



Hydraulic valves



**Flow Control Valves
Accessories**

Catalogue

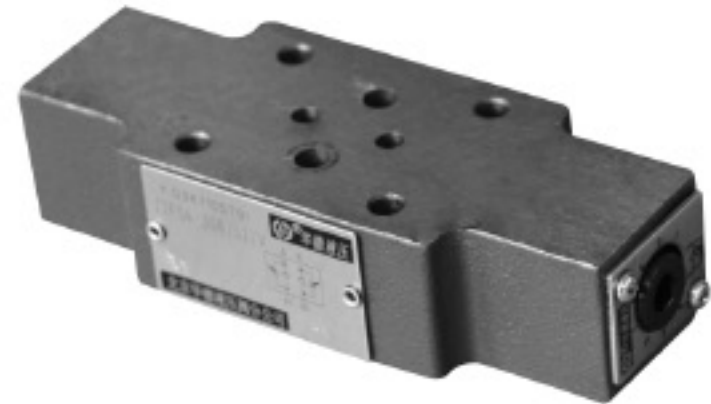


BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS Series 30			RE:27505/12.2004
	Sizes 6, 16, 22	up to 31.5MPa	up to 350 L/min	Replaces: RE27505/5.2001

Features:

- Sandwich plate design
- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Limiting of main or pilot flow with two service ports,
- Meter-in or meter-out control.



Functional , Section

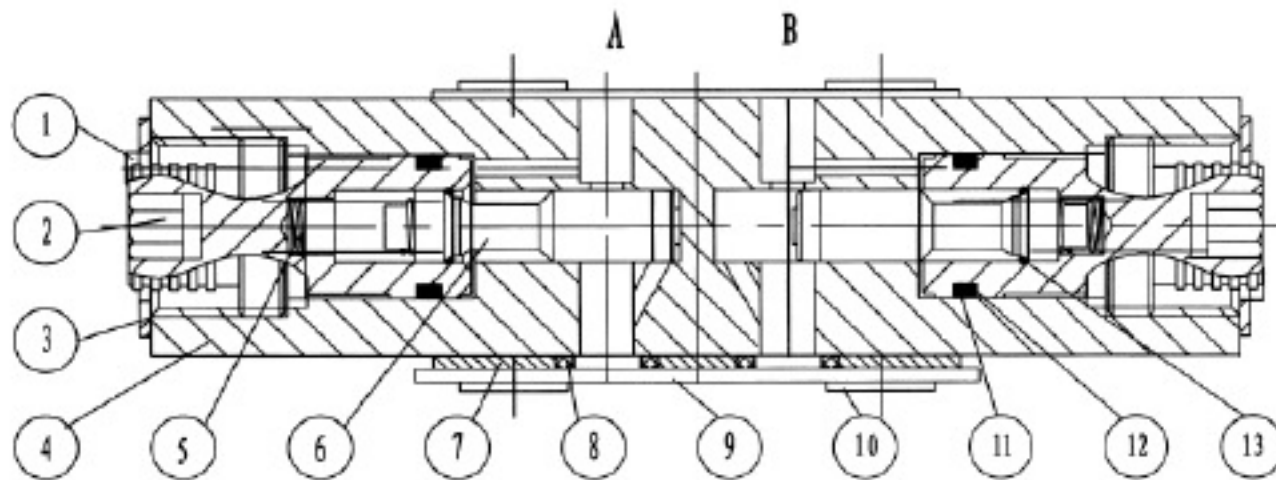
Valves type Z 2 FS are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return flow in the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

Main flow limiting

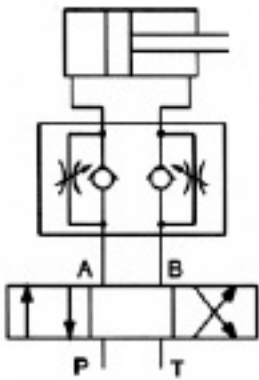
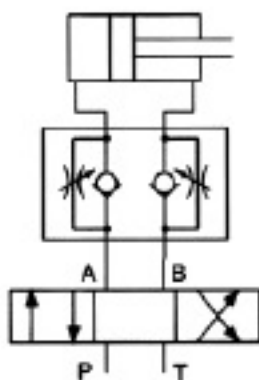
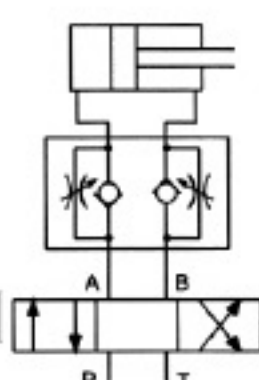
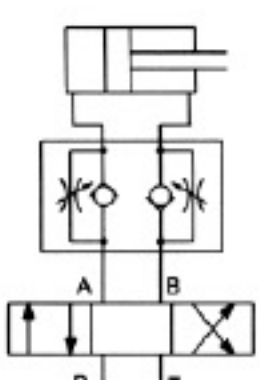
The double throttle/check valve is fitted between the directional valve and the subplate to change the speed of an actuator (main flow limiting).

Pilot flow limiting

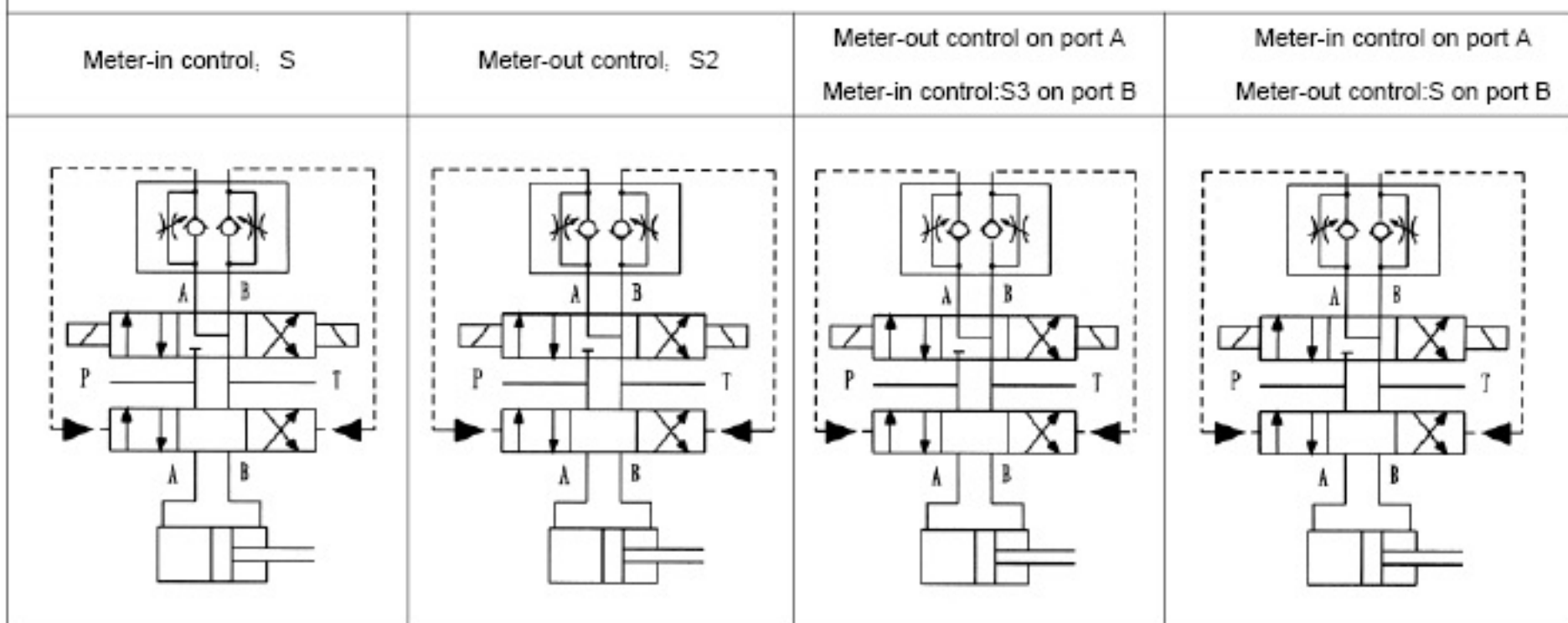
In the case of pilot operated directional valves, the double throttle/check valve may be used as a pilot choke adjustment (pilot flow limiting). In this case, it is fitted between the main valve and the pilot valve.



Double throttle/check valve, Type Z2FS6

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

Principle of Hydraulic systems



Ordering details

Z2FS -30 B / *

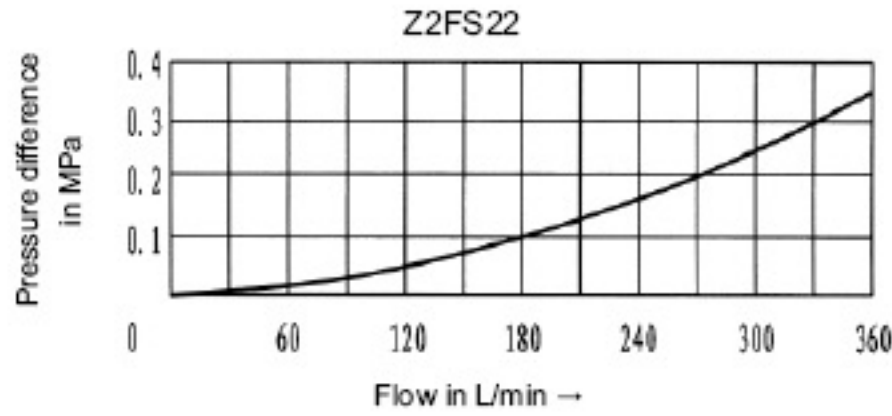
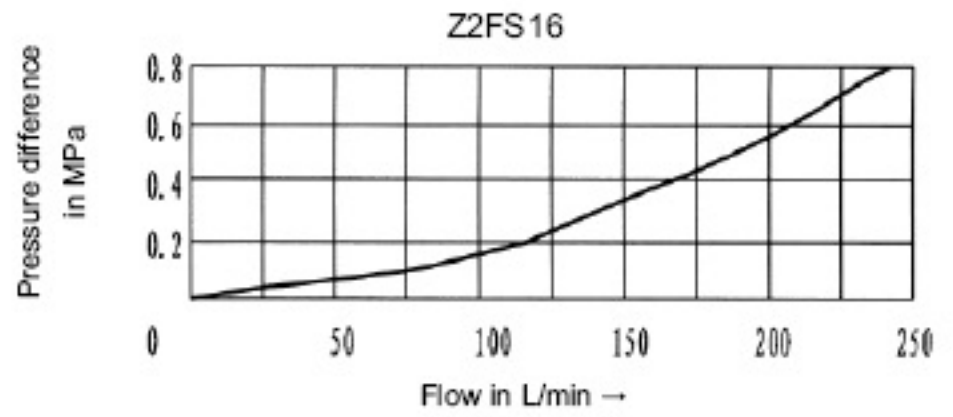
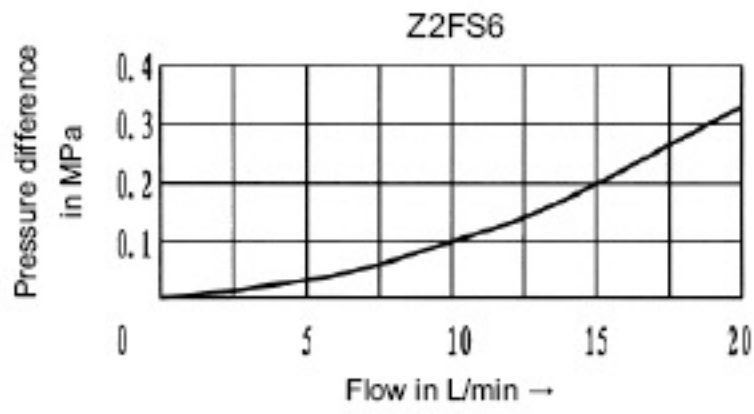
Double throttle/check valve		Further details in clear text
Nominal size 6 = 6		No code= Mineral oil
Nominal size 16 = 16		V= Phosphate ester
Nominal size 22 = 22		
Series 30 to 39 =30 (30 to 39: unchanged installation and connection dimensions)		No code = (With two throttle/check valves)
		S = Meter-in
		S2 = Meter-out
		S3 = Meter-out on port A, meter-in on port B
		S4 = Meter-in on port A, meter-out on port B
Technology of Beijing Huade Hydraulic =B		

