



4/2- and 4/3-way proportional directional valves, direct actuated, without electrical feedback, Type 4WRA

RE 29053/08.00

Size 6, 10

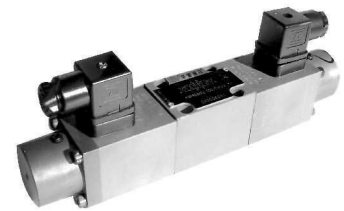
up to 31.5 MPa

up to 95 L/min

Replaces:

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
- Mounting pattern to DIN 24 340 form A, Iso4401



Type 4WRA . . . 10B/24Z4/ . . .

Function, section

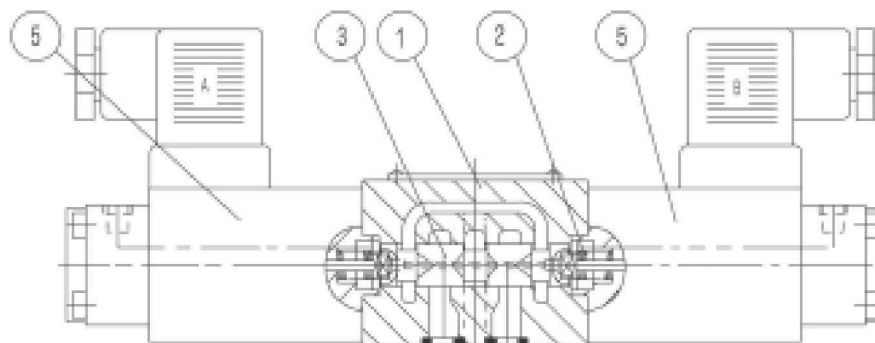
Type 4WRA directional control valves are direct-operated via proportional solenoids and are used to control the direction and quantity of a flow.

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)

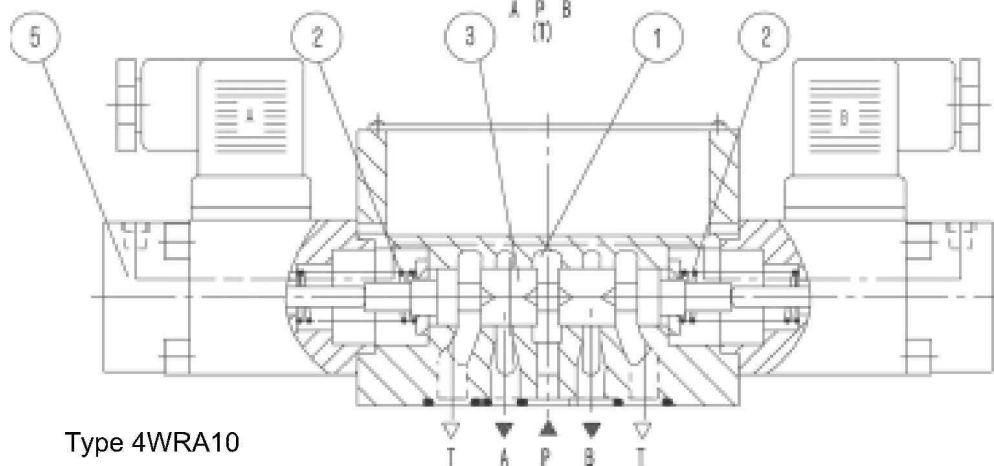
Type 4WRA₁₀10B/.....(3-position valve)

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



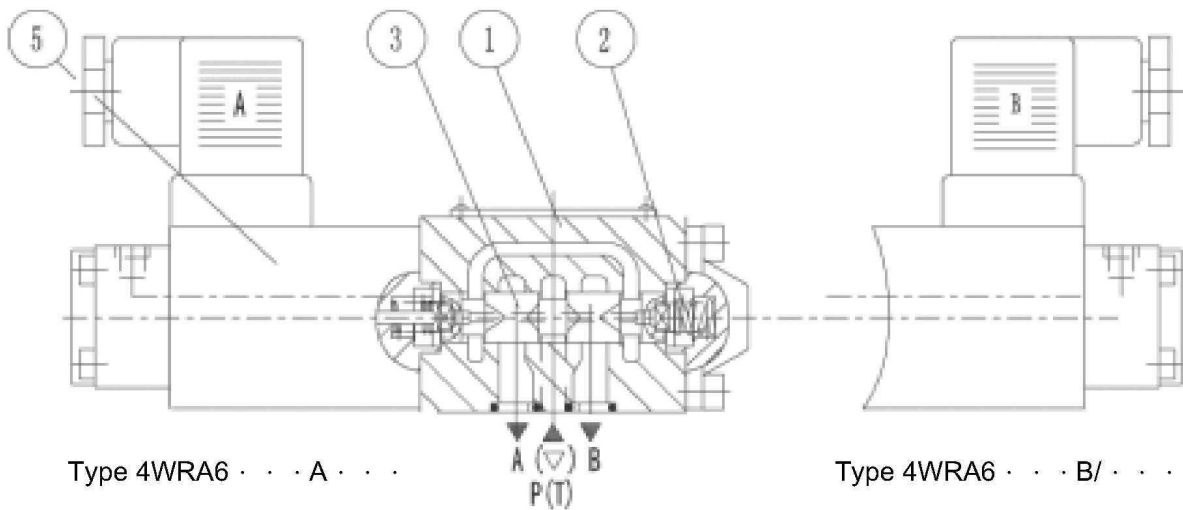
Type 4WRA10

4WRA⁶₁₀ ...^A/_B...10 (2-position valve)

