



**Directional control valves,
hydraulically operated Type WH**

RE22282/12.2004

Size 6, 10

up to 31.5 MPa

up to 120L/min

Replaces:
RE22282/05.2001

Features:

- Direct operated directional spool valve
- Two position valve with stroke limit optional
- Subplate mounting
- Mounting pattern to Din 24 340 form A, ISO 4401 and CETOP-RP 121H



Function, section

WH valves are hydraulic operated directional spool valves. They are used for the control of stop, start and direction of a flow.

The directional valves mainly consist of housing (1), one or two operating elements (2) (hydraulically, pneumatically operating cylinder), the control spool (3), as well as one or two return springs (4).

At rest the control spool (3) is kept in the centre or starting position by the return springs (3) (except impulse valve).

The control spool (3) is pushed into the required switching position by the operating elements.

With detent, type ..OF/..

Hydraulically or pneumatically operated directional valves are also available as 2-position valves with detent (5). When the operating elements with detent are used every switching position may be locked.

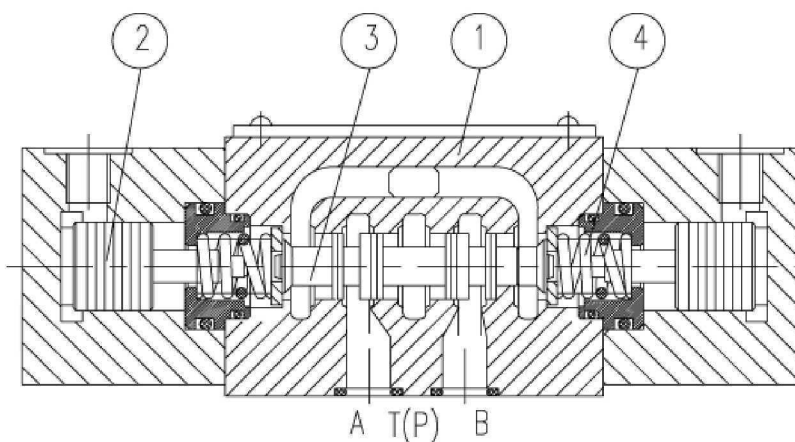
Without return spring, without detent, type ..O/..

When using operating elements without return spring and without detent there is no defined switching position at rest.

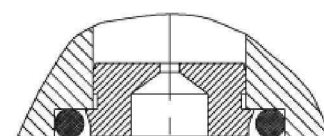
Plug-in throttle

The use of a plug-in throttle is then necessary when during the switching procedures in the given operating conditions flows occur which exceed the performance limits of the valve.

It is plugged into the P-channel of the directional valve.



Type 4WH6...