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

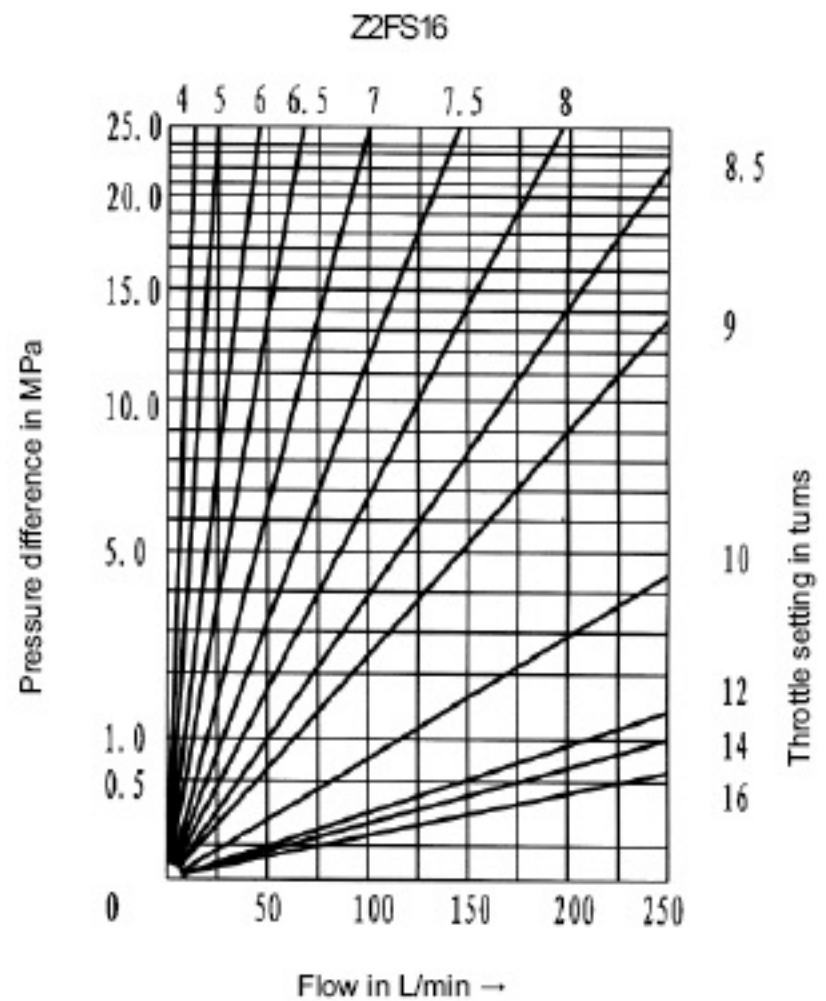
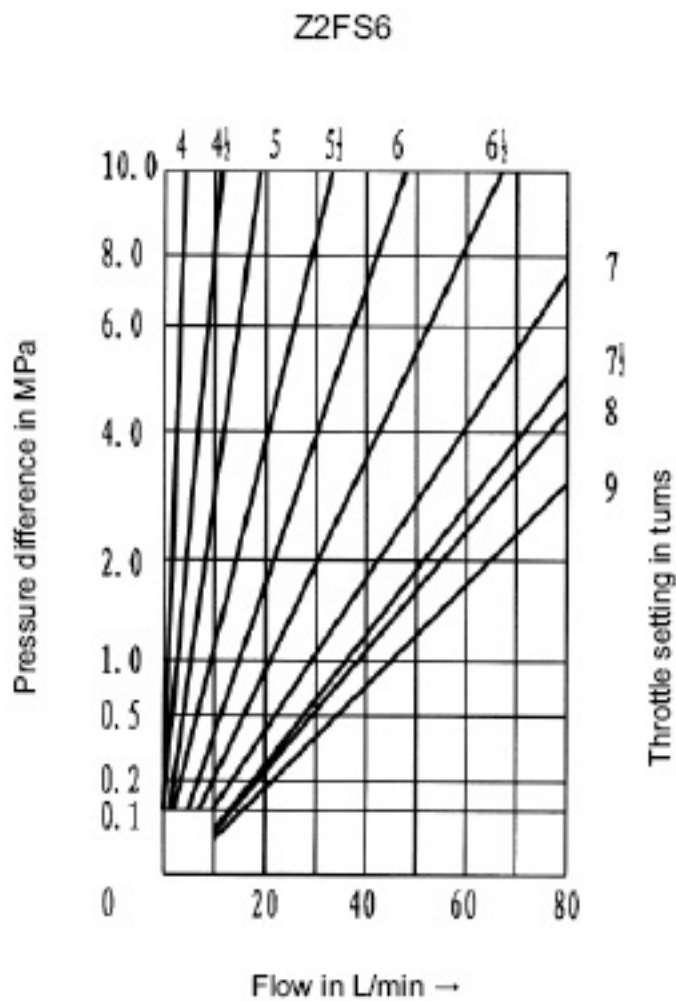
Size	6	16	22
Maximum flow (L/min)	80	250	350
Maximum working pressure (MPa)	31.5	35	
Pressure fluid	Mineral oil (for NBR seal) or Phosphate ester (for FPM seal)		
Viscosity range (mm ² /s)	10 to 800		
Fluid temperature range (°C)	-30 to +80		

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

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



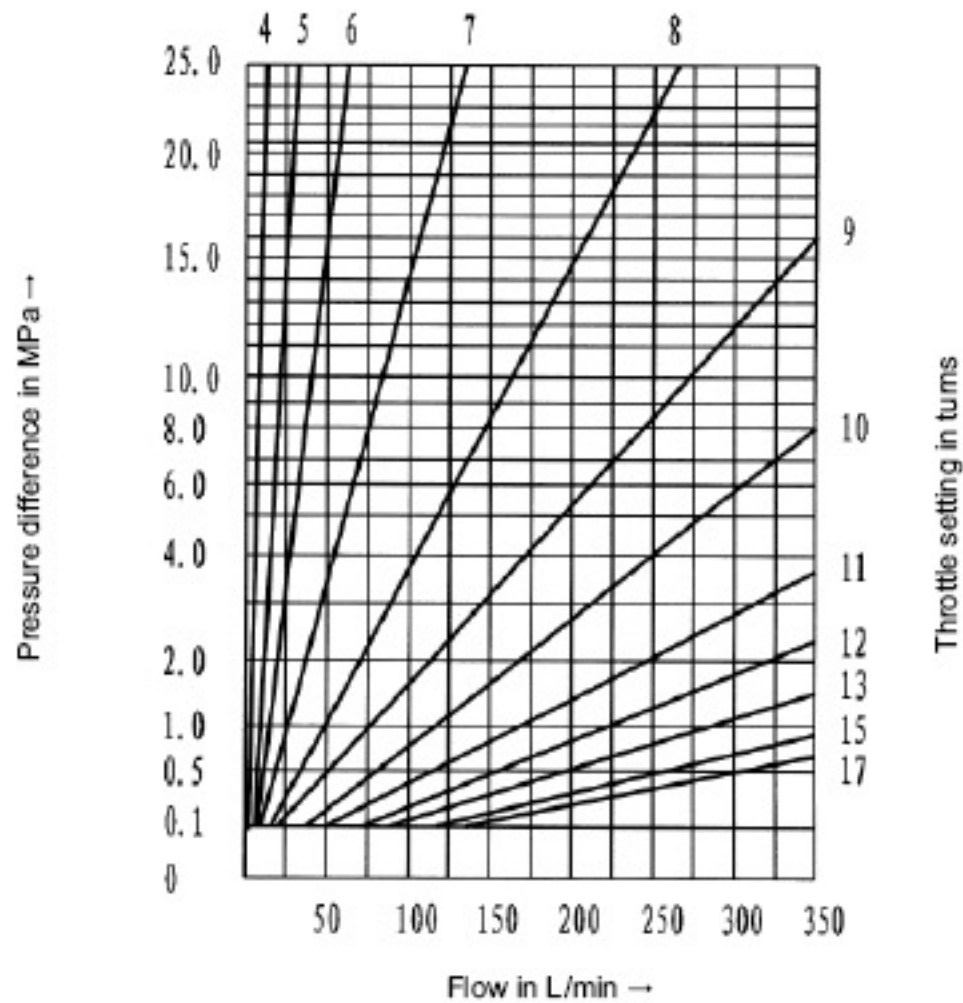
Pressure difference Δp in relationship to the flow q_v at a constant throttle setting.



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

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

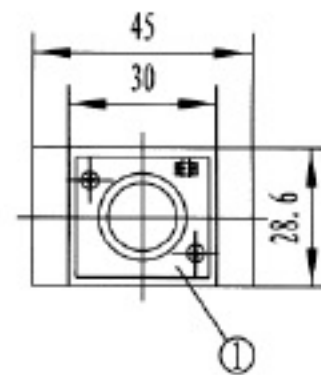
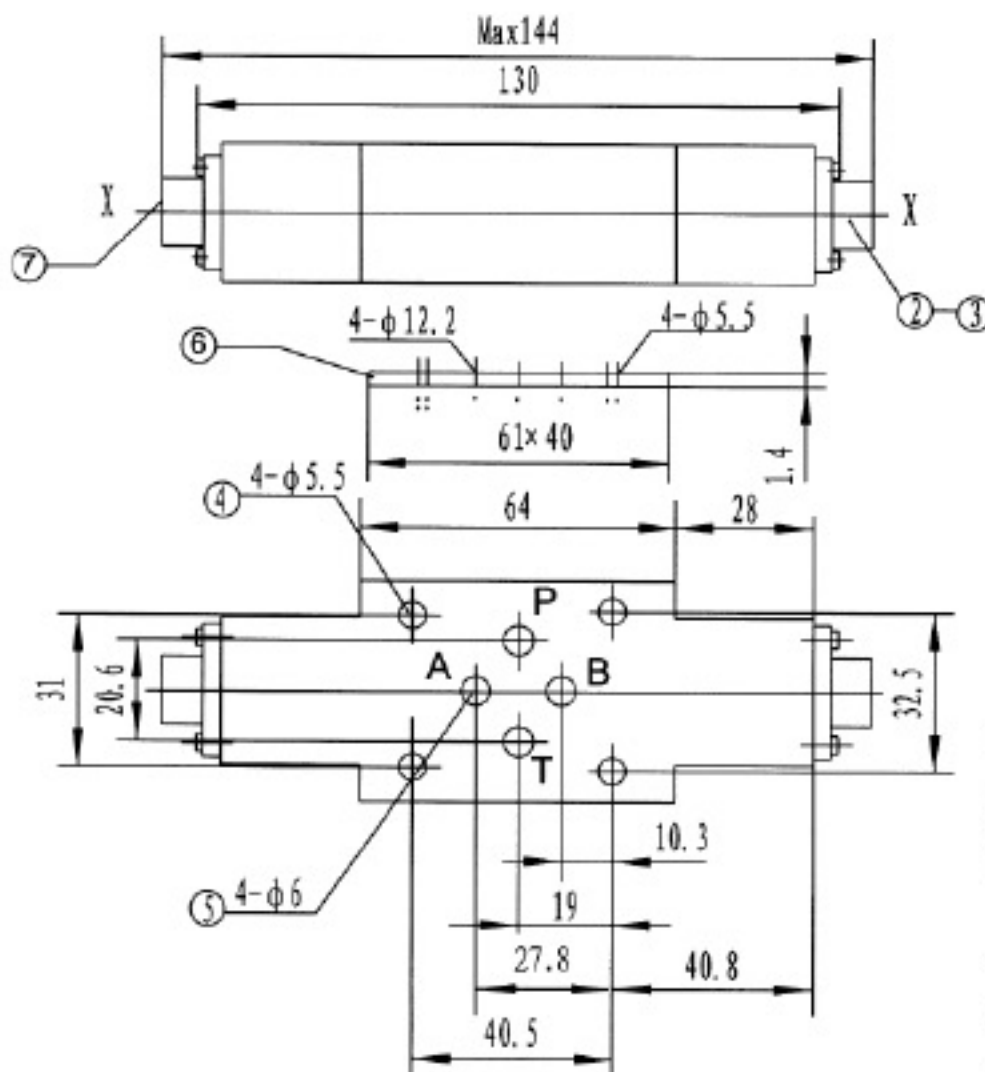
Z2FS22



