产品特点及用途

该产品用于开式回路的静液压驱动轴向柱塞斜盘式结构变量泵。泵的流量与驱动转速及泵排量成正比，通过斜盘的角度变化可无级改变流量。

法兰接口SAE-UNC或SAE-公制具有两个泄油口，高驱动转速，良好的吸油性能，低噪音，功率/重量比高，拥有多种变量方式(恒压、恒压/恒流量、恒功率)可多回路系统的通轴驱动。

广泛用于冶金、矿山、工程机械、船舶、民航地面设备等液压传动领域。

敬请注意

为了使您的液压系统无故障的高效工作，请仔细阅读说明书，以便使该产品能够与您的系统达到最优化的组合。

北京格兰力士机电技术有限责任公司 Beijing Gelanrex M&E Technology Co.,Ltd	A7V变量泵 Variable Displacement Pump A7V 用于开式回路 斜轴式轴向柱塞结构 For open circuits axial tapered piston,bent axis design	
	规格Size 40、55	高压范围 Peak pressure 至 up to40Mpa

说明：

●斜轴式轴向柱塞泵，用于开式回路静液压传动中。

●流量与驱动转速及排量成正比，在恒定驱动转速下，可以无级变化。

●控制装置品种齐全，用于每种控制和调节功能。

●用矿物油和抗燃液体工作。

Description

Variable displacement pump,axial piston,bent axis design,for hydrostatic transmissions in open circuits.

The flow if proportional to the drive speed and the displacement and is steplessly variable at constant drive speed .

comprehensive programme of control devices for every control and regulation function.

operation of both mineral ,and fire-resistant fluids.

结构特点：

结构1

●高性能的旋转组件及球面配油盘，可实现自动对中，低周速，高效率。

●驱动轴能承受径向载荷。

●长寿命。

●低噪声级。

Special Features

series 1

High performance rotary group with well-proven spherical control

area offering the following advantages ;self-centering,low periph-

eral speed,high efficiency.

Long service life robust rolling bearing.

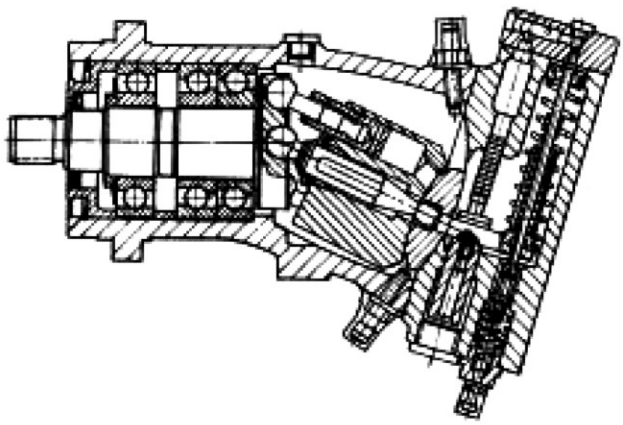
Drive shaft will support radial loads.

Low noise level.

High duty roller bearing for inter-mittent high pressure operation.

For continuous duty hydrostatic bearing are available.

部视图



结 构 Series 1
规格Size 40、55

A7V变量泵 Variable Displacement Pump A7V

型号说明 Type Code

A7V	55	LV	I	L	Z	F	O	O

泵型号Pimp Type

变量泵 Axial piston variable Displacement pump	A7V

规格 Size

0–40.1	40
15.8–54.8	55

（排量 Displacement Vgmin–Vgmax ml/r）

变量方式Control Device

恒功率变量 Constant horsepower control	LV
恒压变量 Constant pressure control	DR
电控比例变量 Electrocal control (with prop.solenoid)	EP
液控变量 Hydraulic control pressure related	HD
手动变量（带手轮）Manual control (with handwheel)	MA
刹车变量 Brake control	SC

结格型式 Series

见剖视图 see section	1

辅助元件 Auxiliary Epuipment

没有none	O

行程限位 Stroke Limiter

没有	none	O
机械行程限位（用于LV和DR）	Stroke limiter mechanically adjustable (for LVand DR)	M
液压行程限位（用于LV）	Stroke Limiter,hydraulic (for LV)	H

油口连接 Pipe Connections

压力油口： SAE法兰；在侧面	Pressure port: SAE flange,on side
吸油口： SAE法兰；在侧面	Suction port: SAE flange,on side
压力油口： 螺纹连接，在侧面	Pressure port : threaded,on side
吸油口： SAE法兰；在侧面	Suction port: SAE flange,on side

	F
	G

轴伸 Shaft End

花键	splined shaft DIN5480	Z
花键	splined shaft GB 3478.1–83	S
平键	keyed shaft GB1096–79	P

转向（从轴端看）
Direction of Rotation（Viewed of shaft end）

顺时针	clockwise	R
逆时针	anti–clockwise	L

订货示例A7V.55.LV.1.L.Z.F.0.0

轴向柱塞变量泵A7V，规格55，恒功率控制，结构1逆时针旋转，花键，SAE法兰连接，没有行程限位器和辅助元件。

Ordering Example:A7V.55.LV.1.L.Z.F.0.0

Axial piston variable displacement pump A7V,size 55.With constant horsepower control,se ries 1.

anti–clockwise rotation,splined shaft SAE side flange connections , without auxil iary equipment.

A7V变量泵 Variable Displacement Pump A7V

技术参数表 Technical Data

（理论值，未考虑机械效率和容积效率）（theoretical values,without considering mech-hyd.and volumetric efficiency）

规格	Size			40	55
变量方式	control Device				
LV恒功率变量	Constant HP control			·	·
DR恒压变量	Constant pressure control			·	
HD液控变量	Hydraulic control			·	·
EP电控比便变量	Electric control（Proportional）			·	·
MA手动变量	Manual control			·	·
SC刹车变量	Brake control				
		V_{gmin}	Mi/r	0	15.8
	在0.09MPa[1]	n_{max}0.09	r /min	3200	2360
最高转速Max.speed[3]	在0.1MPa[1]	n_{max}0.1	r/min	3400	2500
	在0.15MPa[1]	n_{max}0.15	r/min	3750	3000
	在n_{max}0.09	Q_{max}0.09	L/min	124	125
最大流量Max.flow[2]	在 n_{max}0.1	Q_{max}0.1	L/min	132	133
	在n_{max}0.15	Q_{max}0.15	L/min	146	160
	在Q_{max}0.09	P_{max}0.09	KW	75	75
最大功率Max.Power	在 Q_{max}0.1	P_{max}0.1	KW	80	80
（△p=35MPa）	在 Q_{max}0.15	P_{max}0.15	KW	88	96
流量Flow Q^2 功率 Power	在NE=1450r/min		L/min	56.4	77.1
P（△p=35MPa）	在NE=1450r/min		KW	34	46
扭矩Torque	在V_{gmax}		Nm/10MP	63.7	87
M（△p=10MPa）	在V_{gmin}		Nm/10MP	–	25.1
最大扭矩（△p=35MPa）	在V_{gmax}		Nm	223	305
Max.torque M_{max}	在V_{gmin}		Nm	–	88
惯性矩Moment		J	kgm^2	0.0052	0.0052
重量Weight			kg	28	28

1）所示值为吸油口S的绝对压力，且在V_{gmax}用矿物油工作。

2）以容积效率97%算出。

3）即使在更高的负载下，最高转速不得超过0.15MPA时的数值，但对于V_{gmin}>0的那些规格：55-40，通过减少排量（V_g<V_{gmax}）和维持最大流量，最高转速可提高到V_{gmin}=0的那些规格的值。

1）The values shown are valid for Vgmax.with an absolute pressure at suction inlet S and when operatend on mineral oil.

