A8V Variable displacement pump

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Descriptics:

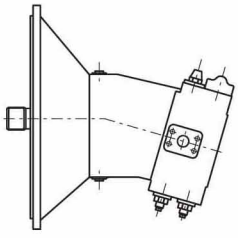
Variable double pump A8V series are bent axis design, two axial piston rotary groups (just equal two pumps) which share in the same housing, summation horsepower control, or constant horse-power control by each single pump. Flow is proportional to drive speed and displacement and is infinitely variable while the swivel angle is from 25° to 7°.

Useage:

Variable double pump A8V series are bent axis design for hydrostatic transmission in open circuit

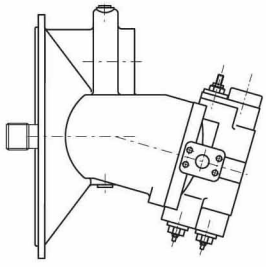
Design 1~4

Design 1



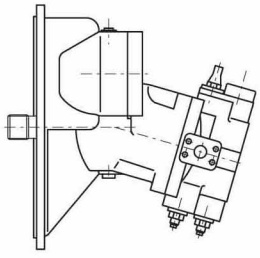
without adaptor gear
without auxiliary drive

Design 1.1



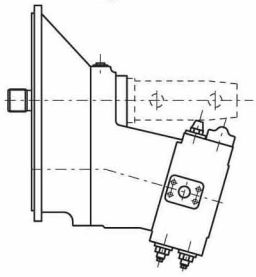
with adaptor gear
with auxiliary drive
Auxiliary pump anti-clockwise rotation
1:1.14 (size 107)
drive ratio: 1:1.33 (size 80)

Design 1.2



without adaptor gear
with auxiliary drive
Auxiliary pump clockwise rotation

Design 4



with adaptor gear
with auxiliary drive
auxiliary pump clockwise rotation
Speed of the auxiliary is the same as input speed

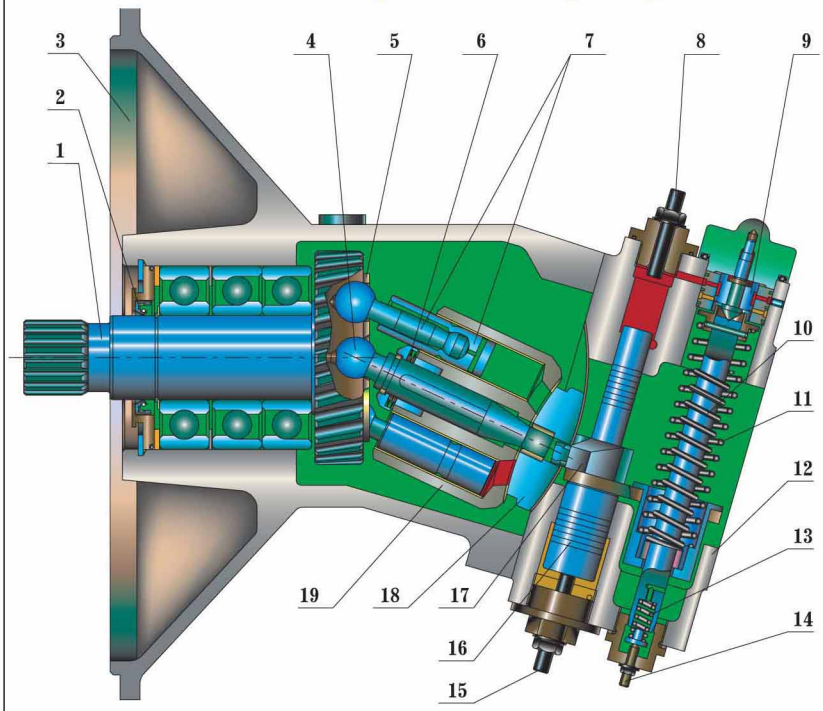
Design1:	
Size	64、58、107

Design1.1:	
Size	80、107

Design1.2:	
Size	107

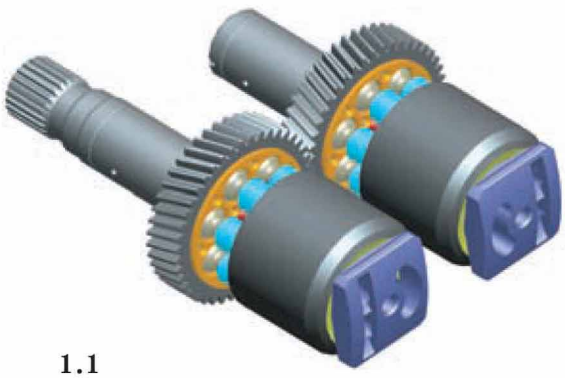
Design4:	
Size	107

A8V Variable displacement pump



1.	Shaft
2.	Oil seal kit
3.	Housing
4.	Center pin
5.	Retainer plate
6.	Dishing spring
7.	Piston
8.	Stop for Qmin
9.	Control rod
10.	Small power spring
11.	Large power spring
12.	Adjustment housing
13.	Adjustment spring
14.	Adjustment screw for commencement of control
15.	Stop for initiative pump
16.	Flow piston
17.	Rocker
18.	Port plate for initiative pump
19.	Cylinder block

Design 1



1.1
Design 1.1

1.2
Design 1.2

4
Design 4

A8V Variable displacement pump

Type Code

A8V	107	SR	1.2	R	1	0	1	F	1

Pump Type

Variable Displacement Double Pump	A8V

Size — Displacement (Vgmin Vgmax)

(18.4~64ml/r)	64
(23.1~80ml/r)	80
(30.8~107ml/r)	107

Control

Summation HP Control	SR
Constant HP control for each rotary group	ER
Variable HP Control	LRCE
Acrossed HP Control	ERC