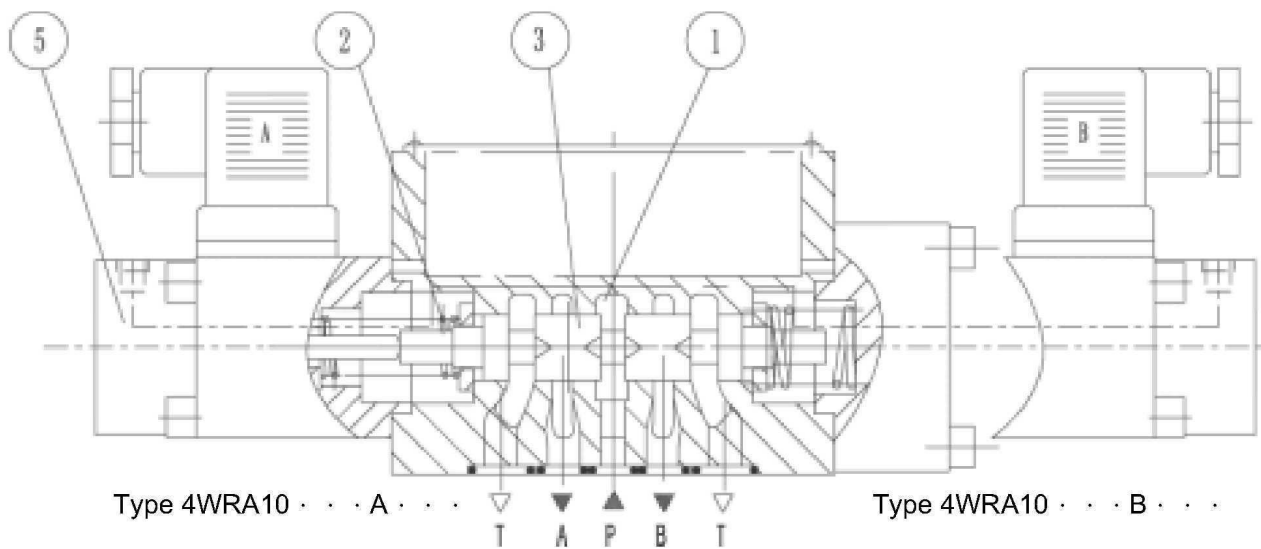
The function of this valve is the same as that for valve type 4WRA. But it's 2-position directional valve with only one proportional solenoid.

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.



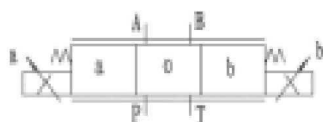
Type 4WRA6^A/_B . . . 10B/ . . .



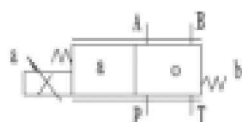
Type 4WRA10^A/_B . . . 10B/ . . .

Symbols

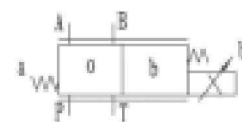
Type 4WRA . . . 10B/ . . .
Proportional valve (3-positions)



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



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



Ordering Code

4WRA 10 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

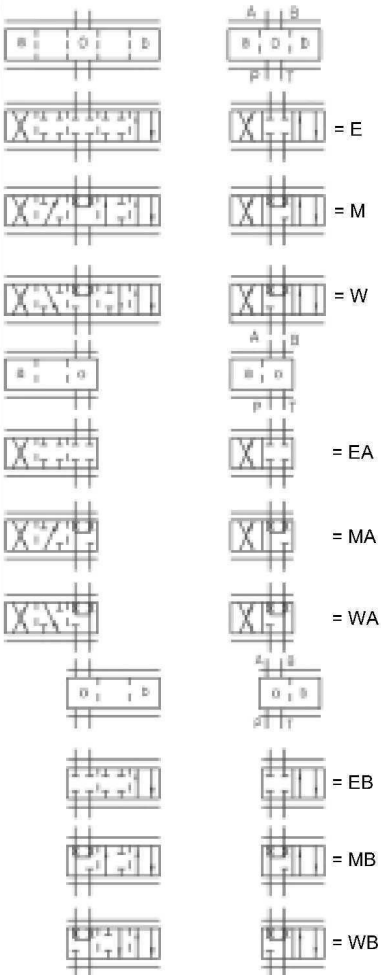
No code = Without special insulation
J = Seawater resistant

