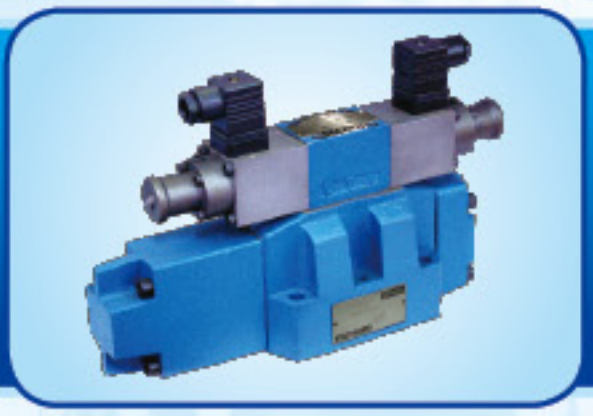


Huade

Hydraulic valves

Proportional Valves
Proportional Amplifiers

Catalogue

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.

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

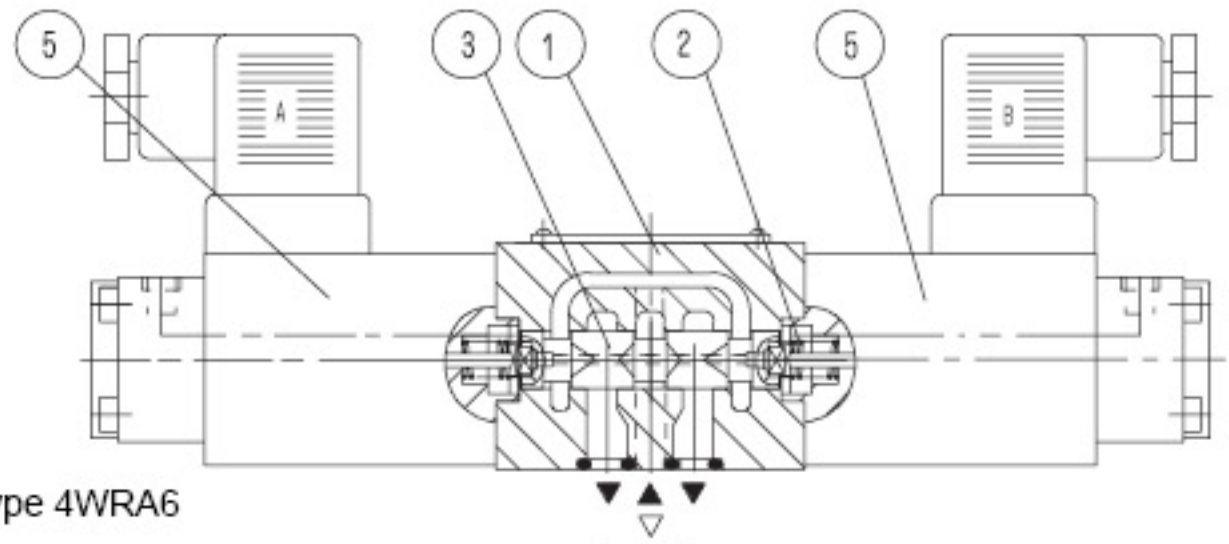
Type 4WRA directional control valves are direct-operated via proportional solenoids and are used to control the direction and quantity of a flow.

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)

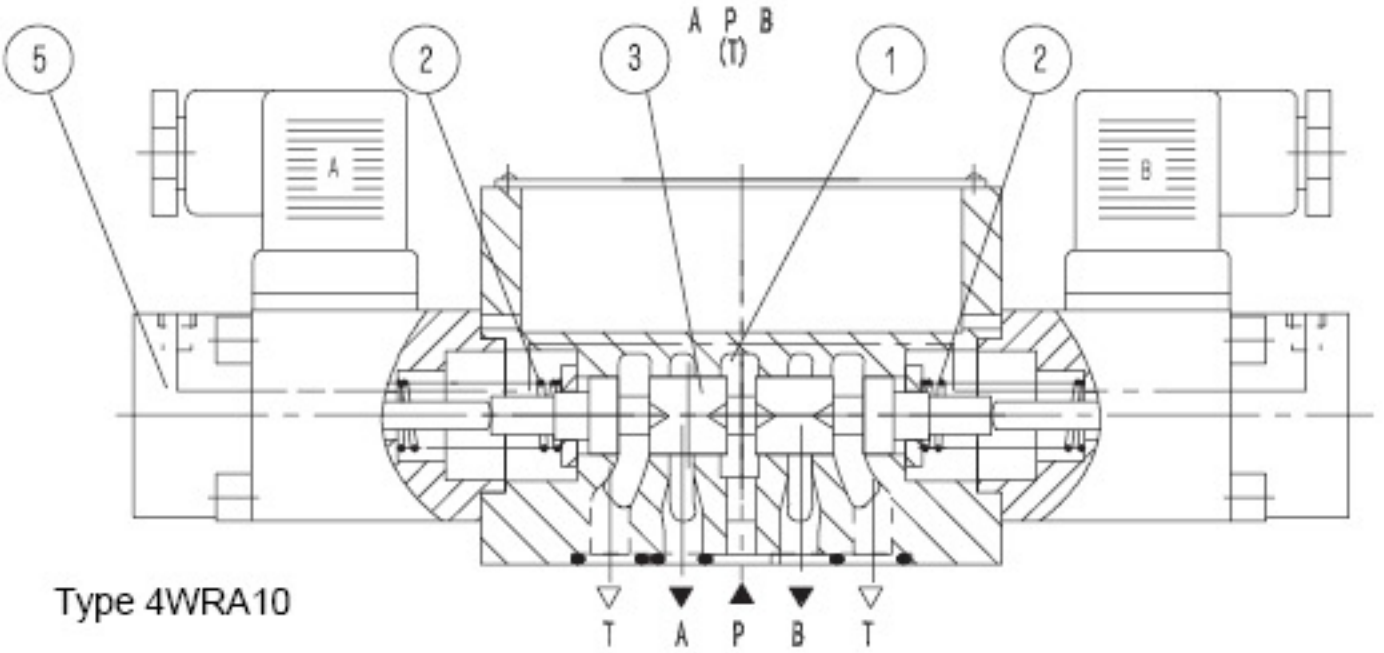
Type 4WRA $^{6}_{10}$.....10B/.....(3-position valve)

