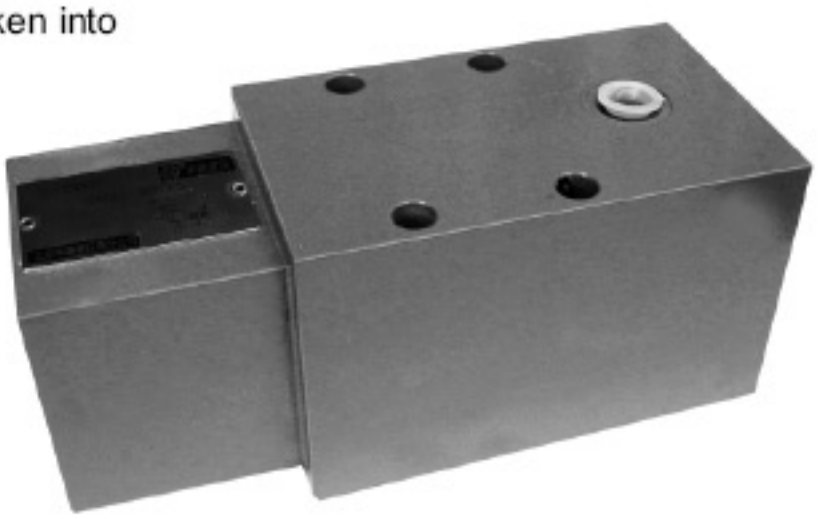
| BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD. | Check-Q-meter type FD | | | RE27551/12.2004 |
|---|---|---|---|---|
| | Size 12 ,16,25,32 | up to 31.5MPa | up to 560 L/min | Replaces: RE27551/05.2001 |