2）Calculated with a volumetric efficiency of 97%.

3）The maximum speeds at 0.15MPa shown must not be exceeded ,even with higher loading .on those sizes with V_{gmin}>0, however the maximum speeds can be increased to the valuse for those sizes with V_{gmin}=0 by reducing the displacement（V_g<V_{gmax}）and maintaining max.flow.The relevant sizes are 55-40.

技术参数Technical Data

进口工作压力（S口绝对压力）Inite Operation Pressure Absolute pressure at port S

$P_{abs\ min}$ —— 0.08 MPa

$P_{abs\ max}$ —— 0.2 MPa

出口工作压力范围Operating Pressure Range–Outlet Side

额定压力Nominal pressure —— P_N=35MPa

最高压力Peak pressure —— P_{max}=40MPa

油温范围：Fluid Temperature Range

t_{min} —— –25℃

t_{max} —— +80℃

粘度范围：Viscosity Range:

V_{min} —— 10mm²/s

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

最佳工作粘度：Optimum Operating Viscosity:

V_{opt} —— 16–36mm²/s

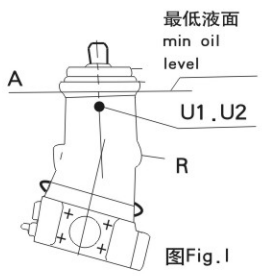
油液选择：Fluid Recmmendation

工作温度 推荐粘度等级符合DIN51519

Operating Recommended Viscosity grade temperature to DIN 51519

range ISO(VG)(在40℃时，at40℃)

30–40℃	VG22. 22mm²/s
40–50℃	VG32. 32mm²/s
50–60℃	VG46. 46mm²/s
60–70℃	VG68. 68mm²/s
70–80℃	VG100. 100mm²/s



图Fig.1

Mounting on Top of Tank

when mounting outside a tank, the pump must be bled at port U1 or U2 prior to commissioning.

Mounting on Top of Tank

Mounting of the A7Vvariable pump above tank must be considered as a special pump installation and should only be realized under specific conditions.

When ordering pumps for mounting on top of tank ,state in clear text:

"To Be Used for Above Tank Mounting"

This installation requires that the suction port be at the top and the suction pipe be kept as short as possible and the end of the pope be at least 200mm below minimum oil level,see Fig2.

The cross–cut of the suction pump should be so dimensioned to ensure that the flow velocity of the pressure fluid lies between 0.8 and lm/s.

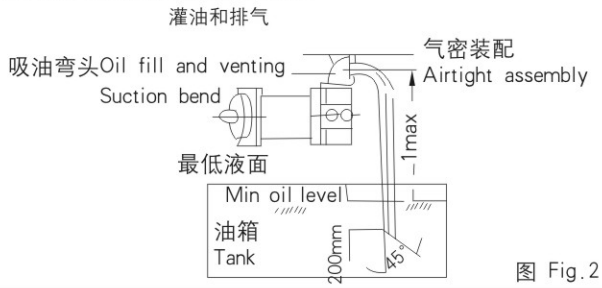


图 Fig.2

液压油的过滤：

推荐过滤精度为10μm。亦可使用25–40μm的，便使用μm的可以延长使用寿命，元件磨损减少。

安装位置

任选。泵壳内必须始终充满油液。当装于油箱内时，油口R的螺塞必须取下，此油口必须在顶部，并拧上一个90° 的弯头（以减少噪声）。驱动轴朝上垂直安装：

对此必须定货带有油口U_1和U_2的型号（用文字说明带油口$_1$和U_2）。最低液面不低于“A”线，如图1所示。

和U_2的型号（用文字说明带油口U_1和U_2）。最低液面不低于“A”线，如图1所示。

该泵装于油箱内时油口U_1和U_2和R的螺塞必须取下，当装于油箱外时，泵在启动前必须在油口U_1或U_2排气。

泵装于油箱顶部：

A7V 变量泵装于油箱顶部应看作特殊安装，只能在特定的条件下实现订时请注明：用于油箱顶部安装。

这种安装要求吸油口位于上方，吸油管尽可能短，管端至少低于最低液面200mm见图2。

吸油管的内径应保证油的流速在0.8至1m/s之间。

Filtration of Hydraulic Fluid

Recommended filtration 10μm Coarser filtration of 25–40μm is possible ,but longer component life,will be achieved using 10μm filtration due to lowest component wear.

Mounting Position

Optional ,The pump housing must always be filled with oil.When mounting within a– tank the plug must be re–moved form port R and this port must be at the top.90℃ pipe bend to be screwed in （noise reduction）.

Note:

Vertical mounting with drive shaft pointing upwards:for this case a model with ports U_1 and U_2 must be orderde（indicate in clear text:"with ports U_1 and U_2"）.The mini mum oil level must not fall below the “A” line,as shown is Figl.

Size	Max speed n_{max} r/min	Max length of suction pipe L_{max}（mm）	规格 最高转速1）吸油管最大长度 在流速V=0.9m/s和下V_{gmax}下算出的吸油管内径（mm） Calculated suction pie 1.D.（mm）at flow velocity V=0.9m/s and V_{gmax}. Speed转速 n_{max}（r/min）	Speed转速 n_E=1450（r/min）
40	3040	750	53.6	37
55	2240	750	53.8	43.3

1）此数值仅适用于吸油口绝对压力为0.09MPa，排量为Vgmax及用矿物油工作时。

注：

A7V泵只能在泵处于最大摆角（Vgmax）时启动，对于调节从Vgmin开始的泵，Qmin限位螺钉必须调到最小流量>Vgmax5%处，以免在零位工作时吸油管放空。

1）The values shown are valid for Vgmax. with 0.09Mpa absolute pressure at suc–tion inlet S and when operated on mineral oil.

