

| | | | | |
|---|---|-------------|----------------|-------------------------------|
| BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD. | 4/3 and 4/2 directional control valves with hand lever, Type WMM | | | RE 22277/12.2004 |
| | Size 6, 10, 16, 25 | up to 35MPa | up to 450L/min | Replaces: RE 22275/05.2001 |

Features:

- Direct actuated directional spool valve with hand lever
- With spring return or detent, optional
- For subplate mounting
- Porting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



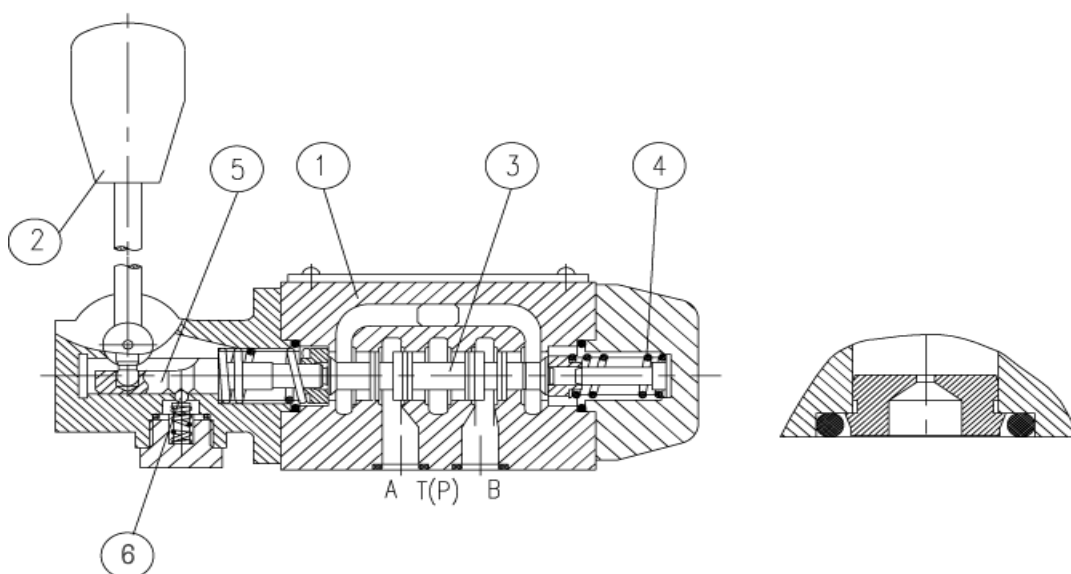
Function, section

The type WMM valves are hand lever actuated directional spool valves. They control the start, stop and direction of a flow.

The directional valves basically comprise of a housing (1), hand lever (2), control spool (3), as well as one or two return springs (4). In the unoperated condition the control spool (3) is held in the neutral or its initial position by the return springs (4). The control spool (3) is actuated via the hand lever (2), this acts via a joint and the pin (5) directly onto the control spool (3). The spool is thereby moved out of its rest position into its required switched position. After the hand lever (2) has been returned to the switched position zero, the spool (3) is returned to the neutral position via the return springs (4).

Type H-4WMM../F.. (with detent)

These valves are either 2 or 3 position directional control valves which are fitted with a detent (6), which operates in all of the switched positions.



Type 4WMM6

Ordering details

| | | | | | | |
|-------------------------|--|----|--|--|--|---|
| H- | | WM | | B | | * |
| 35MPa (Only Size 16、25) | | | | | | Further etails in clear text |
| 3 service ports = 3 | | | | | | No code = Mineral oils |
| 4 service ports = 4 | | | | | | V = Phosphate ester |
| Size 6 = 6 | | | | | | Only for Size 6 and 10 No code = Without throttle insert B08 = Throttle Φ 0.8 mm B10 = Throttle Φ 1.0 mm B12 = Throttle Φ 1.2 mm Note: Size 16, 25 without throttle |
| Size 10 = 10 | | | | | | |
| Size 16 = 16 | | | | | | |
| Size 25 = 25 | | | | | | |
| | | | | | | No code = Without detent F = With detent |
| | | | | B = Technology of Beijing Huade Hydraulic | | |
| | | | | 50 = Series 50 (50 to 59: unchanged installation and connection dimensions) (For Size 6、16、25) | | |
| | | | | 10 = Series 10 (10 to 19: unchanged installation and connection dimensions) (For Size 10) | | |

Example: Spool E on side "a".

Order example: ...EA...

Spool E on side "b".

Order example: ...EB...

- 1) Spool E1: P、A/B, preview port (only for Size 6).
- 2) For Size 10, Spool B、Y, hand lever on side B.
- 3) Spool A and B only for Size 6 and 10.
- 4) Spool K and Z only for Size 16 and 25.

5) Spool S only for Size 16.

6) For Size 16 and 25, spool C is the same as spool H.

For Size 16 and 25, spool D is the same as spool E.

7) Only for Size 16 and 25.

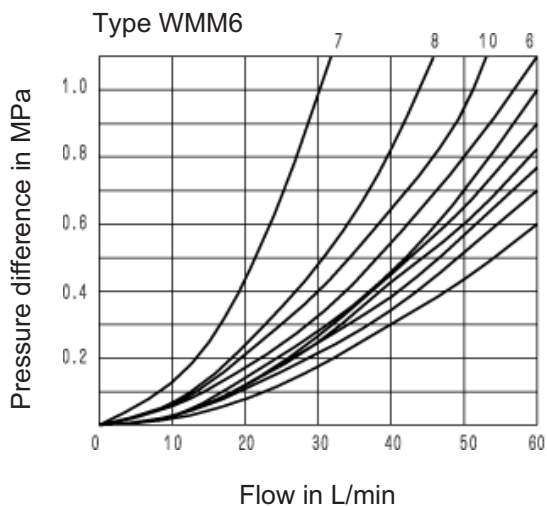
8) Only for Size 16 and 25.

