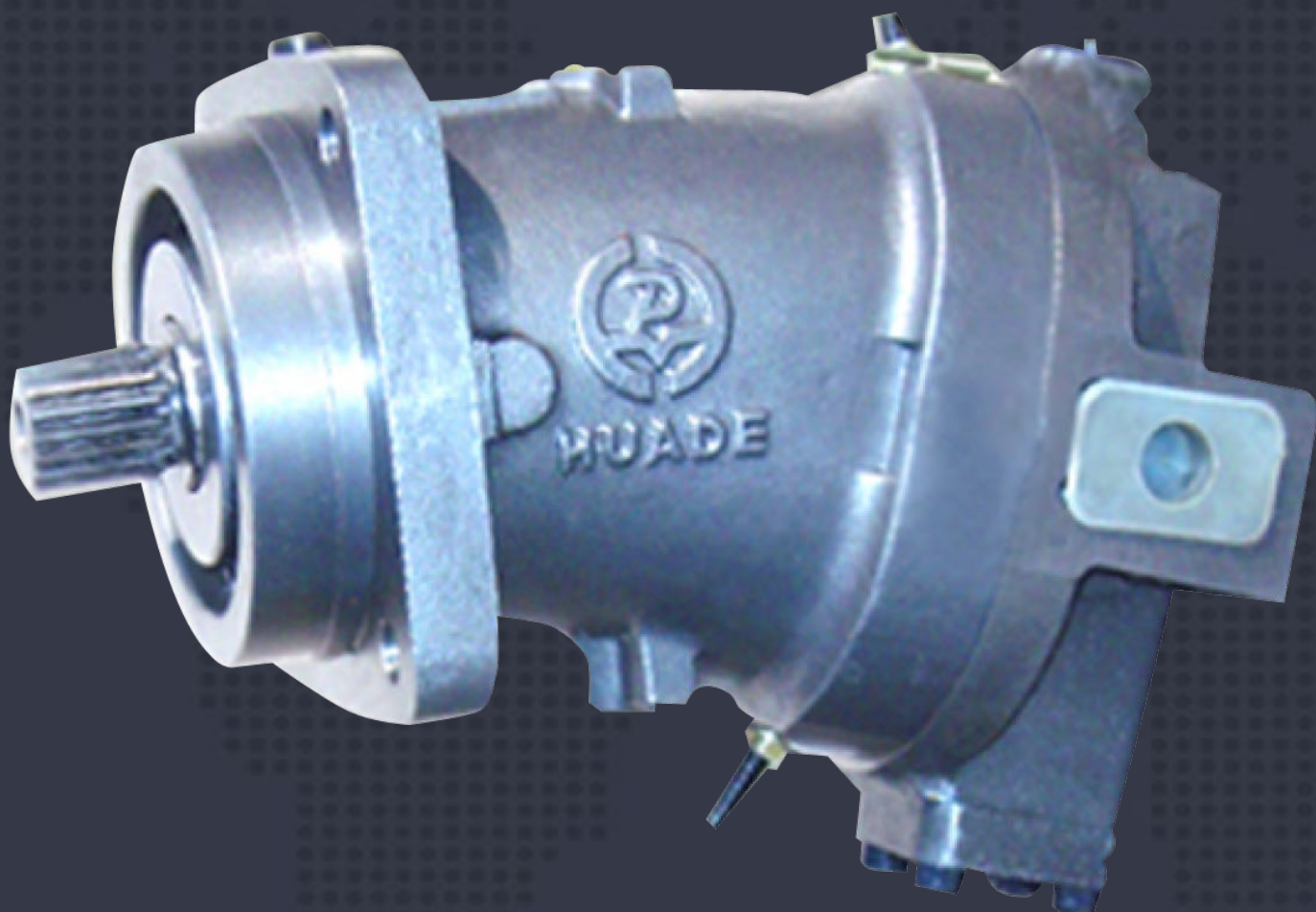


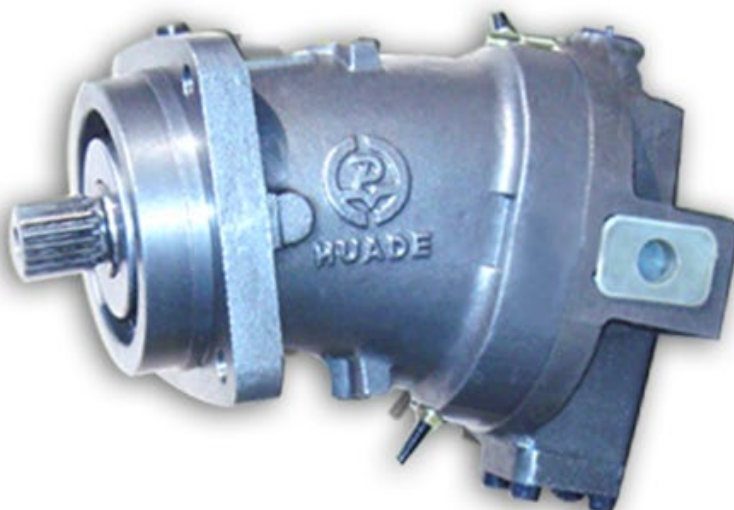


Catálogo de Productos



Variable Displacement Motor - A6VG

北京华德液压工业 集团有限责任公司 BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	A6VG 变量马达 Variable Displacement Motor A6VG		RC91010/12.2004
	用于开式和闭式回路 For open and closed circuits	斜轴式轴向柱塞结构 axial tapered piston, bent axis design	
	规格 Size 107-125	高压范围 Peak pressure 至 up to 40MPa	替代: Replace



说明:

弯轴结构的轴向柱塞变量马达，可用于开式和闭式液压传动回路。

这种马达适合于行走机械及工业中应用。

控制范围宽的变量马达能满足高转速和大扭矩的要求。

流量在 $V_{gmax}/V_{gmin}=4.85$ 范围内无级可调，最大排量达 125ml/r。

输出转速与流量成正比而与排量成反比。输出扭矩随马达上高低压侧压降的加大而增大，并随排量的增大而加大。

特点:

- 用于液压驱动的宽控制范围
- 多种多样的控制及调节装置
- 由于省去齿轮箱并可用较小的泵而节省费用
- 紧凑的、牢固的长寿命轴承系统
- 与原型产品相比，轴向尺寸缩短了
- 最大、最小摆角均为可调式设计
- 单位功率小
- 良好的启动特性
- 惯量小

剖视图: Section

摆角限位调节螺钉 (带护罩)
Adjustment Screw for Swivel Angle Limitation
(with protective cap)

缸体
Cylinder

后盖
End Plate

配油盘
Control Lens

控制起点调节螺钉
Setting Screw for start of control

变量活塞
Positioning Piston

Description

Variable displacement motor with axial piston rotary group of bent axis design, for hydrostatic drives in open and closed circuits.

The motor is suitable for both mobile and industrial applications.

The wide control range of the variable displacement motor allows it to meet the requirements of high speed and high torque.

The flow is infinitely variable in the range $V_{gmax}/V_{gmin}=4.85$, the max. displacement is 125ml/r.

Output speed is proportional to flow and inversely proportional to displacement. The output torque increases with the pressure drop between the high and low pressure sides and with increasing displacement.

Special Features:

Wide control range for hydrostatic drives

Various control and regulating devices

Cost saving through elimination of gearbox and possibility of using smaller motors

Compact, robust bearing system with long service life

20%. Comparing with antetype product, the measure of axes' direction has shortened 20%

