QLP

SANITARY CAM ROTOR PUMP SERIES

卫生级凸轮转子泵系列

卫生转子泵的简介

QLP系列卫生级转子泵是远亚公司多年研发出来的一种旋转式容积泵，专门用来输送高粘度的产品。主要应用于食品、饮料、化工、医药等行业。其融合了最新的卫生设计理念，满足不同工况对于卫生和洁净性日益增多的要求。

产品的专业制造技术和加工精度达到了国际先进水平，使其质量更加稳定、高效、安全。成为全球客户的首选之一。

卫生级转子泵属于容积泵的一种，又称凸轮泵、胶体泵、三叶泵、万用输送泵。其借助于工作腔里的多个固定容积输送单位的周期性转化来达到输送流体的目的。

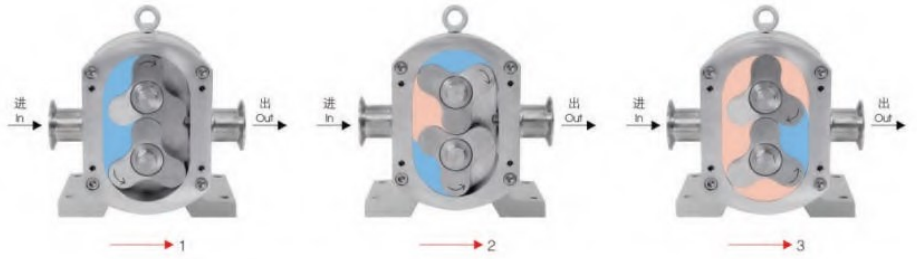
Introduction to sanitary rotor pump

The QLP series sanitary rotor pump is a kind of rotary displacement pump specially used to convey products of high viscosity researched and developed by Yuanya Company. It is mainly applied in such industries as food, beverage, chemical industry, medicine, etc. By integrating the latest sanitary design concepts, the products can meet the increasing requirements for sanitation and cleanliness in different service conditions.

Specialized manufacturing technology and machining precision of the products have reached internationally advanced level, making their quality more stable with high efficiency and good safety, and becoming the preferred choice of clients all over the world.

The sanitary rotor pump is a kind of displacement pump, which is also called cam pump, colloid pump, three-vane pump and universal conveying pump. It realizes the purpose of conveying fluids through periodic transformation of multiple fixed volume conveying units inside the working chamber.

卫生转子泵的工作原理



如图所示,由于两个转子持续运动，介质通过转子顺着容积流动的方向被输送至出料口，介质被加压从而排除。

由此可以看出，两转子的转速越快，泵输送的流量就越大，故泵流量与转子转速成正比。如果改变两个转子的转动方向，则凸轮泵可以逆向运送介质，并不损坏各零件。

Working principle of sanitary rotor pump

As shown in the figure, due to continuous movement of the two rotors, the media are transported to the discharging port in the volume flow direction through the rotor, and then are removed after pressurization.

It can be seen that the faster the rotation speed of the two rotors, the greater the flow rate of the pump. Therefore, the pump flow rate is directly proportional to the rotor rotation speed. If the rotation direction of the two rotors is changed, the cam pump can convey the media in a reverse direction without damaging the parts.

卫生转子泵的分类

Classification of sanitary rotor pump

目前，卫生转子泵按照结构形式大致可以分为两类：立式结构和卧式结构。如图A所示，泵的进出口与水平方向平行的，且两转子中心连线与水平方向是垂直，此种结构称之为卧式结构。而立式结构正好与卧式结构相反，进出口与水平方向垂直，两转子中心连线与水平方向平行，如图B所示。

At present, the sanitary rotor pumps can be roughly classified into two types according to the structural form: those with a vertical structure and those with a horizontal structure. As shown in figure A, the inlet and outlet of the pump are parallel to the horizontal direction, and the center line of the two rotors is perpendicular to the horizontal direction. This structure is called a horizontal structure. The vertical structure is opposite to the horizontal structure. The inlet and outlet are perpendicular to the horizontal direction, and the center line of the two rotors are parallel to the horizontal direction, as shown in figure B.

