

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

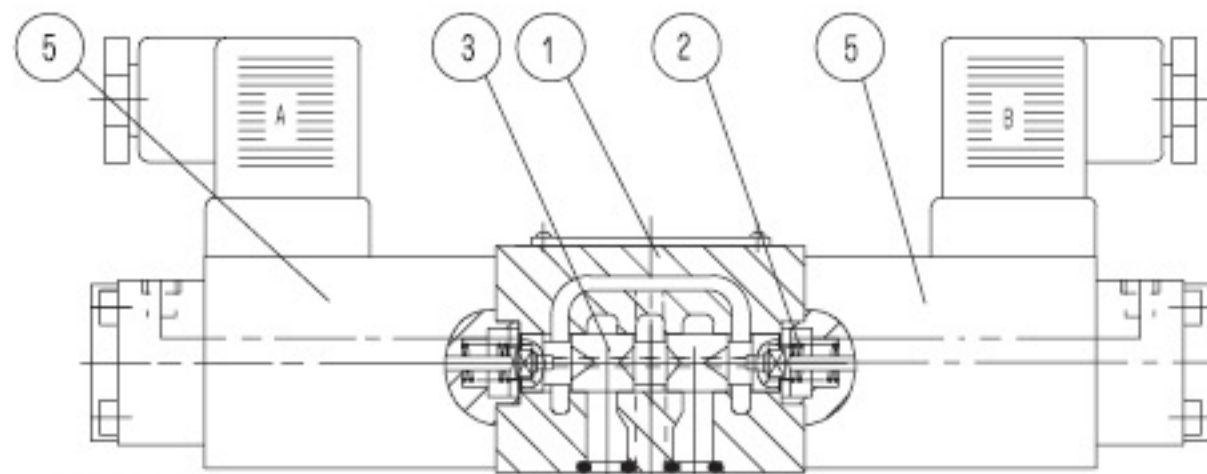
Type 4WRA directional control valves are direct-operated via proportional solenoids and are used to control the direction and quantity of a flow.

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)

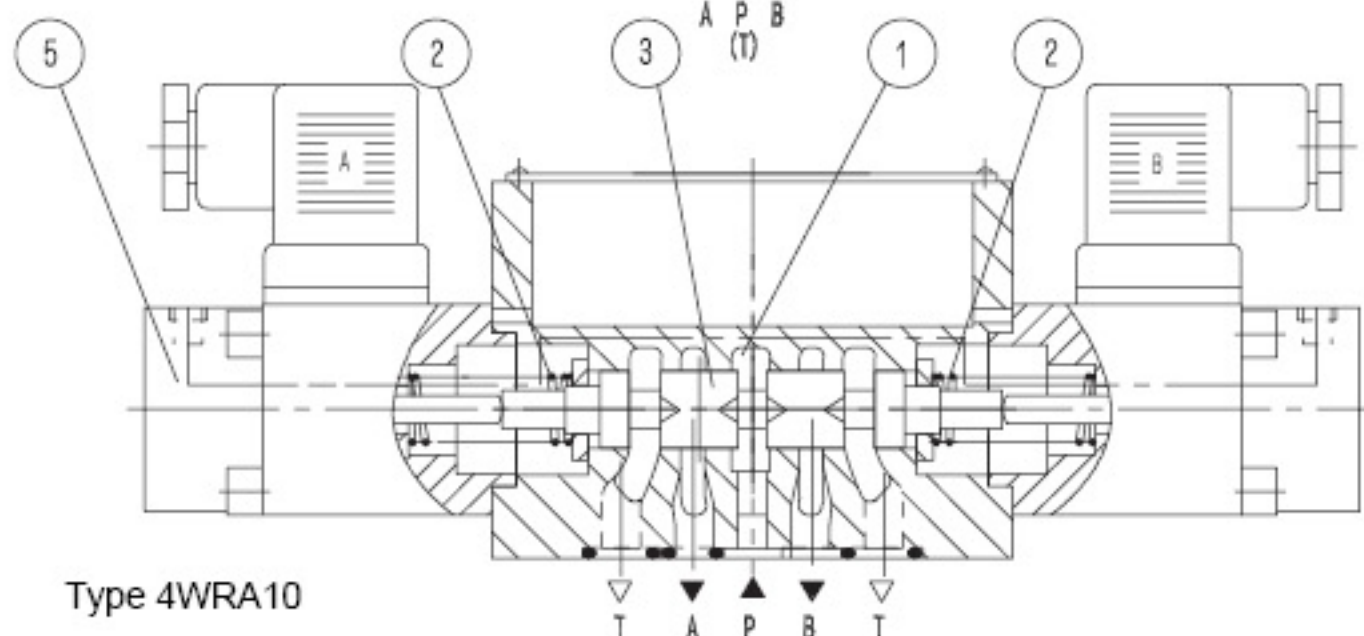
Type 4WRA₁₀^s10B/.....(3-position valve)

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 proportional solenoid (5) is de-energised, the control spool(3) is returned to the center position by the return spring(2).