Cartridge throttle

Ordering code



3 service ports = 3
4 service ports = 4

Size 6 = 6
Size 10 = 10

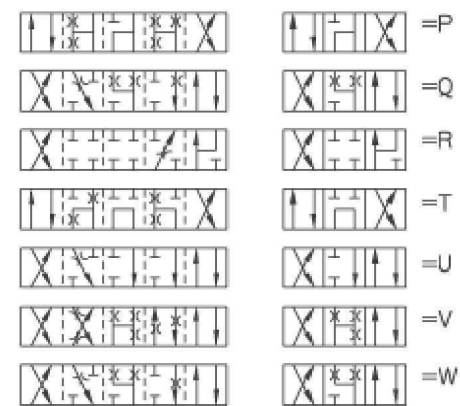
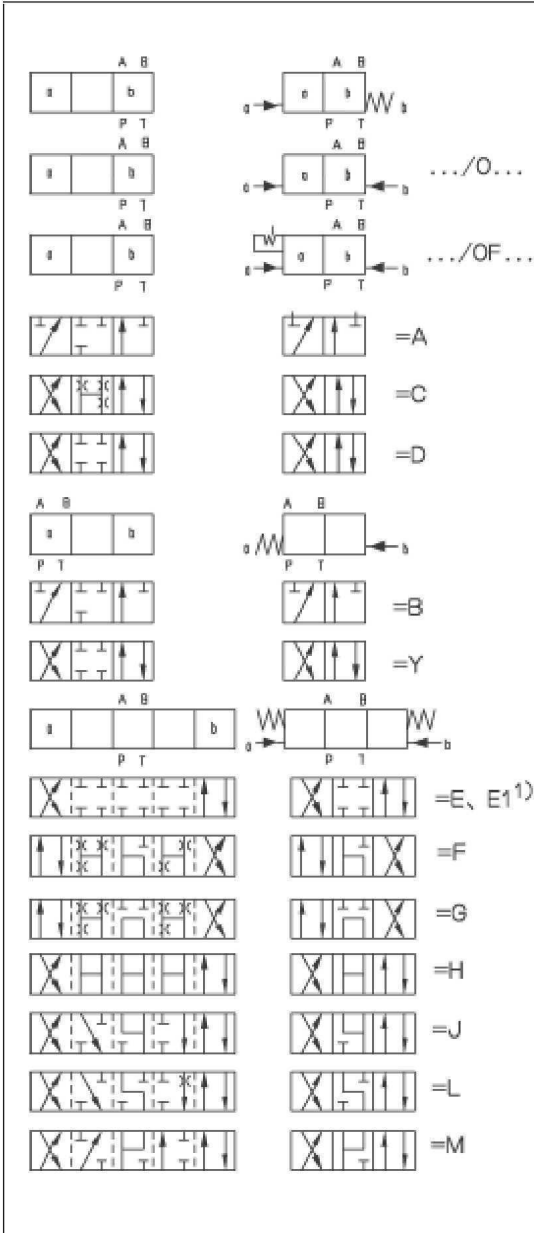
Further details in clear text

No code = mineral oils
V = phosphate ester

No code = without plug-in throttle
B08 = Throttle Φ 0,8 mm
B10 = Throttle Φ 1,0 mm
B12 = Throttle Φ 1,2 mm

No code. = with spring return
O = without spring return
OF = without spring return, with detent

50 = Series 50(50 to 59: unchanged installation and connection dimensions)(only Size 6)
30 = Size 30(30 to 39: unchanged installation and connection dimensions) (only size 10)



Example:

Spool E in switching position "a", ordering code ..EA..

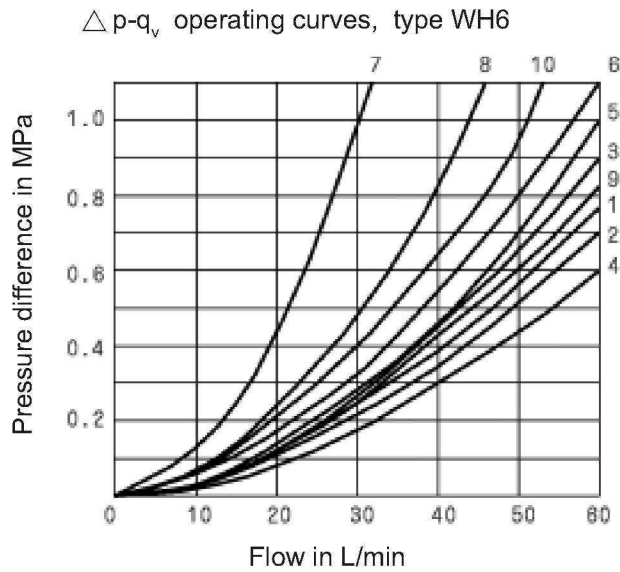
Spool E in switching position "b", ordering code ..EB..

