Huade

Hydraulic valves

Flow Control Valves Accessories

Catalogue

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.

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

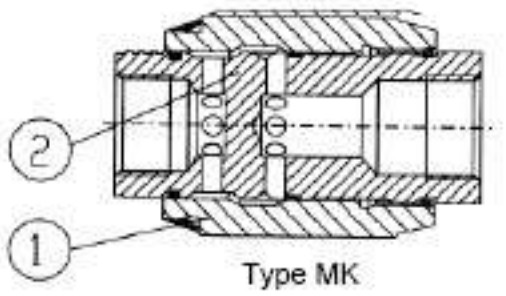
Valve types MG and Mk are pressure and viscosity dependent throttle and throttle check valves.

Type MG (throttle valve)

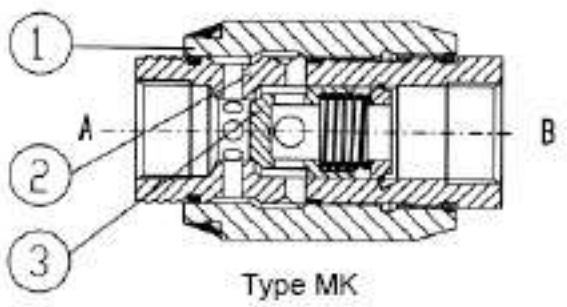
This valve throttles in both flow directions. Fluid flows through side drillings to the throttling point. This is formed between the housing (2) and the adjustable sleeve (1). The throttle cross-section may be steplessly varied by rotating the adjustable sleeve (1).

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.



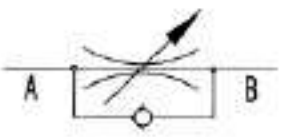
Type MK



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)

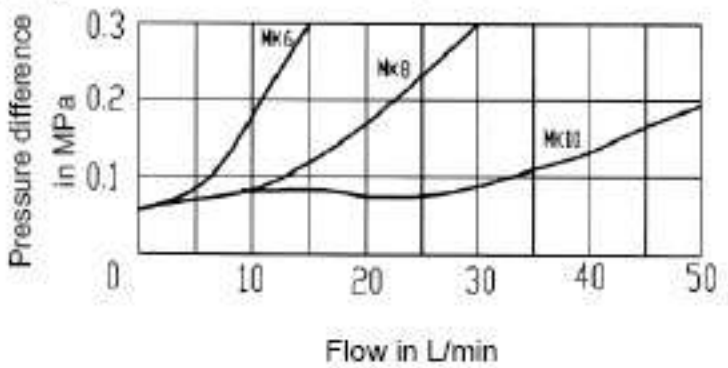
G = For threaded connections

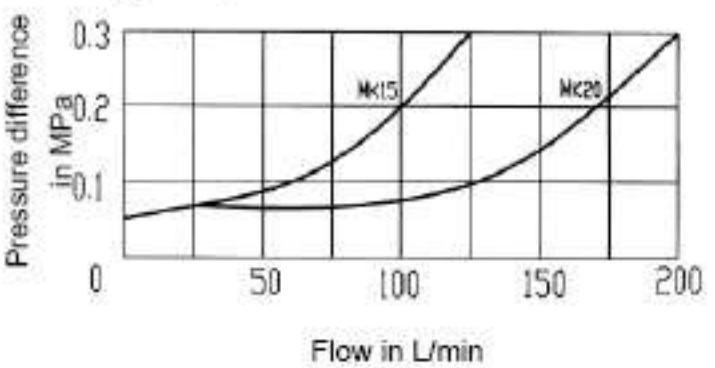
Technical data (for applications outside these parameters, please consult us!)

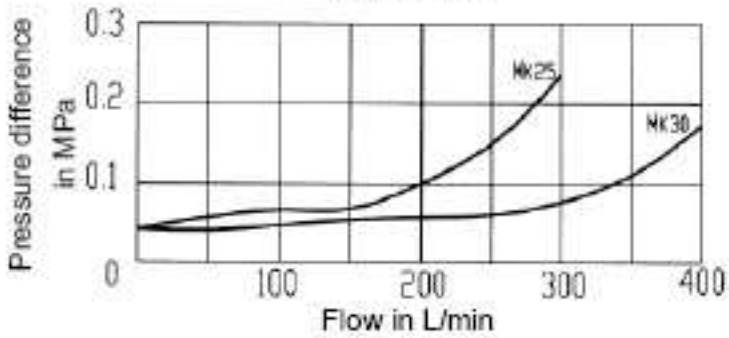
Size		6	8	10	15	20	25	30
Maximum flow	(L/min)	15	30	50	140	200	300	400
Pressure	(MPa)	up to 31.5						
Cracking pressure	(MPa)	0.05 (Type MK)						
Pressure fluid		Mineral oil or Phosphate ester						
Viscosity range	(mm^2/s)	10 to 800						
Pressure fluid temperature range	(°C)	-30 to +80						

Characteristic curves (measured at v = 41 mm^2/s and t = 50 °C)

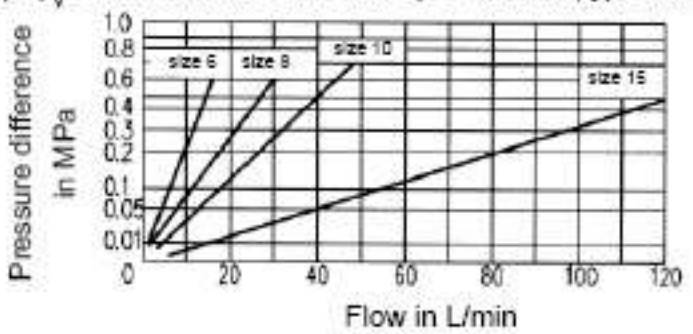
△ p-q_V Characteristic curves via open check valve with closed throttle (type MK)

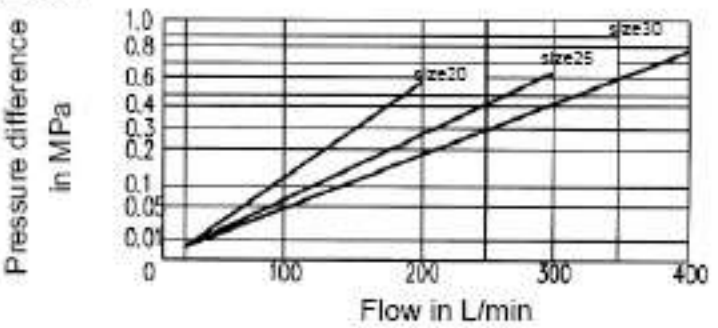




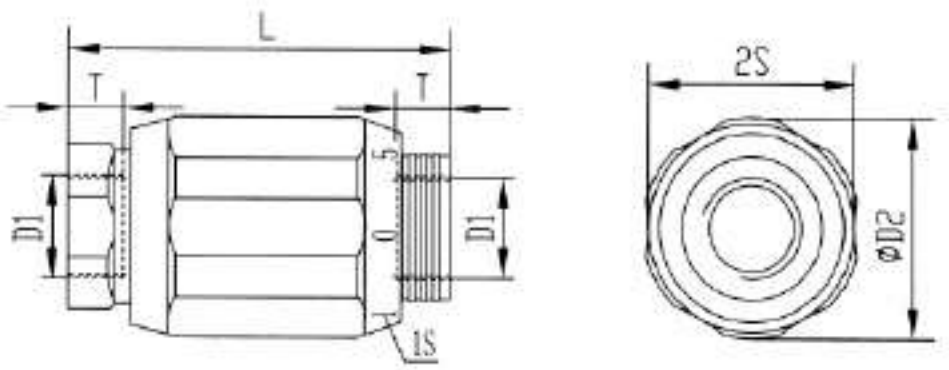


△ p-q_V Characteristic curves via open throttle (types MG and MK)





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

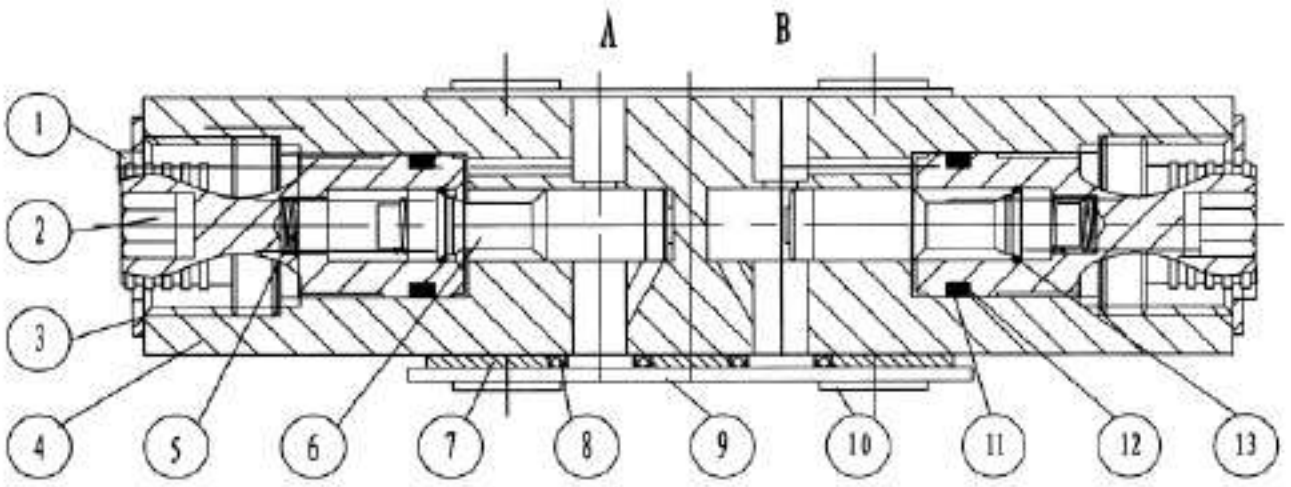
Valves type Z 2 FS are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return flow in the other direction.

Main flow limiting

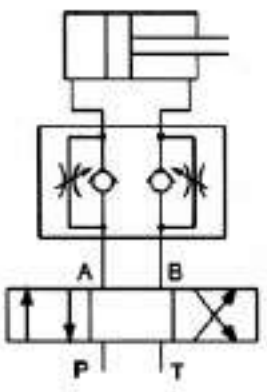
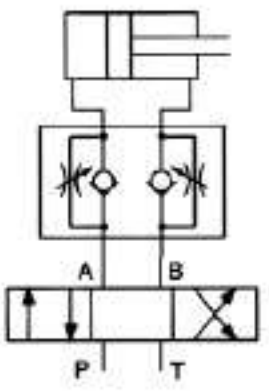
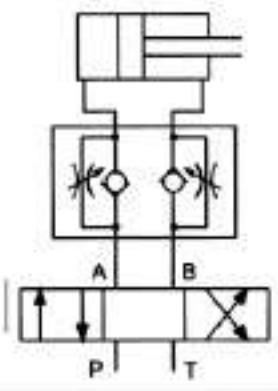
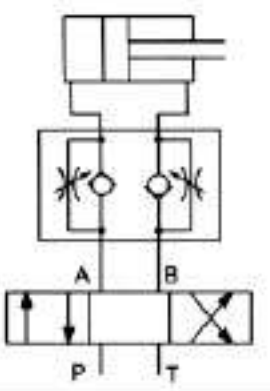
The double throttle/check valve is fitted between the directional valve and the subplate to change the speed of an actuator (main flow limiting).

Pilot flow limiting

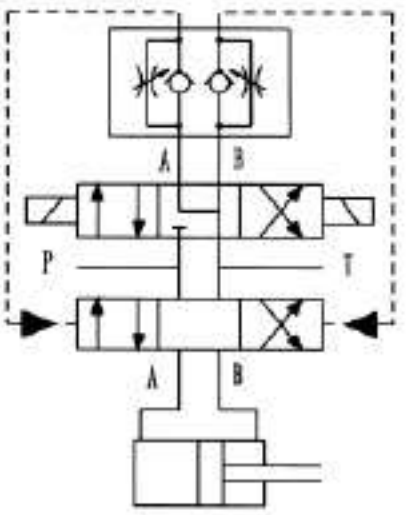
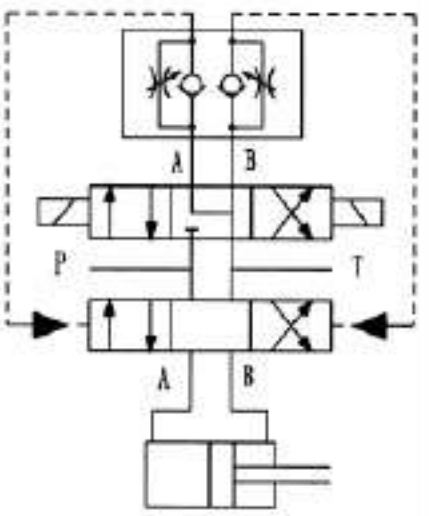
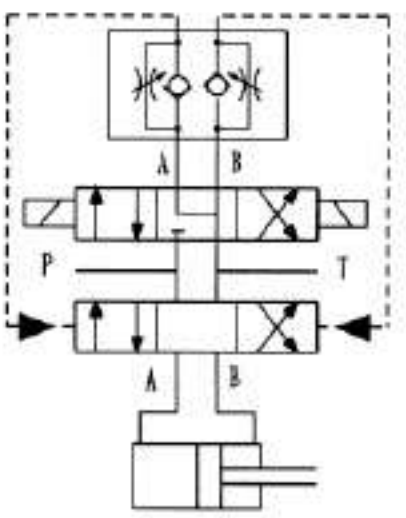
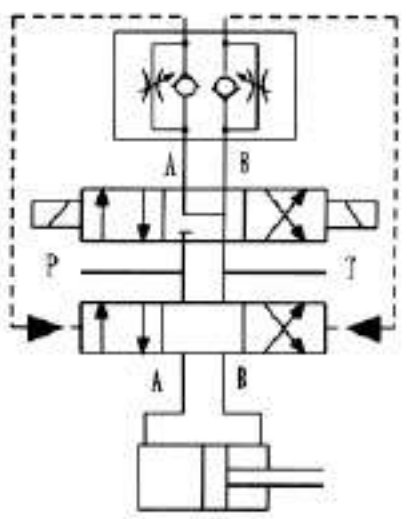
In the case of pilot operated directional valves, the double throttle/check valve may be used as a pilot choke adjustment (pilot flow limiting). In this case, it is fitted between the main valve and the pilot valve.



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

Meter-in control: S	Meter-out control: S2	Meter-out control on port A Meter-in control:S3 on port B	Meter-in control on port A Meter-out control:S on port B
			

Ordering details

Z2FS		-30	B	/		*

Double throttle/check valve

Nominal size 6 = 6
Nominal size 16 = 16
Nominal size 22 = 22

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 oil
V= Phosphate ester

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

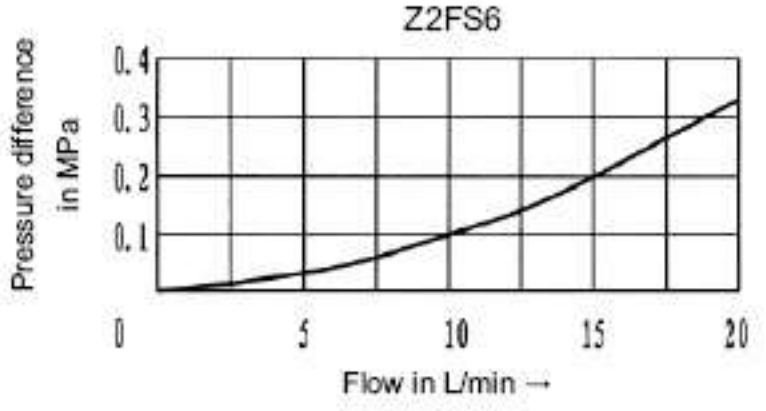
Technical data (for applications outside these parameters, please consult us!)

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		

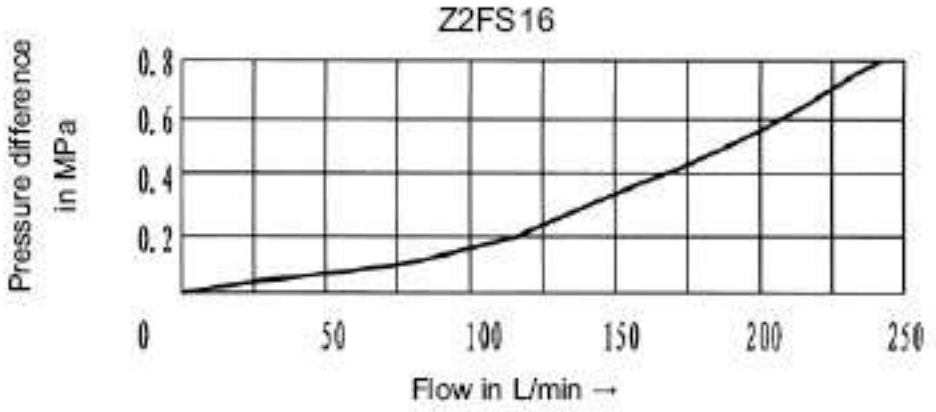
Characteristic curves (measured at v = 41 mm²/s and t = 50 °C)

Pressure difference △ p in relationship to the flow q_v via the check valve (throttle closed)

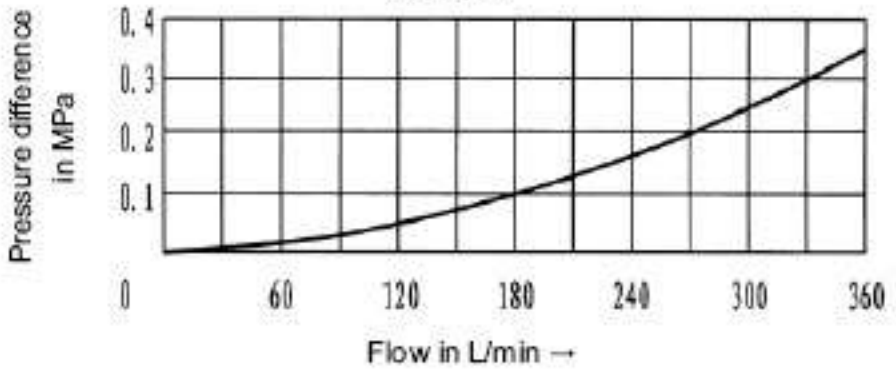
Z2FS6



Z2FS16

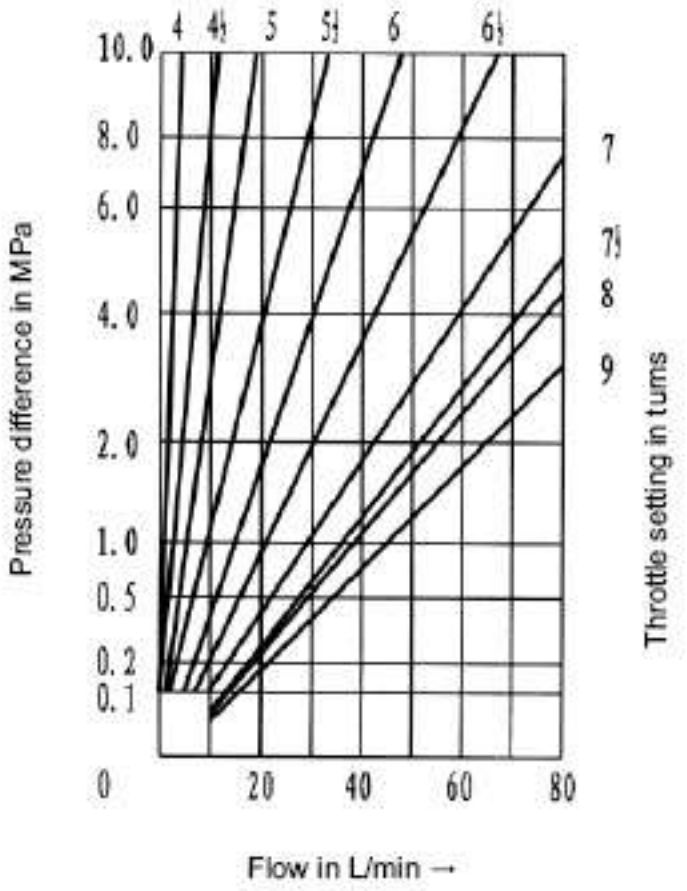


Z2FS22

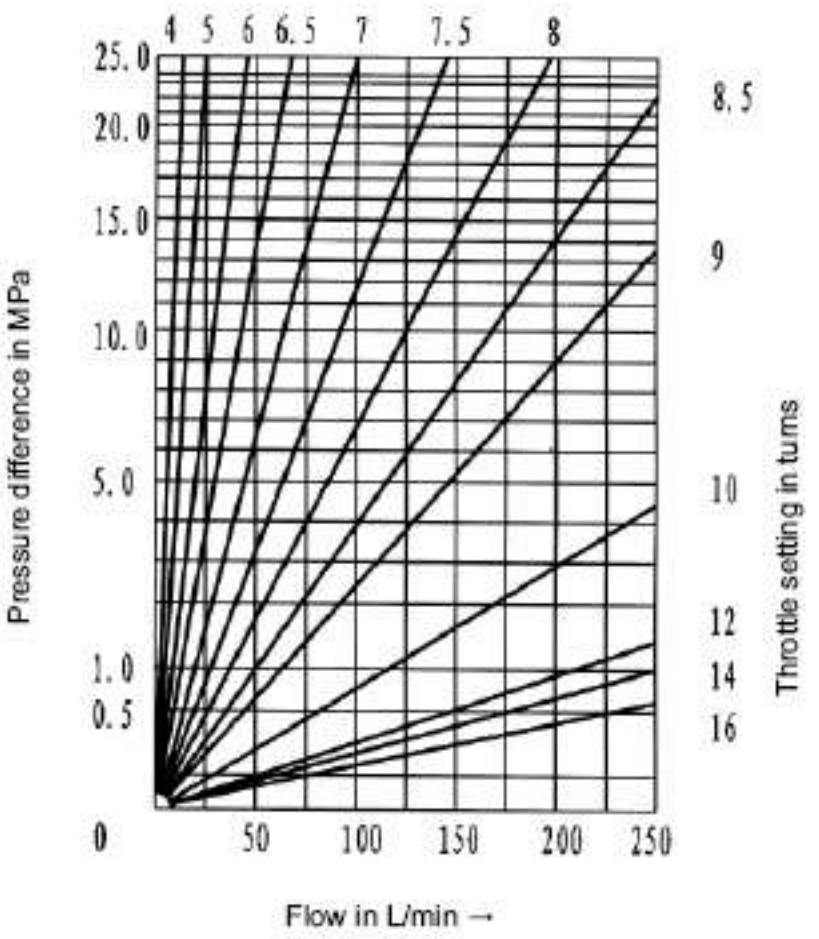


Pressure difference △ p in relationship to the flow q_v at a constant throttle setting.

Z2FS6

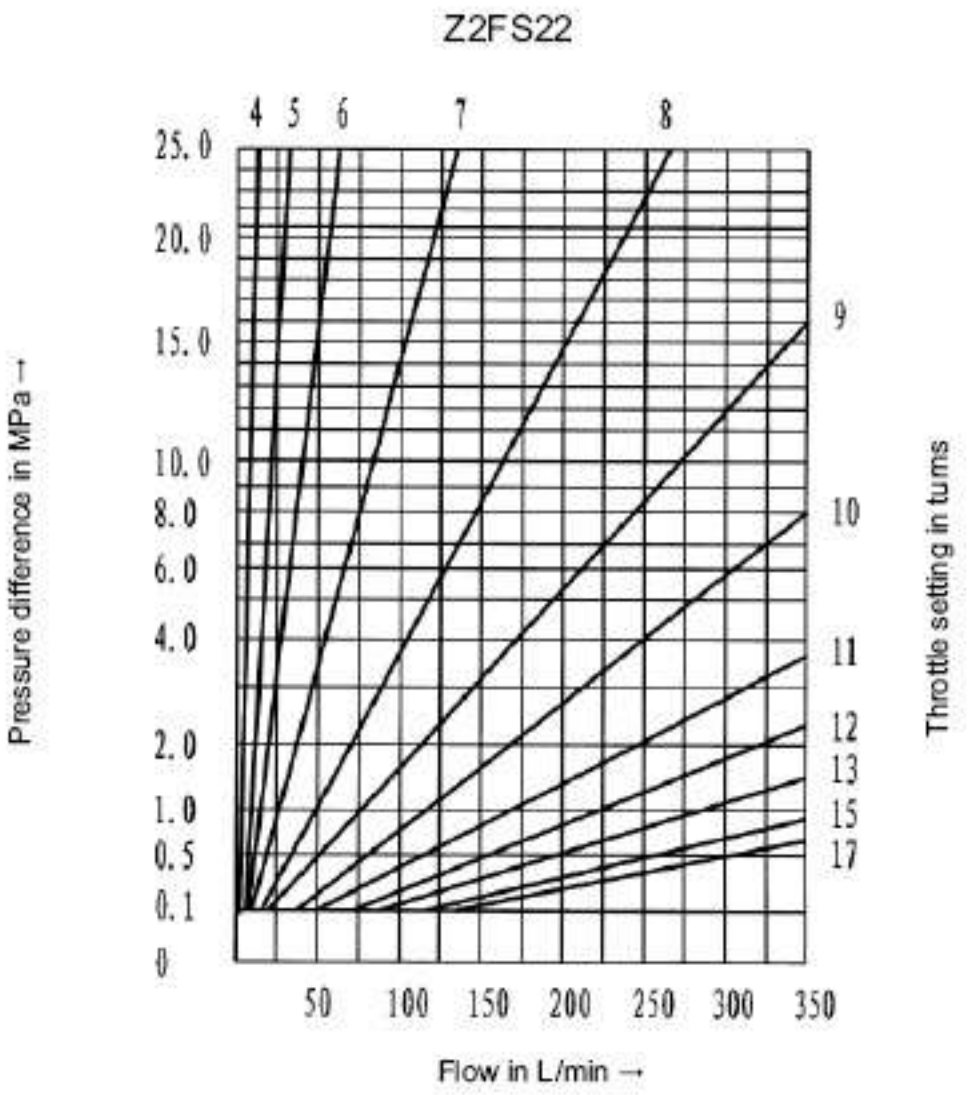


Z2FS16



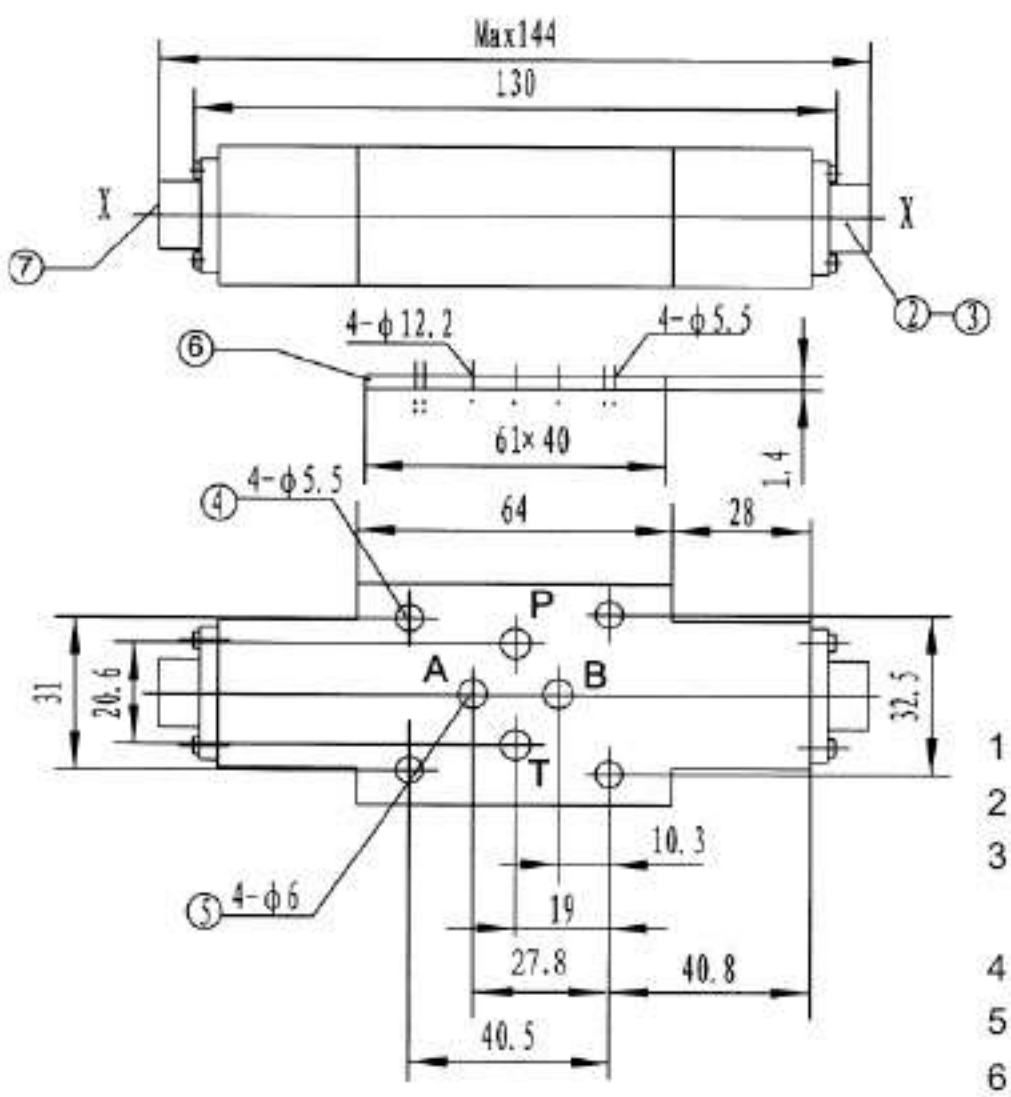
Characteristic curves (measured at v = 41 mm²/s and t = 50 °C)

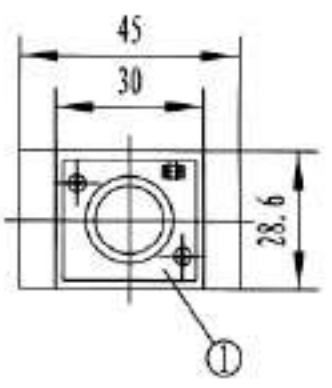
Pressure difference △p in relation to the flow q_v at constant throttle setting



Unit dimensions **(Dimensions in mm)**

Type Z2FS6:

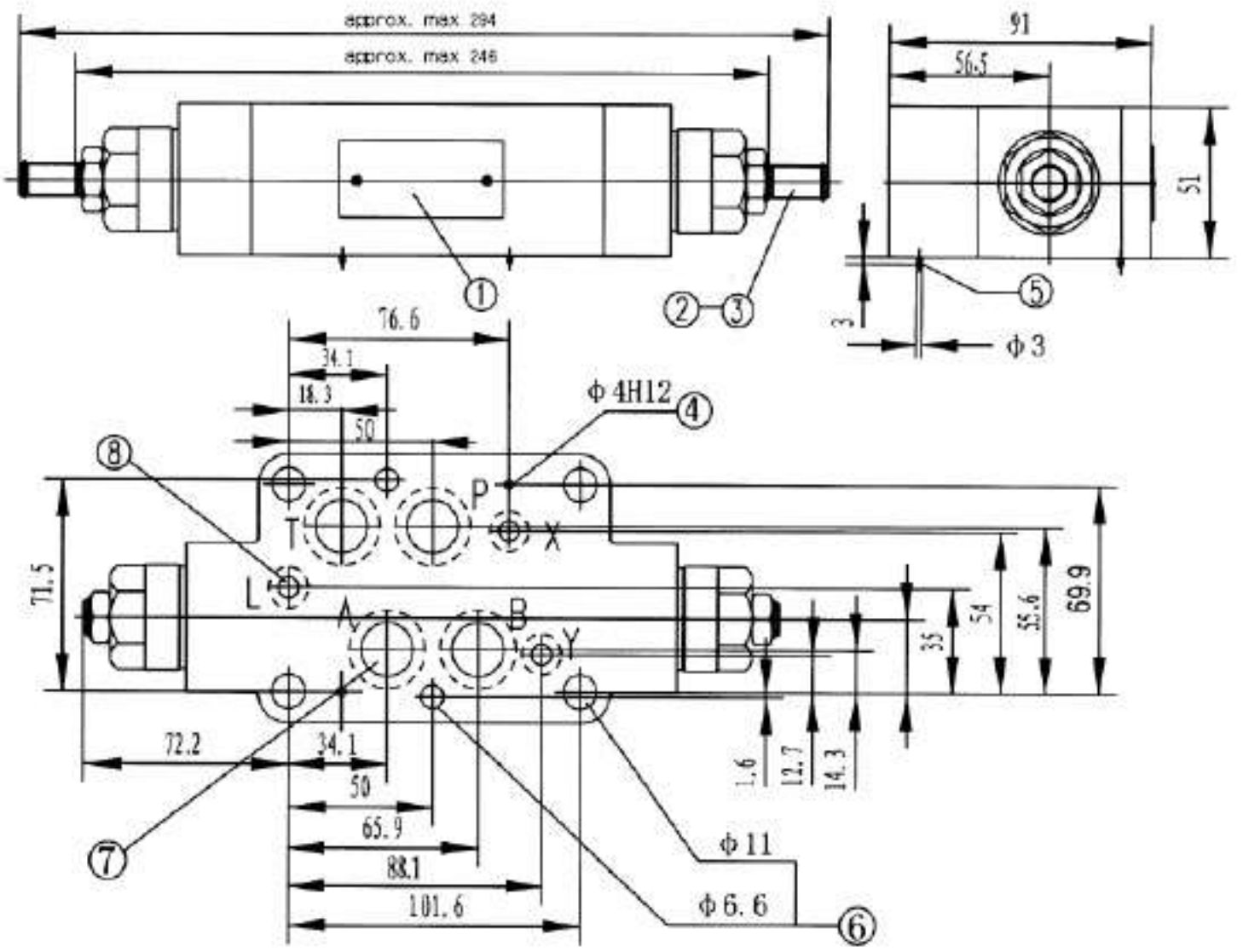




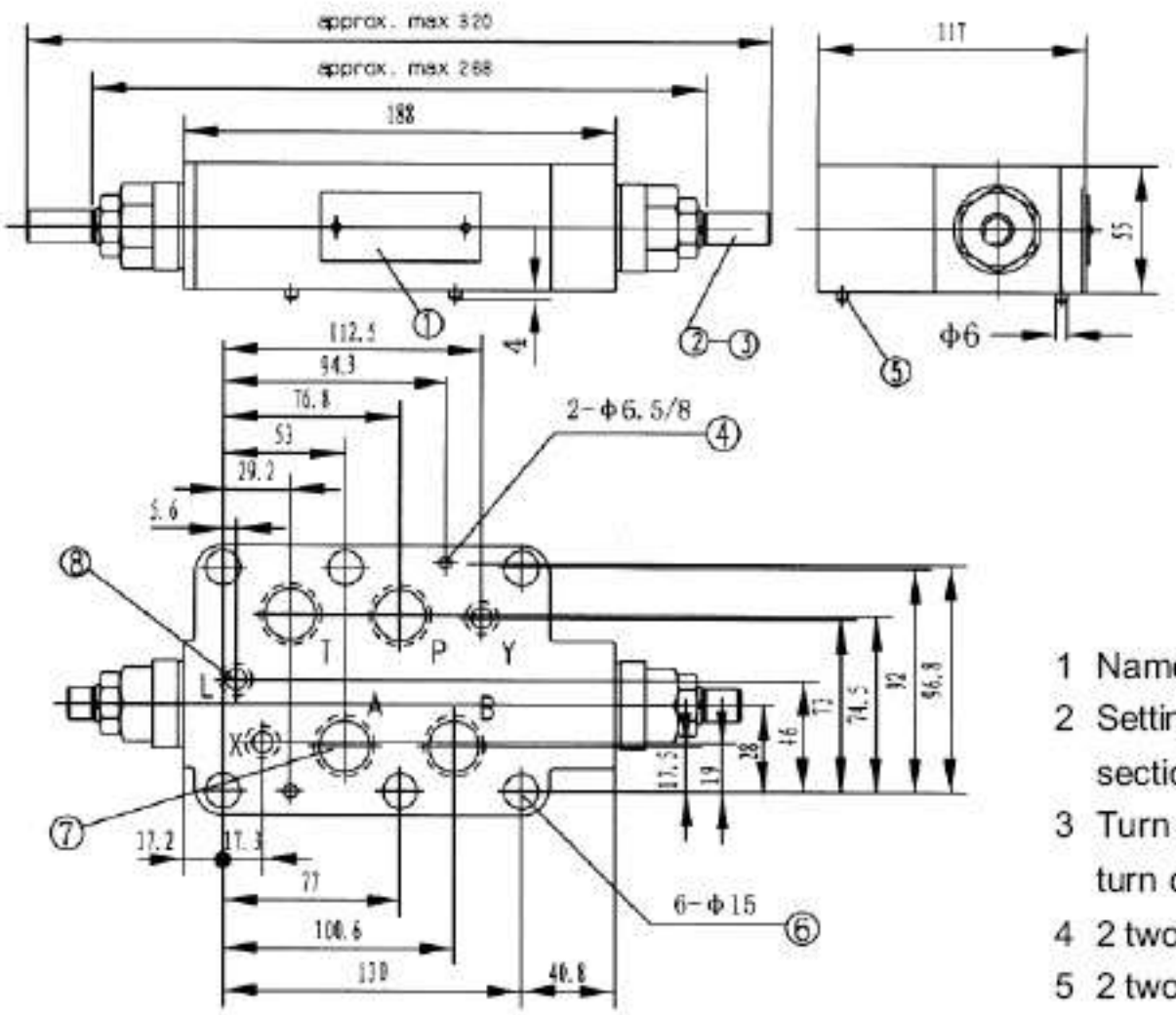
1 Name plate
2 Setting screw for alteration of flow cross section
3 Turn anti-clockwise = increases flow
turn clockwise = decreases flow
4 Valve fixing holes
5 Ports A, B, P, T
6 O-ring plate
7 To change from meter-in to meter-out,rotate the unit about the "X"-"X" axis

Unit dimensions (Dimensions in mm)

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 $\sqrt{0.8}$.
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 160L/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

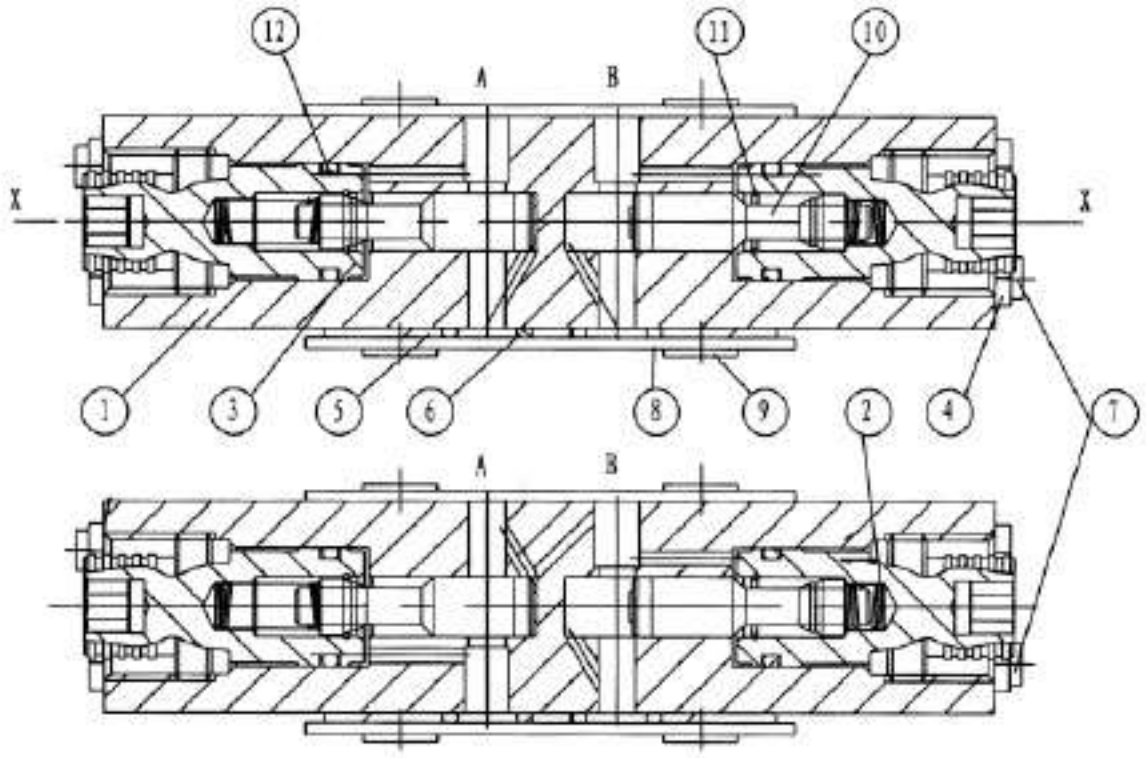
Valves type Z 2 FS10...20B/... are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return flow in the other direction.