实际应用中，一般都采用卧式结构的卫生转子泵，由于进出口是水平方向，有利于连接管道，工作效率高；由于立式结构的卫生转子泵结构占地较少，在特定的工作环境下也会选取此类结构。

In practical applications, the horizontally-structured sanitary rotor pump is generally used. Since the inlet and outlet are horizontal, it is beneficial for the connection with pipes, and the working efficiency is high. Because the sanitary rotor pump with a vertical structure takes less space, this type of structure will also be selected in a specific working environment.

A卧式卫生转子泵 A Horizontal sanitary rotor pump

B立式卫生转子泵 B Vertical sanitary rotor pump

卫生转子泵的特点

Features of sanitary rotor pump

1、卫生安全

转子的流线结构和泵体内腔平整光滑无残留死角。

转子与轴两端有O型圈密封，有效防止物料渗入轴与轴孔的间隙。

与物料接触的零部件，均采用符合卫生标准的不锈钢材料制作，密封橡胶采用无毒橡胶。

泵体部分与齿轮箱部分之间有机械密封和油封，油渍不会渗透或飞溅到泵腔内部，保证介质卫生、安全的输送。

1. Sanitary and safe

The streamlined structure of the rotor and the pump body cavity are flat and smooth without any dead corner of residues.

There are O-ring seals at both ends of the rotor and shaft to effectively prevent materials from entering the gap between the shaft and shaft hole.

The parts contacting the materials are made of stainless steel that meets hygienic standards, and the sealing rubber is non-toxic rubber.

There is a mechanical seal and an oil seal between the pump body and gear box, and the oil stain will not enter or splash into the pump chamber to ensure sanitary and safe transportation of media.

2、使用寿命长

在使用过程中，卫生转子泵的转子与转子间和转子与泵腔间没有硬性的碰撞和金属摩擦，提高了使用寿命。

由于制造精度高，所以震动小，运行平稳，密封件的使用寿命也相应增长。

采购一线品牌的重载轴承，精磨斜齿轮热处理加工，寿命长、噪音低。

2. Long service life

During the use, there is no hard collision and metal friction between rotors and between the rotor and pump chamber of the rotor pump, so as to improve the service life.

Due to high manufacturing precision, the vibration is small, the operation is stable, and the service life of the seal is increased correspondingly.

Heavy-duty bearings of first-line brands are purchased and helical gears are subject to fine grinding and heat treatment to achieve long life and low noise.

3、应用范围广

对运输介质的剪切力小，转子转速一般在40-400r/min。卫生转子泵能输送粘度域较宽的介质，可输送粘度高达200万CP的流体。

由于2个转子间有合理的间隙设计，能使输送介质中的悬浮液、固体颗粒、易结晶的流体通过间隙安全的输送。

配置变频器后，可以调节流量，并可做一般计量泵使用。

移动式泵可以抽吸各种桶装物料，吸入真空度达-0.08MPa。

3. Wide application range

The shearing force on the conveyed media is small, and the rotor rotation speed is generally 40-400r/min. The sanitary rotor pump can convey media with a wide range of viscosities as well as fluids with viscosities up to 2 million CP.

Due to the reasonable gap design between the two rotors, the suspension, solid particles and easily crystallized fluids in the conveyed media can be safely transported through the gap.

After equipped with a frequency converter, it can realize control of flow rate and can serve as a common metering pump.

The mobile pump can pump a variety of barreled materials with a suction vacuum of -0.08MPa.

4、高效节能环保

实践证明，卫生转子泵所消耗功率相当于一般同类泵的50%-70%，节省了社会能源。

卫生转子泵的转子与转子及泵腔的间隙小，即使输送低粘度的流体，产生的回流量也小（回流量大小与间隙成正比），使泵的流量更平稳，效率更高，吸力更好。

4. Highly efficient, energy saving and environment-friendly

Practice has proved that the power consumption of the sanitary rotor pump is equivalent to 50%-70% of that of other pumps of its kind, saving social energy.

The gap between rotors and between the rotor and pump chamber of the sanitary rotor pump is small. Even if fluids of low viscosity are conveyed, the return flow generated is small (the return flow is proportional to the gap), which makes the pump flow more stable, the efficiency higher and the suction force better.