Note:

Start–up of the pump with all controls is only possible when the pump is at its full swivel angle（V_{gmax}）,For pumps with minimum flow of ≥5% of V_{gmax}.in order to avoid emptying of the suction line during zero position operation.

A7V变量泵 Variable Displacement Pump A7V

规格计算Calculation of Size

流量 Flow	$Q=\frac{V_g \cdot n \cdot \eta_v}{1000}$	[L/min]
驱动扭矩Drive Torque	$M=\frac{1.59 \cdot V_g \cdot \Delta p}{10 \cdot \eta_{mh}}$	[Nm]
驱动功率Drive Power	$p=\frac{M \cdot n}{9549}=\frac{Q \cdot \Delta p}{60 \cdot \eta_t}$	[kW]

V_g=排量 geom.displacement per rev（ml/r）
△P=压差 differential pressure（MPa）
n=转速 speed（r/min）
η_v=容积效率 volumetric efficiency
η_{mh}=机械效率 mech.hyd.efficiency
η_t=总效率 overall efficiency
$[\eta_t=\eta_v \cdot \eta_{mh}]$

LV恒功率变量 Constant Horsepower Control

恒功率变量与压力有关的控制流量，以保持液压功率恒定（当驱动转速恒定时）。

The constant HP control controls flow in relation to pressure. thereby maintaining hydraulic power constant .（Provided that the drive speed is constant）.

$P=\frac{P.Q}{60}$ =Constant

P=功率power[KW]

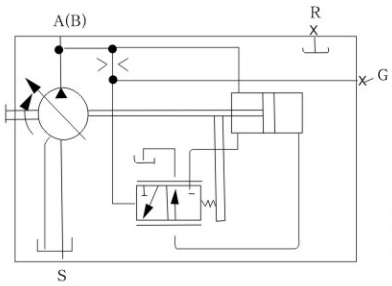
P=压力 pressure[MPa]

Q=流量 flow[1/min]

变量起点Commencement of control:min.5MPa

通过油口G的并联可实现总功率变量

Summation HP control possible by throttles via port G.

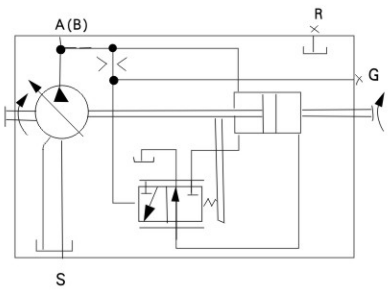


LV恒功率变量
Constant HP control LV

行程限位器 Stroke Limiter:

通过机械行程限位器可无级的改变或限制最大排量，调节范围从V_{gmax}到V_{gmin}.

By means of a mechanical or hydraulic stroke limiter,the max .displacement can be infinitely varied or limited. Adjustment range from V_{gmax} to V_{gmin}.



LV 带机械行程限位的恒功率变量
Constant Hp control LV with mechanical stroke limiter

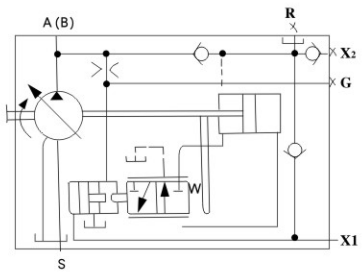
规格 Size	40	55
螺杆转数 Spindle Revolutions	21	21
所需扭矩 Required Torque（approx.）Ncm	140	140

液压行程限位器需要不小于工作压力10%的先导压力（X1油口）。油口X1的最高允压力=20MPa（对所有规格）如果需要限制工作压力<5MPa时的流量，则需在油口X2施加不低于5MPa的供油压力（油口X1压力为5.10%=0.5MPa）.

A Pilot pressure （port X1）of at least 10% of the operating pressure is required for the hydraulic stroke limiter Max. permissible pressure at port X1=20MPa（for all sizes）

if it is required to limit the flow at an operating pressure <5MPa then a boost pressure of min 5MPa must be applied at port X2（at port X1 then,min10%=0.5MPa

LV带液压行程限位的恒功率变量Constant HP control LV with hy draulic stroke limiter



辅助元件:压力切断Auxiliary Equipment: Pressure Cut-off

适用于V_{gmin}=0的所有规格。

压力切断是叠加在恒率控制的恒压控制，它借助于顺序阀，当达到设定的最高压力时（调节范围到31.5MPa），该阀打开，流量自动减小至Q=0。顺序阀与泵分开安装，可装于任何适当位置（遥控）的底板上。其连接管长（单管）不得大于5m，顺序阀与底板需要独订货。

当采用带压力切断的恒功率变量时，泵变量时间将比恒压变量泵DR的长3倍。

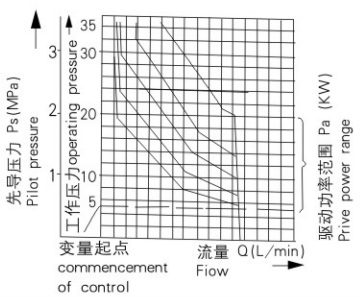
注意：顺序阀油口T和先导回油口T1必须直接通回油箱。

在零位连接工作见DR恒压变量。

LV 的Q-P特性曲线 Characteristics

不带压力切断

Without Pressure Cut-off



带压力切断
with Pressure Cut-Off
驱动功率范围Pa（KW）

A7V变量泵 Variable Displacement Pump A7V

For all sizes with Vgmin=0

The pressure cut-off is a constant pressure control superposed on the constant HP control and is carried out by means of a sequence valve, when the set,maximum pressure is reached（adjustment range up to 315MPa）,the valve opens the flow is automatically reduced （to Q=0）。

The sequence valve is mounted separately from the pump in any suitable location one subplatc（remote control）。

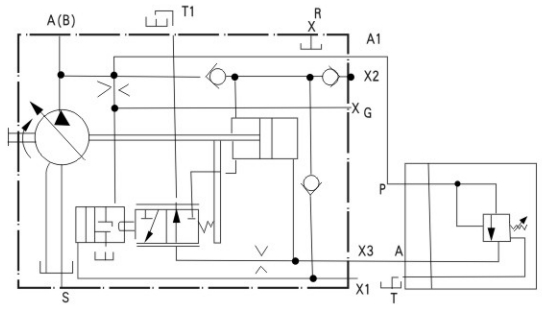
The max./single pipe length must not exceed 5 m.order sequence valve and subplate separately.

When using the constant HP control with pressure cut-off ,the pump control times ,will be approxmately 3 times longer than those obtained wih the constant pressure control DR.

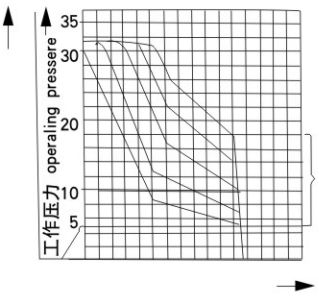
Important:Port T form the sequence valve and pilot oil return line T1 must be piped direct to tank （cooler）.Continuous operation in zero position see constant pressure control DR.