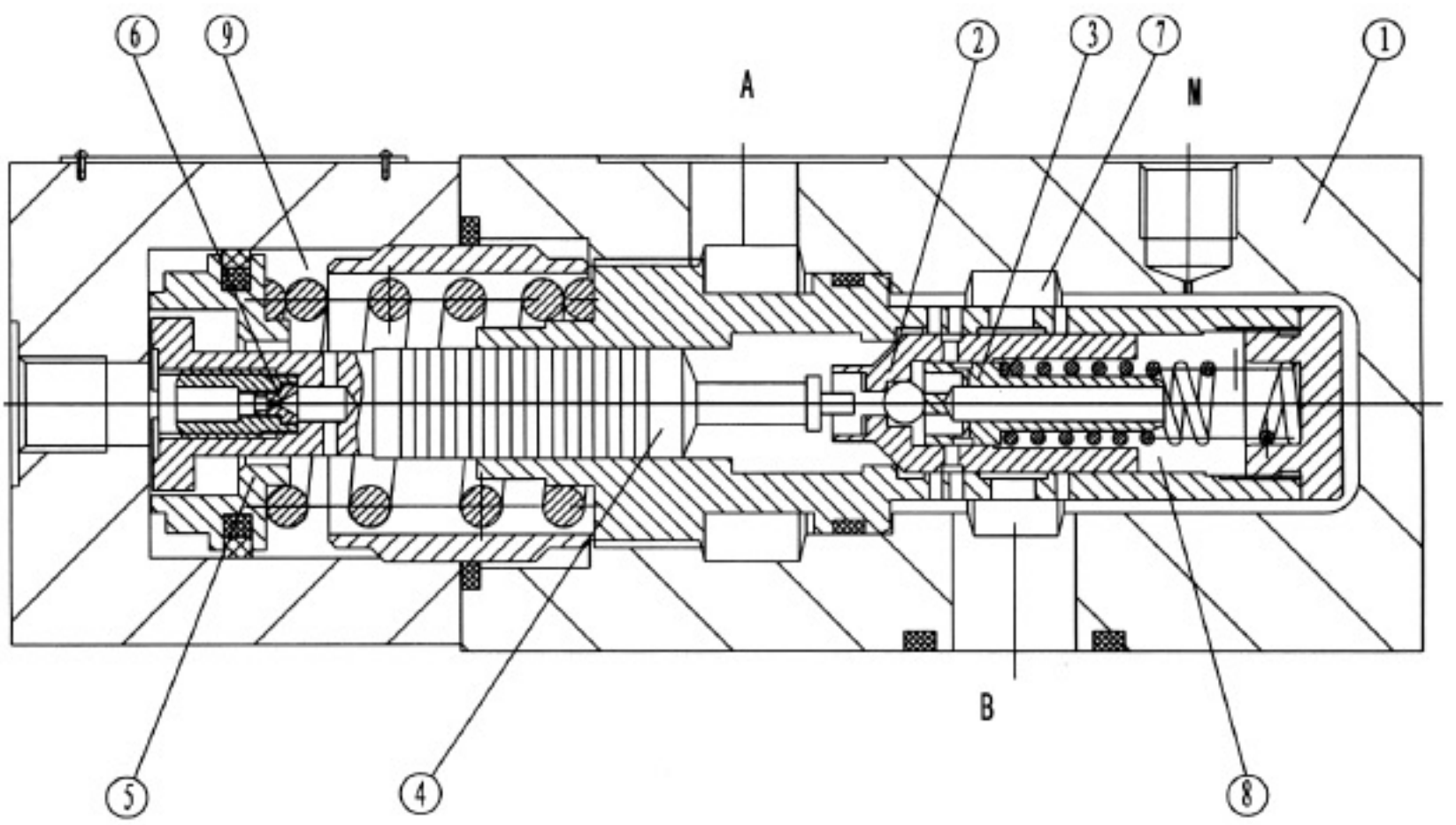
**Features:**

- Porting pattern to DIN 24 340, from D,ISO 5781 and CETOP-RP 121H
- Pilot operated check valve, leak-free,- The check-Q-meter controls the returning flow $q_{v2}$ in relation to the flow being directed into the opposite side of the actuatcr $q_{v1}$ . With cylinders the area ratio( $q_{v2} = q_{v1}\ \varphi$ ) has to be taken into account,
- By-pass valve, free-flow in opposite direction,
- Optional built-in secondary pressure relief valve (only for valve with flange connections).



## Functional, section

Check-Q-meters are used in hydraulic systems to influence the speeds of hydraulic motors and cylinders independent of the load (prevents running away). In addition there is an isolator function for pipe burst safety. The check-Q-meter comprises basically of the housing (1), main poppet (2), pilot part (3), pilot spool (4), damping spool (5) and pilot damping (6).



## Ordering Code

| FD | | | | | B | / | | | * |
|---|---|---|---|---|---|---|---|---|---|

Nominal size 12 = 12
Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32

For manifold mounting (cartridge valve) = K