The max. and the min. displacement are variable design

Low unit power

Good starting characteristics

Low inertia

A6VG 变量马达 Variable Displacement Motor

型号 Type Code

		A6V	G	107	HA1	6	F	Z	2	21.8			
马达型号 Motor Type											最小排量设定值 Min.Swept Volume Setting		
变量马达 Variable displacement motor		A6V									例: Example: $V_{\text{min}}=21.8\text{ml/r}$		
改进型 Ameliorate		G											
规格 Size											装配型式 Assembly Type		
21.8-107ml/r		107									解释见变量说明及元件尺寸 For explanation see description of control device and unit dimensions		
21.8-125ml/r		125											
变量方式 Control Device											轴伸 Shaft End		
高压自动变量	恒压	Constant pressure									平键 GB 1096-79	Keyed parallel shaft	P
Automatic control, high pressure related	不带超调	Without override									花键 DIN 5480	Splined shaft	Z
	带超调	With override									花键 GB 3478.1-83	Splined shaft	S
	升压	Pressure increase $\Delta p=10\text{MPa}$											
	不带超调	Without override											
	带超调	With override											
液控变量	控制压差	$\Delta p=1\text{MPa}$											
Hydraulic control, high pressure related		Pilot pressure Increase											
	控制压差	$\Delta p=2.5\text{MPa}$											
		Pilot pressure Increase											
	控制压差	$\Delta p=1\text{MPa}$											
		Pilot pressure Increase											
手动变量		Manual control (with handwheel)											

订货示例: A6VG.107HA1.6.F.Z.2.21.8
斜轴变量马达 A6VG, 规格 107, 液控变量, $\Delta p=1\text{MPa}$, 结构 2, 侧面 SAE 法兰连接, 德标花键, 第 2 种装配型式, 最小排量 $V_{\text{min}}=21.8\text{ml/r}$

Ordering Example A6VG.107HA1.6.F.Z.2.21.8
Axial piston variable displacement motor A6VG, size 107, with hydraulic control, pilot pressure related, $\Delta p=1\text{MPa}$, series 2, SAE flange connections on side, splined shaft, assembly type 2, min.swept volume setting $V_{\text{min}}=21.8\text{ml/r}$

A6VG 变量马达 Variable Displacement Motor

技术参数 Technical Data

工作压力范围: Operating Pressure Range

A 或 B 口压力: Pressure at port A or B

额定压力 Nominal pressure $p_n=35\text{MPa}$

最高压力 Peak pressure $p_{\max}=40\text{MPa}$

A、B 油口压力总和不得超过 63MPa, 每侧油口压力最高 40MPa。

The sum of the pressures at ports A and B should not exceed 63MPa. (Individual pressure at either port max. 40MPa)

泄油压力: Leakage oil Pressure:

允许 T 口最大泄油压力

Maximum permissible leakage oil pressure(at Port T)

$P_{\text{ole}}=0.2\text{MPa}$

油温范围: Fluid Temperature Range

$t_{\min}=-25^{\circ}\text{C}$

$t_{\max}=+80^{\circ}\text{C}$

粘度范围: Viscosity Range:

$v_{\min}=10\text{mm}^2/\text{s}$

$v_{\max}$ (短时)(for short periods) $1000\text{mm}^2/\text{s}$

最佳工作粘度: Optimum Operating Viscosity:

$v_{\text{opt}}=16\sim 25\text{mm}^2/\text{s}$

油液选择: Fluid Recommendation

工作温度 推荐粘度等级符合 DIN51519

Operating Recommended Viscosity grade

temperature to DIN51519

range ISO (VG)

30-40°C VG22=22mm²/s at 40°C

40-50°C VG32=32mm²/s at 40°C

50-60°C VG46=46mm²/s at 40°C

60-70°C VG68=68mm²/s at 40°C

70-80°C VG100=100mm²/s at 40°C

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 可以延长使用寿命

(降低磨损)。

Filtration of Hydraulic Fluid

Recommended filtration 10 μm.

Coarser filtration of 25 to 40

μm is possible, however longer

service is achieved with fil-

tration of 10μm (reduced

wear).

转速范围:

最低转速没有限制, 在要求十分均

匀的转速时, $n_{\min}$ 不小于 50r/min

最高转速由来自泵的最大流量和变

量马达的最小排量确定。最小排量

则由一个调节螺钉限位, 所以变量

马达不会超速运转。

最高允许转速技术参数表

Speed Range

No limitation on minimum speed $n_{\min}$. Where

very even speeds are required. $n_{\min}$ should not

be less than 50r/min.