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



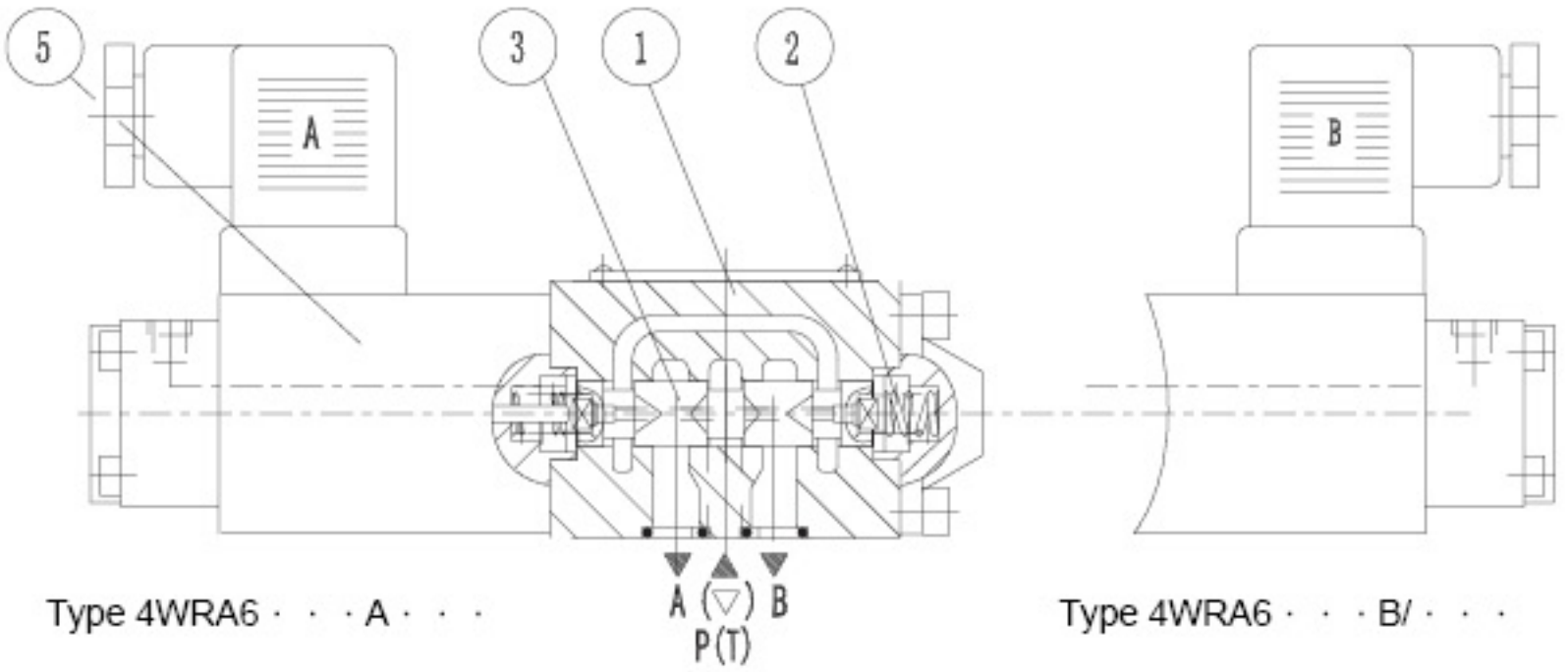
Type 4WRA10

4WRA $^{6}_{10}$ ... $^{A}_{B}$...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.

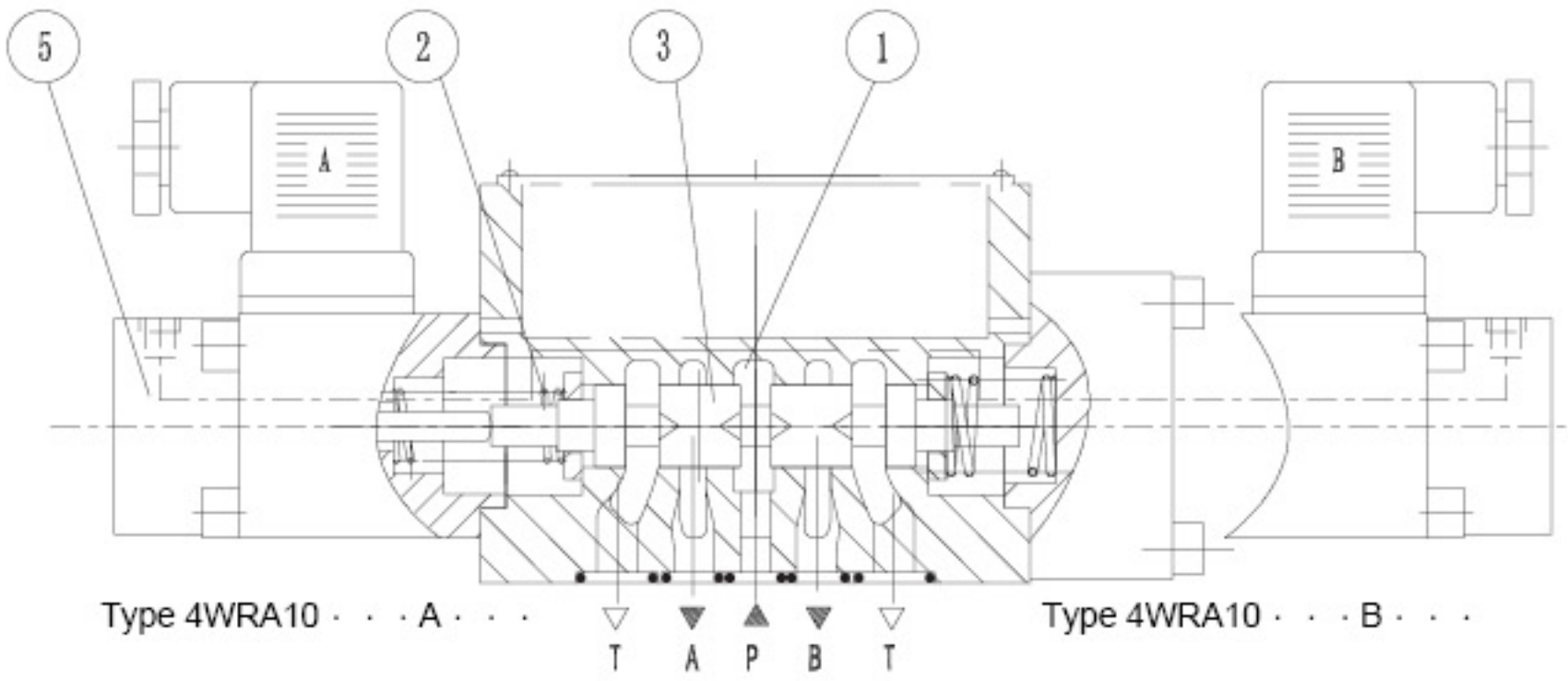
Type 4WRA adopts subplate mounting ,spring center and low pressure drop acrossing the control lands.

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



Type 4WRA6 · · · A · · · Type 4WRA6 · · · B/ · · ·

Type 4WRA6$^{A}_{B}$ · · · 10B/ · · ·

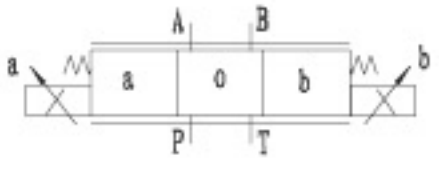


Type 4WRA10 · · · A · · · Type 4WRA10 · · · B · · ·

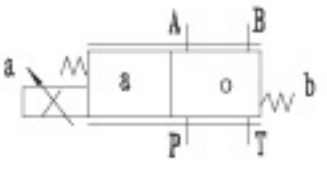
Type 4WRA10$^{A}_{B}$ · · · 10B/ · · ·

Symbols

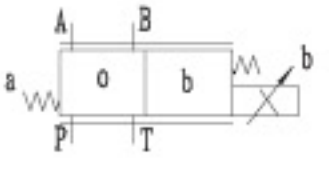
Type 4WRA · · · 10B/ · · ·
Proportional valve (3-positions)