Unit dimensions

(Dimensions in mm)

Type Z2FS6:



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

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

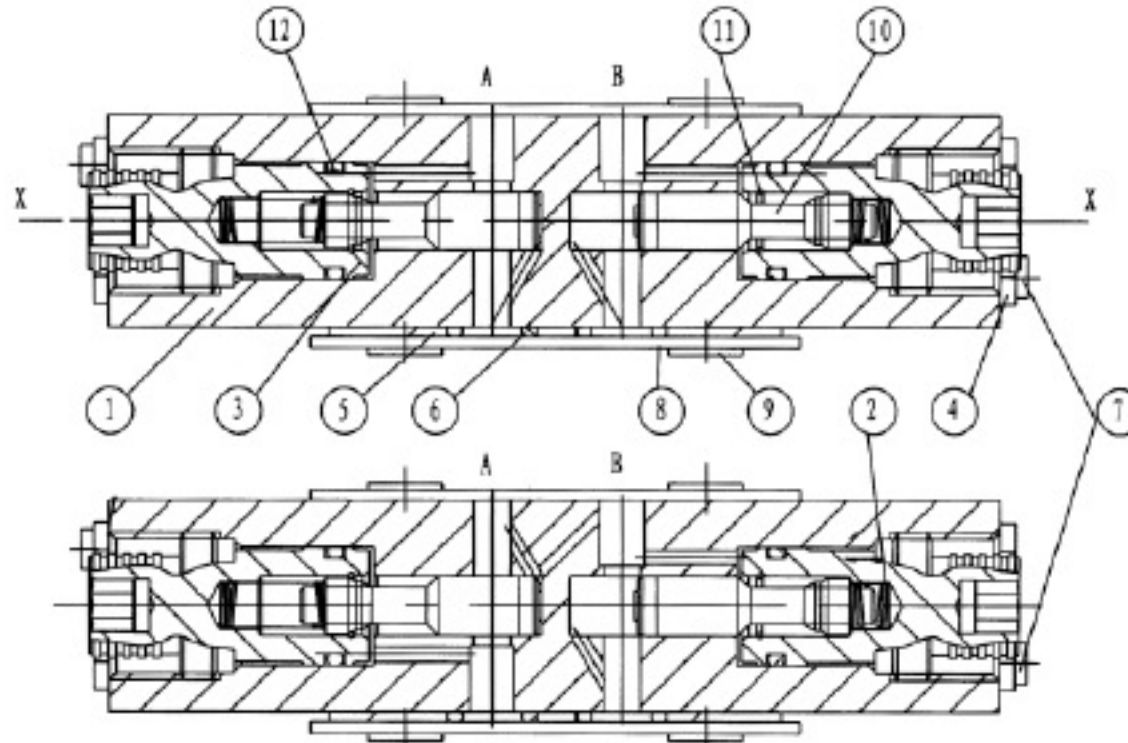
Valves type Z 2 FS10...20B/... are double throttle/check valves in sandwich plate design.They are used to limit main or pilot oil flow at one or two service ports.Two symmetrically arranged throttle/check valves limit flow (by means of adjustable throttle spools) in one direction and permit free return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

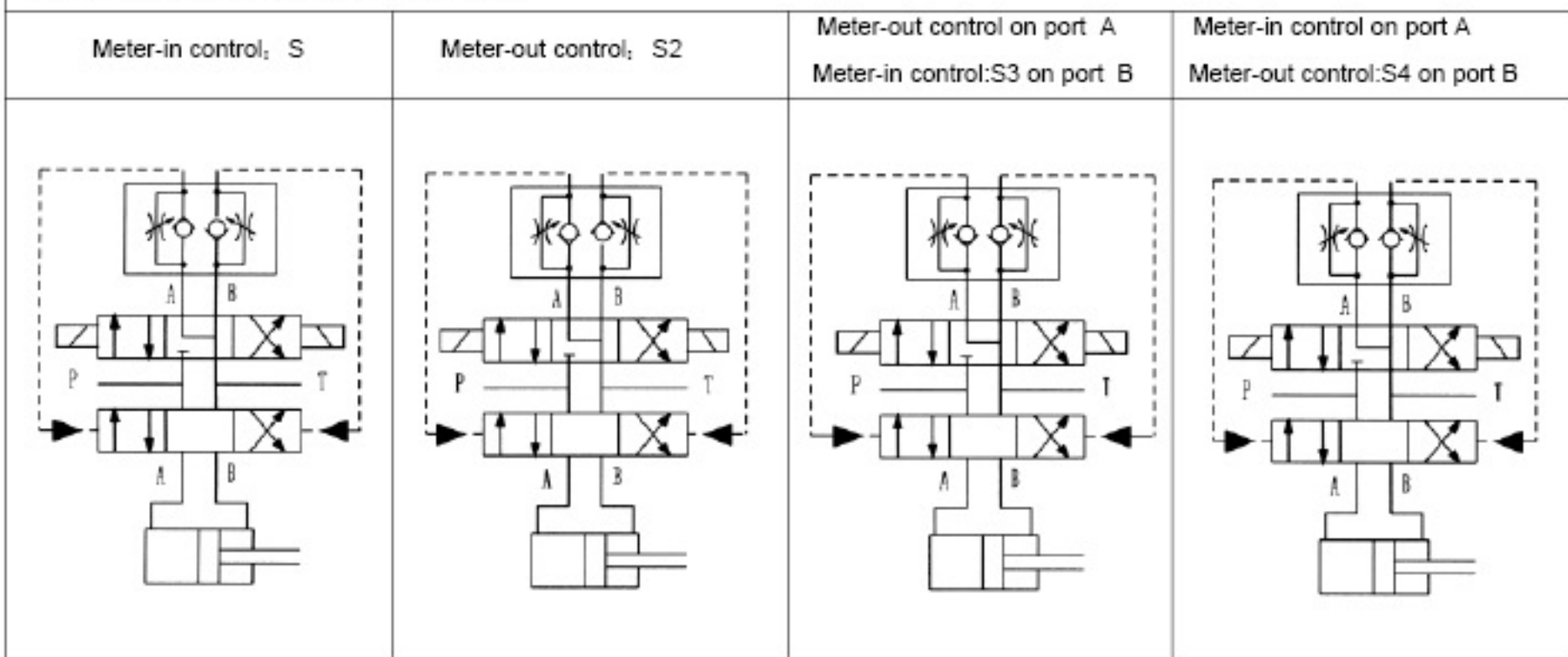
Pilot flow limiting

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



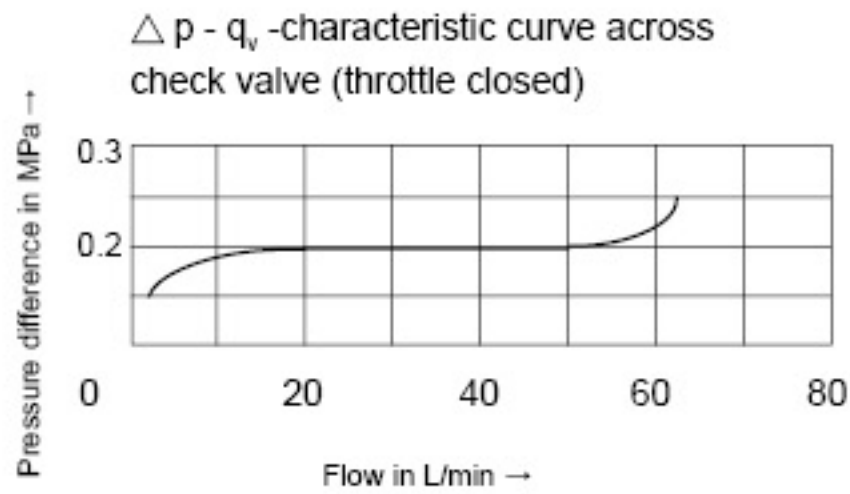
Ordering details

Z2FS	-	20	B	/		*
Double throttle/ check valve						Further details in clear text
Nominal size 10		= 10				No code = Mineral oil V = Phosphate ester
Series 20 to 29 (20 to 29: unchanged installation and connection dimensions)		=20				No code = (With two throttle/check valves) Meter-in /meter-out throttling, (this valve can be turned)
Technology of Beijing Huade Hydraulic		=B				S = Meter-in S2 = Meter-out S3 = Meter-out on port A, meter-in on port B S4 = Meter-in on port A, meter-out on port B

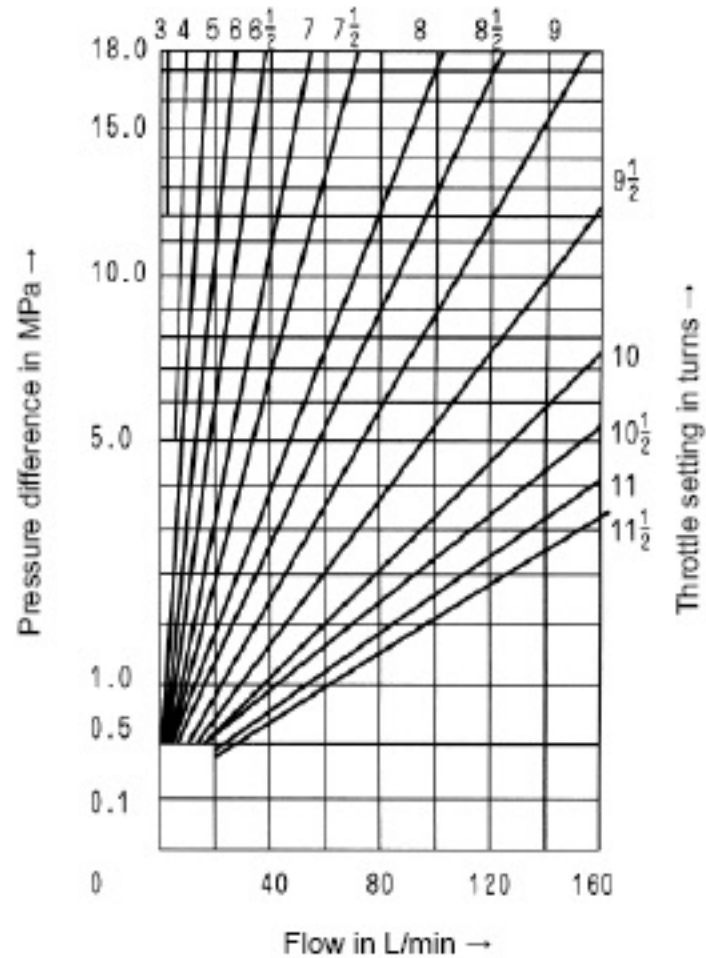
Technical data (for applications outside these parameters, please consult us!)