The maximum flow from the pump and the

minimum swept volume of the variable motor

together determine the maximum output speed.

The min swept volume is limited mechanically

by means of an adjustment screw so that the

max. permissible speeds (of the variable motor

and the driven unit) cannot be exceeded. See

date table for max. permissible speeds.

规格计算:

Calculation of size

流量 Swept Volume $Q = \frac{V_g \cdot n}{1000 \cdot \eta_v}$ [L/min]

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

输出扭矩 Output Torque $M = \frac{V_g \cdot \Delta p \cdot \eta_{mh}}{2\pi}$ [Nm]
 $= \frac{1.59 \times V_g \cdot \Delta p \cdot \eta_{mh}}{10}$

或 or $M = \frac{K_M \cdot \Delta p \cdot \eta_{mh}}{10}$ [Nm]

输出功率 Output Power $P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{M \cdot n}{9549}$ [KW]
 $= \frac{Q \cdot \Delta p}{60} \cdot \eta_i$

V_g = 最大排量 (ml/r)

M = 扭矩 (Nm)

Δp = 压差 (MPa)

n = 转速 (r/min)

η_v = 容积效率

η_{mh} = 机械效率

η_i = 总效率

max geometry displacement [ml/r]

torque [Nm]

differential pressure [MPa]

speed [r/min]

volumetric efficiency

mechanical-hydraulic efficiency

overall efficiency

技术参数表 Technical Data

规格	Size				
变量方式	Control Device		107	125	
HD1D 液控变量	Hydraulic control, pilot pressure related		•	•	
HA 高压自动变量	Automatic control, high pressure related		•	•	
MA 手动变量	Manual control		•	•	
排量	Displacement	$V_{g\max}$	ml/r	107	125
		$V_{g\min}$	ml/r	30.8	21.8
最大允许流量	Max. Permissible Swept volume	$Q_{g\max}$	L/min	342	400
最高转速	Max. speeds	$n_{\max}$ 在 at $V_{g\max}$	r/min	3200	3200
	(在 at $Q_{\max}$ 下)	$n_{\max}$ 在 at $V_g < V_{g\max}$	r/min	4200	4200
扭矩常数	Torque constants	M_x 在 at $V_{g\max}$	Nm/MPa	1.70	1.70
		M_x 在 at $V_{g\min}$	Nm/MPa	0.35	0.34
最大扭矩	Max. torque	$M_{\max}$ 在 at $V_{g\max}$	Nm	594	696
	(在 at $\Delta p=35\text{MPa}$)	$M_{\max}$ 在 at $V_{g\min}$	Nm	171	201
最大输出功率(在 35MPa 和 $Q_{\max}$ 下) Max. output	power(at 35MPa and $Q_{\max}$)		KW	187	199
惯性矩	Moment		kgm ²	0.0127	0.0127
重量 Weight			kg	46.5	46.5

HD 液压控制

与液控压力有关

与液控压力有关的液压控制方式允许马达的排量随液控压力信号无级变化。控制功能与作用在油口 x 上的液控压力成正比。

标准型

控制起点在 V_{gmax} (最大扭矩、最低转速)

控制起点在 V_{gmin} (最小扭矩、最高转速)

控制的设定

HD1

液控压力提高 $(V_{gmax} - V_{gmin}) \Delta Ps = 1MPa$

控制起点可调 0.2~2MPa 之间

标准设定值：控制起点为 0.3MPa (控制终点为 1.3MPa)

HD2

液控压力提高 $(V_{gmax} - V_{gmin}) \Delta Ps = 2.5MPa$

控制起点可调 0.5~5MPa 之间

标准设定值：控制起点为 1MPa (控制终点为 3.5MPa)

定货时，请用文字注明所需的控制起点。

例如：控制起点为 0.3MPa

HD Hydraulic Control.