Type 4WRA6

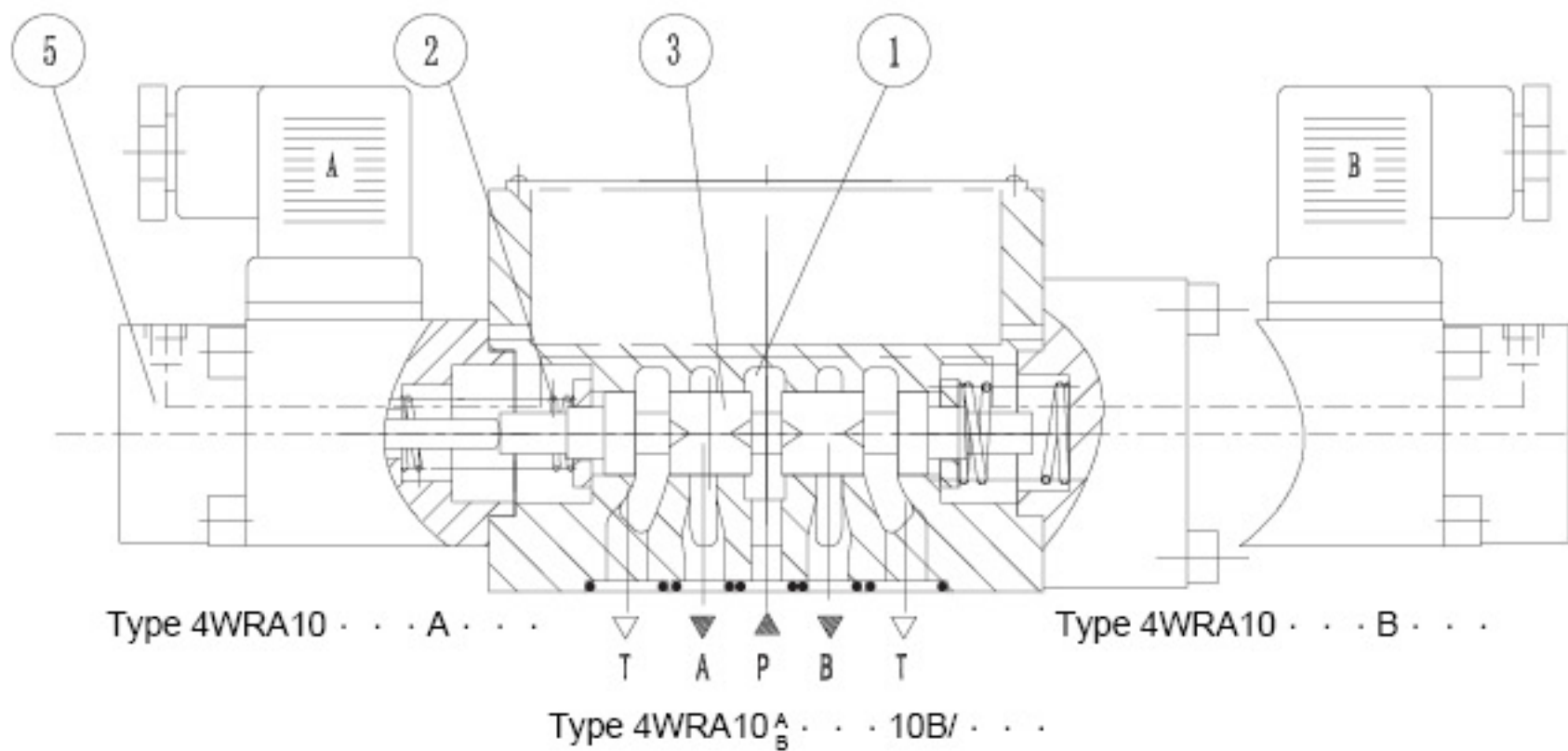
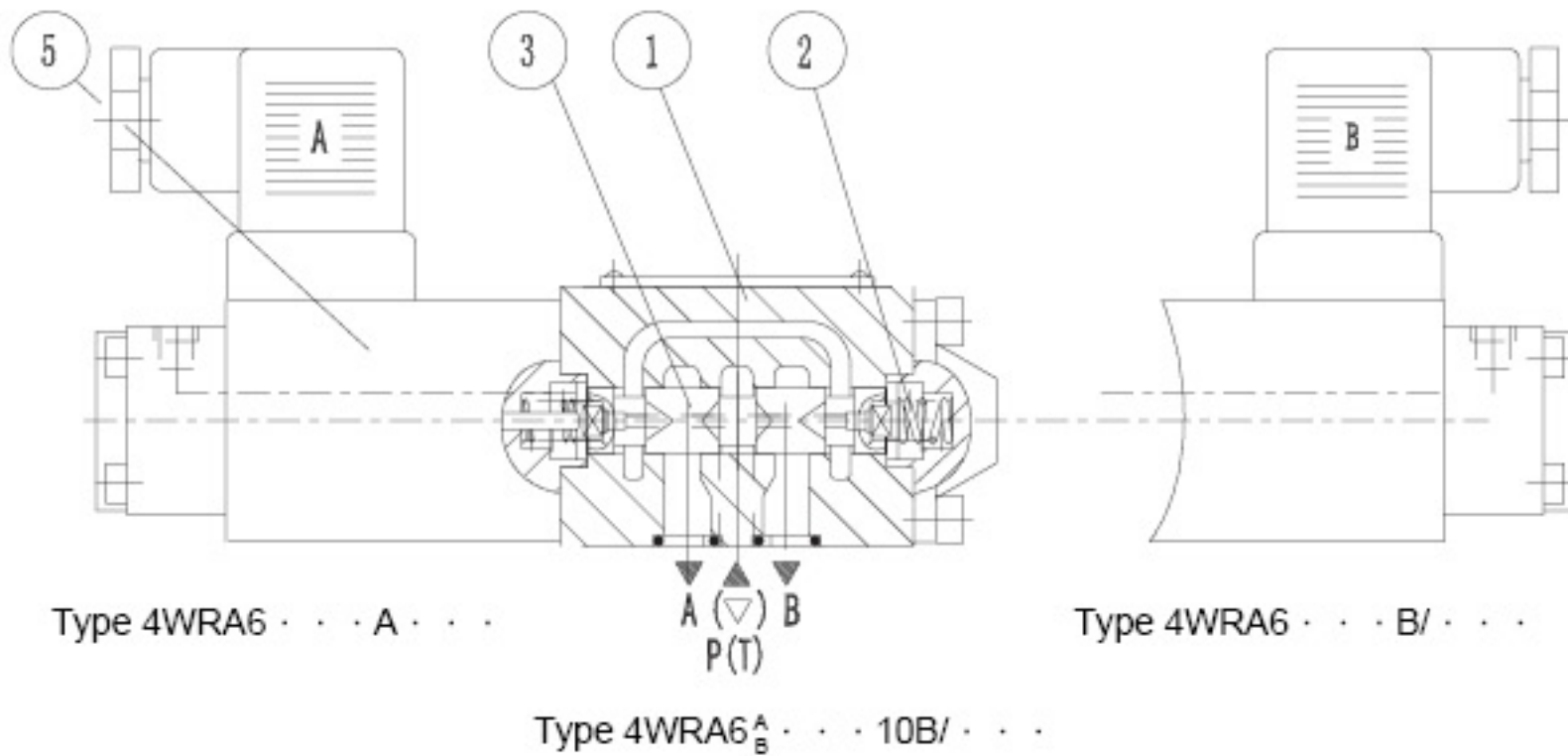


Type 4WRA10

4WRA⁶/₁₀ ...^A/_B...10 (2-position valve)

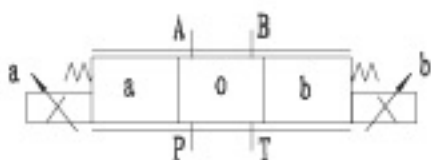
The function of this valve is the same as that for valve type 4WRA. But it's 2-position directional valve with only one proportional solenoid.

Type 4WRA adopts subplate mounting, spring center and low pressure drop acrossing the control lands. They often used in machine, light industry, metallurgy, mine, space flight and other fields.

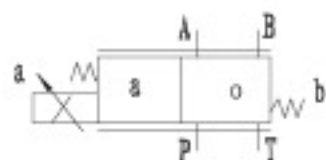


Symbols

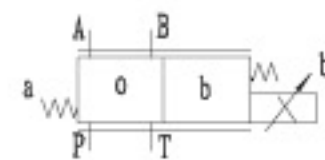
Type 4WRA . . . 10B/ . . .
Proportional valve (3-positions)



