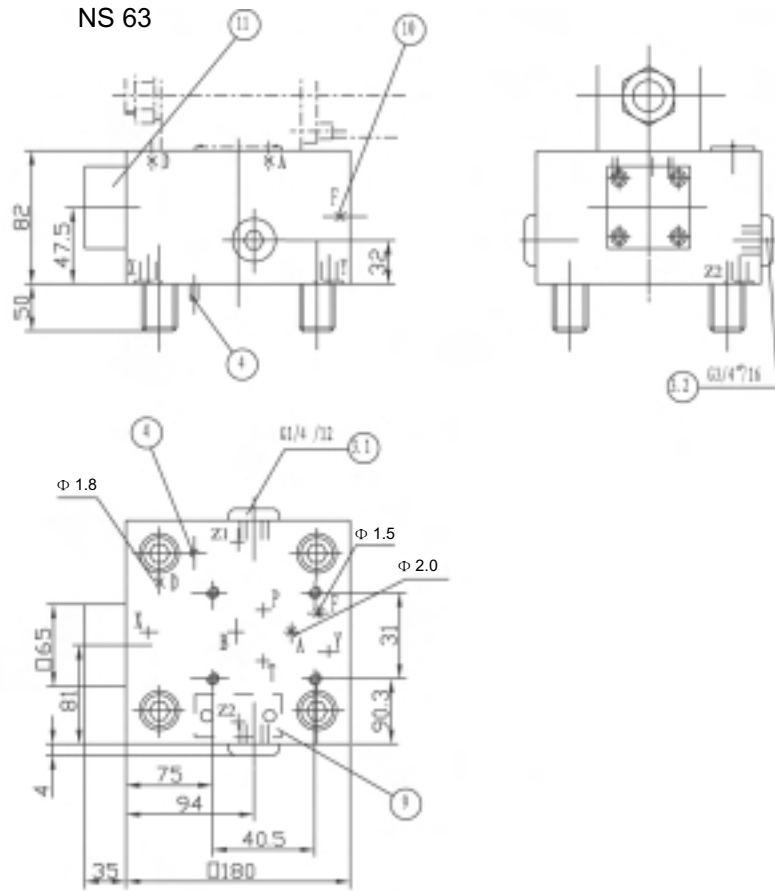
Symbol: 

Control covers for versions DR, DRW, DREV, DREZ, DREWV and DREWZ

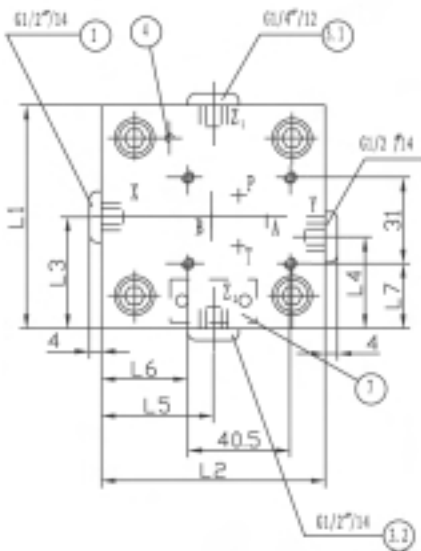
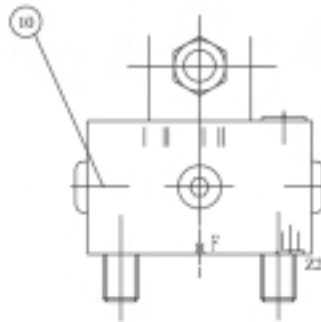
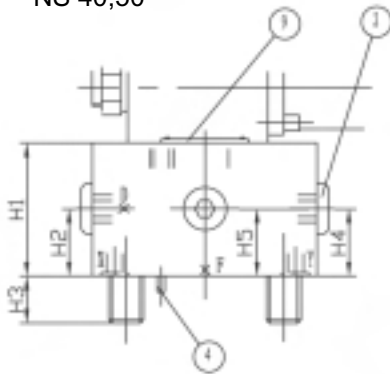
NS 16 to 32



NS 63



NS 40,50



- 1 Port X optionally as threaded port (for NS 16...50)
- 2 Port Y optionally as threaded port (for NS 40, 50)
- 3.1 Port Z1 optionally as threaded port (for LFA..DREZ.. , LFA..DREWZ..., NS 25..63)
- 3.2 Port Z2 optionally as threaded port (for NS 40, 50, 63)
- 4 Locating pin
- 9 Nameplate
- 10 Check valve (for NS 63 orifice F in poppet)
- 11 For control cover NS 63 logic element NS 16

**Orifice -φ

NS	16	25	32	40	50
F**	-	0.8	1.0	1.2	1.5
X**	1.2	-	-	-	-
D**	0.8	1.5	1.5	1.8	1.8
H1	40	40	50	60	68
H2	17	19	26	30	32
H3	15	24	28	32	34
H4	-	-	-	30	32
H5	-	-	-	40	40
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	36.5	49	56.5	72	80
L4	-	-	-	62.5	70
L5	-	-	-	62.5	70
L6	7	22.5	30	43.5	51
L7	17	27	34.5	47	54.5

Control cover for pressure reducing and isolating function

Main spool normally closed - LC..DB 40 D.. - separate order

NS 16 to 63

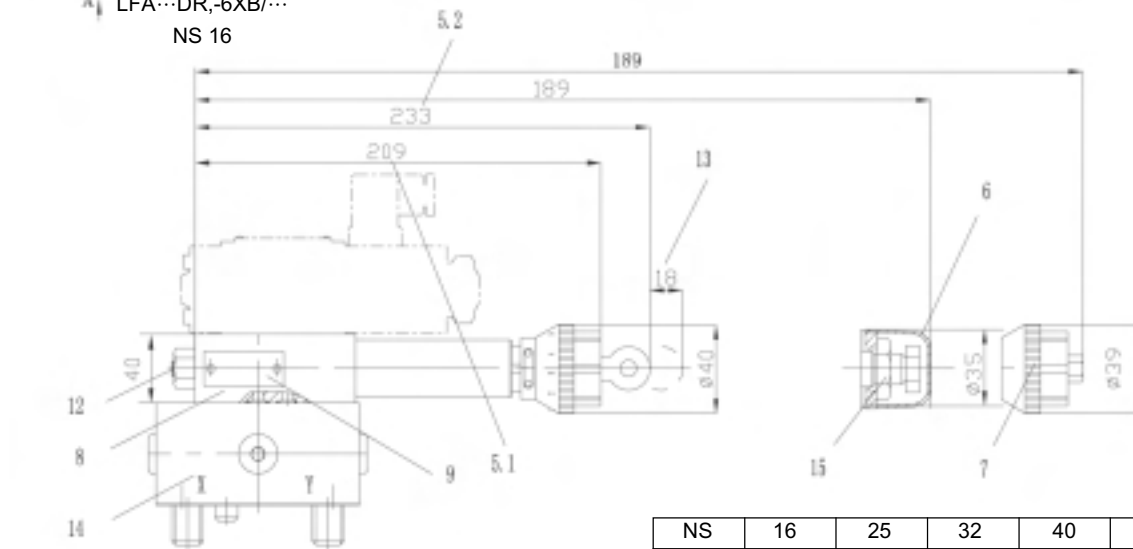
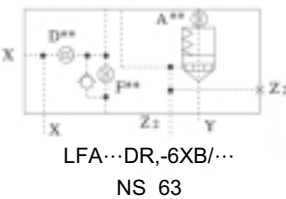
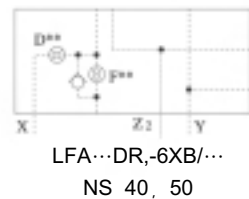
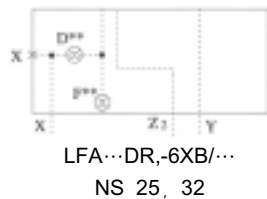
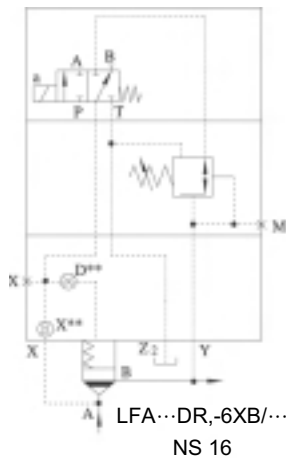
1	2	3	4	5	6	7	8	9
LFA		DRW		6X	B			*

Nominal size 16	= 16
Nominal size 25	= 25
Nominal size 32	= 32
Nominal size 40	= 40
Nominal size 50	= 50
Nominal size 63	= 63

Adjuster type

Rotary knob	= 1
Set screw with hexagon and protective cap	= 2
Lockable rotary knob with scale	= 3 1)
Rotary knot with scale	= 4

Series 6X (NS 16 to 63) = 6X
3WE 6 B9-5XB/...