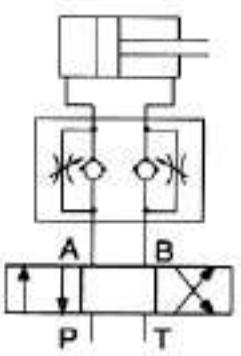
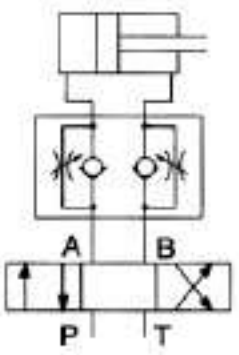
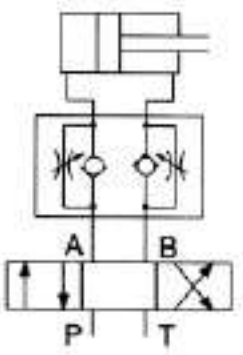
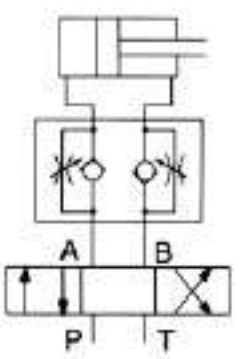
Main flow limiting

The double throttle/check valve is fitted between the directional valve and the subplate to change the speed of an actuator (main flow limiting).

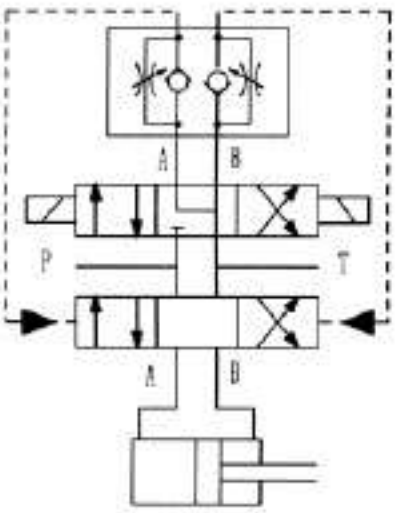
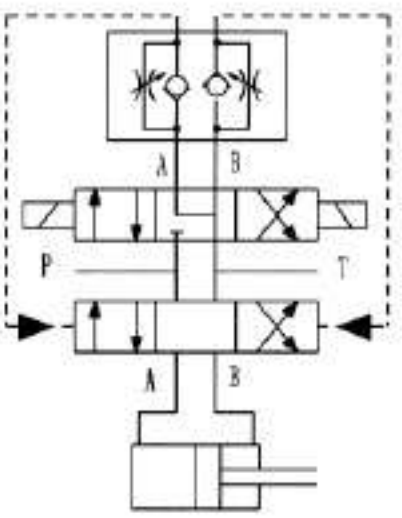
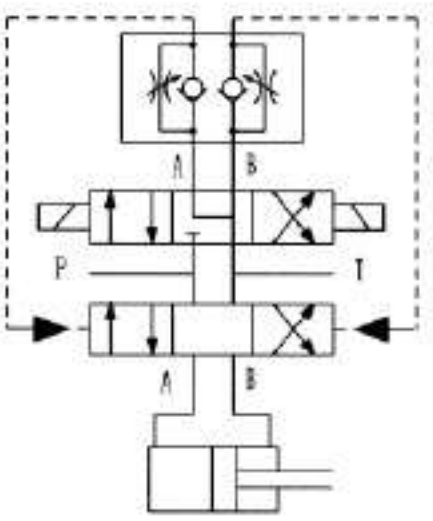
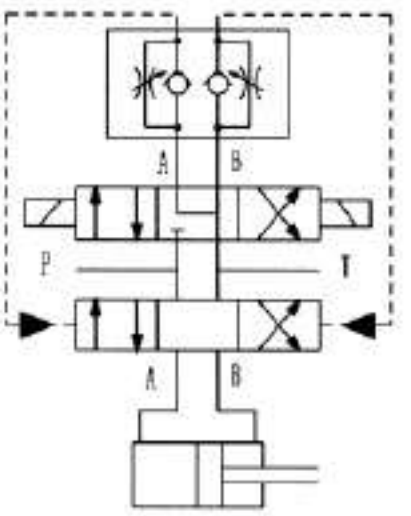
Pilot flow limiting

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

Meter-in control; S	Meter-out control; S2	Meter-out control on port A Meter-in control:S3 on port B	Meter-in control on port A Meter-out control:S4 on port B
			

Ordering details

Z2FS | - | 20 | B | / | | *

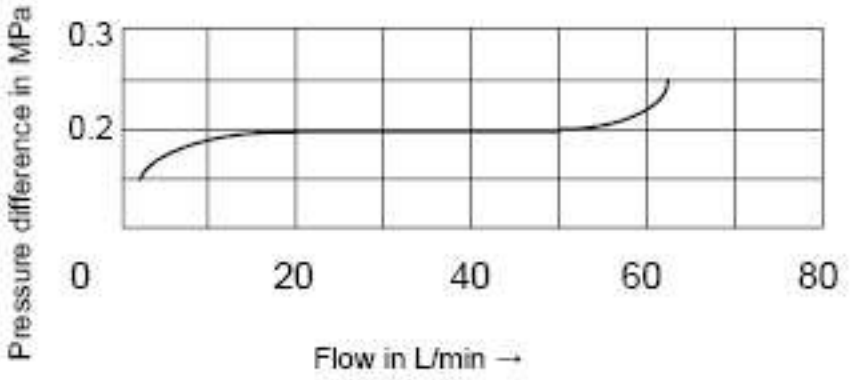
- Double throttle/ check valve
- Nominal size 10 = 10
- Series 20 to 29 =20
  (20 to 29: unchanged installation and connection dimensions)
- Technology of Beijing Huade Hydraulic =B
- Further details in clear text
- No code = Mineral oil
  V = Phosphate ester
- No code = (With two throttle/check valves) Meter-in /meter-out throttling, (this valve can be turned)
  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!)

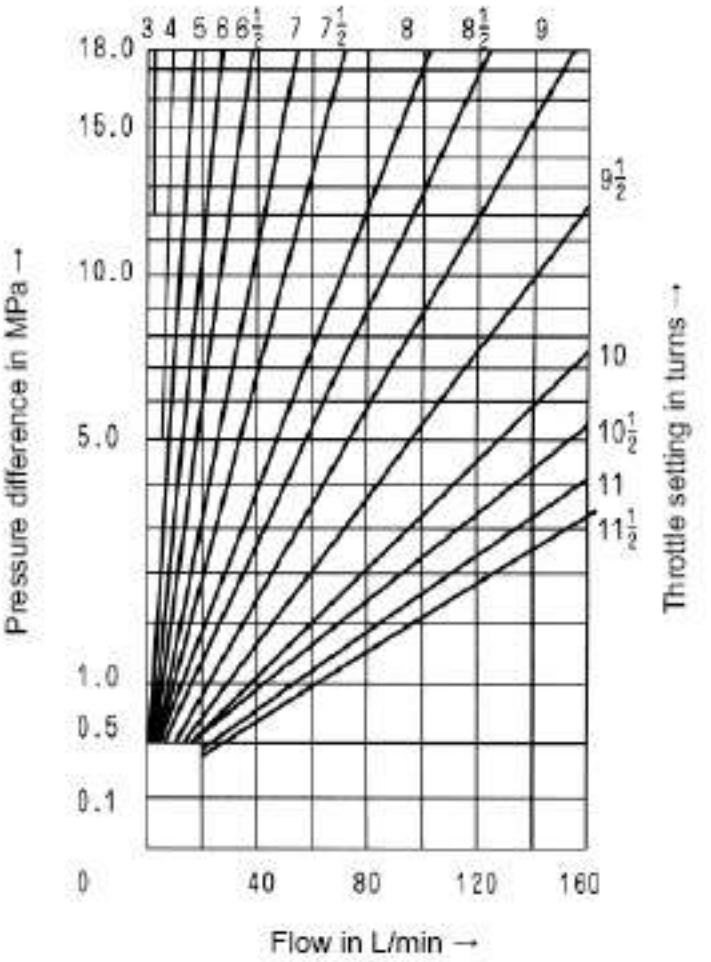
Size		10
Maximum flow	(L/min)	160
Maximum working pressure	(MPa)	31.5
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Viscosity range	(mm^2/s)	10 to 800
Fluid temperature range	(°C)	-30 to +80

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

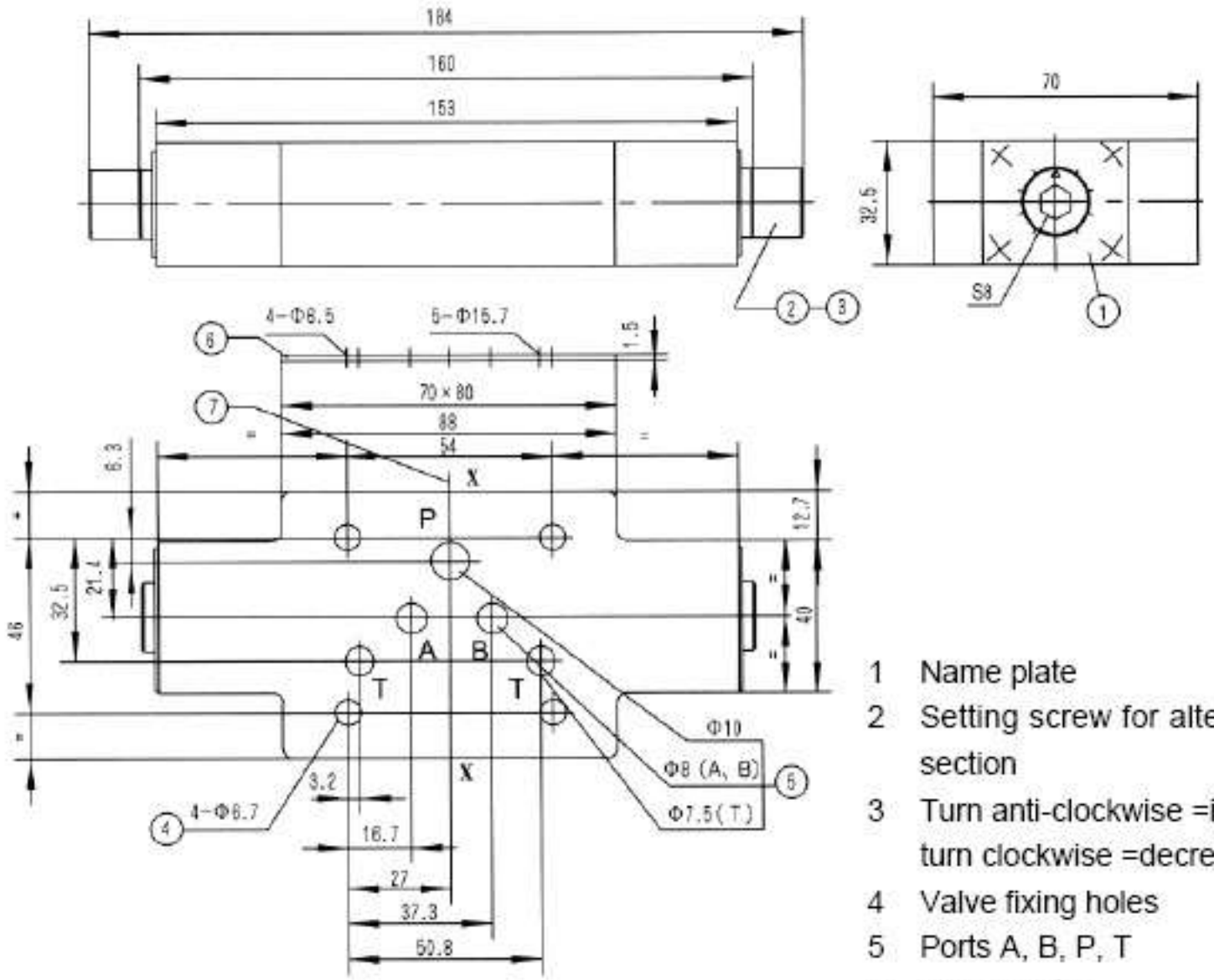
△ p - q_v -characteristic curve across check valve (throttle closed)



Pressure difference △ p 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

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 $\sqrt{0.8}$.
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.

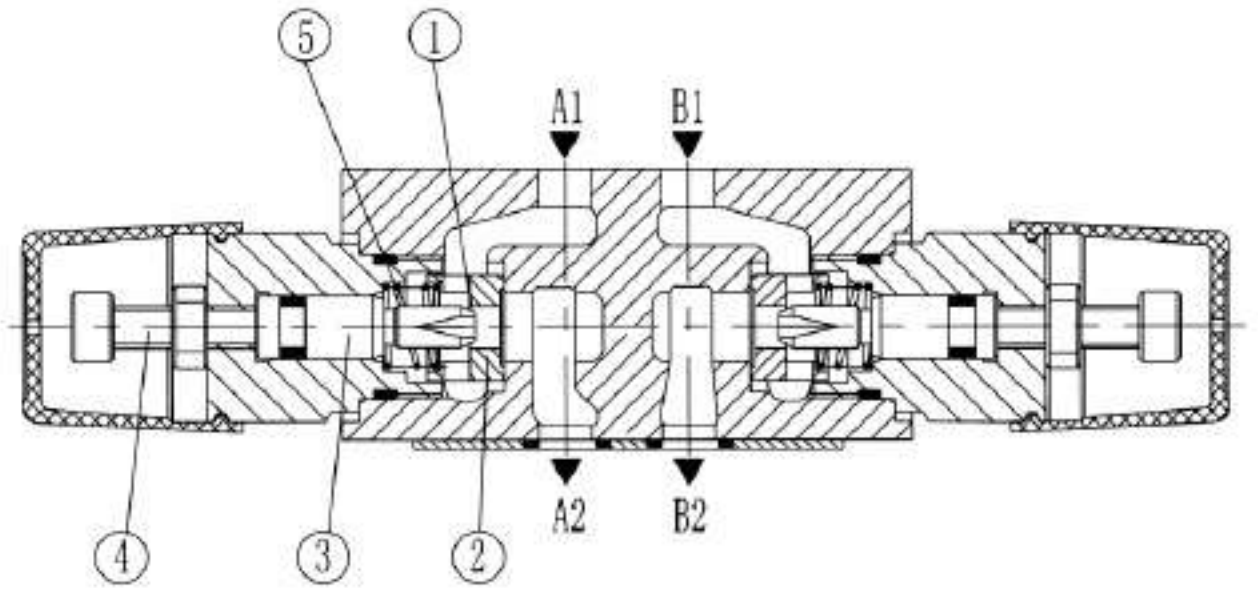
They are used to limit the main or pilot flow of one or two service ports.Two symmetrically arranged throttle/check valves limit the flow in one direction and allow free-flow in the opposite direction.For meter-in control fluid passes from port A1 to port A2 via the throttling point (1), which is made 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

Nominal size 6 = 6

Throttle/check valve ports A and B = -
Throttle/check valve port A = A
Throttle/check valve port B = B

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

1Q = With fine control
2Q = Standard version

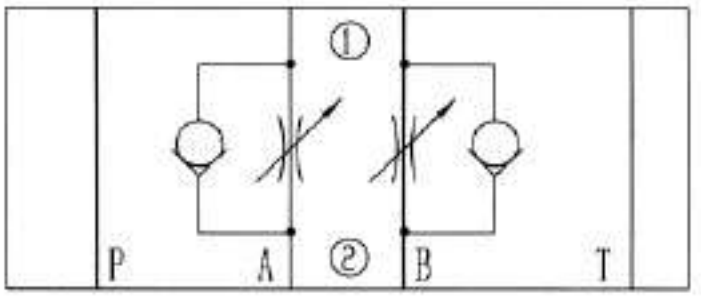
No code= Mineral oil
V= Phosphate ester

Further details in clear text

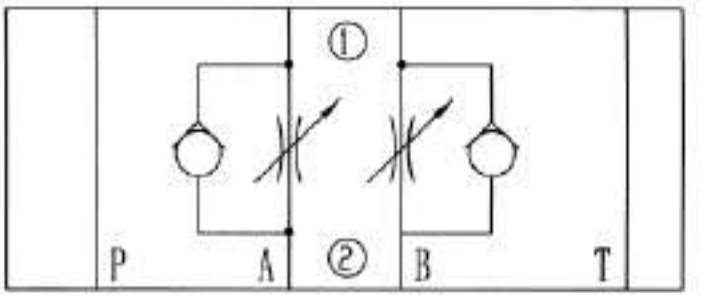
Note:Type Z2FS 6-...-40B/...has the same adjustment elements on ports A and B

Symbols (① = valve side, ② = sub-plate)

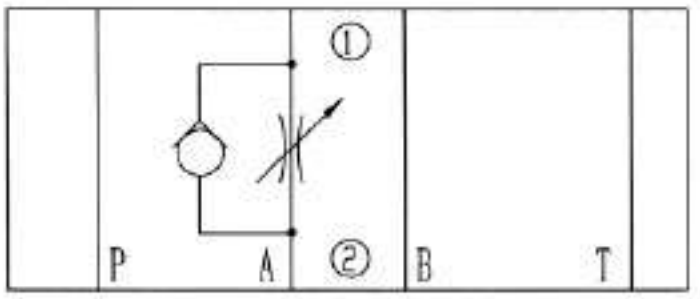
Z2FS6-...-40B/...(meter-in)



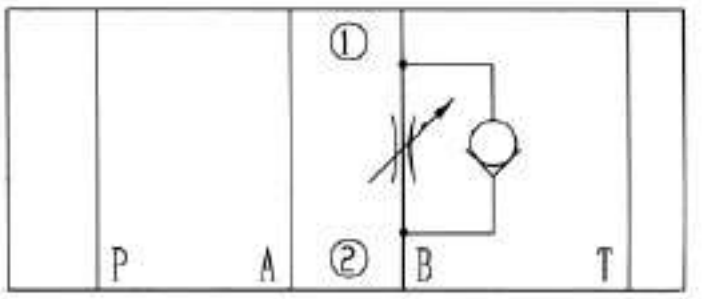
Z2FS6-...-40B/...(meter-out)



Z2FS 6A-...-40B/...(meter-out)



Z2FS 6B-...-40B/...(meter-in)



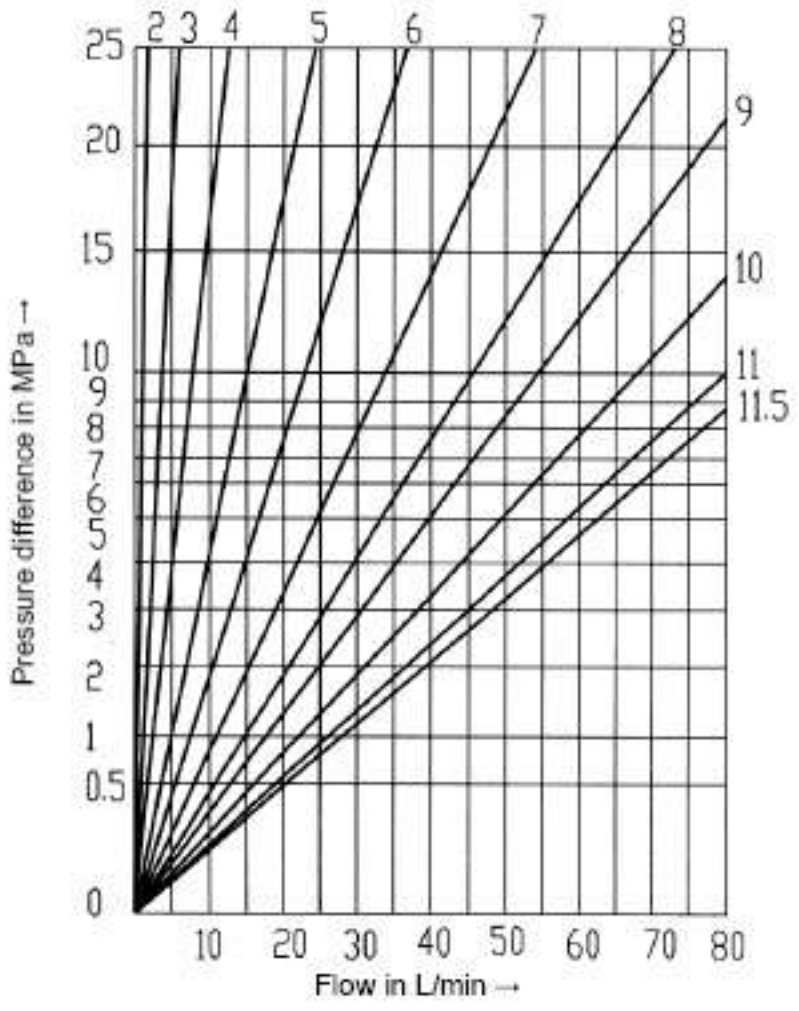
Technical data (for applications outside these parameters, please consult us!)

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 mm^2/s and t = 50°C)

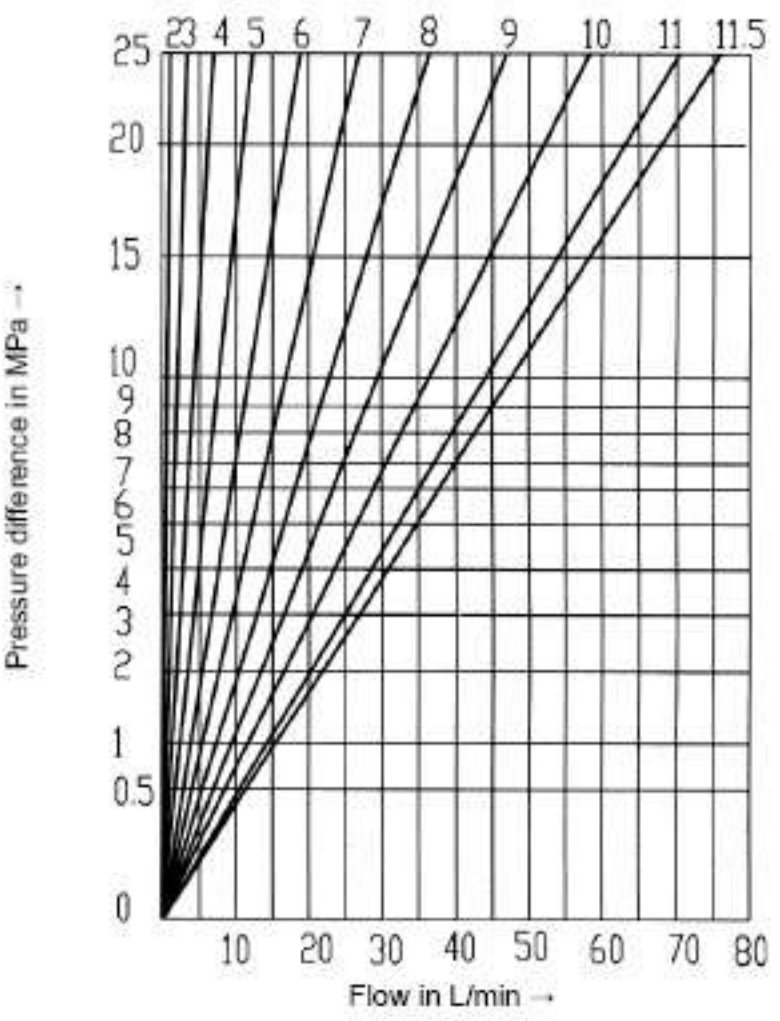
Δp-q_v -characteristic curves - types Z2FS 6 ..-40/2QV

Throttle setting in turns



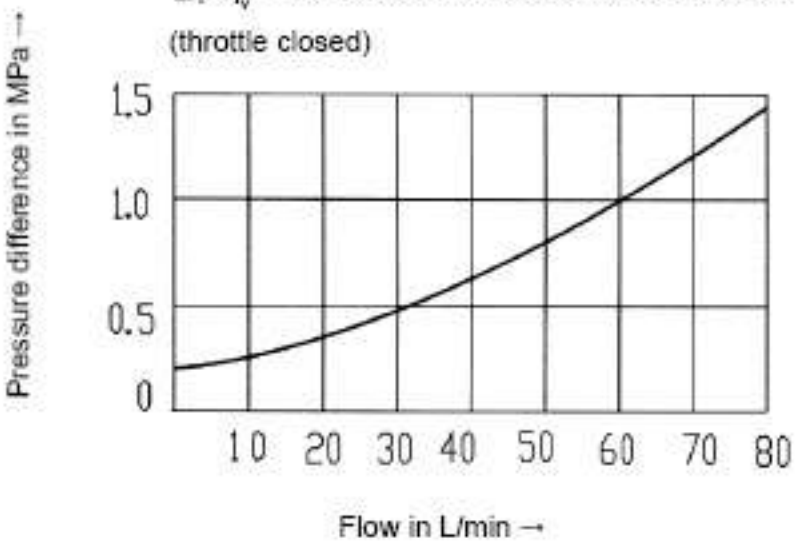
Δp-q_v -characteristic curves - type Z2FS 6 ..-40/1QV

Throttle setting in turns



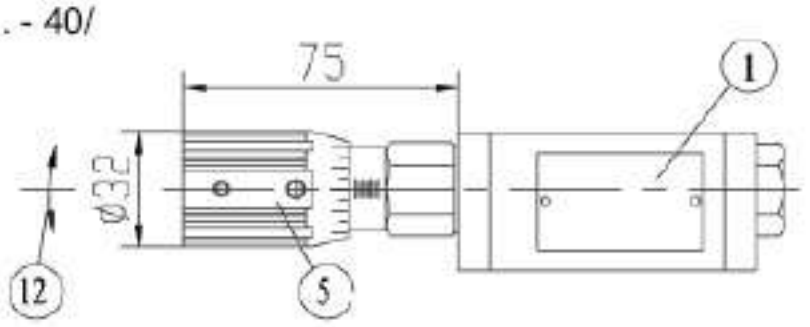
Δp-q_v -characteristic curve across check valve

(throttle closed)

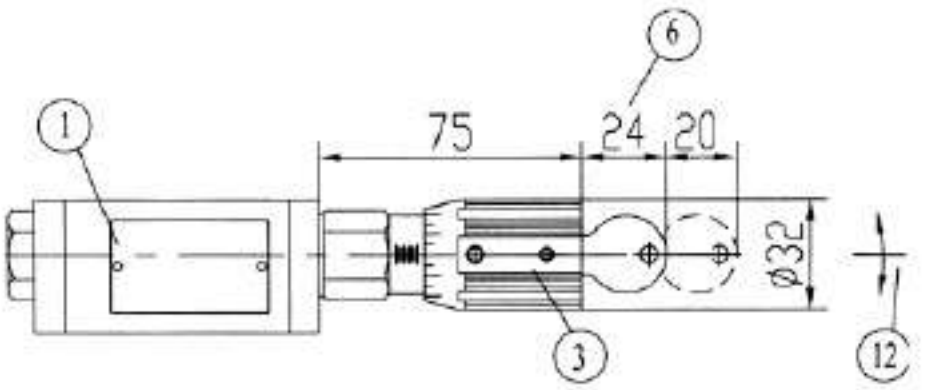


Unit dimensions **(Dimensions in mm)**

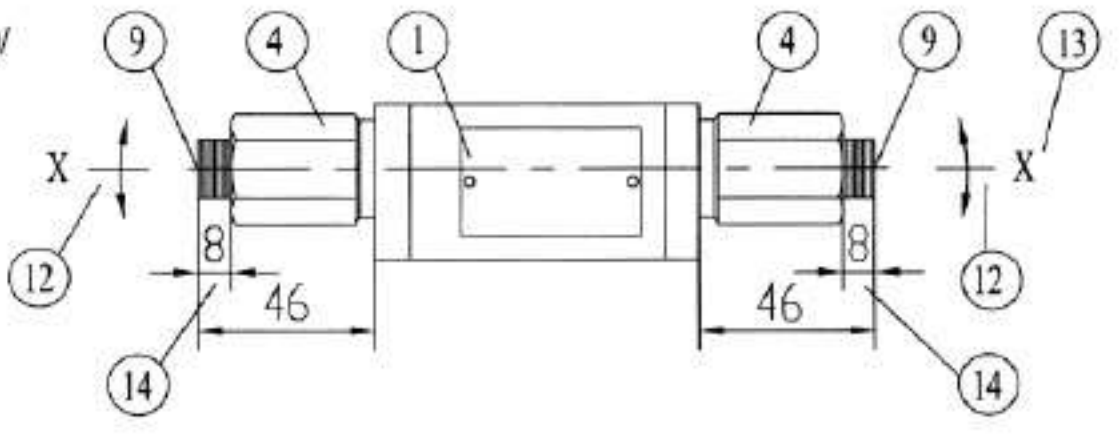
Type Z2FS 6 A.. - 40/

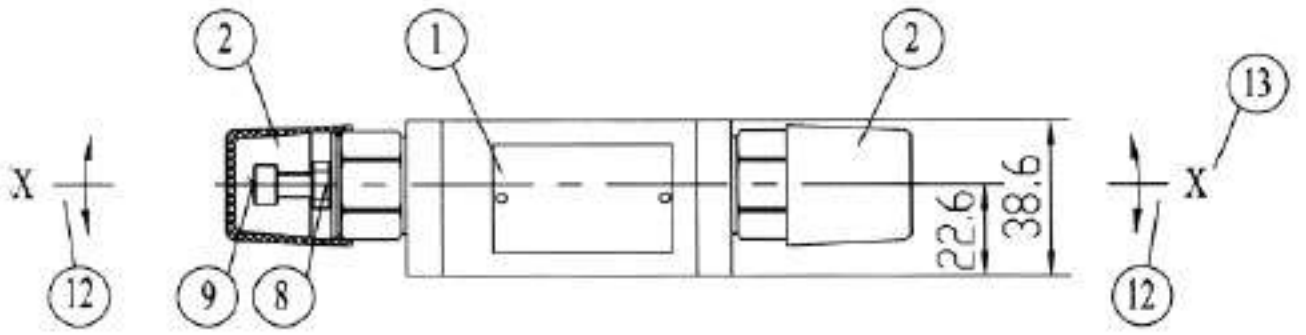


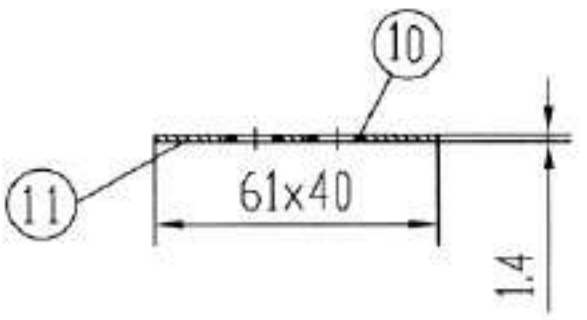
Type Z2FS 6 B.. - 40/

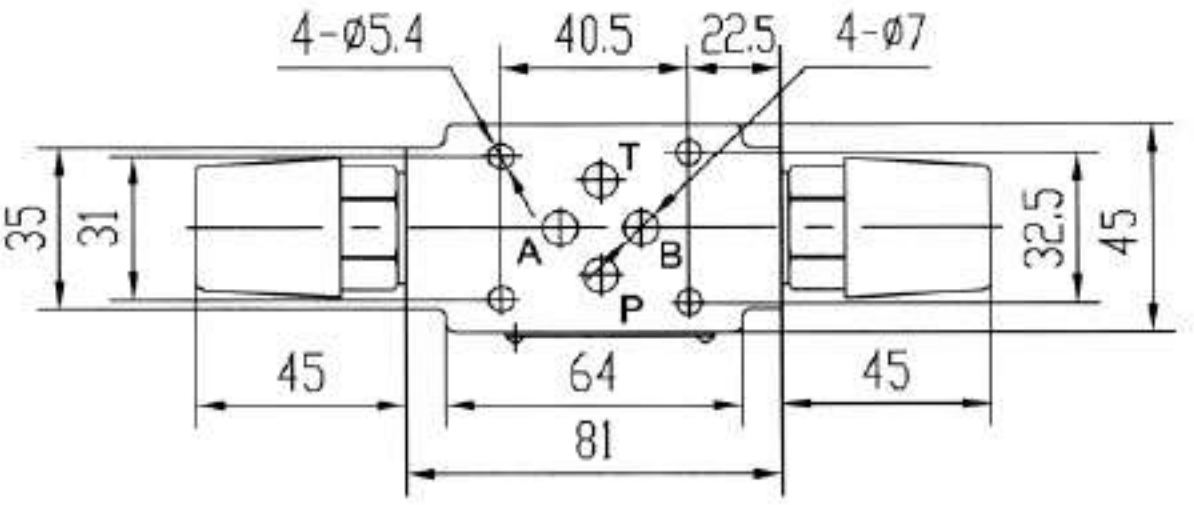


Type Z2FS 6- .. - 40/





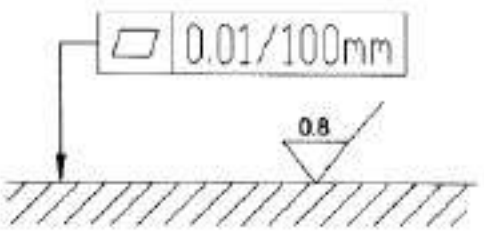




1 Name plate
2 Adjustment element "2"
3 Adjustment element "3"
4 Adjustment element "4"
5 Adjustment element "7"
6 Space required to remove key
7 Valve fixing holes
8 Locknut 10 A/F
9 Adjustment screw/spindle to set flow
cross-section (internal hexagon 5 A/F)
10 O-ring 9.25 x 1.78 for ports A, B, P, 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 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 $\sqrt{0.8}$.
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.

