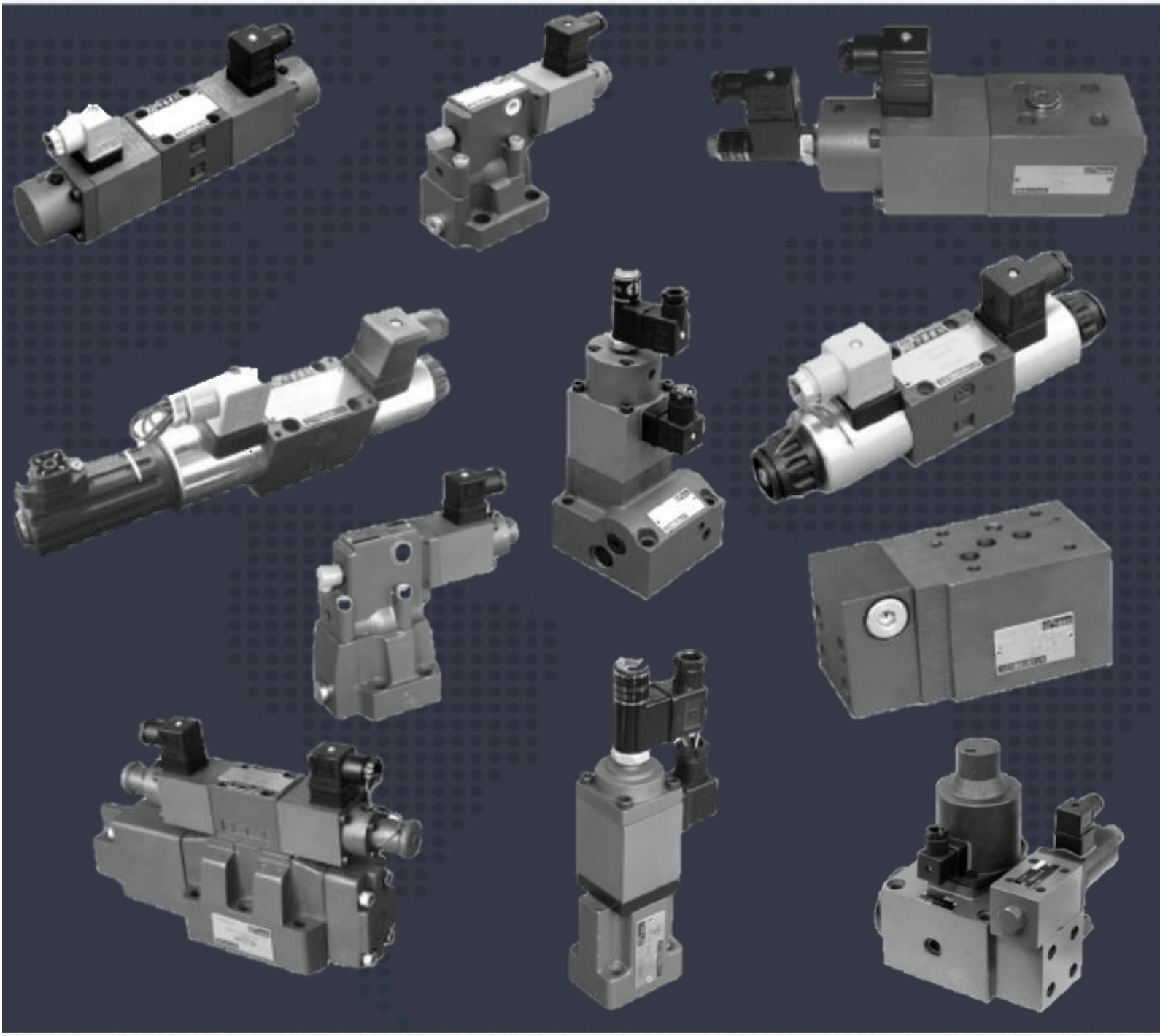
HUADE AMÉRICA

Catálogo de Produtos

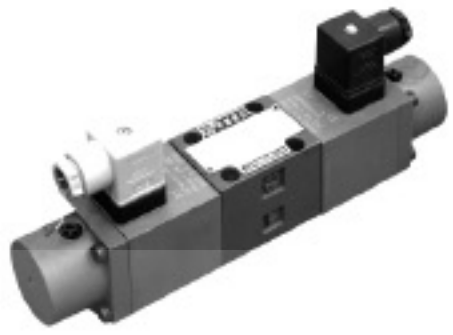


Proportional Valves – Huade América

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/2- and 4/3-way proportional directional valves, direct actuated,without electrical feedback, Type 4WRA			RC29053/9.2006
	Size 6, 10	up to 31.5 MPa	up to 95 L/min	Replaces: RC29053/08.2000

Features:

- Direct actuated proportional valve for controlling the direction and volume flow of a hydraulic fluid
- For subplate mounting
- For the open loop control of both direction and flow of a hydraulic fluid
- Spring centred control spool
- Low pressure drop across the control lands
- Both valve and electronic control from one supplier



Type 4WRA · · · 10B/24Z4/ · · ·

Function,section

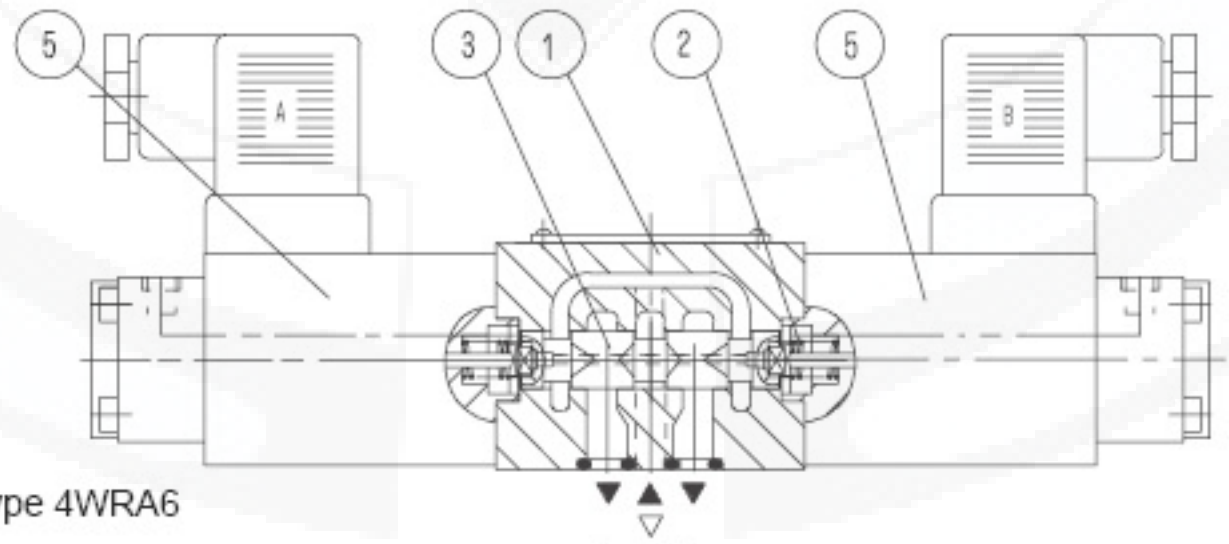
Type 4WRA directional control valves are direct-operated via proportional solenoids and are used to control the direction and quantity of a flow.

They consist basically of the housing (1), the control spool (3),one or two return springs (2),and in addition one or two proportional solenoids (5)

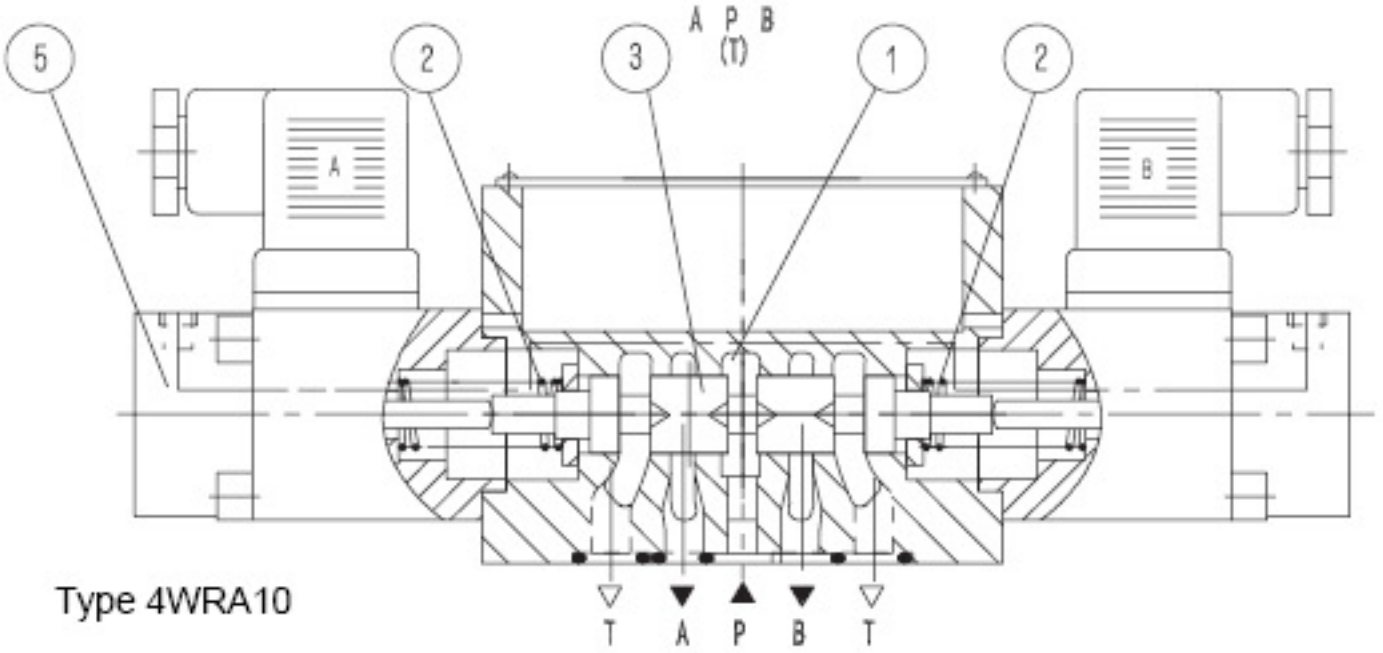
Type 4WRA $^{6}_{10}$.....10B/.....(3-position valve)

If the solenoids are not activated the control spool (3) is maintained in the neutral position by means of the return springs (2).Actuation of the control spool (3) is directly via the proportional solenoid (5). If, for instance, solenoid "A" is energised, it will push the control spool (3) to the right in proportion to the electrical signal.Connections are then made from P to B and A to T。

In this way,the control spool(3)causes the V-shaped grooves to open progressively to flow.When the propotional solenoid (5) is de-energised,the control spool(3) is returned to the center position by the return spring(2).



Type 4WRA6



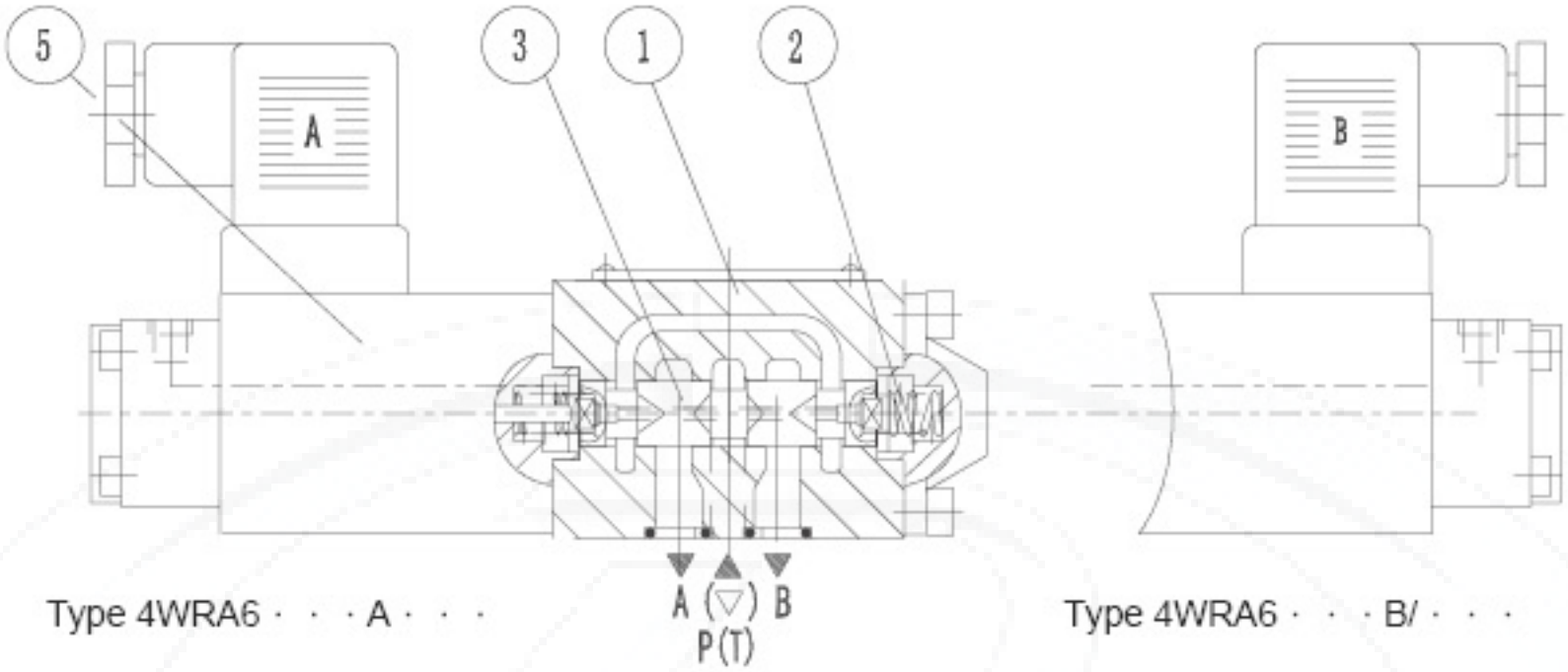
Type 4WRA10

4WRA $\frac{6}{10}$ ... $\frac{A}{B}$...10 (2-position valve)

The function of this valve is the same as that for valve type 4WRA.But it's 2-position directional valve with only one proportional solenoid.

Type 4WRA adopts subplate mounting ,spring center and low pressure drop acrossing the control lands.

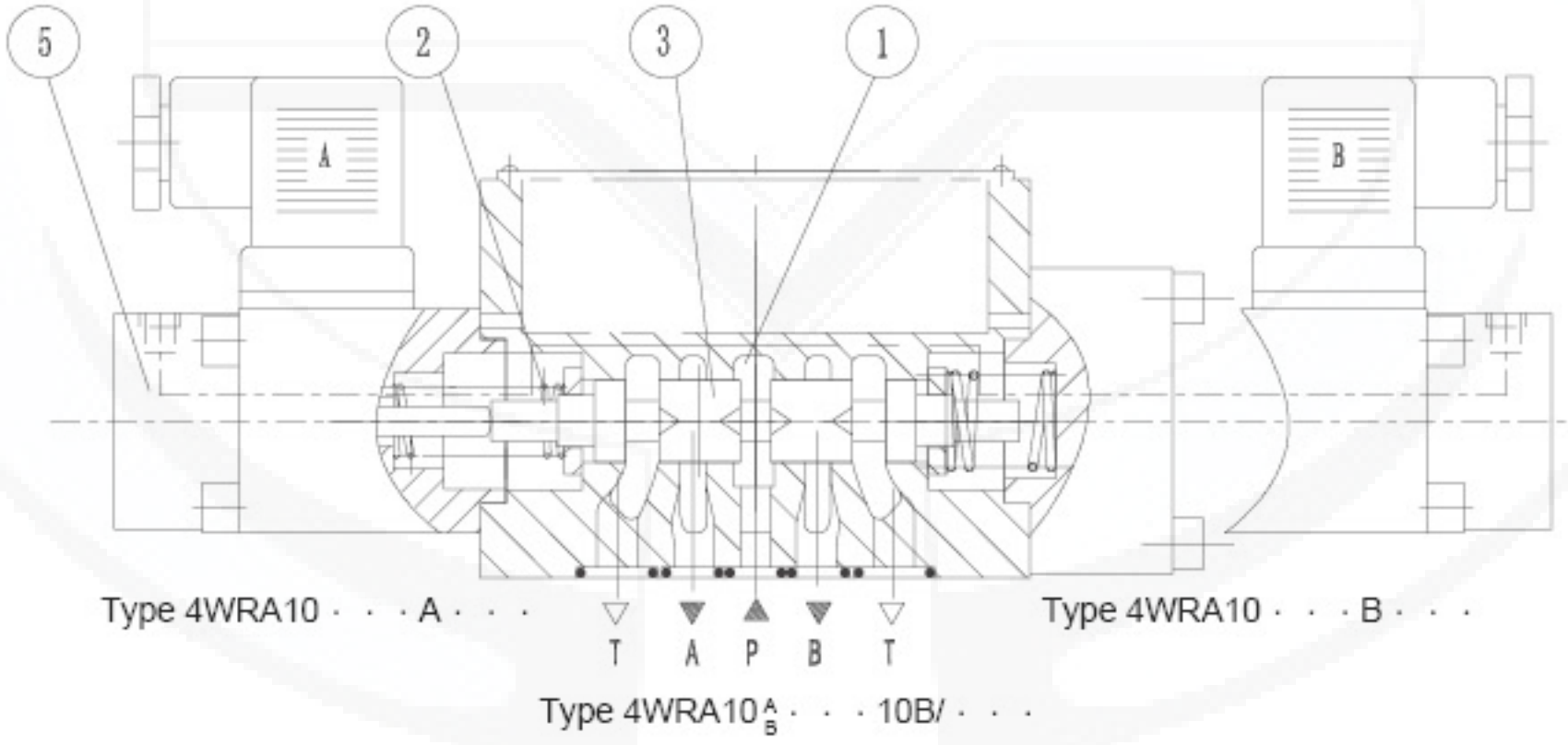
They often used in machine ,light industy ,metallurgy , mine ,space flight and other fields.



Type 4WRA6 · · · A · · ·

Type 4WRA6 · · · B/ · · ·

Type 4WRA6 $\frac{A}{B}$ · · · 10B/ · · ·



Type 4WRA10 · · · A · · ·

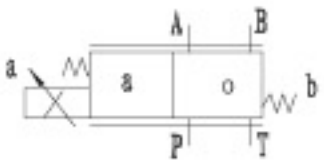
Type 4WRA10 · · · B · · ·

Type 4WRA10 $\frac{A}{B}$ · · · 10B/ · · ·

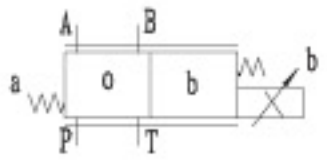
Symbols

Type 4WRA · · · 10B/ · · ·
Proportional valve (3-positions)

Type 4WRA · · · A · · · 10B/ · · ·
Proportional valve (2-positions)



Type 4WRA · · · B · · · 10B/ · · ·
Proportional valve (2-positions)

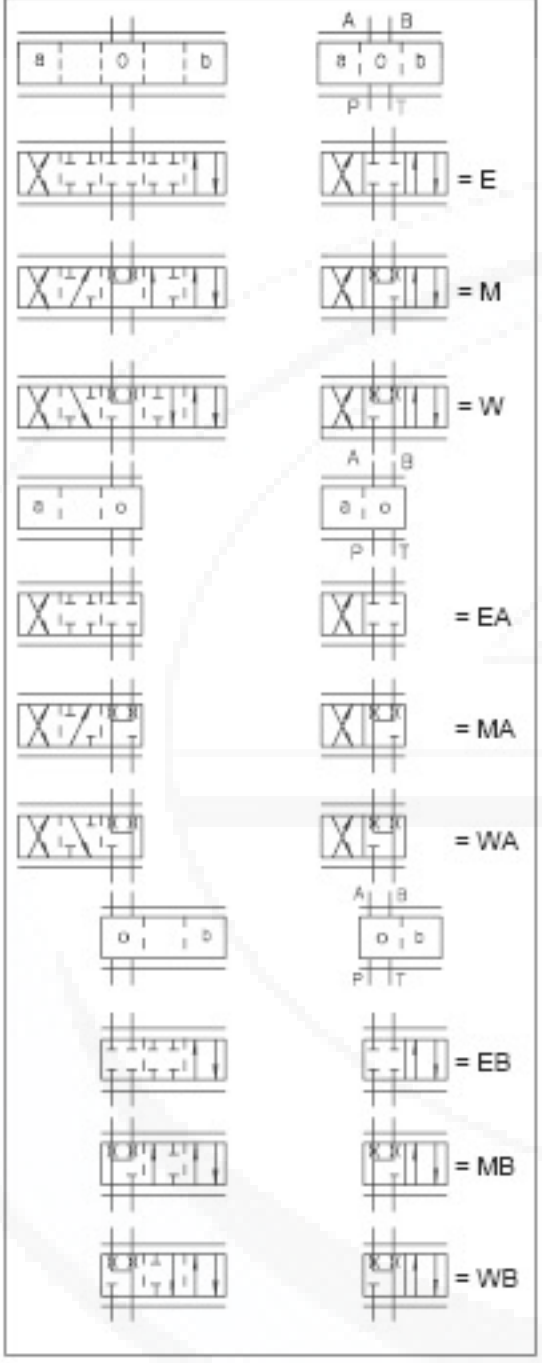


Ordering Code

4WRA | | | | 10 | B | / | | | | / Z_4 | *

Size 6 = 6
Size10 = 10

Symbols



Further details in clear text

M = mineral oils
V = phosphate ester

Z_4 = Plug-in to DIN 43 650

No code= Without special insulation
J = Seawater resistant

no code = Without emergency operator
N= with emergency operator

G24 = 24 VDC

B= Technology of Beijing Huade Hydraulic

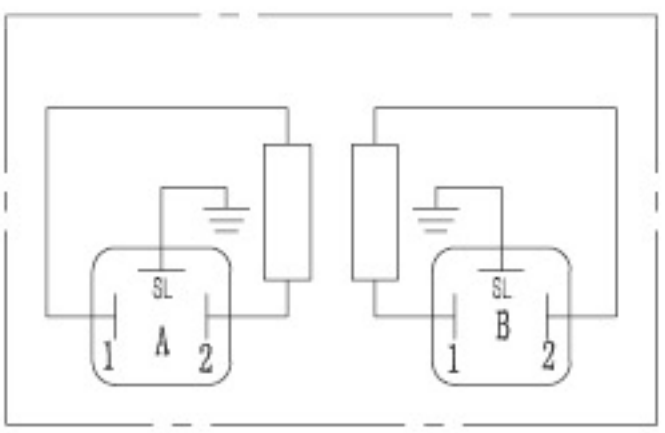
10 = Series 10 to 19
(10 to 19: unchanged installation and connection dimensions)

Nominal flow at 1Mpa valve pressure difference

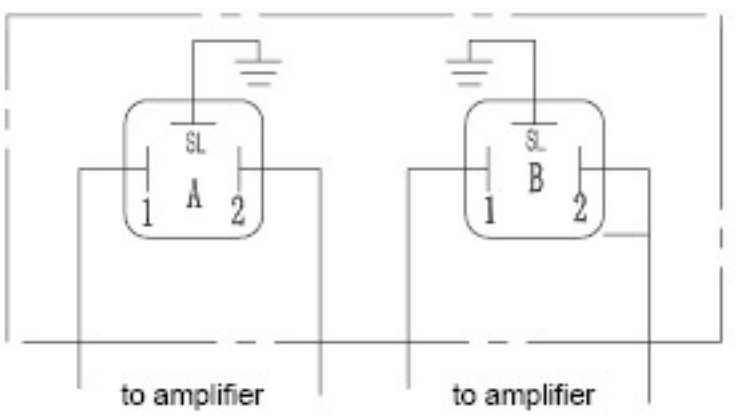
Size 6	5=	8L/min
	10=	13L/min
	20=	17L/min
Size 10	10=	18L/min
	20=	27L/min
	40=	50L/min

Electrical connection with type 4WRA

Coil connection



plug-in connection



Technical data (For application outside these parameters,Please consult us!)

Hydraulic data

size			6	10
Operating pressure (MPa)	port A,B,P		31.5	31.5
	port T		16	16
Flow		(L/min)	43	95
Degree of contamination			⩽ 20(recommend ⩽ 10)	
Hysteresis		(%)	< 6	< 5
Repeatability		(%)	< 3	< 2
Frequency reponse(-3dB,signal ± 100%)		(Hz)	6	4
Pressure fluid			Mineral oil(for NBR seal),Phosphate ester (for FPM seal)	
Viscosity range		(mm^2/s)	3.8 to 380	
Pressure fluid temperature range		(°C)	-30 to +80	
Weight (Kg)	Valve with one solenoid		1.75	5.9
	Valve with two solenoids		2.5	7.5

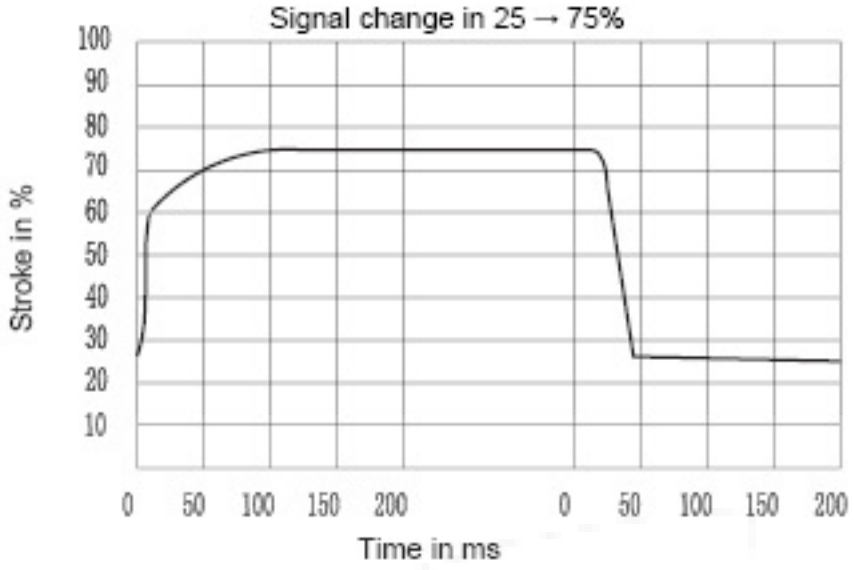
Electrical data

size		6	10
Voltage type		Direct voltage	Direct voltage
Nominal voltage	(V)	24	
Max. current per solenoid	(A)	1.5	
Solenoid coil resistance (Ω)	Cold value at 20°C	5.4	10
	Max. warm value	8.1	15
Environment temperature	(°C)	up to +50	
Coil temperature	(°C)	up to +150	
Insulation of valve to DIN 40 050		IP65	
Associated amplifier (24 V rectifier of bridge type)		VT-3013 S30 VT-3017 S30	VT-3014S30 VT-3018S30

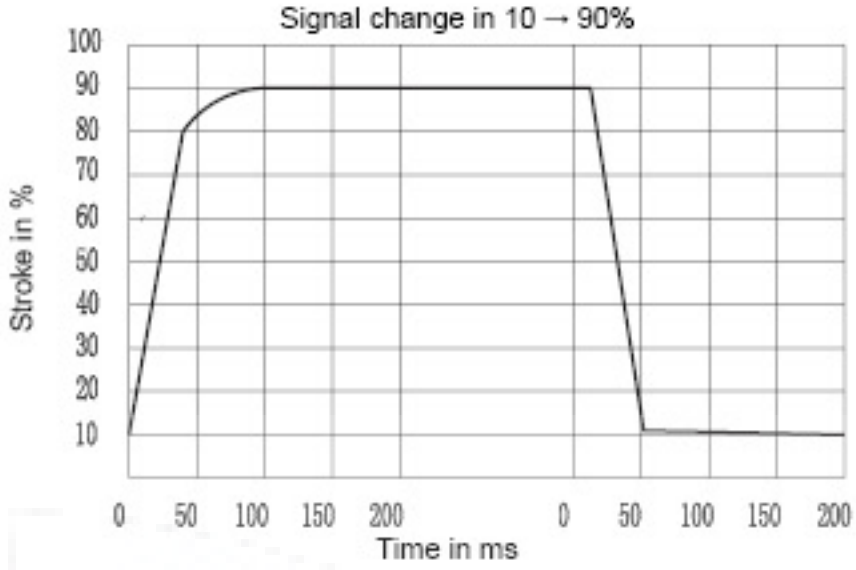
Characteristic curves:(measured at v =36 × $10^{-6}m^2/S$ t=50°C)

Type 4WRA6

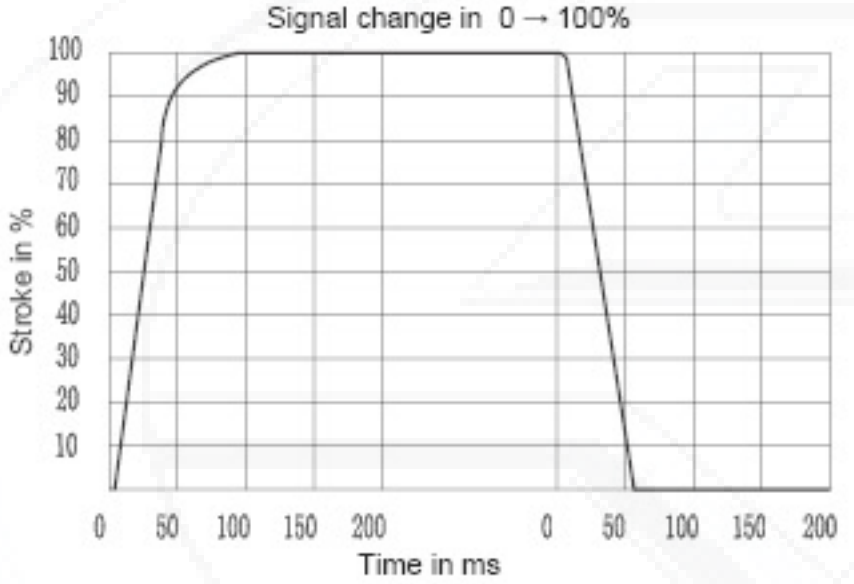
Signal change in 25 → 75%



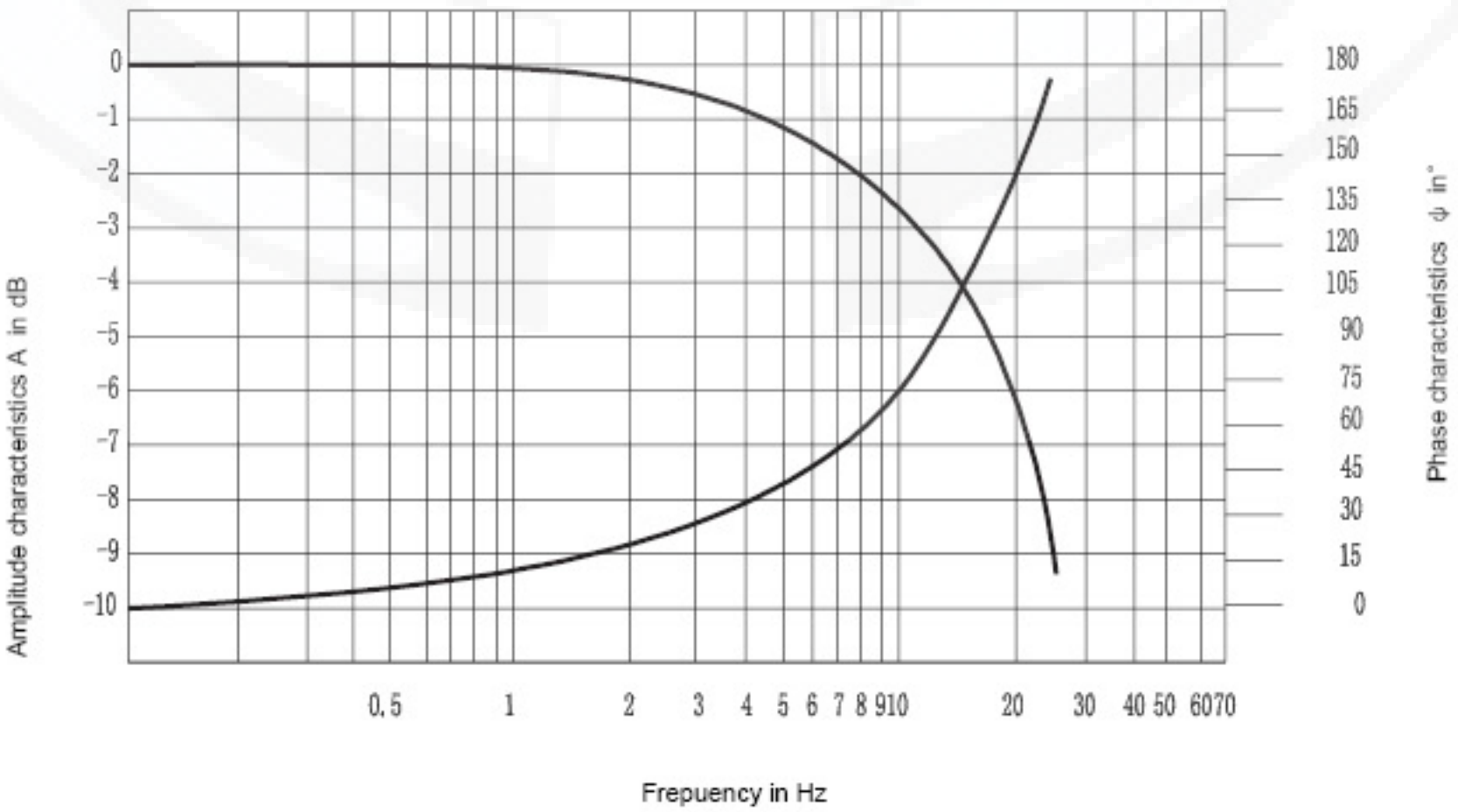
Signal change in 10 → 90%



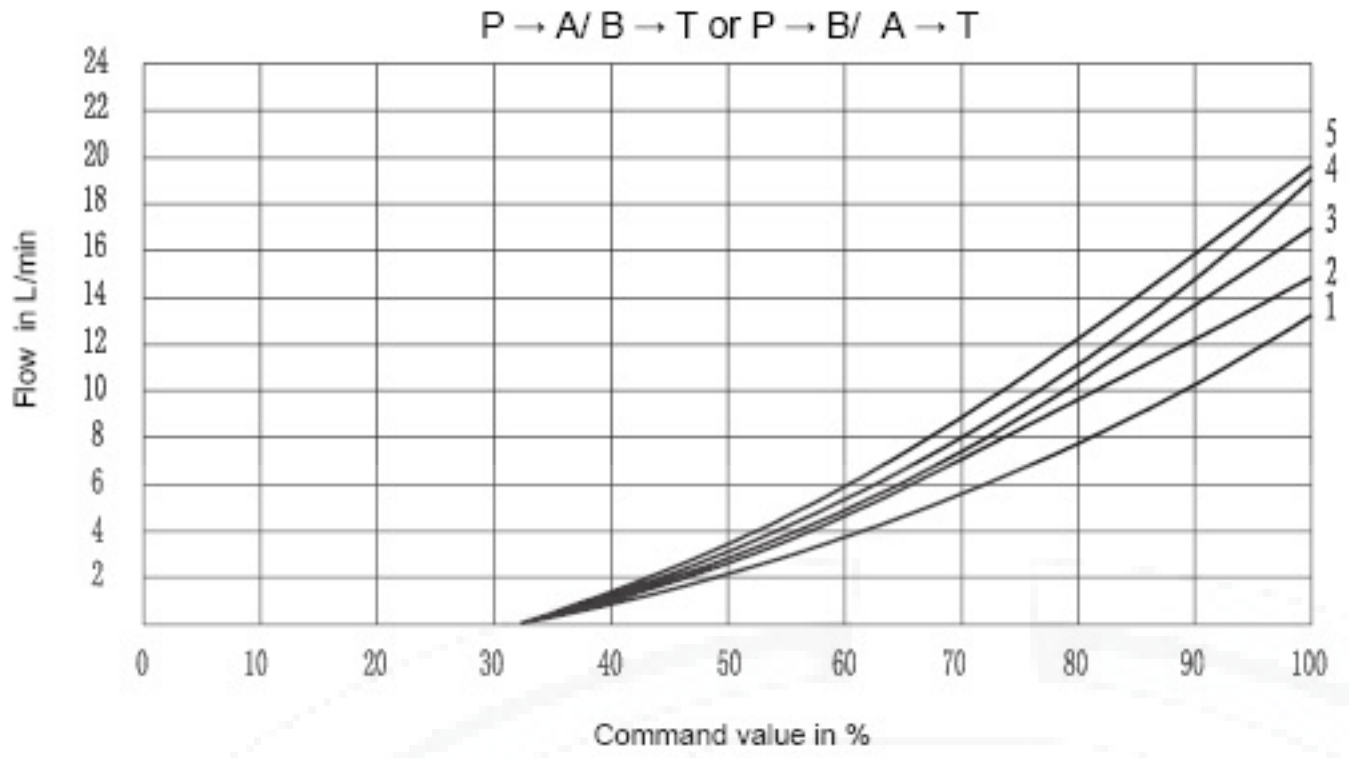
Signal change in 0 → 100%



Signal change in 50 ± 25%

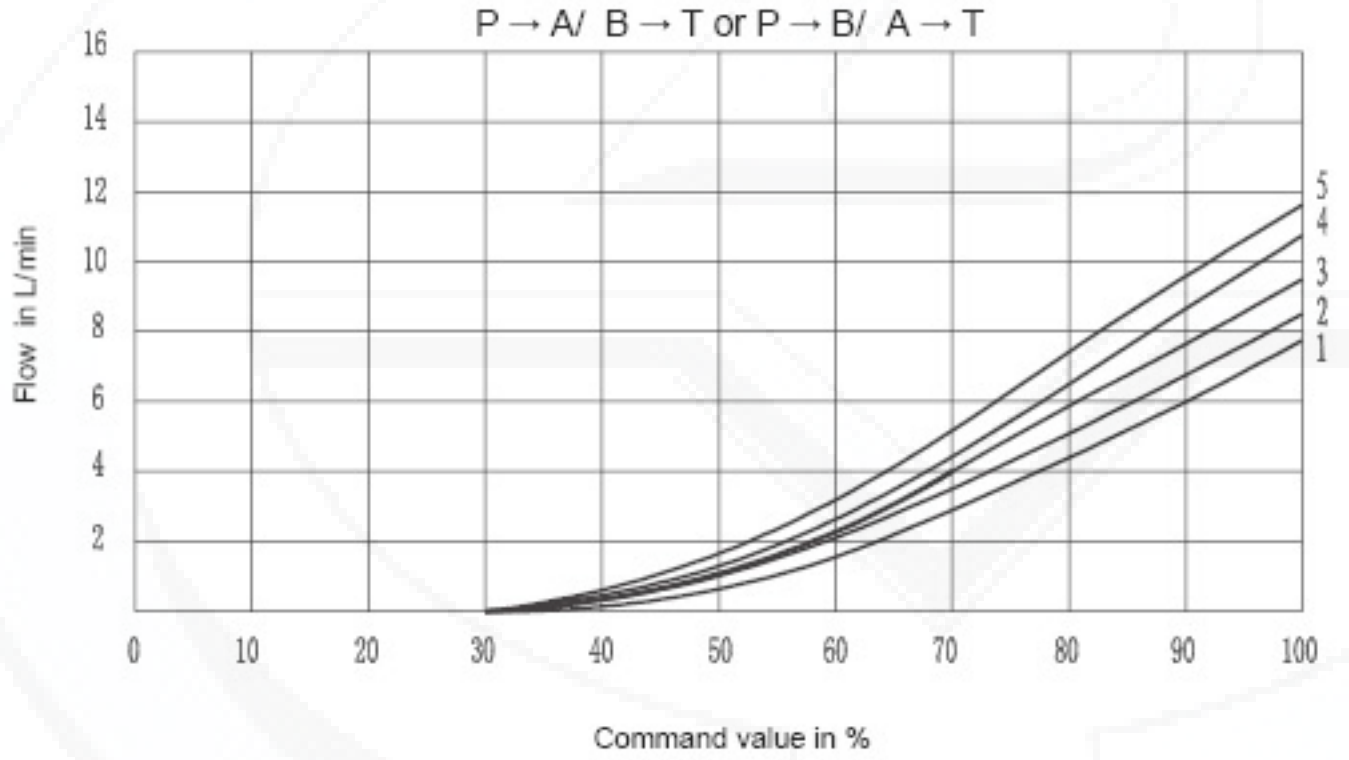


Characteristic curves: (measured at v =36 × $10^{-6}m^2/S$ and t=50°C)



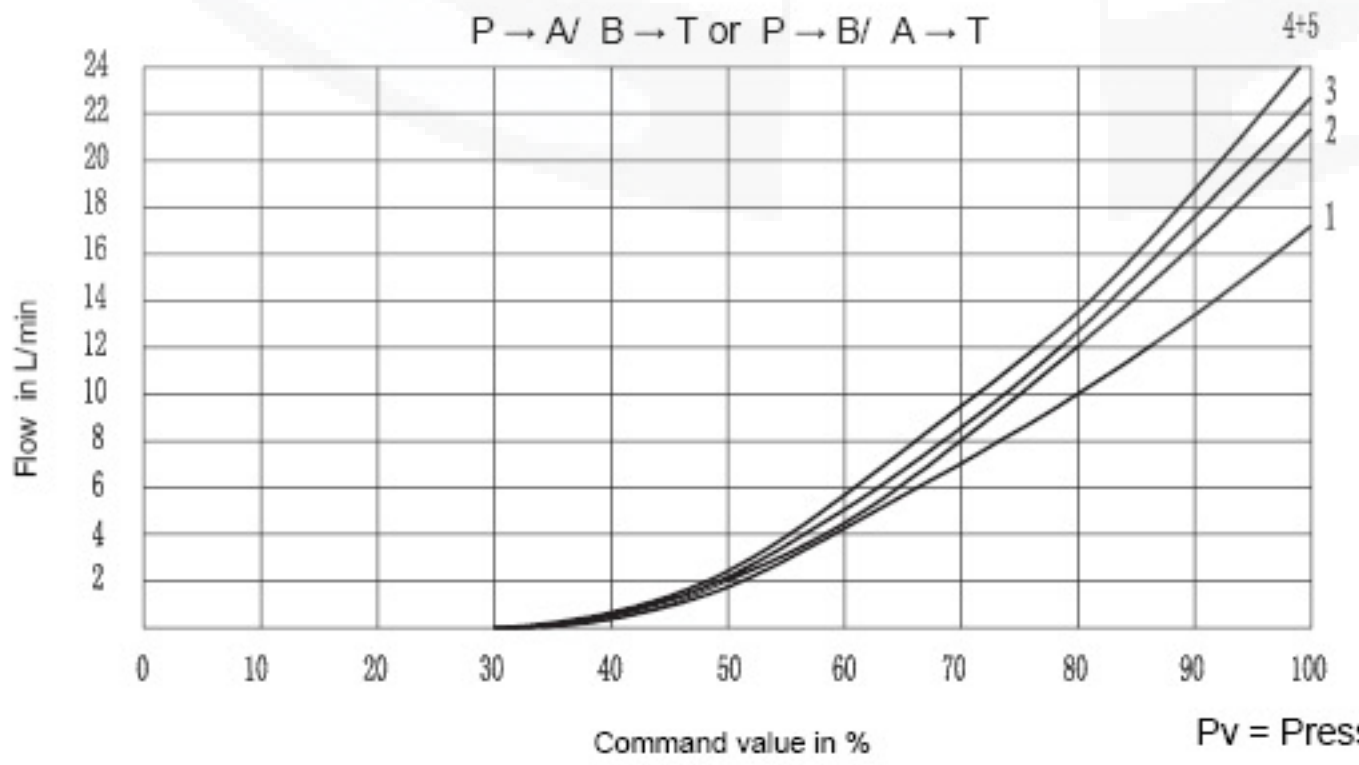
13L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



8L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



17L/min Nominal flow at 1MPa valve pressure difference

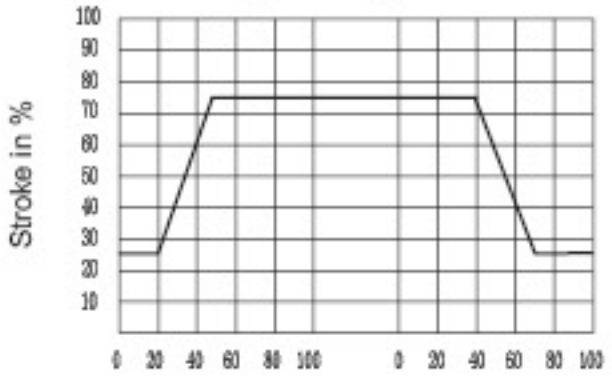
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Pv = Pressure drop across valve (Input pressure minus load pressure and return pressure)

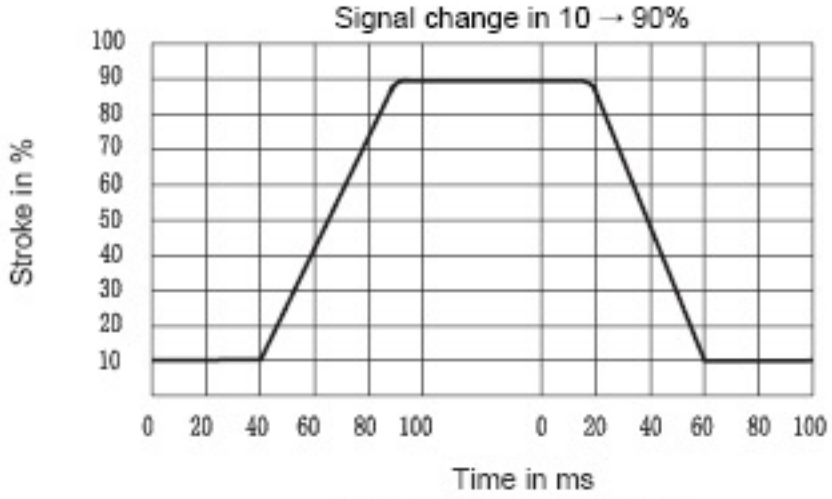
Characteristic curves: (measured at v =36 × $10^{-6}m^2/S$ and t=50°C)

Type 4WRA10

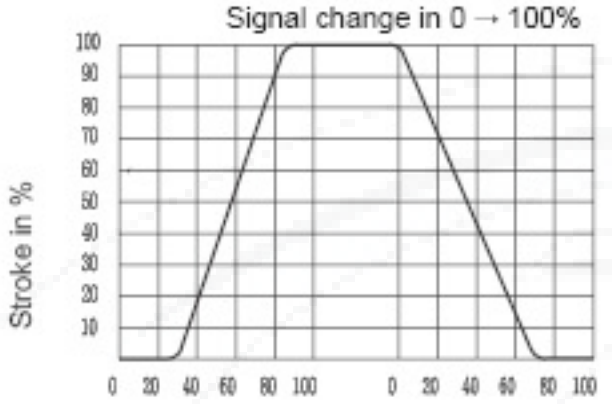
Signal change in 25 → 75%



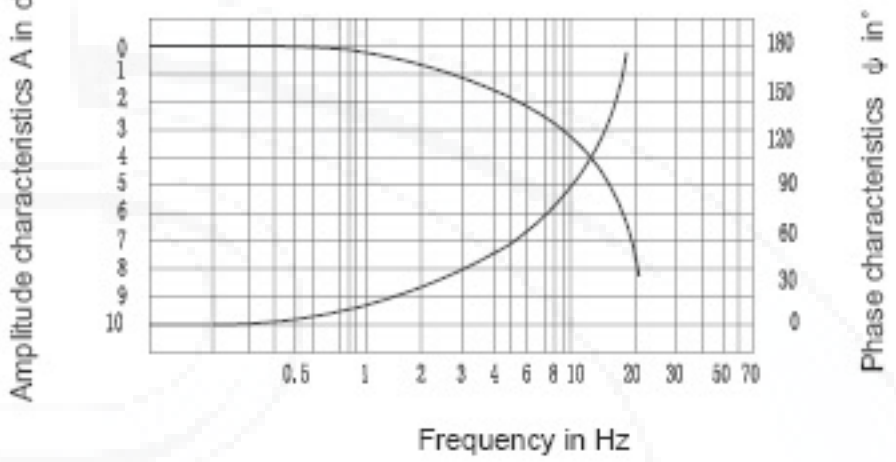
Signal change in 10 → 90%

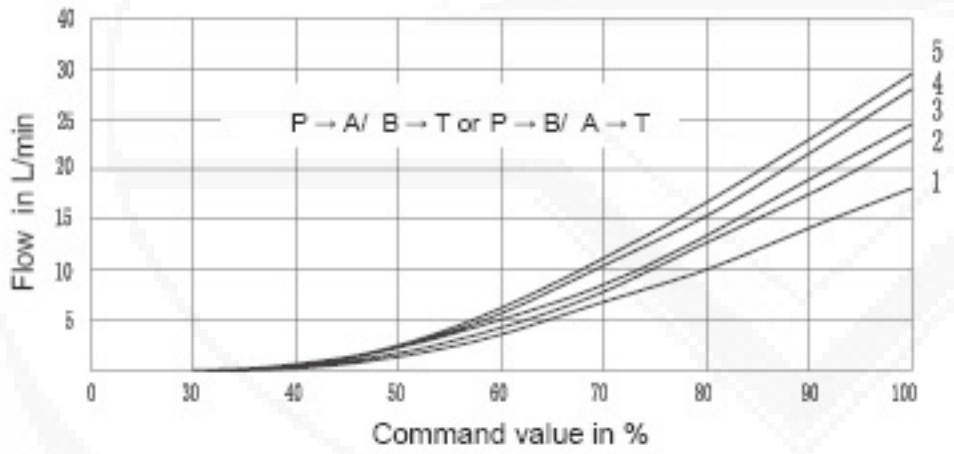


Signal change in 0 → 100%

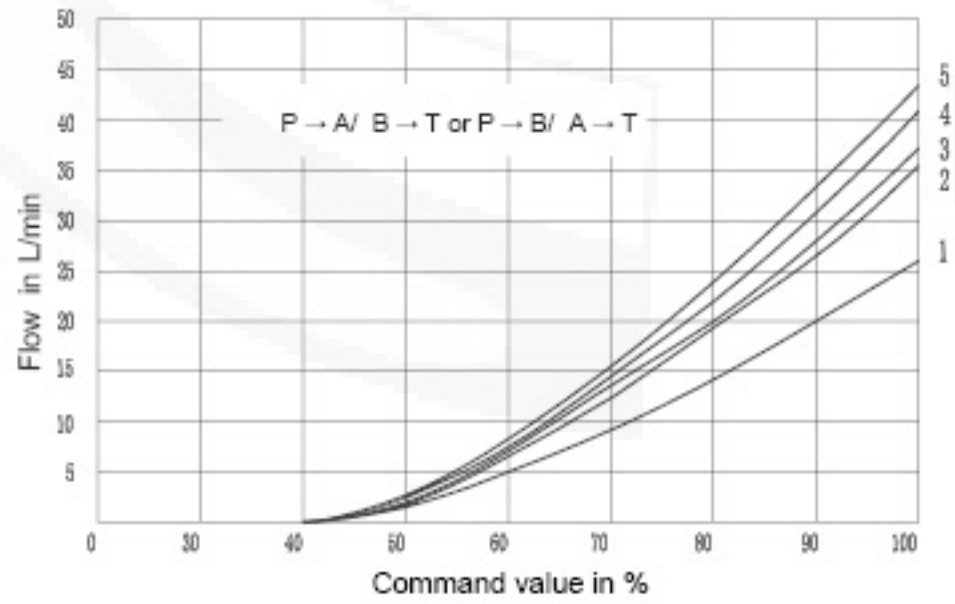


Signal change in 50 ± 25%

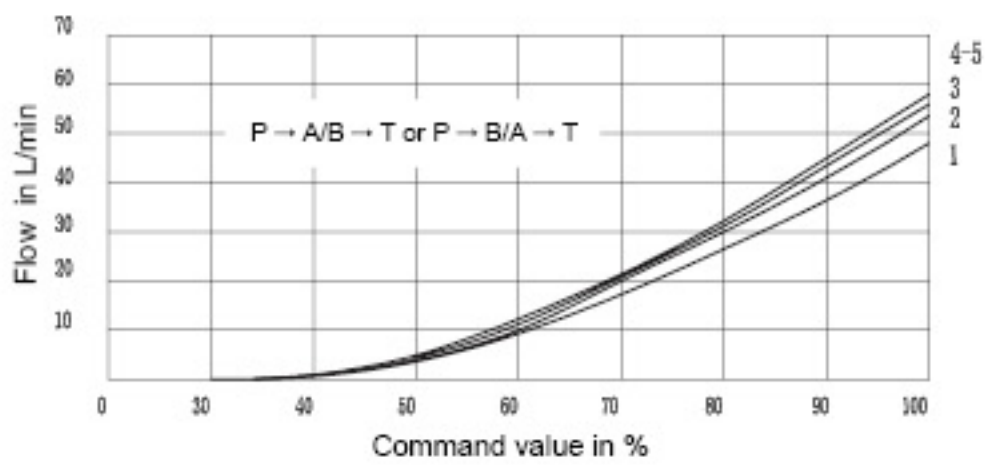




18L/min Nominal flow at
1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



27L/min Nominal flow at
1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



50 L/min Nominal flow at
1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Pv = Pressure drop across valve
(Input pressure minus load pressure and return pressure)

Power Limits:

Type 4WRA6 power limits of

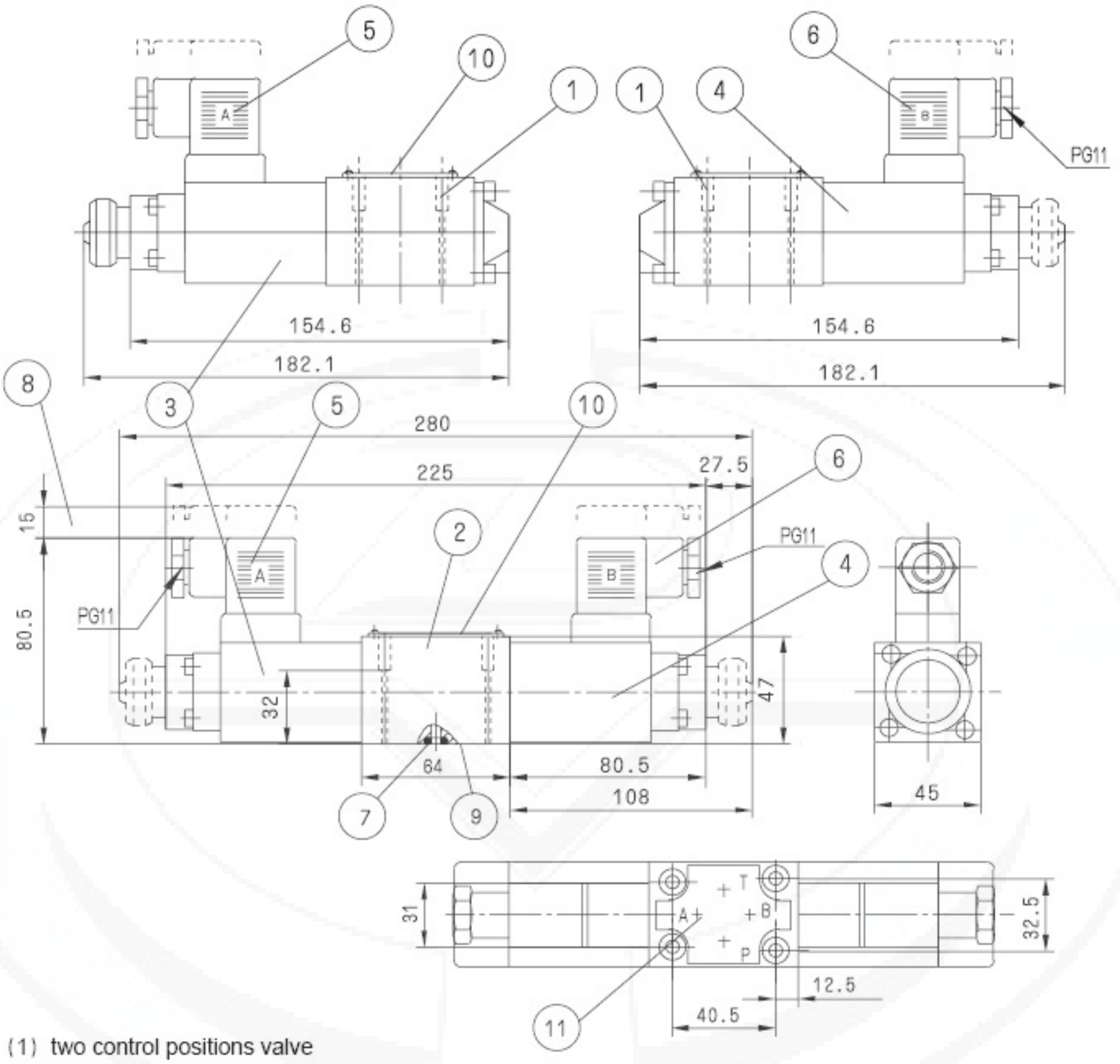
Flow (L/min) / Symbol	Pressure（MPa）				
	6	12	16	24	31.5
E.M.W5 EA.MA.WA5 EB.MB.WB5	13 (27)	14 (27)	14 (27)	14 (26)	14 (*)
E.M.W10 EA.MA.WA10 EB.MB.WB10	20 (40)	20 (37)	19 (34)	17 (31)	16 (*)
E.M.W20 EA.MA.WA20 EB.MB.WB20	22 (43)	22 (37)	20 (34)	19 (32)	18 (*)

Type 4WRA10 Power limits of

Flow (L/min) / Symbols	Pressure（MPa）				
	6	12	16	24	31.5
E.M.W10 EA.MA.WA10 EB.MB.WB10	22 (52)	24 (48)	24 (47)	24 (45)	24 (*)
E.M.W20 EA.MA.WA20 EB.MB.WB20	36 (67)	36 (61)	34 (58)	33 (53)	31 (*)
E.M.W40 EA.MA.WA40 EB.MB.WB40	50 (95)	46 (83)	42 (77)	38 (73)	34 (*)

Note:( )Valves in brackets are applicable for double flow through the valve
(*)Becauses of the max.tank pressure of 24MPa double flow throught the valve is in possible。

Unit dimensions:type 4WRA 6 **(Dimensions in mm)**

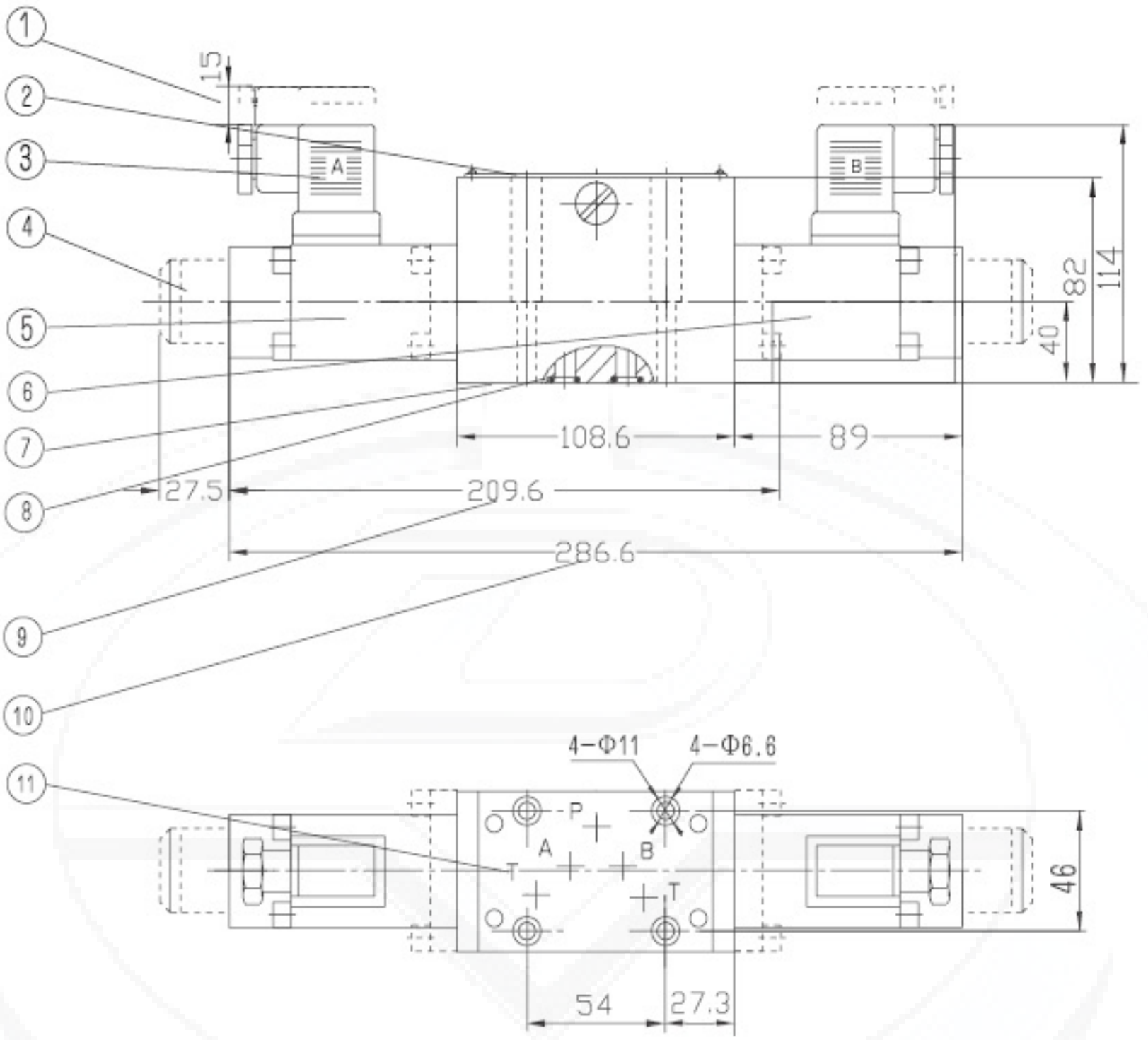


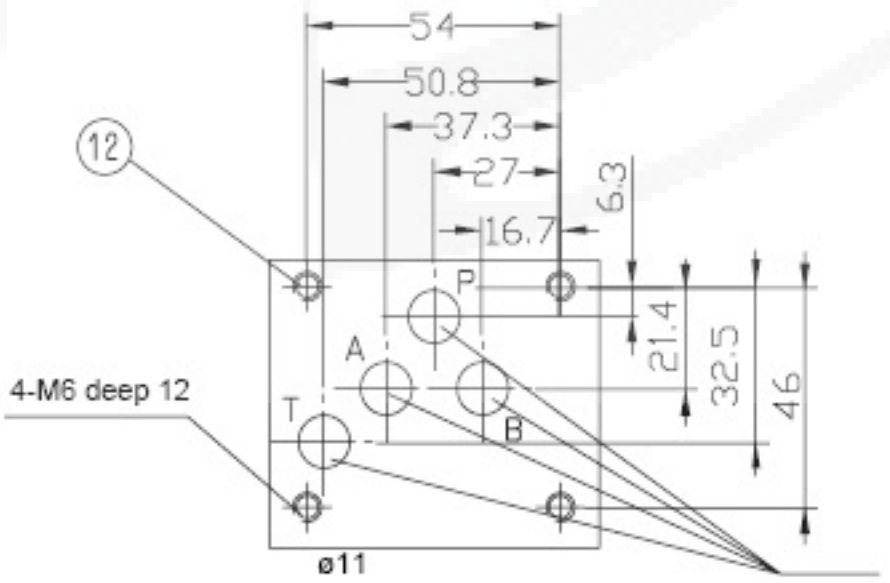
(1) two control positions valve
(2) three control positions valve
(3) Proportional solenoid"a"
(4) Proportional solenoid"b"
(5) Plug(grey)
(6) Plug(black)
(7) O-ring 9.25X1.78
(8) Space required to remove the plug
(9) Valve mounting face with ports positions
(10) Nameplate
(11) Ports positions
(12) Dimensions of valve mounting face

Subplates :G341/01;G342/01;
G502/01

see Page 80

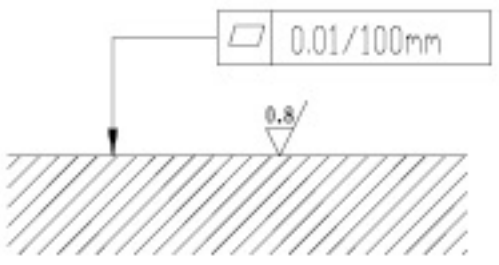
Unit dimensions type 4WRA10 Dimensions **(Dimensions in mm)**





(1) Space required to remove the plug
(2) Nameplate
(3) plug:(A)grey,(B)black
(4) Emergency hand operators
(5)Proportional solenoid "a"
(6)Proportional solenoid "b"
(7) Valve mounting face with ports positions
(8) O-ring 12X2
(9)Dimension of 2-position valve
(10) Dimension of 3-position valve
(11) Ports positions
(12) Dimensions of valve mounting face
Subplates:G66/01;G67/01;G534/01
See Page 81

Required surface finish of mating piece



BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	4/2 and 4/3 Proportional Directional Valves Direct Control, Type 4WRE, Series 1X,with electrical feedback			RC29056/9.2006
	Size 6 and10	up to 31.5MPa	up to 260L/min	Replaces: RC29056/08.2000

Features:

- Valve for controlling both direction and flow of a hydraulic fluid
- For subplate mounting
- Electrical position feedback
- Spring centred control spool
- Low pressure drop across the control lands
- Both valve and electronic control from one supplier
- Mounting pattern to DIN 24 340 form A,ISO4401 and CETOP-RP121H.

Type 4WRE6 · · · 10B/24Z4/ · · ·

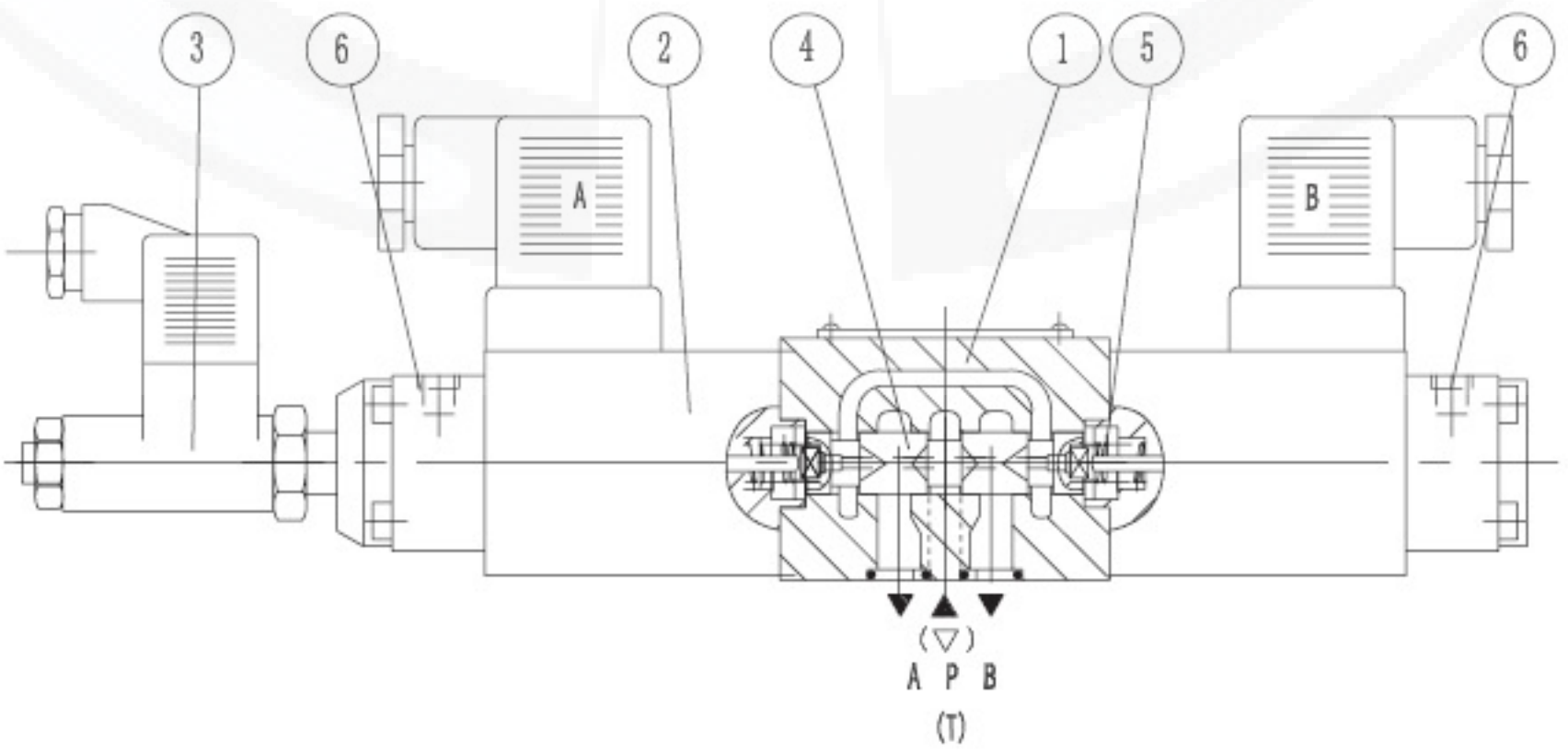
Function ,Section

Type 4WRE directional valves are direct operated by means of proportional solenoids and are used to control the direction and volume of a flow.

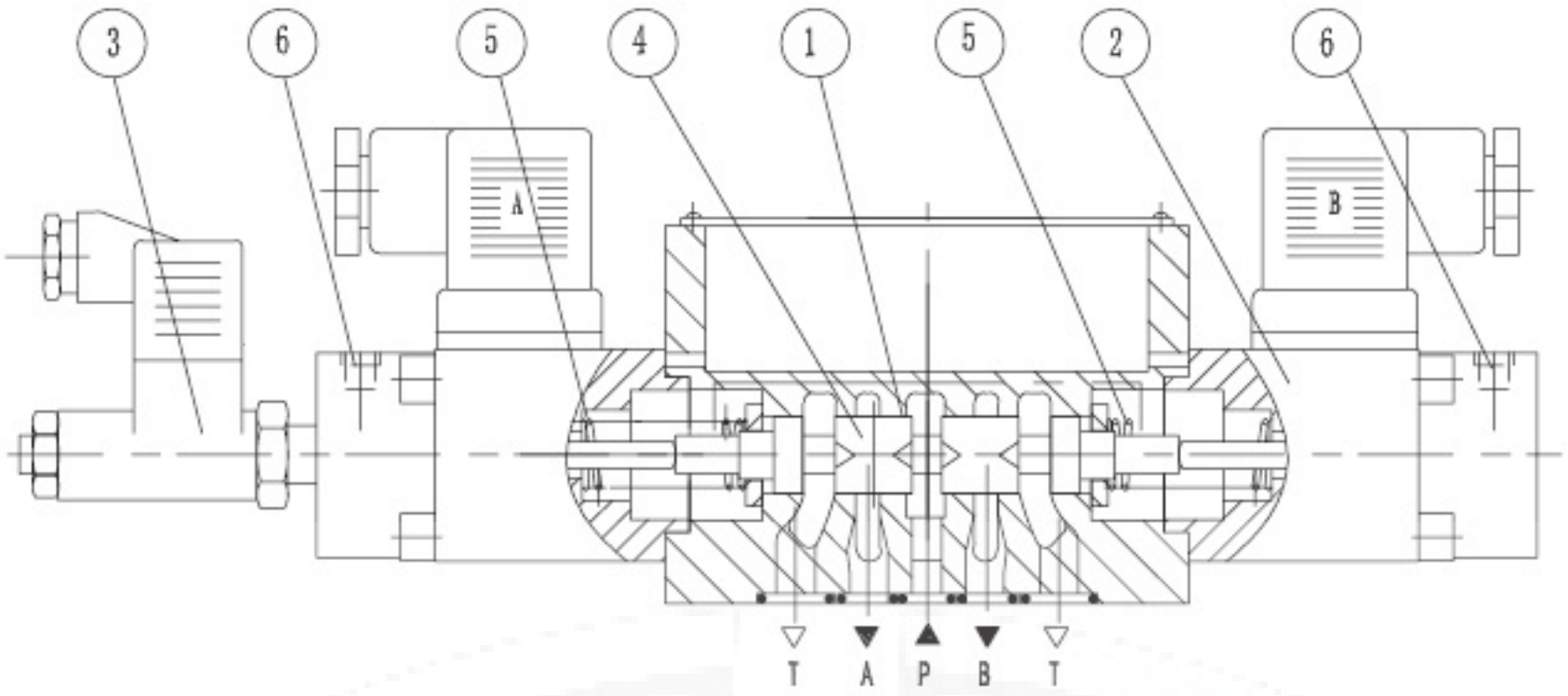
They consist basically of housing (1), control spool (4), two return springs (5), two proportional solenoids (2) and a positional transducer (3).

Type 4WRE $\frac{6}{10}$ · · · 10B/ · · · (3-position)

If the solenoid "a" (2) is energised,the spool is moved to the right, the travel being proportional to the electrical input signal.The control spool (4) causes the V-shaped grooves to open progressively to flow.The position of the control spool (4) is monitored by the positional transducer (3). In the electronic control the actual position of the control spool is compared with the pre-set value. Here we have a position control circuit which recognizes existing differences between the pre-set value (command value) and the feedback value (actual value) and corrected by appropriate signals on the relevant solenoids.Once solenoid "a" (2) is de-energised the control spool is returned to its centre position by the return springs (5).

