

M 系列叶片马达

Series-vane Motor

适用于各种中高压液压系统，如渔船拖网机、船用锚机、绞车、工程机械等。

Suitable for various medium and high pressure hydraulic systems, such as fishing boat trawlers, ship windlasses, winches, engineering machinery, etc.

主要特点为：

转速范围宽广，噪音小，可正、反转，动作灵敏。径向液压平衡，因而工作压力高，使用寿命长，并具有体积小、重量轻、结构简单、使用、维修方便等特点。

The main features are:

The speed range is wide, the noise is low, it can be forward and reverse, and the action is sensitive. Radial hydraulic balance, so the working pressure is high, the service life is long, and it has the characteristics of small size, light weight, simple structure, convenient use and maintenance.



型号说明/Model Designation

25M		65		A	-11	C	20
系列号 Series		排量ml/r Displacement		油口连接 Port connections	轴伸形式 Shaft type	出油口位置 Outlet positions	设计号 Design number
标准 轴承 Standard bearing	25M	重型 轴承 Heavy-duty bearings	26M	SAE 2-螺栓安装法兰和 SAE 4-螺栓法兰连接 2-bolt mounting flange and 4-bolt flange connection	1-平键轴 Straight key shaft 11-花键轴 Spline shaft	(从泵的盖端看) (Viewed from cover end of pump) A-进油口对面 Opposite inlet B-从进油口逆时针90° 90° CCW from inlet C-进油口同侧 Inline with inlet D-从进油口顺时针90° 90° CW from inlet	20-29
	35M		36M				
	45M		46M				
	50M		51M				

技术参数/Technical Data

系列号 Series	扭矩(Torque) Nm/6.9 bar (lb in/100 psi)	排量ml/r Displacement	在1200r/min下 要求的流量输入 L/min (USgpm)	最高转速和压力. Mx.speed and pressure	重量 Weight kg (lb)
25M	4.7(42)	43.9(2.68)	52.6(13.9)	3600r/min@34bar(500psi) † 4000r/min@34bar(500psi) ‡	18 (40)
	6.2(55)	57.7(3.52)	69.3(18.3)		
	7.3(65)	68.7(4.19)	82.5(21.8)		
35M	9.0(80)	83.6(5.10)	100.3(26.5)	2600r/min@155bar(2250psi) † 3000r/min@172bar(2500psi) ‡	29 (64)
	10.7(95)	100.3(6.12)	120.4(31.8)		
	13.0(115)	121.9(7.44)	146.1(38.6)		
45M	14.7(130)	138.0(8.42)	165.4(43.7)	2800r/min@34bar(500psi) † 3200r/min@34bar(500psi) ‡ 2200r/min@155bar(2250psi) † 2400r/min@172bar(2500psi) ‡	39 (85)
	17.5(155)	163.2(9.96)	195.7(51.7)		
	20.9(185)	193.2(11.79)	232.0(61.3)		
50M	24.9(220)	231.2(14.11)	277.5(73.3)	2800r/min@34bar(500psi) † 3200r/min@34bar(500psi) ‡ 2200r/min@155bar(2250psi) † 2400r/min@172bar(2500psi) ‡	73 (160)
	28.8(255)	268.1(16.36)	321.8(85.0)		
	33.9(300)	317.1(19.35)	380.4(100.5)		

† 连续工作 continuously working

‡ 间歇工作:总工作时间的10%; 每次压力和/或转速工作不超过6s.

• 114型号后缀: 2500psi, 逆时针; 2250psi, 顺时针。(从轴端方向看旋转)

• 124型号后缀: 2500psi, 单向旋转

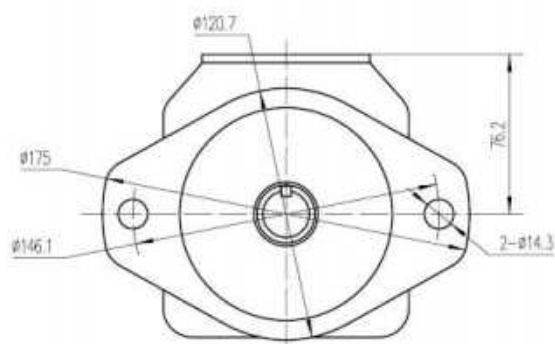
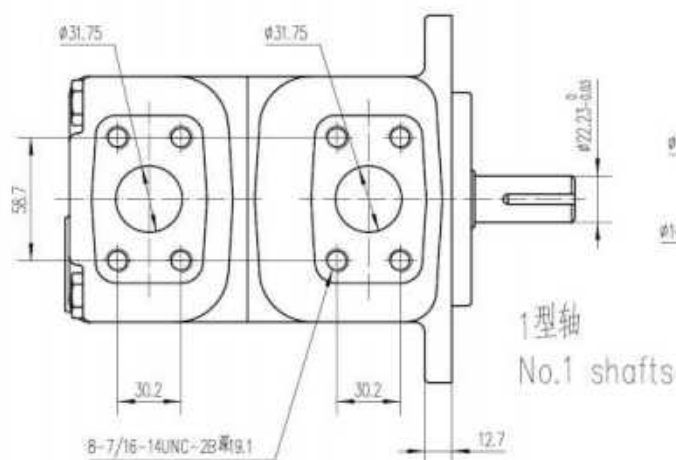
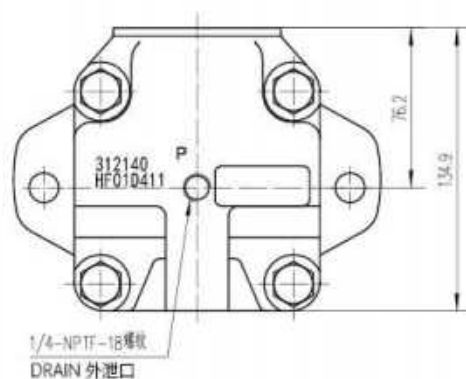
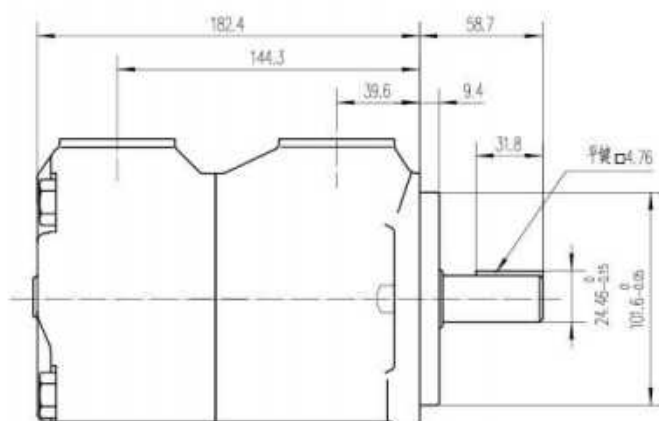
† Continuously working

‡ Intermittent work: 10% of the total working time, each pressure and or speed work does not exceed 6 seconds.