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



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



Ordering Code

4WRA 10 B / / Z₄ *

Size 6 = 6
Size 10 = 10

Further details
in clear text

M = mineral oils
V = phosphate ester

Z₄ = Plug-in to DIN 43 650

No code = Without special insulation
J = Seawater resistant

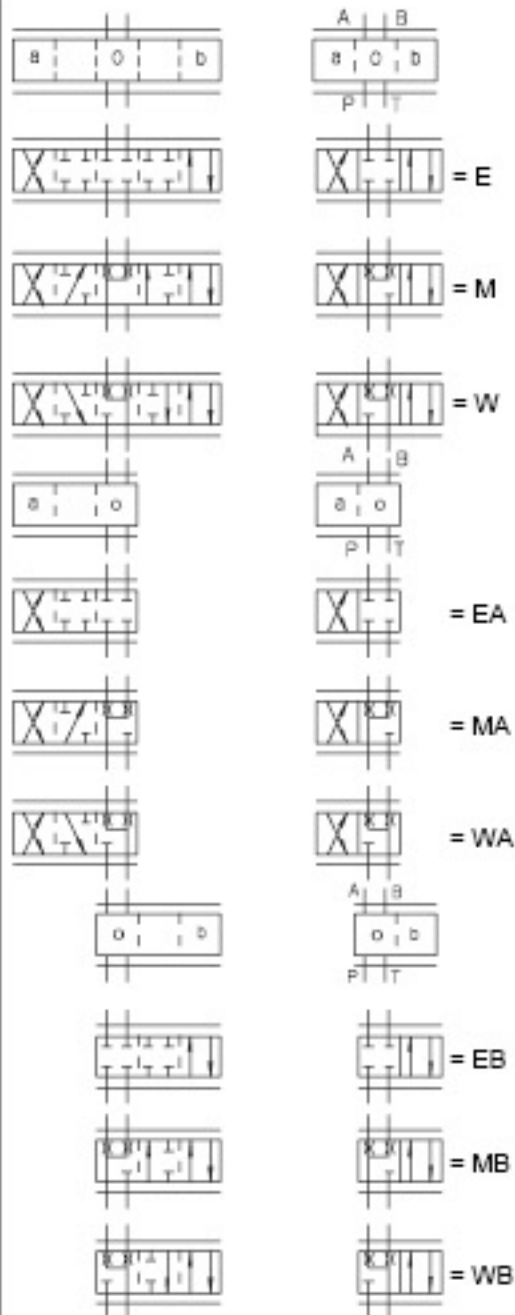
no code = Without emergency operator
N = with emergency operator