安装要求

Installation requirements

1、进料端管道内径必须大于转子泵进口口径1号，出料端管道内径必须等于或大于转子泵出口内径。

1. The inner diameter of the inlet pipe must be one size larger than the inlet diameter of the rotor pump. The inner diameter of the outlet pipe must be equal to or larger than the inner diameter of the rotor pump outlet.

2、严禁使用Y型过滤器或管道过滤网，选用过滤器的有效过滤面积应大于泵进口口径2倍以上。

2. It is strictly forbidden to use a Y type filter or pipeline filter. The effective filtration area of the filter should be more than 2 times larger than the inlet diameter of the pump.

3、泵进口水平安装距离3米以内，严禁安装使用民用球阀（稳定性差、阀芯通径太小）。

3. The horizontal installation distance of the pump inlet is within 3 meters. It is strictly forbidden to install and use a civil ball valve (its stability is poor and its plug diameter is too small).

卫生转子泵的排量 Displacement of sanitary rotor pump

卫生转子泵的排量是指泵中的两个传动轴带动两个转子旋转一周所输出的介质的体积，常用ml/r、L/r等单位表示。卫生转子泵的排量取决于其内部封闭腔的几何体积，装不同形状转子的泵内部结构尺寸有所不同，因此排量也有所差别。

The displacement of the sanitary rotor pump refers to the volume of the media discharged after the two transmission shafts in the pump drive the two rotors to rotate for one cycle, which is usually expressed in such units as ml/r, L/r, etc. The displacement of the sanitary rotor pump depends on the geometric volume of the internal closed cavity. The internal structural sizes of pumps installed with different shapes of rotors are different, so the displacement is also different.

卫生转子泵的流量 Flow rate of sanitary rotor pump

1、理论流量

理论流量是指卫生转子泵在工作过程中，不考虑泄露损失的情况下，在单位时间内输送的介质体积。即：

理论流量=排量X转速X时间

2、实际流量

实际流量是指卫生转子泵在工作过程中考虑到泄露损失，即容积效率。一般容积效率在80%-90%。

实际流量=理论流量X容积效率

1. Theoretical flow rate

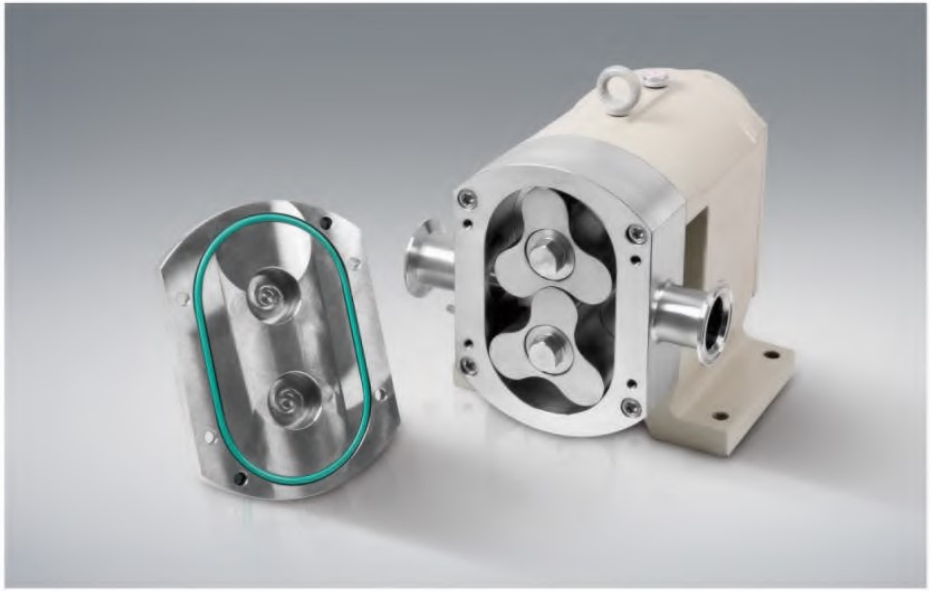
The theoretical flow rate refers to the volume of the media conveyed in unit time during the working process of the sanitary rotor pump without considering the leakage loss, which is:

Theoretical flow rate = displacement X rotation speed X time

2. Actual flow rate

The actual flow rate refers to the value calculated after considering the leakage loss during the working process of the sanitary pump. Generally, the volumetric efficiency is between 80% and 90%.