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

| | | | | |
|---|--|--|--|-----------|
| Size | 6 | 10 | 16 | 25 |
| Maximum port A, B, P (MPa) | to31.5 | | to35 | |
| Working pressure port T (MPa) | to16 | to15 | to25 | to25 |
| Maximum fluid (L/min) | to60 | to100 | to300 | to450 |
| Flow cross section (control position 0) | for symbol Q, 6% of nominal cross section for symbol W, 3% of nominal cross section | | for symbol Q, V, 16% of nominal cross section for symbol W, 3% of nominal cross section | |
| Pressure fluid | Mineral oil or Phosphate ester | | | |
| Fluid temperature range (°C) | -30~ + 80 | | | |
| Viscosity range (mm ² /s) | 2.8~ + 500 | | | |
| Weight (Kg) | approx.1.4 | approx3.3 | approx8 | approx17 |
| Control power of push lever (N) | Without return pressure approx20 Without return pressure approx30 | with detent approx.16~23 without detent approx. 20~27 | approx75 | approx120 |

Characteristic curves (measured at $v = 41 \text{ mm}^2 / \text{s}$ and $t = 50 \text{ }^\circ\text{C}$)

Characteristic curves:

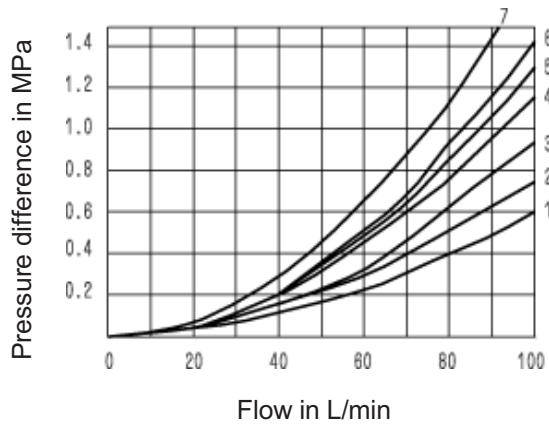


| Spool | Shifted position | | | |
|-------|------------------|-------|-------|-------|
| | P → A | P → B | A → T | B → T |
| A | 3 | 3 | - | - |
| B | 3 | 3 | - | - |
| C | 1 | 1 | 3 | 1 |
| D | 5 | 5 | 3 | 3 |
| E | 3 | 3 | 1 | 1 |
| F | 1 | 3 | 1 | 1 |
| G | 6 | 6 | 9 | 9 |
| H | 2 | 4 | 2 | 2 |
| J | 1 | 1 | 2 | 1 |
| L | 3 | 3 | 4 | 9 |
| M | 2 | 4 | 3 | 3 |
| P | 3 | 1 | 1 | 1 |
| Q | 1 | 1 | 2 | 1 |
| R | 5 | 5 | 4 | 1 |
| T | 10 | 10 | 9 | 9 |
| U | 3 | 3 | 9 | 4 |
| V | 1 | 2 | 1 | 1 |
| W | 1 | 1 | 2 | 2 |
| Y | 5 | 5 | 3 | 3 |

7 Spool "R" at controller position A to B
8 Spool "G" and "T" at middle position P to T

Characteristic curves: Type WMM10

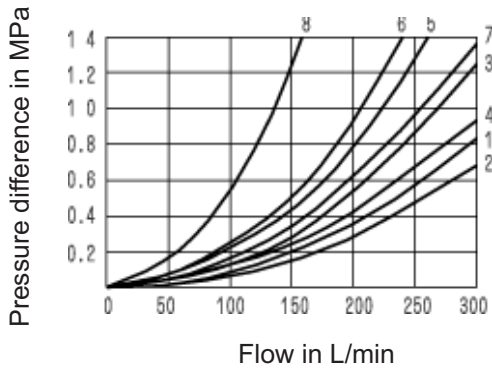
4 Spool "G" and "T" at middle position P to T
 7 Spool "R" at switch position A to B



| Spool | Shifted position | | | |
|-------|------------------|-------|-------|-------|
| | P → A | P → B | A → T | B → T |
| A | 2 | 2 | - | - |
| B | 2 | 2 | - | - |
| C | 2 | 2 | 3 | 3 |
| D | 2 | 2 | 3 | 3 |
| E | 2 | 2 | 4 | 4 |
| F | 2 | 3 | 3 | 5 |
| G | 3 | 3 | 4 | 6 |
| H | 1 | 1 | 4 | 5 |
| J | 2 | 2 | 3 | 3 |
| L | 2 | 2 | 3 | 5 |
| M | 1 | 1 | 5 | 5 |
| P | 3 | 2 | 5 | 3 |
| Q | 2 | 2 | 4 | 4 |
| R | 2 | 4 | 3 | - |
| T | 3 | 5 | 5 | 6 |
| U | 2 | 2 | 3 | 5 |
| V | 2 | 2 | 5 | 5 |
| W | 2 | 2 | 5 | 5 |
| Y | 2 | 2 | 5 | 3 |

