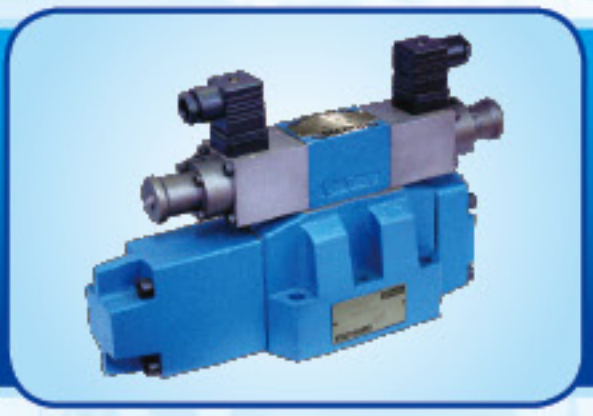


Huade

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 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/ · · ·

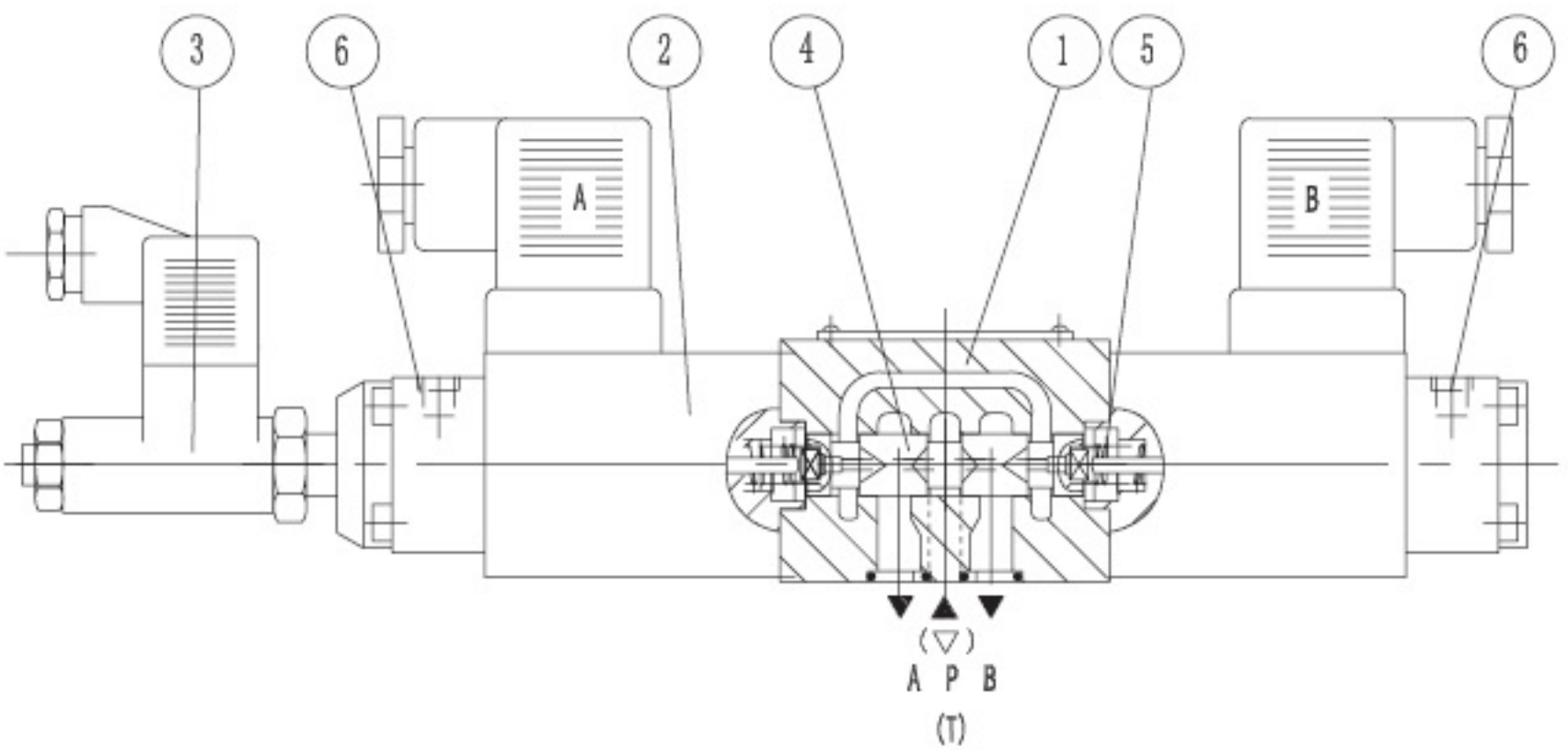
Function ,Section

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

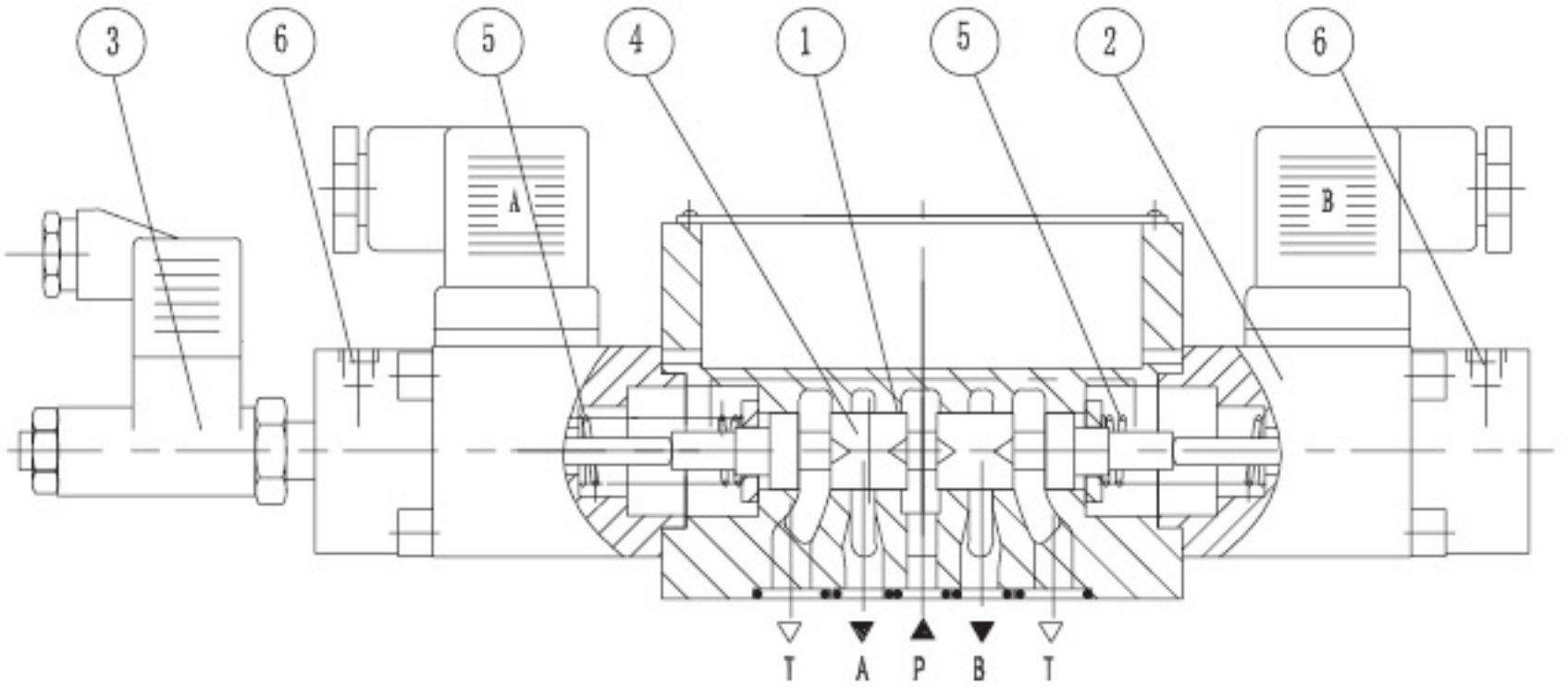
They consist basically of housing (1), control spool (4), two return springs (5), two proportional solenoids (2) and a positional transducer (3).

Type 4WRE $^{6}_{10}$ · · · 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).