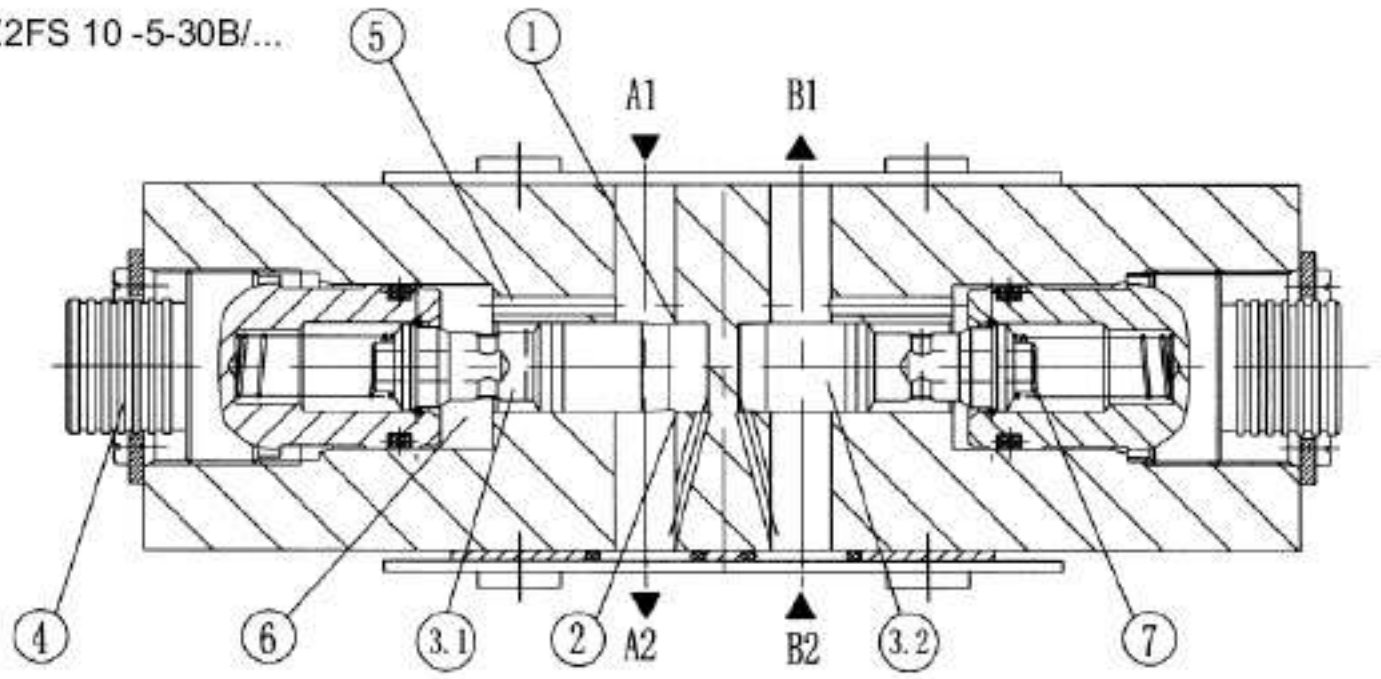
Limiting the main fluid flow

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

Nominal size 10 = 10

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

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

Technology of Beijing Huade Hydraulic =B

Further details in clear text

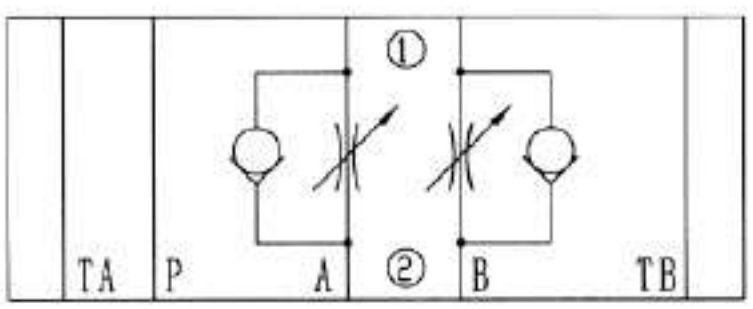
No code = Mineral oil
V = Phosphate ester

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/S2) meter-in on port B
S4 = (...A.-30B/S4) meter-in on port A(...B.-30/S) meter-out on port B

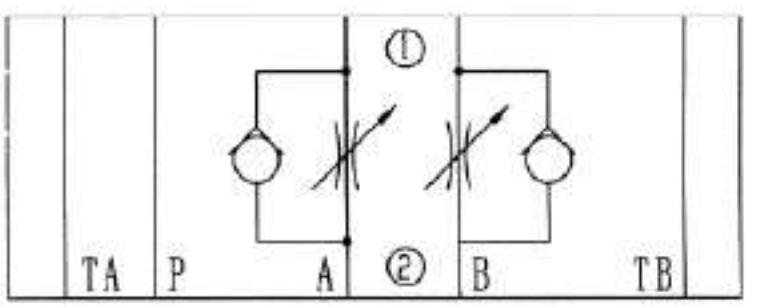
Note:Type Z2FS 10-..-30B/..has the same adjustment elements on ports A and B!

Symbols (① = valve side, ② = sub-plate)

Z2FS10-..-30B/..(meter-in)

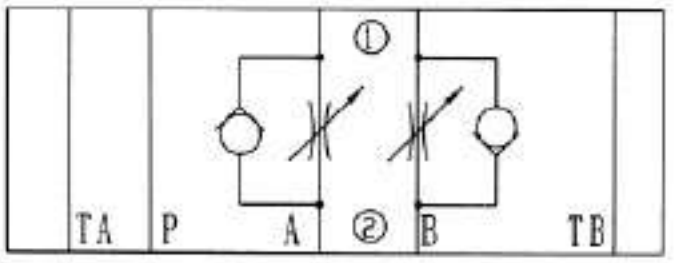


Z2FS10-..-30B/..(meter-out)

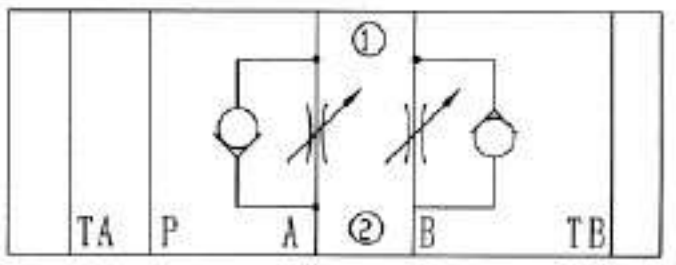


Symbols (① = valve side, ② = sub-plate)

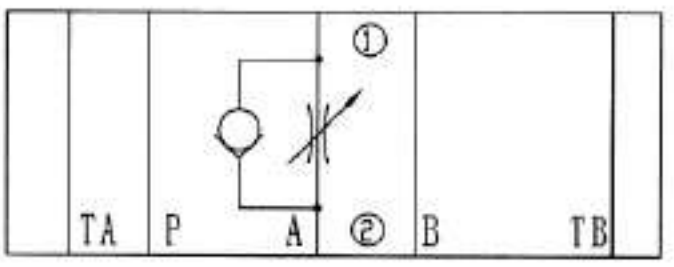
Z2FS10-..-30B/S3..(port A meter- out, port B meter-in)



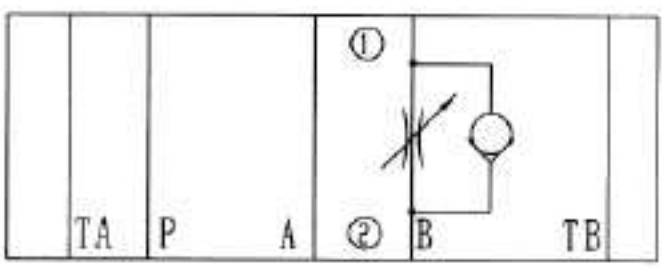
Z2FS10-..-30B/S4..(port A meter-in,port B meter-out)



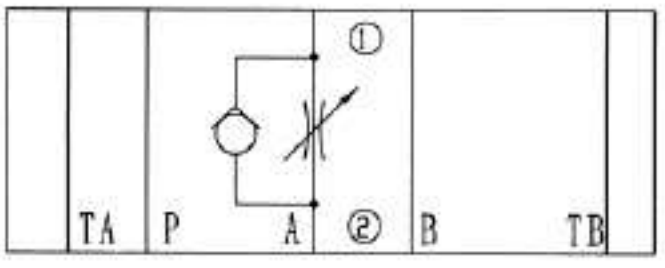
Z2FS10A-..-30B/S..(port A meter-in)



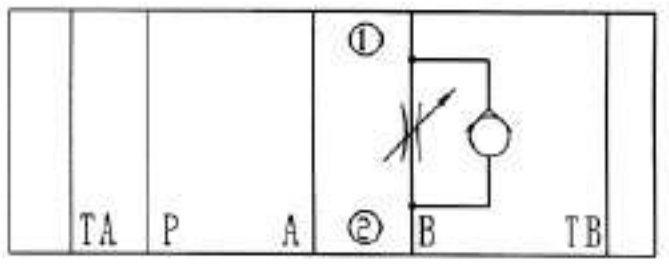
Z2FS10B-..-30B/S..(port B meter-in)



Z2FS10A-..-30B/S2..(port A meter-out)



Z2FS10B-..-30B/S2..(port B meter-out)

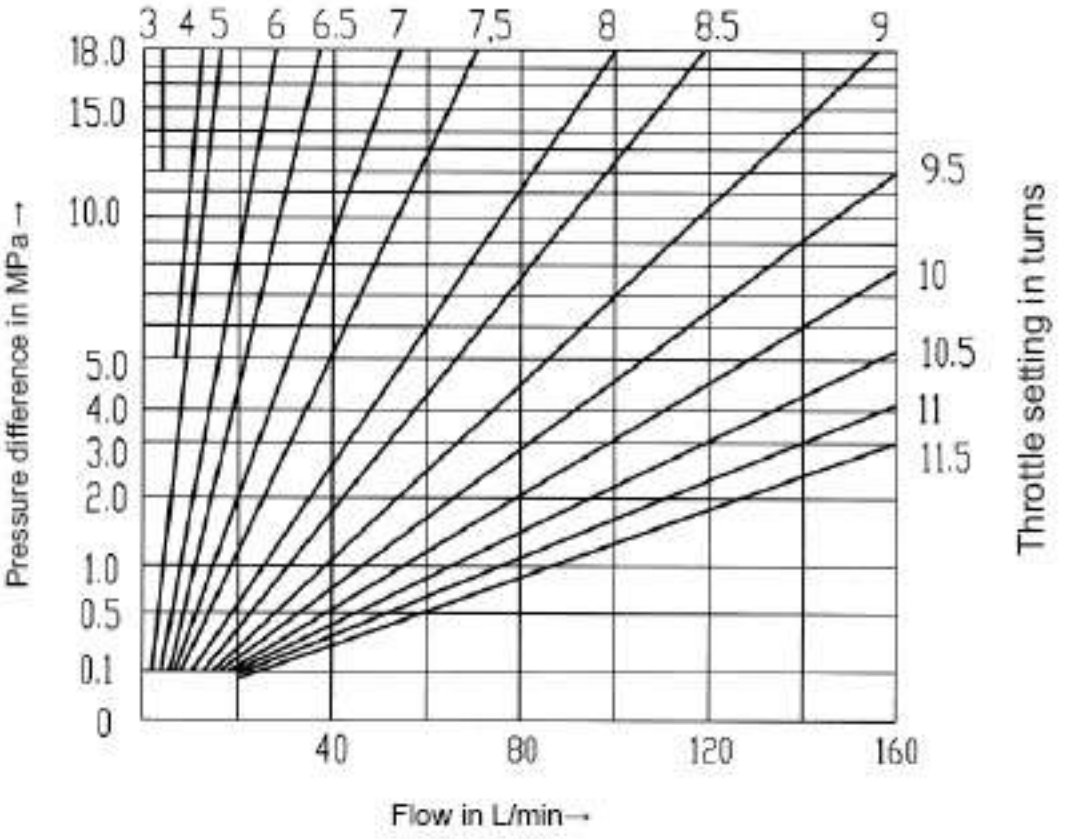


Technical data (for applications outside these parameters, please consult us!)

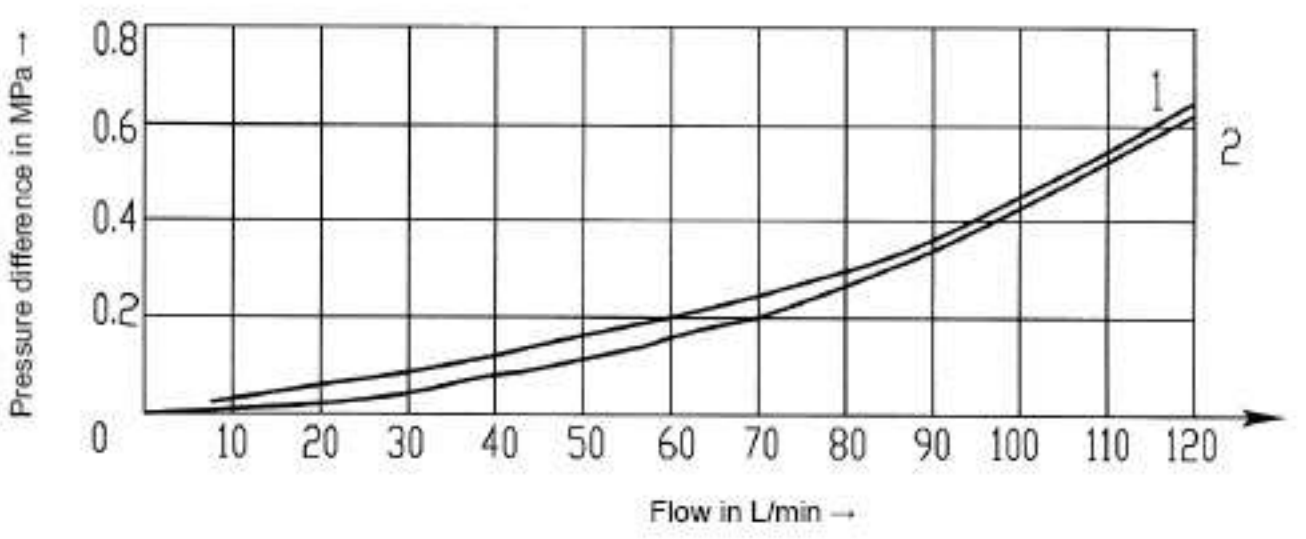
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Pressure fluid temperature range	(°C)	- 30 to + 80
Viscosity range	(mm^2/s)	10 to 800
Degree of contamination		Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter 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 mm^2/s and t = 50°C)

Pressure difference Δp in relation to the flow q_v at constant throttle setting

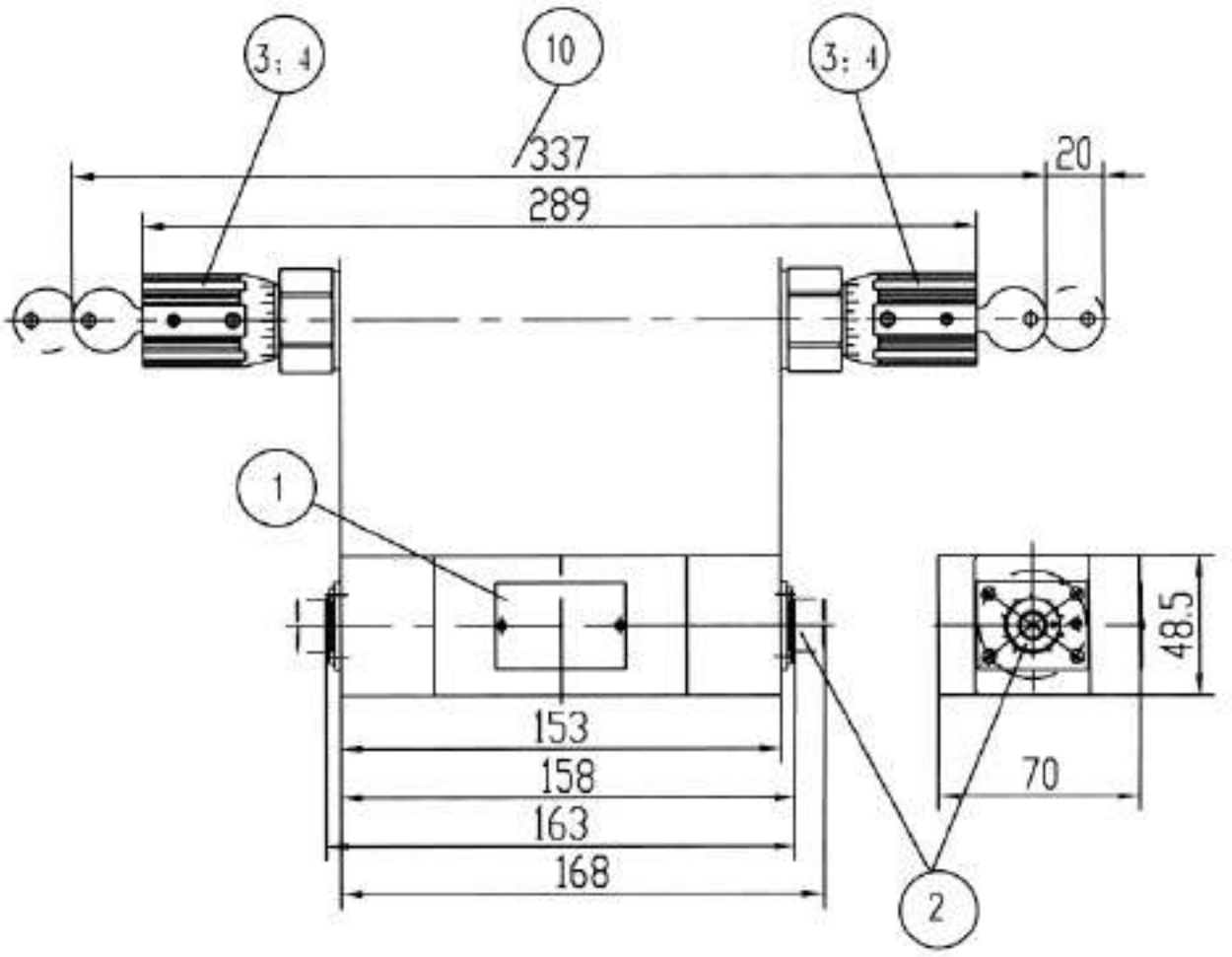


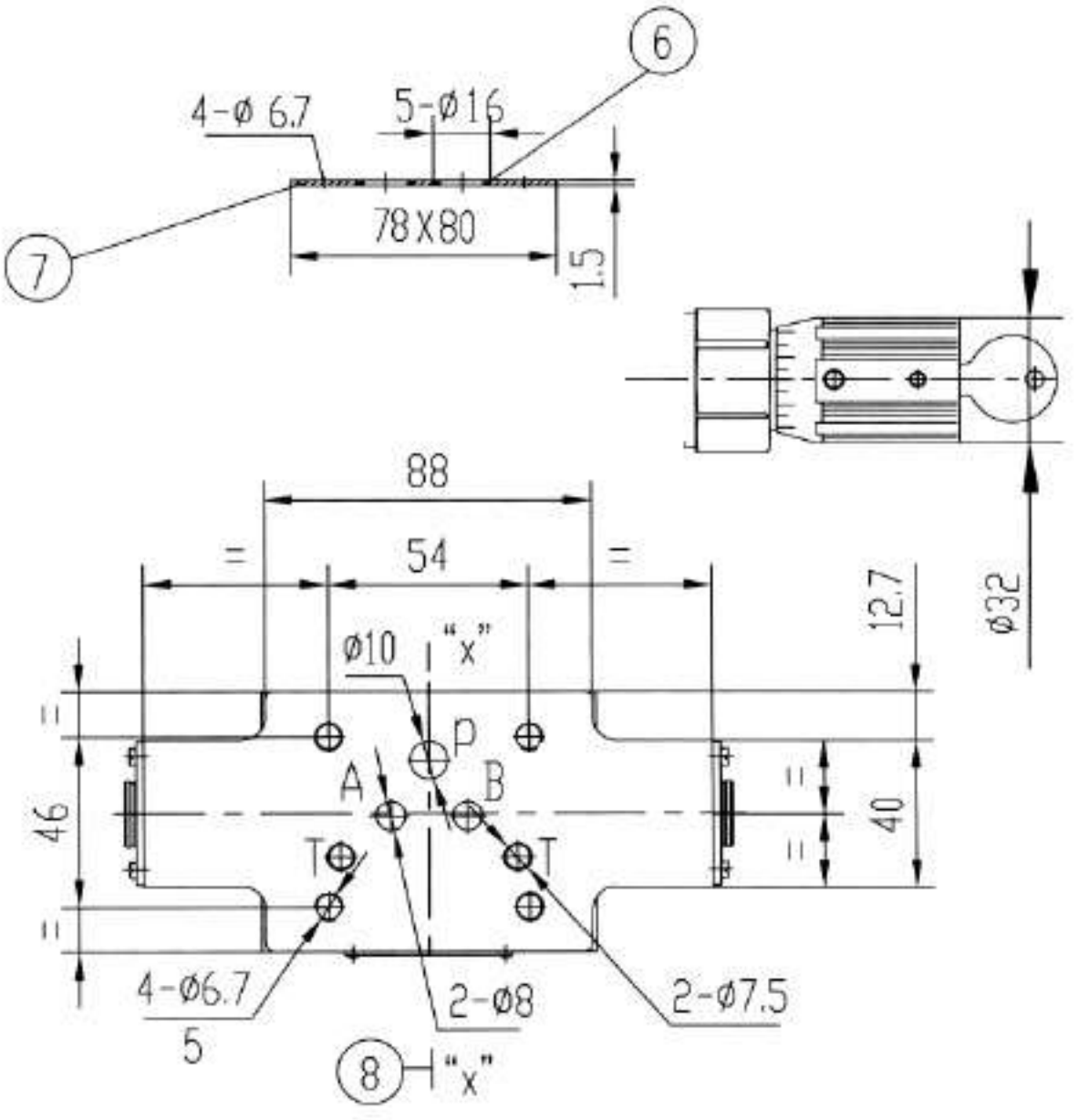
Pressure difference Δp in relation to the flow q_v across the check valve



1 Throttle closed
2 Throttle open

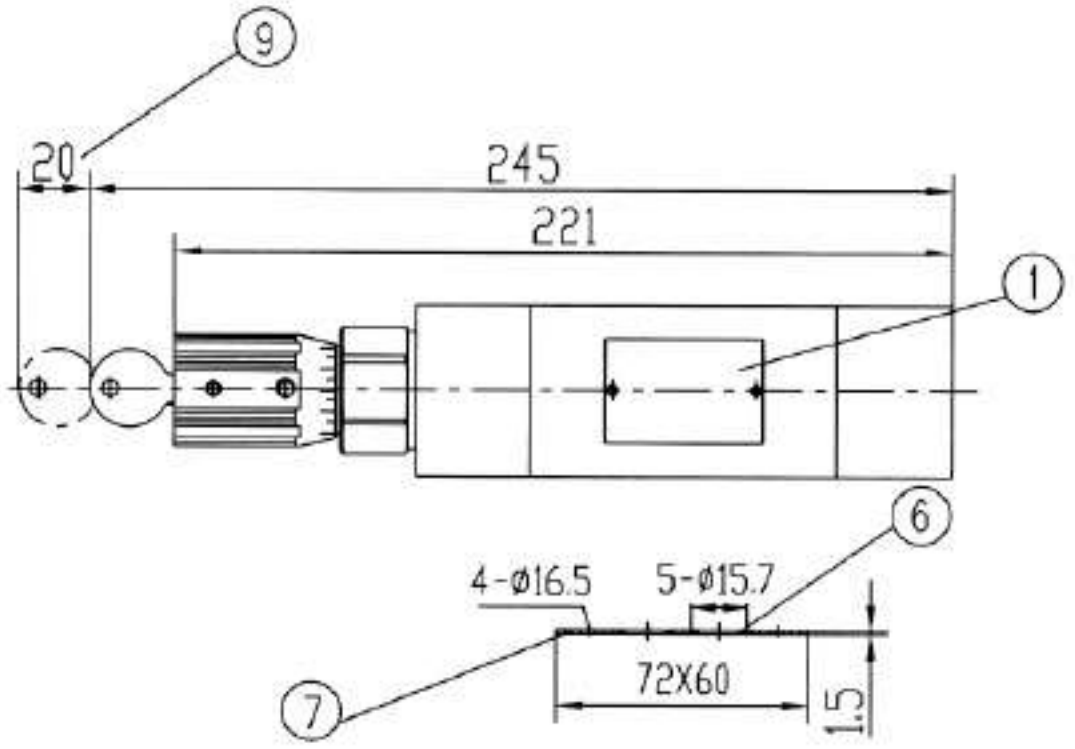
Type Z2FS 10.. -30B/



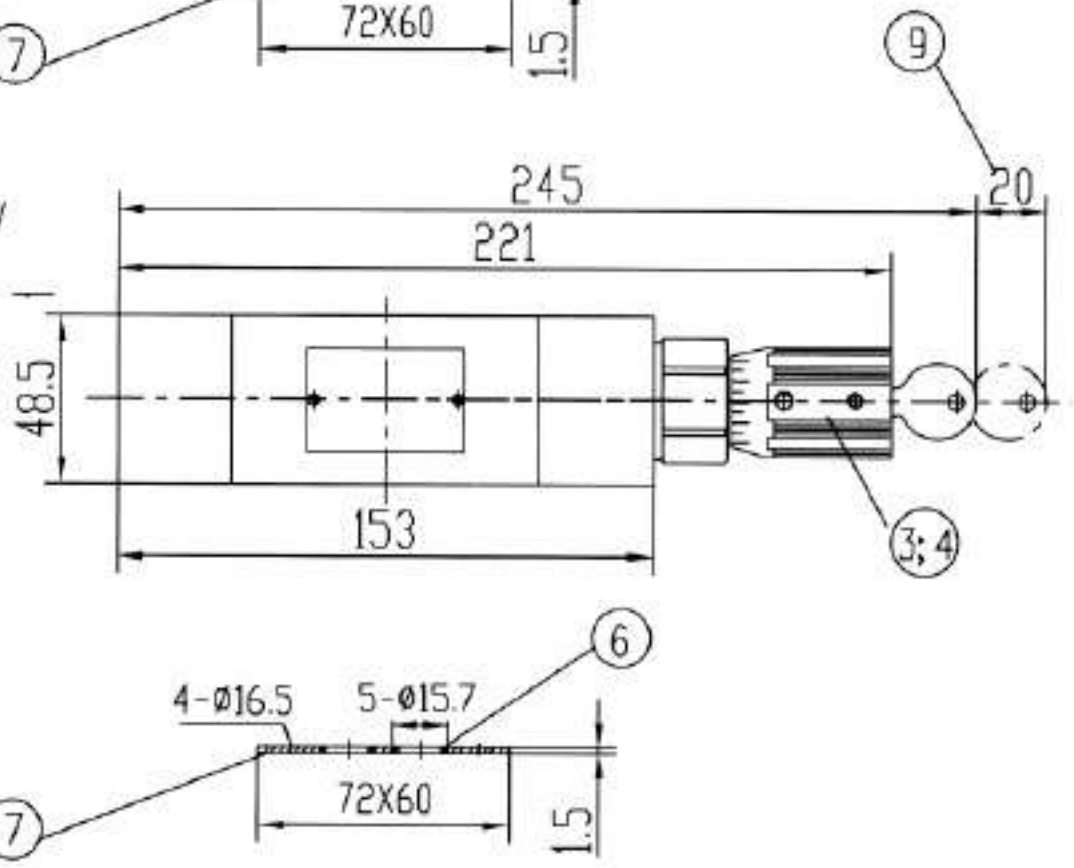


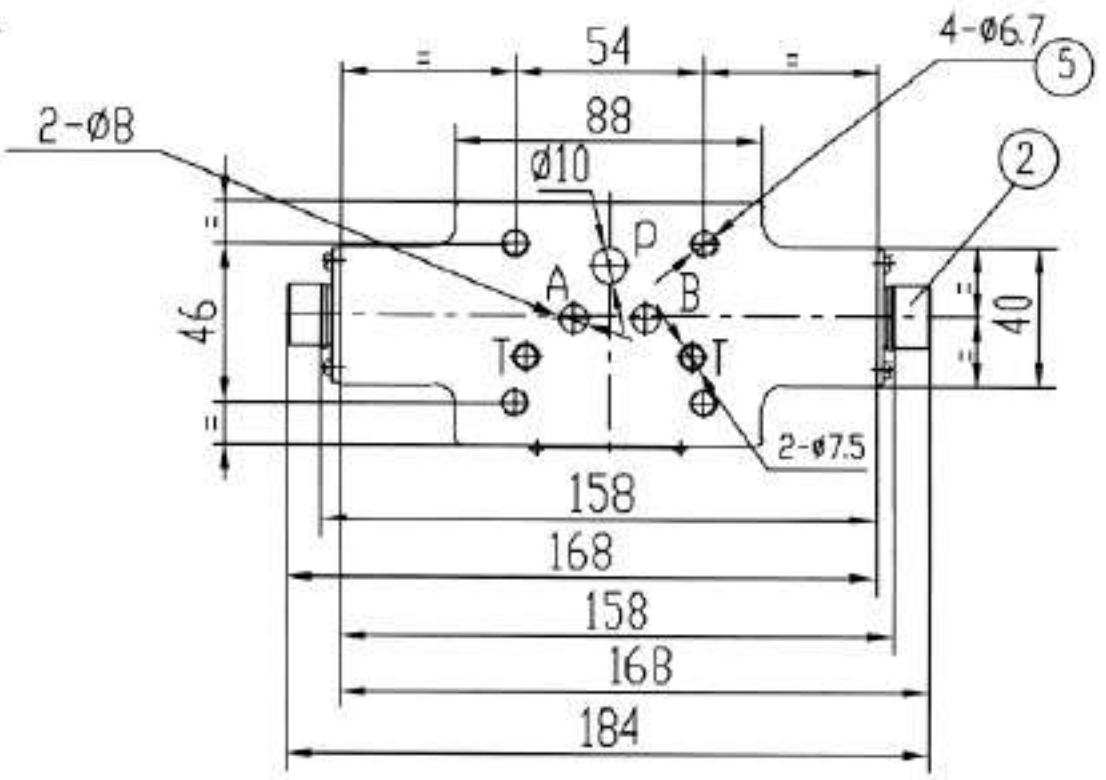
Unit dimensions **(Dimensions in mm)**

Type Z2FS10 A.. - 30B/



Type Z2FS10 B.. - 30B/





Unit dimensions **(Dimensions in mm)**

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 0-ring plate

8 To change from meter-in to meter-out,
rotate the unit about the "X"-"X" axis

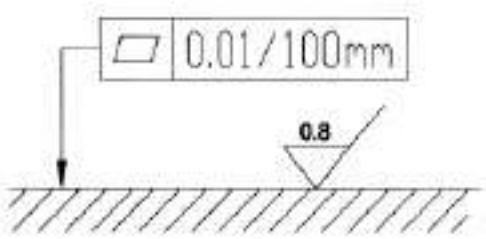
9 Space required to remove key

10 Only for adjustment "3"

11 All setting device
Clockwise rotation for increasing flow
Counter-clockwise rotation for reducing flow

Valve fixing screws
M5 -10.9 (GB/T70.1-2000)
Tightening torque M_A = 15.5 Nm.

Required surface finish of mating piece



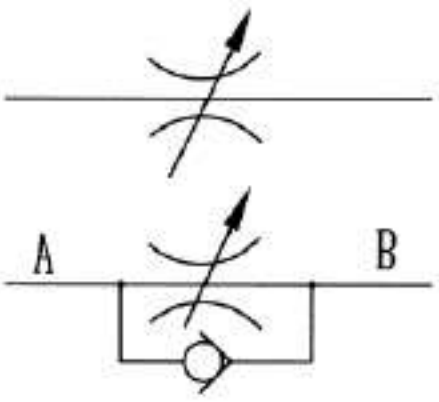
Notice

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 $\sqrt{0.8}$.
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 160 L/min	Replaces: RE32502/5.2001

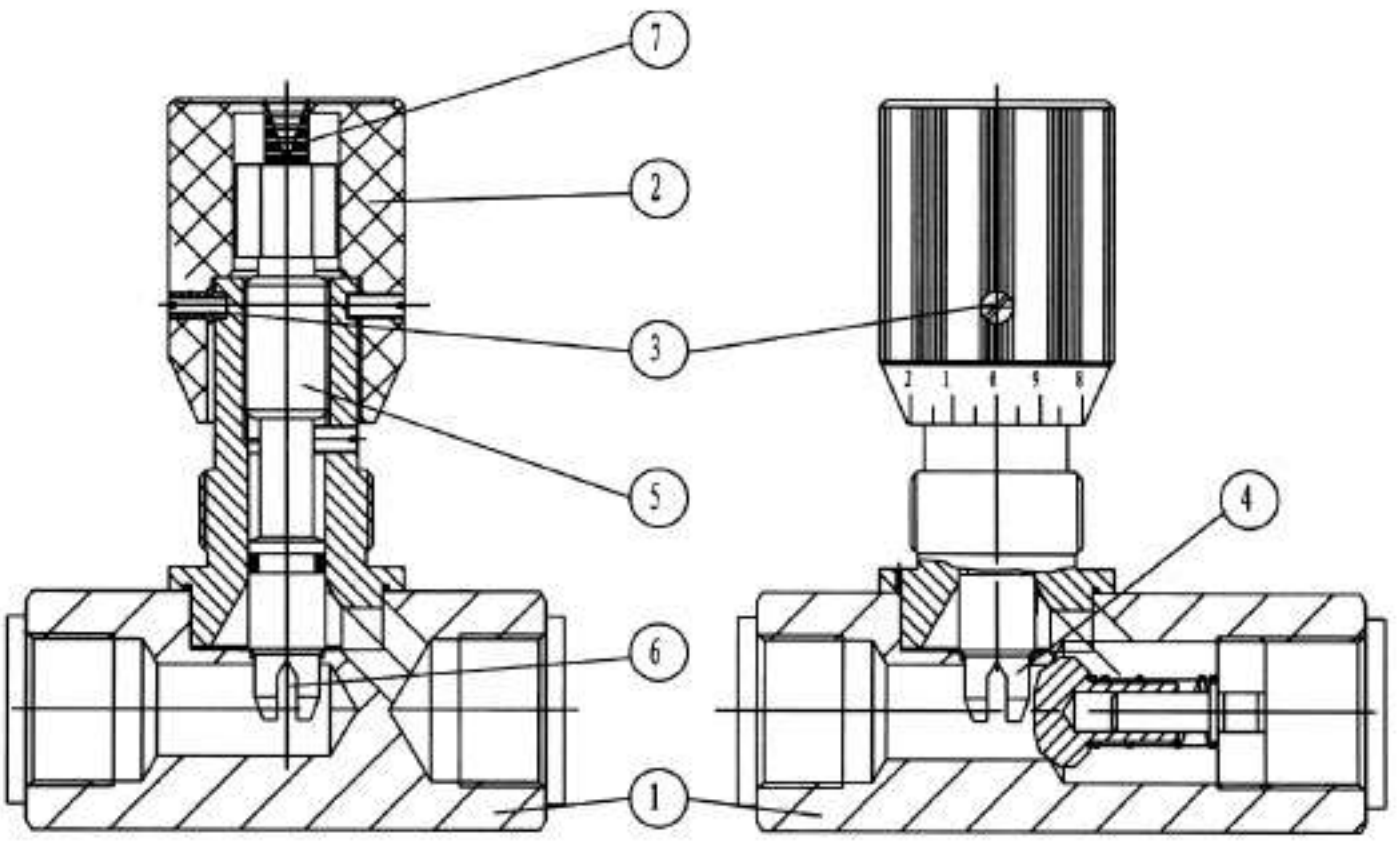
Features:

- threaded connection
- Subplate mounting

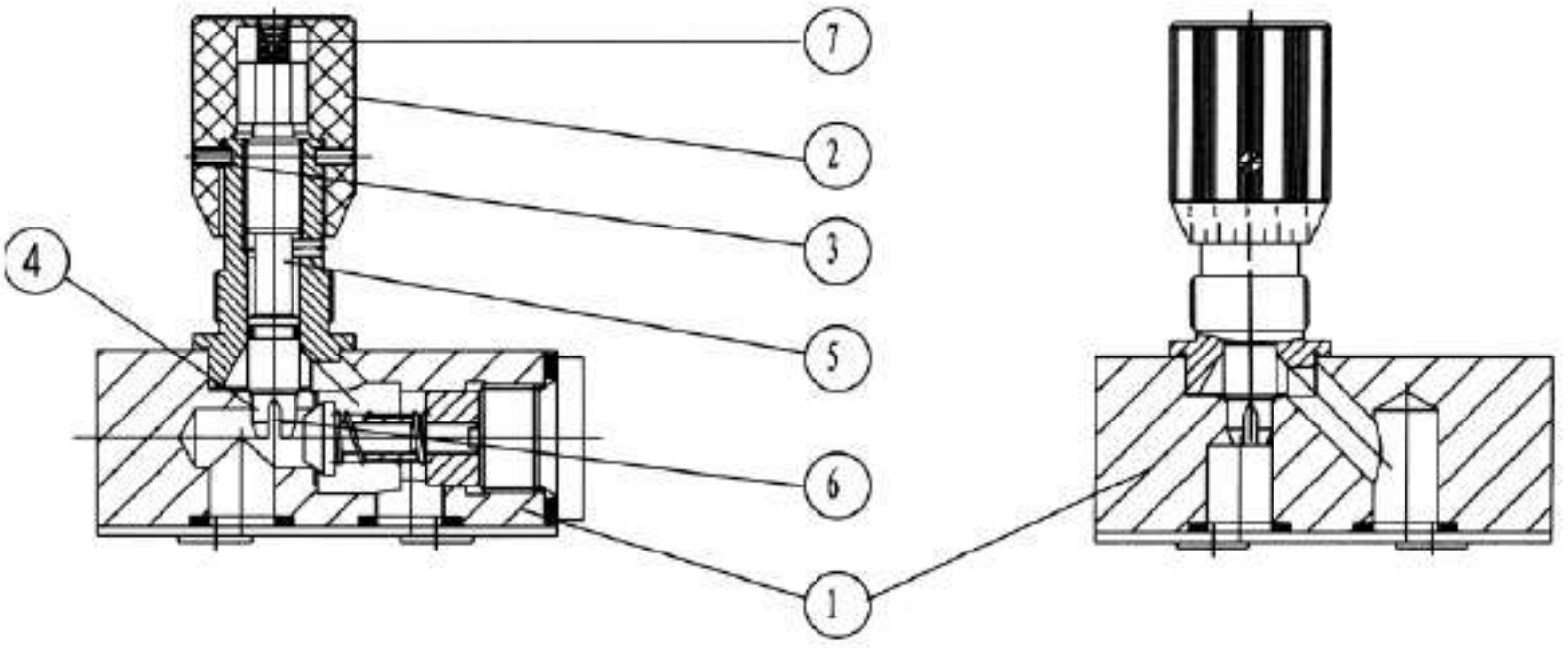


Function, Section

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/...