Characteristic curves: Type WMM16

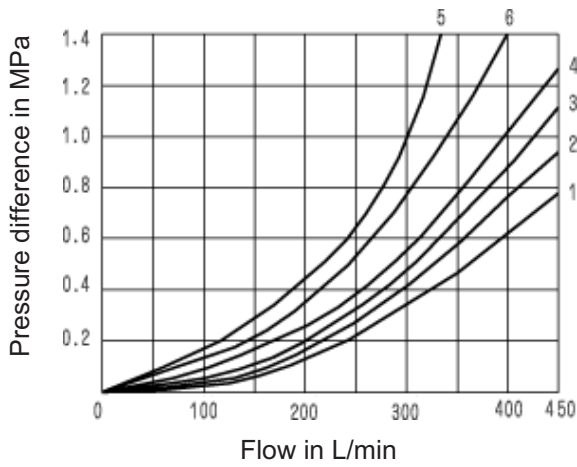
6 Spool "G" and "T" at middle position P to T
 8 Spool "S" at middle position P to T



| Spool | Shifted position | | | |
|---------|------------------|-------|-------|-------|
| | P → A | P → B | A → T | B → T |
| E, D, Y | 1 | 1 | 1 | 3 |
| F | 2 | 2 | 3 | 3 |
| G, T | 5 | 1 | 3 | 7 |
| H, C, Q | 2 | 2 | 3 | 3 |
| V, Z | 2 | 2 | 3 | 3 |
| J, K, L | 1 | 1 | 3 | 3 |
| M, W | 2 | 2 | 4 | - |
| R | 2 | 2 | 4 | - |
| U | 1 | 1 | 4 | 7 |
| S | 4 | 4 | 4 | - |

Characteristic curves: Type WMM25

4 Spool "L" at A to T
6 Spool "U" at B to T



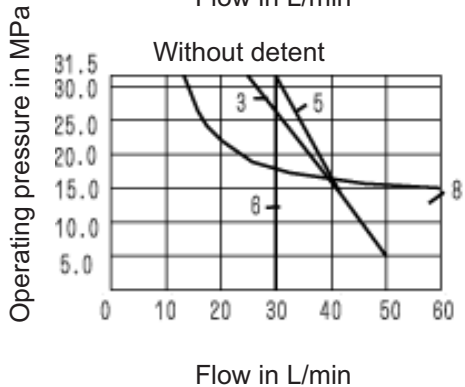
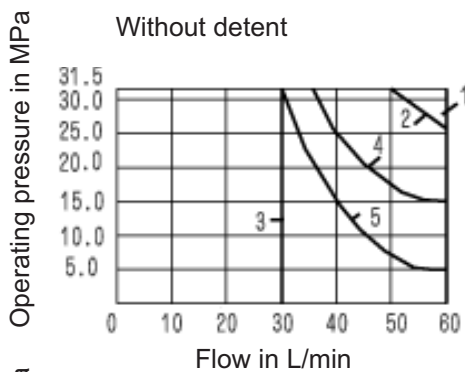
| Spool | Shifted position | | | |
|-------|------------------|-------|-------|-------|
| | P → A | P → B | A → T | B → T |
| E | 2 | 2 | 1 | 4 |
| F | 1 | 2 | 1 | 2 |
| G | 2 | 2 | 2 | 4 |
| H | 2 | 2 | 1 | 3 |
| J | 2 | 2 | 1 | 3 |
| L | 2 | 2 | 1 | 2 |
| M | 2 | 2 | 1 | 4 |
| P | 2 | 2 | 1 | 4 |
| Q | 2 | 2 | 1 | 4 |
| R | 1 | 2 | 1 | - |
| T | 2 | 2 | 2 | 4 |
| U | 2 | 2 | 1 | 4 |
| V | 2 | 2 | 1 | 4 |
| W | 2 | 2 | 1 | 3 |

Performance limits:

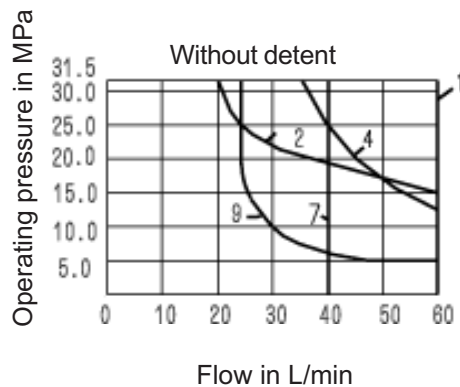
The switching function of the valve is, due to the sticking effect, dependent on the filtration. The flow forces acting within the valve also affects the flow performance limits.

For 4-way valves the stated flow data is valid for the normal application case of 2 directions of flow (e.g. from P to A and at the same time return flow from B to T) (see table). If there is only one direction of flow then the permissible flow can be considerably lower, (e.g. when using a 4-way directional valve as a 3-way directional valve with ports A or B plugged).

Performance limits of WMM6:

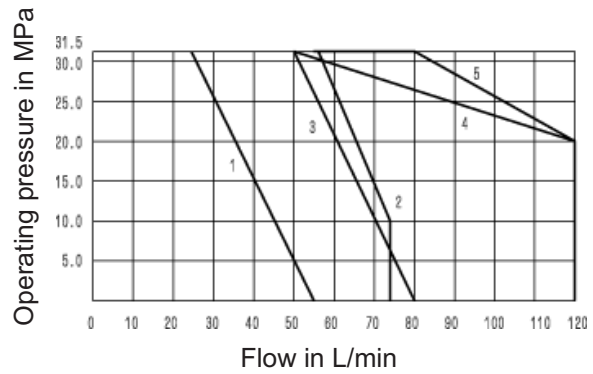


| Characteristic curves | Spool | Characteristic curves | Spool |
|-----------------------|-------|-----------------------|-------|
| without detent | 1 | with detent | 1 |
| | 2 | | 2 |
| | 3 | | 3 |
| | 4 | | 4 |
| | 5 | | 5 |
| | | | 6 |
| | | | 7 |
| | | | 8 |
| | | | 9 |
| | | | |



Characteristic curves: Type WMM10

| Characteristic curves: | Spool |
|------------------------|------------------|
| 1 | A, B |
| 2 | H |
| 3 | F, G, P, R, T |
| 4 | J, L, Q, U, W |
| 5 | C, D, E, M, V, Y |