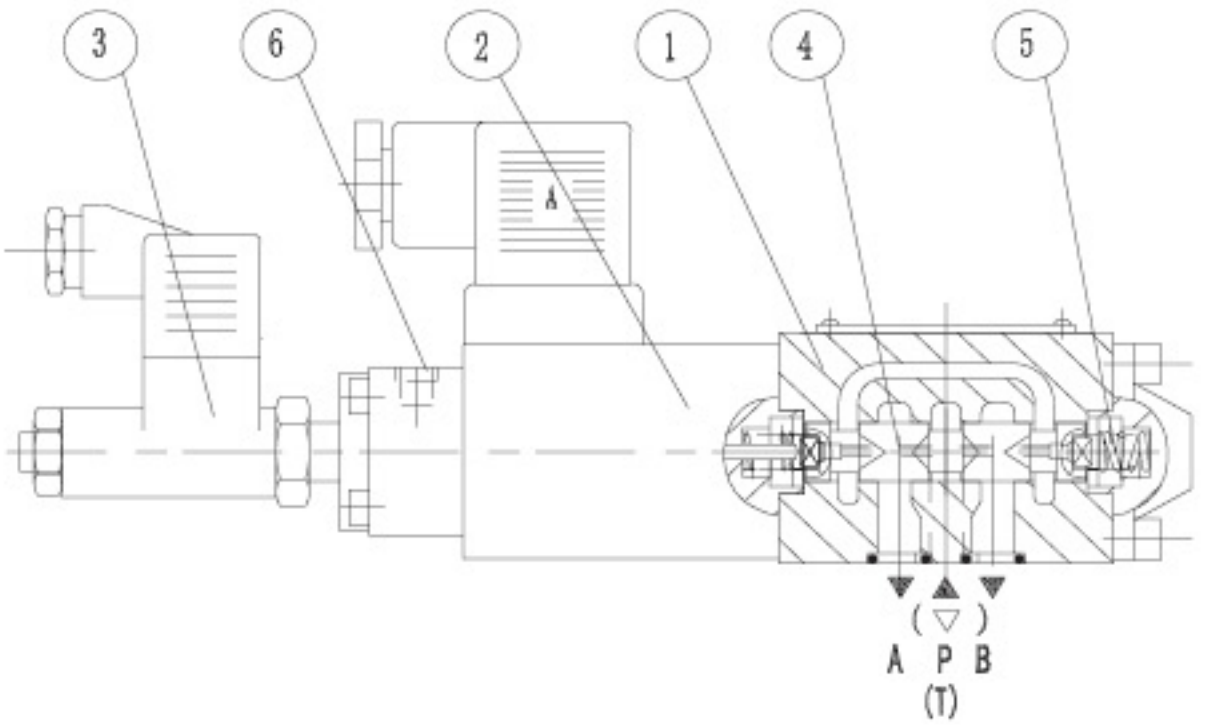


Type 4WRE6

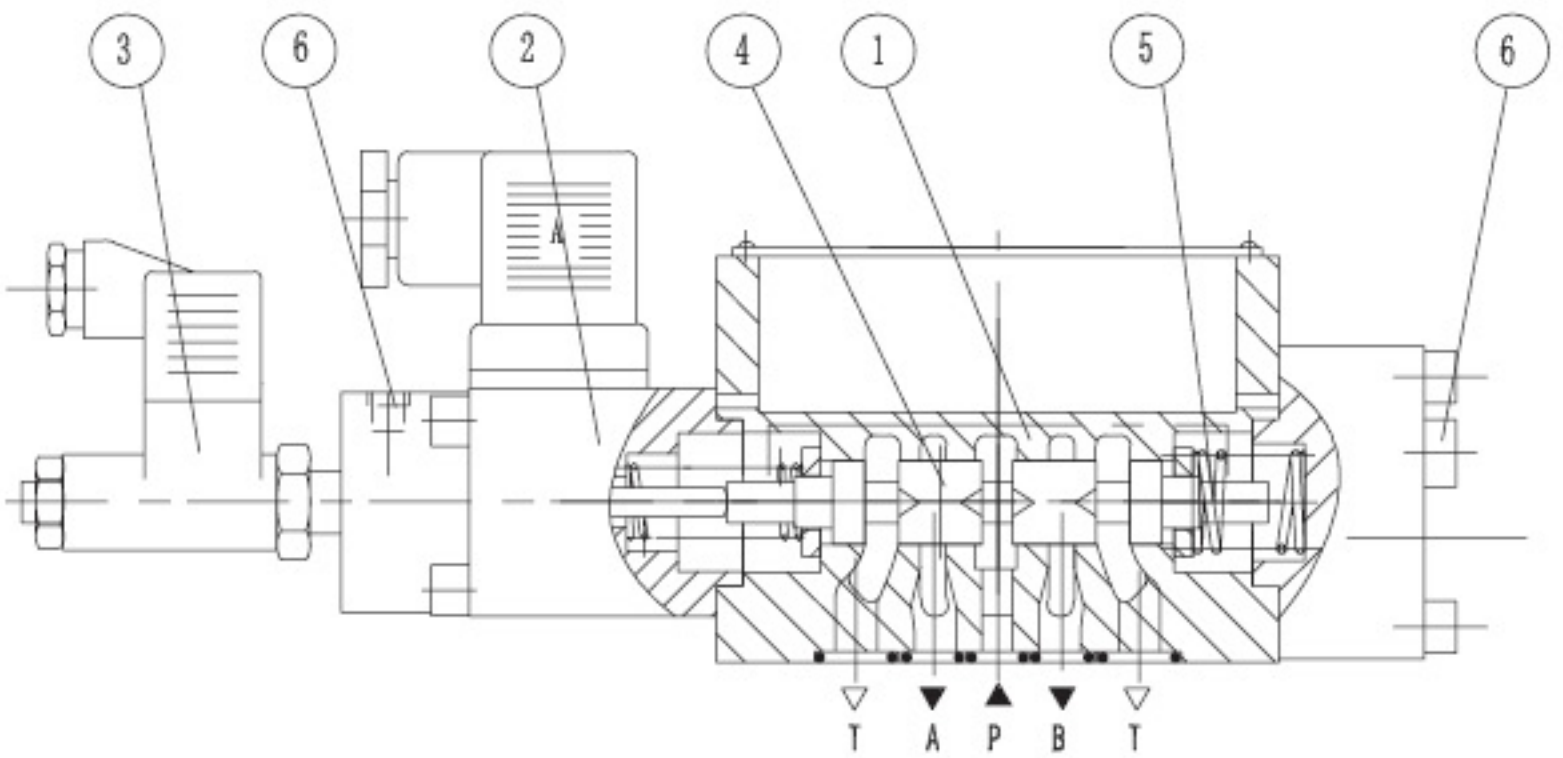


Type 4WRE proportional valve

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

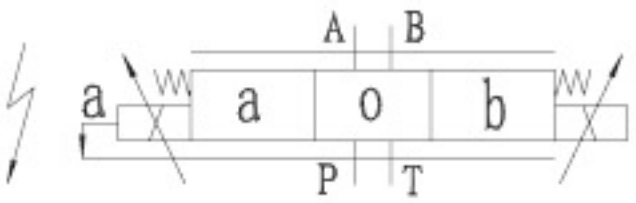


Type 4WRE10...A...10B/...proportional valve

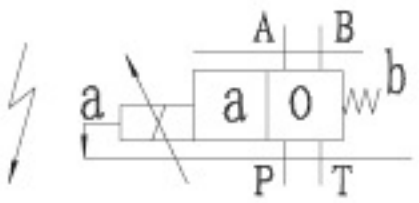
Type 4WRE proportional valve adopts sub-plate mounting,spring center. Good flow capacity,high pressure and excellent repetition precision, convenient for use. The valve is suitable for close circuit, and widely used in machine,light industry, metallurgy,mine,space flight and other field.

Symbols

Type 4WRE...10B..



