A2F Series Axial Piston Fixed Displacement Pump

PIONEER FLURD POWER

Product show and brief introduction

说　明:

•弯轴结构的轴向柱塞元件，具有固定排量，在开式或闭式回路中用作静液传动的泵或马达。

•当作为泵工作时，流量与驱动转速和排量成正比。

•当作为马达工作时，输出转速与流量成正比而与排量成反比。输出扭矩随高压侧与低压侧之间的压差而加大。

Description:

Axial piston unit of bent axis design with fixed displacement,for use as either pump or motor in hydrostatic drivers,in open or closed circuit.

If operated as a pump,the flow is proportional to the drive speed and displacement.

If operated as a motor,the output speed is proportional to the swept volume and inversely proportional to displacement.The output torque increases with the pressure drop between the high and low pressure sides.

特　点:

•带有久经考验的球面配流盘的高性能旋转组件有自动对中、圆周速度低、效率高的优点。

•耐用的球轴承和滚子轴承促进长工作寿命。

•驱动轴能承受径向载荷。

• ISO安装法兰，从规格55起定量泵/马达和变量马达一致。

•可使用抗燃液压油。

•噪声低

Special Features:

High performance rotary group with well-proven spherical control area with the advantages;self-centering low peripheral speed,high efficiency.

Robust rolling bearings endure long service life.

Drive shaft capable of adopting radial loading.

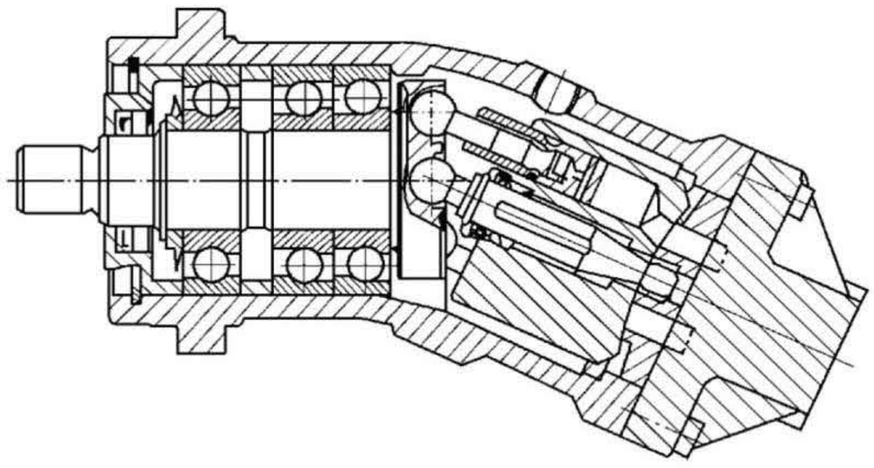
ISO mounting flange,uniform for fixed displacement Pumps/motors and variable motors from size 55.

May be used in conjunction with fire-resistant fluids.

Low noises generation.

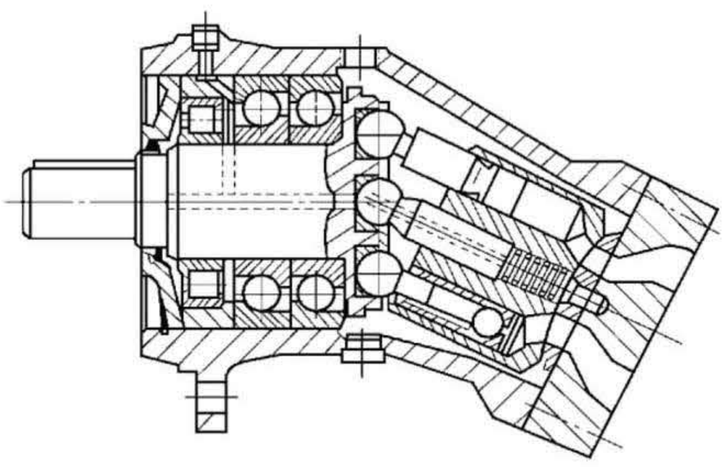
剖视图:

结构1-4，规格10-160



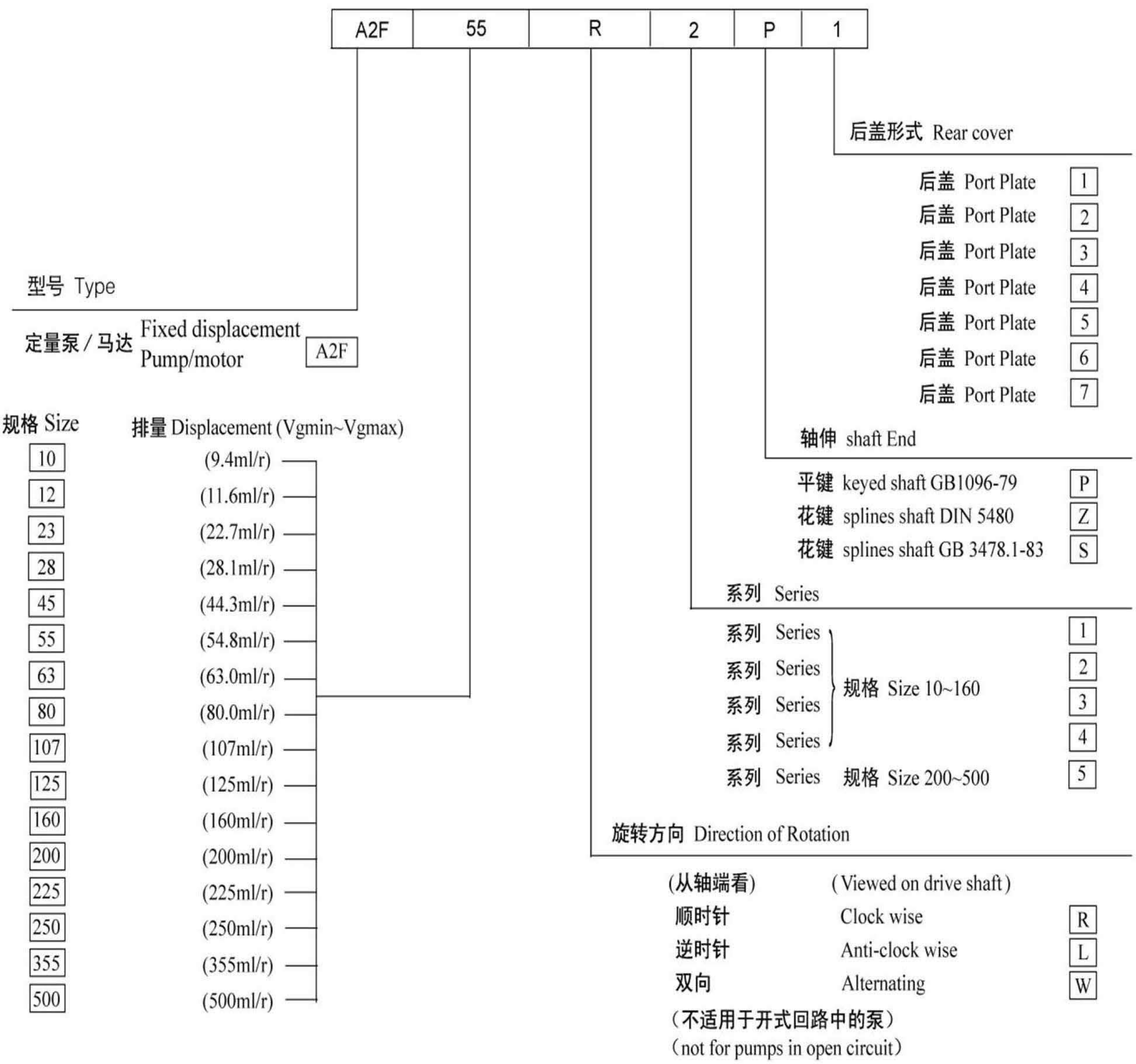
Section:

Series 5,Sizes 200-500



A2F定量柱塞泵/马达 Fixed piston pump/motor A2F

型号说明 Type Code



订货示例:

A2F、55、R、2、P、1
A2F 定量泵，规格 55，顺时针旋转
2 系列，平键，1型后盖。

Ordering Example:

A2F、55、R、2、P、1
Fixed displacement pump A2F, Size 55,
clockwise rotation, series 2, Keyed shaft, port plate 1.

