

A4FO Series Piston Fixed Displacement Pump



PIONEER FLUID POWER

Product show and brief introduction



说明:

- A4FO型斜盘设计轴向柱塞变量泵是为开式回路静液传动系统设计的。
- 流量与输入转速成比例。

特点:

- 开槽控制的斜盘设计
- 良好的自吸特性
- 允许连续工作压力 25MPa
- 低噪声级
- 使用寿命长
- 驱动轴能吸收轴向和径向载荷
- 功率 / 重量比高
- 模块化设计
- 泵可以复合
- 通轴驱动
- 泵位置可选
- 安装位置可选
- 可在降低的工作参数下用 HFC 液工作

Description

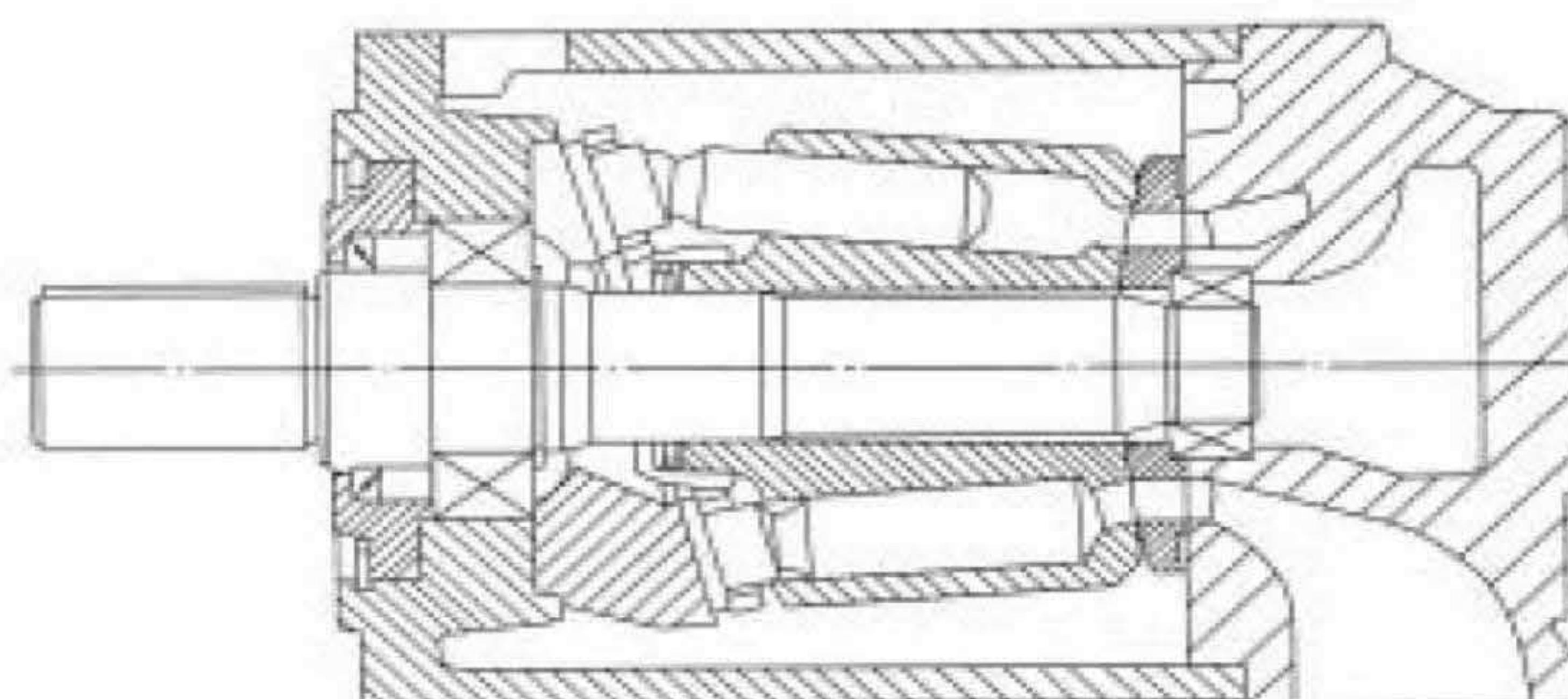
Fixed displacement pump A4FO is an axial piston pump of swash plate design for use in open circuits.
output flow is proportional to the drive speed.