no code = Without emergency operator
N = with emergency operator

G24 = 24 VDC

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

Symbols



Nominal flow at 1Mpa valve pressure difference

Size 6

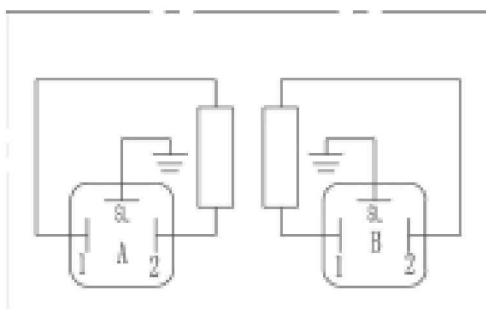
5=	8L/min
10=	13L/min
20=	17L/min

Size 10

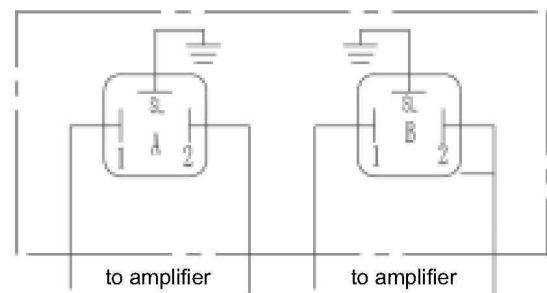
10=	18L/min
20=	27L/min
40=	50L/min

Electrical connection with type 4WRA

Coil connection



plug-in connection



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

Hydraulic data

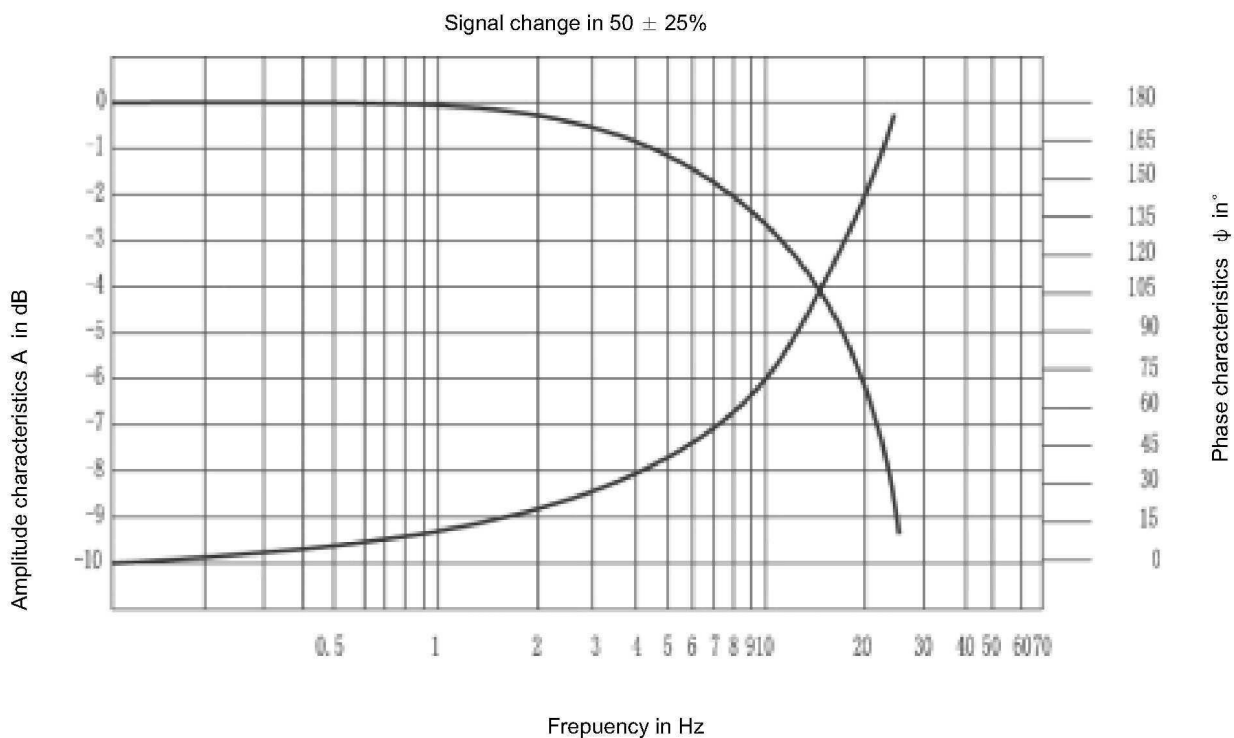
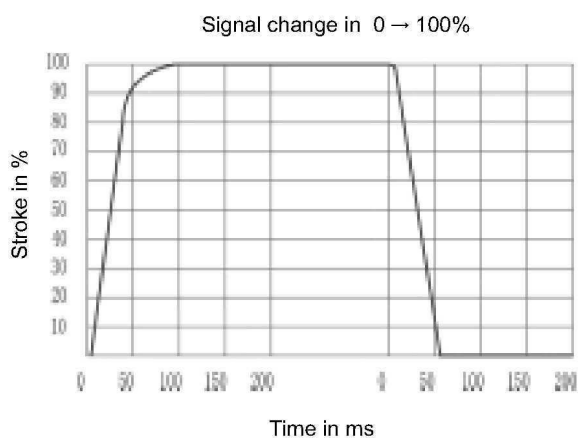
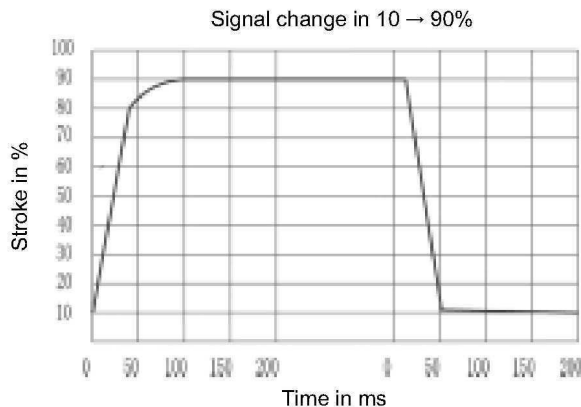
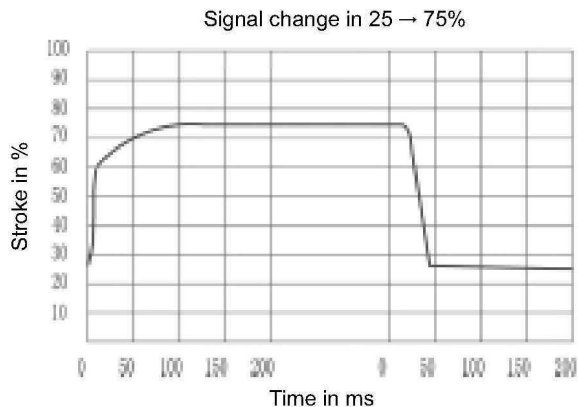
size		6	10
Operating pressure (MPa)	port A,B,P	31.5	31.5
	port T	16	16
Flow (L/min)		43	95
Degree of contamination		≤ 20(recommend ≤ 10)	
Hysteresis (%)		< 6	< 5
Repeatability (%)		< 3	< 2
Frequency reponse(-3dB,signal ± 100%) (Hz)		6	4
Pressure fluid		Mineral oil(for NBR seal),Phosphate ester (for FPM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

