华德液压

# 混凝土搅拌运输车用液压泵和液压马达

技术样本

北京华德液压工业集团有限责任公司

BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.

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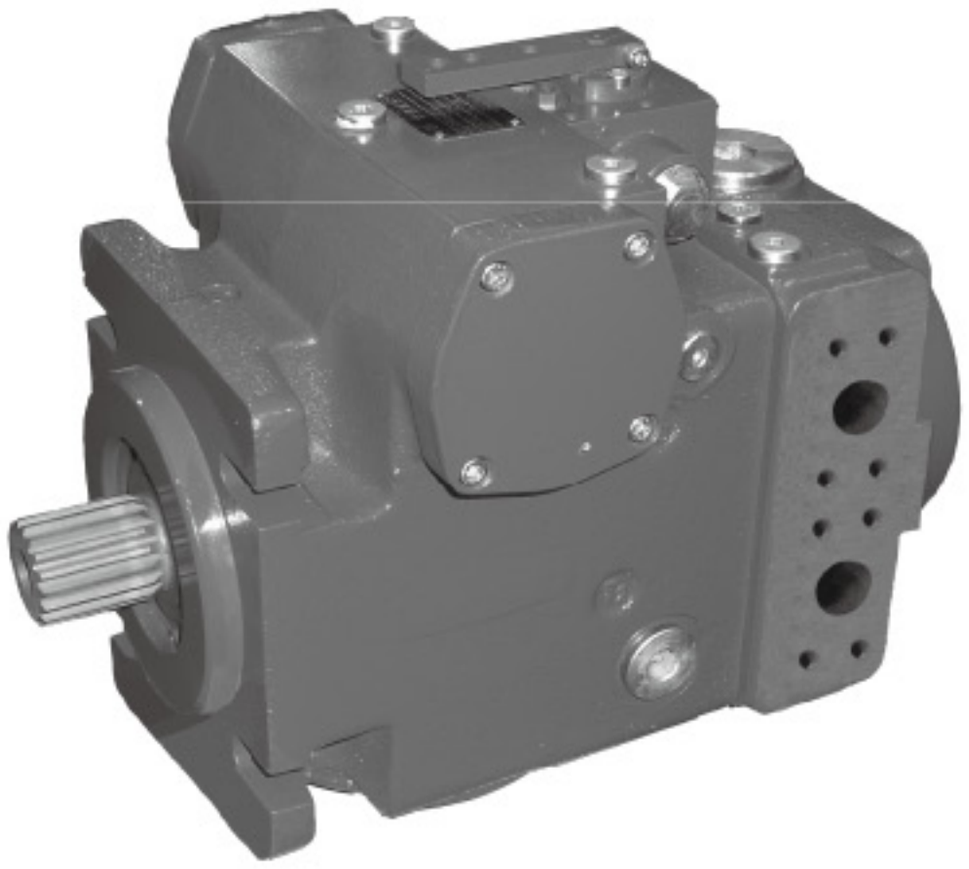
华德

| BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO,.LTD | **Closed- circuits Swash-plate Axial Piston Pump HD-V** | | HDB2009.01 |
|---|---|---|---|
| | Size 71、90 | Peak pressure up to 40MPa | |

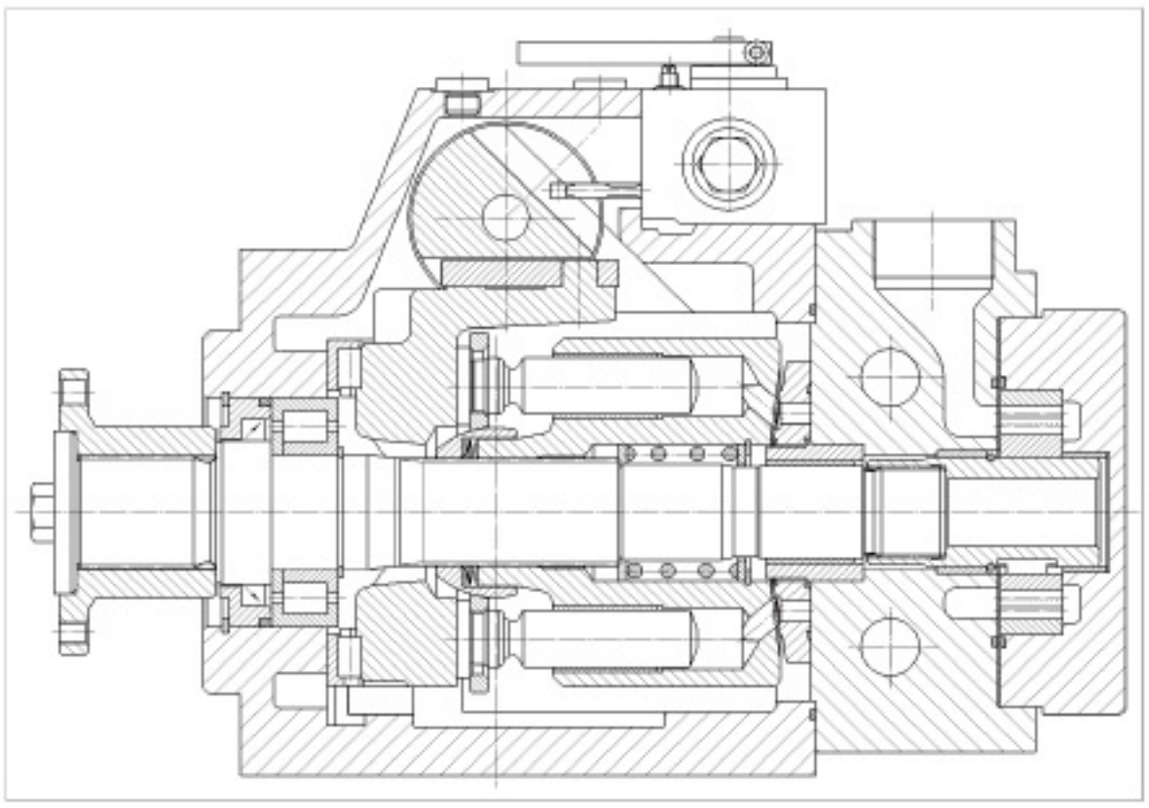


**Description:**

- Fixed displacement pump is an axial piston pump of swash plate design for use in close circuits.
- Output flow is proportional to the drive speed, and be tuned up step-less.
- Be the same with beton mill than sit car engineering machine hydraulic pressure decency.

**Special Features:**

- With the oblique angle of plate swinging increase in traffic from zero to maximum.
- When the oblique disk swing through zero when the flow direction of a smooth switch.
- Good adaptability in various forms of control and regulatory function.
- High-pressure relief valve to protect the side of the two hydraulic components (pumps and motors) but contained.
- At the same time as the premium high-pressure relief valve hydraulic valve.
- Built-assist pump as a supplement to control oil and fuel pumps.
- Through the built-up oil relief valve was the most restrictive of premium oil pressure..



## HD-V For open circuits Swash-plate Axial-piston Variable Displacement Pump

Ordering Code/
Standard Program

| HD | — | V | 90 | HW | R | L | F | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

**Company Name**
HUADE HYDRAULIC

**Axial piston pump**
V

**Size**

| $Vg_{max}$ (ml/r) Displacement | 71 | 90 |
|---|---|---|

**Control device**

| | | |
|---|---|---|
| Hydraulic control. mechanical servo | | HW |
| Electrical control with | 12V | EP1 |
| Proportional solenoid | 24V | EP2 |

**Direction of rotation**

| | | |
|---|---|---|
| Viewed on shaft end | clockwise | R |

**Auxiliary pump and through drive**

| | |
|---|---|
| Without integral auxiliary | 0 |

**Service ports**

| | |
|---|---|
| Port A/B SAE at same side | 1 |

**Service ports**

| | |
|---|---|
| Port A/B SAE,(metric fixing screws) | F |

**Shaft end**

| | |
|---|---|
| Splined shaft SAE,with coupling flange | L |
| Without coupling flange, splines shsft DIN5480 | Z |
| Without coupling flange, splines shsft ANSI B92.1a-1976 | M |

# Technical data

## Operating viscosity range

We recommend that the operating viscosity(at operating temperature), for both efficiency and life of the unit, be chosen within the optimum range of:

$V_{opt}$=16—36mm²/S

Referred to the circuit temperature(close circuit)