Characteristic curves: Type WMM16

| 2-position valves , without detent | | | | | |
|------------------------------------|-----------------------------|-----|-----|-----|-----|
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| C | 300 | 300 | 300 | 260 | 220 |
| D | 300 | 300 | 210 | 190 | 160 |
| K | 300 | 300 | 200 | 150 | 130 |
| Z | 300 | 240 | 190 | 170 | 150 |
| 3-position valves without detent | | | | | |
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| E, H, J, L, M Q, R, U, W | 300 | 300 | 300 | 300 | 300 |
| F, P | 300 | 300 | 210 | 190 | 170 |
| G, S, T | 300 | 300 | 220 | 210 | 180 |
| V | 300 | 260 | 200 | 180 | 170 |

Characteristic curves: Type WMM25

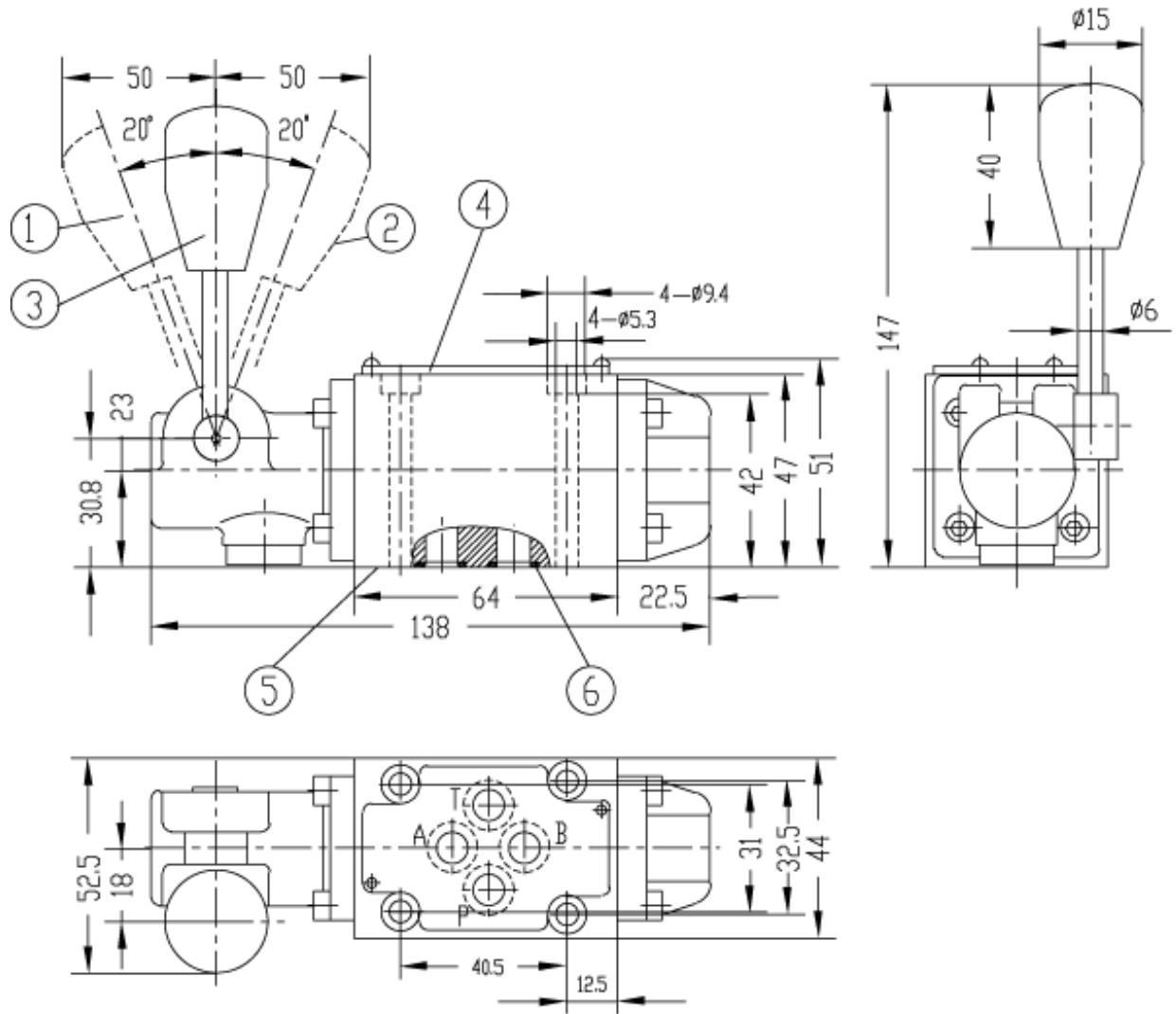
| 2-position valves , with detent | | | | | |
|---------------------------------|-----------------------------|-----|-----|-----|-----|
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| C, D, K, Z | 300 | 300 | 300 | 300 | 300 |
| 3-position valves with detent | | | | | |
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| E, H, J, L, M Q, R, U, W | 300 | 300 | 300 | 300 | 300 |
| F, P | 300 | 300 | 280 | 230 | 230 |
| G, T, S | 300 | 300 | 230 | 230 | 230 |
| V | 300 | 300 | 250 | 230 | 230 |

| 2-position valves without detent | | | | | |
|----------------------------------|-----------------------------|-----|-----|-----|-----|
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| C | 450 | 300 | 250 | 200 | 180 |
| D | 350 | 300 | 275 | 250 | 200 |
| K | 200 | 150 | 140 | 130 | 120 |
| Z | 300 | 270 | 240 | 220 | 200 |
| 3-position valves without detent | | | | | |
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| E, J, L, M Q, R, U, W | 450 | 450 | 450 | 450 | 450 |
| F | 450 | 250 | 200 | 135 | 110 |
| G, T | 450 | 330 | 290 | 230 | 180 |
| H | 450 | 450 | 400 | 400 | 350 |
| P | 450 | 310 | 240 | 215 | 150 |
| V | 450 | 310 | 280 | 270 | 200 |