For sub-plate mounting = P
For SAE flange connections DBV = F

without secondary pressure relief valve = A
wit secondary pressure relief valve = B
(only for valve wih flange connecotions)

Series 12 (nominal size 12，16，25) = 12
Series 11 (nominal size 32) = 11
(10 to19: unchanged installation and connection dimensions)

Operation pressure of secondary pressure relief valve

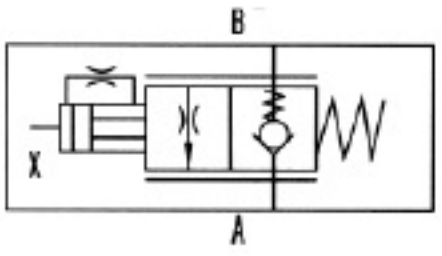
No code= Mineral oil
V= Phosphate ester

B00 = Without orifice
B30 = Orifice Φ 0.30 mm (sizes 12 and 16)
B40 = Orifice Φ 0.40 mm (size 25)
B60 = Orifice Φ 0.60 mm (size 32)
(other orifice diameters on request)

B = Technology of Beijing Huade Hydraulic

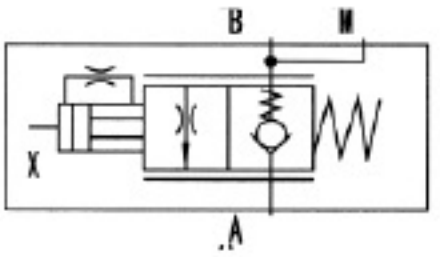
## Symbols

### Without secondary pressure relief valve

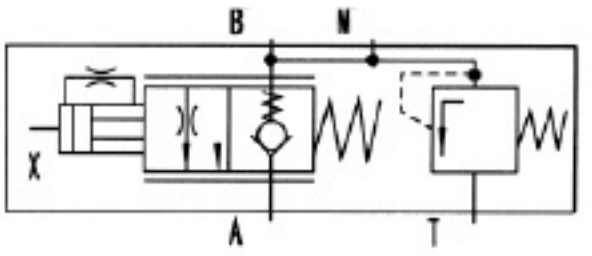



**Valve type:**
FD 12 KA 12/B30..
FD 16 KA 12/B30..
FD 25 KA 12/B40..
FD 32 KA 11/B60..

### With secondary pressure relief valve




**Valve type:**
FD 12 PA 12/B30..
FD 16 PA 12/B30..
FD 25 PA 12/B40..
FD 32 PA 11/B60..
FD 12 FA 12/B30..
FD 16 FA 12/B30..
FD 25 FA 12/B40..
FD 32 FA 11/B60..