LV带压力切断（遥控）和液压行程限位的恒功率变量

ConstantHP control LV with pressure cutoff（remote controlled）and hydraulic stroke limiter



接口connections
A.B工作油口service lines
S吸油口suction-line
G总功率控制油口port for summation HP control line
X1先导压力口pilot pressure
X2遥控口remote contr pressure
A1、X3遥控阀油口ports for remote control valve
T1先导回油口pilot oil return
R排气口air bleed



规格Size		40	55
转速Speed	n_o r/min	1450	1450
最大流量 Max.Flow Q at no	L/min	57	77
驱动率范围不带压力切断	P_{omin}	5.5	7.5
Drive without pressure	P_{omax}	18.5	30
cut-off power 带压力切断 range	P_{omin}	5.5	–
P、(KW) with pressure cut-off	P_{omax}	18.5	–

当转速为n时换算如下 Conversion to speeds n（rpm）other than n.

驱动功率 Drive power $P=P_o \frac{n}{no}$

1）以容积效率97%算出。

Calculated with a volumetric efficiency of 97%

DR 恒压变量

恒压变量在其变量范围内保持系统压力恒定不受泵流量变化的影响，变量泵仅供应工作必须的油液体积。如果压力超过设定值，则泵自动摆回小角度。

所需压力可直接在泵上设定（阀内装，标准型），也可在用于带遥控型单独的顺序阀上设定。设定范围 5-35MPa。

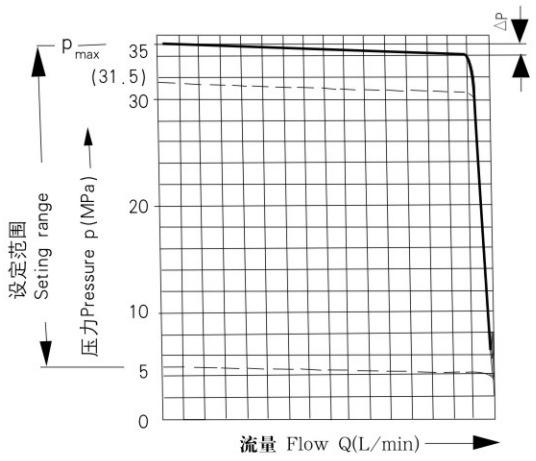
摇控的设定范转 5-35MPa。

Constant Pressure Control

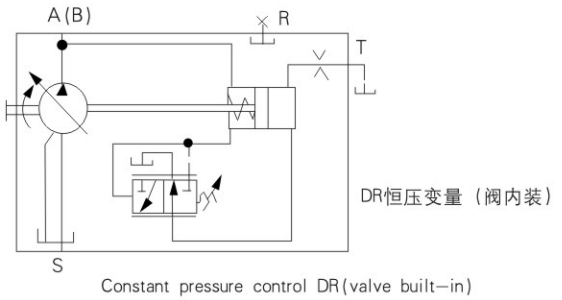
The constant pressure control maintains the pressure in a hydraulic system constant within its control range in spite of changing pump flow requirements. The variable pump supplies only the volume of fluid required by the services. Should operating pressure exceed the set pressure,the pump is automatically swivelled back to a smaller angle. The required pressure is set either direct at the pump(valve built in standard model)or at the separate sequence valve for the model with remote control

Setting from 5 to 35MPa.

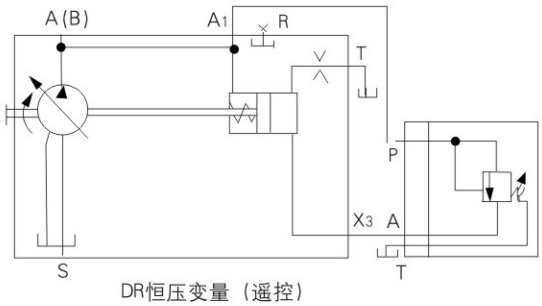
Setting range for remote control 5 to 31.5MPa.



规格 Size	40、50
△P Max（MPa）	1



Constant pressure control DR(valve built–in)



DR恒压变量（遥控）

Constant pressure control DR(remote controlled)

注：

顺序阀和底板须单独定货。

最大遥控管单根长度不超过5m。

顺序阀油口T须单独接回油箱。

装于系统中用于压力保护的安全阀，其压力设定必须比恒压变量的压力设定值高2MPa.

Note:

Order sequence valve subplate separately .The max.single pipe length should not exceed 5m.port T form the sequence valve must be piped separately to tank.A pressure relief valve installed in the system for protection of the max.pressure must be set 2MPa above the setting of the constant pressure control.

调节时间 Adjustment times

规格Size	40
$V_{gmin}–V_{gmax}$ $te_{(S)}$	0.2
卸压35–5MPa Pressure unloading	
$V_{gmin}–V_{gmax}$ $ta_{(S)}$	0.04
升压5–35MPa Pressure built–up	

对于遥控，表中数值增大3倍。

The values in the table are increased by 3 times for re–mote control.

并联工作Parallel Operation

几台A7V恒压变量泵并联工作时，其恒压曲线较徒。在订货时请注明“并联工作”。

并联工作时每台泵需要各自的顺序阀。

For parallel operation of several A7V pumps with constant pressure control . a steeper curve is used for the constant pressure control.

please indicate this requirement in text after the type code when order in (“parallel operation”) .

For parallel peration each individual pump requires its own sequence valve.

行程限位

借助于机械行程限位器可把最大排量无级地限制在V_{gmax}与 V_{gmin}之间，详见LV变量。

Stroke Limiter

The max. displacement can be steplessly limited between V_{gmax} to V_{gmin} by means of a mechanical stroke limiter.

For details see control device LV.

在零位连接续工作

不带体冲洗的零行程工作

Continuous Operation in Zero position

Zero stroke operation without flushing of housing.