Pilot Pressure Related

The pilot pressure related hydraulic control allows infinite variation of the motor displacement in relation to a pilot pressure signal. The control function is proportional to the pilot pressure applied at port X.

Standard model

Start of control at V_{gmax} (max. torque, min. speed)

Start of control at V_{gmin} (min. torque, max. speed)

Control setting

HD1

Pilot pressure increase $(V_{gmax} - V_{gmin}) \Delta Ps = 10MPa$

Start of control, setting range between 2 and 20MPa

Standard setting: start of control at 0.3MPa (end of control at 1.3MPa)

HD2

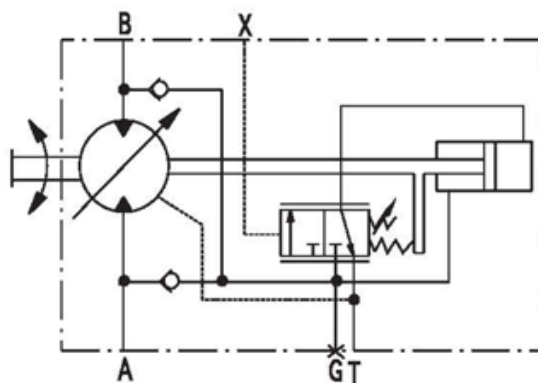
Pilot pressure increase $(V_{gmax} - V_{gmin}) \Delta Ps = 25MPa$

Start of control, setting range 0.5 and 5MPa

Standard setting: start of control at 1MPa (end of control at 3.5MPa)

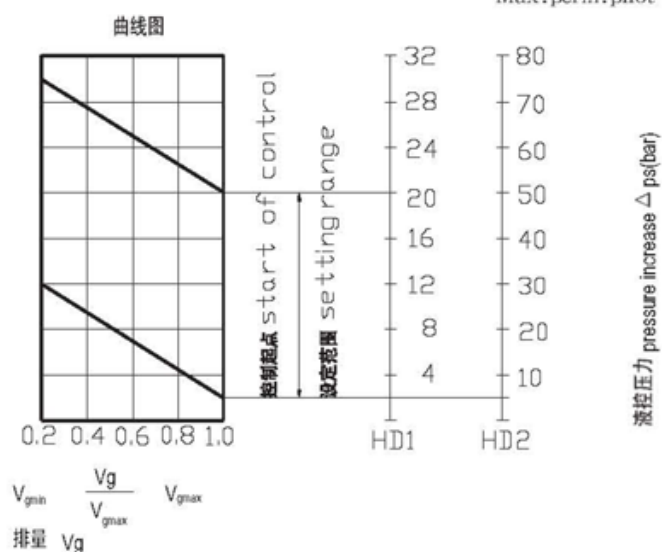
When ordering please state required start of control in clear text, e.g. start of control at 0.3MPa.

HD 液控变量 (HD1: HD2)



所需的控制油来自高压侧，因此，必需最低的工作压力为1.5MPa。
假如需要在工作压力<1.5MPa进行控制工作，需外加一台单向
阀，使作用在油口G上升压压力最低值为1.5MPa。
最高允许的液控压力 _____ 10MPa。

The required control oil is taken from the high pressure side, for this, a minimum operating pressure of 1.5MPa is necessary. If it is necessary to operate the control at an operating pressure of <1.5 MPa, a boost pressure of min.1.5MPa must be applied at port G via an external check valve.
Max.perm.pilot pressure _____ 10MPa.