Design

View page **53**	1
	1.1
	1.2
	4

Direction of Rotation (View on shaft end)

clockwise	R

Series

Series	1

Stroke Limiter

Fixed	1
Hydraulic	H
Mechanical	M

Pressure connection

thread	G
SAE SAE Flange	F

(for size 64、80、107)

Suction connection

SAE SAE Flange	1

Gear Ratio

	64	80	107	
Ratio	1.00	1.00	1.00	0
Ratio	-	0.87	0.84	1
Ratio	-	1.05	1.08	2
Ratio	-	1.35	1.23	3
	-	-	-	4
Ratio	-	1.18	-	5

Note: Ratio 0 suitable for design 1,1.2
Ratio 1~5 suitable for design 1.1~4

A8V、107、SR、1.2、R、1、0、1、F、1

Ordering Example:

A8V、107、SR、1.2、R、1、0、1、F、1
Variable double pump A8V, Size 107, Summation horsepower control , design 1.2, clockwise rotation , series 1, gear ration 1:1,suction connection 1(flange), SAE flange pressure connection, fixed stroke limiter.

NOTE:

To help ensure its longevity,please be careful to:
1. Keep the operating fluid clean anywhere.
2.Change the hydraulic fluid periodically(Operation 1000~3000 hours or six months).

● Technical Data:

●Operating Pressure Range:

Pressure at ports A or B:

Nominal pressure ———— Pn=35MPa

Peak pressure———————Pmax=40MPa

Inlet Operating Pressure at port S:

Pabs min———————— 0.08MPa

Pabs max———————0.2MPa

●Fluid Temperature Range : –25~80℃

●Viscosity Range:

tmin ———————10mm²/s

tmax ———————(for short periods)1000mm²/s

Optimum Operating Viscosity:————16~25 mm²/s

Fluid Recommendation: 40 low-solidifing

●Filtration of Hydraulic Fluid:

Recommended filtration 10 μm,Coarser filtration of 25 to 40 μm is possible.However ionger service life is achieved with filtration of 10μm (reduce wear).

●Mounting position:

Horizontal, as referred to the drive shaft, other positions are possible, but require prior range consultation with us.

●Speed Range:

No limitation on minimum speed n min.See data table for max.permissible speeds n_{Amax} .

●Auxiliary Drive:

Output speed of the auxiliary is the same as input speed n_A.

●Direction of rotation:

Clockwise viewed on shaft end.

Technical Data (theoretical values,without considering ηv and ηmh)

Size	Displacement of single	Gear ratio	Splitter box gear ratio $i=\frac{n_a}{n_p}$	① Max.drive speed n_{Amax}(r/min)	② Max. flow Qmax of double pump (l/min)	③ Drive power of double pump (kW)	Moment of inertia J
28	28.1	1	0. 729	2040 2185 2350	2×76 2×82 2×88	46 49 53	0. 014020
		2	0. 860	2410 2580 2770			0. 009351
55	54.8	1	0. 745	1760 1860 1965	2×126 2×133 2×140	76 80 84	0. 03743
		4	0. 837	1975 2090 2210			0. 02818
		2	0. 9318	2200 2330 2460			0. 02175
		0	1. 000	2360 2500 2640			0. 012475
		5	1. 051	2480 2625 2775			0. 01639
		3	1. 1714	2765 2930 3090			0. 012977
80	80	1	0. 8666	1840 1940 2055	2×165 2×174 2×184	99 105 111	0. 05590
		0	1. 000	2120 2240 2370			0. 02680
		2	1. 054	2235 2360 2500			0. 03579
		5	1. 181	2505 2645 2800			0. 02797
		3	1. 3448	2850 3010 3185			0. 02137
107	107	1	0. 8431	1600 1685 1800	2×197 2×208 2×222	119 125 134	0. 08257
		0	1. 000	1900 2000 2135			0. 03625
		2	1. 075	2040 2150 2295			0. 047012
		3	1. 2285	2335 2455 2625			0. 035353

Note:

①.Max. drive speed $n_{0.09}$,$n_{0.10}$ and $n_{0.15}$ for absolute pressure 0.09 MPa, 0.10 MPa and 0.15 MPa atSuction port while max. displacement of the double pump;

②.Displacement losses of 3% included at speed $n_{0.09}$,$n_{0.1}$ and $n_{0.15}$;

③.Drive power P(kw) of double pump with ΔP1+ΔP2=35MPa and Qmax per rotary group at speed $n_{0.09}$,$n_{0.10}$ and $n_{0.15}$.

ηm: mechanical efficiency ηp: pump speed

ηv: volumetric efficiency ηA: drive speed

●Summation HP Control SR

Summation horsepower control SR is a pressure related pilot operated control which stepless adjust the displacement swivel angle, and thus the displacement of the inter-coupled pumps in the range Vgmax to Vgmin. Flow is inversely proportional to system pressure, thereby maintaining hydraulic power constant.

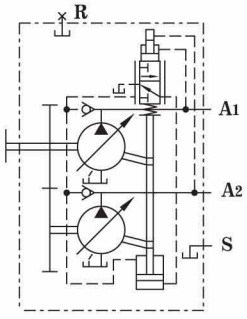
Summation HP control means using control the sum of the two pressure(P1+P2) , the adjusting system gains control energy from heavier-load operating circuit, therefore, if one pump requires less power, then the remaining power is available to the other pump. In extreme cases, either pump can be supplied with the maximum power.

The control course is the system operating pressure acts on two same area of a ladderlike control spool in the pilot valve kit overcomes, a set of spring force which work as approximate hydraulic curve, then, the setting torque of the pump keeps constant. At constant control drive speed, constant drive power is therefore obtained.