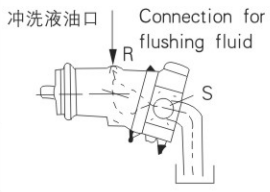
短期short periods <10min (~50%ED)		长期 long periods	
最高允许压力 max.perm pressure P_{max} (Mpa)	最高允许温度 max.perm tank temper–ature t_{max} (℃)	最高允许压力 max.perm pressure P_{max} (Mpa)	最高允许温度 max.perm tank temper–ature t_{max} (℃)
31.5	50	20	50

带壳体冲洗的零行程工作

Zero stroke operation with flushing of housing

长期 long periods

最高允许压力 max.perm perssure p_{max} (Mpa)	最高允许温度 max.perm tank temper ature t_{max} (℃)
31.5	50



冲洗流量Flushing flow

规格Size	40
流量 flow Qsp 1/min	4

冲洗液温度 ≤ 油箱温度

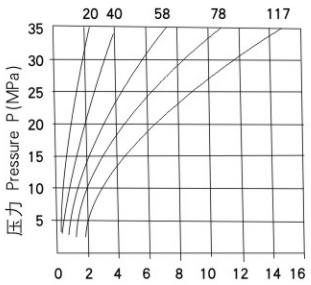
注：当所A7V泵装于油箱顶部在Pmax为 31.5MPa下长时间零行程工作时，必须提供≥上表对应规格的冲洗流量对壳体冲洗。

Temperature of flushing fluid≤tank temperature

Note:When mounting the A7V on top of tank and at zero stroke operation for longer periods of time at pressures up to

P_{max} 31.5MPa a minimum flow≥ corresponding to flushing flow as indicated for each size in the above table must be set instead of case flushing.

零行程时的功率 Power at Zero Stroke



规格Size
在转速n=1450r/min油温
t=50℃时的典型曲线
Typical values at speed
n=1450 rpm
fluid temperature=50℃
零行程时的功率（KW）
Power at zero stroke（KW）

EP电控比例变量

电控比例变量可以无级地按程序控制泵的排量。泵排量与电磁铁吸力成正比，即与电磁铁的电流成正比。变量活塞上的控制力由比例电磁铁产生。比例电磁铁需要一个电流为300~630mA（600~1260mA）的24V（12V），直流电源。

变量起点约在300 mA（600mA）变量终点约在630m A（1260mA）调节从V_{gmin}至V_{gmax}，如果需要反向控制（V_{gmax}至V_{gmin}）请询问我厂。

如果泵在零位启动或工作压力<4MPa，则油口G须接入4MPa的先导压力。

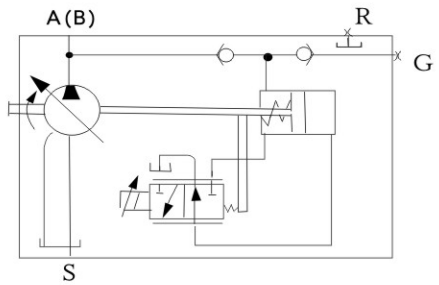
Electric Proportional control

The electric control permits stepless and programmable adjustment of the solenoid force i.e.the strength of solenoid current.The control force on the control piston is generated by a proportional solenoid .

The proportional solenoid need a 24V （12V）DC power supply that the current is 300–630mA （ 600–1260mA.）commen cement of control at approx.300mA （600mA.）

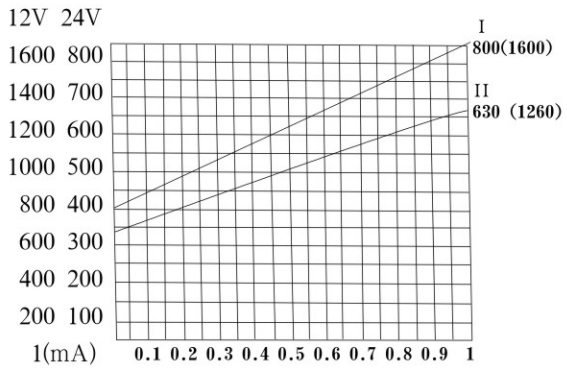
End of control at approx.630 mA（1260mA）. Adjustment is from V_{gmin} to V_{gmax} . please consult us if control in the opposite direction（V_{gmax} to V_{gmin}）is required.

if the pump is to be moved out of the zero position（V_g=0）or if the operating pressure<4MPa,a pilot pressure of 4MPa is necessary at port G.



EP电控比例变量 Electric pro.Control

EP 电控比例变量 Electric pro.Control



变量起点在 Commencement of control at V_{gmin} $\frac{V_g}{V_{gmax}}$

注：

曲线I适用于V_{gmax}≥250ml/r；曲线II适用于V_{gmax}<250ml/r.

Line I adapts for V_{gmax}≥250ml/r,Line II adapts for V_{gmax}<250ml/r.

调节时间Adjustment Times

规格Size	40
	55
$V_{gmin}-V_{gmax}$ T_{min} ※(s)	0.2
$V_{gmax}-V_{gmin}$ T_{min} ※(s)	0.16

※所示值仅适用于工作压力P_b=20MPa时。

※The values shown are valid for operating pressure P_b=20MPa.

滞环

由于电气/液压控制（对于V_{gmin}至V_{gmax}的整个调节范围内），在控制中约有2.5~4%的滞环。

当从同一方向启动时泵位置的重复精度约为2~4%。

Hysteresis

A hysteresis of ± 2.5 to 4%（approx.）is present in the control because of the electric/hydraulic control （referred to the complete adjustment ,range V_{gmin} to V_{gmax}.）The repeatability of the pump position ,when starting from the same direction,is around 2~4%.

注：

只有当使用矿物油箱内最高油温不大于80℃时才能把EP变量泵装在油箱内。（如果把泵浸在油中，请在订货时说明）。

Note:

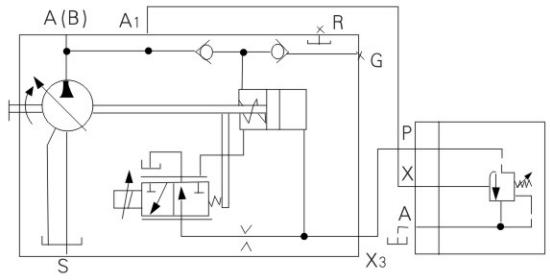
Mounting of the pump with EP.con–trol inside the oil tank is possible.only when using mineral hydraulic oils and with a max.oil temperature in the tank of 80 C.if the pump is to be submersed in oil ,please indi cate in clear text when ordering）.Auxiliary Equipment :Pressure Cut–Off

辅助元件：压力切断

用于V_{gmin}=0的所有规格。说明见HD变量。顺序阀和底板需单独订货。

For all sizes with V_{gmin}=0.

For description see control device HD.Order sequence valve and subplate separately



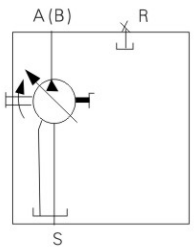
Ep带压力切断的电控比例变量	Electric Pro.Control with pressure cut-off
接口	Connections
A. B工作油口	Service lines
S. 吸油口	suction line
G.遥控压力口	remote control pressure
R.排气口	air bleed
A_1，X_3，遥控阀油口	ports for remote control valve

MA手动变量

通过转动手轮借助于螺杆使变量活塞沿轴向运动，并经拨销使配油盘沿其滑动面运动，从而使泵在V_{gmax}范围内无级地改变其排量。

Manual Control

By turning the handwheel ,a piston is moved in an axial direction by means of a threaded spindle.A carrier pin moves the control lens on its sliding plane ,thus permitting stepless variation of the pump displacement in the range V_{gmin} to V_{gmax}.The pump position indicator is located in the handwheel.



