

Series

| | | | | | | | | |
|--|---|---|---|---|---|---|---|-----------|
| | ✓ | ✓ | – | – | – | ✓ | – | 10 |
| | – | – | ✓ | ✓ | ✓ | ✓ | ✓ | 22 |
| | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 30 |

Direction of rotation

| | | |
|------------------------|------------------|----------|
| With view on shaft end | Clockwise | R |
| | Counterclockwise | L |

Seals

| | |
|--------------------|----------|
| NBR Nitrile rubber | P |
| FKM Fluoro-rubber | V |

Shaft end

| | |
|----------------------|----------|
| Keyed parallel shaft | P |
| Splined shaft | Z |

Mounting flange

40 71 125 180 250 355 500

| | | | | | | | | |
|------------|---|---|---|---|---|---|---|----------|
| ISO 4 hole | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | – | B |
|------------|---|---|---|---|---|---|---|----------|

Service ports

| | | | | | | | | |
|---|---|---|---|---|---|---|---|-----------|
| Port B and port S 90 degree offset; auxiliary pressure port B1 Metric fixing screws | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 13 |
| Port B and port S 90 degree offset; pressure connection B1 connected by flange | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 25 |

Through drive

| | | | | | | | | |
|---|---|---|---|---|---|---|---|------------|
| Without auxiliary pump, without through drive | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | N00 |
|---|---|---|---|---|---|---|---|------------|

* Technical Data

Performance parameters (these figures did not consider the efficiency of mechanical and volumetric efficiency)

| Size | | 40 | 71 | 125 | 180 | 250 | 355 | 500 |
|------------------------|-------------------------------|------|------|------|------|------|------|------|
| Displacement (Vg max) | cm ³ /r | 40 | 71 | 125 | 180 | 250 | 355 | 500 |
| Max. speed (n max1) | rpm | 2600 | 2200 | 1800 | 1800 | 1500 | 1500 | 1320 |
| Max. Output flow | if n = n _{max} L/min | 104 | 156 | 225 | 324 | 375 | 532 | 600 |
| | if n=1500rpm L/min | 60 | 107 | 186 | 270 | 375 | 532 | – |
| Max. power | if n = n _{max} KW | 61 | 91 | 131 | 189 | 219 | 310 | 385 |
| | if n=1500rpm KW | 35 | 62 | 109 | 158 | 219 | 310 | – |
| Max. torque (ΔP=35MPa) | N.m | 223 | 395 | 696 | 1002 | 1391 | 1976 | 2783 |
| Torque (ΔP=10MPa) | N.m | 64 | 113 | 199 | 286 | 398 | 564 | 795 |
| Weight (approximately) | kg | 40 | 54 | 87 | 103 | 186 | 206 | 318 |

Parameter calculation

$$\text{Flow } q_v = \frac{V_g \cdot n \cdot \eta_v}{1000} \text{ [L/min]}$$

V_g = Geometry displacement each rotate [cm³]

$$\text{Drive torque } T = \frac{1.59 \cdot V \cdot \Delta p}{1000 \cdot \eta_{mh}} \text{ [N.m]}$$

Δp = Pressuredrop/differential [bar]

n = Rotary speed [rpm]

η_v = Cubage's efficiency

$$\text{Drive power } P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{T \cdot n}{9549} = \frac{q_v \cdot \Delta p}{600 \cdot \eta_t} \text{ [kW]}$$

η_{mh} = Mechanical hydraulic efficiency

$\eta_t = (\eta_v \cdot \eta_{mh})$ Overall efficiency

* Operation Mode

1. Outlined

DR/DRG

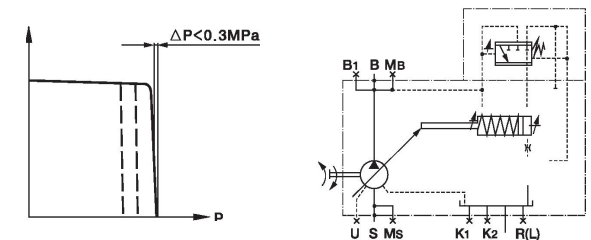
Pressure control DR

Remote pressure control DRG

Maximum pressure adjustment in hydraulic system;

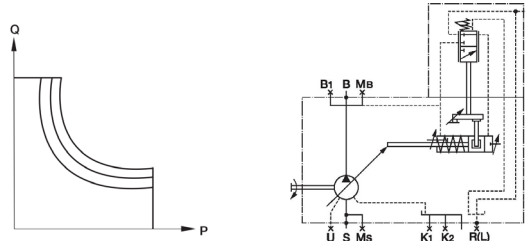
Set range 20...350 bar;

Option: remote control DRG



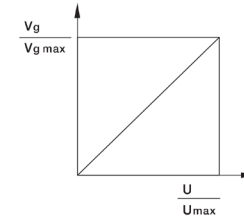
LR Power control LR

The hyperbolic power control is kept constant at the same input speed
Option: pressure control LR2D,
remote control LR2G;
Flow control LR2S, LR2F;
Hydraulic stroke limiter LR2H;
Mechanical stroke limiter LR2M;
Hydraulic two point control LR2Z;
Electrical discharge valve for help starting LR2Y.