HD1D 液控恒压变量

恒压控制是在 HD 功能基础上增加的。

如果系统压力由于负载扭矩缘故或由于马达摆角减小而升高，则达到恒压控制的设定值时，马达摆出到较大的摆角。

由于增大排量和减小压力，控制偏差消失。

通过增大排量，马达在恒压下产生较大扭矩。

通过在油口 G2 处施加一压力信号可得到第二个恒压设定压力。

(如起身和下降)，该信号须在 2~5MPa 之间。

恒压控制阀的设定范围为 8~40MPa。

标准型：按第二种装配型式供货。

控制起点在 V_{gmax} (最大扭矩、最低转速)

控制起点在 V_{gmin} (最小扭矩、最高转速)

HD1D: Constant pressure control

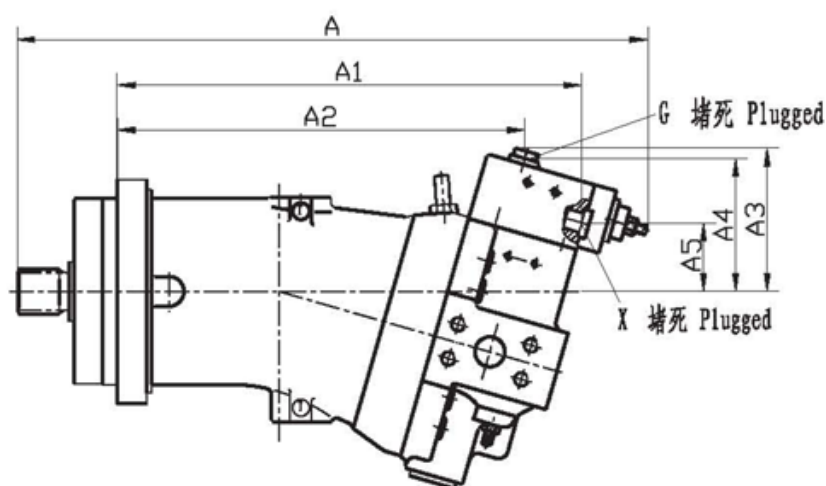
The constant pressure control is superimposed on the HD function. Should system pressure rise as a result of the load torque or reduction of the motor swivel angle, When the setting swivelled out to a higher angle.

As a result of the increased displacement and consequent pressure reduction, the control deviation is eliminated. By increasing the displacement the motor produces a higher torque at a constant pressure.

Throw a pressure signal at port G2 will receive the second constant setting pressure.

(for example rise and drop), the signal between 2 and 5MPa.

Setting range of constant pressure control valve: 8~40MPa



HA 高压自动变量

按工作压力自动控制马达排量

标准结构：按第一种装配型式供货

控制起点在 V_{gmin} (最小扭矩、最高转速)

控制终点在 V_{gmax} (最大扭矩、最低转速)

此种变量方式，当 A 或 B 口的内部工作压力达到设定值时，马达由最小排量 V_{gmin} 向最大排量 V_{gmax} 转变。

控制起点在 8 至 35MPa 间转变。

有两种方式供选用：

- 1.HA1——在控制范围内，工作压力保持恒定。 $\Delta P=1MPa$
从 V_{gmin} 变至 V_{gmax} 时，压力升高约为 1MPa。
- 2.HA2——在控制范围内，工作压力保持恒定。 $\Delta P=10MPa$
从 V_{gmin} 变至 V_{gmax} 时，压力升高约为 10MPa。

HA 变量可在 X 口进行外控（即带有超调），在这种情况下，变量机构的压力设定值（工作压力）按每 0.1MPa 先导（外控）压力下降 1.6MPa 的比率降低。

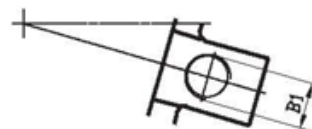
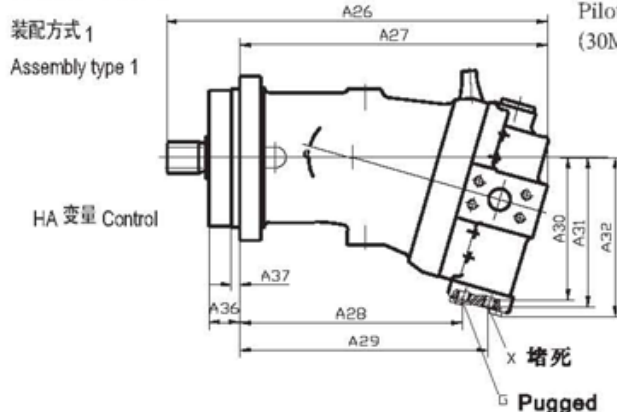
例如：