Type DRVP...10B/...

Type DVP...10B/...

Ordering Code

				–	10	B	/		*

Throttle/Isolating valves (threaded connection) = DV
One-way throttle/check valves (threaded connection) = DR
Throttle/Isolating valves (subplate mounting) = DVP
One-way 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 conrection = -
For subplate mounting = S

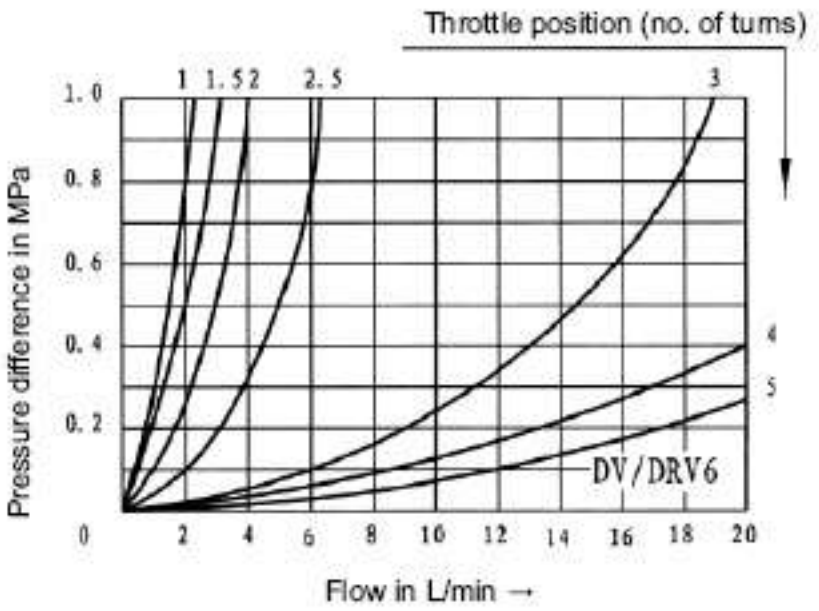
1 = Steel
2 = Brass
3 = Stainless steel

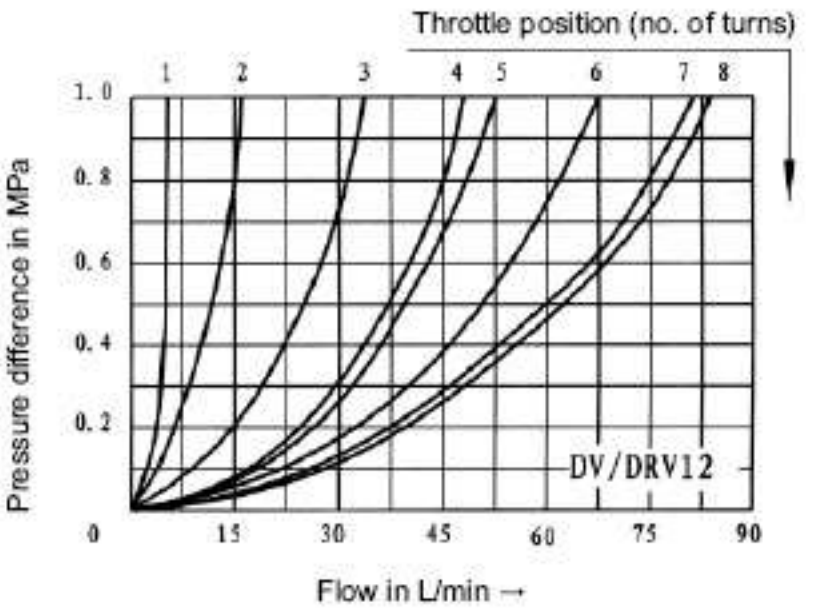
Technical Data (For applications outside these parameters, please consult us!)

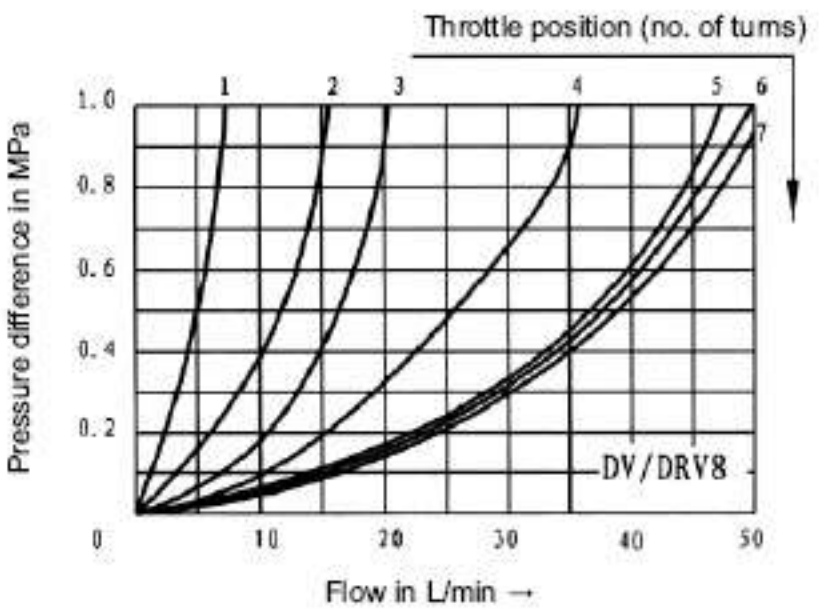
Material		Steel	Brass	Stainless steel
Max. permissible operating pressure	(MPa)	to 35	to 15	to 35
Cracking pressure of check valve (type DRV)		0.05 (cracking pressures available if required)		
Fluid		Mineral oil or Phosphate ester		
Fluid temperature range	(℃)	-30 to +80		
Viscosity range	(mm^2/s)	10 to 800		
Installation postion		optional		

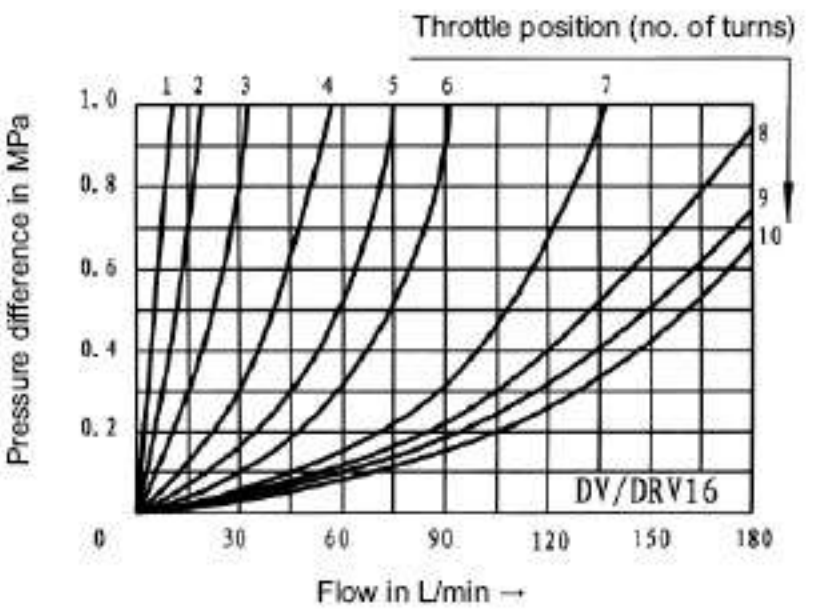
Operating Curves: (measured at v = 41 mm² /s and t = 50°C)

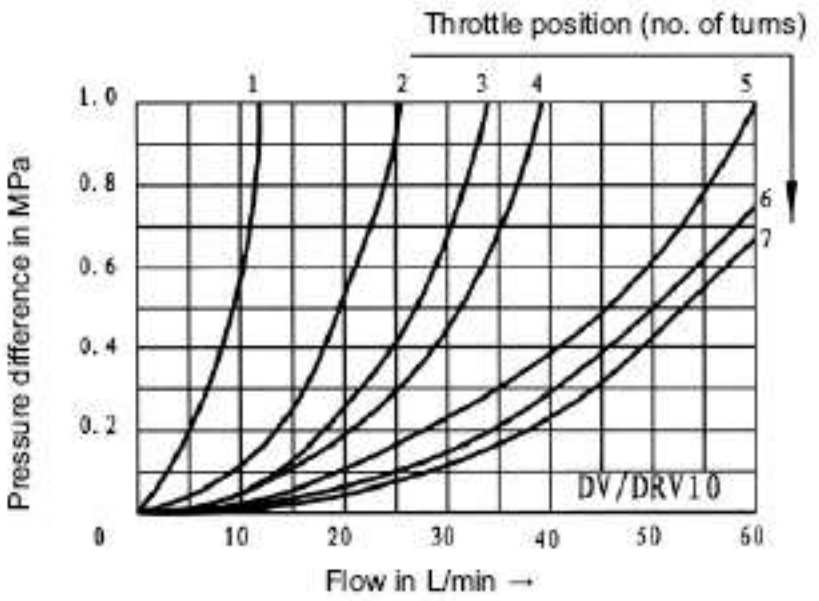
Δ p - q_v-operating curves for free return flow via open check valve; direction of flow: A → B

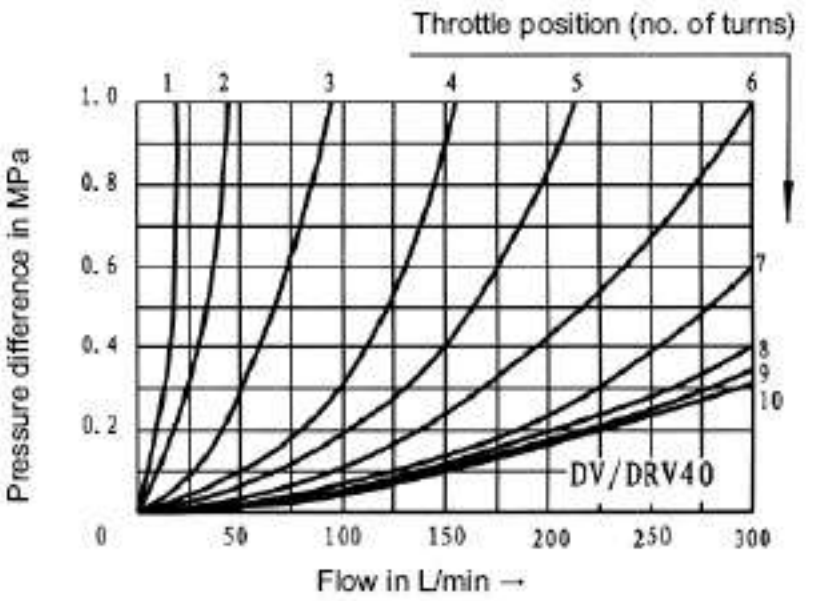




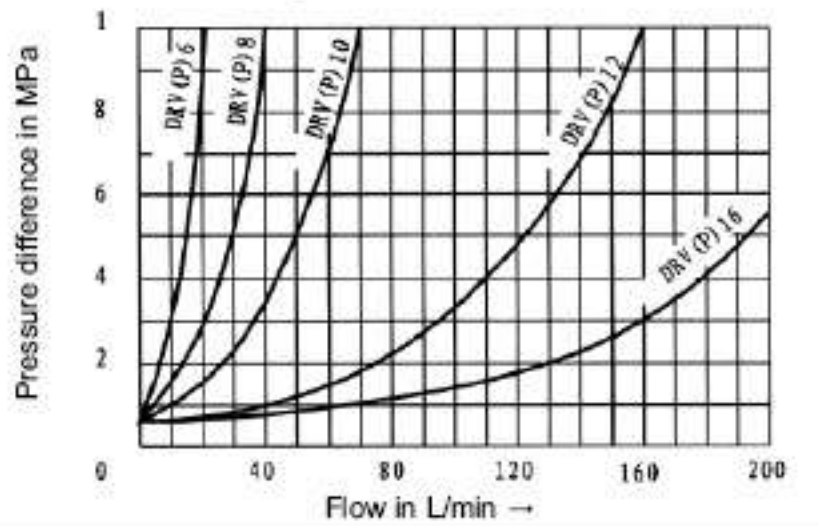


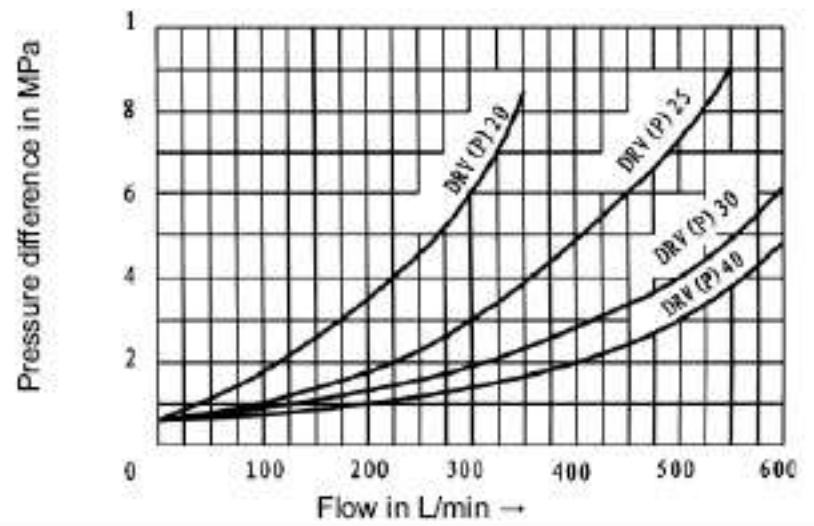






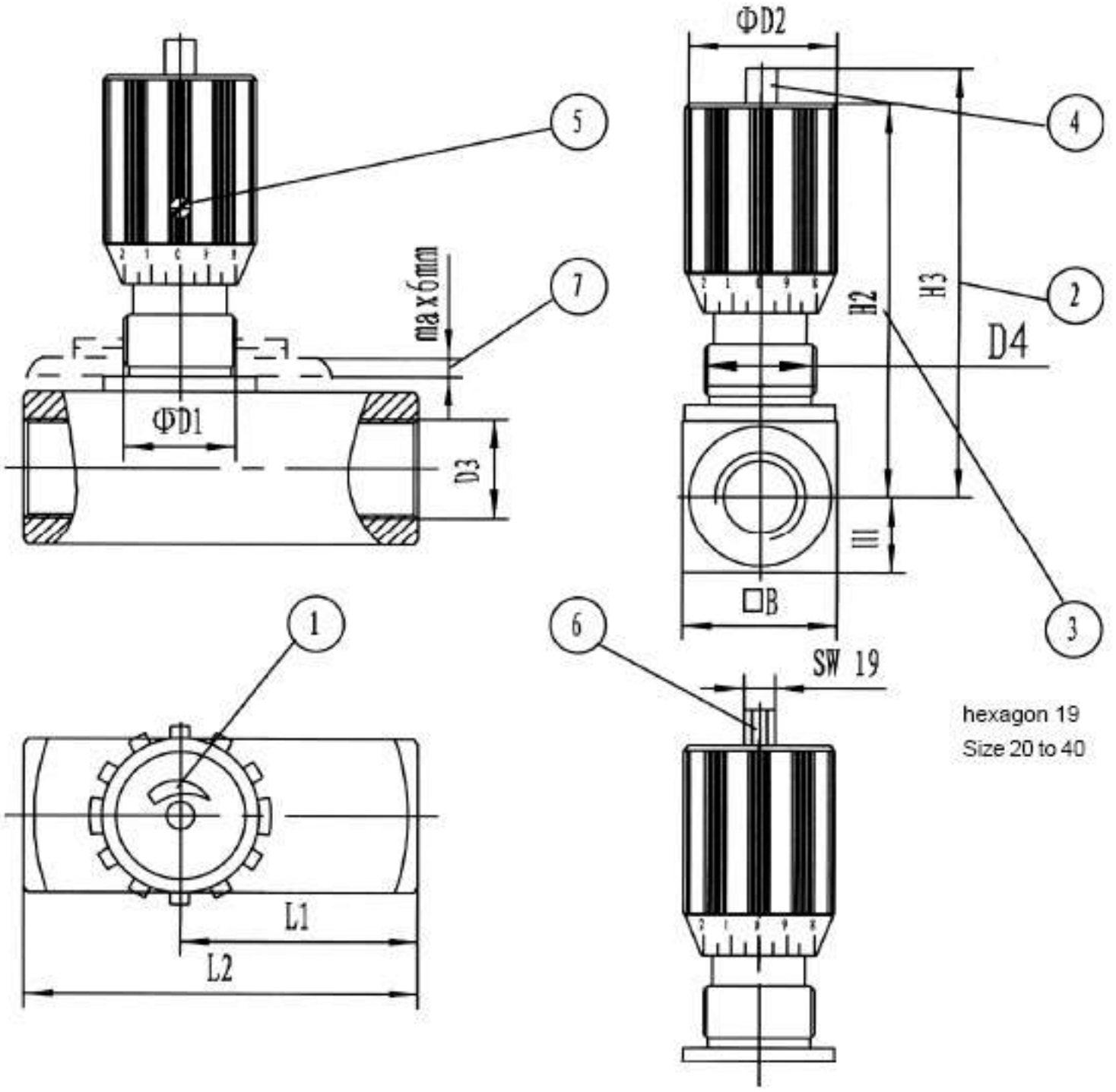
△ p - q_v-operating curves for free return flow via open check valve; direction of flow: B → A





Unit Dimensions: type DV/DRV

(dimensions in mm)



Note:

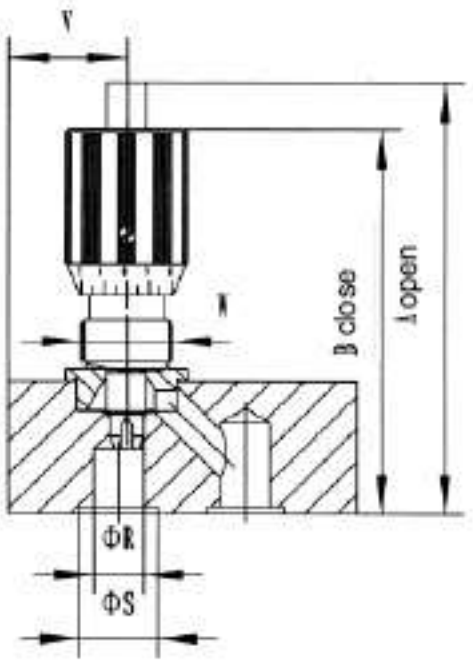
The table below shows the dimensions of DV on the left, and dimensions of DRV on the right.

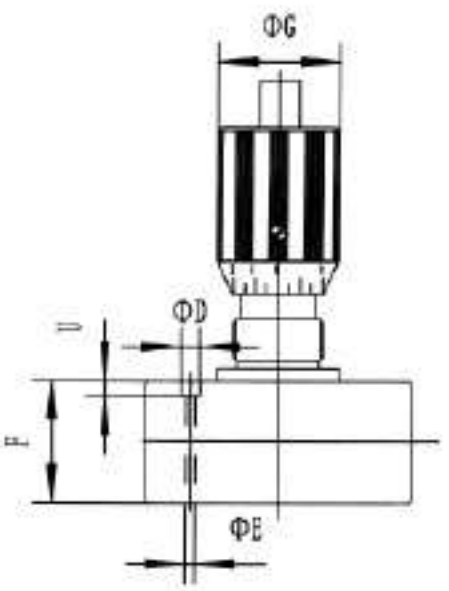
Size	□ B	Φ D1	Φ D2	D3		D4	H1	H2	H3	L1		L2	
6	16	16	24	G1/8″	M10X1	M14X1.5	8	54	59	19	26	38	45
8	25	19	29	G1/4″	M14X1.5	M18X1.5	12.5	66	73	24	33.5	48	55
10	30	19	29	G3/8″	M18X1.5	M18X1.5	15	68	75	29	41	58	65
12	35	23	38	G1/2″	M22X1.5	M22X1.5	17.5	82	92	34	44	68	73
16	45	23	38	G3/4″	M27X2	M22X1.5	22.5	97	107	39	57	78	88
20	50	35	49	G1″	M33X2	M33X2	25	128	145	54	77	108	127
25	60	35	49	G11/4″	M42X2	M33X2	30	133	150	54	93	108	143
30	70	35	49	G11/2″	M48X2	M33X2	35	138	155	54	108	108	143
40	90	35	49	G2″	M60X2	M33X2	45	148	165	54	130	108	165

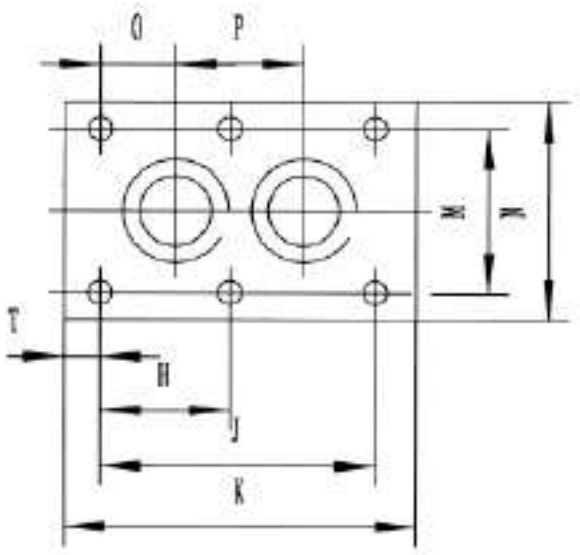
1 Anti-clockwise rotation increases flow
Clockwise rotation reduces flow
2 Throttle fully open
3 Throttle closed
4 Multi color for repeat setting
5 Screw to lock flow setting
6 Hexagon 19 A/F
7 Panel thickness

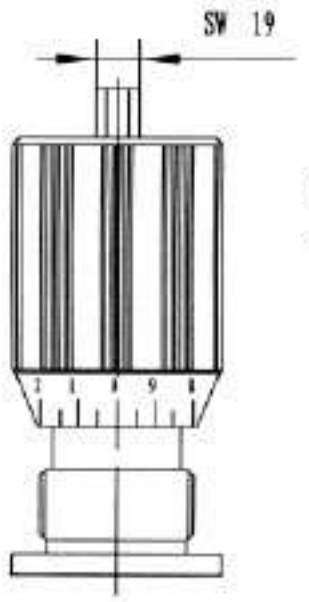
Unit Dimensions: type DVP

(dimensions in mm)







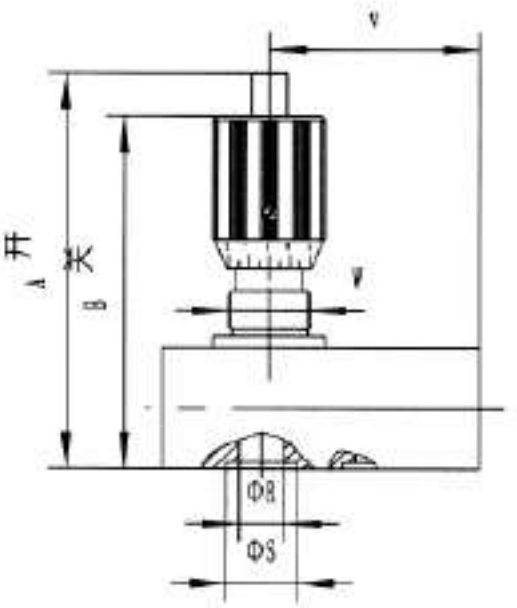


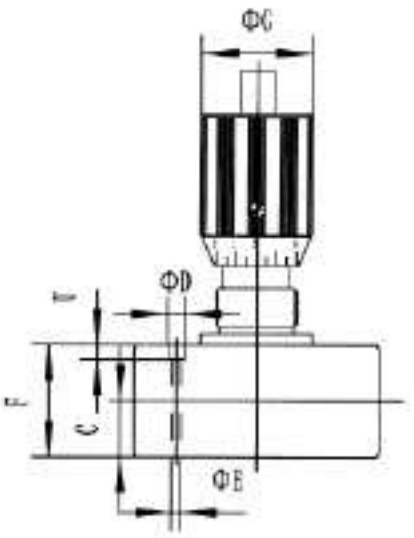
hexagon 19
Size 20 to 40

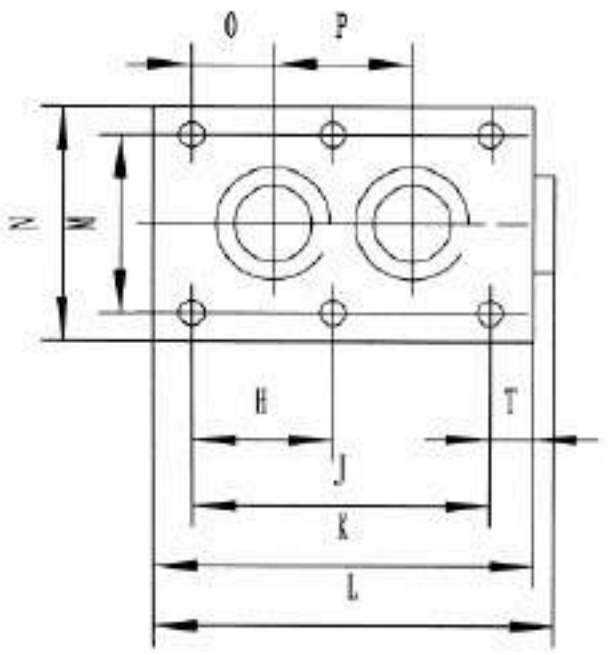
Size	A	B	D	E	F	G	H	J	K	M
6	69	64	11	6.6	18	24	-	19	35	28.5
8	80	73	11	6.6	20	24	-	35	47.5	33.5
10	85	78	11	6.6	25	29	-	33.5	51	38
12	99	89	11	6.6	25	29	-	38	75	44.5
16	114	104	14	9	30	38	38	76	93.5	54
20	165	148	14	9	45	38	47.5	95	111	60
25	165	148	18	11.5	45	49	60	120	143	76
30	170	153	20	14	50	49	71.5	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

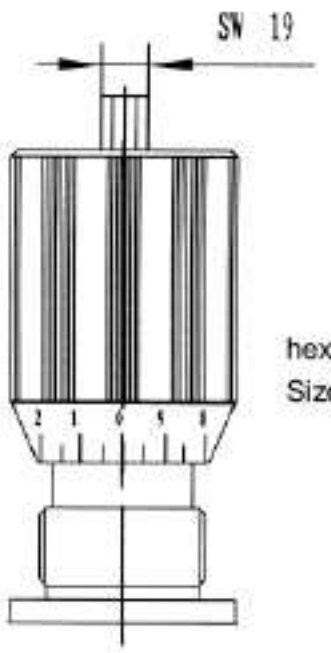
Unit Dimensions: type DRVP

(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

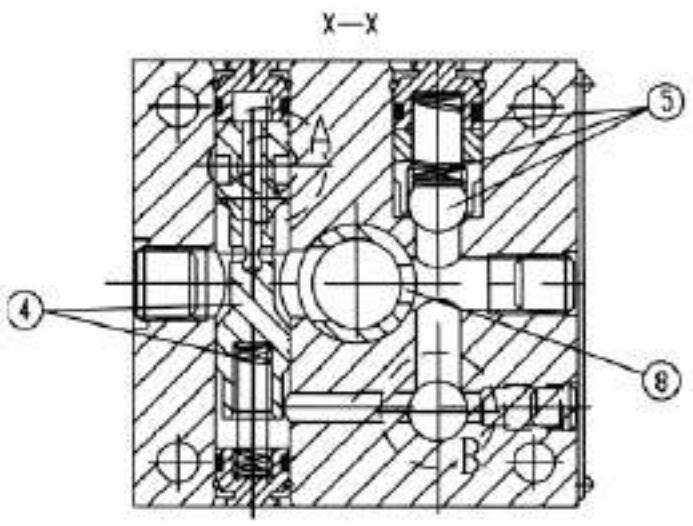
Function , section

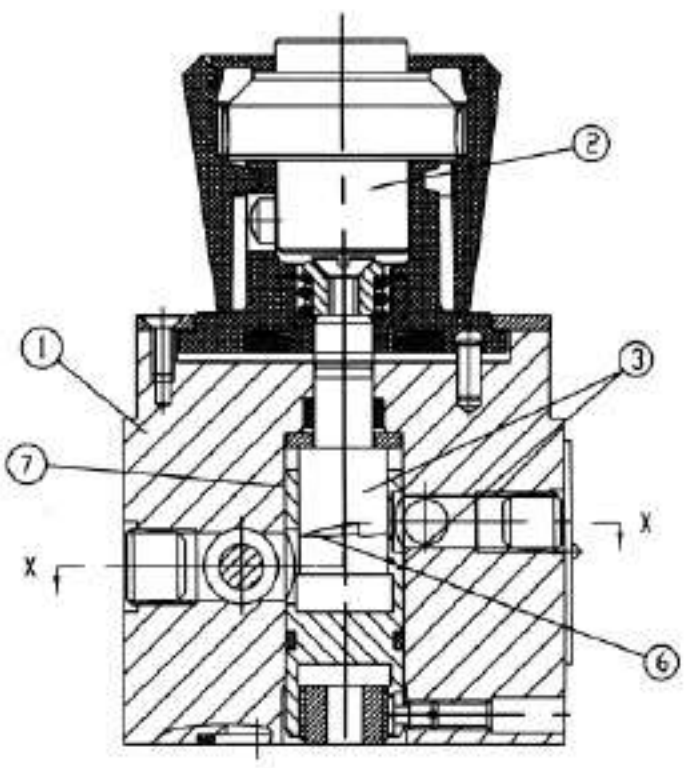
The 2FRM flow valve is a 2-way flow control valve.It mainly consists of housing(1),setting element(2),orifice(3), pressure compensator(4)optionally with stroke limiter as well as check valve(5) and is used for the throttling of a flow at low pressure and temperature dependency.

The throttling cross section is set by the roration 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 independance is the result of the throttling point being constructed as an orifice.