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

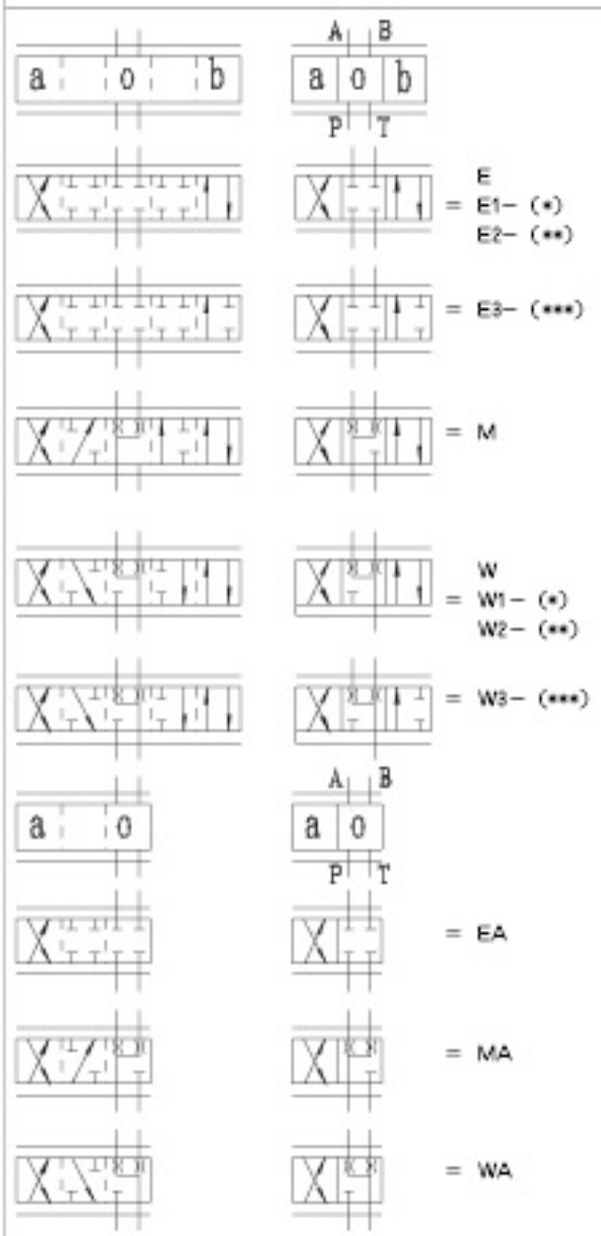


Symbols

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

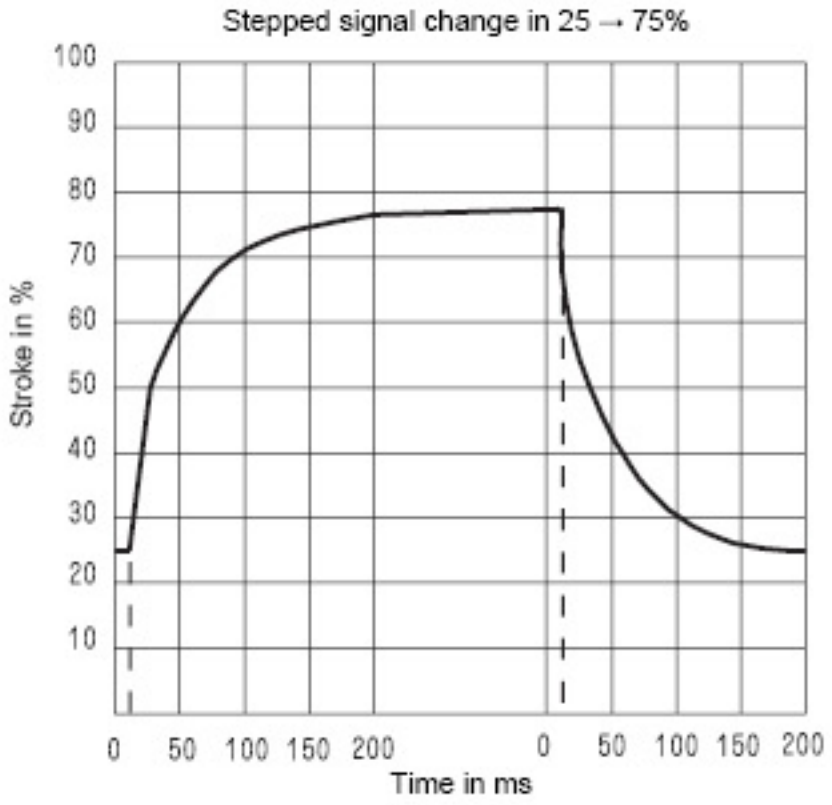
Type of voltage		Direct voltage 24V or 12V	
Max. current per solenoid (A)		1.5	1.5
coil resistance (Ω)	Cold value at 20 ℃	5.4	10
	Max. warm value	8.1	15
Duty		Continuous	
Coil temperature (℃)		+150	
Environment temperature (℃)		+50	
Valve insulation		IP65	
Associated amplifier	with 2 ramp times	VT-5001S20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

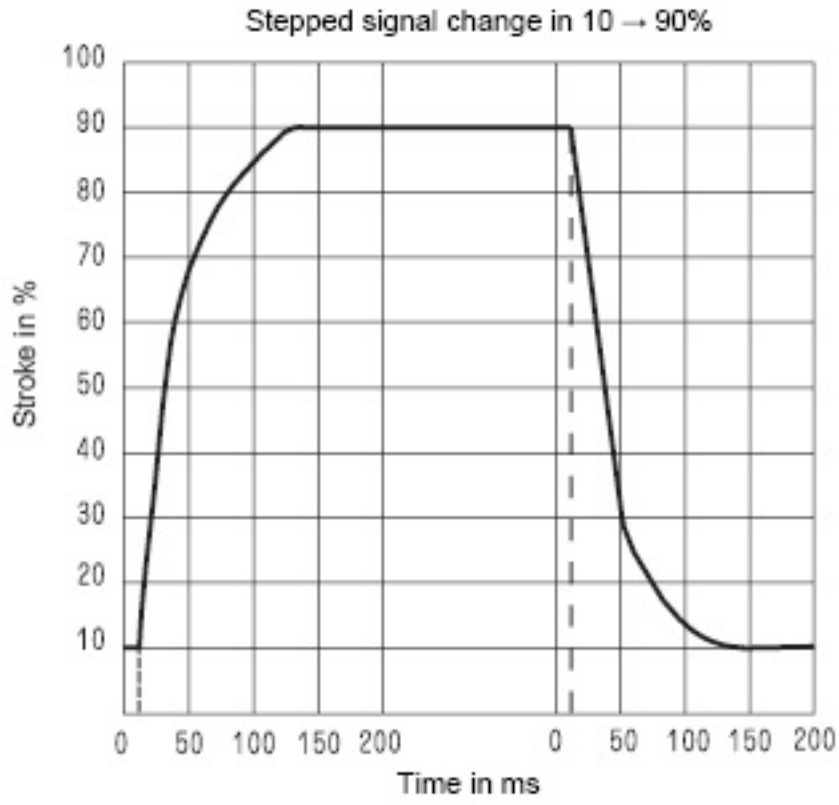
Inductive positional transducer

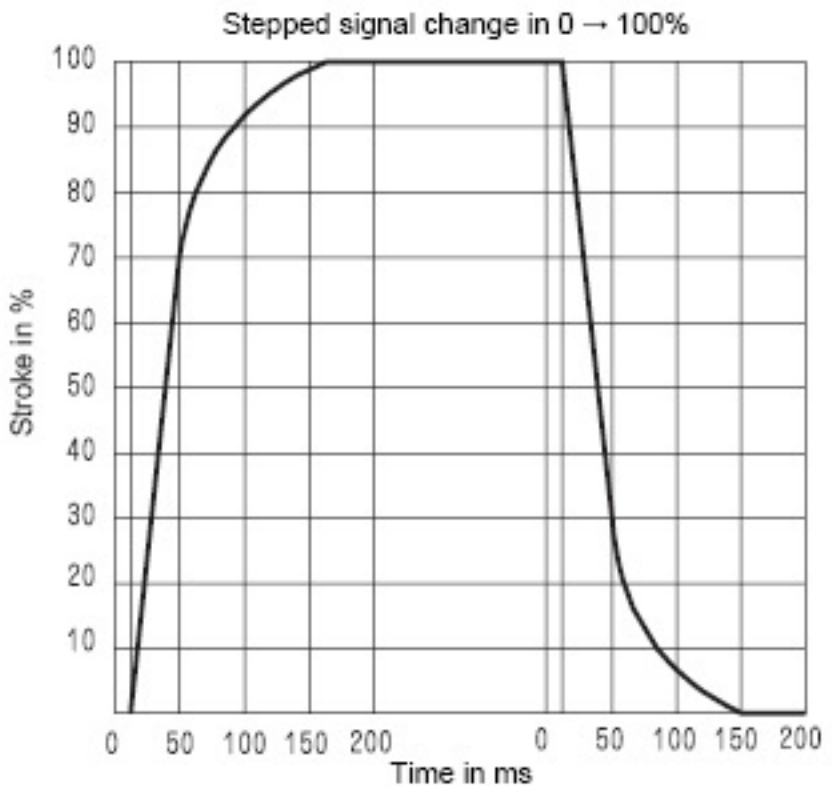
Electrical measuring system		LVDT
Control stroke (mm)		± 4.5 linear
Linearity tolerance (%)		1
Coil resistance(Ω)	Ⅰ R20	56
	Ⅱ R20	56
	Ⅲ R20	112
Inductivity (mH)		6 to 8
Oscillator frequency (KHz)		2.5
Valve insulation		IP65