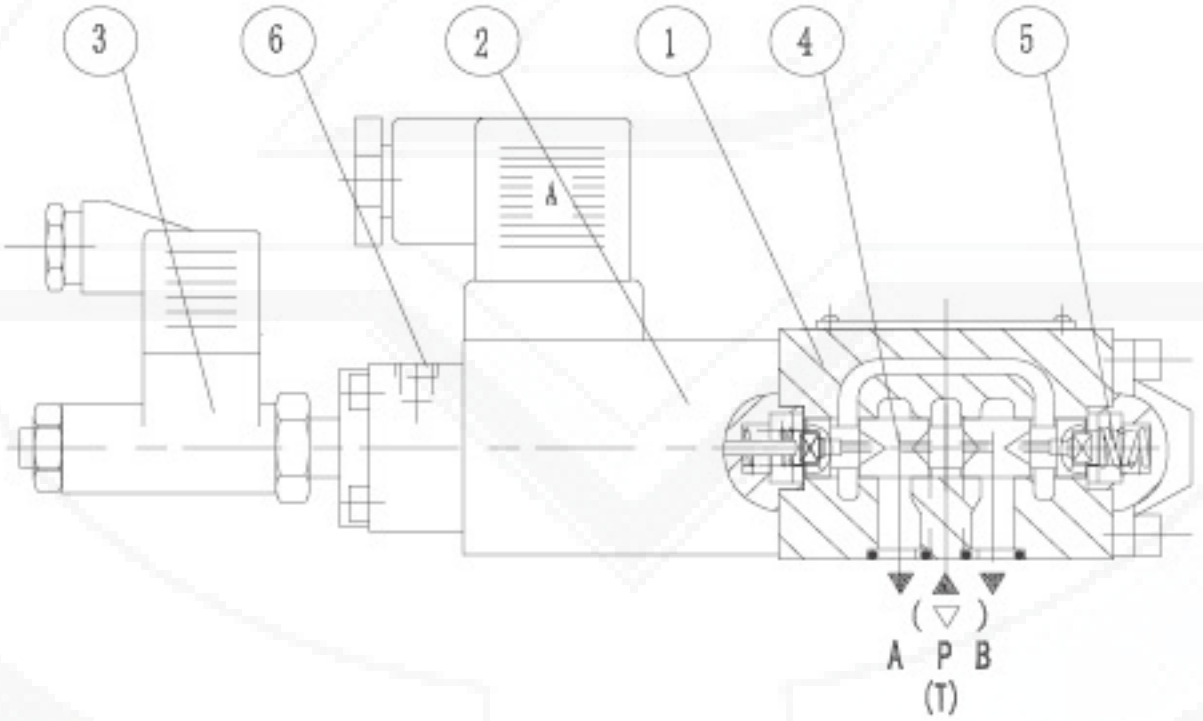


Type 4WRE6

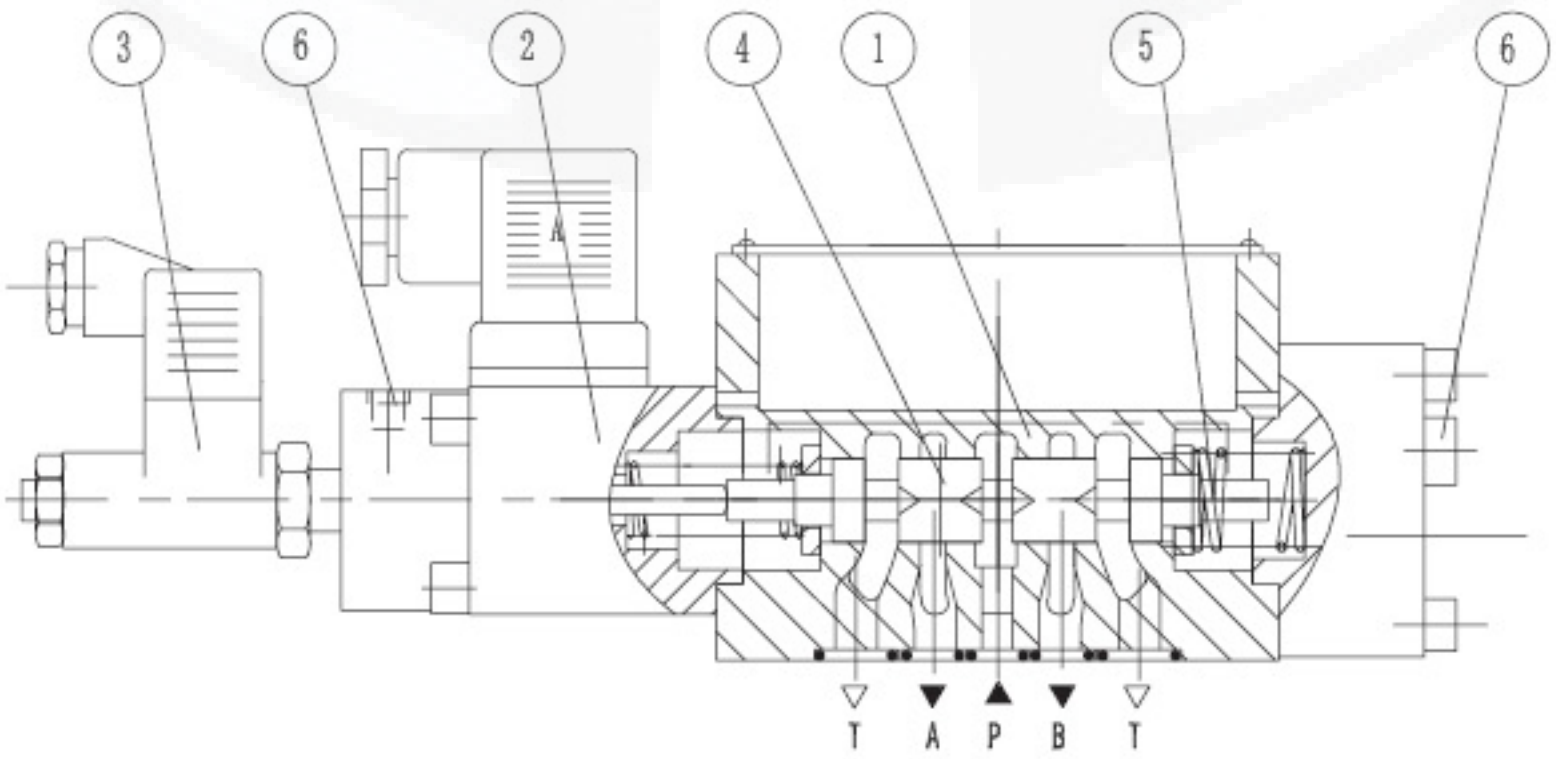


Type 4WRE proportional valve

Type 4WRE...A...10B/...(2 position valve)
Principle of this type of valve is the same as 4WRE...10B/... However,this type valve has only one sensor and one solenoid.



Type 4WRE6...A...10B/...proportional valve

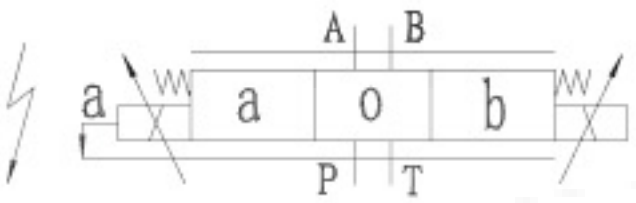


Type 4WRE10...A...10B/...proportional valve

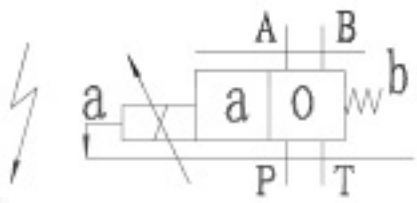
Type 4WRE proportional valve adopts sub-plate mounting,spring center. Good flow capacity,high pressure and excellent repetition precision, convenient for use. The valve is suitable for close circuit, and widely used in machine,light industry, metallurgy,mine,space flight and other field.

Symbols

Type 4WRE...10B..



Type 4WRE...A...10B..

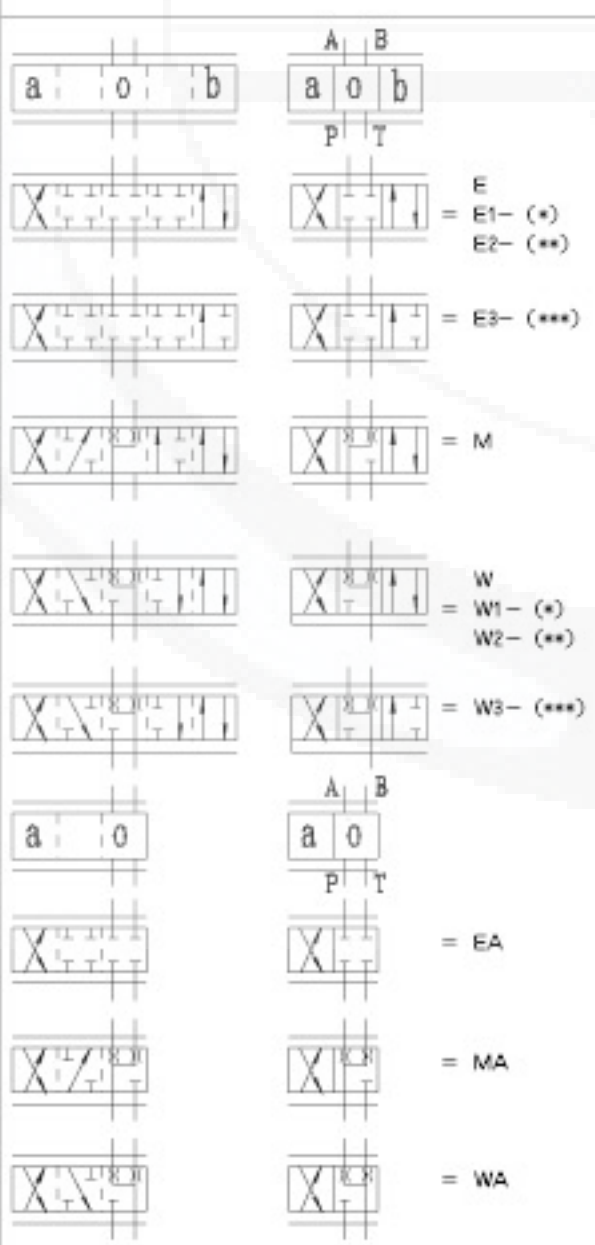


Symbols

4WRE			—	10	B	/	24	Z4	/		*

size 6 =6
10 =10

Symbols



Note: Type 4WRE6...10B/... without E1, E2,W1,W2,W3 symbols

Further details in clear text

M= mineral oils
V= phosphate ester

Z4= Plug-in to DIN 43 650

G24= 24 VDC

B= Technology of Beijing Huade Hydraulic

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

Nominal flow at 1Mpa valve pressure difference

size6 8=10L/min
16=21L/min
32=32L/min

size10 16=27L/min
32=42L/min
64=64L/min E1,E2,E3,W1,W2,W3 ,64L/min Only 64L/min

(*) $P \rightarrow A=Q_{max}$ $B \rightarrow T=\frac{Q}{2}$
$P \rightarrow B=\frac{Q}{2}$ $A \rightarrow T=Q_{max}$

(**) $P \rightarrow A=\frac{Q}{2}$ $B \rightarrow T=Q_{max}$
$p \rightarrow B=Q_{max}$ $A \rightarrow T=\frac{Q}{2}$

(***) $P \rightarrow A=Q_{max}$ $B \rightarrow T$=Blocked
$P \rightarrow B=Q_{max}$ $A \rightarrow T=Q_{max}$

For regenerative control, connect full bore of cyl.to port A

Technical data (For application outside these parameters,Please consult us!)

Hydraulic

size		6	10
Max. flow (L/min)		65	260
Operating pressure (MPa)	Port A,B,P	31.5	31.5
	Port T	16	16
Hysteresis (%)		< 1	< 1
Repeatability (%)		< 1	< 1
Response sensitivity (%)		⩽ 0.5 of nominal signal	⩽ 0.5 of nominal signal
Frequency response (-3dB) (Hz)		6	4
Hydraulic fluid		Mineral oil(for NBR seal), Phosphate ester(for FPM seal)	
Viscosity range (mm^2/s)		2.8 to 380	
Hydraulic fluid temperature range (℃)		-20 to +70	
Degree of contamination (μm)		⩽ 20(recommcend 10)	
Mounting position		Optional	
Weight (Kg)	Valve with 1 solenoid	1.91	5.65
	Valve with 2 solenoids	2.66	7.65

Electrical

Type of voltage		Direct voltage 24V or 12V	
Max. current per solenoid (A)		1.5	1.5
coil resistance (Ω)	Cold value at 20 ℃	5.4	10
	Max. warm value	8.1	15
Duty		Continuous	
Coil temperature (℃)		+150	
Environment temperature (℃)		+50	
Valve insulation		IP65	
Associated amplifier	with 2 ramp times	VT-5001S20 (for 2-positions)	VT-5002S20 (for 2-positions)
	with 1 ramp time	VT-5005S10(for 3-positions)	VT-5006S10(for 3-positions)

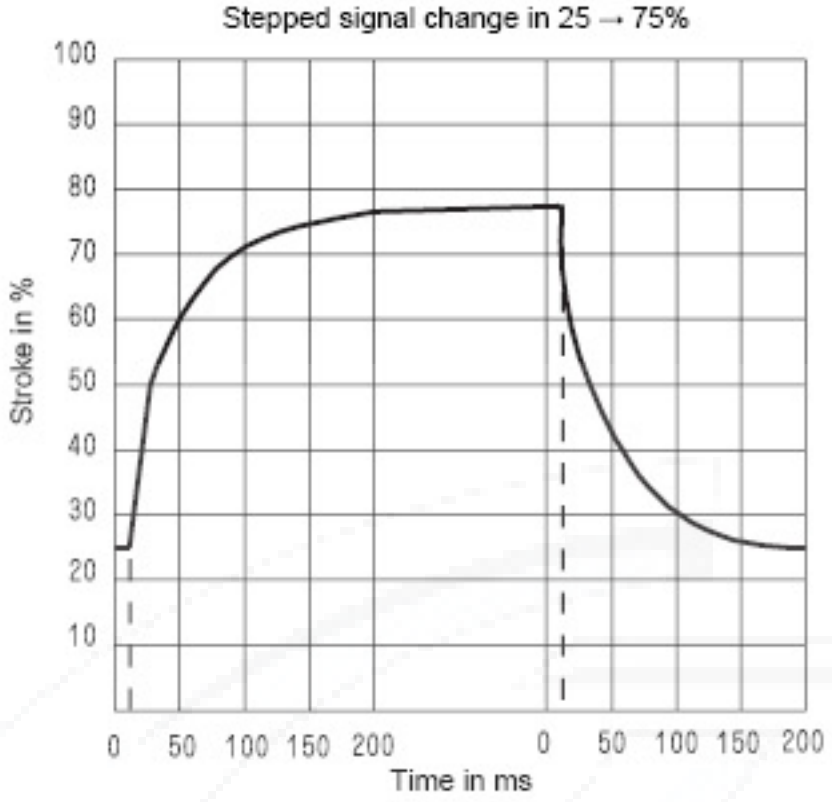
Inductive positional transducer

Electrical measuring system		LVDT
Control stroke (mm)		± 4.5 linear
Linearity tolerance (%)		1
Coil resistance(Ω)	Ⅰ R20	56
	Ⅱ R20	56
	Ⅲ R20	112
Inductivity (mH)		6 to 8
Oscillator frequency (KHz)		2.5
Valve insulation		IP65

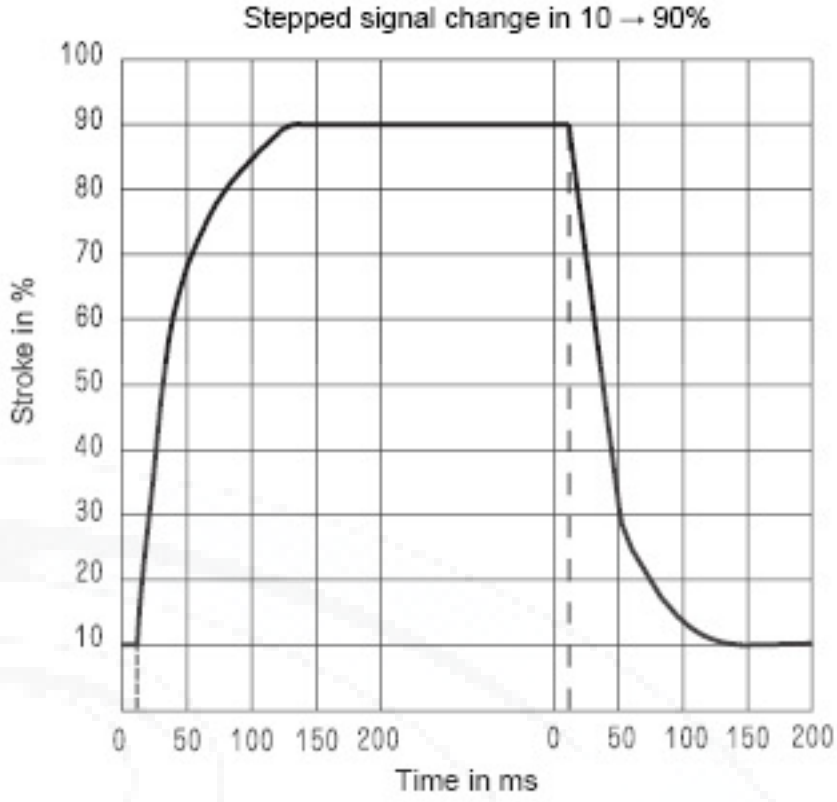
Transient functions with stepped electrical input signals

Type 4WRE6

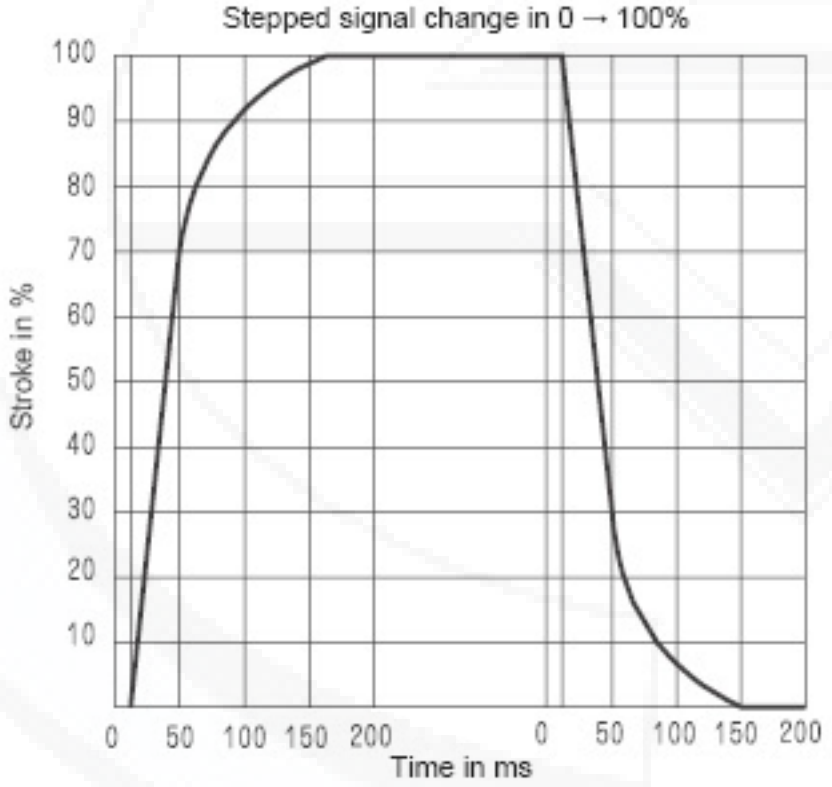
Stepped signal change in 25 → 75%



Stepped signal change in 10 → 90%

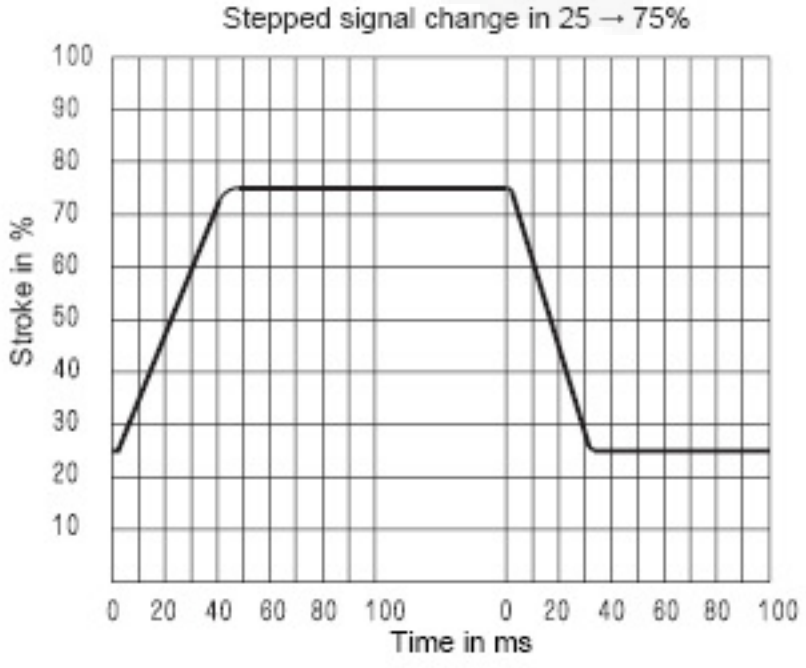


Stepped signal change in 0 → 100%

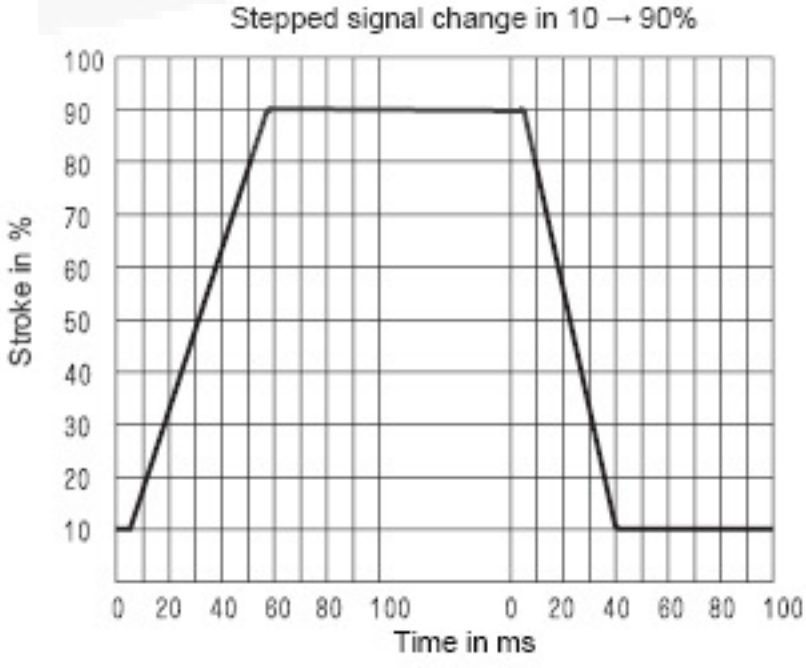


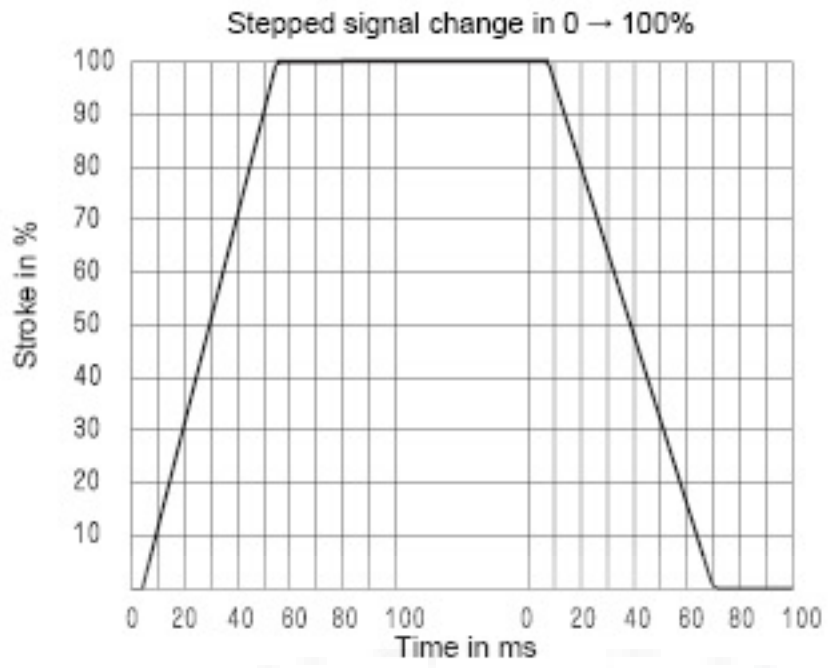
Type 4WRE10

Stepped signal change in 25 → 75%



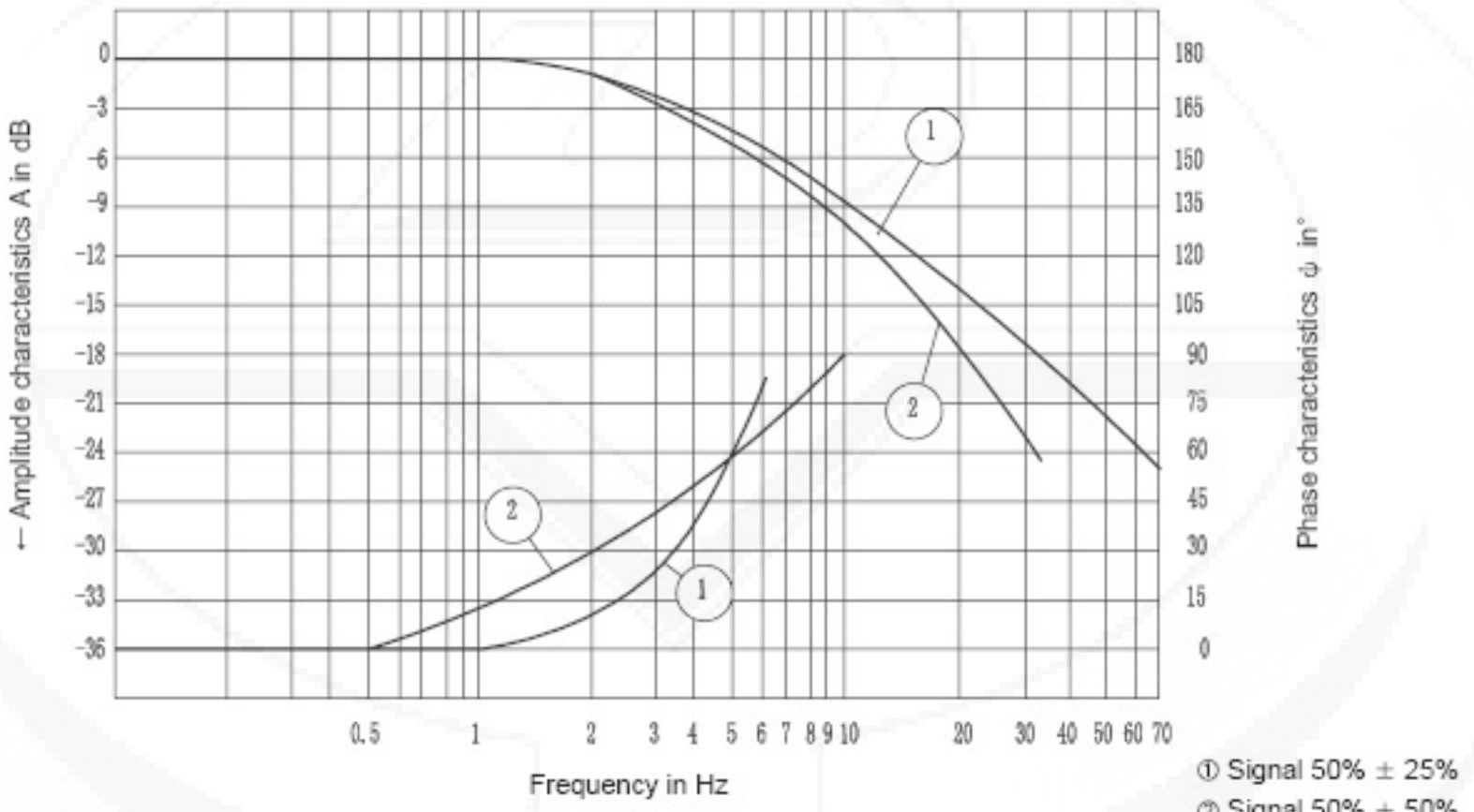
Stepped signal change in 10 → 90%





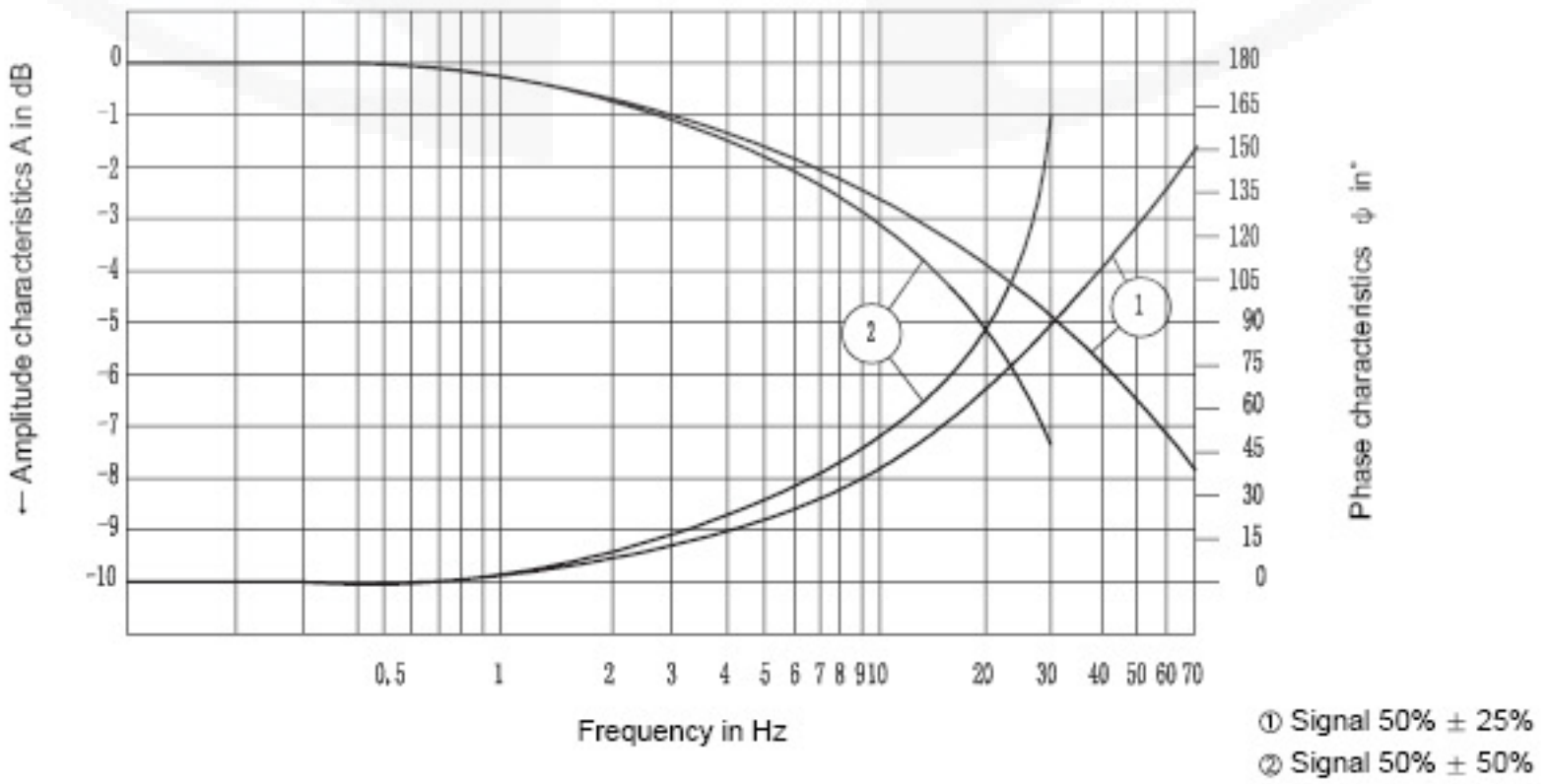
Characteristic curves: (measured at v=36 × $10^{-6}m^2/S$ and t=50°C)

Type 4WRE6



① Signal 50% ± 25%
② Signal 50% ± 50%

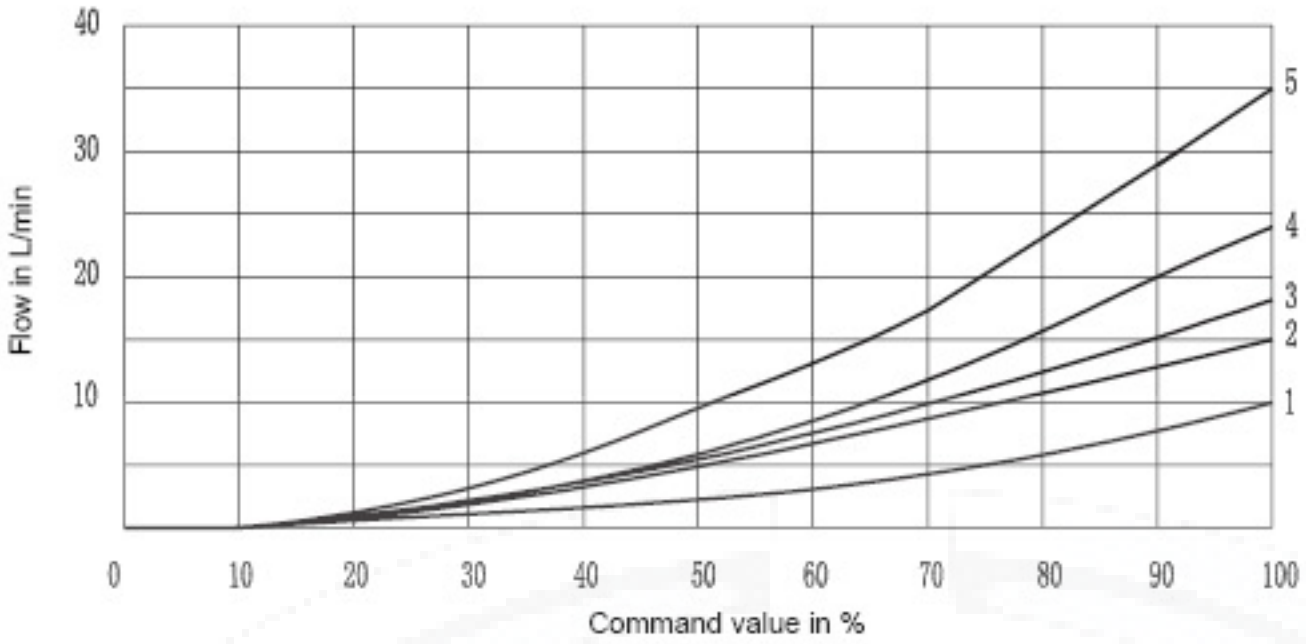
Type 4WRE10



① Signal 50% ± 25%
② Signal 50% ± 50%

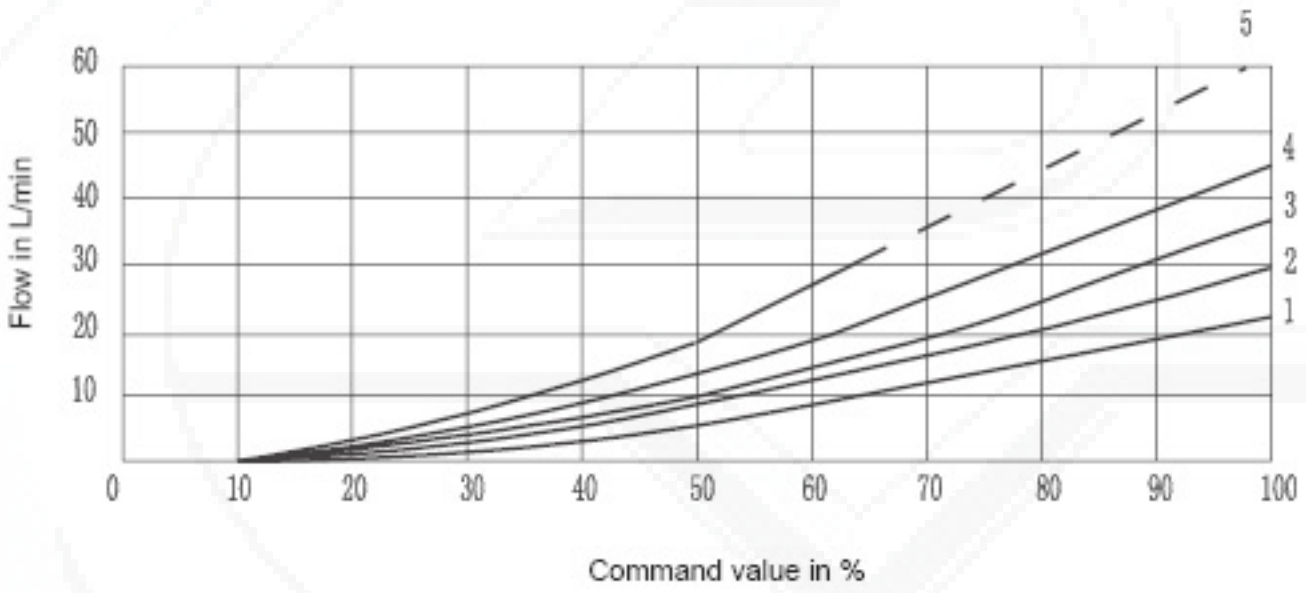
Characteristic curves: (measured at v=36 × $10^{-6}m^2/S$ t=50°C)

Type 4WRE6



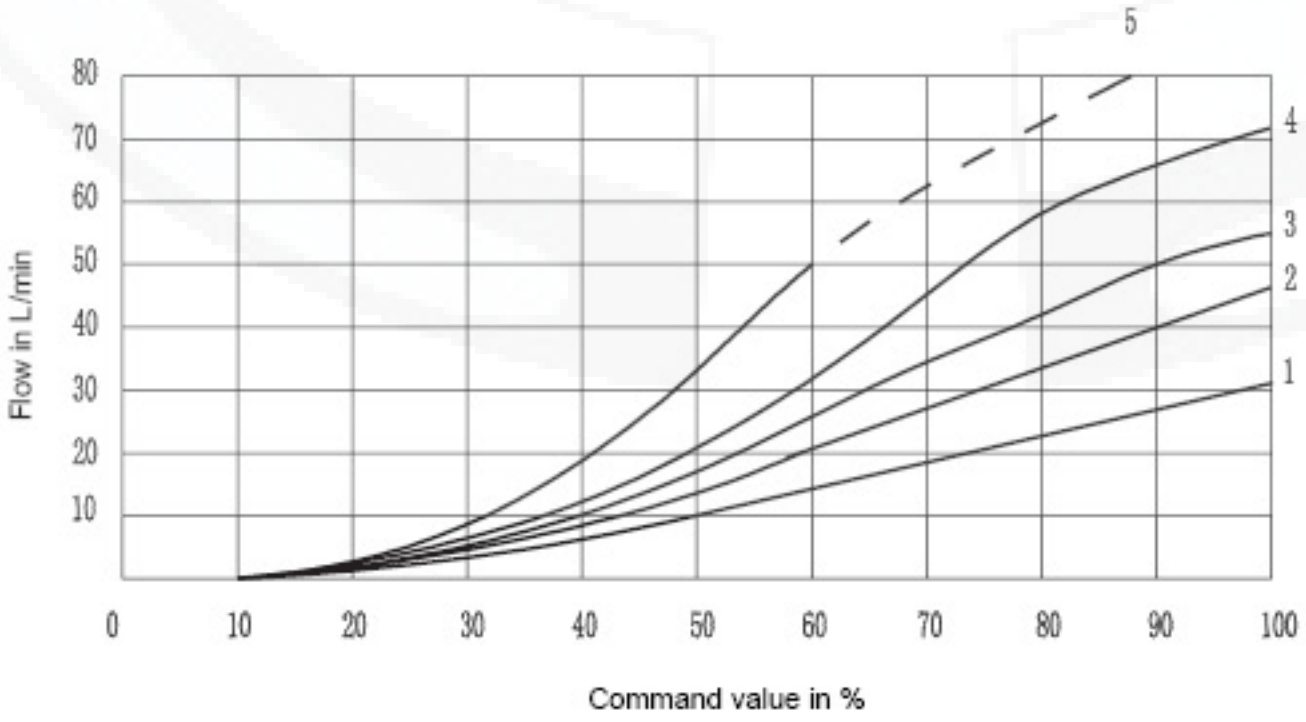
10L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



21L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



32L/min Nominal flow at 1MPa valve pressure difference

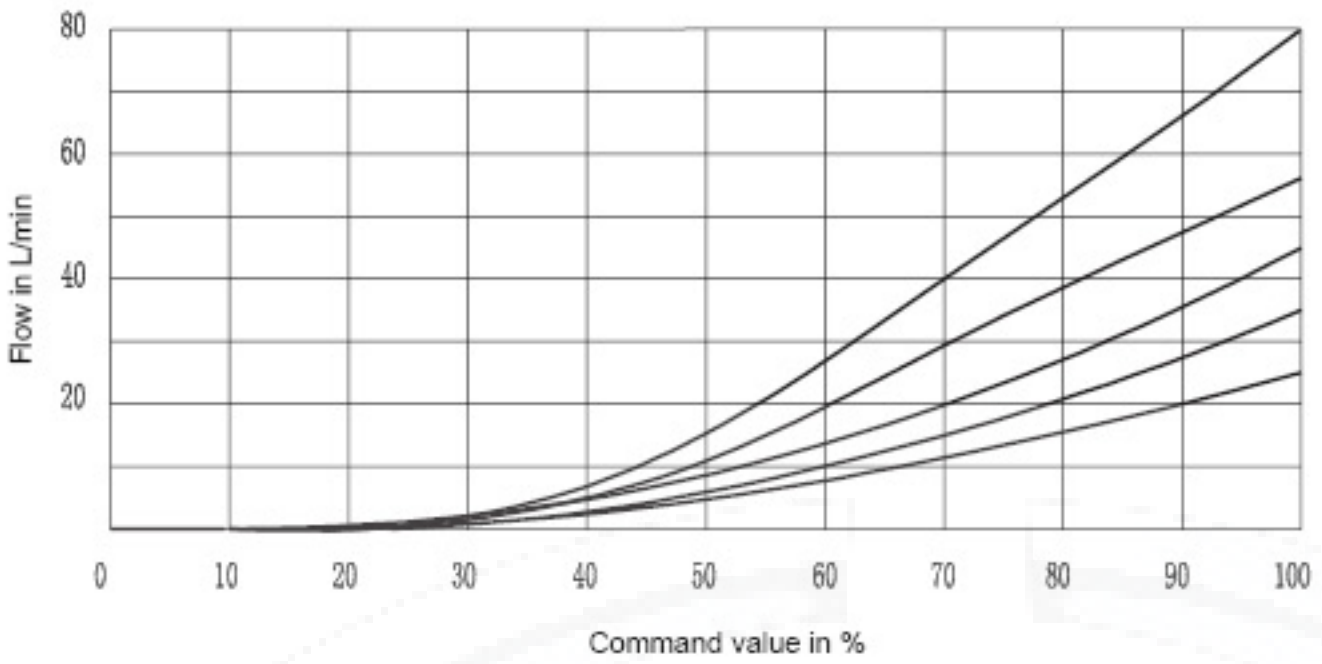
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Warning : Please note the power limits

Pv = Valve pressure difference
(Input pressure minus load pressure and return pressure)

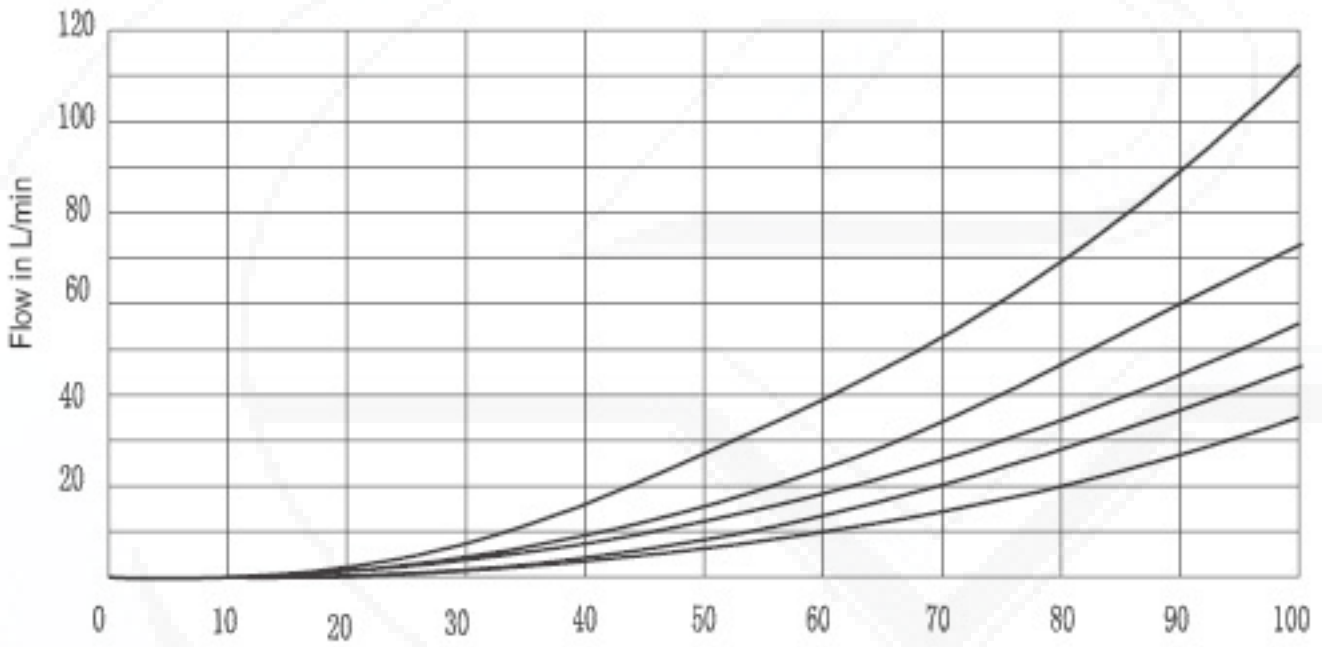
Characteristic curves: (measured at v=36 × $10^{-6}m^2/s$ t=50°C)

Type 4WRE10:



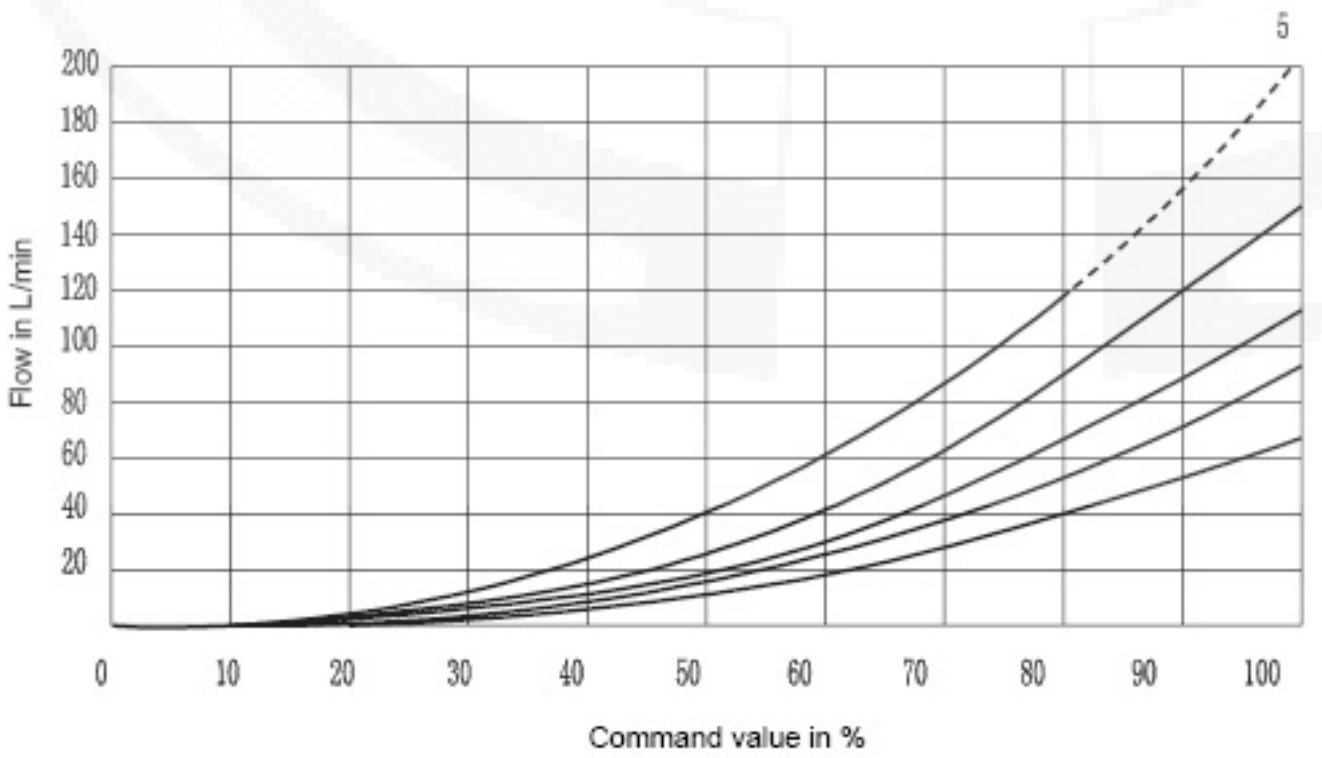
27L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



42L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



64L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Warning : Please note the power limits

Pv = Valve pressure difference
(Input pressure minus load pressure and return pressure)

Power limit:

Type 4WRE6

Flow (L/min) / Symbol	Pressure (MPa)				
	6	12	16	24	32
E.M.W8	27	25	23	22	20
EA.MA.WA8	(48)	(40)	*	*	*
E.M.W16	38	34	29	25	23
EA.MA.WA16	(65)	(51)	*	*	*
E.M.W32	52	41	36	34	32
EA.MA.WA32*	(65)	(58)	*	*	*

( ) Values in brackets apply for double flow through the valve

* Because of the max.tank pressure of 16 MPa double flow throught the valve is impossible

Type 4WRE10

Flow (L/min) / Symbol	Pressure (MPa)				
	6	12	16	24	32
E.M.W16	49	80	65	60	60
EA.MA.WA16	(98)	(115)	(****)	(****)	(****)
E.M.W32	130	110	100	95	90
EA.MA.WA32	(180)	(150)	(****)	(****)	(****)
E;M;W64 EA;MA;WA64 E E1;W164(*) EA E2;W264(**) EB E3;W364(***)	180 (260)	130 (180)	110 (****)	100 (****)	90 (****)

( ) Values in brackets apply for double flow through the valve

(*) For spools E1 and W1:

$P \rightarrow A = \rightarrow Q_{max} / B \rightarrow T = \frac{Q}{2}$

$P \rightarrow B = \frac{Q}{2} / A \rightarrow T = Q_{max}$

(**) For spools E2 and W2

$P \rightarrow A = \frac{Q}{2} / B \rightarrow T = Q_{max}$

$P \rightarrow B = \rightarrow Q_{max} / A \rightarrow T = \frac{Q}{2}$

(***) For spools E3 and W3

$P \rightarrow A = Q_{max} / B \rightarrow T = blocked$

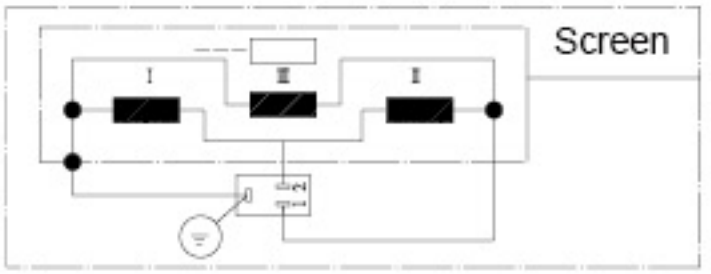
$P \rightarrow B / A \rightarrow T = Q_{max}$

(****) Because of the max.tank pressure of 16 MPa,double flow throught the valve is impossible

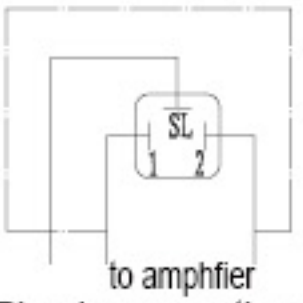
Electrical connections

Inductive positional transducer

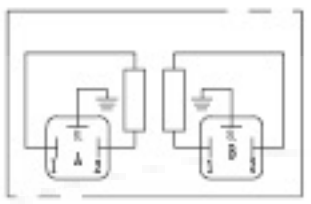
Coil connections



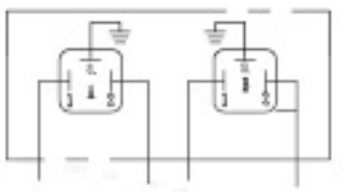
Plug-in connection



Coil connections

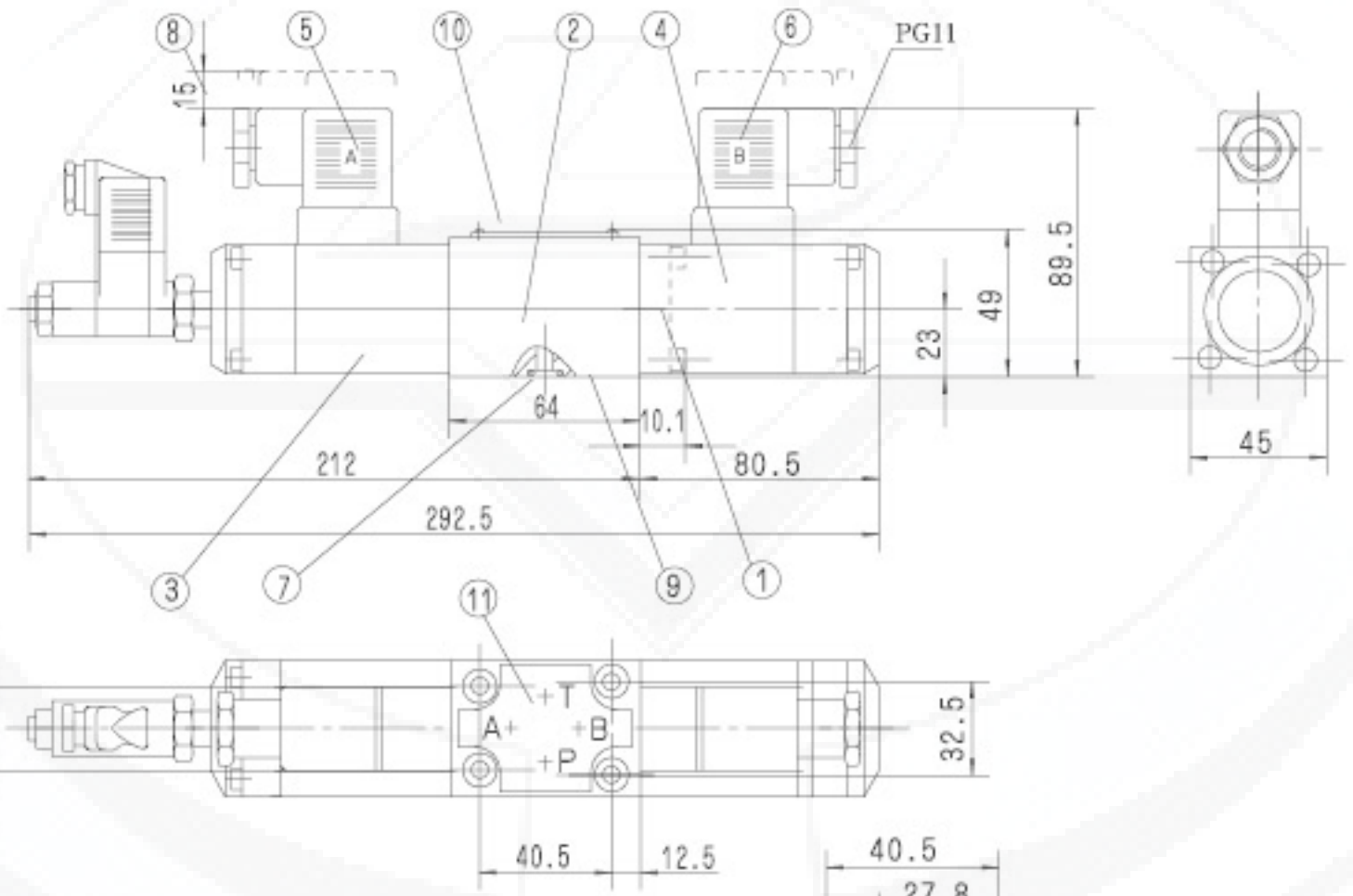


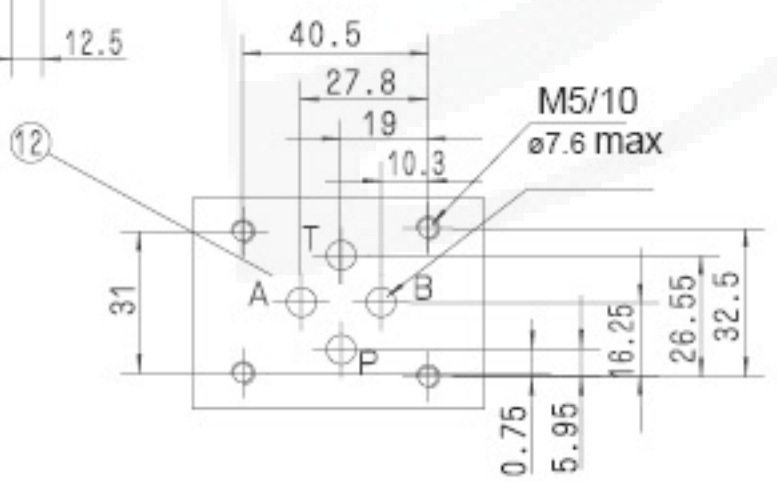
Plug-in connection



Unit dimensions: Type 4WRE6

(Dimensions in mm)



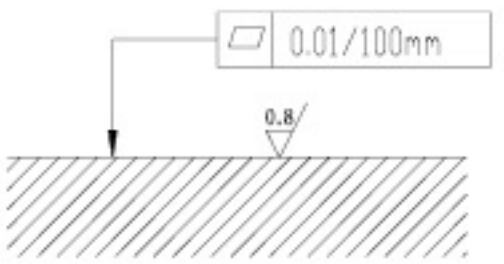


(1) Two control position valve
(2) Three control position valve
(3) Proportional solenoid"a"
(4) Proportional solenoid"b"
(5) Plug (grey)
(6) Plug (black)
(7) O-ring 9.25X1.78
(8) Space requires to remove plug
(9) Valve mounting surface
(10) Nameplate
(11) Position of ports
(12) Dimensions of valve mounting surface

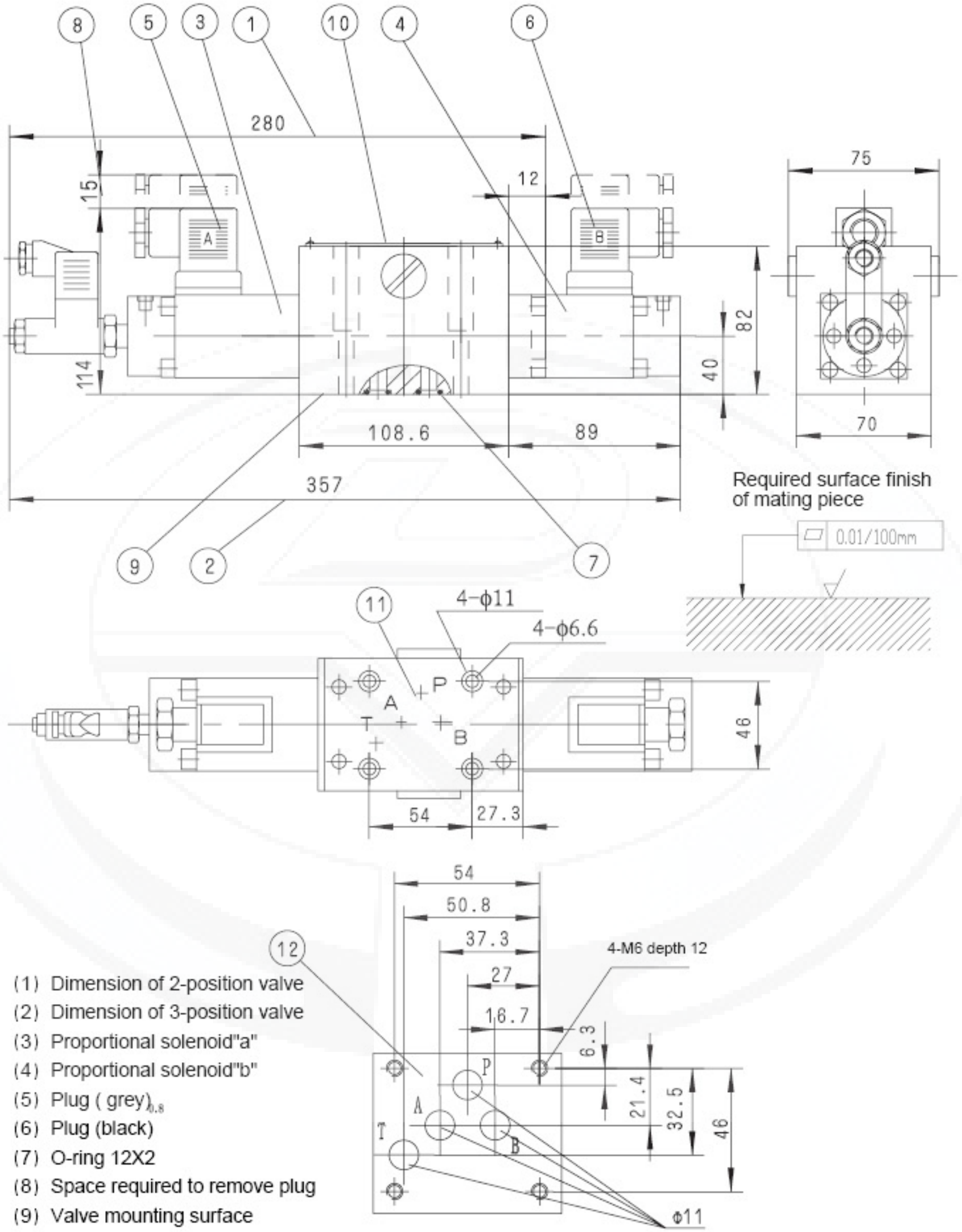
Subplates：G341/01;G342/01;G502/01

See page 80

Required surface finish of mating piece



Unit dimensions: Type 4WRE10 **(Dimensions in mm)**



(1) Dimension of 2-position valve
(2) Dimension of 3-position valve
(3) Proportional solenoid"a"
(4) Proportional solenoid"b"
(5) Plug (grey)$_{0.8}$
(6) Plug (black)
(7) O-ring 12X2
(8) Space required to remove plug
(9) Valve mounting surface
(10) Nameplate
(11) position of ports
(12) Dimensions of valve mounting surface

Subplates：G66/01;G67/01;G534/01 G0535/01

See page 81 and 82

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Directional Valves pilot operated type 4WRZ, external pilot operated type 4WRH			RC29110/9.2006
	Size 10 to 32	up to 35 MPa	up to 1600 L/min	Replaces: RC29110/08.2000

Features:

- Pilot (WRZ) and direction (WRH) proportional valve
- For subplate mounting
- For the control of both direction and flow rate of a hydranlic fluid
- Spring centred ,no spool drift
- Low pressure drop across control lands
- Valve and electronic control from one source
- Proportional solenoid operation
- Porting pattern to DIN 24 340 form A,ISO4401 and CETOP-RP121H.

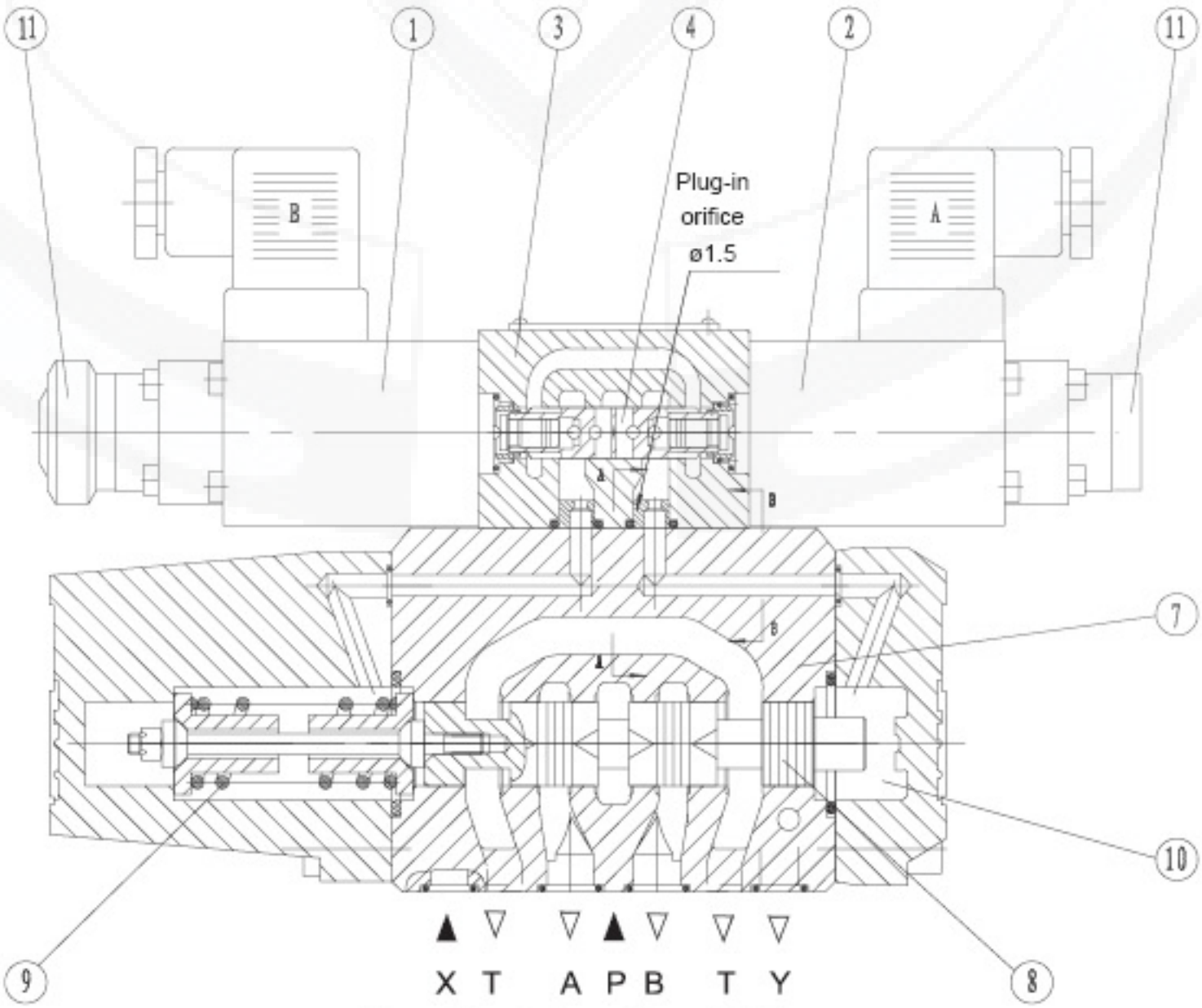
Function,section

Valve types 4WRZ... are 4- way valves operated by means of proportional solenoids.They control the direction and flow rate of hydraulic fluid.

They basicly consist of the pilot valve (3) ,the main valve (7) with the main spool (8),and the centering spring (9).

If solenoid "B" is energised, pilot spool (4) is moved to the right.Pilot oil is then either fed internally from port P,or "externally" from port X via the pilot valve (3) into the pressure chamber (10) and moves the main spool (8) a distance proportional to the strength of the electrical current.The throttling grooves in the main spool open progressively with increasing current, thus controlling the flow of hydraulic fluid to the actuator ports.

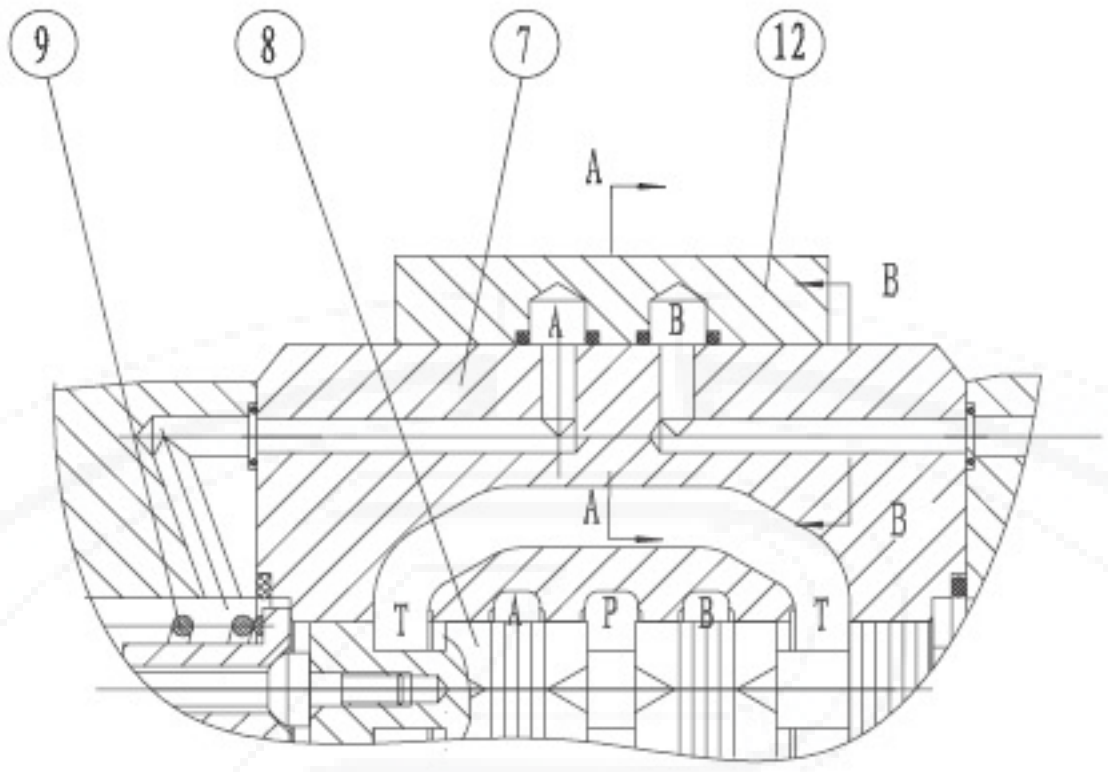
When the electrical singal is switched off, both the pilot spool (4) ,and the main spool (8) return to neutral independent of the control pressure supply.An energency hand operator permits movement of the pilot spool position without energising the solenoids.



Proportional valve of type 4WRZ

Type 4WRH:

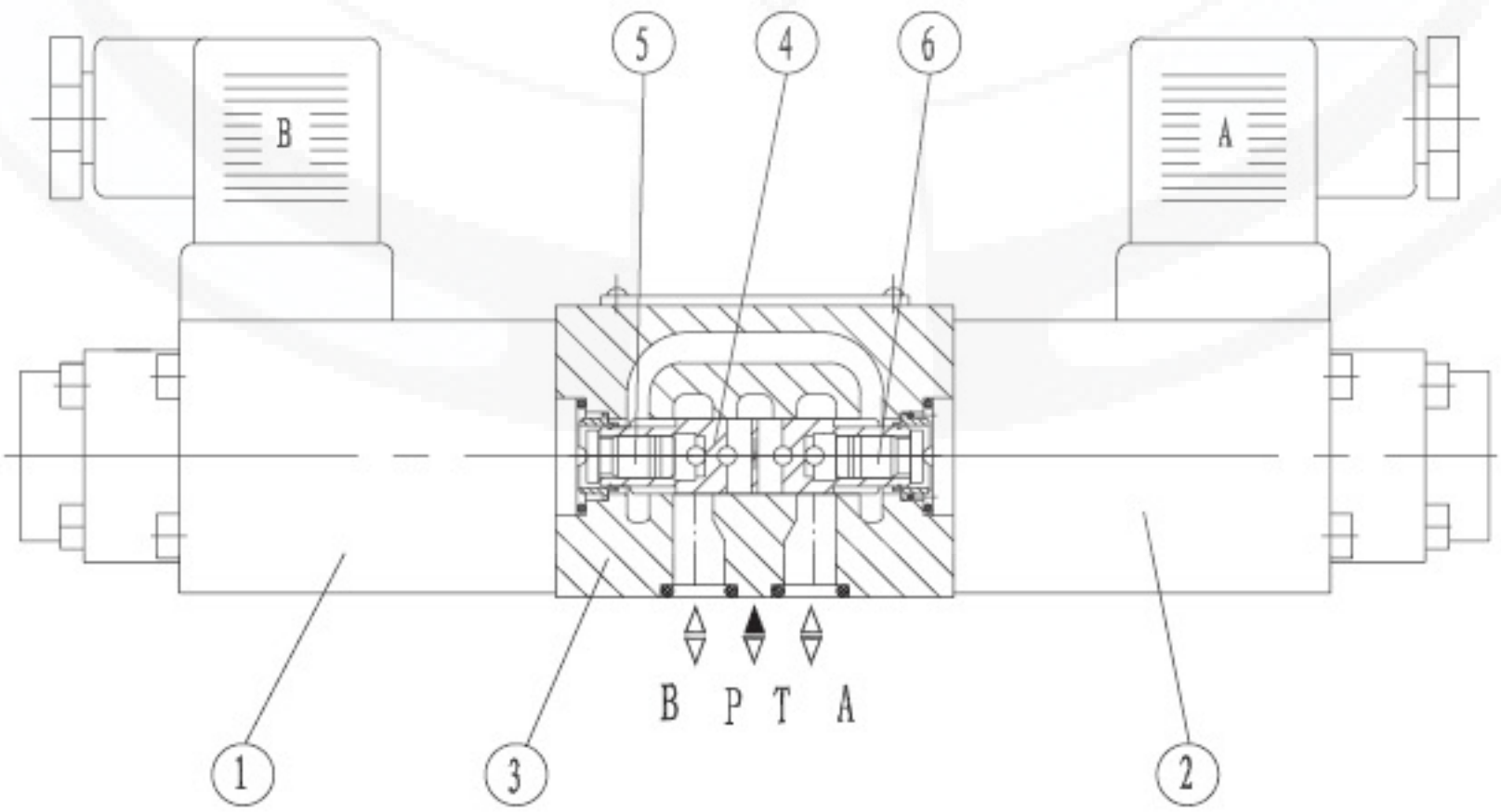
The type 4WRH valves are pilot operated proportional directional valves for external operation via pressure control valves.The function and principle is the same as that for valve type 4WRA.The inter-connecting plate (12) connects the pilot connection A with connection T(Y) and pilot connection B with P(X).The pilot pressure at the main valve must be from 0.4 MPa to 2.5 MPa,so flow is either from P to A and B to T or P to B and A to T.



proportional valve of type 4WRH

Pilot valve:

The pilot valve is a proportional solenoid operated 3-way pressure reducing valve(type 3DREP6).Throttle insert are installated in port A and B,further detils see the text of 3DREP6.