NS	16	25	32	40	50	63
L6	7	22.5	30	43.5	51	75
L7	17	27	34.5	47	54.5	90.3

- 5.1 Adjustment element "7" reducing valves
- 5.2 Adjustment element "3" 11 Valve fixing screws
- 6 Adjustment element "2" M5x50 DIN 912-10.9 $M_A = 8.9$ Nm are within the control cover scope of supply
- 7 Adjustment element "1"
- 8 Direct operated pressure reducing valve 12 Pressure gauge port G 1/4", depth 12; socket screw A/F 6
- (is included within the scope of supply) 13 Space required to remove key
- 9 Nameplate for pressure 14 Control cover, see page 78
- 15 Lock nut A/F 24

Further details in clear text

No code = Mineral oils
V = Phosphate ester

025 = Max. secondary pressure 2.5 MPa
075 = Max. secondary pressure 7.5 MPa
150 = Max. secondary pressure 15.0 MPa
210 = Max. secondary pressure 21.0 MPa

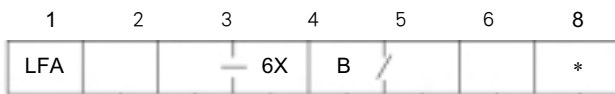
B = Technology of Beijing Huade Hydraulic

1) H-key to part no. 00008158 is included within the scope of supply

Control cover for pressure reducing function-electrical-proportional

Main spool normally closed - LC..DB 40 D.. - separate order

NS 25 to 63



Nominal size 25 = 25
 Nominal size 32 = 32
 Nominal size 40 = 40
 Nominal size 50 = 50
 Nominal size 63 = 63

Further details in clear text

Pressure reducing function, electrical-proportional = DREV
 Pressure reducing function, electrical-proportional and possibility for 2-way flow control function = DREZ

No code =
 V =

Mineral oils
 Phosphate ester

Series 6X (NS 25 to 63) = 6X

Pressure ratings (pressure reducing valve)

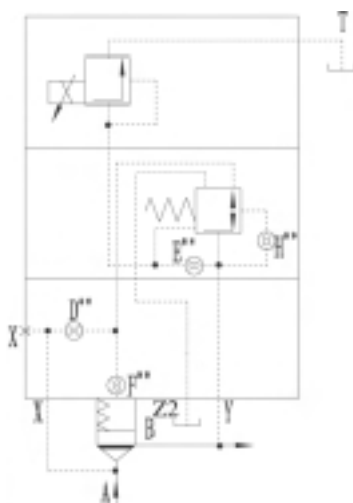
006 =

0.7 MPa (only for DREV)

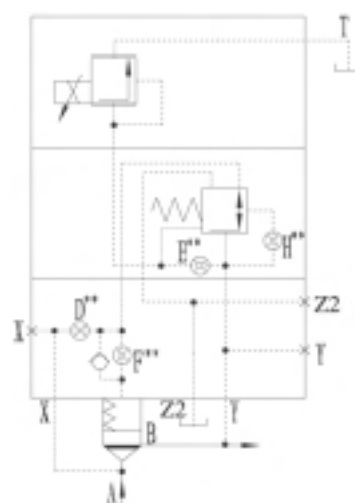
014 =

1.6 MPa (only for DREZ)

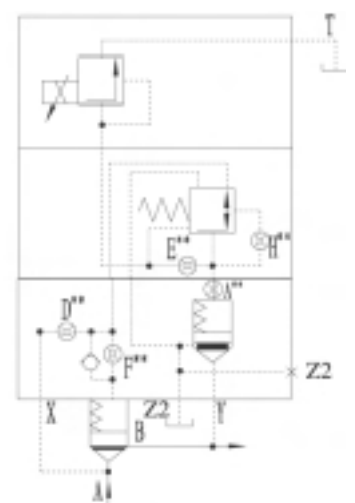
Technology of Beijing Huade Hydraulic = B



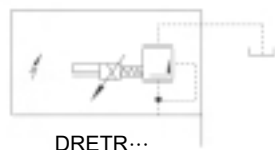
LFA...DREV-6XB/...
 NS 25, 32



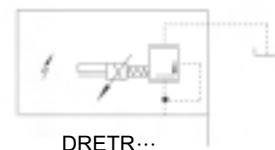
LFA...DREV-6XB/...
 NS 40, 50



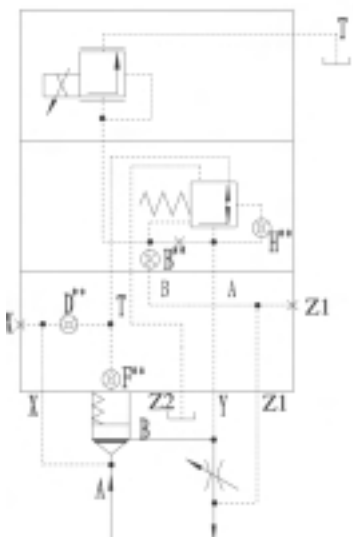
LFA...DREV-6XB/...
 NS 63



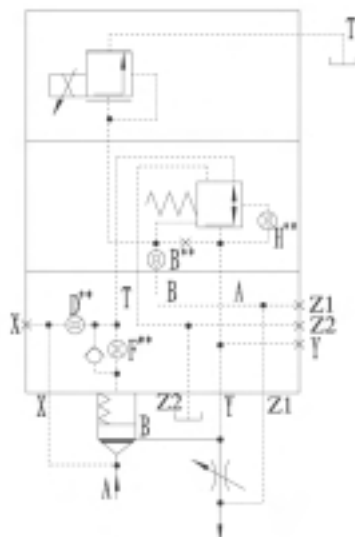
DRETR...



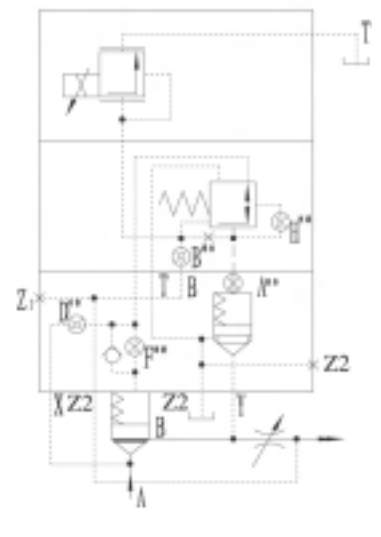
DRETR...