技术参数：

●进口工作压力：

● 泵：

进油口S、A 或 B 最低压力： Pabs ———— 0.08MPa

在闭式回路中，补油压力必须在 0.2 至 0.6MPa 之间，视泵的转速和液压油的粘度而定。

● 马达：A 或 B 口的压力：

额定压力 ———— Pn =35MPa

最高压力 ———— Pmax=40MPa

A 口和 B 口压力之和不得超过 70MPa

（每侧压力最高 40MPa）

●出口工作压力：

● 泵： 额定压力 ———— Pn =35MPa

最高压力 ———— Pmax=40MPa

●最高允许壳体压力(油口T)：

P_{abs} ———— 0.2MPa

●油温范围：-25℃ ~80 ℃

●粘度范围：

T_{min} ———— 10mm²/s

T_{max} ———— (短时) 1000mm²/s

最佳工作粘度：———— 16-25 mm²/s

油液选择：40号低凝液压油层

●液压油的过滤：

推荐过滤精度为10μm,亦可使用25~40μm的,

但使用10μm的可延长使用寿命(降低磨损)。

●转速范围：

最低转速没有限制，若要求旋转高度均匀则最低转速不低于 50r/min, 关于最高转速，请见下页表格。

●安装位置：

任选，泵内必须充满液压油：

●流动方向：

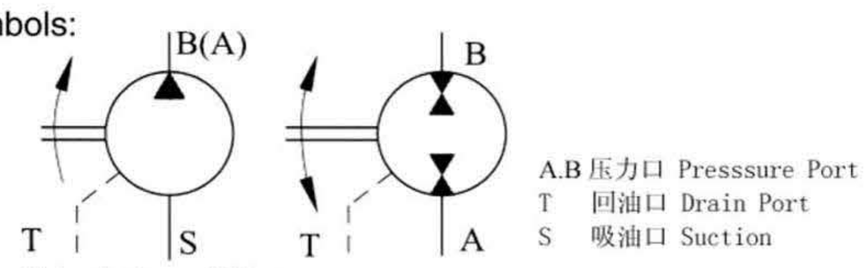
顺时针：

A到B S到B（开式回路）

逆时针：

B到A S到A（开式回路）

符号 Symbols:



●规格计算：Calculation of Size

• 泵 pump：

输出流量 Output Flow $Q=\frac{V_g \times n \times \eta_v}{1000}$ [L/min]

输入扭矩 Intput Torque $M=0.159\times V_g\times \Delta P/\eta_{mh}$ [N·m]

输入功率 Intput Power $P=\frac{Q\times \Delta p}{60\times \eta_t}$ [Kw]

• 马达 Motor：

输入流量 Input Flow $Q=\frac{V_g\times n}{1000\times \eta_v}$ [L/min]

输出转速 Output Speed $n=\frac{Q\times 1000\times \eta_v}{V_g}$ [r/min]

输出扭矩 Output Torque $M=0.159\times V_g\times \Delta P\times \eta_{mh}$ [Nm]

输出功率 Output Power $P=\frac{Q\times \Delta p\times \eta_t}{60}$ [Kw]

Vg=最大排量变	max geometric displacement	[ml/r]
M =扭距今	torque	[N·m]
ΔP=压差	differential pressure	[Mpa]
n=转速	speed	[r/min]
η_v=容积效率	volumetric efficiency	
η_m=机械效率	mechanical-hydraulic efficiency	
η_t=总效率	overall efficiency	

●Inlet Operating Pressure：

●Pump：

Minimum pressure at ports S、A or B： Pabs ———— 0.08MPa

In closed circuits,the feed pressure must be between 0.2MPa and 0.6MPa,depending on pump speed and viscosity of hydraulic fluid.

●Motor： Pressure at port A or B：

Nominal pressure ———— Pn =35MPa

Peak pressure ———— Pmax=40MPa

The sum of the pressures at ports A and B must not exceed 70MPa (individual pressure on either side max.40MPa)

● outlet Operating Pressure：

●Pump： Nominal pressure ———— Pn =35MPa

Peak pressure ———— Pmax=40MPa

Maximum permissible case pressure(at port T):

P_{abs} ———— 0.2MPa

●Oil Temperature Range：-25℃ ~80 ℃

●Viscosity Range

T_{min} ———— 10mm²/s

T_{max} ———— (for short periods) 1000mm²/s

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

Fluid Recommendation: 40 low-solidifing

● Filtration of hydraulic Fluid:

Recommended filtration 10μm. Coarser filtration of 25 to 40μm is acceptable,Howerver longer service life is achieved.

● Speed Range:

No limitation on minimum speed,

If high uniformity of rotation is required, nmin should not be less than 50r/min,See table on page 5 for maximum speed.

● Mounting position:

Arbitrarily Choose, the housing must be filled with oil;