Transient functions with stepped electrical input signals

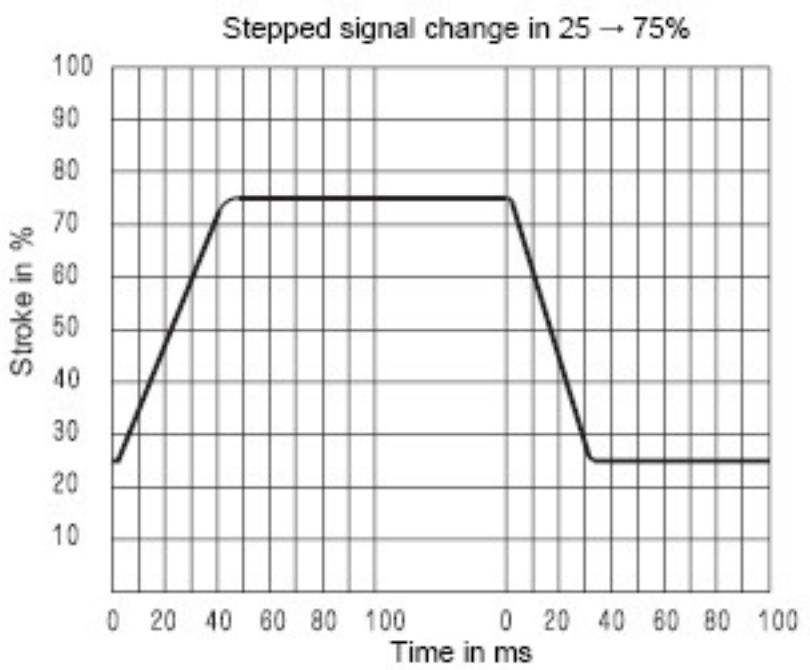
Type 4WRE6

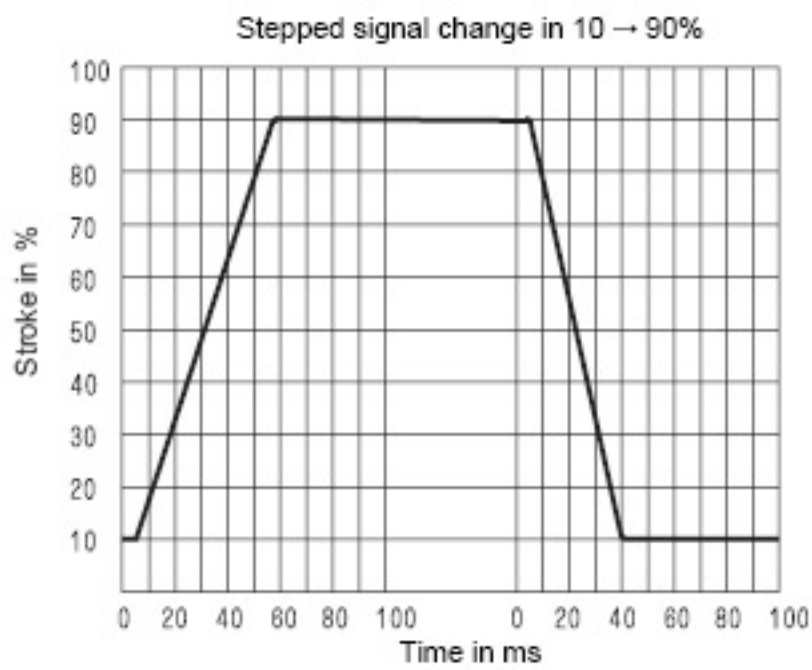


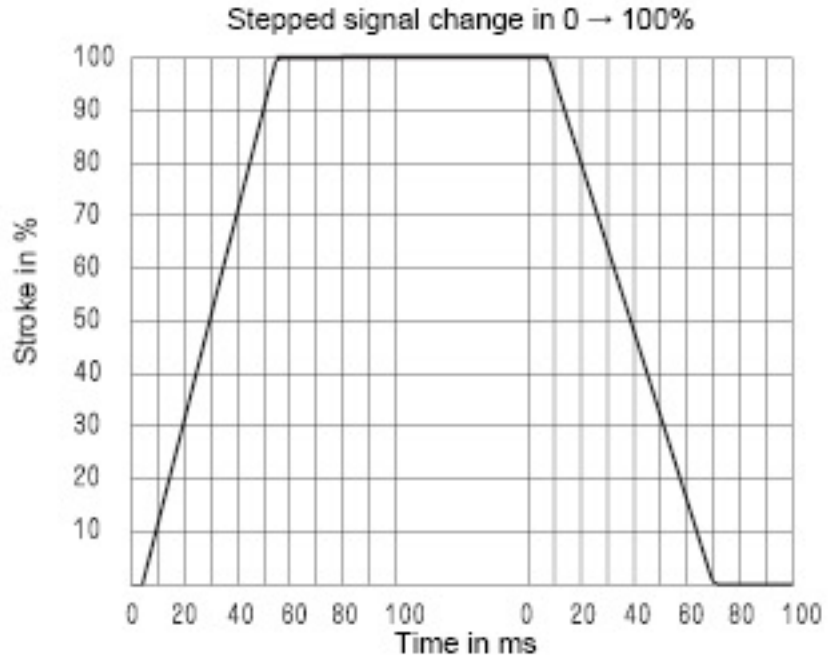




Type 4WRE10

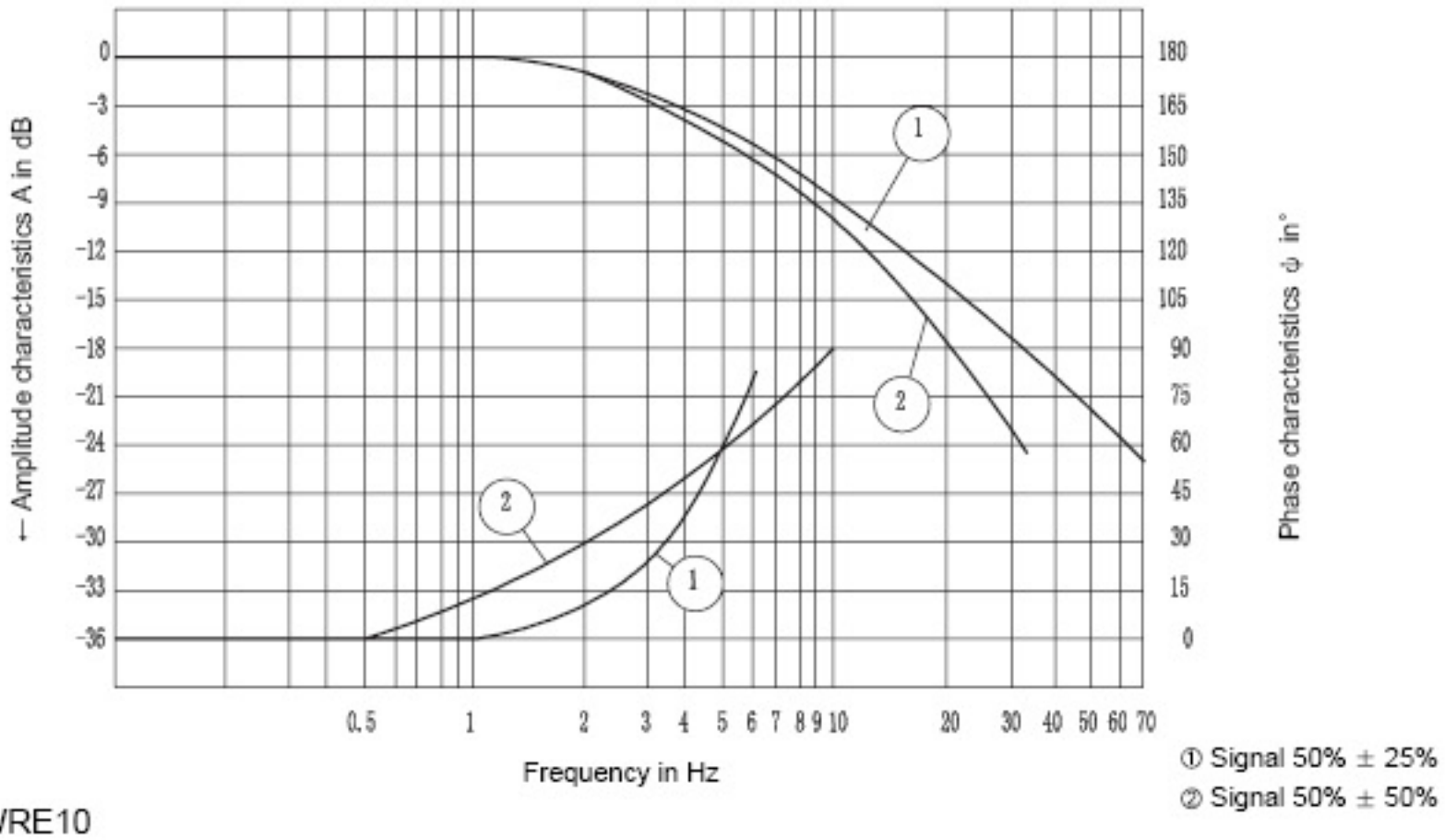






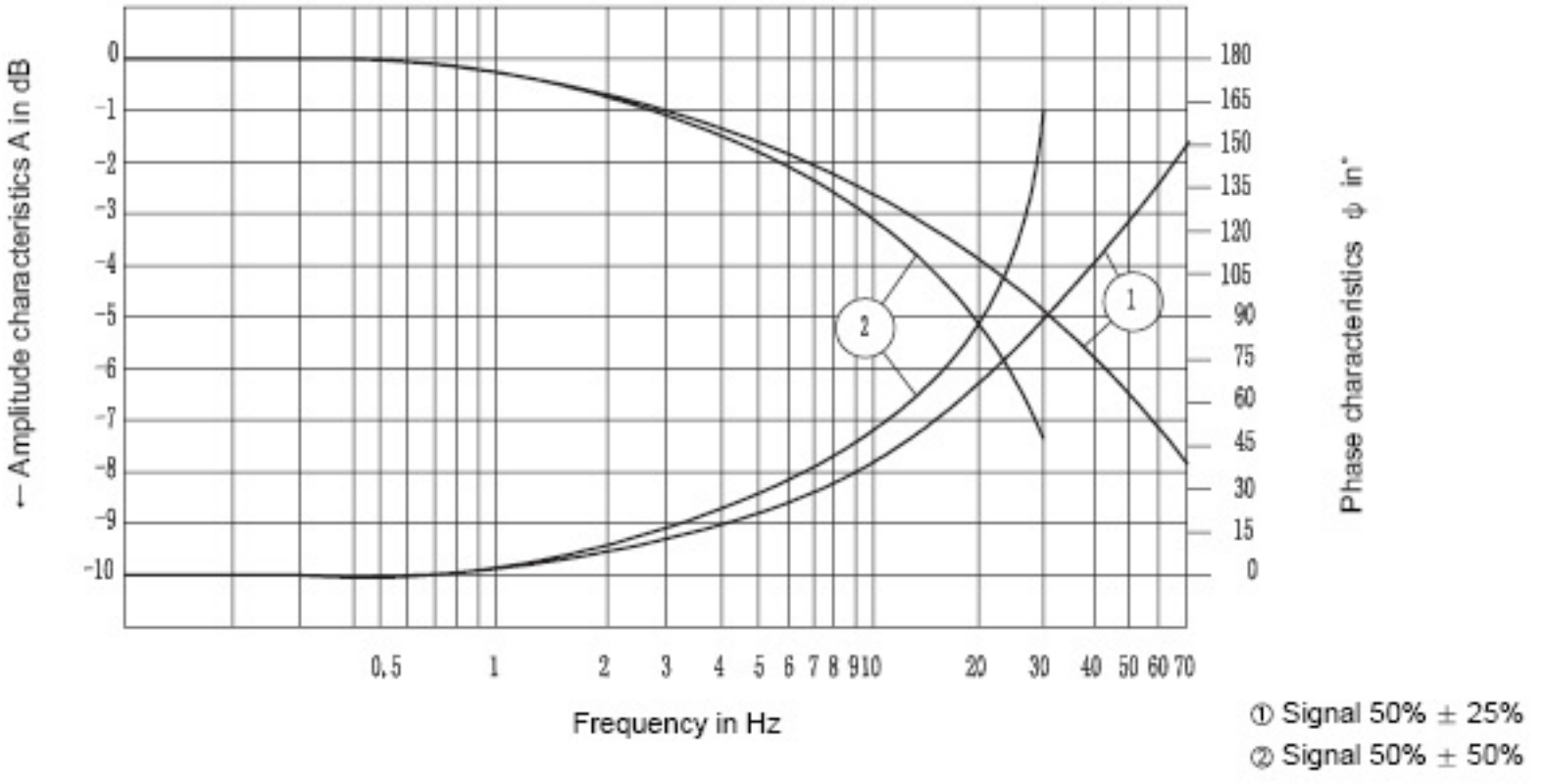