**Valve type:**
FD 12 FB 12/B30..
FD 16 FB 12/B30..
FD 25 FB 12/B40..
FD 32 FB 11/B60..

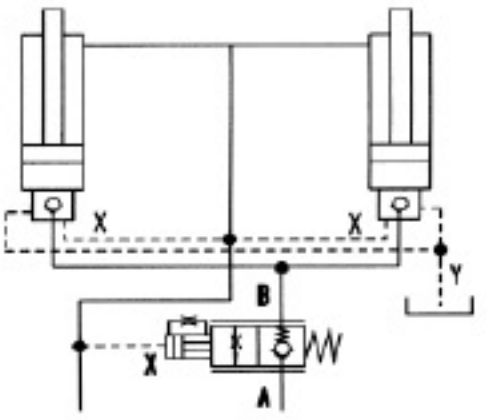
## Circuit examples

**Note:**

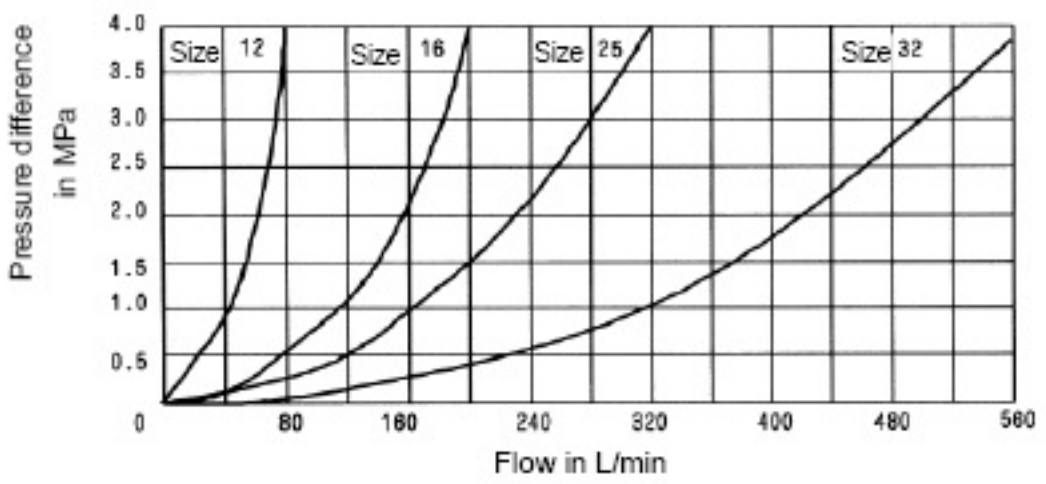
Two check-Q-meters cannot be used to control two cylinders which are forced mechanically to move together, as synchronisation and the same pressure cannot be guaranteed in each cylinder.

Therefore, the cylinders have to be equipped with two pilot operated check valves, type SL. The check-Q-meter is fitted in a common line.

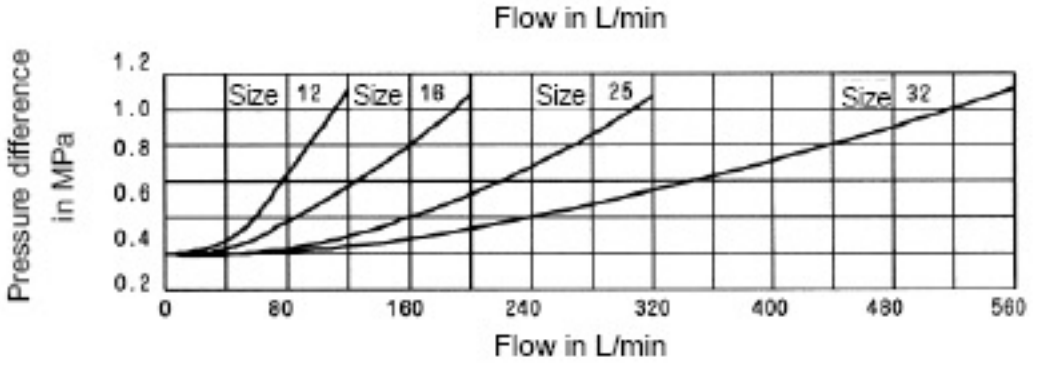
In this case, the load pressure must not exceed 20MPa !




## Characteristic curves (measured at v = 41 mm² and t = 50°C)




Pressure difference
$\Delta p$ in relation to flow $q_v$, measured at throttle position:
Throttle fully open
( Px = 6 MPa)
B to A