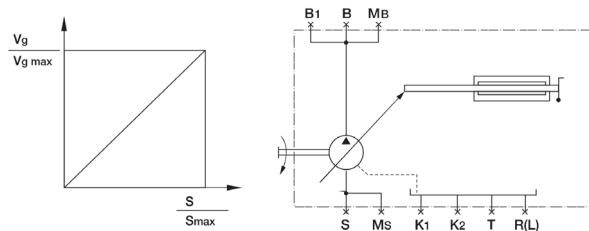
EO Hydraulic displacement control EO

Through the angle of the electronic feedback of the proportional valve to achieve stepless displacement adjustment.
Electronic control
Available options: EO1K, EO2K
No valve EO1E, EO2E



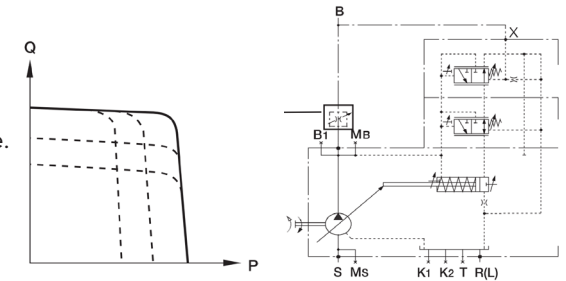
Manual control MA

Stepless adjustment of flow through the hand wheel



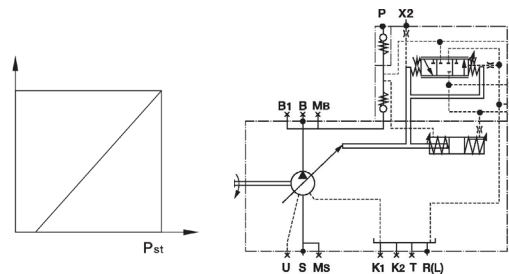
DFR Pressure and flow control DFR

This control can be kept constant in the constant flow rate of the pump under the condition of constant change.
Mechanical adjustable pressure control is preferred.
Available options: the throttle hole in the x of the oil port DFR1



Hydraulic control HD

Pump flow(displacement) of the stepless regulation and the pilot pressure.
Adjust the proportion of the applied lead pressure.
Option: pilot pressure characteristic curve, HD1, HD3, HD2;
pressure control HD.B, remote control HD.GB;
Power control DH1P;
Electrical lead pressure control HD1T;



2. The code of control section and technical parameter

- Hydraulic control HD

Outline

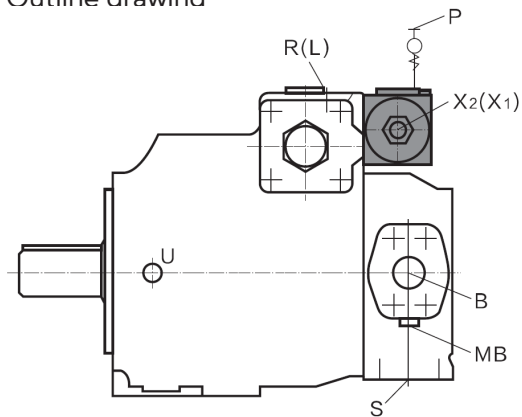
HD Hydraulic control of displacement dependent on pilot pressure signal. The displacement is proportional to the pilot pressure. The mechanical pivot angle limit setting range is 50%--100%Vgmax.

The ordering code number as following form

| Pilot pressure characteristic | 40 | 71 | 125 | 180 | 250 | 355 | 500 | |
|---|----|----|-----|-----|-----|-----|-----|---|
| 1-4.5 Mpa | Δ | Δ | Δ | Δ | Δ | Δ | Δ | 1 |
| 1-2.8 Mpa | Δ | Δ | Δ | Δ | Δ | Δ | Δ | 2 |
| 0.55-1.9 Mpa | Δ | Δ | Δ | Δ | Δ | Δ | Δ | 3 |
| Closed loop pressure control | | | | | | | | |
| Control at A port | Δ | Δ | Δ | Δ | Δ | Δ | Δ | A |
| Control at B port | Δ | Δ | Δ | Δ | Δ | Δ | Δ | B |
| Without pressure control/need not fill the code | | | | | | | | |

Note: ✓ available; Δ in preparation

Outline drawing



Technical parameter

| Size | | 40 | 71 | 125 | 180 | 250 | 355 | 500 |
|-----------------------------|-----------------|------|------|------|------|------|------|------|
| Control moving distance | mm | 14.2 | 17.3 | 20.7 | 20.7 | 25.9 | 25.9 | 32.6 |
| Control area | cm ² | 3.9 | 6.4 | 9 | 9 | 14.4 | 14.4 | 18.8 |
| Control volume | cm ³ | 5.5 | 11 | 18.7 | 18.7 | 37.3 | 37.3 | 61.4 |
| Min.control pressure | Mpa | 3 | 3 | 5 | 5 | 5 | 5 | 5 |
| Control time 20Mpa pressure | s | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.8 |

Hydraulic displacement control HD

Outline

In the EO electric control work, the pump flow could set by proportion direction valve. Mean while, pump's current flow through inductance type position transducer feedback signal. This pump could reset the cylinder's zero position by the spring controls in the situation of normal pressure.

Do not reset at high-pressured work. Simultaneously, in order to reduce controls cylinder's loss flow, all size of hydraulic pressure fluid cylinder cavity is sealed.

The ordering code number as following form

| | | 40 | 71 | 125 | 180 | 250 | 355 | 500 | |
|---|--------|----|----|-----|-----|-----|-----|-----|------|
| Hydraulic control with proportion valve | EO 1 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO1 |
| | EO 1 E | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO1E |
| | EO 1 K | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO1K |
| | EO 2 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO2 |
| | EO 2 E | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO2E |
| | EO 2 K | Δ | Δ | Δ | Δ | Δ | Δ | Δ | EO2K |