LFA...DREZ-6XB/...
 NS 25, 32



LFA...DREZ-6XB/...
 NS 40, 50

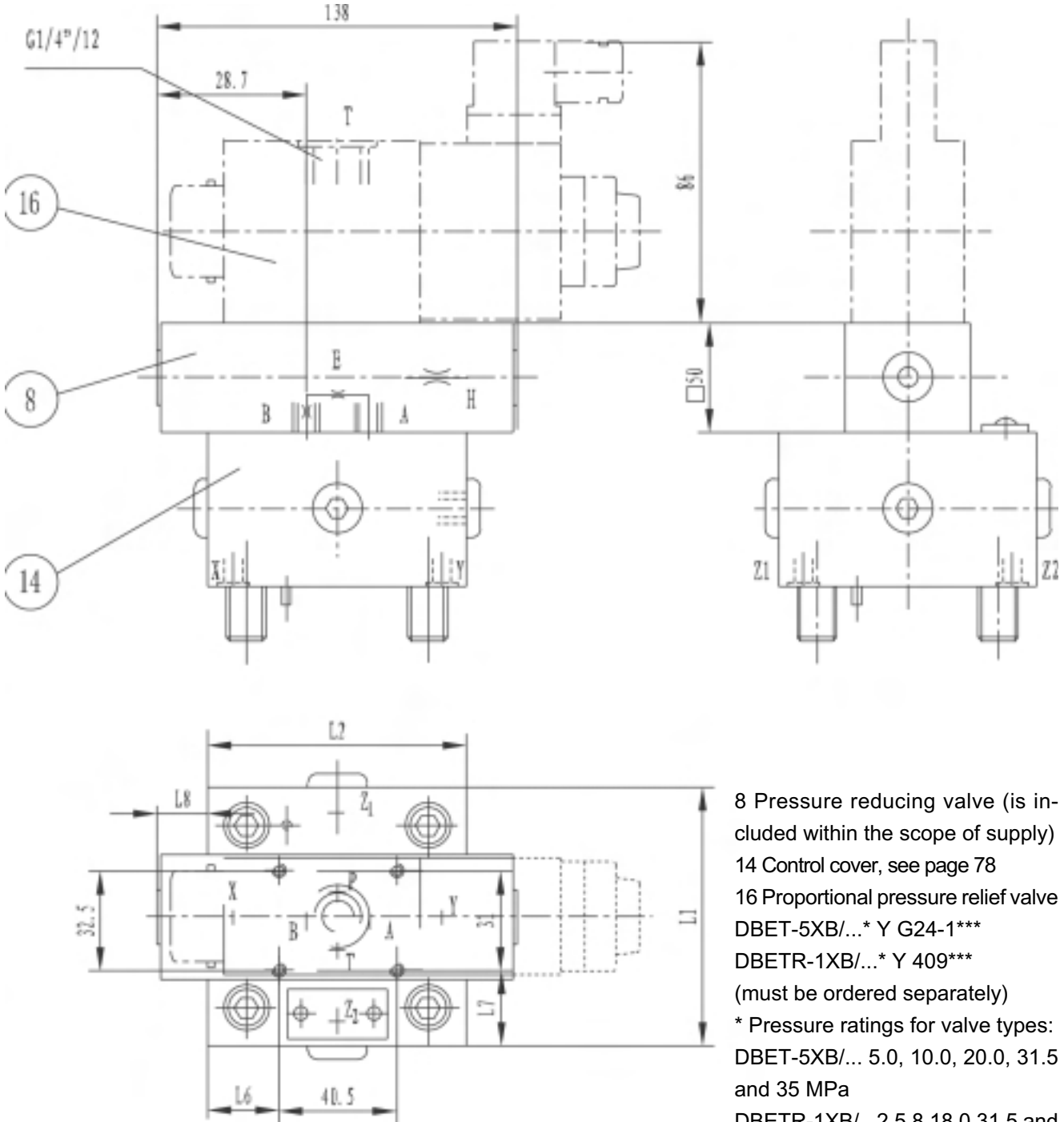


LFA...DREZ-6XB/...
 NS 63

Control cover for pressure reducing function-electrical-proportional

Main spool normally closed - LC..DB 40 D.. - separate order

NS 25 to 63



- 8 Pressure reducing valve (is included within the scope of supply)
- 14 Control cover, see page 78
- 16 Proportional pressure relief valve DBET-5XB/... * Y G24-1*** DBETR-1XB/... * Y 409*** (must be ordered separately)
- * Pressure ratings for valve types: DBET-5XB/... 5.0, 10.0, 20.0, 31.5 and 35 MPa DBETR-1XB/...2.5,8,18.0,31.5 and 35 MPa
- *** = G 1/4" threaded port T

for type ...-6XB/006

for type ...-6XB/014

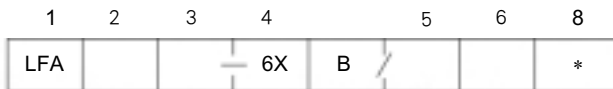
** Orifice - Φ

NS	H"	E/B"	E/B"	D"	P"	A"	L1	L2	L6	L7	L8
25	0.8	0.8	0.6	1.2	0.8	-	85	85	22.5	27	6.5
32	0.8	0.8	0.6	1.2	1.0	-	100	100	30	34.5	-
40	0.8	0.8	0.6	1.5	1.2	-	125	125	43.5	47	-
50	0.8	0.8	0.6	1.5	1.5	-	140	140	51	54.5	-
63	0.8	0.8	0.6	1.8	1.5	2.0	180	180	75	90.3	-

Control cover for pressure reducing and isolating function-electrical-proportional

Main spool normally closed - LC..DB 40 D.. - separate order

NS 25 to 63



Nominal size 25 = 25
 Nominal size 32 = 32
 Nominal size 40 = 40
 Nominal size 50 = 50
 Nominal size 63 = 63

Pressure reducing function, electrical-proportional = DREWW
 Pressure reducing function, electrical-proportional and possibility for 2-way flow control function = DREWZ

Series 60 to 69(60 to 69: unchanged installation and connection dimensions) = 6X

Technology of Beijing Huade Hydraulic = B

Further details in clear text

No code =
 V =

Mineral oils
 Phosphate ester

Pressure ratings (pressure reducing valve)

006 =

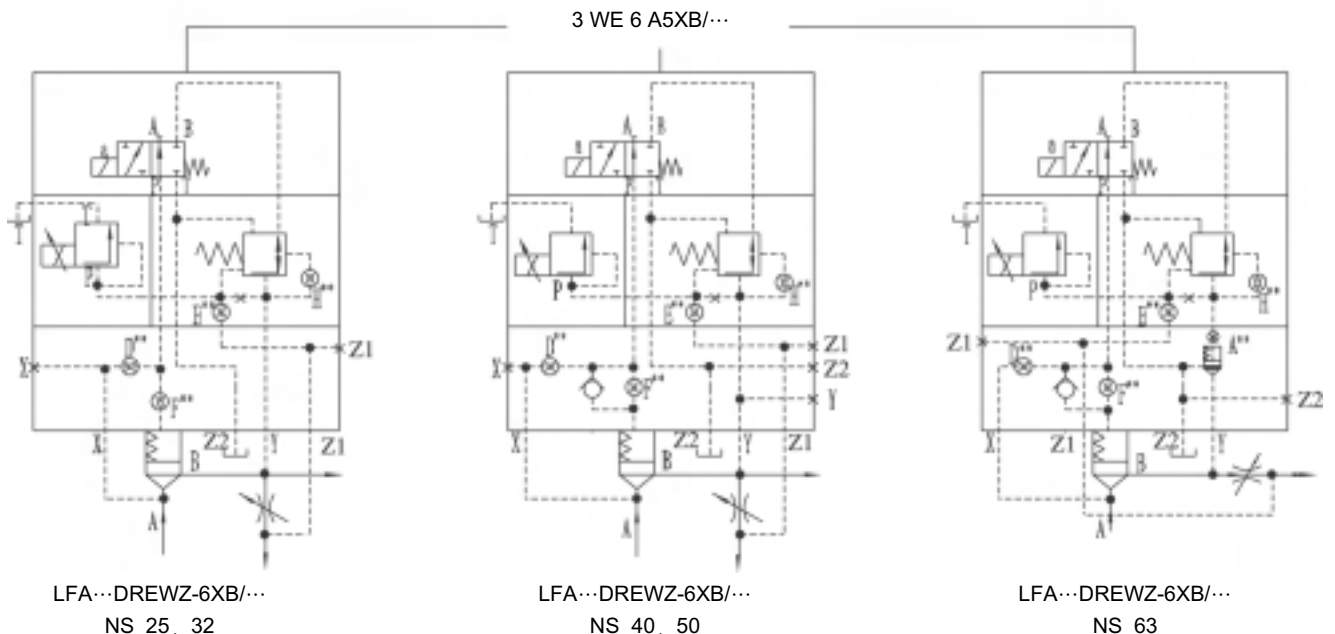
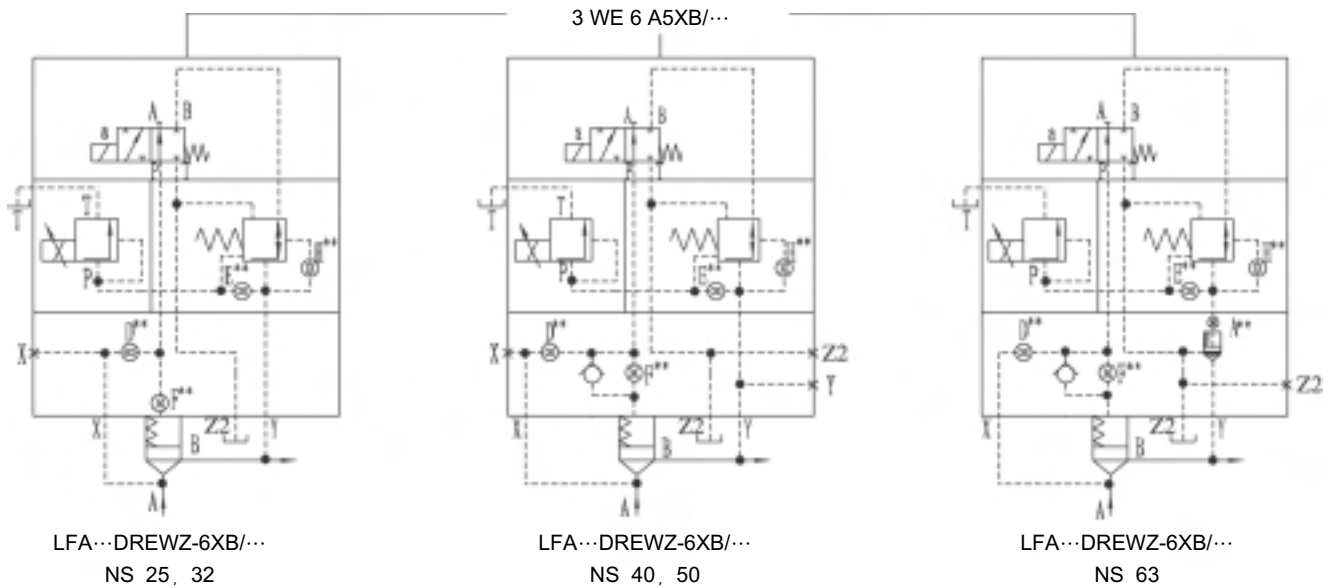
0.7 MPa (only for DREWW)