• 114 model: 2500psi, CCW; 2250psi, CW (see rotation from the shaft end)

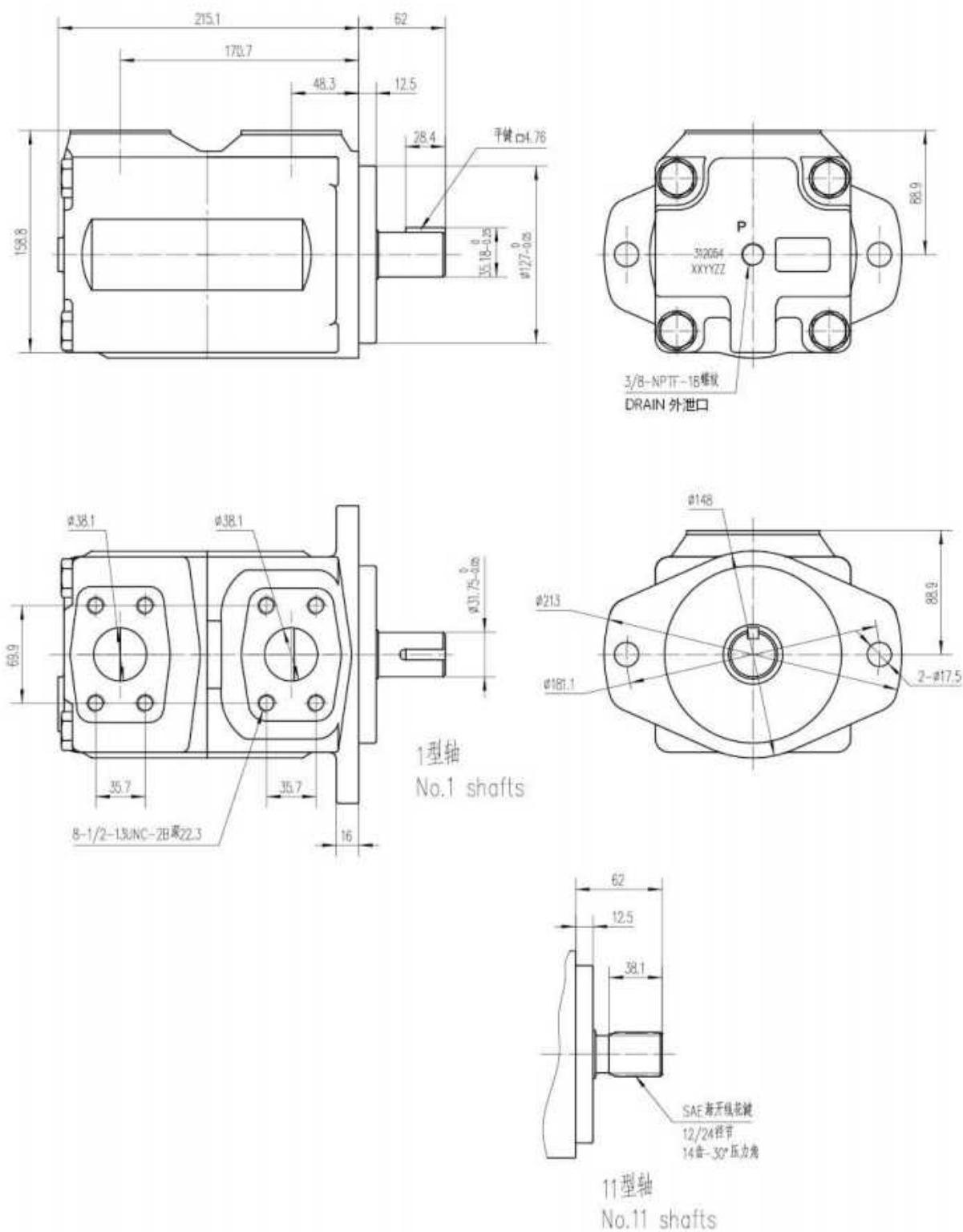
• 124 model: 2500psi, one-way rotation

25M安装连接尺寸/Installation Dimensions

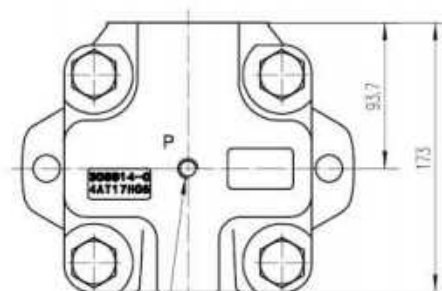
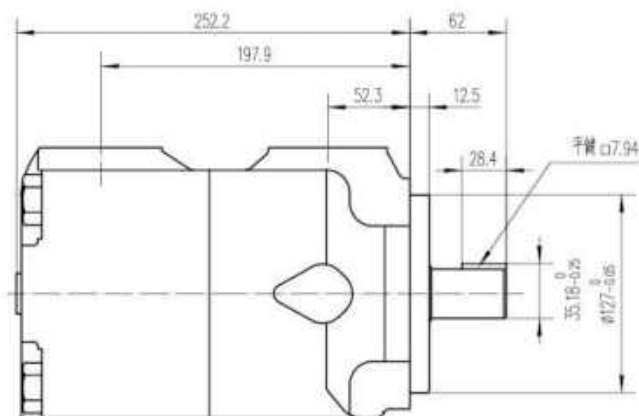


11型轴
No.11 shafts

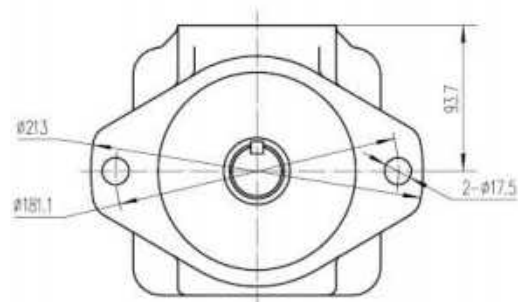
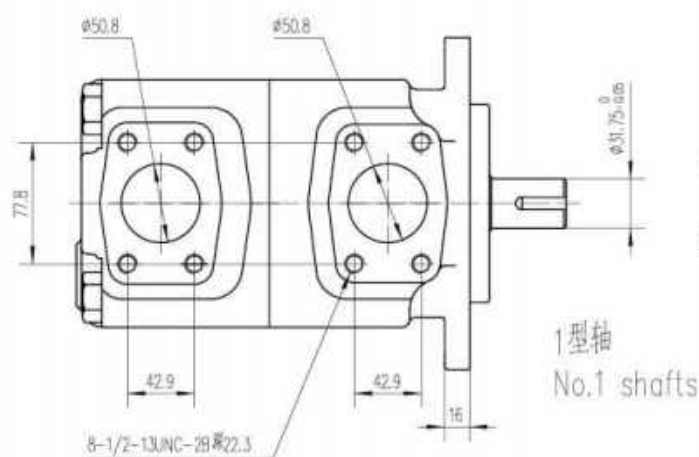
35M安装连接尺寸/Installation Dimensions