The free flow retum 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

2FRM5-31	B	/				*

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

Technology of Beijing Huade Hydraulic = B

Progressive	Progressive
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	

flow direction
A → B

No code = without pressure compensator stroke limiter
B = with pressure compensator stroke limiter

No code = Mineral oil
V = Phosphate ester (other seals on enquiry)

Further details in clear text

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 (℃)	-30～+ 80
Viscosity range (mm²/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
Δ p 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 Δ 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 sandwith plate

Z4S5-10	B	/		*

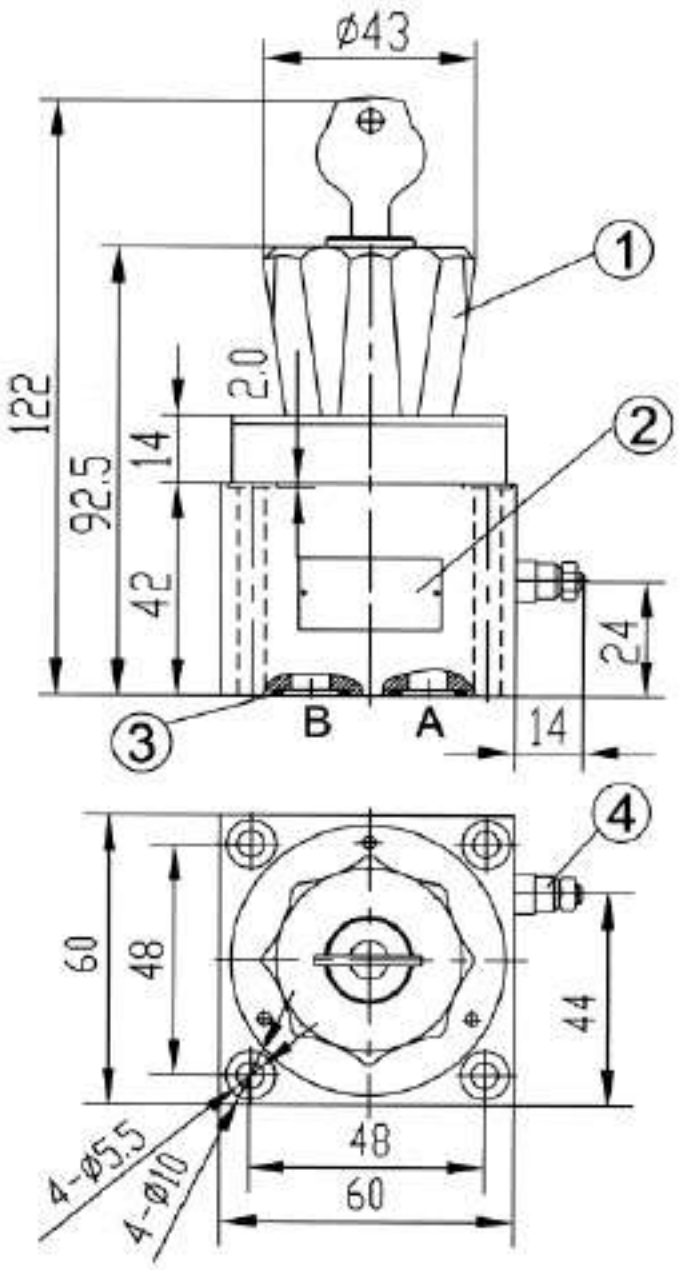
Series 10 (10 to 19: : unchanged installation and connection dimensions) = 10

Technology of Beijing Huade Hydraulic = B

No code = Mineral oil
V = Phosphate ester

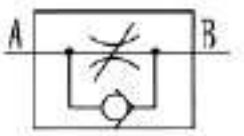
Further details in clear text

Ordering code: 2-way flow control valve

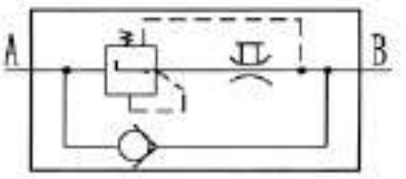


Symbols

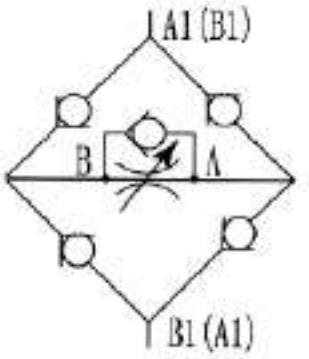
Flow control valve simplified

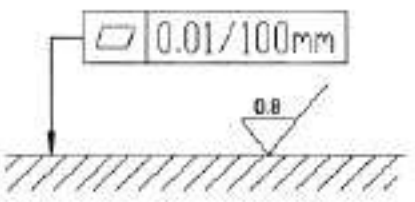


Flow control valve detailed



Rectifier sandwich plate





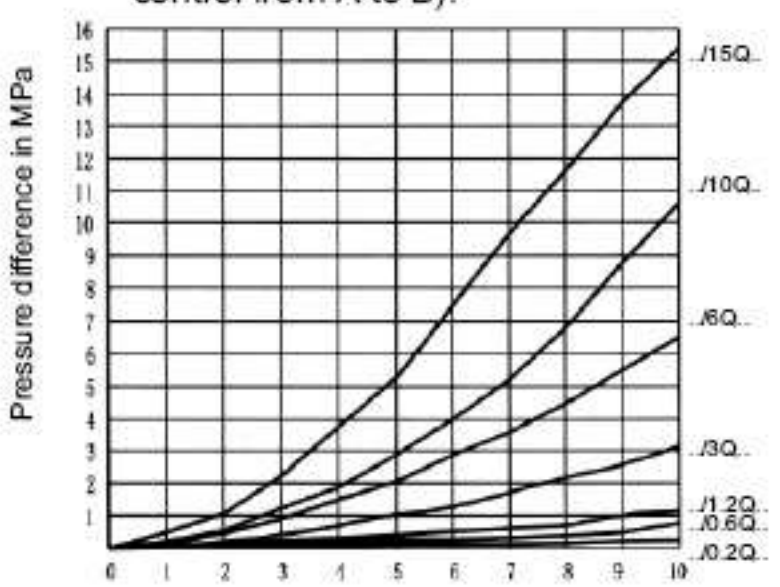
Required surface finish of the mating piece

1. Adjustment element, lockable rotary knob(may be locked in any position)
   Turning range 300° = 10 scale divisions
   Tighting torque M_A =0.5 Nm
2. Nameplate
3. O-ring 12 x 2
4. Pressure compensator stroke limiter

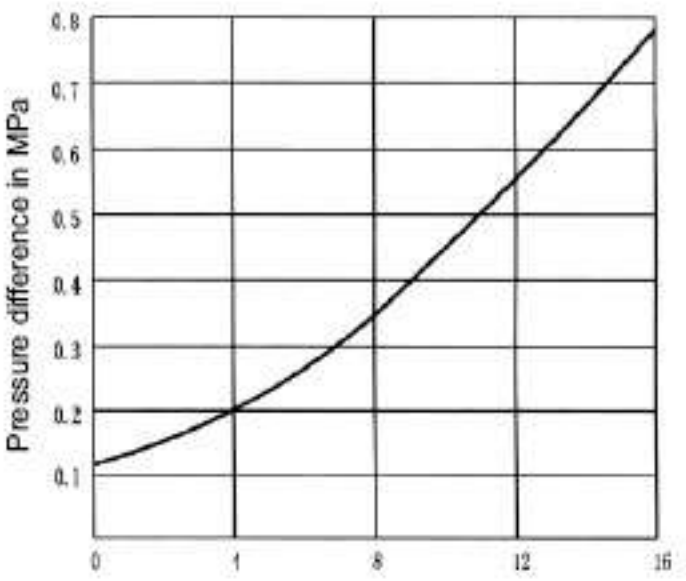
Subplates for: see page 69
G 44/01 (G 1/4") G 44/02 (M14 × 1.5)
G 45/01 (G 1/2") G 45/02 (M22 × 1.5))

Characteristic curves: 2-way flow control valve (measured at v = 41 mm²/s and t = 50°C)

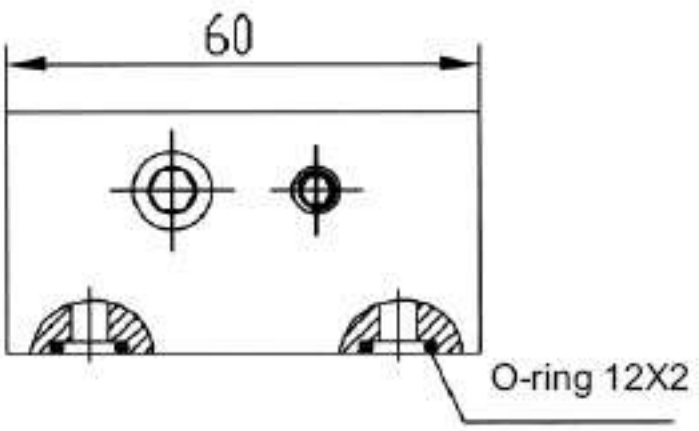
Flow q_v dependent on scale (flow control from A to B):

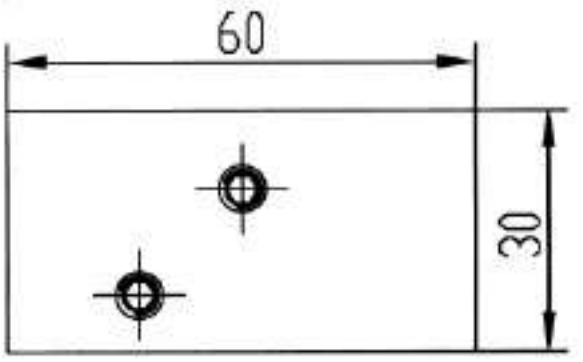


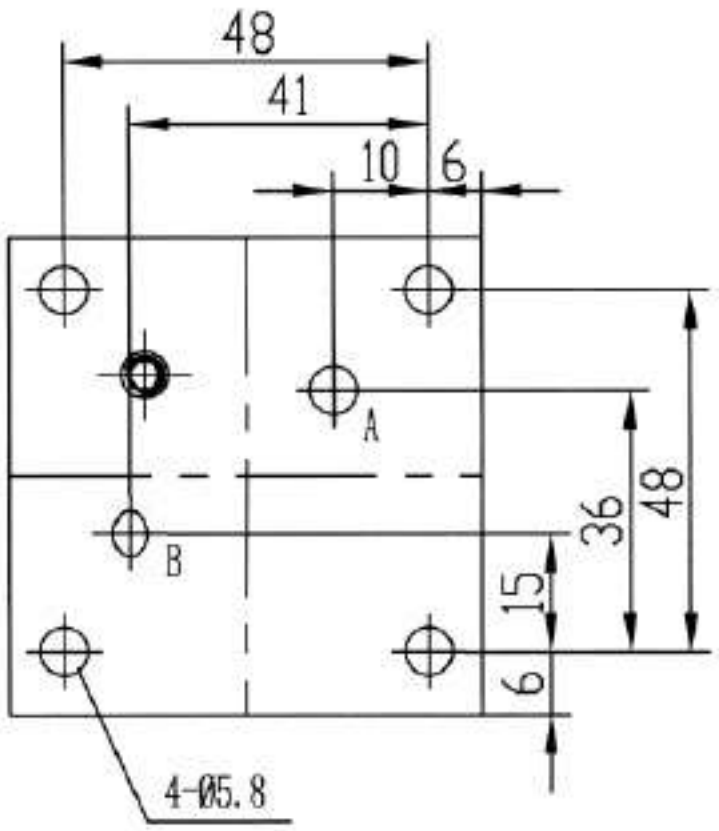
Operating curve of rectifier sandwich plate

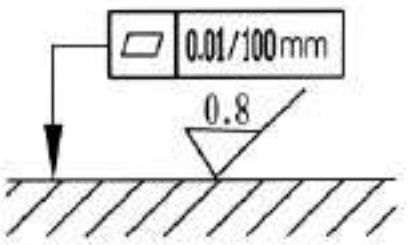


Unit dimensions: Rectifier sandwich plate **(Dimensions in mm)**









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:

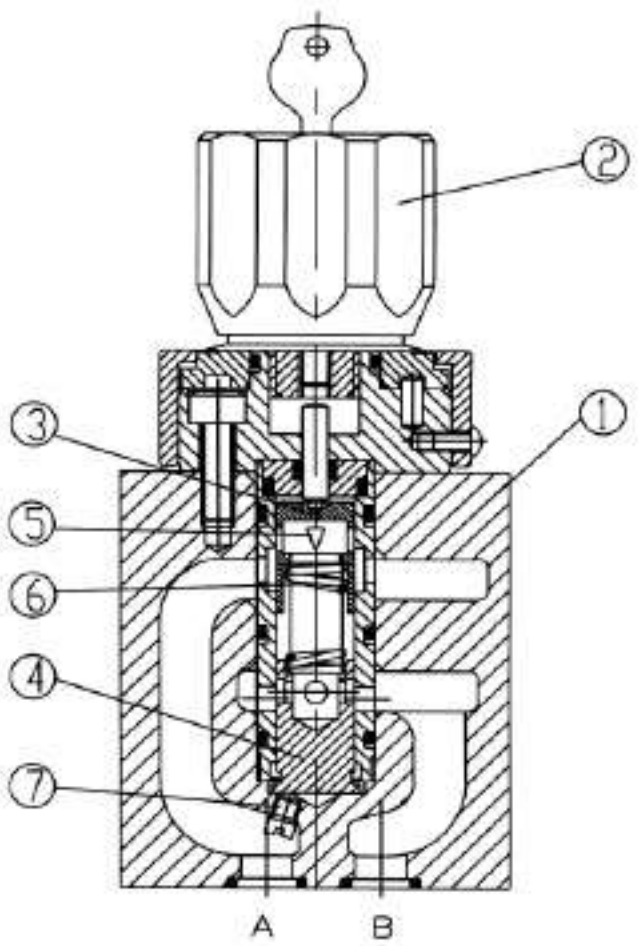
General:

The flow control valve type 2 FRM is a 2-way flow control valve. It is used for maintaining a contant 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...

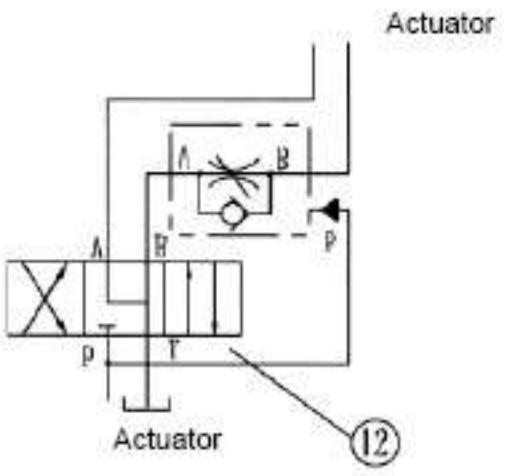
Type 2FRM 6 A..-20B/..R

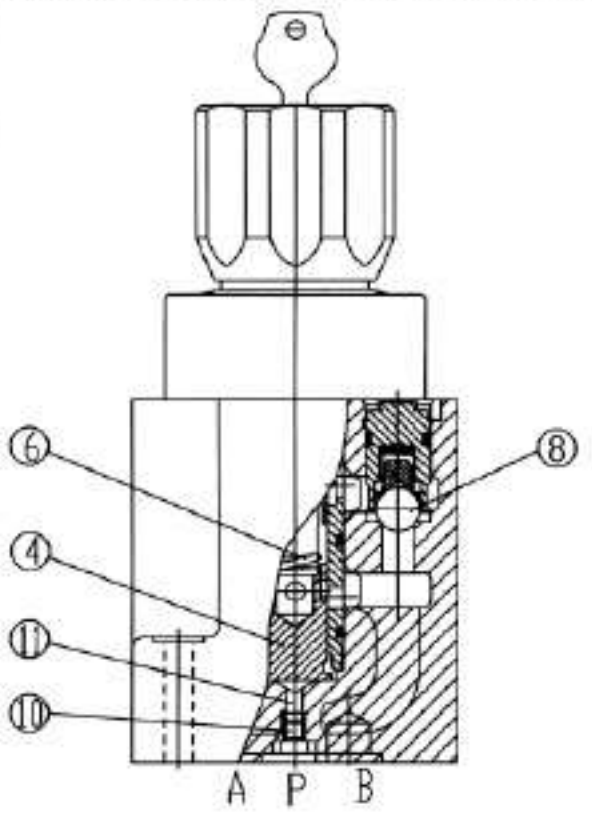
The function of this valve is basically the same as that of valve type 2FRM 6 B..-20B/..M.

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.

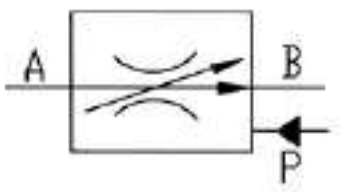
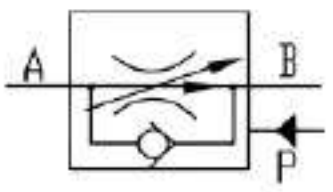
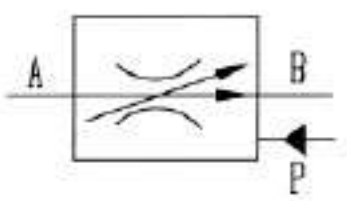
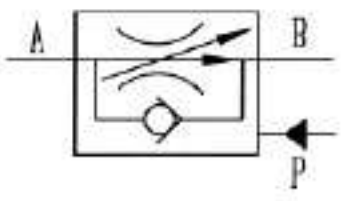
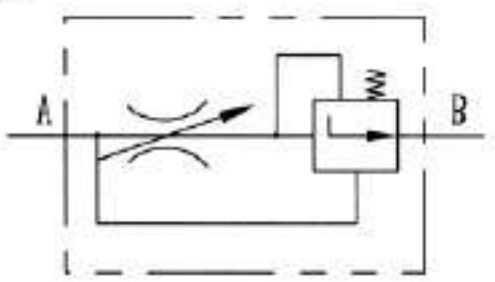
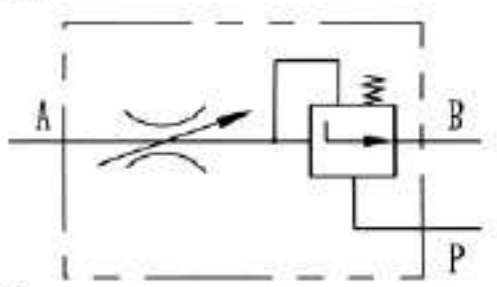
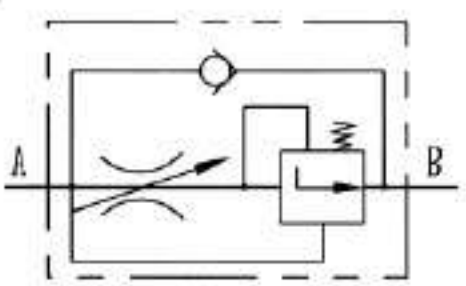
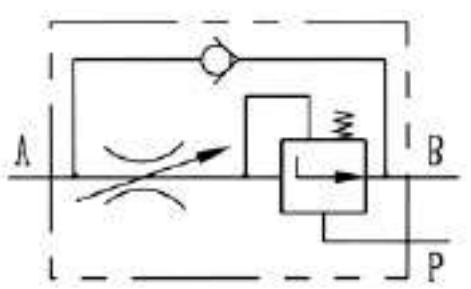
This version with external closing of the compensator may only be used for meter-in control.

Free return flow from port B to A is via check valve (8).





Symbols: 2-way flow control valves (simplified, detailed)

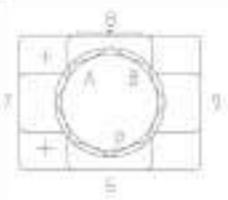
Flow control valve: simplified (without check valve; without external closing)  Type 2FRM6B..-20B/..M	Flow control valve: simplified (with check valve; without external closing)  Type 2FRM6B..-20B/..R	Flow control valve: simplified (without check valve; with external closing)  Type 2FRM6A..-20B/..M	Flow control valve: simplified (with check valve; with external closing)  Type 2FRM6A..-20B/..R
Flow control valve: detailed (without check valve; without external closing)  Type 2FRM6B～-20B/～M		Flow control valve: detailed (without check valve; with external closing)  Type 2FRM6A～-20B/～M	
Flow control valve: detailed (with check valve; without external closing)  Type 2FRM6B～-20B/～R		Flow control valve: detailed (with check valve; with external closing)  Type 2FRM6B～-20B/～R	

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

Lockable rotary knob with scale = 3
Rotary knob with scale = 7



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

Series 20 to 29(20 to 29: unchanged installation and connection dimensions) = 20

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code = Mineral oil
V = Phosphate ester (other seals on request)

R = with check valve
M = without check valve

	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

Technical data: 2-way flow control valve (for applications outside these parameters, please consult us!)

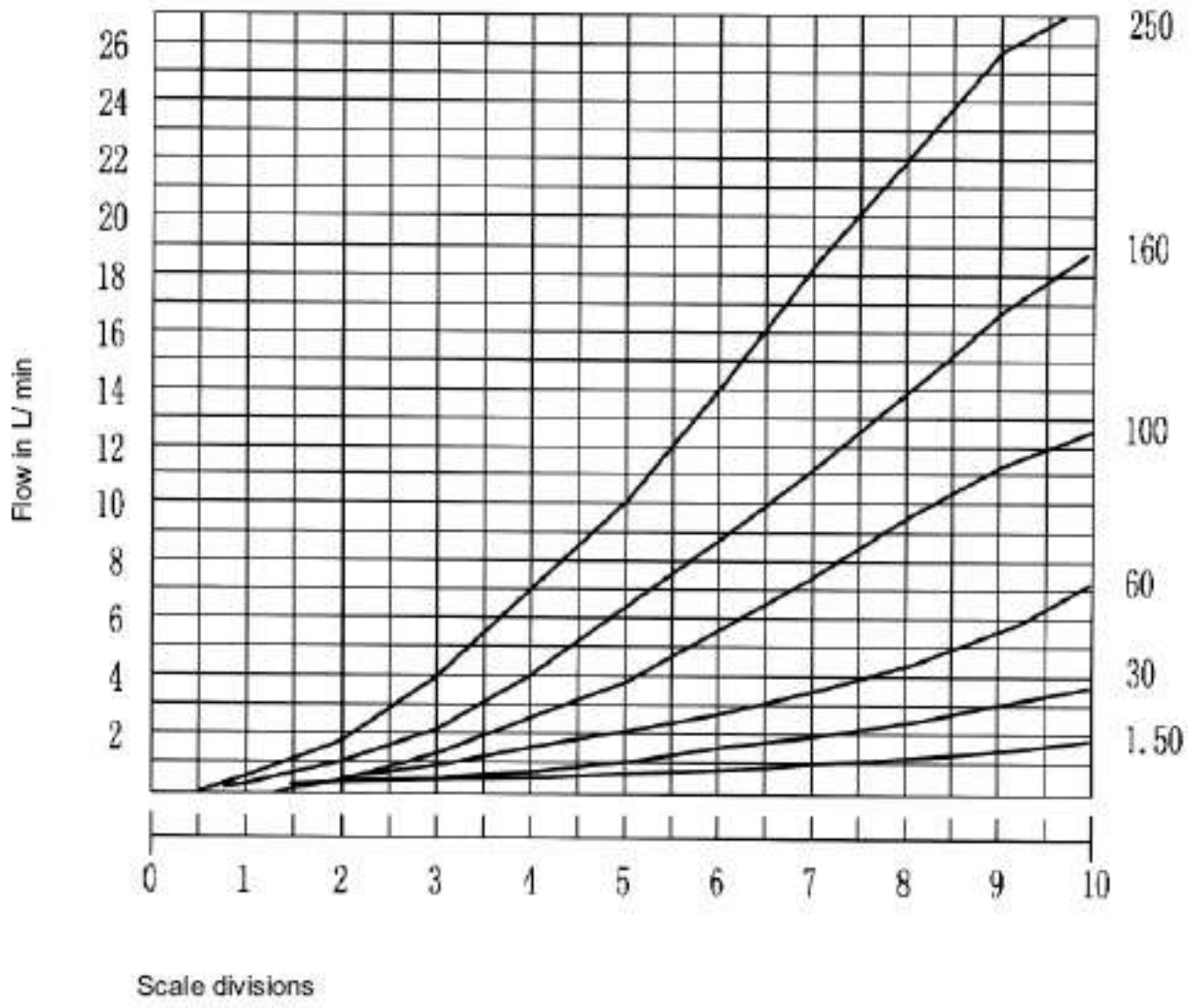
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)					
Pressure fluid temperature range	(°C)	-30 to +80					
Viscosity range	(mm^2/s)	10 to 800					
Flow q_V max	(L/min)	1.5	3.0	6.0	10.0	16.0	25.0
Flow q_V min	to10MPa (L/min)	0.015	0.015	0.025	0.05	0.07	0.1
Flow q_V min	to 31.5MPa (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!

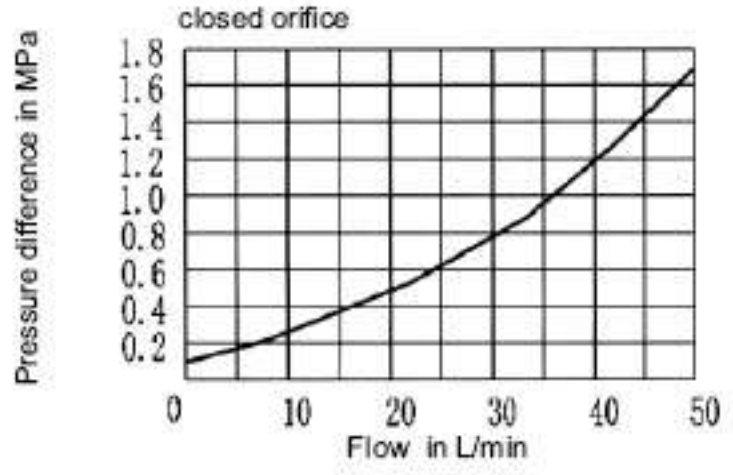
The pressure loss from P (at the inlet of the directional valve) to A (at the inlet of the flow control valve) is noticeable at low flows.

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

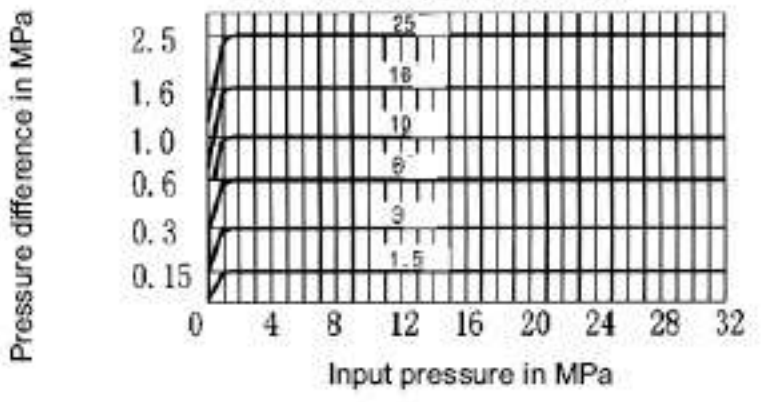
Flow in relationship to the scale setting (flow control from A to B)



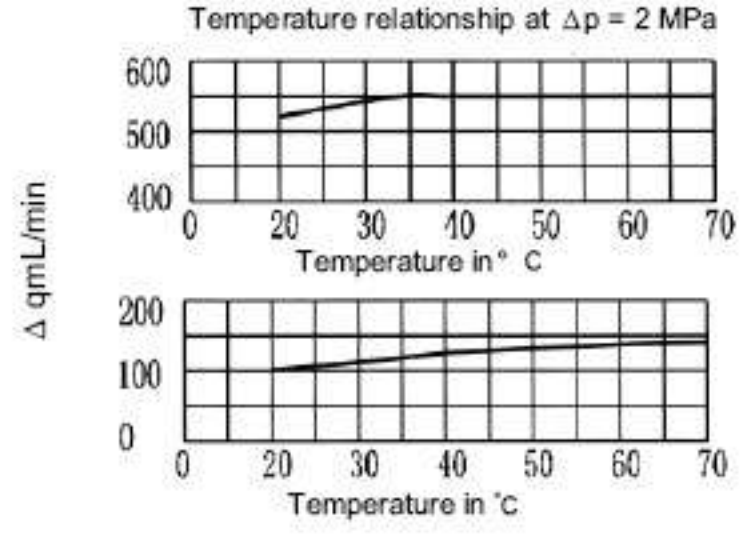
Δp-q_v - characteristic curve B to A;
closed orifice

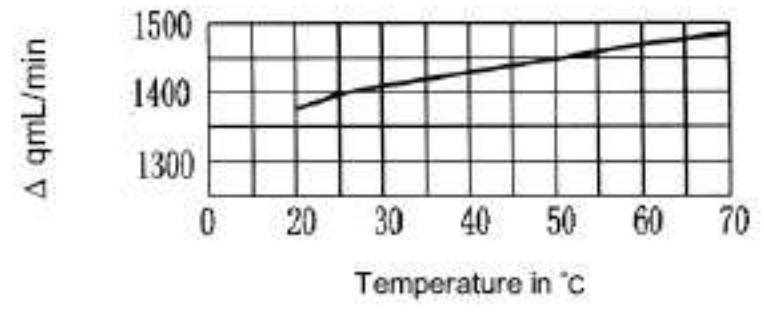


Flow - pressure relationship

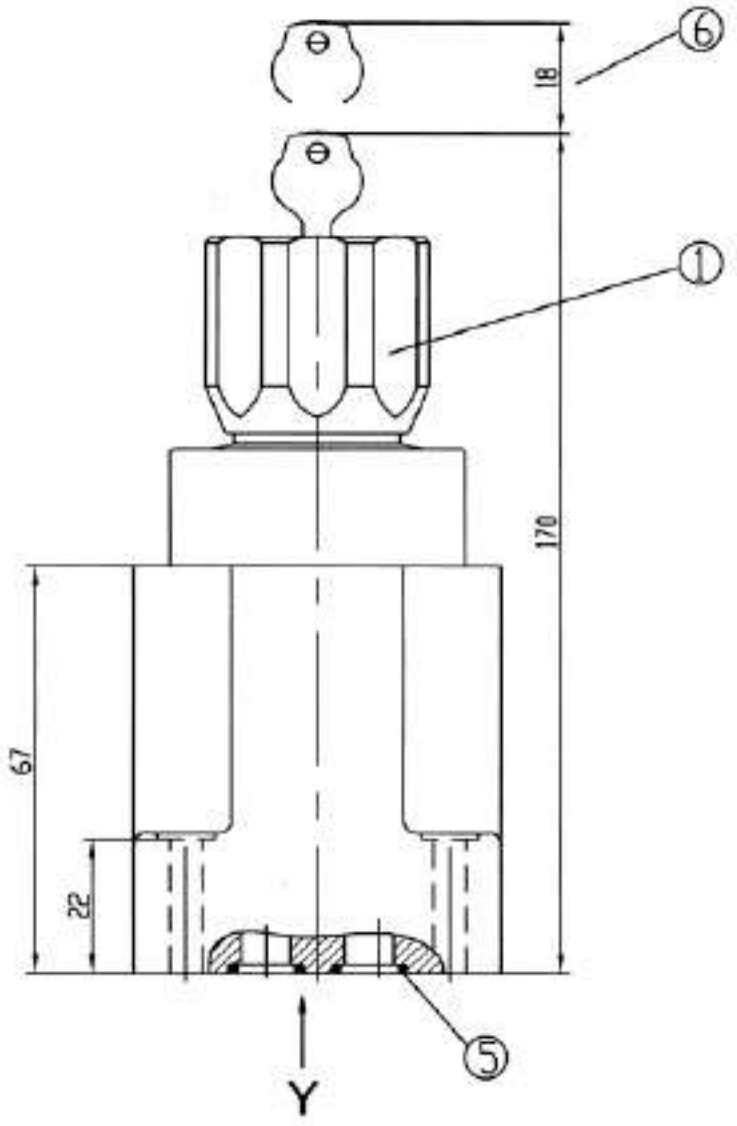


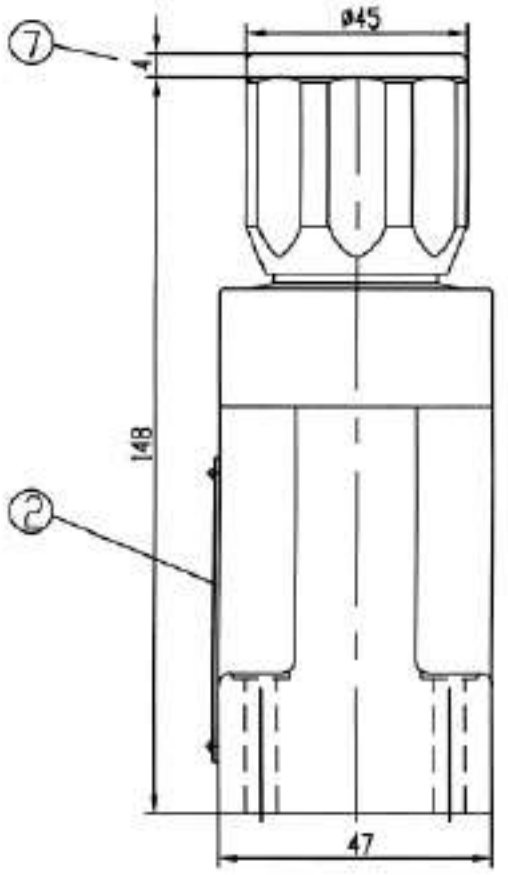
Temperature relationship at Δp = 2 MPa

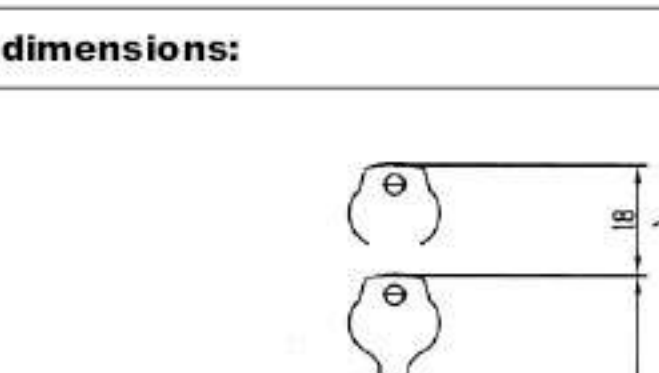


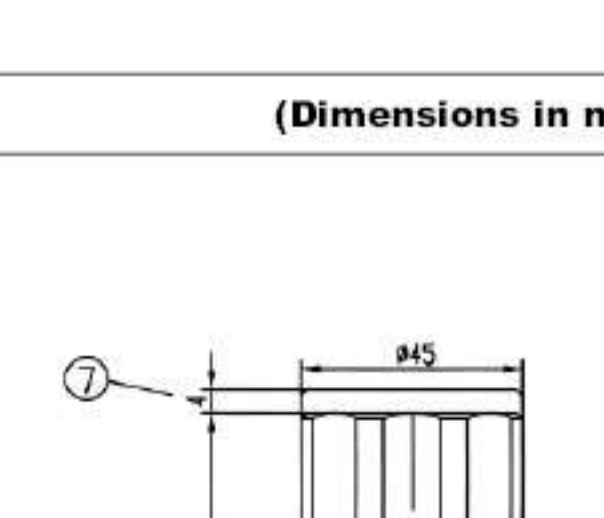


Unit dimensions: **(Dimensions in mm)**









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 $\sqrt{0.8}$.
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:

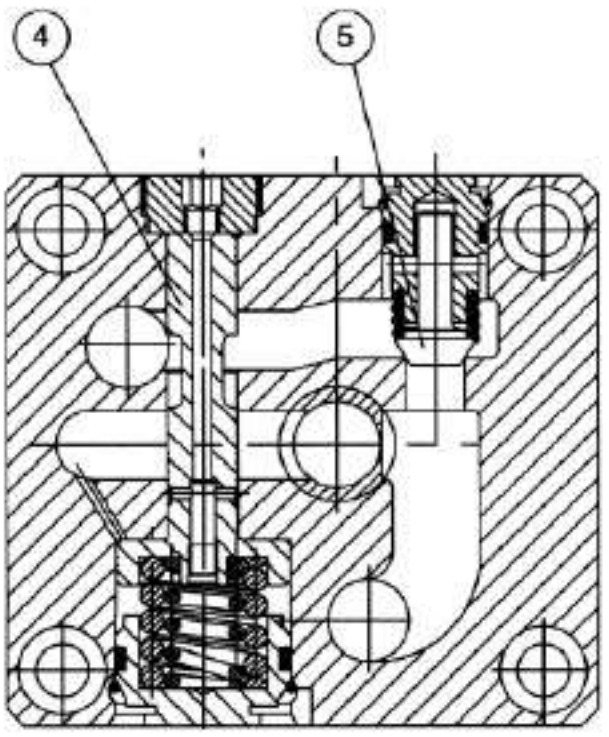
- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Pressure compensator stroke limiter, optional
- Mechanical operation
- Start-up jump reduction
- Flow control in both directions using a rectifier sandwich plate

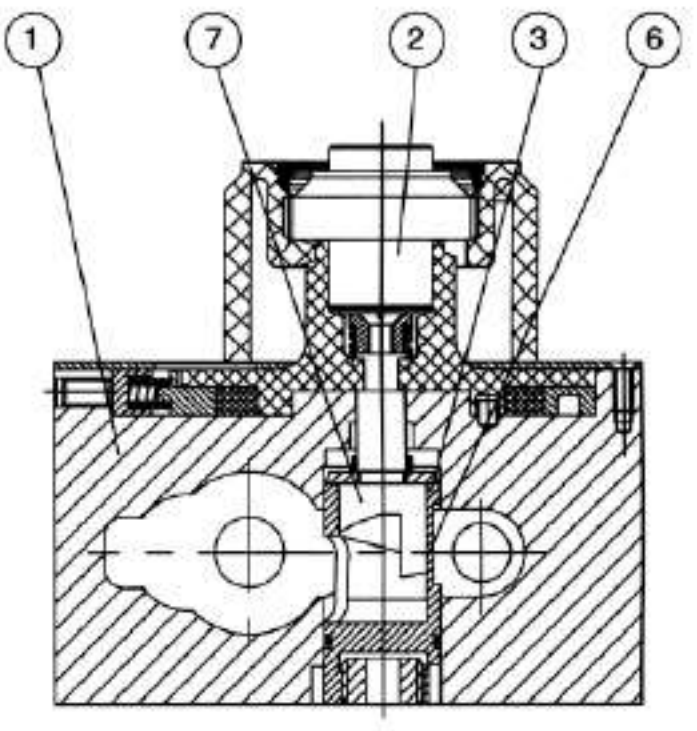
Functional, section

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).

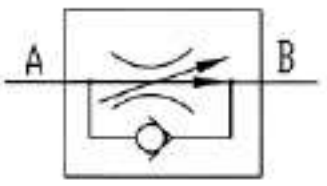
The flow from channel A to channel B is throttle at the orifice (6).In order to maintain the flow across the orifice constant, a pressure compensator is connected upstream of the orifice (6). The flow is maintained largely independent of temperature due to the orifice design.Free return flow from channel 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.