G24 = 24 VDC

B = Technology of Beijing Huade Hydraulic

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

Symbols



Nominal flow at 1Mpa valve pressure difference

Size 6

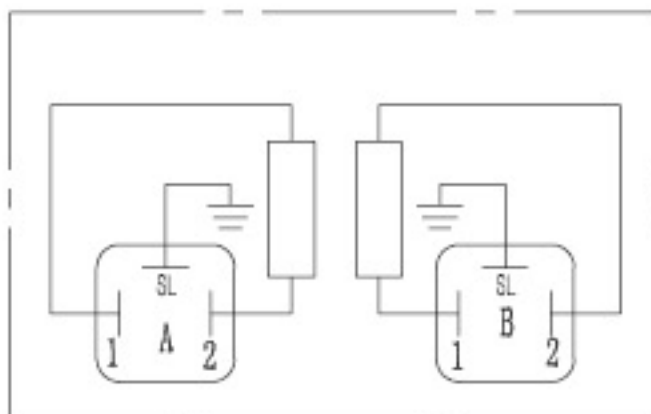
5=	8L/min
10=	13L/min
20=	17L/min

Size 10

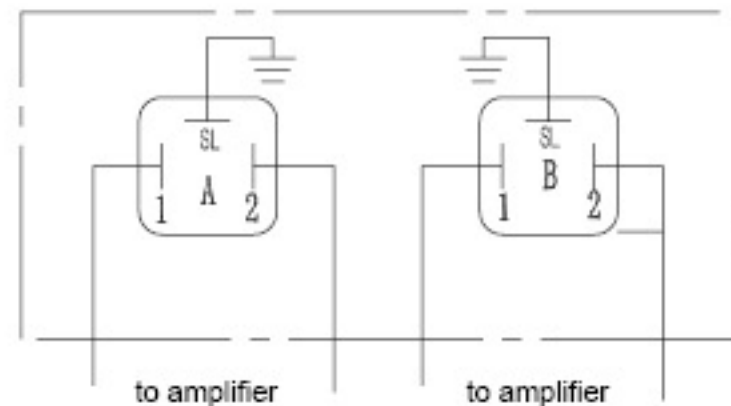
10=	18L/min
20=	27L/min
40=	50L/min

Electrical connection with type 4WRA

Coil connection



plug-in connection



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

Hydraulic data

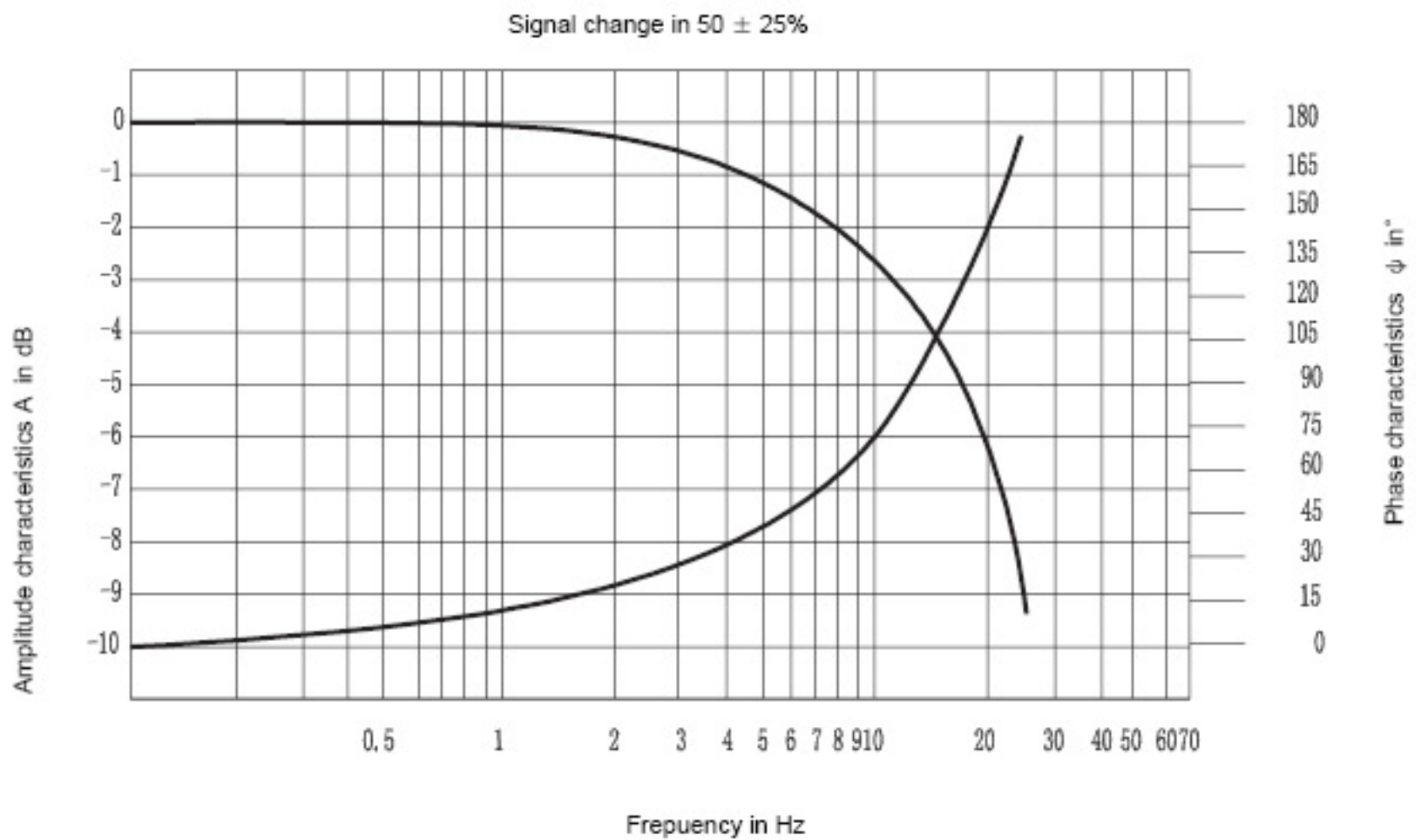
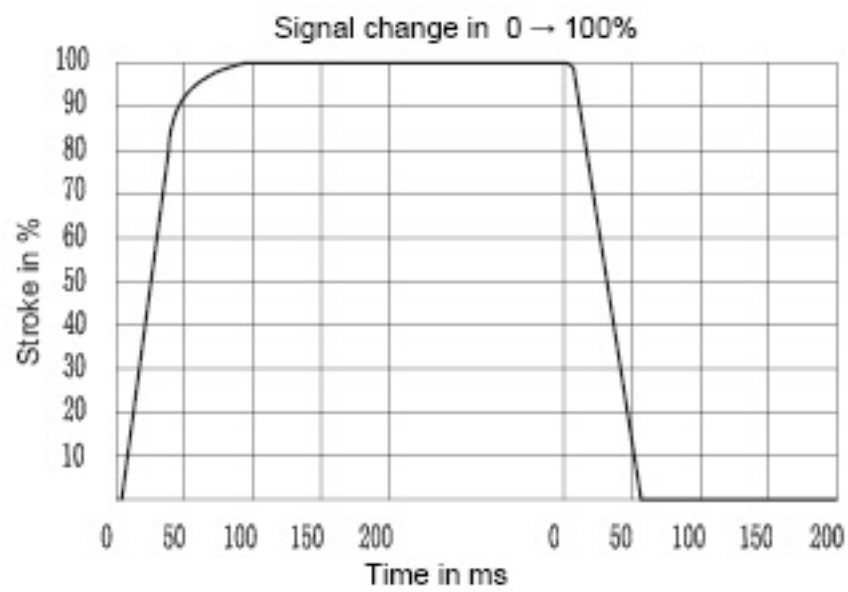
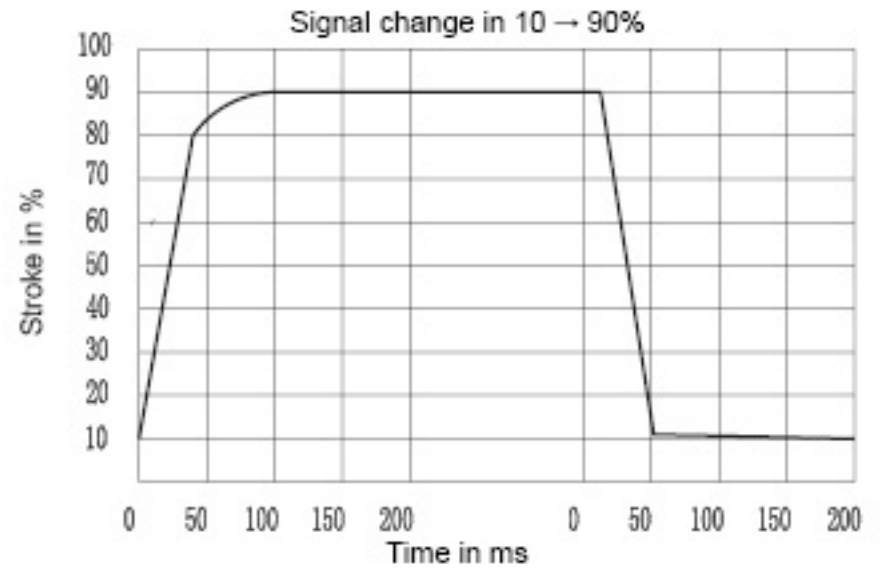
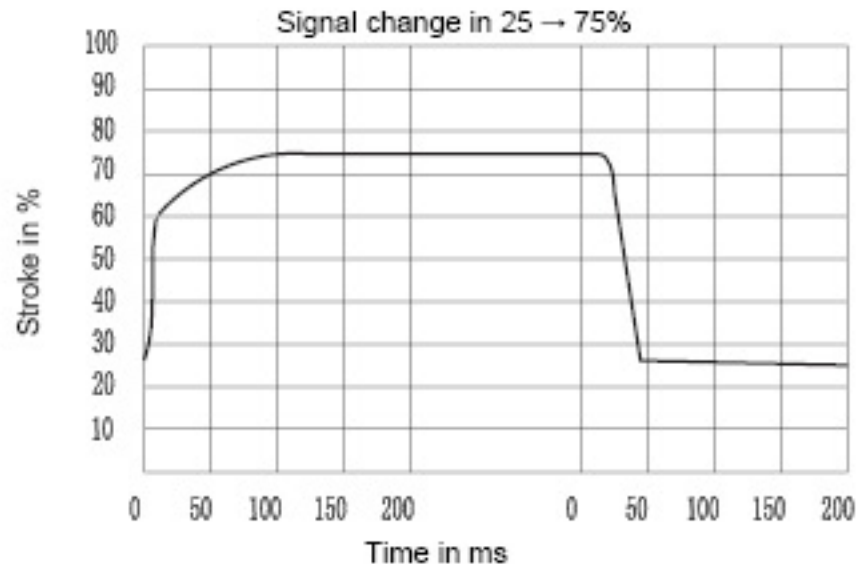
size		6	10
Operating pressure (MPa)	port A,B,P	31.5	31.5
	port T	16	16
Flow	(L/min)	43	95
Degree of contamination		≤ 20(recommend ≤ 10)	
Hysteresis	(%)	< 6	< 5
Repeatability	(%)	< 3	< 2
Frequency reponse(-3dB,signal ± 100%)	(Hz)	6	4
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM seal)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

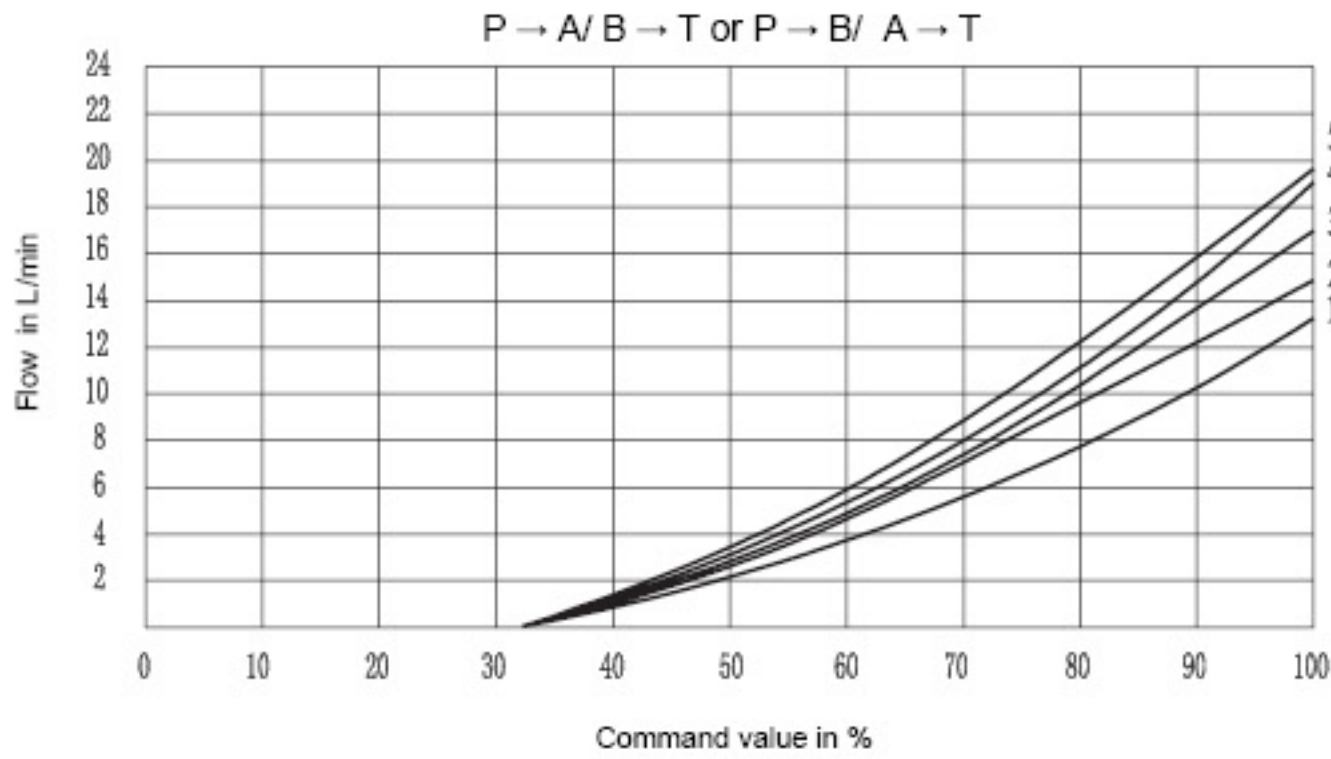
size		6	10
Voltage type		Direct voltage	Direct voltage
Nominal voltage	(V)	24	
Max. current per solenoid	(A)	1.5	
Solenoid coil resistance (Ω)	Cold value at 20°C	5.4	10
	Max. warm value	8.1	15
Environment temperature	(°C)	up to +50	
Coil temperature	(°C)	up to +150	
Insulation of valve to DIN 40 050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