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



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



Ordering Code

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

Size 6 = 6
Size10 = 10

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

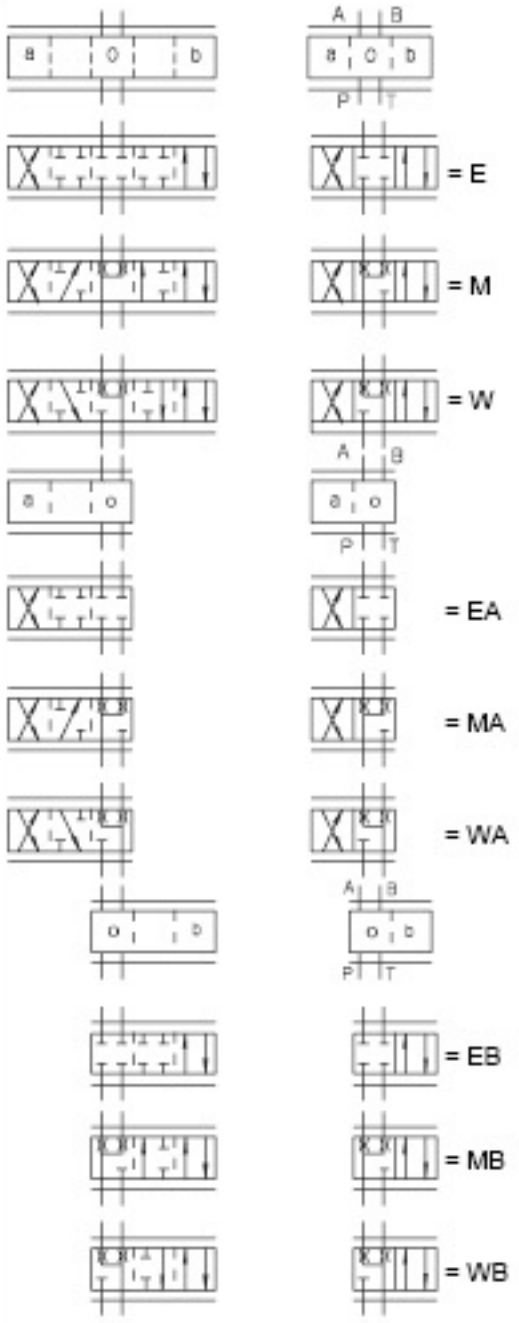
no code = Without emergency operator
N= with emergency operator

G24 = 24 VDC

B= Technology of Beijing Huade Hydraulic

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

Symbols

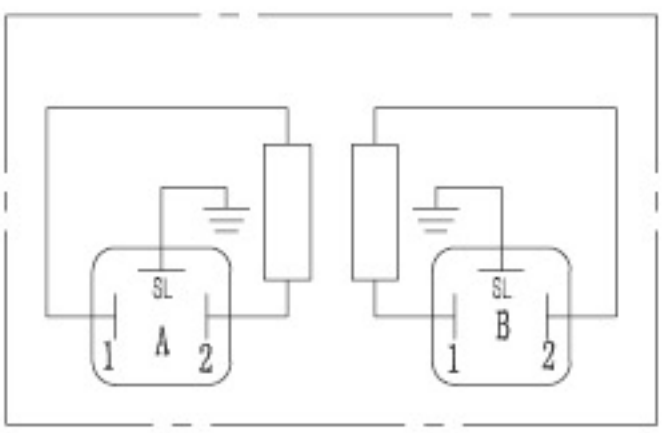


Nominal flow at 1Mpa valve pressure difference

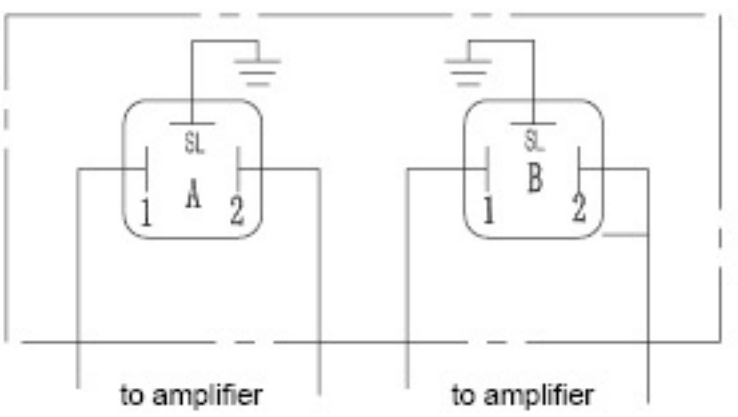
Size 6	5=	8L/min
	10=	13L/min
	20=	17L/min
Size 10	10=	18L/min
	20=	27L/min
	40=	50L/min

Electrical connection with type 4WRA

Coil connection



plug-in connection



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

Hydraulic data

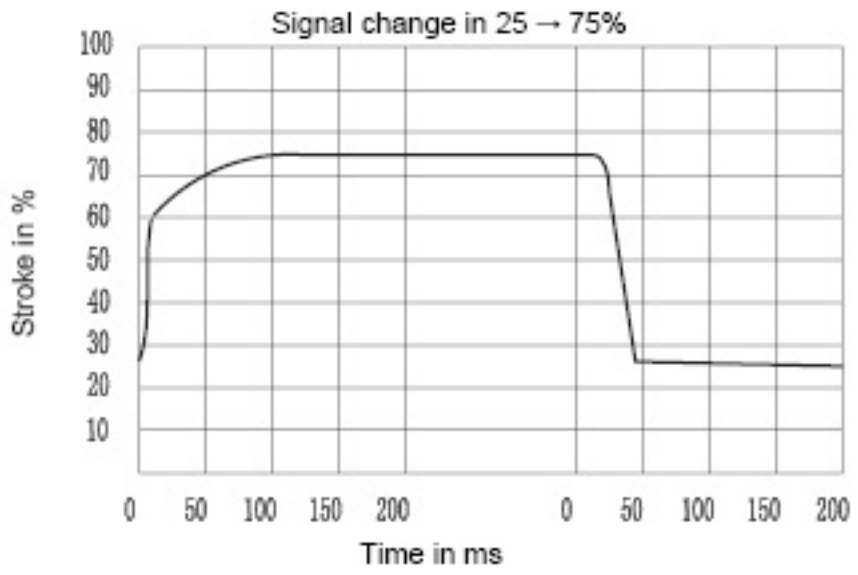
size			6	10
Operating pressure (MPa)	port A,B,P		31.5	31.5
	port T		16	16
Flow		(L/min)	43	95
Degree of contamination			⩽ 20(recommend ⩽ 10)	
Hysteresis		(%)	< 6	< 5
Repeatability		(%)	< 3	< 2
Frequency reponse(-3dB,signal ± 100%)		(Hz)	6	4
Pressure fluid			Mineral oil(for NBR seal),Phosphate ester (for 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