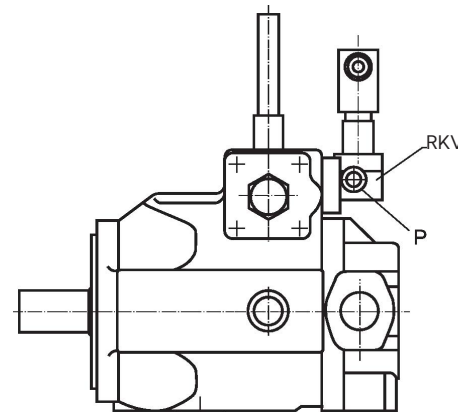
Max.setting pressure 10Mpa

Max.setting pressure 35Mpa

Bypass valve

Without valve

Outline drawing



Specification of oil ports:

P Pressure port: M22 x 1.5 deep 16

RKV Case drain port : M22 x 1.5 deep 16

Technical parameter

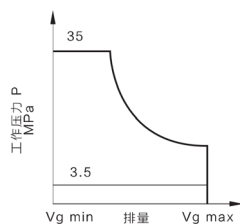
| Size | | 40 | 71 | 125 | 180 | 250 | 355 | 500 |
|------------------------------------|-----------------|------|------|------|------|------|------|-------|
| Control cylinder's moving distance | mm | 14.2 | 17.3 | 20.7 | 20.7 | 25.9 | 25.9 | 32.8 |
| Control cylinder area | cm ² | 8.1 | 12.6 | 18.1 | 16.1 | 28.3 | 28.3 | 38.2 |
| Control volume | cm ³ | 11.4 | 21.5 | 37.5 | 37.5 | 37.3 | 73.2 | 124.5 |
| Min.control pressure | Mpa | 10 | 10 | 10 | 12.5 | 12.5 | 12.5 | 15 |
| Max.control pressure | Mpa | 31.5 | 31.5 | 31.5 | 31.5 | 31.5 | 31.5 | 31.5 |
| Control time | s | 0.1 | 0.12 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 |

- Power control LR

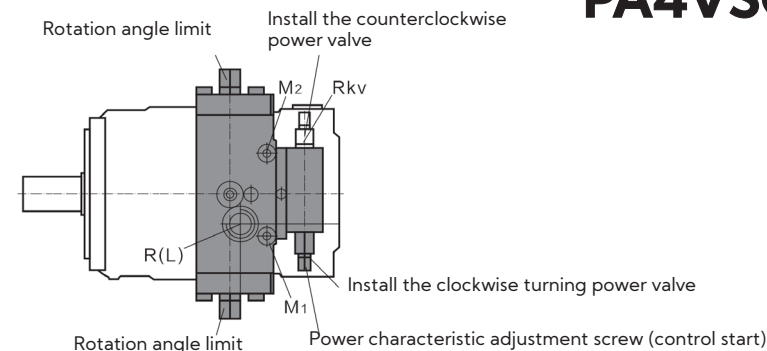
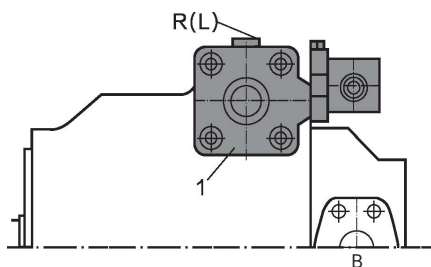
Outline

At the very beginning, the control scope could use the mechanical way to set, the setting value scope could use the spring and screw to adjust. When the pressure decreases, we could adjust spring and enter its starting position, the setting range of preset value:3.5Mpa-35Mpa. The smallest and the biggest angle of rotation's limit can use the mechanical way, adjustment to Vgmax 50%.

Characteristic curv



Outline drawing



The ordering code number as following form

Used for hydraulic drives in open loop circuits with the hyperbolic curve characteristic power adjuster, basic setting value Vgmax

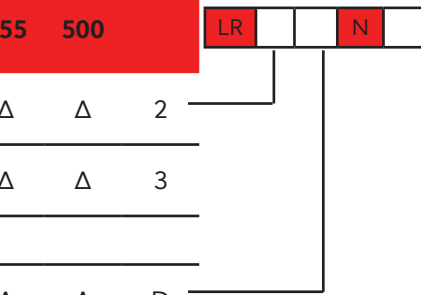
| Power regulation | 40 | 71 | 125 | 180 | 250 | 355 | 500 | LR | | |
|---|----|----|-----|-----|-----|-----|-----|----|---|---|
| The machinery adjust | ✓ | ✓ | ✓ | ✓ | ✓ | Δ | Δ | | 2 | |
| Remote hydraulic control | Δ | Δ | Δ | Δ | Δ | Δ | Δ | | | 3 |
| Pressure control | | | | | | | | | | |
| With pressure control | ✓ | ✓ | ✓ | ✓ | ✓ | Δ | Δ | | | D |
| With pressure control, remote hydraulic control | ✓ | ✓ | ✓ | ✓ | ✓ | Δ | Δ | | | G |
| Without pressure control/need not fill the code | | | | | | | | | | |
| Flow control, limit | | | | | | | | | | |
| With mechanical traveling schedule limit | Δ | Δ | Δ | Δ | Δ | Δ | Δ | | | M |
| Without flow control, limit, need not fill the code | | | | | | | | | | |

Note: ✓ available; Δ in preparation

Used for hydraulic drives in open, semi-close and close loop circuits with the hyperbolic curve characteristic power adjuster, basic setting value V_{gmax} depend on control pressure

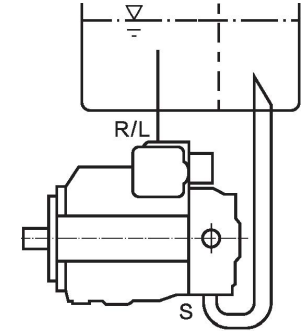
| Power regulation | 40 | 71 | 125 | 180 | 250 | 355 | 500 | |
|---|----|----|-----|-----|-----|-----|-----|---|
| The machinery adjust | Δ | Δ | Δ | Δ | Δ | Δ | Δ | 2 |
| Remote hydraulic control | Δ | Δ | Δ | Δ | Δ | Δ | Δ | 3 |
| Pressure control | | | | | | | | |
| With pressure control | Δ | Δ | Δ | Δ | Δ | Δ | Δ | D |
| With pressure control, remote hydraulic control | Δ | Δ | Δ | Δ | Δ | Δ | Δ | G |
| Without flow control, limit, need not fill the code | | | | | | | | |