45M安装连接尺寸/Installation Dimensions

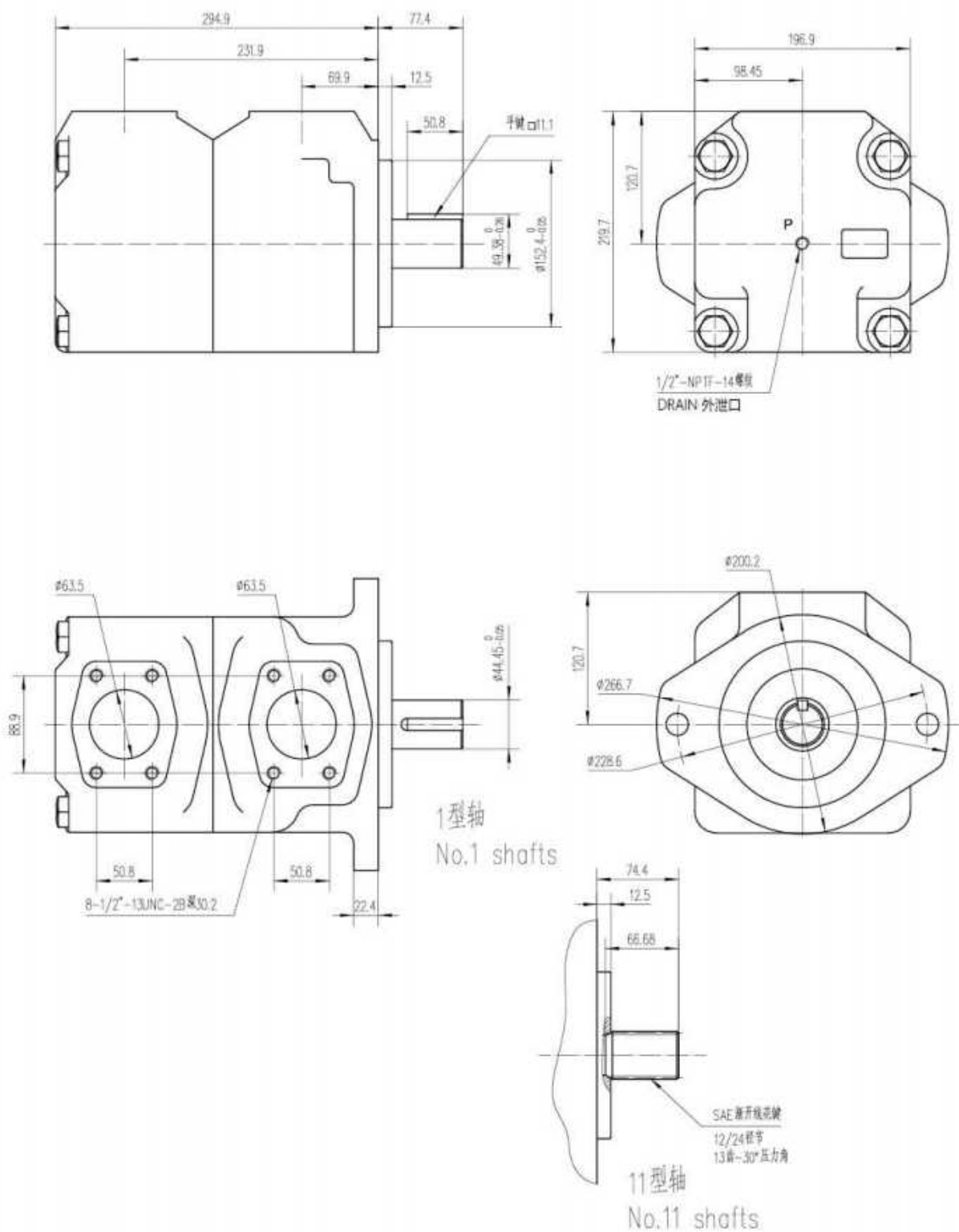


1/2" NPT-14 螺口
DRAIN 外泄口



11型轴
No.11 shafts

50M安装连接尺寸/Installation Dimensions



M4 系列叶片马达 Series-vane Motor



型号说明/Model Designation

M4C	067	-1	N	00	A	1	02
系列号 Series	排量ml/r Displacement	轴伸形式 Shaft type	转向 Rotation	油口位置 Port positions	设计号 Design number	密封等级 Sealing Level	油口 Oil port
M4C	024 (24.2)	1—平键轴 Straight key shaft	N: 双向 N: Two-way	见下图 See picture below	A	1—丁腈橡胶 NBR Nitrile rubber	见下图 See picture below
	027 (28.2)						
	031 (34.5)						
	043 (46.5)						
	055 (58.8)						
	067 (71.1)						
075 (80.1)	2—平键轴 Straight key shaft	A: 顺时针 A: Clockwise					
062 (65.1)							
074 (76.8)							
088 (91.1)							
102 (105.5)			3—花键轴 Spline shaft			B: 逆时针 B: anti-lockwise	
113 (116.7)							
128(132.4)							
138 (144.4)							
153 (158.6)							
M4E	185 (191.6)						
	214 (222.0)						

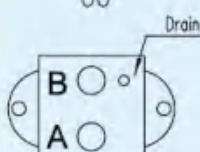
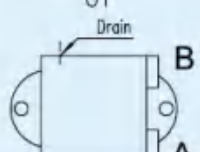
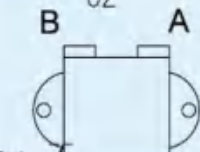
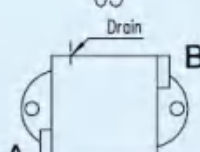
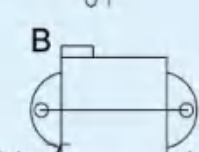
技术参数/Technical Data

型号 Model	规格 Specification	排量 Displacement	比扭矩 Torque	100rpm 时的效率 Efficiency	最高压力 Max.pressure Mpa	最高转速/Max.speed r/min		
						额定压力/Rated pressure		低压 Minimum pressure
						连续/Continuous	间歇/Temporarily	
		ml/rev	Nm/bar	kW/bar	bar	rpm	rpm	rpm
M4C	024	24.4	0.390	0.0040	230	2500	3600	4000 (80bar)
	027	28.2	0.450	0.0047				
	031	34.5	0.550	0.0058				
	043	46.5	0.740	0.0078	210			
	055	58.8	0.930	0.0098				
	067	71.1	1.130	0.0120				
	075	80.1	1.270	0.0130	175			
M4D	062	65.1	1.040	0.0110	230	2500	3000	4000 (80bar)
	074	76.8	1.220	0.0130				
	088	91.1	1.450	0.0150				
	102	105.5	1.680	0.0180	210			
	113	116.7	1.860	0.0200				
	128	132.4	2.110	0.0220				
	138	144.4	2.300	0.0240	175			
M4E	153	158.5	2.520	0.0260	190	2500	3000	4000 (80bar)
	185	191.6	3.050	0.0320	180			
	214	222.0	3.530	0.0370	175			