1) Symbol E1: P → A/B, pre-opening(only for size 6)

Technical data

Size		6	10
Max.operating pressure	Ports A, B, P(MPa)	to 31.5	
	Port T (MPa)	to 16	
With symbols A and B ,port T must be used as a leakage port if the operating pressure is greater than 16.0 MPa.			
Flow max.	(L/min)	up to 60	up to 120
Operating to flow (Spool position 0)		Symbol Q ,6% of nominal cross-sectional area	
		Symbol W, 3% of nominal cross-sectional area	
Fluid		Mineral oil or phosphate ester	
Fluid temperature range	(°C)	-20 to +80	
Viscosity range	(mm ² /s)	2.8 to 500	
Weight (kg)	1 operating cylinder	approx.2	approx.3.5
	2 operating cylinder	approx.2.2	approx.4.5
Pilot pressure (MPa)	min.	0.6 to 1> tank pressure	0.5
	max.	20	6

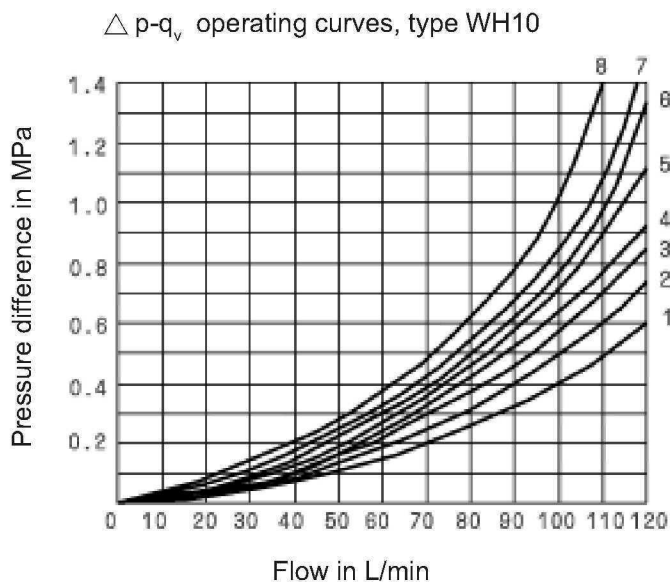
Operating curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)



Symbol	Flow direction			
	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	-
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.Symbol "R" in switching position A → B

8.Symbol "G" and "T" in neutral position P → T



Symbol	Flow direction			
	P → A	P → B	A → T	B → T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
Y	4	4	6	6
E	2	2	4	4
F	1	2	3	4
G, T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
L	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3

7.Symbol "R" in switching position A → B

8.Symbol "G" and "T" in neutral position P → T

Performance limits:

The function of the valves is dependent on the filtering due to the sticking effect. In order to achieve the given permissible flow.

Values a full flow volume filtration rate of 20µm is recommended.

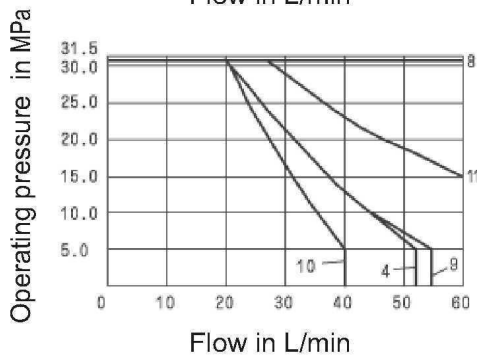
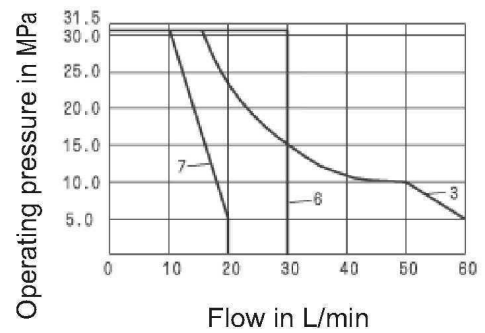
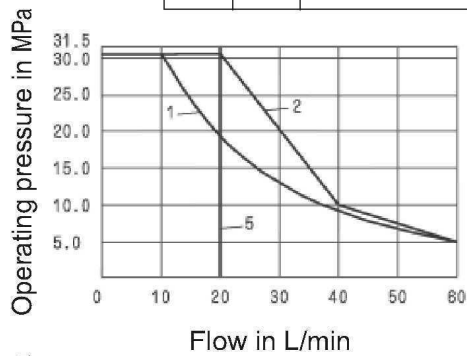
The flow forces effective inside the valves also influence the flow performance.