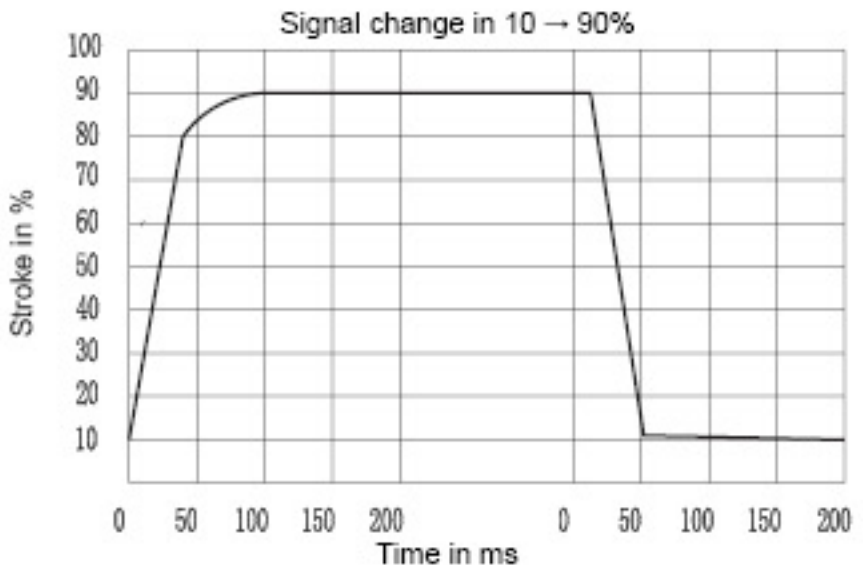
Electrical data

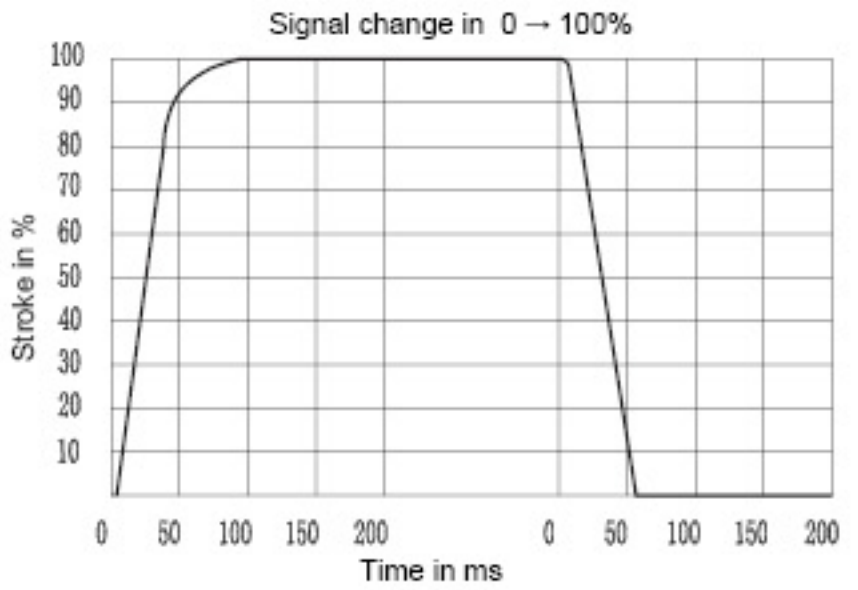
size		6	10
Voltage type		Direct voltage	Direct voltage
Nominal voltage	(V)	24	
Max. current per solenoid	(A)	1.5	
Solenoid coil resistance (Ω)	Cold value at 20°C	5.4	10
	Max. warm value	8.1	15
Environment temperature	(°C)	up to +50	
Coil temperature	(°C)	up to +150	
Insulation of valve to DIN 40 050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

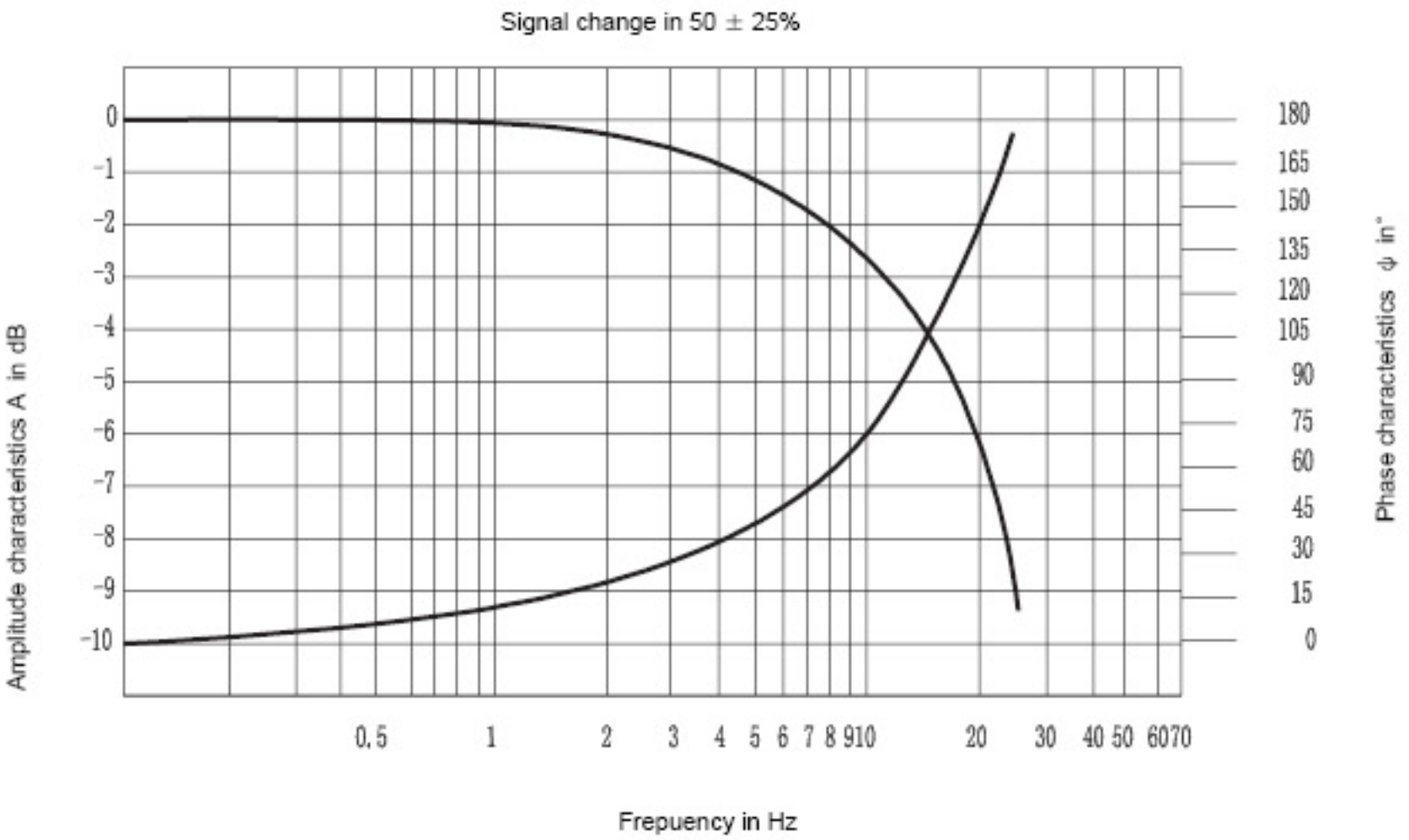
Characteristic curves:(measured at v =36 × $10^{-6}m^2/S$ t=50°C)