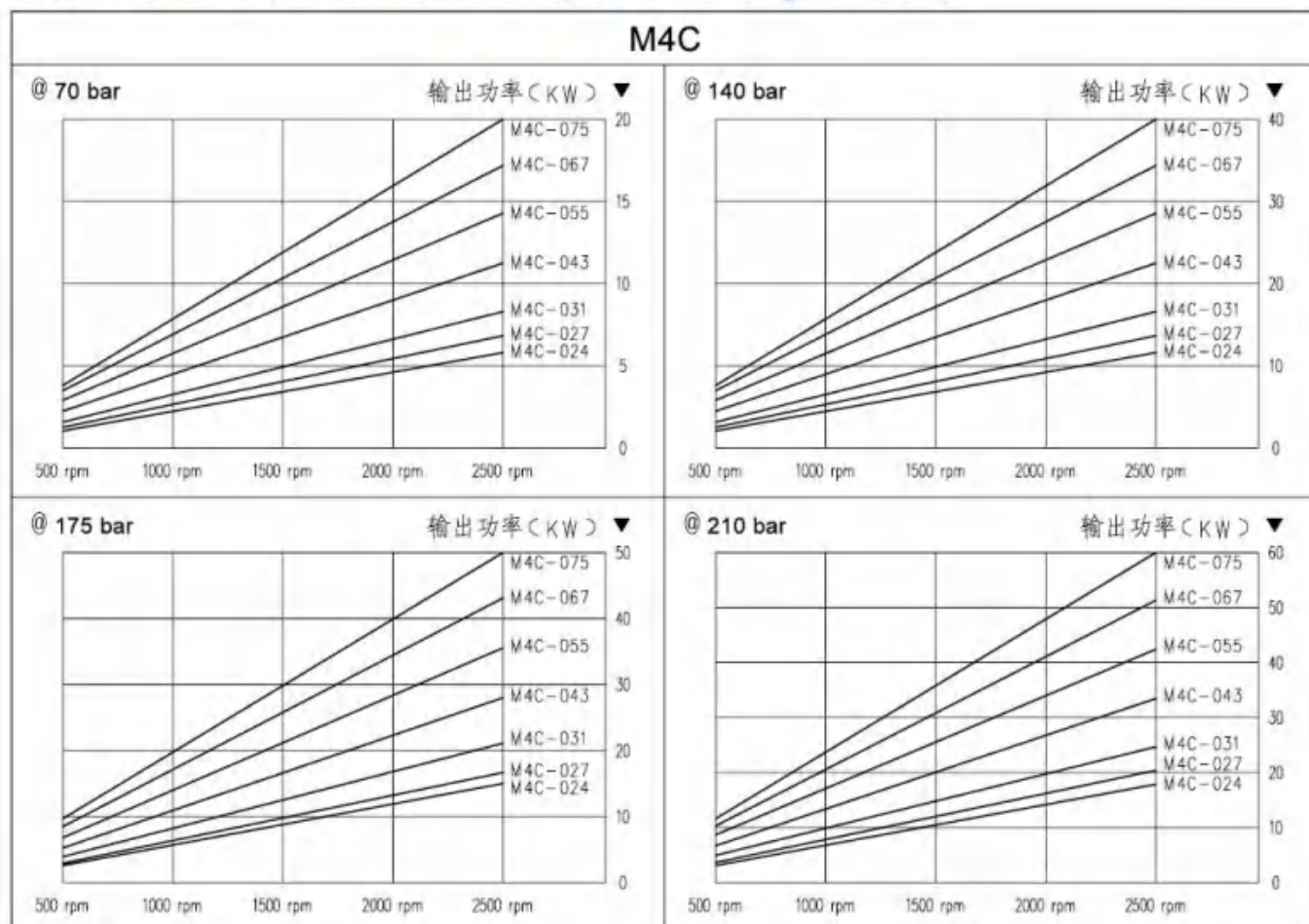
油口/Oil port

	SAE螺纹油口 Threaded port	SAE 4螺栓(Bolt)	
		UNC	公制螺纹 (Metric thread)
SAE泄油口(Drain)	01	02	—
BSPP泄油口(Drain)	—	04	M4
M4C	●	●	●
M4D	●	●	●
M4E	●	●	—

油口位置说明/Port location Description

系列号 Series	尾部 (Tail)	侧面 (Side)			
	00	01	02	03	04
					
M4C	●	●	●	●	●
M4D	●				
M4E	●				

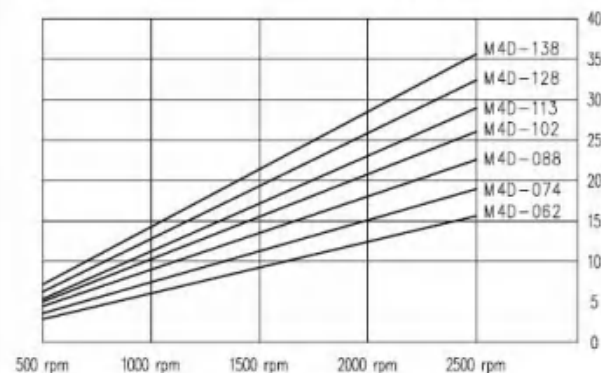
性能曲线/Characteristic curve (Oil viscosity 24 cSt)