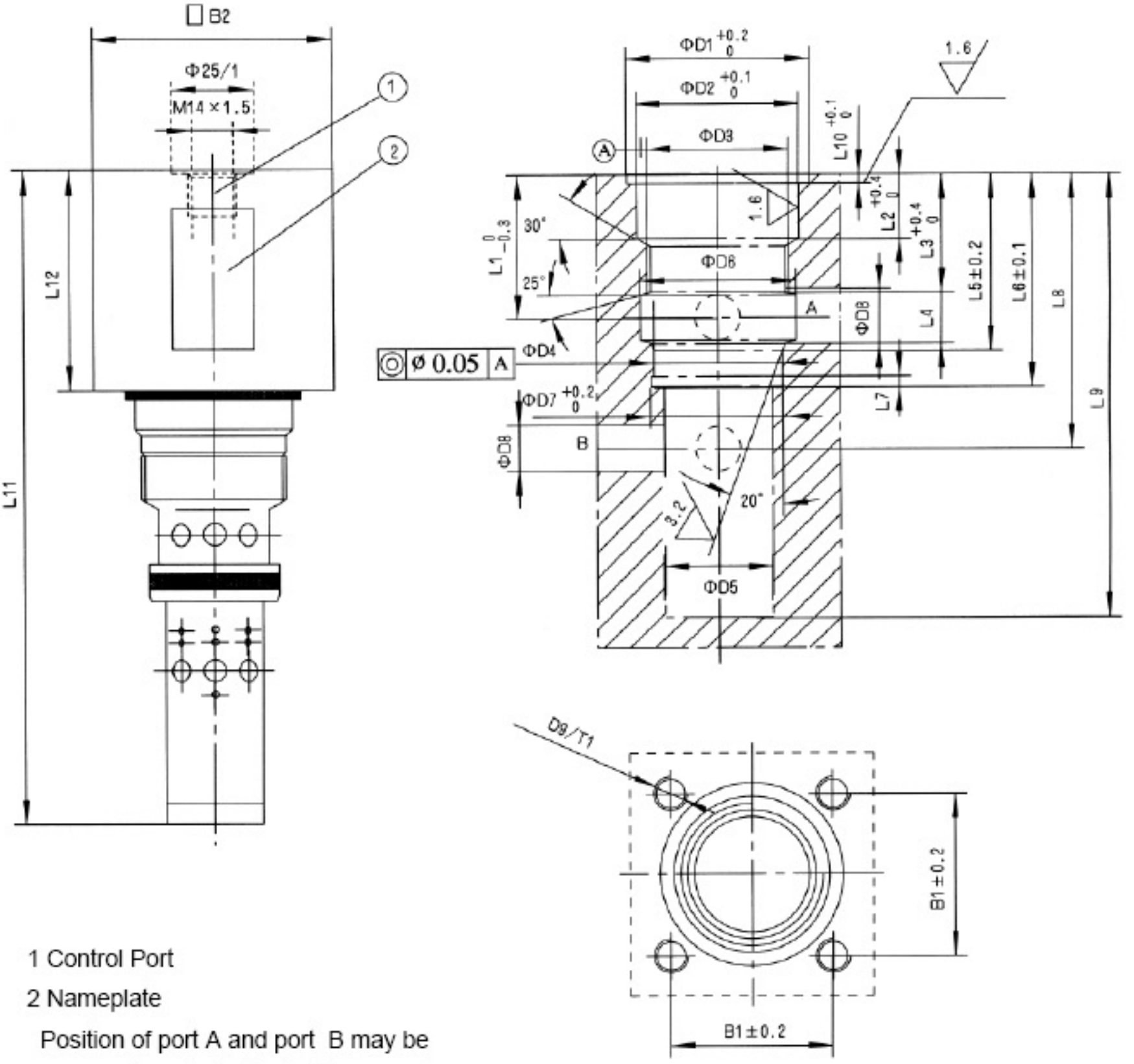



Pressure difference in MPa
Flow in L/min
Pressure difference
$\Delta p$ in relation to flow $q_v$, measured over the check valve
A to B

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

| | | |
|---|---|---|
| Operating pressure, ports A, X | (MPa) | to 31.5 |
| Operating pressure, port B | (MPa) | to 42 |
| Pilot pressure, port X (flow control range) | (MPa) | min. 2 to 3.5 , max. 31.5 |
| Cracking pressure, A to B | (MPa) | 0.2 |
| Setting pressure for secondary pressure relief valve | (MPa) | to 40 |
| Flow | (L/min) | 80 (size12) 200 (size16)<br>320 (size25) 560 (size32) |
| Area ratio of the pre-opening | | $\frac{\text{poppet seat area}}{\text{area of pilot spool}} = \frac{1}{20}$ |
| Pressure fluid temperature range | (°C) | -30 to +80 |
| Viscosity range | ($mm^2$ /s) | 10 to 800 |
| Pressure fluid | | Mineral oil(for NBR seal) or Phosphate ester (for FPM seal) |