With 4-way valves the given flow data is therefore valid for the normal use with 2 flow directions (e.g. from P to A and at the same time return flow from B to T) (see table).

If only one flow direction is available the permissible flow may be much lower in critical cases (e.g. when using a 4-way directional valve with blocked port A or B as 3-way directional valve).

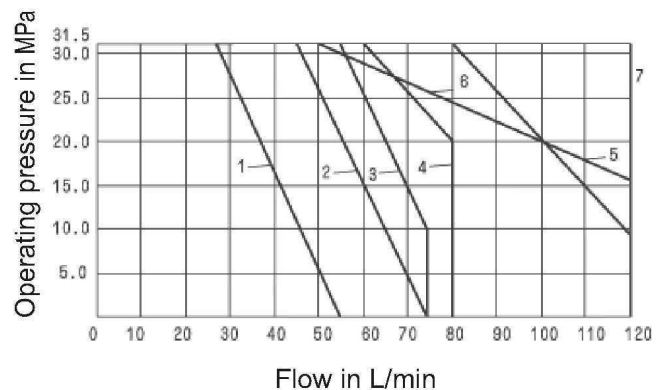
Type WH6

Control pressure 0.6 Mpa > T-pressure			Control pressure 1 Mpa > T-pressure		
Operating curve		Symbol	Spring return		Symbol
Spring return	1	A, B	Spring return	1	A, B
	2	C, D, Y		8	C, D, Y, E, G
	3	E, J, L, U, M		1	H, J, L, U, M
	4	Q, V, W, E		9	Q, V, W, E1
	5	F, P		10	F, P
	7	R	11	R	
.../O	8	A, C, D	.../O	8	A, C, D
.../OF			.../OF		



Type WH10

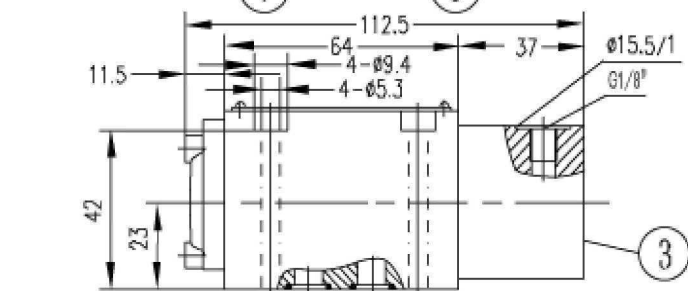
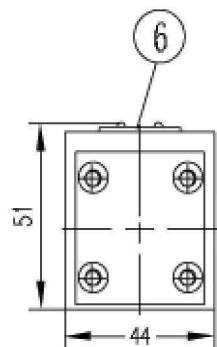
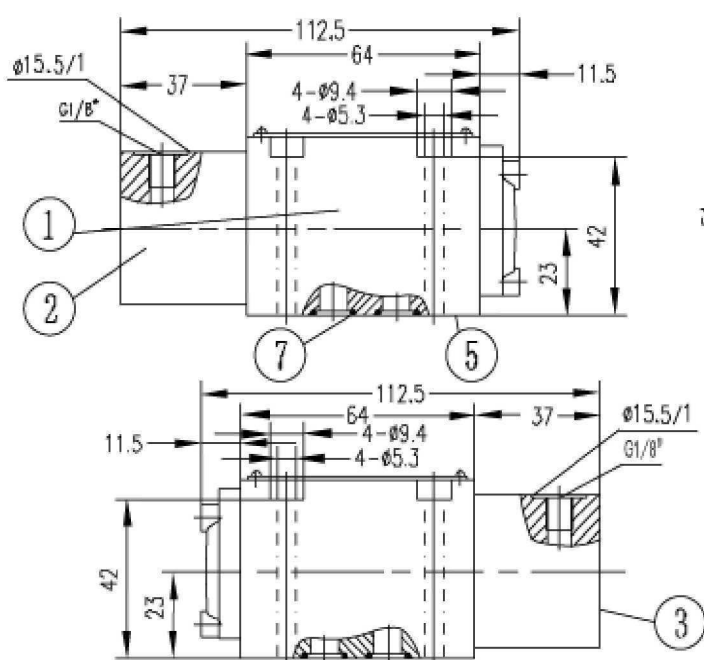
curves	symbols
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	CV/O, C/OF, D/O/D/OF