Characteristic curves: (measured at v=36 × $10^{-6}m^2/S$ and t=50°C)

Type 4WRE6



① Signal 50% ± 25%
② Signal 50% ± 50%

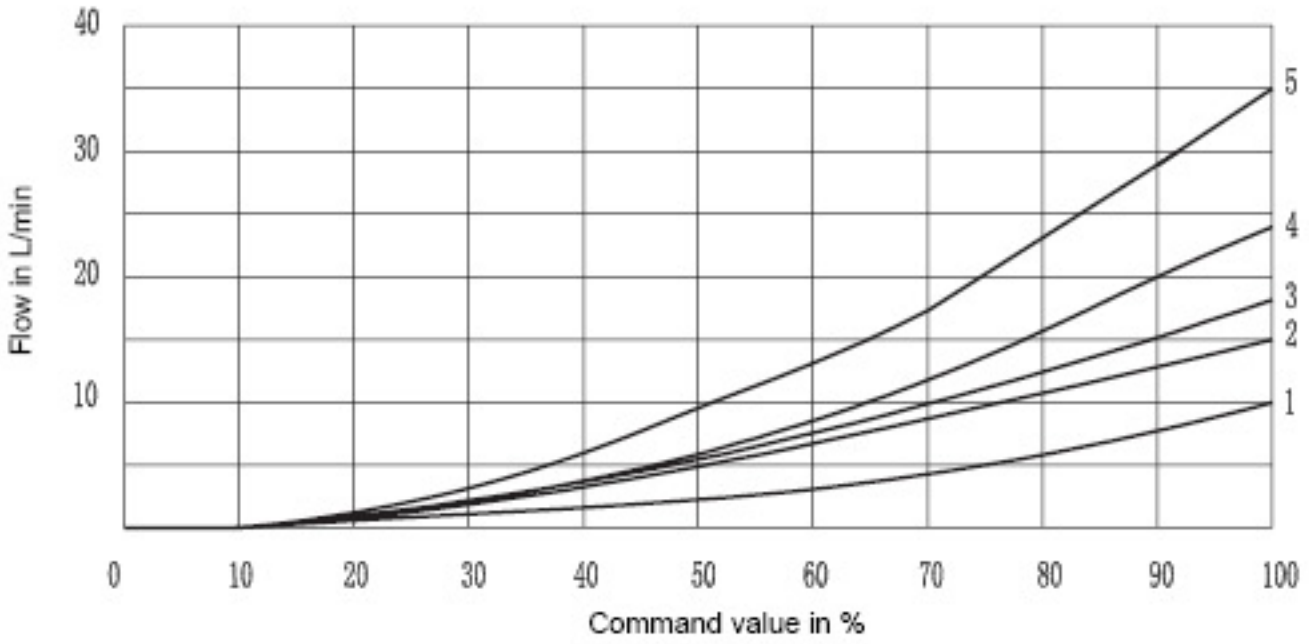
Type 4WRE10



① Signal 50% ± 25%
② Signal 50% ± 50%

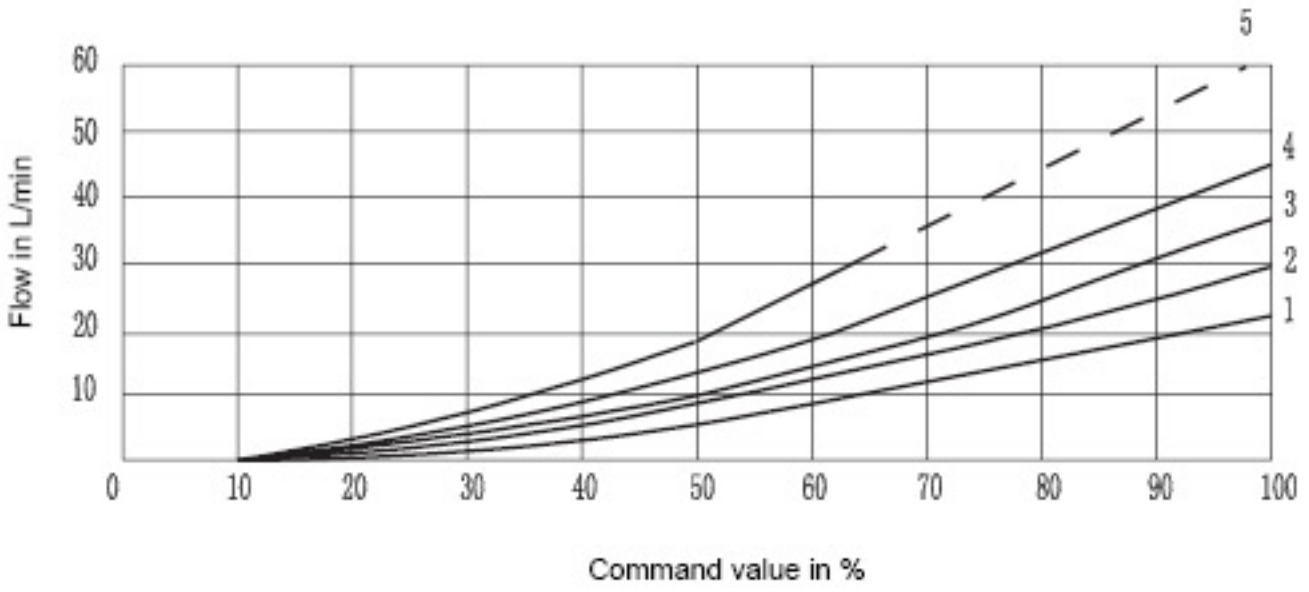
Characteristic curves: (measured at v=36 × $10^{-6}m^2/S$ t=50°C)