Actual flow rate = theoretical flow rate X volumetric efficiency



转子叶数选择参照
Rotor Vane Quantity Selection Reference

单叶转子 Single impeller

适用于输送含有大颗粒的物料，其独特的形状和曲线使其在输送过程中有效避免物料中颗粒的损坏。缺点是出口流量脉动较大，压力低。

It is suitable for conveying materials containing large particles. Its unique shape and curve allow it to effectively avoid damage to particles in the material during transportation. The disadvantage is that the outlet flow rate pulsation is high and the pressure is low.

腰轮转子 Paddle wheel rotor

适用于输送较大颗粒的物料，破碎率低，出口流量脉动比单叶小，压力较低。

It is suitable for conveying large particles. The breaking rate is low, the outlet flow rate pulsation is smaller than that of a single-vane product, and the pressure is lower.

蝶形转子 Butterfly rotor

适用于输送馅料类含中小颗粒的物料，破碎率较低，出口流量脉动较小，压力高。

It is suitable for conveying filling materials containing medium and small particles. The breaking rate is low, the outlet flow pulsation is small, and the pressure is high.

三叶转子 Tri - impeller

通用性能最广的一种转子，排量高于所有转子。对颗粒物料有一定的破碎率。

As one of the most versatile rotors, its displacement is higher than that of other rotors. There is a certain breaking rate of granular materials.

多叶转子 Multi - impeller

转子随着叶片的增加，其排量会减小。但输送物料的稳定性也随着叶数的增加而增加。对物料颗粒有较大的破损率。

With the increase of the blade of the rotor, its displacement will decrease. However, the stability of the conveyed material also increases with the increase of the number of blades. There is a high breaking rate of the material particles.

驱动配置 Driving configuration

配普通无极减速机 Equipped with ordinary stepless reducer

主要特点：调速范围大（转速在200–1000之间任意调节），可连续工作运行，性能稳定，流量调节精度高。缺点是需要手动调节转速，调速必须在运行中进行，不宜用在高负荷的工作环境里。

Main features: wide speed control range (the rotation speed can be freely adjusted within 200-1000), continuous operation, stable performance and high flow rate adjustment accuracy. The disadvantage is that the rotation speed needs to be adjusted manually, speed adjustment must be carried out during operation and it is not suitable for use in heavy-load working environments.

配一级无极减速机 Equipped with primary stepless reducer

主要特点：调速范围为40–500转/分，与普通无极减速机相比，在同样的功率条件下，其输出扭矩更大，传动更加平稳，性能更加稳定。缺点是需要手动调节转速，调速必须在运行中进行，不宜用在高负荷的工作环境里。

Main features: speed control range 40-500rpm. Compared with the ordinary stepless reducer, its output torque is greater, driving is more steady and performance is more stable under the same power condition. The disadvantage is that the rotation speed needs to be adjusted manually, speed adjustment must be carried out during operation and it is not suitable for use in heavy-load working environments.

配齿轮减速机 Equipped with gear reducer

主要特点：承载能力强，传动方式简单，使用寿命长。在输送高粘度物料的情况下，优势比较明显。若采用变频电机配套变频器，可实现流量自动调节。

Main features: strong carrying capacity, simple transmission and long service life. In the case of conveying materials of high viscosity, the advantages are obvious. If the variable frequency motor is used with the inverter, the flow can be automatically adjusted.

变频控制 Variable frequency control

主要特点：通过变频器或数字化控制，实现物料的定量、定时、定压输送，可做一般计量泵使用。

Main features: Through the frequency converter or digital control, the materials can be conveyed in a quantitative, timed manner at fixed pressure. It can be used as a common metering pump.

驱动配置 Driving configuration

上进下出型 Upward incoming and downward outgoing type

主要特点：针对一些流动性较差的物料输送，或现场使用空间有限的情况下使用。

Main features: It is used for conveying some materials of low fluidity or used when the space available for use at the site is limited.