接口 Connections

A，B	工作油口	service lines
S	吸油口	suction line
R	排气口	air bleed

MA手动变量 Manual Control

HD液控变量

液控变量可按先导压力无级地调节泵的排量，调节量与油口X1的先导压力成正比。

当用HD作2位变量时（V_{gmin}至V_{gmax}），X1口的先导压力不得超过4MPa 调节从V_{gmin} 至V_{gmax}.

在整个变量范围 内（min-max）先导压力升高1MPa

变量起点的设定范围为0.4-1.5MPa。所需的控制油从高压回路取得，要求的最低工作压力为4MPa 。若低于此值，需在油口X2通入4MPa的先导压力。

先导口X1处的供油量约为0.5L/min。

Hydraulic Control ,Pressure Related

The hydraulic control .pressure related,permits the stepless adjustment of the pump displacement in relation to pilot pressure Adjustment is proportional to the pilot pressure at port X1.When using the Hd control ax 2-position control（V_{gmin} to V_{gmax}）.the pilot oil pressure on port X1 must not exceed 4MPa.Adjustment is from V_{gmin} to V_{gmax}.The increase in pilot pressure over the complete adjustment range(min-max)is 1MPa. The setting range for commencement of control is between 0.4 and 1.5MPa.The necessary control oil is taken from the high pressure circuit ,and a minmum operating pressure of 4MPa is required.If necessary apply pilot pressure of 4MPa at port X2.

The oil flow at pilot X1 is approx 0.5L/min.

附加功能：压力切断

用于V_{gmin}=0的所有规格。

压力切断用来把流量限制成高压的函数，以便不超过设定的工作压力。此功能由顺序阀实现。

达到设定的最高压力（调节范围达31.5MPa）时，该阀打开，流量自动减小（到Q=0）。

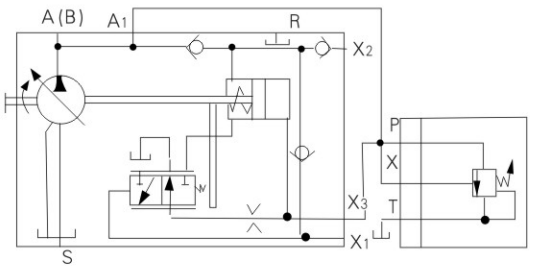
顺序阀离泵单独安装，借助于底板可装于任何适当的位置（遥控）。最大单管长度不大于5m.顺序阀与底板须单独订货。

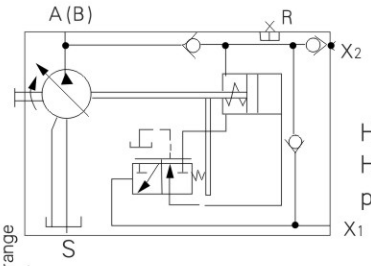
Additional Function:Pressure cut-Off

For all sizes with V_{gmin}=0.

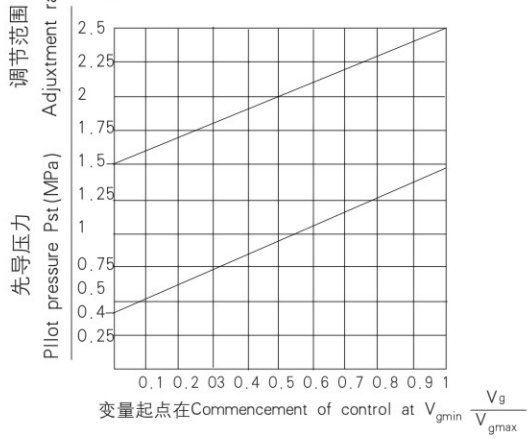
The pressure cut-off serves to limit the flow as a function of the high pressure so that a predetermined operating pressure is not exceeded.This function is carried out by a sequence valve.On reaching the set maximum pressure（adjustment range up to 31.5MPa）,the valve opens and the flow is automati-cally reduced（to Q =0）.

The sequence valve is mounted separately from the pump in any suitable location by means of a subplate （remote control）.The max,Single pipe length should not exceed 5m. Order sequence valve and subplate separately.





HD液控变量
Hydraulic control, pressure related, HD



HD带压力切断的液控变量

注意：顺序阀油口T 必须单独通油箱

在零位连续工作：详见DR恒压变量。

Hydraulic Control,pressure related，HD with pressure cut-off

Important:port T from the sequence valve must be piped separately to tank.

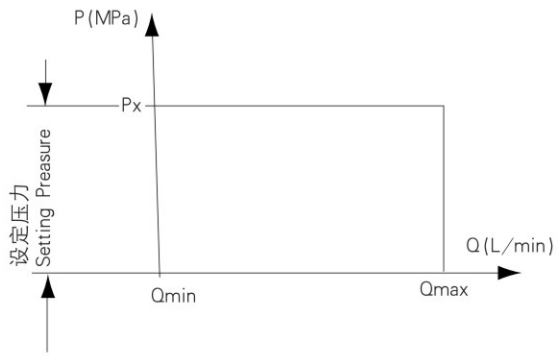
Continuous Operations is Zero position

For details see constant pressure control DR.

接口	Connections
A，B工作油口	service lines
S.吸油口	suction line
X_1先导压力油口	pilot pressure
X_2遥控压力油口	remote control pressure
A_1，X_3，遥控阀油口	ports for remote control valve
R.排气口	air bleed

SC刹车变量

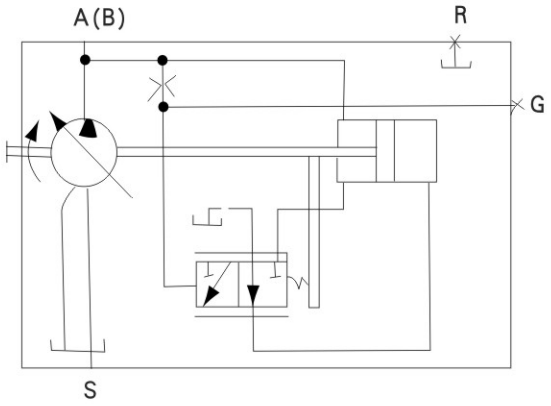
用于刹车系统，当系统压力达到一定值后（P_x≥4MPa），立刻使泵达到大摆角，即大流量，大扭矩。