● Flow direction

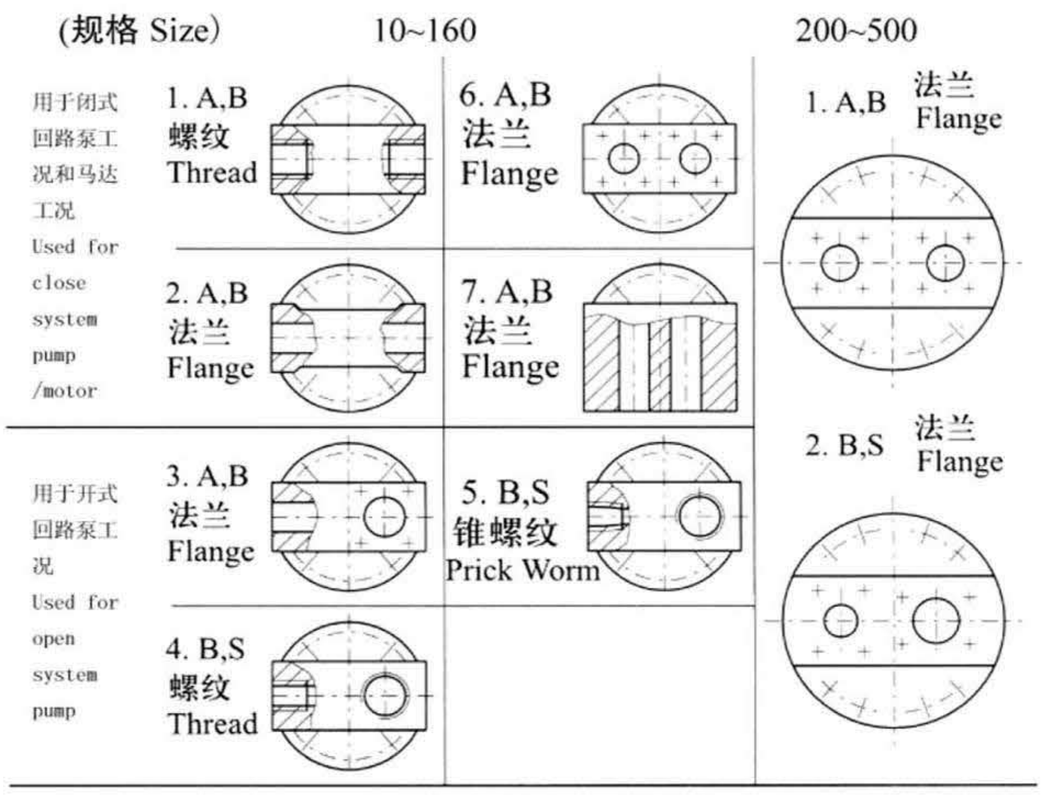
Clockwise:

A to B S to B(Open Circuit)

Anticlockwise:

B to A S to A(Open Circuit)

后盖形式 Rear cover：



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●油温范围：-25℃ ~80 ℃

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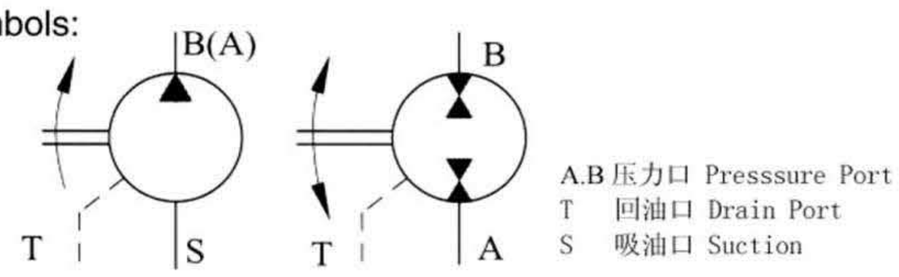

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输入功率 Intput Power $P=\frac{Q\times \triangle p}{60\times \eta_t}$ [Kw]

• 马达 Motor:

输入流量 Input Flow $Q=\frac{V_g\times n}{1000\times \eta_v}$ [L/min]

输出转速 Output Speed $n=\frac{Q\times 1000\times \eta_v}{V_g}$ [r/min]

输出扭矩 Output Torque $M=0.159\times V_g\times \triangle P\times \eta_{mh}$ [Nm]

输出功率 Output Power $P=\frac{Q\times \triangle p\times \eta_t}{60}$ [Kw]

Vg=最大排量变	max geometric displacement	[ml/r]
M =扭距今	torque	[N·m]
ΔP=压差	differential pressure	[Mpa]
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● Mounting position:

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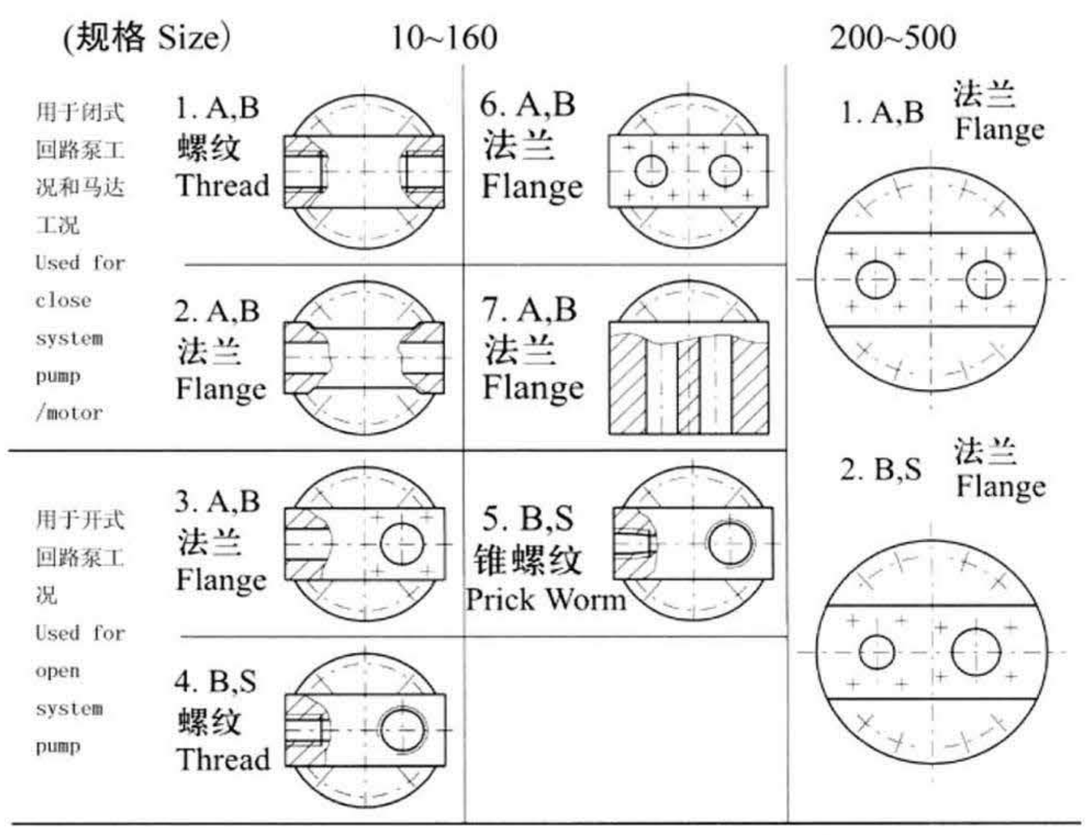
● Flow direction

Clockwise: A to B S to B(Open Circuit)

Anticlockwise: B to A S to A(Open Circuit)

后盖形式 Rear cover：



元件外形尺寸 系列1-4规格10-160 Unit Dimensions Series1-4 size 10-160

系列 Series 1,3,4

系列 Series 2

后盖形式 Rear cover

1
A,B油口：螺纹 Thread
P向
Direction P

2
A,B油口：法兰 Flange
P向
Direction P

3
A,B油口：
S油口：法兰 Flange
P向
Direction P

4
A,B油口：螺纹 Thread
P向
Direction P

6
A,B油口:法兰 Flange
P向
Direction P

7
A,B油口:法兰 Flange
Z向
Direction Z

S向
Direction S

轴伸 Shaft
花健Splined DIN5480
花健Splined GB3478.1-83

平键Keyed shaft(GB1096-79)

注：
1.A1、A2和A3的尺寸只适用于系列2，对系列1,3,4的对应值由下式求出：
A1'=A1-（A6-A6'）；A2'=A2-（A6-A6'）；A3'=A3-（A6-A6'）。
除上述结构形式外，还可以根据用户特殊需要对现有产品进行改制。
Note:
1.The dimensions of A1、A2、A3 are only valid for series 2.The parallel dimensions of the three above mentioned positions for series 1,3 and 4 can be calculated according to the follows formula:A1'=A1-(A6-A6'); A2'=A2-（A6-A6'）; A3'=A3-（A6-A6'）。
2.Besides above mentioned constructures,we can adjust the design of the present product according to the customers' special needs.

A2F定量柱塞泵/马达(1~5系列)　　A2F Fixed Displacement pump/motor(1~5 Series)

元件外形尺寸 系列1~4 规格10~160 Unit Dimensions Series 1~4 size 10~160

规格 Size		系列 Series	后盖形式 Rear cover	A1		A2		A3		A4	A5	A6	A5'	A6'	A7	A8	A9	
α20°	α25°			α20°	α25°	α20°	α25°	α20°	α25°								α20°	α25°
10	12	2,4	1,4	174	172	–	–	–	–	80	20	62	40	42	12.5	8	69	75
23	28	2,3	1,2,4	223	218	–	–	–	–	100	25	75	50	50	16	8	88	95
45	55	1,2	1,2,3,6	292	289	286	284	–	–	125	32	108	63	77	20	10	110	118
63	80	1,2	1,2,3	350	348	345	342	–	–	140	32	137	83	86	23	10	126	140
87	107	1,2	1,2,3,7	360	356	353	348	358	353	160	40	130	80	90	25	12	138	149
125	160	2	1,2,3,7	422	417	417	410	408	420	180	40	156	–	–	28	10	159	173.5