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

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

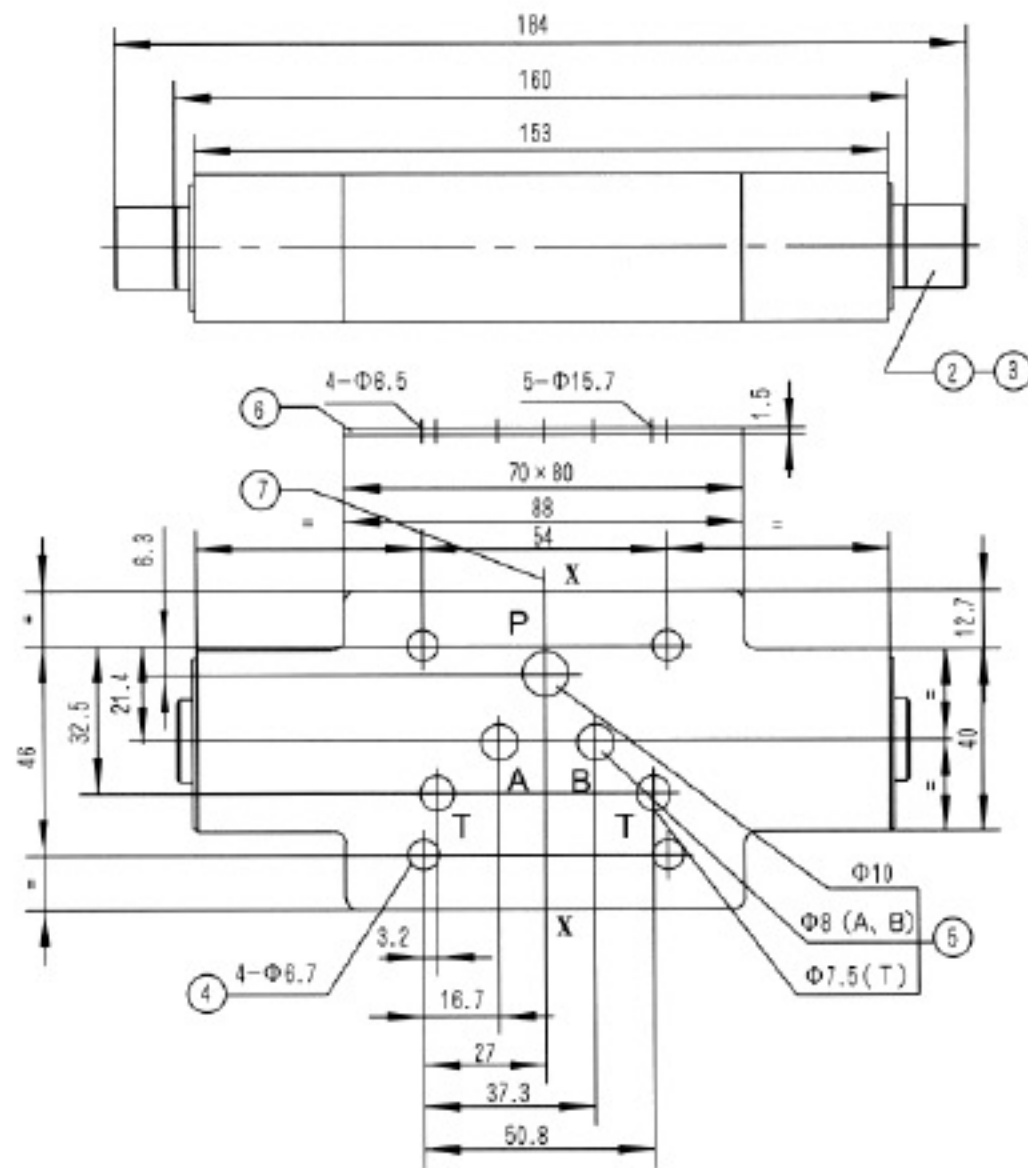


Pressure difference Δp in relation to the flow q_v at constant throttle setting



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

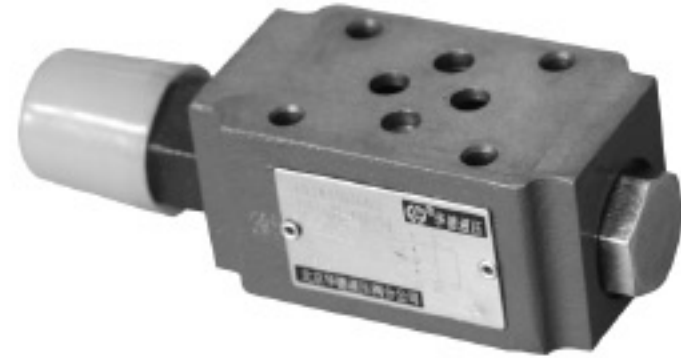
Notice

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

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS 6 Series 40 (New Series)			RE:27500/12.2004
	Size 6	up to 31.5MPa	up to 80 L/min	

Features:

- Sandwich plate valve
- Parting pattern to DIN 24340, from A, ISO 4401 and CETOP-RP 121H
- 4 adjustment elements :
 - Screw with locknut and protective cap
 - Lockable rotary knob with scale
 - Spindle with internal hexagon and scale
 - Rotary knob with scale
- For limiting the main or pilot fluid flow of 2 service ports
- For meter-in or meter-out control



Function , section

Valve type Z2FS 6 ...-40B/... is a double throttle/check valve in sandwich plate design.

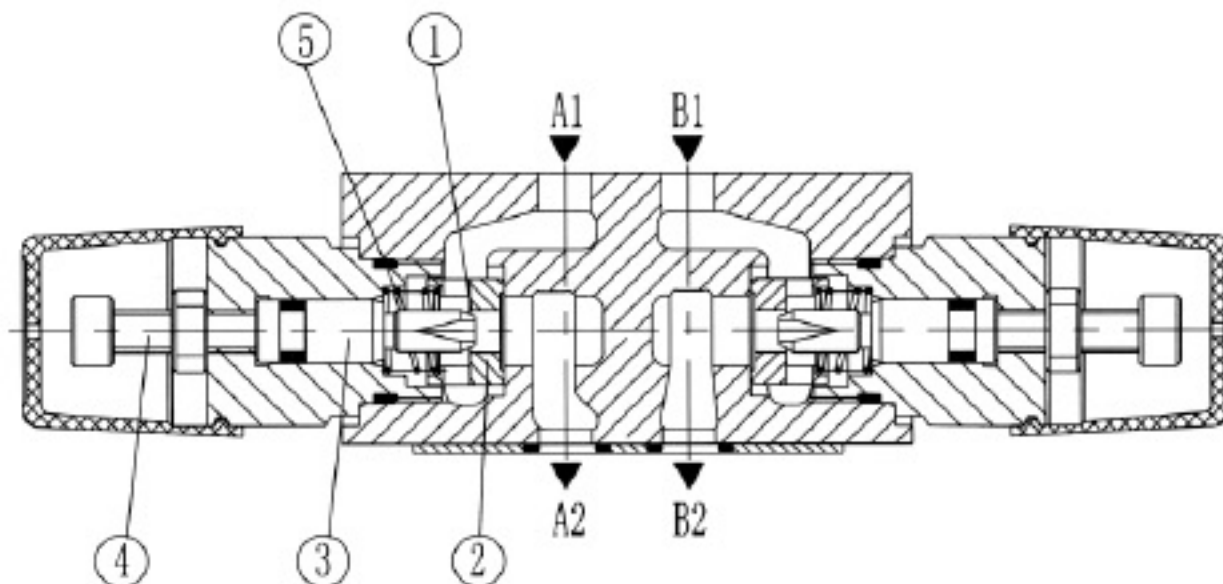
They are used to limit the main or pilot flow of one or two service ports. Two symmetrically arranged throttle/check valves limit the flow in one direction and allow free-flow in the opposite direction. For meter-in control fluid passes from port A1 to port A2 via the throttling point (1), which is made up to the valve seat (2) and the throttling spool (3). The throttling spool (3) is axially adjustable via the adjustment screw (4), thus allowing the throttling point (1) to be adjusted. Flow flowing back from the service port A2 moves the valve seat (2) against spring (5) in the direction of the throttling spool (3), causing the valve to act as a check valve and allowing free-flow. Depending upon the way in which the valve is installed, the throttling effect can be arranged as a meter-in or a meter-out control.

Limiting the main fluid flow (style ..2Q..)

In order to change the velocity of an actuator (main fluid flow), the double throttle/check valve is installed between the directional valve and the sub-plate.

Limiting the pilot fluid flow (style ..1Q..)

In pilot operated directional control valves, the double/throttle check valve is installed as a pilot choke adjustment (pilot fluid flow). It is fitted between the main valve and the pilot valve.



Type Z2FS6-2-40B/...

Ordering details

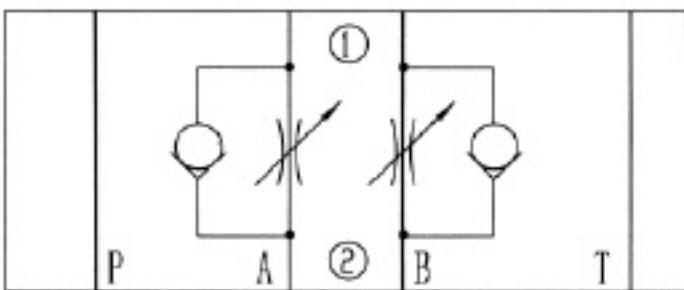
Z2FS 6 - 40 B / *

Double throttle/check valve		Further details in clear text
Nominal size 6 = 6		No code= Mineral oil V= Phosphate ester
Throttle/check valve ports A and B = - Throttle/check valve port A = A Throttle/check valve port B = B		1Q = With fine control 2Q = Standard version
Adjustment element Screw with locknut = 2 Lockable rotary knob with scale = 3 Spindle with internal hexagon and scale = 5 Rotary knob with scale = 7		
Series 40 to 49 = 40 (40 to 49: unchanged installation and connection dimensions)		
Technology of Beijing Huade Hydraulic = B		

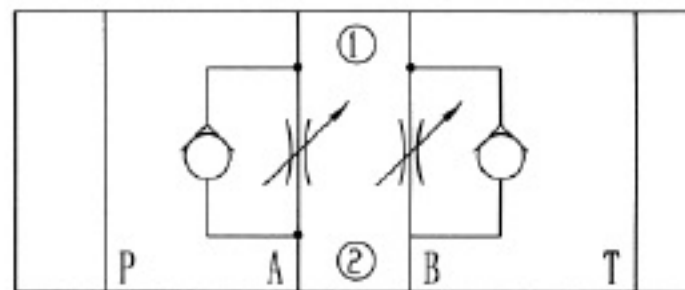
Note: Type Z2FS 6-...-40B/...has the same adjustment elements on ports A and B

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

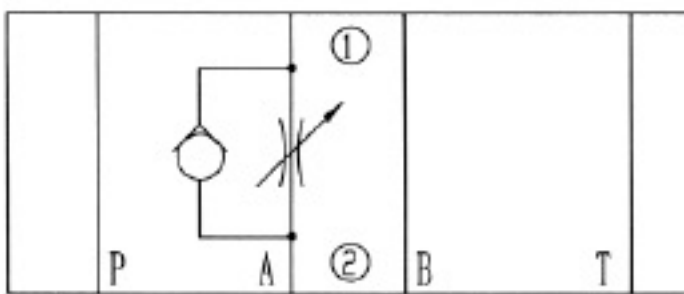
Z2FS6-...-40B/...(meter-in)



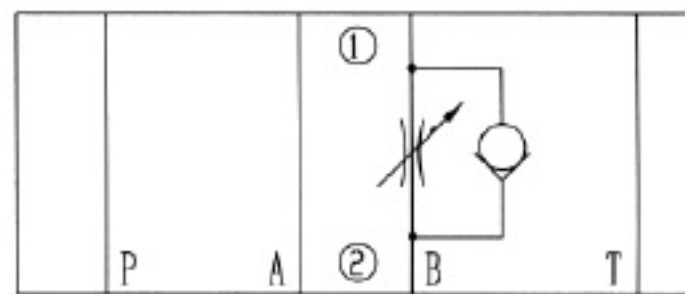
Z2FS6-...-40B/...(meter-out)