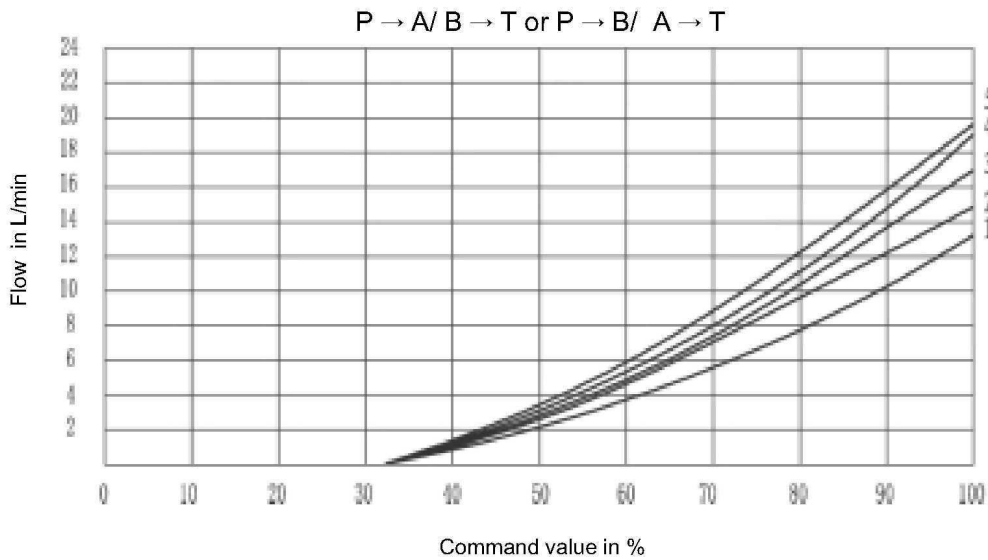
size		6	10
Voltage type		Direct voltage	Direct voltage
Nominal voltage (V)		24	
Max. current per solenoid (A)		1.5	
Solenoid coil resistance (Ω)	Cold value at 20°C	5.4	10
	Max. warm value	8.1	15
Environment temperature (°C)		up to +50	
Coil temperature (°C)		up to +150	
Insulation of valve to DIN 40 050		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