Pilot valve type 3DREP6

Pilot Oil Supply

1、 Pilot oil feed , external ; drain , external。
On this model,the pilot oil feed via the port "X" , return is not directed into the T-port of main valve, but is led separately via port Y to tank(externaily)
13 Plug M6

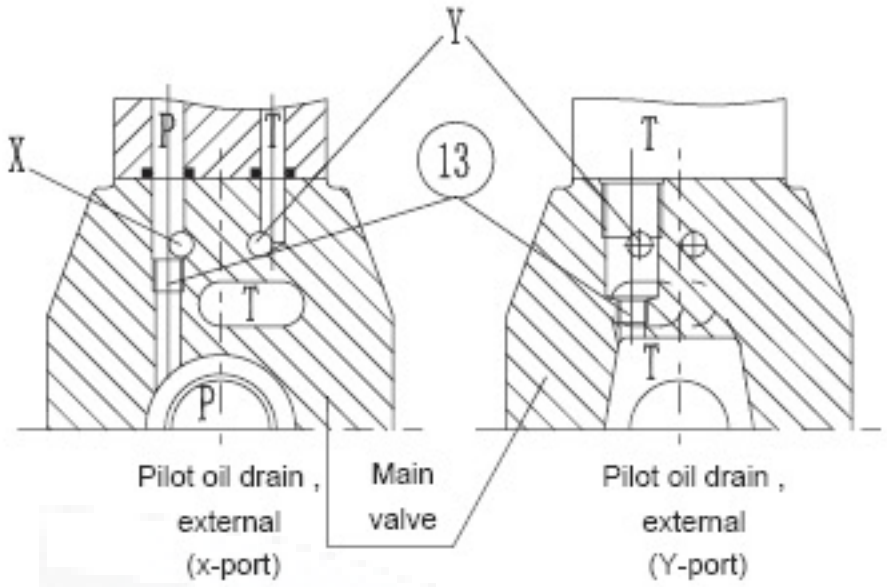


chart for feed external and drain external

2、 Pilot oil feed , internal ; drain , external。
On this model,the pilot oil inlet is supplied from the P-port of the main valve(internaliy).The polit oil return is not directed into the T-port of main valve, but is led separately via port Y to tank(externaily)
13 Plug M6

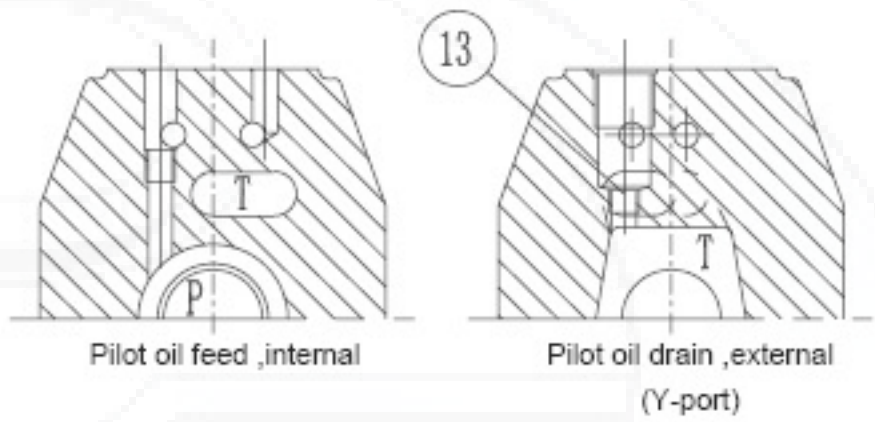


chart for feed internal and drain external

3、 Pilot oil feed , internal ; drain , internal。
On this model,the pilot oil inlet is supplied from the P-port of the main valve(internaliy).The polit oil return is taken directly into the T-port of the main valve (internaliy).Ports "X" and "Y" in the subplate are both plugged.

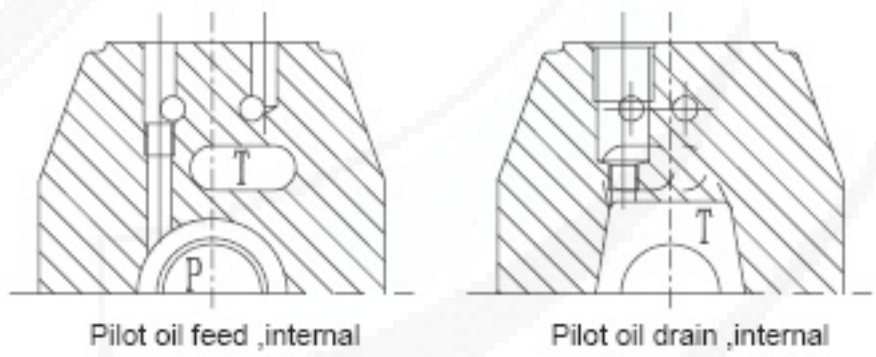


chart for feed internal and drain internal

4、 Pilot oil feed , external ; drain , internal。
On this model,the pilot oil inlet is feed from port "X", The polit oil return is taken directly into the T-port of the main valve (internaliy).Port "Y" in the subplate is plugged.
13 Plug M6

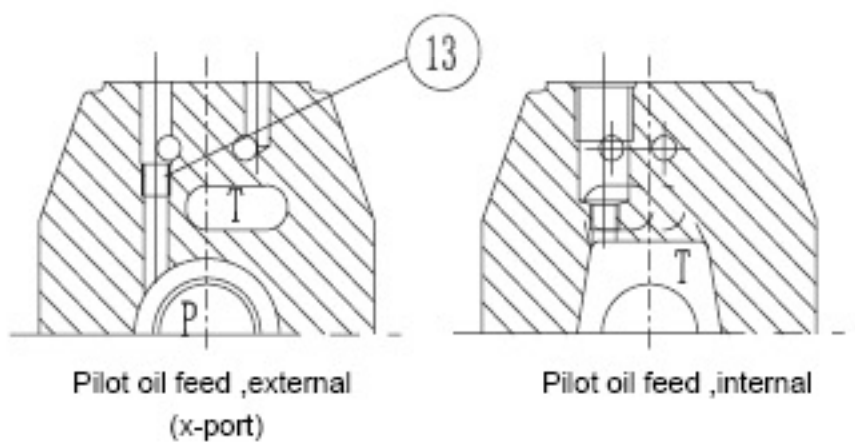
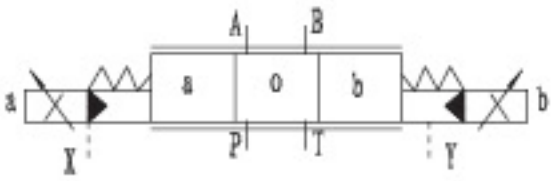


chart for feed externd and drain internal

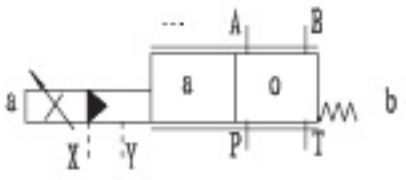
Symbols(simplified)

Type 4WRZ...30B/...

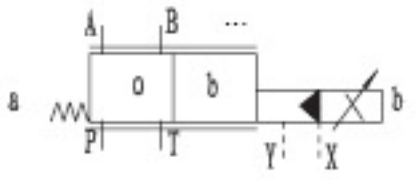


X=external
Y=external

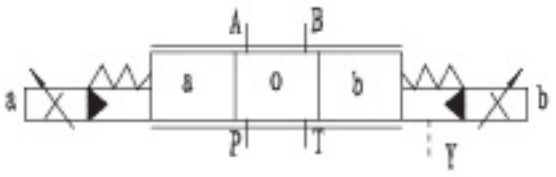
Type 4WRZ...A...30B/



Type 4WRZ...B...30B/

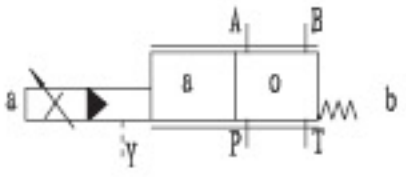


Type 4WRZ...30B/...E..

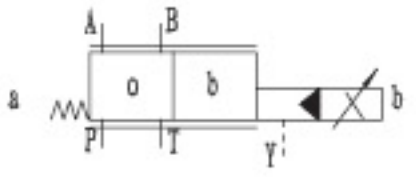


X=intemal
Y=external

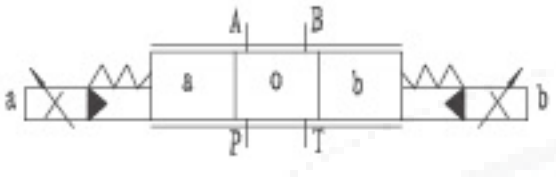
Type 4WRZ...A...30B/...E...



Type 4WRZ...B...30B/...E...

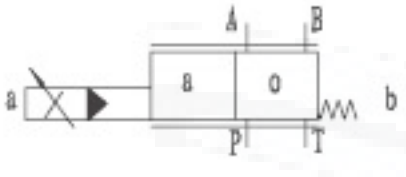


Type 4WRZ...30B/...ET...

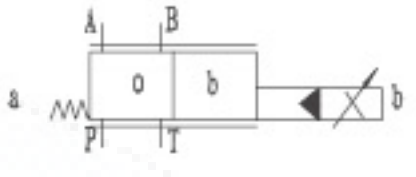


X=intemal
Y=intemal

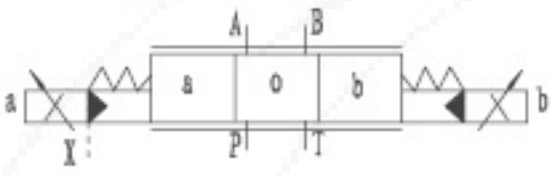
Type 4WRZ...A...30B/...ET...



Type 4WRZ...B...30B/...ET...

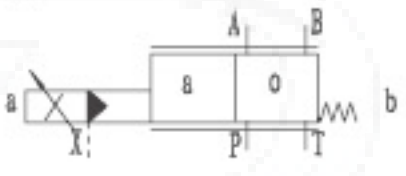


Type 4WRZ...30B/...T...

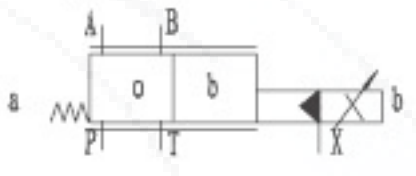


X=external
Y=intemal

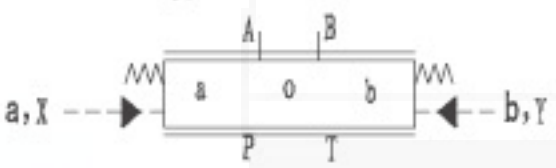
Type 4 WRZ...A...30B/...T...



Type 4WRZ...B...30B/...T...

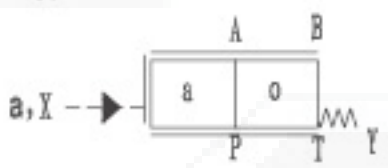


Type 4WRH...30B/...

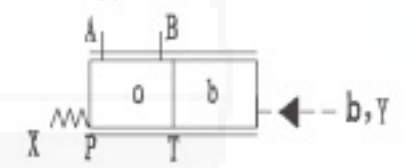


X=external
Y=external

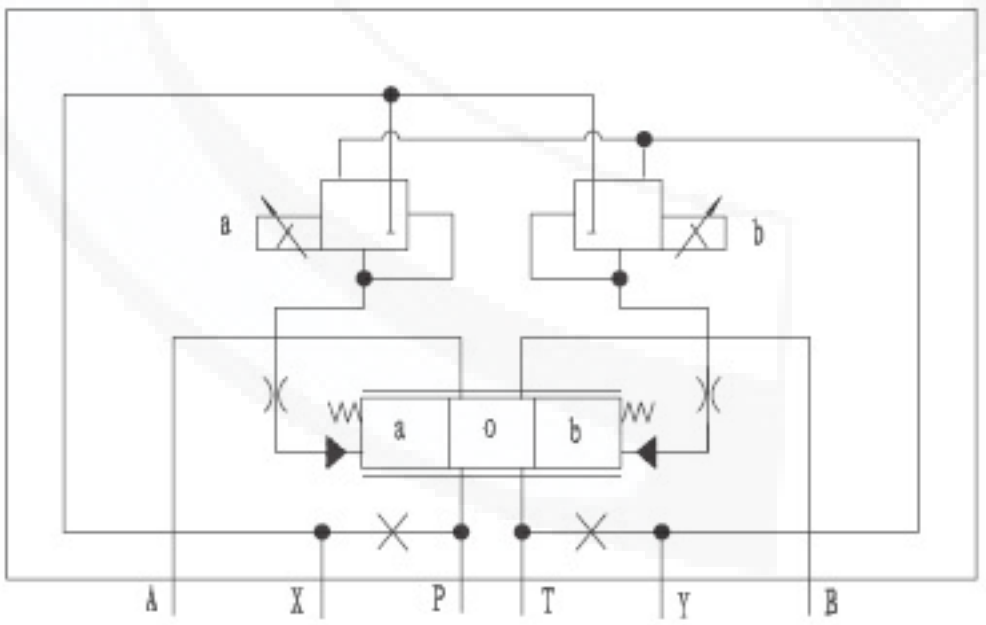
Type 4WRH...A...30B/...



Type 4WRH...B...30B/...



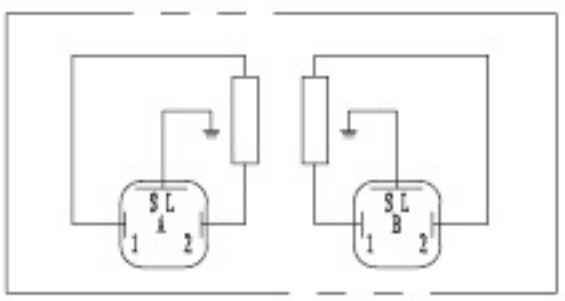
Symbols(detailed):



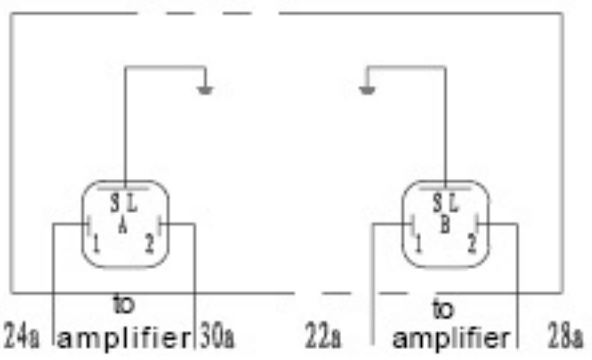
Example: 4WRZ...
Polit oil feed,external
polit oil drain,external

Electrical Connection:

Coil connections



Plug connections



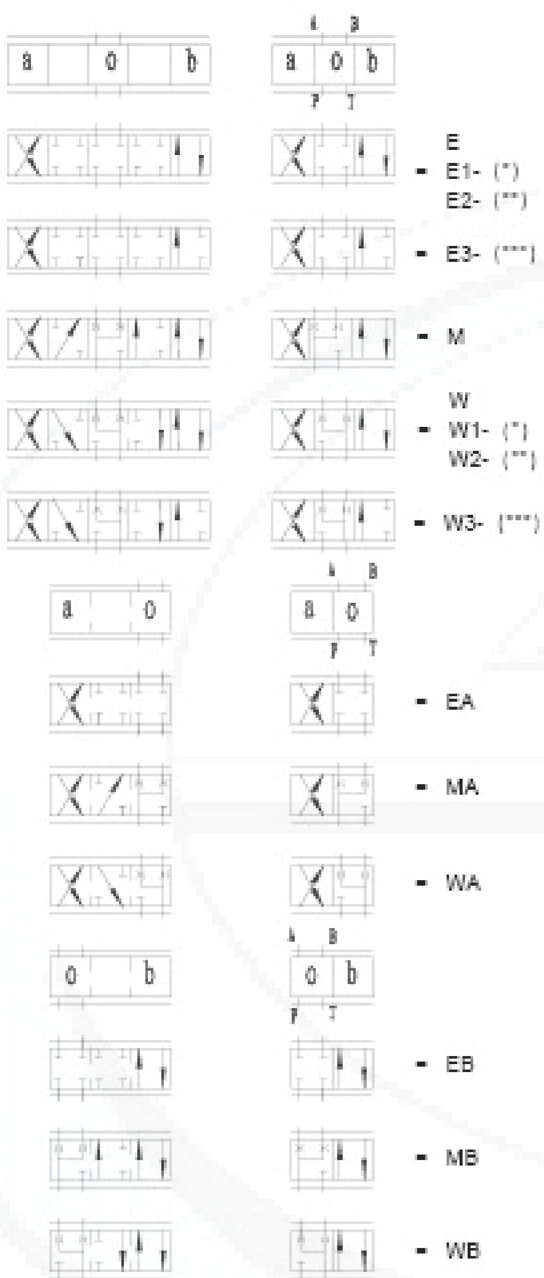
Ordering code

4WR | | | | 30 | B | | | | | | | | | *

Hydraulic operation =H
Electro-hydraulic operation =Z

size		
	10	=10
	16	=16
	25	=25
	32	=32

Spools



Nominal flow at 1MPa pressure drop accross valve		
Size 10	25 L/min	=25
	50 L/min	=50
	85 L/min	=85
E1、E2、E3、W1、W2、W3 only 85L/min		
Size 16	100 L/min	=100
	150 L/min	=150
E1、E2、E3、W1、W2、W3 Only 150L/min		
Size 25	270 L/min	=270
	325 L/min	=325
E1、E2、E3、W1、W2、W3 only 325L/min		
Size 32	360 L/min	=360
	520 L/min	=520
E1、E2、E3、W1、W2、W3 only 520L/min		

Further details in clear text

M= mineral oils
V= phosphate ester

no code= without press.reducing valve
D 2= with press.reducing valve ZDR6DP2-30/75 YM(not for 4WRH or 4WRZ without pilot valve)

Z4=Pulg-in connector (not for 4WRH or 4WRZ without pilot or type J)

No code = Pilot oil supply external, drain external
E= Pilot oil supply internal, drain external
ET = Pilot oil supply internal, drain interna
T= Pilot oil supply external, drain internal
(type 4WRH without E,ET,T)

No code = Without special protection
J = Sea water resistant

No code = Without hand override
N = With hand override
(not for 4WRH or 4WRZ without pilot valve)

24 = 24V DC (standard version) (not for 4WRH or 4WRZ without pilot valve)

6A= Pilot control valve size 6 (not for 4WRH or 4WRZ without pilot valve)

B=Technology of Beijing Huade Hydraulic

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

(*) For spool symbol E1 and W1:

$P \rightarrow A = Q_{max}$ $B \rightarrow T = \frac{Q}{2}$

$P \rightarrow B = \frac{Q}{2}$ $A \rightarrow T = Q_{max}$

(**)For spool symbol E2 and W2:

$P \rightarrow A = \frac{Q}{2}$ $B \rightarrow T = Q_{max}$

$p \rightarrow B = Q_{max}$ $A \rightarrow T = \frac{Q}{2}$

(***) For spool symbol E3 and W3:

$P \rightarrow A = Q_{max}$ $B \rightarrow T$=Blocked

$P \rightarrow B/A \rightarrow T = Q_{max}$

(For regenerative control,connect full of cylinder to port A)

Technical data

Hydraulic data

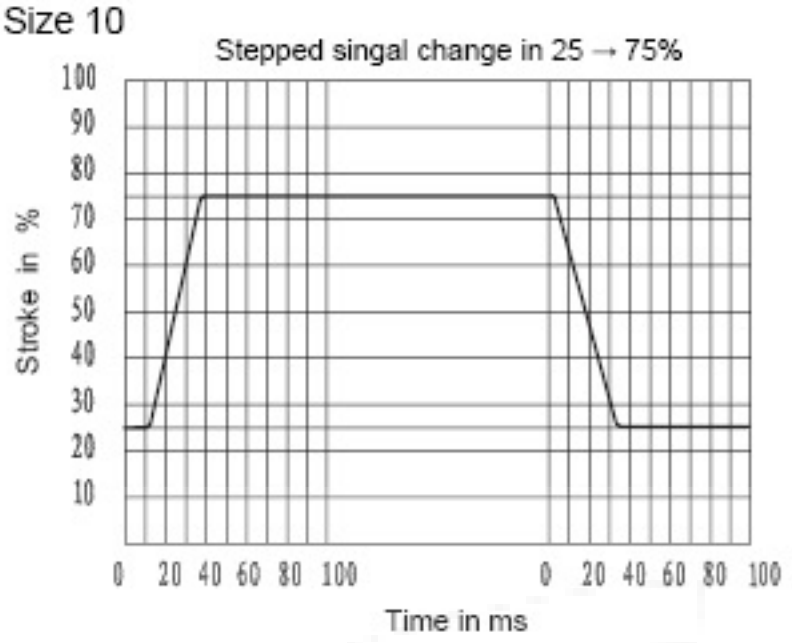
size		10	16	25	32
pilot valve pressure (MPa)	external pilot oil supply	3 to 10			
	internal pilot oil supply	Up to 10 (over 10 must installate ZDR6DP$_2$-30B/75YM)			
Main valve pressure (MPa)		31.5	35		
Return pressure (MPa)	port T(external pilot oil return)	31.5	25		15
	port T(internal pilot oil return)	3			
	port Y	3			
Pilot oil volume (cm^3) or spool movement 0~100%		1.7	4.6	10	26.5
Pilot oil flow at port X or Y (L/min) for spool movement 0~100%		3.5	5.5	7	15.9
Flow throught main valve (L/min)		270	460	877	1600
Hysteresis (L/min)		6			
Repeatability (%)		3			
degree of contamination (μm)		⩽ 20			
Fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range (mm^2/s)		2.8 to 380			
Fluid temperature range (°C)		-20 to +70			
mounting position		optional			
Weight (Kg)	valve with one solenoid	7.4	12.7	17.5	41.8
	valve with two solenoids	7.8	13.4	18.2	42.2

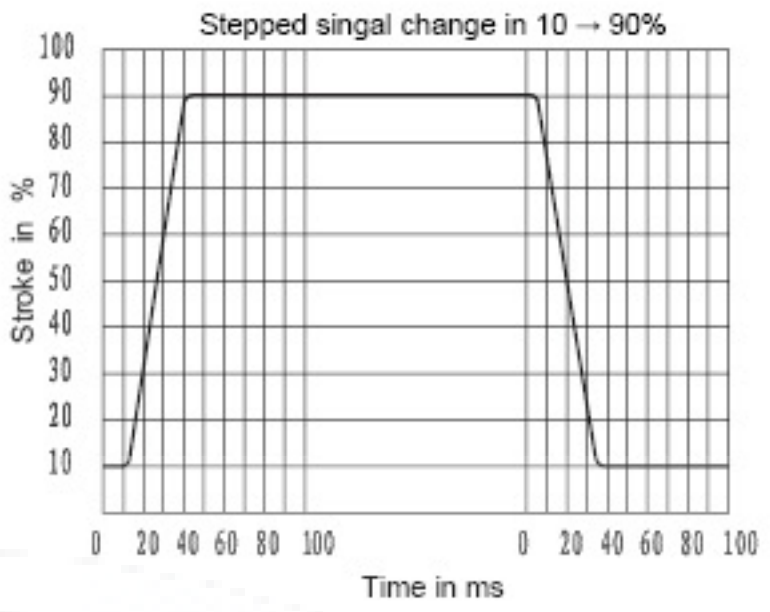
Electrical data

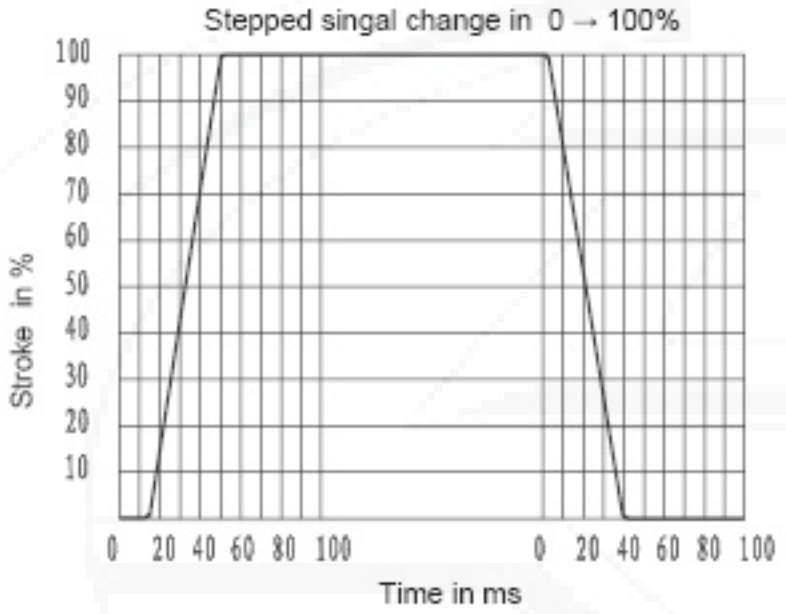
Type of supply		DC
Norminal current of solenoid (A)		0.8
Coil resistance (Ω)		cold (at20°C) 19.5;max.valve,hot 28.8
Enviomment temperature (°C)		+50
Coil temperature (°C)		+150
Duty cycle		Continuous
Pilot current (A)		⩽ 0.02
Insulation		IP65
Associated amplifier	With 1 ramp time	VT-3000S30
	With 5 ramp times	VT-3006S30
Electrical connection		Plug connection

Valve Movement with Stepped Electrical Input Singal

Size 10

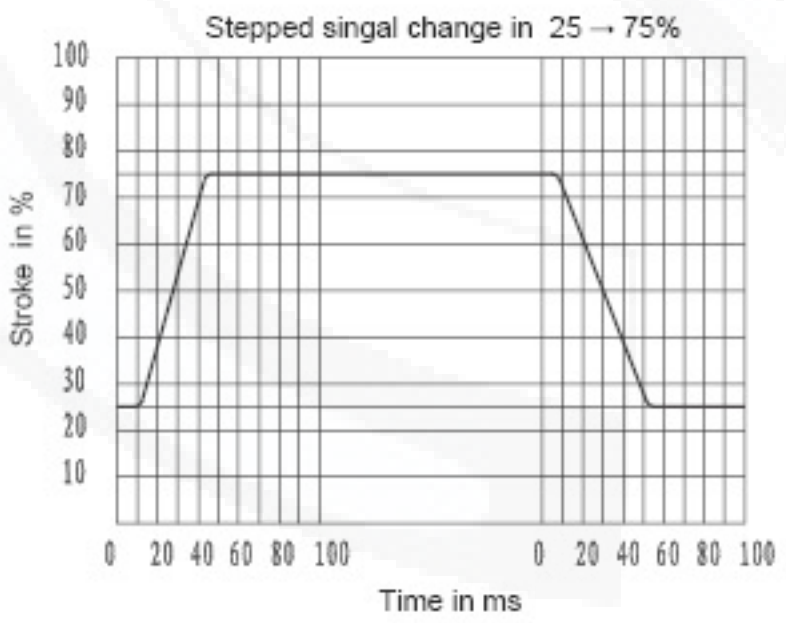


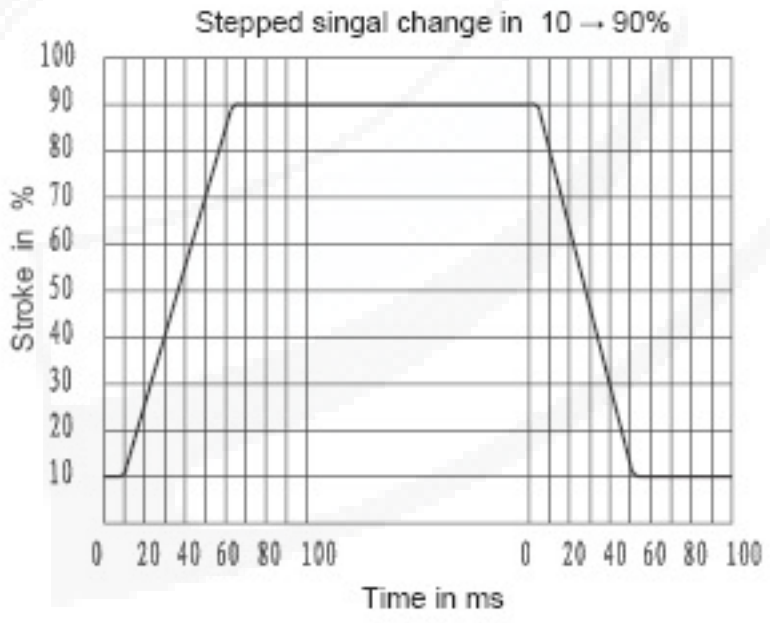


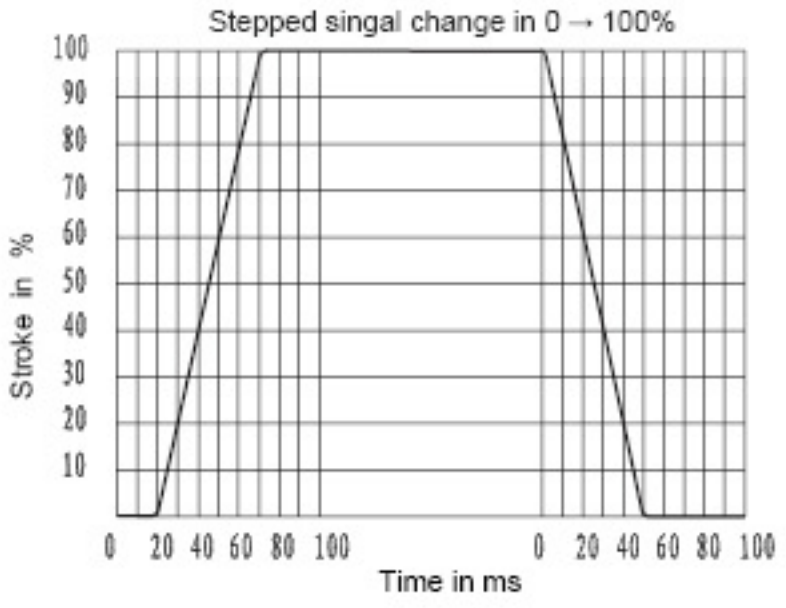


Pilot pressure at 5MPa

Size 16

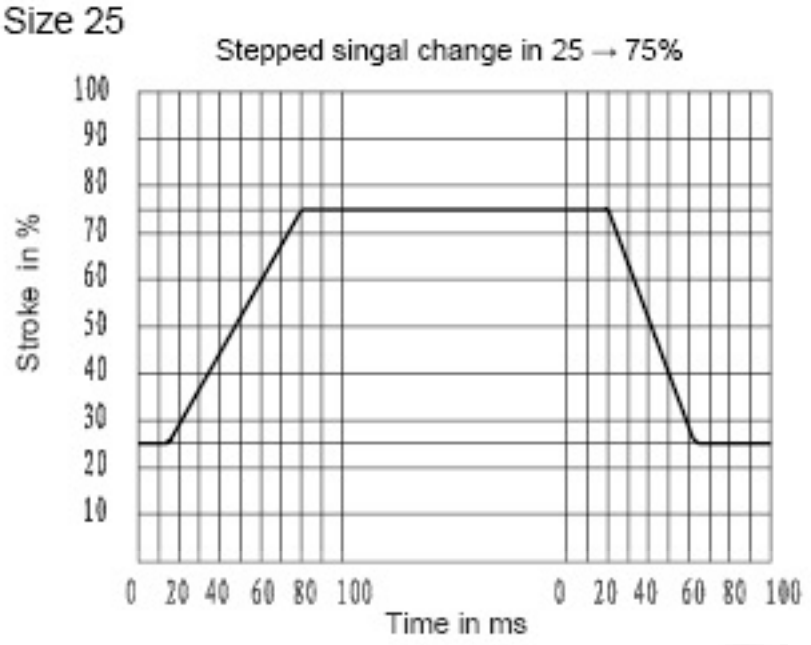


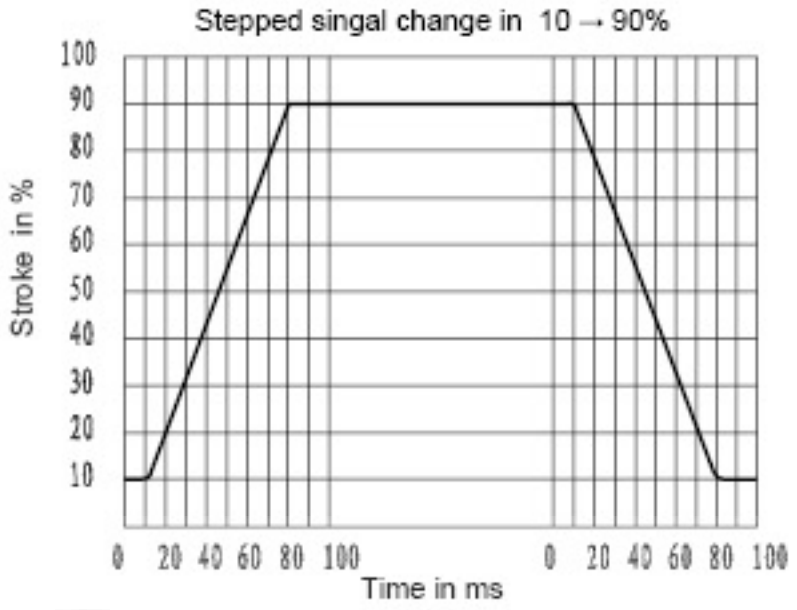


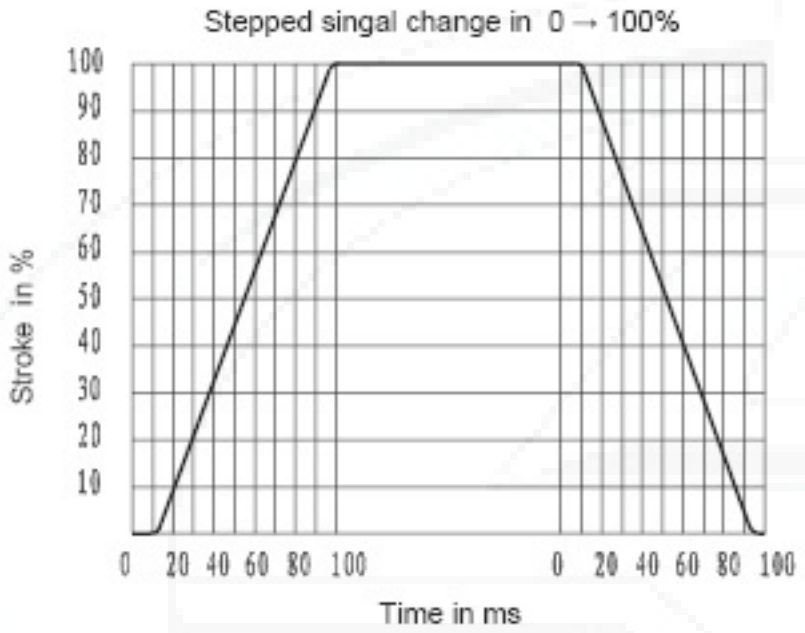


Pilot pressure at 5MPa

Size 25

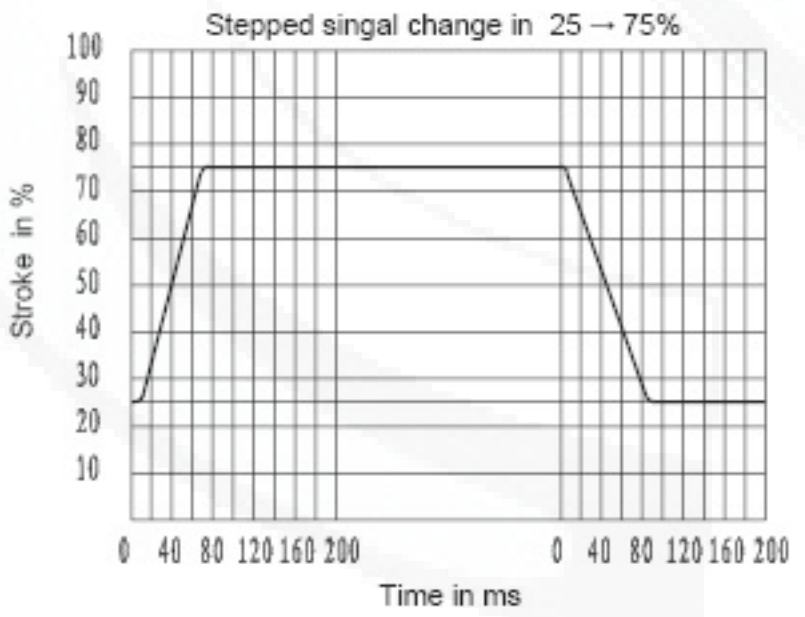


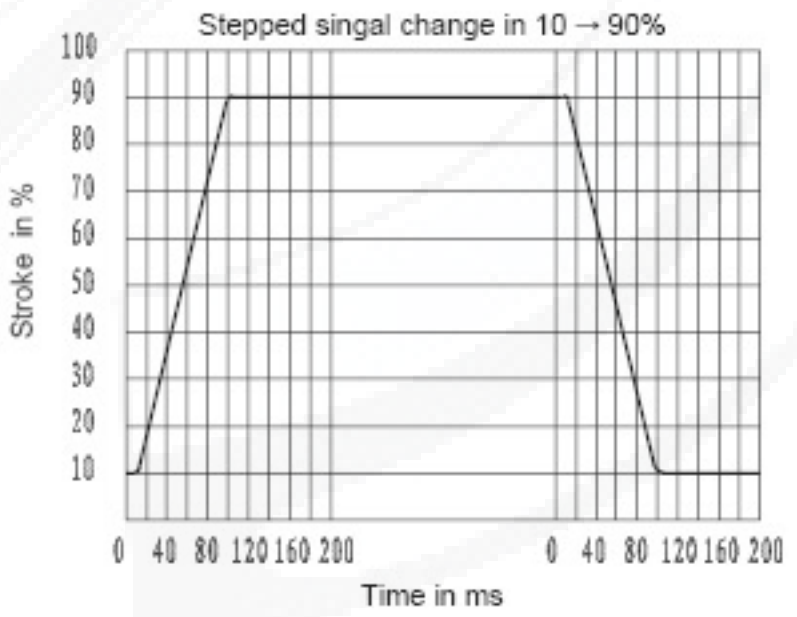


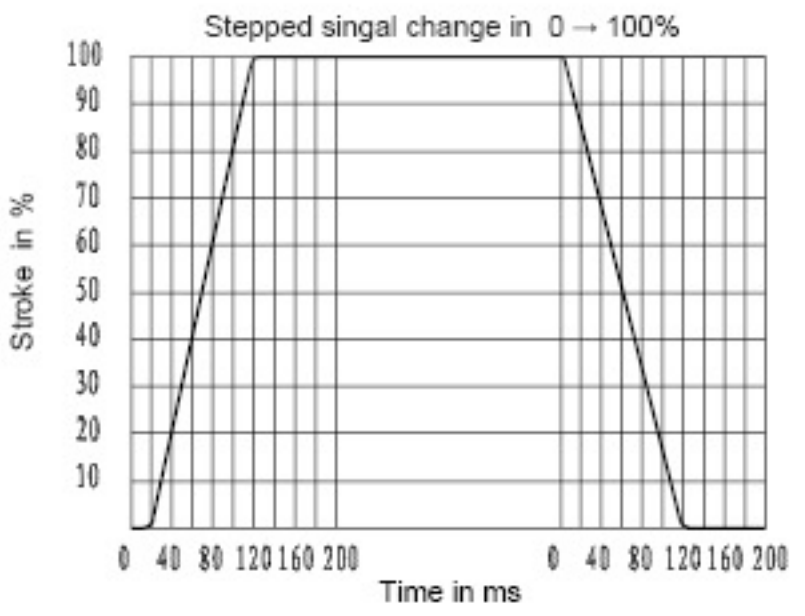


Pilot pressure at 5MPa

Size 32



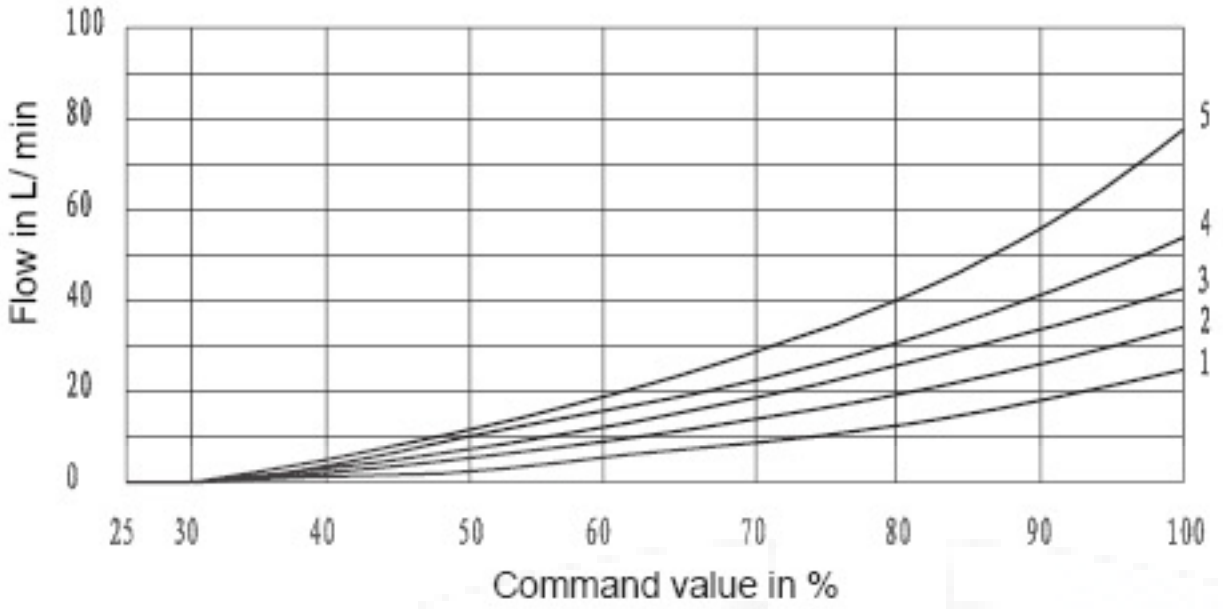




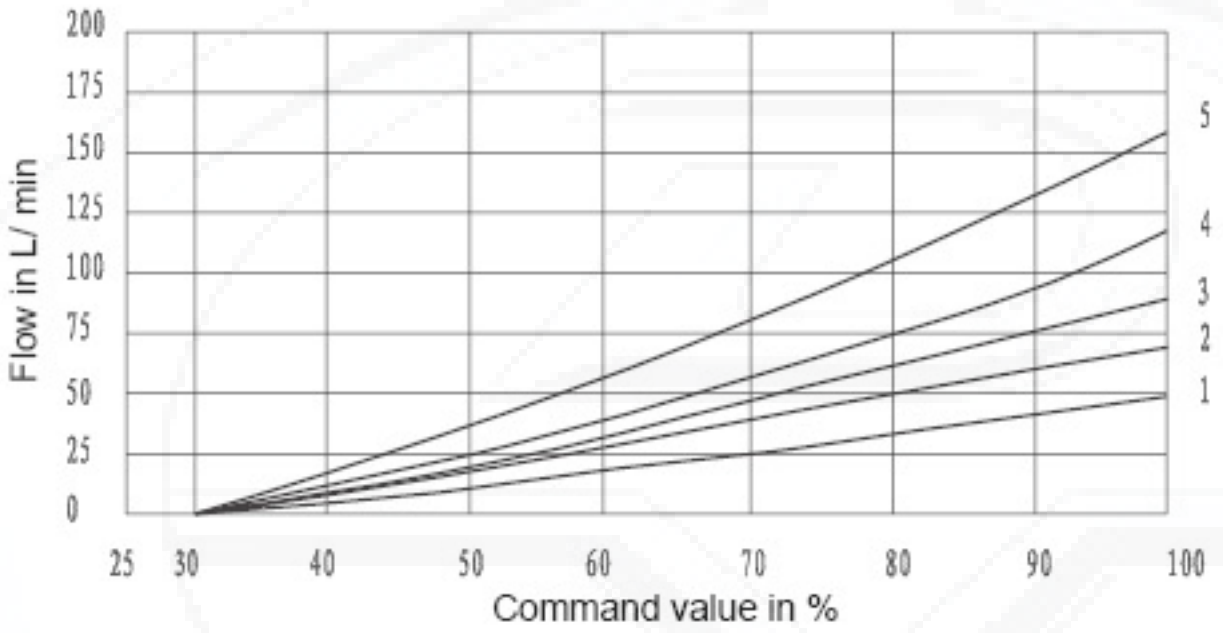
Pilot pressure at 5MPa

Characteristic curves:(measured at v=36 × $10^{-6}m^2/S$ t=50°C)

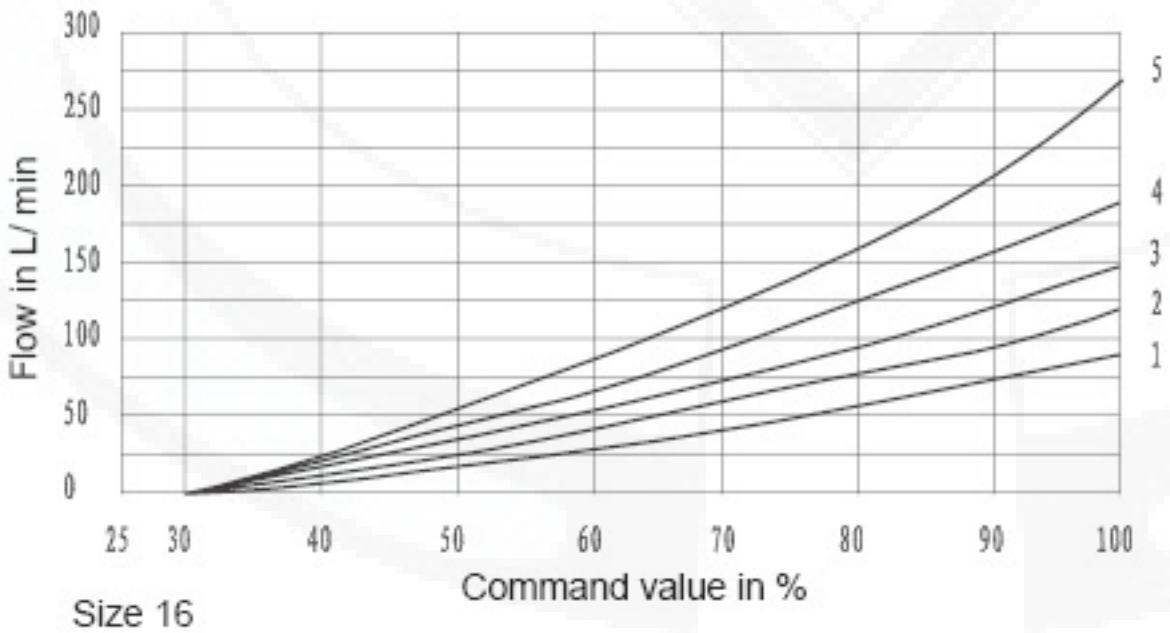
Size 10



25L/min Nominal flow at 1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

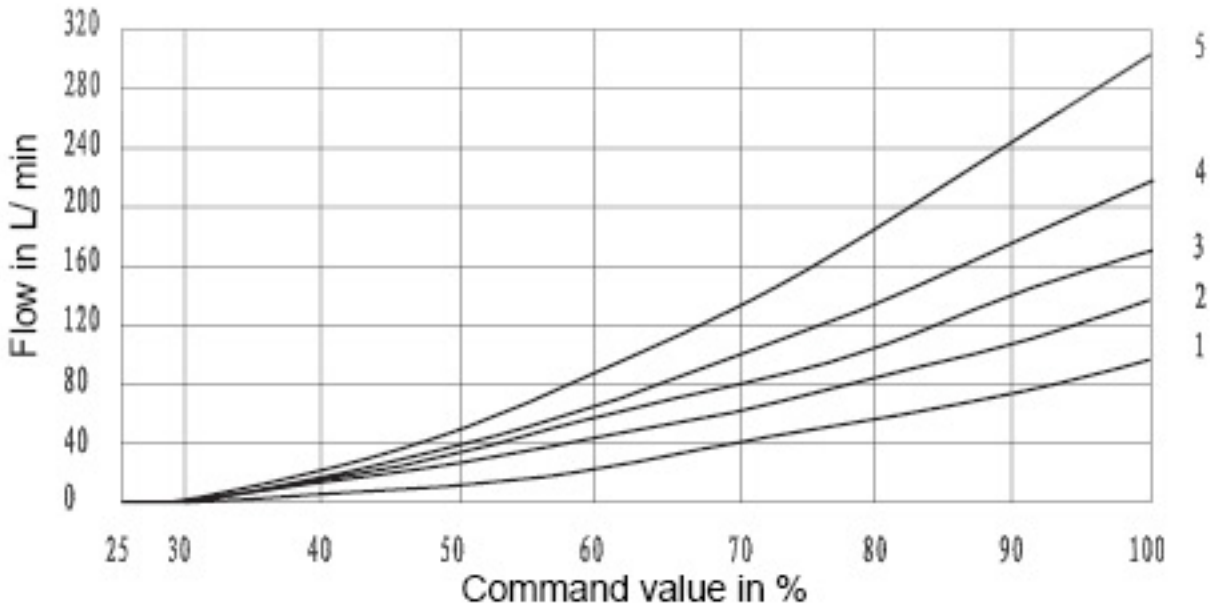


50L/min Nominal flow at 1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



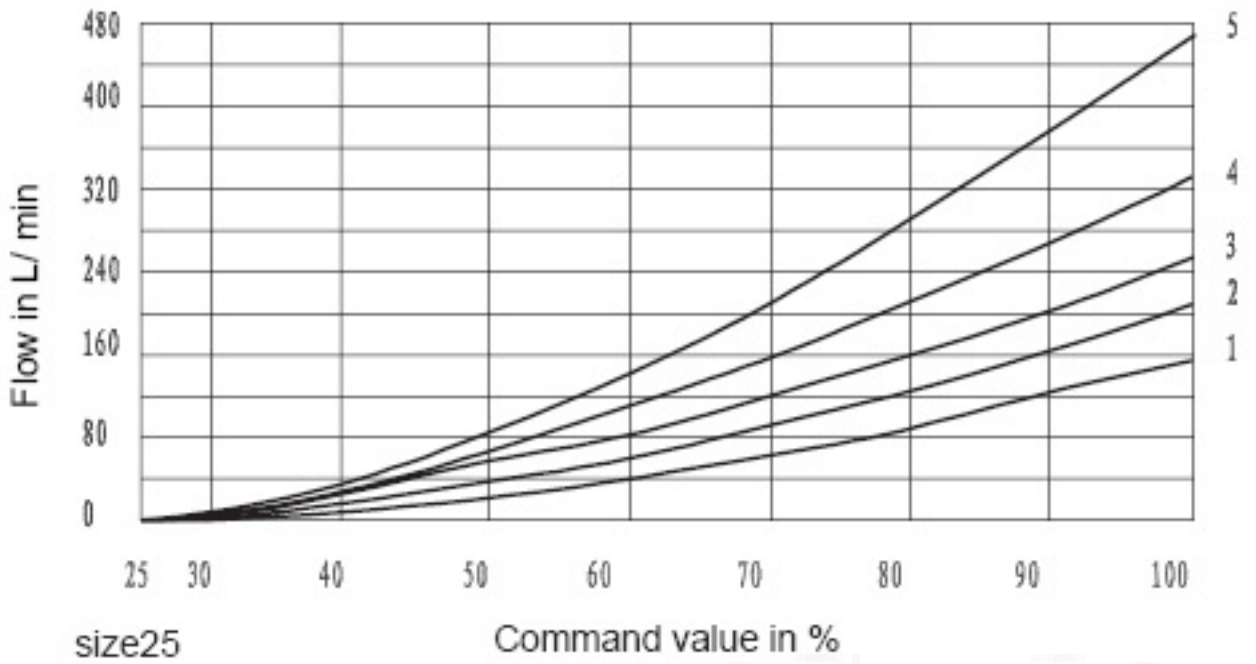
85L/min Nominal flow at 1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Size 16



100L/min Nominal flow at 1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

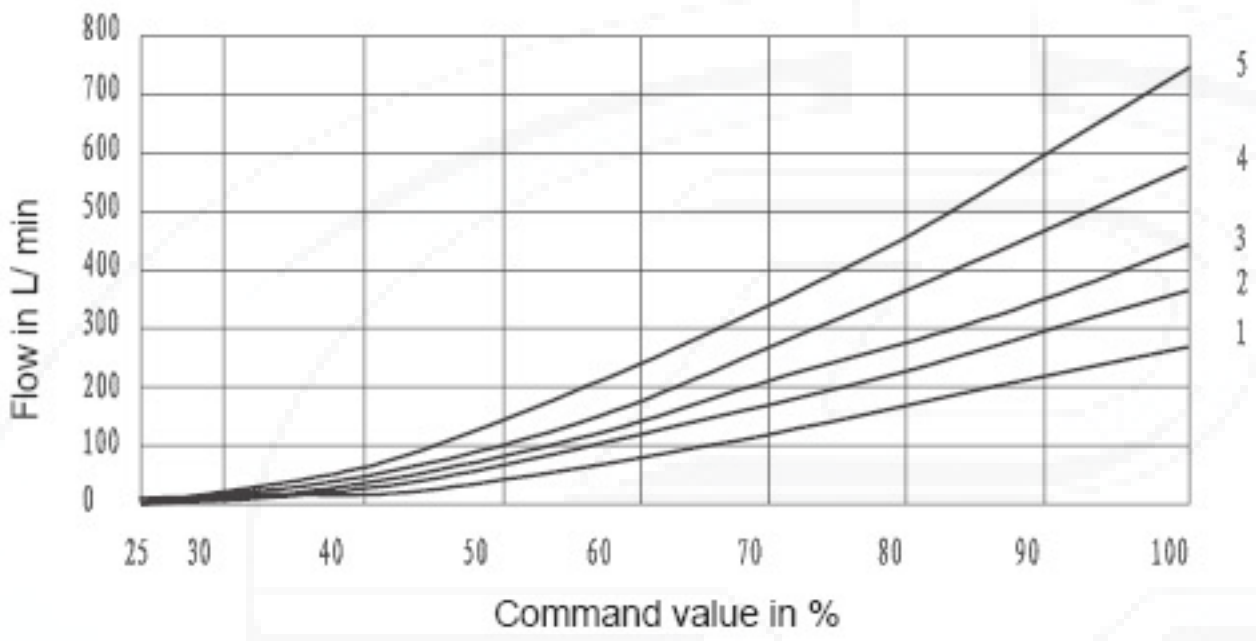
Please note power limit!



150L/min Nominal flow at 1MPa valve pressure difference

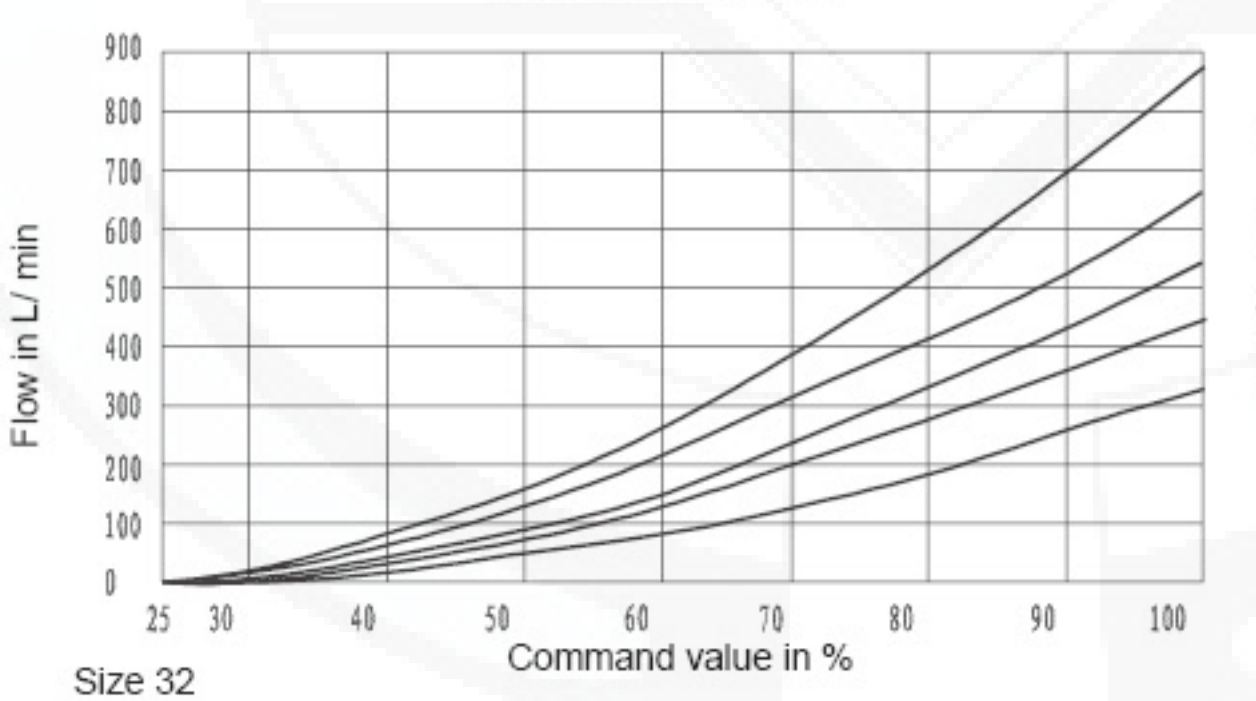
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

size25



270L/min Nominal flow at 1MPa valve pressure difference

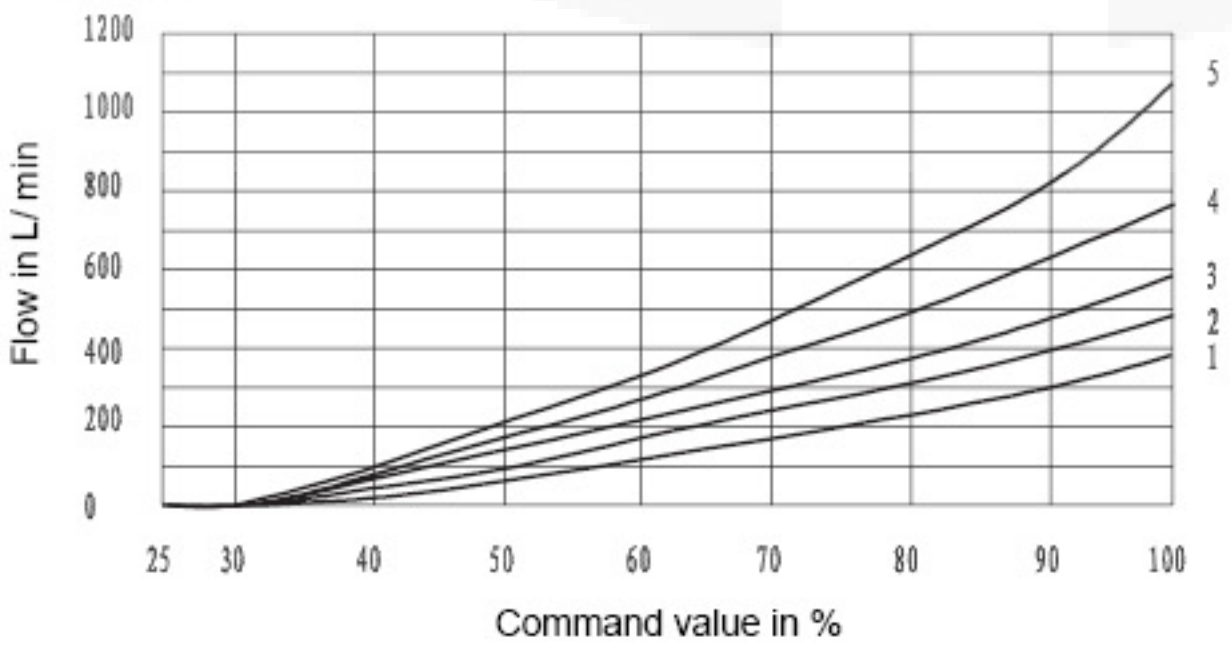
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



325L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Size 32

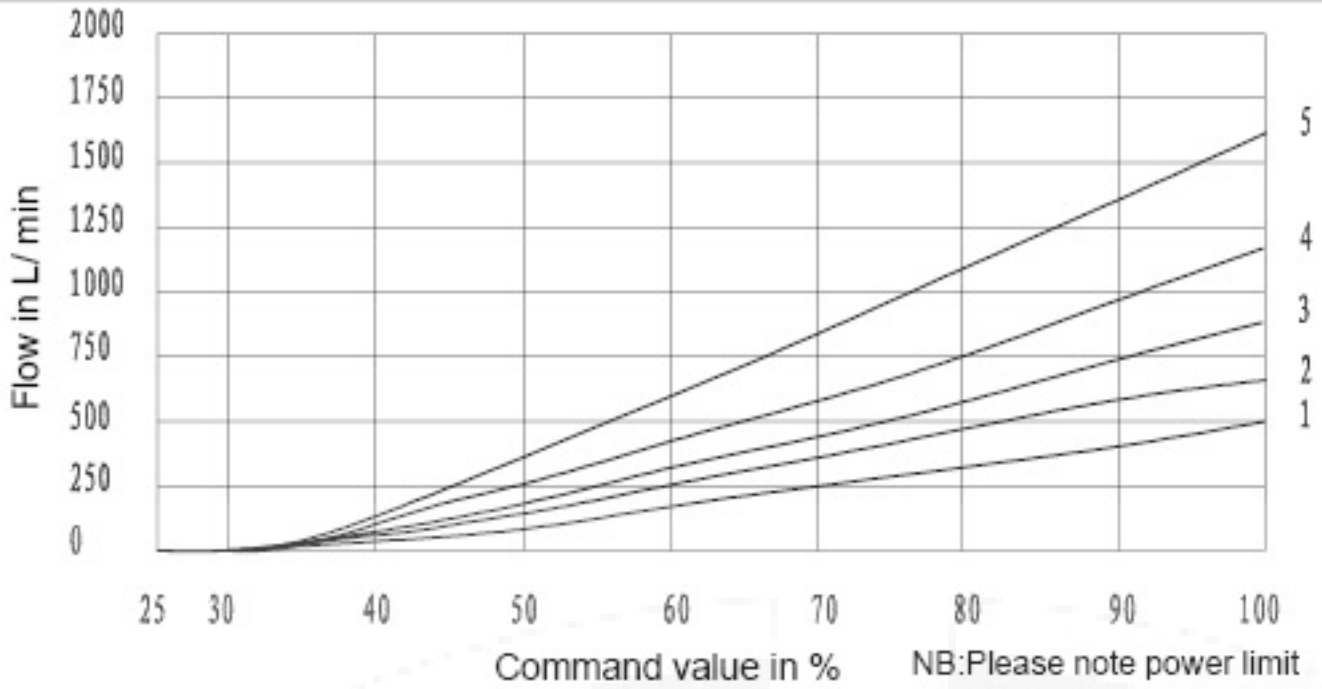


360L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Pv=Pressure drop across valve (inlet pressure minus load pressure and return line pressure)

Characteristic curves:(measured at v=36 × $10^{-6}m^2/S$ t=50°C)



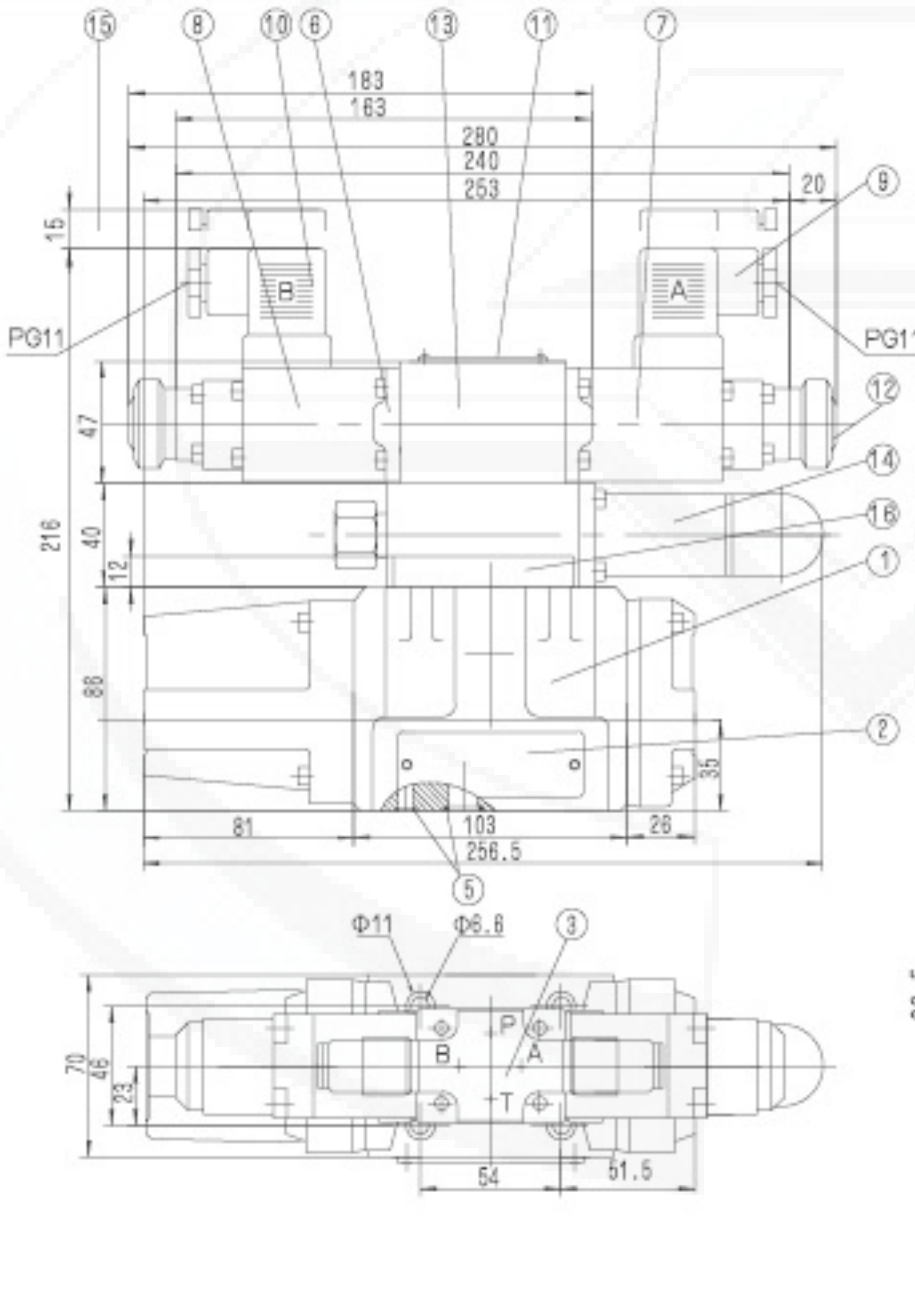
NB:Please note power limit

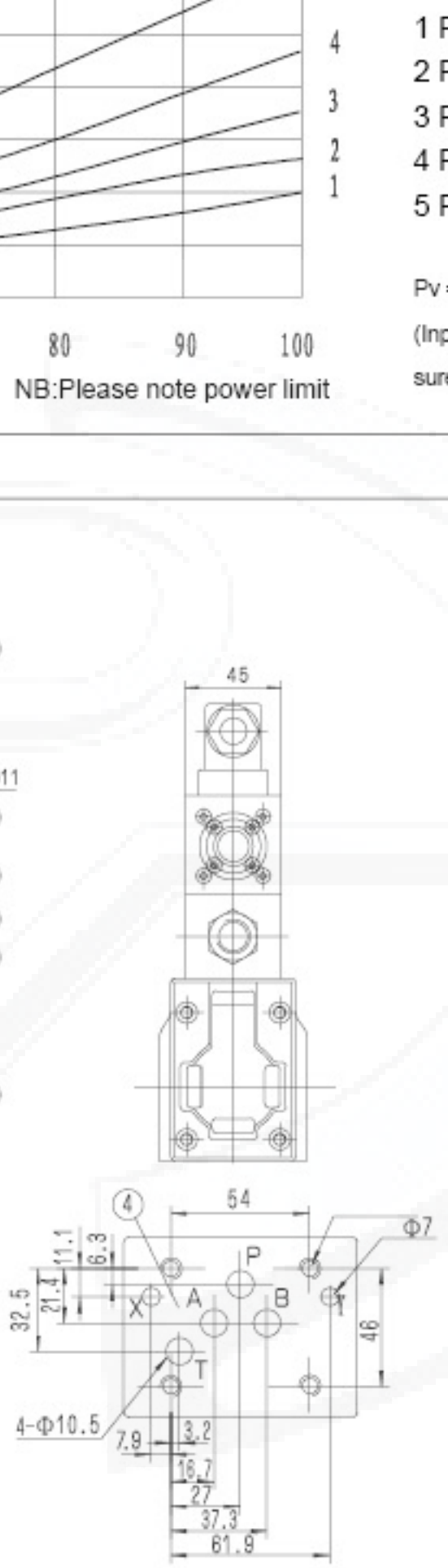
520L/min Nominal flow at 1MPa valve pressure difference

1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

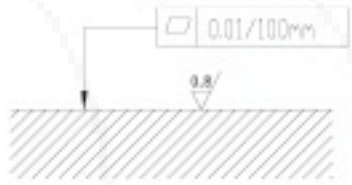
Pv = Pressure drop across valve (Input pressure minus load pressure and return pressure)

Unit Dimensions Type 4WRZ10 (Dimensions in mm)





Required surface finish of mating piece

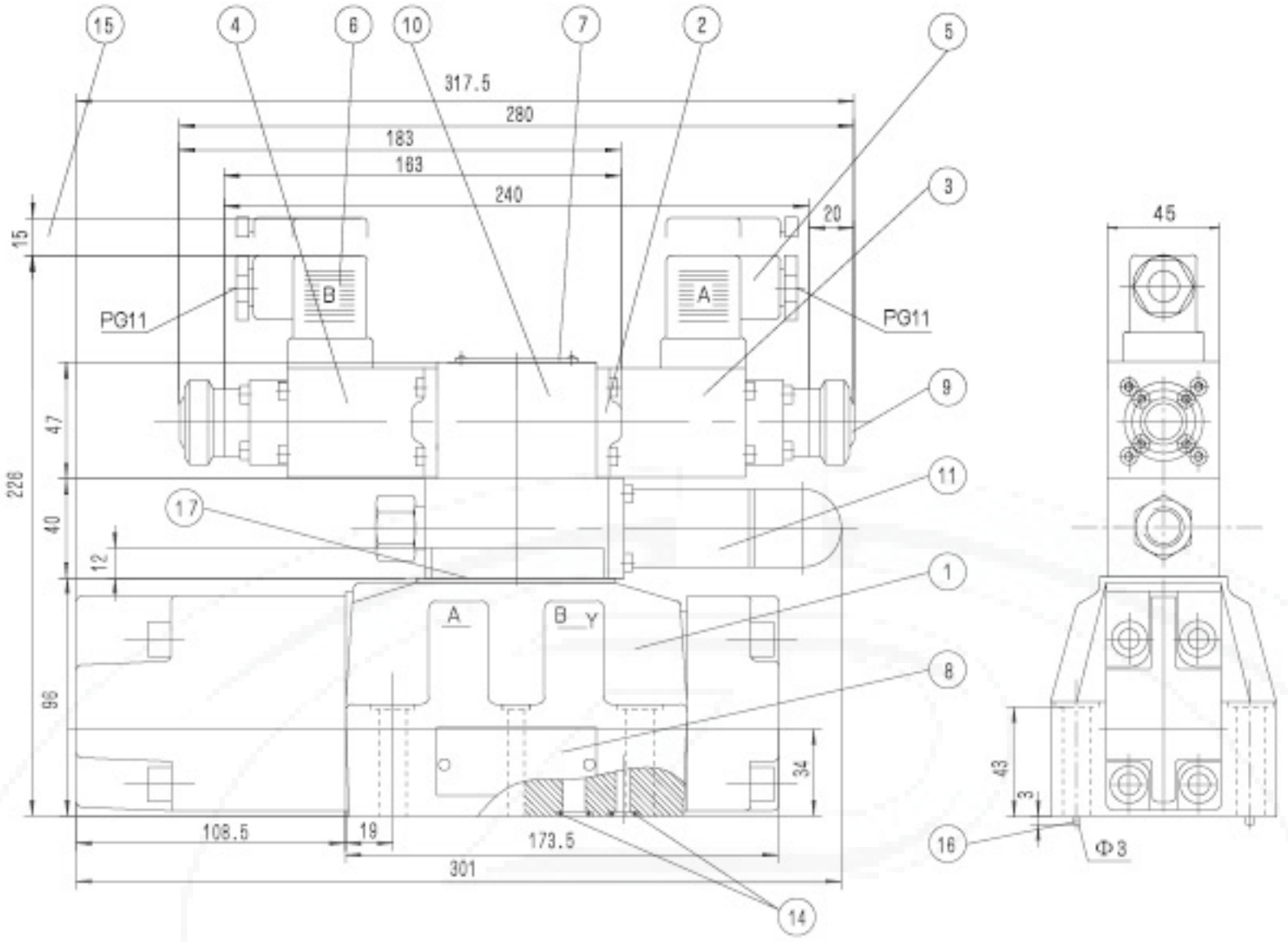


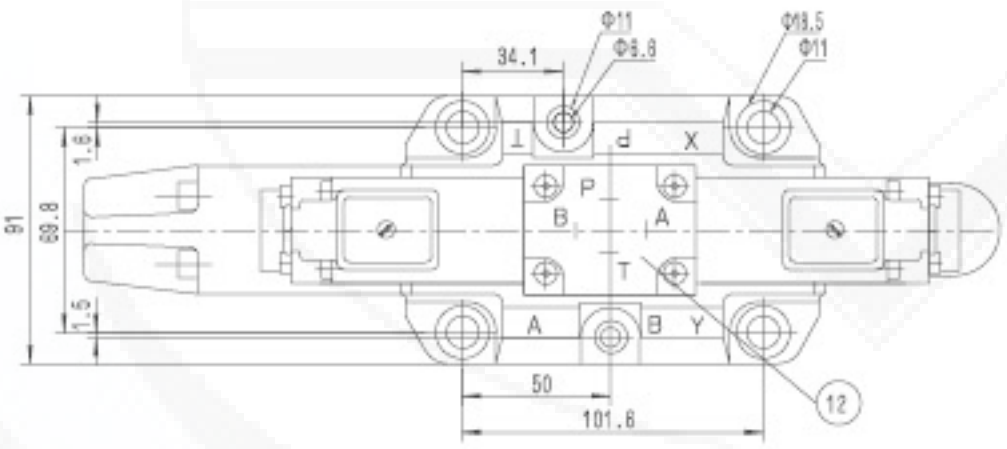
1 Main valve
2 Nameplate for main valve
3 Ports position of poilt valve
4 Machined mounting surface and position of ports
5 O-ring 12X2(Ports A,B,P,T) O-ring 10.82X1.78(Ports X,Y)
6 Pilot valve for 2-position valve (Type A and B)
7 Proportional solenoid "a"
8 Proportional solenoid "b"
9 Plug "A",coloured grey
10 Plug "B",coloured black
11 Nameplate of pilot valve
12 Emergency hand operator
13 Poilt valve for 3-position valve with two solenoids and plug Z4
14 Pressure reducing valve ZDR6DP2-30/75YM
15 Space required to remove plug
16 Connector plate(type WRH)