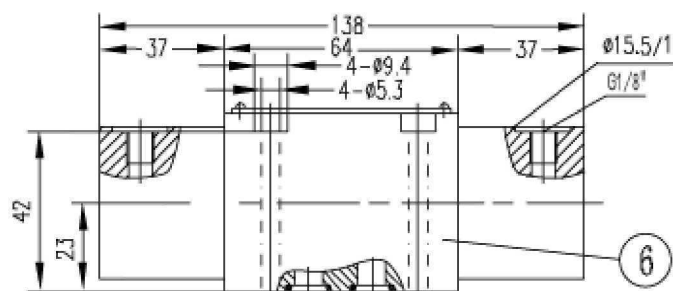
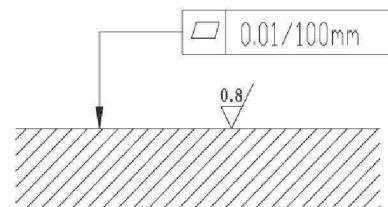
Unit dimensions

(Dimensions in mm)

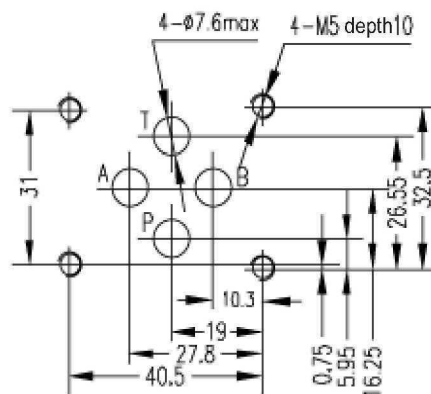
Type WH6



Required surface finish of mating piece



Units for ports` s connecting surface



- | | |
|---|---|
| 1. Valve with 2 switching positions and 1 operating cylinders | 6. Valve with 2 switching positions and 2 operating cylinders |
| 2. Operating cylinder "a" | Valve with 3 switching positions and 2 operating cylinders |
| 3. Operating cylinder "b" | |
| 4. Nameplate | 7. O-ring 9.81 x 1.78 with ports A, B, P, T |
| 5. Connecting surface | |

Subplate(see page 205)