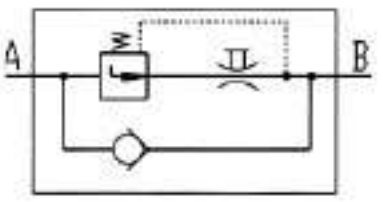


Symbols: 2-way flow control valve

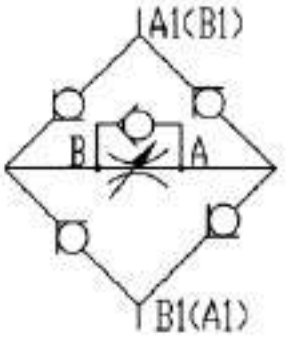
Simplified



Detailed



Rectifier sandwich plate



Ordering code: 2-way flow control valve

2FRM		-21	B	/			*

Size10 =10
Size16 =16

Series 21 to 29(20 to 29: unchanged installation and connection dimensions) = 21

Technology of Beijing Huade Hydraulic =B

Size 10, linearity	to 2L/min =2L to 5L/min =5L to10L/min =10L to16L/min =16L to25L/min =25L to35L/min =35L to50L/min =50L	Flow range A → B
Size 16, linearity	to 40L/min =40L to 60L/min =60L to 80L/min =80L to100L/min =100L to125L/min =125L to160L/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 = Mineral oil
V = Phosphate ester

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

General

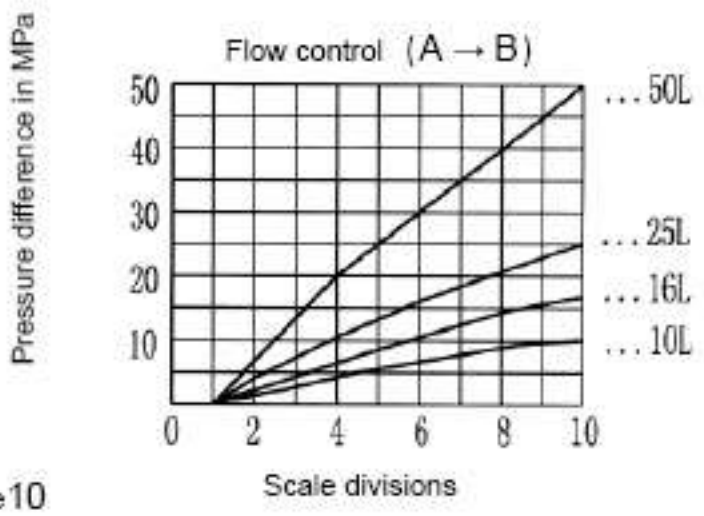
Hydraulic fluid	Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Temperature range (℃)	-30 to +80
Viscosity range (mm^2/s)	10 to 800

Rectifier sandwich plate

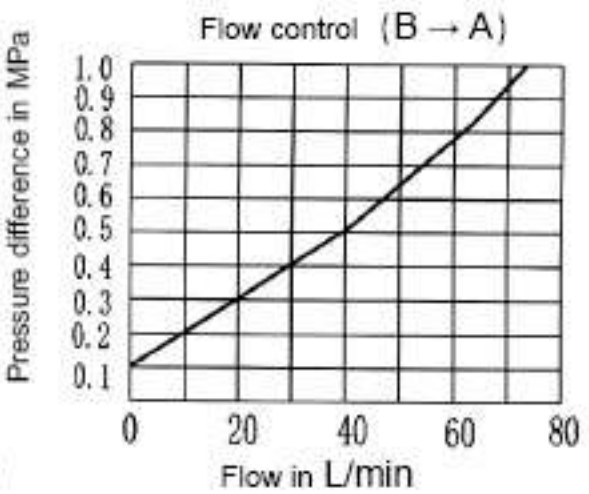
Flow, max (L/min)	Size 10	Size 16
	up to 50	up to 160
Operating pressure (MPa)	up to 31.5	
Cracking pressure (MPa)	0.15	
Weight (Kg)	Size10	Size16
	3.2	9.3

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℃)	± 2% (q_v max)						
	pressure-stable (up to Δp = 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 (μm)		25 (q_v < 5L/min) 10 (q_v < 0.5L/min)						
Weight (Kg)		Size10				Size16		
		5.6				11.3		

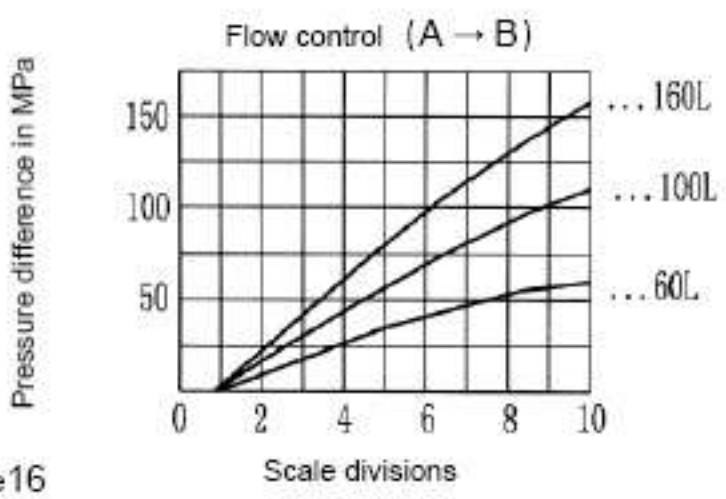
Characteristic curves: 2-way flow control valve (measured at v = 41 mm^2/s and t = 50℃)



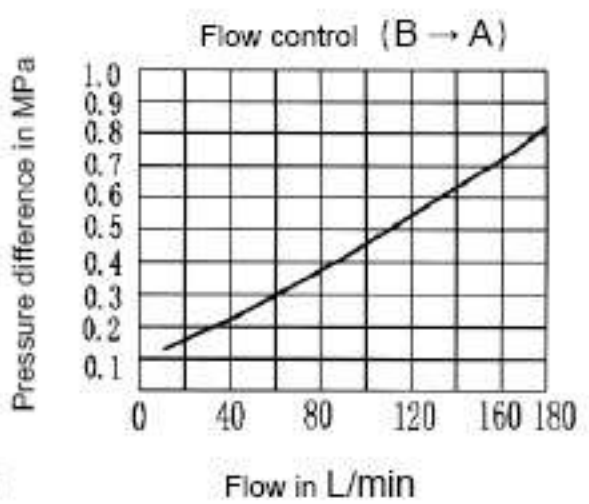
Size10



Size10



Size16

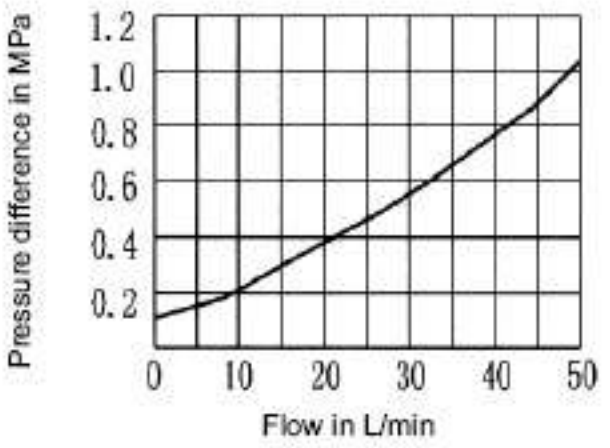


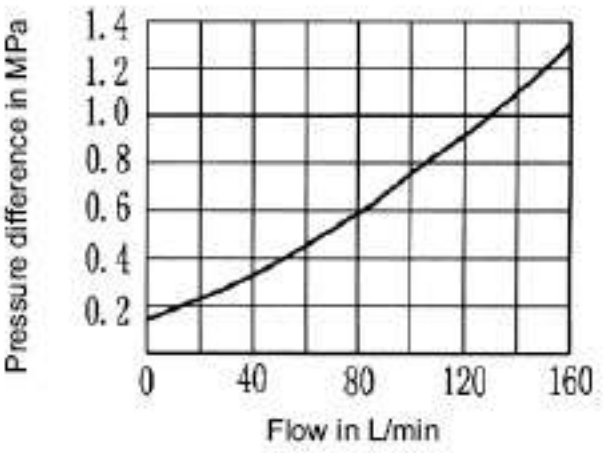
Size16

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

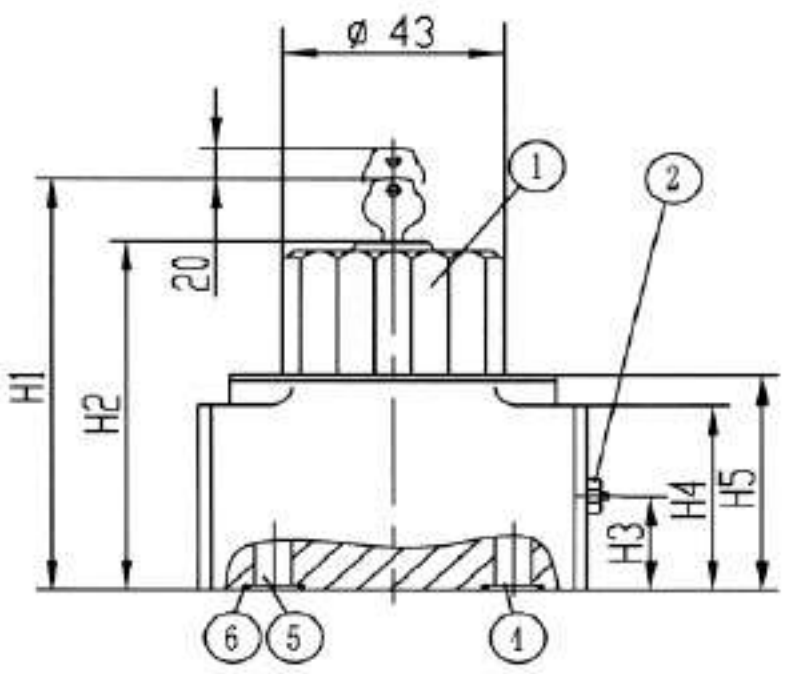
Pressure difference Δp is the same for both directions of flow

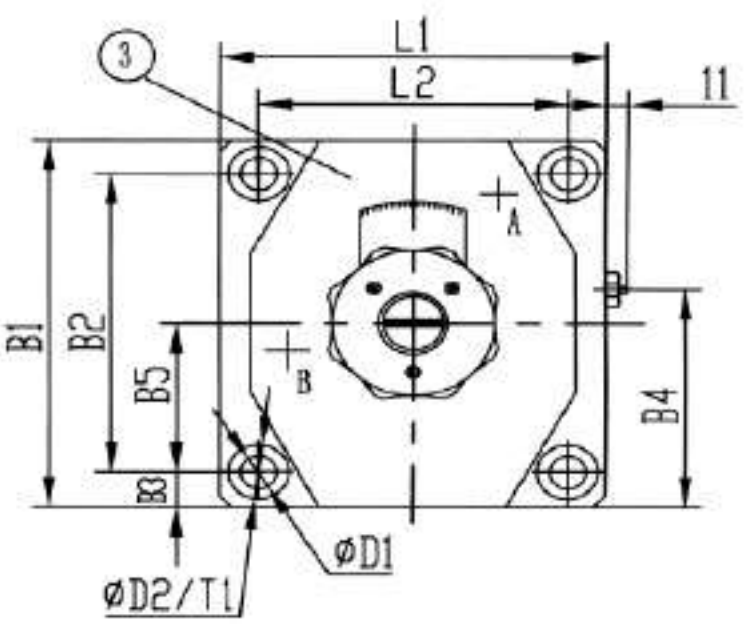
Flow q_v from A → B (B → A)





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° = 10 scale divisions
   M A =0.7 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)

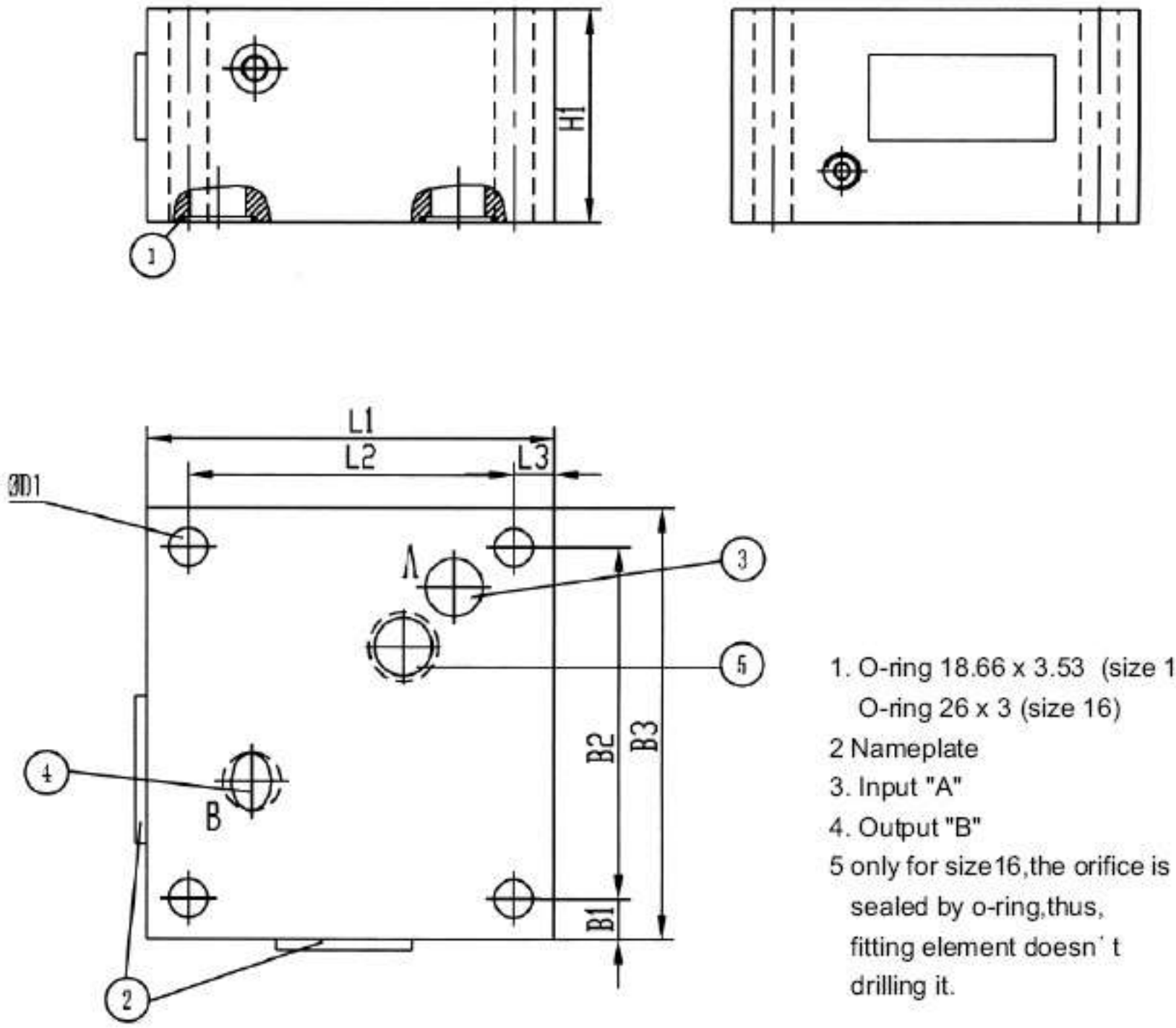
Subplates for: see page 69

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 (G11/4") 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)
	Size10	4 fixing screws
	Size16	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 $\sqrt{0.8}$.
6. Surface finish of mating piece is required to 0.01/100mm.

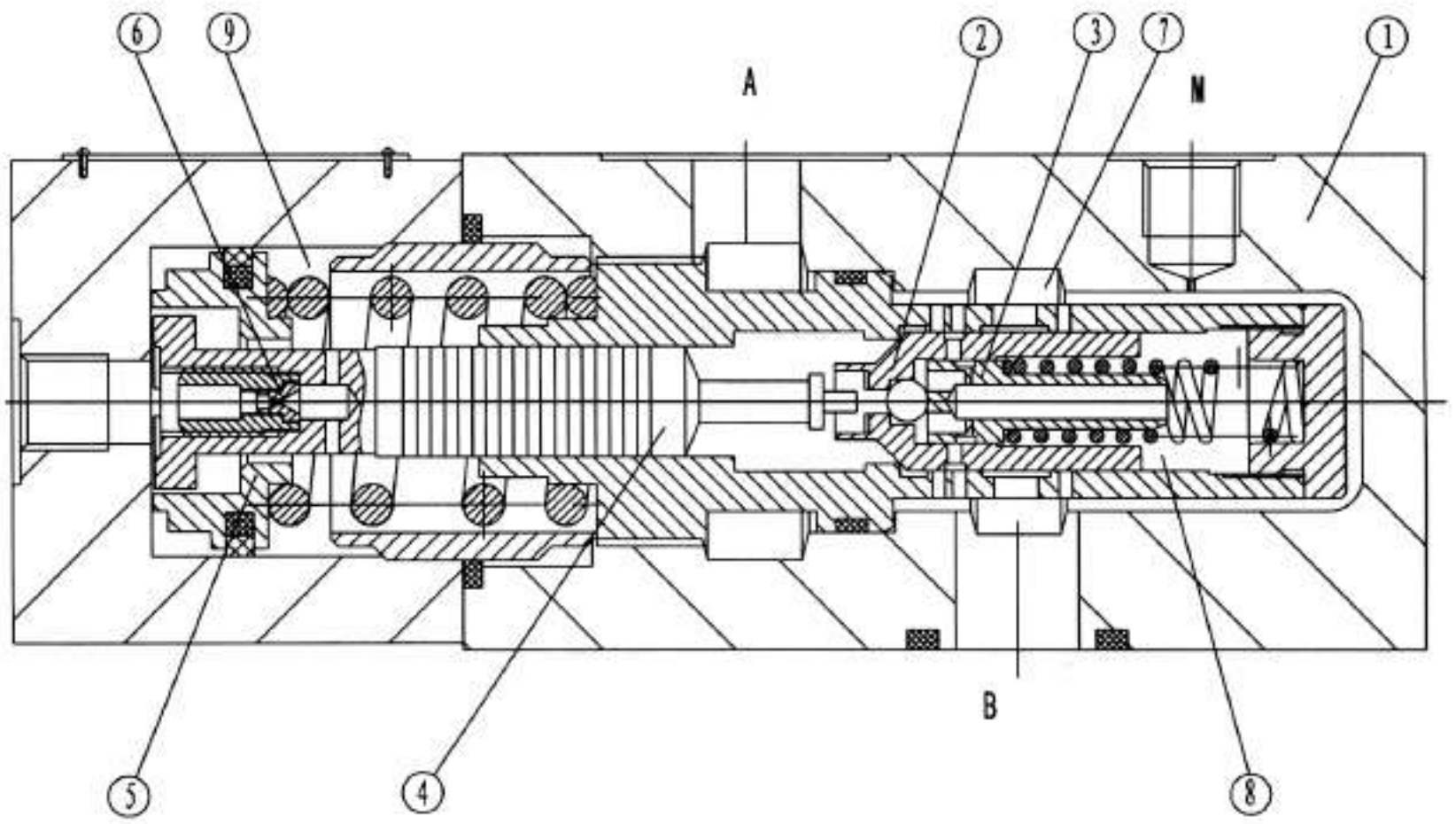
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Check-Q-meter type FD			RE27551/12.2004
	Size 12 ,16,25,32	up to 31.5MPa	up to 560 L/min	Replaces: RE27551/05.2001

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 actuater q_{v1}. With cylinders the area tratio($q_{v2} = q_{v1}\ \varphi$) 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
wit secondary pressure relief valve = B
(only for valve wih flange connecotions)

Series 12 (nominal size 12, 16, 25) = 12
Series 11 (nominal size 32) = 11
(10 to19: unchanged installation and connection dimensions)

Operation pressure of secondary pressure relief valve

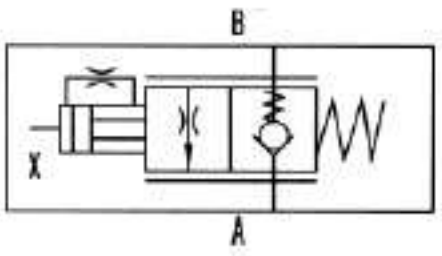
No code= Mineral oil
V= Phosphate ester

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

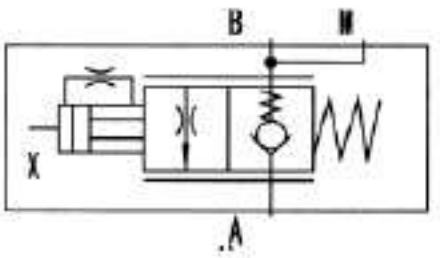
Symbols

Without secondary pressure relief valve

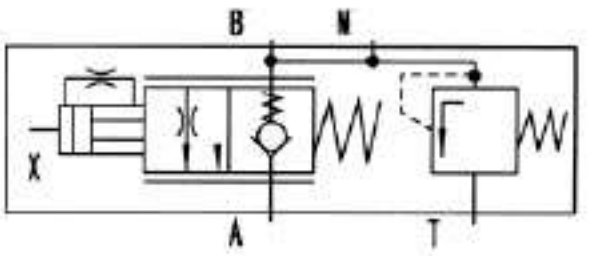


Valve type:
FD 12 KA 12/B30..
FD 16 KA 12/B30..
FD 25 KA 12/B40..
FD 32 KA 11/B60..

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..

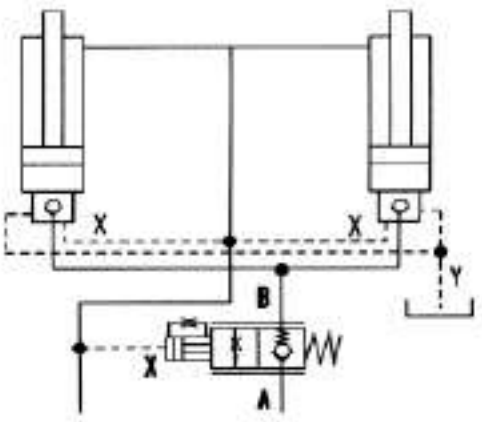
Circuit examples

Note:

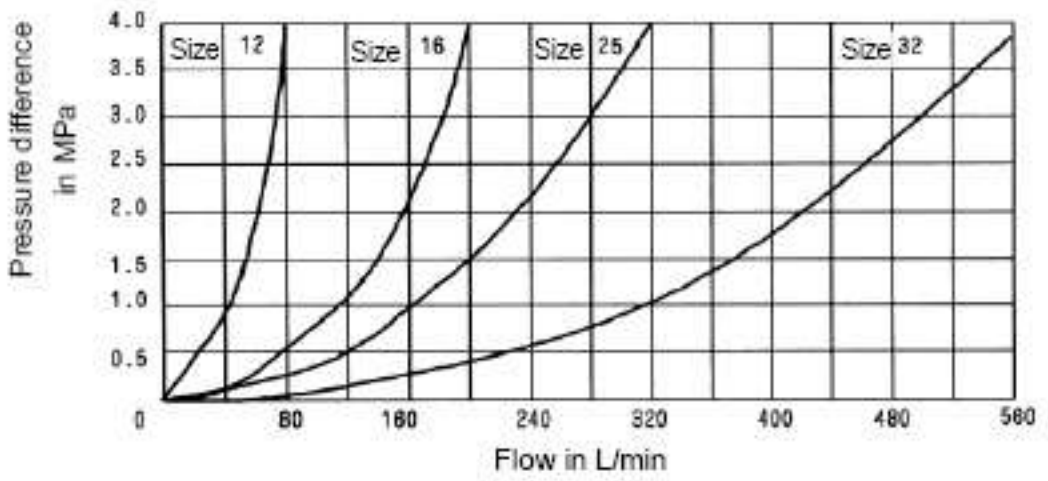
Two check-Q-meters cannot be used to control two cylinders which are forced mechanically to move together, as synchronisation and the same pressure cannot be guaranteed in each cylinder.

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.

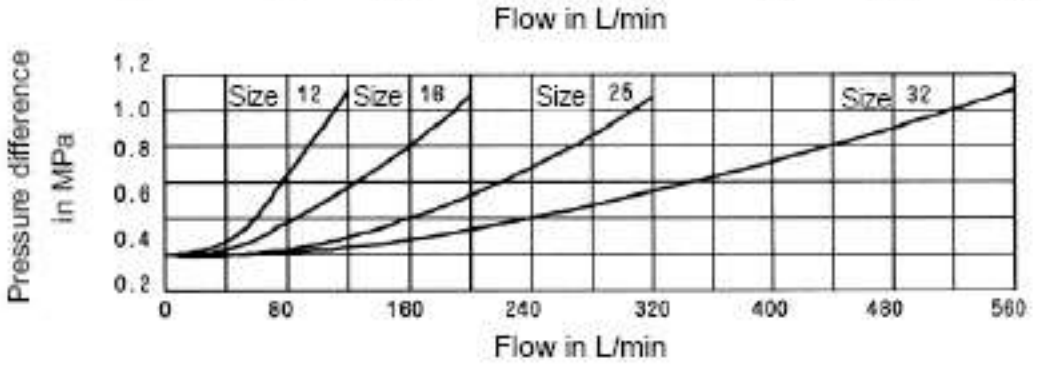
In this case, the load pressure must not exceed 20MPa !



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



Pressure difference
Δp in relation to flow q_v, measured at throttle position:
Throttle fully open
(Px = 6 MPa)
B to A

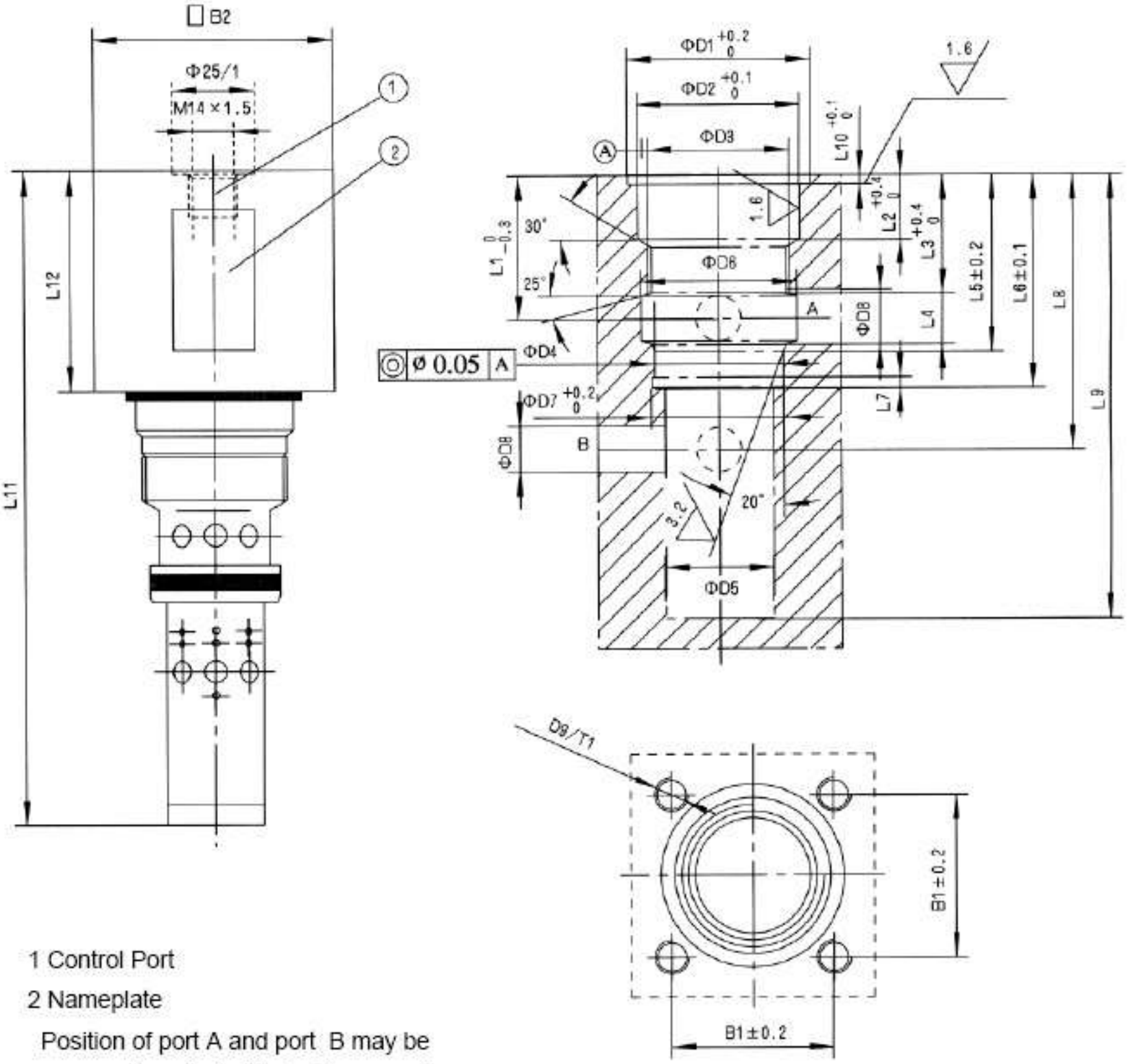


Pressure difference in MPa
Flow in L/min
Pressure difference
Δp in relation to flow q_v, measured over the check valve
A to B

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	(°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

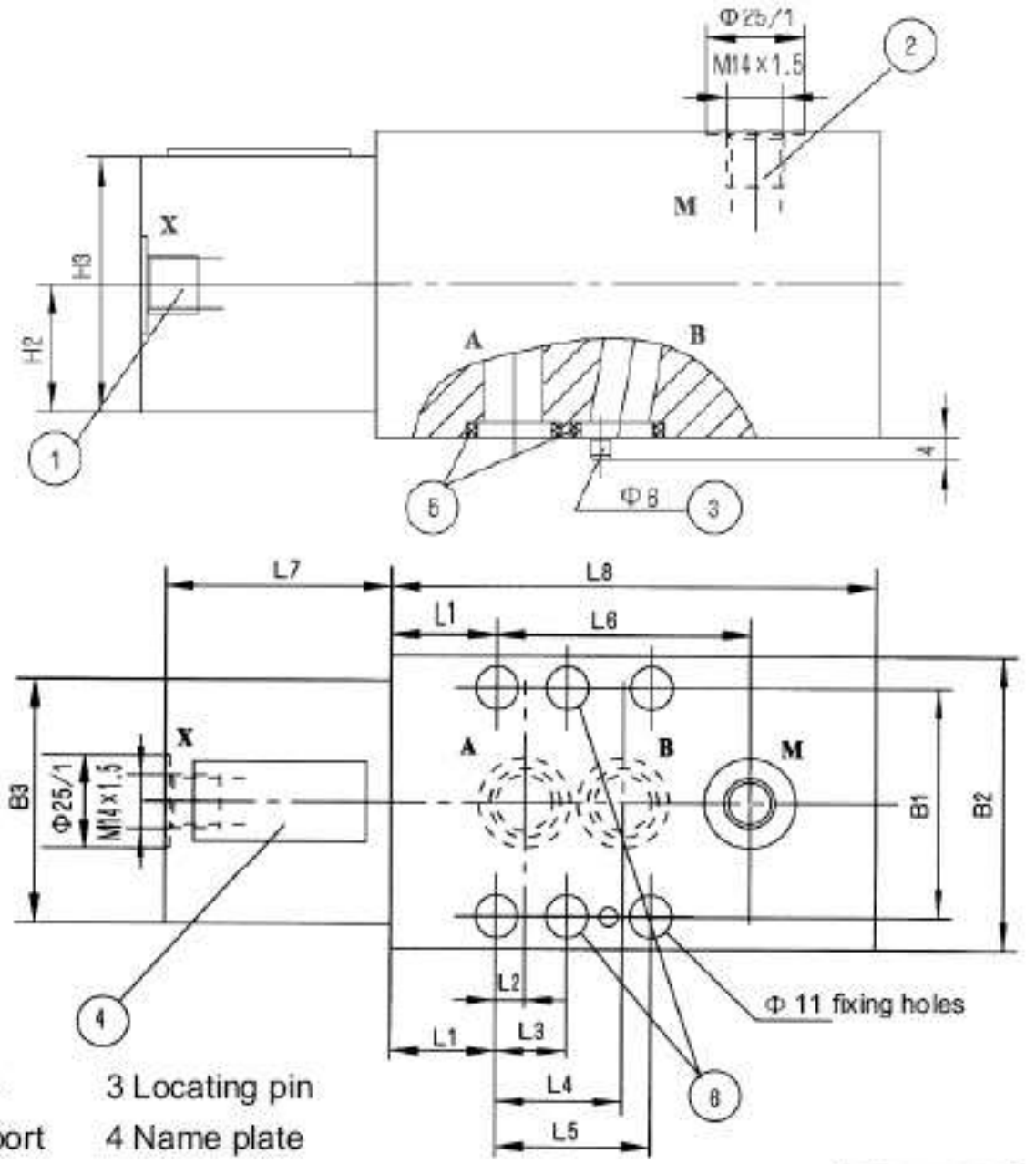
2 Nameplate

Position of port A and port B may be arranged as desired,but dot occupy the position of the fixing screw holes

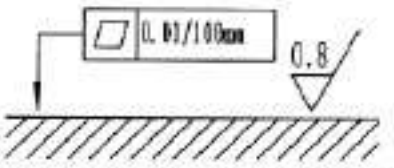
Type	B1	B2	D1	D2	D3	D4	D5	D6	D7	D8	D9	T1	L1	L2	L3	L4	L5	L6
FD12KA10	48	70	54	46	M42X2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
FD16KA10	48	70	54	46	M42X2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
FD25KA10	56	80	60	54	M52X2	48	40	60	48.6	25	M12	19	50	19	39	22	65	80
FD32KA10	66	95	72	65	M64X2	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
FD16KA12	3	78	128	2.75	191	65	12	4-M10 × 70-10.9	69	2.8kg
FD25KA12	4	105	182	2.3	253	75	25	4-M12 × 80-10.9	120	2.8kg
FD32KA11	4	115	198	2.3	289	94	32	4-M16 × 100-10.9	295	7.5kg

Unit dimensions: for sub-plate mounting (Dimensions in mm)



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)



Required surface finish of mating piece

Subplates for:see page 70

NG12、16：G460/01 G460/02
G461/01 G461/02

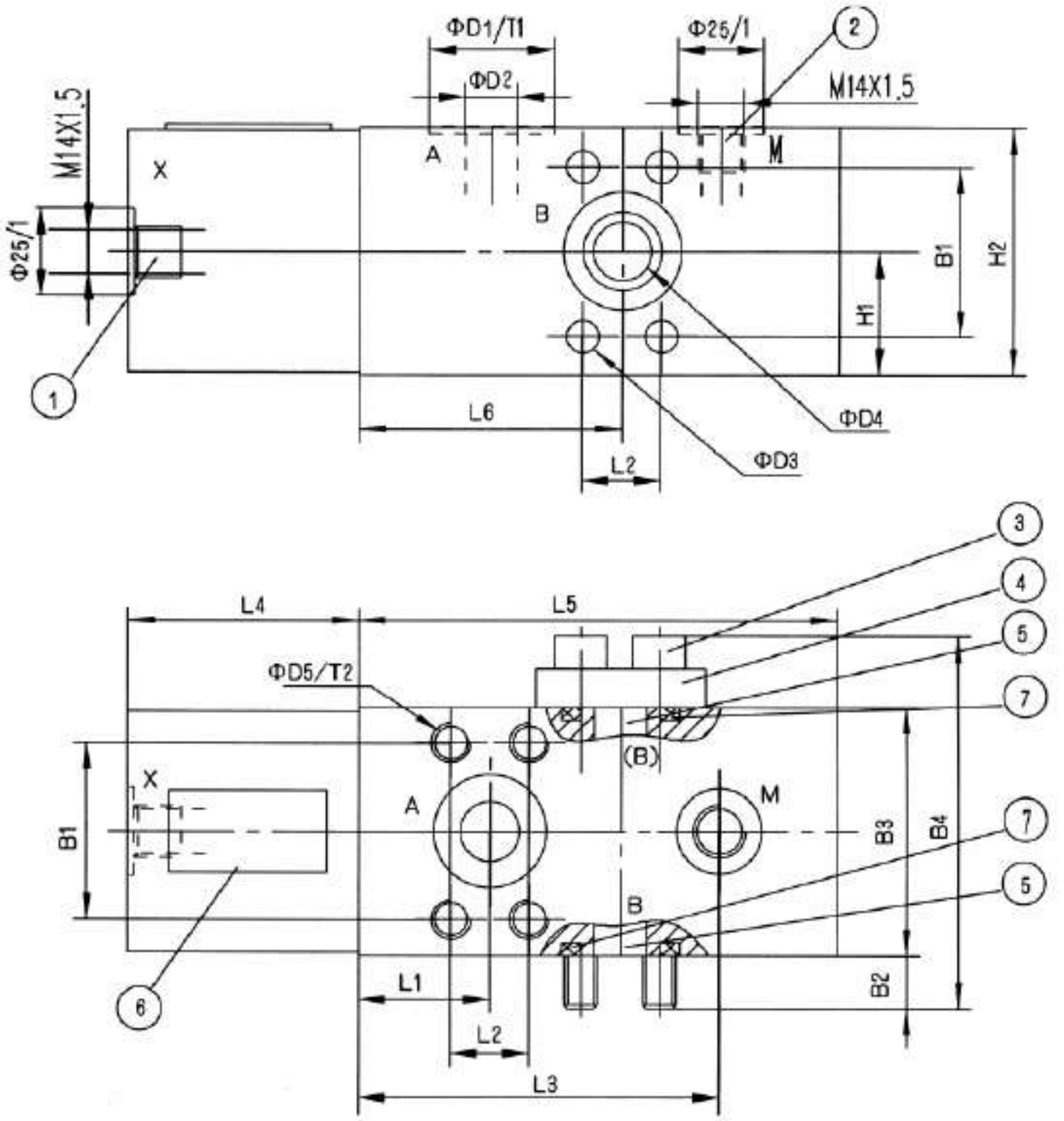
NG25：G412/01 G412/02
G413/01 G413/02

NG32：G414/01 G414/02
G415/01 G415/02

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

Unit dimensions: for SAE flange connections, without secondary pressure relief valve **(Dimensions in mm)**

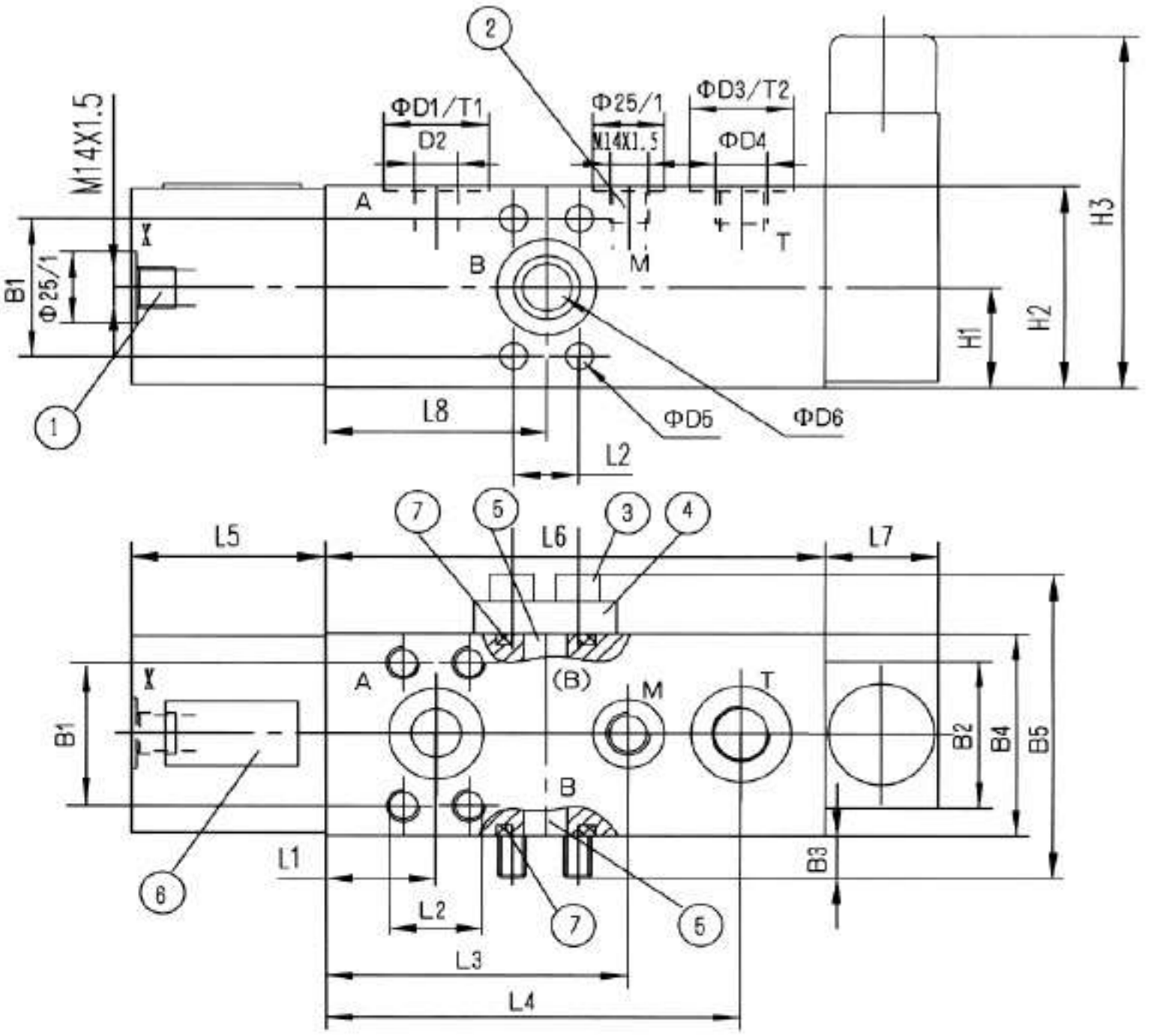


1 Control port 3 Flange fixing screws 5 Optional port B 7 O-ring
2 Measuring port 4 Blanking flange 6 Nameplate

Type	B1	B2	B3	B4	D1	D2	D3	D4	D5	H1	H2
FD12FA12	50.85	16.5	72	110	42	18	10.5	18	M10	36	72
FD16FA12	50.85	16.5	72	110	42	18	10.5	18	M10	36	72
FD25FA12	57.2	14.5	90	132	50	25	13.5	25	M12	45	90
FD32FA11	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

Unit dimensions: for SAE flange connections, without secondary pressure relief valve **(Dimensions in mm)**



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	32.92x3.53
FD32 FB11	145	52	31.6	155	215	94	240	50	115	0.2	1	21	24Kg	37.7x3.53

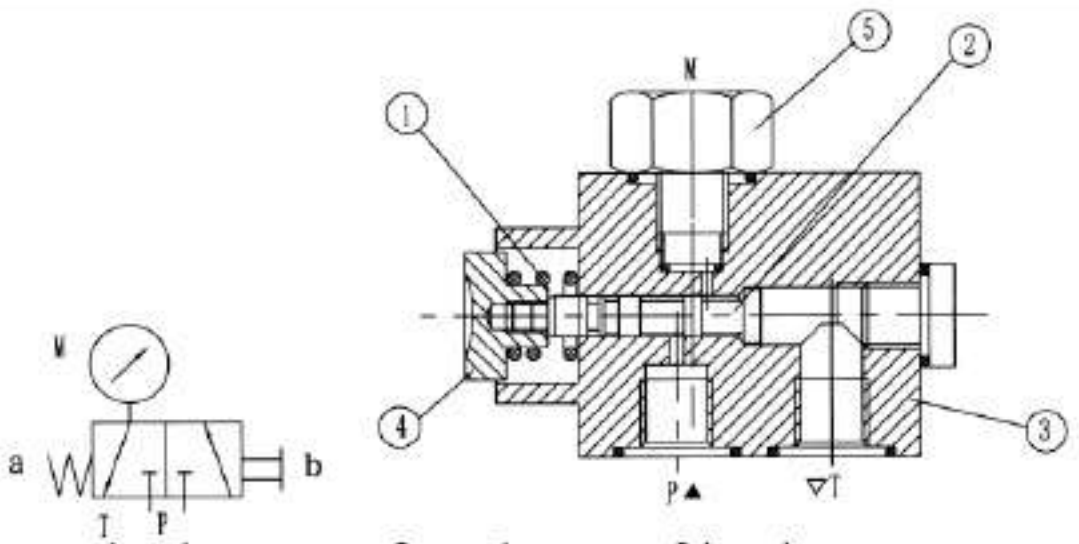
Notice

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 $\sqrt{0.8}$.
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 ressure spring (1) and thereby unloads the pressure gauge.The pressure gauge can be directly crewed in to the valve housing or fitted separately (see installation examples on page 58).