SC的P—Q特性曲线Characteristics

Brake Control

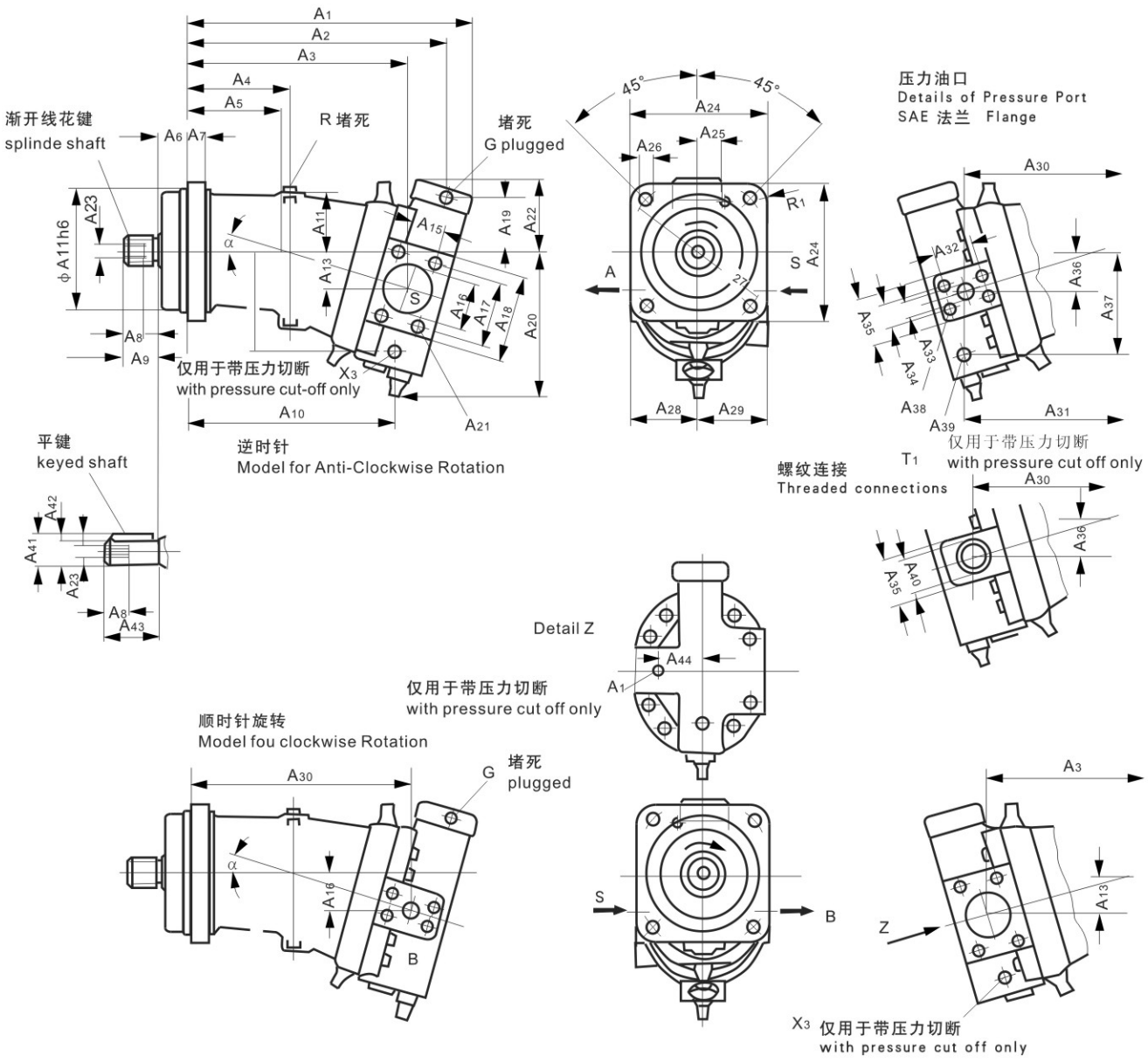
When operating pressure goes up to the setting pressure (≥4MPa), the flow is max, and the torque is max.



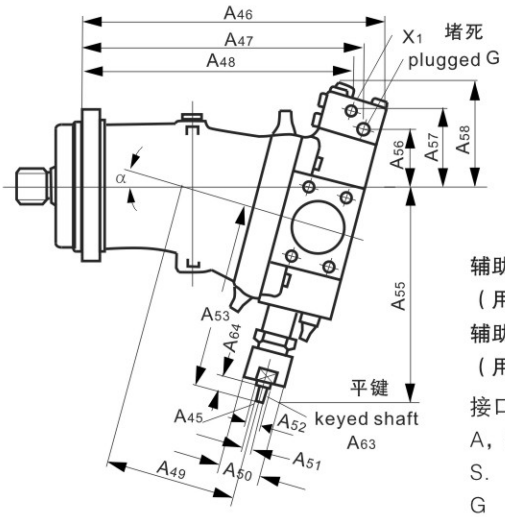
SC刹车变量
Brake control, SC

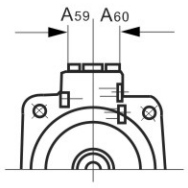
元件尺寸 Unit dimensions规格Size 40、55

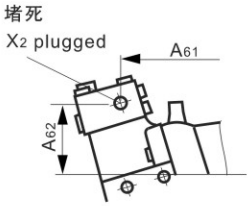
LV：恒功率控制 Constant HP Control



A7V变量泵 Variable Displacement Pump A7V







辅助元件：液压行程限位（用于LV）
辅助无件：机械行程限位（用于LV和DR）

Auxiliary equipment:hydraulic stroke limiter (for LV)
Auxiliary equipment:mechanical stroke limiter (for LV–and DR)

接口		Connections
A，B	工作油口	service lines
S.	吸油口	suction line
G	遥控压力口（总功率控制油口）	remote control pressure M14 × 1.5 (connection for summation HP control)
X_1	先导压力油口	pilot pressure M14 × 1.5
X_2	遥控压力口（HD）	remote control pressure(HD)M14 × 1.5
A_1,X_3	遥控阀油口	ports for remote control valve
T	先导油回油口	pilot oil return line M12 × 1.5
T_1	先导油回油口	pilot oil return line
R.	排气口	air bleed

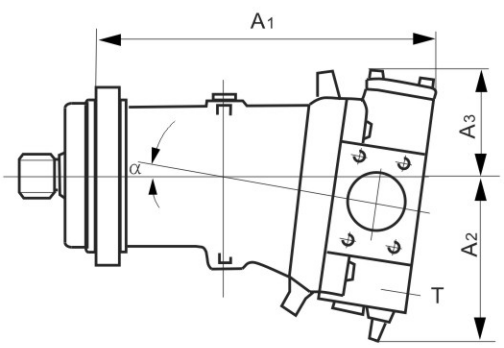
规格																						深						
Size	a	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}	A_{13}	A_{14}	A_{15}	A_{16}	A_{17}	A_{18}	A_{19}	A_{20}	A_{21}	deep	A_{22}	A_{23}	A_{24}	A_{25}	A_{26}	A_{27}
40	9	317	287	255	123	108	32	20	28	35	244	125	95	23	63	42.9	50	77.8	102	87	166	M12	20	109	M12	150	29	13.5	160
55	16	327	296	251	123	108	32	20	28	35	–	125	–	41	63	42.9	50	77.8	102	64	182	M12	20	91	M12	150	29	13.5	160