Note: ✓ available; Δ in preparation



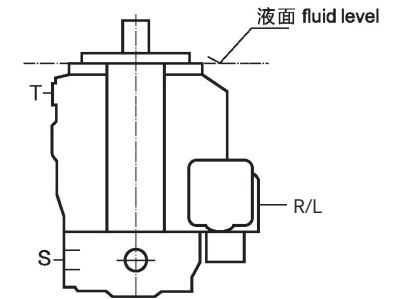
The hydraulic pump installed outside a tank
If the pump installed below the tank, drain pipe and port S must be piped, as right diagram.

If the pump installed above the tank, drain pipe and port S must be piped, refer.



Vertical installation

The hydraulic pump installed within a tank
If the minimum fluid level is level with of above the pump, mounting flange case drain ports T, S and port R/L are open, as right diagram.

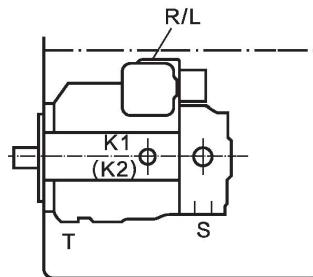


* Installation Postion

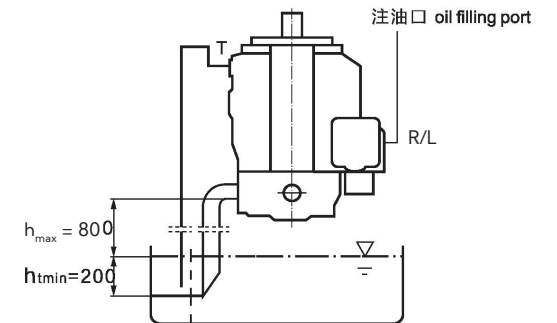
Horizontal installation

The hydraulic pump installed within a tank
If the minimum fluid level is level above the top of pump, case drain ports and port S are open, as right diagram.

If the minimum fluid level falls the top of pump, case drain ports and port S must be piped, as following diagram.

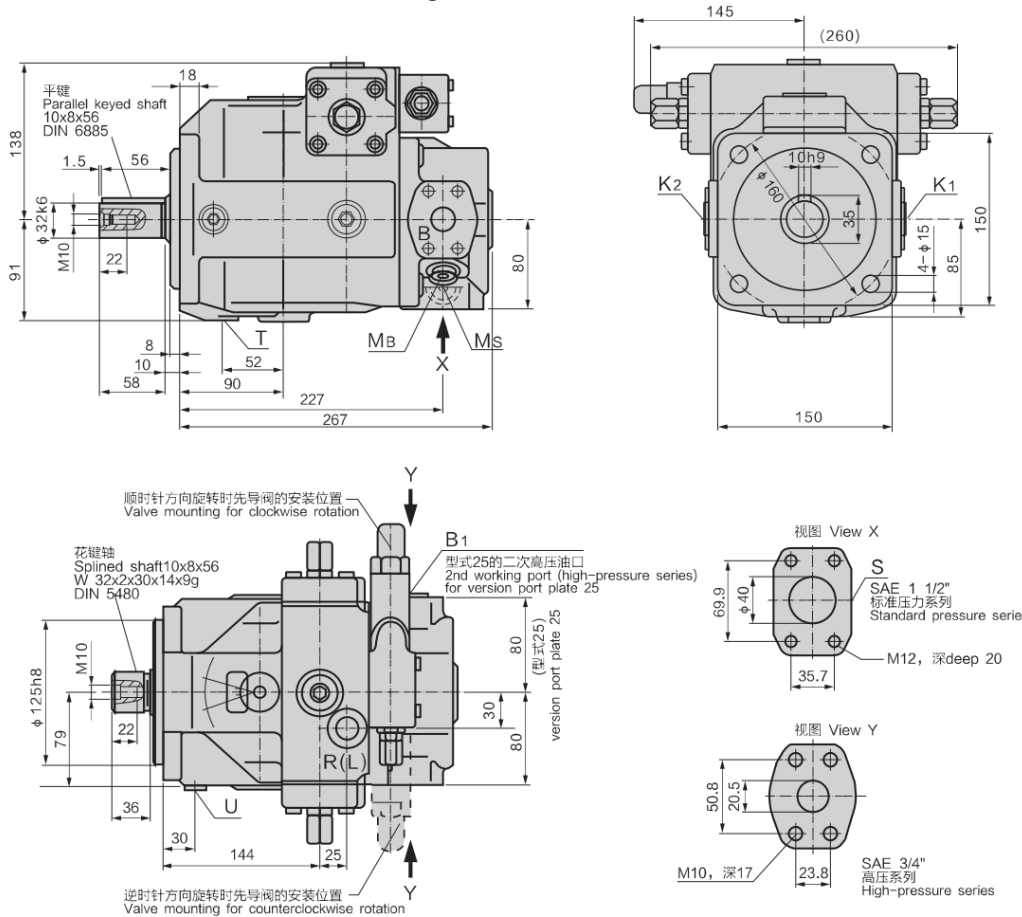


If the minimum fluid level fall below the pump mounting flange, case drain ports T, S and port P/L must be piped, as right diagram.