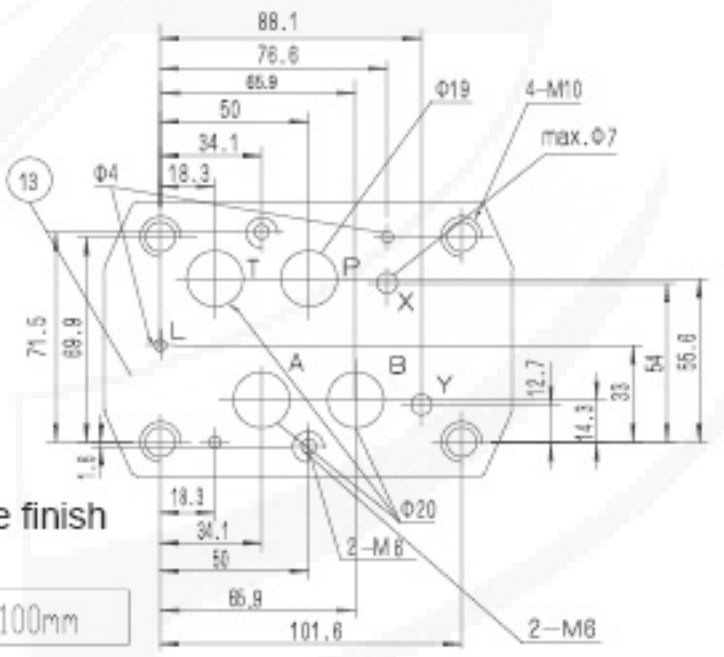
Subplates G534/01
G535/01
G536/01

see page 81and 82

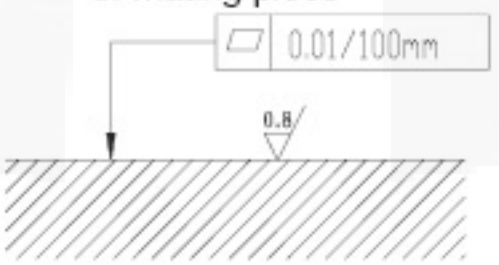
Unit Dimensions Type 4WRZ16 (Dimensions in mm)







Required surface finish of mating piece

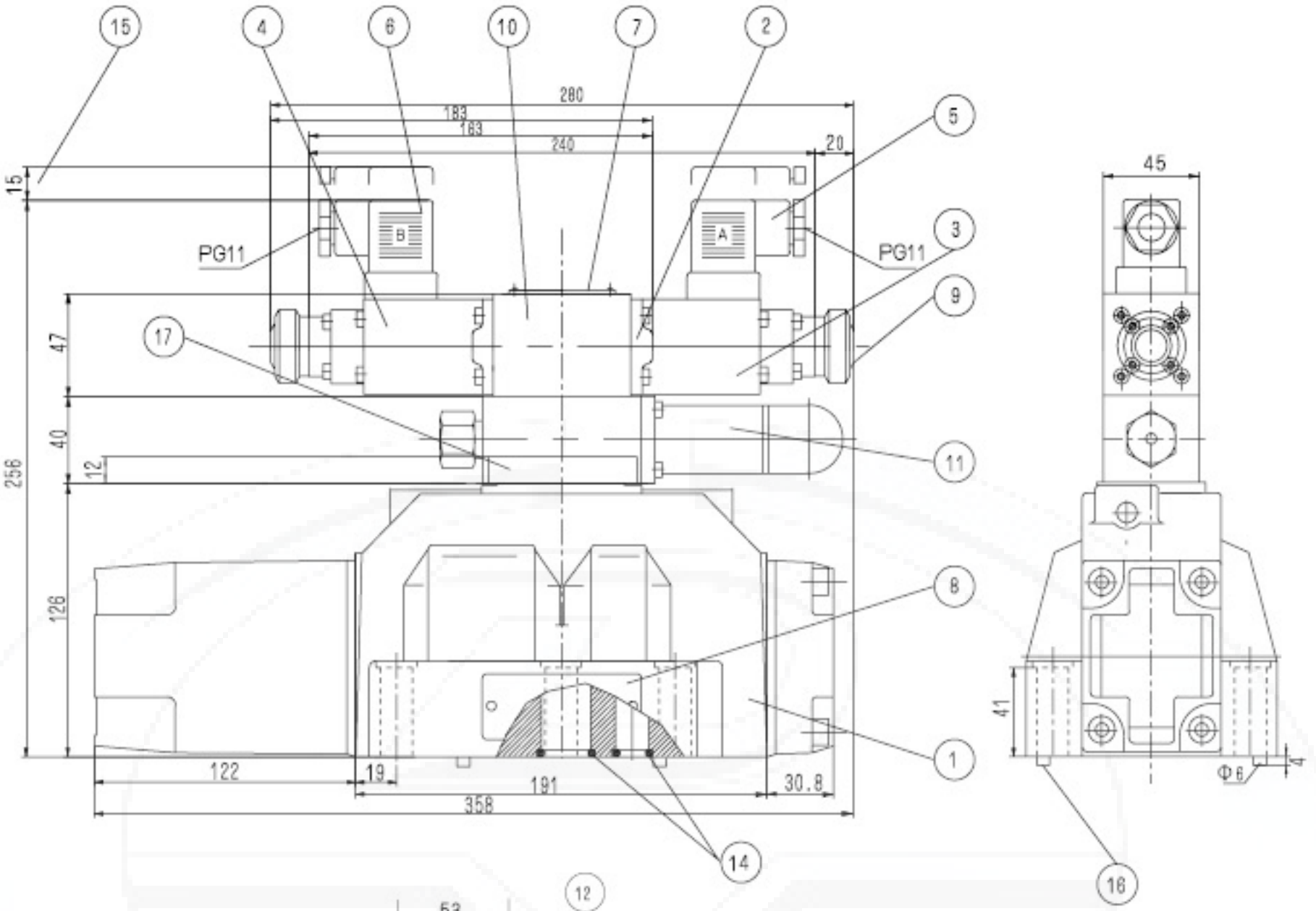


1 Main valve
2 Pilot valve for 2-position valve (models A and B),with one solenoid and plug Z4
3 Proportional solenoid a
4 Proportional solenoid b
5 Plug "A",coloured grey
6 Plug "B",coloured black
7 Nameplate for pilot valve
8 Nameplate for wain valve
9 Emergency hand operator
10 Pilot valve for 3-position with two solenoid and plug "Z4"
11 Pressure reducing valve ZDR6DP2-30B/75YM
12 Ports position of pilot valve
13 Machined mounting surface and position of ports
14 O-ring 22X2.5 (for Ports A,B,P,T)
O-ring 10X2 (for Ports X,Y)
15 Space required to remove plug
16 Locating pin
17 Connector plate(type WRH)

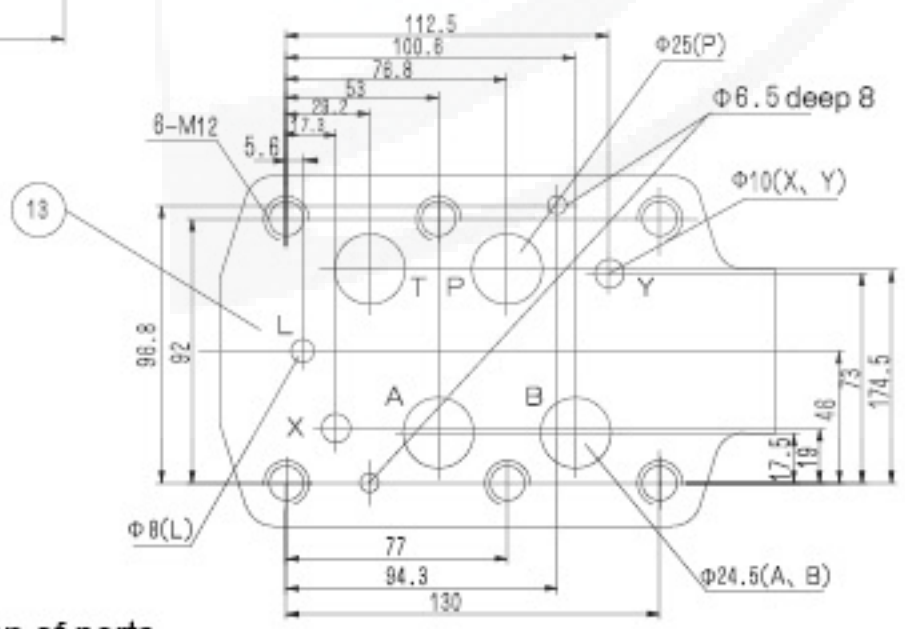
Subplates
G172/01
G172/01
G174/01
G174/02
G174/08
See page 82 and 83

Unit Dimensions Type 4WRZ25

(Dimensions in mm)



Required surface finish of mating piece

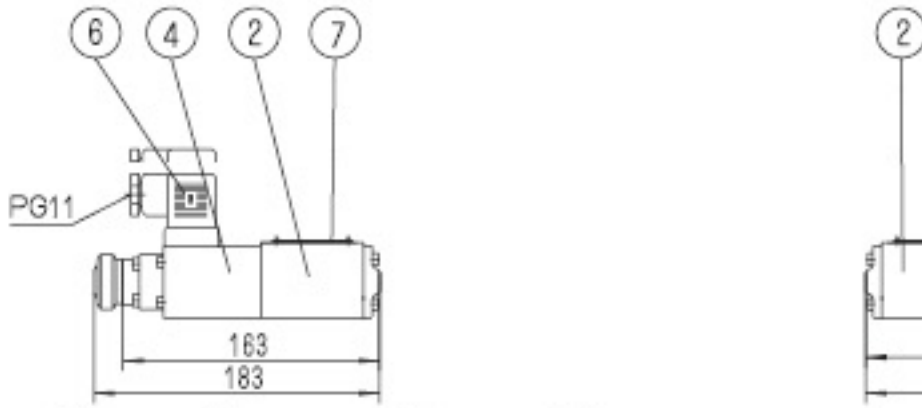


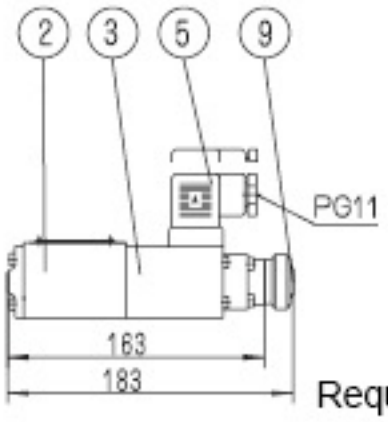
1 Main valve
2 Pilot valve for 2-position valve with one solenoid and plug "Z4" (models A and B)
3 Proportional solenoid "a"
4 Proportional solenoid "b"
5 Plug "A",coloured grey
6 Plug "B",coloured black
7 Nameplate for pilot valve
8 Nameplate for wain valve
9 Emergency hand operator
10 Pilot valve for 3-position valve with two solienoid and plug "Z4"
11 Pressure reducing valve ZDR6DP 2-30B/75YM
12 Ports Position of pilot valve
13 Machined mounting surface and position of ports
14 O-ring 27X3 (for Ports A,B,P,T)
O-ring 19X3 (for Ports X,Y)
15 Space required to remove plug
16 Locating pin
17 Connector plate(type WRH)

Subplates G151/01 G153/01
G154/01 G156/01
see page 84

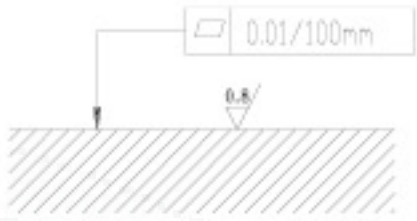
Unit Dimensions Type 4WRZ32

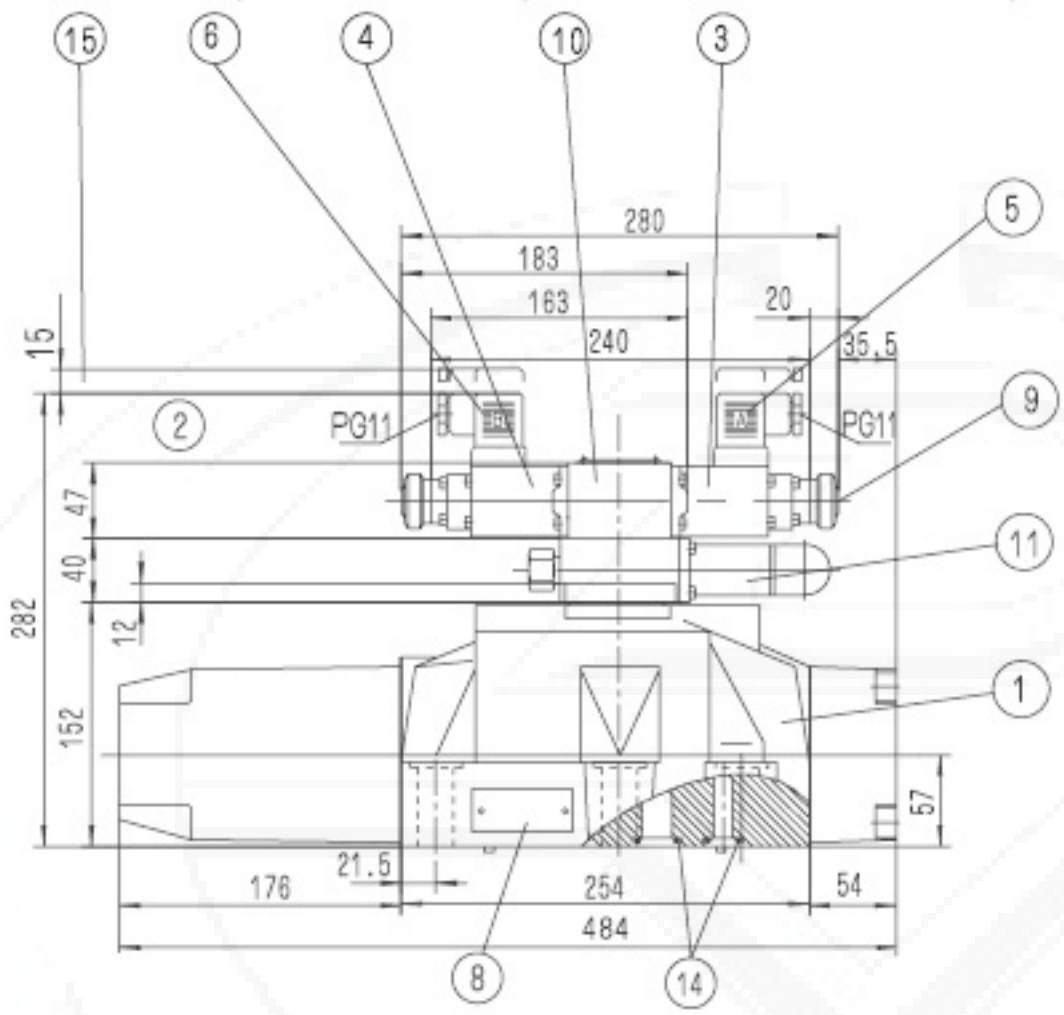
(Dimensions in mm)

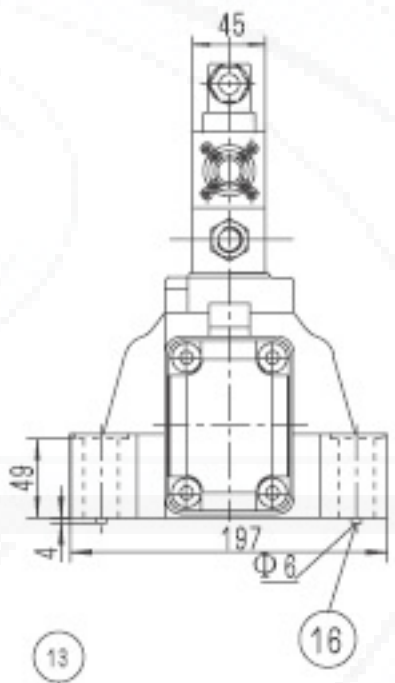


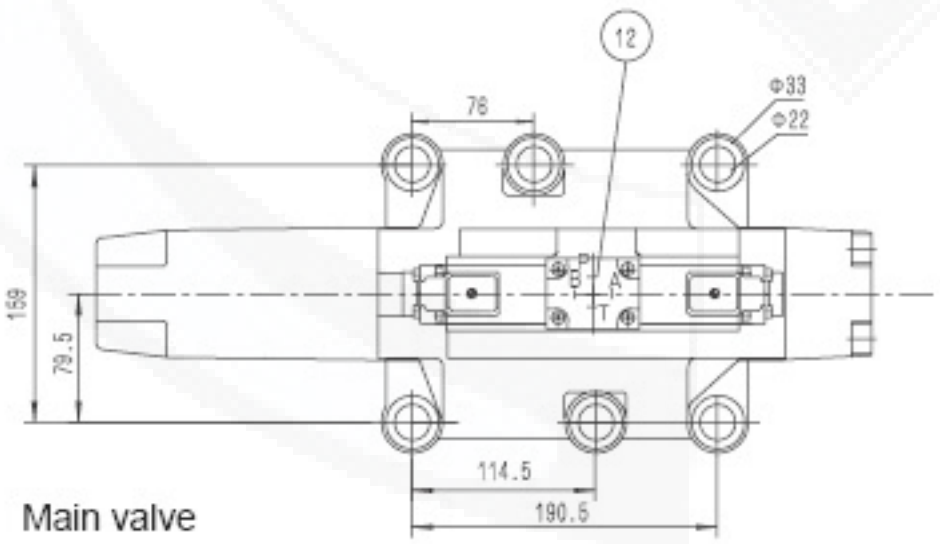


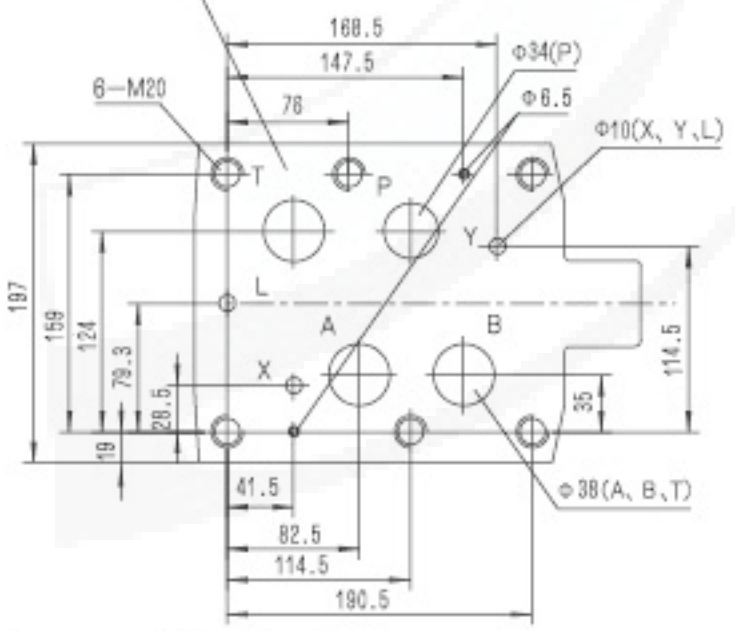
Required surface finish of mating piece











1 Main valve
2 Pilot valve for 2-position valve with one solenoid and plug "Z4" (models A and B)
3 Proportional solenoid "a"
4 Proportional solenoid "b"
5 Plug "A",coloured grey
6 Plug "B",coloured black
7 Nameplate for pilot valve
8 Nameplate for wain valve
9 Emergency hand operator
10 Pilot valve for 3-position valve with two solienoid and plug "Z4"
11 Pressure reducing valve ZDR6DP2-30B/75YM
12 Ports position of pilot valve
13 Maachined mounting surface and position of ports
14 O-ring 42X3(Ports A,B,P,T)
O-ring 19X3(Ports X,Y)
15 Space required to remove plug
16 Locating pin
17 Connector plate(type WRH)

Subplates
G157/01
G157/02
See page 85

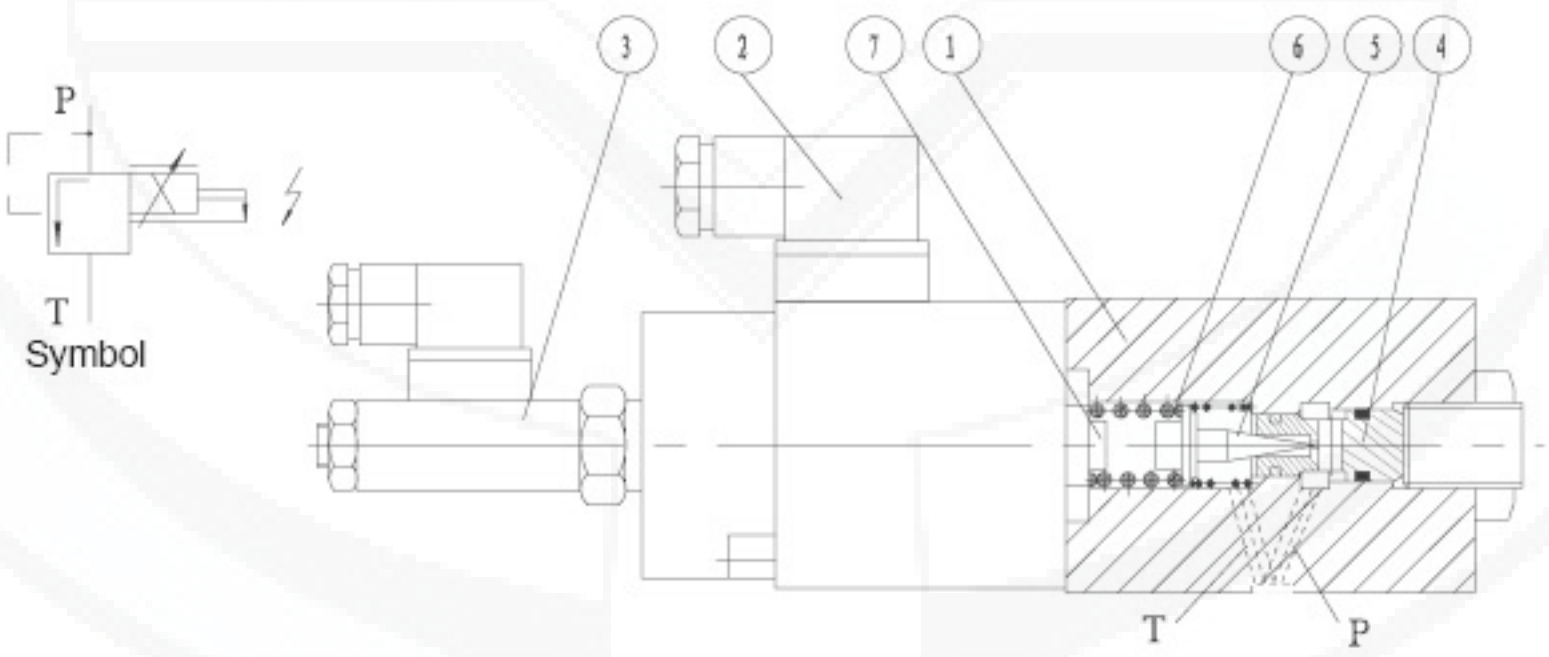
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Pressure Relief Valve Type DBETR			RC29166/9.2006
	Size 6	up to 31.5 MPa	up to 10 L/min	Replaces: RC29166/08.2000

Features:

- Low hysteresis
- Good repeatability
- Electrical closed loop position control of spring pre-tension,
- Proportional solenoid actuation with inductive position transducer (pressure balanced)
- Valve and electronic control from one source

Function, section,symbol

This valve regulates pressure in proportion to the electrical command value.
The valve consists basically of a housing (1), proportional solenoid (2) with inductive posistional transducer (3), valve seat (4) and valve poppet (5).
Pressure is set by adjusting the command value potentiometer (0 to 9 V). Adjusting the command value causes tensioning of the compression spring via the electronic controls and the proportional solenoid (2). Tensioning of the compression spring (6), i.e. the position of the spring plate (7), is determined by the inductive positional transducer (3). Any deviations from the command value are corrected by the closed loop positional control.
The use of this principle eliminates the effect of solenoid friction.
Advantages: - Low hysteresis
- Good repeatability



Ordering details

DBETR	10	B			*

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

Technology of Beijing Huade Hydraulic =B

Pressure stage:
up to 2.5MPa =25
up to 8MPa =80
up to 18MPa =180
up to 31.5MPa =315

Further details in clear text

M= mineral oils
V = phosphate ester

No code= let oil inside
Y= let oil outside

Technical data

Hydraulic data

Max. settable pressure (MPa)	Pressure stage 2.5 MPa	2.5
	Pressure stage 8.0 MPa	8
	Pressure stage 18.0 MPa	18
	Pressure stage 31.5 MPa	31.5
Min. settable pressure (MPa)		(see p_{min} - q_v characteristic curves)
Max.Operating pressure (MPa)	port T (with pressure adjusting)	0.2
	por T (without pressure adjusting)	10
	port P	31.5
Max. flow (L/min)	Pressure stage 25	10
	Pressure stage 80	3
	Pressure stage 180	3
	Pressure stage 315	2
Degree of contamination (μm)		≤ 20 (recommendation 10)
Hysteresis (%)		< 1 of max. settable pressure
Repeatability (%)		< 0.5 of max. settable pressure
Linearity (%)	180; Pressure stage from 3 to 18 MPa	≤ 1.5 of max. settable pressure
	315; Pressure stage from 6 to 31.5MPa	
Typical variation (%)	Valve	± 3 of max. settable pressure
	Electrical control	< 0.5

Stepped response 0 to 100% (ms)			Response time (Pmin-Pmax)	Response time (Pmax-Pmin)
	Pressure stage 2.5 and 18MPa	0 to100	100	50
	Pressure stage 31.5MPa	0 to100	150	100

Pressure fluid	Mineral oil(for NBR seal),Phosphate ester (for FPM seal)
Viscosity range (mm²/s)	2.8 to 380
Pressure fluid temperature range (℃)	-20 to +70
Installation position	optional
Weight (kg)	4

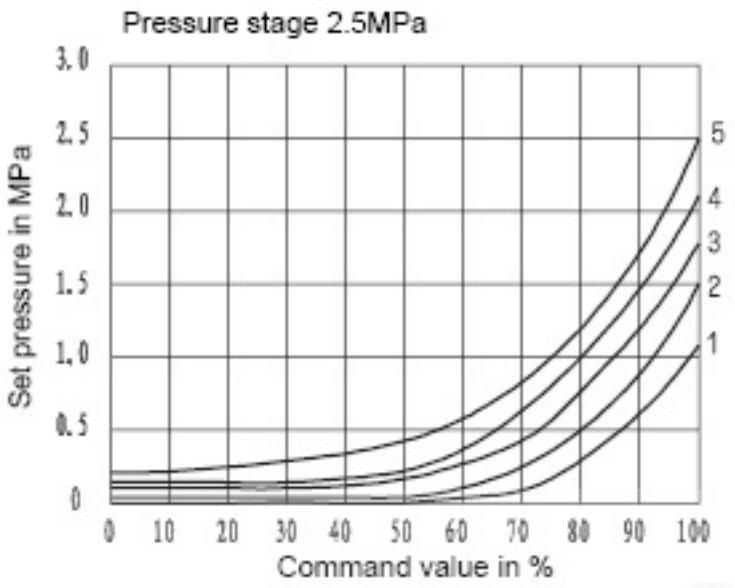
Electrical

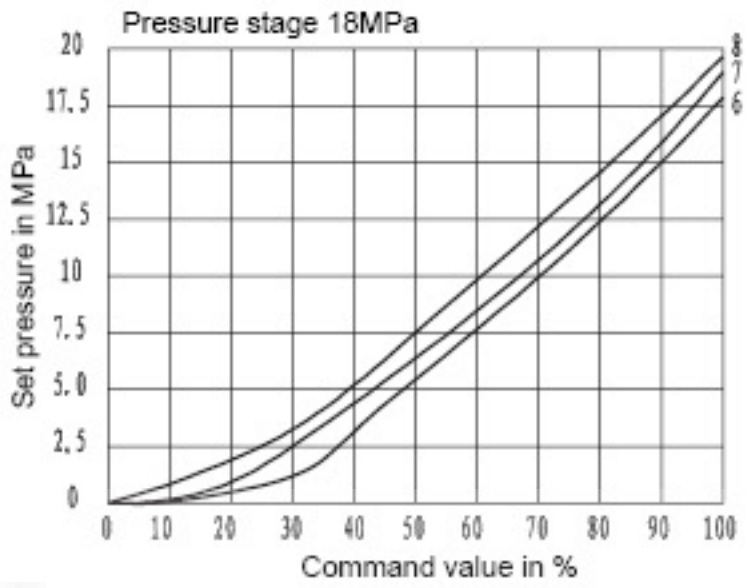
Amplifier associated		VT-5003S30
Supply voltage		DC
Coil resistance (Ω)	Cold value at 20 ℃	10
	Max. warm value	13.9
(Working state) Duty		Continuous
Pressure fluid temperature (℃)		+50
Amplifier voltage	commutate completely	24 ± 10%
	commute three electrical source	24 to 35
Max. power consumption (VA)		50

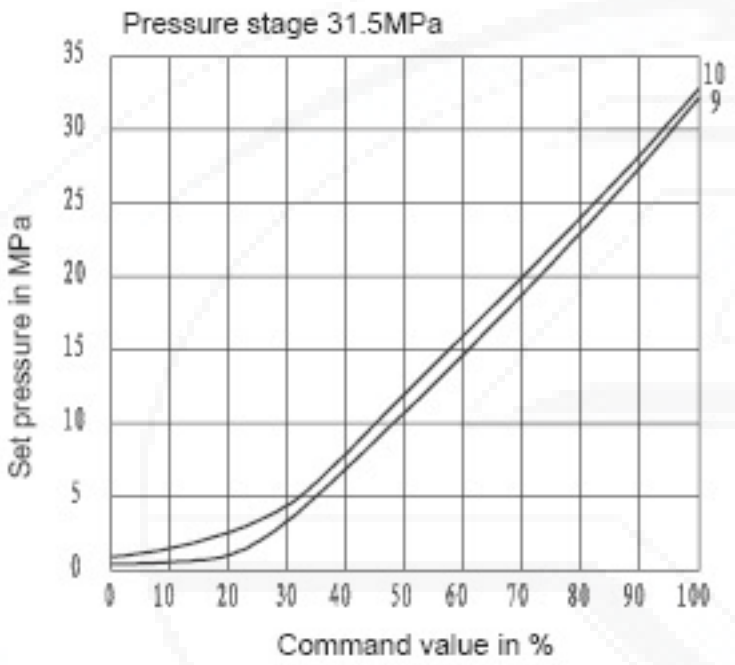
Coil resistance at 20 ℃ (Ω)			
1	11	111	
56	56	112	

Inductivity (transducer) (mH)	6 to 8
Oscillator frequency (transducer) (KHz)	2.5
Protection to DIN 40 050	IP65

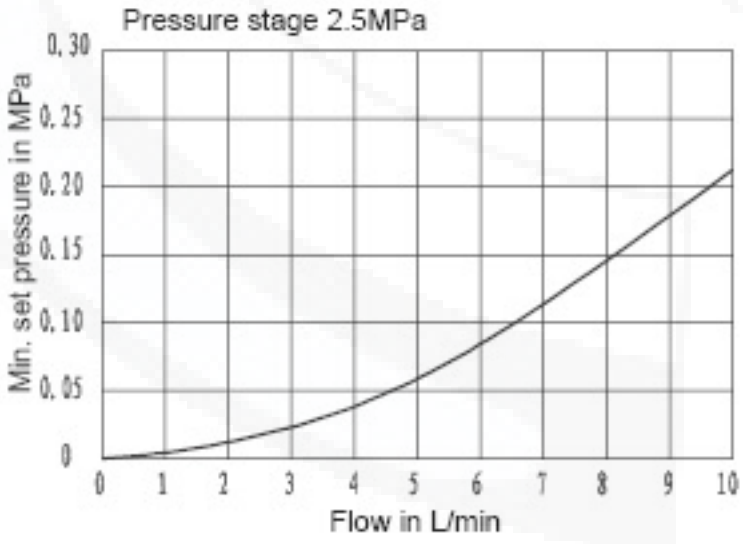
Characteristic curves:(measured at v=36 × $10^{-6}m^2/S$ t=50°C)

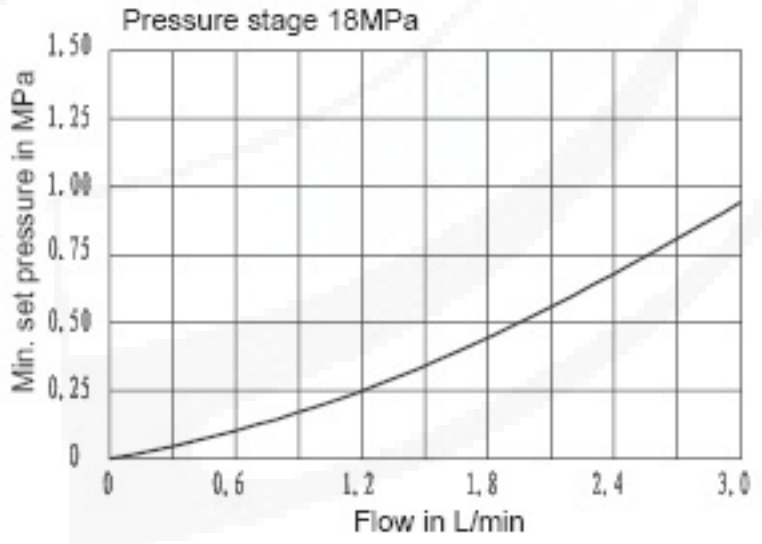


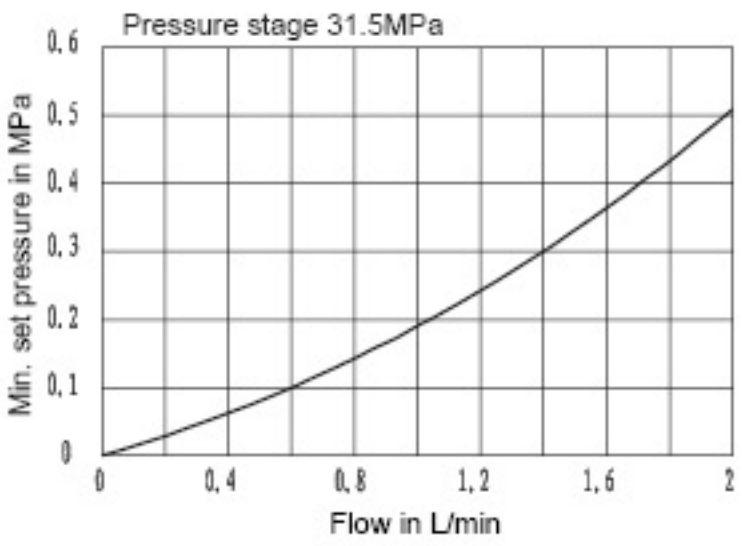




Curve 1 - flow = 2 L/min
Curve 2 - flow = 4 L/min
Curve 3 - flow = 6 L/min
Curve 4 - flow = 8 L/min
Curve 5 - flow = 10 L/min
Curve 6 - flow = 0.5 L/min
Curve 7 - flow = 1.5 L/min
Curve 8 - flow = 3L/min
Curve 9 - flow = 1 L/min
Curve 10 - flow = 2 L/min

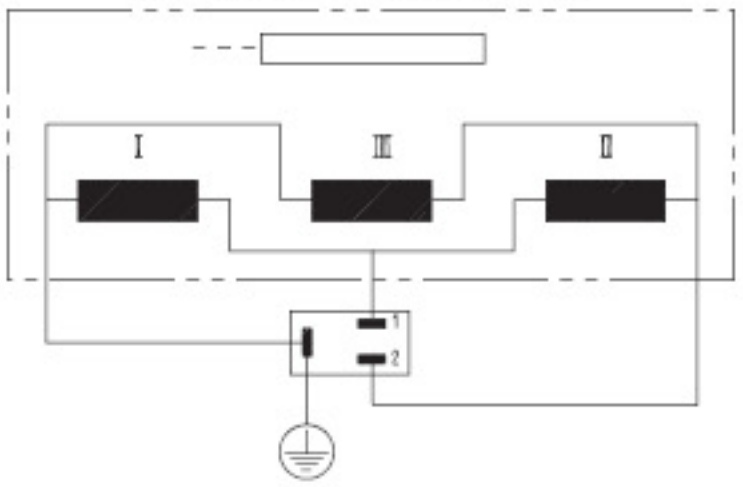




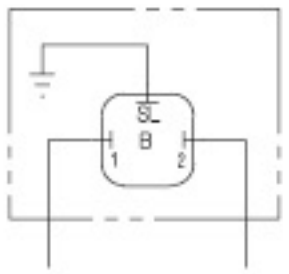


Electrical connections (Inductive postion transducer)

Inductive postion transducer



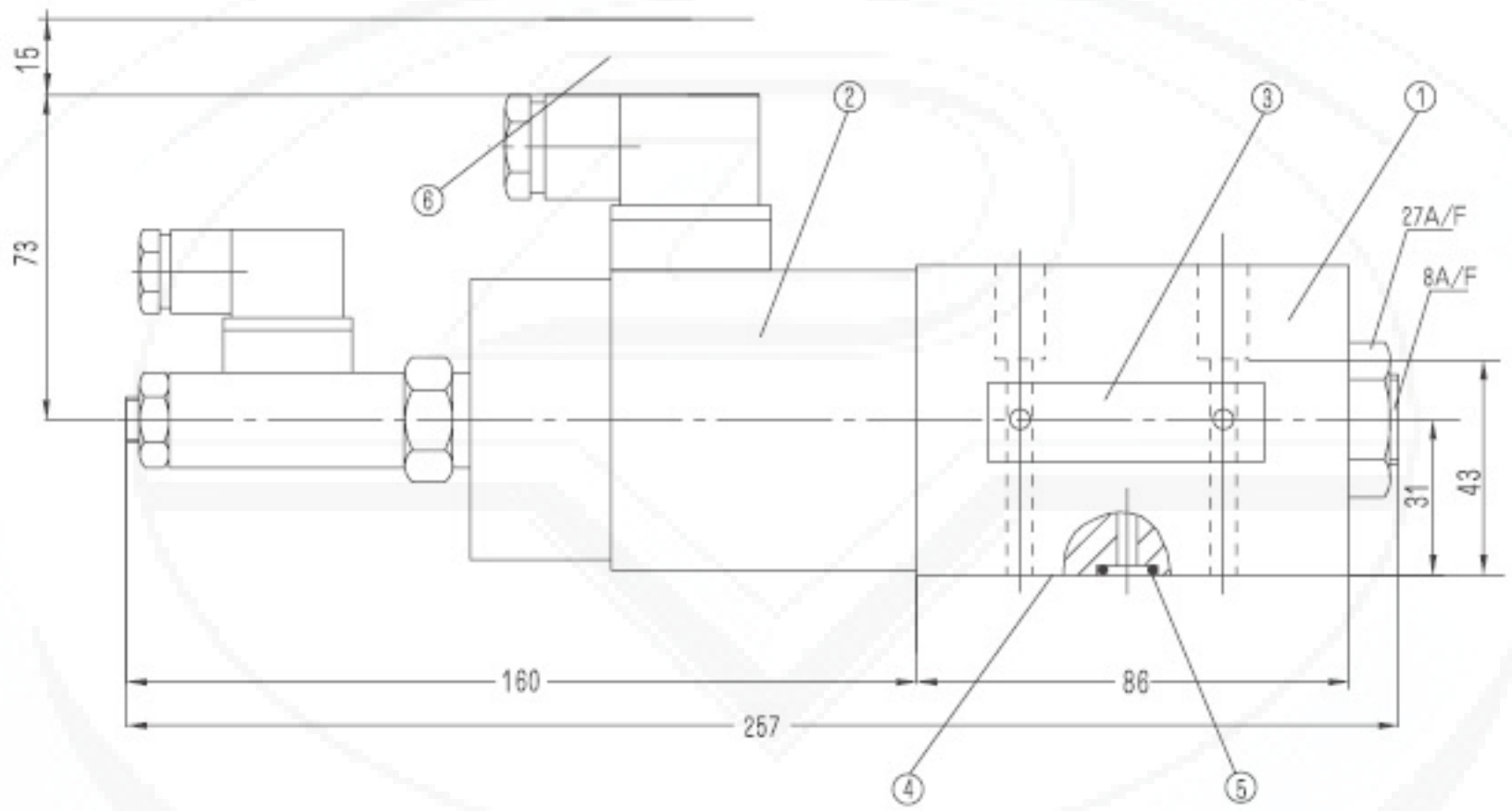
Type Connection of plug-in connector



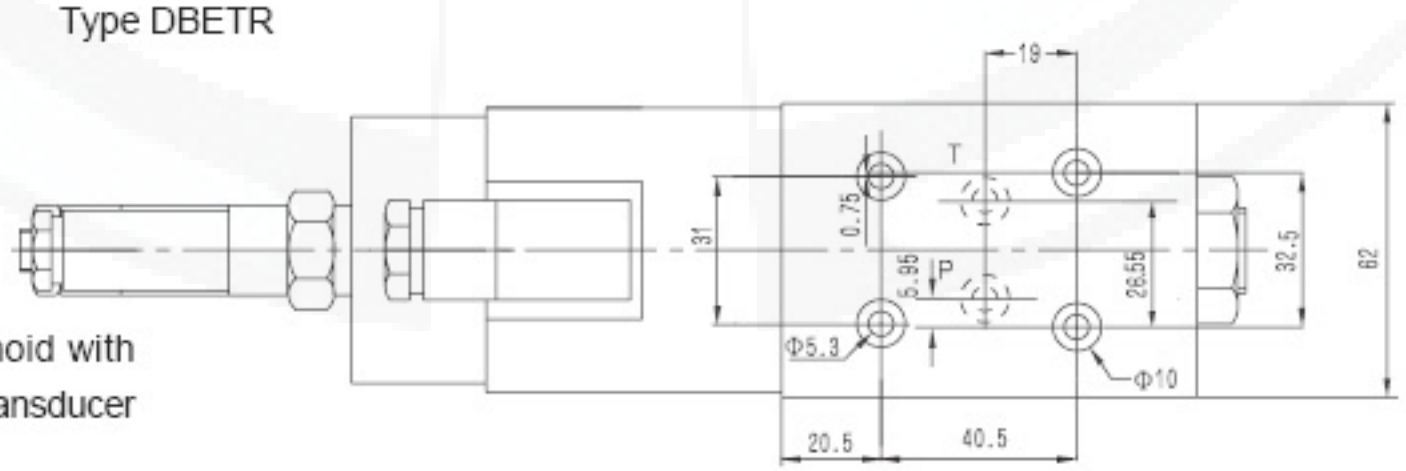
To amplifier

Unit dimensions

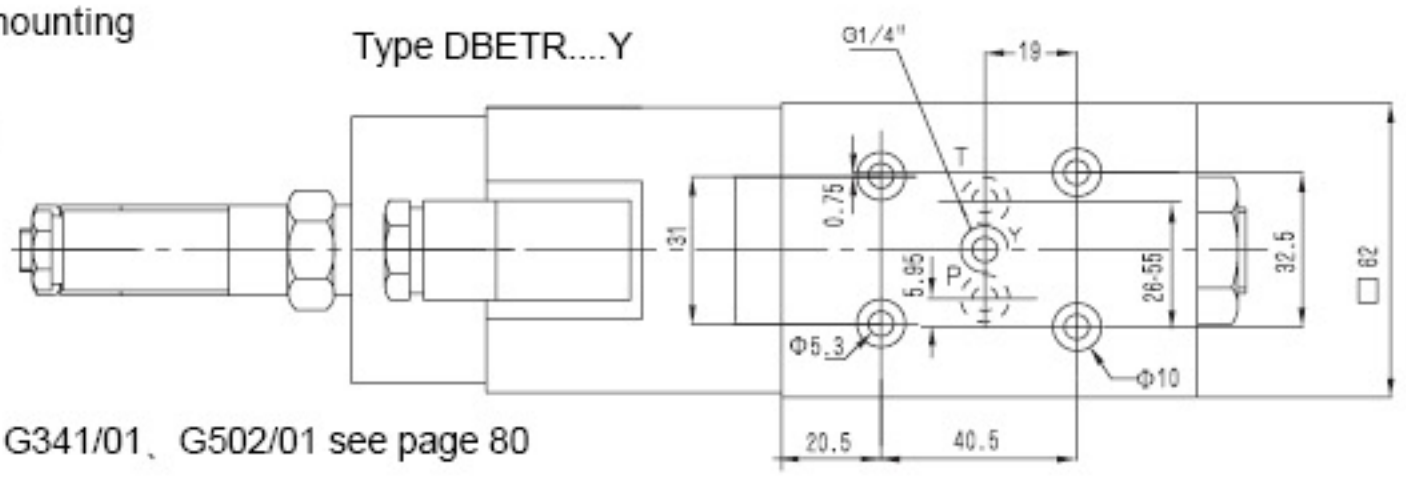
(Dimensions in mm)



Type DBETR



Type DBETR....Y



1 Valve housing
2 Proportional solenoid with inductive position transducer
3 Nameplate
4 Machined valve mounting surface
5 O-ring 9.25 x 1.78
6 Space required to remove the plug-in connec-tor

Subplates:G340/01、G341/01、G502/01 see page 80

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure relief valve Type DBE/DBEM			RC29160/9.2006
	Size 10 ,25 ,32	up to 31.5 MPa	up to 600 L/min	Replaces: RC29160/08.2000

Features:

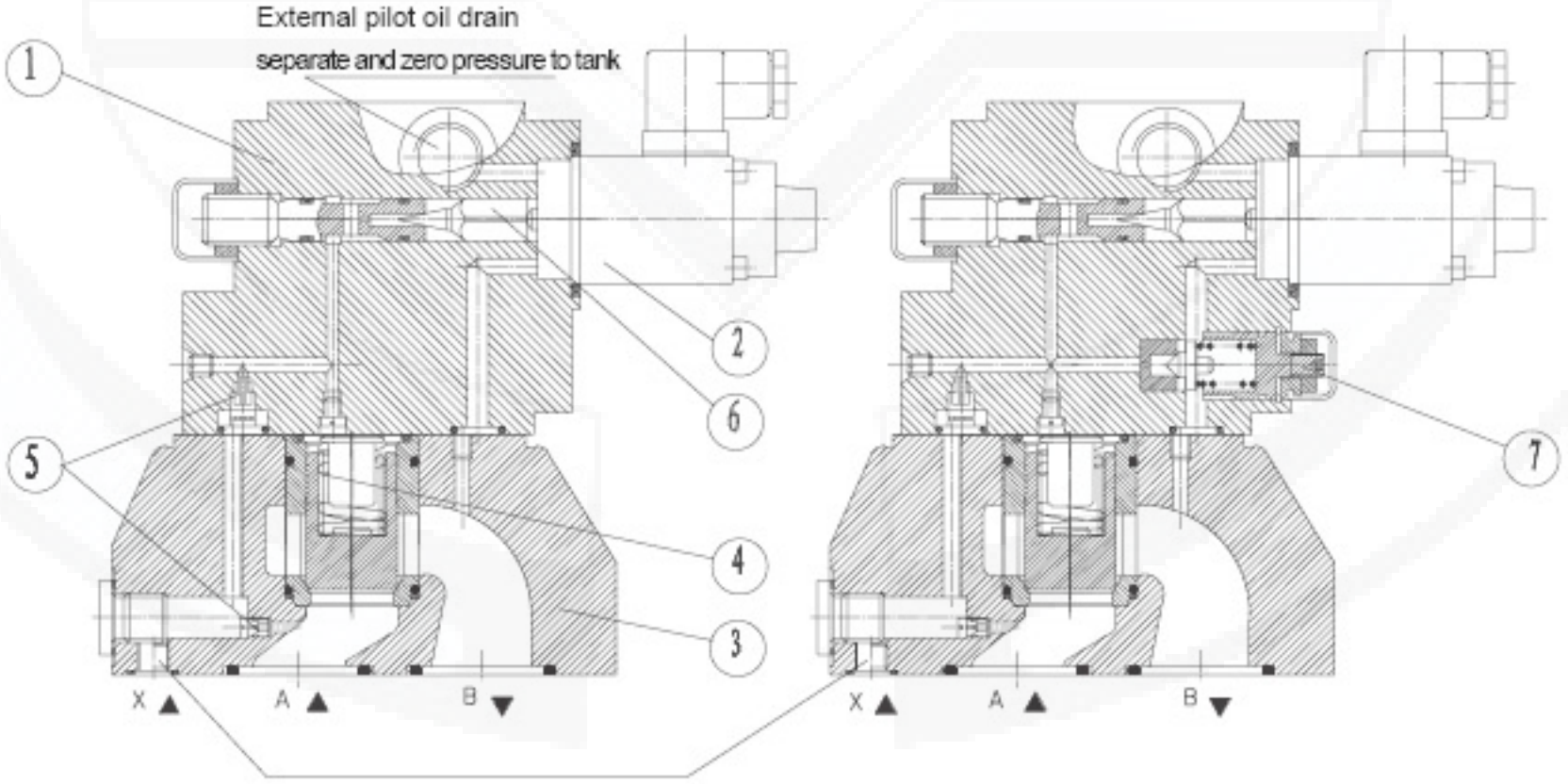
- For subplate mounting:
- Encased in block
- Optional additional maximum pressure limitation by means of a spring loaded pilot control valve
- Valve and electronic control form one source

Functional , section

These valves basically consist of the pilot control valve (1) with proportional solenoid (2) and the main valve (3) with main spool insert (4).

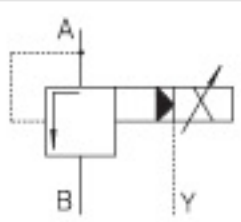
Type DBE:
The adjustment of the pressure is command value dependent via a proportional solenoid (2). The pressure present in port A acts on the underside of the main spool (4). At the same time this pressure acts on the spring loaded side of the main spool (4) via orificies (5). The hydraulic force acts on the pilot poppet (6) When the hydraulic force over comes the solenoid force then the pilot poppet (6) opens. Due to the fact that the pilot oil can now flow to tank via port Y, a pressure drop occurs at the main spool (4) which acts on the main spool and lifts it against the force of the return spring . The connection from A to B is opened and there is no longer any increase in pressure.

Type DBEM:
Optionally the valve can be supplied with an additional spring loaded pilot control valve for maximum pressure safety (redundant pressure safety).

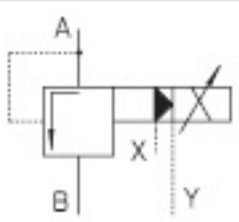


Type DBE — Port "X" is bolcked when internal pilot oil supply — Type DBEM

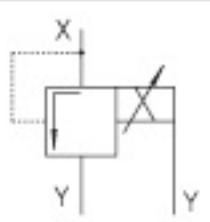
Symbols



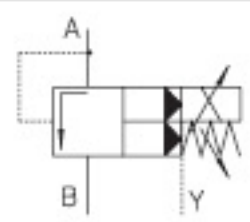
10
DBE 20- ..Y
30
DBEC30- ..Y



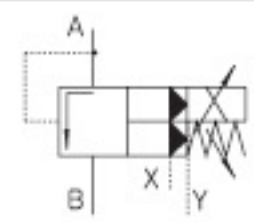
10
DBE 20- ..XY
30



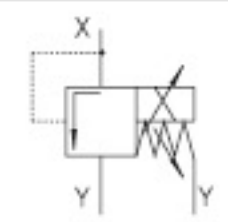
DBE C T- ..
DBEC- ..Y



10
DBE 20- ..Y
30
DBEMC30- ..Y



10
DBEM 20- ..XY
30



DBE C T-
DBEMC- ..Y

Ordering details

DBE | | | | 30 | B | / | | | *

Without maximum
Pressure limitation = No code
With maximum pressure limitation = M

Pilot pressure relief valve =No code
Insert pressure relief valve =C
(sign size 10 or 30)
Pilot pressure relief valve without =C
the main spool (signless size)
Pilot pressure relief valve use as remote control=T

Size 10 = 10
Size 25 = 20
Size 32 = 30

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

Technology of Beijing Huade Hydraulic =B

Further details in clear text

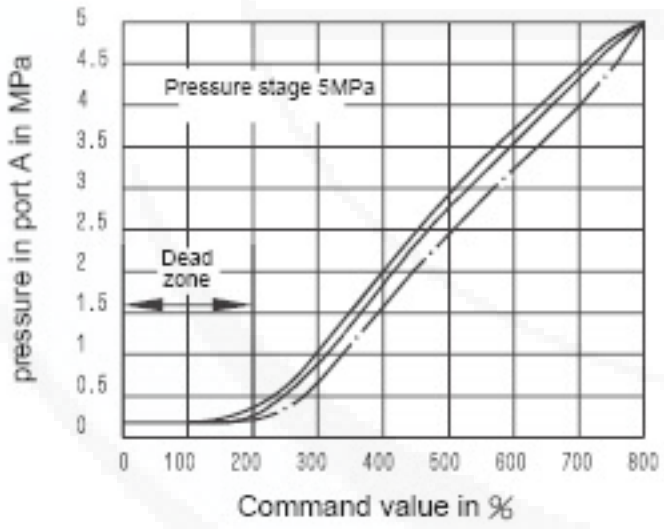
M= mineral oils
V= phosphate ester

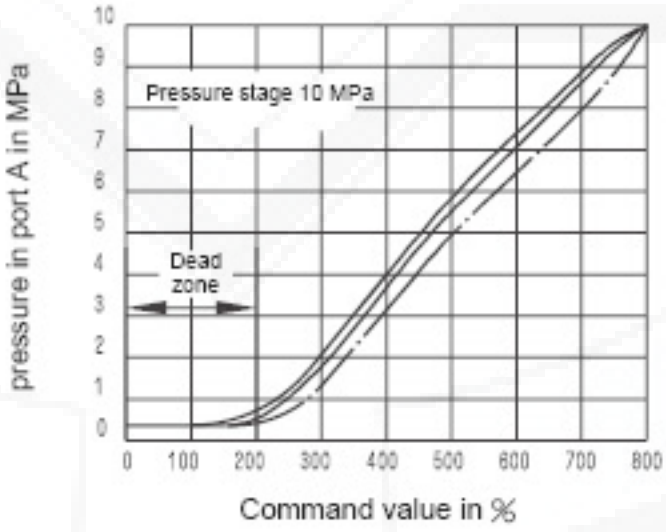
Y= pilot oil supply, internal
drain external
XY= pilot oil supply, external
drain external

Pressure stage
50= Up to 5.0 MPa
100= Up to 10.0 MPa
200= Up to 20.0 MPa
315= Up to 31.5 MPa

Characteristic curves:(measured at v=36 × $10^{-6}m^2/S$ t=50℃)

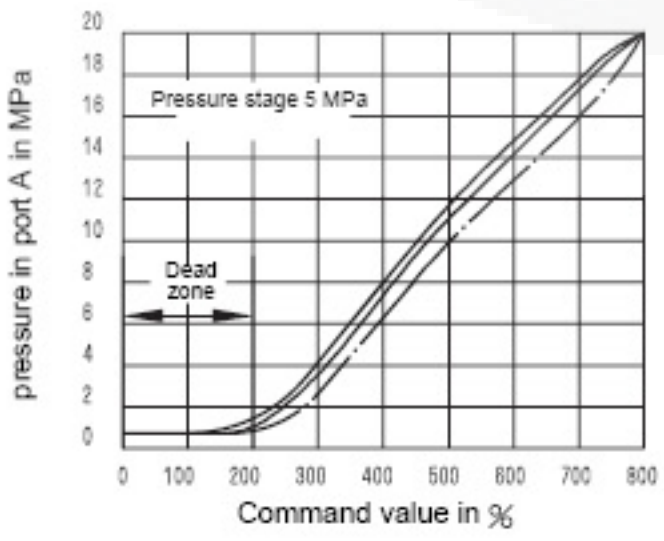
Type DBE10、20、30/DBET input pressure/current curves

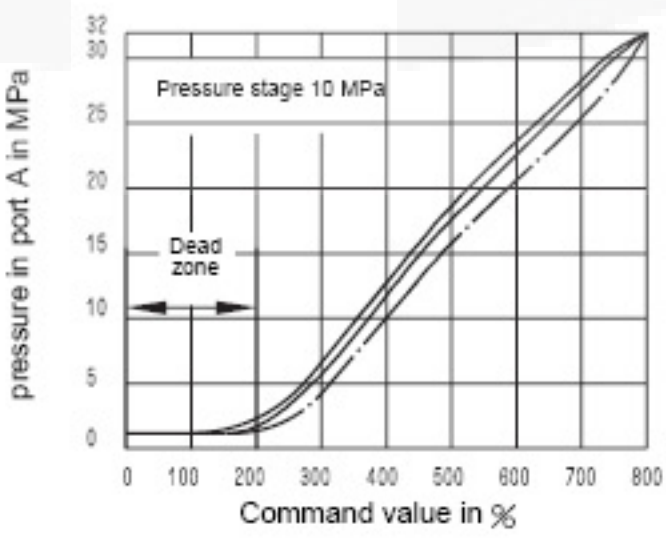




Type DBE10、20 and 30 (measured at a flow of 27 L/min)
Type DBET(measured at a flow of 0.8 L/min)

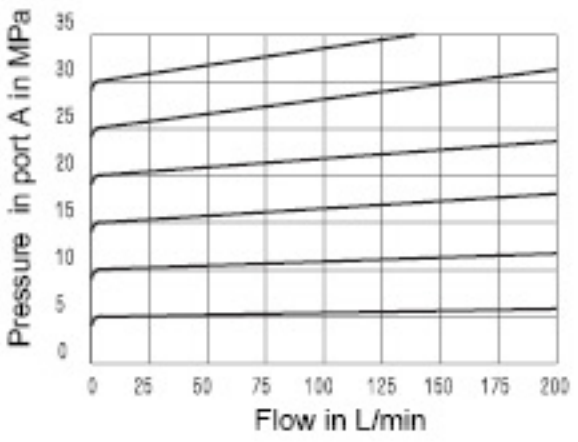
Hysteresis:
With surge ——————
Without surge —·—·—

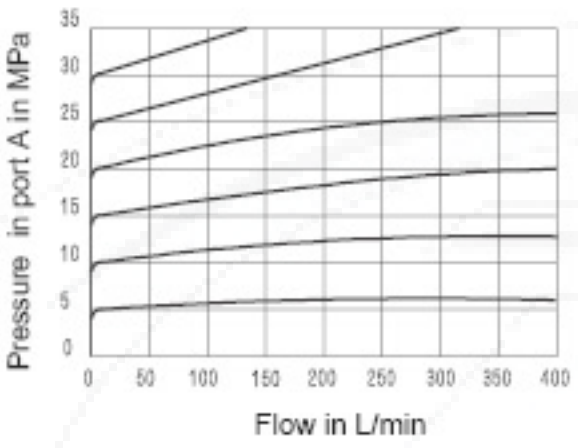


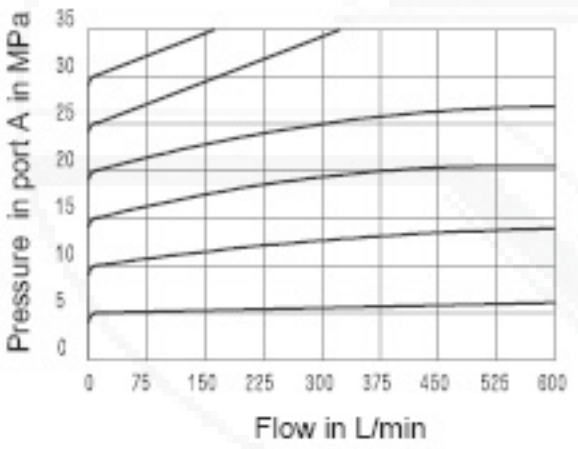


Note: So that the minimum settable pressure can be achieved the bias current must not exceed 100 mA.

Settsble Pressure in relation to the flow

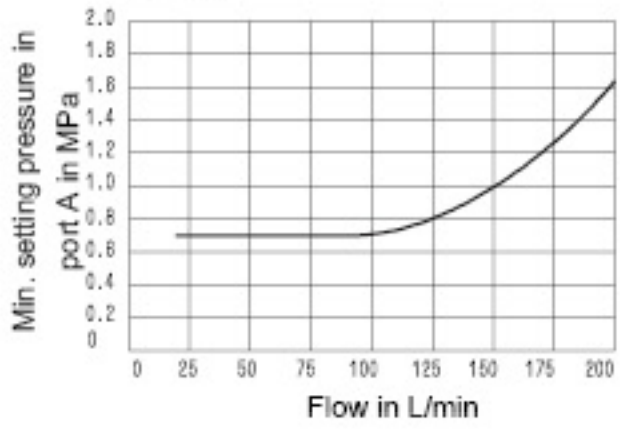




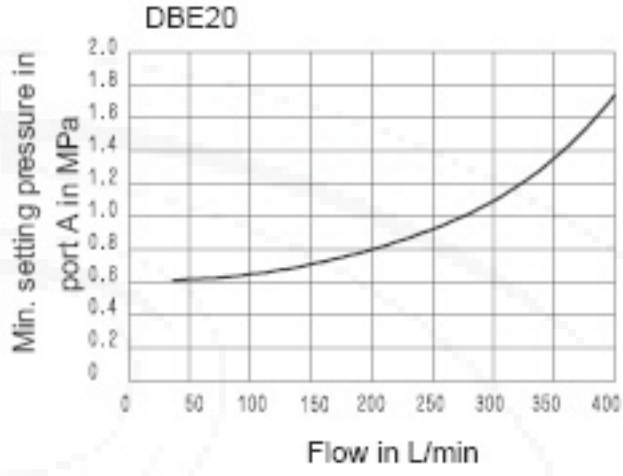


Min. settable pressure in relation to flow

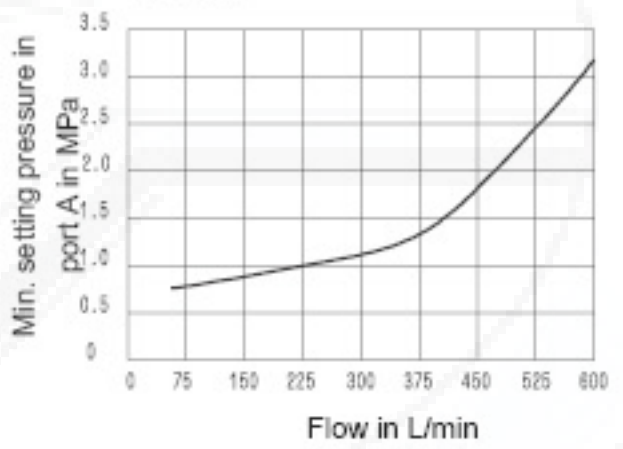
DBE10



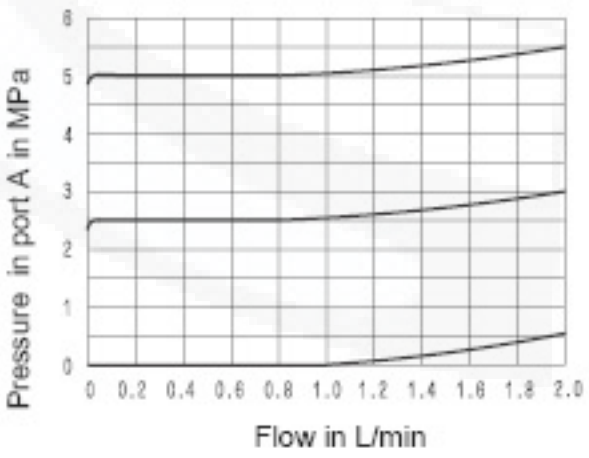
DBE20



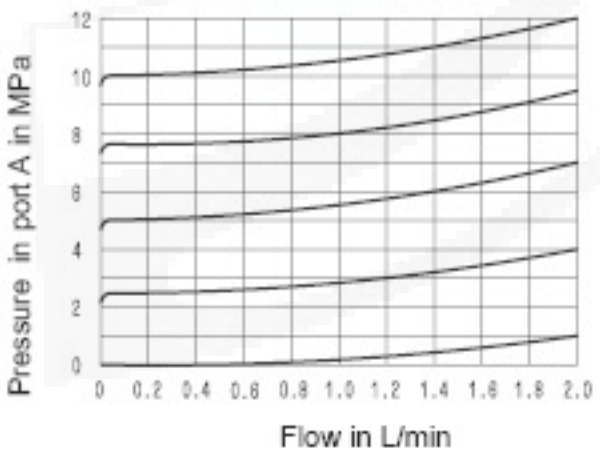
DBE30



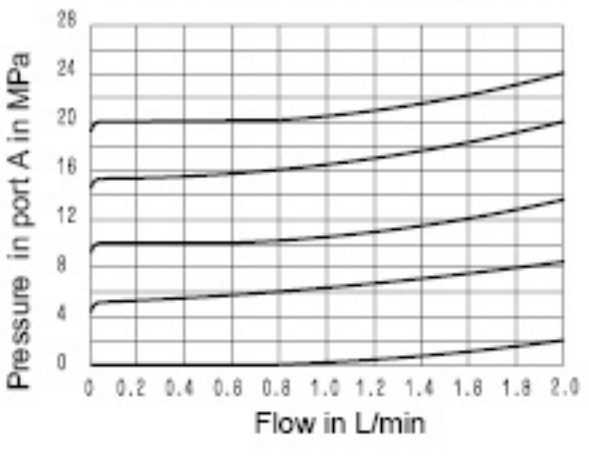
DBET-30/50 and DBEMT-30/50



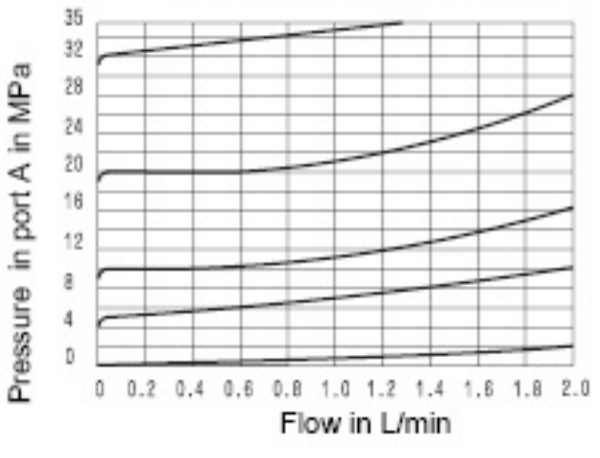
DBET-30/100 and DBEMT-30/100



DBET-30/200 and DBEMT-30/200



DBET-30/315 and DBEMT-30/315



Technical data

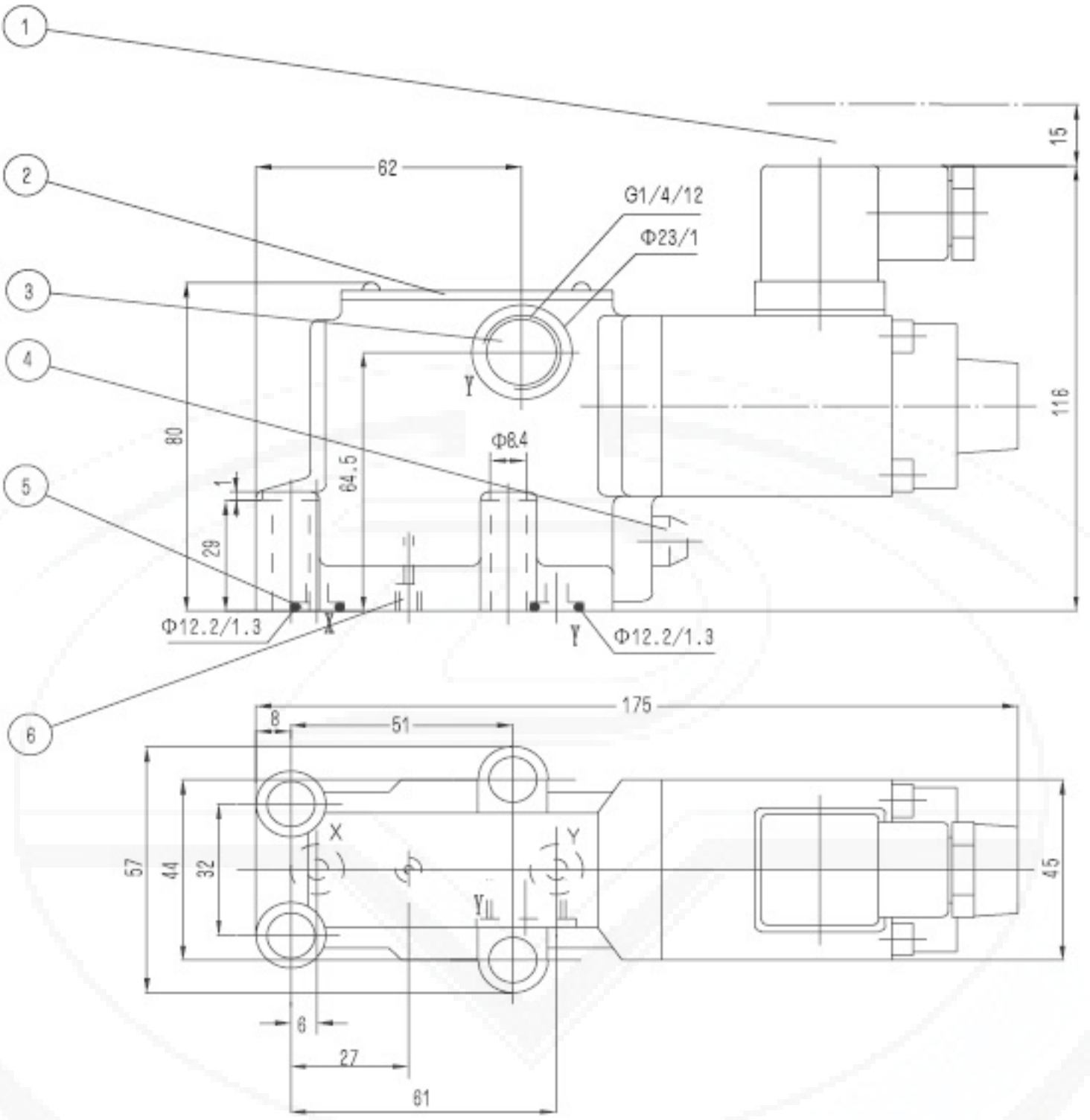
Hydraulic data

Max. operating pressure Ports A、B and X	(MPa)	31.5			
Return pressure	(MPa)	Port Y, separate and at zero pressure to tank			
Max. settable pressure	(MPa)	5、10、20、31.5, same as pressure stage			
Min. settable pressure	(MPa)	see characteristic curves			
Max. pressure safety	(MPa)	settable pressure			
		5	10	20	31.5
		1 to 6^{+2}	1 to 12^{+2}	1 to 22^{+2}	1 to 34^{+2}
Max. pressure safety Adjustable pressure range	(MPa)	rated pressure			
		5	10	20	31.5
		6 to 8	12 to 14	22 to 24	34 to 36
Max. flow	(L/min)	10	20	30	
		200	400	600	
Pilot flow	(L/min)	0.7 to 2			
Linearity	(%)	± 3.5			
Repeatability	(%)	< ± 2			
Typical variation	(%)	< ± 2 Max. pressure			
Hysteresis	(%)	With surge ± 1.5 of Max.pressure, Without surge ± 4.5 of Max.pressure			
Switching time	(ms)	30 to 150			
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range	(mm^2/s)	2.8 to 380			
Pressure fluid temperature range	(℃)	-20 to +70			
Degree of contamination	(μm)	≤ 20(recommendation 10)			

Electrical technical data

Amplifier		VT-200$^{S}_{X}$40 supplied with valve together
Supply voltage		DC
Min. control current	(A)	0.1
Max. control current	(A)	0.8
Coil resistance	(Ω)	Cold value at 20℃ is 19.5; Max. warm value is 28.8
Pressure fluid temperature range	(℃)	+50
Working state		Continue
Valve protection		IP65
Electrical connections		plug