M4D

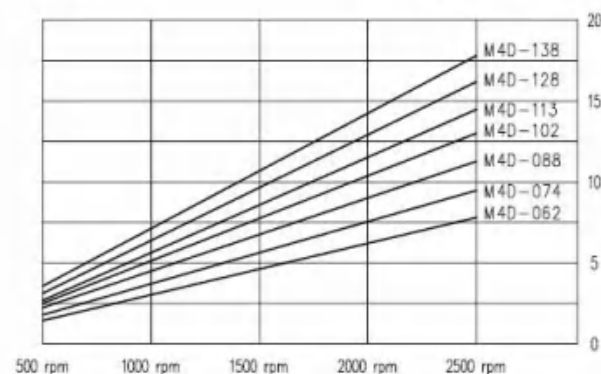
@ 70 bar

输出功率 (KW) ▼



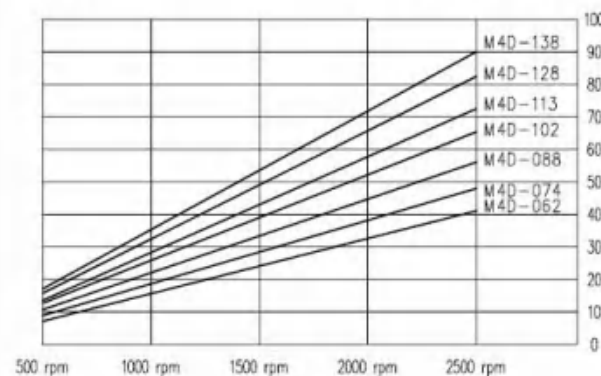
@ 140 bar

输出功率 (KW) ▼



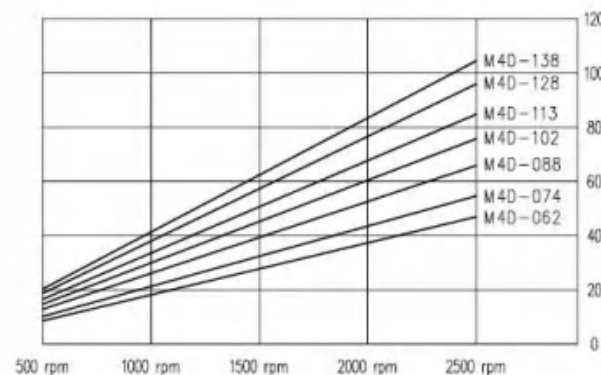
@ 175 bar

输出功率 (KW) ▼



@ 210 bar

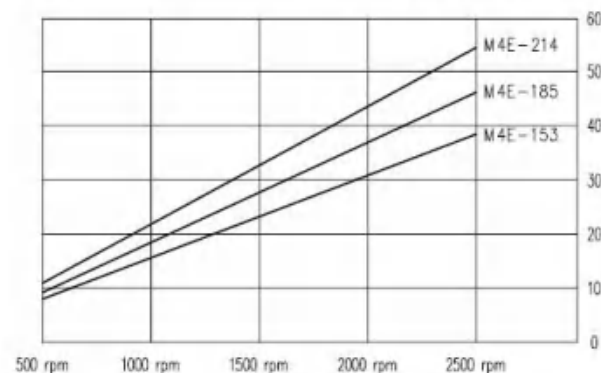
输出功率 (KW) ▼



M4E

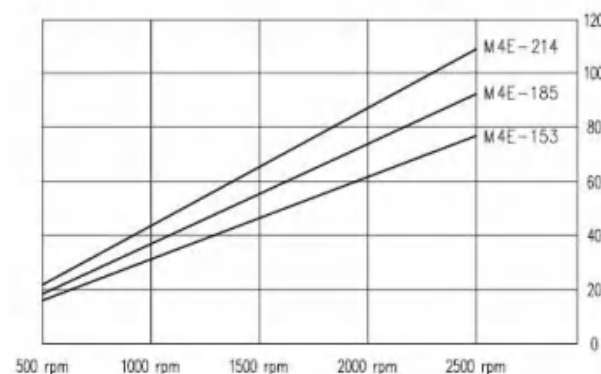
@ 70 bar

输出功率 (KW) ▼



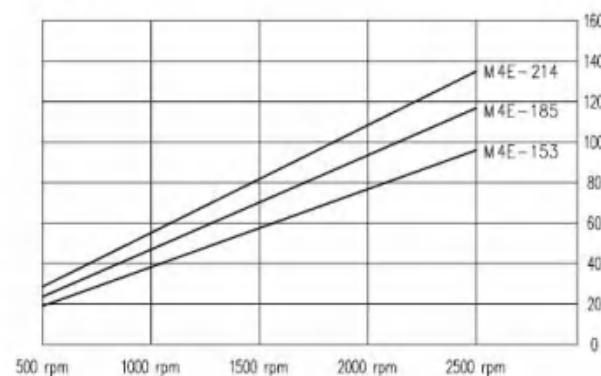
@ 140 bar

输出功率 (KW) ▼



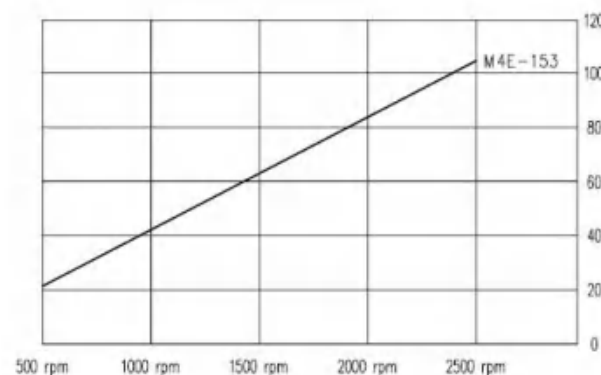
@ 175 bar

输出功率 (KW) ▼

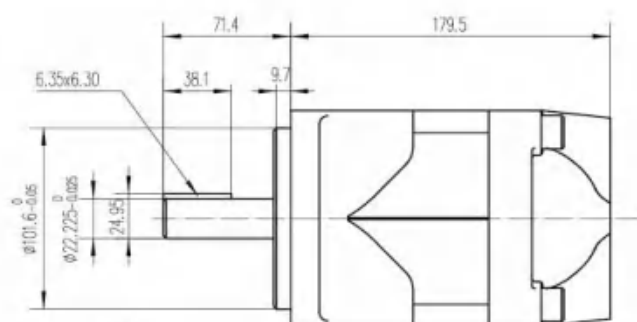


@ 190 bar

输出功率 (KW) ▼

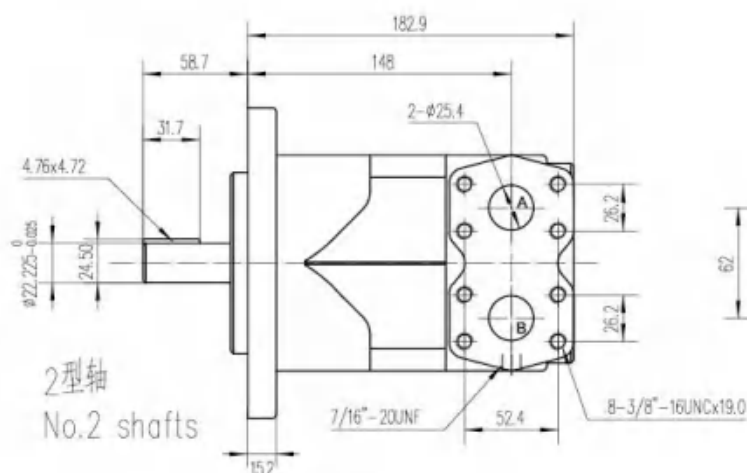
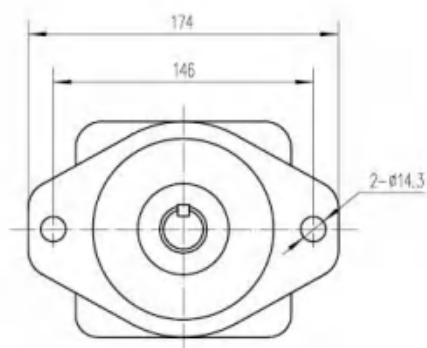