014 =

1.6 MPa (only for DREWZ)

Solenoid de-energised-closed

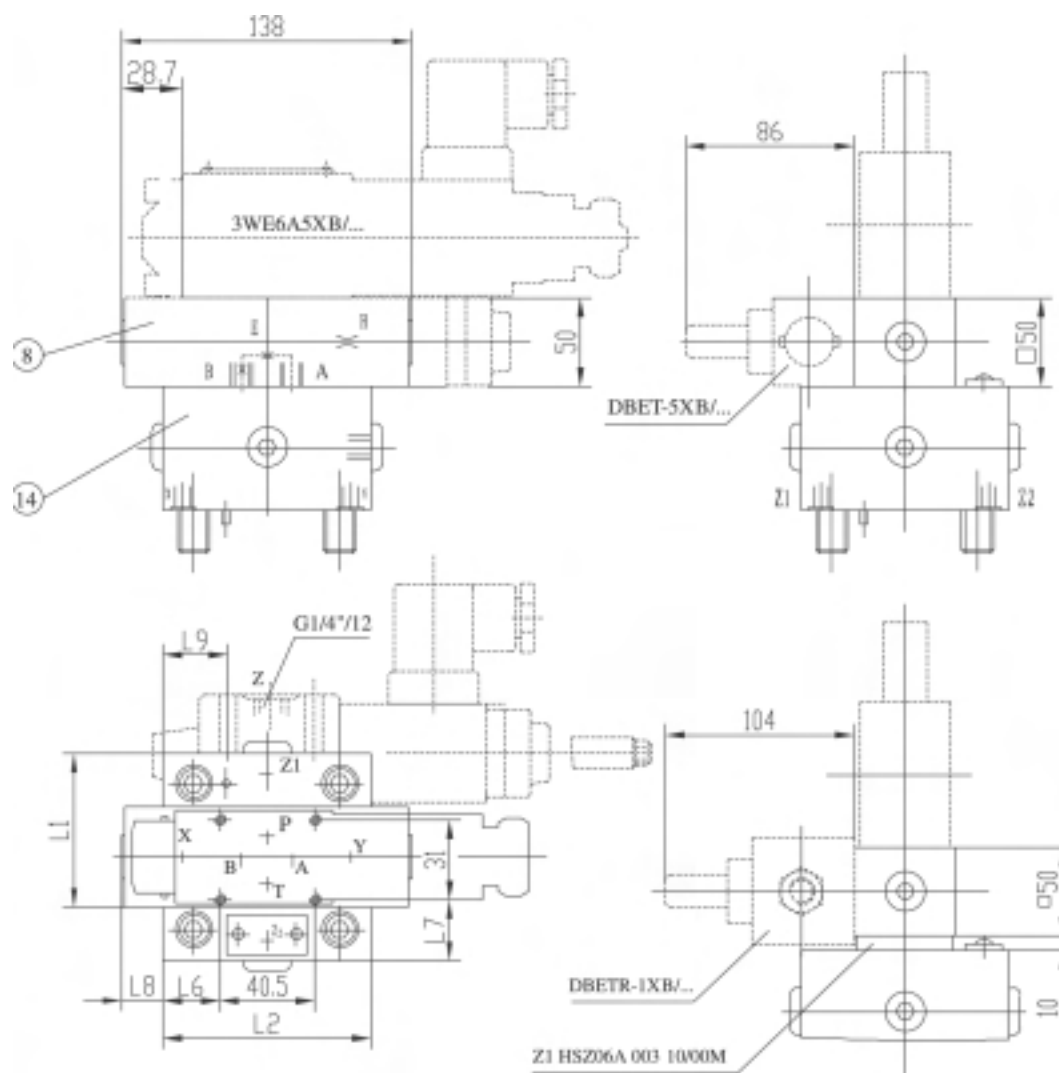
Solenoid de-energised-pressure reducing function



Control cover for pressure reducing and isolating function-electrical-proportional

Main spool normally closed - LC..DB 40 D.. - separate order

NS 25 to 63



8 Pressure reducing valve (is included within the scope of supply)

14 Control cover, see page 78

16 Proportional pressure relief valve

DBET-5XB/... * Y G24-1***

DBETR-1XB/... * Y 409***

(must be ordered separately)

* Pressure ratings for valve types:

DBET-5XB/... 5.0, 10.0, 20.0, 31.5

and 35.0 MPa

DBETR-1XB/... 2.5, 8.0, 18.0, 31.5 and 35.0 MPa

*** G 1/4" threaded port T, special poppet

for type ...-6XB/006

for type ...-6XB/014

** Orifice- ϕ

NS	H**	E/B**	E/B**	D**	F**	A**	L1	L2	L6	L7	L8	L9
25	0.8	0.8	0.6	1.5	0.8	-	85	85	22.5	27	6.5	13
32	0.8	0.8	0.6	1.5	1.0	-	100	100	30	34.5	-	20.5
40	0.8	0.8	0.6	1.8	1.2	-	125	125	43.5	47	-	34
50	0.8	0.8	0.6	1.5	1.5	-	140	140	51	54.5	-	41.5
63	0.8	0.8	0.6	1.8	1.5	2.0	180	180	75	90.3	-	65.5

Pressure sequencing functions

General information regarding control cover for pressure sequencing functions

Normally notes					1	2	3	4	5	6	7	8	9	10
LFA									6X	B				*

Nominal size					Type	Page	Adjuster type	Series	Note	Max. settable sequencing pressure in MPa	Pilot oil supply	Fluid	Further details in clear text
16	25	32	40	50									
●	●	●	●	●	DZ	87 to 89				21			
●	●	●	●	●	DZWA	90 to 92		6X	Technology of Beijing Huade Hydraulic	31.5		ordering details see pages 87 and 90	
●	●	●	●	●	DZWB					35			

● = available



4 Adjustment type for pressure sequence valves
 1 = Rotary knob
 2 = Hexagon with protective cap
 3 = Lockable rotary knob with scale (H-lock to automotive industry standards)
 4 = Rotary knob with scale not lockable



5 Series
 6X = Series 60 to 69 (unchanged installation and connection dimensions)
 Pressure:



210 = Max. sequencing pressure is 21.0Mpa
 315 = Max. sequencing pressure is 31.5Mpa
 350 = Max. sequencing pressure is 35.0Mpa



7 Pilot oil supply
 No code =
 X = * } ordering details according to symbol
 Y = } (see pages 87 and 90)
 XY =

For seal kits see page 89 Attention!
 Control cover type LFA..DZ...are combined with 2-way cartridge valves type LC..DB... (for ordering details see page 32)

The orifices built into the control cover are screwed type orifices. These are standard orifices. No type is entered in the ordering code.



Symbol

Directional spool valve (porting pattern to DIN 24 340 form A6)

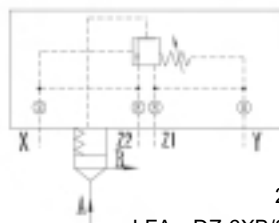
Directional spool valve Type	NS	Catalogue sheet RE no.	Control cover Type
	4WE 6 D5XB/...	6	

Attention! Pilot valves (electrical directional spool valves type 4WE 6 D...) must be ordered separately, for further details see catalogue sheet RE 23 178.

Overview of symbols (basic symbols), pressure sequencing functions

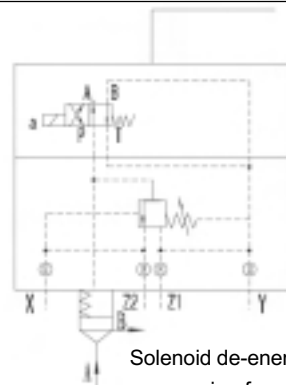
Valid symbols are shown in the following type descriptions !