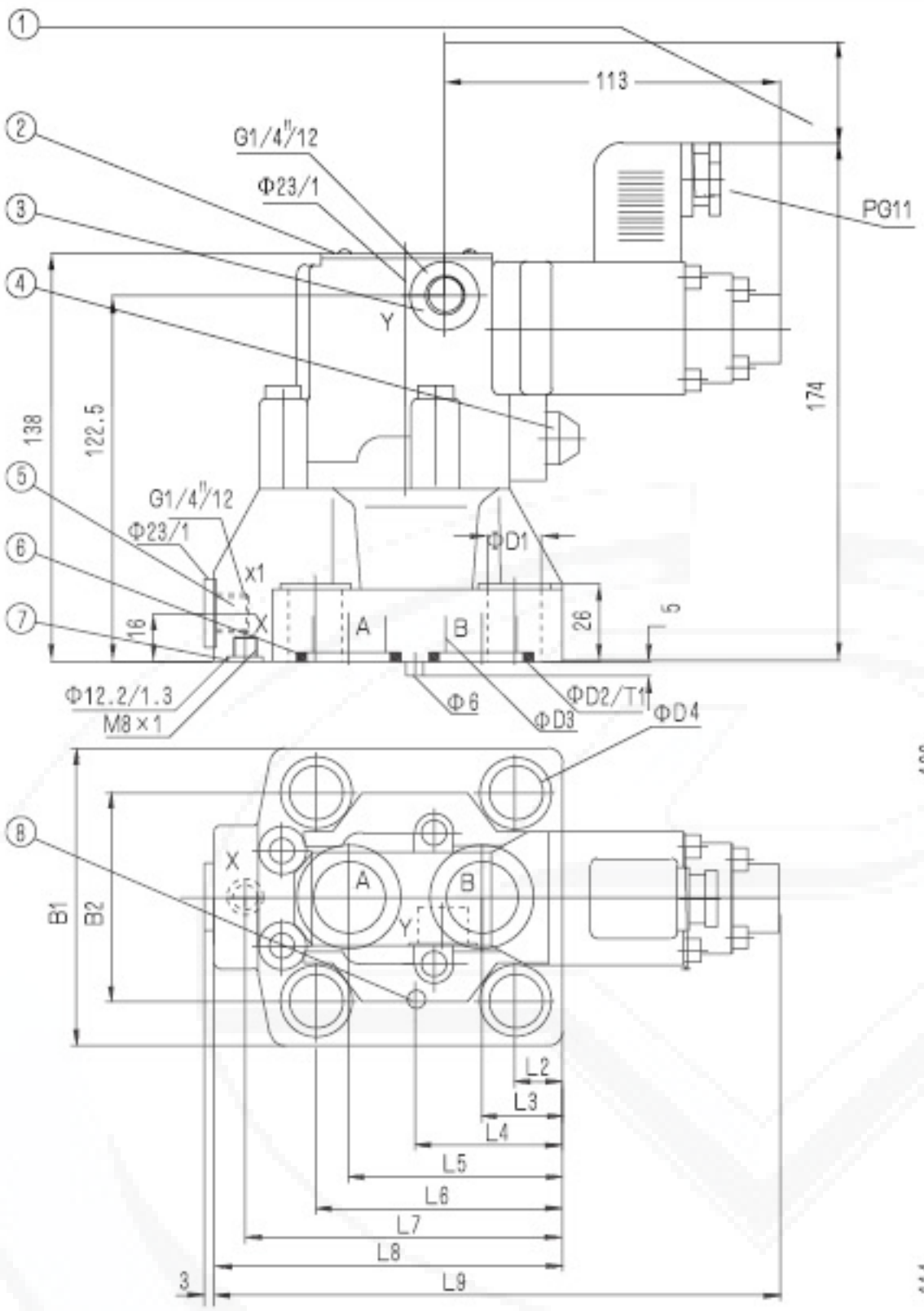
Unit dimensions **(Dimensions in mm)**

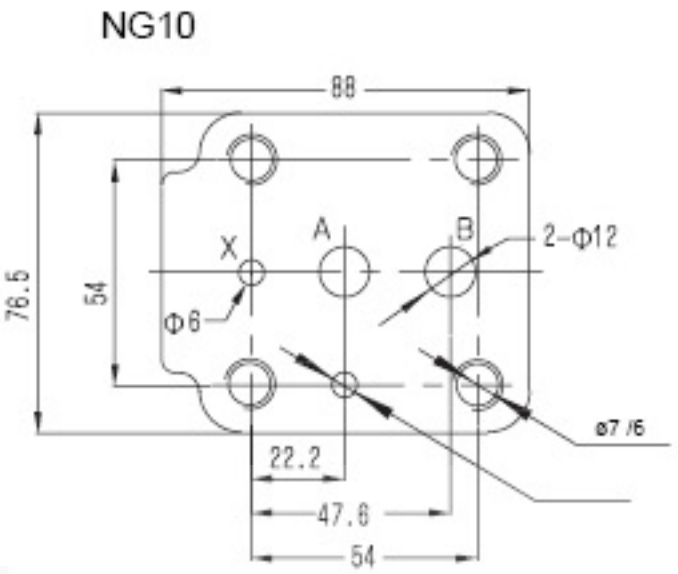


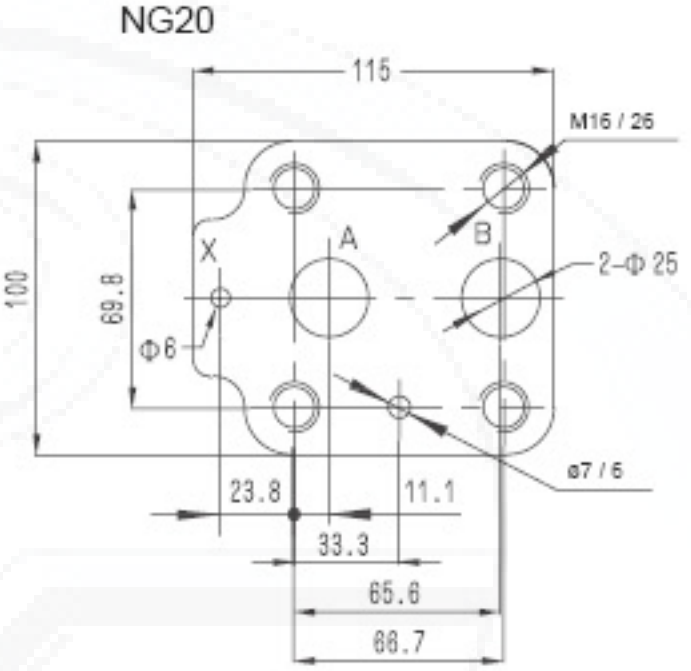
1. Space required to remove plug-in connector
2. Nameplate
3. Port for pilot oil drain external
4. Maximum pressure limitation
5. O-ring 9.25X1.78 (for ports X and Y)
6. The hole is blocked in DBET/DBEMT and fix throttle in DBEC/DBEMC
   SubplateG51/01, see page 87

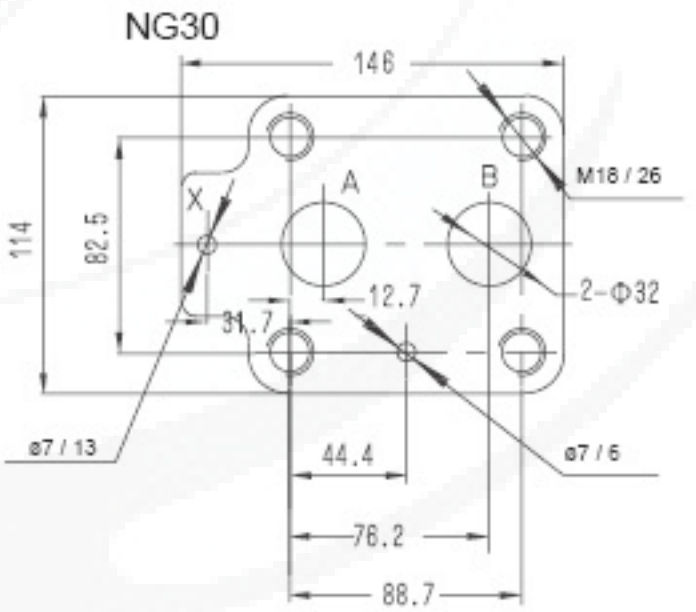
Unit dimensions (type DBE/DBEM)

(Dimensions in mm)









1. Space required to remove plug-in connector
2. Nameplate
3. Pilot oil drain,external
4. Maximum pressure limitation
5. Pilot oil supply external(optionally at port X or X1)
6. O-ring (for ports A, B)
7. O-ring 9.25X1.78 (for port X)
8. Locating pin

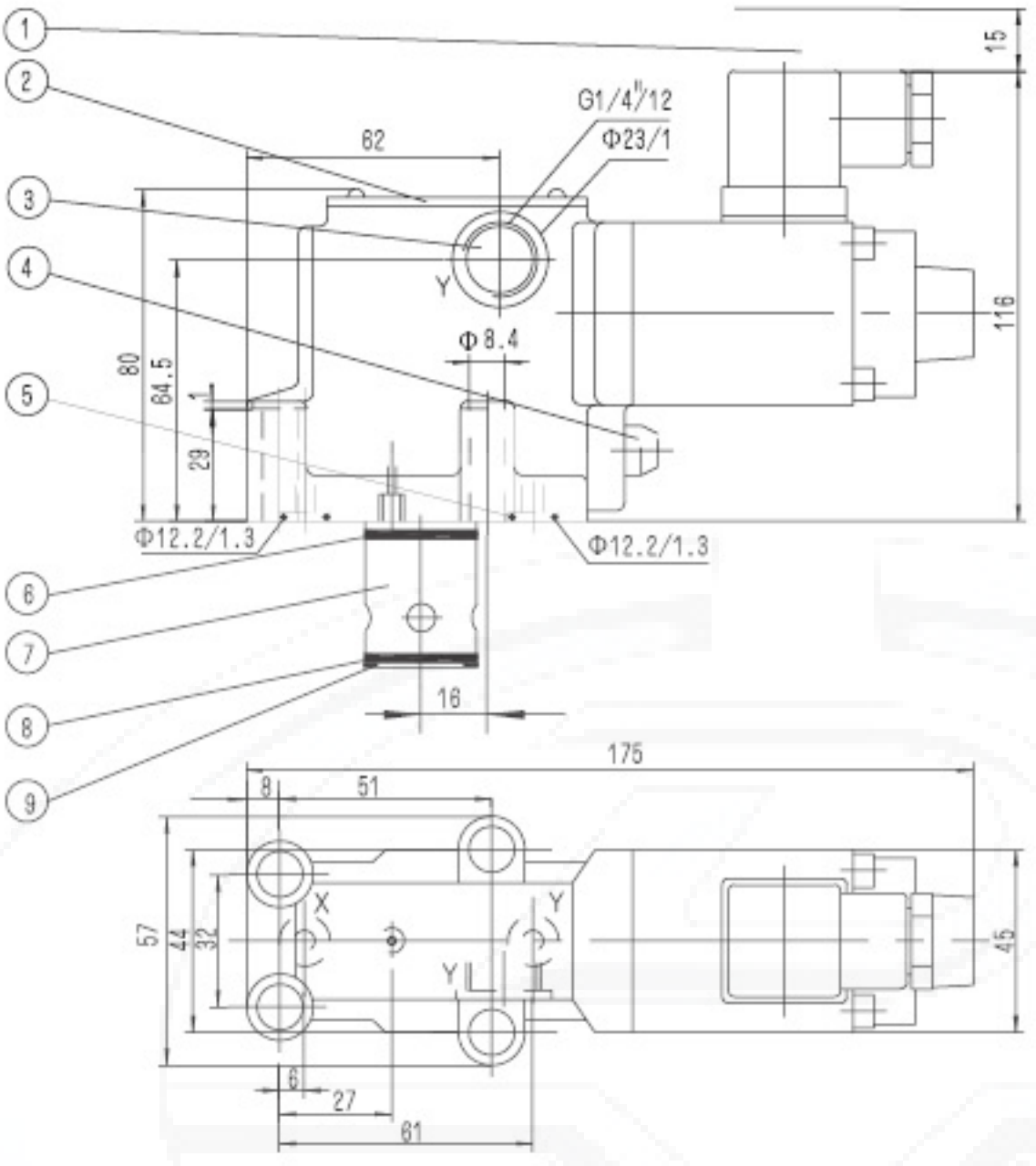
Subplates (see page 89):

NG10	NG20	NG30	
G545/01	G408/01	G410/01	G410/01
G546/02	G409/01	G411/01	G411/01

Size	B1	B2	Φ D1	Φ D2	Φ D3	Φ D4	O-ring (ports A and B)	Valve fixing screws:
10	78	54	18	21.8	12	14	17.12 × 2.62	M12 × 50-10.9, M_A = 84Nm
20	100	70	24	34.8	24	18	28.17 × 3.53	M16 × 50-10.9, M_A = 206Nm
30	115	82.5	28	41	30	20	34.25 × 3.53	M18 × 50-10.9, M_A = 267Nm

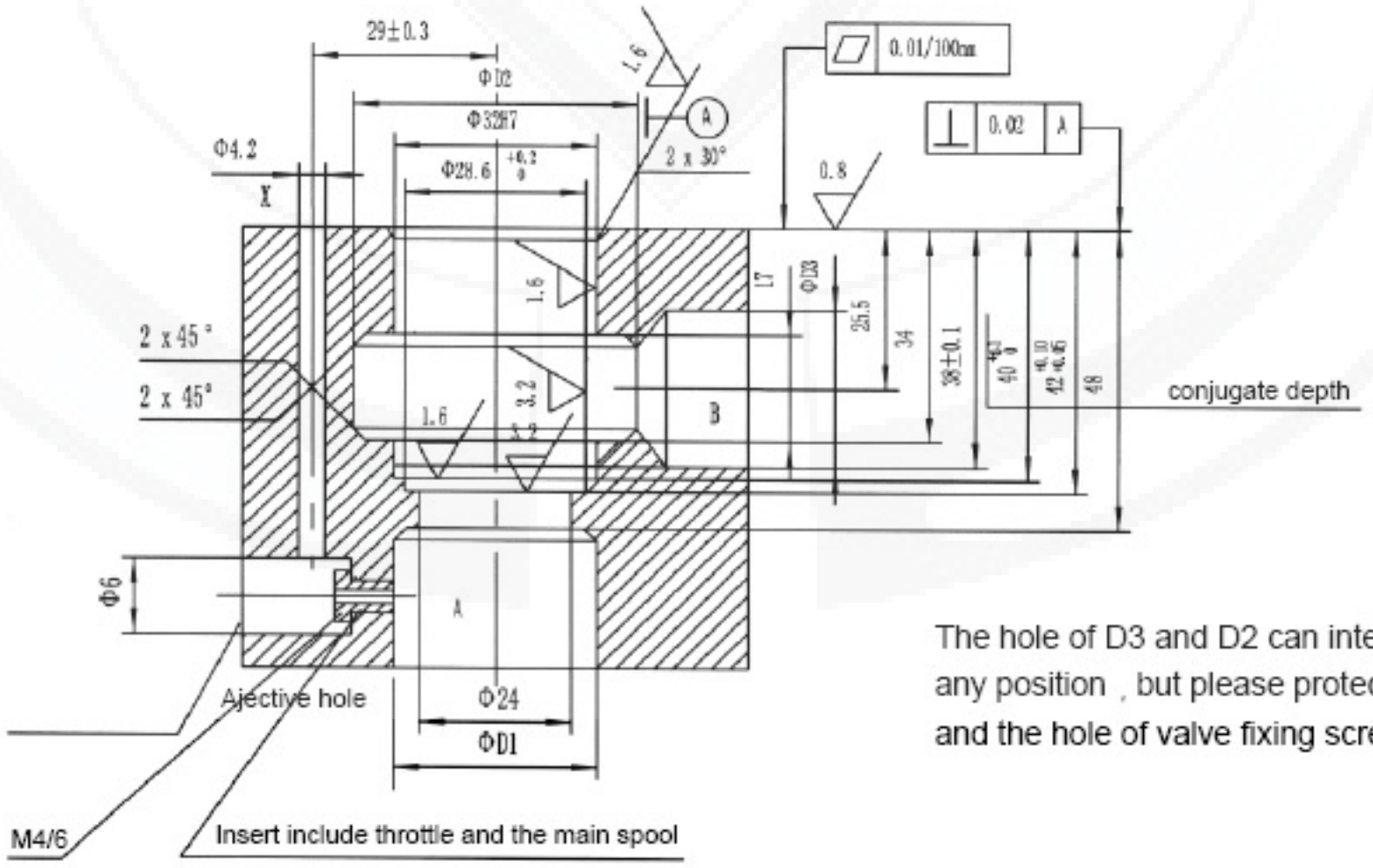
Size	L2	L3	L4	L5	L6	L7	L8	L9	T1	Weight (Kg)
10	12.5	18.9	44.3	44.3	66.5	66.5	90	176.5	2	4.1
20	16	27.1	49.4	71.6	82.5	106.5	117	190	2.9	4.5
30	17.5	61.9	30	93.7	106.4	138.2	148	200	2.9	6

Unit dimensions **(Dimensions in mm)**



1. Space required to remove plug-in connector
2. Nameplate
3. Pilot oil drain external(port Y)
4. Maximum pressure safety
5. O-ring 9.25X1.78
6. O-ring 27.3X2.4 (*)
7. The main spool
9. Retainer ring 32/28.4X0.8 (*)

(*) This kind of ring should be installed before installing insert housing



The hole of D3 and D2 can intersect at any position , but please protect port X and the hole of valve fixing screw

Size	The ordering code of the main spool		Φ D1	Φ D2	Φ D3	Valve fixing screw	MA	Weight (kg)
10	207341 (NBR)	307342 (FPM)	25	40	10	M8 × 40-10.9 (GB/T70.1-2000) must be ordered separately	20Nm	1.5
20			32	45	25			
30					32			

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure reducing valve of 3-way design,Type 3DREP			RC29183/9.2006
	Size 6	up to 10 MPa	up to 15 L/min	Replaces: RC29183/08.2000

Features:

- Directly controlled proportional valves for the control of the pressure and direction of a flow
- Actuated via proportional solenoids with central thread and removable coil
- Spring centred control spool

Function, section

The 3-way pressure reducing valve type 3DREP 6.. is directly actuated by proportional solenoids. They convert an electrical input signal into a proportional pressure output signal.

The proportional solenoids are controlable wet pin DC solenoids with central thread and removable coil. The solenoids are controlled optionally via external control electronics .

Design:

The valve mainly comprises of:

-Housing (3) with mounting surface

-Control spool (5) and(6) and (4)

-Solenoids (1 and 2) with control thread

Function:

With the solenoids (1 and 2) de-energised the control spool (5) is held in its centre position by compression springs

The control spool (2) is directly actuated when one of the solenoids is energised

E.g. by energising solenoid "a" (1)

→The pressure measuring spool (5) and control spool (4) move to the right in proportion to the electrical input signal

→ The connection from P to B and A to T is via orifice form cross-sections with progressive flow characteristics

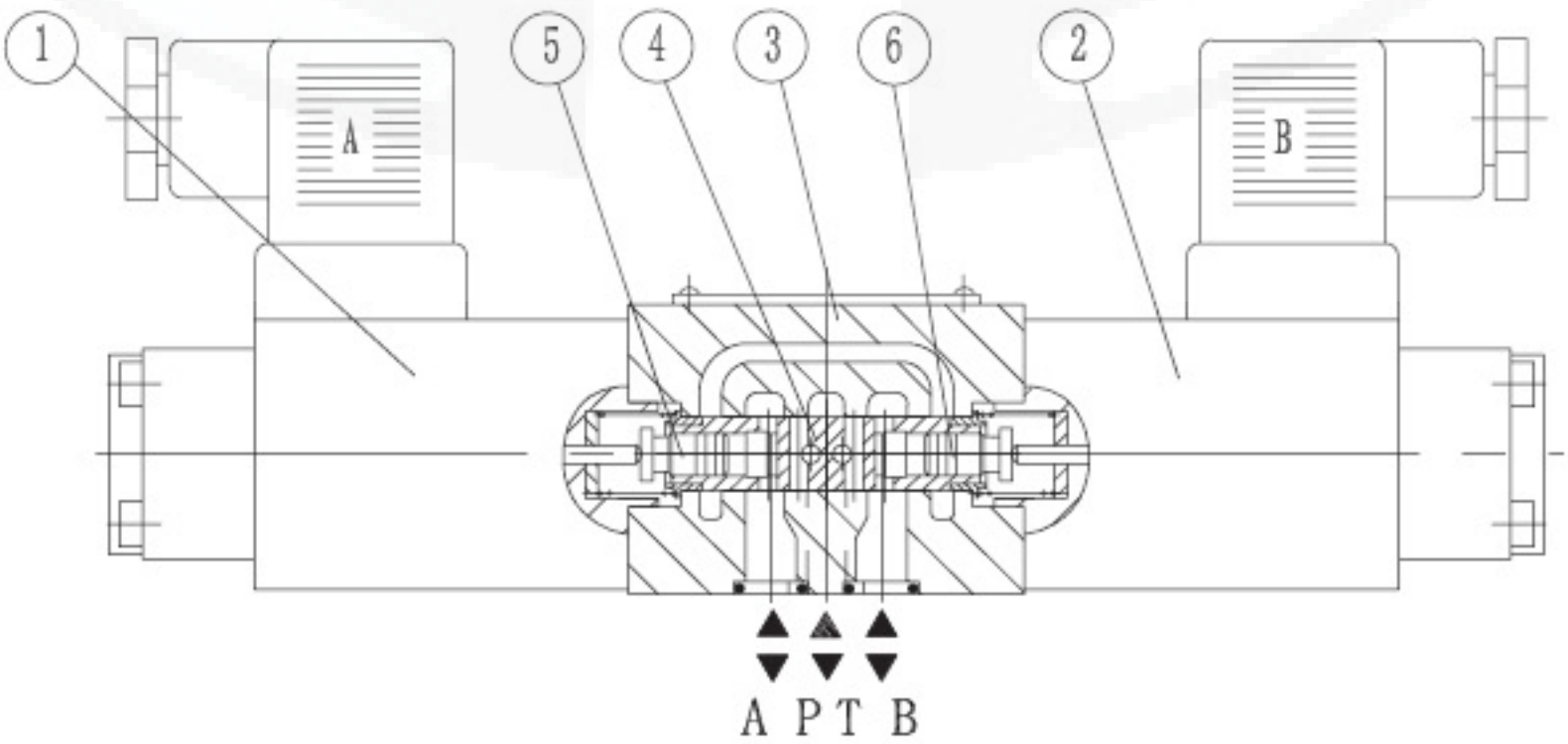
-De-energisation of the solenoid (1)

→The control spool (4) is returned to its centre position by the compression springs

In the middle postion the connections A and B to T are open, therefore, the pressure fluid can freely flow to tank. An optional hand overrides makes is possible to move the control spool (4) without energising the solenoid.

Attention!

Unintended use of the hand override can cause uncontrolled machine movement!



Type 3DREP6...

Ordering details

3DREP6 | | 10 | B / A | | | | | | | | *

Control form:
chamber A = A
chamber B = B
chambers A and B = C
See symbols (detailed)

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

Technology of Beijing Huade Hydraulic =B

Pressure stage1.6 MPa = 16
Pressure stage 2.5 MPa = 25
Pressure stage 4.5 MPa = 45

Further details in clear text

M = Mineral oils
V= phosphate ester

Z4=Small quadrate plug-in connecter

No code = Without special protection
J = Sea water resistant

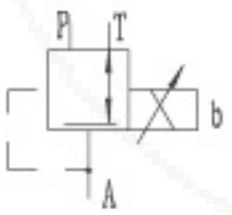
No code = Without hand override
N9 = With protected hand override

24 = DC supply voltage for the control electronics G24

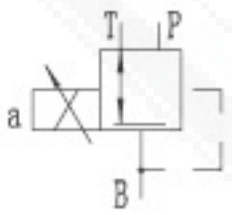
Symbols

Simplified

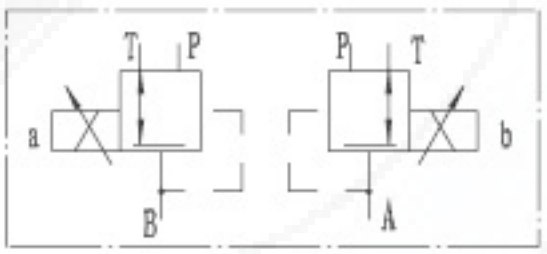
Type 3DREP6A-10B/...A...



Type 3DREP6B-10B/...A...

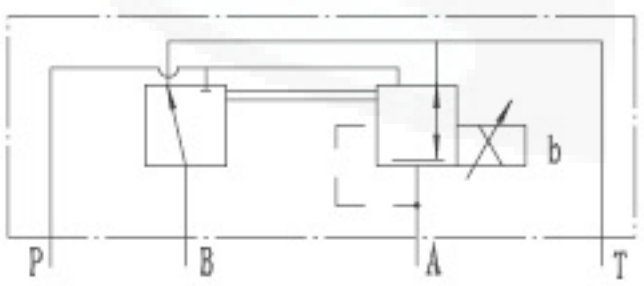


Type 3DREP6C-10B/...A...

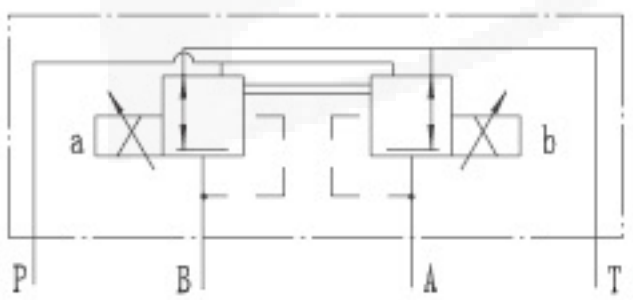


Detailed

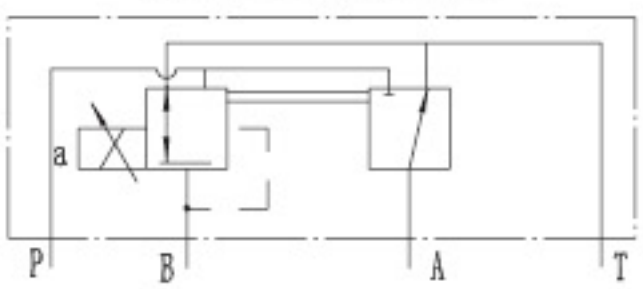
Type 3DREP6A-10B/...A...



Type 3DREP6C-10B/...A...



Type 3DREP6B-10B/...A...



Technical data

Hydraulic

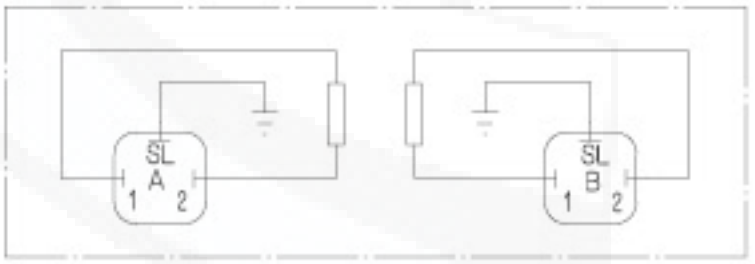
Operating pressure (MPa)	Port P	10,If excess 10,then installate the valve,type ZDR6DP...-30B/...in input port
	Port T	3
Max. flow (L/min)		15 (Δ P=5MPa)
Degree of contamination (μ m)		Filter recommendation with a minimum retention rate of $\beta_{10} \geqslant 75$
Hysteresis (%)		⩽ 3
Repeatability accuracy (%)		⩽ 1
Response sensitivity (%)		⩽ 1
Reversal span (%)		⩽ 1
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)
Viscosity range (mm^2/s)		2.8 to 380
Pressure fluid temperature range (°C)		-20 to +70
Installation		optional, preferably horizontal
Weight (kg)		Type C: 2.6; type A,B: 1.5

Electrical, solenoid

Supply voltage		DC24V
Nominal current per solenoid (A)		0.8
Max. current per solenoid (A)		⩽ 0.02
Solenoid coil resistance (Ω)	Cold value at 20°C	19.5
	Max. warm value .	28.8
Working state		continuous
Condition temperature (°C)		~+50
Coil temperature (°C)		~+150
Protection to DIN 40 050		IP65
Electrical connections	3DREP	with component plug to DIN 43 650-AM2 plug-in connector to DIN 43 650-AF2/Pg11 1)
	3DREPE	with component plug to E DIN 43 563-AM6-3 plug-in connector E DIN 43 563-BF6-3/Pg11 1)

Electrical connections (Dimensions in mm)

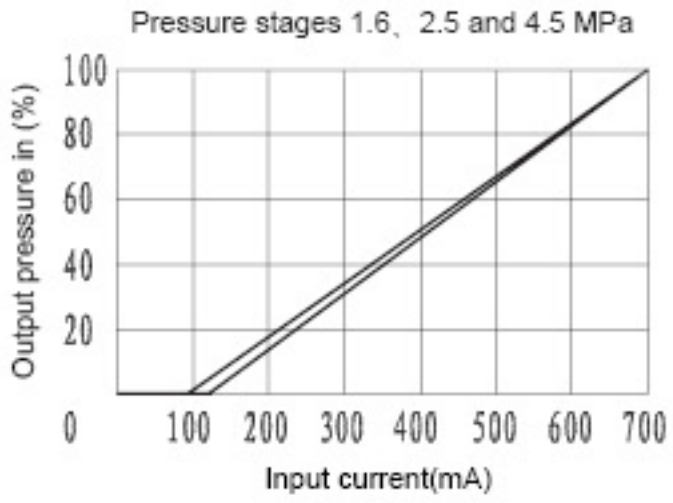
Connections at component plug



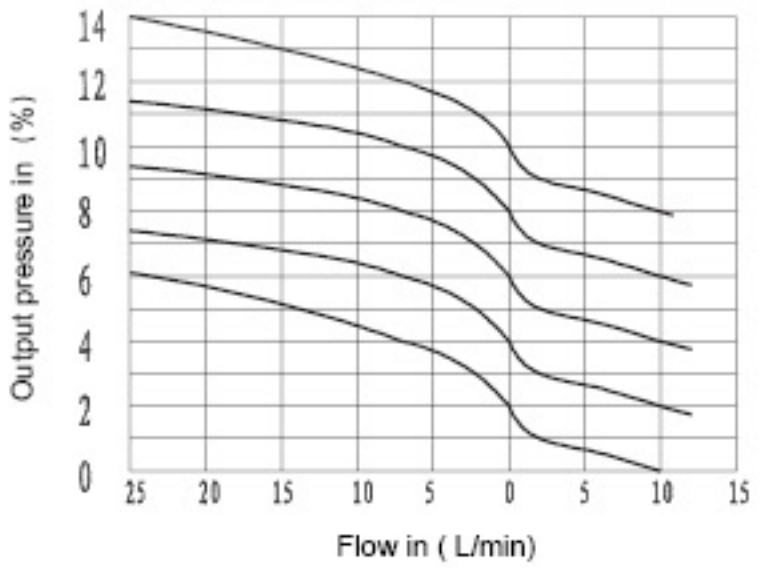
Connections at plug-in connector

Characteristic curves (measured at V =36 × $10^{-6}m^2/S$ t=50°C)

Pressure stages 1.6、2.5 and 4.5 MPa

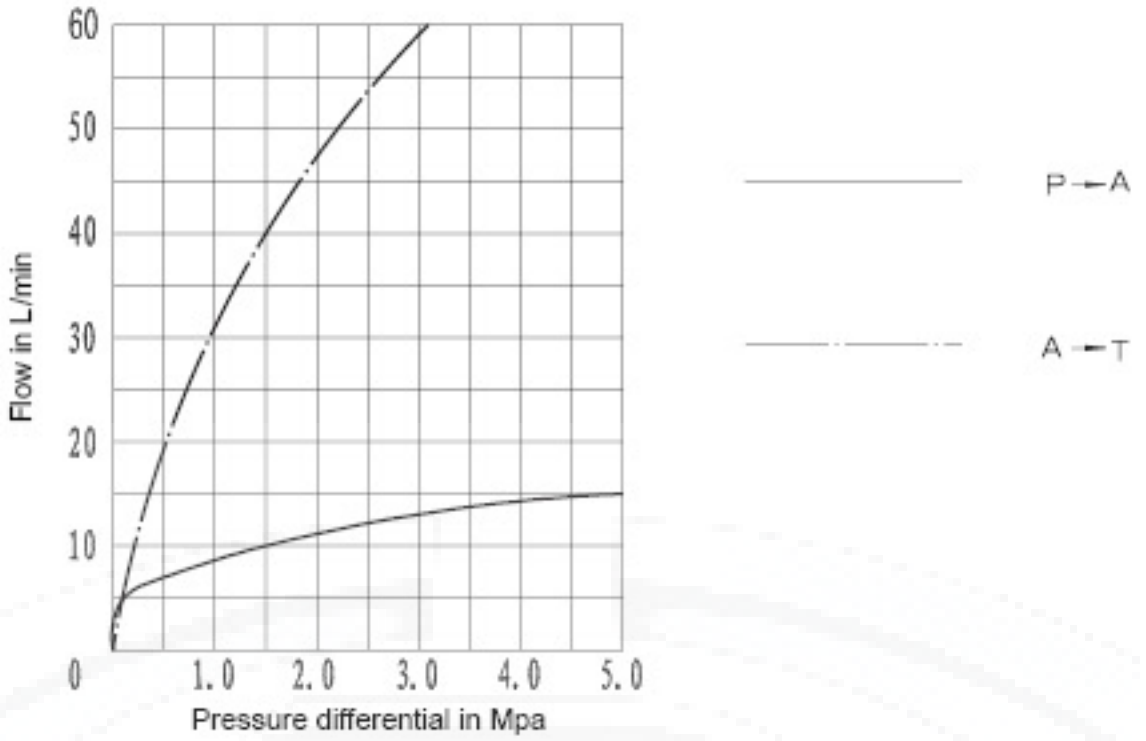


Pressure-flow relationship



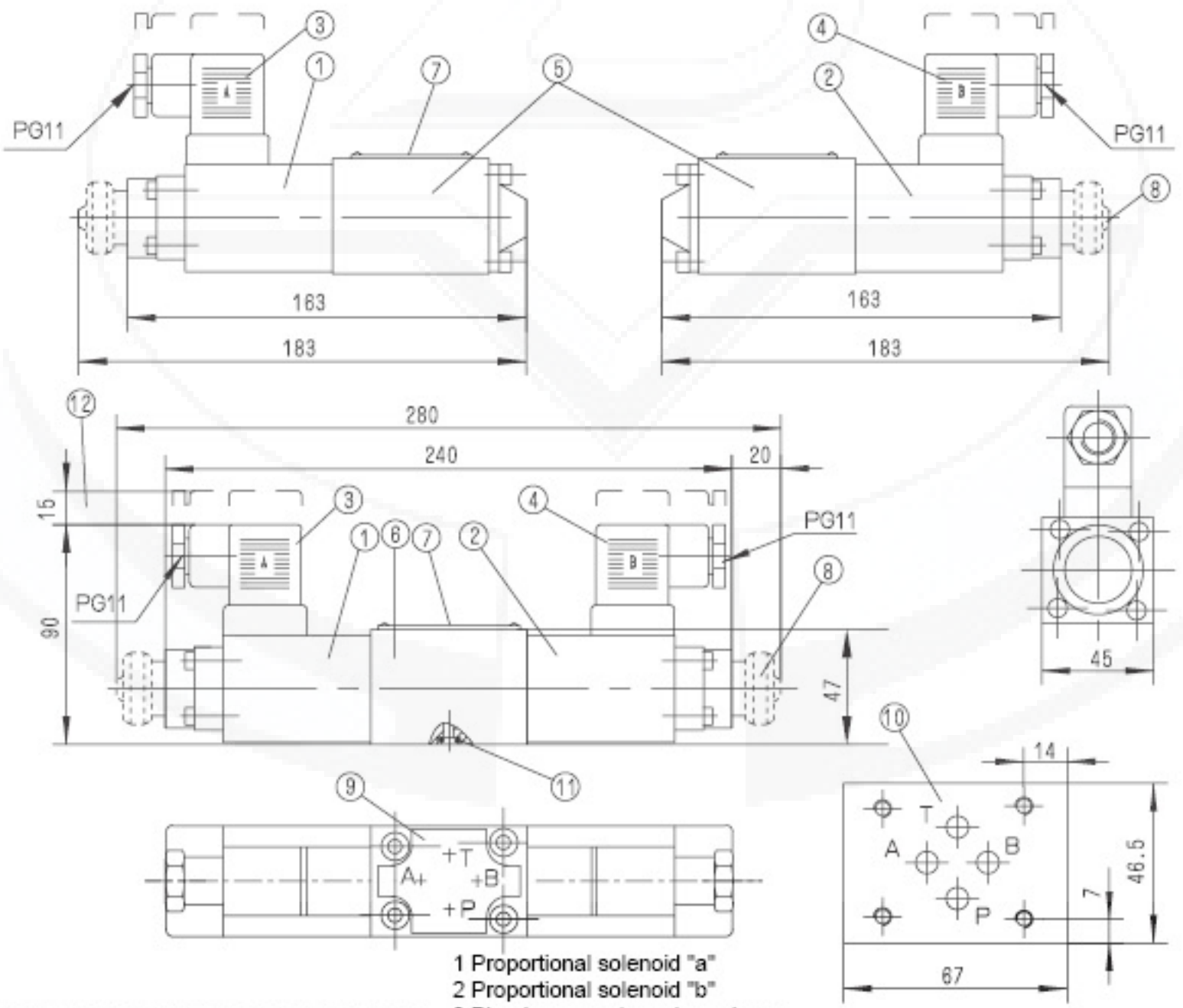
Characteristic curves

Pressure stages 1.6, 2.5 and 4.5Mpa



Unit dimensions: type 3DREP

(Dimensions in mm)



1 Proportional solenoid "a"
2 Proportional solenoid "b"
3 Plug-in connector coloured grey
4 Plug-in connector coloured black
5 2-Position valve
6 3-Position valve
7 Nameplate 8 Protected hand override"N"
9 Ports position 10 Machined valve mounting face and position of the ports
11 O-ring, 9.25 x 1.78 (for ports A, B, P, T)
12 Space required to remaove the plug-in connector
Subplates G 340/01 (G 1/4) G 341/01 (G 3/8) G 502/01 (G 1/2)
Valve fixing screws
M5 x 50 DIN 912-10.9; M_A = 8.9 Nm see page 80

When used with a proportional directional valve type 4WRZ then the following throttle inserts are to be used for ports A and B:

NS	10	16	25	37
Hde (mm)	1.5	1.8	2.3	2.8
material no.	156476	158510	157511	157948

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional pressure reducing valve Types DRE and DREM			RC29148/9.2006
	Size 10.25.32	up to 31.5 MPa	up to 300 L/min	Replaces: RC29148/08.2000

Features:

- Optional max.pressure protecting
- Optional check valve between A and B
- Valve used for reducing a working pressure
- For subplate mounting
- Valve and electronics from one scurce

Function, section

The valve types DRE and DREM are pilot operated pressure reducing valves. They are used for the reduction of a working pressure.

The valves basically consist of the pilot valve (1) with proportional solenoid (2), main valve (3) with main spool assembly (4), as well as an optional check valve (5).

Type DRE...

The setting of the pressure in port A is dependent on the voltage present at the proportional solenoids (2).

At rest, with no pressure in port B the spring holds the main spool (4) in its start position. The connection from B to A is closed. A start-up jump is, therefore avoided.

The pressure in port A acts via connection on the area of the main spool.

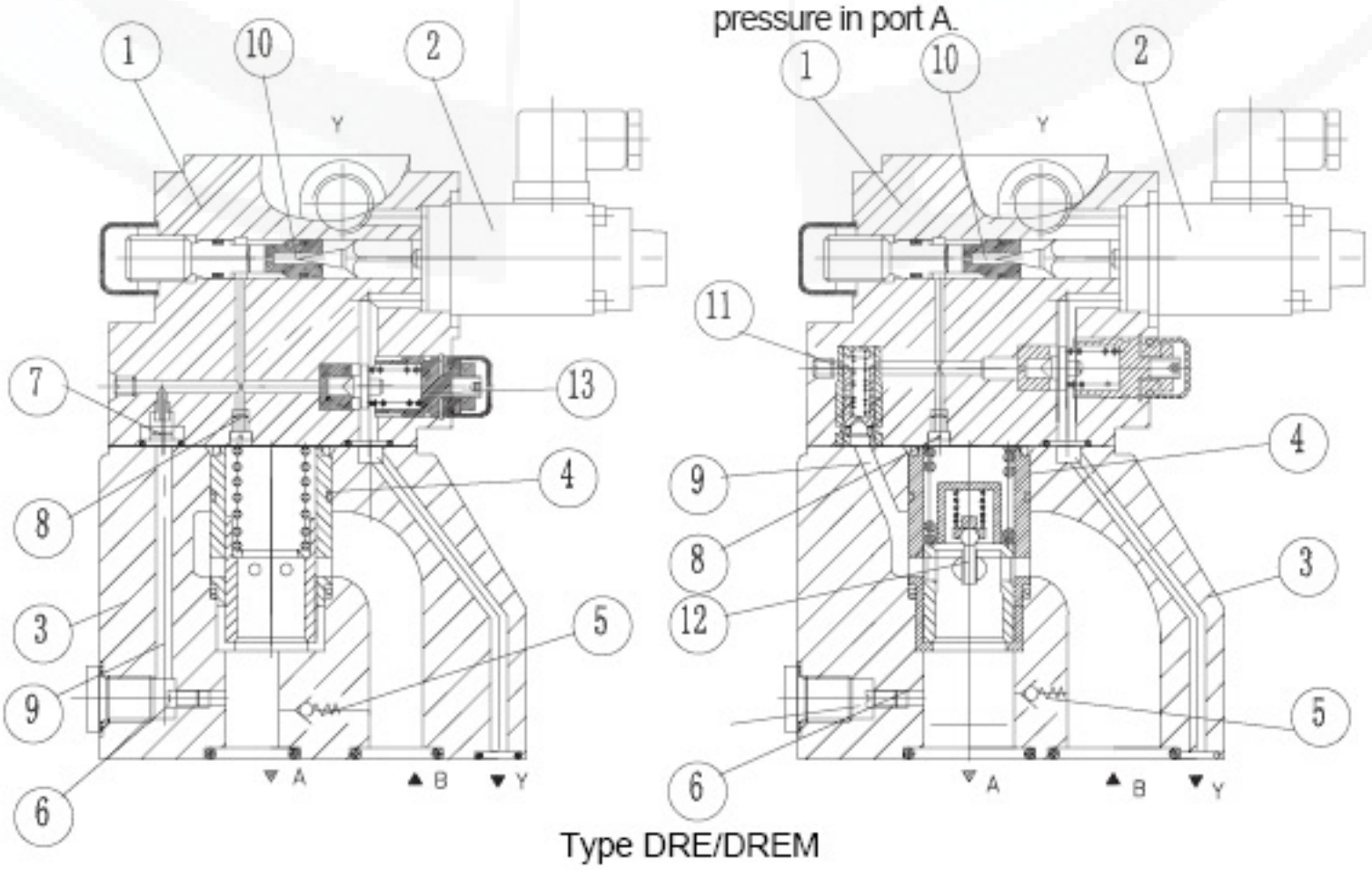
The pilot oil is taken from port A(NS 10) or port B(NS 20,30) and passes through the connection to the constant flow controller, which holds the pilot oil flow constant independent of pressure drops between ports A and B. From the constant flow controller the pilot oil flow passes into the spring chamber, through two connections, via valve seat into the Y port and from there into the drain line.

The pressure required in port A is defined at the relevant amplifier.

Type DREM...

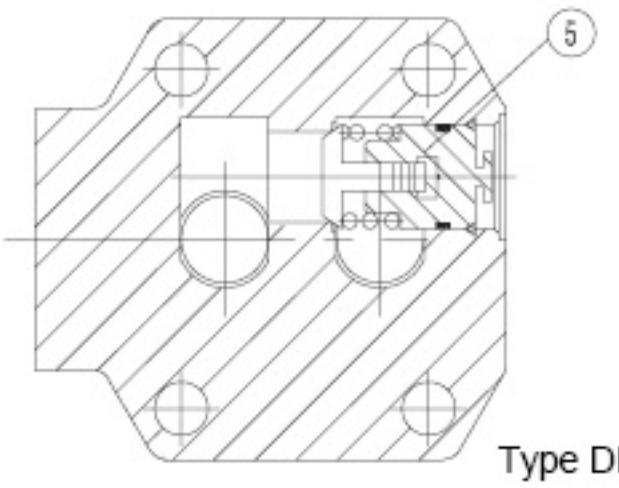
In order to ensure that excessive hydraulic pressures (hydraulic safety) do not occur due to unpermissibly high control currents at the proportional solenoid that automatically cause higher pressure in port A, a spring loaded maximum pressure relief valve, for maximum pressure safety, can be optionally installed if required.

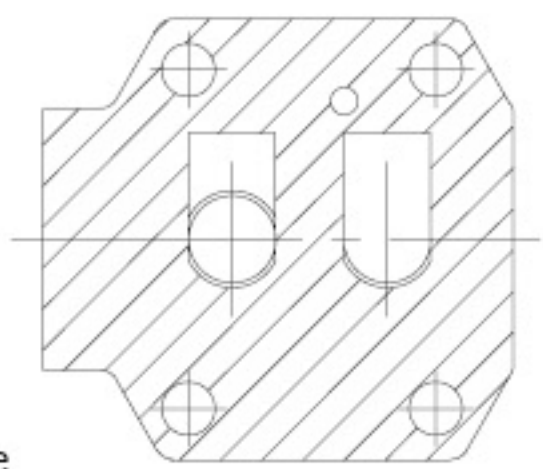
Note: When the pressure fluid flow from port A to port B via the check valve (5), the parallel flow of oil via Y to tank affects the deceleration process of the actuator attached to port A if this is being decelerated by a throttle valve in port B (e.g. proportional directional valve). Under such circumstances, the third flow direction A to Y is not suitable for limiting the maximum pressure in port A.



Type DRE/DREM

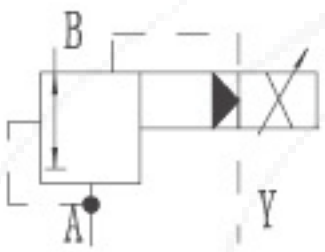
With check valve	Without check valve



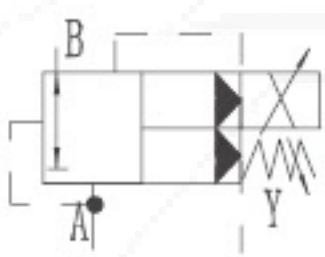


Type DRE, with check valve

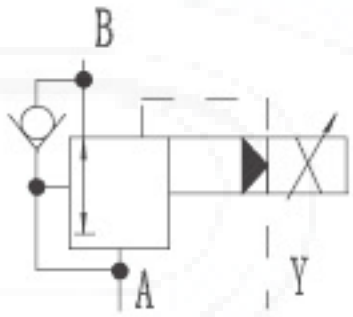
10
DRE 20-30B...YM
30
DRE CN-30B...Y
DRE CH-30B...Y



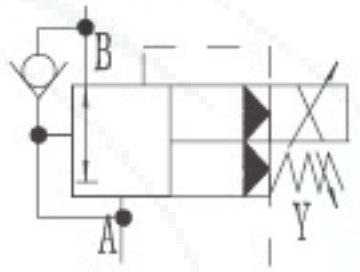
10
DREM 20-30B...YM
30
DREM CN-30B...Y
DREM CH-30B...Y



10
DRE 20-30B...Y
30

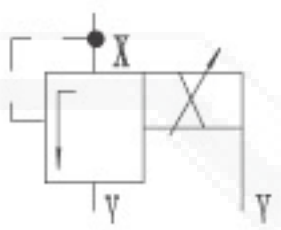


10
DREM 20-30B...Y
30



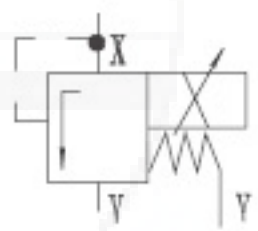
DREC N/H -30B/...Y

DREC N/H -30B



DREM C N/H -30B/...Y

DREM C N/H -30B



Ordering details

DRE				30	B		Y			*

Without maximum pressure limitation=No code
With maximum pressure limitation = M

Pilot operated pressure reducing valve = No code
Pilot valve, size 10 (do not state valve size) = CN
Pilot valve with main valve cartridge for installation in manifolds, size 10 (state valve size) = CN
Pilot valve, size 20,30 (do not state valve size) = CH
Pilot valve with main valve cartridge for installation in manifolds, size 20,30 (state valve size) = CH

NS	10	=10
	25	=20
	32	=30

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

Further details in clear text

M = for mineral oils
V = for phosphate ester

No code = With check valve between A and B
M = Without check valve

Y= Pilot oil drain external,separate and zero pressure to the tank

Pressure rating:	50=	5MPa
	100=	10MPa
	200=	20MPa
	315=	31.5MPa

B= Technology of Beijing Huade Hydraulic

Technical data

Hydraulic

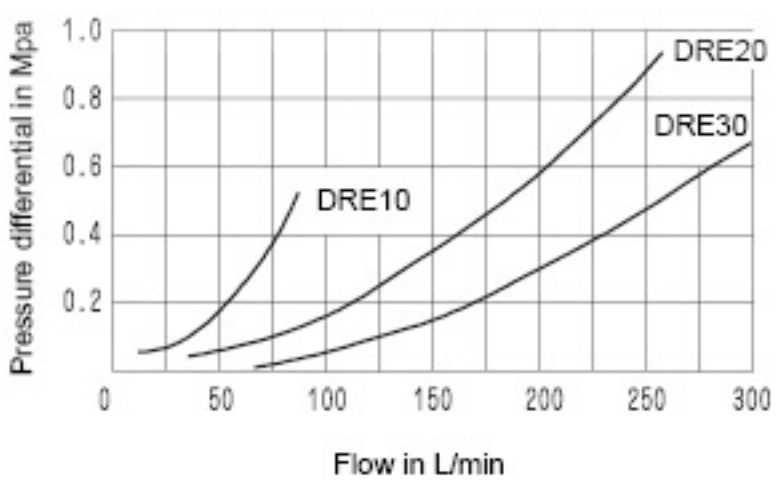
Max.setting pressure (MPa)	ports A and B	31.5			
	port Y	go to tank ,no pressure			
Max.setting pressure,for port A	(MPa)	The same as pressure rating			
Min.setting pressure,for port A	(MPa)	Be related to "Q". (see curves)			
Max.pressure limiter (steplessly settable)					
Setting pressure range set as delivered	(MPa)	pressure rating			
		5	10	20	31.5
		1 to 6+2	1 to 12+2	1 to 22+2	1 to 34+2
Max.pressure limiter (assembly settable)	(MPa)	6 to 8	12 to 14	22 to 24	34 to 36
Max. flow (L/min)	size	10	20	30	
	flow	80	200	300	
Pilot oil		See characteristic curves			
Linearity	(%)	± 3.5			
Repeatability	(%)	< ± 2			
Hysteresis		With quiver ± 2.5%Pmax,without quiver ± 4.5%Pmax			
Typical scatter		± 2.5Pmax See characteristic curves			
Operating time	(ms)	100 to 300			
Fluids		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)			
Viscosity range	(mm^2/s)	2.8 to 380			
Fluid temperature range	(°C)	-20 to +70			
Degree of the contamination	(μm)	≤ 20(recommend 10)			

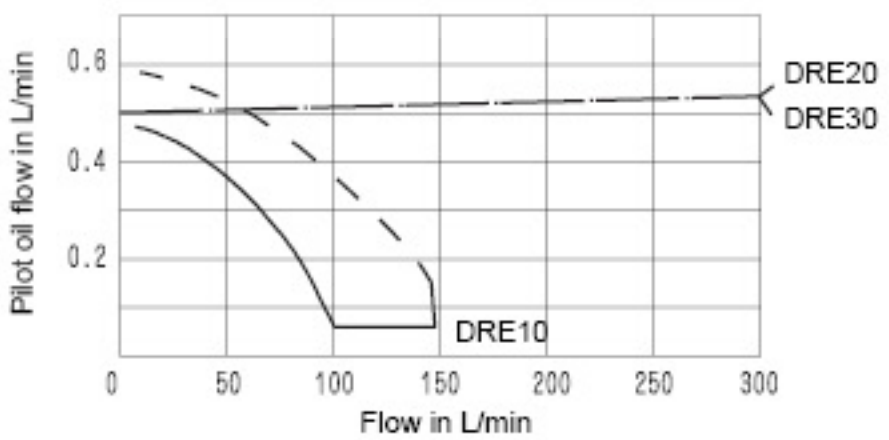
Electrical

Supply voltage		DC
Min.control current	(A)	0.1
Max.control current	(A)	0.8
Coil resistance	(Ω)	cold valve at 20°C is 19.5,Max.warm valve is 28.8
Duty		continuous
Max. condition temperature	(°C)	+50
Insulation to DIN 40 050		IP65
Associated amplifier		Plug-in connecter
Electrical applifier		VT-2000*40(together provide)

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

Pressure difference from A to B,via check valve

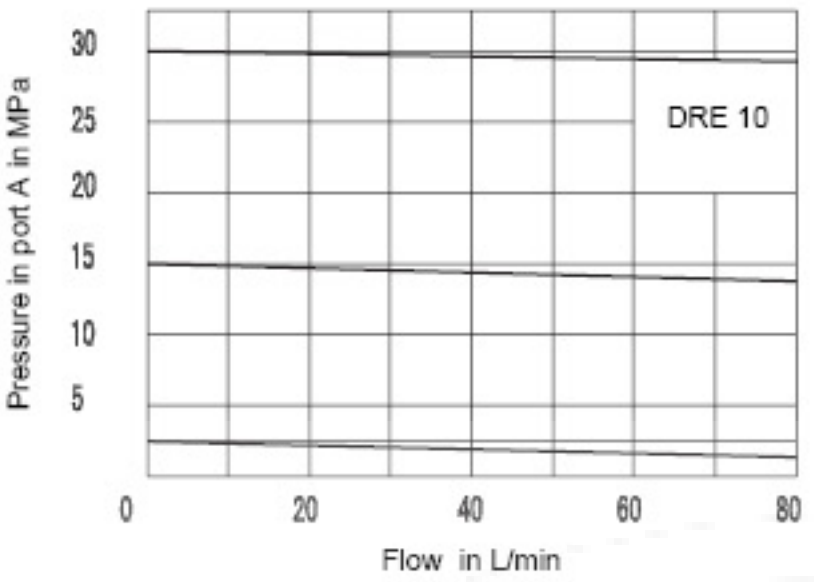




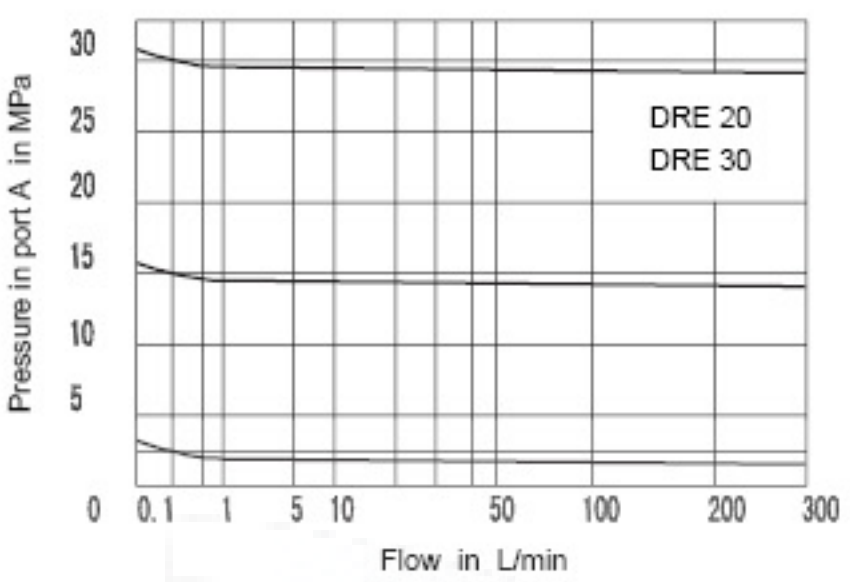
= Δ P is 2MPa DRE10
= Δ P is 10MPa DRE10
= Δ P is 2MPa and 10MPa DRE20 and DRE30

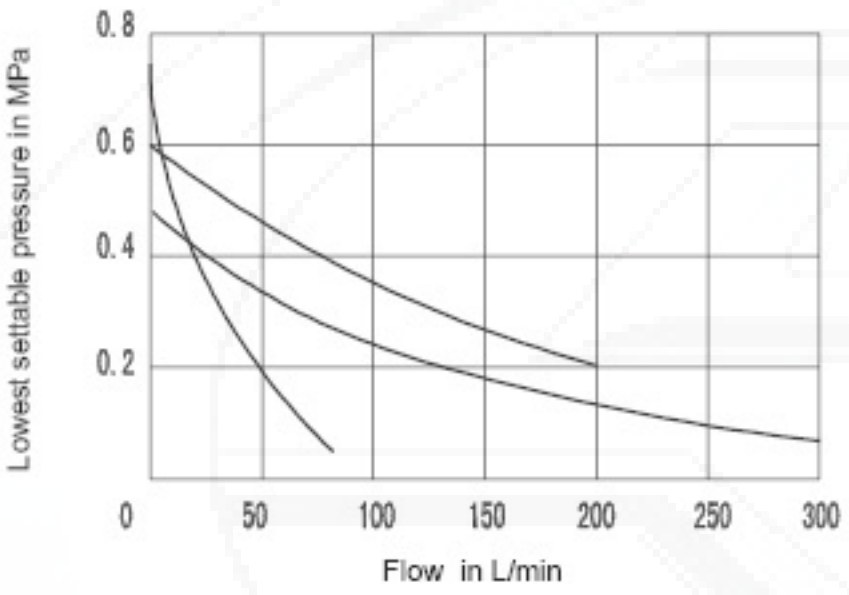
Characteristic curves (measured at V = 41 mm²/s and t = 50°C)

Pressure in port A in relation to flow

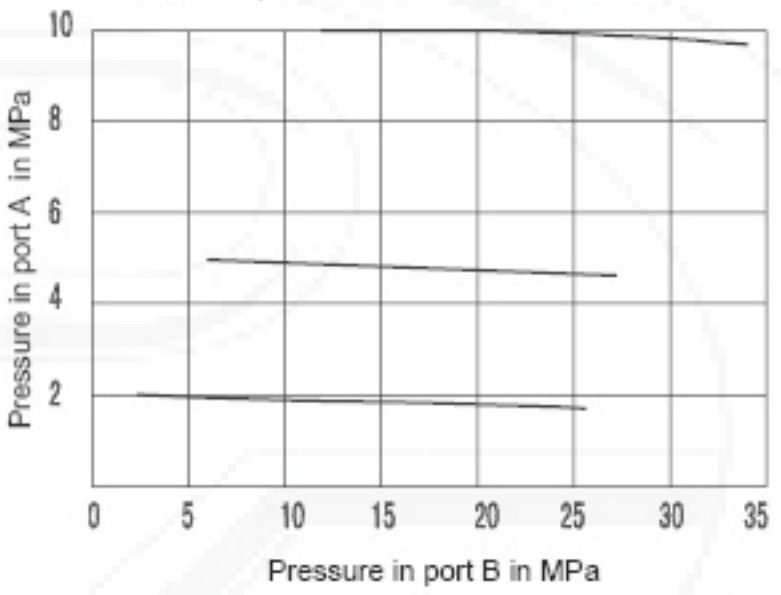


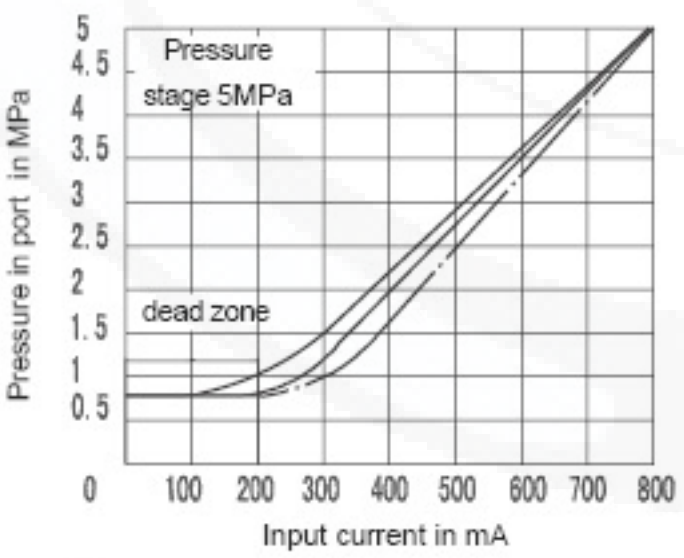
Pressure in port A in relation to flow

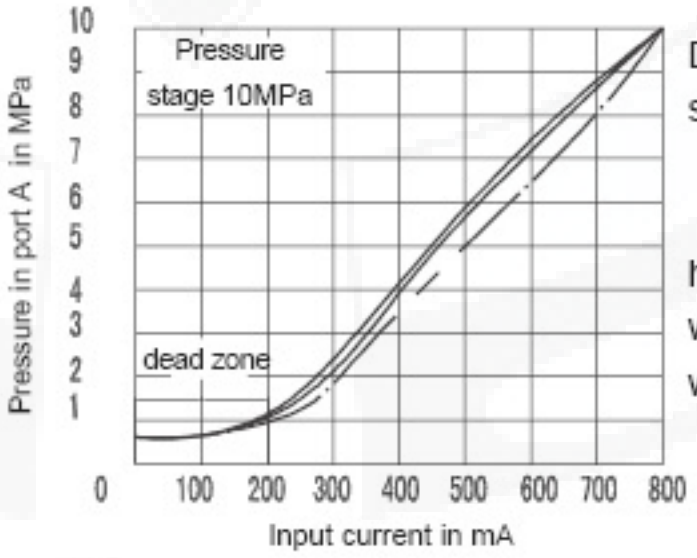




Pressure in port A in relation to flow

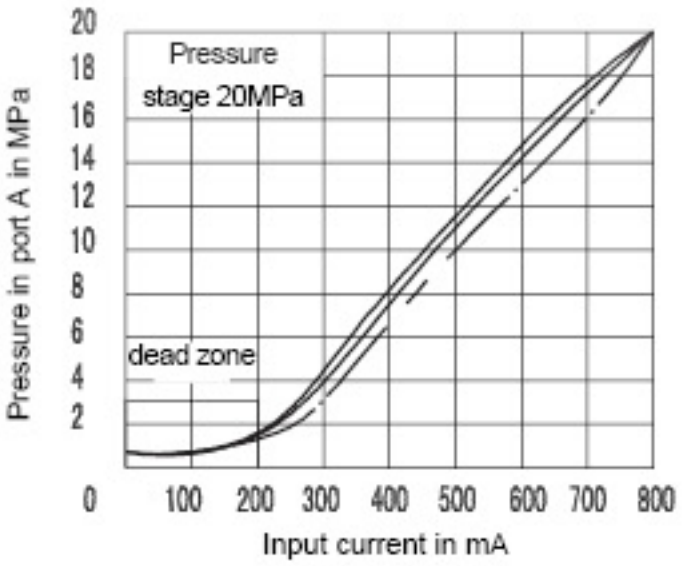


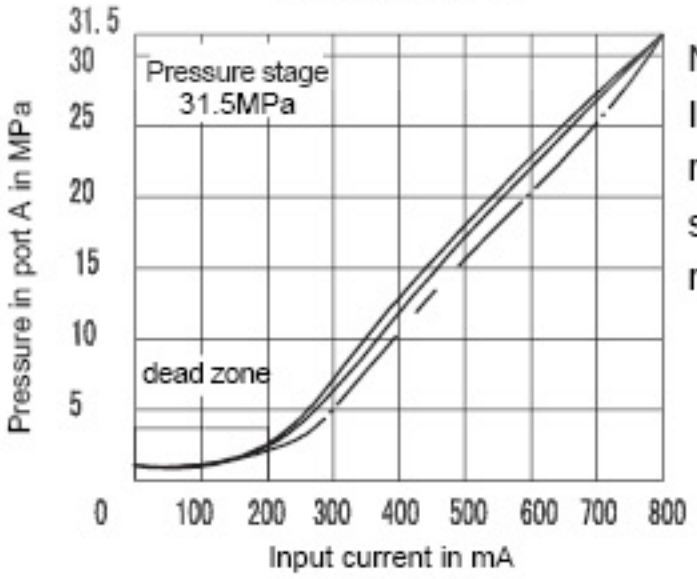




DRE10.20 and 30,measured in flow 6L/min.

hysteresis:
with quiver ———
without quiver —·—·—

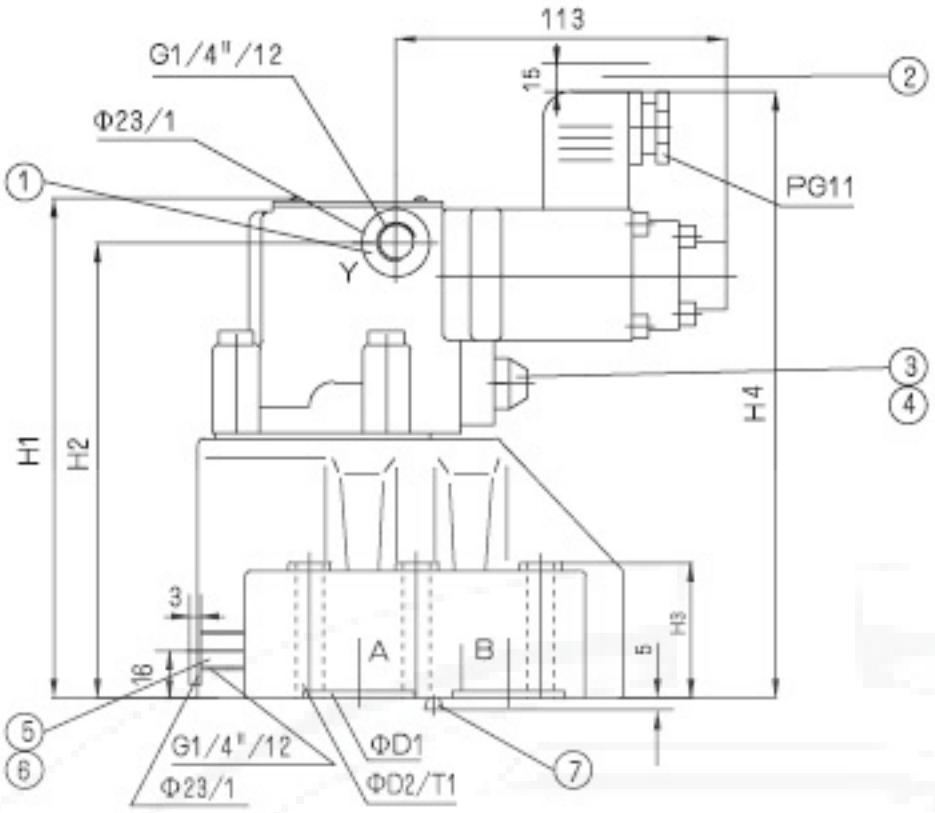


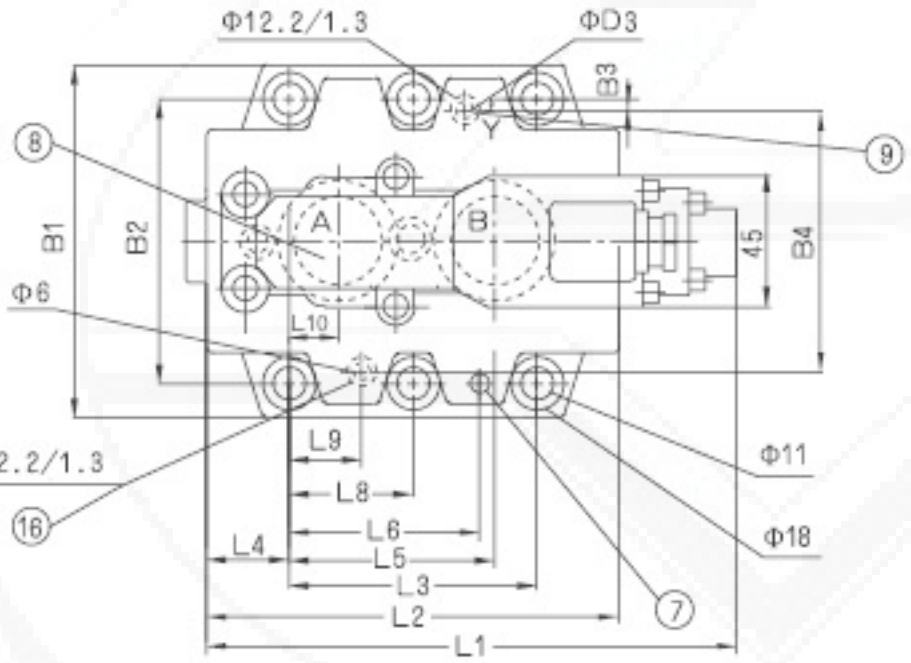


Note:
In order to achieve the minimum setable pressure the bias current must not exceed 100 mA

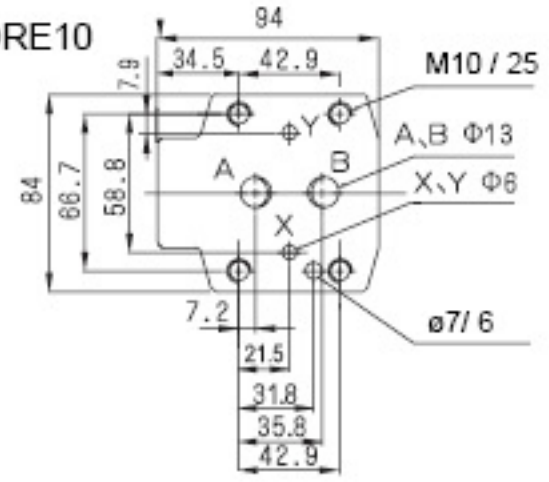
Unit dimensions

(Dimensions in mm)

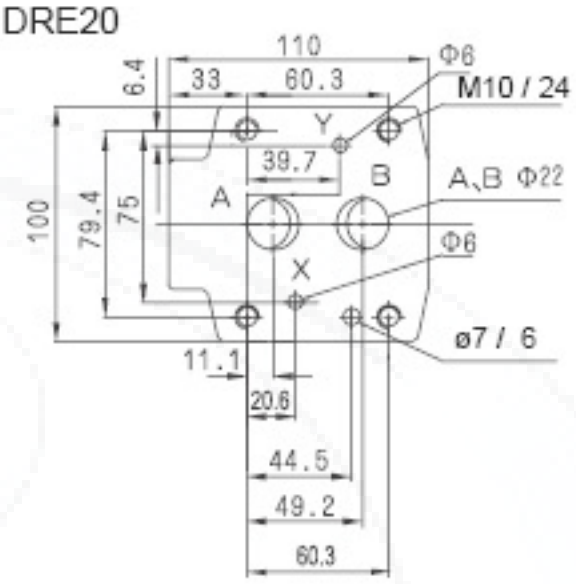




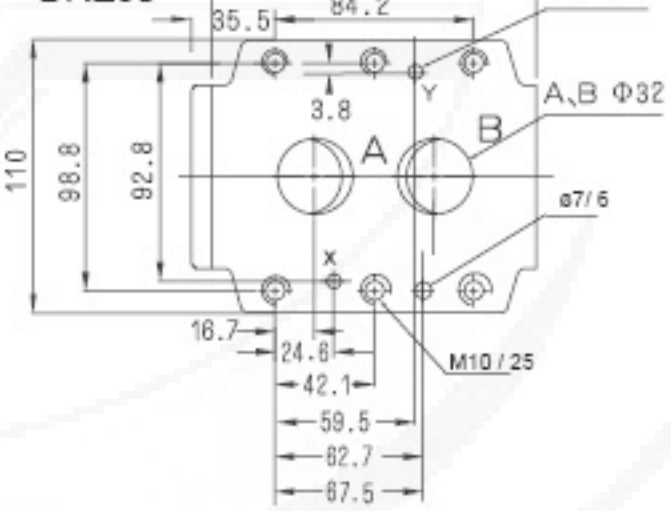
DRE10



DRE20



DRE30



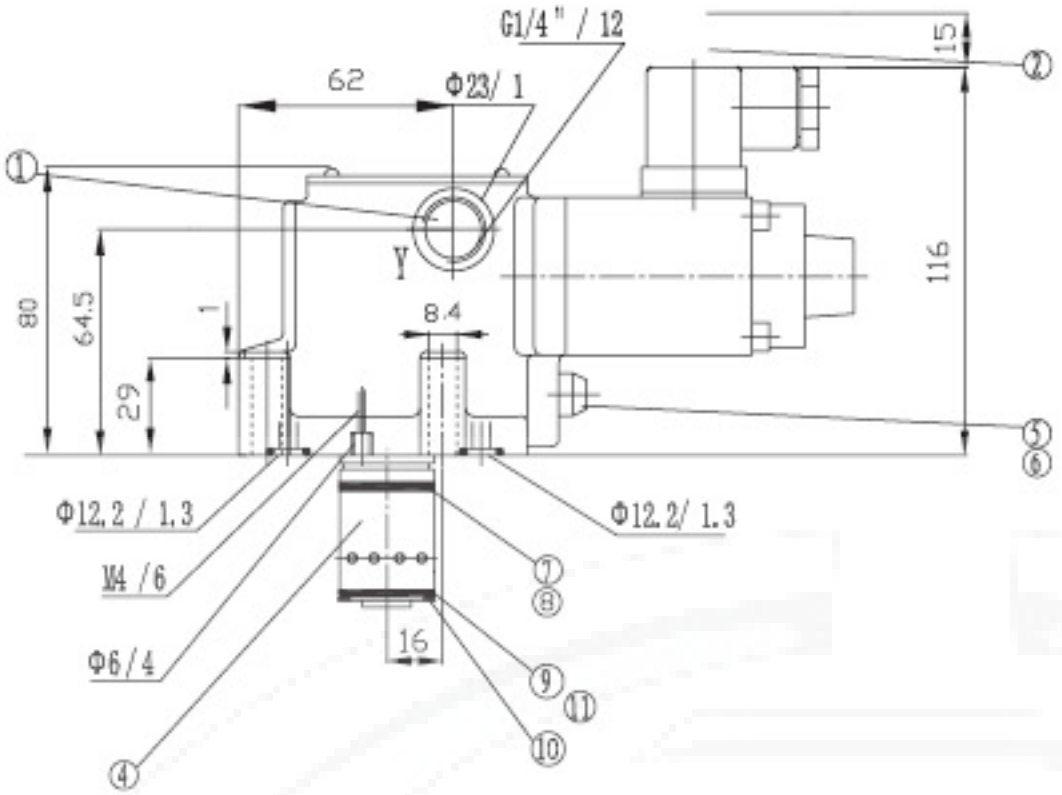
1 As supplied, this port (G 1/4″) is plugged. After removing the plug, this port may be used as an external pilot oil drain, separate and at zero pressure to tank.
2 Space required to remove plug-in connector
3 Maximum pressure limitation, type DREM
4 when using these valves, please take note of the guidelines
5 Port X for external control DRE10
6 Pressure gauge connecter for DRE20 and DRE30
7 Locating pin
8 Name plate
9 Pilot oil drain external at zero pressure to tank
10 Blind hole

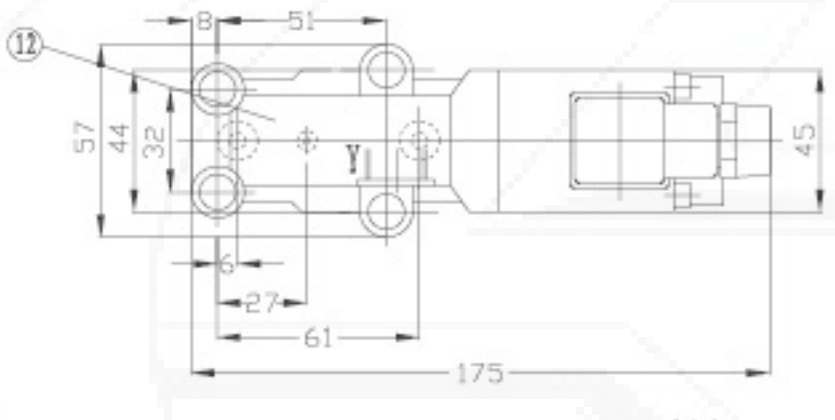
NS	O-ring (A、B)	O-ring (X、Y)	B1	B2	B3	B4	D1	D2	D3
10	17.12 × 2.62	9.25 × 1.78	85	66.7	7.9	58.8	15	21.8	4.2
25	28.17 × 3.53	9.25 × 1.78	102	79.4	6.4	73	25	34.8	6
32	34.52 × 3.53	9.25 × 1.78	120	96.8	3.8	92.8	31	41	6

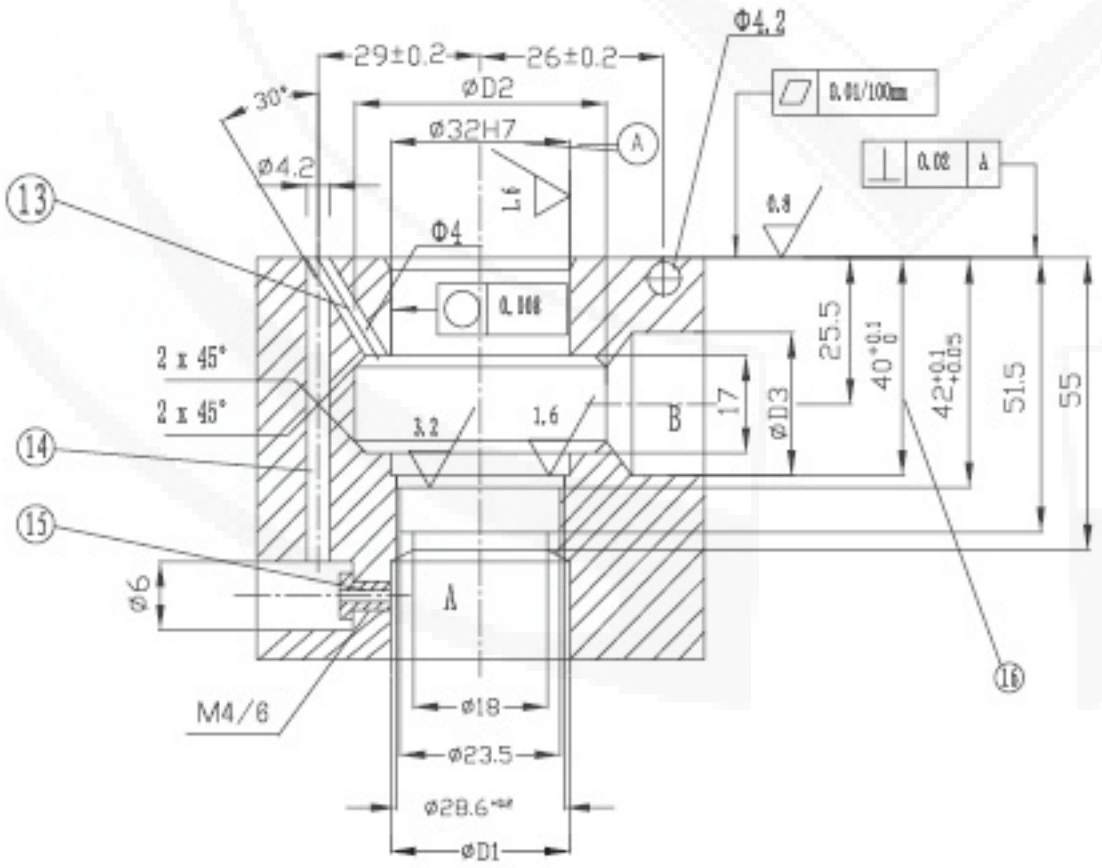
Subplates
G 460/01; G461/01
G 412/01; G413/01
G 414/01; G415/01
See page 88

size	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	T1	Weight
10	152	136.5	28	188	181	96	42.9	35.5	35.8	31.8	21.5	-	21.5	7.2	2	4.5kg
25	162	146.5	38	198	177	112	60.3	33.5	49.2	44.5	39.7	-	20.6	11.1	2.9	6.3kg
32	170	154.5	46	206	176.5	140	84.2	28	67.5	62.7	59.5	42.1	24.6	16.7	2.9	8.6kg

Unit dimensions **(Dimensions in mm)**







1 Pilot oil drain external at zero pressure to tank
2 Space required to remove plug-in connector
3 O-ring 9.25X1.78
4 Main spool core assembly
5 Maximum pressure limitation, type DREM
6 When using these valves, please take note of the guidelines
7 O-ring 9.25X1.78
8 O-ring 27.3X2.4
9 O-ring 27.3X2.4
10 Retainer ring 32/28.4x0.8(FPM)
11 O-ring with retainer ring must be input the hole before assemble the main spool core
12 Name plate
13 Pilot oil
15 Orifice hole
16 Assort depth

NS	D1	D2	D3	Code no. for main spool core assembly		Fixing screws	Torque(Nm)	Weight
				NBR	FPM			
10	10	40	10	360 727	360 728	4-M8 × 10-10.9 GB/T70.1-2000	20	1.5kg
25	20	45	20	360 729	306 730			
32	30	45	30					

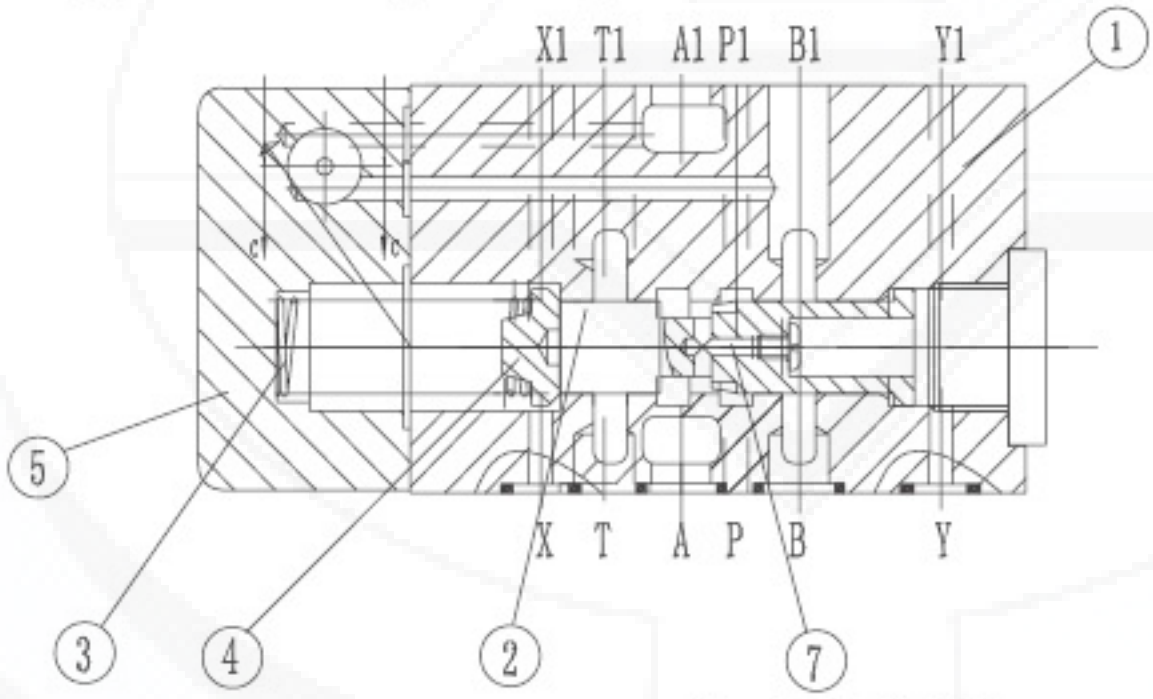
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Meter-in pressure compensator, direct operated, Type ZDC			RC29223/9.2006
	Size 10.16.32	up to 35 MPa	up to 325 L/min	Replaces: RC29223/08.2000

Features:

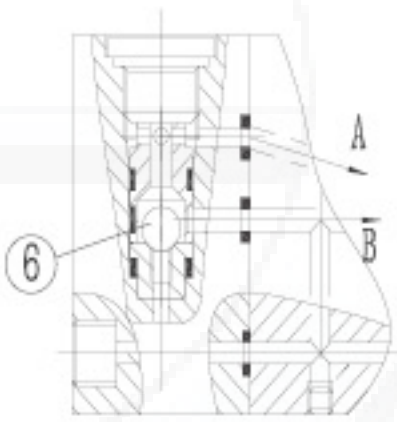
- Load compensation in port P to A or P to B via a built-in shuttle valve
- 2-way version "P"
- 3-way version "P T" (NS10-25)
- Flow control when working together with a pro-portional directional valve

Function, section

The ZDC... valves are direct operated meter-in pressure compensators of 2 or 3-way design.
They are used for the load compensation as a meter-in pressure compensator in channel P.
These valves basically consist of the housing (1), the control spool (2), compression spring (3) with spring washer (4) and the cover (5) with integrated shuttle valve (6).
The compression spring (3) holds the control spool (2) in the open position from P1 to P,when the pressure differential P1 to A1 or P1 to B1 is less than 1.0 MPa
If the pressure differential exceeds 1.0 MPa, then the control spool (2) is moved to the left until the pressure differential is restored.