Type 4WRA6

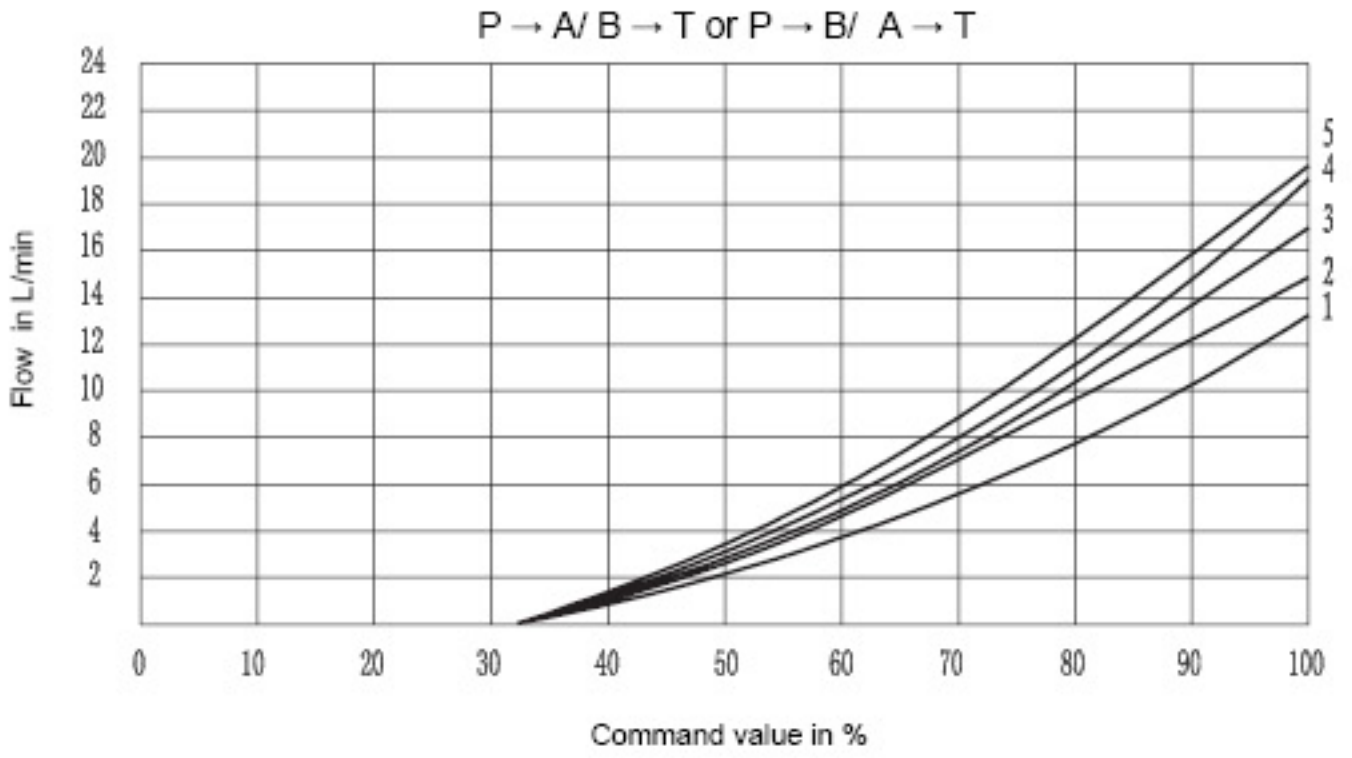






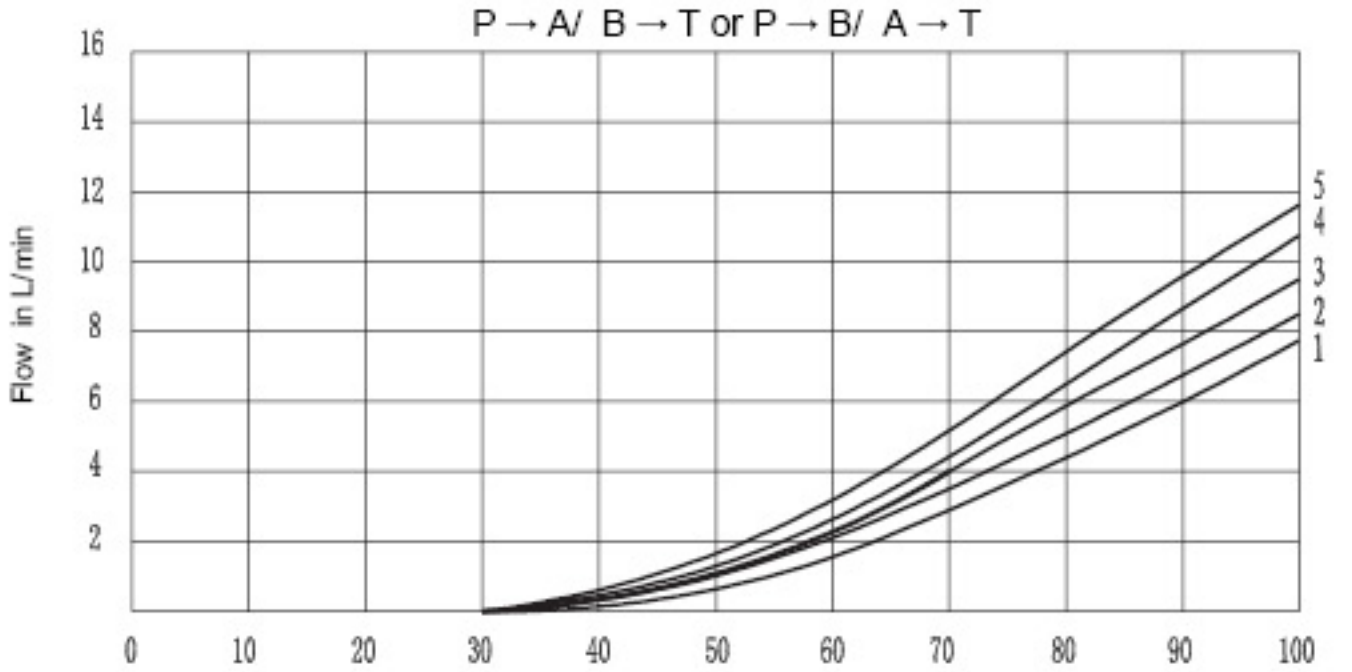


Characteristic curves: (measured at v =36 × $10^{-6}m^2/S$ and t=50°C)