Control cover with manual pressure adjustment and pressuredependent or pressure independent sequence function

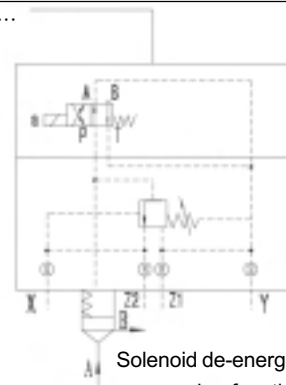


210
 LFA...DZ-6XB/315
 350

Control cover with manual pressure adjustment



Solenoid de-energised: sequencing function
 210
 LFA...DZWA-6XB/315
 350

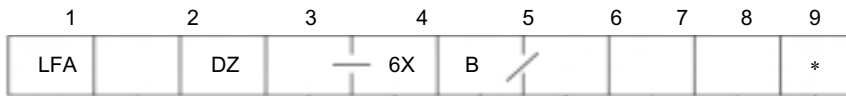


Solenoid de-energised: sequencing function
 210
 LFA...DZWB-6XB/315
 350

Control cover for pressure sequencing functions								
Technical data (for applications outside these parameters, please consult!)								
Pressure fluid	Mineral oil for NBR seals or phosphate ester for FPM seals							
Pressure fluid temperature range (°C)	-20 to +80							
Viscosity range (mm ² /s)	2.8 to 380							
Control cover								
Control cover type	LFA..DZ -6XB/...	LFA..DZW.-6XB/...	/...Y					
		/...X	/...XY					
Max. operating pressure at port...	31.5MPa							
...Y	When controlling pressure	zero pressure (up to 0.2 Mpa)						
	Static	31.5MPa	16.0MPa(=) * 10.0MPa(~) *					
...Z1	When controlling pressure	zero pressure (up to 0.2 Mpa)						
	Static	31.5MPa	16.0MPa(=) * 10.0MPa(~) * 31.5MPa					
Settable sequencing pressure 21.0MPa	21.0MPa 31.5MPa 35.0MPa							
Directional spool valve (porting pattern on A6 to DIN24340)								
O-rings dimensions for ports X, Y, Z1, Z2 (are included within the scope of supply)								
NS	Dimensions in mm	Material no.						
		NBR	FPM					
16	7.65 × 1.78	004 491	006 585					
25	9.25 × 1.78	007 111	009 097					
32	10.82 × 1.78	008 937	008 941					
40,50	12.37 × 2.62	004 489	008 949					
Seal kits for cartridge valves and control covers								
Seal kits for cartridge valves Type LC.. DB../... (NS 25 to 50)		Seal kit for control covers Type LFA.. /... (NS 25 to 50)						
Seal kit for...	Material no.							
	NBR	FPM						
	LC25DB...6XB/...	314 354	314 355					
	LC32DB...6XB/...	314 356	314 357					
	LC40DB...6XB/...	314 055	314 046					
LC50DB...6XB/...	314 056	314 065						
Seal kit for...	Material no.							
	25		32		40		50	
	NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
	DZ...							
	ADZW...	311 540		311 541		311 542		311 542
Fixing screws				Orifice thread size				
(are included within the scope of supply)				All built-in orifices: M6 tapered				
NS	Qty.	Dimensions	Tightening torque in mm					
16		M8 × 115	32					
25		M12 × 120	110					
32	4	M16 × 120	270					
40		M20 × 70	520					
50		M20 × 80	520					

Control cover for pressure sequencing functions

NS 16 to 50



Nominal size 16	= 16
Nominal size 25	= 25
Nominal size 32	= 32
Nominal size 40	= 40
Nominal size 50	= 50

Adjuster type

Rotary knob	= 1
Hexagon with protective cap	= 2
Lockable rotary knob with scale (H-lock to automotive industry standards)	= 3
Rotary knot with scale not lockable	= 4

Series 6X (60 to 69: unchanged installation and connection dimensions) = 6X

Technology of Beijing Huade Hydraulic = B

Further details in clear text

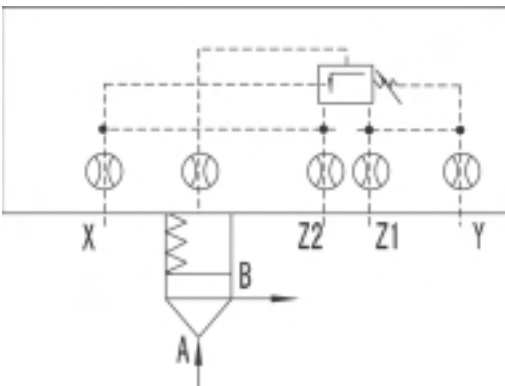
No code = Mineral oils
V = Phosphate ester

Pilot oil supply

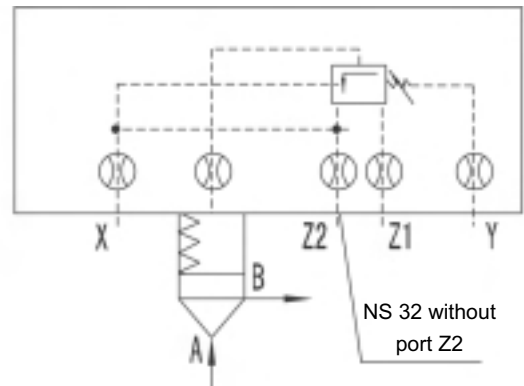
	Pilot oil supply	Pilot oil supply
No code =	internal	internal
X =	external	internal
Y =	internal	external
XY =	external	external

Pressure stages (max. settable sequencing pressure)

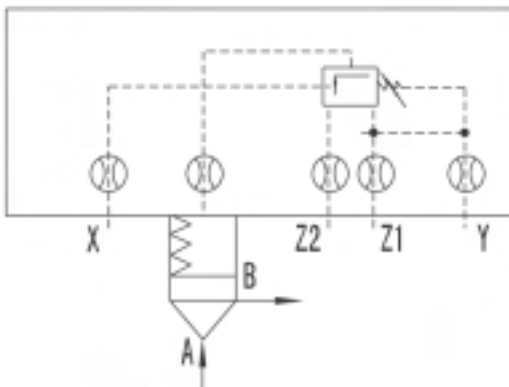
210 =	21.0 MPa
315 =	31.5 MPa
350 =	35.0 MPa