**Unit dimensions:** for SAE flange connections, without secondary pressure relief valve **(Dimensions in mm)**




1 Control Port

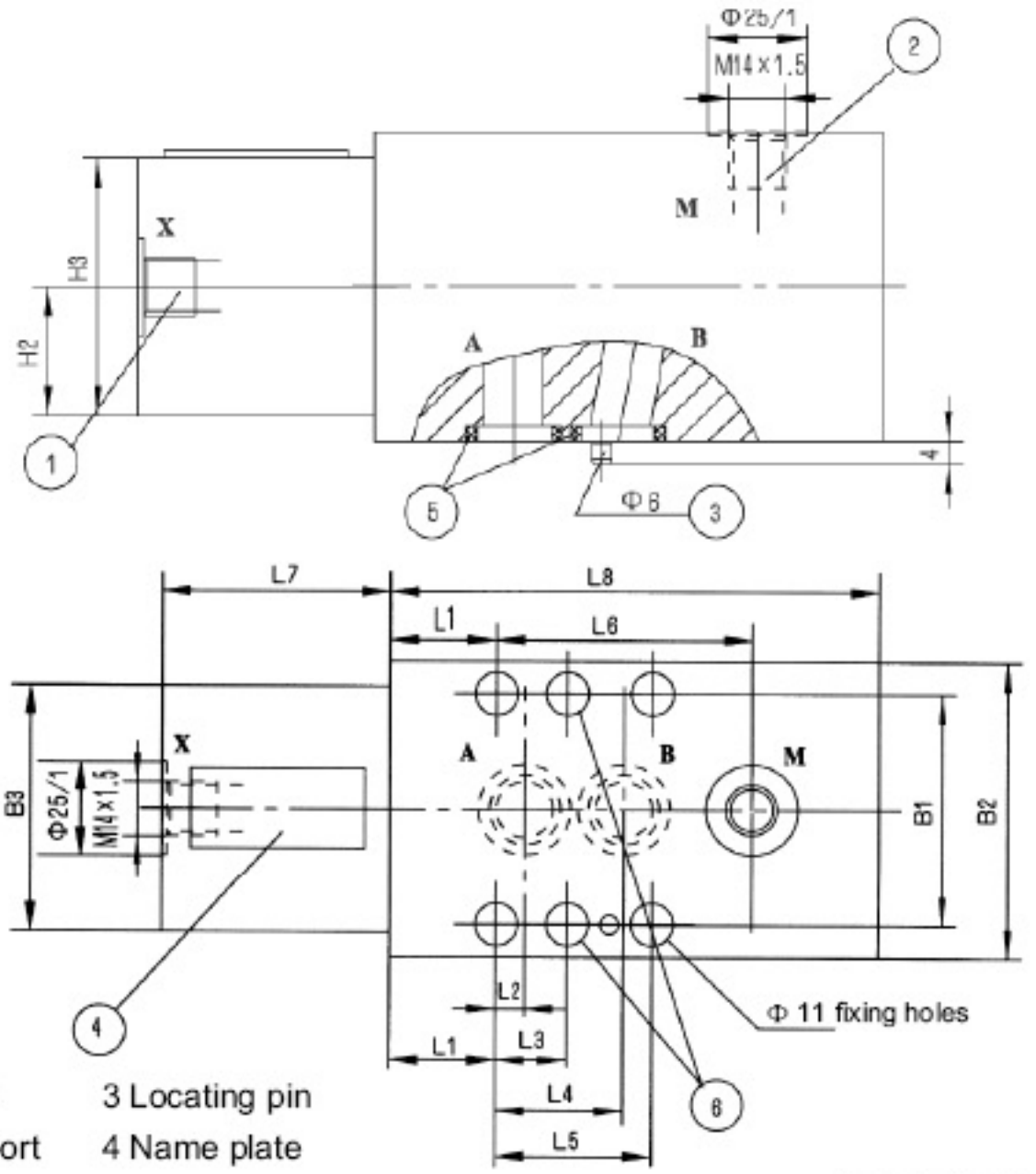
2 Nameplate

Position of port A and port B may be arranged as desired,but dot occupy the position of the fixing screw holes

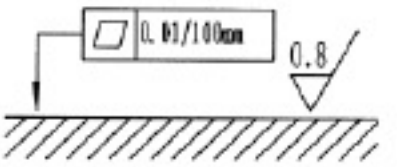
| Type | B1 | B2 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | T1 | L1 | L2 | L3 | L4 | L5 | L6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FD12KA10 | 48 | 70 | 54 | 46 | M42X2 | 38 | 34 | 46 | 38.6 | 16 | M10 | 16 | 39 | 16 | 32 | 15.5 | 50.6 | 60 |
| FD16KA10 | 48 | 70 | 54 | 46 | M42X2 | 38 | 34 | 46 | 38.6 | 16 | M10 | 16 | 39 | 16 | 32 | 15.5 | 50.6 | 60 |
| FD25KA10 | 56 | 80 | 60 | 54 | M52X2 | 48 | 40 | 60 | 48.6 | 25 | M12 | 19 | 50 | 19 | 39 | 22 | 65 | 80 |
| FD32KA10 | 66 | 95 | 72 | 65 | M64X2 | 58 | 52 | 74 | 58.6 | 30 | M16 | 23 | 52 | 19 | 40 | 25 | 71 | 85 |