Symbols



1.spring 2.spool 3.housing
4.push button 5. pressure gauge connection piece

Ordering details

A	F	6	E		30	B	/		/	*

Further details in clear text

No code= Mineral oil
V= Phosphate ester

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

Isolator valve = A

Spring return = F

Nominal size 6 = 6

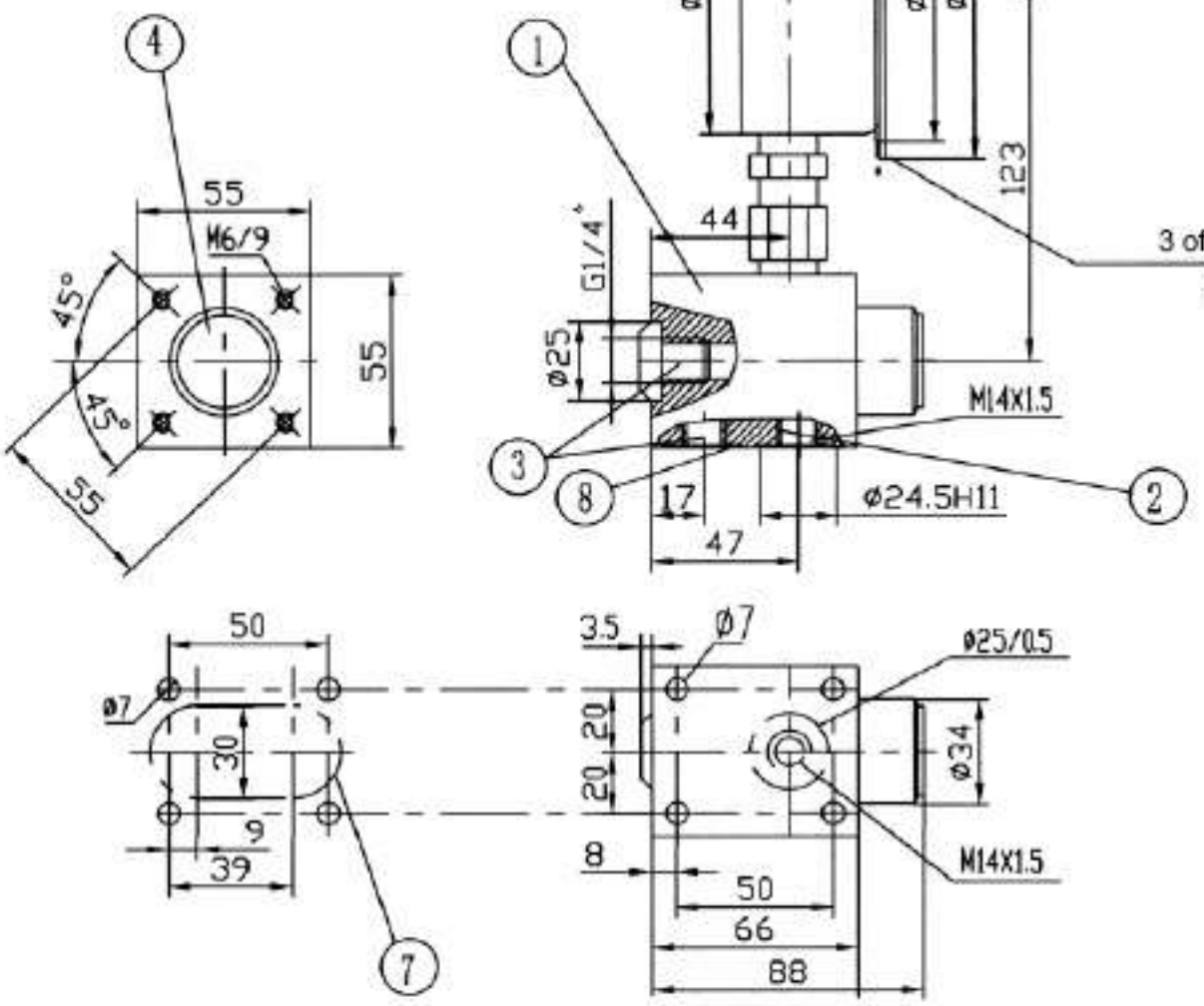
Single valve = E

For threaded connections = A
For subplate mounting = P

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

Unit dimensions

(Dimensions in mm)



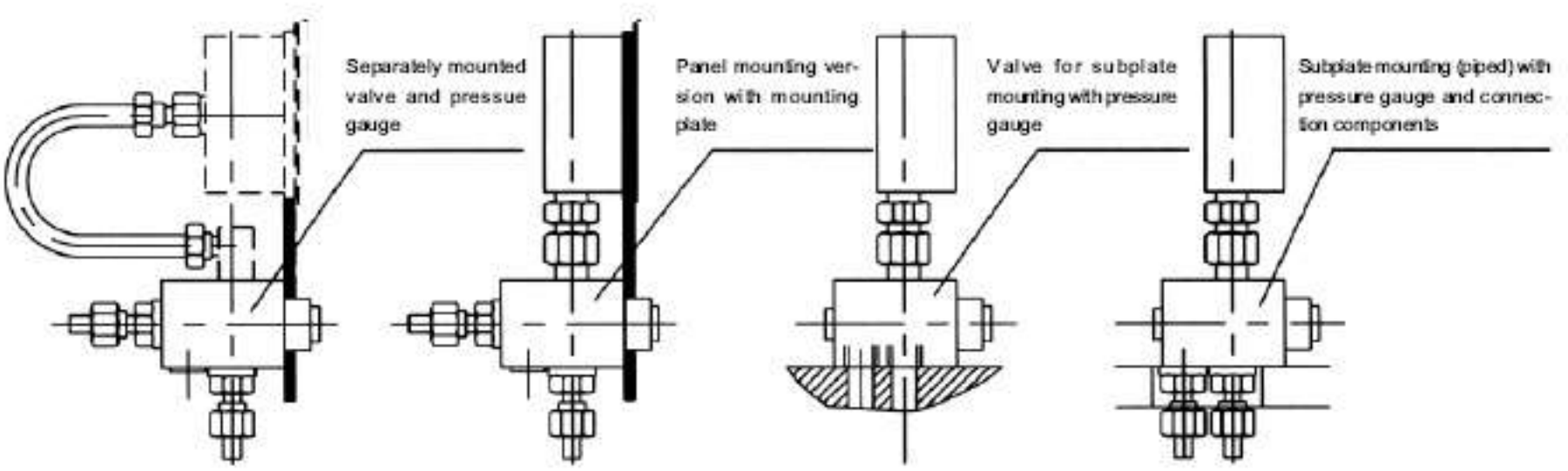
1 Pressure gauge isolator valve
2 Pressure port (pump)
3 Tank port, optional
4 Push button, stroke 4 mm
5 Glycerine filled pressure guage Φ 100 mm
6 Mounting plate
7 Panel cut-out
8 O-ring 20X2.5

3 off Φ 4.8 holes
ced at 120° intervals

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).

Installation examples



Type AF6EA30B/X··· Type AF6EA30B/Z··· Type AF6EP30B/Y··· Type AF6EA30B/Y···

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

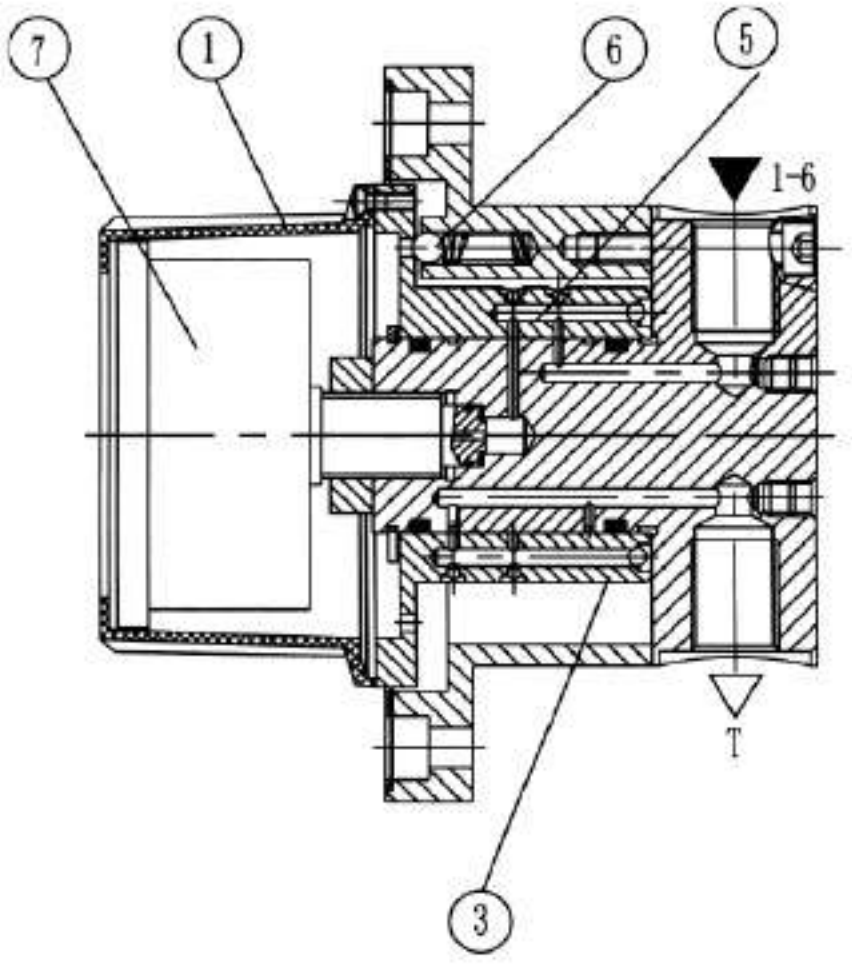
Features:

- Valve housing with threaded connections
- Flange mounting
- with built-in pressure gauge

Functional, section

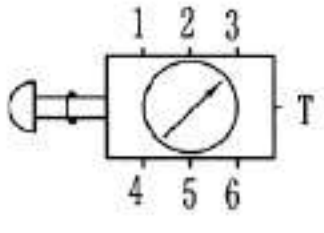
Multi-circuit gauge isolators type MS 2 with built-in pressure gauge (6 meausing points)

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

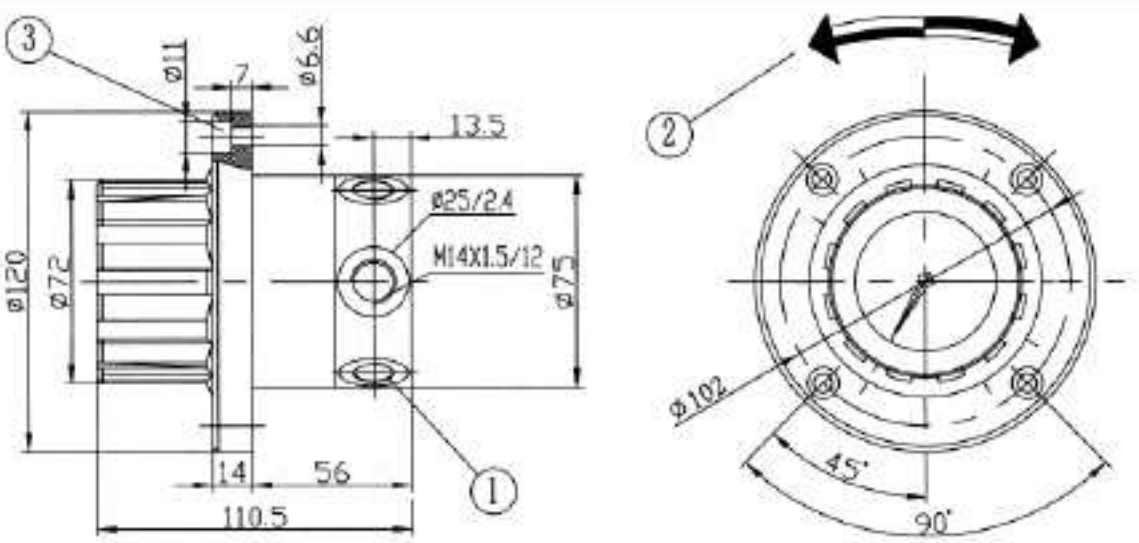
No code= Mineral oil
V= Phosphate ester

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 MS2A (Dimensions in mm)



Type MS 2A

1 6 measuring connections and 1 tank port are equally spaced around the circumference
2 Readings are obtained by turning the rotary knob to the left or right. Zero points are arranged between the indicating points
3 4 fixing screw holes

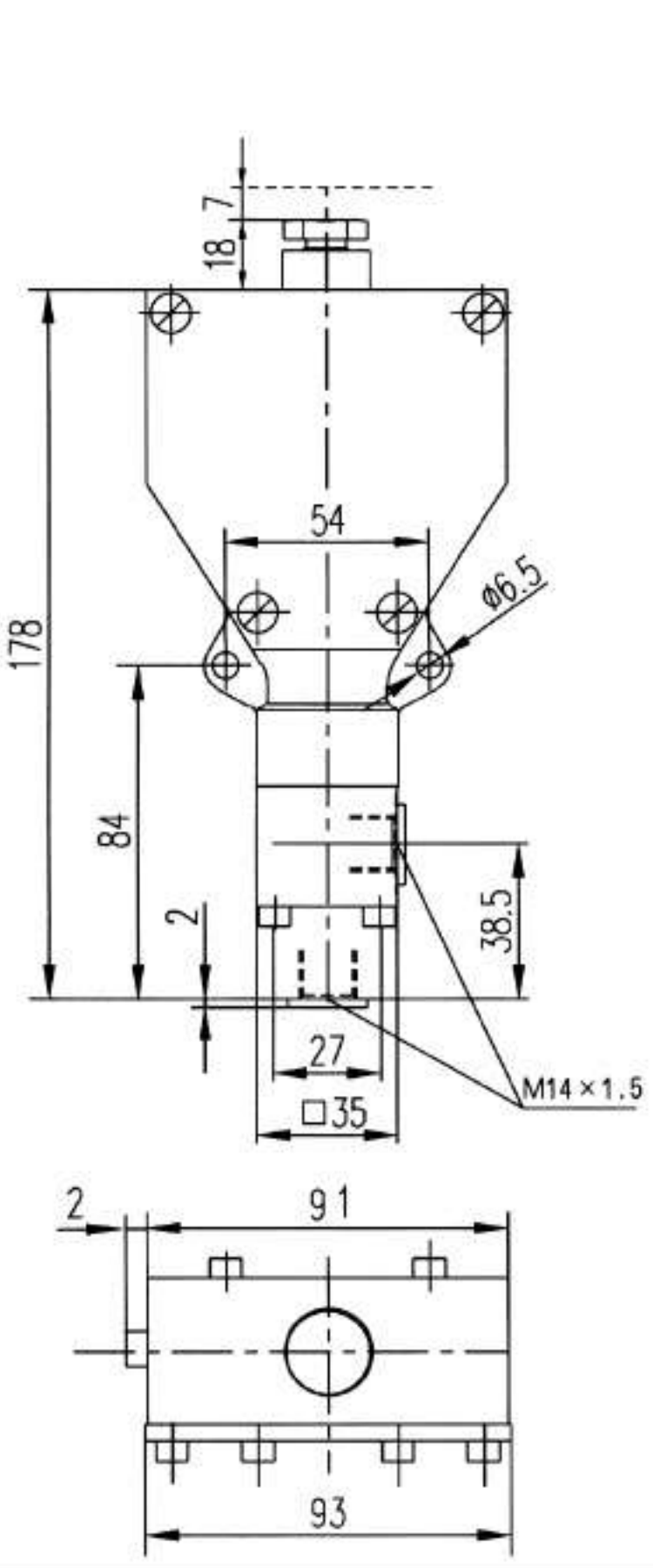
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	**Piston Type Pressure Switch Type HED 1, Series 40**	RE30166/12.2004
	up to 50 MPa	Replaces: RE30166/5.2001

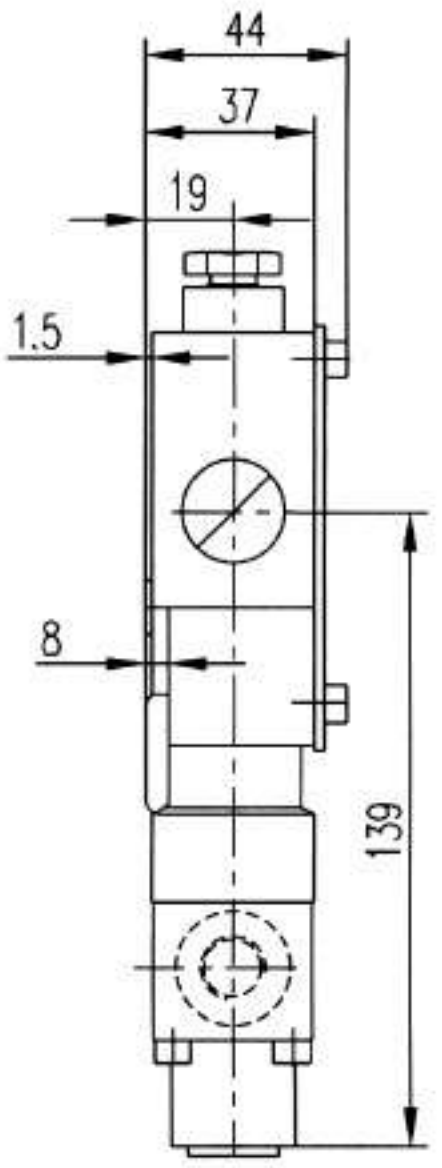
Hydro-electric pressure switches type HED 1 are piston pressure switches.
Type HED 1 pressure switches have the task of switching on or off an electrical circuit dependent on pressure.The live electrical terminals are covered by an isolating strip.

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

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 = Standard model without intrinsically safe circuit

No code = Mineral oil
V = Phosphate ester

Further details in clear text

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 min.	Recovering pressure max.	Action pressure min.	Action pressure 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

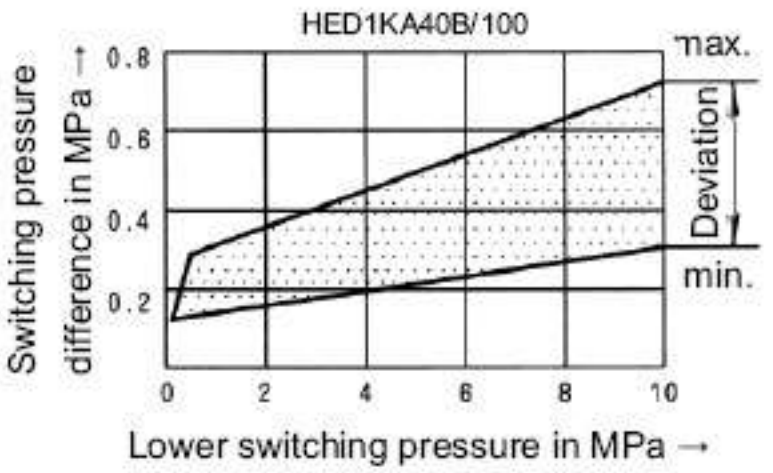
Settable ranges for HED10A40B/..

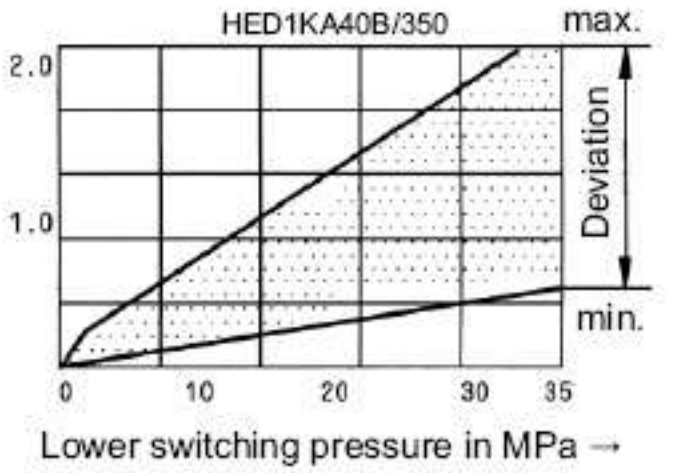
Pressure rating	Max. operating pressure briefly	Recovering pressure min.	Recovering pressure max.	Action pressure min.	Action pressure max.
5	8	0.2	4.5	0.35	5
10	35	0.3	8.2	0.8	10
35	35	0.6	29.5	2.0	35

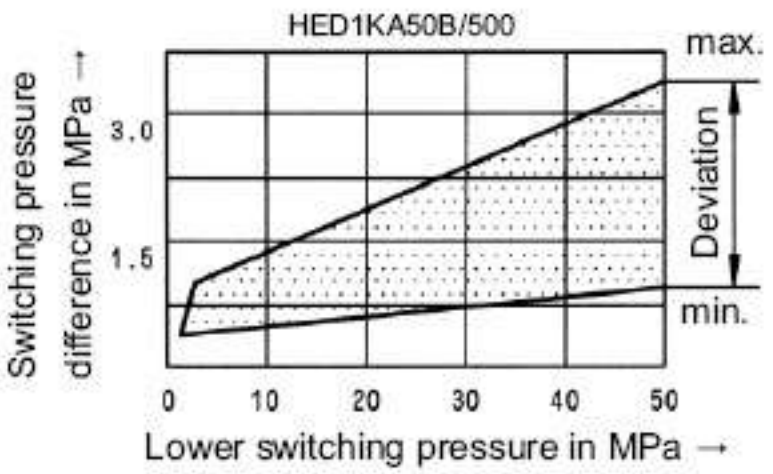
Electrical connection		cable gland
Contact loading	- AC voltage	460V; 15A
	- DC voltage	40V; 1.0A / 125V; 0.4A / 250V; 0.2A
Insulation to DIN 40 050		
Weight	(kg)	1.2

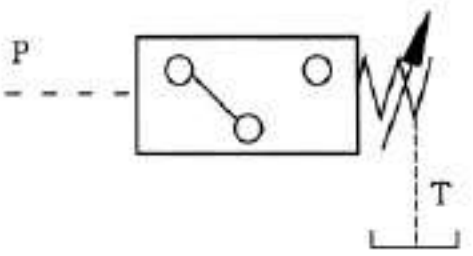
Switching pressure difference - pressure switches with or without drain port

With drain port

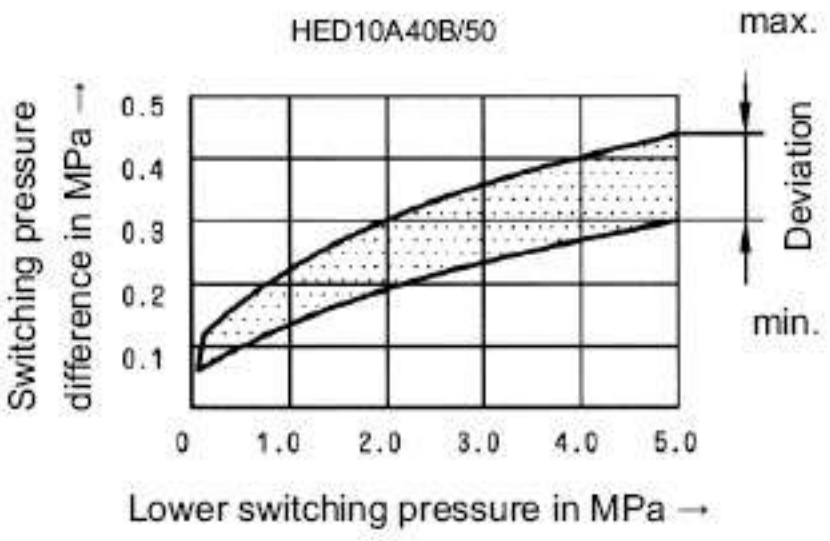


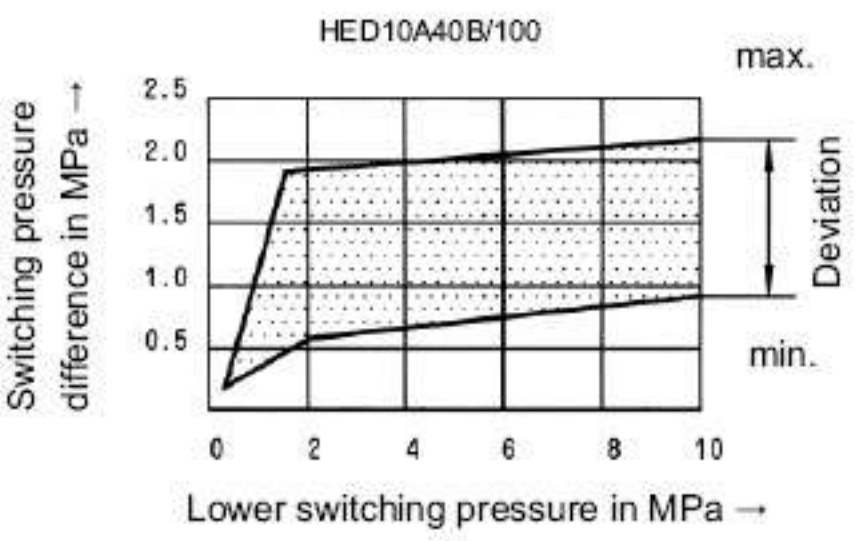


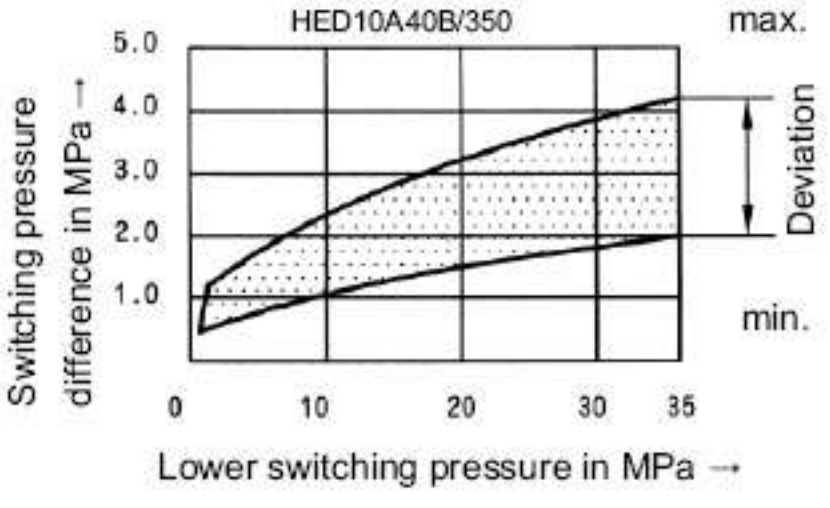


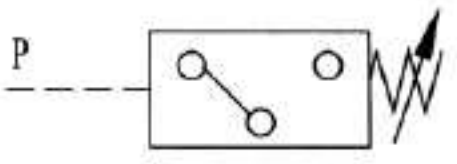


Without drain port









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 $\sqrt{0.8}$.
6. Surface finish of mating piece is required to 0.01/100mm.