P=(P1+P2)×Q/60= Constant
P= Power (KW)
P1+P2= Pressure (MPa)
Q= Flow (L/min)

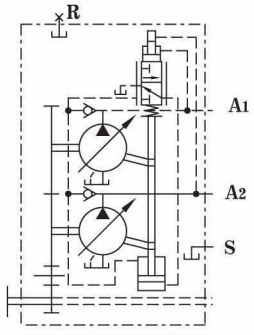
A8V....SR

Design 1



A8V....SR

Design 1.1~4



A1, A2 Oil port
S Suction port
R Air bleed

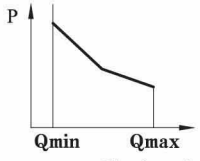
Auxiliary Deivice: Stroke Limiter

The fixed setting of the max: Flow at the required value Vgmax is made by means of a stop screw (please indicate required value in clear text when ordering).

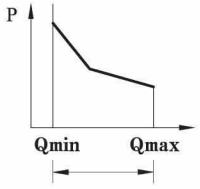
By means of an additional hydraulic stroke limiter: The max.displacement can be steplessly varied or limited. Adjustment range is from Vgmax(fixed setting) to Vgmin.

By means of an additional mechanical stroke limiter: The max.displacement can be infinitely varied or limited. Adjusted range from Vgmax to Vgmin.

A pilot pressure (port X) of at least 10% of the operating pressure is required for the hydraulic stroke limiter, however, min.pressure at port X must not 0.5MPa. Max.permissible pressure is 5MPa(for all sizes).



Fixed setting



Adjustment range

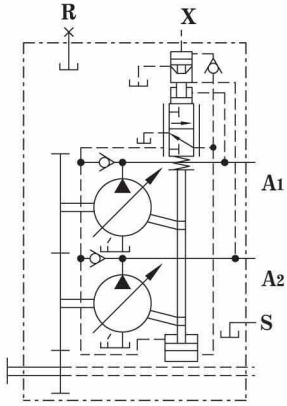
Hydraulic

Mechanical

A8V.....SR

Design 1.1~4

with hydraulic stroke limiter



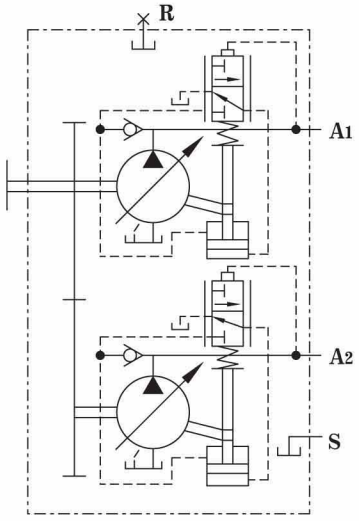
A1, A2 Oil port
S Suction port
R Air bleed
X Pilot pressure port

● Constant HP Control for each rotary group ER

Constant HP control for each rotary group ER means two control devices of the double pump A8V series aren't mechanically connected as the summation HP control, as a matter of fact each rotary group (just works as a single pump) has its constant horsepower control device either and works according to the different require of the system, but the working power of each rotary group mustn't be adjusted beyond the drive power.
The control principle of ER is similar to the control principle of SR.

A8V.....ER

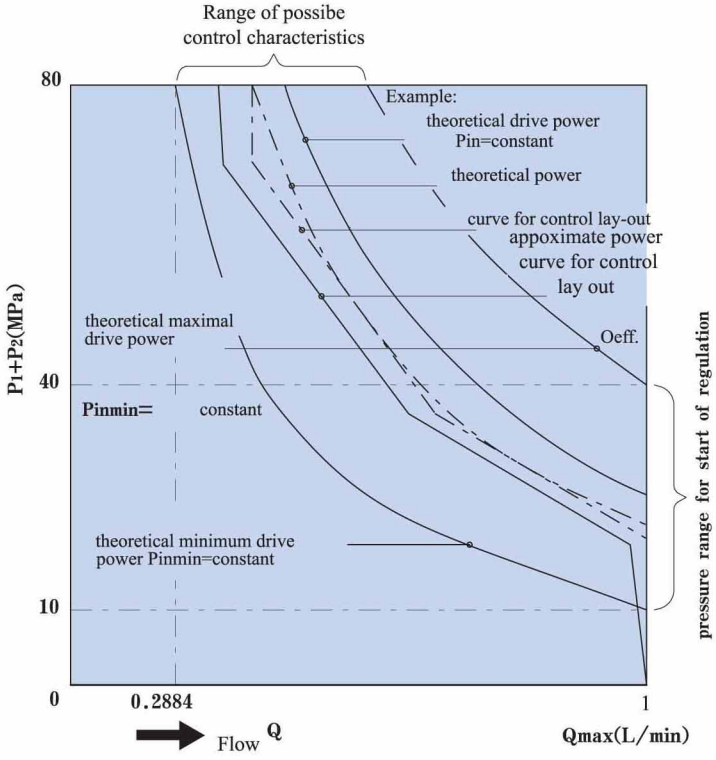
Design 1



A1, A2	Oil port
S	Suction port
R	Air bleed

Note:
This control device is available according to the requirement of the user.