Viscosity limits:

$\upsilon_{min}$=5mm²/S，short term at a max,permissible. $oft_{max}$=115°C

$\upsilon_{max}$=1600mm²/S，short term on cold start（n≤1000rpm，$t_{min}$=-40°C）

Is also not exceeded on certain areas(for instance bearing area)

## Fluid temperature range

$t_{min}$ _____ -25℃

$t_{max}$ _____ +80℃

## Notes on the selection of the hydraulic fluid

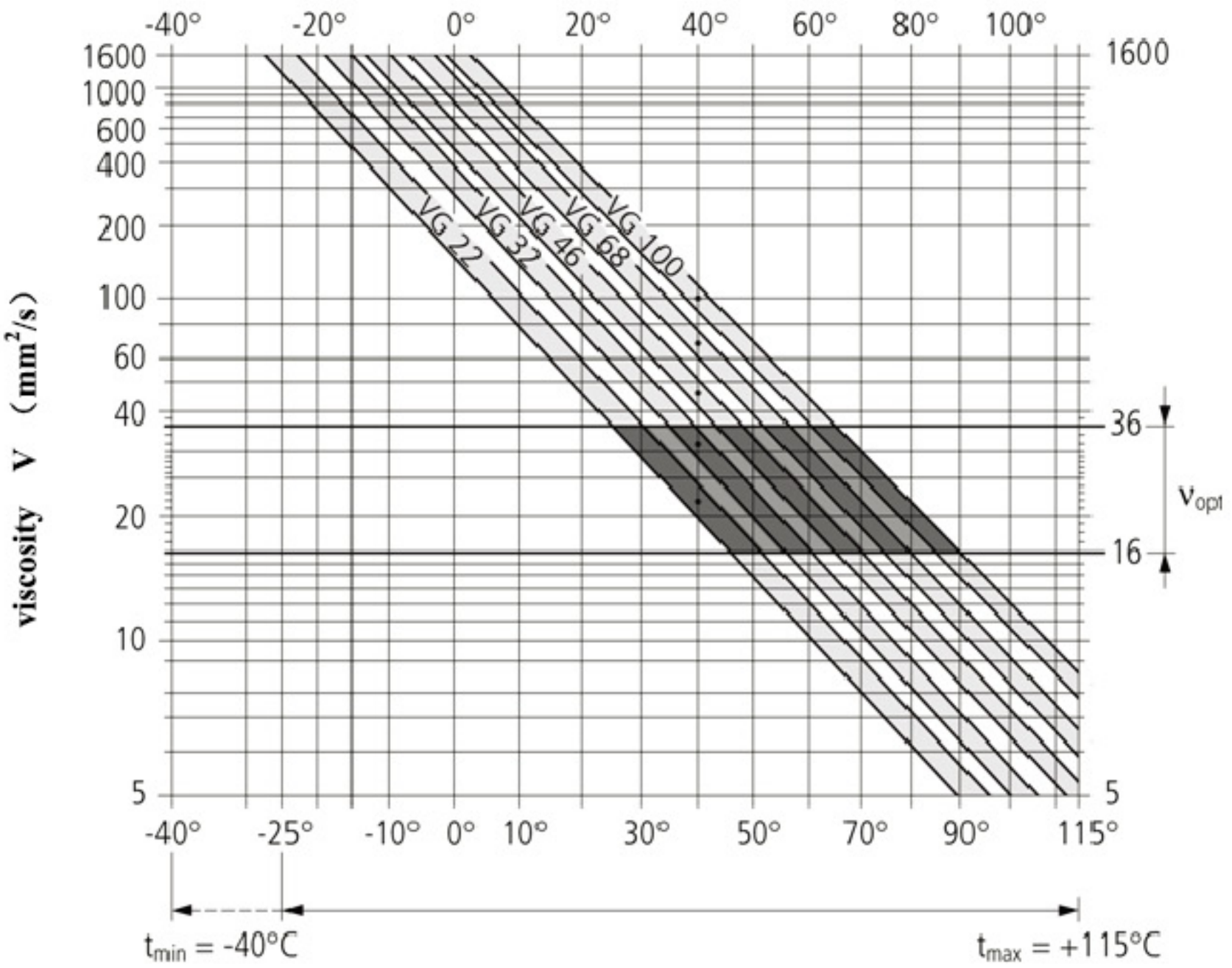
For correct selection of the fluid, it is necessary to know the operating temperature in the circuit (closed circuits), in relation tothe ambient temperature. The hudraulic fluid should be selected so that, within the operating temperature range. The operating viscosity lies within the optimum range （$V_{opt}$）(see shaded section of selection diagram). We recommend that the higher viscosity grade is selected in each case.

Example: At an ambient temperature of X°C the operating temperature in the tank will be 60°C. In the optimum operating viscosity range ($V_{opt}$;shaded section) this corresponds to viscosity grade VG 46 or VG 68 should be selected

## Important:

The leakage oil (case drain oil) temperature is influenced by perssure and pump speed and is always higher than the circuit temperature. However, at mo point in the circuit may the temperature exceed 115°C if it is not possible to comply with the above conditions because of extreme operating parameters or high ambient temperatures please consult us.

## Selection diagram




**Fluid Temperature Range**

### Fluid Temperature Range

When the shell temperature of -25 ℃ to +115 ℃ between the use of fluorinated rubber seal ring.

Description: When the temperature is below -25 ℃ to be used nitrile rubber shaft seals（Allowing the temperature range: -40 ℃ to +90 ℃.）

Nitrile rubber shaft seals orders, please explain in words.

### Operating pressure range-inlet

Auxiliary pump

Oil pressure $P_{s\,min}$（ $\upsilon \leqslant 30mm^2/s$） _____ ⩾0. 08 MPa Absolute pressure