规格												深	(T1)									深						
Size	A_{28}	A_{29}	A_{30}	A_{31}	A_{32}	A_{33}	A_{34}	A_{35}	A_{36}	A_{37}	A_{38}	deep	A_{39}	A_{40}	A_{41}	A_{42}	A_{43}	A_{44}	A_{45}	deep	A_{46}	A_{47}	A_{48}	A_{49}	A_{50}	A_{51}	A_{52}
40	71	81	253	261	50.8	19	23.8	53	23	98	M10	17	M18 × 1.5	M33 × 2	32.9	30	60	40	M4	10	323	290	279	134	–	11.2	10
55	71	81	249	–	50.8	19	23.8	53	40	–	M10	17	–	M33 × 2	32.9	30	60	40	M4	10	337	299	292	134	–	11.2	10

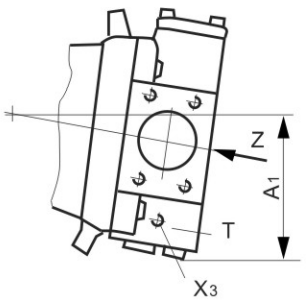
规格											平键 A63	平键	花键	花键		油口	油口	重量
											Keyed	Keyed	Splined	Splined		Connection	Connection	Weight
Size	A_{53}	A_{54}	A_{55}	A_{56}	A_{57}	A_{58}	A_{59}	A_{60}	A_{61}	A_{62}	GB1096–79	GB1096–79	DIN5180	GB3478.1–83	R_1	R	A_1X_3	kg
40	184	16	204	85	117	147	30	30	276	104	键3 × 10	键8 × 50	W30 × 2 × 14 × 9g	EXT14Z × 2m × 30R × 5f	12	M16 × 1.5	M12 × 1.5	28
55	184	16	215	62	98	128	30	30	288	83	键3 × 10	键8 × 50	W30 × 2 × 14 × 9g	EXT14Z × 2m × 30R × 5f	12	M18 × 1.5	M12 × 1.5	28

DR 恒压变量 Constant Pressure Control

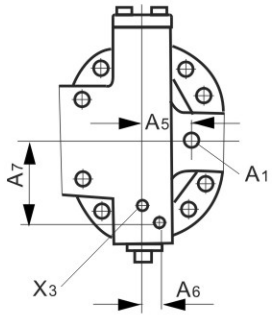
标准型 Standard Model



遥控Remote Control



Z向Detail z

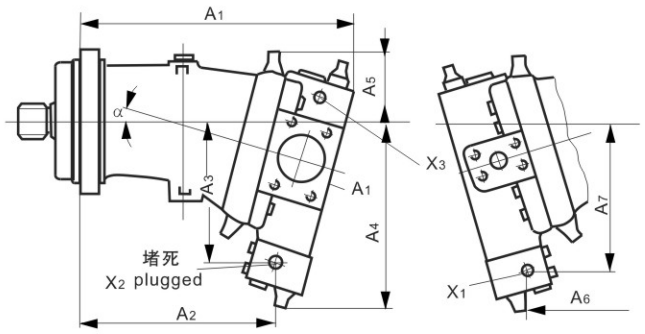


A7V变量泵 Variable Displacement Pump A7V

规格								
Size	a	A_1	A_2	A_3	A_4	A_5	A_6	A_7
40	9°	315	166	107	127	40	14	53

A1和X3仅用于遥控A1 and X3 only for remote control
其余尺寸见LV.Other dimensions see LV.
T1：M12×1.5

HD 液控变量 Hydraulic Control,Pressure Related



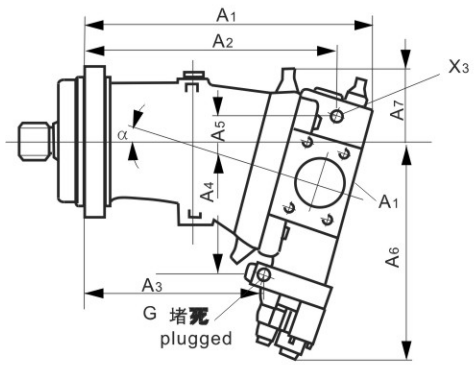
规格								
Size	a	A_1	A_2	A_3	A_4	A_5	A_6	A_7
40	9°	312	236	151	206	110	233	166
55	16°	318	217	166	220	84	212	180

其余尺寸见LV Other dimensions see LV.

A_1和X_3仅用于带压力切断A_1 and X_3 with pressure cut-off only

EP 电控比例变量 electric Proportional Control

标准型 Standard Model



规格								
Size	a	A_1	A_2	A_3	A_4	A_5	A_6	A_7
40	9°	312	267	201	130	49	234	110
55	16°	318	217	184	140	29	249	84

其余尺寸见LV Other dimensions see LV.

A_1和X_3仅用于带压力切断A_1 and X_3 with pressure cut-off only

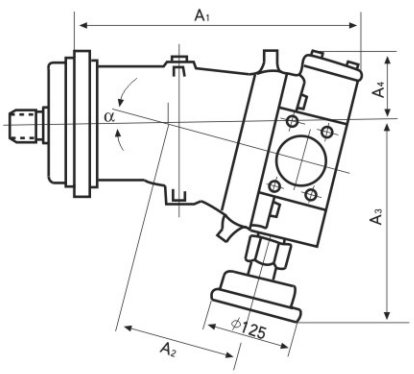
MA 手动变量 Manual Control

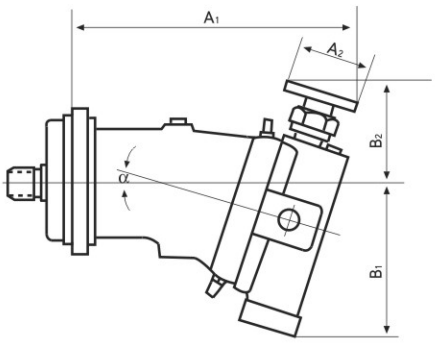
手动朝下 handwheel downwards

规格Size	a	A_1	A_2	A_3	A_4
40	9°	315	134	197	108
55	16°	323	134	215	89

手动朝上 handwheel upwards

规格Size	a	A_1	A_2	B_1	B_2
40	9°	317	100	175	132.5





注：手轮朝上或朝下，订货时请说明。
Please give clear indication of the handwheels are upwards or downwards,when you order goods!