Control Curve(general)

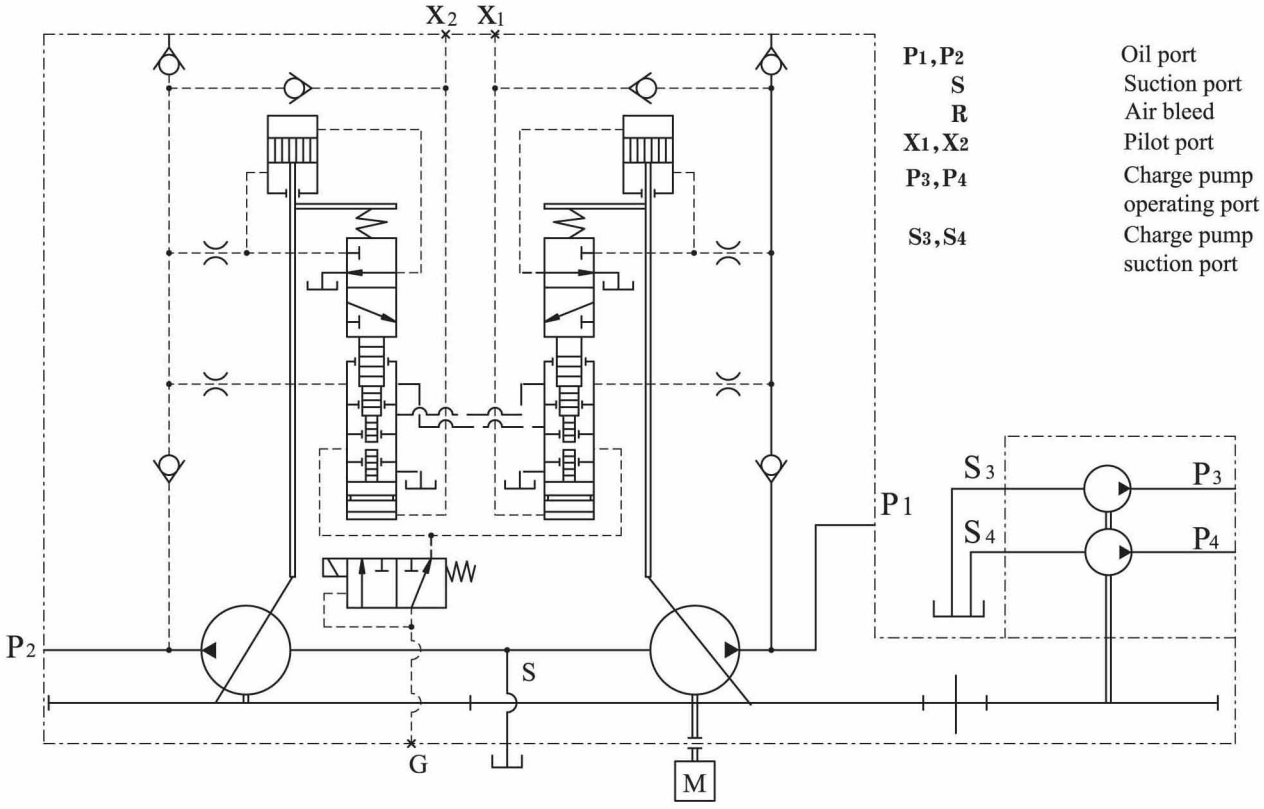


Pressure range at start of control 10~40 MPa total summated pressure P_1= pressure from pump 1, P_2=pressure from pump 2.
Special curves are produced for each individua drive.

A8V Variable displacement pump

● Cross power control

Cross power control is a new constant power control mode,based on traditional sumonation power control and individual power control, the two individual pumps are all control by sums of the double-pump's operating pressure (P_1+P_2). Depened on the operating pressure of system, the double-pump adjusted displacement of pumps in the range Vgmax to Vgmin at the same time. flow is inverse proportional to the operating pressure of system, so as to reach a constant hydraulic power.
When one pump operate at less than 50% of the total drive power, the second pump can automatically obtain the remanent power. In the extreme case,one pump can obtain 100% of the total drive power.



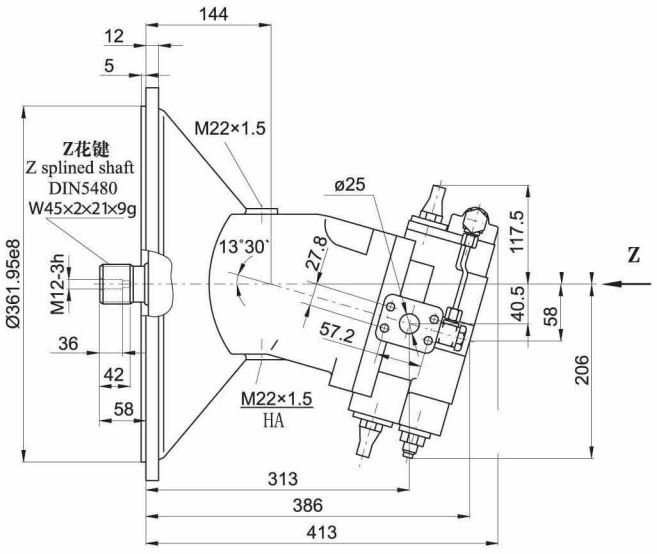
P_1, P_2	Oil port
S	Suction port
R	Air bleed
X_1, X_2	Pilot port
P_3, P_4	Charge pump operating port
S_3, S_4	Charge pump suction port