Special Features

slot-controlled swashplate design.
good suction characteristics.
continuous pressure up to 25 MPa.
Low noise level.
Long service life.
drive shaft capable of absorbing axial and radial loads.
high power/weight ratio.
modular design.
tandem pumps possible.
through drive of 100% torque.
pump position optional.
operating on fire resistant fluids HFC under reduced operating parameters.

剖视图:

Section



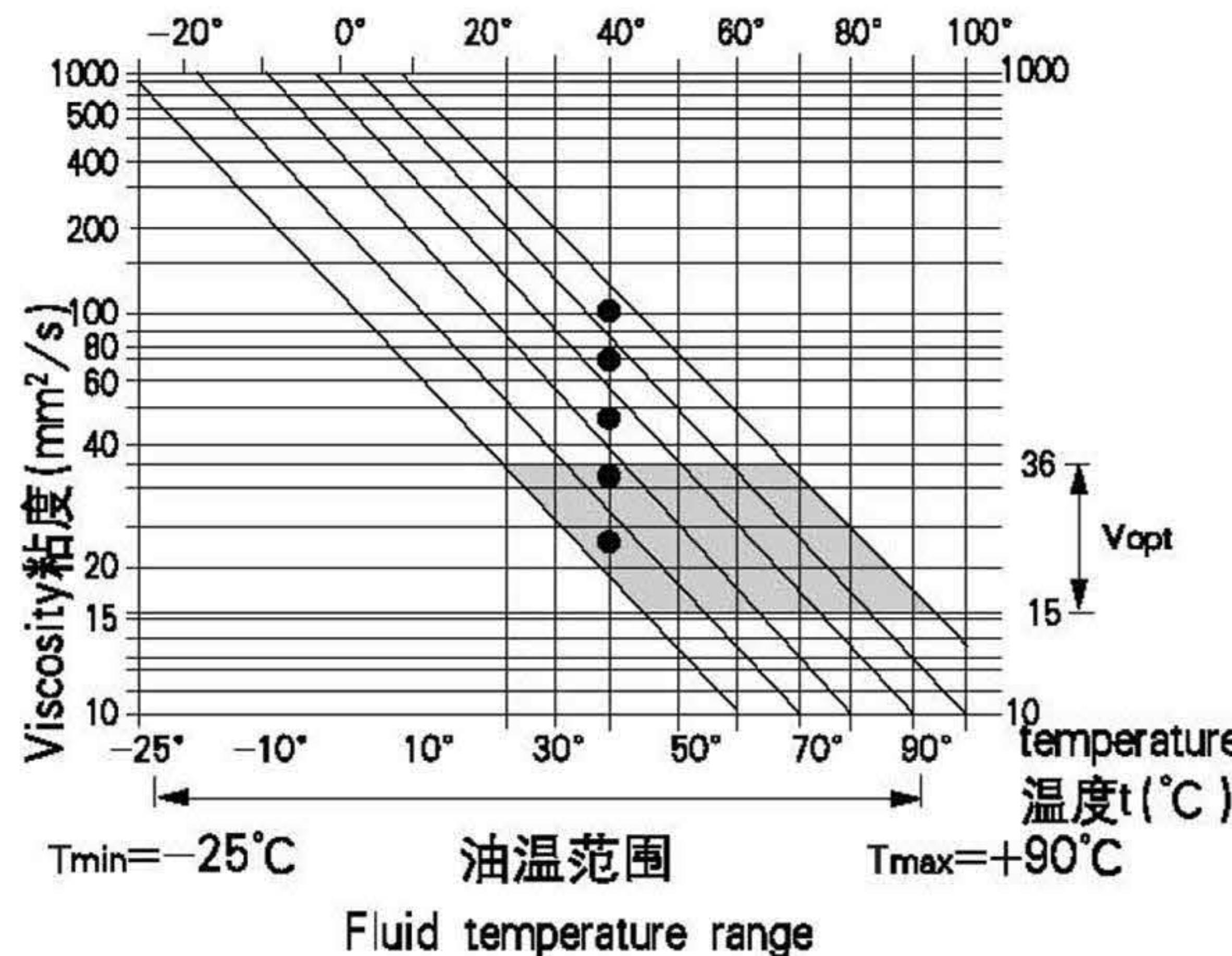
Model code

A4F	O	125	R	2	P	3	
轴向柱塞单元 Axial Piston Unit					后盖 Port plate		3
定量, 斜盘设计, 用于工业用途					轴伸 Shaft End		
Fixed Capacity Swashplate design for industrial applications					平键 Keyed shaft GB1096-79		P
工作方式 Type of operation					花键 Splined shaft DIN5480		Z
泵, 开式回路 Pump, open circuit					花键 Splined shaft GB3478.1-83		S
规格 Size					结构型式 Series		
排量 V _g (ml/r) displacement	40	71	125	180	250	500	结构 Series
							2
					旋轴方向 Direction of Rotation		
					从轴端看 viewed on drive shaft		
					顺时针 clockwise		R
					逆时针 anti-clockwise		L

液压油液	Hydraulic Fluid	V _{max} =1000mm ² /s 短时,	
工作粘度范围	Operating Viscosity Range	冷起动	for, short periods upon cold start.
为了得到最佳效率和工作 寿命, 我们推荐把工作粘 度在工作温度下选在以下 范围内	In order to obtain optimum efficiency and service life, we recommend that the operating viscosity(at operating temperature)be selected in the range	对液压油液选择的意见	comments of the Selection of the
		为了选择正确的油液, 必须	Hydraulic Fluid