Type 4WRE6



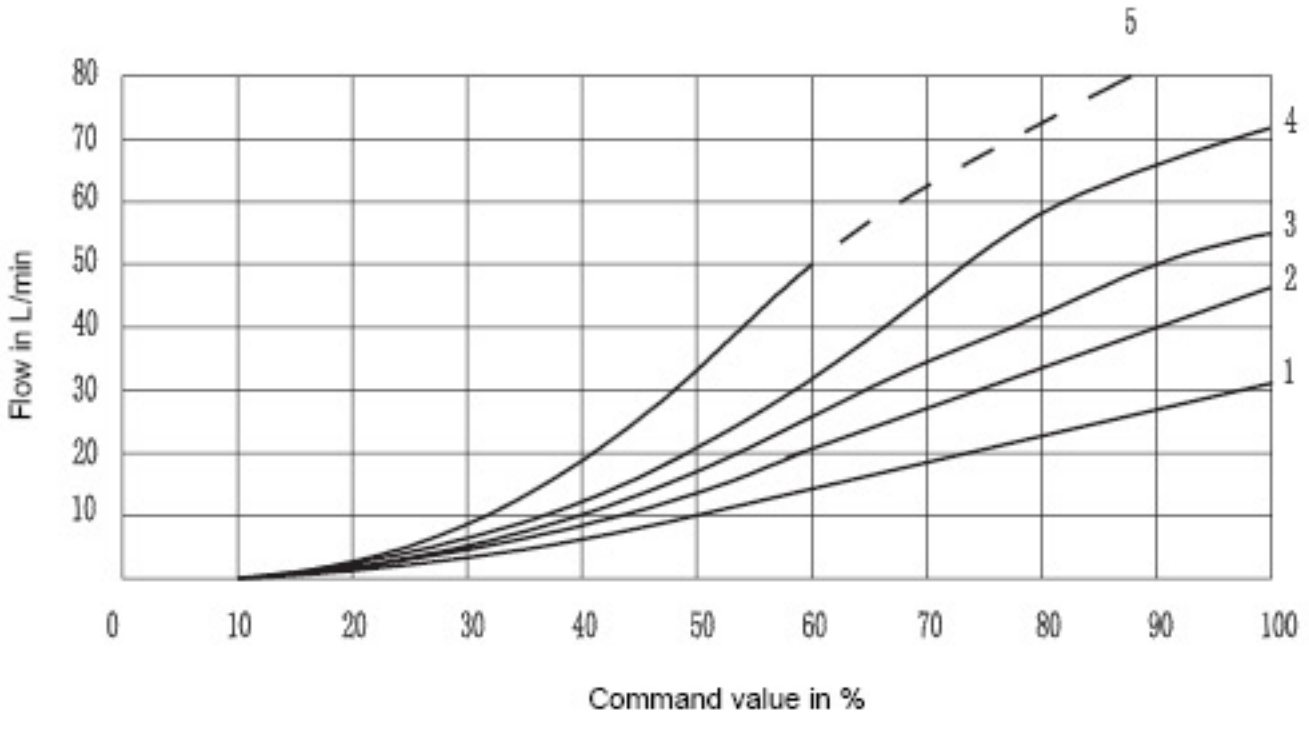
10L/min Nominal flow at 1MPa valve pressure difference

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

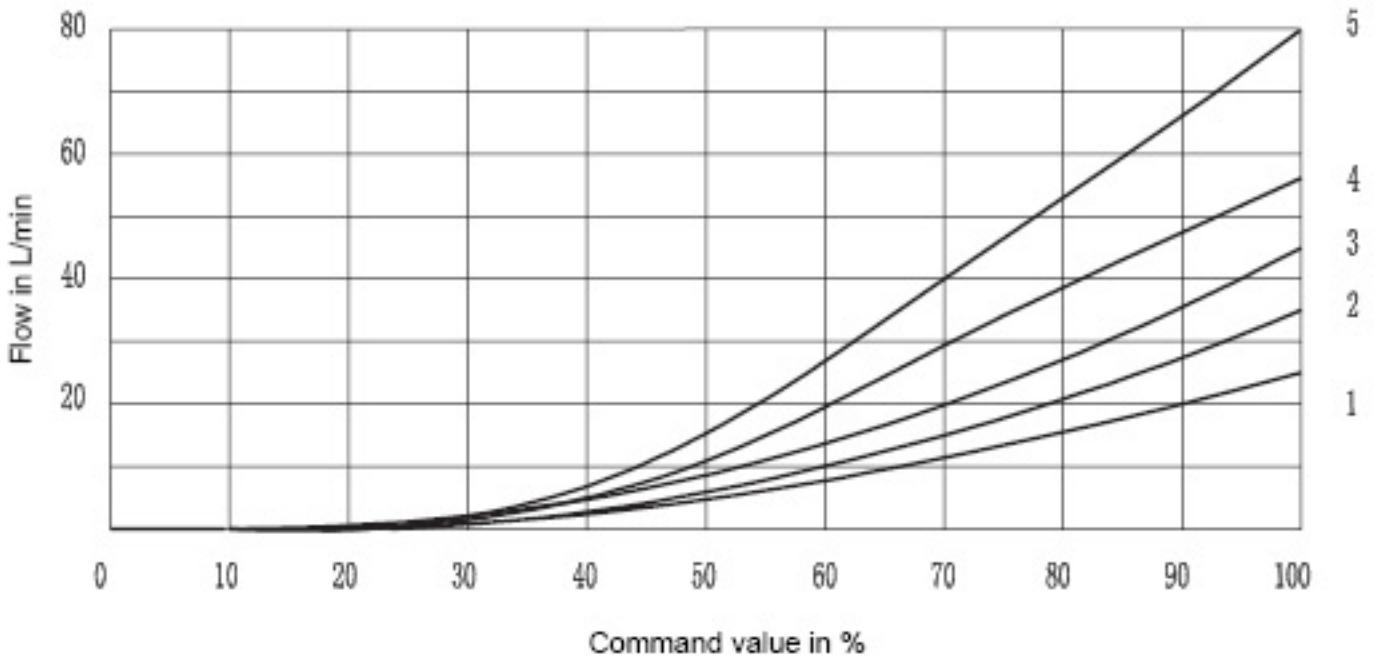
1 Pv = 1MPa constant
2 Pv = 2MPa constant
3 Pv = 3MPa constant
4 Pv = 5MPa constant
5 Pv = 10MPa constant

Warning : Please note the power limits

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

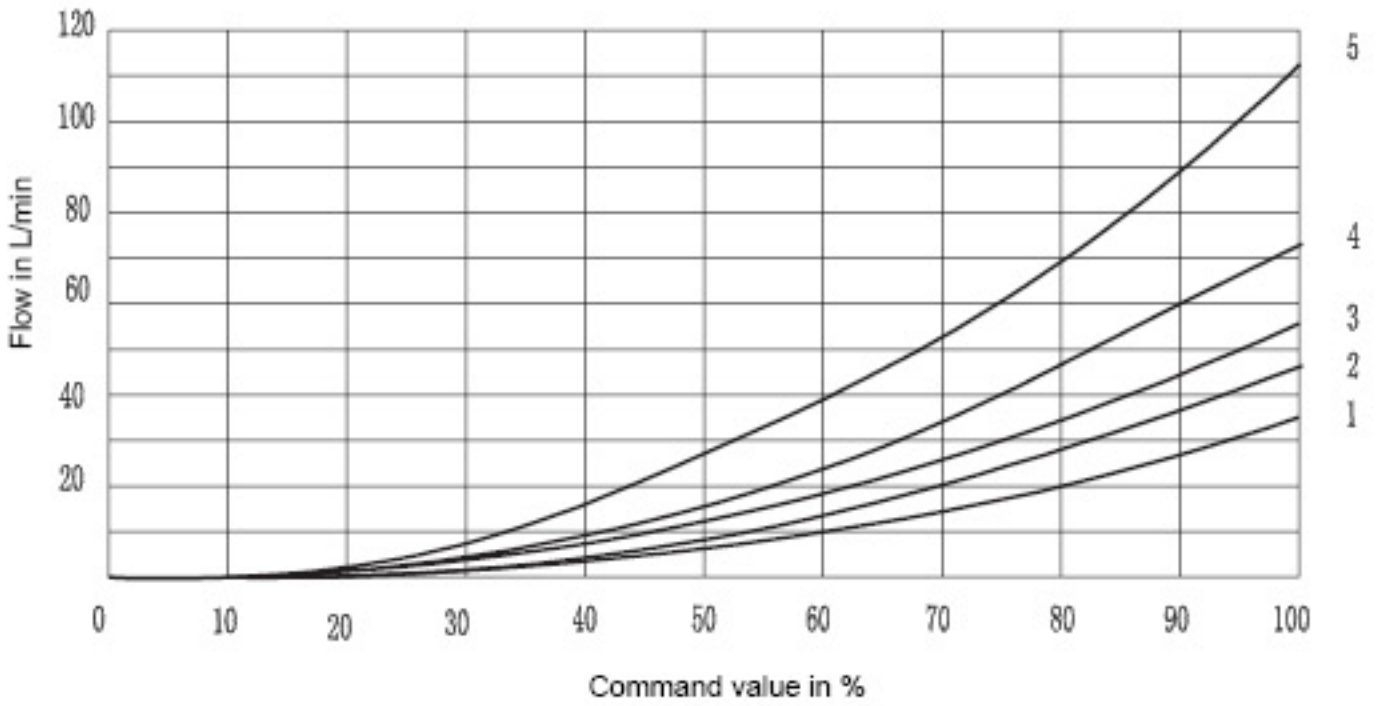
Characteristic curves: (measured at v=36 × $10^{-6}m^2/s$ t=50°C)