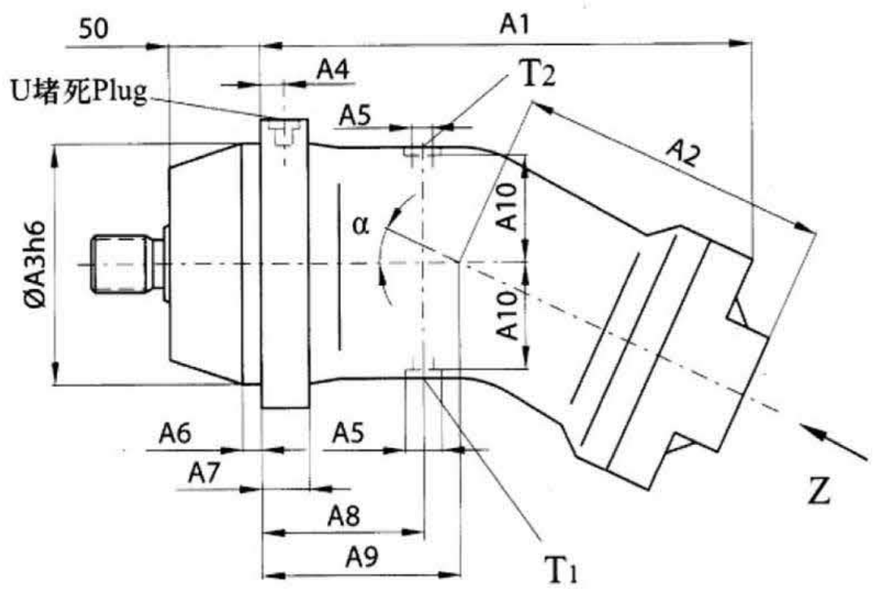
规格 Size		A10	A11	A12	A13	A14	A15	A16	A17	A 18		A19	A20	B1	B2	B3	B4
α20°	α25°									α20°	α25°						
10	12	14	M12×1.5	40	–	90	112	–	–	–	–	–	–	89	M22×1.5	14	40
23	28	25	M16×1.5	50	–	118	145	118	–	–	–	–	–	106	M27×2	16	47
45	55	31.5	M18×1.5	63	–	151	183	151	178	–	–	–	–	132	M33×2	18	53
63	80	36	M18×1.5	77	–	174	213	174	208	–	–	–	–	156	M42×2	20	63
87	107	40	M18×1.5	80	–	190	230	190	225	185	200	230	195	165	M42×2	20	66
125	160	45	M22×1.5	93	–	212	262	212	257	204	220	252	212	195	M48×2	22	70

规格 Size		B5	B6	B7	B8	B9	深 Deep	B10	B11	B12	B13	B14	B15	深 Deep	B16	深 Deep	B17	B18	B19	B20
α20°	α25°																			
10	12	–	–	–	–	–	–	44.5	18	–	–	–	–	–	M33×2	18	42	–	–	–
23	28	120	13	18.2	40.5	M8	15	53	25	–	–	–	–	–	M42×2	20	48	–	–	–
45	55	126	19	23.8	50.8	M10	15	63	29	129	48	50	M10	13	–	–	–	67	20	–
63	80	150	25	27.8	57.1	M12	15	75	35.5	153	60	56	M12	15	–	–	–	–	–	–
87	107	160	25	27.8	57.1	M12	17	80	35.5	162.5	60	56	M12	18	–	–	–	–	–	25
125	160	190	32	31.8	66.7	M14	19	95	42.2	192.5	75	70	M16	20	–	–	–	–	–	39

规格 Size		B21	深 Deep	B22	B23	C1	C2	C3	C4	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
α20°	α25°																		
10	12	–	–	–	–	95	100	10	9	40	16	22.5	20	M6	0.8	34	2	22	16.7
23	28	–	–	–	–	118	125	12	11	50	19	27.9	25	M8	0.8	43	1.2	28	21.5
45	55	–	–	–	–	150	160	16	13.5	60	28	33	30	M12	1.5	35	1.5	28	25
63	80	–	–	–	–	165	180	16	13.5	70	28	38	35	M12	1.6	40	1.5	33	30
87	107	M12	25	50	78	190	200	20	17.5	80	28	43	40	M12	1.6	45	2	37.5	35
125	160	M12	25	50	78	210	224	20	17.5	90	36	48.5	45	M16	2.5	50	2.5	43	40