		了解与环境温度有关的油箱	In order to select the correct fluid,
		内工作温度(开式回路)。液	it is necessary to know the oper-
		压油应该这样选择, 即在工	ating temperature in the tank (open
		作温度范围内, 工作粘度处	circuits)in relation to the ambient
		于最佳范围内(Vopt)(见选择	temperature, Hydraulic fluid should
		图的阴影部分)。我们建议在	be selected so that, within the
		每种情况下均选择较高的粘	operating temperature range, the
		度等级。	operating viscosity lies with in the optimum range(Vopt)(see shaded section of selection diagram). We recommend.

Technical Data

that the higher viscosity grade is selected in each case.
选择图 Selection Diagram



规格计算 Calculation of size

$$\text{输出流量 output flow } Q = \frac{V_g \cdot n \cdot \eta_v}{1000} \quad (\text{L/min})$$

$$\text{扭矩 Torque } M = \frac{1.59 \cdot V_g \cdot \Delta p}{10 \cdot \eta_{mh}} \quad (\text{Nm})$$

$$\text{功率 Power } P = \frac{M \cdot n}{9549} = \frac{Q \Delta p}{60 \cdot \eta_t} \quad (\text{Kw})$$

技术数据 Technical Date

工作压力范围 – 进口侧

Operating Pressure Range – Inlet side

进口 S(吸油口)处的绝对压力

Absolute pressure at port S(suction inlet).

$P_{abs\ min}$ _____ 0.08MPa

$P_{abs\ max}$ _____ 3MPa

示例：在 X°C 的环境温度下，油箱内的工作温度 60°C。在最佳粘度范围内(V_{opt} , 阴影部分)，这对应着粘度等级 VG 46 或 VG68；应选择 VG68。

Example: At an ambient temperature of X°C, the operating temperature in the tank is 60°C, in the optimum viscosity range(V_{opt} , shaded section), this corresponds to viscosity grades VG46 or VG68; VG68 should be selected.