| Type | L7 | L8 | L9 | L10 | L11 | L12 | Size | Valve fixing screws/tighting torque $M_A$(Nm) | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| FD12KA12 | 3 | 78 | 128 | 2.75 | 191 | 65 | 12 | 4-M10 × 70-10.9 | 69 | 2.8kg |
| FD16KA12 | 3 | 78 | 128 | 2.75 | 191 | 65 | 12 | 4-M10 × 70-10.9 | 69 | 2.8kg |
| FD25KA12 | 4 | 105 | 182 | 2.3 | 253 | 75 | 25 | 4-M12 × 80-10.9 | 120 | 2.8kg |
| FD32KA11 | 4 | 115 | 198 | 2.3 | 289 | 94 | 32 | 4-M16 × 100-10.9 | 295 | 7.5kg |

## Unit dimensions: for sub-plate mounting (Dimensions in mm)




1 Control port 3 Locating pin
2 Measuring port 4 Name plate
5 O-ring
6 Valve fixing holes(for size 32,6,the other 4)




Required surface finish of mating piece

Subplates for:see page 70

NG12、16：G460/01 G460/02
G461/01 G461/02

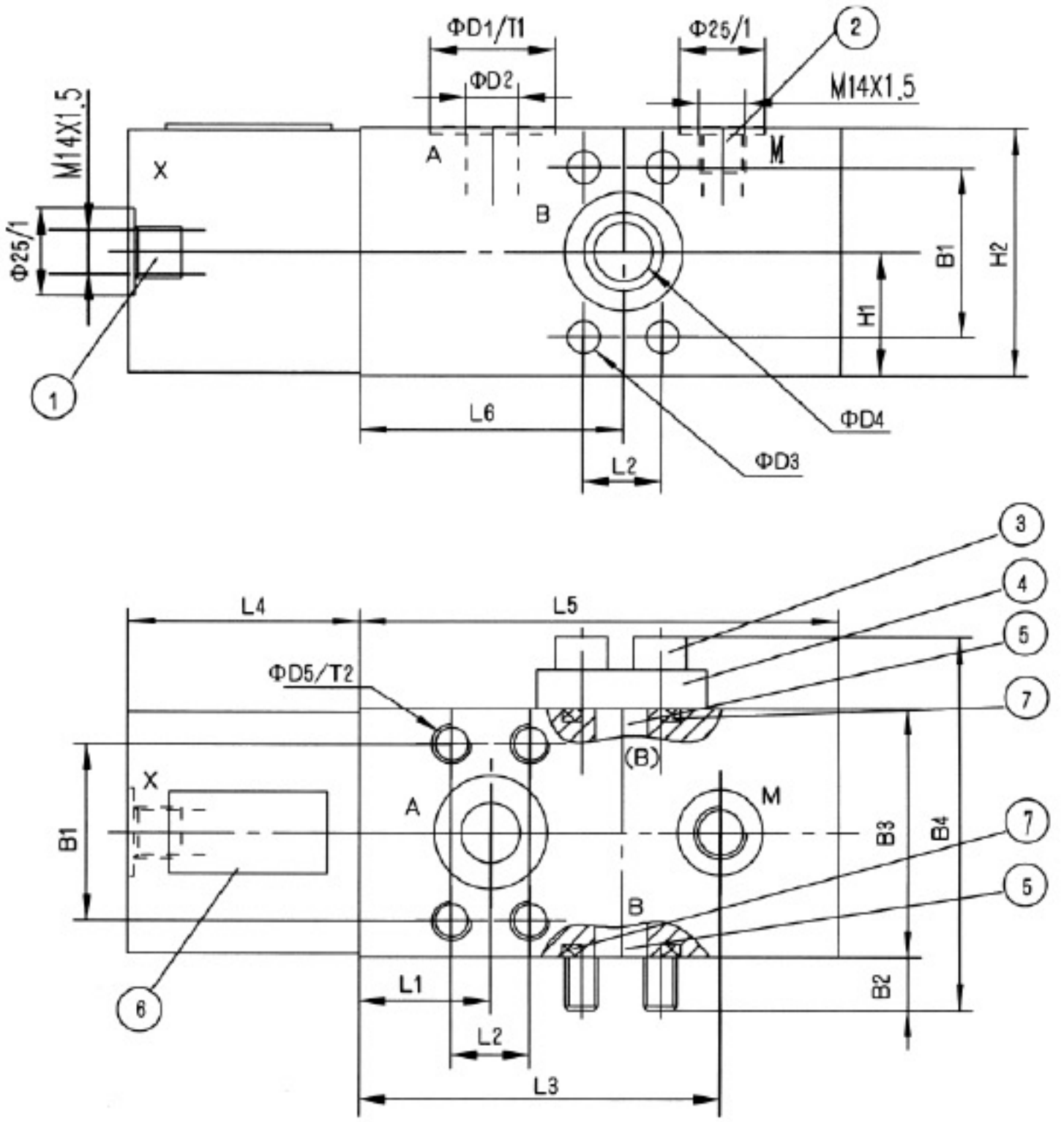
NG25：G412/01 G412/02
G413/01 G413/02

NG32：G414/01 G414/02
G415/01 G415/02

| Type | B1 | B2 | B3 | H1 | H2 | H3 | L1 | L2 |
|---|---|---|---|---|---|---|---|---|
| FD 12 PA12 | 66.5 | 85 | 70 | 85 | 42.5 | 70 | 32 | 7 |
| FD 16 PA12 | 66.5 | 85 | 70 | 85 | 42.5 | 70 | 32 | 7 |
| FD 25 PA12 | 79.5 | 100 | 80 | 100 | 50 | 80 | 39 | 11 |
| FD 32 PA11 | 97 | 120 | 95 | 120 | 60 | 95 | 35.5 | 16.5 |

| Type | L3 | L4 | L5 | L6 | L7 | L8 | Weight | O-Ring |
|---|---|---|---|---|---|---|---|---|
| FD 12 PA12 | - | 35.5 | 43 | 73 | 65 | 140 | 9kg | 21.3x2.4 |
| FD 16 PA12 | - | 35.5 | 43 | 73 | 65 | 140 | 9kg | 21.3x2.4 |
| FD 25 PA12 | - | 49 | 60.5 | 109 | 75 | 200 | 18kg | 29.82x2.62 |
| FD 32 PA11 | 42 | 67.5 | 84 | 119.5 | 94 | 215 | 24kg | 38x3 |