M4C安装连接尺寸/Installation Dimensions



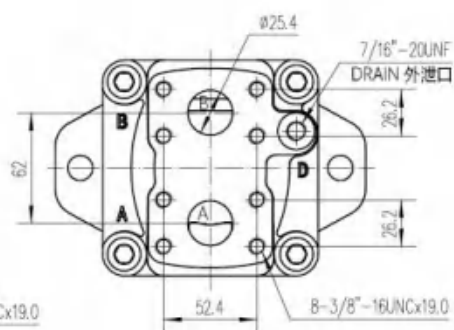
1型轴

No.1 shafts



2型轴

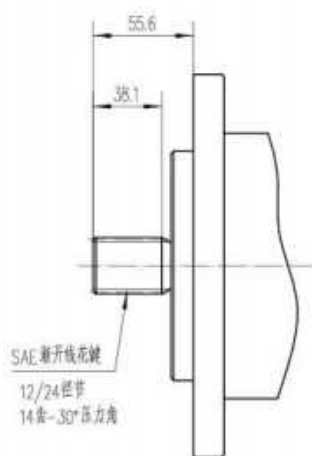
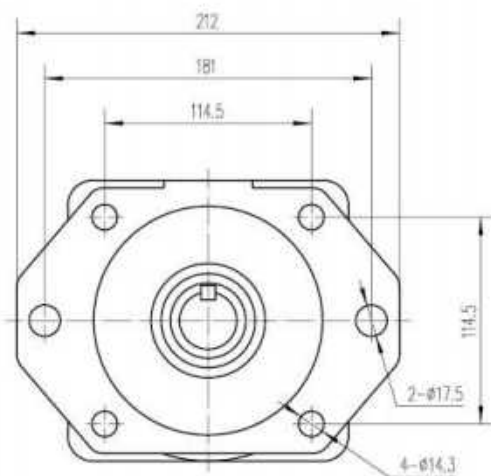
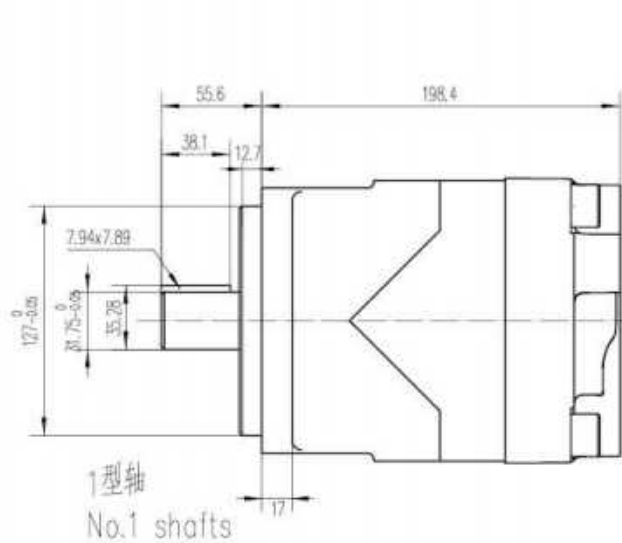
No.2 shafts



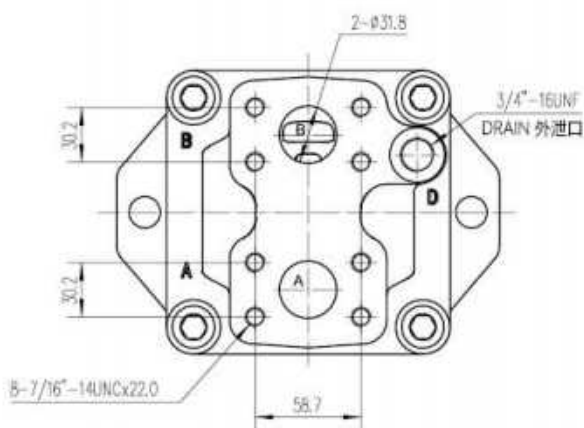
3型轴

No.3 shafts

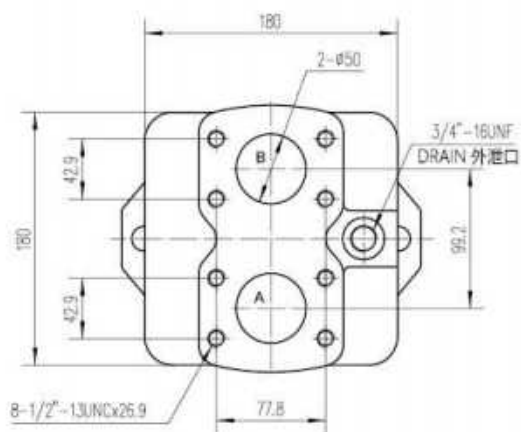
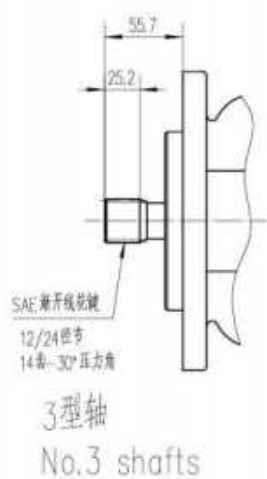
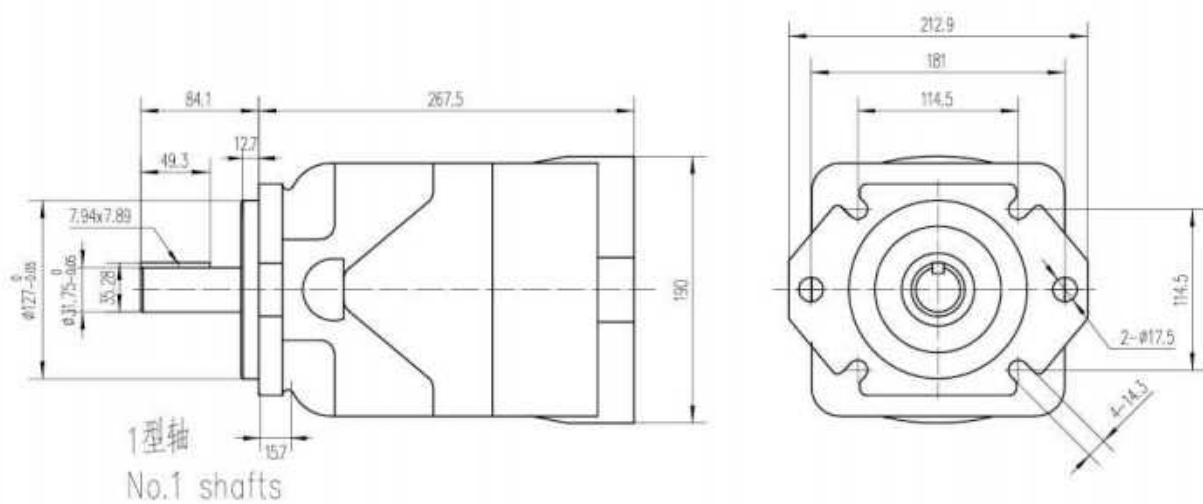
M4D安装连接尺寸/Installation Dimensions