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



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

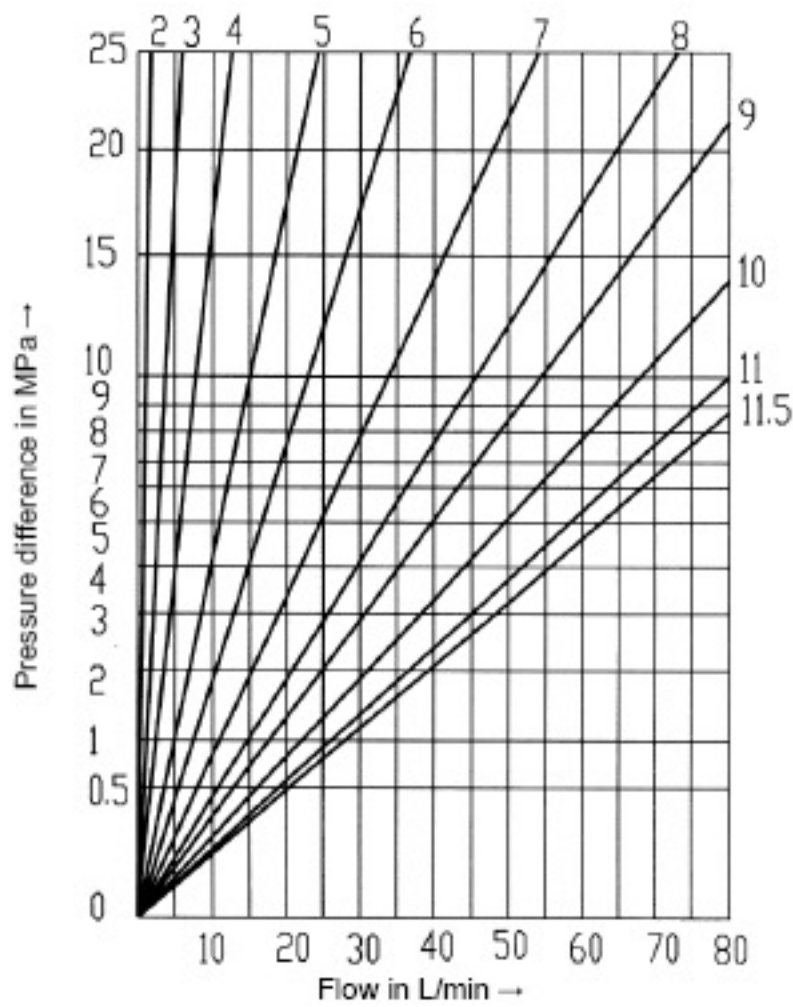


Technical data (for applications outside these parameters, please consult us!)

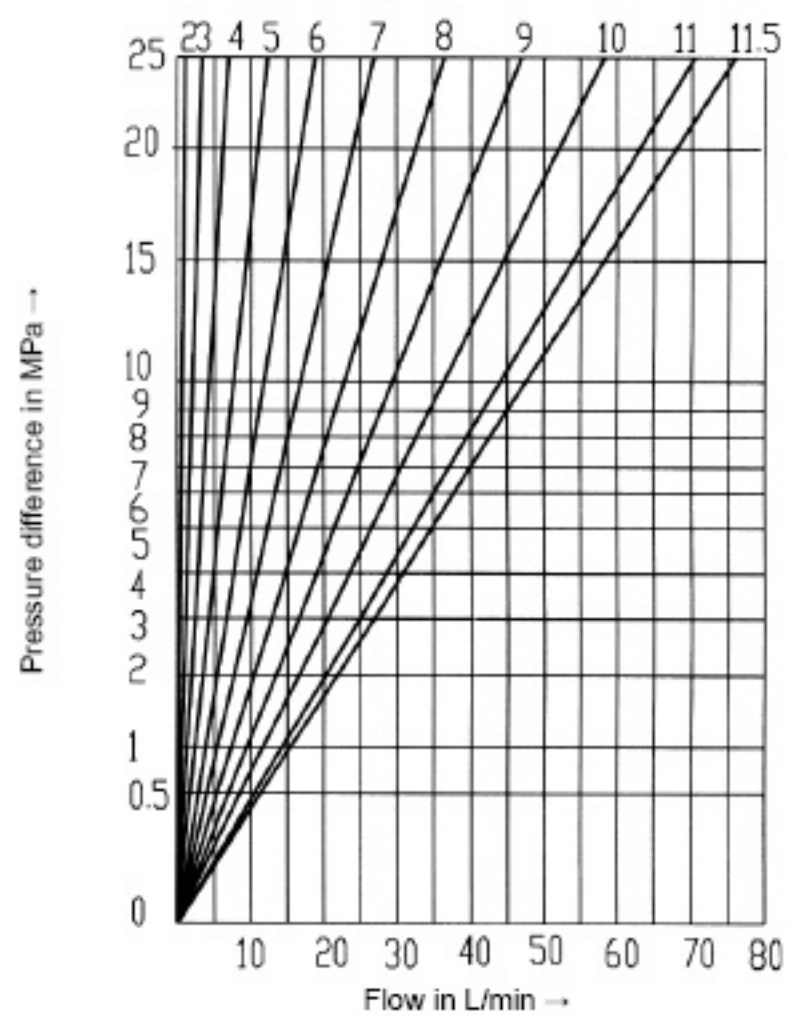
Pressure fluid	Mineral oil
	Phosphate ester
Pressure fluid temperature range (°C)	- 30 to + 80
Viscosity range (mm ² /s)	10 to 800
Degree of contamination	Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.
Maximum working pressure (MPa)	up to 31.5
Maximum flow (L/min)	up to 80
Weight (Kg)	approx. 0.8

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

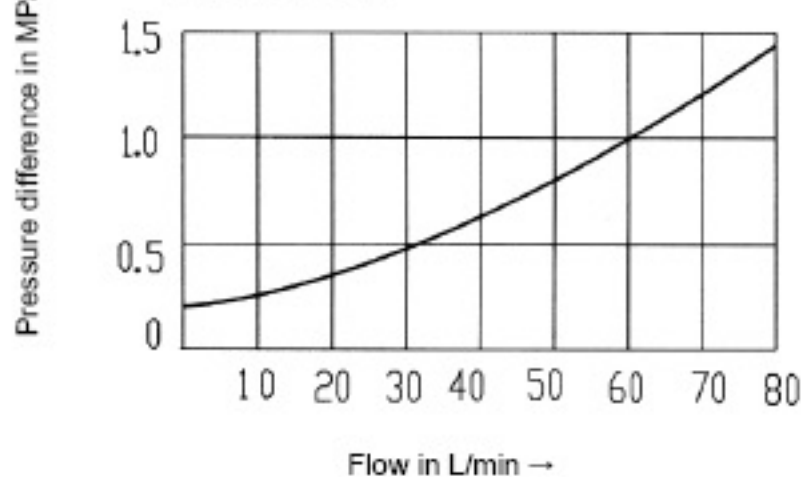
Δp - q_v -characteristic curves - types Z2FS 6 ...-40/2QV
Throttle setting in turns



Δp - q_v -characteristic curves - type Z2FS 6 ...-40/1QV
Throttle setting in turns



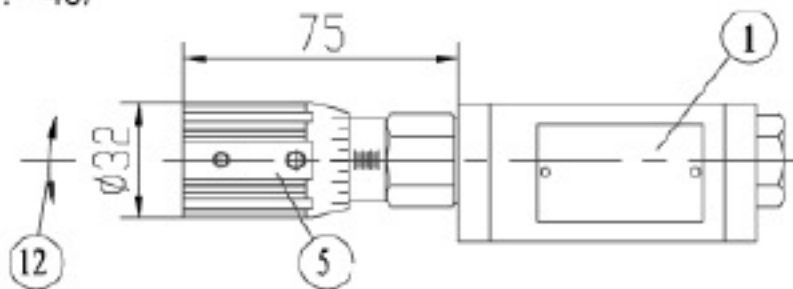
Δp - q_v -characteristic curve across check valve
(throttle closed)



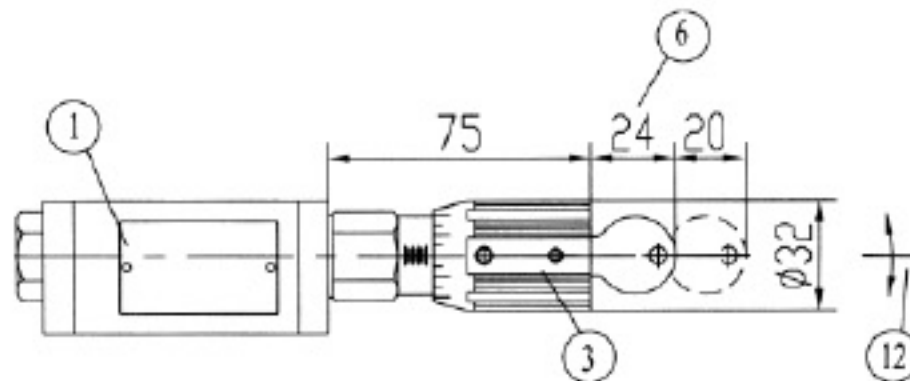
Unit dimensions

(Dimensions in mm)