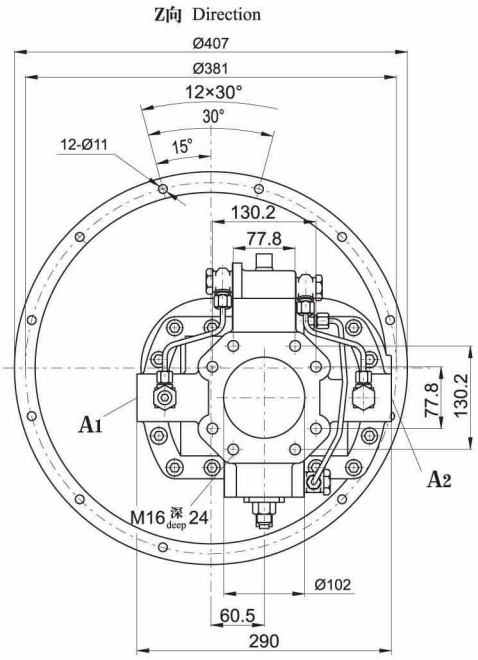
● Variable power control LRCE

On certain conditions ,to improve the operating quality of machine and reduce energy consumption. It is required the pumps can output different power according to operating condition.
As thown in the fig above,pilot pressure from port G is regulate after a porprotional solenoids control valve.it operated together with load pressure of the pump (P_1, P_2) to lower the pressure (P_1+P_2) required for change displacement, i.e. pump begin to change displacement at a lower operating pressure.thus the output power is reduced.
By adjust the input current of proportional solenoid. it can change the pilot pressure so as to change output power of the pump, and realize variable power control.

Unit Dimensions

Series 1 size 64

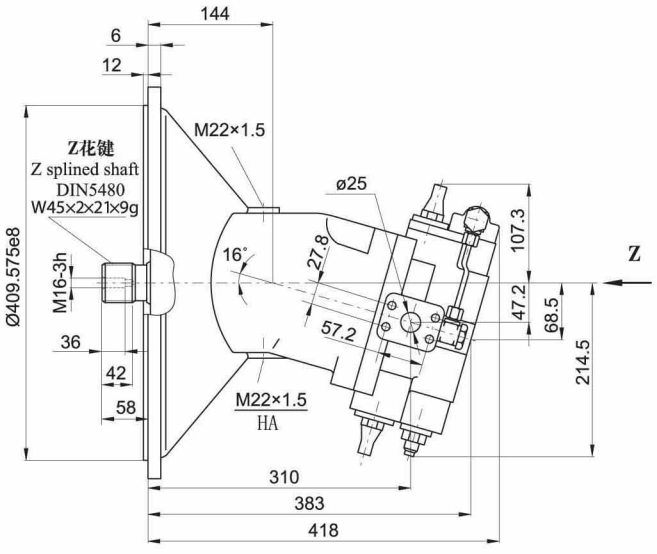


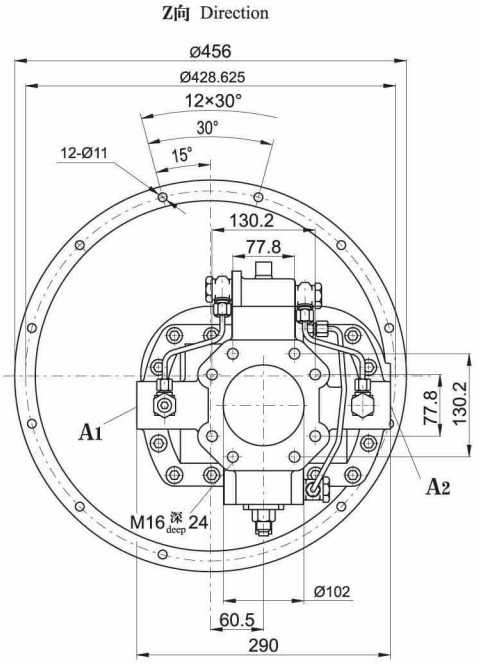


- Oil port:

A, B	Operating port
S	Suction port
R	Air bleed port(plugged)
HA	Drain oil port(plugged)

Series 1 size 80





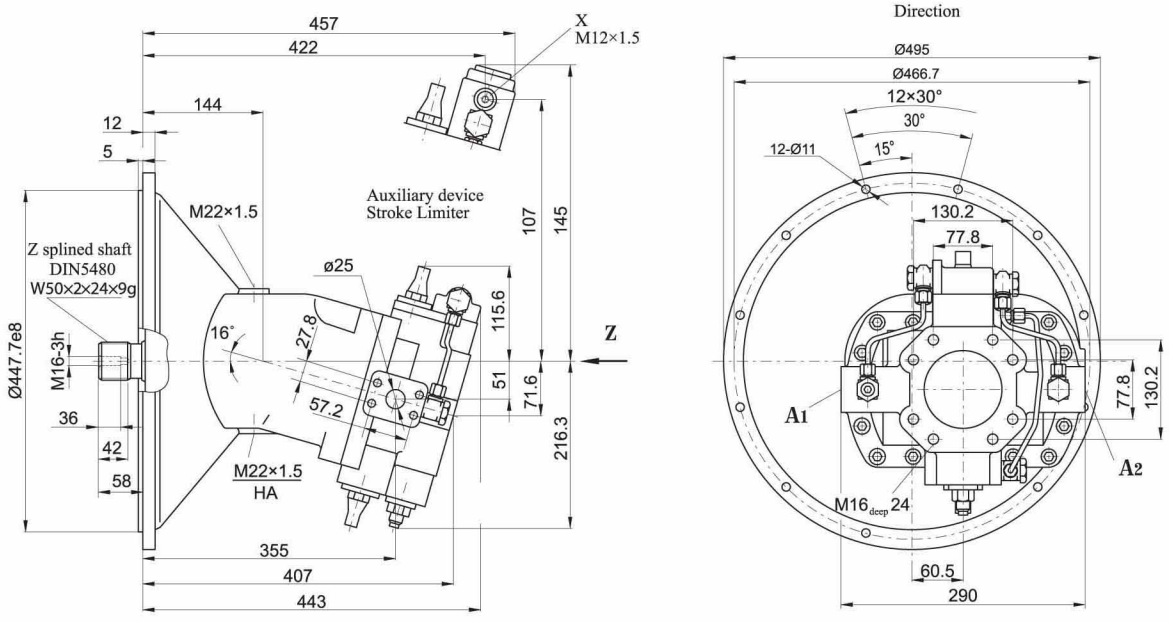
- Oil port:

A, B	Operating port
S	Suction port
R	Air bleed port(plugged)
HA	Drain oil port(plugged)

A8V Variable displacement pump

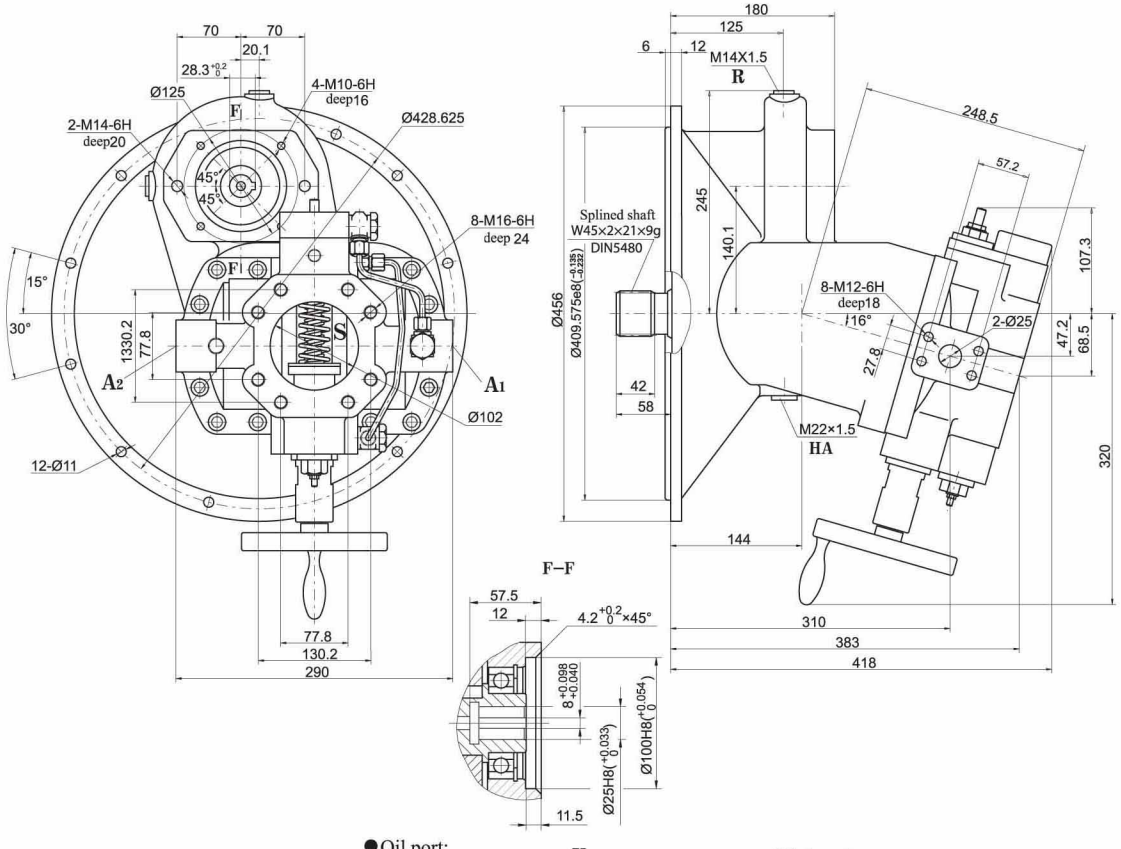
Unit Dimensions

Series 1 size 107



●Oil port:			
A1, A2	Operating port	X	Pilot port
S	Suction port	R	Air bleed port(plugged)
		HA	Drain port(plugged)