Cold start _____ ⩾0. 05 MPa Absolute pressure

## Operating pressure range –outlet

Variable pump： pressure at port A or B

nominal pressure $P_N$ _____ 35 MPa

peak pressure $P_{max}$ _____ 40 MPa

## Case drain pressure

Permissible case drain pressure at ports $T_1$ and $T_2$

$P_L$ _____ 0. 2 MPa absoluteness pressure

## Technical Data

**Table of values**（theoretical values, without considering $\eta_{mh}$ and $\eta_v$; values rounded）

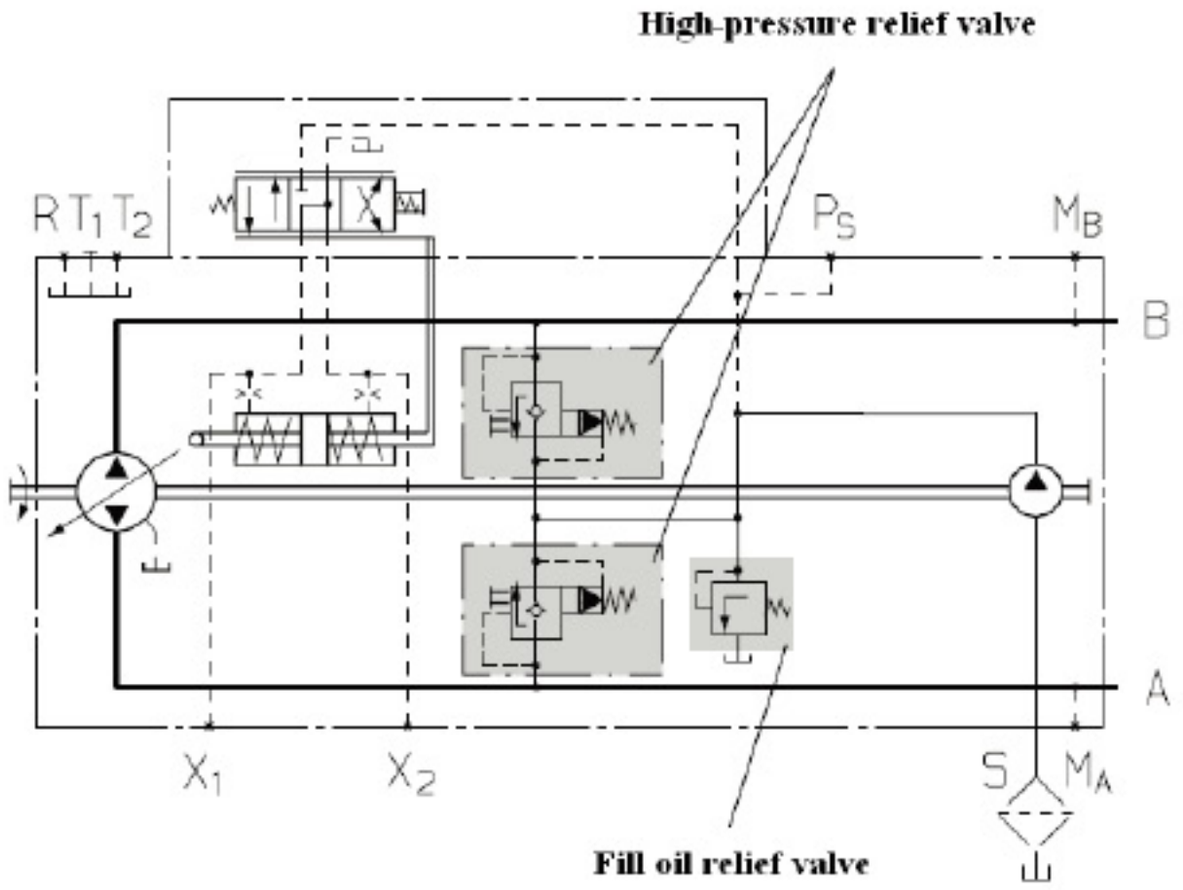
| **size** | | | | **71** | **90** |
|---|---|---|---|---|---|
| Displacement | variable pump | $V_{g\ max}$ | ml/r | 71 | 90 |
| | auxiliary pump（at P=2MPa） | $V_{gH}$ | ml/r | 19.6 | 28.3 |
| Speed | max. speed with $V_{g\ max}$ | $n_{max\ continuous}$ | $min^{-1}$ | 3300 | 3050 |
| | minimum speed | $n_{min}$ | $min^{-1}$ | 500 | 500 |
| Flow | at $n_{max\ continuous}$ and $V_{g\ max}$ | $Q_{max}$ | L/min | 234 | 275 |
| Power | at $n_{max\ continuous}$ △P=40MPa | $P_{max}$ | kW | 156 | 183 |
| Torque (variable pump without aux. pump) | at $V_{g\ max}$ △P=40MPa | $T_{max}$ | Nm | 451 | 572 |
| | △P=10MPa | T | Nm | 112.8 | 143 |
| Moment of inertia (about drive axis) | | J | $kgm^2$ | 0.0072 | 0.0106 |
| Weight (standard model without through drive) approx | | m | kg | 46 | 48 |

## Relief

Two high-pressure relief valve to prevent hydrostatic transmission components (pumps and motors) have been set to limit the related high-pressure pipeline of the highest pressure, at the same time as a fill valve.

Oil pressure through the fill valve set up the oil pressure

Standard settings:




Fill the oil pressure valve $P_{sp}$ _____2.2MPa

High-pressure valve $P_{max}$ _____ 42MPa

Attention: Valve set at n = 1000 $min^{-1}$ and when $V_{gmax}$ conditions. Work in other parameters, there will be pressure to open the deviation.

## Filtration

The finer the filtration the better the achieved purity grade of the pressure fluid and the longer the life of the axial piston unit.

To ensure the functioning of the axial piston unit a minimum purity grade of 9 to NAS 1638,or ISO/DIS 4406, 18/15.

At very high temperatures of the hydraulic（90℃ to max.115℃）at least clean-less class: 8 to NAS 1638,

or ISO/DIS 4406,17/14.

If above mentioned grades cannot be maintained please consult supplier.

**Standard: filtration in the suction line of the auxiliary pump, S**

Filter type: _____filter **without** bypass

Recommendation: ___with contamination indicator

Through flow resistance at the filter element:

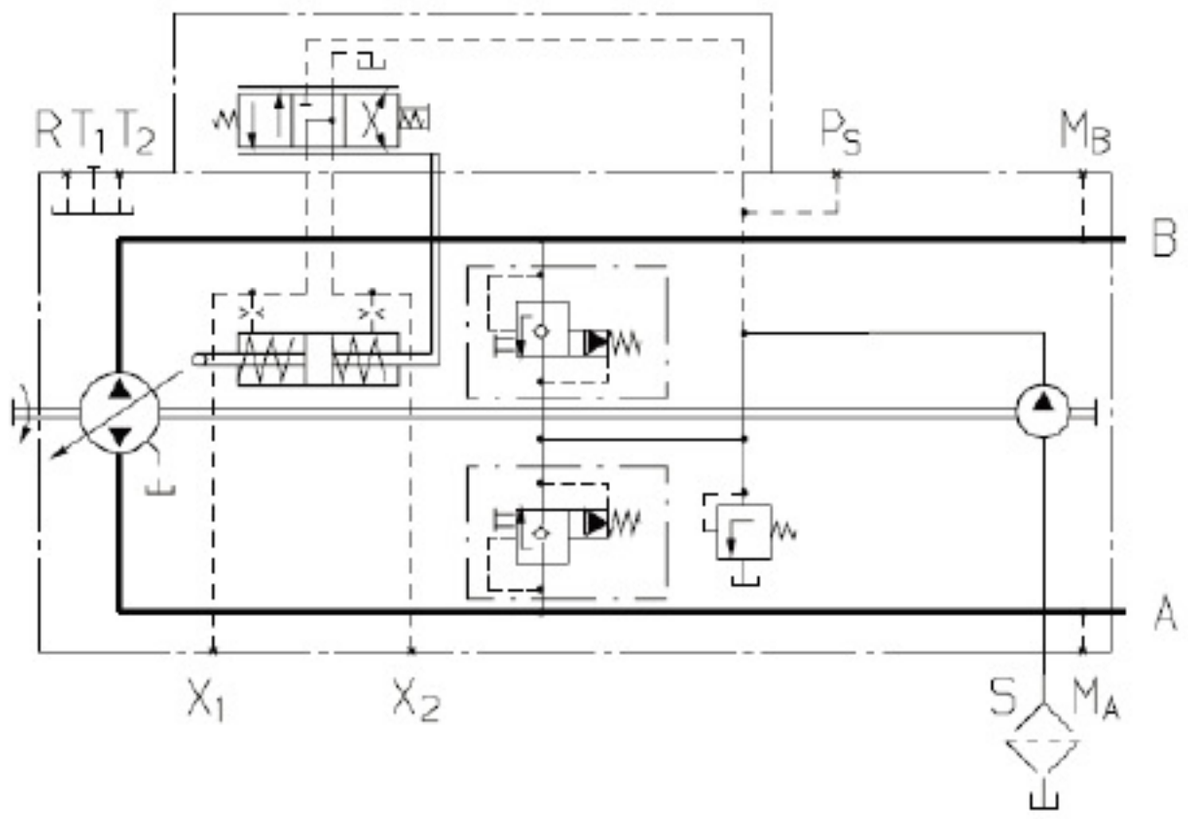
at v=30 $mm^2/s$， $n=n_{max}$ _____ $\triangle P \leq 0.01MPa$

at v=1000 $mm^2/s$， $n=n_{max}$ _____ $\triangle P \leq 0.03MPa$

Pressure at port S of the auxiliary pump:

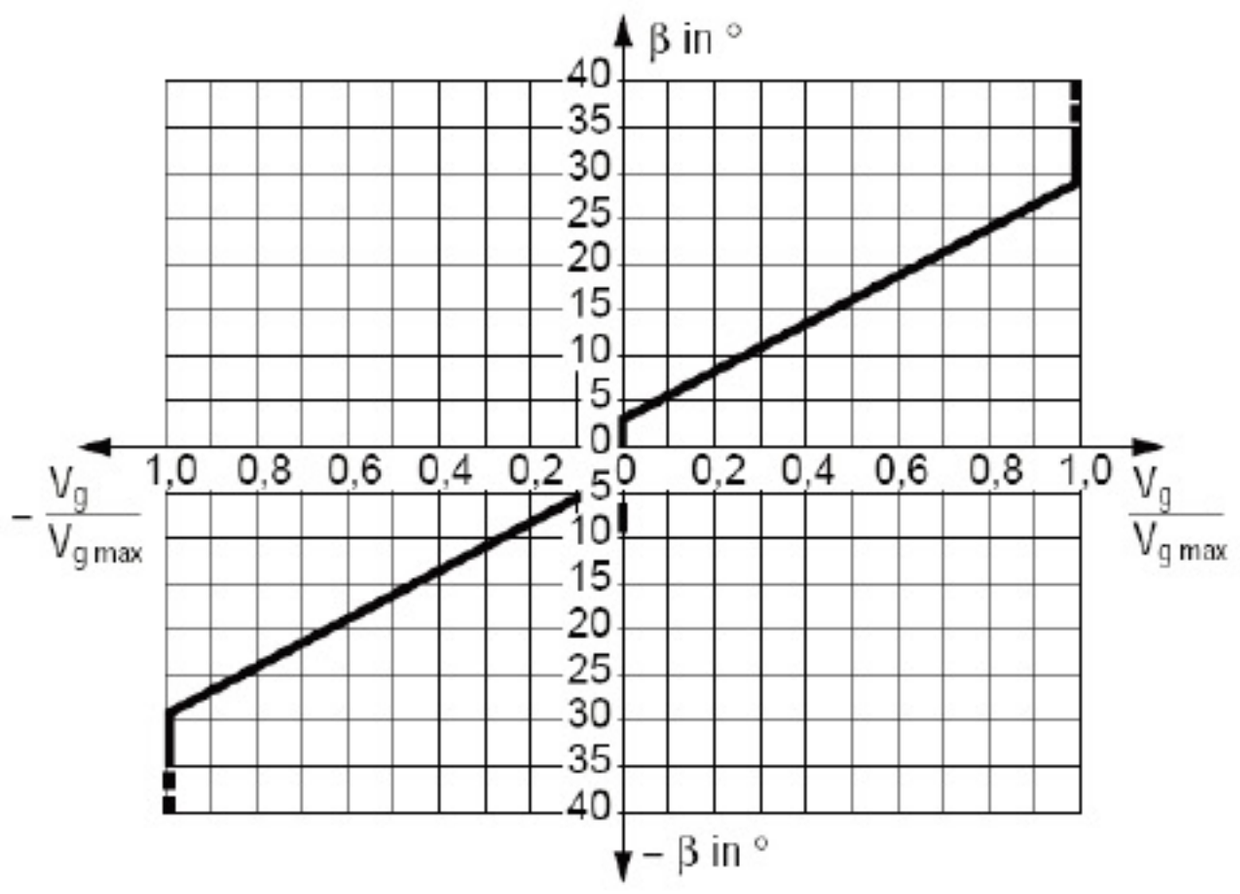
at $V=30mm^2/s$ _____ $P \geq 0.08MPa$

at cold start（$v=1600\ mm^2/s$，$n \leqslant 1000min^{-1}$） ____ $P \geq 0.05MPa$




## HW Hydraulic Control Mechanical Servo

And control the operation of the direction of a stroke or b (°), and by the HW control valve to the pump chamber of variable variables exert pressure so inclined plate with displacement steppless change lever to control the operation of the direction of flow direction.




Swivel angle of control lever

From 0 to $\pm V_{g\ max}$ _____ β =0° 至±29°

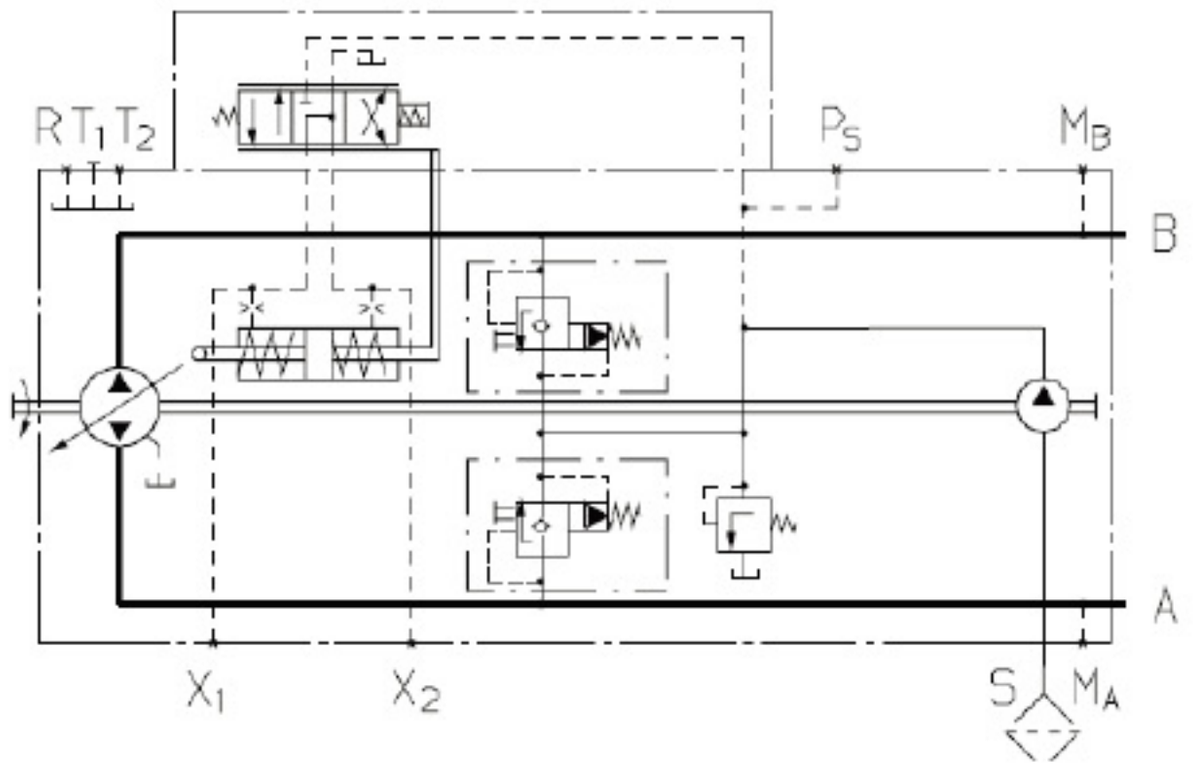
mech.stop: _____ ±40°

## Closed-loop Swash-plate Axial Piston Pump HD-V

Torque at control lever

Torque necessary at control lever is between 85 and 210 N.cm , Max. torque is 700 N.cm（7 Nm）

Depends on the pump working condition(Operating pressure， oil temperature),Offset curve can occur.