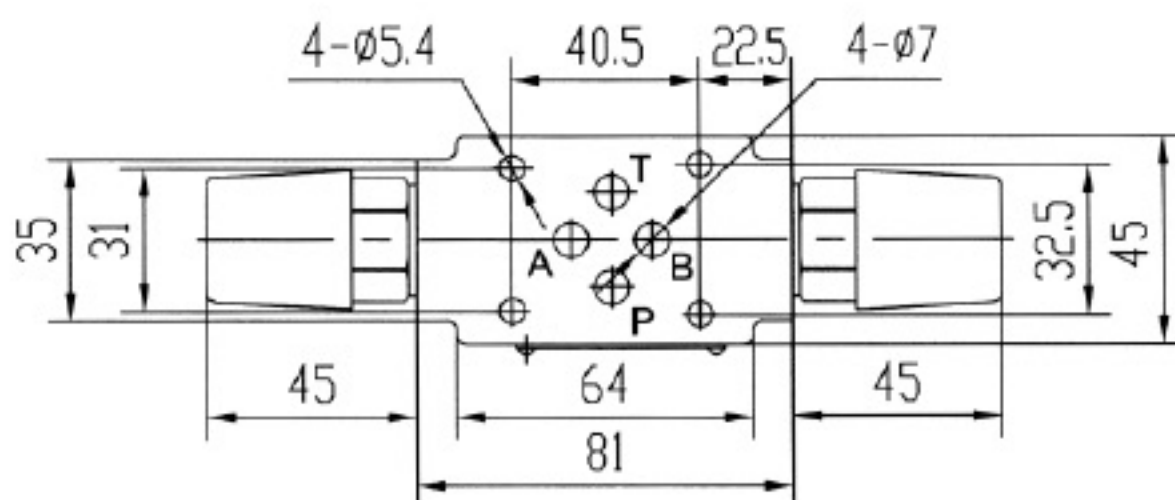
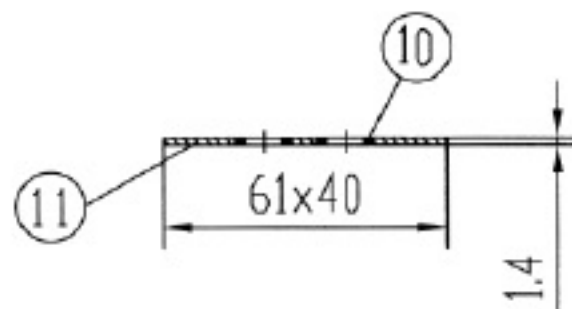
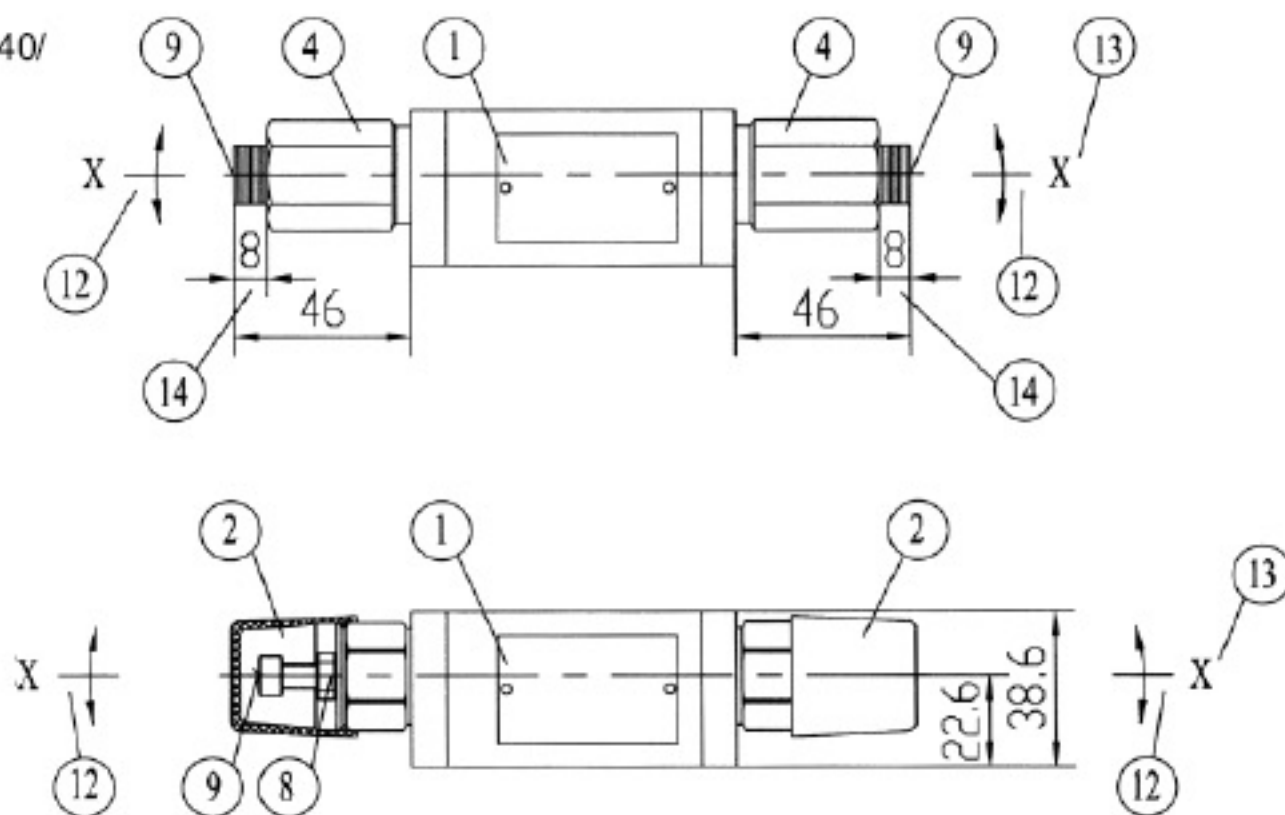
Type Z2FS 6 A.. - 40/



Type Z2FS 6 B.. - 40/



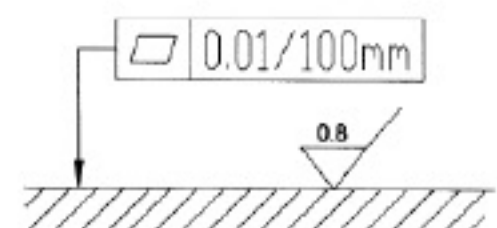
Type Z2FS 6- ... - 40/



- 1 Name plate
- 2 Adjustment element "2"
- 3 Adjustment element "3"
- 4 Adjustment element "4"
- 5 Adjustment element "7"
- 6 Space required to remove key
- 7 Valve fixing holes
- 8 Locknut 10 A/F
- 9 Adjustment screw/spindle to set flow
cross-section (internal hexagon 5 A/F)
- 10 O-ring 9.25 x 1.78 for ports A, B, P, T
- 11 O-ring plate
- 12 For all adjustment elements:
turn anti-clockwise = increases flow
turn clockwise = decreases flow
- 13 To change from meter-in to meter-out,
rotate the unit about the "X" - "X" axis
- 14 Stroke

Valve fixing screws
M5 --10.9 (GB/T70.1-2000)
Tightening torque $M_A = 8.9 \text{ Nm}$,

Required surface finish of
mating piece



Notice

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

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Double throttle/check valve, Type Z2FS 10...-30B/ (New Series)		RE:27501/12.2004
	Size 10	up to 31.5MPa	up to 160 L/min

Features:

- Sandwich plate valve
- Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP-RP 121 H
- For limiting the main or pilot fluid flow of 2 service ports
- 3 adjustment elements:
 - Lockable rotary knob with scale
 - Spindle with internal hexagon and scale
 - Rotary knob with scale
- For meter-in or meter-out control



Function , section

Valve type Z2FS 10...-30B/...is a double throttle/check valve in sandwich plate design.

It is used to limit the main or pilot flow of one or two service ports. Two symmetrically arranged throttle/check valves limit the flow in one direction and allow free-flow in the opposite direction. For meter-in control fluid passes from port A1 to port A2 via the throttling point (1), which is made up to the valve seat (2) and the throttling spool (3.1). The throttling spool (3.1) is axially adjustable via the spindle (4), thus allowing the throttling point (1) to be adjusted. At the same time the fluid in port A1 reaches spool side (6) via bore(5). The pressure present in addition to the spring force holds the throttle spool (3.1) in its throttling position. Flow flowing back from the service port B2 moves the throttle spool(3.2) against the spring (7) causing the valve to act as a check valve and allowing free-flow. Depending upon the way in which the valve is installed, the throttling effect can be arranged as a meter-in or meter-out control.

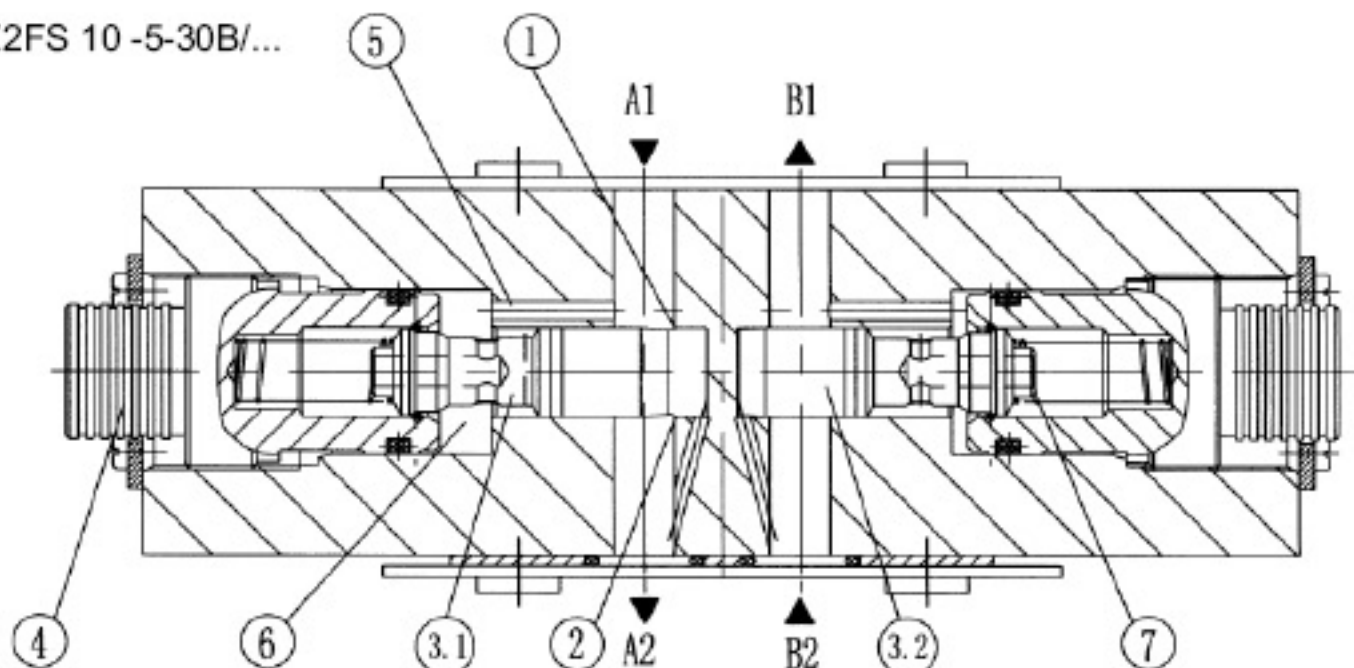
Limiting the main fluid flow

In order to change the velocity of an actuator (main fluid flow), the double throttle/check valve is installed between the directional valve and the sub-plate.

Limiting the pilot fluid flow

In pilot operated directional control valves, the double/throttle check valve is installed as a pilot choke adjustment (pilot fluid flow). It is fitted between the main valve and the pilot valve.

Type Z2FS 10 -5-30B/...



Ordering details

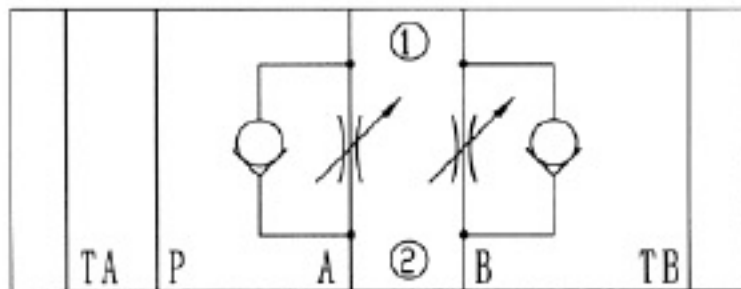
Z2FS 10 - 30 B / *

Double throttle/check valve		Further details in clear text
Nominal size 10 = 10		No code = Mineral oil V = Phosphate ester
Throttle/check valve ports A and B = - Throttle/check valve port A = A Throttle/check valve port B = B		<p>No code = (With two throttle/check valves) Meter-in /meter-out throttling, (this valve can be turned)</p> <p>S = (...A.-30B/S) meter-in on port A (...B.-30/S) meter-in on port B</p> <p>S2 = (...A.-30B/S2) meter-out on port A (...B.-30/S2) meter-out on port B</p> <p>S3 = (...A.-30B/S3) meter-out on port A (...B.-30/S2) meter-in on port B</p> <p>S4 = (...A.-30B/S4) meter-in on port A (...B.-30/S) meter-out on port B</p>
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		

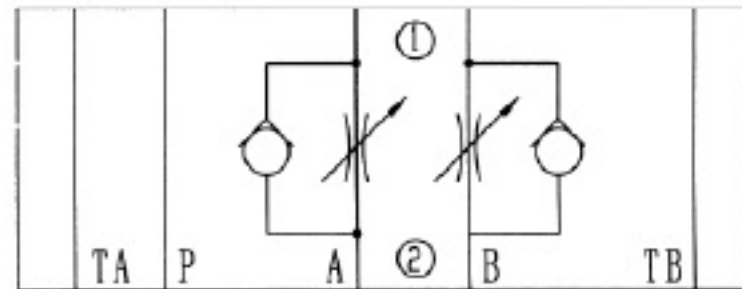
Note: Type Z2FS 10-.-30B/..has the same adjustment elements on ports A and B!