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

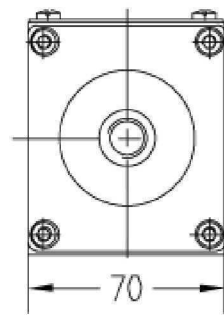
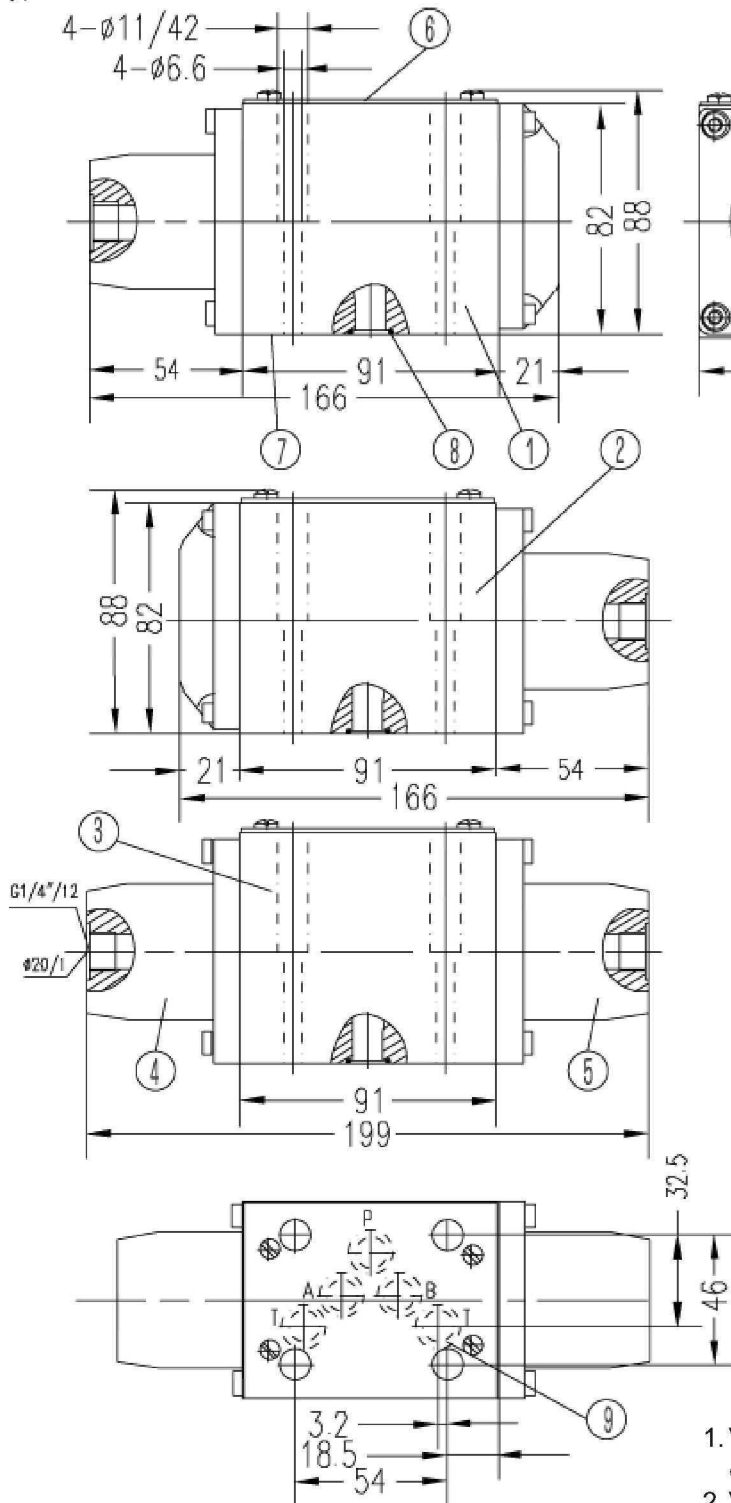
G342/01 (G3/8"); G342/02 (M18X1.5)

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

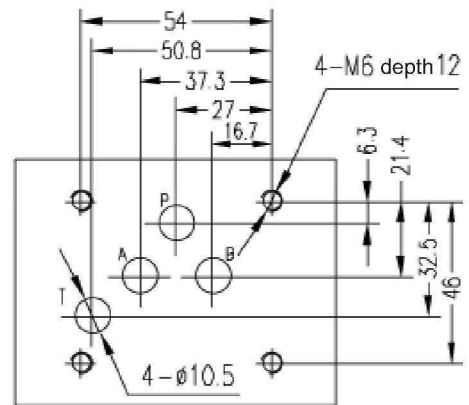
Unit dimensions

(Dimensions in mm)

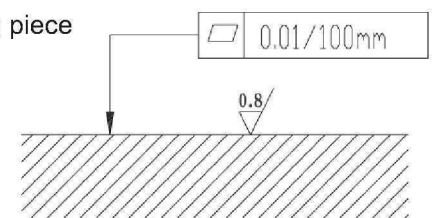
Type WH10



Units for ports' s connecting surface



Required surface finish of mating piece



Subplate(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. Valve with 2 switching positions and operating cylinder "a"
2. Valve with 2 switching positions and operating cylinder "b"
3. Valve with 3 switching positions and 2 operating cylinders
4. Operating cylinder "a"
5. Operating cylinder "b"
6. Nameplate
7. Valve connecting surface
8. O-ring 12 x 2 with ports A, B, P, T
9. If use control block, it used as assistant port

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