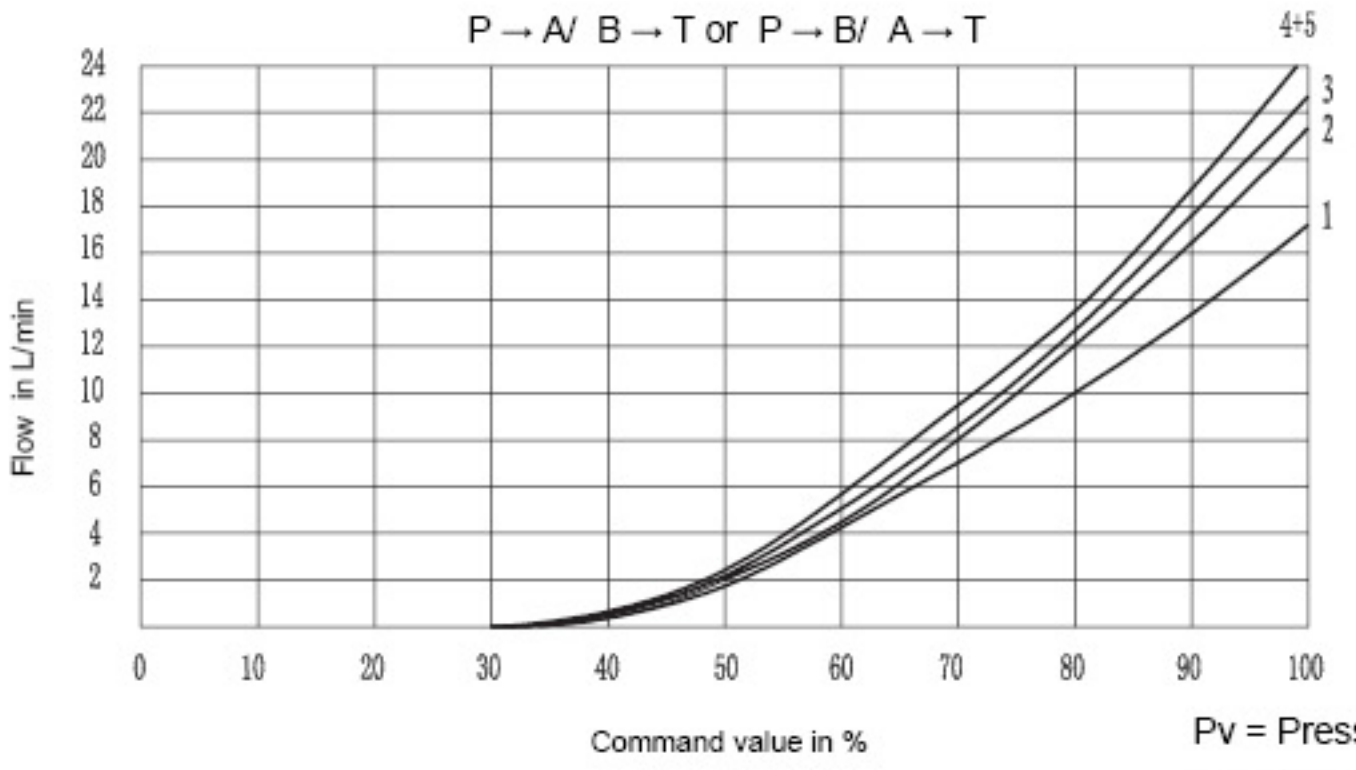
13L/min Nominal flow at 1MPa valve pressure difference

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

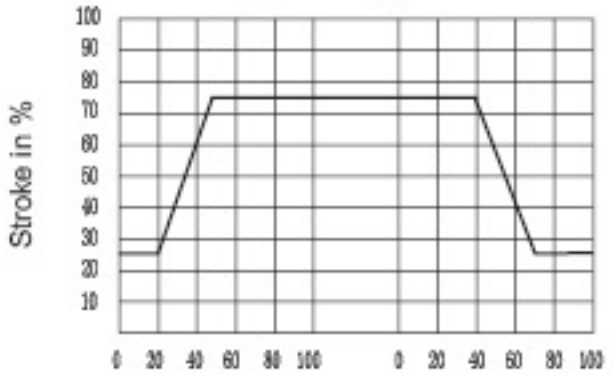
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

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

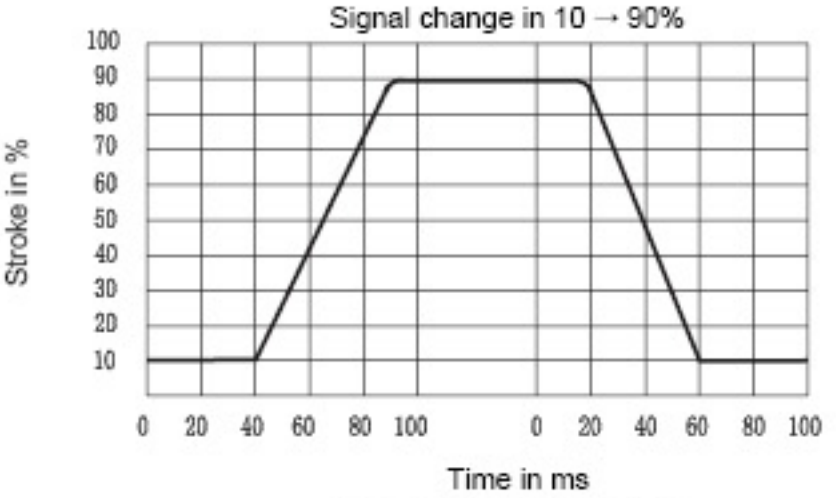
Characteristic curves: (measured at v =36 × $10^{-6}m^2/S$ and t=50°C)