3型轴
No.3 shafts



M4E安装连接尺寸/Installation Dimensions



安装、使用与维护

1. 工作介质

- 为提泵油性能, 延长使用寿命, 推荐使用抗磨液压油, 粘度范围10-860cst, 推荐粘度46cst。
- 液压油的污染会引起叶片泵的故障和降低其寿命, 应对液压油液进行有效的控制, 系统过滤精度不低于 $25\mu\text{m}$ 。为防止吸入污物和杂质, 应在吸油口处安装过滤精度70-150 μm 的过滤器, 其额定流量不低于泵流量的两倍。
- 油泵工作温度范围: 0°C - 70°C , 为保证长期的可靠寿命, 最佳油温 10°C - 60°C 。

2. 泵的安装

- 油泵支架结构要牢固, 刚性好, 并能充分吸收振动。
- 油泵可卧式或立式安装(最好卧式)。泵和电机轴必须对齐, 同轴度应控制在 0.1mm 以内, 尽量采用柔性联轴器, 以避免因弯曲或侧向力引起的任何应力。
- 尽量避免进出口油管采用钢管硬连接, 建议使用橡胶软管, 以避免出现额外的负载导致额外的噪声。
- 吸入阻力不应太高, 以防产生空蚀现象。油泵允许吸入真空度为110mm水银柱。安装应尽量接近油箱, 吸入高度不得大于500mm。
- 注意进出口处连接法兰、接头以及整个吸油管道必须严格密封, 防止漏气。否则将会引起噪声、系统振动, 并使油箱内产生大量泡沫, 降低泵的寿命。
- 油泵的吸油管道口径不小于泵入口口径。
- 油箱应设有隔板, 用来分隔回油带来的气泡与脏物。回油管应伸到油面以下(不得直接和泵的入口连接), 防止回油飞溅引起气泡。

3. 启动

- 油泵启动前, 应检查进、出口, 切勿搞错方向。泵旋转方向应与标牌指示方向一致(订货时未注明旋向者, 一律按顺时针旋向供货)。初次启动应向泵里注满油, 并用手动转动联轴器, 旋转力量应均匀、灵活。
- 启动时, 应尽量在无负荷工况下经点动运转正常后再正式启动。
- 由于泵装配后或长时间停运再启动, 会产生吸空现象, 故应在排油口安装放气阀, 或松动出口法兰、接头, 以便放出空气。

4. 维护

- 用户购回油泵后, 如不及时使用, 必须将内部注入防锈油, 并将外加工表面涂防锈油膜, 然后盖好防尘盖, 妥善保存。
- 要定期检查油液性能, 达不到规定要求时要及时予以更换, 并清洗油箱。
- 过滤器应经常清洗, 以便正油液吸入通畅。
- 保持油箱正常油面高度。配管和油箱的容量很大时, 尽管最初已加入足够数量的油, 在启动之后, 油进入管道和油缸, 也会发生油面下降使过滤器露出油面。因此必须再补油。在使用过程中, 还会发生泄漏, 应该在油箱中设置油面计, 以便经常观察和补油。
- 油泵工作一段时间后, (由于振动) 安装螺钉或进出口法兰螺钉有可能松动, 要注意检查, 并拧紧防松。
- 由于ABT伺服泵泵腔采用插装式结构, 因此正常维修时只需要更换泵芯, 更换时应检查密封圈是否完整, 防止切边。拧紧壳体连接螺钉时, 应按对角线方向逐渐拧紧, 用力均匀。

Installation, Application and Maintenance

1. Operating oil

- Anti-wear hydraulic oil is recommended for better performance and longer life. Viscosity range: 10-860cst, Recommended viscosity 46cst.
- Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. The filtration rating should not be lower than $25\mu\text{m}$. Filter of 70-150 μm on the inlet port is recommended and its rated flow should not be lower than 200% of pump's.
- Oil temperature range of pump working: 0°C - 70°C . The best oil temperature is 10°C - 60°C for ensuring long-term and reliable life.

2. Installation

- Foot and frame for pump must be reliable, solid and good in vibration absorbent.
- Horizontal mounting is recommended to maintain necessary case fluid level. Concentricity of shafts between pump and motor is important to pump life and should be within 0.1mm . It is better to use flexible coupling to avoid harmful effects.
- Try to avoid using the steel pipe connection for tubing, the rubber hose is recommended for avoiding additional load causes the extra noise.
- The oil pump allows the inhalation vacuum as 110 mm column of mercury. Installation should near fuel tank, inhaling the height can not be big in 500 mm.
- Please notice the seal of flange at port connections, ports and absorb pipeline has to be sealed strictly, to prevent air leakage. If not it will cause the noise and vibration of system, also will make foam, to low the life of pump.
- The diameter of absorb pipeline should not smaller than that of inlet.
- There should be a plank in the tank to separate bubble and dirty thing from used oil. Return pipeline under oil is recommended(not connect with inlet) for avoid bubble.

3. Start

- Before starting pump, please check up if the inlet and outlet have been correctly connected and the rotation of the pump is inline with the nameplate.(CW without notice).
- After confirming it is able to work well without burthen, please restart.
- When initially starting the pump after long-time unused, removing all trapped air from the system can be accomplished by loosening flange or connections.

4. Maintenance

- Please inject defend-rust oil in the pump, paint the surface with defend-rust grease and then cover ports, if you do not want to use it right now.
- Please check up oil periodically, while if the oil can not reach the demand, replace it and clean up tank.
- Purging of filter regular is recommended.
- Keep the normal level of oil in the tank. When capability of tubing and tank are large, even if injected enough oil. Because when starting, the level of oil would fall, then please add some oil. Please observe the level of oil and add some oil when needed.
- After a period of working, it is likely that the install bolt and flange of inlet and outlet would loose because of vibrating, please tight them.
- The cartridge design of ABT series servo pumps offers fast and efficient field service ability, when replacing the cartridge, seals inside the pump should be checked to avoid them crimping, when tightening the fastening screws, they should be treated with even force in diagonal direction.