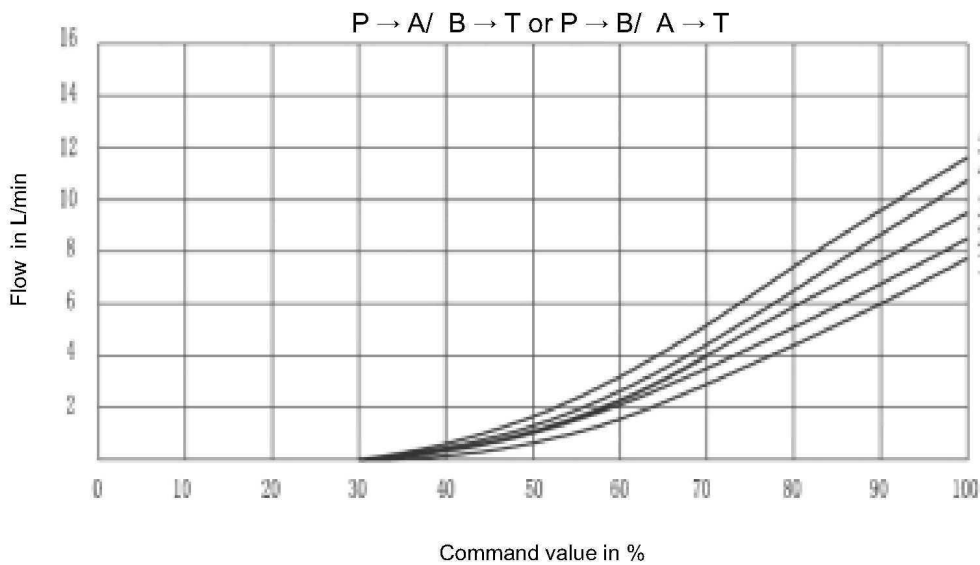


Characteristic curves: (measured at $v = 36 \times 10^{-6} \text{m}^2/\text{S}$ and $t=50^\circ\text{C}$)



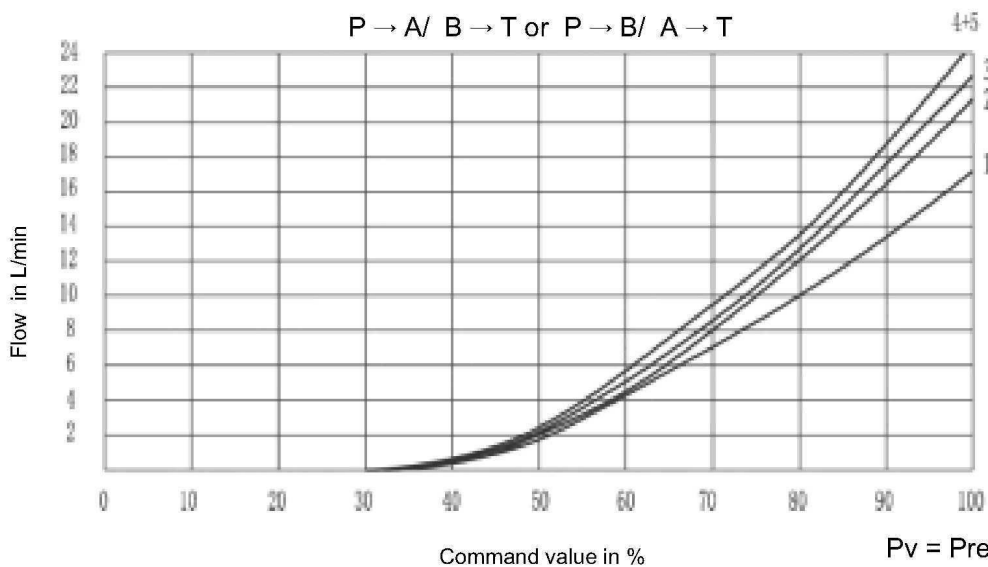
13L/min Nominal flow at
1MPa valve pressure dif-
ference

- 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



8L/min Nominal flow at
1MPa valve pressure dif-
ference

- 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



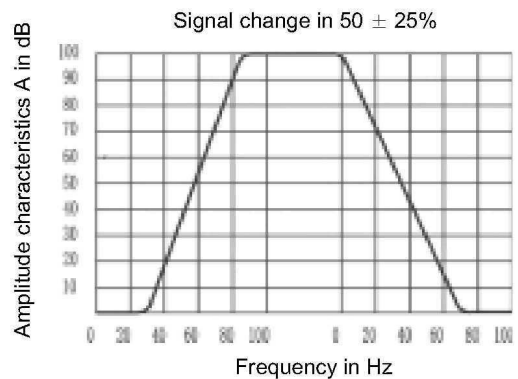
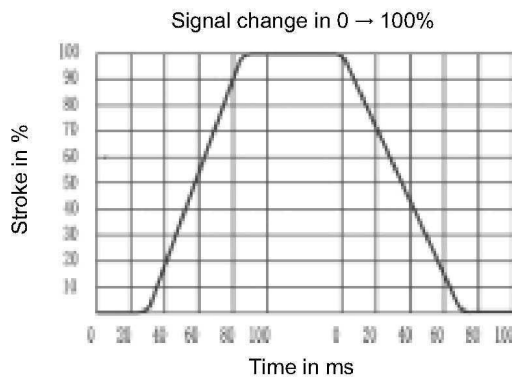
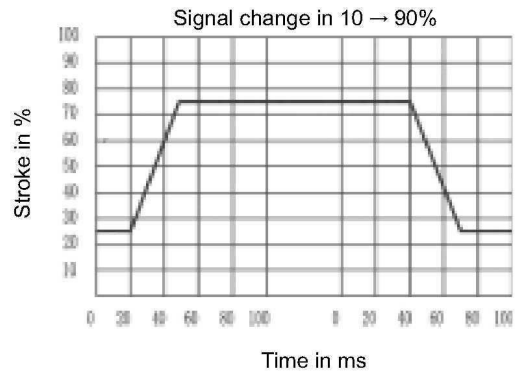
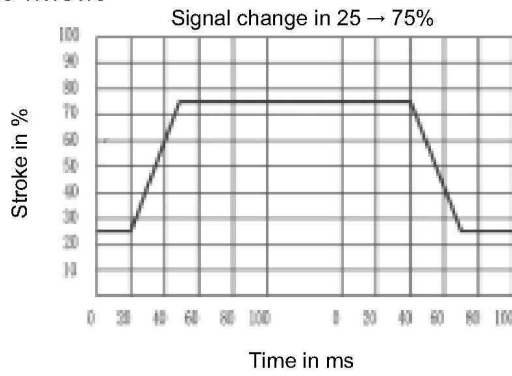
17L/min Nominal flow at
1MPa valve pressure dif-
ference