Type 4WRA10

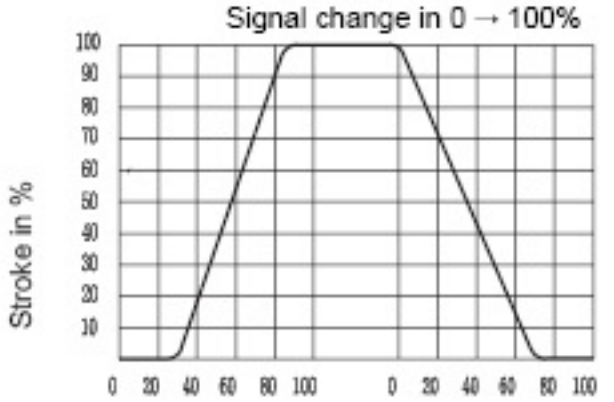
Signal change in 25 → 75%



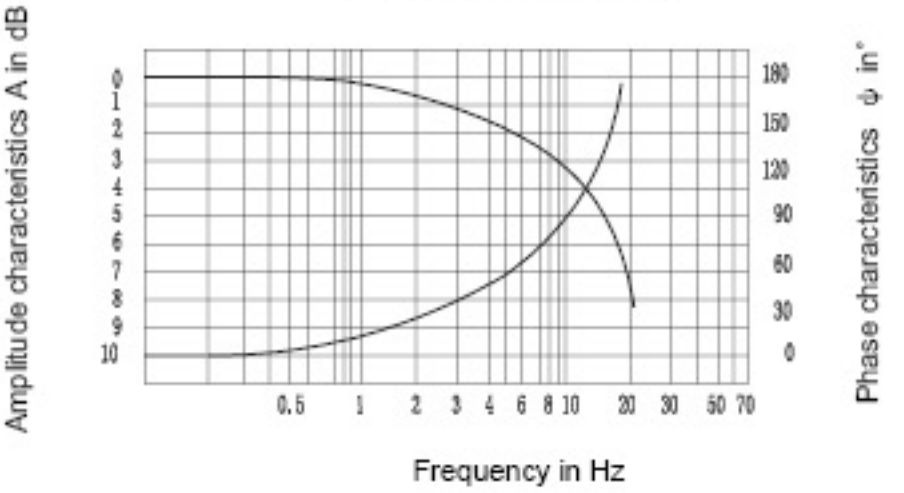
Signal change in 10 → 90%

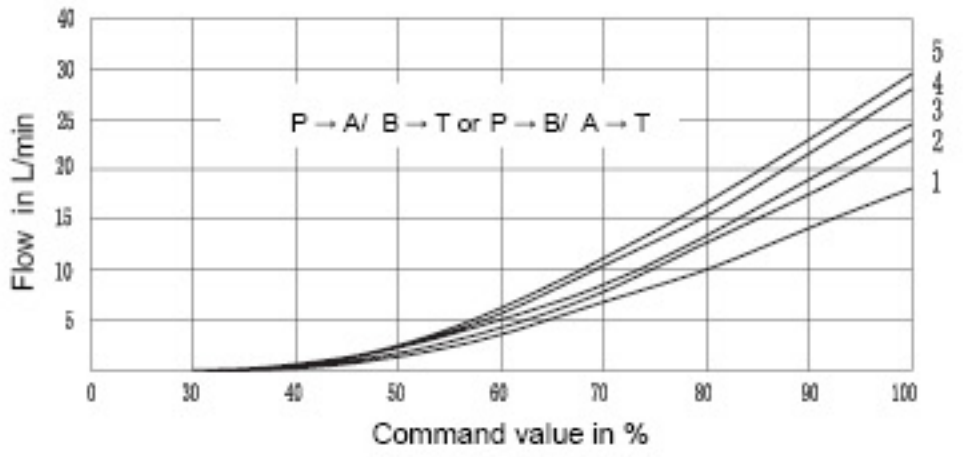


Signal change in 0 → 100%

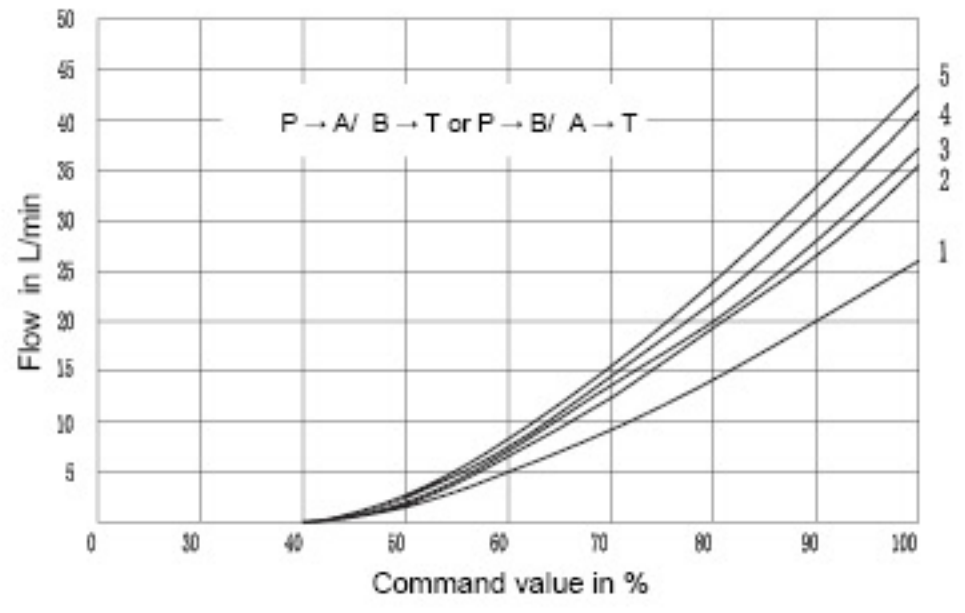


Signal change in 50 ± 25%

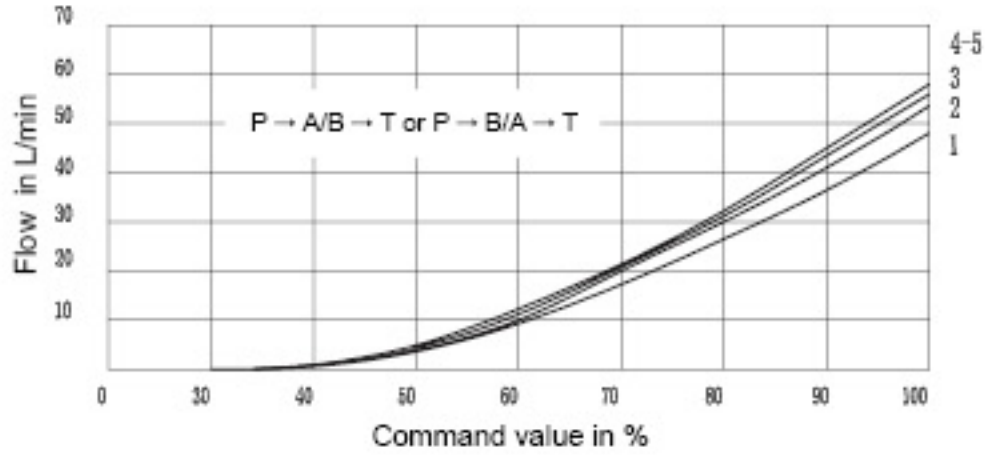




18L/min Nominal flow at
1MPa valve pressure difference
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant



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 (*)