过滤 Filtration

为了保证可靠的功能，必须至少使工作油液达到以下清洁度。

In order to guarantee reliable function, the operating fluid must be maintained to a cleanliness grade of minimum.

9 按 NAS1638

9 to NAS1638

18/15 按 ISO4406

18/15 to ISO4406

温度范围

Temperature range

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

$T_{max} = +90^\circ\text{C}$

V_g = 排量 Displacement per rev.(ml/r)

Δp = 压差 Differential pressure(MPa)

n = 转速 Speed(rpm)

η_v = 容积效率 Volumetric efficiency

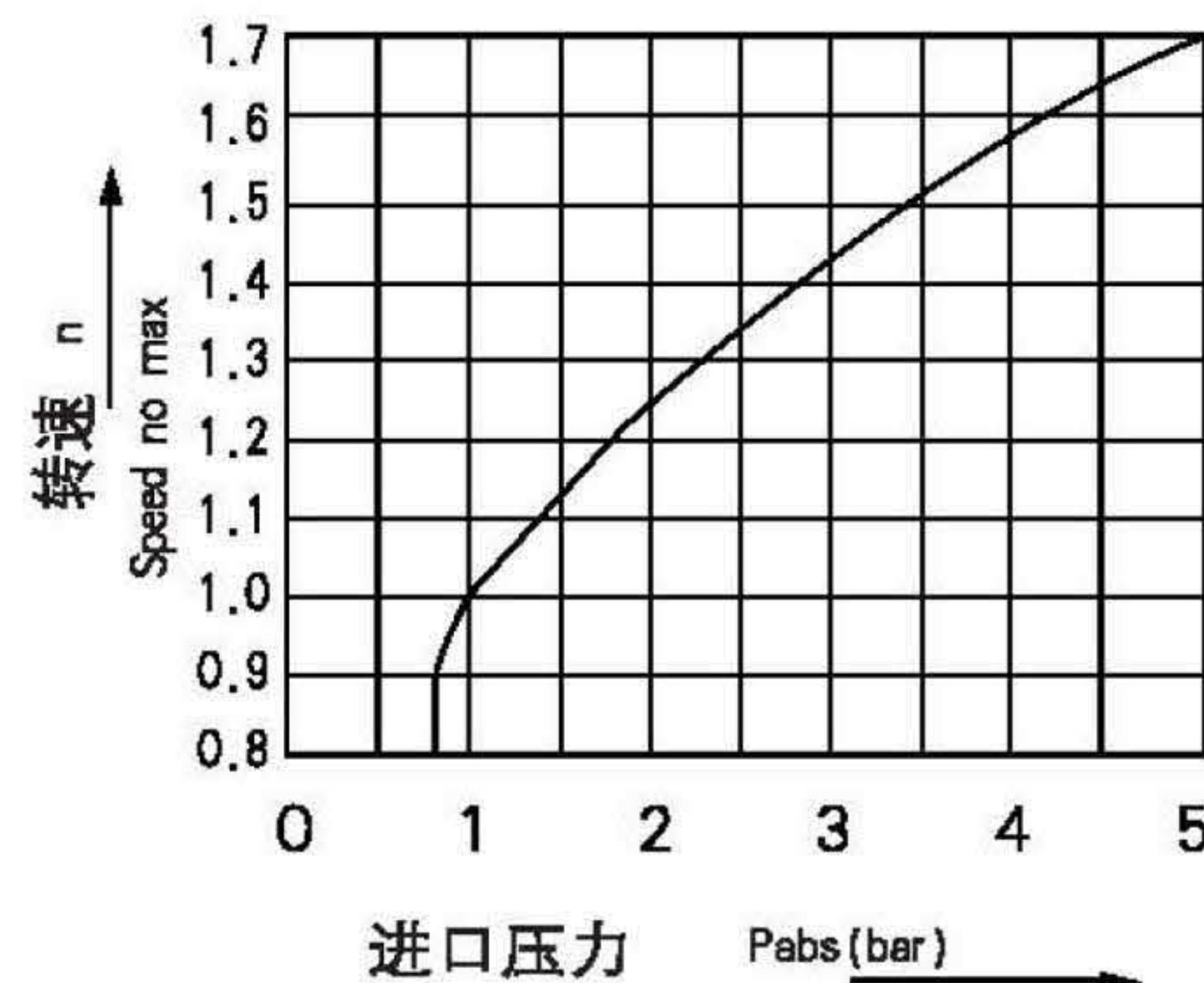
η_{mh} = 机械效率 Mech-hydr.efficiency

η_t = 总效率 Overall efficiency($\eta_t = \eta_v \cdot \eta_{mh}$)

Installation dimensions

转速提高时吸油上 S 处的进口压力 Pabs 的确定

Determination of inlet pressure pabs at the suction S ,when increasing rotational speed.



注 Note.

最高允许转速 n_{o,max_perm} (极限转速)

max,permissible speed n_{o,max_perm} (speed limit)

壳体泄油压力 Case Drain Pressure

最高壳体泄油压力(壳体压力)

Max.Caes drain pressure(housing pressure)

Pabs max _____ 0.2MPa

数值表 Table of Values (理论值, 未考虑 η_{mh} 和 η_v ; 数值经过圆整)

(theoretical values, without considering η_{mh} and η_v ; values rounded off)