**Unit dimensions: for SAE flange connections, without secondary pressure relief valve** **(Dimensions in mm)**

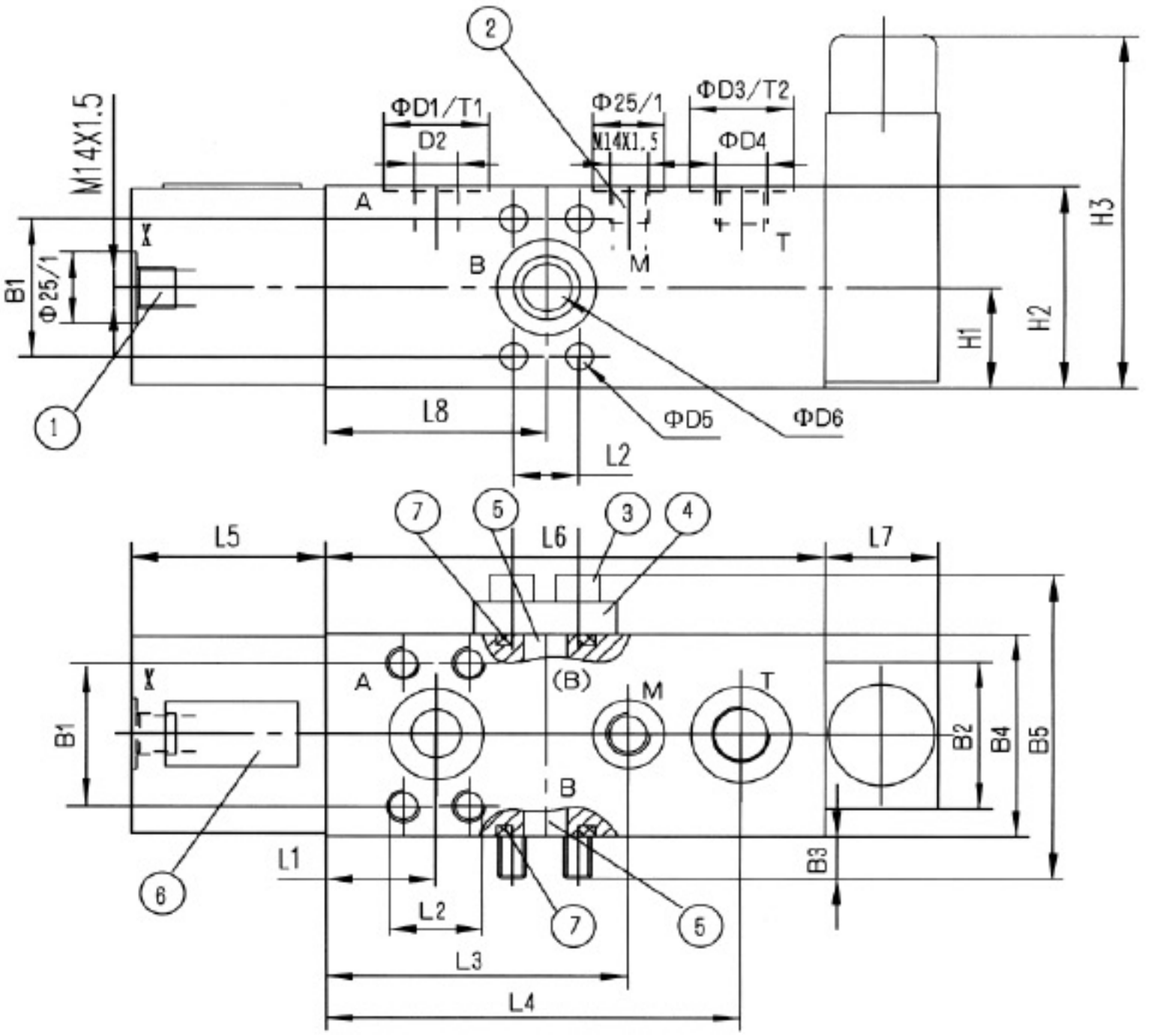



1 Control port 3 Flange fixing screws 5 Optional port B 7 O-ring
2 Measuring port 4 Blanking flange 6 Nameplate

| Type | B1 | B2 | B3 | B4 | D1 | D2 | D3 | D4 | D5 | H1 | H2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FD12FA12 | 50.85 | 16.5 | 72 | 110 | 42 | 18 | 10.5 | 18 | M10 | 36 | 72 |
| FD16FA12 | 50.85 | 16.5 | 72 | 110 | 42 | 18 | 10.5 | 18 | M10 | 36 | 72 |
| FD25FA12 | 57.2 | 14.5 | 90 | 132 | 50 | 25 | 13.5 | 25 | M12 | 45 | 90 |
| FD32FA11 | 66.7 | 20 | 105 | 154 | 56 | 30 | 15 | 30 | M14 | 50 | 105 |

| Type | L1 | L2 | L3 | L4 | L5 | L6 | T1 | T2 | Weight | O-Ring |
|---|---|---|---|---|---|---|---|---|---|---|
| FD12FA10 | 39 | 23.8 | 105 | 65 | 140 | 78 | 0.2 | 15 | 7kg | 25x3.5 |
| FD16FA10 | 39 | 23.8 | 105 | 65 | 140 | 78 | 0.2 | 15 | 7kg | 25x3.5 |
| FD25FA10 | 50 | 27.8 | 148 | 75 | 200 | 105 | 0.2 | 18 | 16kg | 32.92x3.53 |
| FD32FA10 | 52 | 31.6 | 155 | 94 | 215 | 115 | 0.2 | 21 | 21kg | 37.7x3.53 |

**Unit dimensions: for SAE flange connections, without secondary pressure relief valve** **(Dimensions in mm)**




1 Control port 3 Flange fixing screws 5 Optional port B 7 O-ring
2 Measuring port 4 Blanking flange 6 Nameplate

| Type | B1 | B2 | B3 | B4 | B5 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | H1 | H2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FD12 FB12 | 50.8 | 49 | 16.5 | 72 | 110 | 42 | 18 | 34 | M22x1.5 | 10.5 | 18 | M10 | 36 | 72 |
| FD16 FB12 | 50.8 | 49 | 16.5 | 72 | 110 | 42 | 18 | 34 | M22x1.5 | 10.5 | 18 | M10 | 36 | 72 |
| FD25 FB12 | 57.2 | 78 | 14.5 | 90 | 132 | 50 | 25 | 42 | M27x2 | 13.5 | 25 | M12 | 45 | 90 |
| FD32 FB11 | 66.7 | 78 | 20 | 105 | 154 | 56 | 30 | 42 | M27x2 | 15 | 30 | M14 | 50 | 105 |

| Type | H1 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | T1 | T2 | T3 | Weight | O-Ring |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FD12 FB12 | 118 | 39 | 23.8 | 105 | 141.5 | 65 | 162 | 38 | 78 | 0.2 | 1 | 15 | 9Kg | 25x3.5 |
| FD16 FB12 | 118 | 39 | 23.8 | 105 | 141.5 | 65 | 162 | 38 | 78 | 0.2 | 1 | 15 | 9Kg | 25x3.5 |
| FD25 FB12 | 145 | 50 | 27.8 | 148 | 198 | 75 | 225 | 50 | 105 | 0.2 | 1 | 18 | 18Kg | 32.92x3.53 |
| FD32 FB11 | 145 | 52 | 31.6 | 155 | 215 | 94 | 240 | 50 | 115 | 0.2 | 1 | 21 | 24Kg | 37.7x3.53 |

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