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

Type 4WRA6

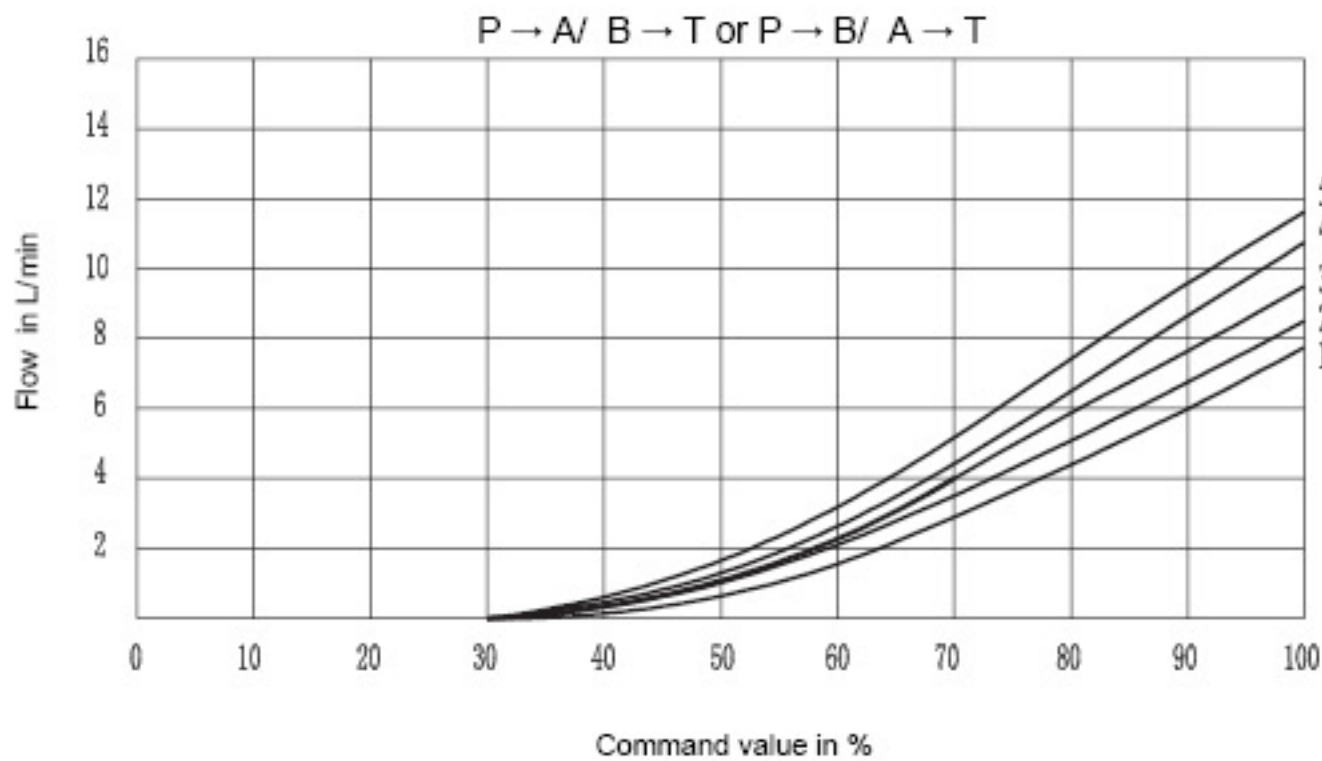


Characteristic curves: (measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$ and $t=50^\circ\text{C}$)



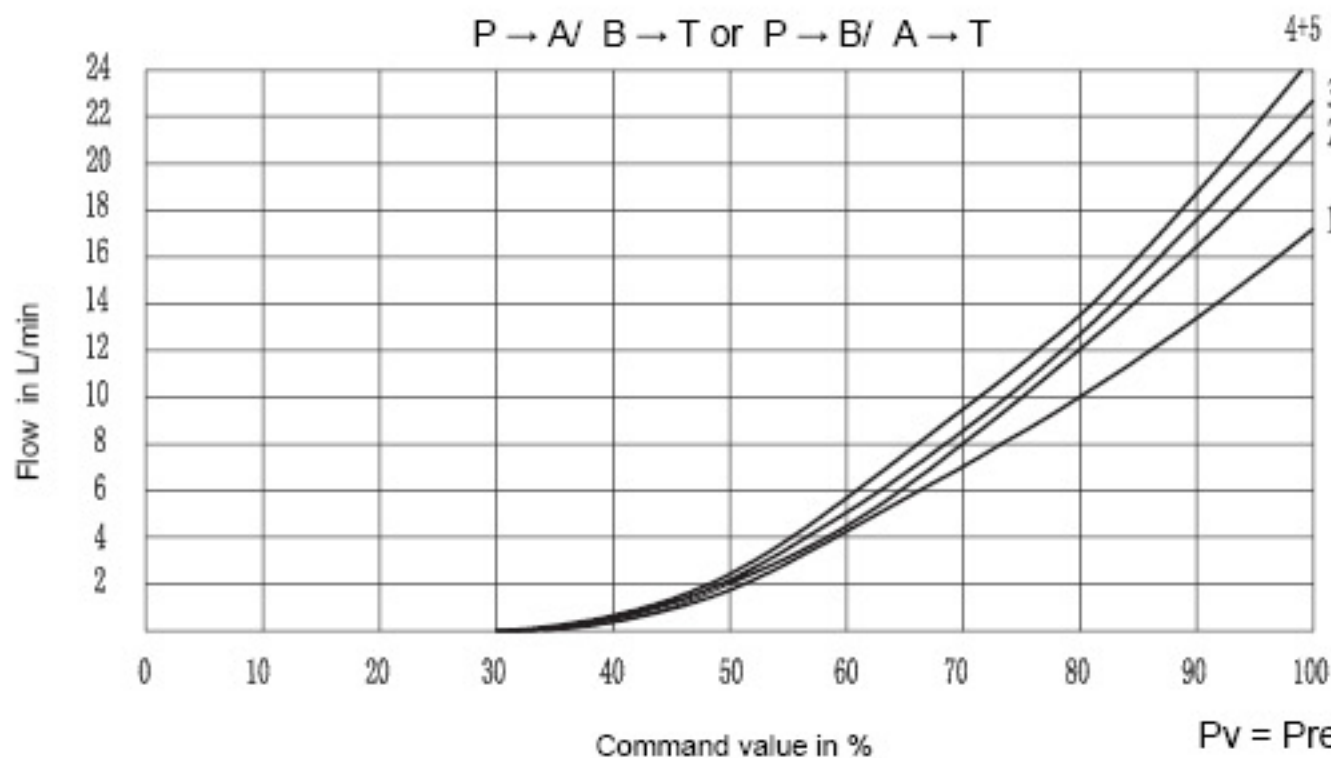
13L/min Nominal flow at 1MPa valve pressure difference