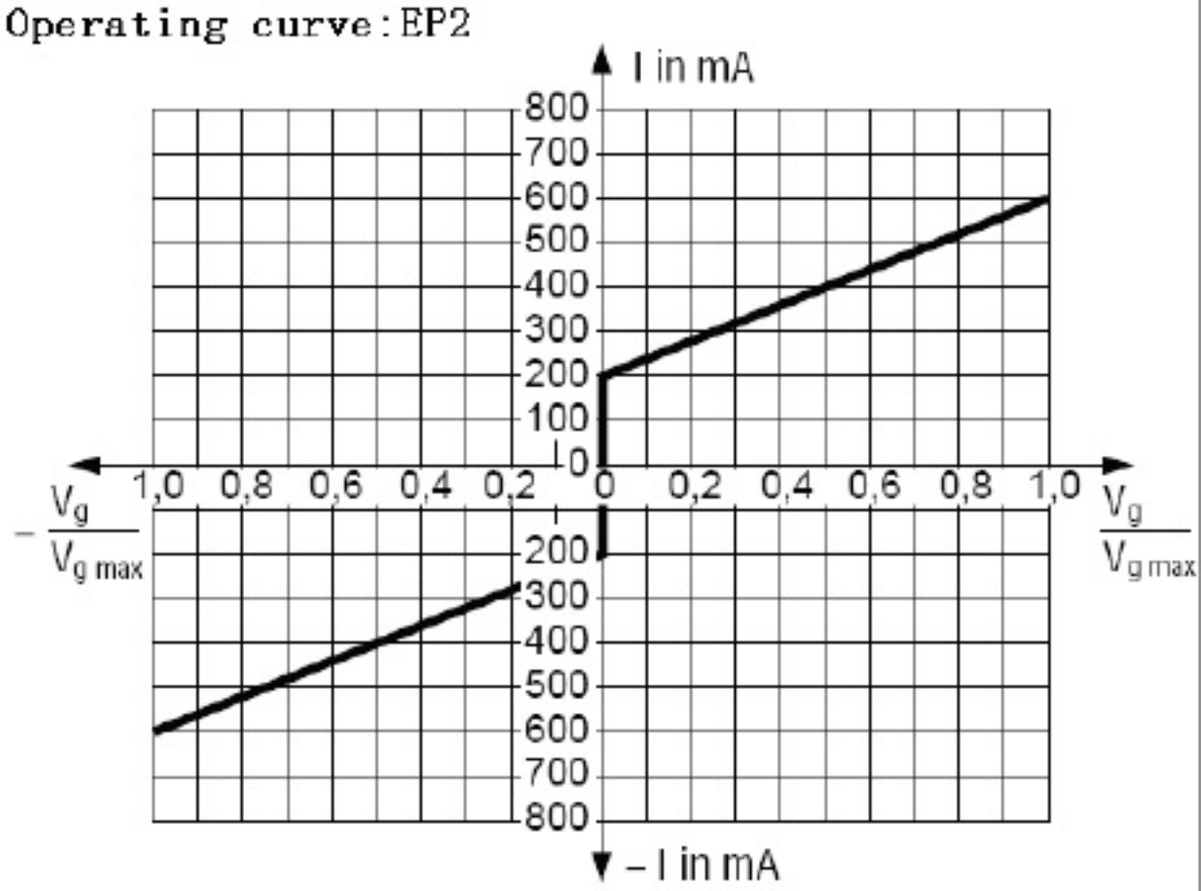



### EP Electrical Control, with Proportional Solenoids

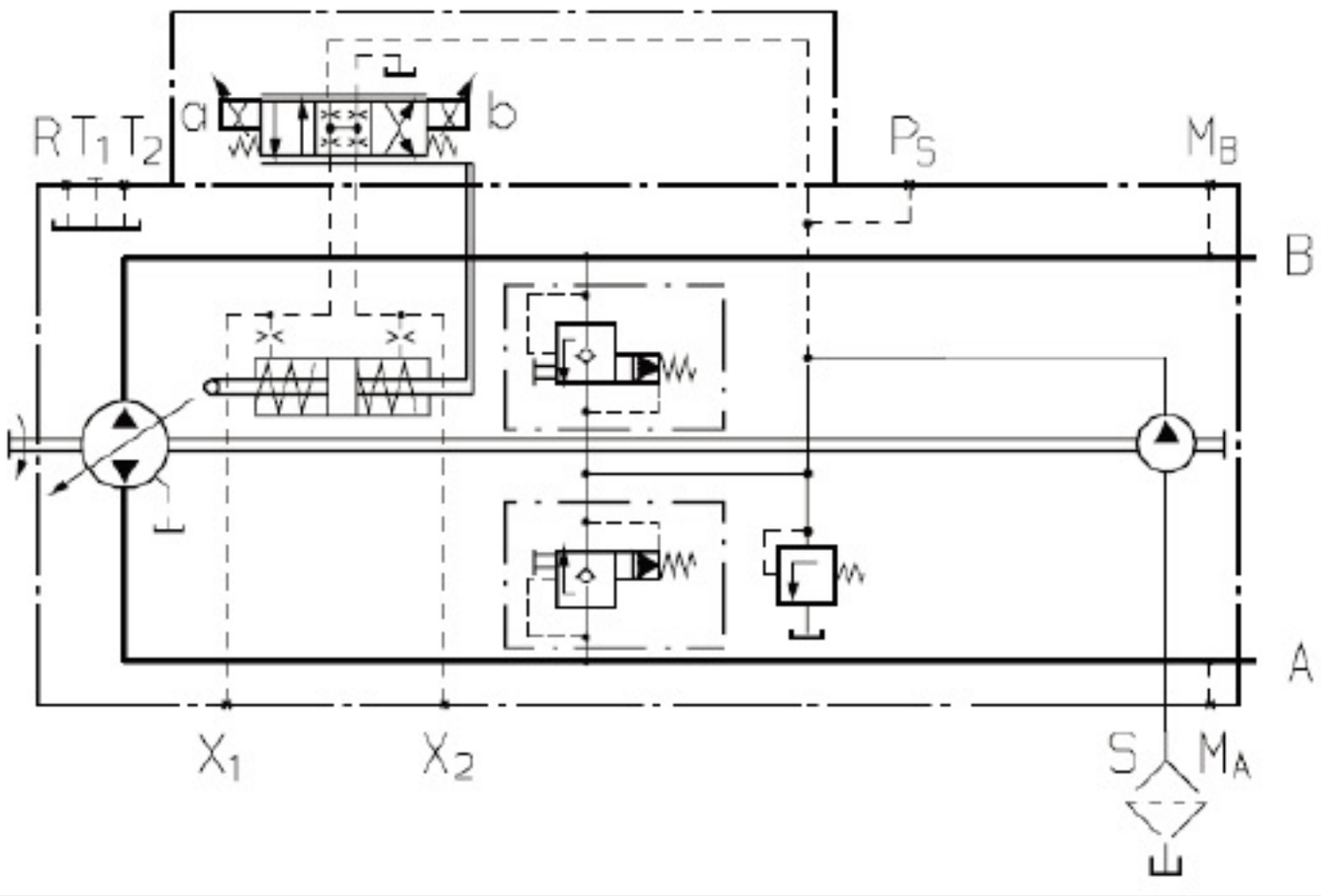
In relation to the preselected current, control pressure is applied to the positioning cylinder of the pump via two proportional solenoids on control device EP. The displacement of the pump is thus steplessly variable. One solenoid is assigned to each direction of flow.

| Model | Control voltage （DC） | Control current | |
|---|---|---|---|
| | | start of control at $V_{g0}$ | end of control at $V_{gmax}$ |
| EP1 | 12V | 400mA | 1200mA |
| EP2 | 24V | 200mA | 600mA |