* Dimensions & Size

Dimensions, Size PA4VSO-40 (Diagram: DR Variable)

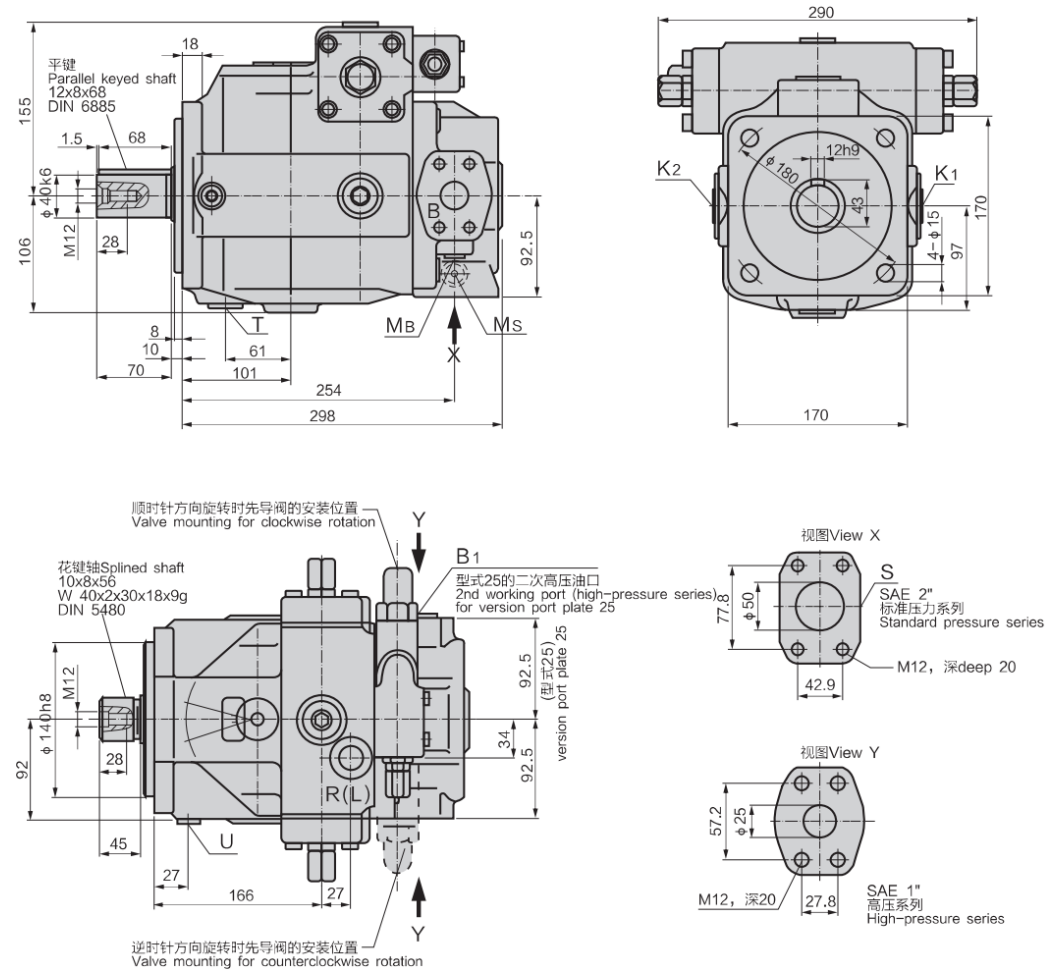


| | | |
|-------------------------------|--|---------------------------|
| B | Pressure port | ø20.5 |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M22 x 1.5 deep 16 |
| S | Suction port | ø40 |
| T | Case drain port | M22 x 1.5 deep 16 |
| R(L) | R(L) Fluid fill and air bleed port | M22 x 1.5 |
| M _B M _S | Test port | M14 x 1.5 deep 12 |
| K ₁ K ₂ | Flushing port | M22 x 1.5 deep 14 |
| U | Bearing flushing port | M14 x 1.5 deep 12 plugged |

PA4VSO

* Dimensions & Size

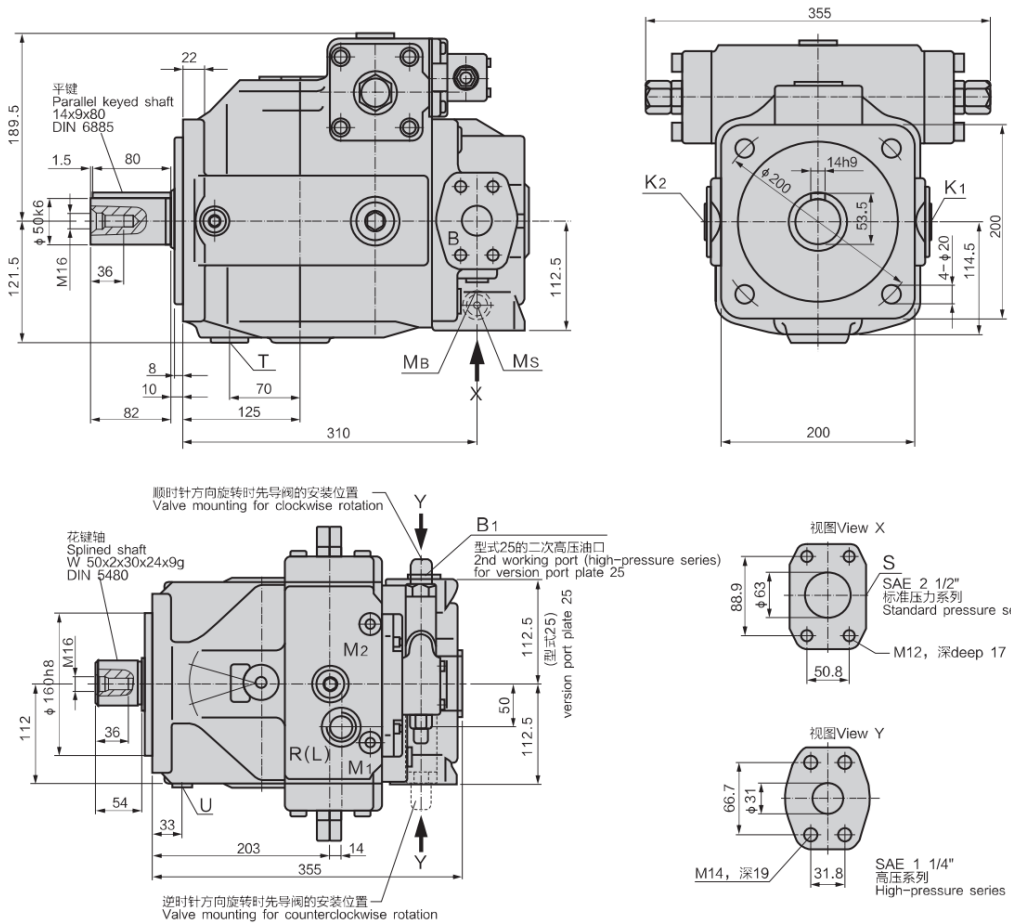
Dimensions, Size PA4VSO-71 (Diagram: DR Variable)