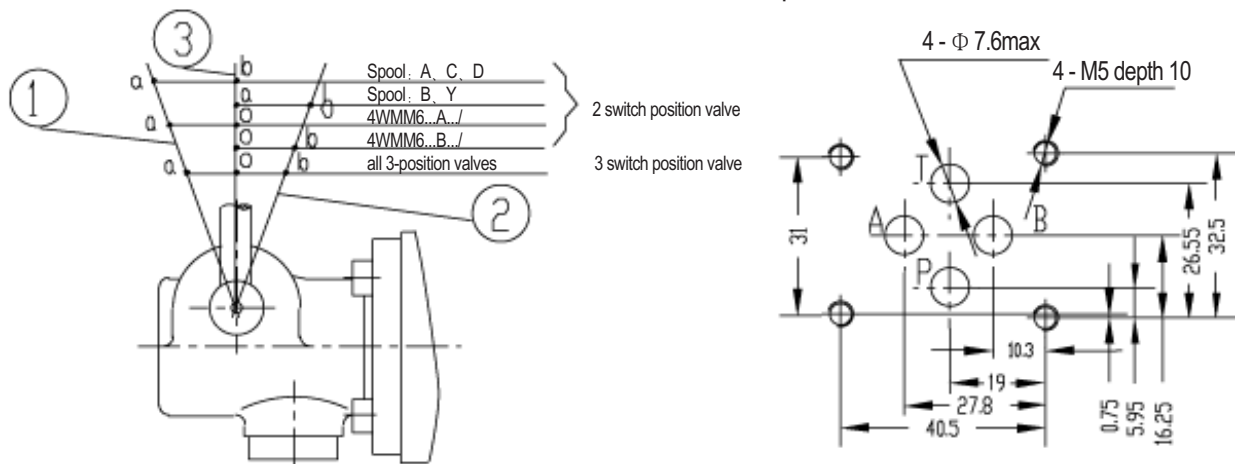
| 2-position valves with detent | | | | | |
|--|-----------------------------|-----|-----|-----|-----|
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| C, D, K, Z | 450 | 450 | 450 | 450 | 450 |
| 3-position valves with detent | | | | | |
| flow q_v in L/min | Operating pressure max(MPa) | | | | |
| Spool | 7 | 14 | 21 | 28 | 35 |
| E, F, G, H, J L, M, P, R, T U, W | 450 | 450 | 450 | 450 | 450 |
| V | 450 | 450 | 400 | 350 | 300 |

Unit dimensions: Type WMM6

(Dimensions in mm)



Unit dimensions of ports :



Subplates: see page 205

G341/01 (G1/4"); G341/02 (M14X1.5)

G342/01 (G3/8"); G342/02 (M18X1.5)

G502/01 (G1/2"); G502/02 (M22X1.5)