规格 Size		40	71	125	250	500
排量 Displacement	V_{gmax}	cm ³	40	71	125	250
最高转速 Max.speed ¹⁾	$n_{o,max}$	rpm	2600	2200	1800	1500
最高允许转速 Max.perm.speed ²⁾						
当进口压力 P_{abs} 提高 With increased inlet pressure P_{abs}	n_{o,max_perm}	rpm	3200	2700	2200	1800
最大流量 Max.flow ³⁾	当 at $n_{o,max}$	$Q_{o,max}$	L/min	101	151	218
	当 at $n_E=1450$ rpm		L/min	56	100	176
最大功率 Max.Power	当 at $n_{o,max}$	$P_{o,max}$	KW	44	65	94
($\Delta p=25$ MPa)	当 at $n_E=1450$ rpm		KW	25	43	76
最大扭矩 Max.torque($\Delta p=25$ MPa)	当 at V_{gmax}	M_{max}	Nm	159	282	497
扭矩 Torque ($\Delta p=10$ MPa)	当 at V_{gmax}	M	Nm	64	113	199
惯性矩 Moment		J	kgm ²	0.0049	0.0212	0.03
控制体积 Filling volume			L	2	2.5	5
近似重量 Approx., weight		m	kg	39	53	88
允许轴向载荷, 当壳体压力 P_{max} 0.1MPa abs	$\pm Fax_{max}$	N	1000	1400	1900	3000
perm.axial load with case pressure P_{max} 0.1MPa abs						4000
允许径向载荷 perm.radial load	Fq_{max}	N	1200	1700	2500	4000
						5000

1)只要在吸油 S 处有 0.1MPa 的绝对压力则所示数值成立。

The values shown are valid provided there is an absolute pressure of 0.1MPa at suction inlet S.