- 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



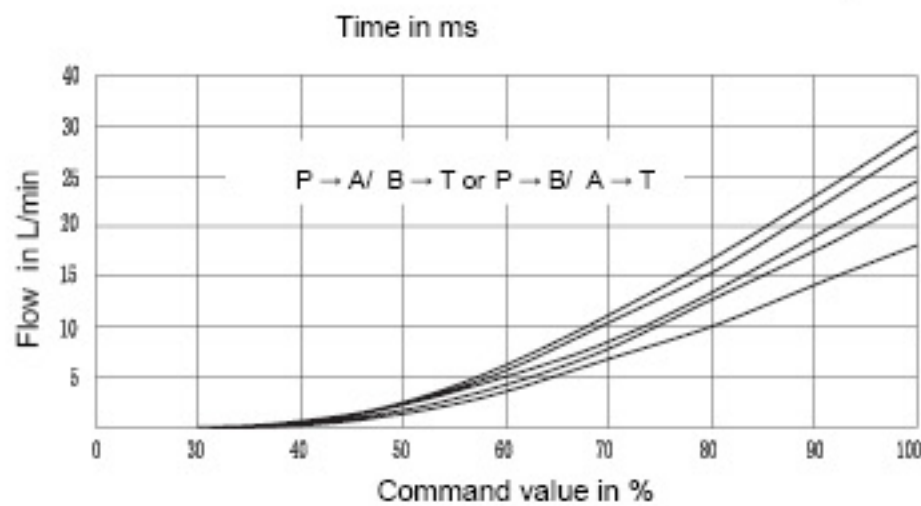
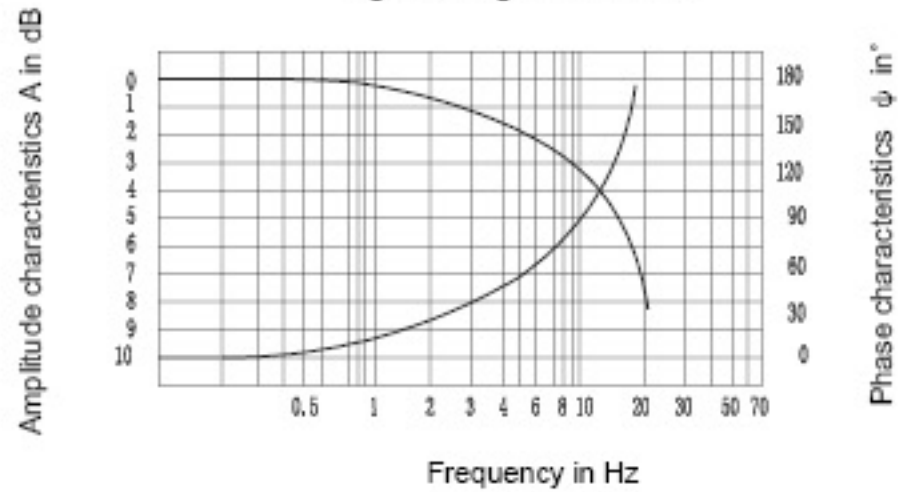
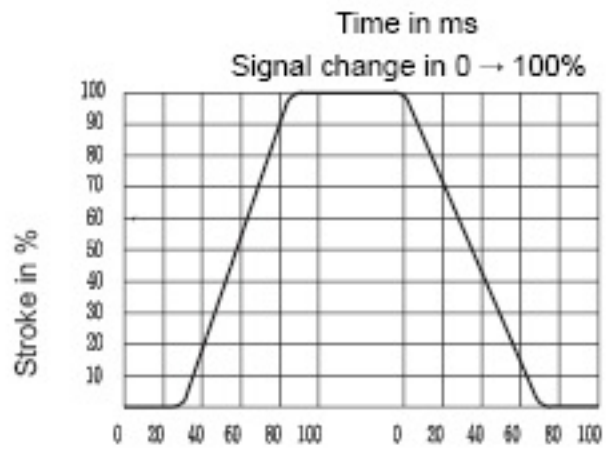
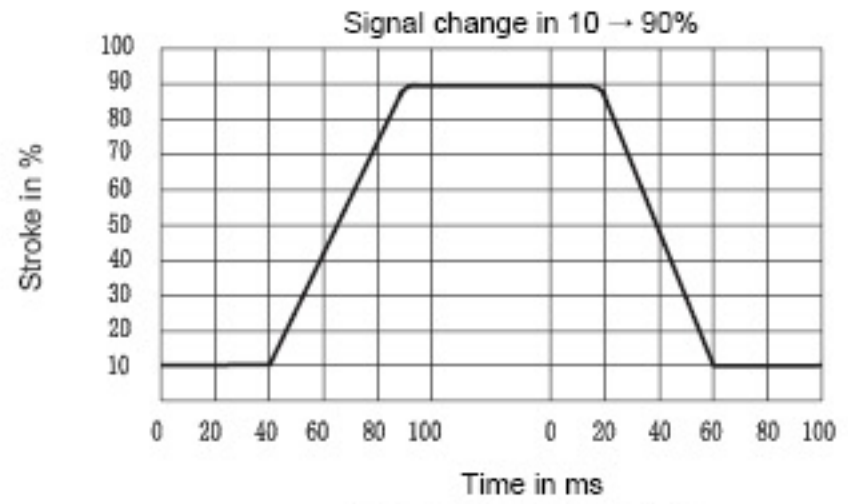
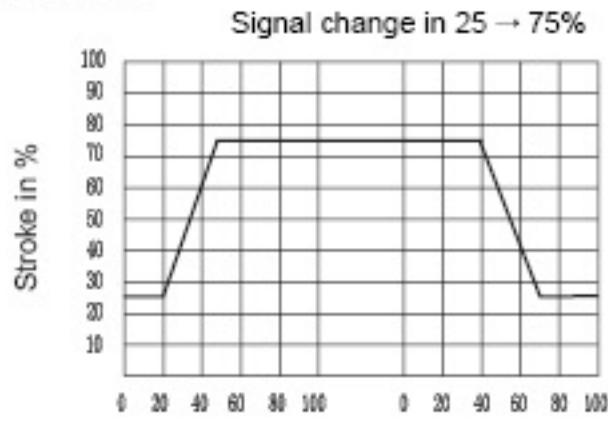
17L/min Nominal flow at 1MPa valve pressure difference