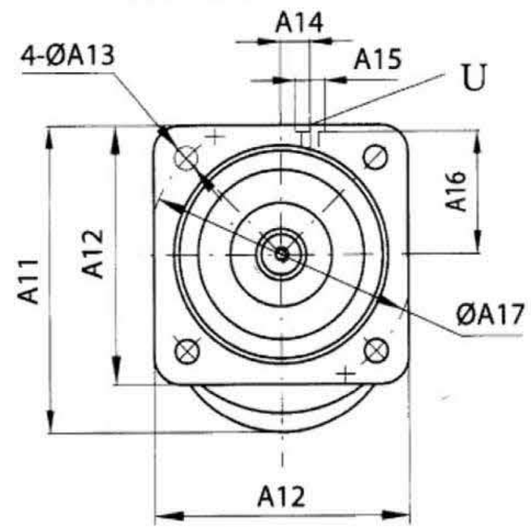
规格 Size		SEA法兰 SEAFlang		平键盘Paralled	花键Splined Shaft	花键Splined Shaft	重量 Weight (kg)
α20°	α25°	D1	D2	BG1096-79	DIN5480	GB3478-83	
10	12	–	–	键Key6×32	W20×1.25×14×9g	EXT14Z×1.25×30R×5f	5
23	28	1/2″	1/2″	键Key8×40	W25×1.25×18×9g	EXT18Z×1.25×30R×5f	12
45	55	3/4″	1 3/4″	键Key8×50	W30×2×14×9g	EXT14Z×2m×30R×5f	23
63	80	1″	2″	键Key10×56	W35×2×16×9g	EXT16Z×2m×30R×5f	33
87	107	1″	2″	键Key12×63	W40×2×18×9g	EXT18Z×2m×30R×5f	44
125	160	1 1/4″	2 3/4″	键Key14×70	W45×2×21×9g	EXT21Z×2m×30R×5f	63