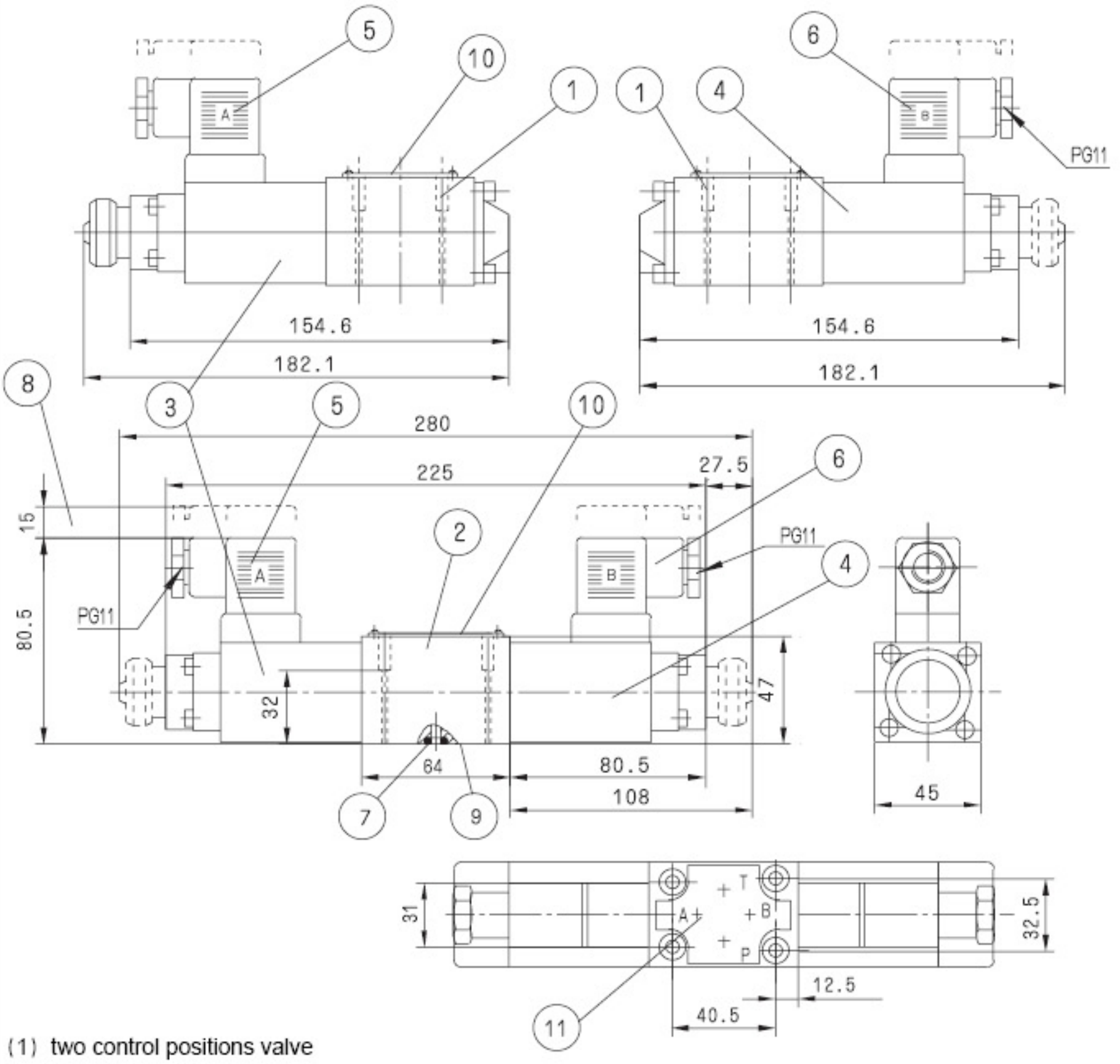
Type 4WRA10 Power limits of

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。

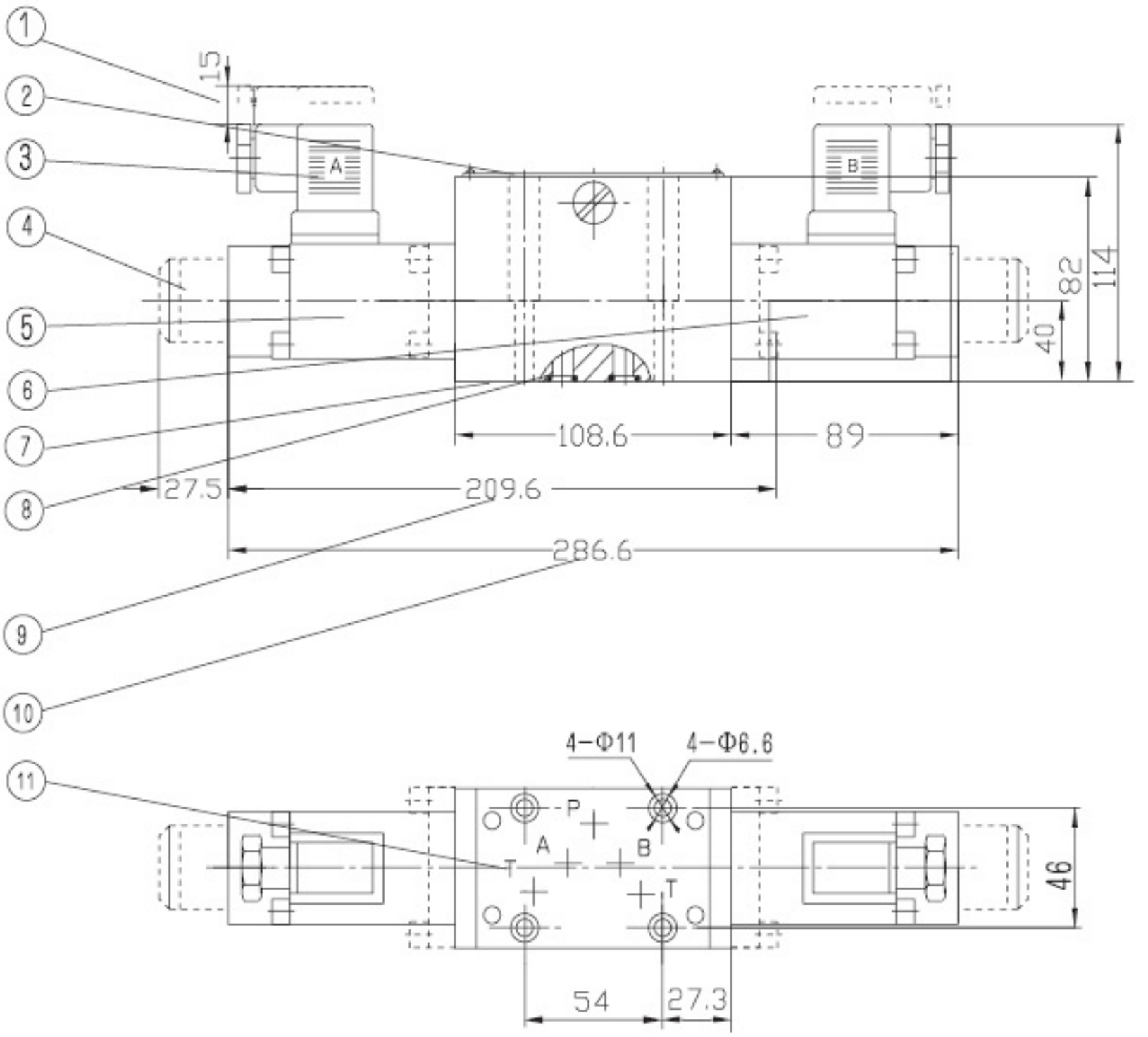
Unit dimensions:type 4WRA 6 **(Dimensions in mm)**

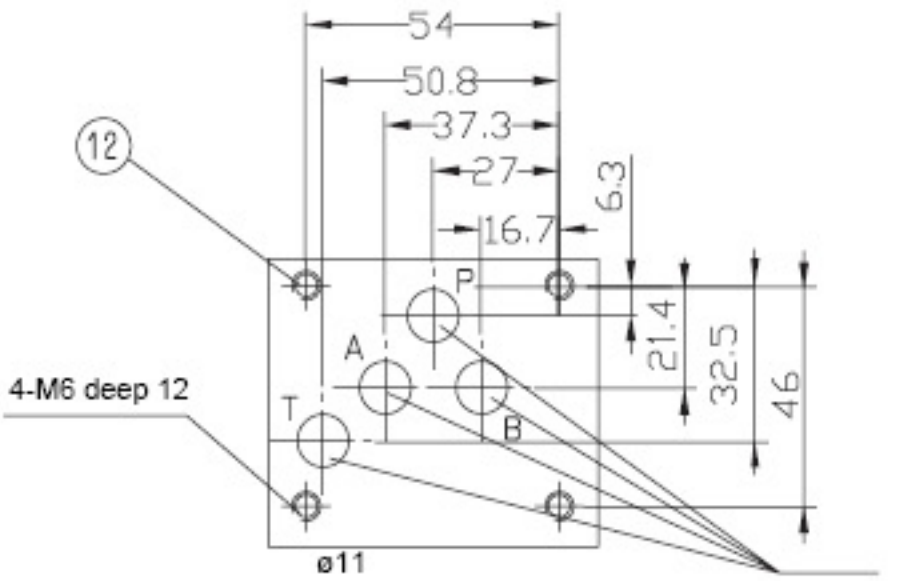


(1) two control positions valve
(2) three control positions valve
(3) Proportional solenoid"a"
(4) Proportional solenoid"b"
(5) Plug(grey)
(6) Plug(black)
(7) O-ring 9.25X1.78
(8) Space required to remove the plug
(9) Valve mounting face with ports positions
(10) Nameplate
(11) Ports positions
(12) Dimensions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

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

see Page 80





(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

Notice

1. **The fluid must be filtered. Minimum filter fineness is 20 μm.**
2. **The tank must be sealing up and an air filter must be installed on air entrance.**
3. **Products without subplate when leaving factory, if need them, please ordering specially.**
4. **Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.**
5. **Roughness of surface linked with the valve is required to**

.
6. **Surface finish of mating piece is required to 0.01/100mm.**