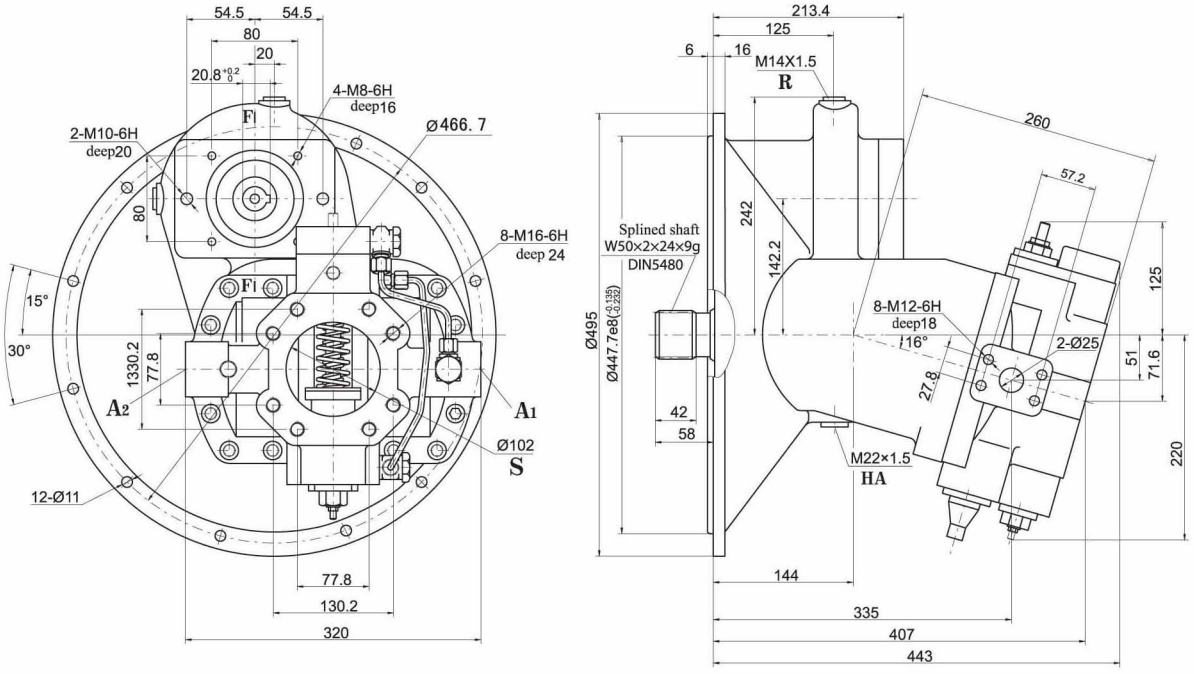
Series 1.1 size 80



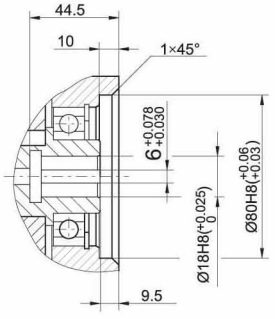
●Oil port:			
A1, A2	Operating port	X	Pilot port
S	Suction port	R	Air bleed port(plugged)
		HA	Drain port(plugged)

Unit Dimensions

Series 1.1 size 107



F–F



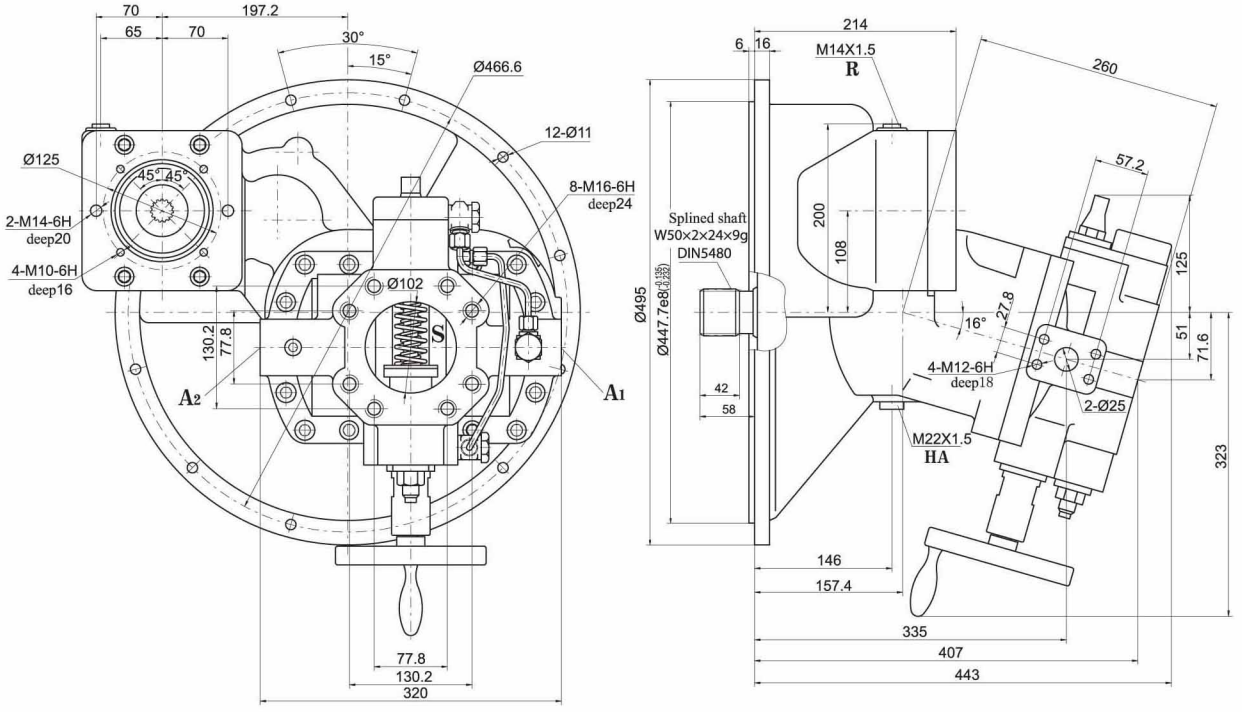
● Oil port:

A1 , A2	Operating port
S	Suction port
R	Air bleed port(plugged)
HA	Drain port(plugged)