| | | |
|-------------------------------|--|-----------------|
| B | Pressure port | ø25 |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M27 x 2 deep 16 |
| S | Suction port | ø50 |
| T | Case drain port | M27 x 2 deep 16 |
| R(L) | R(L) Fluid fill and air bleed port | M27 x 2 |
| K ₁ K ₂ | Flushing port | M27 x 2 deep 16 |

* Dimintions & Size

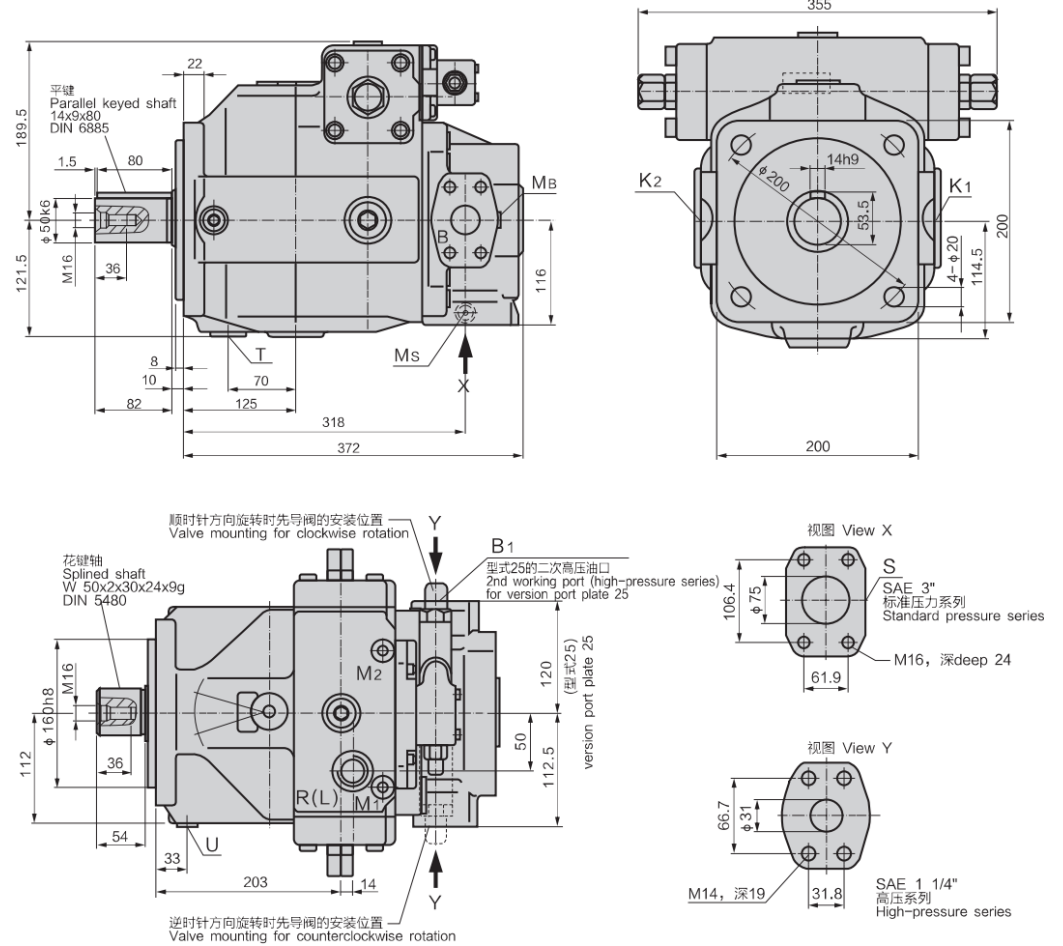
Dimensions, Size PA4VSO-125 (Diagram: DR Variable)



| | | |
|-------------------------------|--|---------------------------|
| B | Pressure port | ø31 |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M32 x 2 deep 18 |
| S | Suction port | ø63 |
| T | Case drain port | M33 x 2 deep 18 |
| R(L) | R(L) Fluid fill and air bleed port | M33 x 2 |
| M _B M _S | Test port | M14 x 1.5 deep 12 |
| K ₁ K ₂ | Flushing port | M33 x 2 deep 18 |
| U | Bearing flushing port | M14 x 1.5 deep 12 plugged |