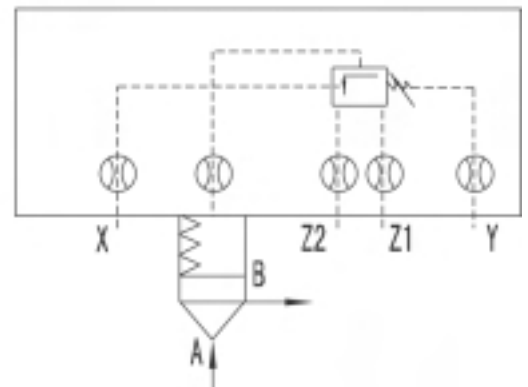
LFA...DZ.-6XB/ 210
315
350



LFA...DZ.-6XB/ 210
315 Y
350



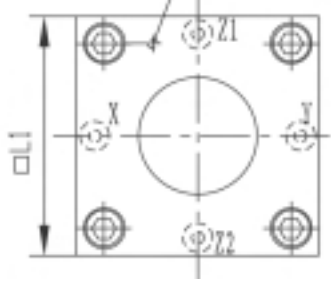
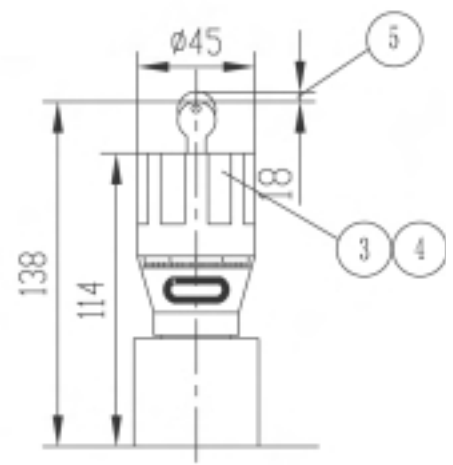
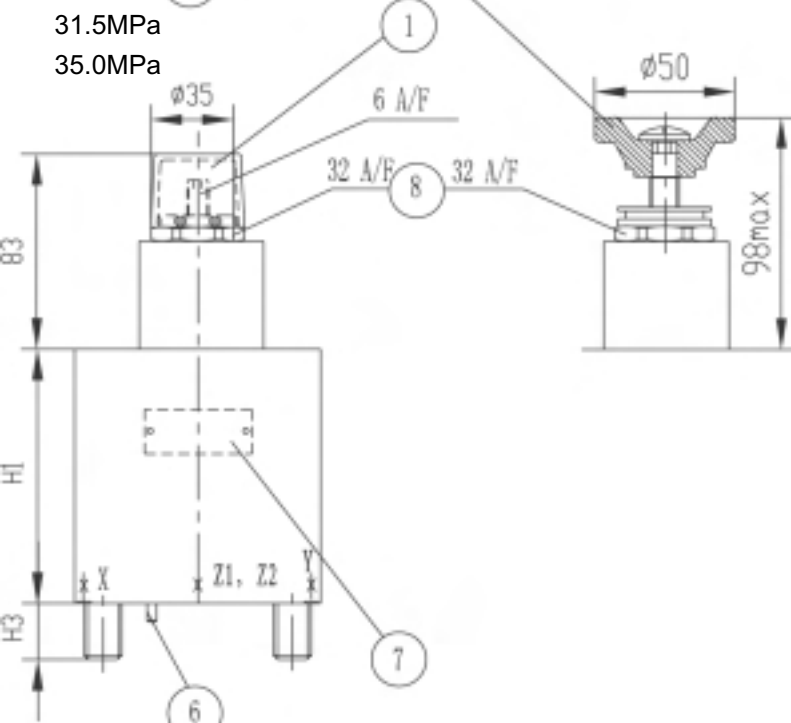
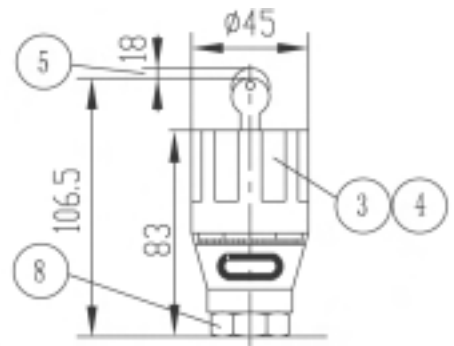
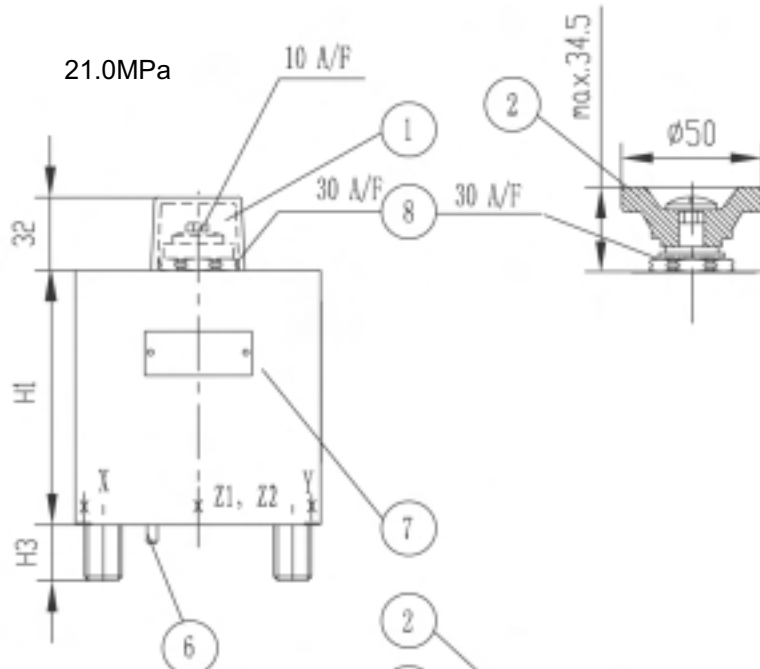
LFA...DZ.-6XB/ 210
315 X
350



LFA...DZ.-6XB/ 210
315 XY
350

Control cover for pressure sequencing functions

NS 16, 25, 32



- 1 Adjuster type "2"
- 2 Adjuster type "1"
- 3 Adjuster type "3"
- 4 Adjuster type "4"
- 5 Space required to remove key
- 6 Locating pin
- 7 Nameplate
- 8 Lock nut

** Orifice - ϕ

NS	16	25	32
X"	0.8	0.8	1.0
Y"	1.0	1.0	1.2
Z1"	1.0	1.0	1.2
Z2"	0.8	0.8	1.0
P"	1.0	1.0	1.2
H1	110	110	110
H3	16	24	28
□L1	65	85	100

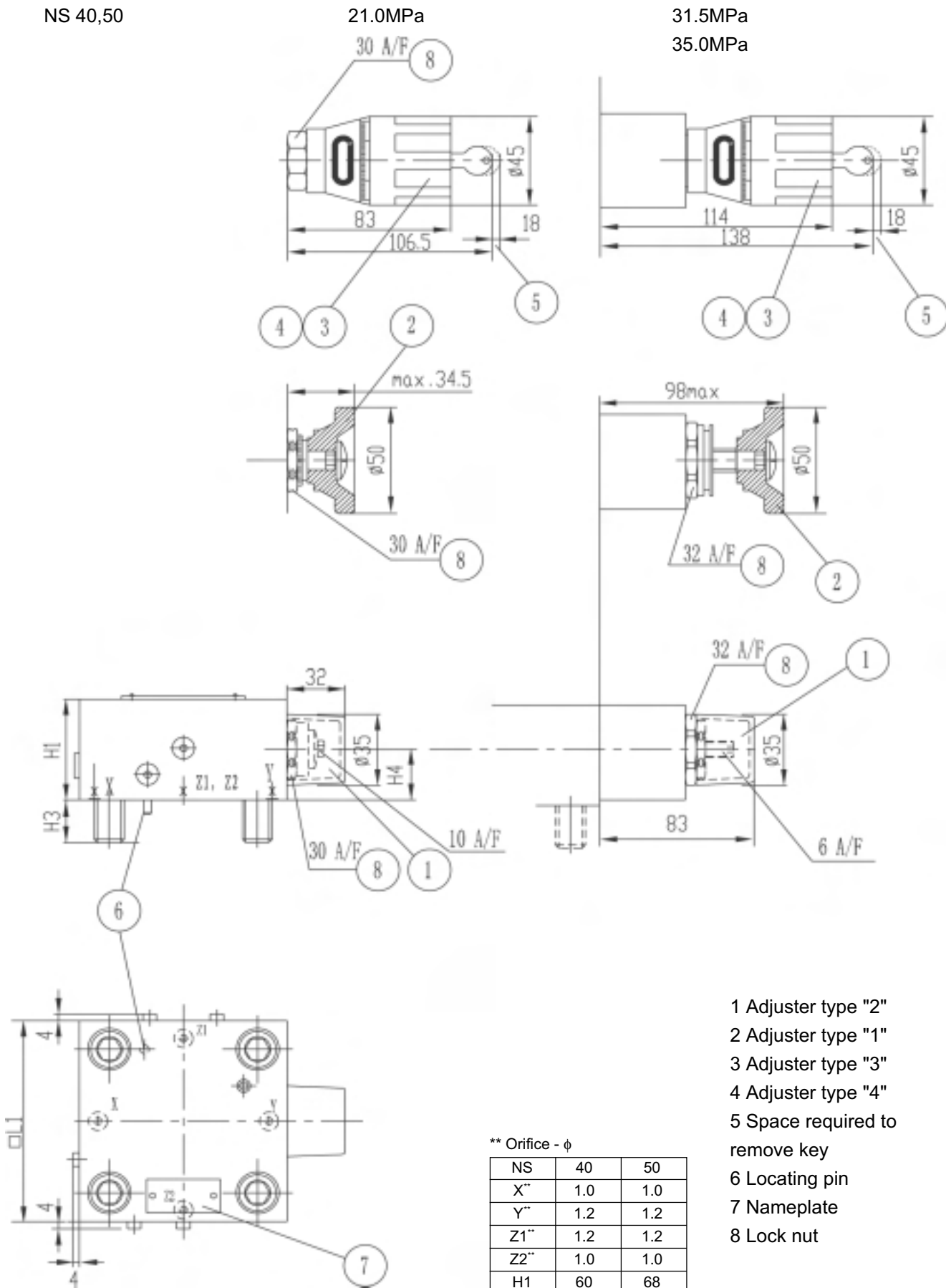
Control cover for pressure sequencing functions

NS 40,50

21.0MPa

31.5MPa

35.0MPa



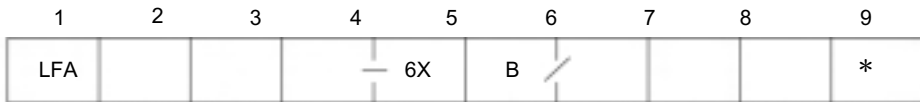
- 1 Adjuster type "2"
- 2 Adjuster type "1"
- 3 Adjuster type "3"
- 4 Adjuster type "4"
- 5 Space required to remove key
- 6 Locating pin
- 7 Nameplate
- 8 Lock nut