- 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

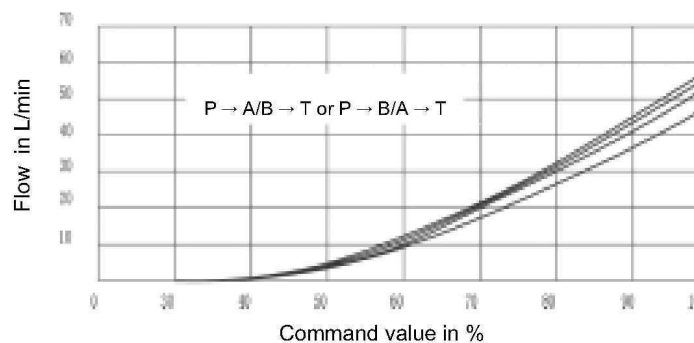
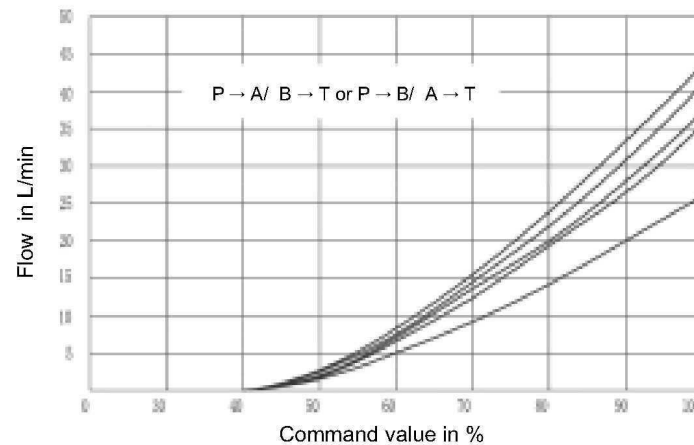
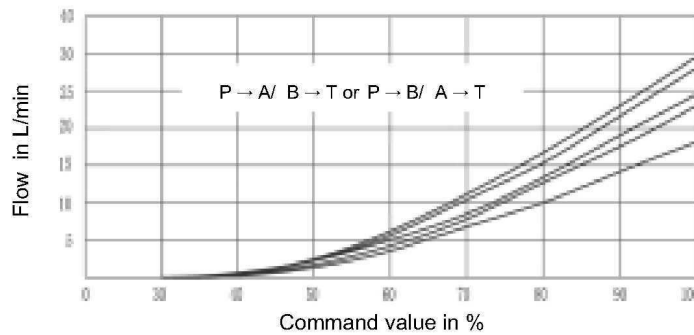
$P_v =$ Pressure drop across valve
(Input pressure minus load pressure
and return pressure)

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

Type 4WRA10



Phase characteristics ϕ in °



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

Power Limits:

Type 4WRA6 power limits of

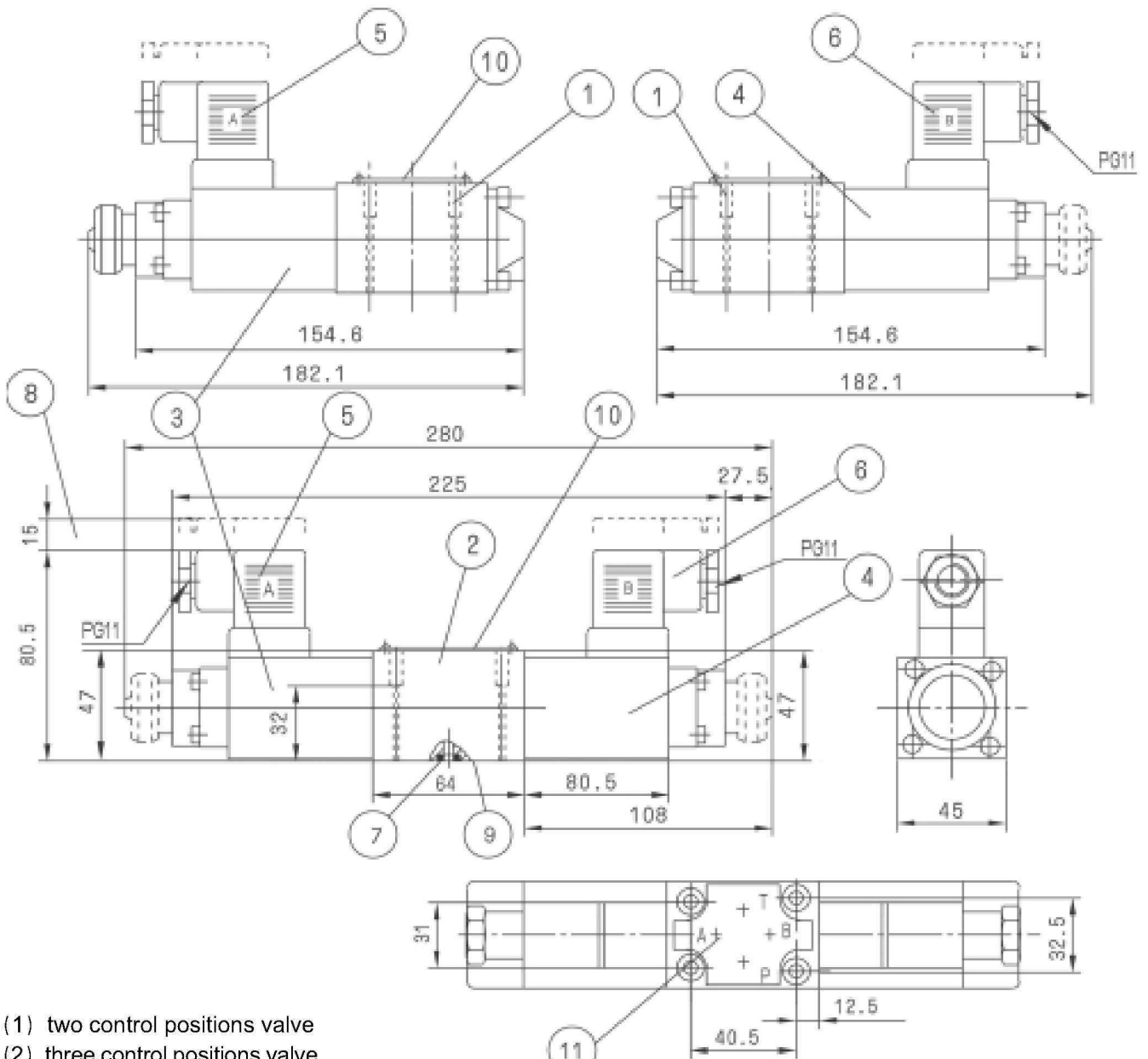
Flow (L/min) Symbol	Pressure (MPa)				
	6	12	16	24	31.5
E.M.W5 EA.MA.WA5 EB.MB.WB5	13 (27)	14 (27)	14 (27)	14 (26)	14 (*)
E.M.W10 EA.MA.WA10 EB.MB.WB10	20 (40)	20 (37)	19 (34)	17 (31)	16 (*)
E.M.W20 EA.MA.WA20 EB.MB.WB20	22 (43)	22 (37)	20 (34)	19 (32)	18 (*)

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

(*)Because of the max.tank pressure of 24MPa double flow throught the valve is in possible.

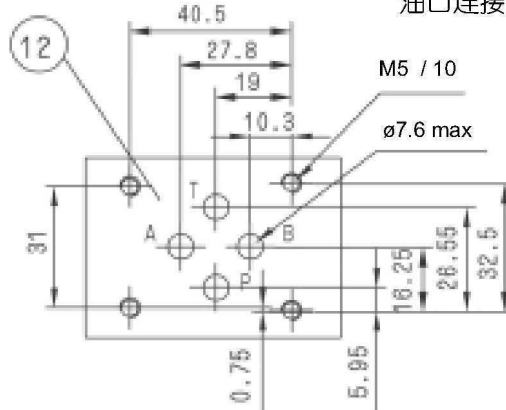


- (1) two control positions valve
- (2) three control positions valve
- (3) Proportional solenoid "a"
- (4) Proportional solenoid "b"
- (5) Plug (grey)
- (6) Plug (black)
- (7) O-ring 9.25X1.78
- (8) Space required to remove the plug
- (9) Valve mounting face with ports positions
- (10) Nameplate
- (11)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