1 Switched position a

2 Switched position b

3 Switched position 0, a, b
(a and b on 2-position valve)

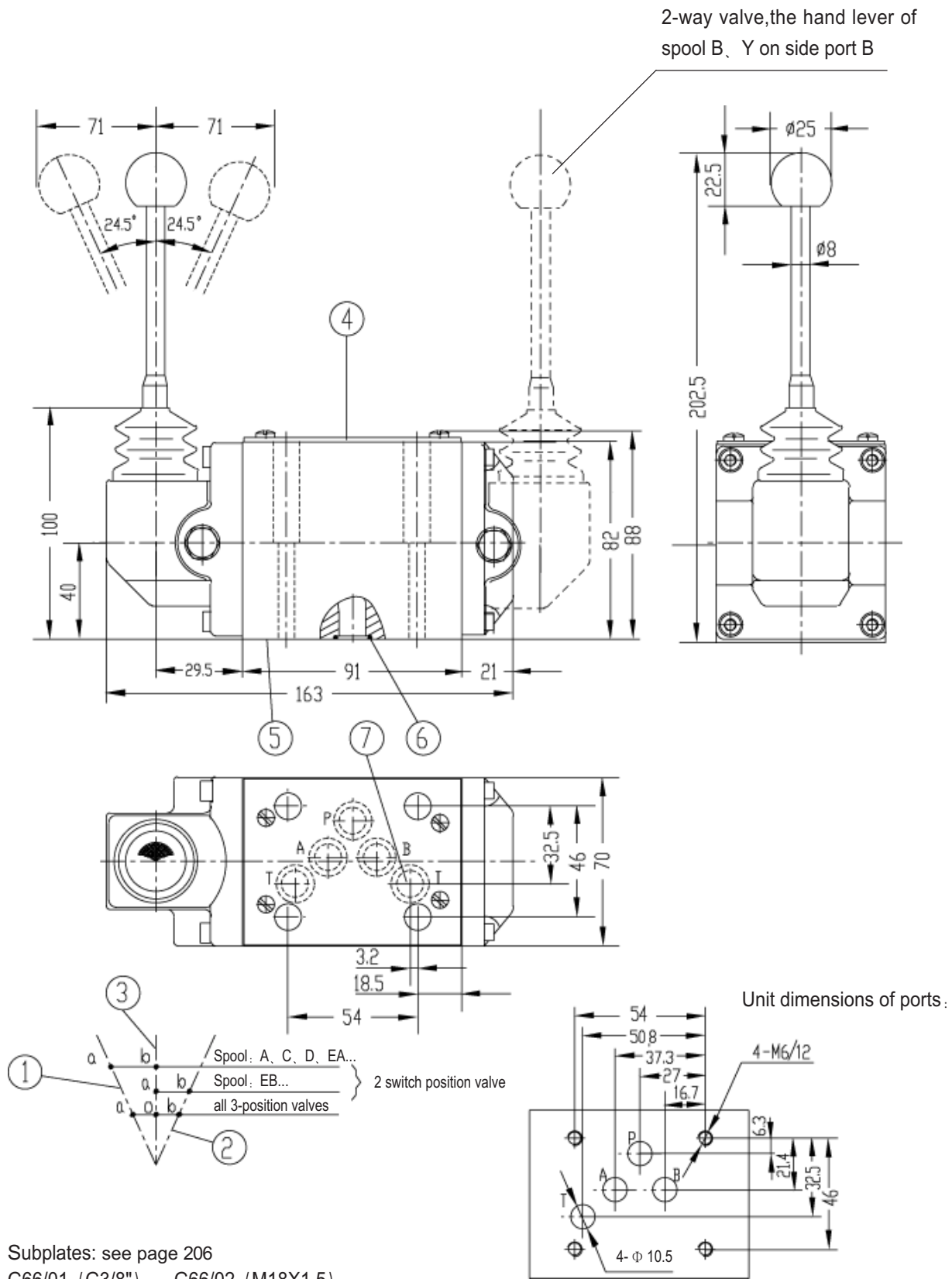
4 Nameplate

5 Connection surface

6 O-ring 9.25 x 1.78 (for ports A, B, P and T)

Unit dimensions: Type WMM10(with detent)

(Dimensions in mm)

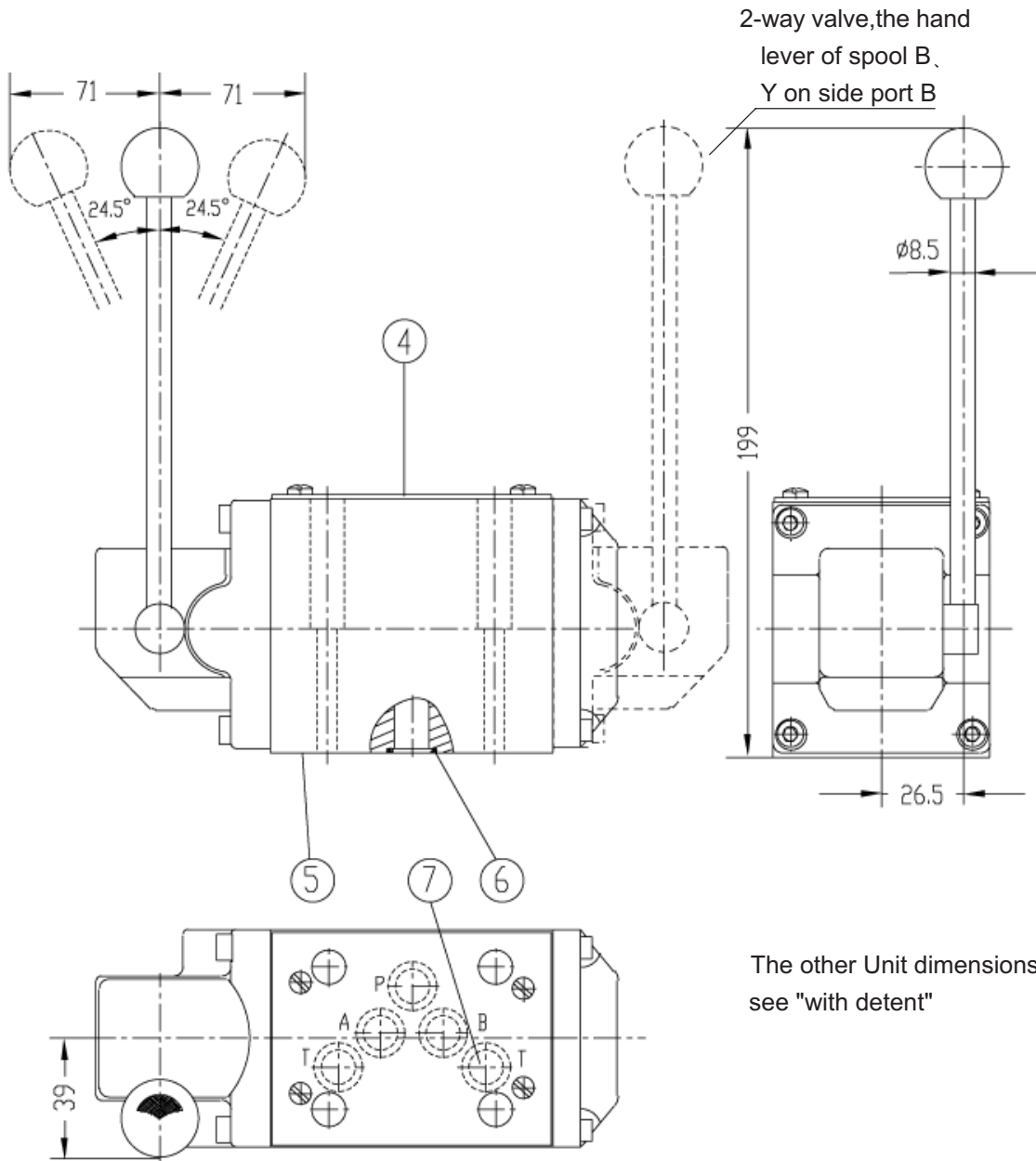


Subplates: see page 206
 G66/01 (G3/8"); G66/02 (M18X1.5)
 G67/01 (G1/2"); G67/02 (M22X1.5)
 G534/01 (G3/4"); G534/02 (M27X2)