* Dimintions & Size

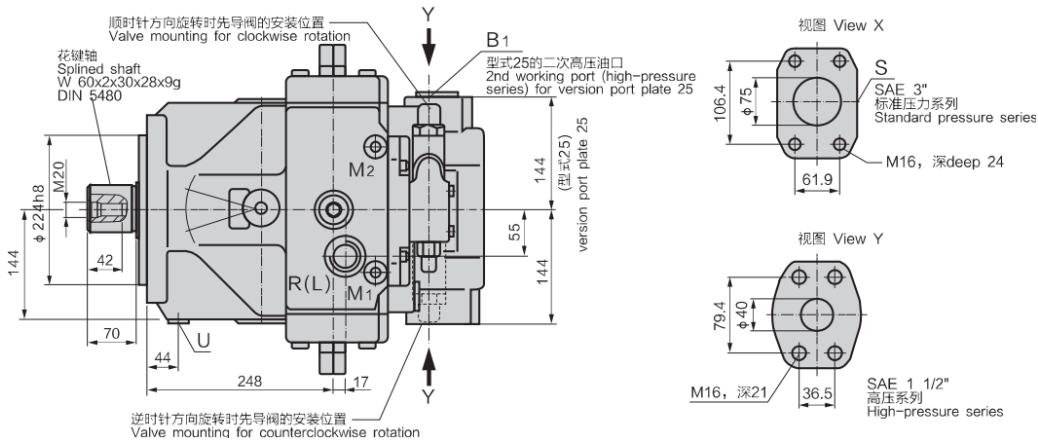
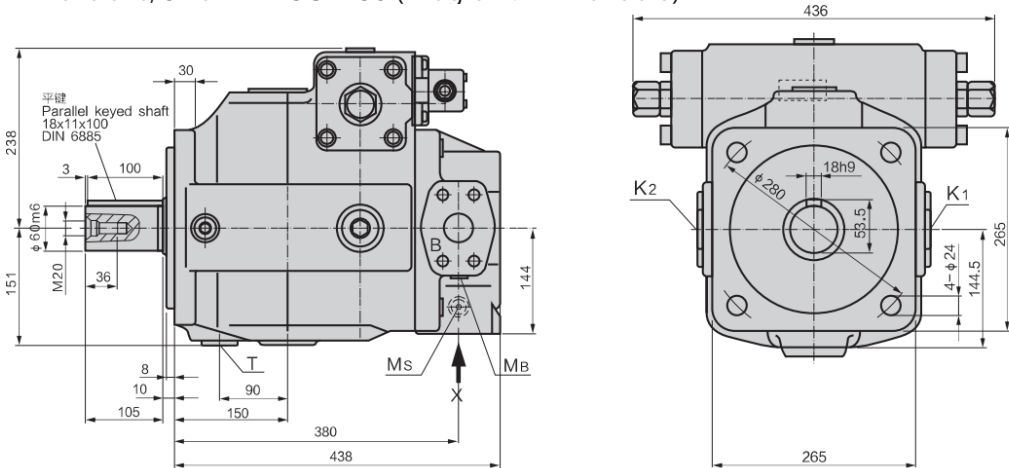
Dimensions, Size PA4VSO-180 (Diagram: DR Variable)



| | | |
|-------------------------------|--|---------------------------|
| B | Pressure port | ø31 |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M33 x 2 deep 18 |
| S | Suction port | ø75 |
| T | Case drain port | M33 x 2 deep 18 |
| R(L) | R(L) Fluid fill and air bleed port | M33 x 2 |
| M _B M _S | Test port | M14 x 1.5 deep 12 |
| K ₁ K ₂ | Flushing port | M33 x 2 deep 18 |
| U | Bearing flushing port | M14 x 1.5 deep 12 plugged |

* Dimintions & Size

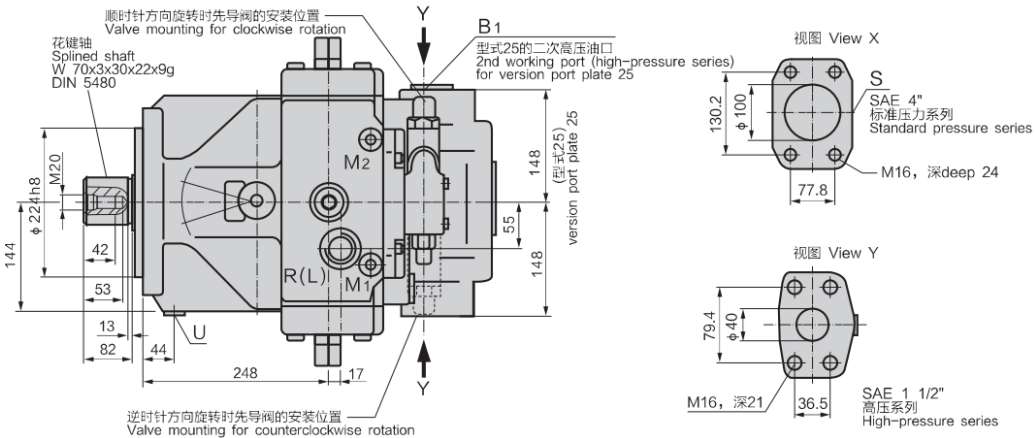
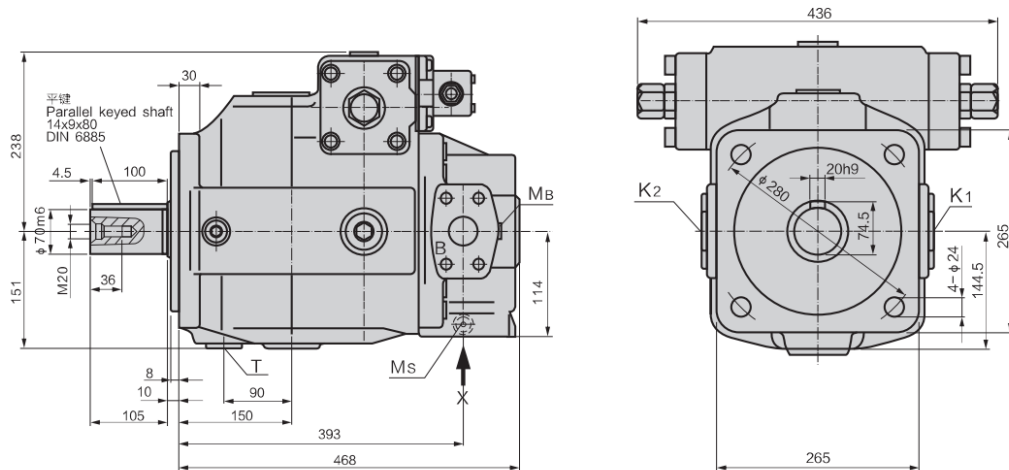
Dimensions, Size PA4VSO-250 (Diagram: DR Variable)