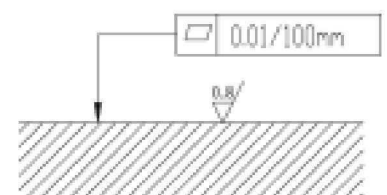
Subplates : G341/01; G342/01;
G502/01

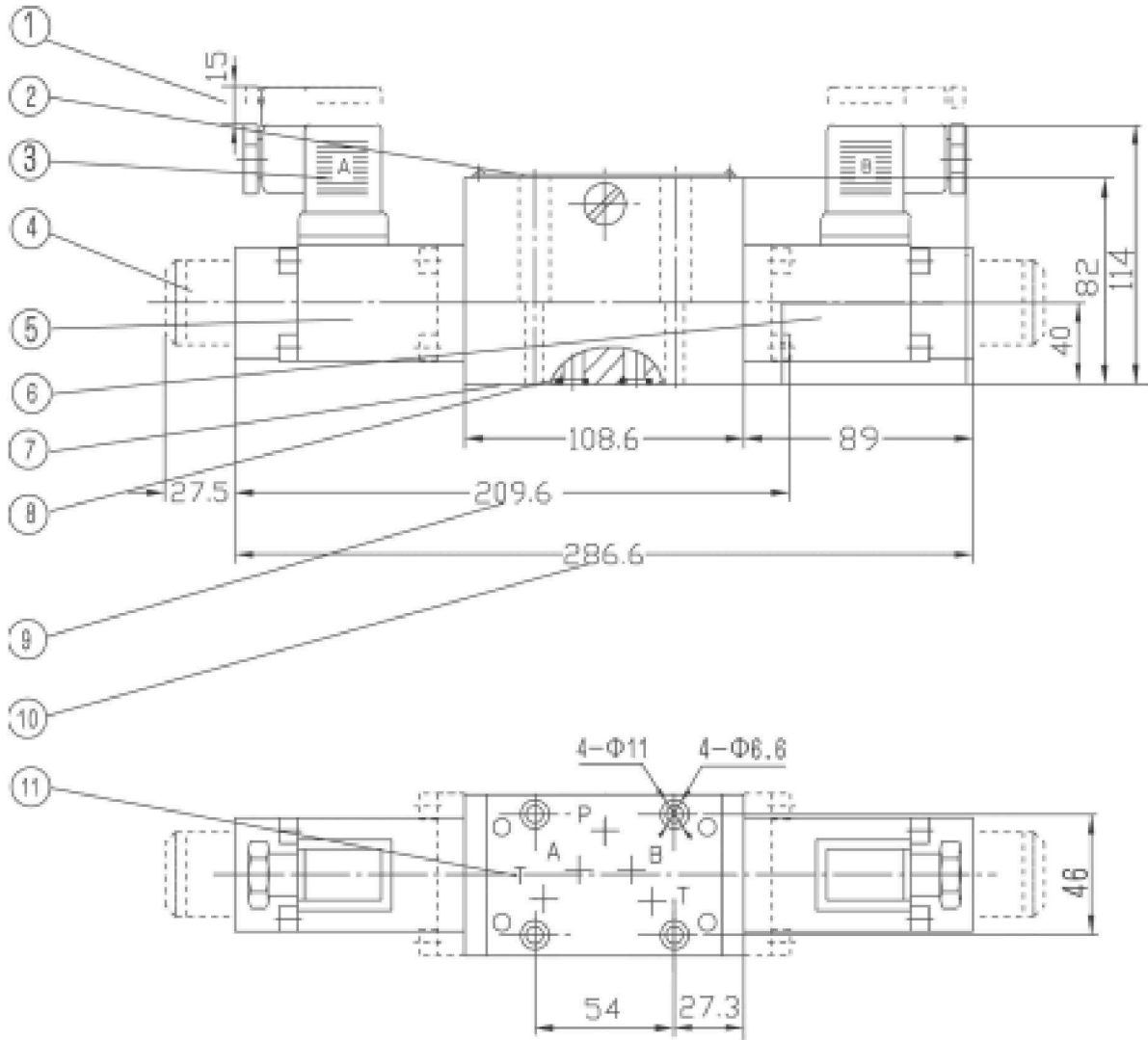
see Page 80

油口连接面尺寸

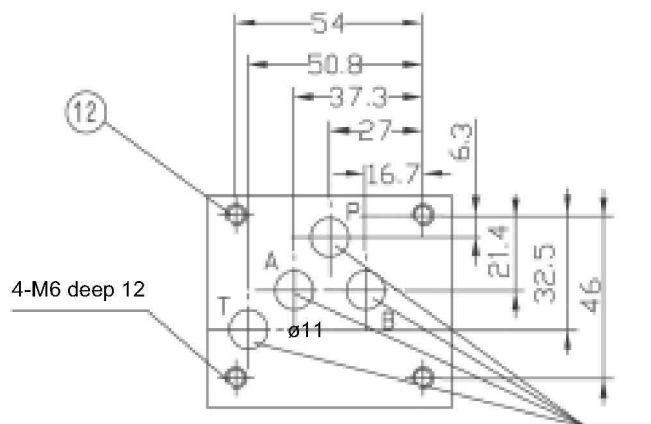


Required surface finish of mating piece





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