A8V Variable displacement pump

Unit Dimensions

Series 1.2 size 107



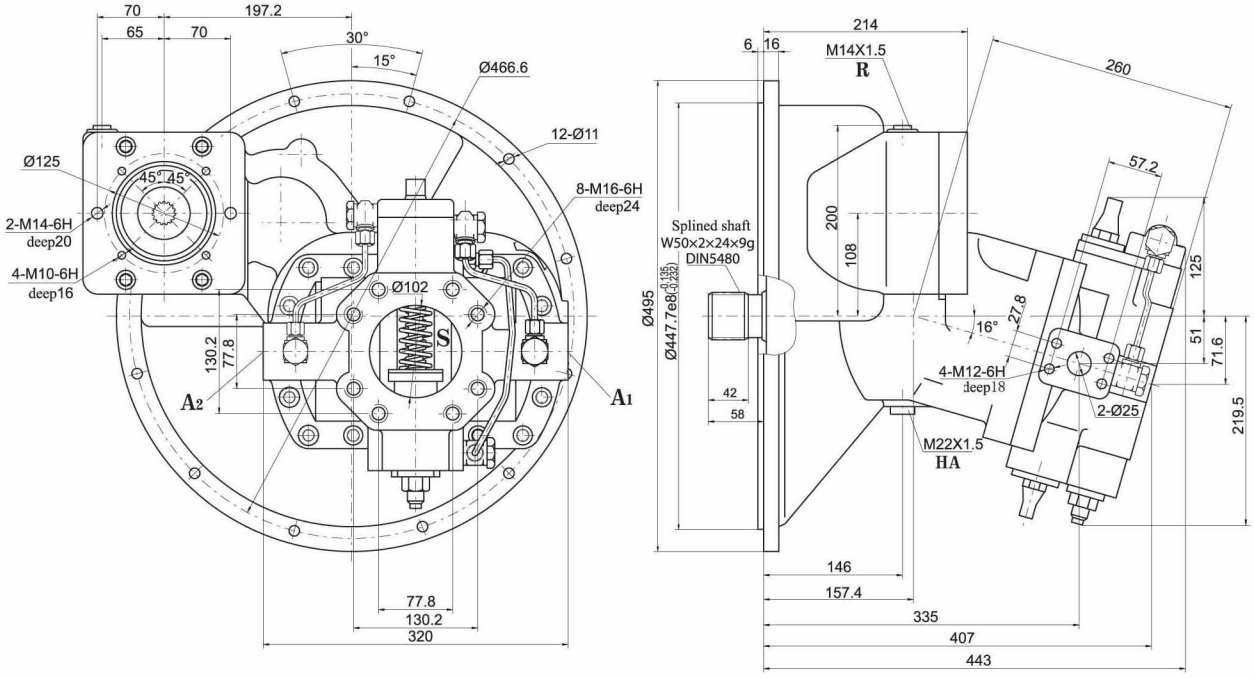
Note: Pipe on one-side,used for convergent flow only

● Oil port:

A1, A2 Operating port

S Suction port

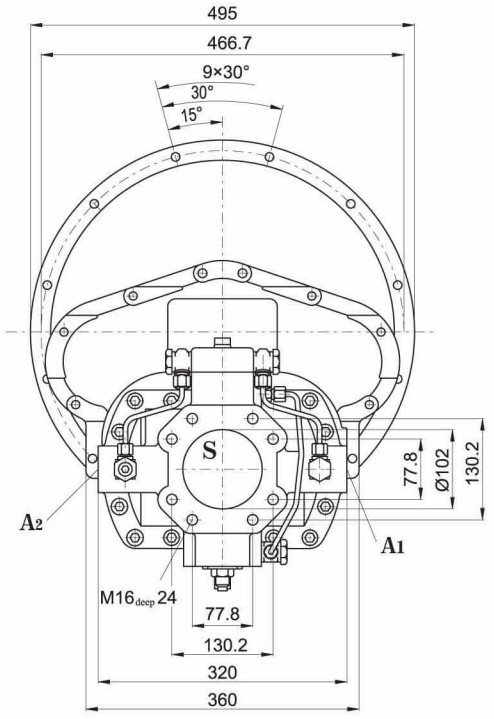
R Air bleed port(pugged)

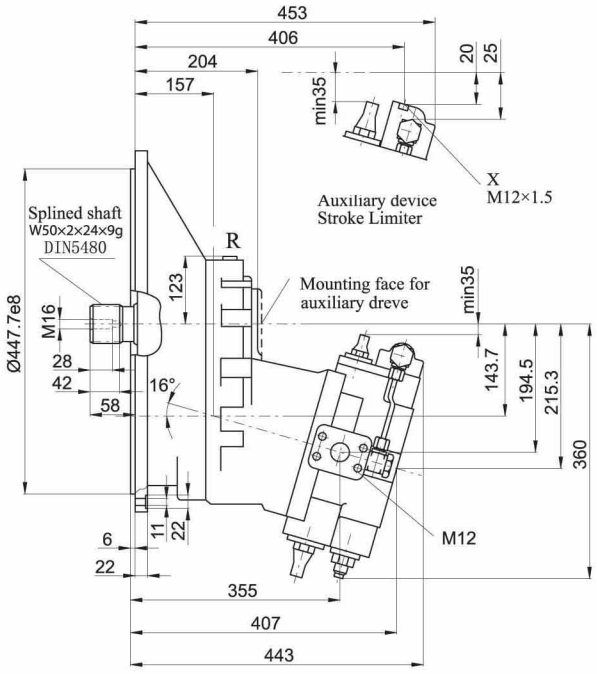


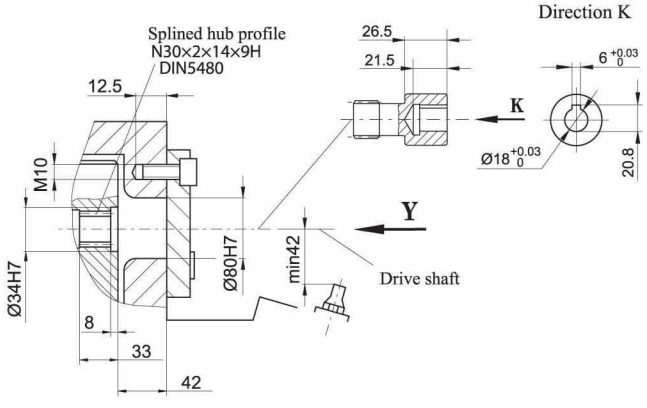
Note: Pipe on two-side,used for split flow or convergent flow

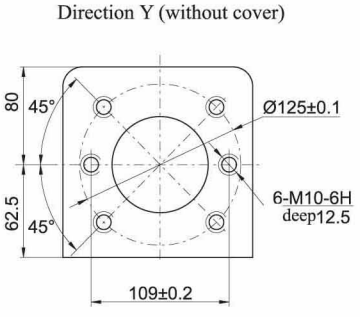
Unit Dimensions

Series 4 size 107









● Oil port:

A1, A2	Operating port	X	Pilot port
S	Suction port	R	Air bleed port(pugged)