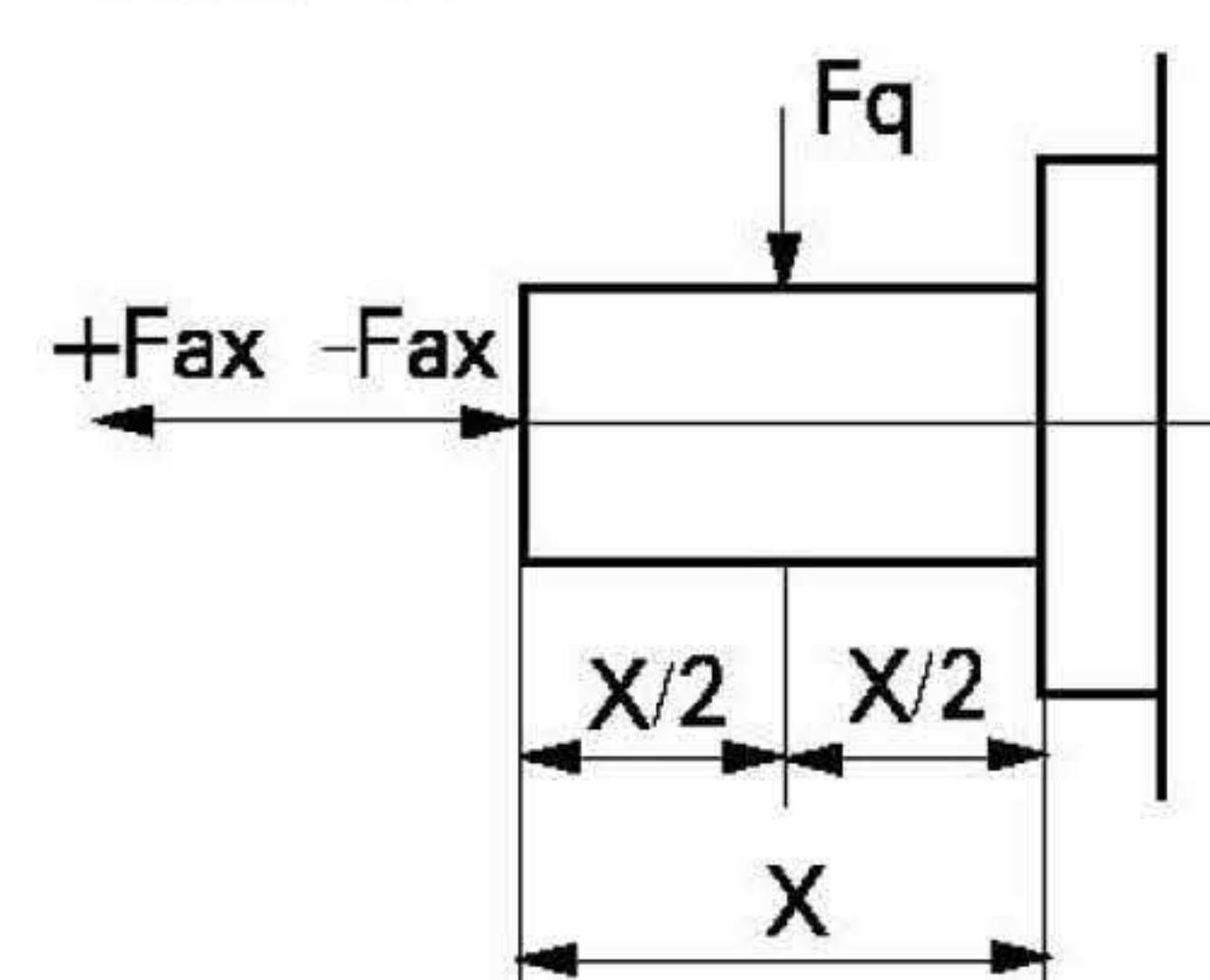
2)超过提高进口压力(超过 0.1MPa) 或减小输出流量, 转速可以提高到最高转速极限(见图).

By increasing the inlet pressure (pabs 0.1MPa) or reduction of the output flow, the speed can be raised up to the maximum speed limit (see diagram).

3)包括 3% 的容积损失。

3% Volumetric loss included.

作用力 Application of force



Installation dimensions

元件尺寸, 规格 125 Unit Dimensions.Size 125