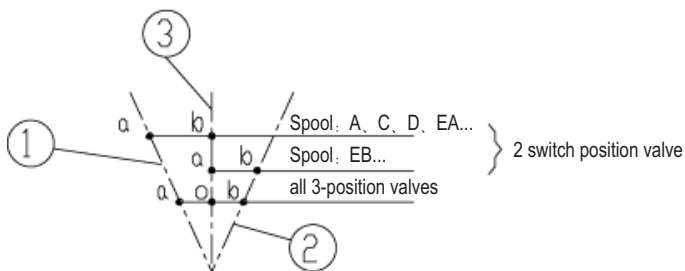
- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0, a, b
(a and b on 2-position valve)
- 4 Nameplate
- 5 Connection surface
- 6 O-ring 12 x 2(for ports A, B, P and T)
- 7 When using control piece,may regarded as assistant return port

Unit dimensions: Type WMM10(without detent)

(Dimensions in mm)



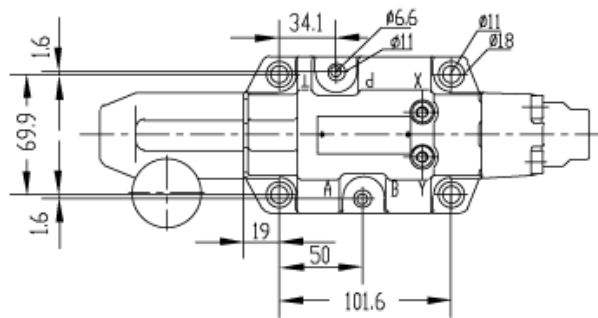
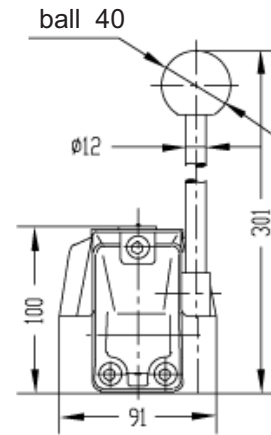
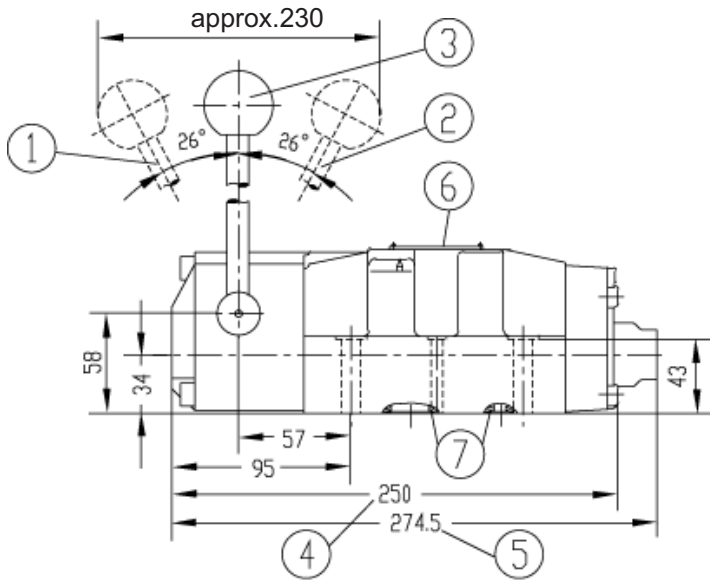
The other Unit dimensions see "with detent"



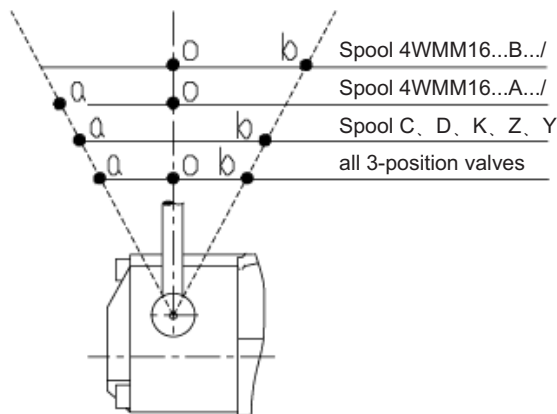
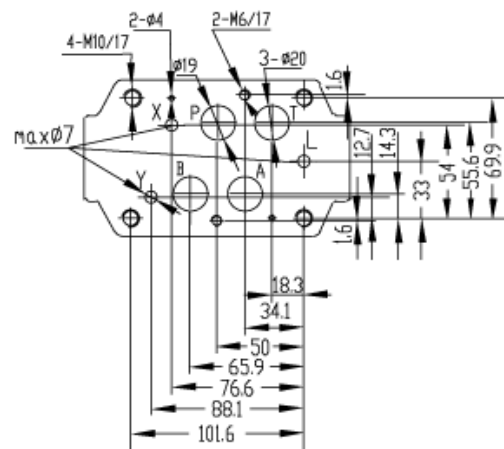
- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0, a, b
(a and b on 2-position valve)
- 4 Nameplate
- 5 Connection surface
- 6 O-ring 12 x 2(for ports A, B, P and T)
- 7 When using control piece, may regarded as assistant return port

Unit dimensions: Type WMM16

(Dimensions in mm)



Unit dimensions of ports :



Subplates (see page207, 208)

G172/01; G172/02

G174/01; G174/02

G174/08

1 Switched position a

2 Switched position b

3 Switched position 0 (a and b on 2-position valve)

4 2-position valve and 3-position valves , with detent.