Operating curve：EP2

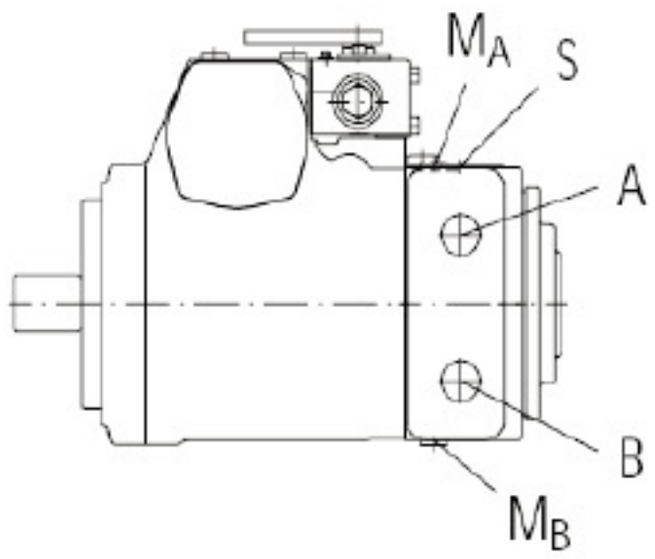


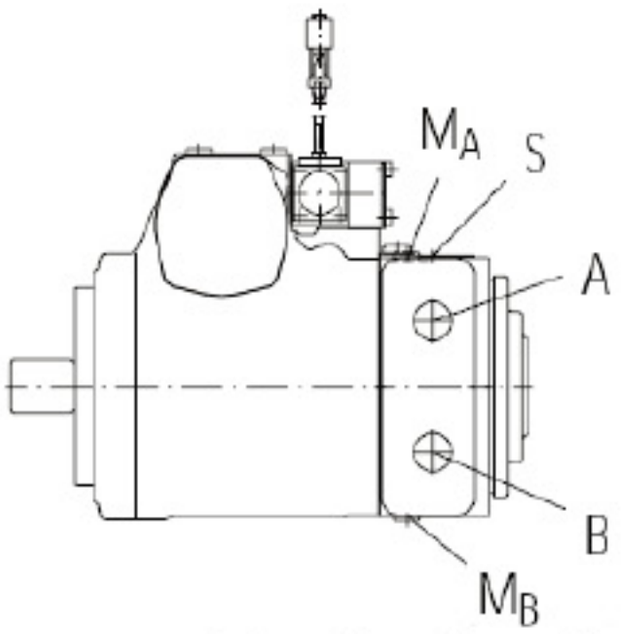

Standard： proportional solenoid with manual emergency（without spring return）



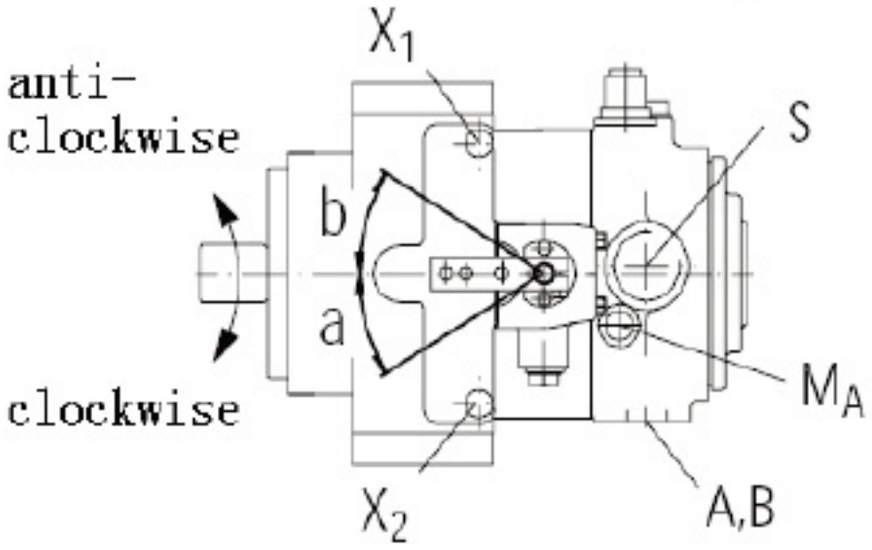
## Direction of rotation—Control—Direction of through flow

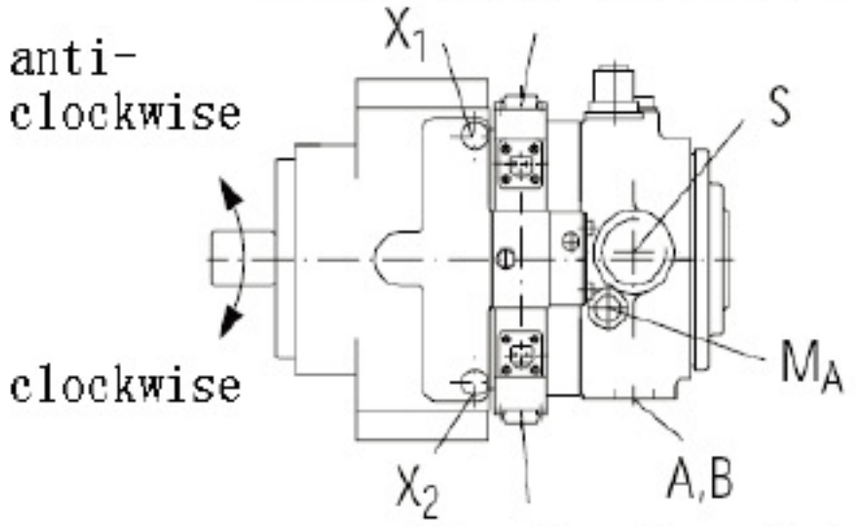
| Direction of rotation | Clockwise | | Anti-clockwise | |
|---|---|---|---|---|
| Lever direction | a | b | a | b |
| Solenoid (EP) | b | a | b | a |
| Control pressure | $X_2$ | $X_1$ | $X_2$ | $X_1$ |
| Direction flow | B to A | A to B | A to B | B to A |
| Operating pressure | $M_A$ | $M_B$ | $M_B$ | $M_A$ |