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

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

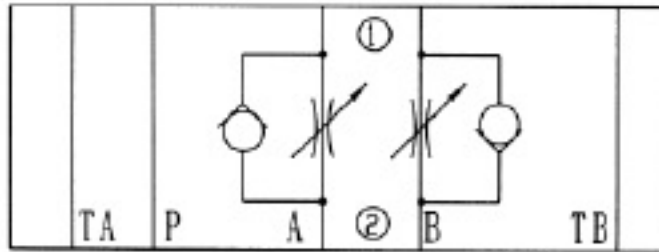


Z2FS10-.-30B/..(meter-out)

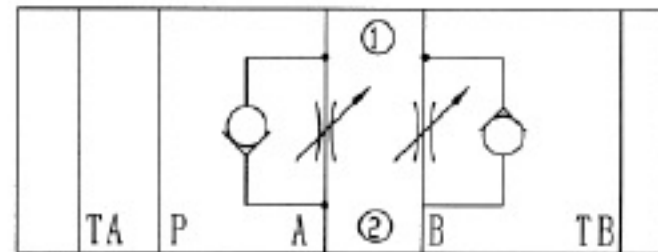


Symbols (① = valve side, ② = sub-plate)

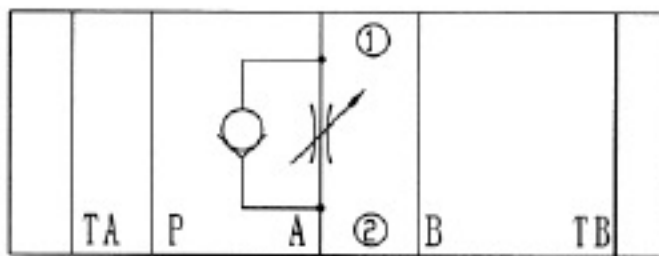
Z2FS10-...-30B/S3..(port A meter- out, port B meter-in)



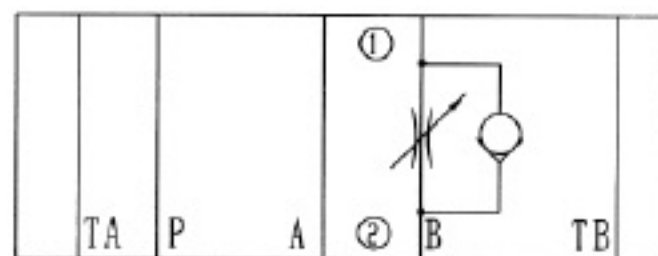
Z2FS10-...-30B/S4..(port A meter-in, port B meter-out)



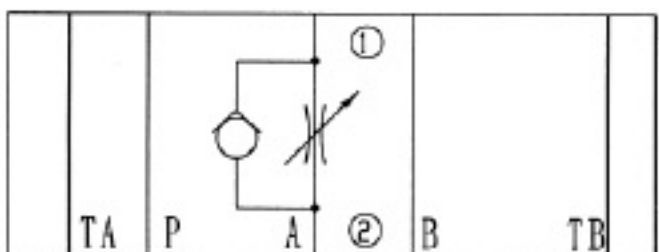
Z2FS10A-...-30B/S..(port A meter-in)



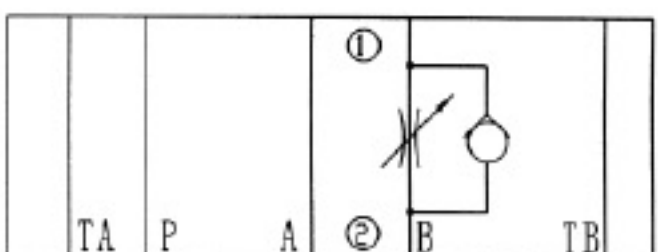
Z2FS10B-...-30B/S..(port B meter-in)



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



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

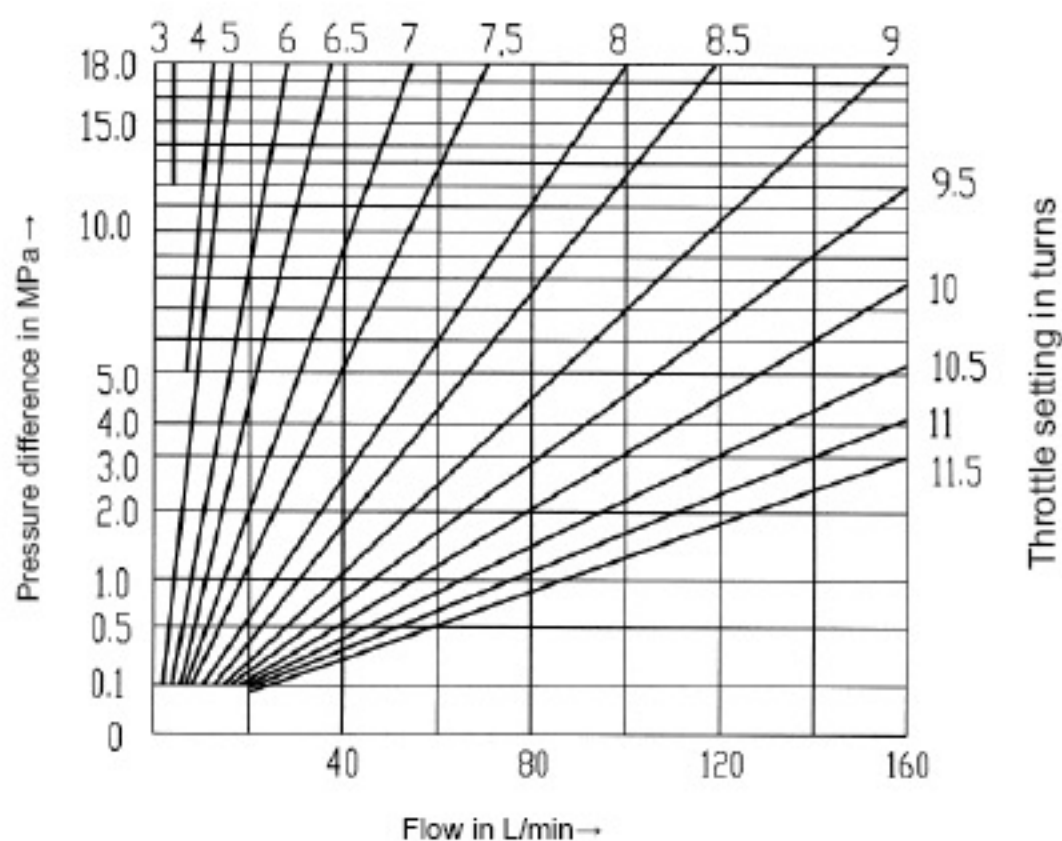


Technical data (for applications outside these parameters, please consult us!)

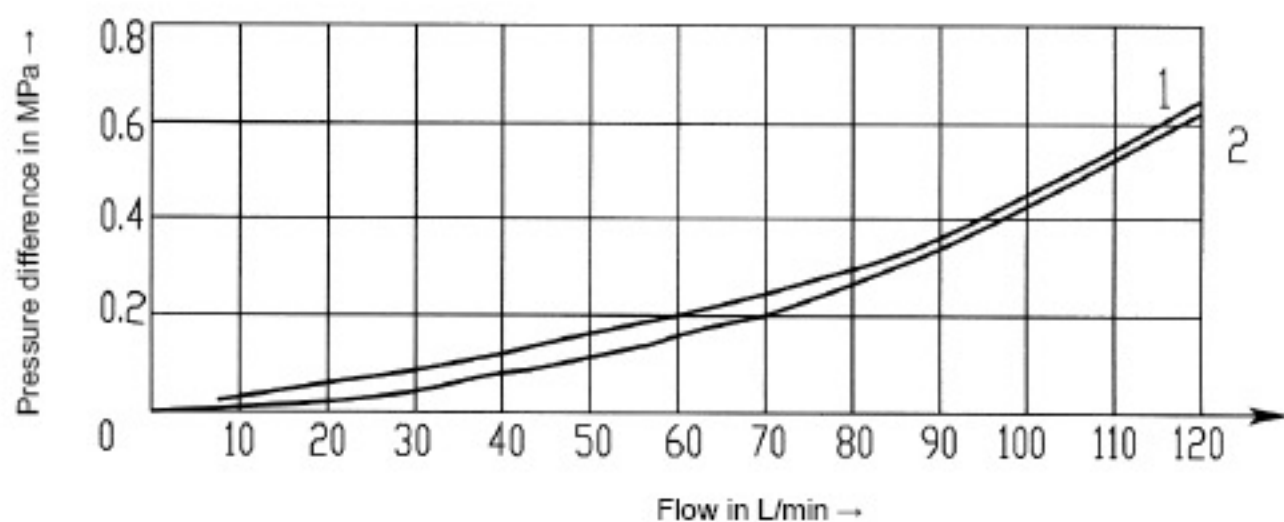
Pressure fluid		Mineral oil(for NBR seal) or Phosphate ester (for FPM seal)
Pressure fluid temperature range	(°C)	- 30 to + 80
Viscosity range	(mm ² / s)	10 to 800
Degree of contamination		Maximum permissible degree of contamination of the hydraulic fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{0.5} \geq 75$.
Maximum working pressure	(MPa)	up to 31.5
Maximum flow	(L/min)	up to 160
Weight	(kg)	approx.3.1