3-position valve, spring-centred

5 2-position valve , without detent

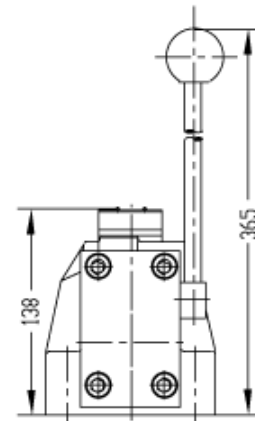
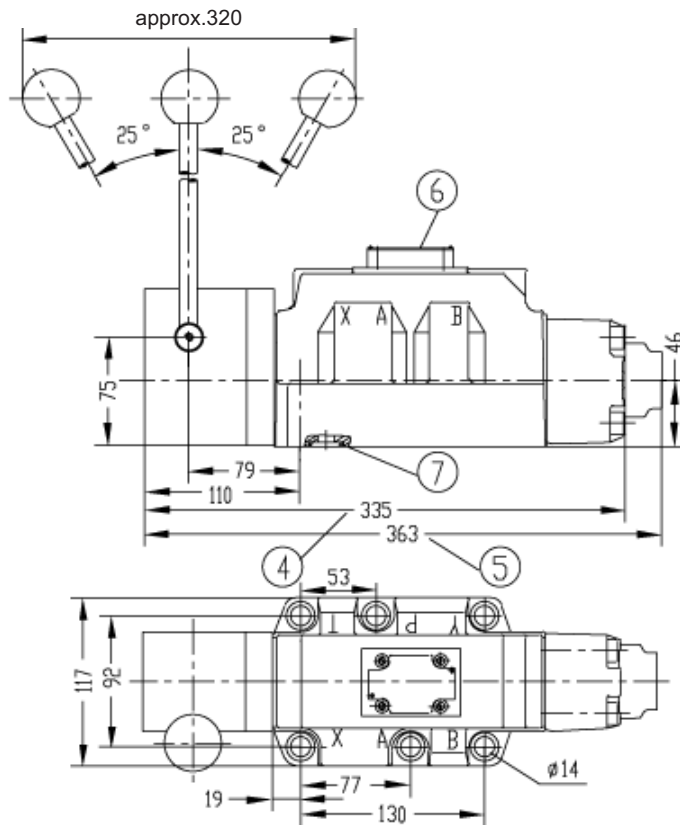
6 Nameplate

7 O-ring 22 x 2.5 (For ports A, B, P and T)

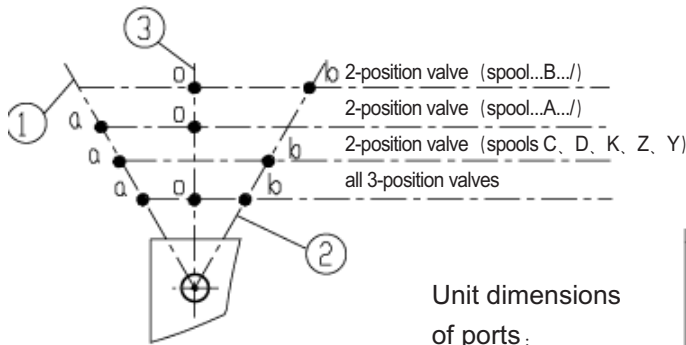
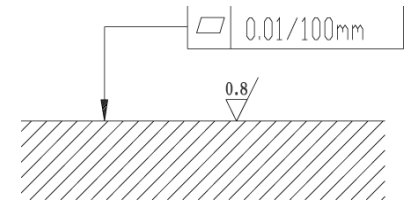
O-ring 10 x 2 (For ports X , Yand L)

Unit dimensions: Type WMM25

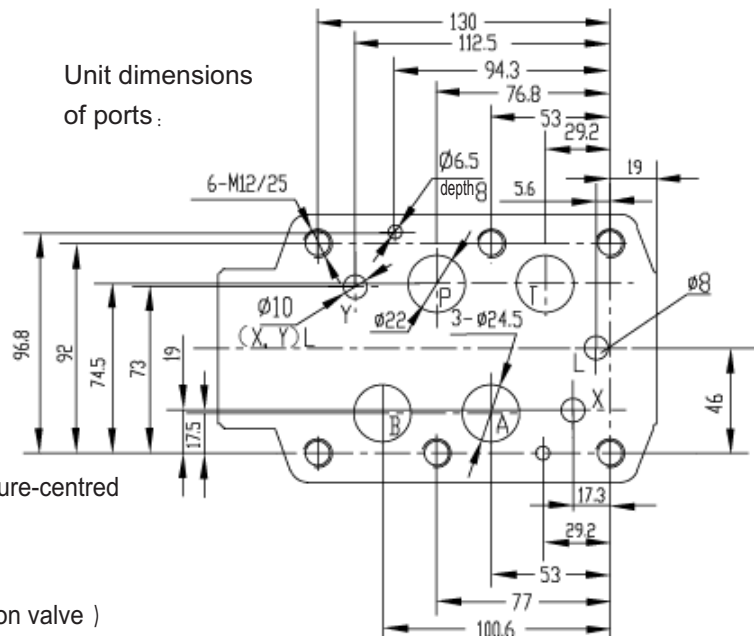
(Dimensions in mm)



Required surface finish of mating piece



Unit dimensions of ports :



Subplates (see page 209)

- G151/01 (G1"); G151/02 (M33X2)
- G153/01 (G1"); G153/02 (M33X2)
- G154/01 (G1 1/4"); G154/02 (M42X2)
- G156/01 (G1 1/2"); G156/02 (M48X2)
- G153 only used on valves which are pressure-centred

- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0 (a and b on 2-position valve)
- 4 2-position valve and 3-position valve with detent, 3-position valve, spring-centred
- 5 2-position valve, without detent
- 6 Nameplate
- 7 O-ring 27 x 3 (for ports A, B, P and T)
O-ring 19 x 3 (for ports X, Y and L)

Notice

1. The fluid must be filtered. Minimum filter fineness is 10 μm .
2. The tank must be sealed up and an air breather/filter must be installed on air suction/entrance.
3. Subplate are not supplied, if required, please ordering separately.
4. Valve fixing bolts/screws must be high tensile (class 10.9). Please select and consult manufacturer according to the parameter listed in the datasheet.
5. Roughness of surface mating with the valve is required to $\sqrt{0.8}$.
6. Surface straightness of mating piece is required to 0.01/100mm.

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