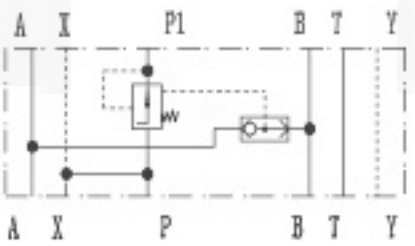
Type ZDC (NS 10)



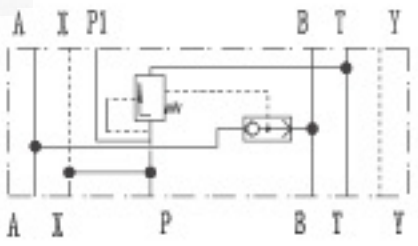
section C-C

Symbols

Pilot oil supply "internal"

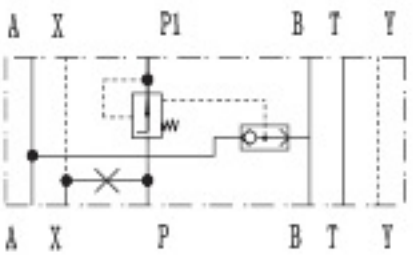


Type ZDC...P-20B/...

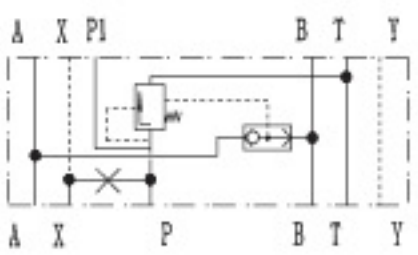


Type ZDC...PT-20B/...

Pilot oil supply "external",port X is closed on the valve side(only NS10)



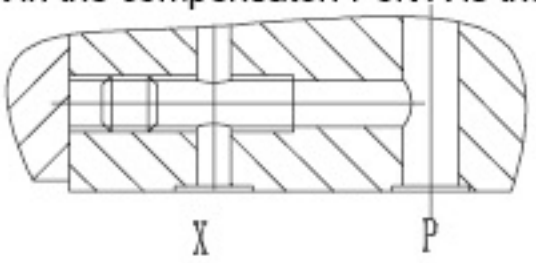
Type ZDC...P-20B/X...



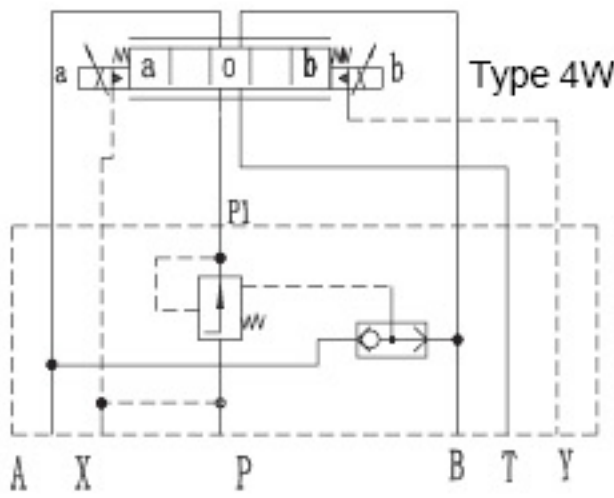
Type ZDC...PT-20B/X...

Pilot oil supply

For internal pilot oil supply for the proportional valve and the meter-in compensator,the oil is taken from the throttling point in the compensator. Port X is then plugged.



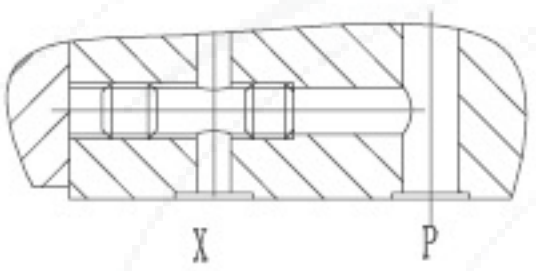
Pilot oil supply internal



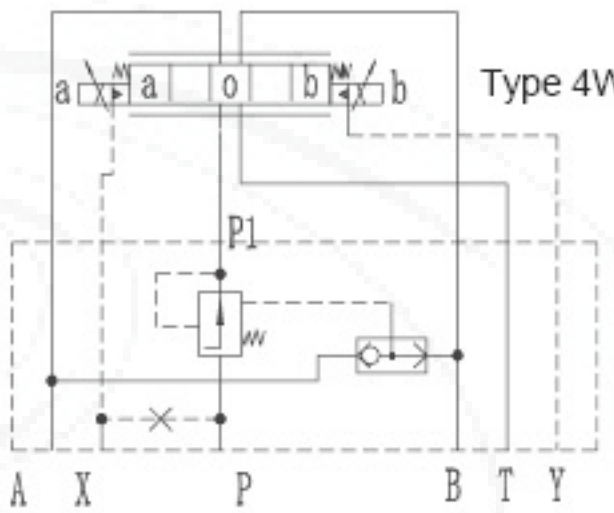
Type 4WRZ

Type ZDC · · · P · · · 20B/ · · ·

With external pslot oil supply, the connection in port p is closed.The pilot oil is supplied by a separate control circuit.



Pilot oil supply external



Type 4WRZ

Type ZDC · · · P · · · 20B/X · · ·

Ordering code

ZDC | | | | / | | | | *

NS 10 = 10
NS 16 = 16
NS 25 = 25

2-way version(pressure reduction function) =P
3-way version(pressure limitation function) =PT

Series 20 to 29 =20
(20 to 29 unchanged installation and connection dimension)

Technology of Beijing Huade Hydraulic = B

Further details in clear text

M= Mineral oils
V= phosphate ester

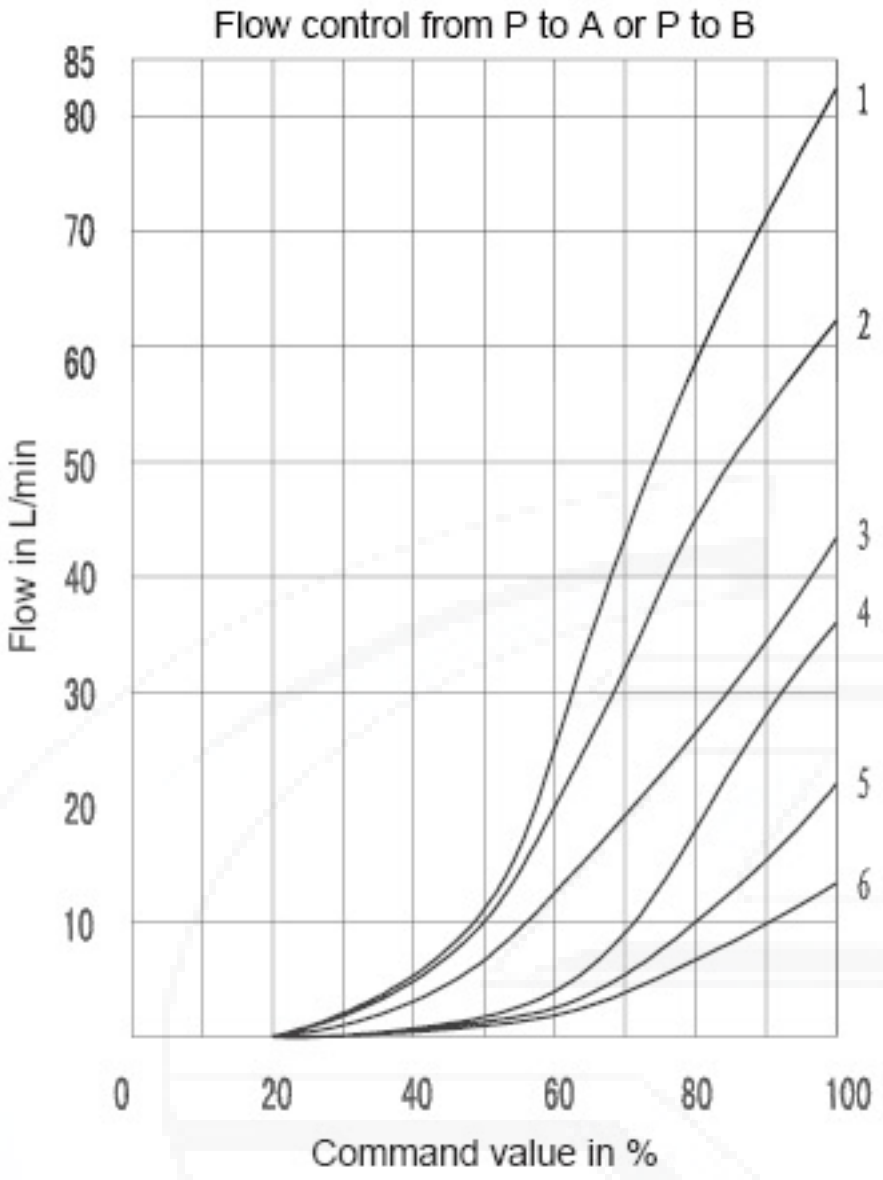
No code= Without special protection
J= Sea water resistant

No code= Pilot oil feed "internal"
X= Pilot oil feed "external"

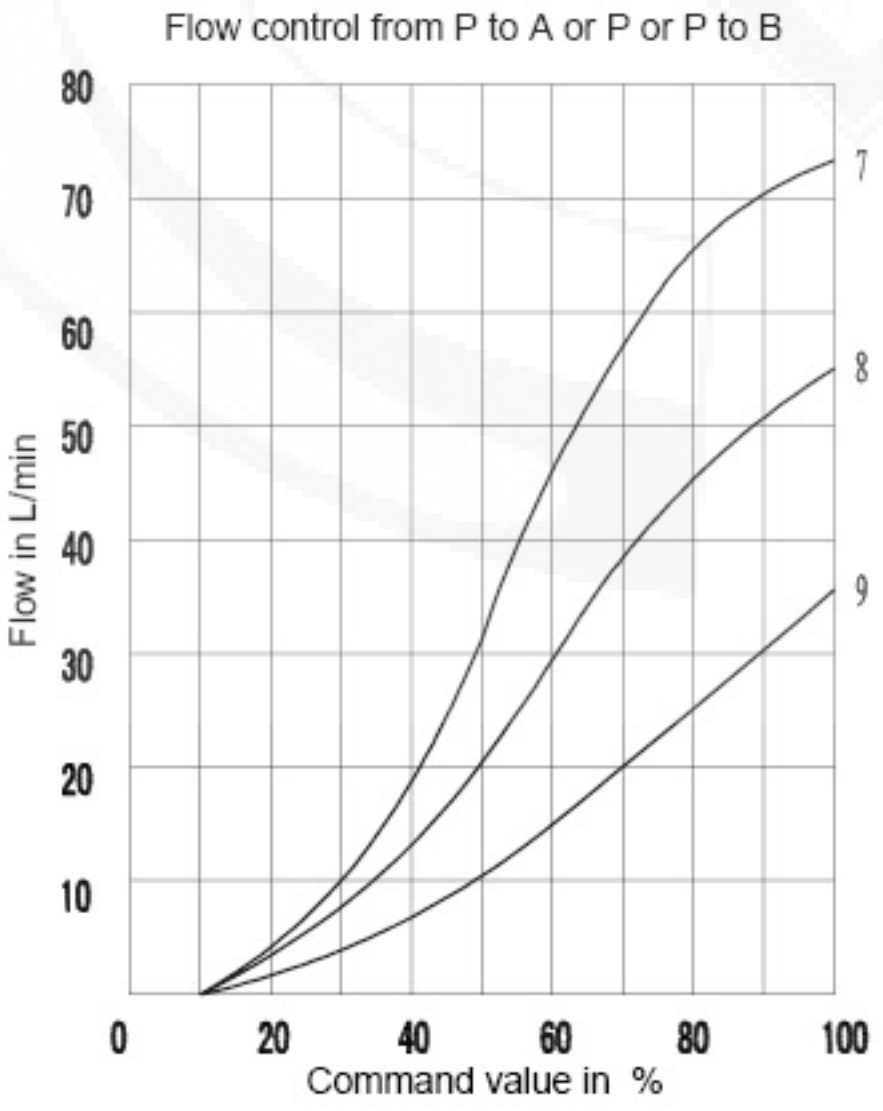
size		10	16	25	
flow	(L/min)	85	150	325	
weight	(Kg)	3	3.5	8.9	
Operating pressure (MPa) P_{max}	A、B、P	35			others is the same as the valves having same dimension
	T	25			
	X	3 to 10			
	Y	up to 3,(Only when be used with the port operated proportional direction valve,otherwise 15)			
Degree of containsnation	(μm)	⩽ 20(recommend 10)			

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

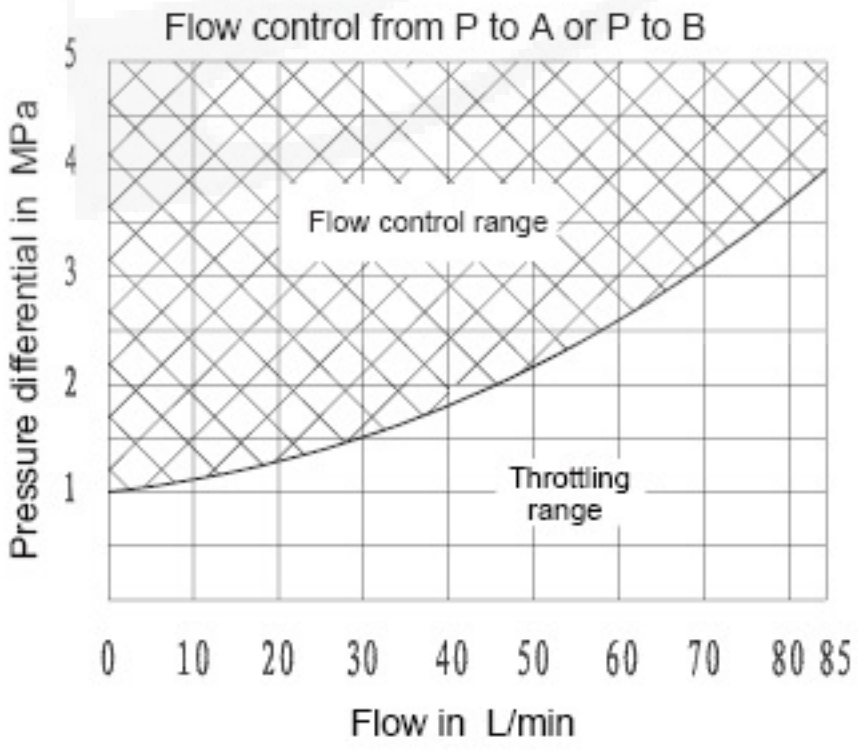
ZDC10:



1= With valve type 4WRZ10...50-30B/6A.../...
2= With valve type 4WRZ10...50-30B/6A.../...
3= With valve type 4WRZ10...25-30B/6A.../...
4= With valve type 4WRA10...40-10B/...Z4/...
5= With valve type 4WRA10...20-10B/...Z4/...
6= With valve type 4WRA10...10-10B/...Z4/...

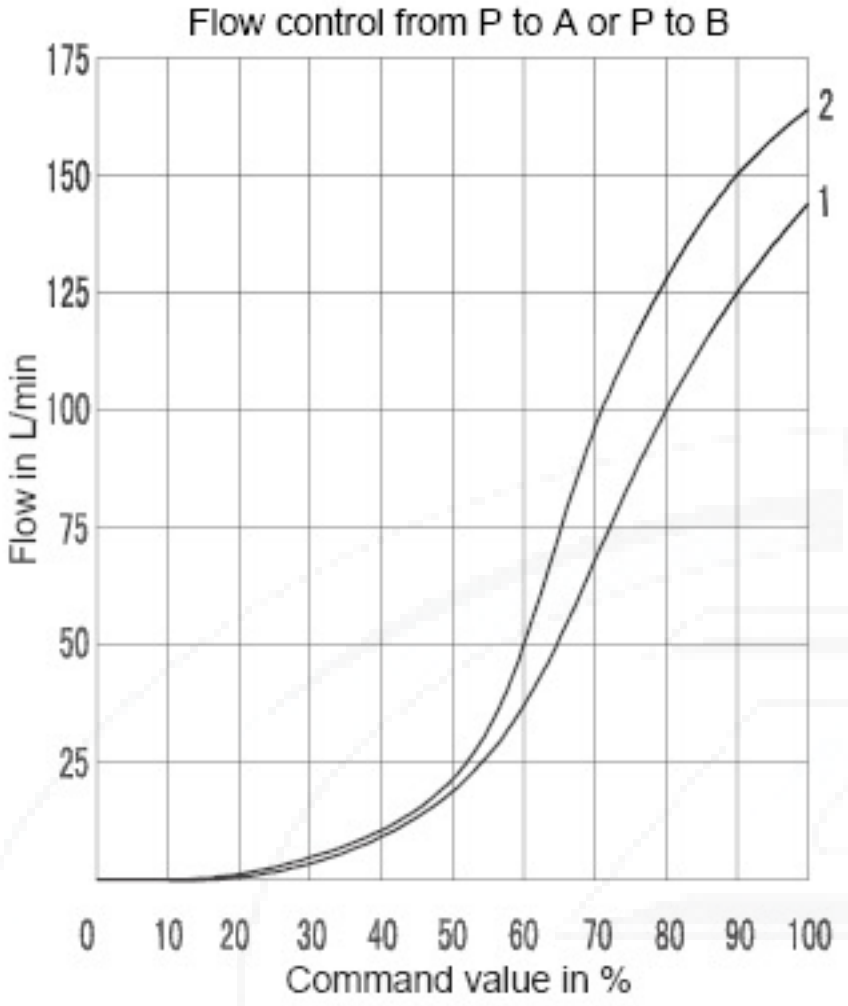


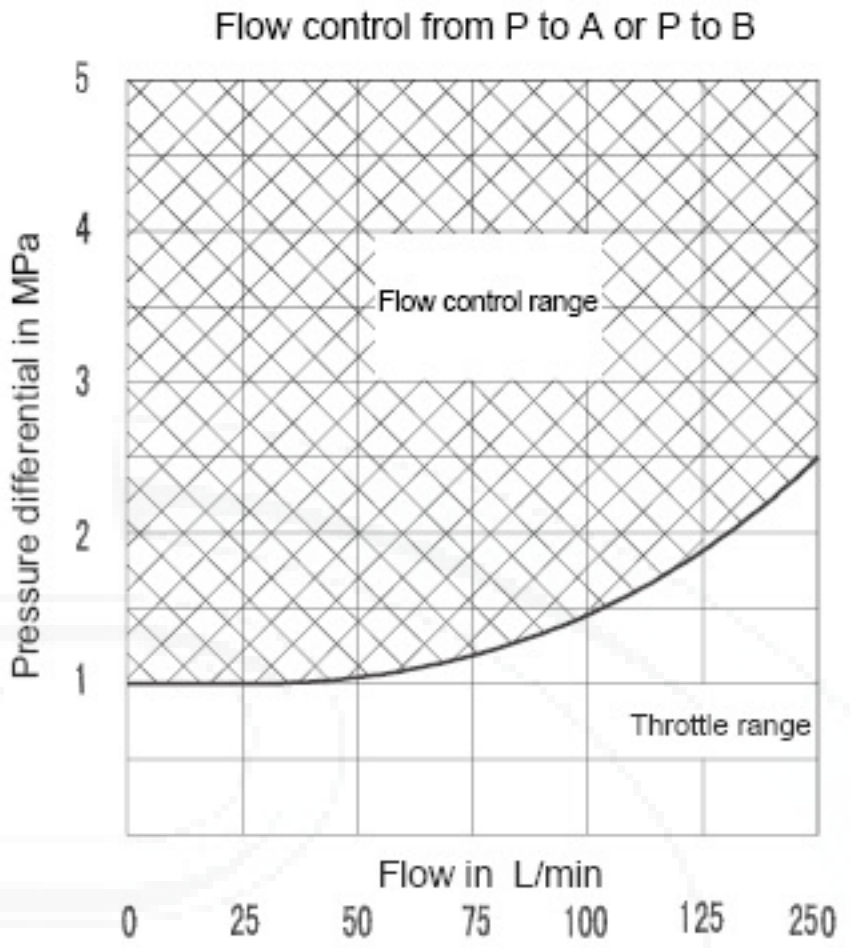
7= With valve type 4WRE10...64-10B/24Z4/...
8= With valve type 4WRE10...32-10B/24Z4/...
9= With valve type 4WRA10...16-10B/24Z4/...



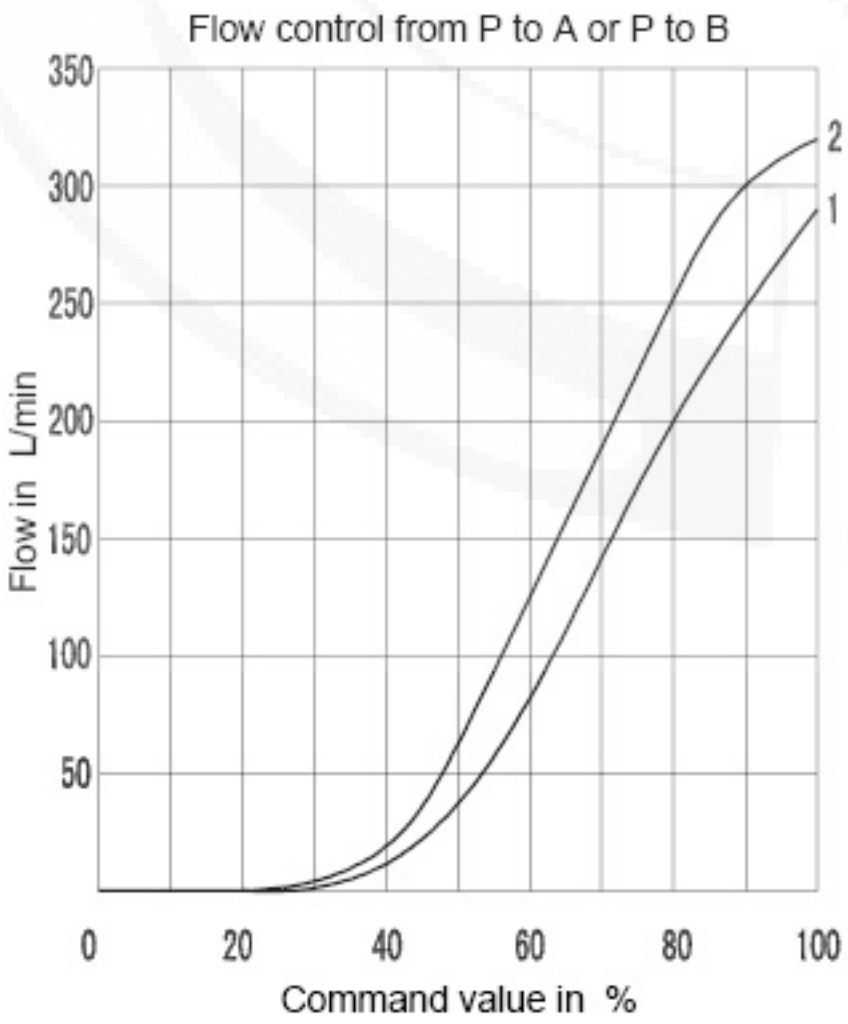
Characteristic curves (measured at V = 41 mm²/s and t = 50°C)

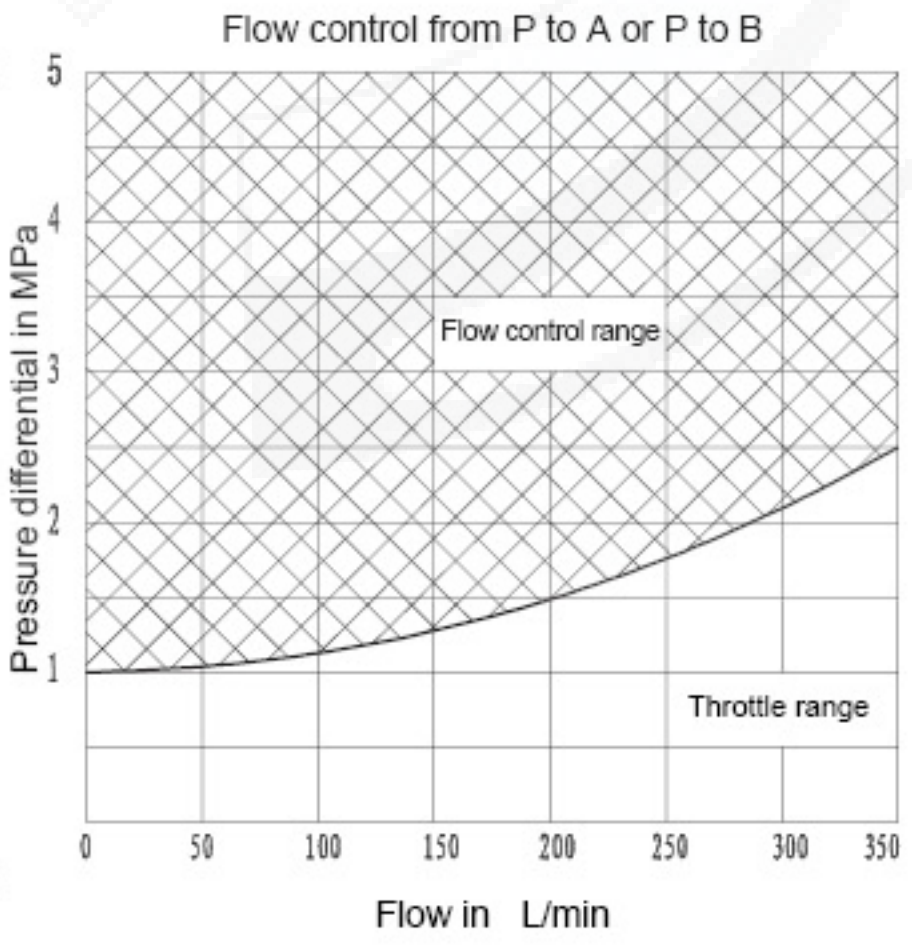
ZDC16 : 1= with valve type 4WRZ16...100-30B/6A.../...
2= with valve type 4WRZ16...150-30B/6A.../...





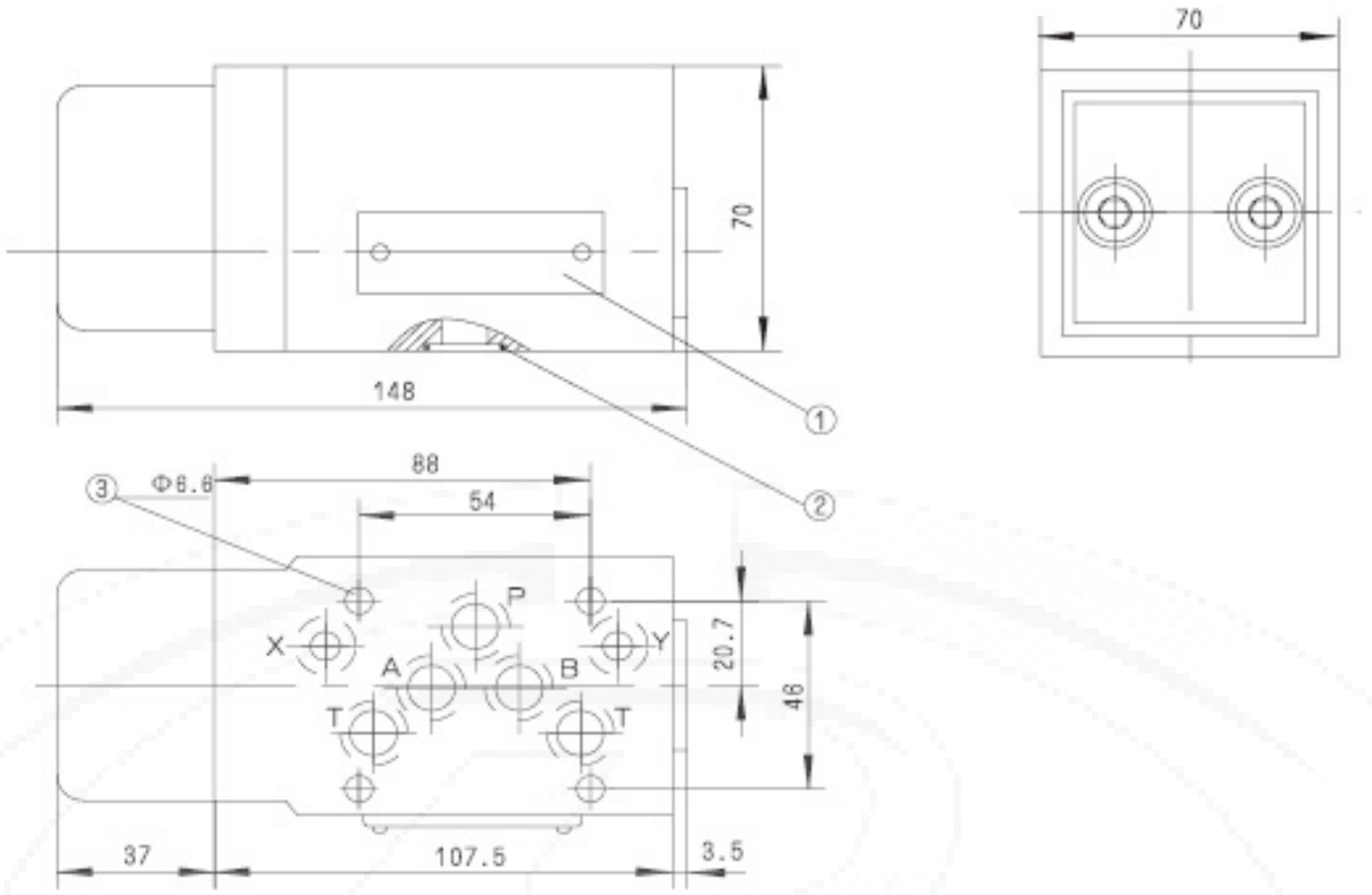
ZDC25 : 1= with valve type 4WRZ25...270-30B/6A.../...
2= with valve type 4WRZ25...325-30B/6A.../...





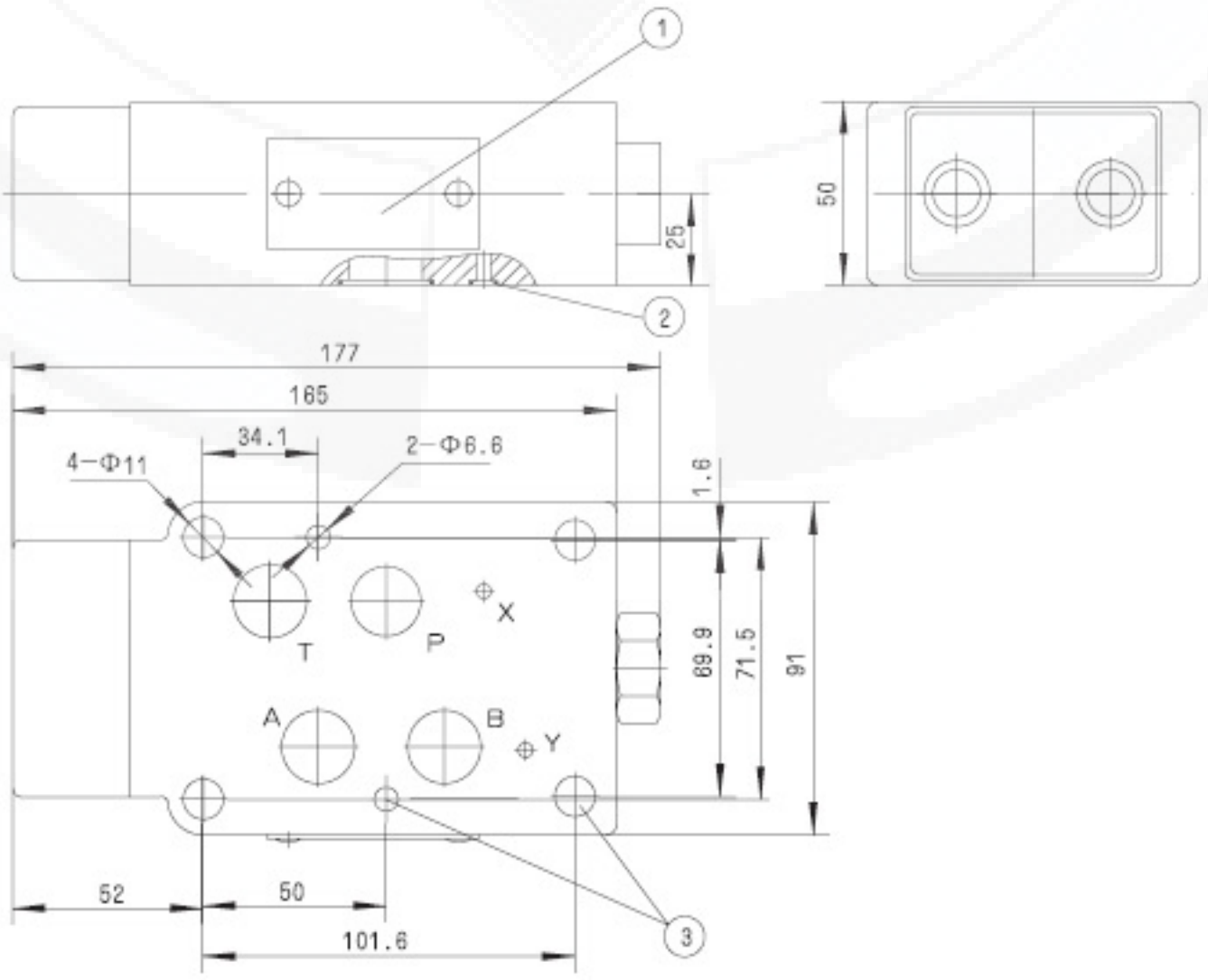
Unit Dimensions: **(dimensions in mm)**

ZDC10:



1. Nameplate
2. O-ring 12x2 for ports A,B,P,T
3. Valve fixing screw holes

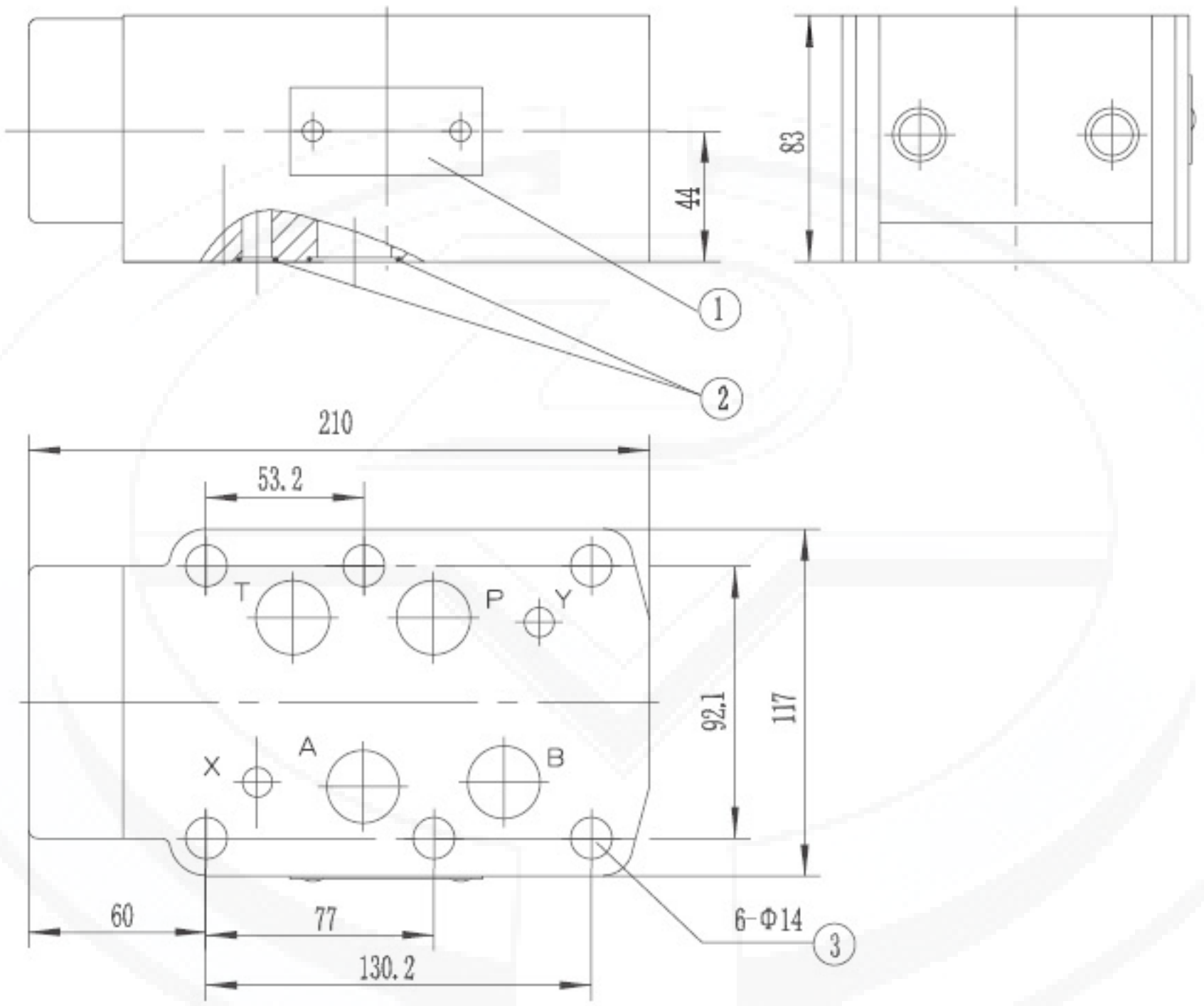
ZDC16:



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

1. Nameplate
2. O- rings 22x2.5 for port A,B,P,T
3. Valve fsxing screws

ZDC25：



1. Nameplate
2. O-rings 27x3 for ports A,B,P,T
   O-rings 19X3 for ports X,Y
3. Valve fixing screws

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional flow control valve 2-way version, Type 2FRE 6...RC			RC29188/9.2006
	Size 6	up to 21 MPa	up to 25 L/min	Replaces: RC29188/08.2000

Features:

- Valve with a pressure compensator for the pressure compensated control of a flow
- Actuation via a proportional solenoid
- With electrical position feedback of the control orifice
- The position transducer coil can be axially moved making the zero point adjustment of the control orifice easy, without having to touch the electronics (electrical-hydraulic)
- Flow control is possible in both directions by using a rectifier sandwich plate

Functional , section , symbol

The type 2FRE ...proportional flow control valves have a 2-way function. They can, from a applied electrical command value, regulate flow which is pressure and temperature compensated.

They basically comprise of the housing (1), proportional solenoid with inductive position transducer (2), measuring orifice (3), pressure compensator (4) as well as the optional check valve (5).

Proportional flow control valve 2FRE 6 B:

The setting of the flow is determined (0 to 100 %) at the command value potentiometer. The applied command value adjusts, via the amplifier as well as the proportional solenoid, the measurement orifice(3). The position of the measurement orifice (3) is obtained by the inductive position transducer. Any deviations from the command value are compensated for by the feedback control.

The pressure compensator (4) holds the pressure drop at the measurement orifice (3) at a constant value. The flow is, therefore load compensated.

The small temperature drift is achieved due to the design of the measurement orifice.

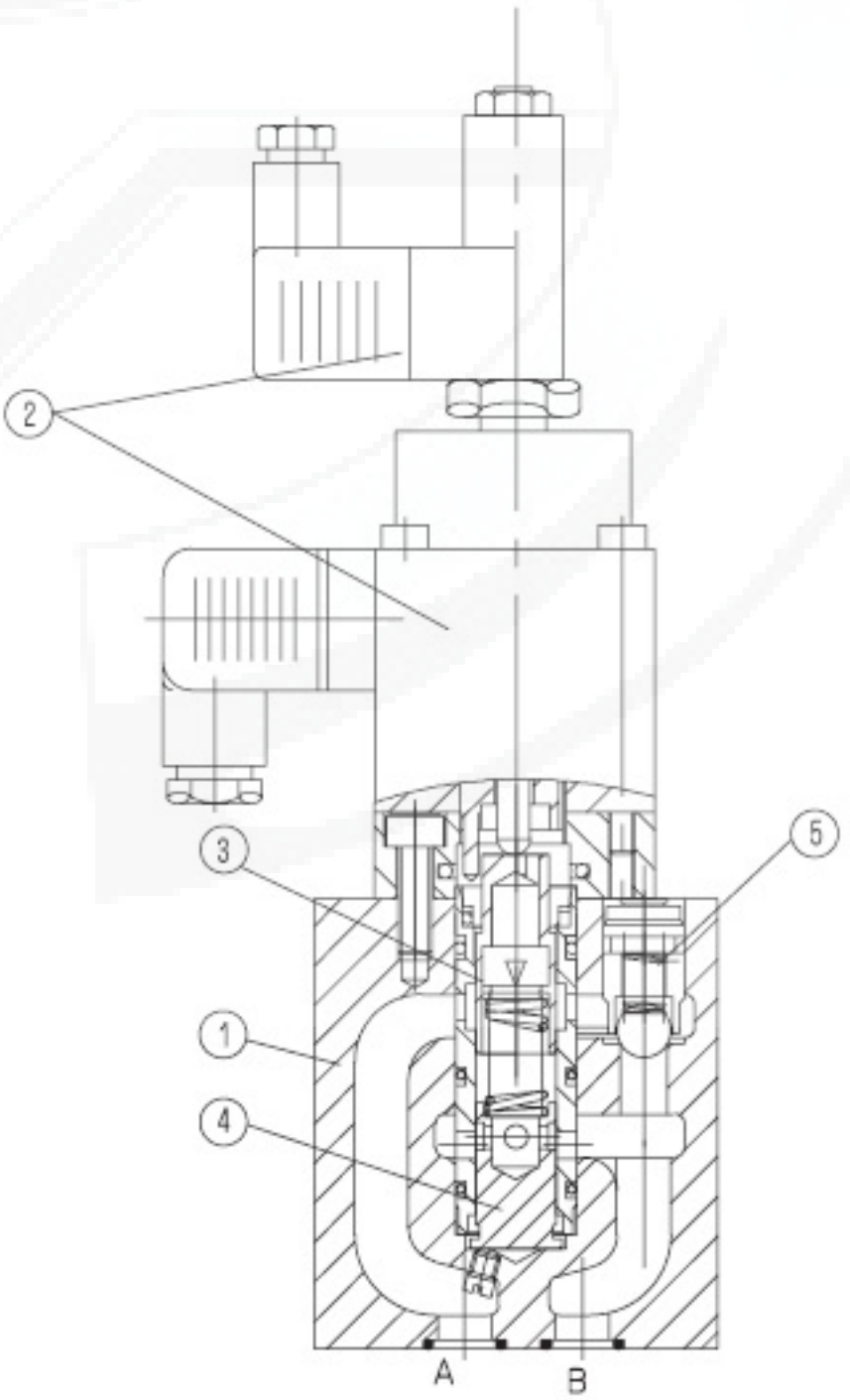
At a 0 % command value the measurement orifice is closed.

In the case of a loss of power or a cable break at the position transducer the measurement orifice closes.

From a 0 % command value a jump free start is possible.

Via two ramps within the electrical amplifier, it is possible to delay the opening and closing of the measurement orifice.

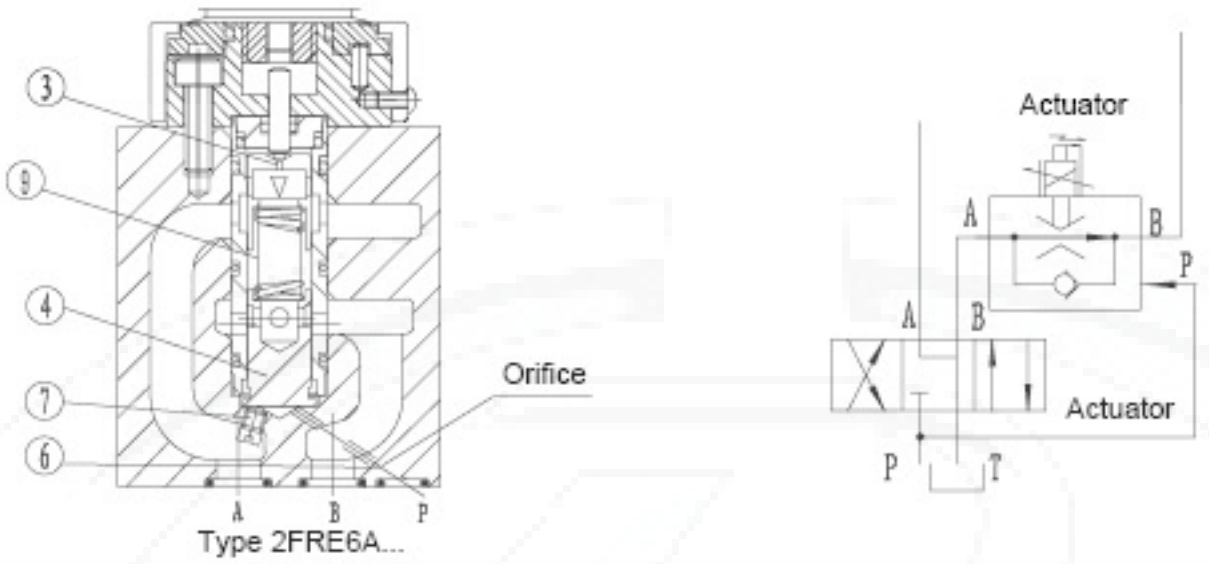
Via the check valve (5) a free flow is possible from B to A.



Proportional flow control valve type 2FRE 6 A:

The function of this valve is in principle the same as valve type 2FRE 6 B:

To suppress the start-up jump when the measurement orifice (3)(command value > 0 %) is open, there is provision for the pressure compensator (4) to be held closed via port P (6). The internal connection (7) between port A and the pressure compensator (4) is plugged. Via the external port P (6) the pressure in port P, before the directional valve (8) acts on the pressure compensator (4) and holds it against the spring force (9) in the closed position. If the directional valve (8) is switched over from P to B, then the pressure compensator(4) moves from the closed position into the regualting position and the start-up jump is thereby avoided.



Ordering details

2FRE6 — 20 B /

With external closing of the pressure compensator = A
Without external closing of the pressure compensator = B

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

Technology of Beijing Huade Hydraulic =B

Flow range A → B
up to 3 L/min = 3Q
up to 6 L/min = 6Q
up to 10 L/min = 10Q
up to 16 L/min = 16Q
up to 25 L/min = 25Q
Progressive with fast feed
Fine control range up to 2 L/min = 2QE

* Further details in clear text

No code= Mineral oil
V= phosphate ester

R= with check valve
M= without check valve

Rectifier sandwich plate

Z4S6 — 10 B /

Rectifier sandwich plate
Nominal size 6 = 6

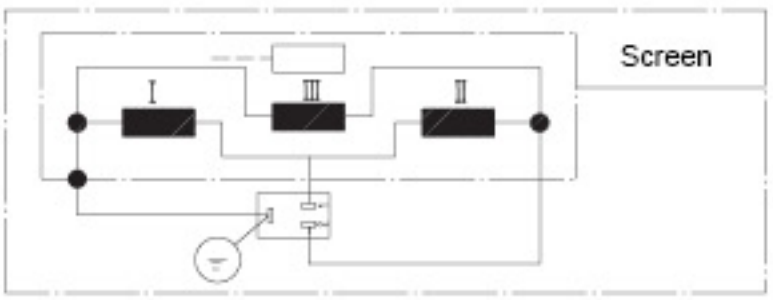
Technology of Beijing Huade Hydraulic =B

* Further details in clear text

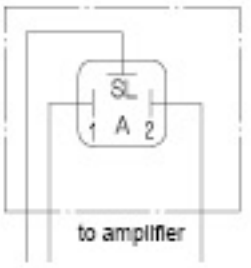
No cade=Mineral oil
V= Phosphate ester

Electrical connections ---- Inductive position transducer

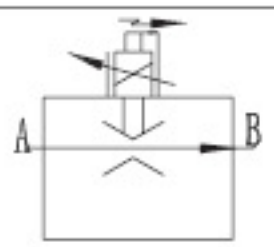
Connections on loops



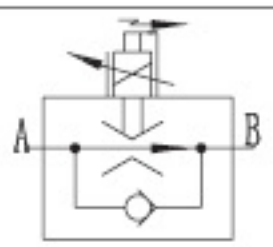
Connections on plug-in connector



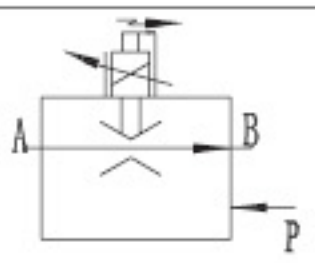
Symbols：Proportional flow control valve (simplified, complete)



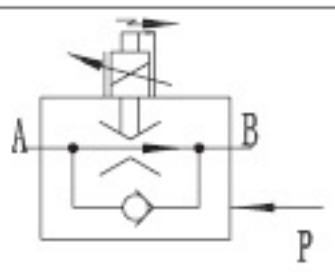
Type 2FRE6B-...M



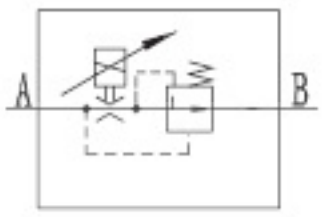
Type 2FRE6B-...R

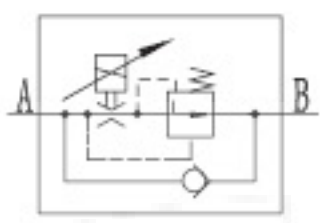


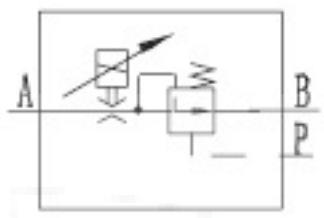
Type 2FRE6A-...M

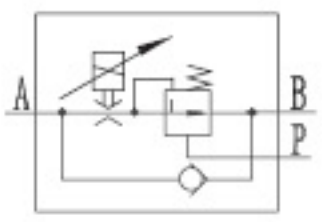


Type 2FRE6A-...R

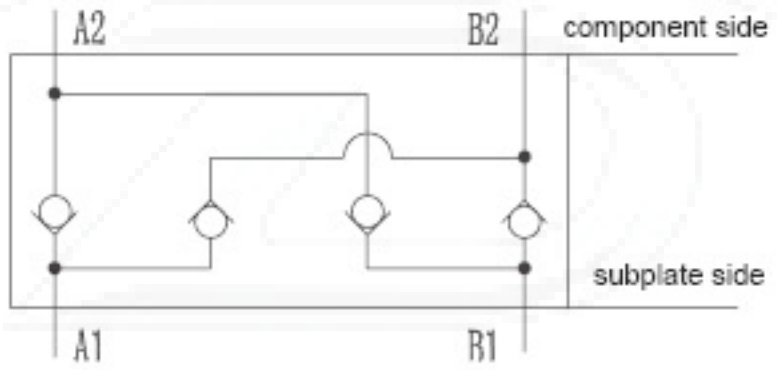








Rectifier sandwich plate：



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

Hydraulic

Max. permissible operating pressure, port A		21 (port A)					
Flow q_v max. (L/min)	Type	2QE	3Q	6Q	10Q	16Q	25Q
		2	3	6	10	16	25
Flow q_v min. (L/min)	to 10MPa	0.015	0.015	0.025	0.05	0.07	0.1
	to 21MPa	0.025	0.025	0.025	0.05	0.07	0.1
Max. leakage flow at Δ P (A→B)							
command value 0%(L/min)	5MPa	0.004	0.004	0.004	0.006	0.007	0.01
(measured at υ =36^{-6}	10MPa	0.005	0.005	0.005	0.008	0.01	0.015
× 10m²/s and t=50℃	21MPa	0.007	0.007	0.007	0.012	0.015	0.022

Minimum pressure differential	(MPa)	0.6 to 1
△p free return flow (B→A)		see diagram on page 69
Pressure flow relationship: inlet/outlet pressure		see diagram on page 69
Flow stability		see diagram on page 69
Hysteresis		$< \pm 1\%Q_{max}$
Repeatability		$< 1\%Q_{max}$
Degree of contamination	(μm)	⩽ 20 (We recommend a filter with a minimum retention rate of 10)
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)
Viscosity range	(mm²/S)	2.8 to 380
Pressure fluid temperature range	(℃)	-20 to +70
Installation		optional

Electrical

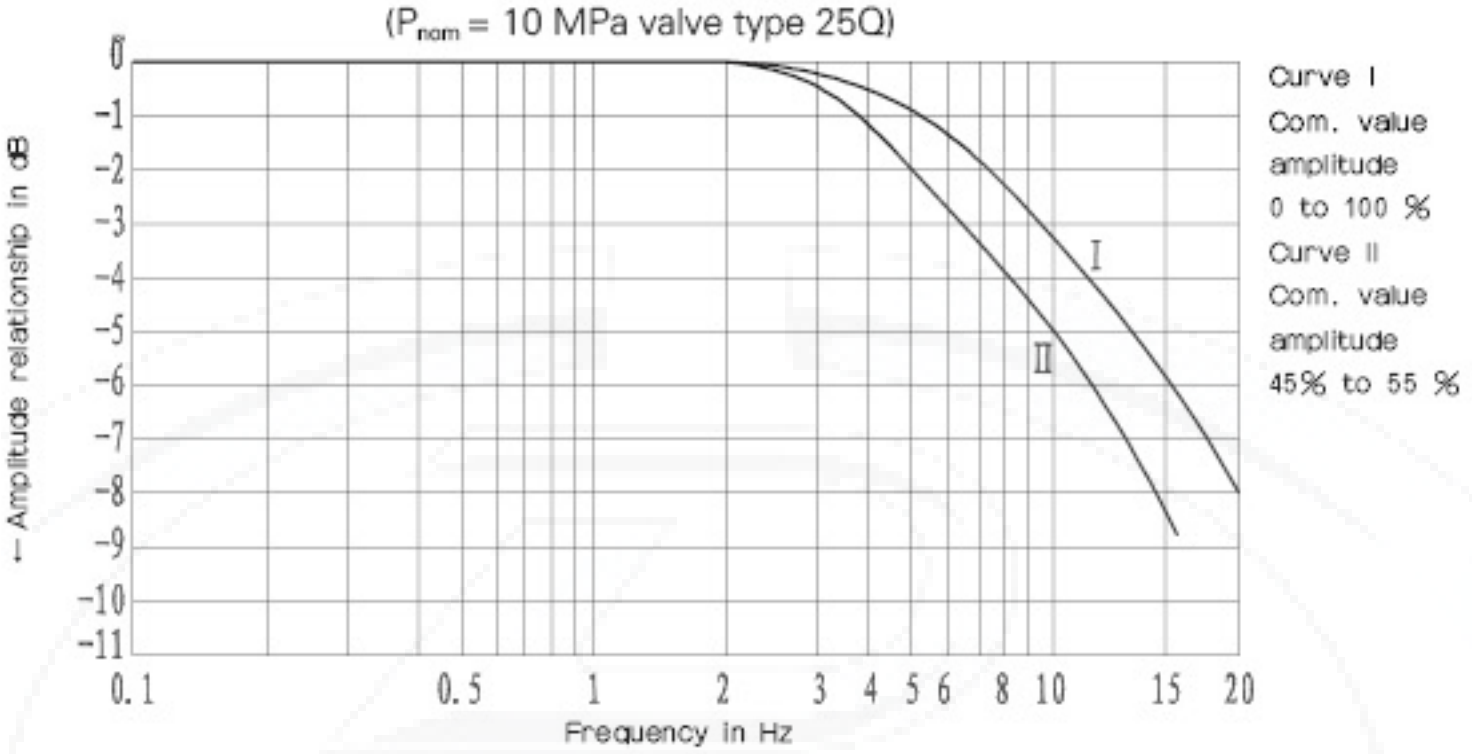
Voltage type		DC
Coil resistance of solenoid	(Ω)	Cold value at 20℃ 5.4， Max. warm value 8.2
Coil resistance of transducer	(Ω)	at 20℃ Ⅰ -56、Ⅱ -56、Ⅲ -112
Max. Power	(VA)	50
Inductivity	(mH)	6 to 8
Oscillator frequency	(KHz)	2.5
Surroundubgs temperature	(℃)	Max.50
Amplifier		VT-5010S30 Demand of insulation IP65

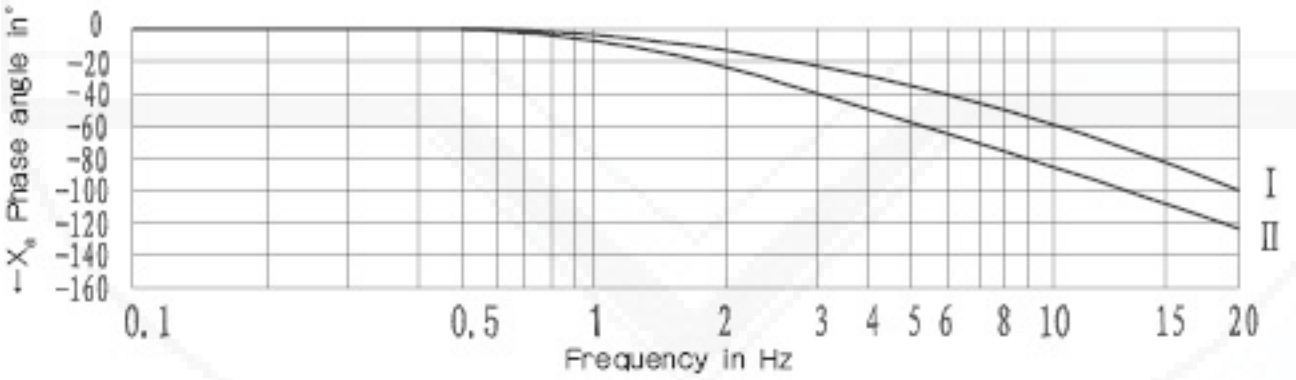
Characteristic curves (measured at v=36 × $10^{-6}m^2/S$; t=50℃)

Frequency response characteristic curve

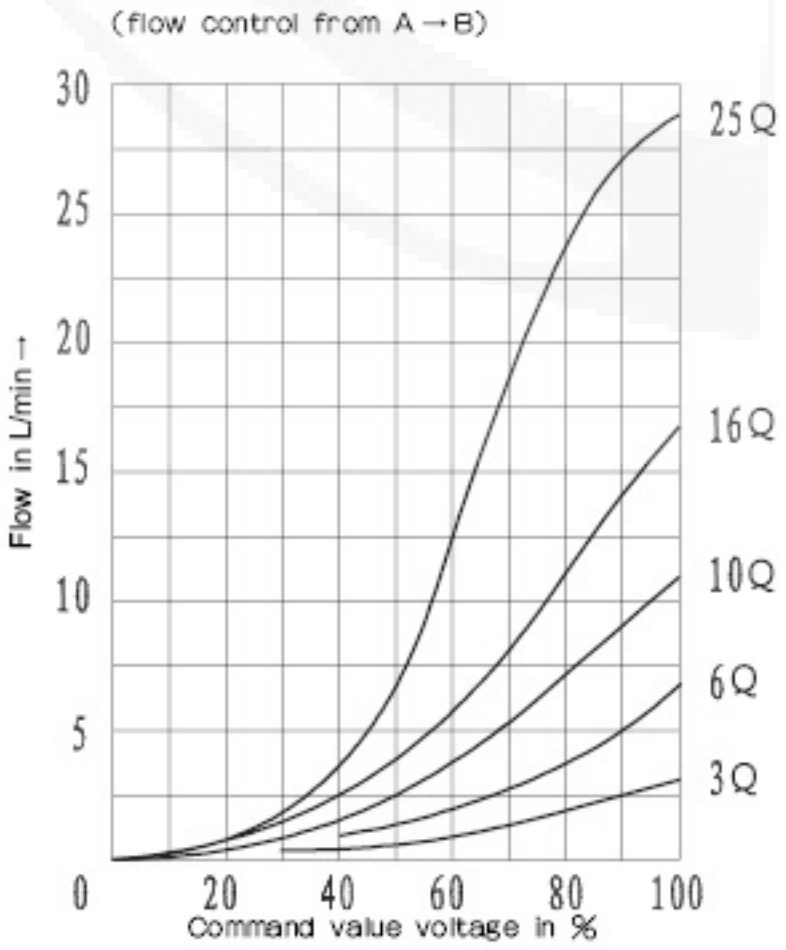
Input signals (%)	Qmin to Qmax Tu+Tg(ms)	Qmax to Qmin Tu+Tg(ms)
0-100	50	60
10-90	45	50
25-75	40	45

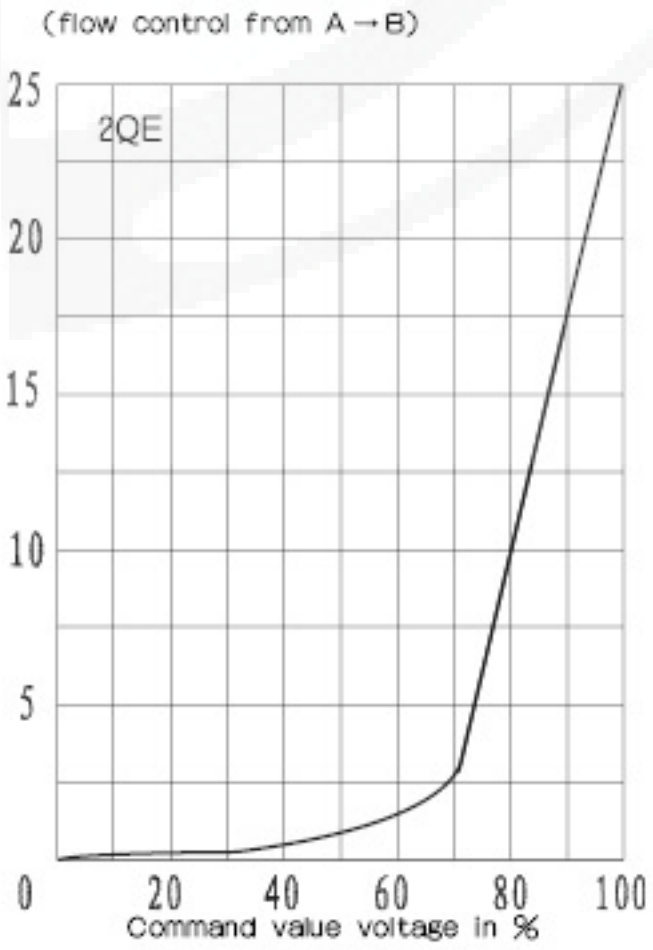
(P_{nom} = 10 MPa valve type 25Q)





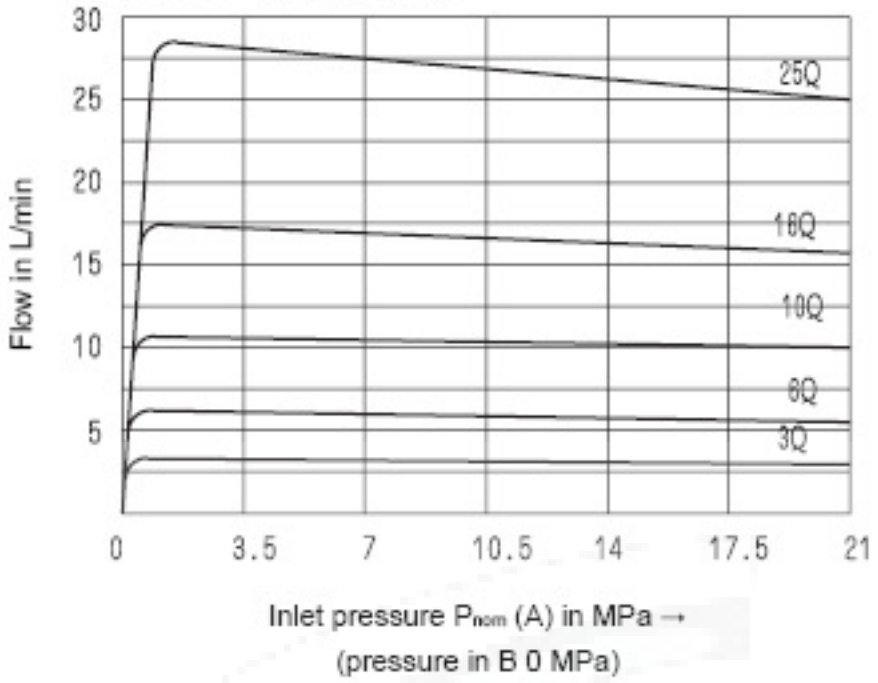
Relationship of the flow to the command value(P_{nom} =50 MPa)