常见故障及排除方法一览表 Common trouble and solving

现象 Trouble	产生原因 Cause of trouble	排除方法 Remedy method
油泵吸不上油或 无压力 Pump starveling Or no pressure	1.原动机与油泵旋向不一致 Not the same of rotation direction of primer as that of pump	纠正原动机旋向 Correct rotation direction of primer
	2.油泵传动键脱落 Key of pump shaft falls off	重新安装传动键 Re-assembly the key
	3.进出油口接反 Wrong connecting of inlet and outlet	按说明书选用正确接法 According to operating manual, re-connect them
	4.油箱内油面过低,吸入管口露出液面 Oil level in tank too low,suction pipe exposed above the oil level	补充油液至最低油标线以上 Fill oil to the position above the lowest oil level in tank
	5.转速太低吸力不足 Rotation speed too low,suction not enough	提高转速达到油泵最低转速以上 Increase speed of pump above the lowest one
	6.油粘度过高,使叶片运动不灵活 Oil viscosity too high	选用推荐粘度的工作油 Use recommended operating oil
	7.油温过低,使油粘度过高 Oil viscosity too high due to lower ambient temperature	加热至推荐正常工作油温 Heat oil to normal oprating temperature range
	8.系统油液过滤精度低导致叶片在槽内卡住 Vane is clipped due to lower filtration of system oil	拆洗、修磨油泵内脏件,仔细重装,并更换油液 Disassembly,mend pump cartridge parts;after finishing the above, carefully reassemble them and change the oil
	9.吸入管道或过滤装置堵塞造成吸油不畅 Pipe line or filter blocked,oil in suction line can't flow freely	清洗管道或过滤装置,除去堵塞物,更换或过滤油箱内油液 Clean pipe line and filter,remove foreign material, change or filter oil in the tank
	10.吸入口过滤器过滤精度过高造成吸油不畅 Filtration rating of the suction filter too high	按说明书正确选用过滤器 Select correct filter according to oprating manual
流量不足达 不到额定值 Flow not enough, lo-wer than rated one	11.吸入管道漏气 Air leak in suction line	检查管道各连接处,并予以密封.紧固 Check every connection and re-tighten them
	12.小排量油泵吸力不足 Small delivery pump poor suction	向泵内注满油 Full fill the pump with oil
	1.转速未达到额定转速 Speed of pump lower than rated value	按说明书指定额定转速选用电机转速 According to rated speed in oprating manual, select correct model of electric motor
	2.系统中有泄漏 There is leakage in system	检查系统,修补泄漏点 Check system,repair leakage point
	3.由于油泵长时间工作.振动使泵盖螺钉松动 Locking screws for pump cover loosen due to longer time vibration	适当拧紧螺钉 Properly tighten the screws
	4.吸入管道漏气 There is leakage in suction line	检查各连接处,并予以密封.紧固 Check all connection and re-seal or lock them
	5.吸油不充分 Suction oil not enough	
	①油箱内油面过低 Oil level in tank too low	补充油液至最低油标线以上 Fill oil to and above the lowest level
	②入口滤油器堵塞或通流量过小 Inlet Filter blocked or its size too small	清洗过滤器或选用通流量为油泵流量2倍以上的滤油器 Clean filter or select bigger size filter(with double flow of that of pump)
	③吸入管道堵塞或通径小 Suction line blocked or too small in size	清洗管道,选用不小于油泵入口通径的吸入管 Clean pipe line,select bigger size pipe
压力升 不上去 Pressure lower	④油粘度过高或过低 Oil viscosity too high or too low	选用推荐粘度工作油 Use recommended operating oil
	1.油泵不上油或流量不足 Pump starveling or flow not enough	同前述排除方法 Same as the above
	2.溢流阀调整压力太低或出现故障 Adjusting pressure of relief valve too low or trouble in it	重新调试溢流阀压力或修复溢流阀 Re-adjust relief valve or repair it
	3.系统中有泄漏 There is leakage in system	检查系统.修补泄漏点 Check system and repair leakage point
	4.由于油泵长时间工作.振动,使泵盖螺钉松动 Locking screws for pump cover loosen due to longer time vibration	适当拧紧螺钉 Properly tighten screws

现象 Trouble	产生原因 Cause of trouble	排除方法 Remedy method
压力升不上去 Pressure lower	5.吸入管道漏气 Leakage in suction line	检查各连接处, 并予以密封.紧固 Check all connections and seal or tighten them
	6.吸油不充分 Suction not enough	同前述排除方法 Same as the above
噪声过大 Noise too high	1.吸入管道漏气 Leak in suction line	检查管道各连接处, 并予以密封.紧固 Check all connections in pipe line and reseal or tighten them
	2.吸油不充分 Suction not enough	同前述排除方法 Same as the above
	3.泵轴和原动机轴不同心 Poor concentricity between shaft of pump and that of electric motor	重新安装达到说明书要求精度 Re-assemble until attain the precision specified
	4.油中有气泡 There are bubbles in oil	补充油液或采取结构措施把回油口浸入油面以下 Fill more oil or put return port under oil level in tank
	5.泵转速过高 Pump speed too high	选用推荐转速范围 Select recommended speed range
	6.泵压力过高 Pump pressure too high	降压至额定压力以下 Decrease pressure below rated value
	7.轴密封处漏气 Air leak in shaft seal	更换油封 Change the seal
过度发热 Too much heat	1.油温过高 Oil temperature too high	改善油箱散热条件或增设冷却器使油温控制在推荐正常油温范围内 Improve heat radiation or install a cooler to control oil temperature within normal range
	2.油粘度太低, 内泄过大 Oil viscosity too low and internal leakage too much	选用推荐粘度工作油 Select operating oil with recommended viscosity
	3.工作压力过高 Operating pressure too high	降压至额定压力以下 Decrease it below rated value
	4.回油口直接接到油泵入口 Return pipe directly connected to pump inlet	回油口接至油箱液面以下 Connecting return pipe under oil level in tank
振动过大 Vibration too big	1.泵轴与电机轴不同心 Poor concentricity between shafts of pump and motor	重新安装达到说明书要求精度 Re-assemble until attain the precision specified
	2.安装螺钉松动 Mounting screw loosen	拧紧螺钉 Tighten screws
	3.转速或压力过高 Speed or pressure too high	调整至许用范围以内 Decrease them below rated value
	4.油液过滤精度过低, 导致叶片在槽中卡住 Vane is clipped due to lower filtration of system oil	拆洗修磨内脏件, 并仔细重新组装, 并更换油液或重新过滤油箱内油液 Disassemble, mend and clean cartridge parts; after finishing the above, carefully reassemble them and change the oil
	5.吸入管道漏气 Air leak in suction line	检查管道各连接处, 并予以密封.紧固 Check all connections and reseal or tighten them
	6.吸油不充分 Suction area not enough	同前述排除方法 Same as the above
	7.油液中有气泡 There are bubbles in oil	补充油液或采取结构措施把回油口浸入油面以下 Fill more oil or put return port under oil level in tank
外渗漏 External leakage	1.密封老化或损伤 Seal aging or damaged	更换密封 Replace seals
	2.进出油口连接部位松动 Connection of inlet or outlet loosen	紧固螺钉或管接头 Tighten screws of fittings
	3.密封面磕碰 Sealing surface cracking	修磨密封面 Mend or grind the surface
	4.外壳体砂眼 Sand holes in housing	更换外壳体 Replace housing

订货须知: NOTE

1.订货时要考虑如下因素: Please notice the following factors when booking.
 产品用途及使用环境压力(常用压力, 瞬时最高压力, 及使用压力—时间曲线状况),
 转速及转向, 扭矩排量原动机种类, 安装位置及方式, 使用油液的种类等。

The product use, using environmental pressure (usual pressure, moment highest pressure and cartridge performance)
 speed and rotation, torque, flow, kinds of prime motive, install positions and ways, kinds of oil.

2.订货时必须详细写明型号规格 Please note model and specification in detail when booking.

例如: eg: 25V19A-1A22R