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

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

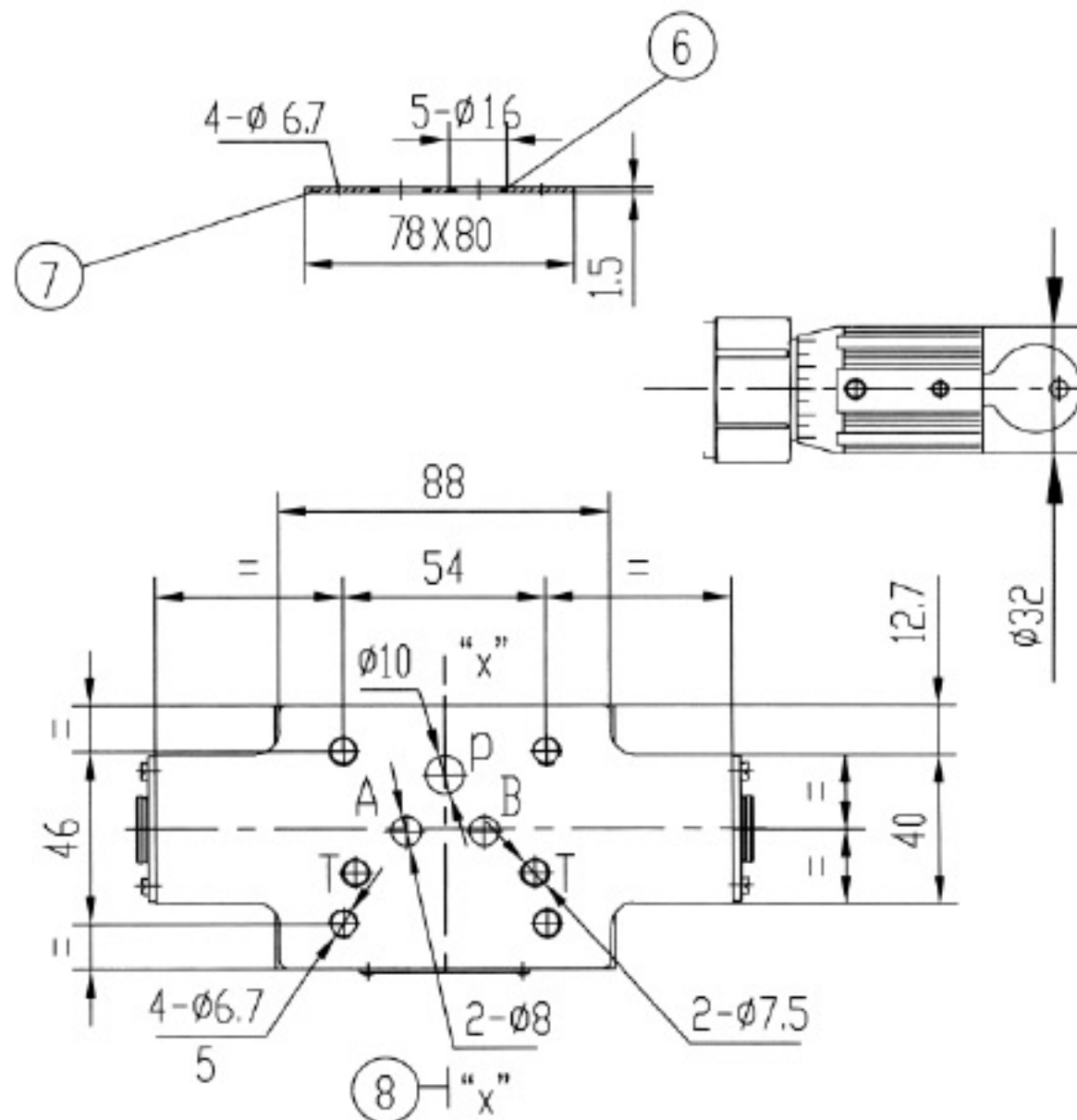
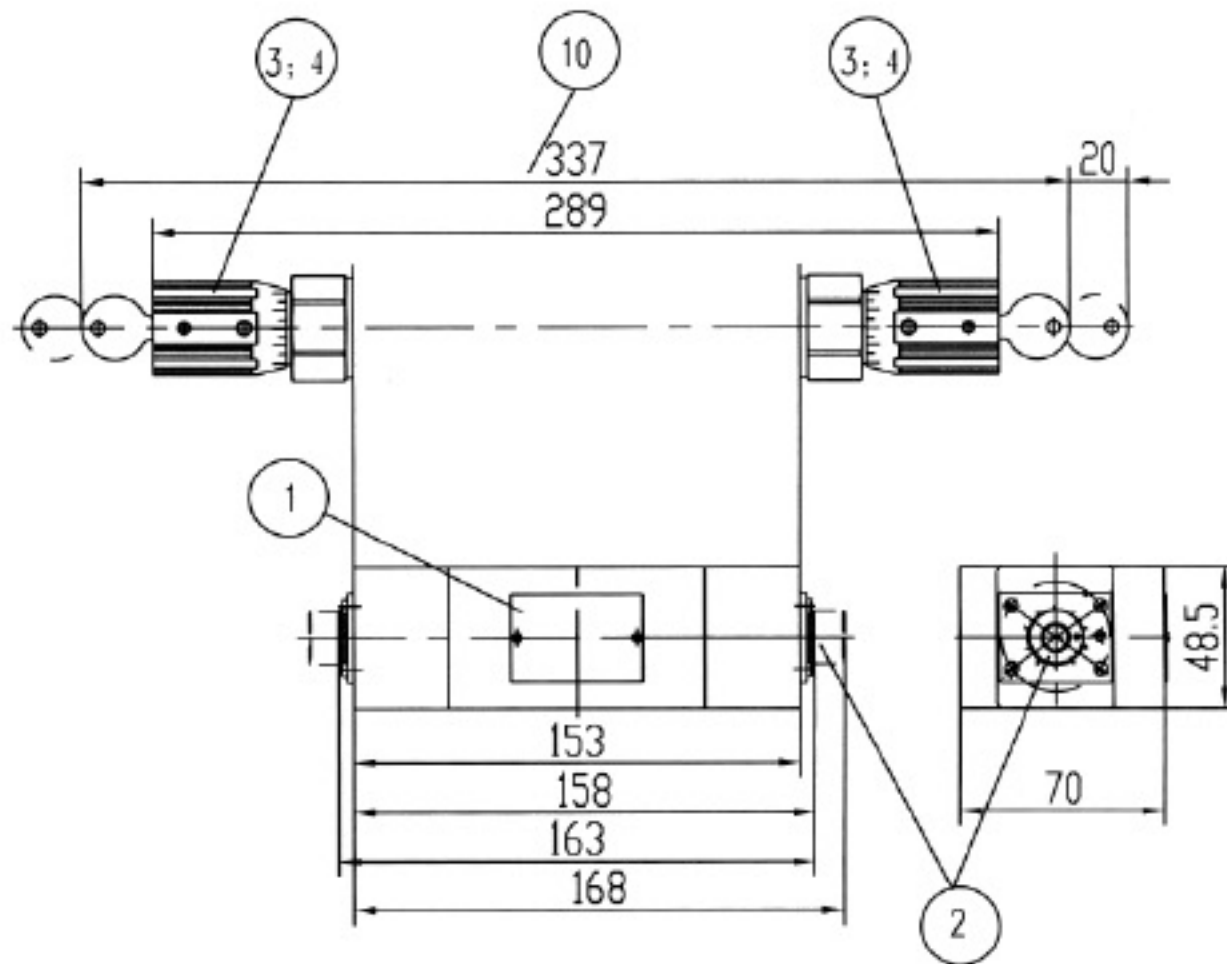


Pressure difference Δp in relation to the flow q_v across the check valve

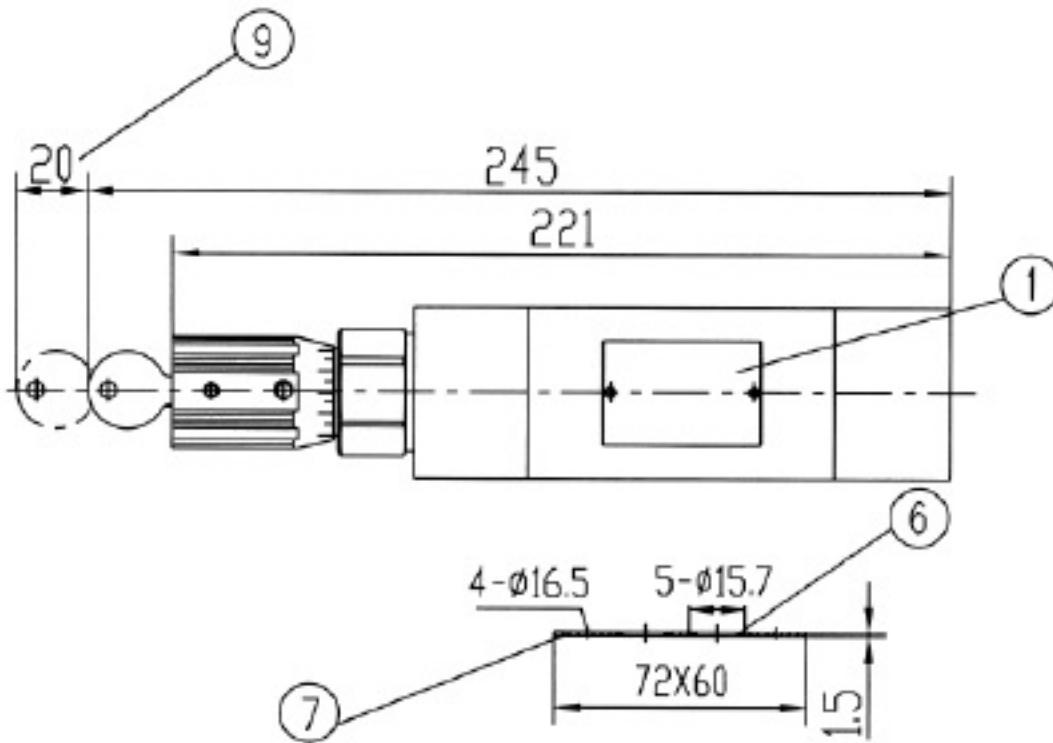


- 1 Throttle closed
- 2 Throttle open

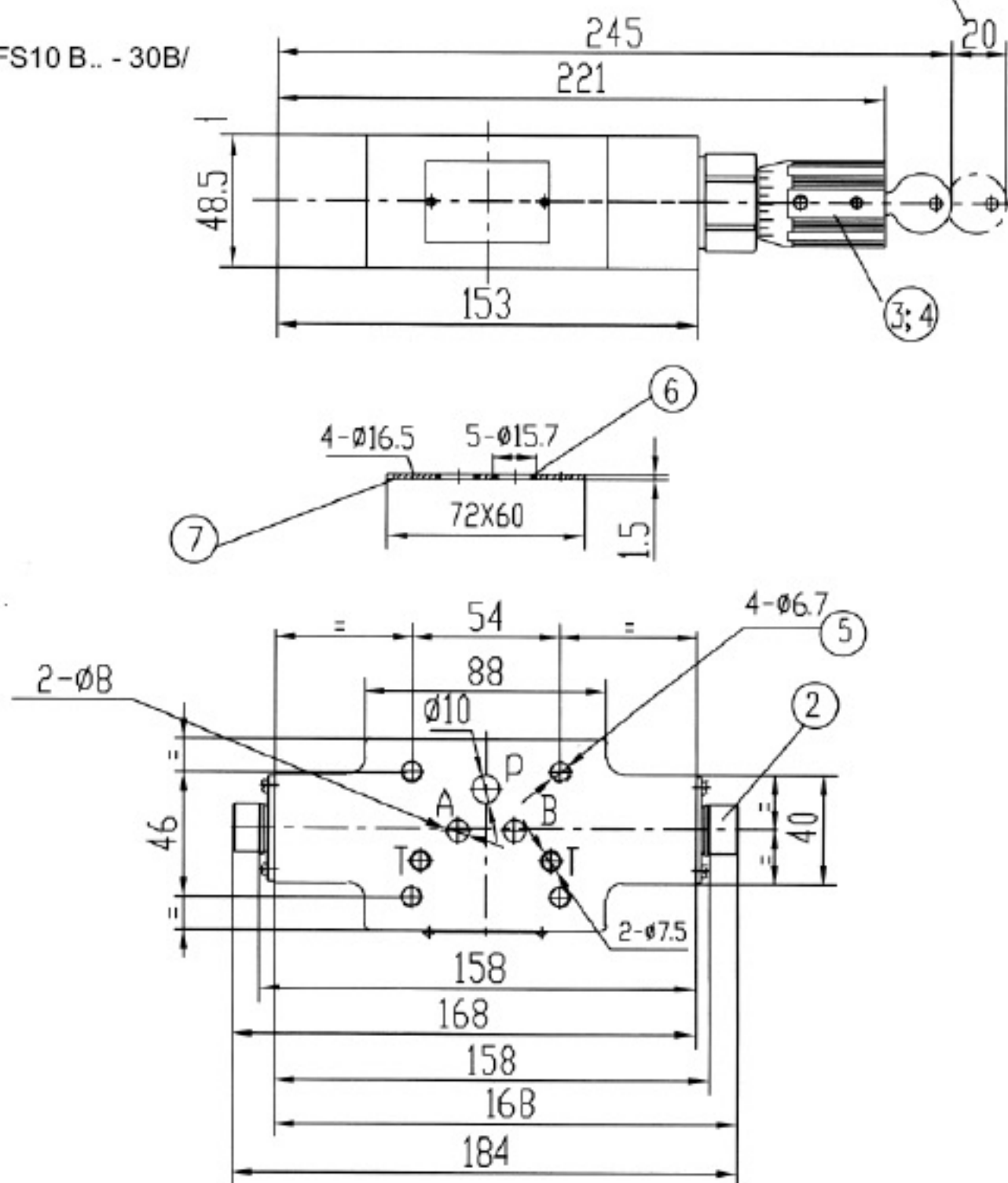
Type Z2FS 10..-30B/



Type Z2FS10 A.. - 30B/



Type Z2FS10 B.. - 30B/

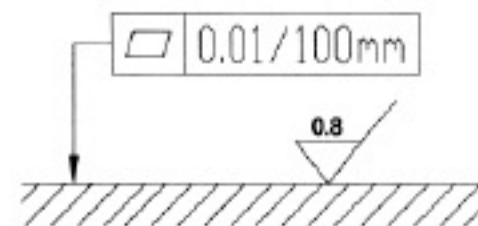


Unit dimensions**(Dimensions in mm)**

- 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 O-ring plate
- 8 To change from meter-in to meter-out, rotate the unit about the "X"- "X" axis
- 9 Space required to remove key
- 10 Only for adjustment "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 $M_A = 15.5 \text{ Nm}$.

Required surface finish of mating piece



Notice

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