变量机构起始变量压力设定值为 30MPa

先导压力（X 口）：0MPa 时变量起点在 30MPa。

先导压力（X 口）：1MPa 时变量起点在 14MPa。

(30MPa-10 × 1.6MPa=14MPa)



带有超调的 HA 变量有两种方法供选用：

- 1.HA1H——在控制范围内，工作压力保持恒定， $\Delta P=1MPa$ 。
- 2.HA2H——在控制范围内，工作压力保持恒定， $\Delta P=10MPa$ 。

如果控制仅需要达到最大排量，则允许先导压力最高为 5MPa。

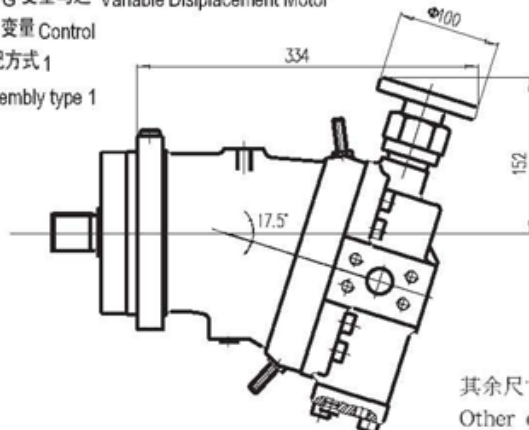
外控口 X 处的供油量：约 0.5L/min。

A6VG 变量马达 Variable Displacement Motor

MA 变量 Control

装配方式 1

Assembly type 1



其余尺寸见 HD/HA

Other dimensions see HD/HA

MA 手动变量

通过手轮驱动螺杆以调节马达的排量。装配型式：第一种装配型式

Automatic Control, High Pressure Related, HA

Automatic control of motor capacity dependent on operating pressure.

Assembly type 1

Start of control at V_{gmin} (min. torque, max speed)

End of control at V_{gmax} (max. torque, min speed)

This control device measures the internal operating pressure at port A or B (no pilot line required), and when the set operating pressure is reached, swivels the motor from min. 0 capacity (V_{gmin}) to max. capacity (V_{gmax}).

Start of control, is adjustable between 8MPa and 35MPa.

Two options are available:

- 1.HA1——Within the control range, the operating pressure is held practically constant. Pressure increase between

V_{gmin} and V_{gmax} is approx. 1MPa

- 2.HA2——Within the control range, with pressure increase $\Delta P=10MPa$ from V_{gmin} to V_{gmax} .

The HA control can be overridden at port X. In this case, set value of pressure at the regulator (operating pressure) is reduced 1.6MPa per 0.1MPa pilot pressure.

Example:

Regulator setting: 30MPa.

Pilot pressure (at X): 0MPa start of control at 30MPa

Pilot pressure (at X): 1MPa start of control at 14MPa

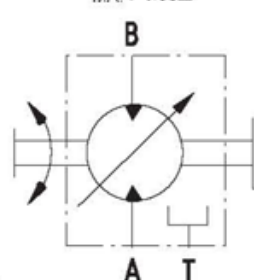
(30MPa-10 × 1.6MPa=14MPa)

Two options are available for HA control with override.

- 1.HA1H——Within the control range, the operating pressure is held, practically constant. $\Delta P=1MPa$
- 2.HA2H——Within the control range, the operating pressure is held, practically constant. $\Delta P=10MPa$

If override is only required to set max. capacity (swivelling the motor to V_{gmax}), a pilot pressure of up to 5MPa max is permissible. The max oil flow at pilot X is approx 0.5L/min

MA 手动变量



MA, Manual Control

Adjustment of motor capacity dependent on the position of a threaded spindle - hand operation.

Assembly design 1

ANNOTATIONS :

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CEP : 03162-020

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