V型口进料型 V port feeding type

主要特点：增大进料口的口径，防止进口堵塞，适合物料流动性极差、粘度极高的工况使用。

Main features: The size of the feeding port is increased to avoid blocking at the inlet. It is suitable for use in service conditions where the materials have very poor fluidity and very high viscosity.

加装安全阀型 Installed with safety valve

主要特点：防止泵出口堵塞，导致憋压损坏泵。加装安全阀，泄压回流，对泵和管道的一种保护。

Main features: It avoids blocking at the outlet of the pump, which may cause damage to the pump. The safety valve installed can provide protection for the pump and pipe through pressure relief and return flow.

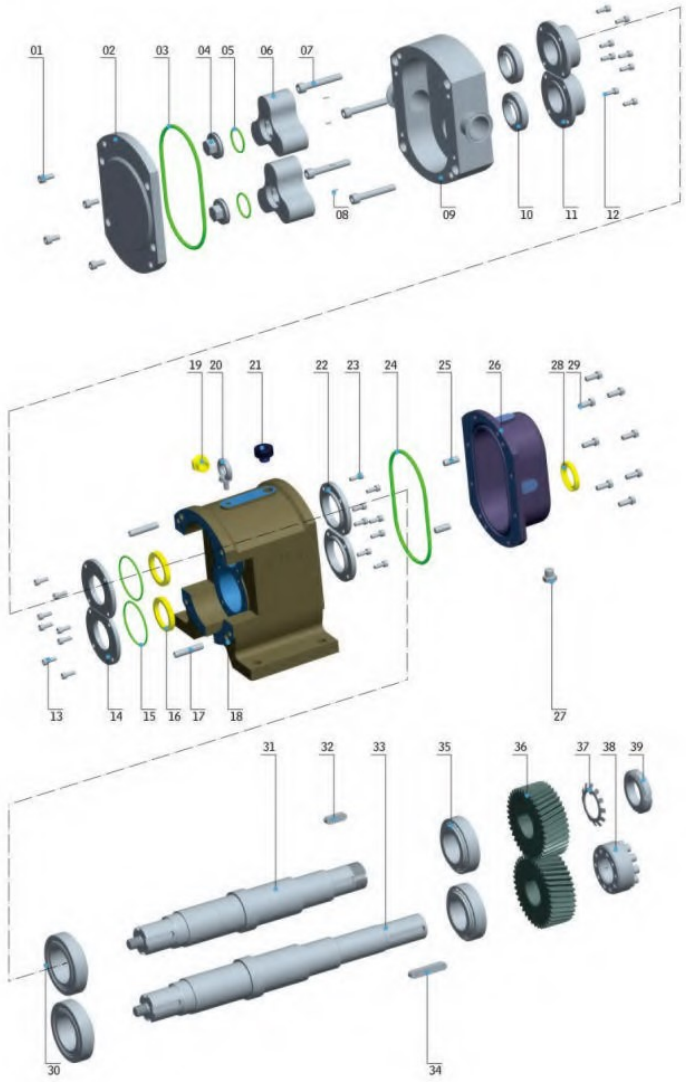
加装推车和护罩型 Installed with trolley and protective cover

主要特点：应用于非指定物料场合，根据要求定做。

Main features: It is applied in applications of non-specified materials. It can be customized according to requirements.

卫生转子泵泵头结构及零件明细
Sanitary rotor pump head structure and description of parts

示例 For Example



卫生转子泵泵头主要由两个相同的转子、两个传动轴、泵体和齿轮箱等零件组成。

The sanitary rotor pump head is mainly composed of two same rotors, two driving shafts, pump body, gear box, etc.