元件外形尺寸 Unit Dimensions Series 5

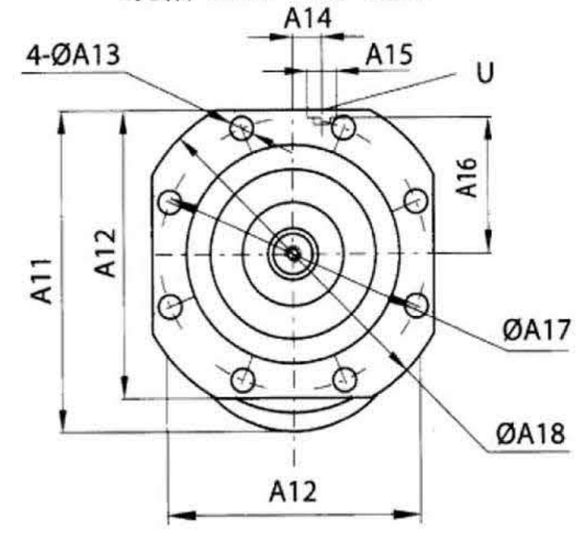


轴伸shaft end

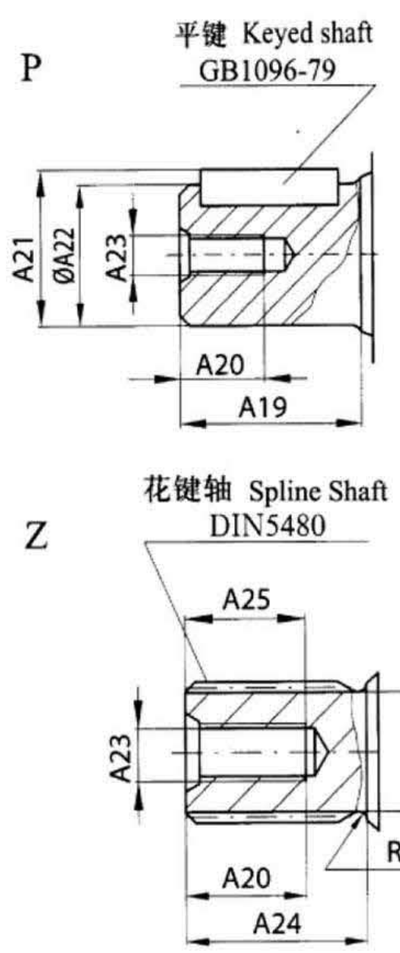
规格 Size 200–250



规格 Size 355–500

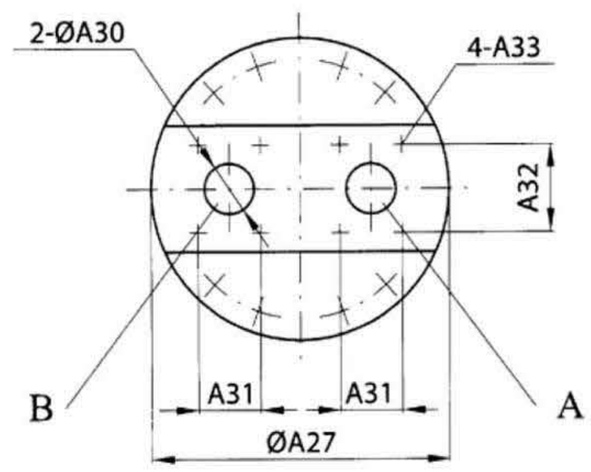


后盖（Z向）End Plate(Direction Z)



1

用于马达工况和泵工况(闭式回路)
Used for Pump and Motor(Closed Circuit)

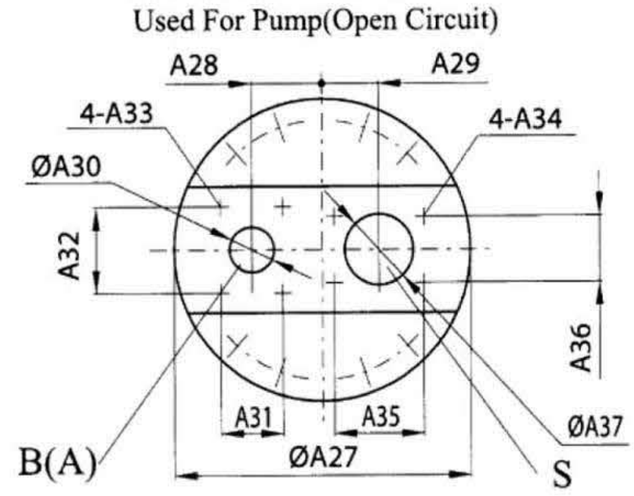


A,B油口：法兰42MPa(见尺寸表A38)
A,B Port:Flange 42MPa(See From A38)

A,B	工作管	Operation
S	吸油管	Suction
T1	漏油口	Drain Port
T2	泄油口	Drain Port
U	冲油口	(轴承) Clear port(Bearing)

2

用于泵工况(开式回路)
Used For Pump(Open Circuit)



A,B油口：法兰42MPa(见尺寸表A38)
逆时针旋转时，后盖2旋转180°
S油口：法兰42MPa(见尺寸表A39)
规格200–355：17.5MPa,规格500：14MPa.
A,B Port:Flange 42MPa(See From A38)
S Port:Flange 42MPa(See From A39)
When rotation with anti–clockwise,
The end plate will be rotary 180° .
Size 200–355:17.5MPa.Size 500:14MPa.

系列5 规格200–500元件外形尺寸表 Series 5 Size 200–500 Table Of Unit Dimensions

规格 Size	α	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
200	21°	368	232	224	13	M22×1.5	9	25	120	134	107	300	252	22	70	M14×1.5
250	26.5°	370	232	224	13	M22×1.5	9	25	120	134	107	314	252	22	70	M14×1.5
355	26.5°	422	260	280	14	M33×2	15	28	142	160	128	380	335	18	35	M14×1.5
500	26.5°	462	283	315	15	M33×2	15	30	155	175	142	420	375	22	35	M18×1.5

规格 Size	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30	A31	A32	A33
200	122	280	/	82	36	53.5	50k6	M16	58	47	45	216	55	45	32	31.8	66.7	M14
250	122	280	/	82	36	53.5	50k6	M16	58	47	45	216	55	45	32	31.8	66.7	M14
355	166	320	360	105	42	64	60m6	M20	82	69	55	245	60	50	40	36.6	79.4	M16
500	180	360	400	105	42	74.5	70m6	M20	82	67	62.5	270	65	55	40	36.6	79.4	M16

规格 Size	Deep	A34	Deep	R	A35	A36	A37	A38	A39	平键Paralled BG1096–79	花键Spline DIN5480	重量 Weight (kg)
200	22	M12	18	1.2	88.9	50.8	63	1 1/4″	2 1/2″	键Key14×80	W50×2×24×9g	88
250	22	M12	18	1.2	88.9	50.8	63	1 1/4″	2 1/2″	键Key14×80	W50×2×24×9g	88
355	24	M12	18	1.6	88.9	50.8	63	1 1/2″	2 1/2″	键Key18×100	W60×2×28×9g	138
500	24	M16	24	1.6	106.4	62	75	1 1/2″	3″	键Key20×100	W70×3×22×9g	185