** Orifice - φ

NS	40	50
X"	1.0	1.0
Y"	1.2	1.2
Z1"	1.2	1.2
Z2"	1.0	1.0
H1	60	68
H3	32	34
H4	36	36
□L1	125	140

Control cover for pressure-dependent and independent sequencing functions

NS 25 to 50



Nominal size 25 = 25
 Nominal size 32 = 32
 Nominal size 40 = 40
 Nominal size 50 = 50

Solenoid de-energised:pressure sequence function =DZWA
 Solenoid energised:open =DZWB
 Solenoid de-energised:open =DZWB
 Solenoid energised:pressure sequence function

Adjuster type

Rotary knob = 1
 Hexagon with protective cap = 2
 Lockable rotary knob with scale = 3
 (H-lock to automotive industry standards)
 Rotary knob with scale not lockable = 4

Series 6X (60 to 69: unchanged installation and connection dimensions) = 6X

Technology of Beijing Huade Hydraulic = B

Further detail in clear text

No code = Mineral oils
 V = Phosphate ester

Pilot oil supply

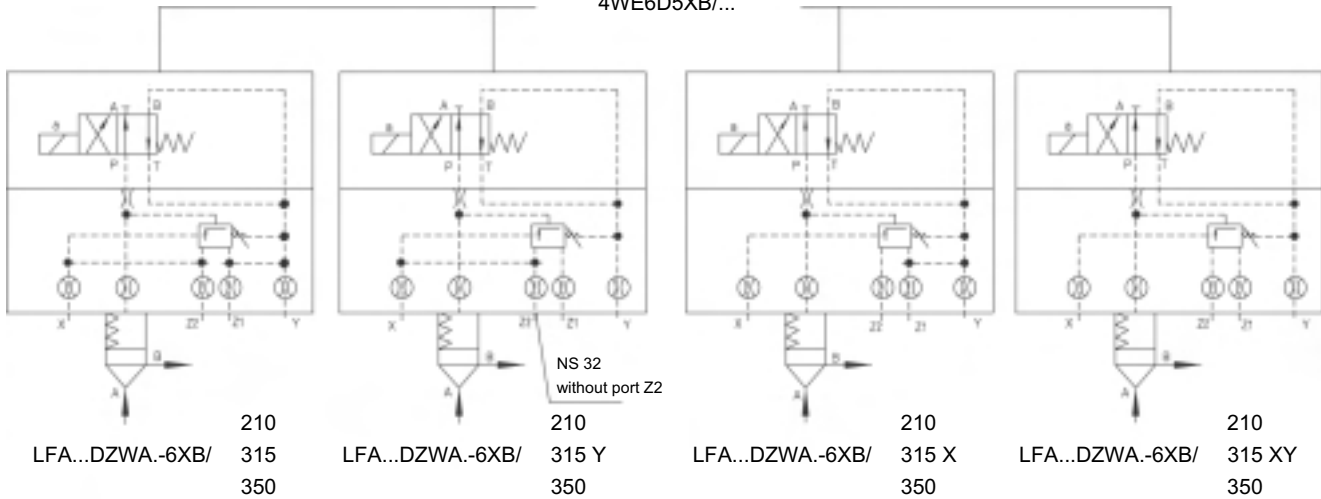
	Pilot oil supply	Pilot oil supply
No code =	internal	internal
X =	external	internal
Y =	internal	external
XY =	external	external

Pressure stages

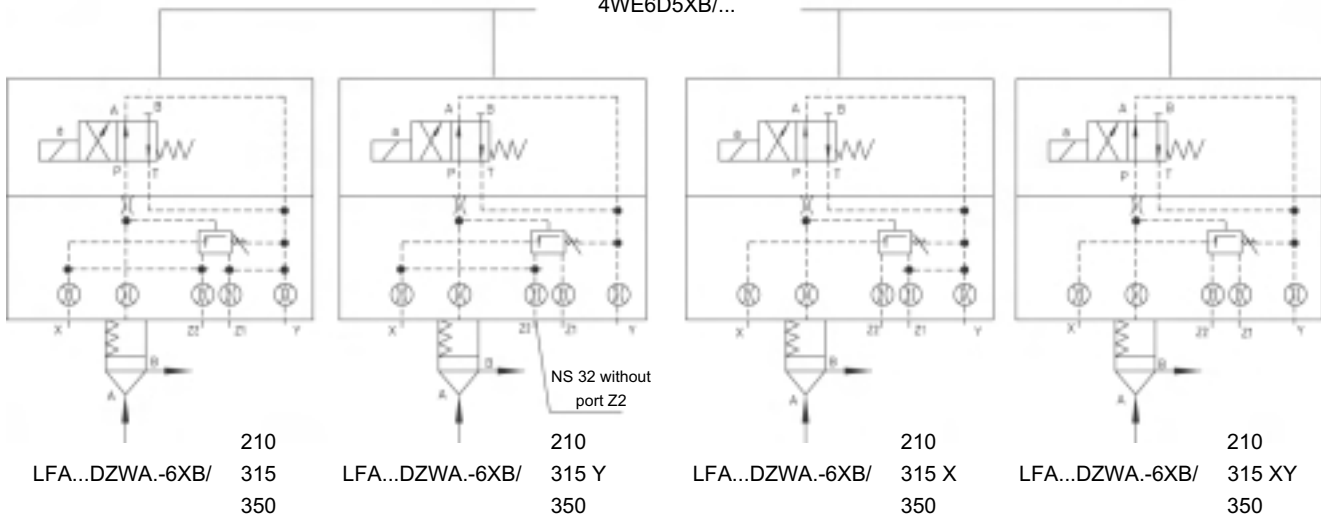
(max. settable sequencing pressure)

210 = 21.0 MPa
 315 = 31.5 MPa
 350 = 35.0 MPa

4WE6D5XB/...



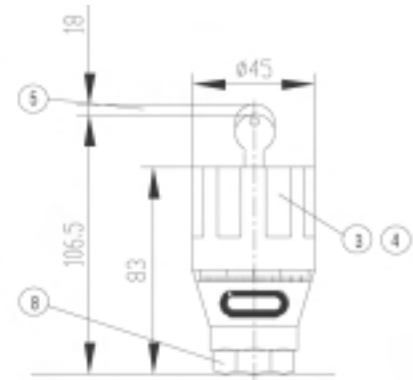
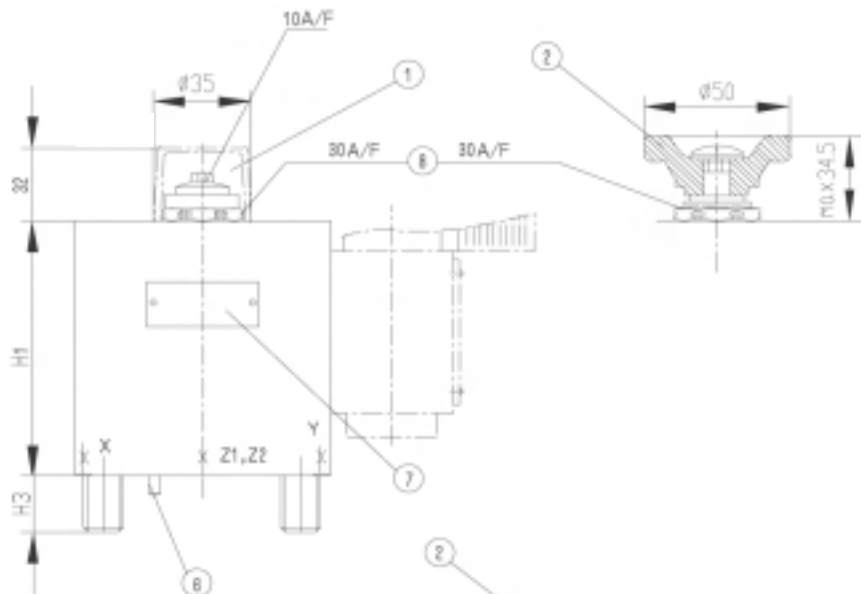
4WE6D5XB/...