proportional solenoid a

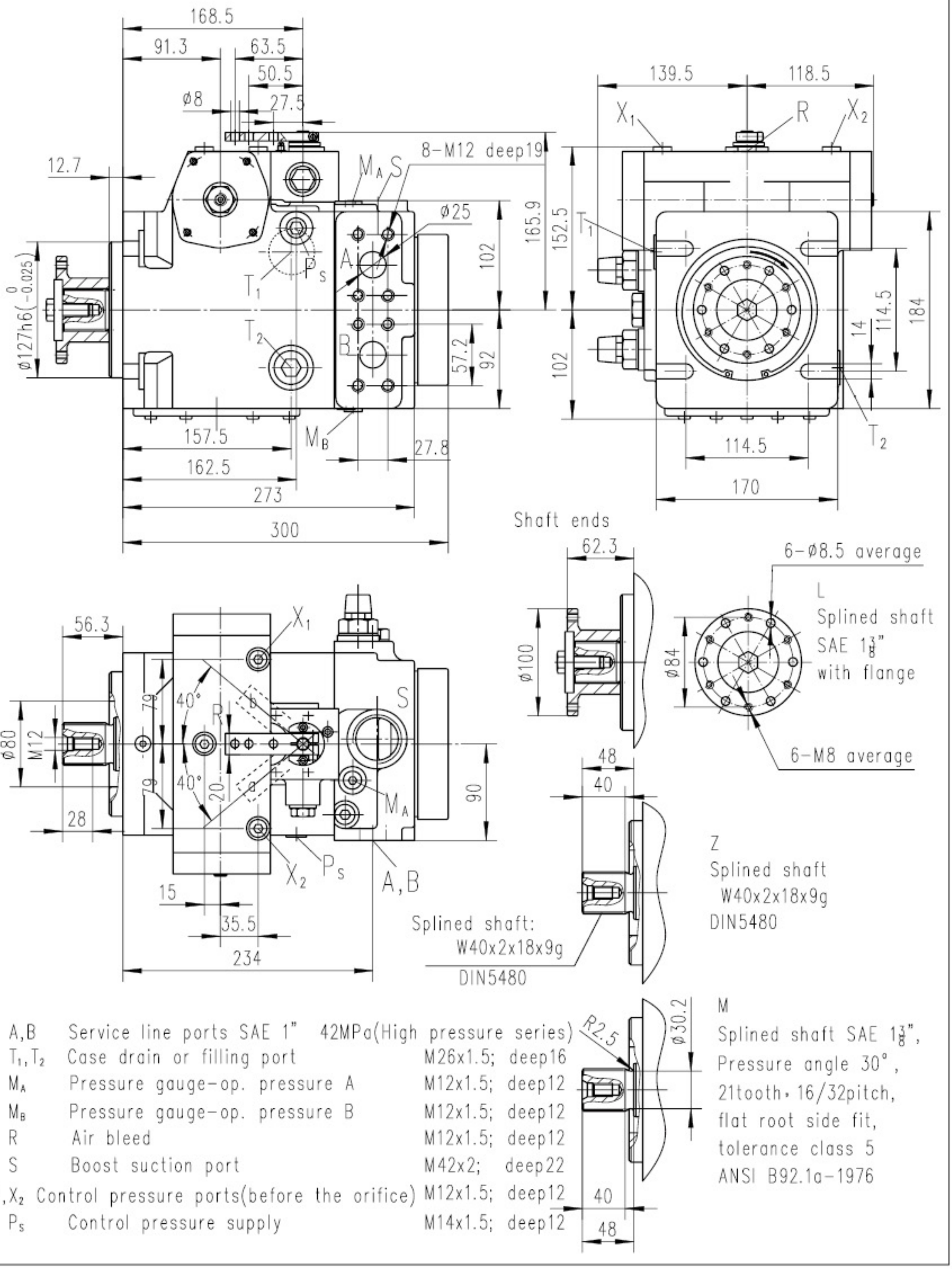



proportional solenoid b

Unit type: HD-V71HWRLF10

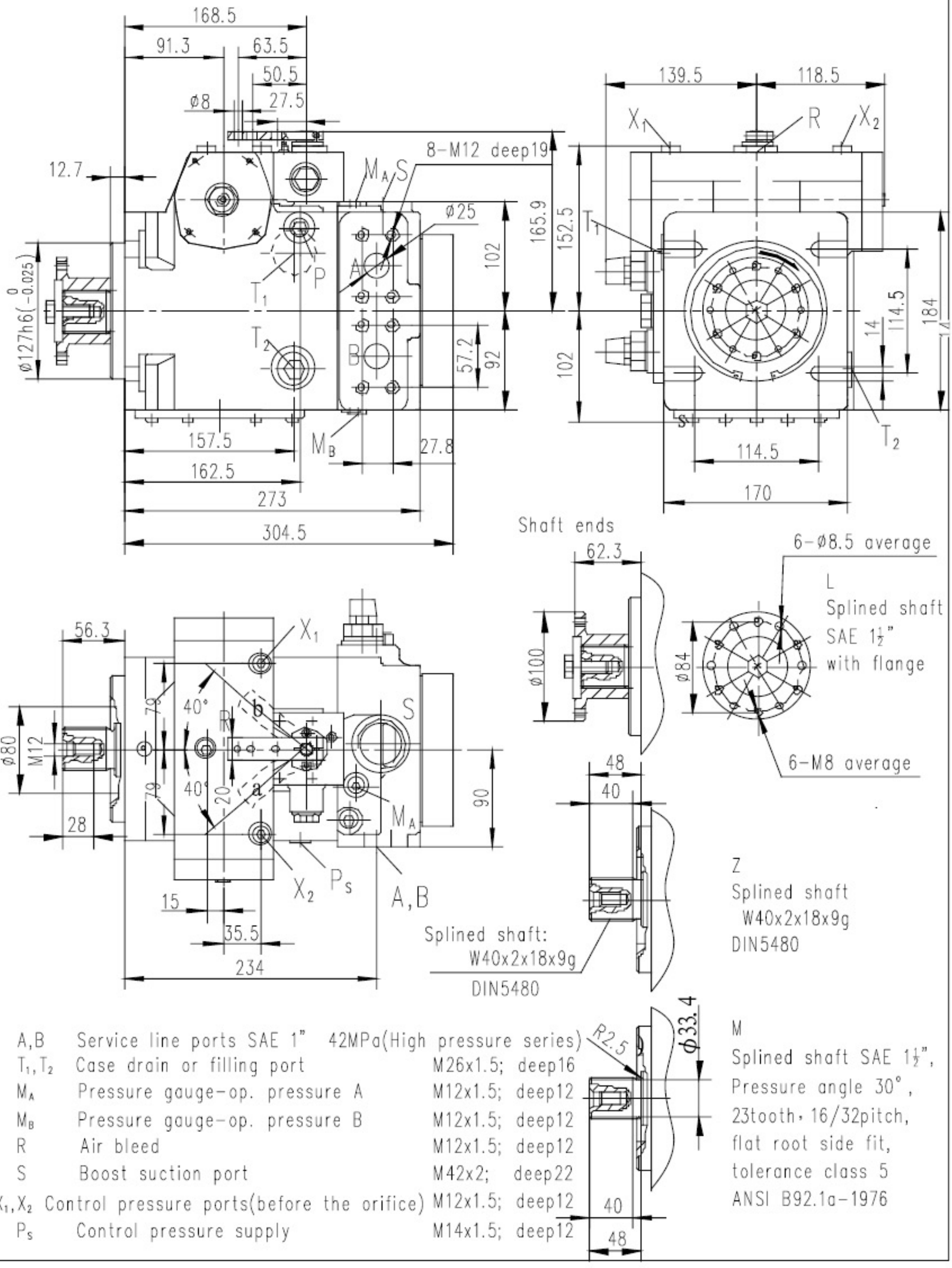
Size 71, Control Device: Hydraulic control, mechanical servo, HW




| | | |
|---|---|---|
| A,B | Service line ports SAE 1" 42MPa(High pressure series) | |
| $T_1$,$T_2$ | Case drain or filling port | M26x1.5; deep16 |
| $M_A$ | Pressure gauge-op. pressure A | M12x1.5; deep12 |
| $M_B$ | Pressure gauge-op. pressure B | M12x1.5; deep12 |
| R | Air bleed | M12x1.5; deep12 |
| S | Boost suction port | M42x2; deep22 |
| $X_1$,$X_2$ | Control pressure ports(before the orifice) | M12x1.5; deep12 |
| $P_S$ | Control pressure supply | M14x1.5; deep12 |

Unit type: HD-V90HWRLF10

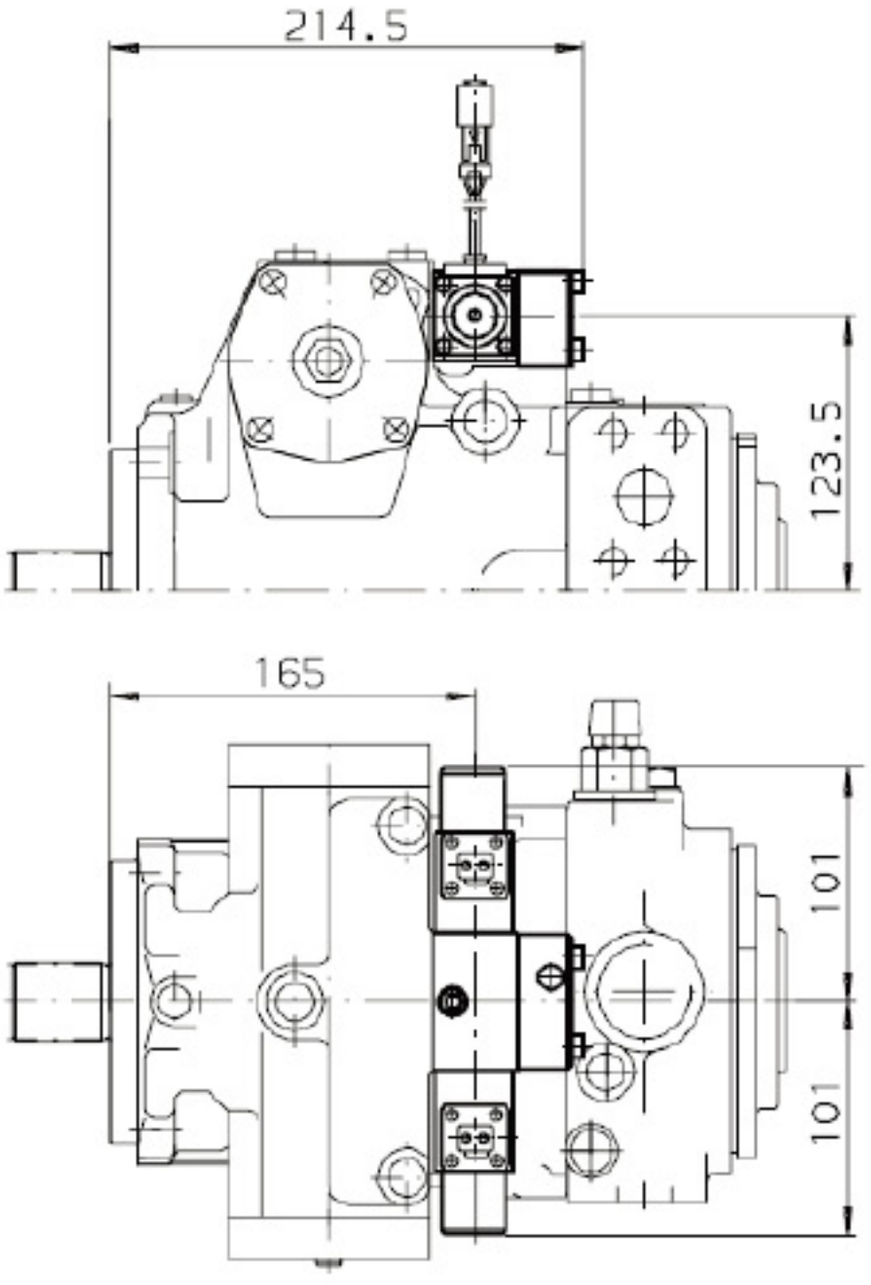
Size 90, Control Device: Hydraulic control, mechanical servo, HW




| | | | |
|---|---|---|---|
| A,B | Service line ports SAE 1" 42MPa(High pressure series) | | |
| $T_1$,$T_2$ | Case drain or filling port | M26x1.5; | deep16 |
| $M_A$ | Pressure gauge-op. pressure A | M12x1.5; | deep12 |
| $M_B$ | Pressure gauge-op. pressure B | M12x1.5; | deep12 |
| R | Air bleed | M12x1.5; | deep12 |
| S | Boost suction port | M42x2; | deep22 |
| $X_1$,$X_2$ | Control pressure ports(before the orifice) | M12x1.5; | deep12 |
| $P_S$ | Control pressure supply | M14x1.5; | deep12 |

**Size 71、90**

**Electrical control with proportional**




## Applications

HD-V closed-loop Swashplate Axial Piston Pump is widely used in concrete mixing transport vehicles hydraulic system. Engine power through the check driver HD-V/HW plunger-type variable pump, variable pump with the HD-A2F-type motor composed of a typical closed system, motor-driven through the mixing tube reducer. Variable pump and motor connection diagram is as follows:

## Closed-loop Swash-plate Axial Piston Pump HD-V

**Concrete mixer truck with hydraulic pumps and hydraulic motors commonly used technical parameters specifications table**

| Type | Maximum pressure (MPa) | Rated pressure (MPa) | Displacement (ml/r) | Maximum speed (rpm) | Control mode | Shaft size | Installation flange diameter (mm) | High-pressure oil port | Weight (kg) | Applicable models |
|---|---|---|---|---|---|---|---|---|---|---|
| HD-V71 | 40 | 35 | 71 | 3300 | HW/EP | 16/32 diametral pitch, 21 teeth | 127 | 1” | 46 | 6-7m$^3$ |
| HD-V90 | 40 | 35 | 90 | 3050 | HW/EP | 16/32 diametral pitch, 21 teeth | 127 | 1” | 48 | 6-10m$^3$ |
| HD-A2F 63W2M2 | 40 | 35 | 63 | 3350 | | 16/32 diametral pitch, 21 teeth | 127 | 1” | 33 | 6-7m$^3$ |
| HD-A2F 80W2M2 | 40 | 35 | 80 | 3350 | | 16/32 diametral pitch, 21 teeth | 127 | 1” | 33 | 6-10m$^3$ |
| HD-A2F 95W2M2 | 40 | 35 | 95 | 3000 | | 16/32 diametral pitch, 21 teeth | 127 | 1” | 41 | 8-12m$^3$ |

### Note to install and test

**Introduction**

Start before the pump housing must be filled with oil, and in the course of their work is full of oil. Initial startup, non-load must be low until the system is fully exhaust. Long-term shutdown, the pump casing of oil pipelines through the work of China's air. again, we must ensure that within the pump casing filled with oil. Through the highest place I will pump oil leak within the shell back to the leakage of oil tank platoon. S oil port can not be less than the minimum oil pressure 0.08MPa (absolute pressure). (cold start, 0.05MPa absolute pressure).

**Installation location**

Axis level of the installation. Other circumstances, such as installation, please contact us.

**Installation location is under the fuel**

Pump fuel tank located under the lowest level (standard)

Axial Piston initial start before the leak from the highest place I filled with oil;

Recommendation: From the oil tube feeding oil;

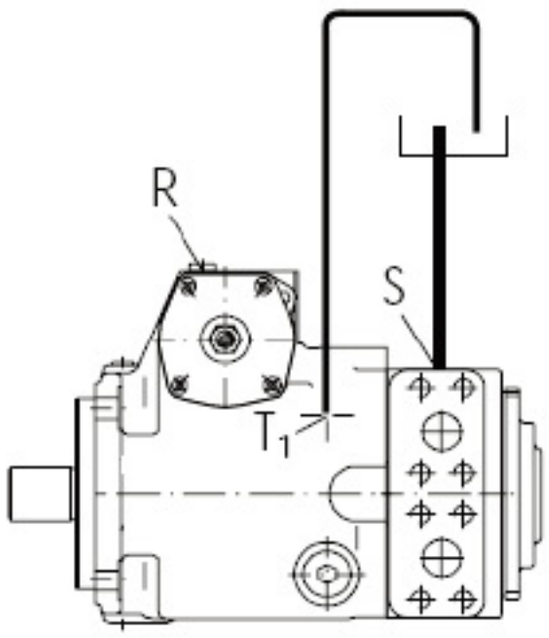
Installation location for the "control valve in the upper part of" R oil pump through the exhaust port

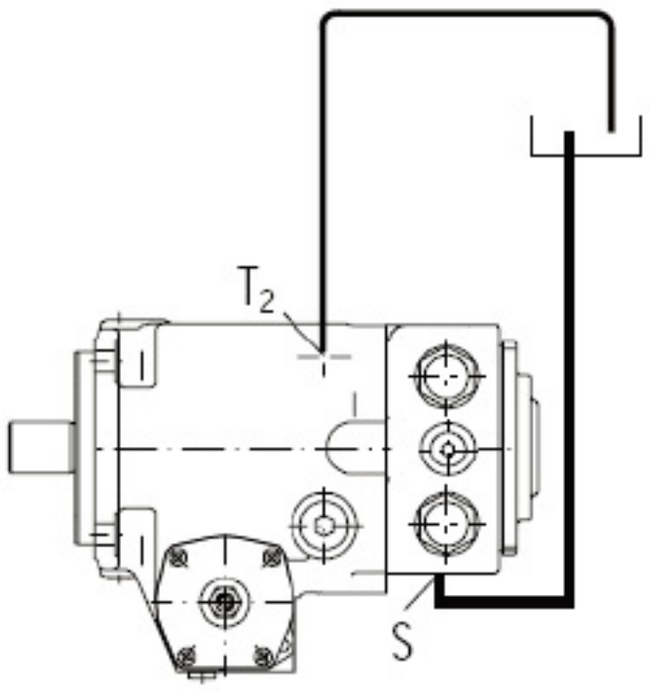
Closed-loop exhaust:

—A6Vm variable motor: G oil through the mouth

—Quantitative motor A2FM: Through A, B work in the oil port

Oil pipeline leaks in pipes and tanks under the surface of the minimum depth of 200mm (minimum surface run from the tank).




**Installation location in the fuel above the tank**

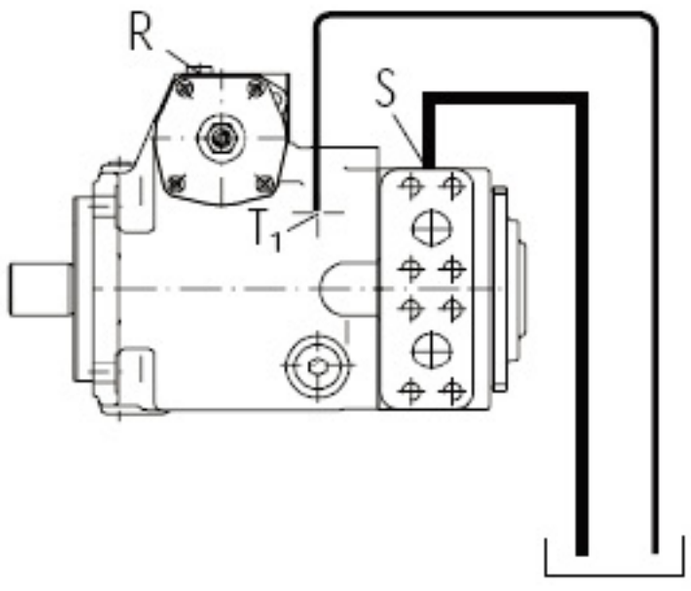
Pump at the lowest level of the upper tank

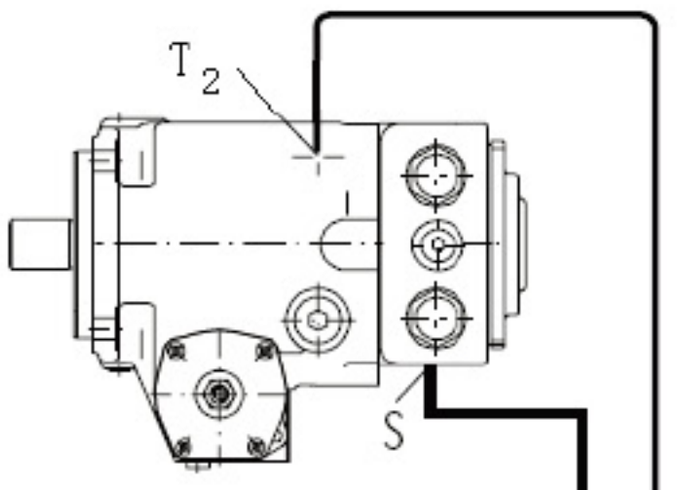
Measure taken to see: Installation location above the fuel tank

Note:

—Absorption maximum allowable height $h_{max}$ = 800mm

—S oil-mouth to allow a minimum pressure (the minimum oil pressure)



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本公司通过：

- 【ISO9001质量管理体系认证】
- 【ISO14001环境管理体系认证】
- 【OH SAS18001职业健康安全管理体系认证】
- 【CE认证】

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**BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO., LTD.**

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