Type 4WRE10:



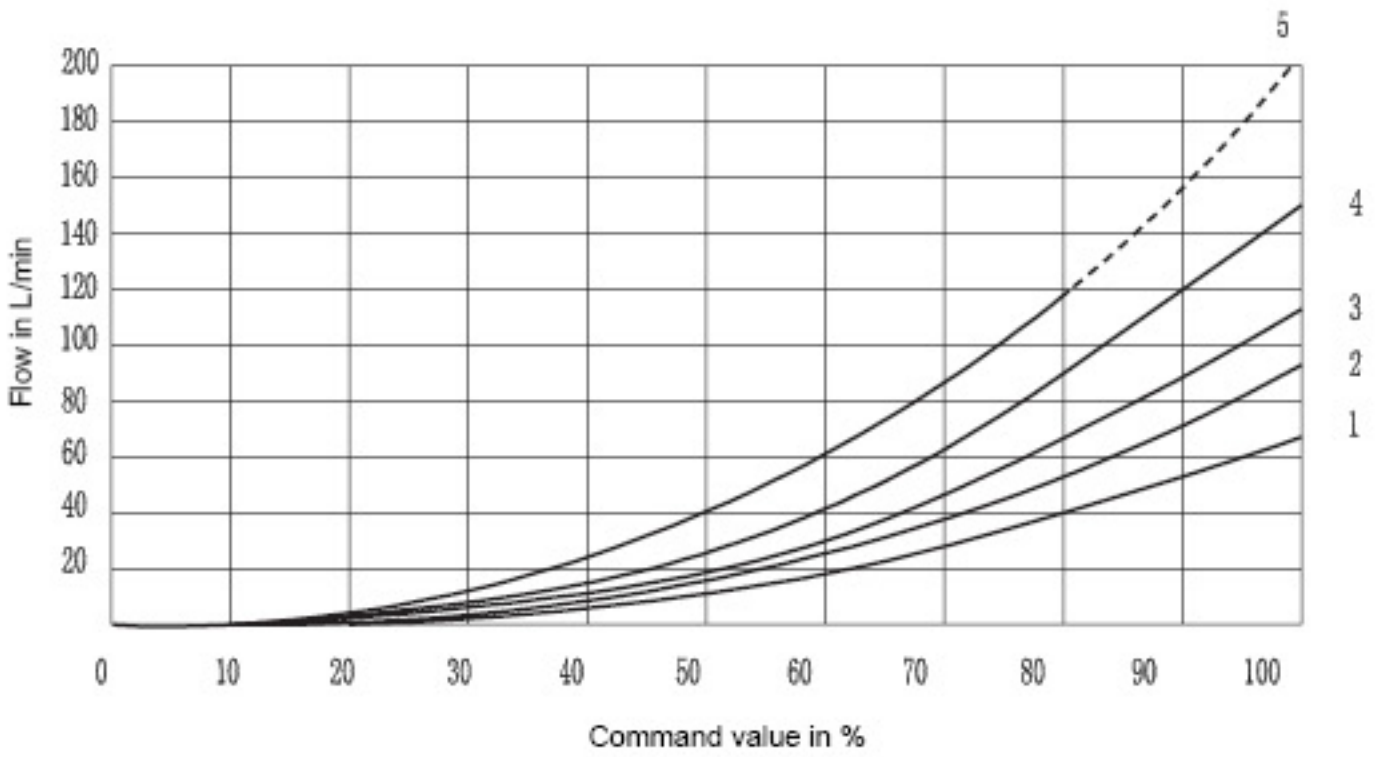
27L/min Nominal flow at 1MPa valve pressure difference

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

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

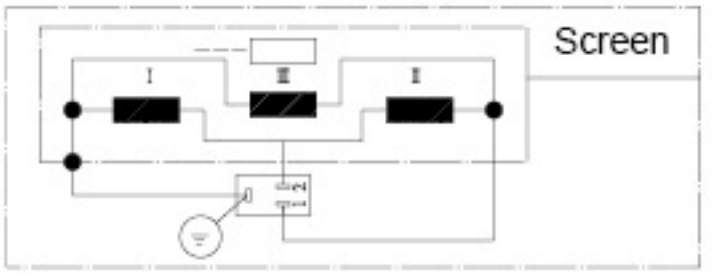
$P \rightarrow B / A \rightarrow T = Q_{max}$