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

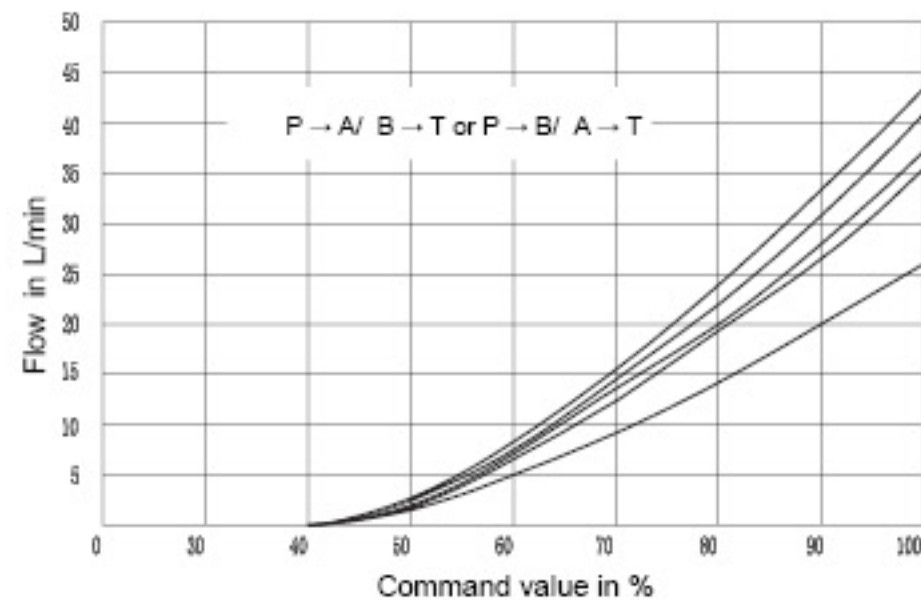
Pv = Pressure drop across valve
(Input pressure minus load pressure and return pressure)

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

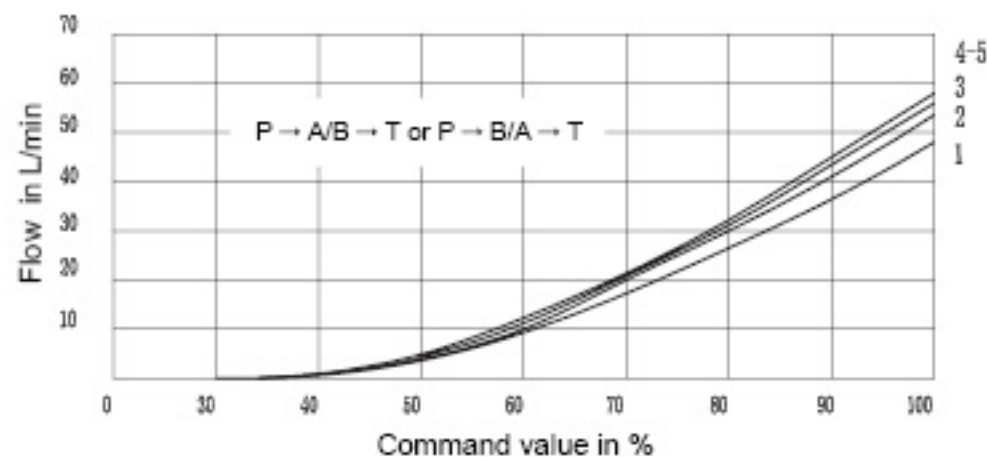
Type 4WRA10



- 18L/min Nominal flow at 1MPa valve pressure difference
- 1 $P_v = 1\text{MPa}$ constant
- 2 $P_v = 2\text{MPa}$ constant
- 3 $P_v = 3\text{MPa}$ constant
- 4 $P_v = 5\text{MPa}$ constant
- 5 $P_v = 10\text{MPa}$ constant



- 27L/min Nominal flow at 1MPa valve pressure difference
- 1 $P_v = 1\text{MPa}$ constant
- 2 $P_v = 2\text{MPa}$ constant
- 3 $P_v = 3\text{MPa}$ constant
- 4 $P_v = 5\text{MPa}$ constant
- 5 $P_v = 10\text{MPa}$ constant



- 50 L/min Nominal flow at 1MPa valve pressure difference
- 1 $P_v = 1\text{MPa}$ constant
- 2 $P_v = 2\text{MPa}$ constant
- 3 $P_v = 3\text{MPa}$ constant
- 4 $P_v = 5\text{MPa}$ constant
- 5 $P_v = 10\text{MPa}$ constant

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

Power Limits:

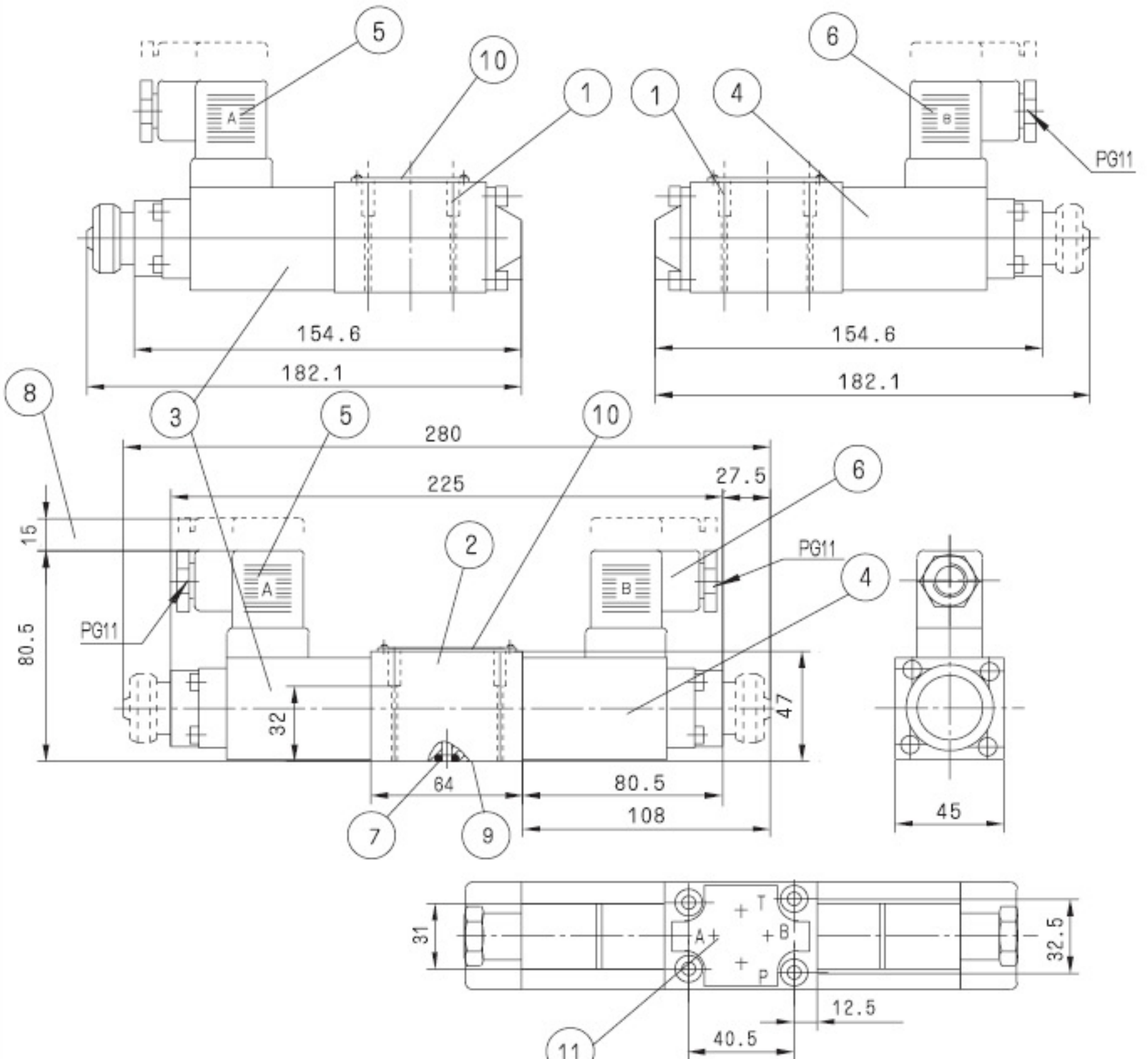
Type 4WRA6 power limits of

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

Type 4WRA10 Power limits of

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

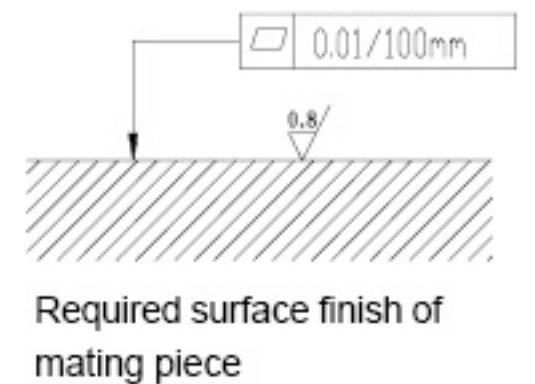
Note:()Valves in brackets are applicable for double flow through the valve
 (*)Because of the max.tank pressure of 24MPa double flow throught the valve is in possible .

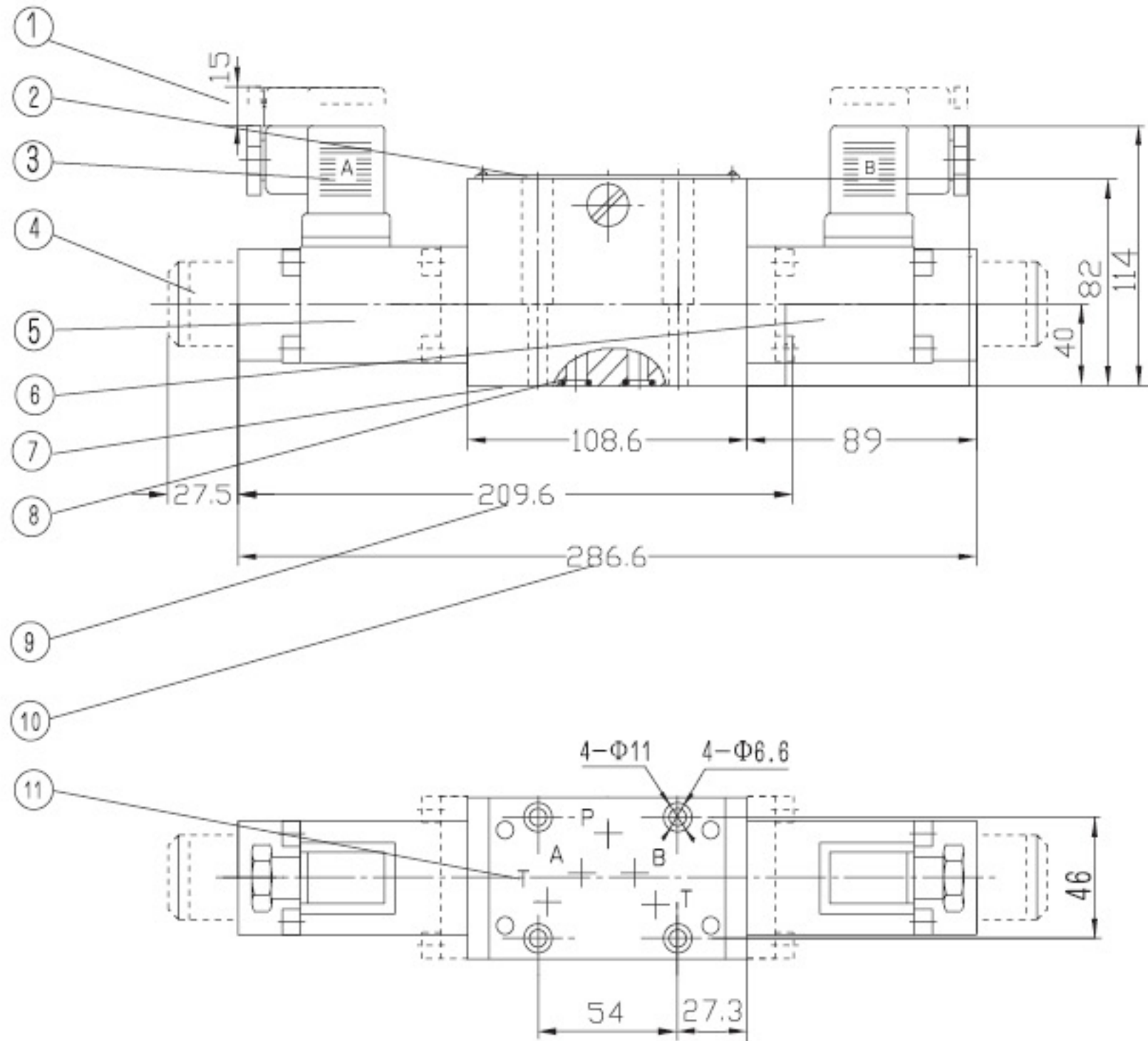


- (1) two control positions valve
- (2) three control positions valve
- (3) Proportional solenoid "a"
- (4) Proportional solenoid "b"
- (5) Plug (grey)
- (6) Plug (black)
- (7) O-ring 9.25X1.78
- (8) Space required to remove the plug
- (9) Valve mounting face with ports positions
- (10) Nameplate
- (11)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

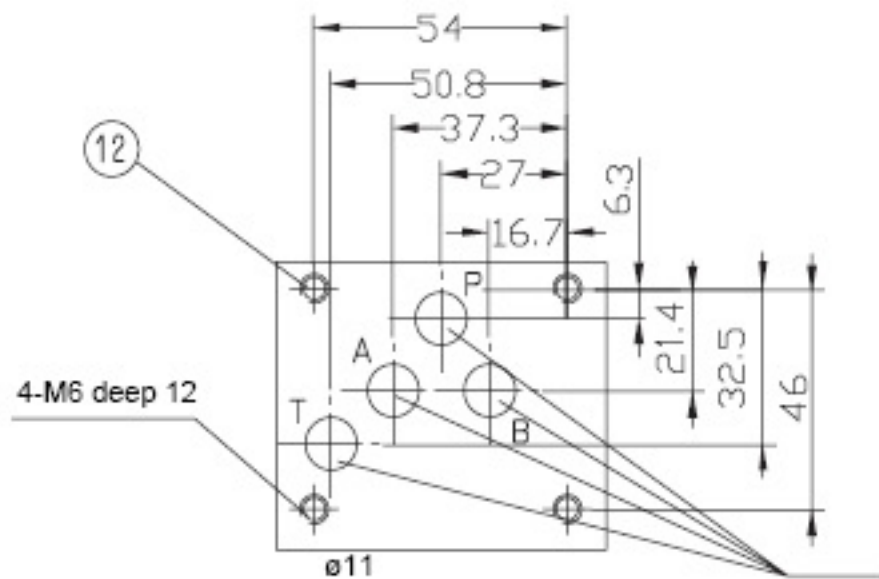
Subplates :G341/01;G342/01;
G502/01

see Page 80





- (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