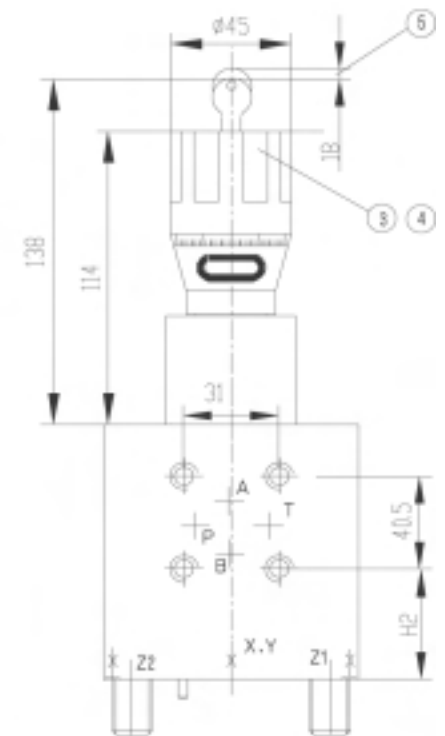
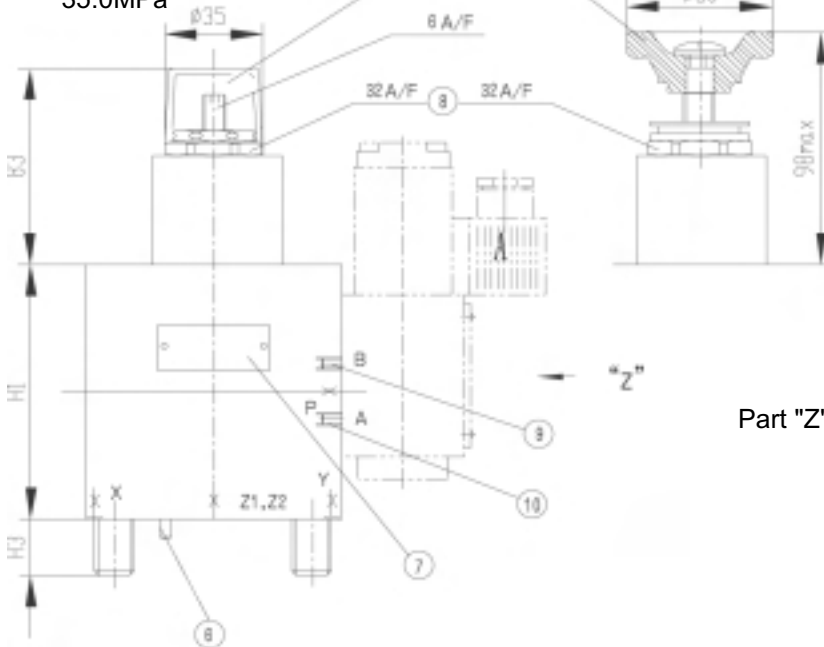
Control cover for pressure-dependent and independent sequencing functions

NS 16,25,32

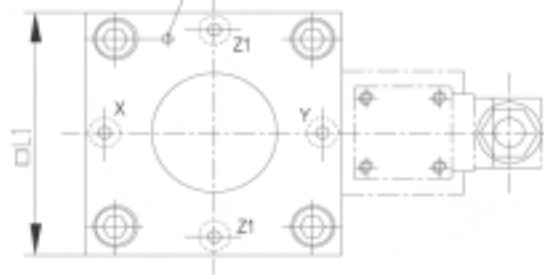
21.0MPa



31.5MPa
35.0MPa



Part "Z"



** Orifice - ϕ

NS	16	25	32
X"	0.8	0.8	1.0
Y"	1.0	1.0	1.2
Z1"	1.0	1.0	1.2
Z2"	0.8	0.8	1.0
P"	1.0	1.0	1.2
H1	110	110	110
H2	40	40	40
H3	16	24	28
□ L1	65	85	100

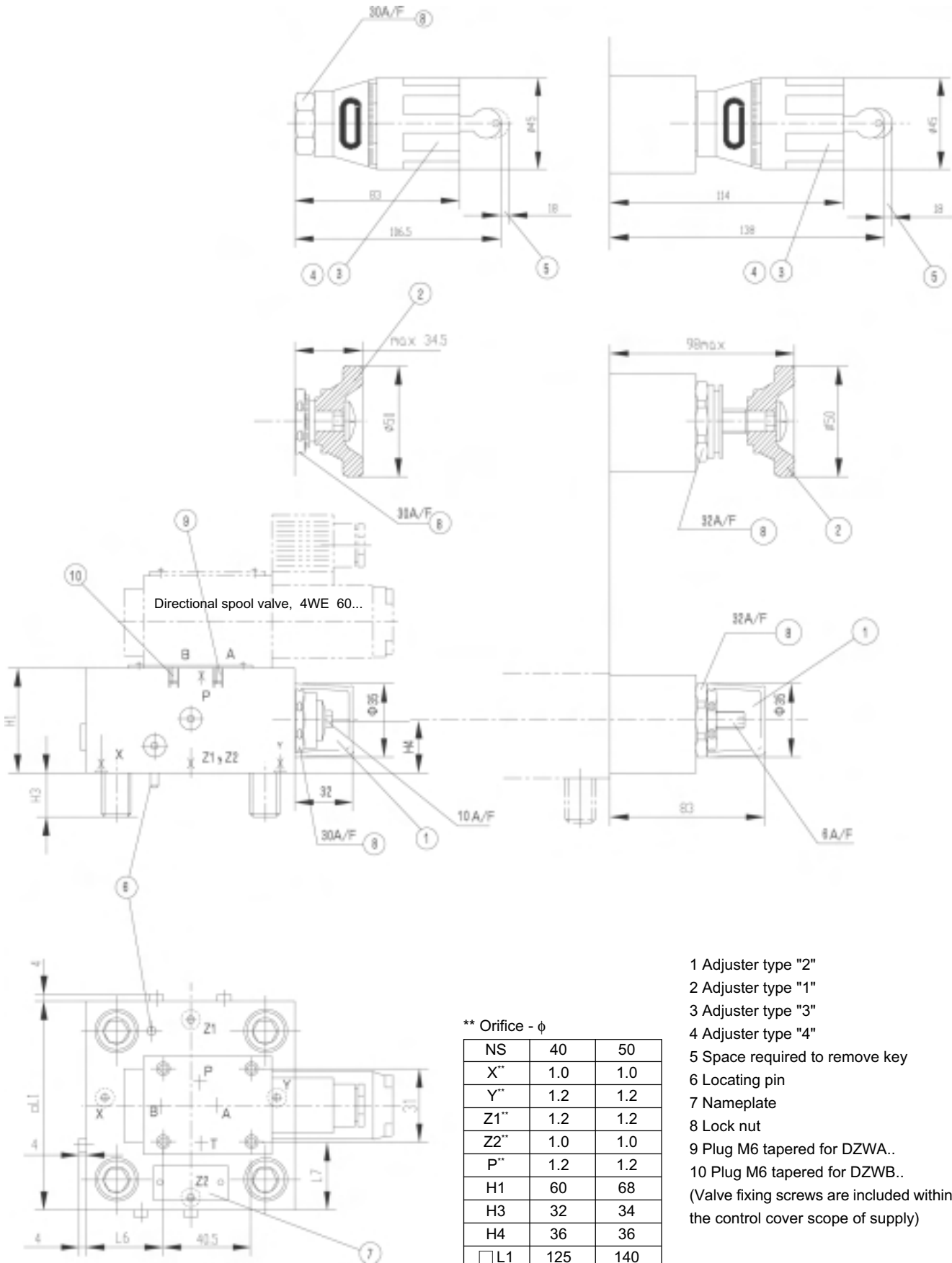
- 1 Adjuster type "2"
 - 2 Adjuster type "1"
 - 3 Adjuster type "3"
 - 4 Adjuster type "4"
 - 5 Space required to remove key
 - 6 Locating pin
 - 7 Nameplate
 - 8 Lock nut
 - 9 Plug M6 tapered for DZWA..
 - 10 Plug M6 tapered for DZWB..
- (Valve fixing screws are included within the control cover scope of supply)

Control cover for pressure-dependent and independent sequencing functions

NS 40,50

21.0MPa

31.5MPa
35.0MPa



** Orifice - ϕ

NS	40	50
X**	1.0	1.0
Y**	1.2	1.2
Z1**	1.2	1.2
Z2**	1.0	1.0
P**	1.2	1.2
H1	60	68
H3	32	34
H4	36	36
□ L1	125	140
L6	55	70
L7	44.5	52

- 1 Adjuster type "2"
 - 2 Adjuster type "1"
 - 3 Adjuster type "3"
 - 4 Adjuster type "4"
 - 5 Space required to remove key
 - 6 Locating pin
 - 7 Nameplate
 - 8 Lock nut
 - 9 Plug M6 tapered for DZWA..
 - 10 Plug M6 tapered for DZWB..
- (Valve fixing screws are included within the control cover scope of supply)

注 意 事 项

- 1 液压系统用的介质必须过滤；过滤精度至少 20 μ m。
- 2 液压系统用的油箱必须密封；并加空气过滤器。
- 3 本厂产品出厂时不带底板。（如需用请订货）。
- 4 固定螺栓请按样本中列的参数选用。
- 5 与阀连接的表面粗糙度要求 $\frac{0.8}{\nabla}$ 。
- 6 与阀连接的平面度要求 0.01/100mm。