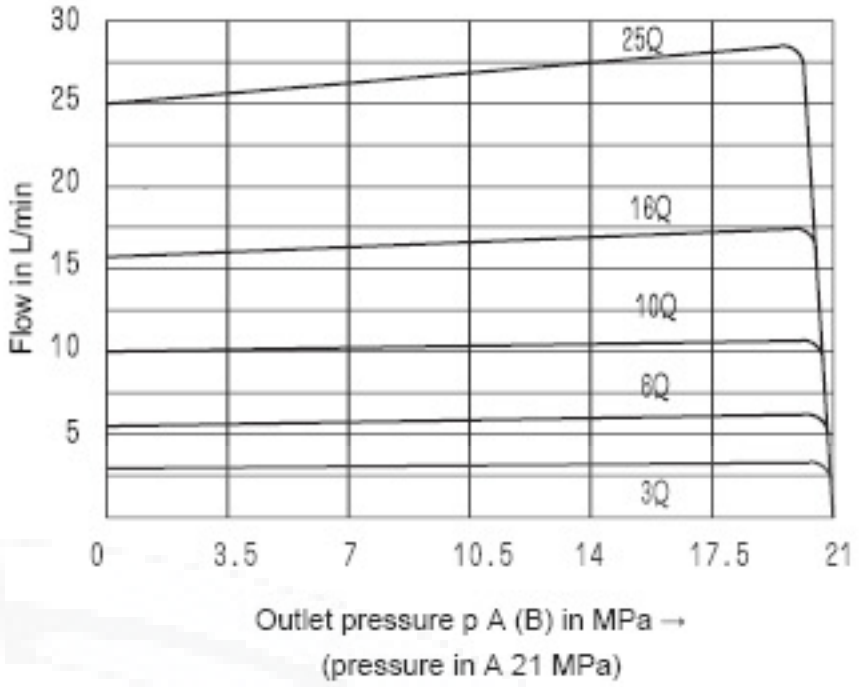




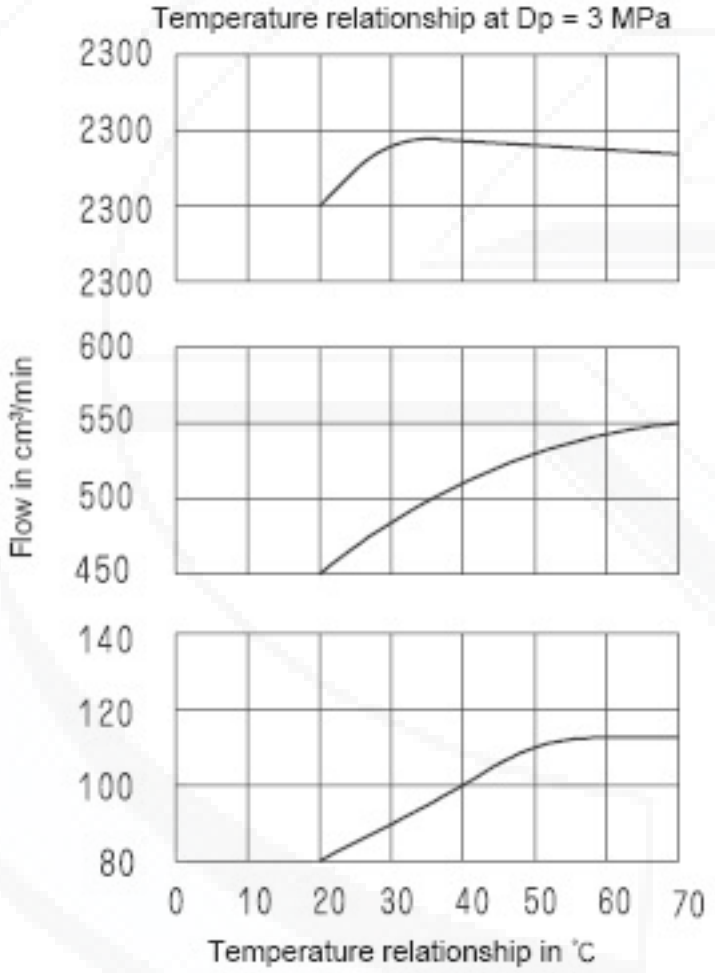
Proportional flow control valve

Pressure - flow relationship

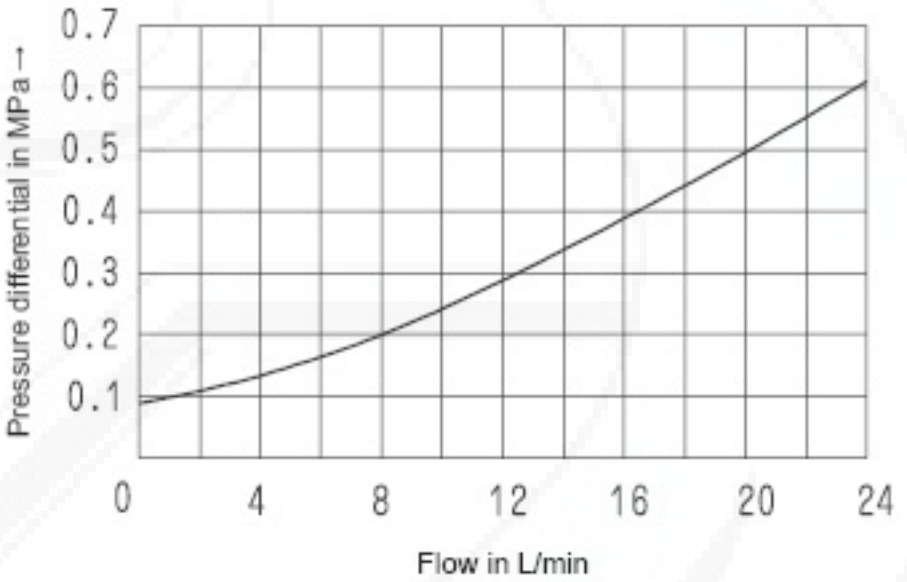




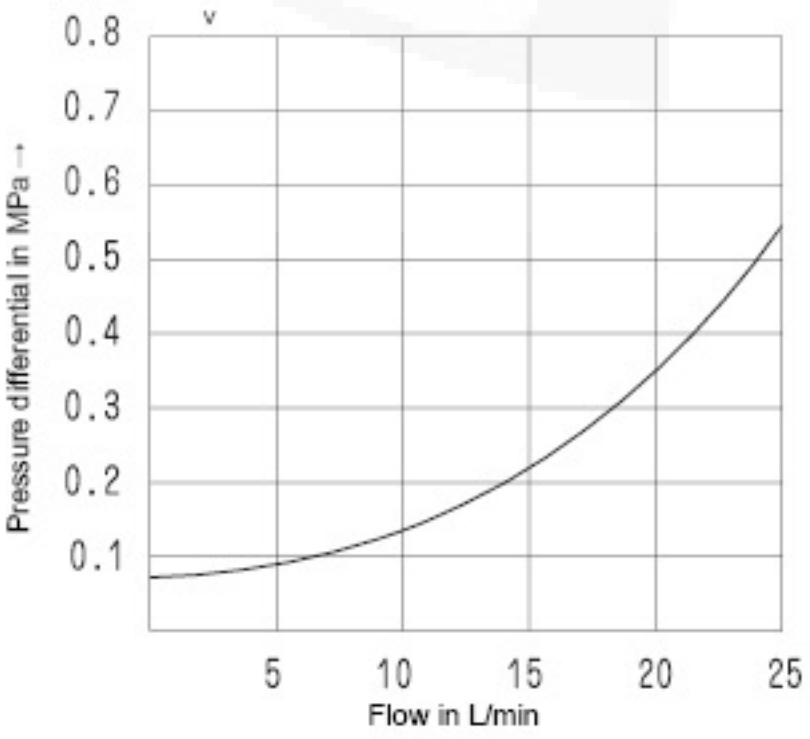
Temperature relationship at Dp = 3 MPa



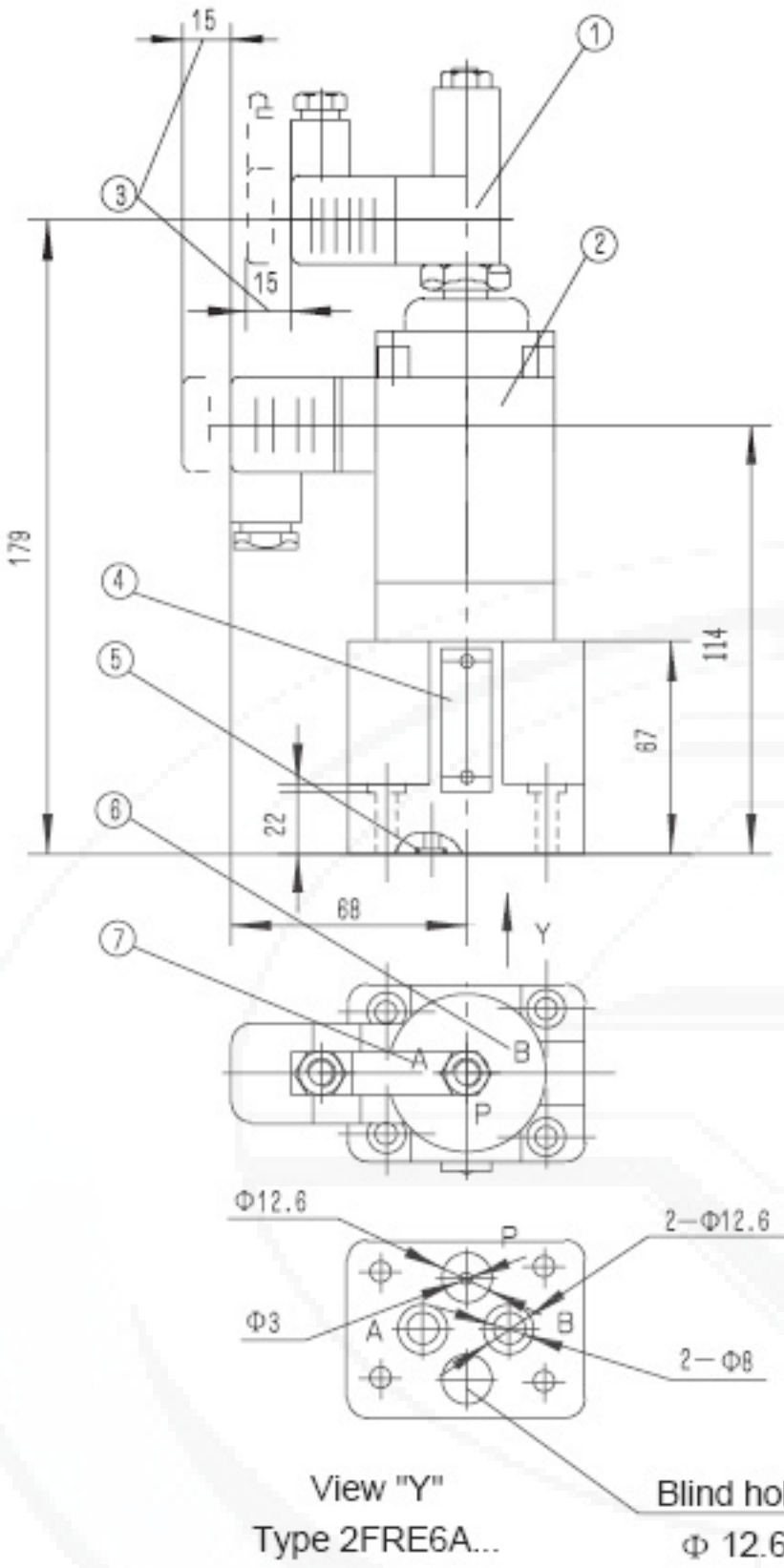
Pressure differential over check valve B → A
Orientation closed



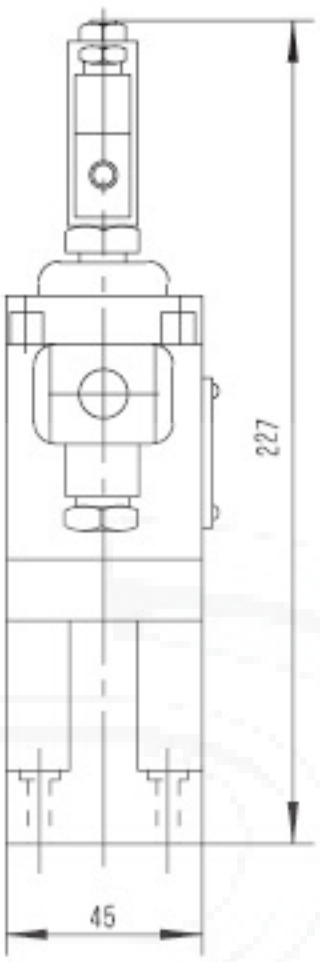
Rectifier sandwich plate
△ p- q -characteristic curve - cartridge check valve

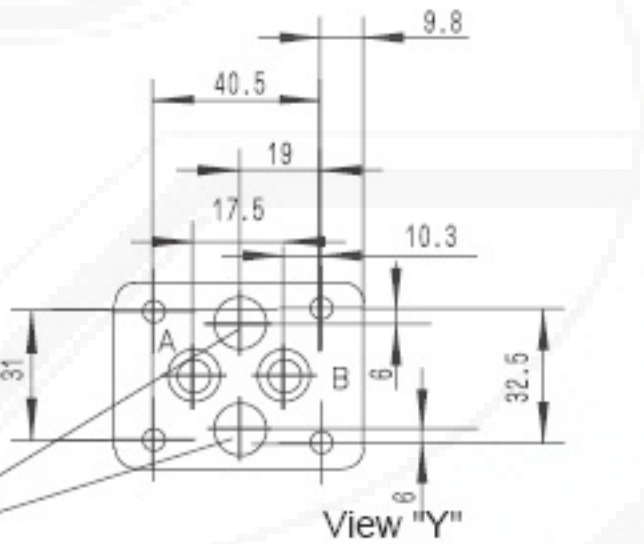


Unit dimensions: **(Dimensions in mm)**



View "Y"
Type 2FRE6A...





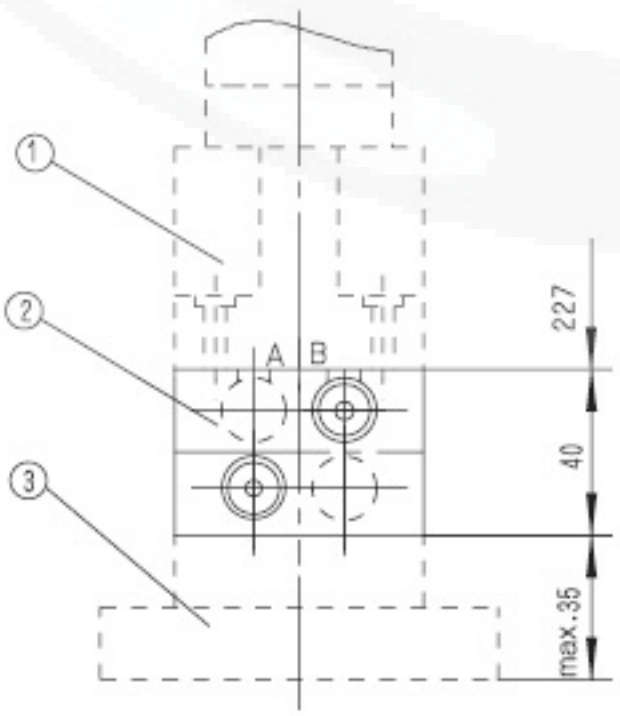
View "Y"
Type 2FRE6B...

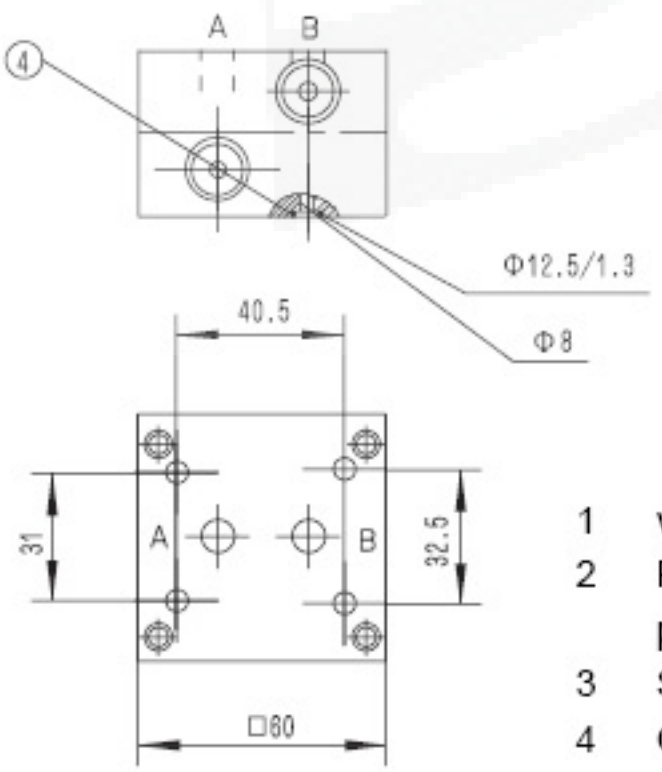
Blind hole
Φ 12.6

1 Inductive position transducer
2 Solenoid
3 Space required to remove plug-in connector
4 Nameplate
5 O-Ring 9.25 x1.78(for ports A, B, P,T and blind hole)
6 Port B
7 Port A

Subplates:
G 341/01 (G 1/4")
G 342/01 (G 3/8")
G 502/01 (G 1/2")
See page 80

Rectifier sandwich plate





1 valve 2FRE6
2 Rectifier sandwich plate Z4S6
3 Subplates
4 O-ring 9.25 x 1.78

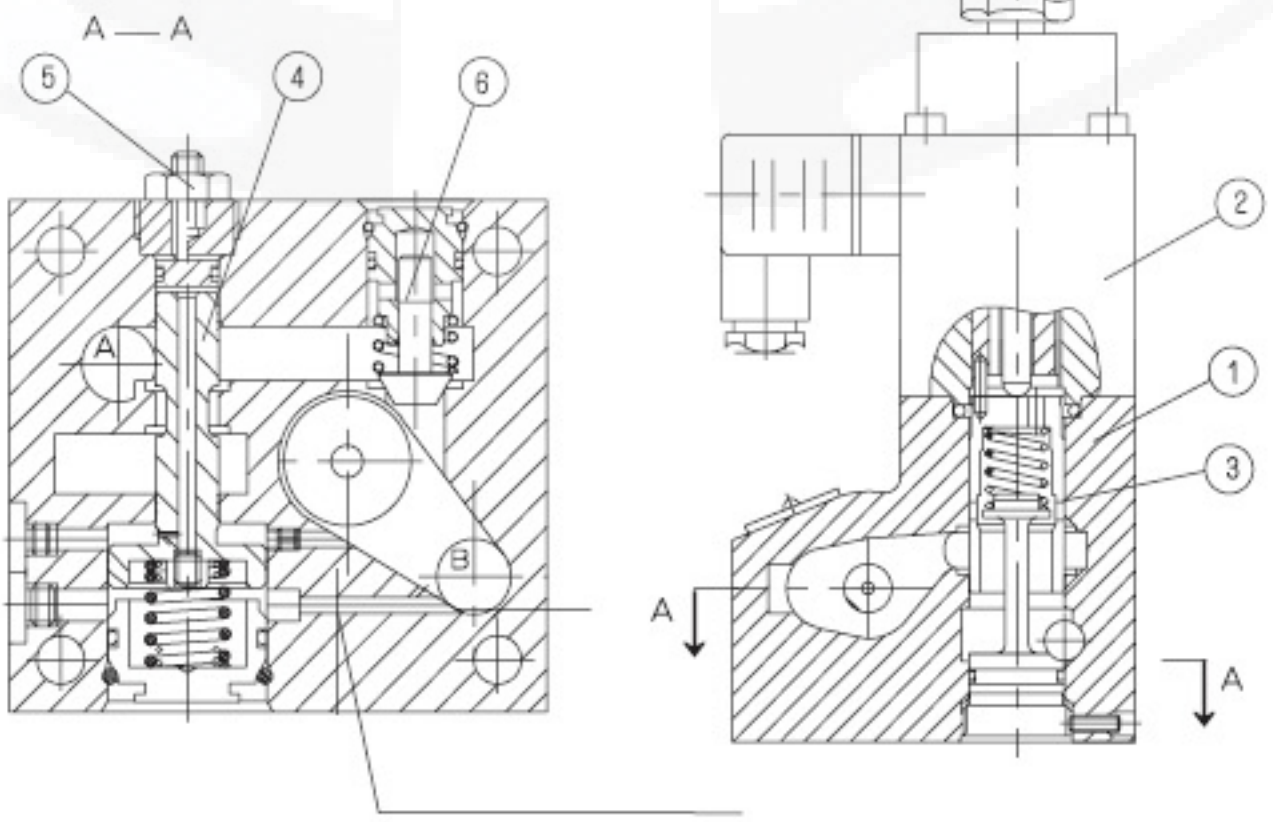
BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional flow control valve 2-way version，Type 2FRE 10、16...			RC29190/9.2006
	Size 10、16	up to 21 MPa	up to 160 L/min	Replaces: RC29190/08.2000

Features:

- Valve with a pressure compensator for pressure compensated control of a flow
- Actuation via a proportional solenoid
- With electrical position feedback of the control orifice
- The position transducer coil can be axially moved making the zero point adjustment of the control orifice easy, without having to touch the electronics (electrical-hydraulic)
- Minimum sample variation of valve and electrical amplifier VT 5004 (separate order)

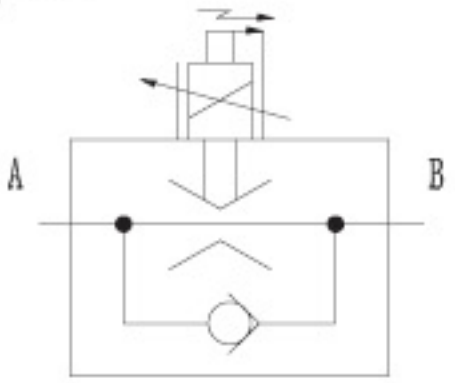
Functional , section

The type 2FRE.. proportional flow control valves have a 2-way function. They can, from an applied electrical command value, regulate a flow which is pressure and to a great extent temperature compensated.
They basically comprise of the housing (1), proportional solenoid with inductive position transducer (2), measuring orifice (3), pressure compensator (4), stroke limiter (5), as well as an optional check valve (6).
The setting of the flow is determined (0 bis 100 %) at the command value potentiometer. The applied command value, causes via the amplifier as well as the proportional solenoid, the adjustment of the measurement orifice (3). The position of the measurement orifice (3) is obtained by the position transducer. Any deviations from the command value are compensated for by the position feedback control.
The pressure compensator (4) holds the pressure drop at the measurement orifice (3) at a constant value. The flow is, therefore pressure compensated.
The small temperature drift is achieved due to the design of the measurement orifice.At a 0 % command value the measurement orifice is closed.
In the case of a loss of power or a cable break at the position transducer the measurement orifice closes.From a 0 % command value a jump free start is possible. Via two ramps within the electrical amplifier it is possible to delay the opening and closing of the measurement orifice.
Via the check valve (6) free flow is possible from B to A.

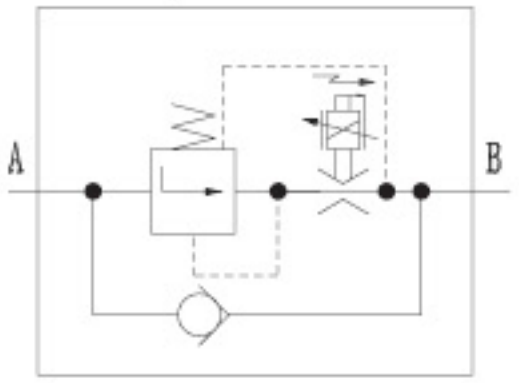


Symbols:

simplified



complete



Ordering details

2FRE		40	B	/			*

Nominal size 10 = 10
Nominal size 16 = 16

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

Technology of Beijing Huade Hydraulic =B

Further details in clear text

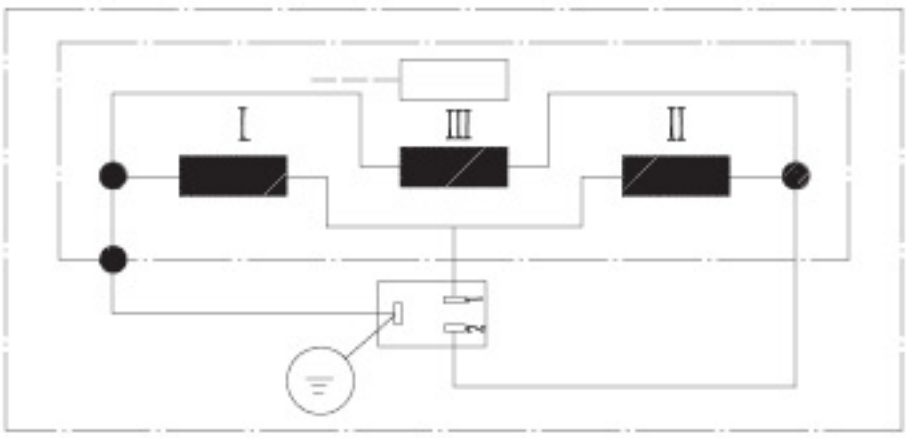
No code = Mineral oil
V = Phosphate ester

No cade= Without pressure compensator stroke limiter
B = With pressure compensator stroke limiter

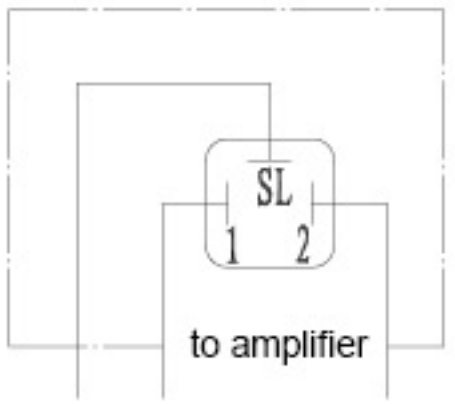
Flow control range A → B			
Nominal size 10			Nominal size 16
Linear	Increase by degrees	Progressive with fast feed Linear (fine control range)	Linear
up to 5 L/min = 5L up to 10 L/min = 10L up to 16 L/min = 16L up to 25 L/min = 25L up to 50 L/min = 50L up to 60 L/min = 60L	up to 5 L/min=5 Q up to 10L/min=10Q up to 16L/min=16Q up to 25L/min=25Q	up to 2L/min=2QE up to 5L/min=5QE	up to 80 L/min = 80L up to 100 L/min = 100L up to 125 L/min = 125L up to 160 L/min = 160L

Electrical connections ---- Inductive position transducer

Connections on loops



Connections on plug-in connector



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

Hydraulic

Operating pressure (MPa)		31.5									
Minimum pressure differential (MPa)		Size 10						Size 16			
		0.3~0.8						0.6~1			
△p free retum	Measurement orifice open(MPa)	0.1	0.12	0.15	0.2	0.3	0.35	0.16	0.19	0.24	0.31
flow B → A	Measurement orifice closed(MPa)	0.17	0.2	0.25	0.3	0.5	0.6	0.3	0.35	0.45	0.6
Flow Q max. (L/min)		5	10	16	25	50	60	80	100	125	160
		40									
Flow Character	Temperature drift △Q/℃(%) Hydraulic + electrical	0.1Q max									
	Pressure compensated up to △p = 31.5MPa (%)	± 2Qmax									
Degree of contamination (μM)		⩽ 20 (We recommend a filter with a minimum retention rate of 10)									
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)									
Viscosity range (mm^2/s)		2.8 to 380									
Pressure fluid temperature range (℃)		-20 to +70									
Hysteresis (%)		< ± 1Qmax									
Repeatability (%)		< 1Qmax									
Sample spread (%)		< ± 2									
Installation		optional									
Weight (Kg)		6						8.3			

Electrica

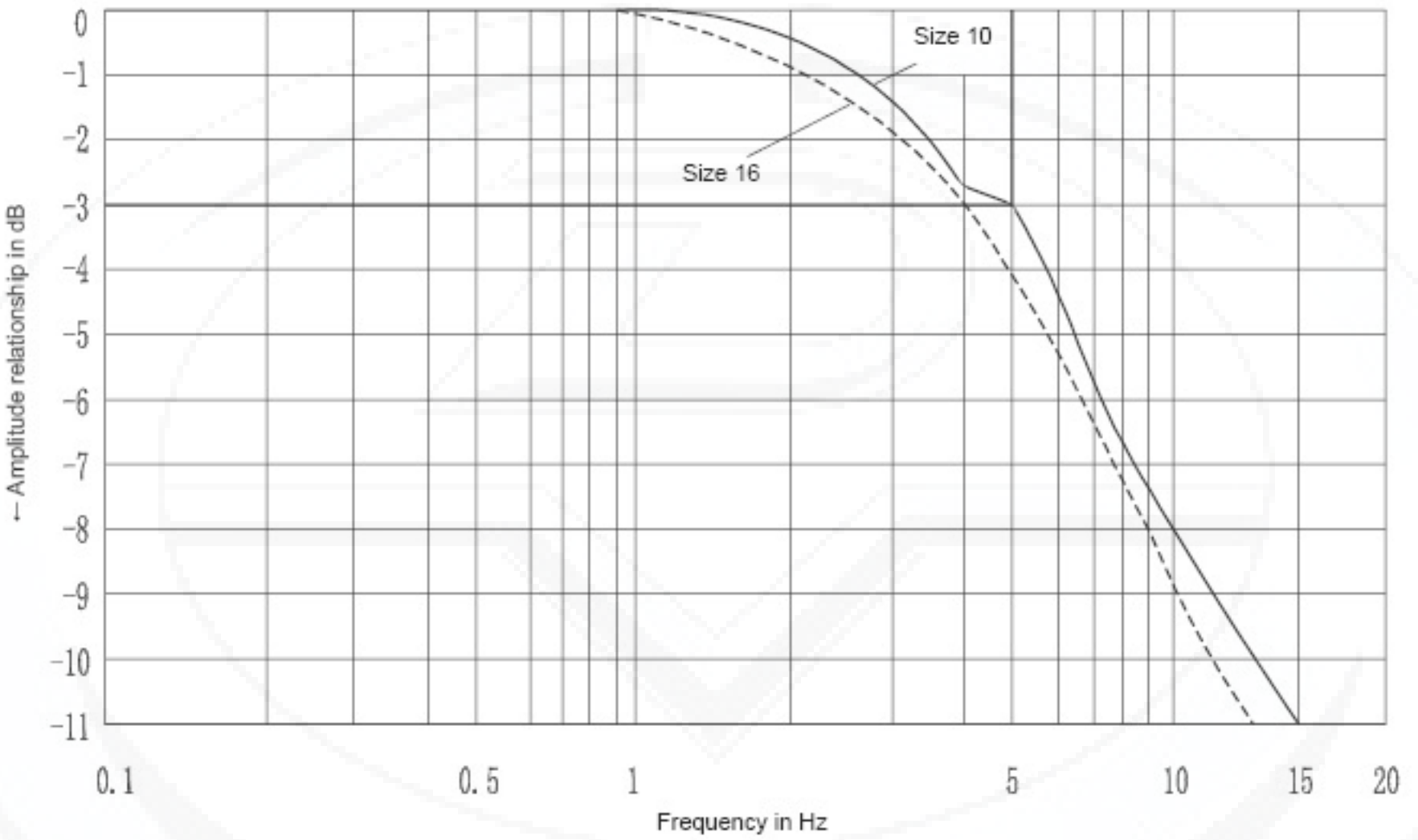
Voltage type	DC 24V
Coil resistatance (Ω)	Cold value at 20℃ 10 , Max. warm value 13.9
Operation state	Continuous
Max.fulid temperature (℃)	+50
Max. Power (VA)	50
Coil resistance of transducer (Ω)	at 20℃ I -56, II -56, III -112
Inductivity (mH)	6~8
Oscillator frequency (KHz)	2.5
VT-5010S30 Demand of insulation IP65	IP65
Amplifier (Supplied with valves)	VT-5004 S30
Types of Electrical connections	see page 72

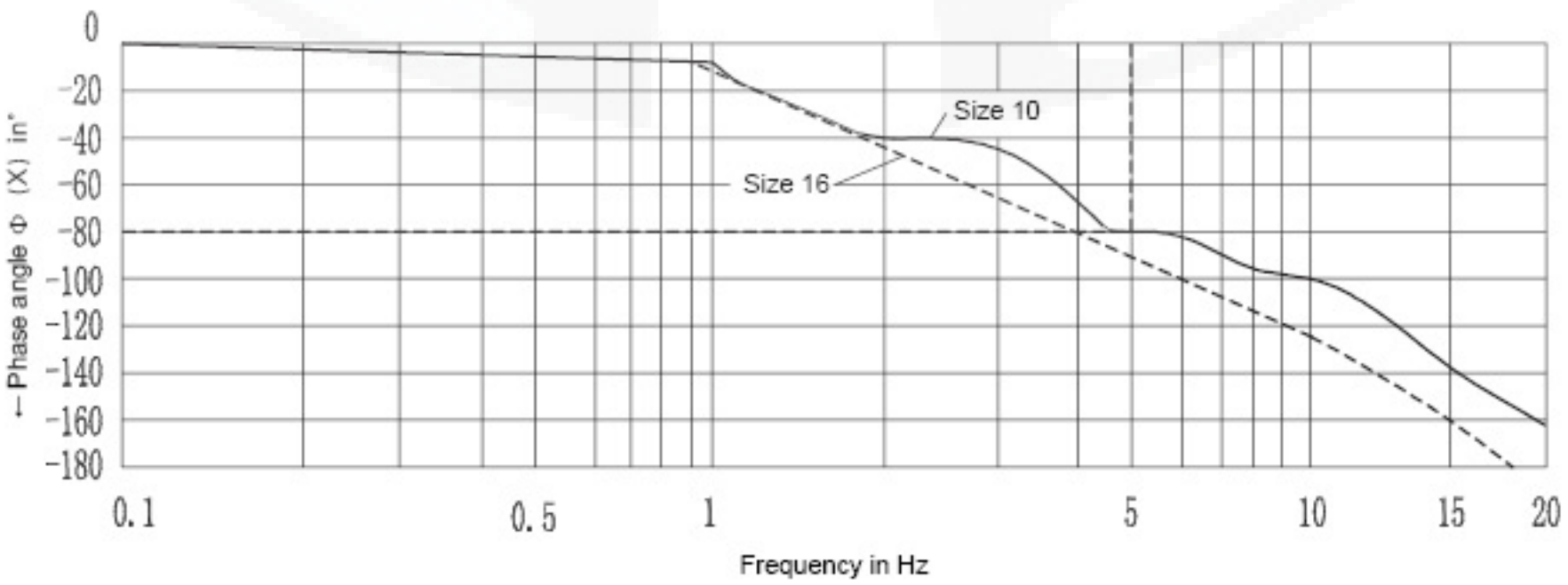
Characteristic curves (measured at v = 36 × $10^{-6}m^2/S$; t=50℃)

(measured at t = 50 ℃; P_{nom} = 5 MPa; amplitude 0 ~100 %; NS 10 / 60L ; NS 16 / 160L)

Transient function with a stepped form of command value change

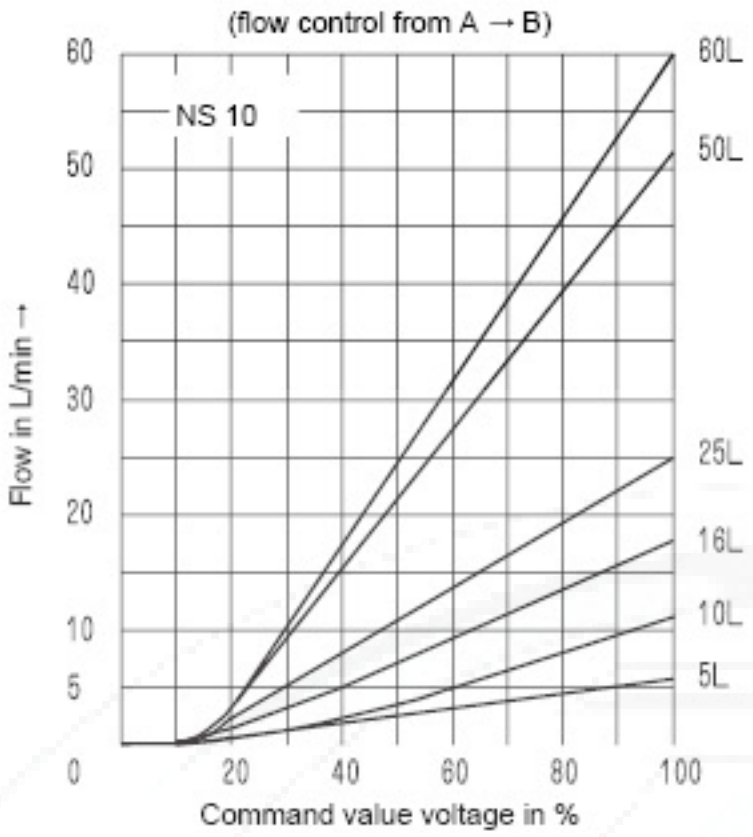
Stroke	Time (from start to 100% amplitude) (ms)		Time (from start to Min. amplitude) (ms)	
%	NS 10	NS 16	NS 10	NS 16
0-100	100	110	80	110
10-90	90	100	85	100
25-75	85	95	80	95

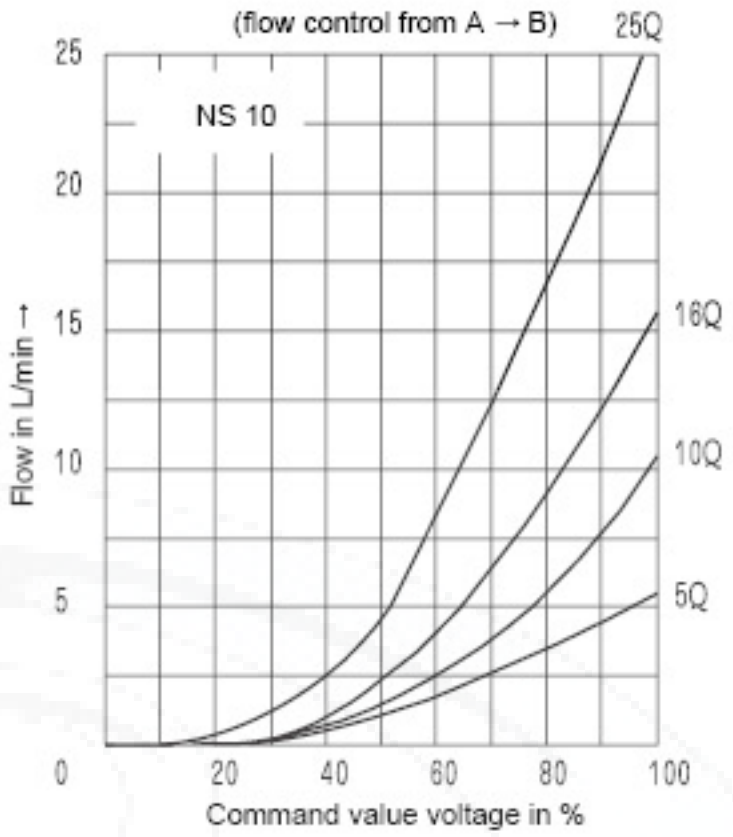


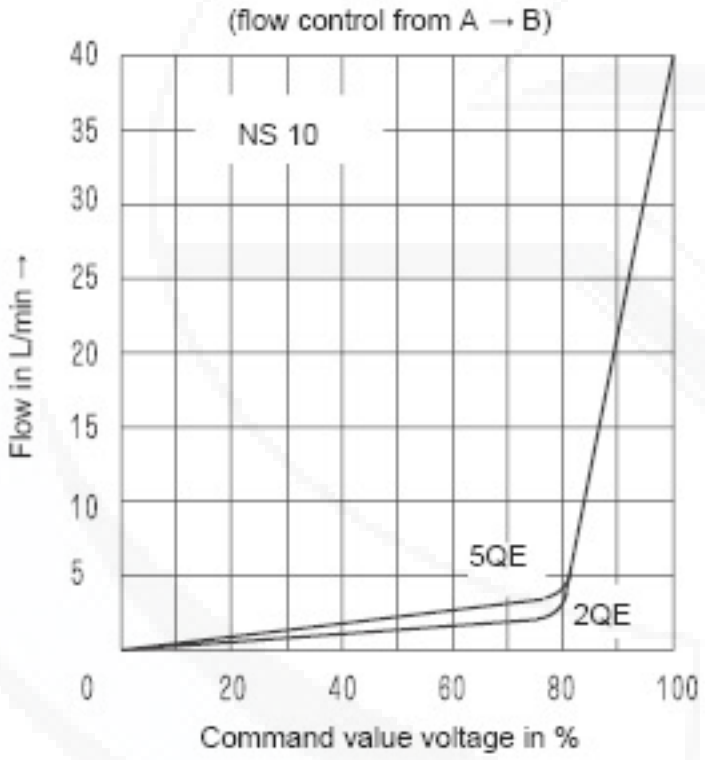


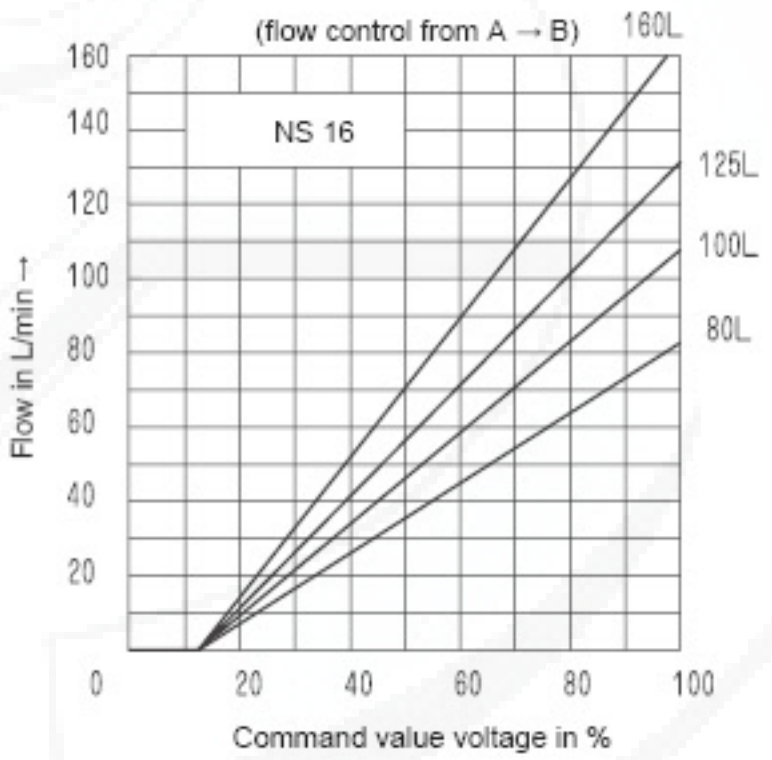
Characteristic curves (measured at v = 36 × $10^{-6}m^2/S$; t=50°C)

Relationship of the flow to the command value voltage (flow control from A → B)

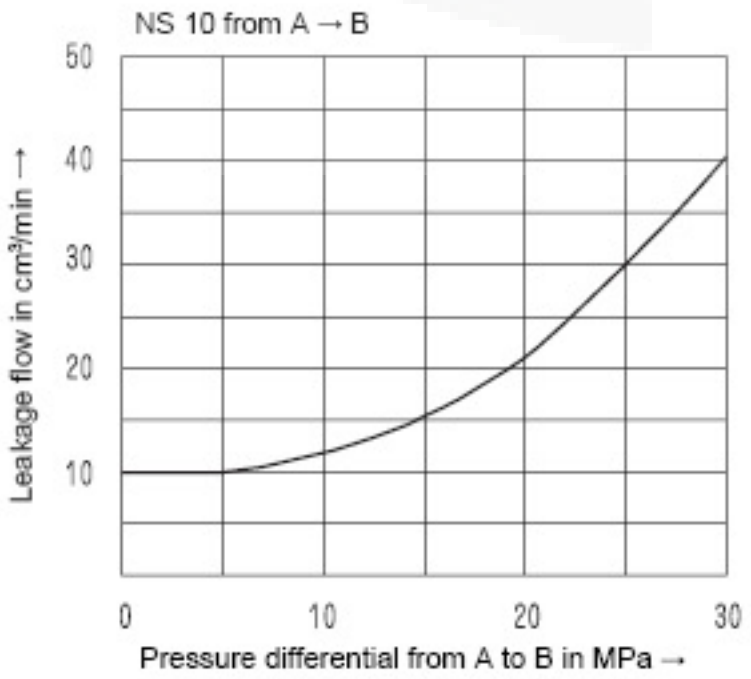


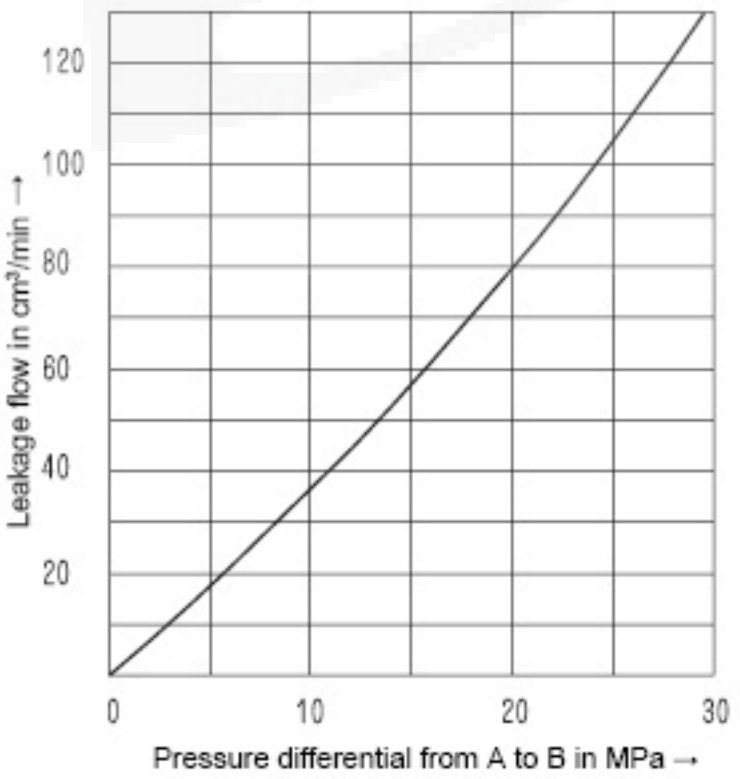






Leakage flow from A → B



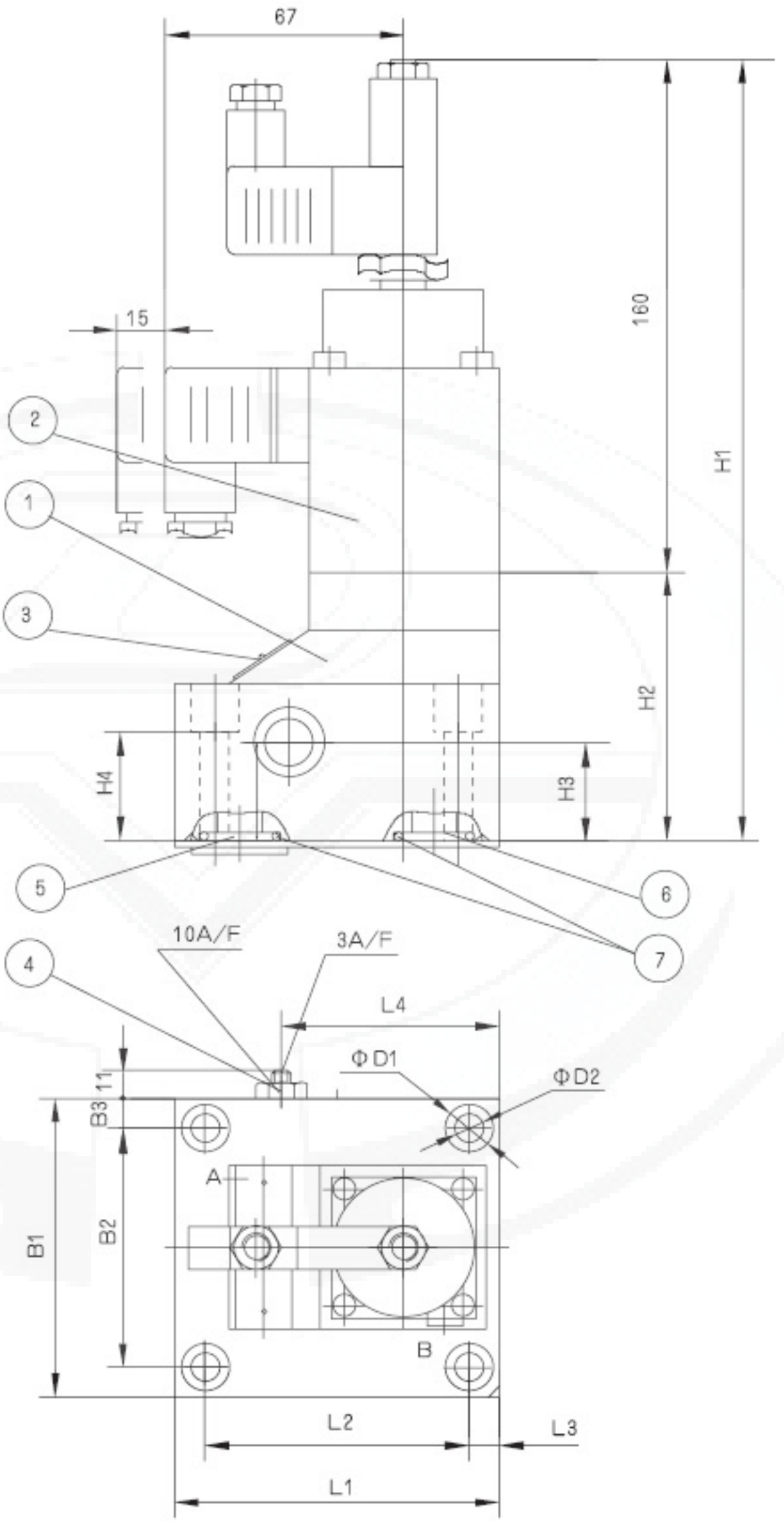


Unit dimensions: **(Dimensions in mm)**

1 Valve housing
2 Proportional solenoid with inductive position transducer
3 Nameplate
4 Pressure compensator stroke limiter
5 Port A
6 Port B
7 O-Ring for ports A, B
18.66 X 3.53(NS 10)
26.58 X 3.53(NS 16)

Subplates :
NS 10: G279/01 (G 1/2") G280/01 (G 3/4")
NS 16: G281/01 (G 1") G282/01 (G 1 1/4")
See page 90

Valve fixing screws
NS 10: 4 -M8 x 60-10.9
(GB/T70.1-2000)
NS 16: 4 -M10 x 70-10.9
(GB/T70.1-2000)

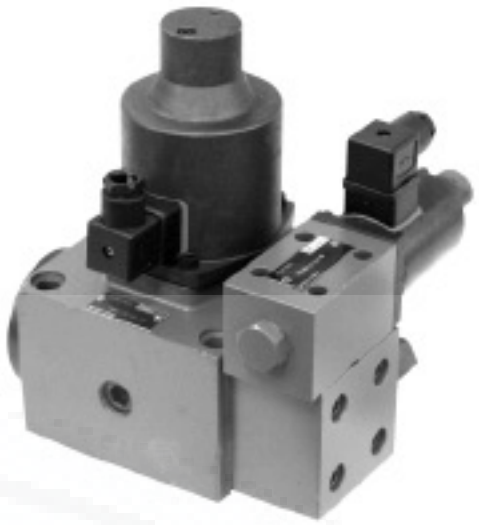


NS	B1	B2	B3	øD1	øD2	H1	H2	H3	H4	L1	L2	L3	L4
10	95	76	9.5	15	9	245	85	38	48	102.5	82.5	10	68.5
16	123.5	101.5	11	18	11	255.5	95.5	31	51	123.5	101.5	11	81.5

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	Proportional Electro-Hydraulic Relif and Flow Control Valves,Type PQ10-20/140-125			RC27500/9.2006
	Size 10	up to 14 MPa	up to 125 L/min	

Features:

- For subplate mounting
- Protected by high voltage
- Output flows scale by input elec-messages
- System Pressure could achieve the changes to scale

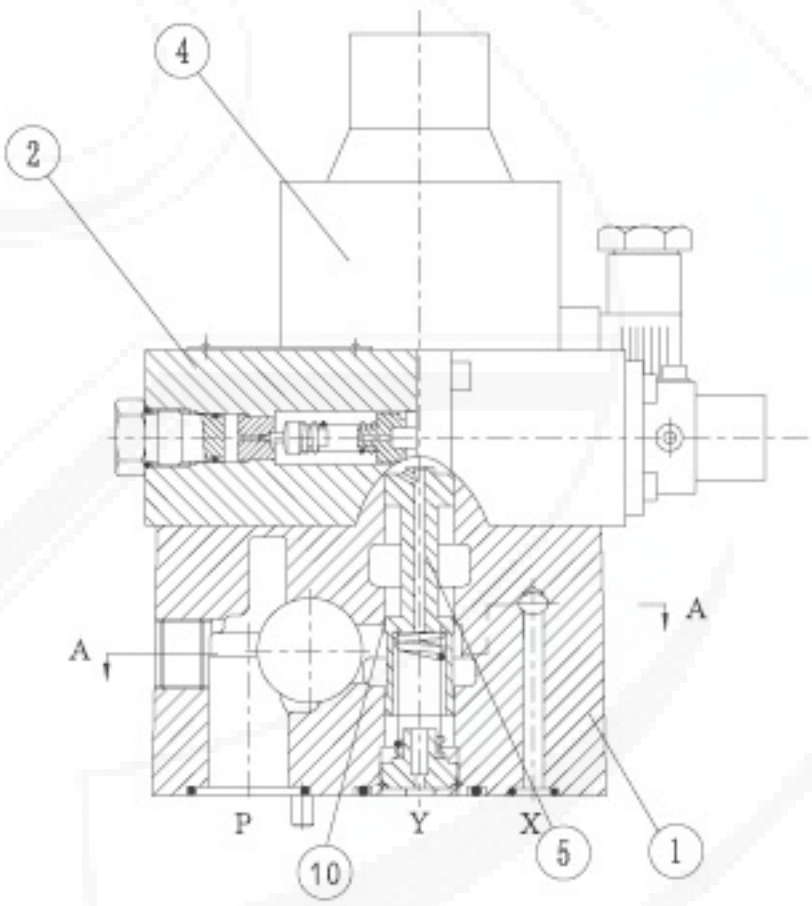


Function, section;Symbol

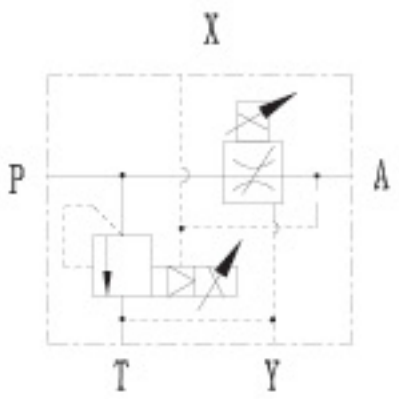
This pressure and flow control valve is an energy-saving valve that can adjust the pressure and flow of system proportional to electrical sign。

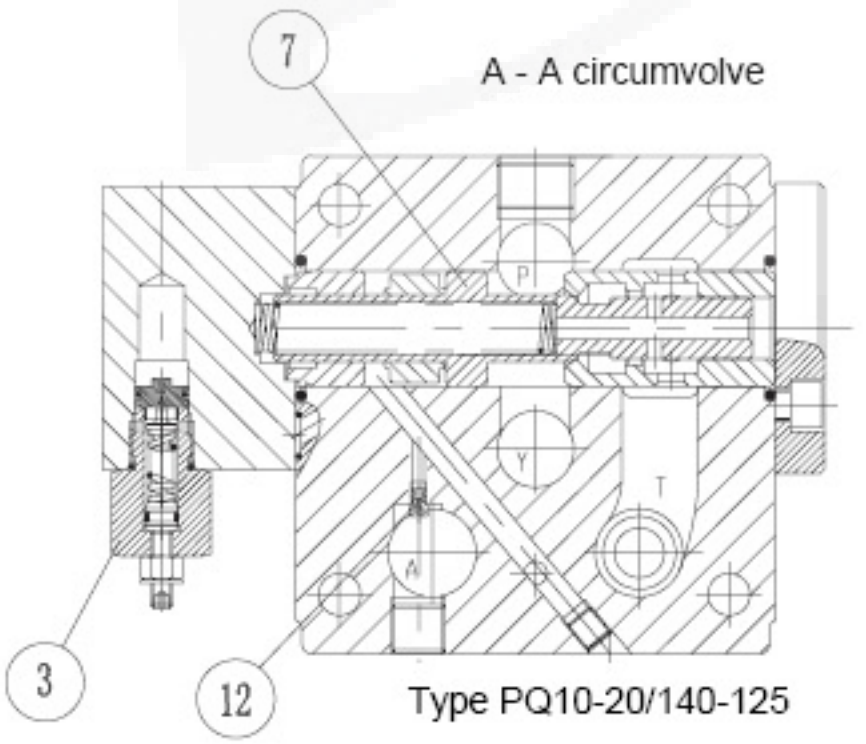
Since the valves controls the pump pressure by following the load pressure while keeping the differential pressure minimized,it serves as a low power-consumption energy-saving ,meter-in,controlled flow control valve.

Further,since a temperature compensation function is incorporated,this valve provides consistent flow control without respect to the fluid temperature.



Symbol:





Type PQ10-20/140-125

Ordering details

PQ	10	—	20	B	/	140	125		*

Further details in clear text

Proportional Electro-Hydraulic pressure and Flow Control Valves

No code = Mineral oils
V = phosphate ester

Nominal size 10 = 10

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

125 = Max. Flow 125 L/min

Technology of Beijing Huade Hydraulic =B

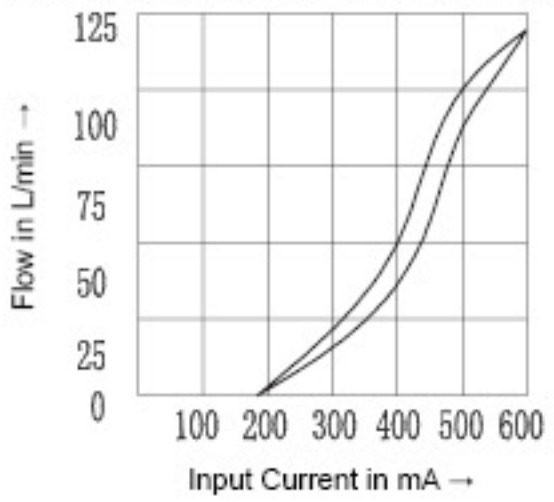
140 = Pressure stage 140

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

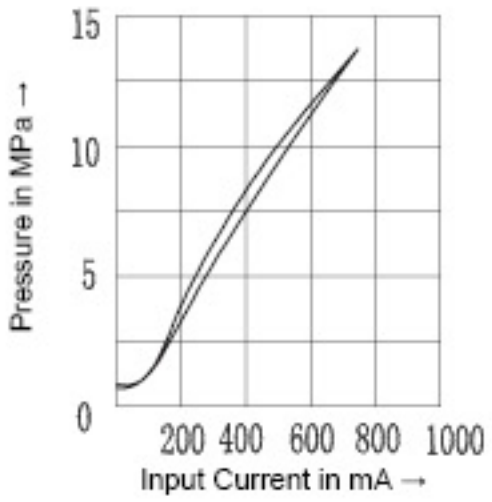
Pressure fluid			Mineral oil(for NBR seal),
			Phosphate ester (for FPM seal)
Pressure fluid temperature range		(°C)	- 30 to + 80 (with NBR seals)
			- 20 to + 80 (with FKM seals)
Viscosity range		(mm²/s)	2.8 to 500
Degree of contamination			Maximum permissible degree of contamination of the pressure fluid is to NAS 1638
			class 9. We, therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.
Max. operating pressure		(MPa)	to 14
Max. flow		(L/min)	to 125
Pressure fluid flow range		(L/min)	1～125
Flow Controls	Rated Current	(L/min)	680
	Coil Resisitance	(Ω)	43.5
	Differential Pressure	(MPa)	0.6
	Hysteresis		7%
	Repeatabibly		1%
Pressure Controls	Pressure Adjust Range	(MPa)	0.8～14
	Rated Current		710
	Coil Resisitance	(Ω)	10
	Hysteresis		3%
	Repeatabibly		1%
Weight		(Kg)	16

Operating Curves (measured at v =41 × $10^{-6}m^2/S$ t=50°C)

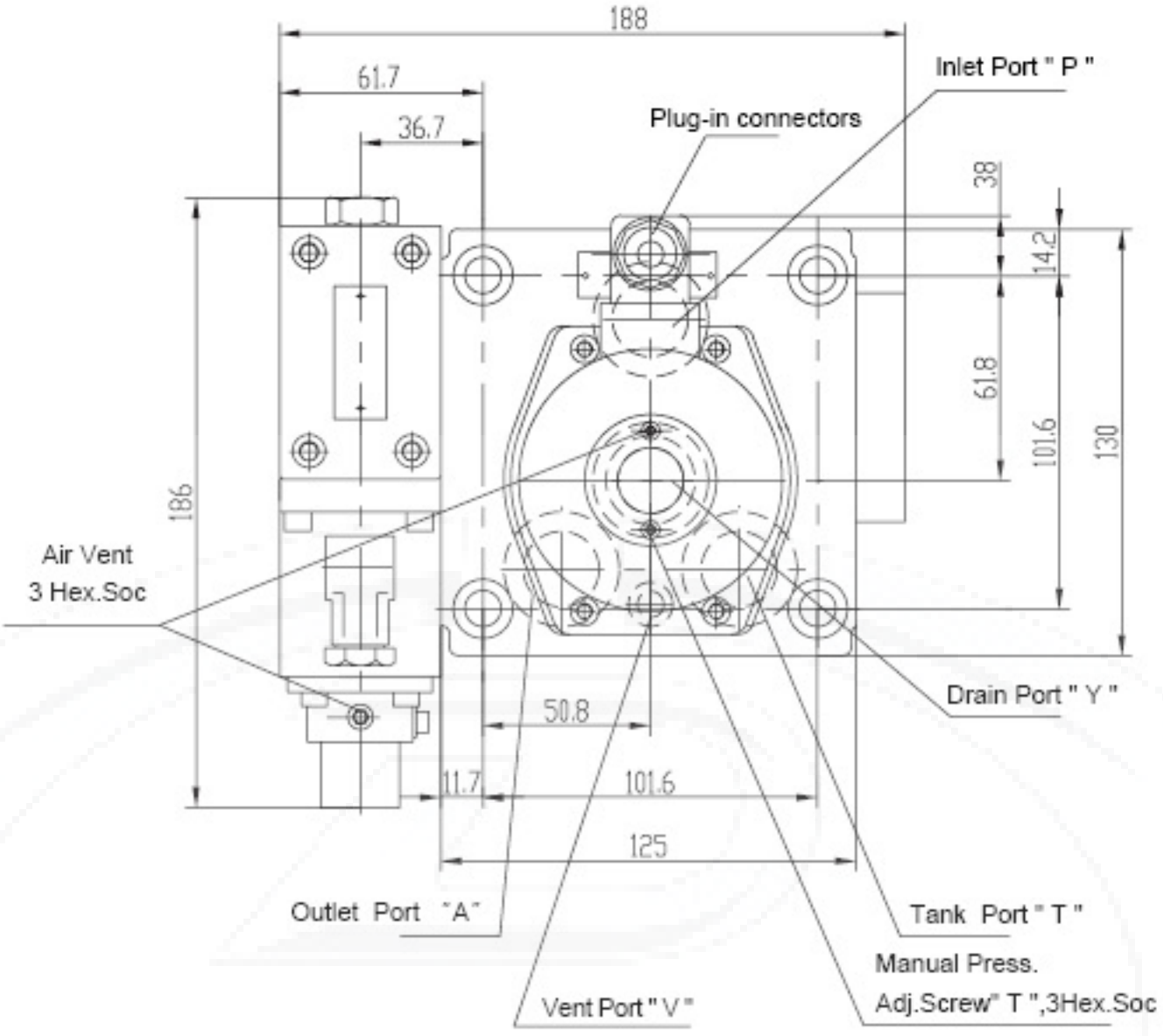
Relationship of the flow to the input current

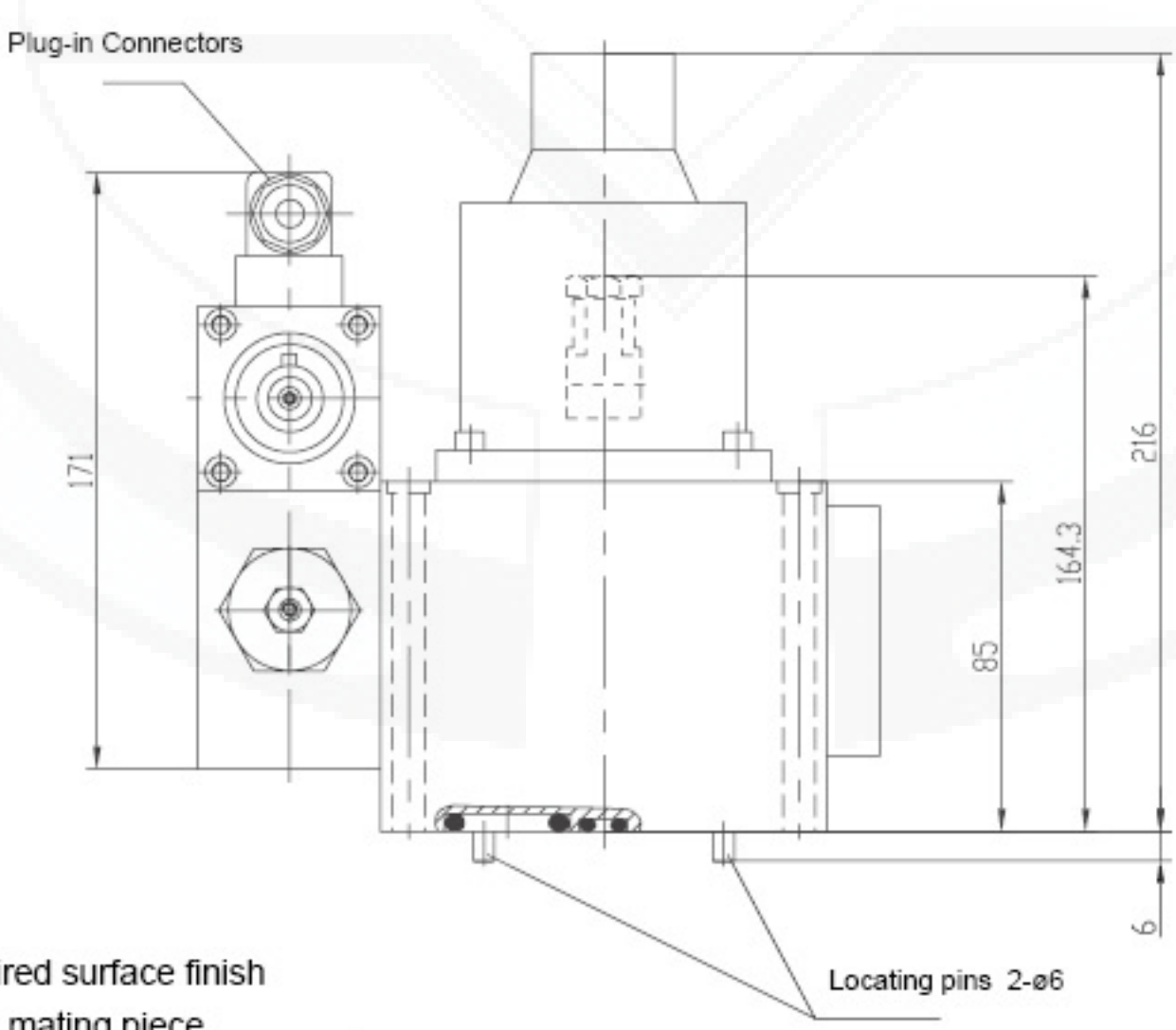


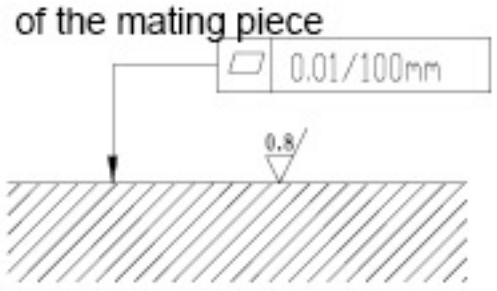
Relationship of the pressure to the input current



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

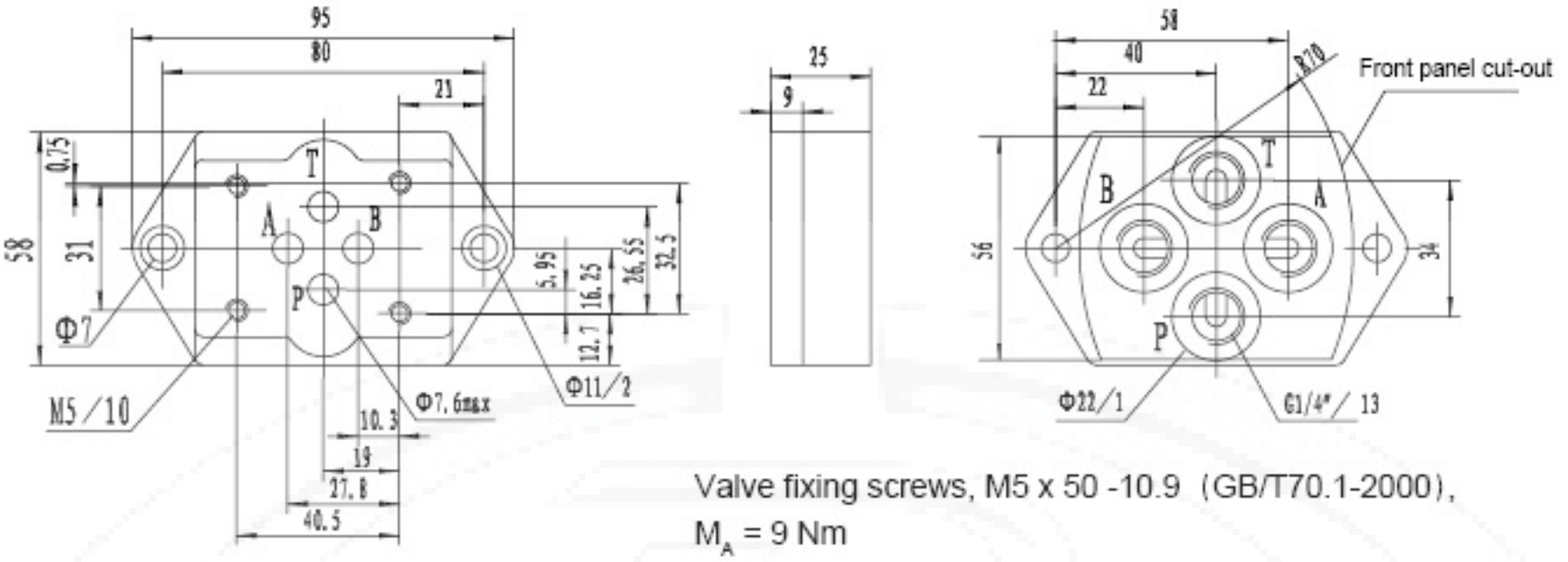






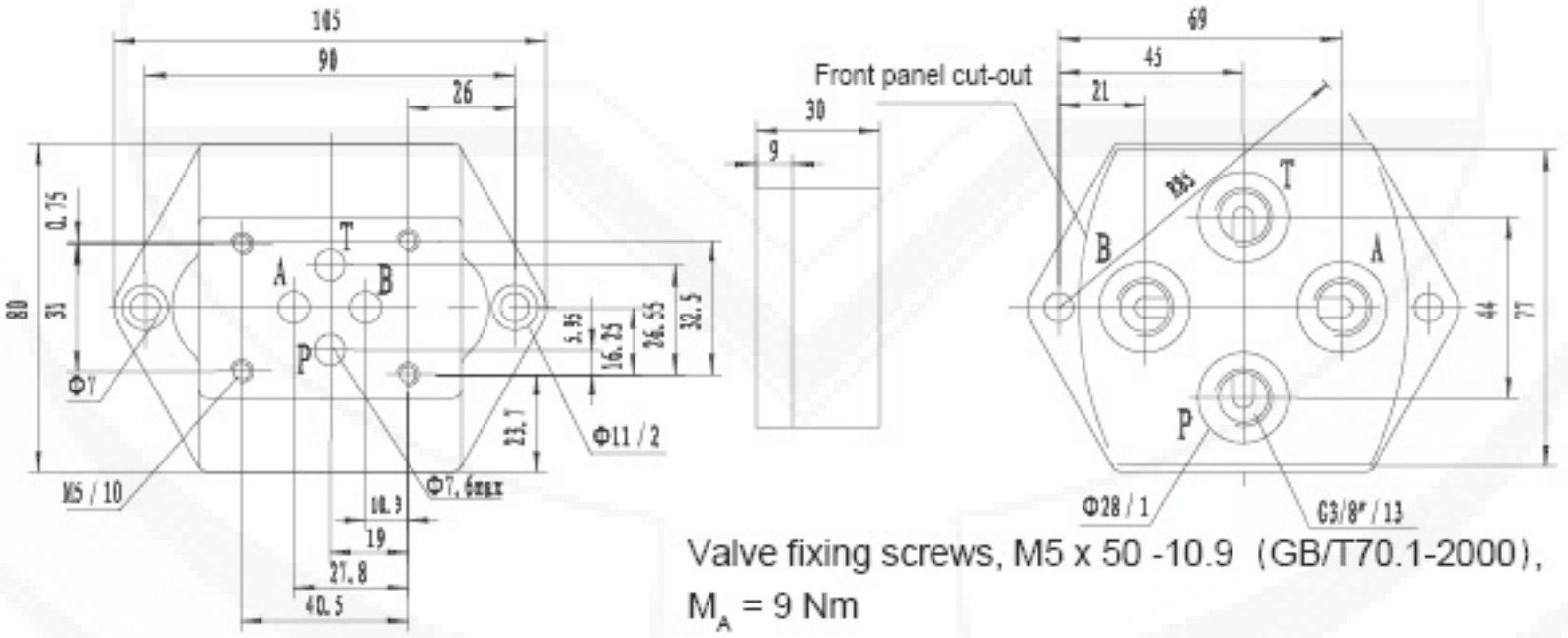
Subplates

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



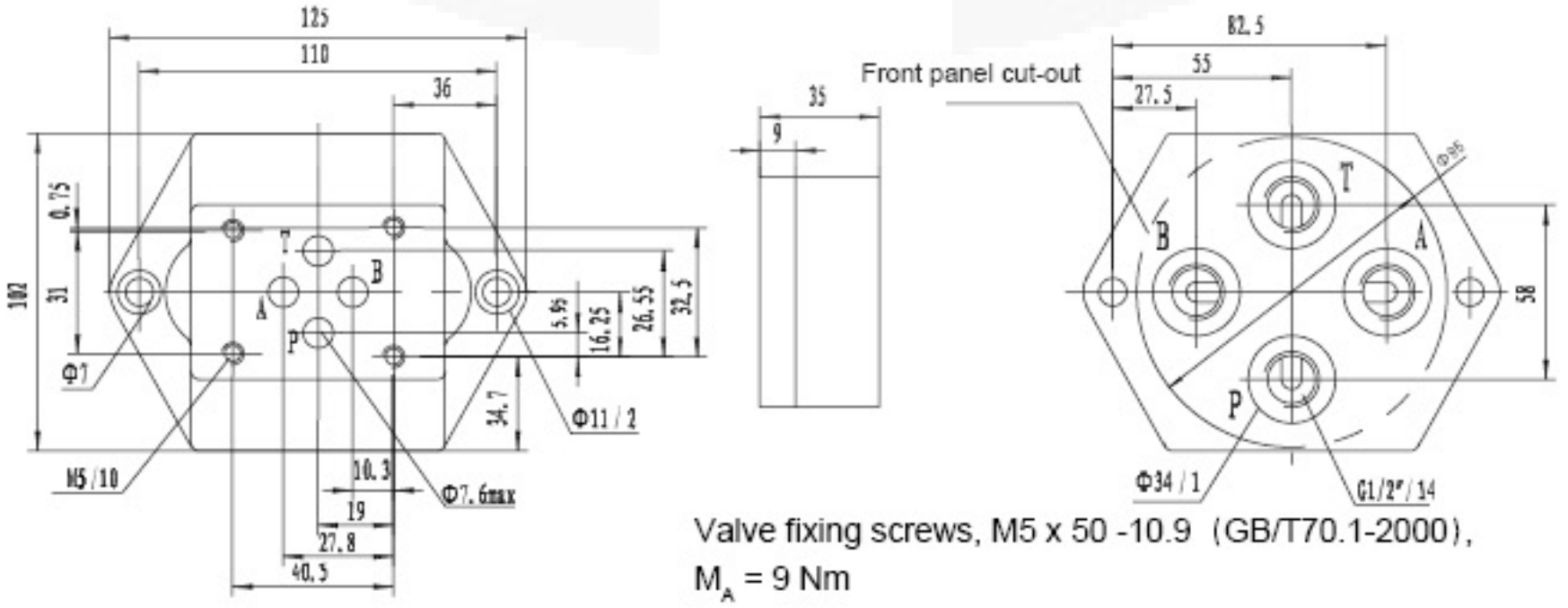
Valve fixing screws, M5 x 50 -10.9 (GB/T70.1-2000),
M_A = 9 Nm