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

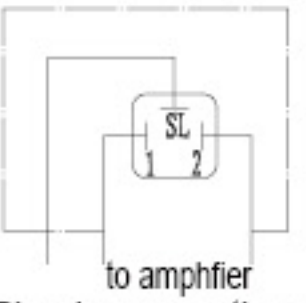
Electrical connections

Inductive positional transducer

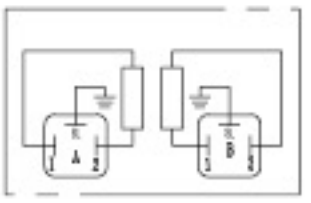
Coil connections



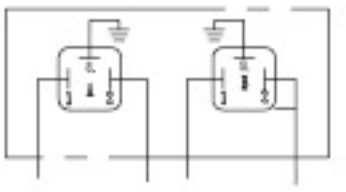
Plug-in connection



Coil connections

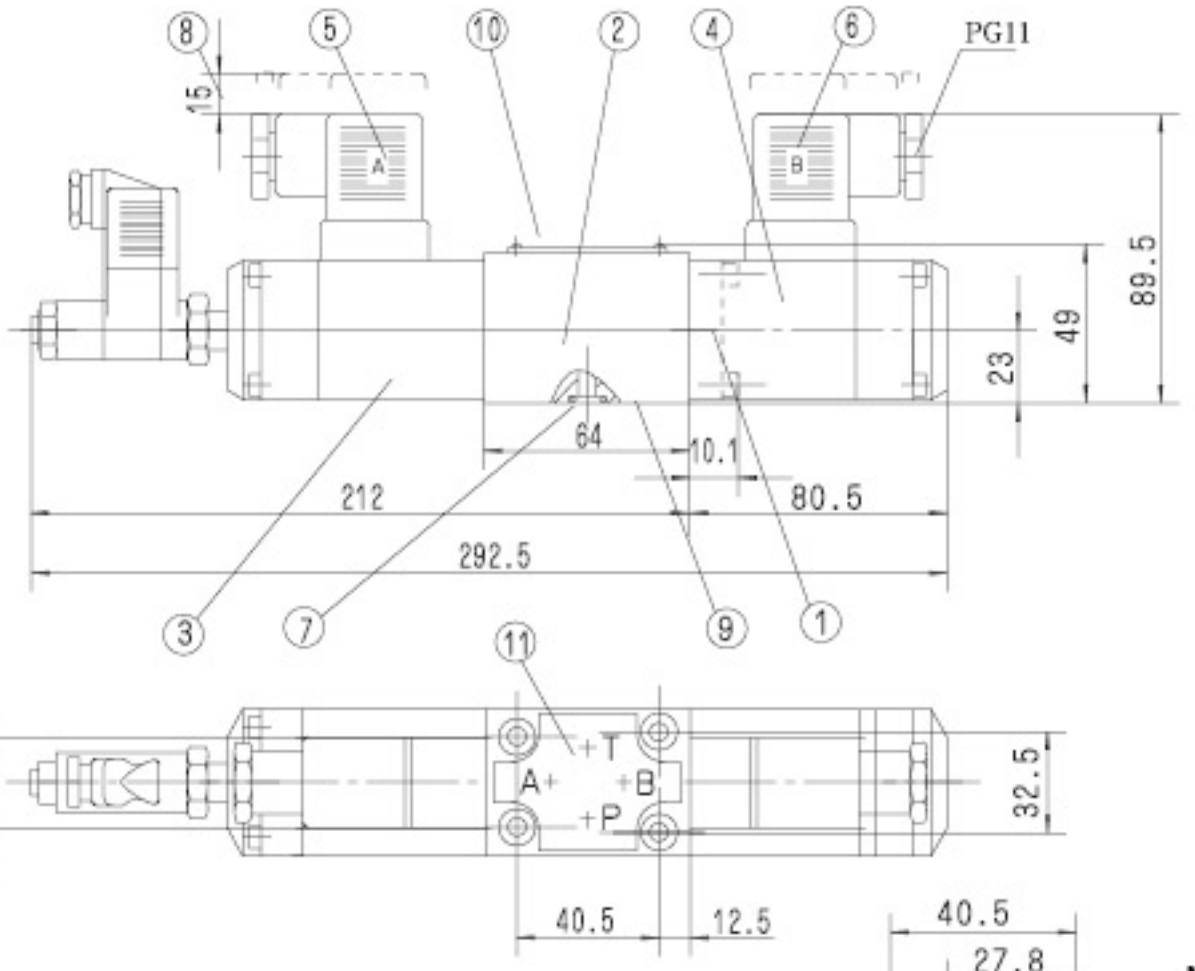


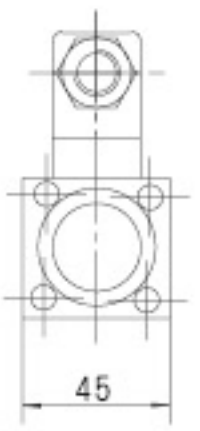
Plug-in connection

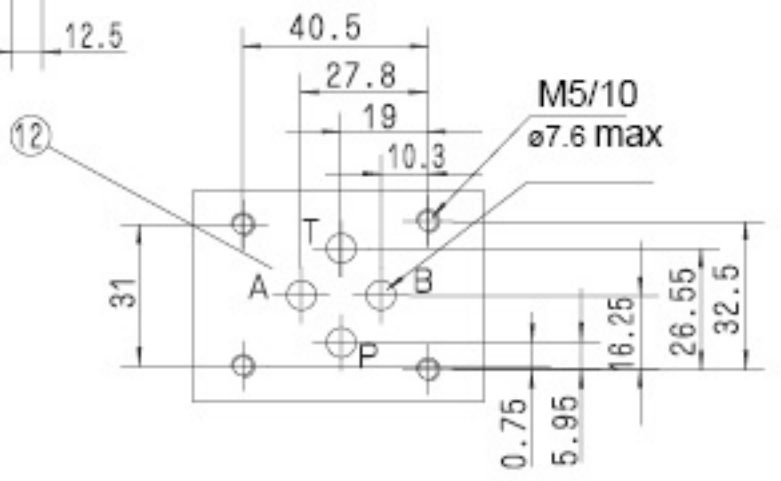


Unit dimensions: Type 4WRE6

(Dimensions in mm)





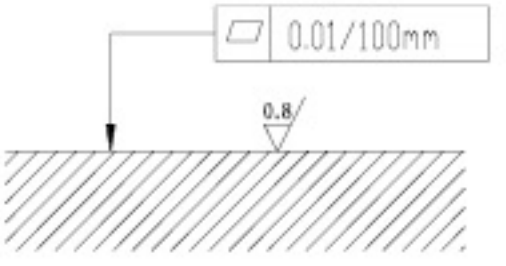


(1) Two control position valve
(2) Three control position valve
(3) Proportional solenoid"a"
(4) Proportional solenoid"b"
(5) Plug (grey)
(6) Plug (black)
(7) O-ring 9.25X1.78
(8) Space requires to remove plug
(9) Valve mounting surface
(10) Nameplate
(11) Position of ports
(12) Dimensions of valve mounting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

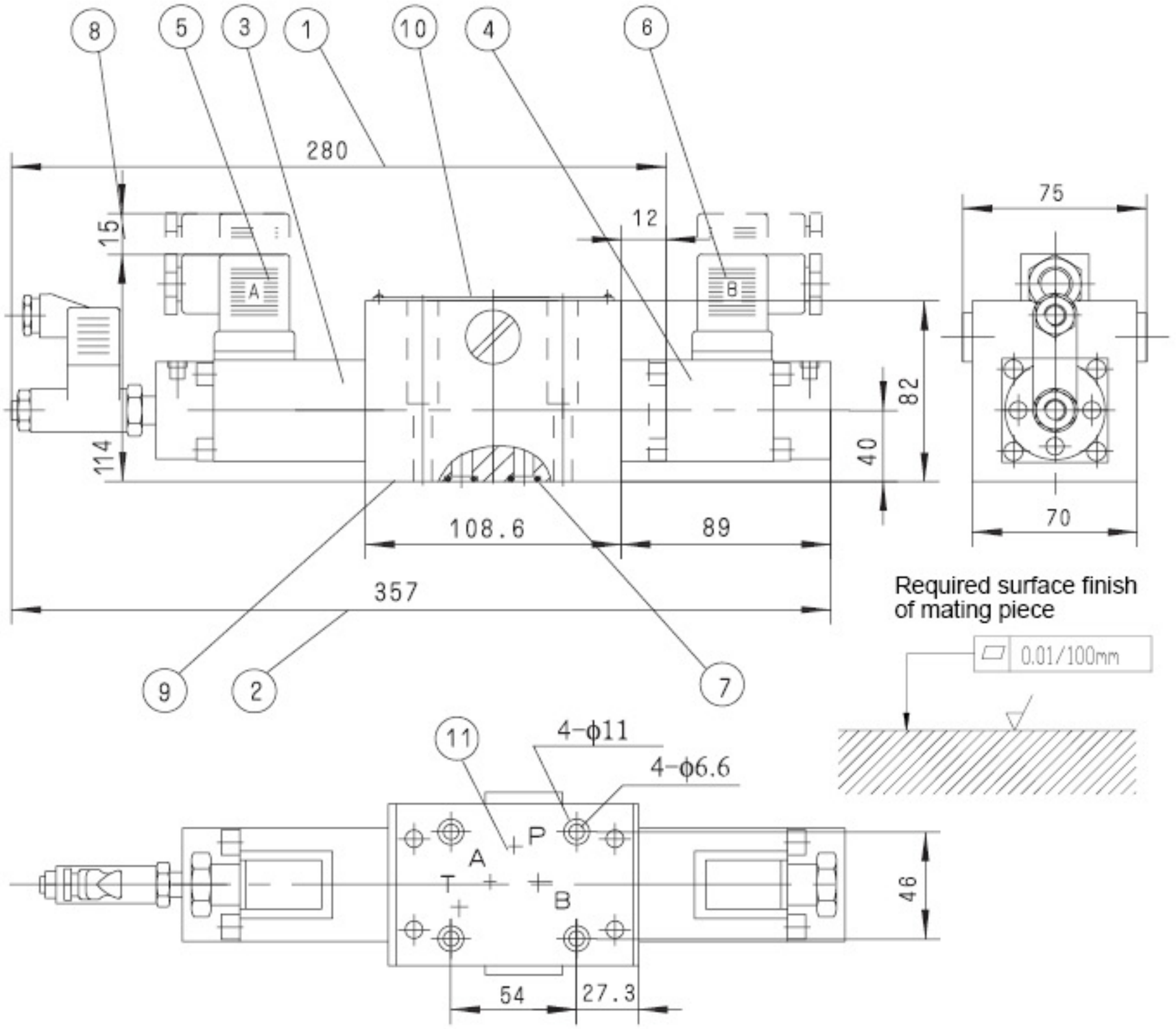
Subplates：G341/01;G342/01;G502/01

See page 80

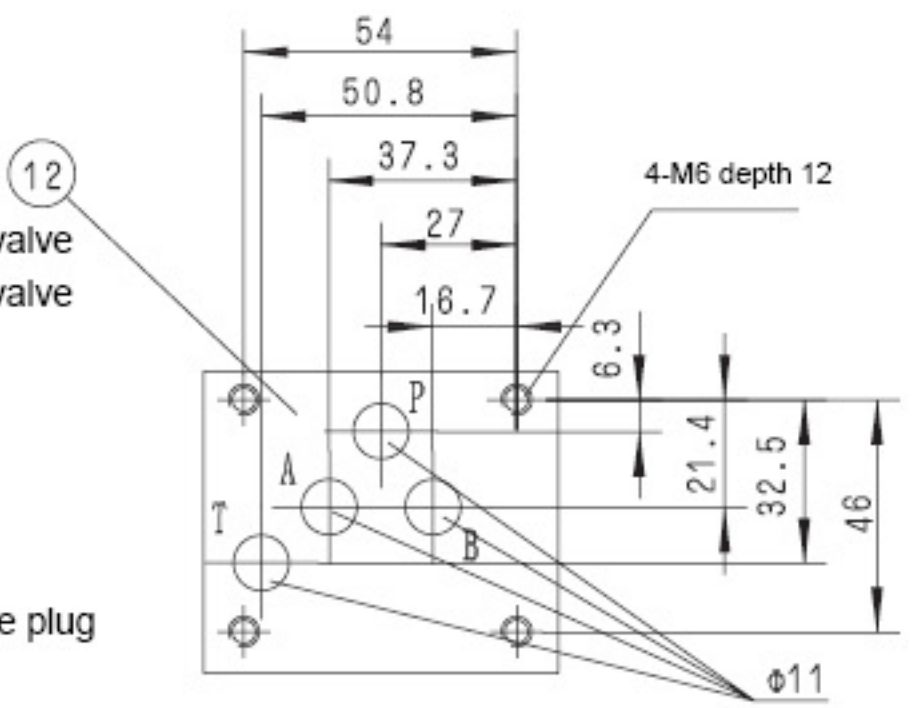
Required surface finish of mating piece



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



Required surface finish of mating piece



(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

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.**