| | | |
|-------------------------------|--|---------------------------|
| B | Pressure port | ø40 |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M33 x 2 deep 18 |
| S | Suction port | ø75 |
| T | Case drain port | M42 x 2 deep 18 |
| R(L) | R(L) Fluid fill and air bleed port | M42 x 2 |
| M _B M _S | Test port | M14 x 1.5 deep 12 |
| K ₁ K ₂ | Flushing port | M42 x 2 deep 18 |
| U | Bearing flushing port | M14 x 1.5 deep 12 plugged |

* Dimintions & Size

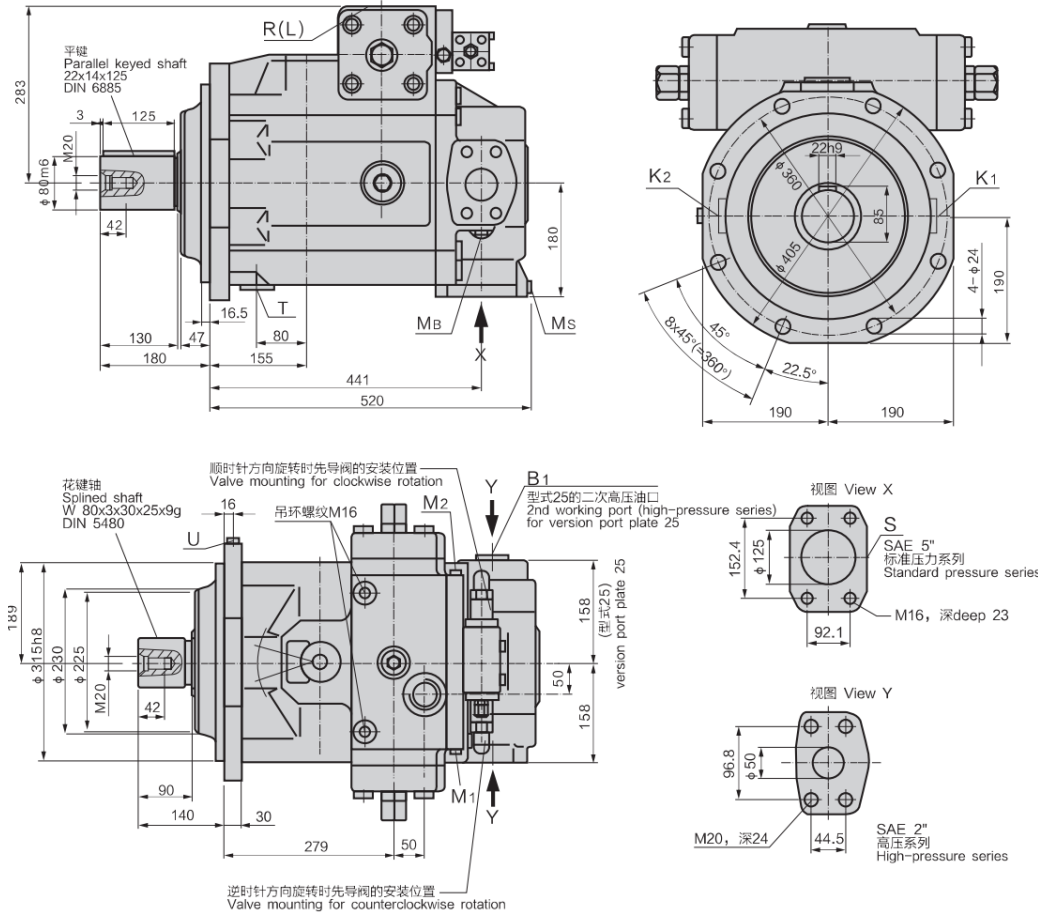
Dimensions, Size PA4VSO-355 (Diagram: DR Variable)



| | | |
|----|---------------------------------------|------------------------|
| B | SAE 1 1/2" M42 x 2 | |
| B1 | 4" M42 x 2 M14 x 1.5 M24 x 2 | M18 x 1.5 M18 x 1.5 |
| S | Suction port | ø100 |

* Dimentions & Size

Dimensions, Size PA4VSO-500 (Diagram: DR Variable)



| | | |
|-------|--|-------------------|
| B | Pressure port | SAE2n" |
| B1 | Auxiliary pressure port When the working port type is 25, B1 port corresponding viewed on Y direction. | M48 x 2 deep 22 |
| S | Suction port | SAE5n" |
| T | Case drain port | M48 x 2 deep 22 |
| R(L) | R(L) Fluid fill and air bleed port | M48 x 2 |
| MB MS | Test port | M18 x 2 deep 12 |
| K1 K2 | Flushing port | M48 x 2 deep 12 |
| U | Bearing flushing port | M18 x 1.5 deep 12 |