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

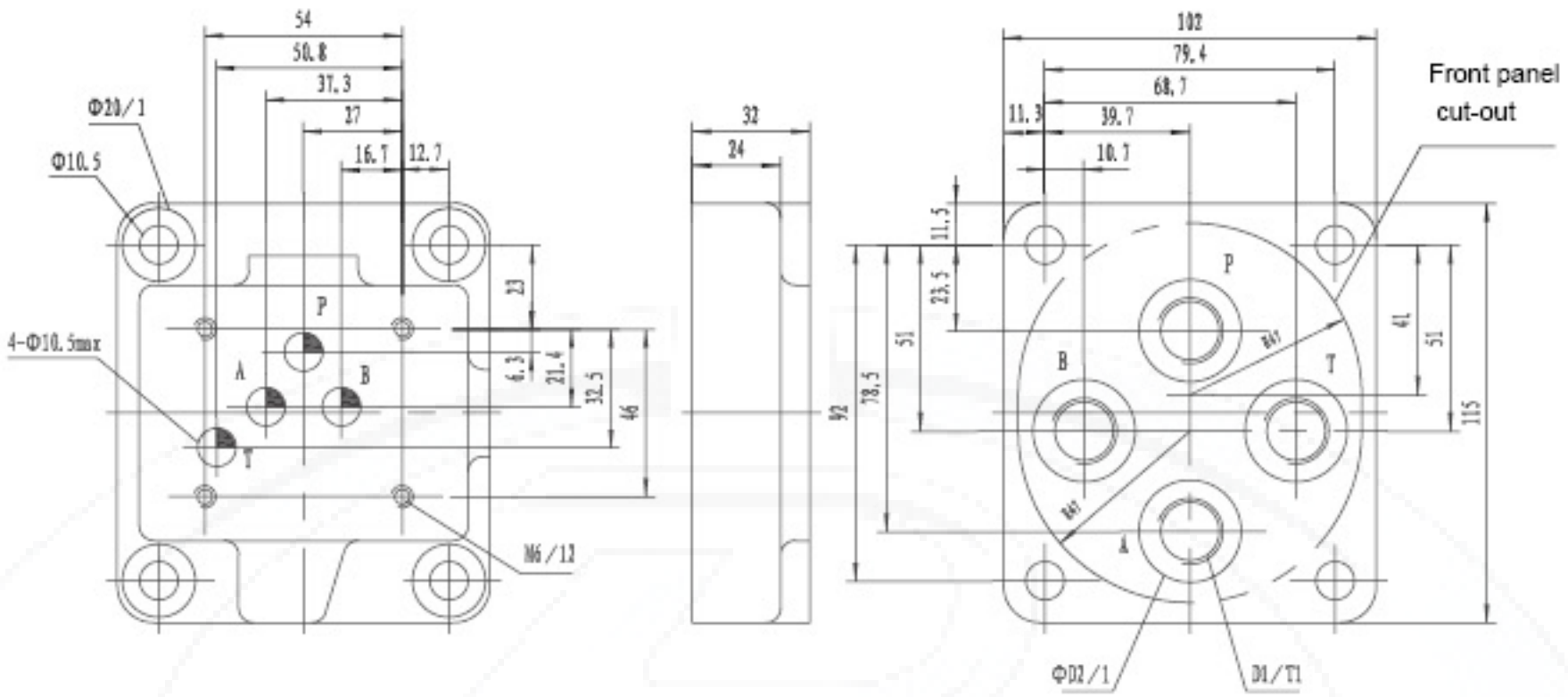
G502/01 (G1/2″) G502/02 (M22x1.5) Weight ≈ 1.9kg (Dimensions in mm)



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

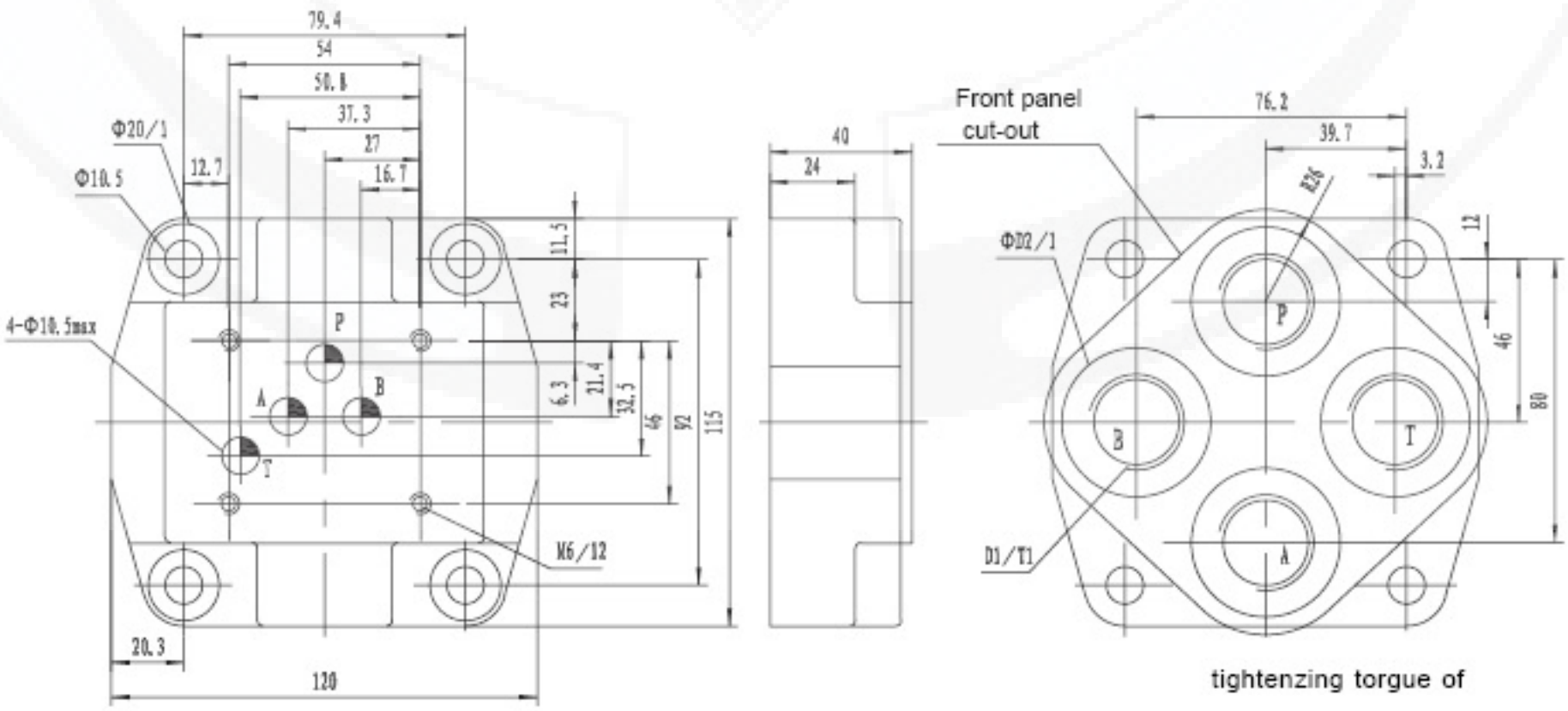
Subplates

G66/01 G66/02 G67/01 G67/02 (Dimensions in mm)



Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G66/01	G3/8"	12	28	approx. 2.3Kg	4 - M6 × 50 -10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G66/02	M18x1.5					
G67/01	G1/2"	14	34			
G67/02	M22x1.5					

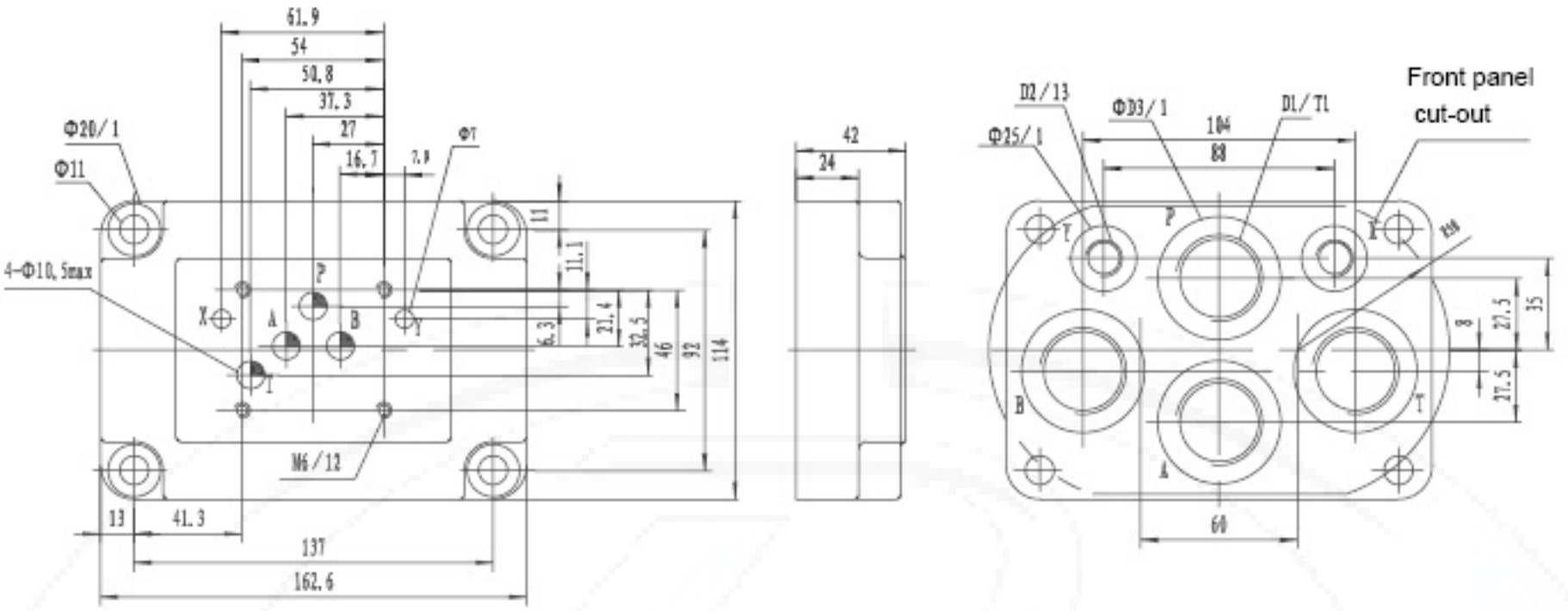
G534/01 G534/02 (Dimensions in mm)



Type	D1	T1	Φ D2	Weight	Valve fixing screws	Tightening torque for screws
G534/01	G3/4"	17	42	approx. 2.5Kg	4 - M6 × 50-10.9 (GB/T70.1-2000), Should be ordered seperately.	15N.m
G534/02	M27x2					

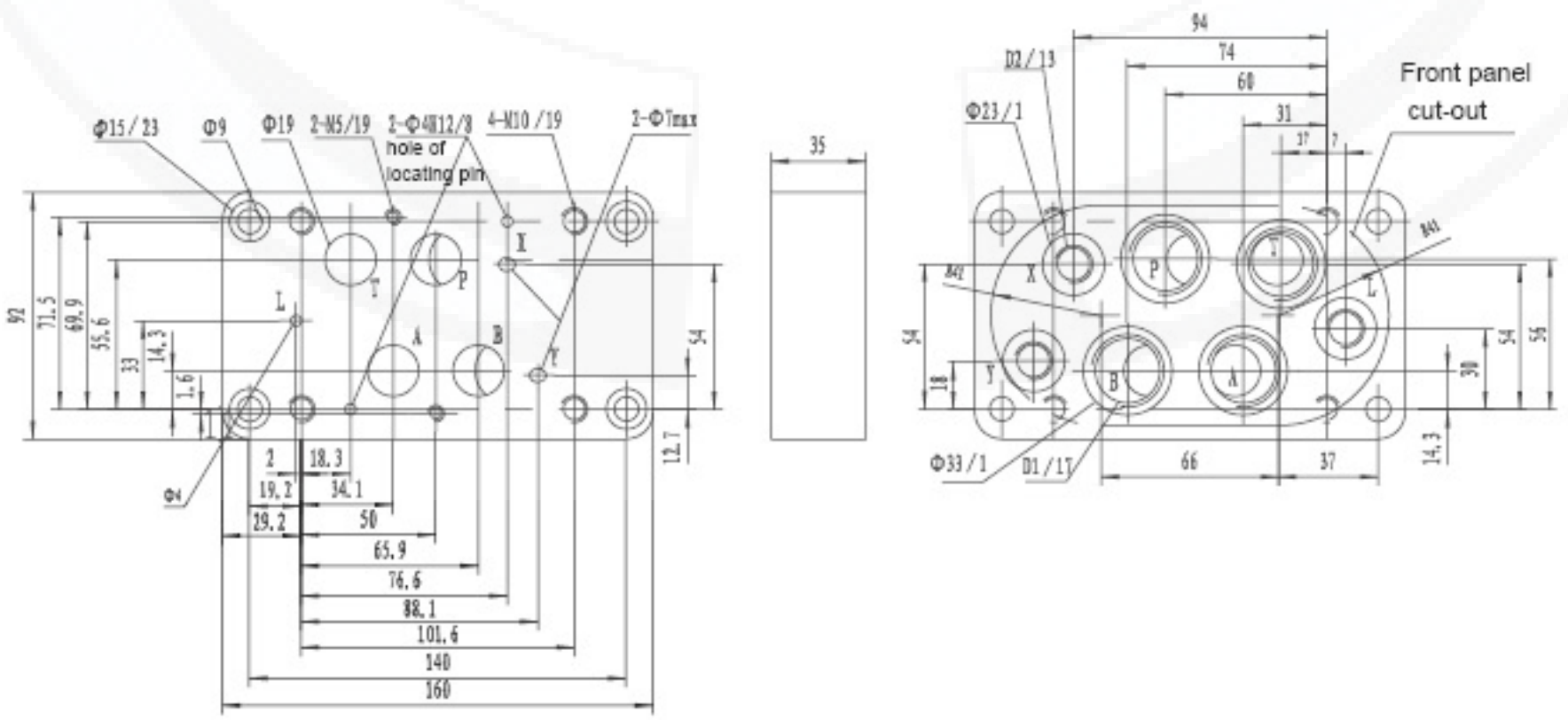
Subplates

G535/01 G535/02 G536/01 G536/02 (Dimensions in mm)



Type	D1	T1	D2	ϕ D3	Weight	Valve fixing screws	Tightening torque for screws
G535/01	G3/4"	16	G1/4"	42	approx. 3.6Kg	4 - M6 × 45 -10.9 (GB/T70.1-2000) Should be ordered seperately.	15N.m
G535/02	M27x2		M14x1.5				
G536/01	G1"	18	G1/4"	47			
G536/02	M33x2		M14x1.5				

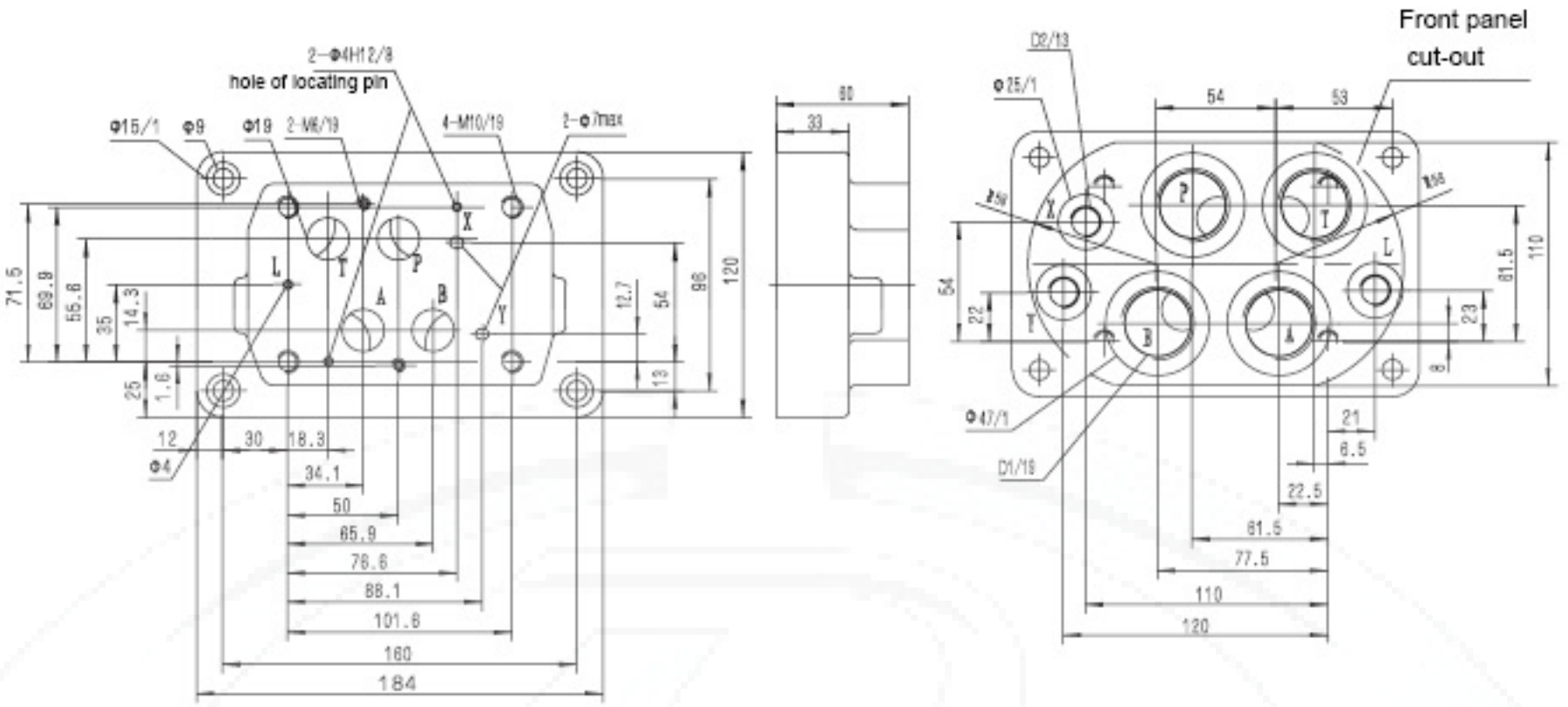
G172/01 G172/02 (Dimensions in mm)



Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G172/01	G3/4"	G1/4"	approx. 2.8kg	4 - M10 × 60 -10.9 (GB/T70.1-2000),Should be ordered seperately.	62N.m
G172/02	M27x2	M14x1.5		2 - M6 × 60 --10.9 (GB/T70.1-2000),Should be ordered seperately.	12.5N.m

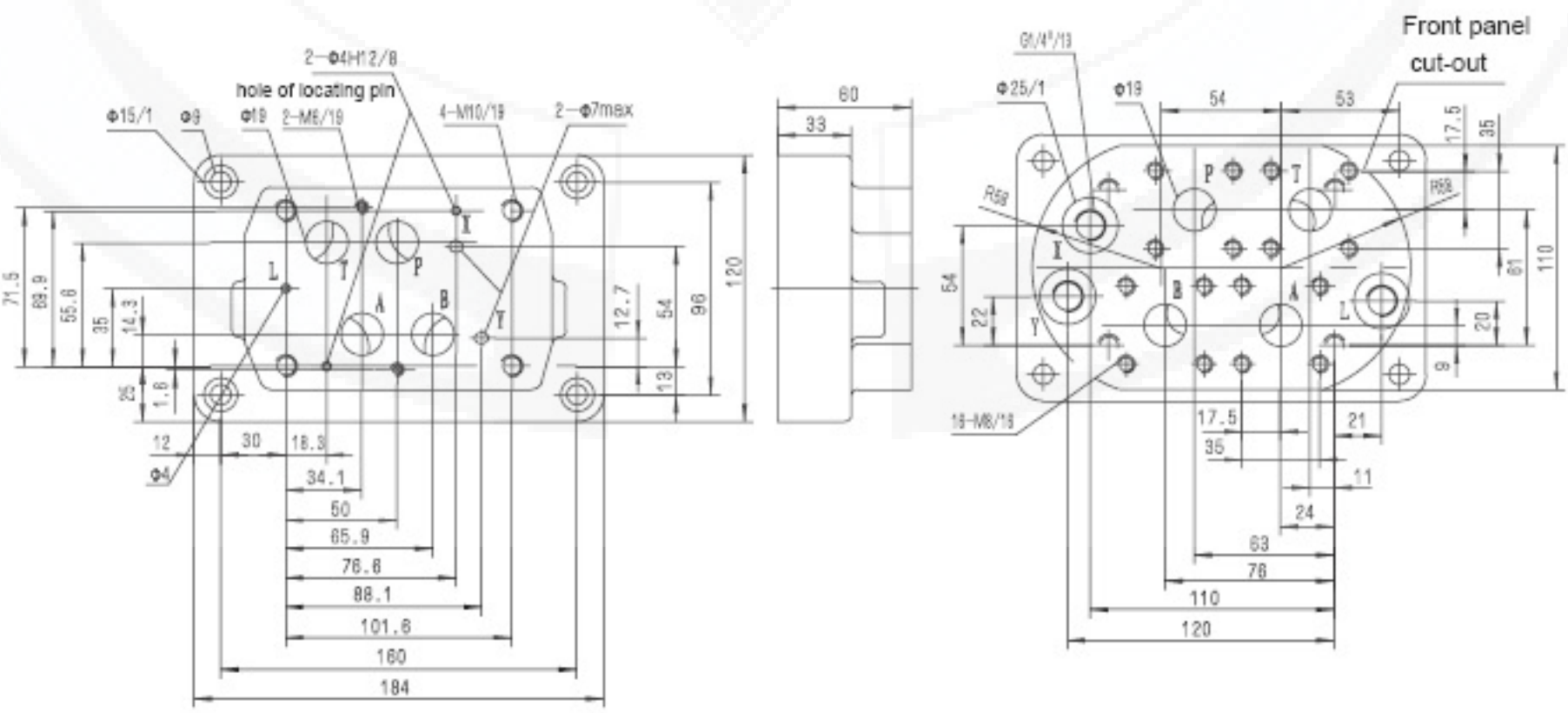
Subplates

G174/01 G174/02 (Dimensions in mm)



Type	D1	D2	Weight	Valve fixing screws	Tightening torque for screws
G174/01	G1″	G1/4″	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000),Should be ordered seperately.	62N.m
G174/02	M33x2	M14x1.5	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000),Should be ordered seperately.	12.5N.m

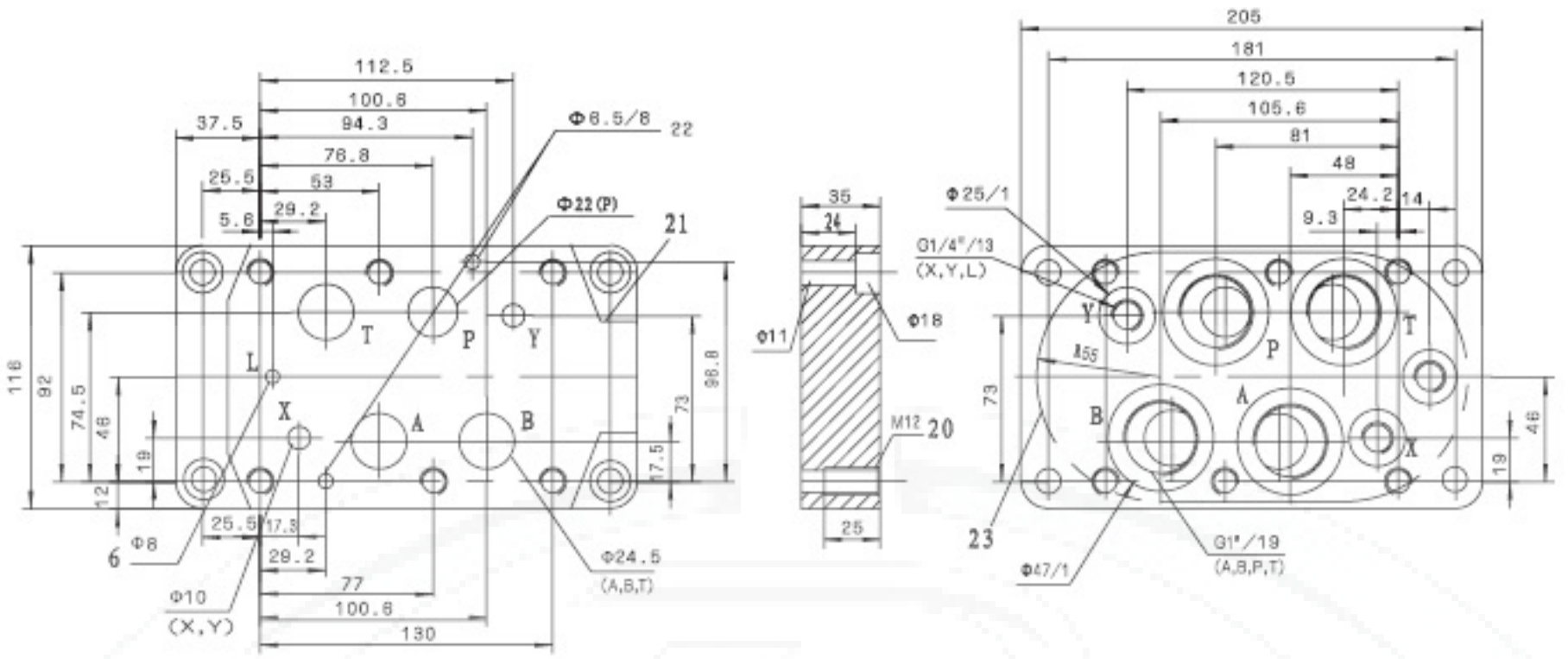
G174/08 (Dimensions in mm)



Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G174/08	25MPa	009 271	approx.	4 - M10 × 60-10.9 (GB/T70.1-2000),Should be ordered seperately.	62N.m
	40MPa	009 272	5.5kg	2 - M6 × 60-10.9 (GB/T70.1-2000),Should be ordered seperately.	12.5N.m

Subplates

G151/01(G1")G151/02(M33x2):G153/01(G1") G153/02(M33x2) (Dimensions in mm)

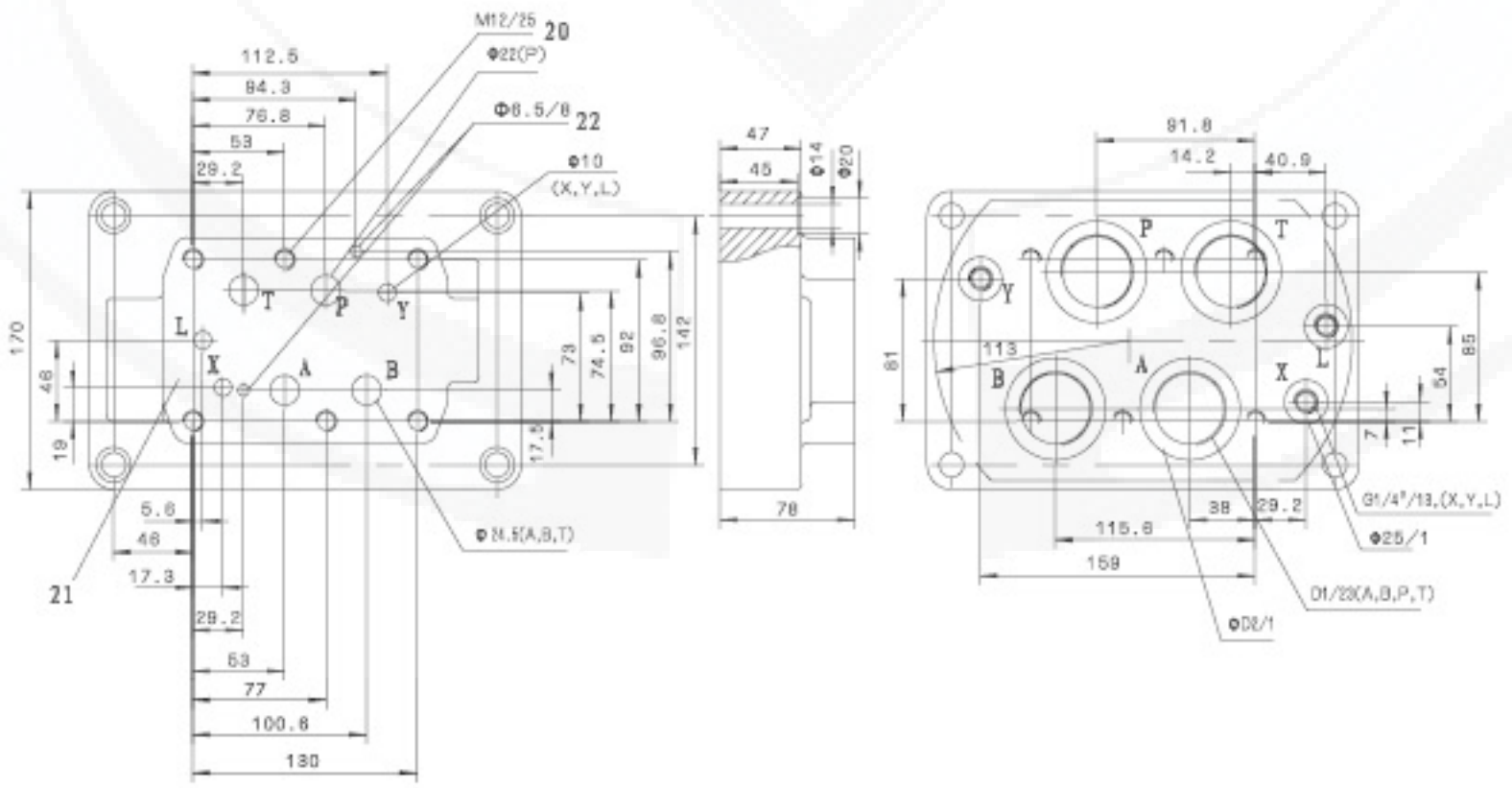


L of ϕ 8 only used on G153/01

Size	Type	Weight	Valve fixing screws	Tightening torque for screws
NG25	G151/01 G151/02 G153/01 G153/02	5kg	6 - M12x60-10.9 (GB/T70.1-2000),	105Nm

1) Only used on valves which are pressure-centred

G154/01(G11/4");G154/02(M42x2):G156/01 G156/02(M48x2) (Dimensions in mm)



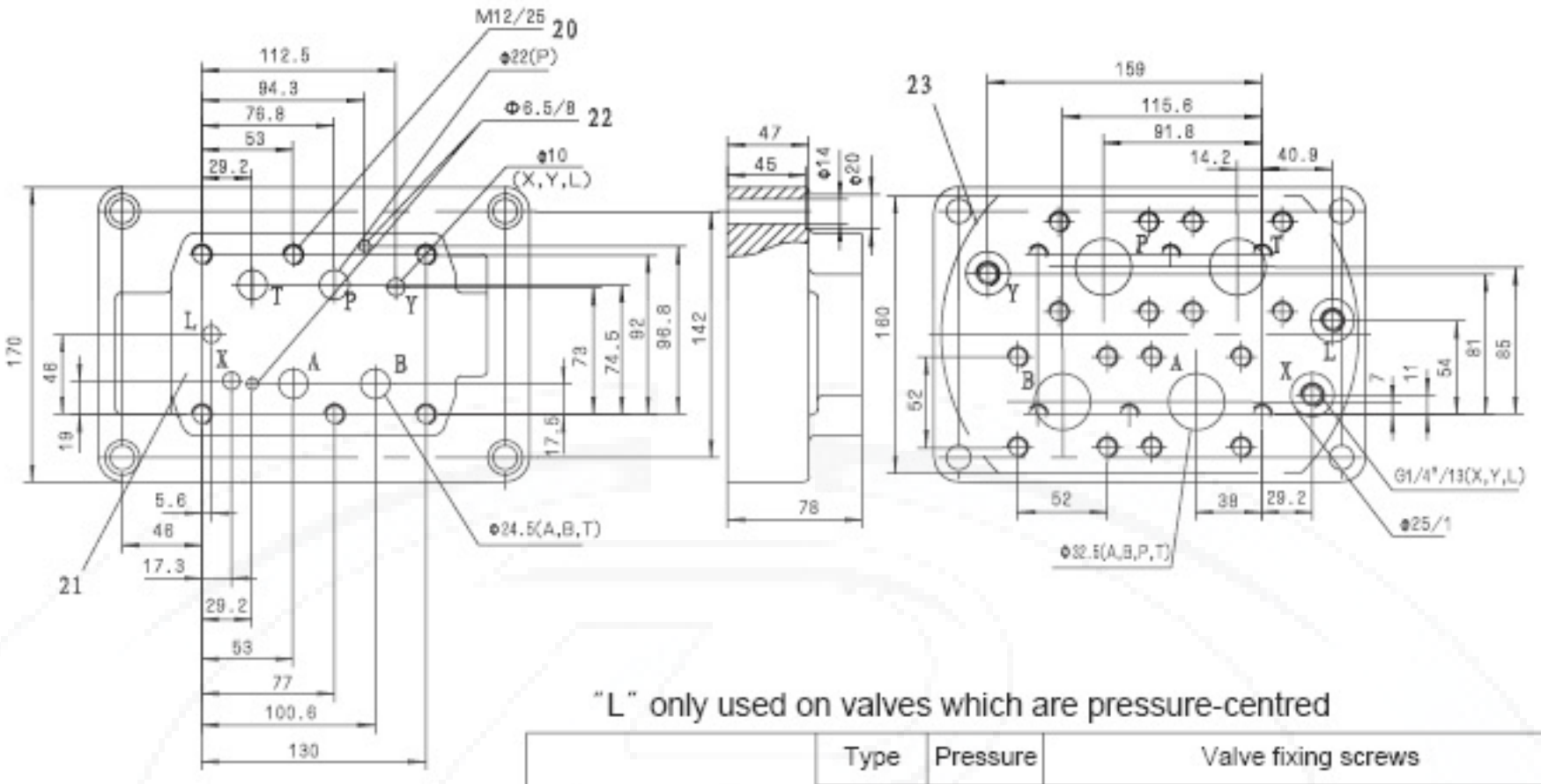
L only used on valves which are pressure-centred

Size	Type	Weight	D1	D2	Valve fixing screws	Tightening torque for screws
NG25	G154/01	5kg	G1 1/4"	58	6 - M12x60 -10.9 (GB/T70.1-2000)	105Nm
	G154/02		M42x2			
	G156/01		G1 1/2"	65		
	G156/02		M48x2			

20 Valve fixing screws 21 mating piece of valve 22 locating pin 23 Front panel cut-out

Subplates

G154/08 flange connection (Dimensions in mm)

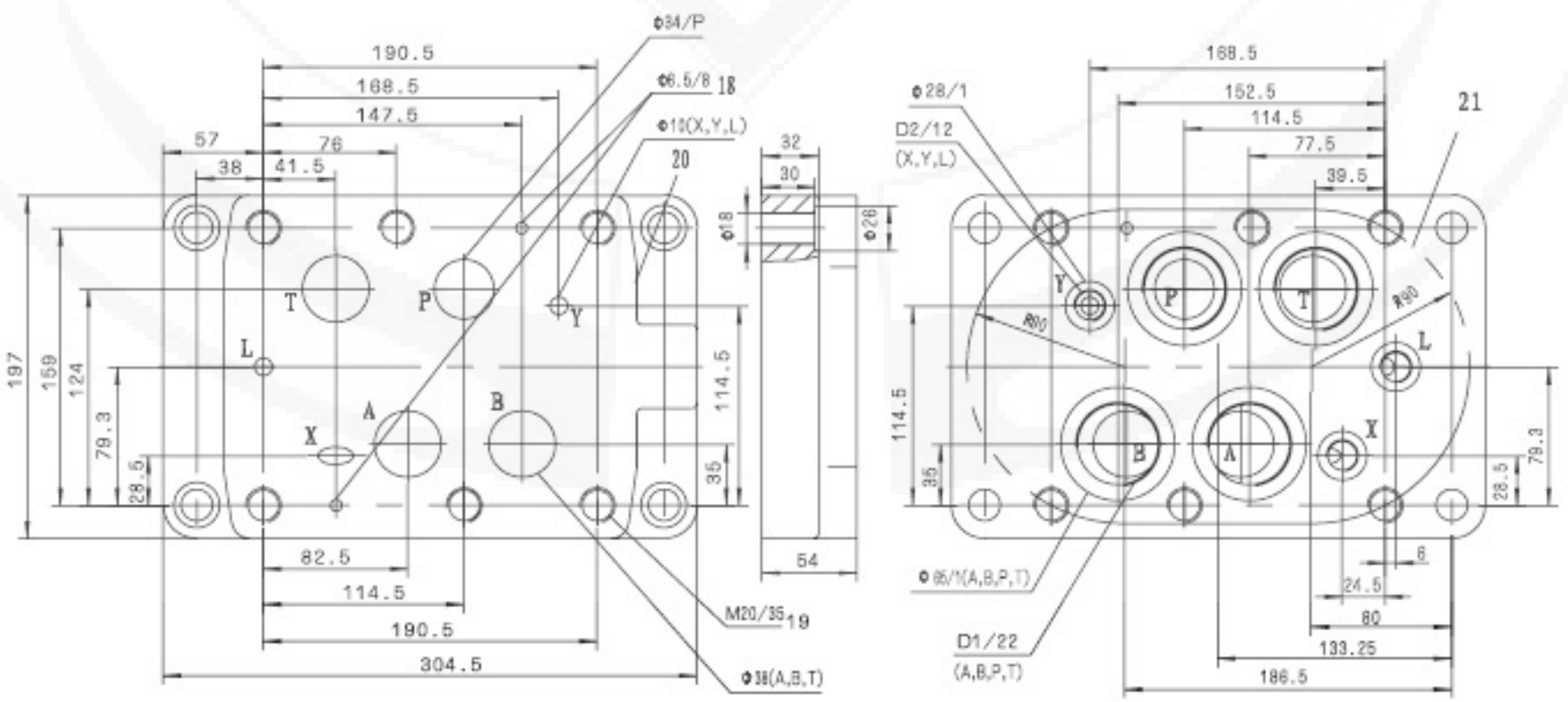


"L" only used on valves which are pressure-centred

	Type	Pressure	Valve fixing screws
flange conneting	009176	25MPa	6 - M12x60 -10.9 (GB/T70.1-2000),
	009177	40MPa	

20 Valve fixing screws 21 mating piece of valve 22 locating pin 23 Front panel cut-out

G157/01(G1 1/2");G157/02(M48 × 2) (Dimensions in mm)



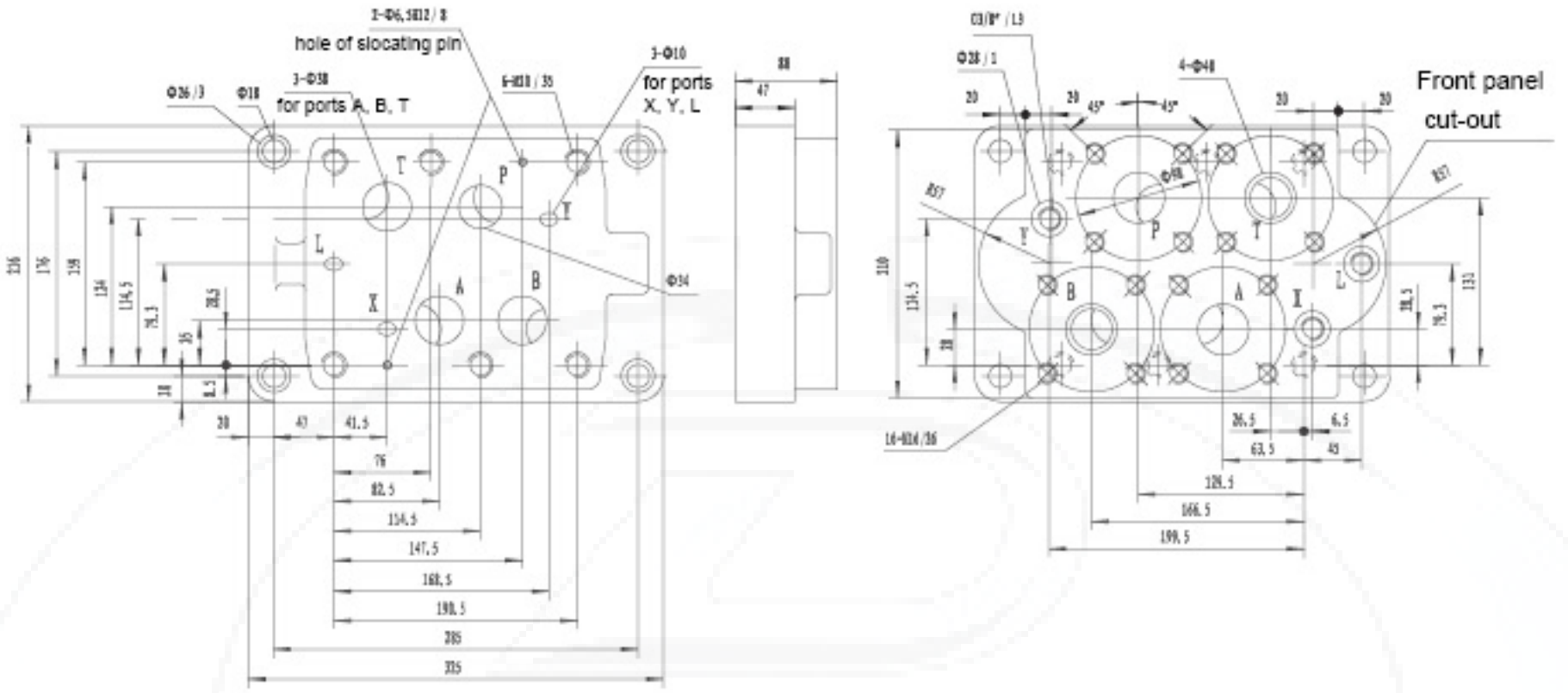
"L" only used on valves which are pressure-centred

Type	Weight	D1	D2	Valve fixing screws	Tightening torque for screws
G157/01	18kg	G1 1/2"	G3/2"	6 - M12x60-10.9 (GB/T70.1-2000)	105Nm
G157/02		M48x2	M18x1.5		

18 locating pin 19 Valve fixing screws 20 mating piece of valve 21Front panel cut-out

Subplates

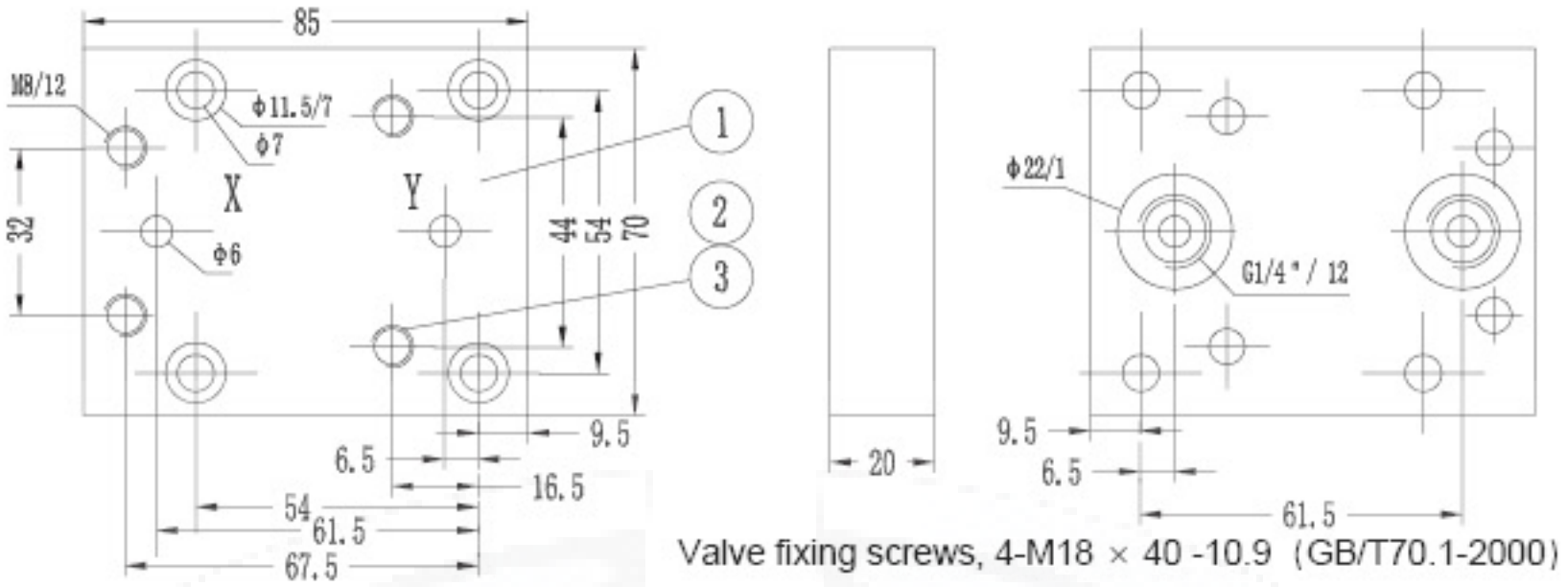
G158/10 flange connection (Dimensions in mm)



Type	Pressure	Type	Weight	Valve fixing screws	Tightening torque for screws
G158/10	165MPa	303 901	approx. 30.5kg	6 - M20 × 80 -10.9 (GB/T70.1-2000), Should be ordered seperately.	580N.m
	to 25MPa	303 902			
	to 40MPa	303 903			

Subplates

G51/01（G1/4 "） G51/02（M14 × 1.5） Weight：1kg **(Dimensions in mm)**

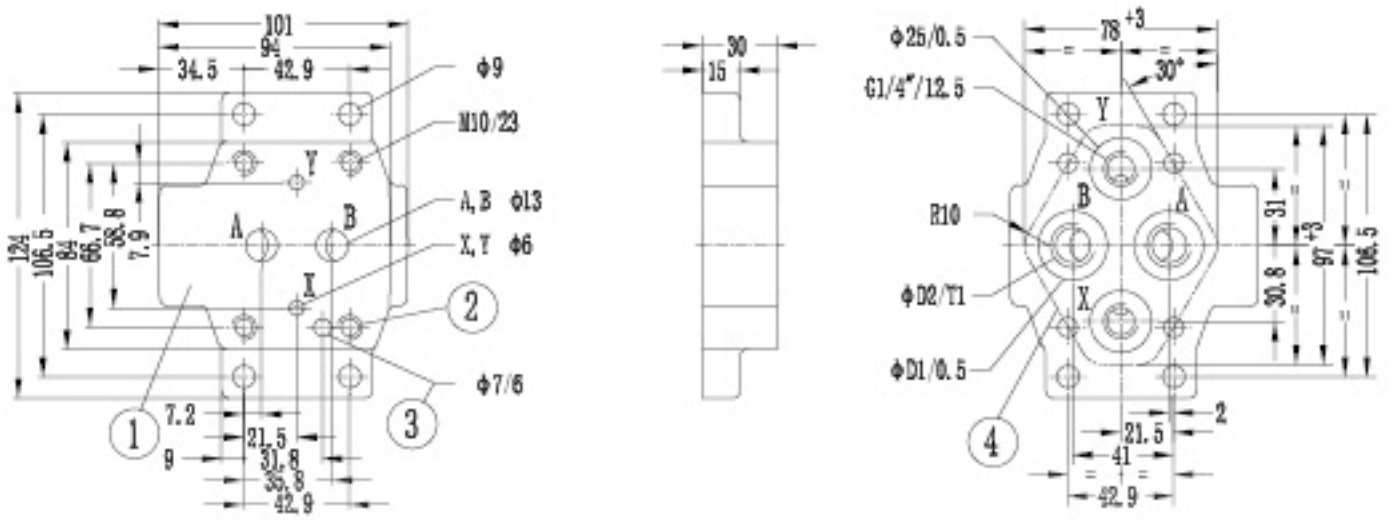


Valve fixing screws, 4-M18 × 40 -10.9（GB/T70.1-2000）

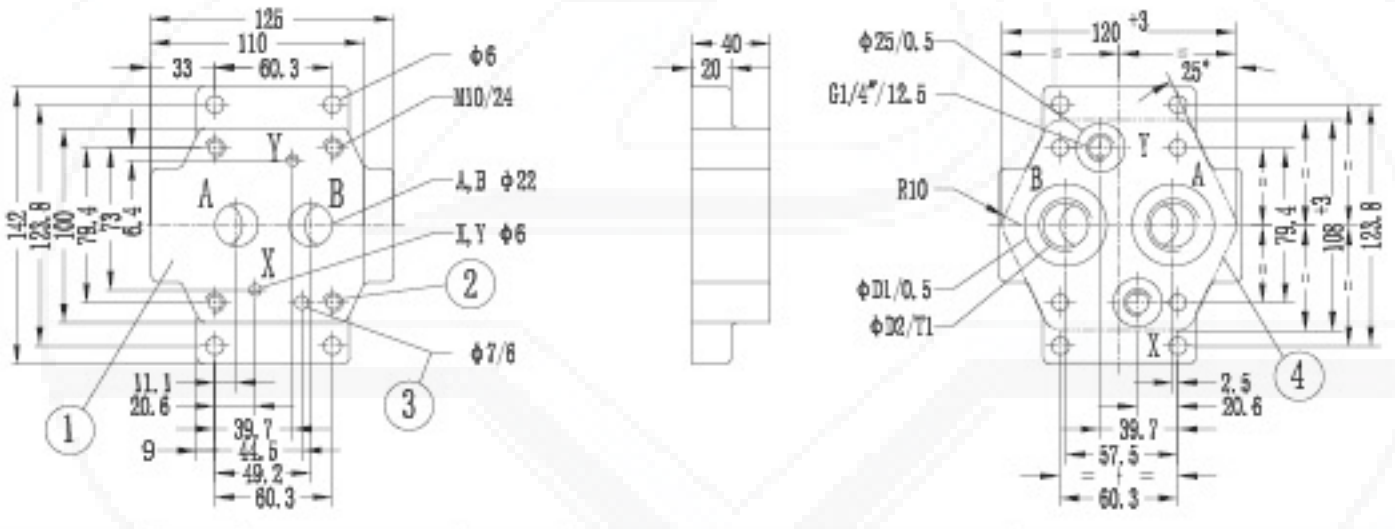
G565/01（G3/4 "） G565/02（M27 × 2） Weight：1kg **(Dimensions in mm)**

Valve fixing screws, 4-M12 × 50-10.9(GB/T70.1-2000)

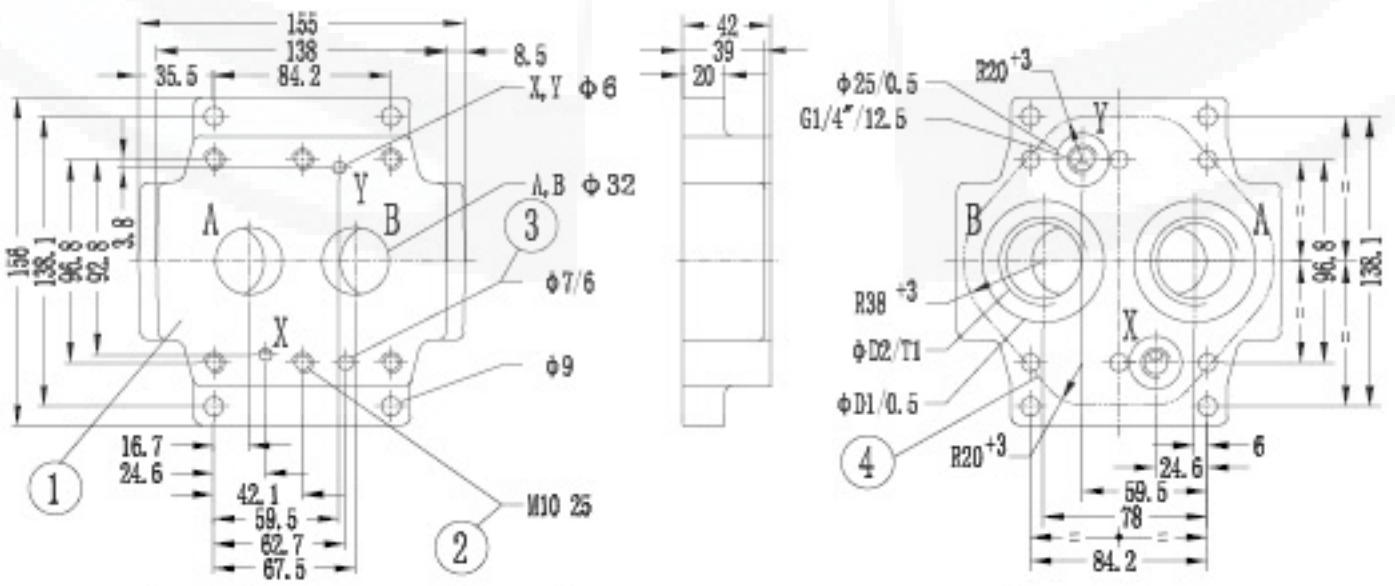
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG10	G460/01	28	G3/8"	13	4 - M10 × 40 -10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02		M18 × 1.5				
	G461/01	34	G1/2"	16			
	G461/02		M22 × 1.5				



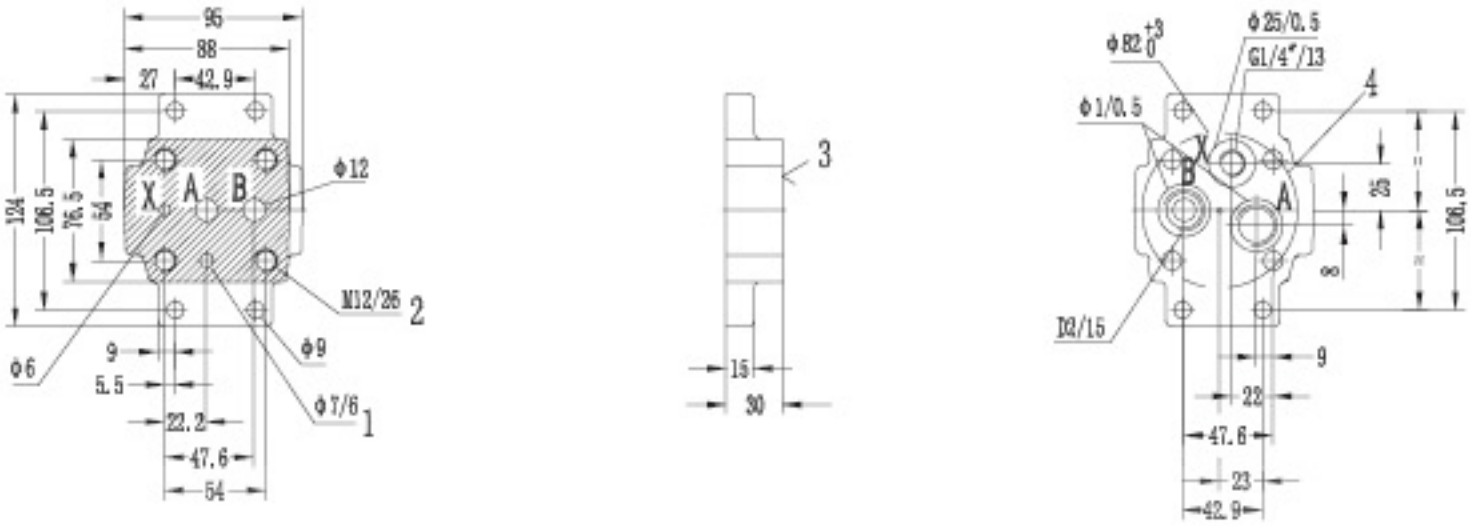
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG25	G412/01	42	G3/4"	17	4 - M10 × 50 -10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02		M27 × 2				
	G413/01	47	G1"	20			
	G413/02		M33 × 2				



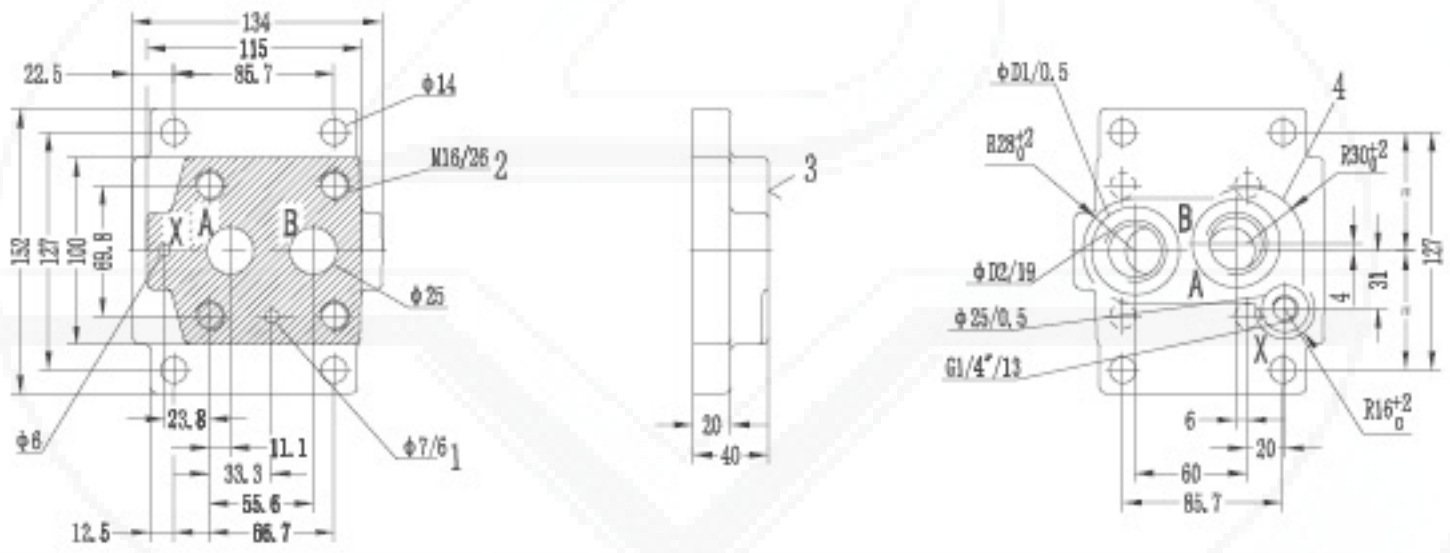
Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NG32	G414/01	56	G1 1/4"	20.5	6 - M10 × 60 -10.9 (GB/T70.1-2000)	69Nm	5kg
	G414/02		M42 × 2				
	G415/01	61	G1 1/2"	22.5			
	G415/02		M48 × 2				

1 mating piece of valve **2 Valve fixing screws** **3 locating pin** **4 Front panel cut-out**

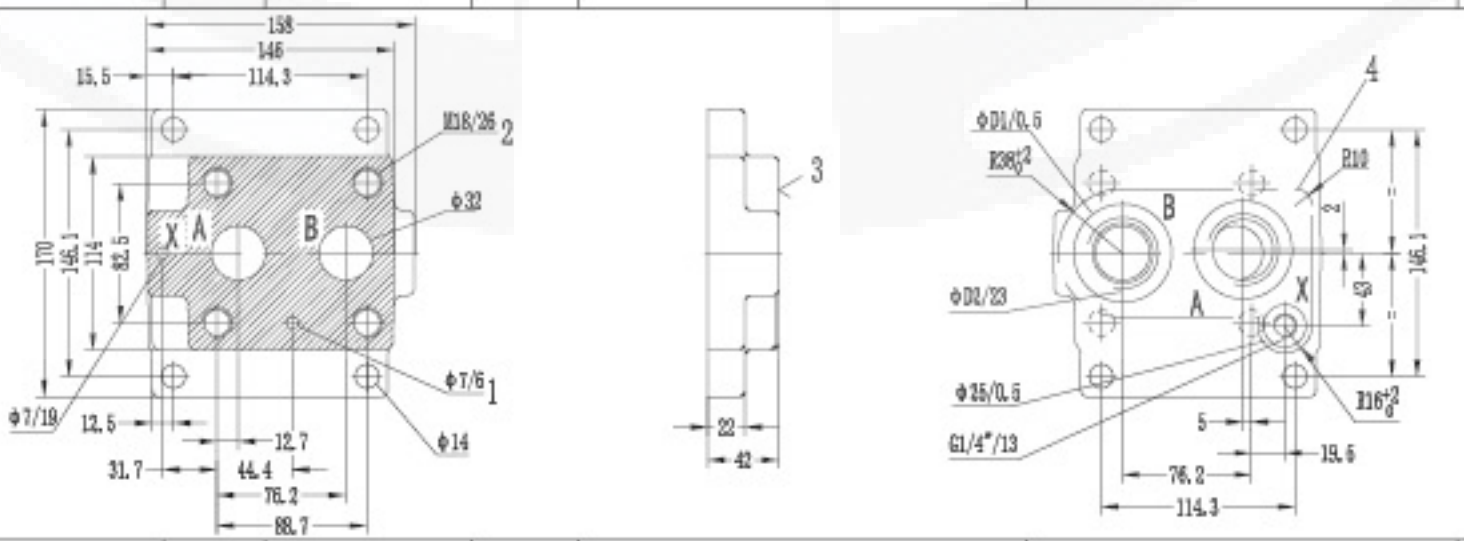
Subplates



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC10	G545/01	28	G3/8"	13	4-M12 × 50 -10.9 (GB/T70.1-2000)	120Nm	1.5kg
	G545/02		M18 × 1.5				
	G546/01	34	G1/2"	16			
	G546/02		M22 × 1.5				



Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC25	G408/01	42	G3/4"	17	4-M16 × 50 -10.9 (GB/T70.1-2000)	295Nm	3.0kg
	G408/02		M27 × 2				
	G409/01	47	G1"	20			
	G409/02		M33 × 2				

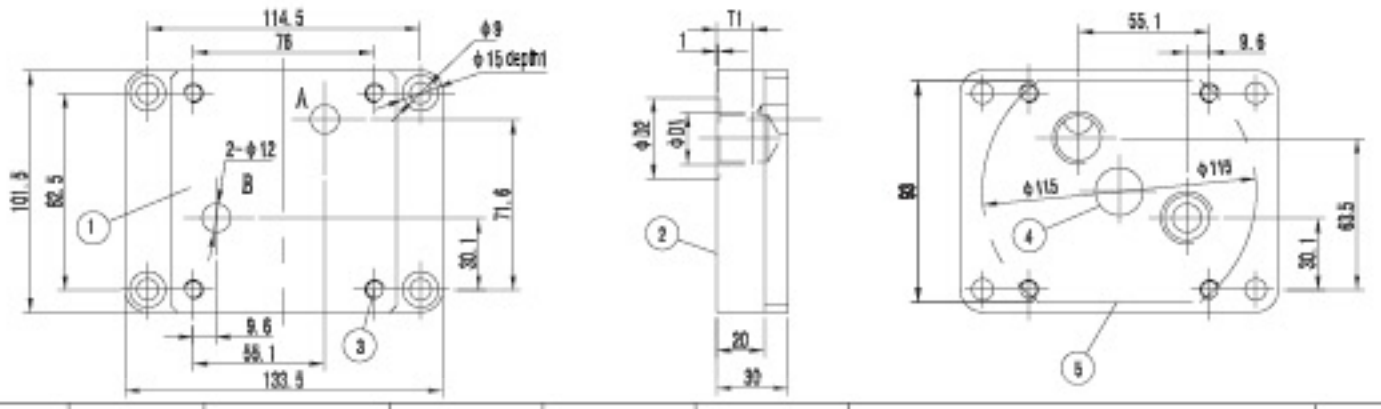


Size	Type	D1	D2	T1	Valve fixing screws	Tightening torque for screws	Weight
NC32	G410/01	58	G1 1/4"	20.5	4-M18 × 50 -10.9 (GB/T70.1-2000)	405Nm	5.0kg
	G410/02		M42 × 2				
	G411/01	65	G1 1/2"	22.5			
	G411/02		M48 × 2				

1 mating piee of valve 2 Valve fixing screws 3 locating pin 4 Front panel cut-out

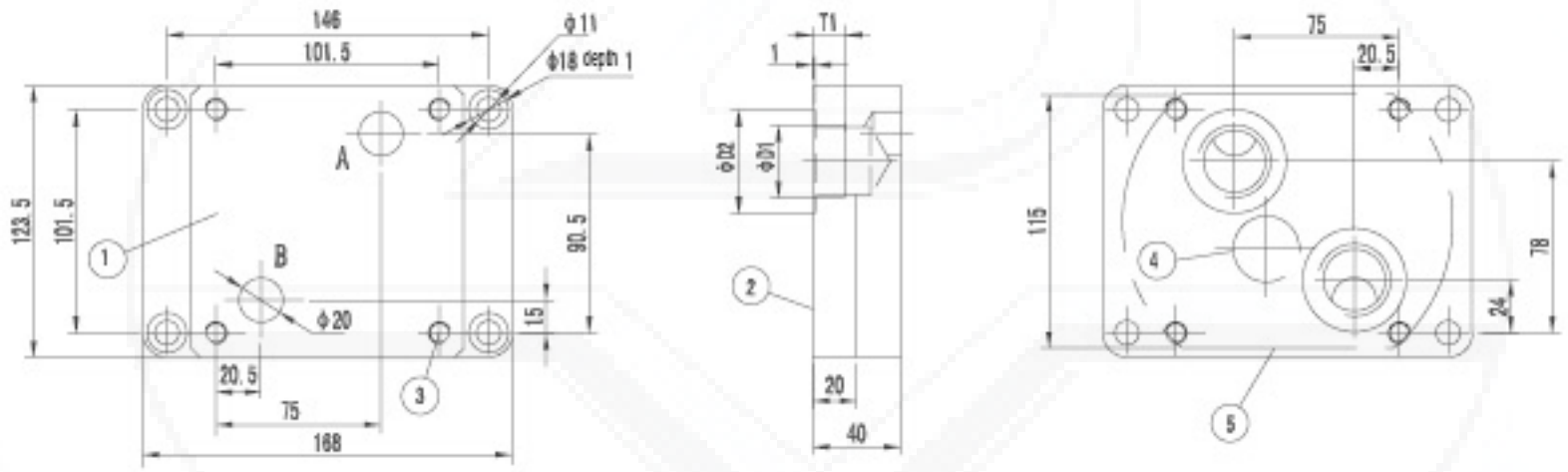
Subplates

G279/01(G1/2) G279/02(M22 × 1.5) G280/01 (G3/4) G280/02(M27 × 2) (Dimensions in mm)



Size	Type	Weight	D1	D2	T1	T2	Valve fixing screws	Tightening torque
NC10	G279/01	2.3kg	G1/2"	34	15	17	4-M8 × 50 -10.9 (GB/T70.1-2000)	37N.m
	G279/02		M22 × 1.5					
	G280/01		G3/4"	42	17	20		
	G280/02		M27 × 1.5					

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



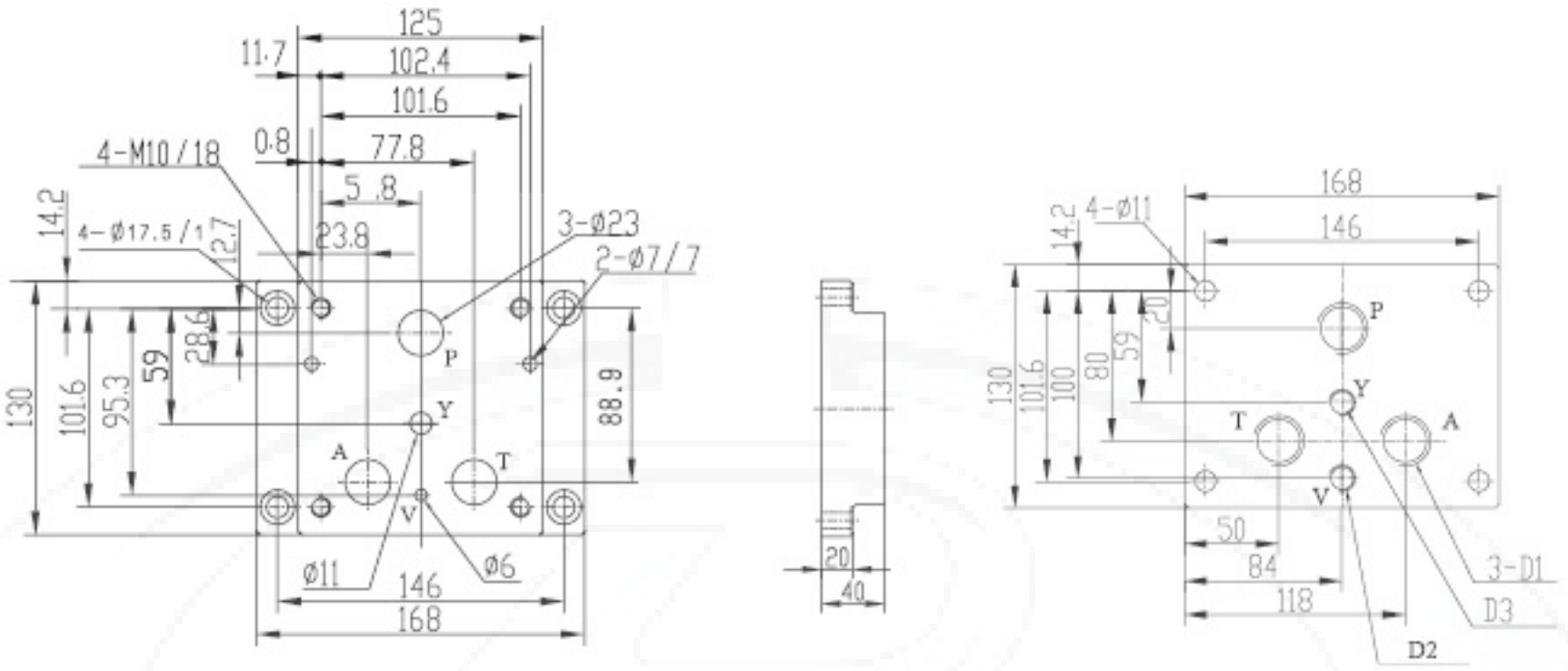
Size	Type	Weight	D1	D2	T1		Valve fixing screws	Tightening torque
NC16	G281/01	4kg	G1"	47	19		4-M10 × 80 -10.9 (GB/T70.1-2000)	75N.m
	G281/02		M33 × 2					
	G282/01		G1 1/4"	56	21			
	G282/02		M42 × 1.5					

1、mating piece of valve 2、underside 3、Valve fixing screws 4、φ 20 for size 10 φ 30 for size 16 keep free from drillings used for orifice support 5、Valve panel cut-out

Subplates

If have special request for dimensions of ports, please consult us when ordering!

G701/01(G3/4") G701/02(M27 × 2) G702/01 (G1") G702/02(M33 × 2) **(Dimensions in mm)**



Type	D1	D2	D3	Weight
G701/01	G3/4"	G1/4"	G1/4"	6Kg
G701/02	M27 × 2	M14 × 1.5	M14 × 1.5	
G702/01	G1"	G1/4"	G1/4"	
G702/02	M33 × 2	M14 × 1.5	M14 × 1.5	

Annotations:

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