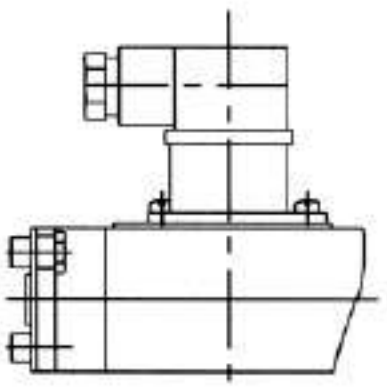
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	**Piston Type Pressure Switch Type HED 4 ,Series 40**	RE30180/12.2004
	up to 35 MPa	Replaces: RE30180/05.2001

Features:

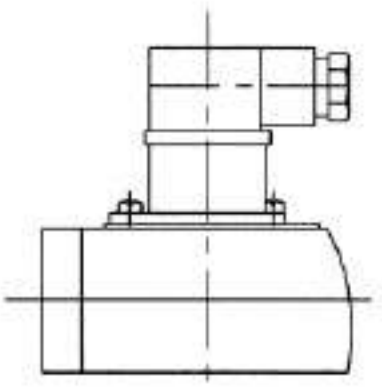
- For subplate mounting
- For pipe installation
- 3 pressure stages
- Plug-in connector with circuit (indicator lamp) (separate order)

Features

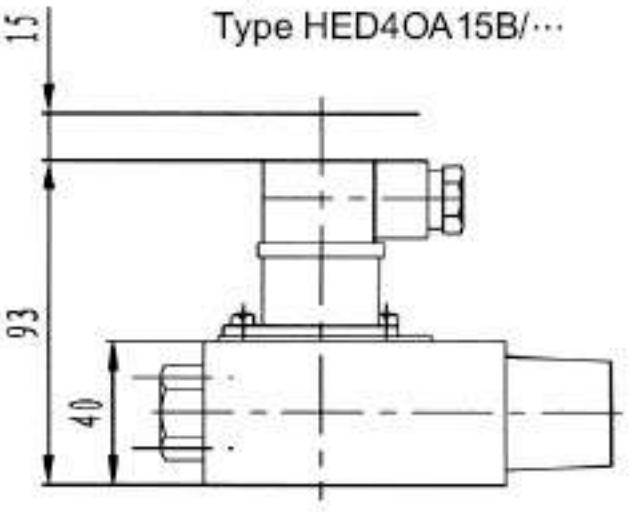
Vertical stacking systems
Type HED4OH15B/···

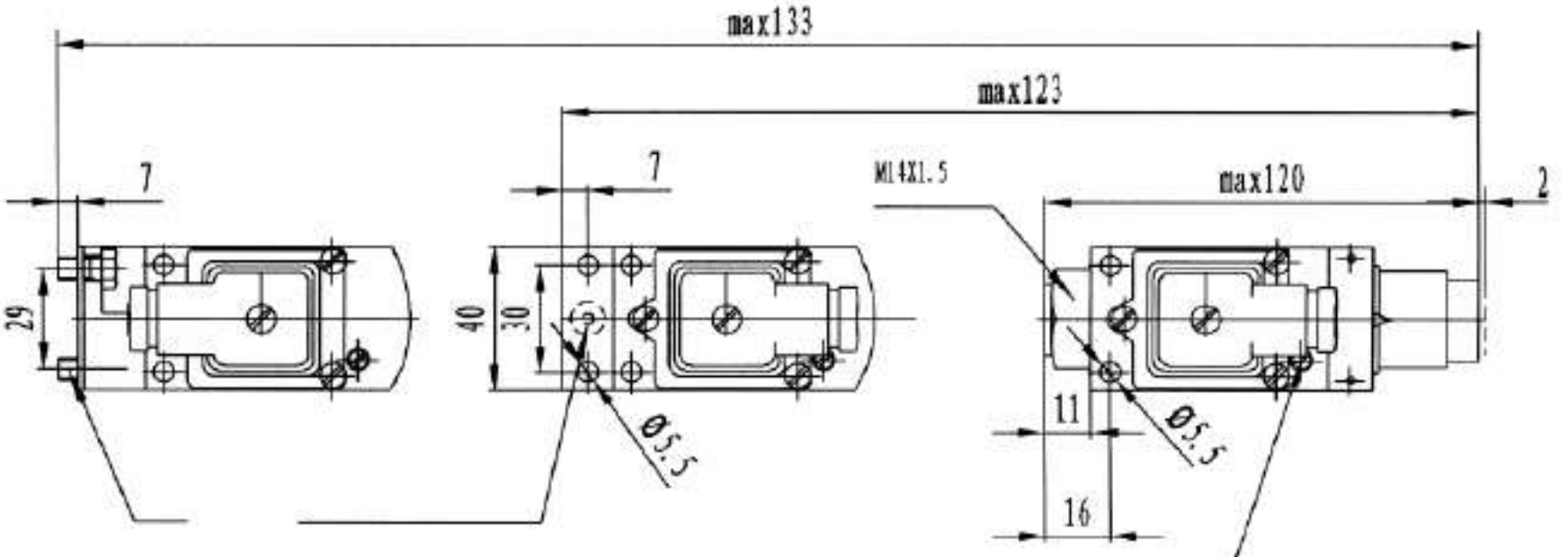


Subplate mounting
Type HED4OP15B/···



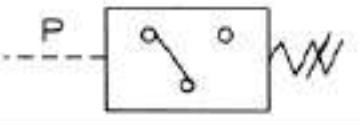
Pipe installation
Type HED4OA15B/···





screw is loosened before adiustzing pressure

screw is screwed down after adjusting pres



Ordering details

HED40		15	B /			S		*

Vertical stacking systems = H
Subplate mounting = P
Pipe installation = A

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

Further details in clear text

*Sould 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 range10 to 800mm² /s

Switching accuracy (repeatability) < ± 1% of set pressure

Switching frequency 120/min

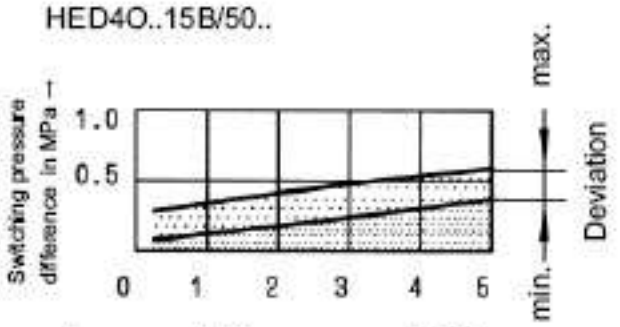
Max. connection cross sectional area 1.5mm²

Contact loading - AC250V;5A
- DC50V,1A or 250V,0.2A

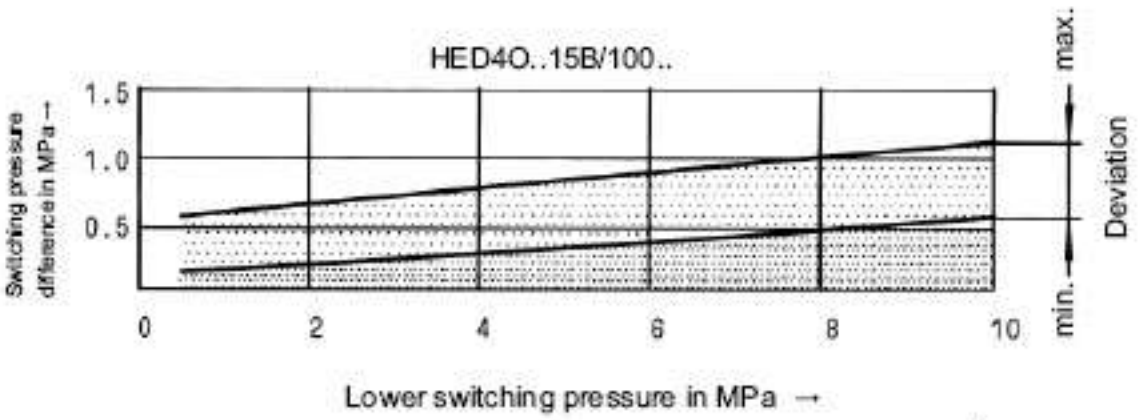
Weight - Hydro-electric pressure switches 0.6Kg
- Sandwich plate for vertical stacking assemblies
0.8kg (Size 6), 1.9kg (Size 10)

Switching pressure difference - pressure switches with or without drain port

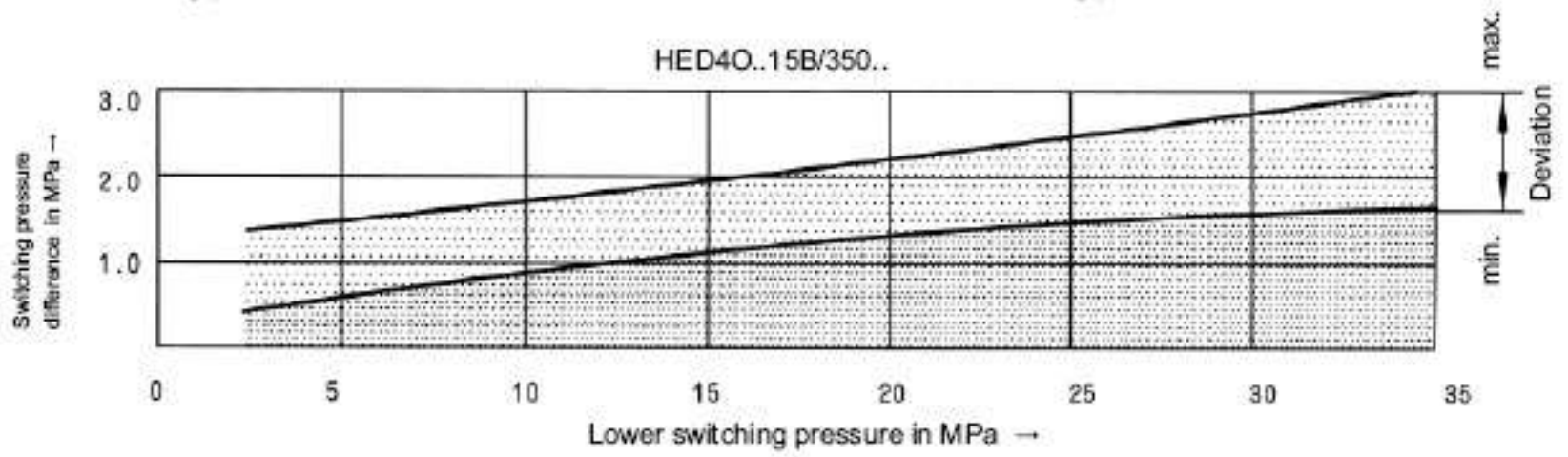
HED4O..15B/50..



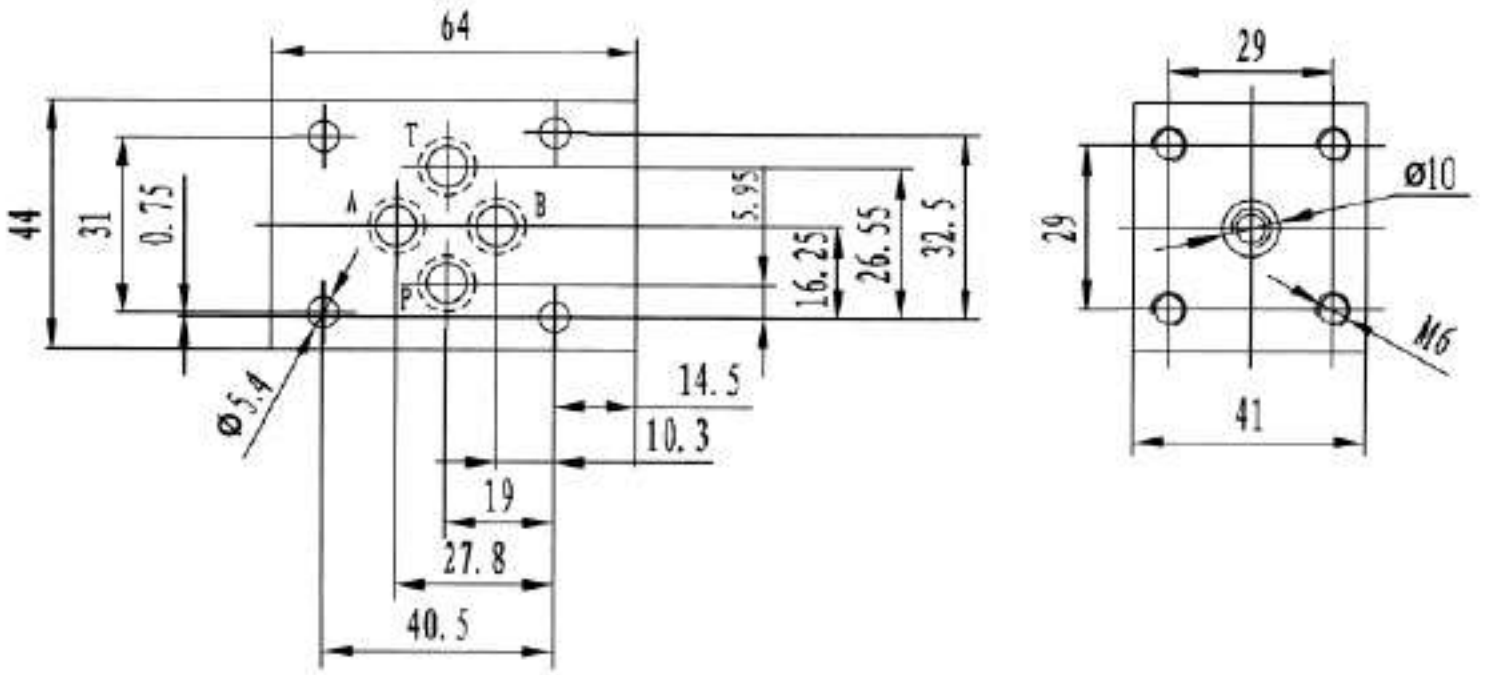
HED4O..15B/100..



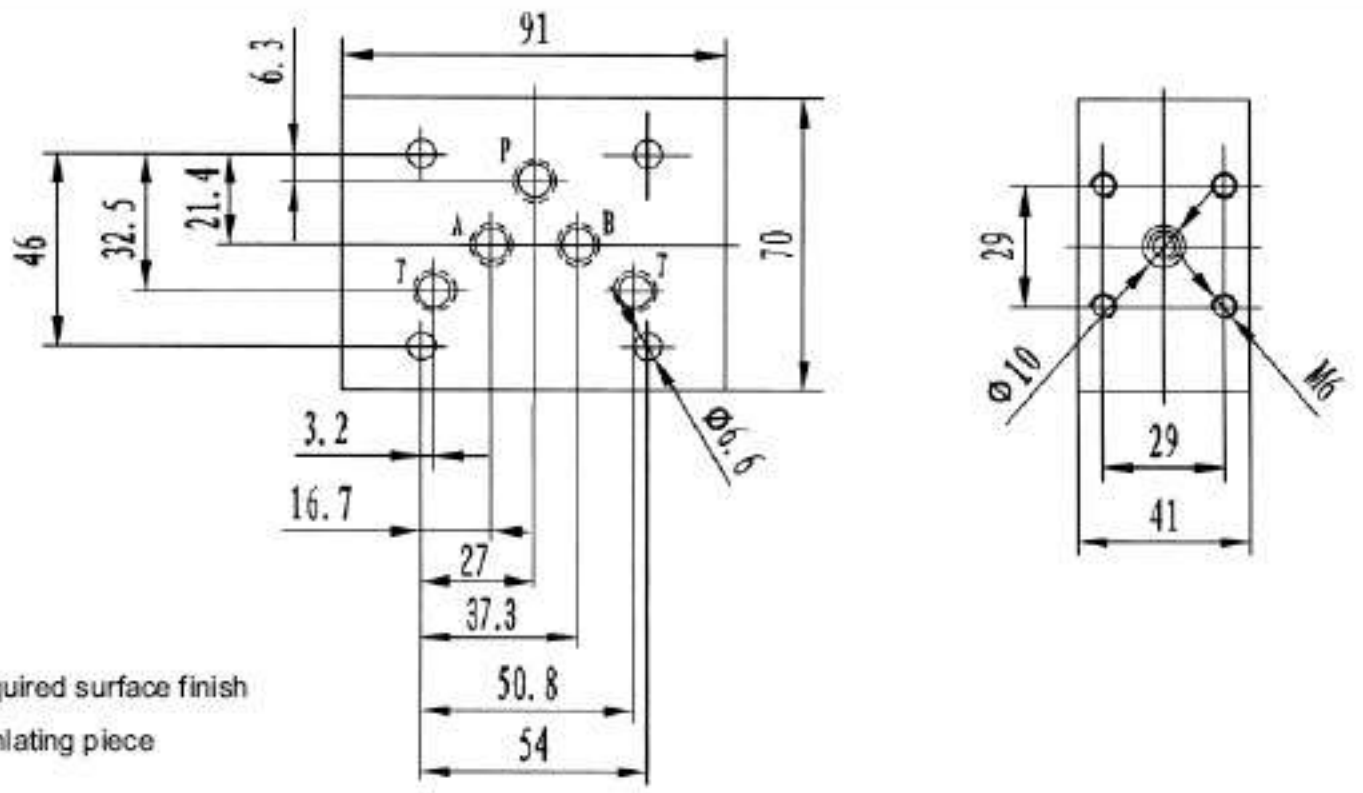
HED4O..15B/350..



Installation guidelines: for applying the pressure switch HED 4...in stacking assemblies size 6 (Dimensions in mm)



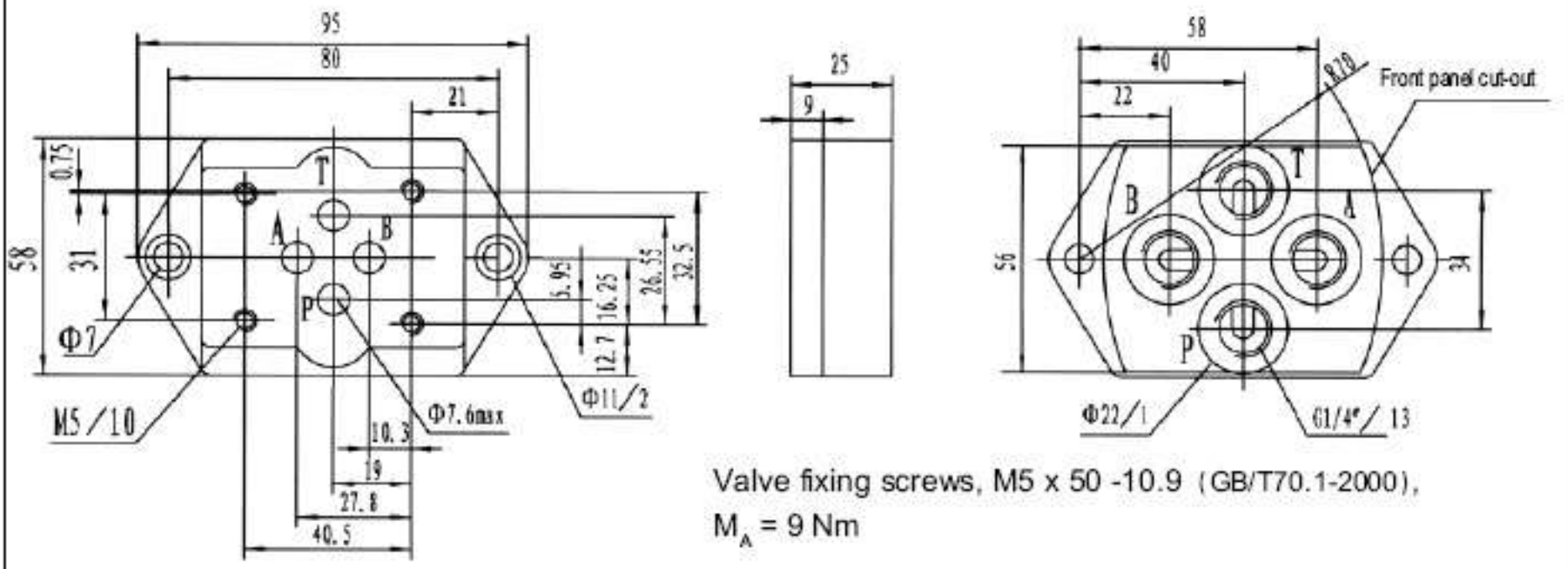
Installation guidelines: for applying the pressure switch HED 4...in stacking assemblies size 10 (Dimensions in mm)



Required surface finish
of mlating piece

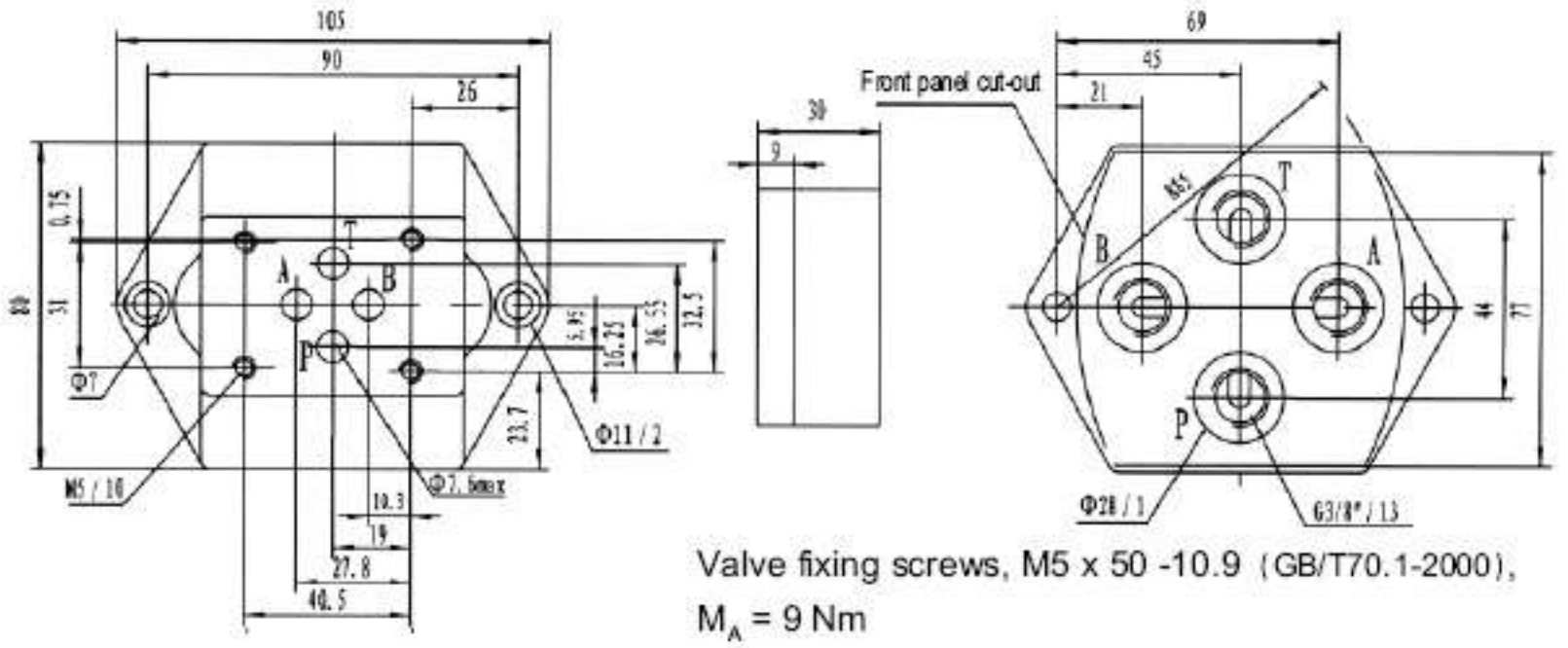
Subplates

G341/01 (G1/4″) G341/02 (M14x1.5) Weight ≈ 0.6kg (Dimensions in mm)



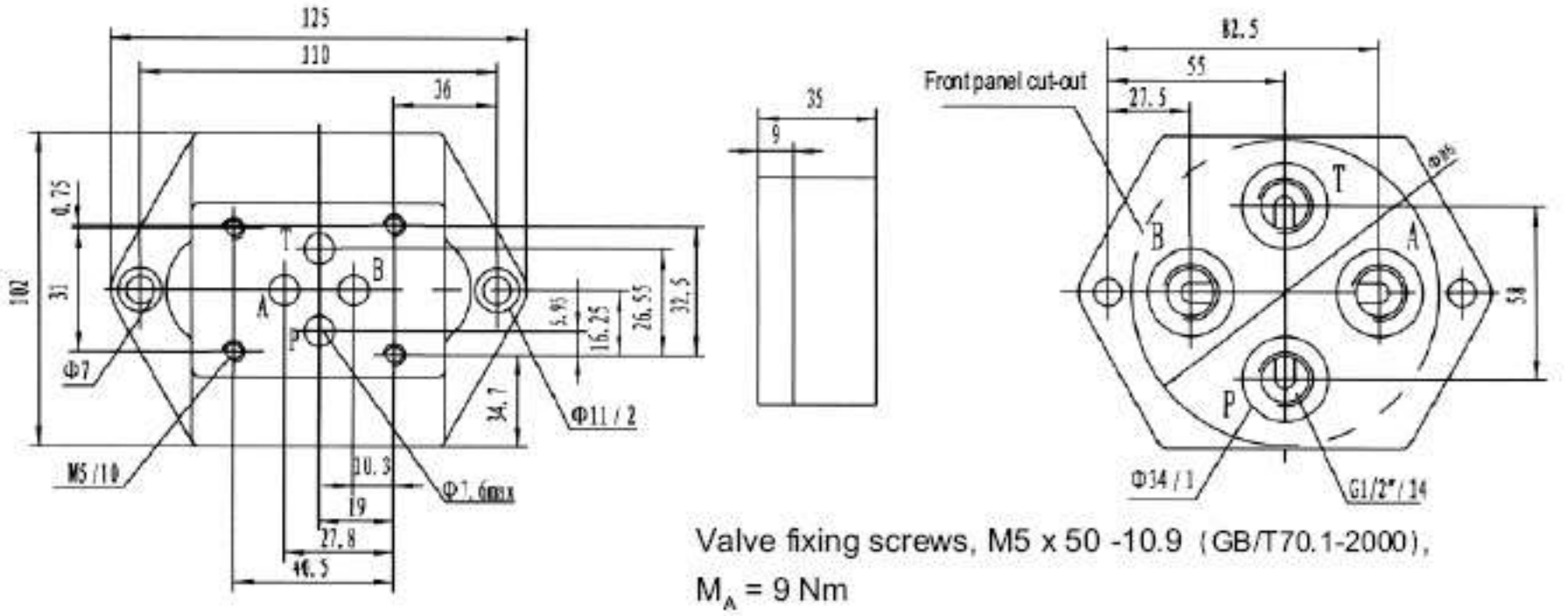
Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
M_A = 9 Nm

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 Nm

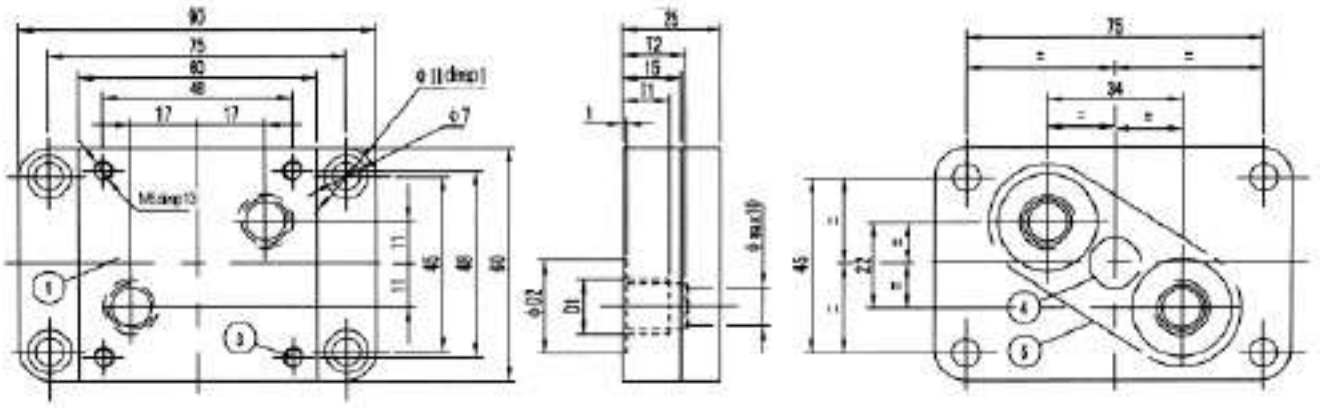
G502/01 (G1/2″) G502/02 (M22x1.5) Weight ≈ 1.9kg (Dimensions in mm)



Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
M_A = 9 Nm

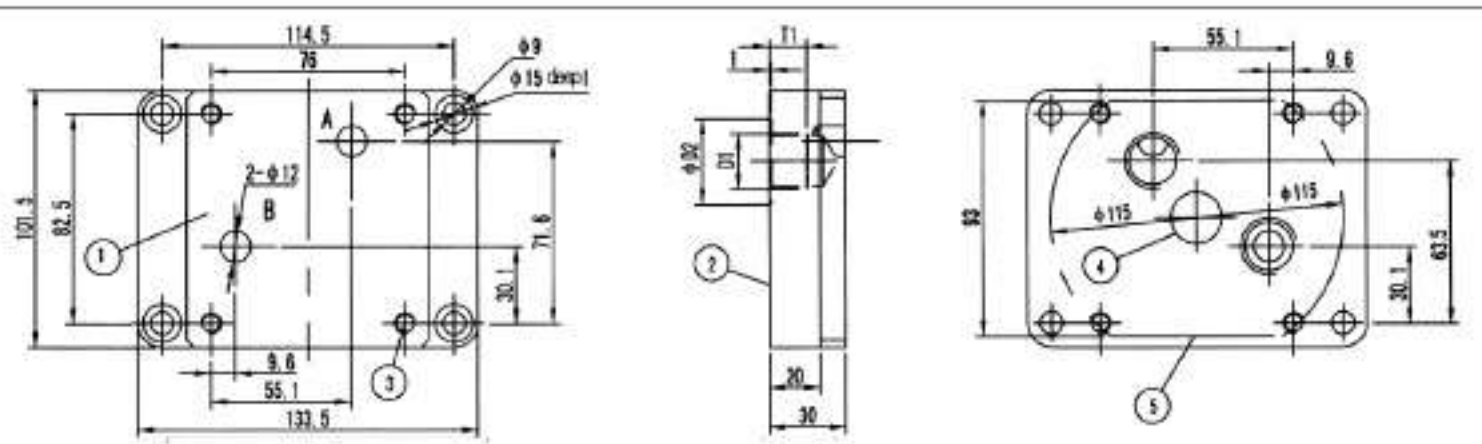
Subplates

G44/01(G1/4) G44/02(M14 × 1.5) G45/01(G1/2) G45/02(M22 × 1.5) (Dimensions in mm)



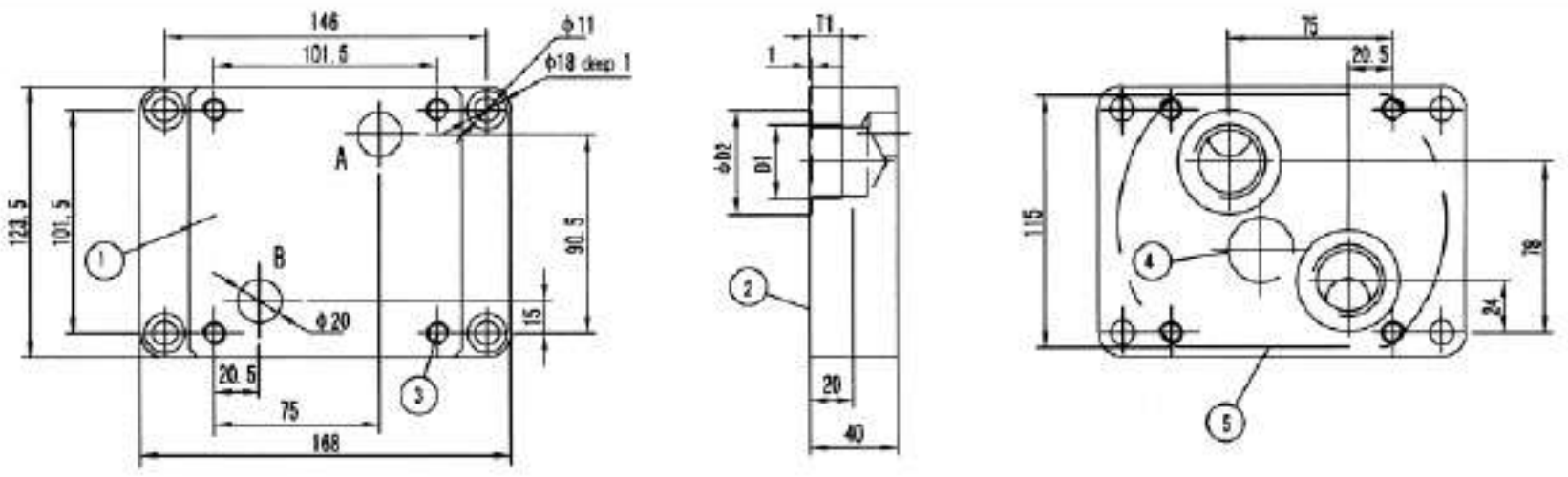
Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC25	G44/01	0.9kg	G1/4"	25	12	17	4-M5 × 50 -10.9 (GB/T70.1-2000)	6.1N.m
	G44/02		M14 × 1.5					
	G45/01		G1/2"	34	14	20		
	G45/02		M22 × 1.5					

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					

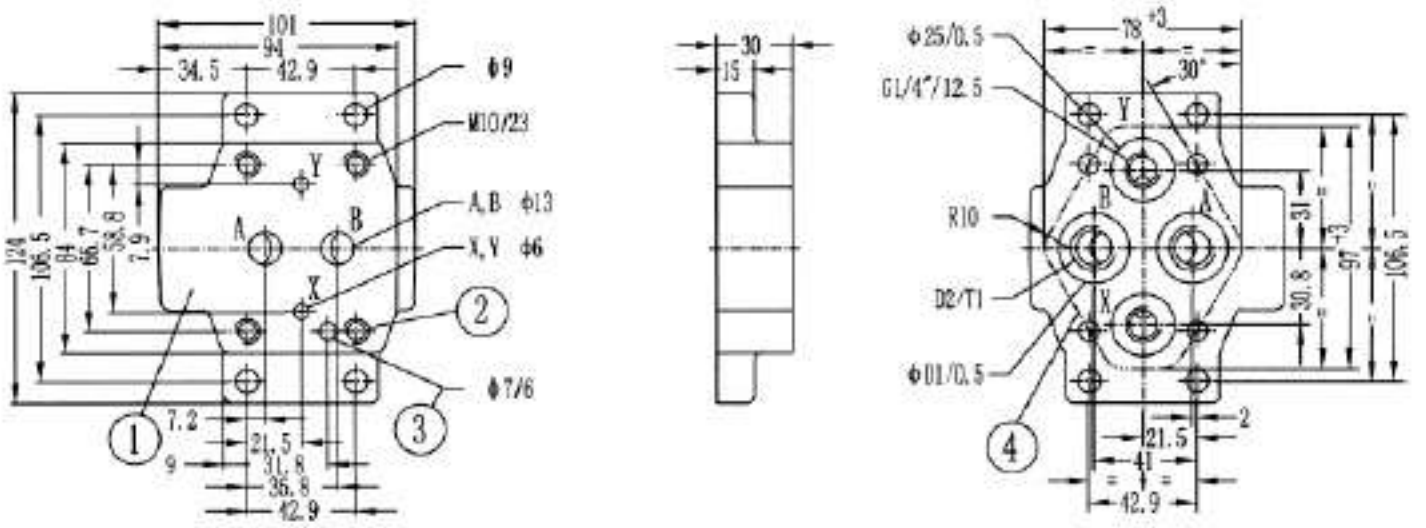
G281/01(G1/2) G281/02(M23 × 2) G282/01(G1/4) G282/02(M42 × 1.5) (Dimensions in mm)



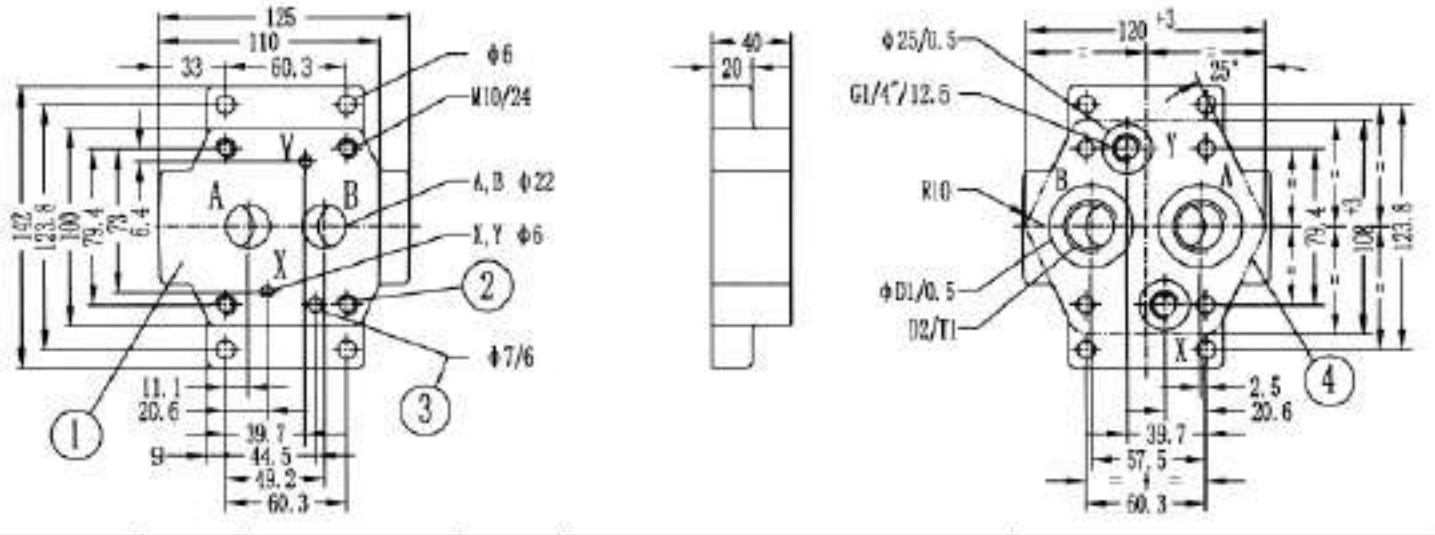
Size	Type	Weight	D1	D2	T1		Valve fixing screws	Tightening torque
NC18	G281/01	4kg	G1"	47	19		4-M10 × 80 -10.9 (GB/T70.1-2000)	
	G281/02		M33 × 2					
	G282/01		G1 1/4"	56	21			
	G282/02		M42 × 1.5					

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

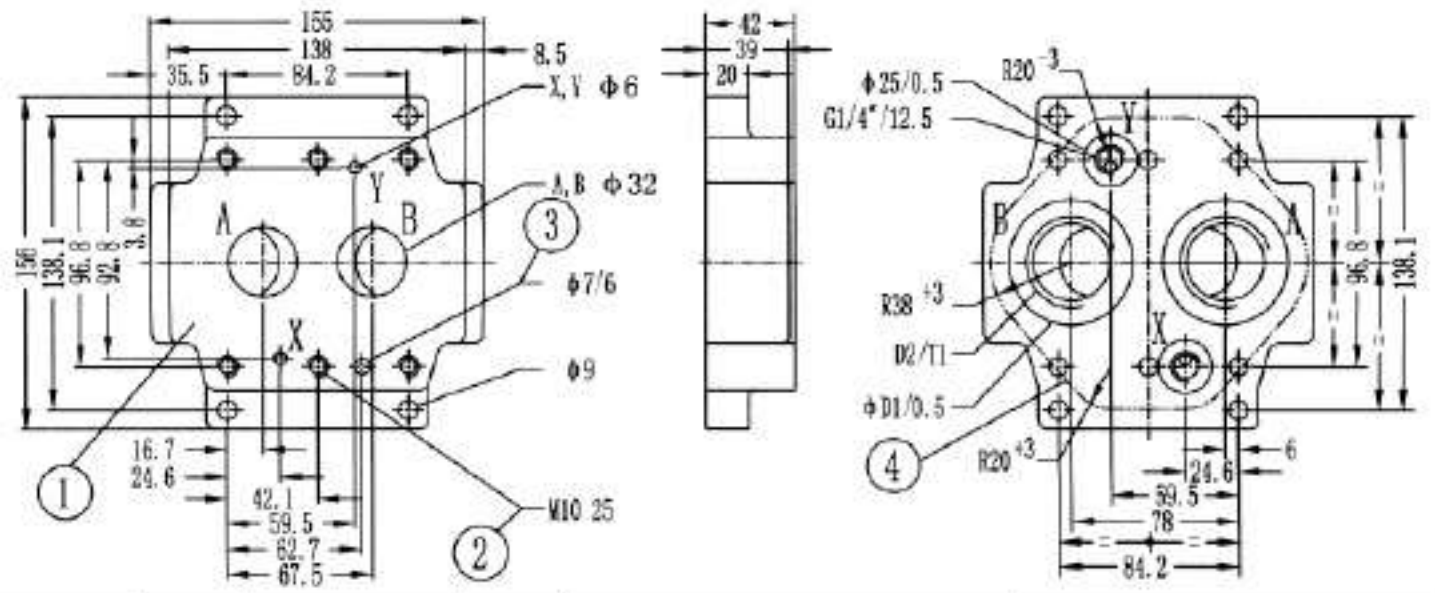
Scaleboard



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

CONTENTS

Flow Control Valves

Accessories

"*": 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

☎ Tel: 400-000-6987

Our company has passed:

- ISO9001 Quality Managing System Certificate
- ISO14001 Environment Managing System Certificate
- OH SAS18001 Occupational Health Safety Managing System Certificate
- CE Certificate

Compiled by Huade Hydraulic Technical Center

Huade

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO., LTD.

Compiled in Oct.2012