零件明细 Description of parts

序号 No.	名称 Name	材料 Material	数量 Quantity
1	泵盖锁紧螺钉 Pump cover lock screw	304	4-8
2	泵盖 Pump cover	304/316L	1
3	泵盖O型圈 Pump cover O ring	氟/硅胶/四氟 Fluorine/silica gel/ tetrafluorine	1
4	转子锁紧螺帽 Rotor locking nut	304/316L	2
5	转子锁紧螺帽O型圈 Rotor locking nut O ring	氟/硅胶/四氟 Fluorine/silica gel/ tetrafluorine	2
6	转子 Rotor	304/316L	2
7	泵头锁紧螺钉 Pump head lock screw	304	4-8
8	转子定位销 Rotor locating pin	304/316L	4
9	泵头 Pump head	304/316L	1
10	机械密封动环 Mechanical seal dynamic ring	304/316L	2
11	机械密封静环 Mechanical seal static ring	304/316L	2
12	机械密封锁紧螺钉 Mechanical seal lock screw	304	8
13	前轴承盖板锁紧螺钉 Front bearing cover plate lock screw	304	8
14	前轴承盖板 Front bearing cover plate	QT250	2
15	前轴承盖板O型圈 Front bearing cover plate O ring	丁腈 Nitrile	2
16	骨架油封 Framework oil seal		2
17	泵头定位销 Pump head locating pin	431	2
18	齿轮箱体 Gear box	QT250	1
19	油镜 Oil immersion lens		1
20	泵头吊装环 Pump head hoisting ring		1

零件明细 Description of parts

序号 No.	名称 Name	材料 Material	数量 Quantity
21	通气帽 Ventilation cap		1
22	后轴承盖板 Rear bearing cover plate	QT250	2
23	后轴承盖板锁紧螺钉 Rear bearing cover plate lock screw	304	8
24	齿轮箱盖板O型圈 Gear box cover plate O ring	丁腈 Nitrile	1
25	齿轮箱盖板定位销 Gear box cover plate locating pin	431	2
26	齿轮箱盖板 Gear box cover plate	QT250	1
27	油塞 Oil plug		1
28	骨架油封 Framework oil seal		1
29	齿轮箱盖板螺钉 Gear box cover plate screw	304	8
30	前重载轴承 Front heavy-duty bearing		2
31	副轴 Auxiliary shaft	304/316L/431	1
32	副轴平键 Auxiliary shaft flat key		1
33	主轴 Spindle	304/316L/431	1
34	驱动平键 Driving flat key		1
35	后重载轴承 Rear heavy-duty bearing		2
36	斜齿轮 Helical gear		2
37	圆螺母垫圈 Round nut washer		1
38	账套 Expansion sleeve		1
39	圆螺母 Round nut		1

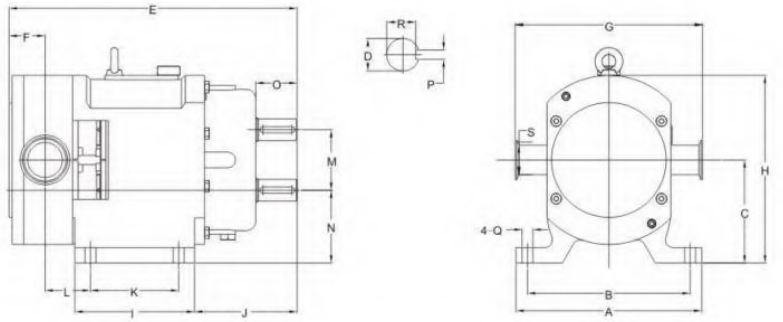
性能选型表 Performance selection table

型号 Model	排量(L/r) Displacement	转速(r/min) Rotation speed	对应流量(L/H) Corresponding flow rate	功率(Kw) Power	压力(Mpa) Pressure	最高粘度(CP) Maximum viscosity	标准口径(mm) Standard size	接口形式 Connector form
QLP-5	0.05	40-500	120-1500	0.55-0.75	0.1-1.2	200万	Φ25	
QLP-10	0.10	40-500	240-3000	1.5	0.1-1.2	200万	Φ32	
QLP-15	0.15	40-500	320-4000	1.5-2.2	0.1-1.2	200万	Φ32	
QLP-20	0.20	40-500	480-5400	1.5-3	0.1-1.2	200万	Φ32	
QLP-35	0.35	40-450	840-9450	2.2-4	0.1-1.2	200万	Φ51	
QLP-45	0.45	40-450	950-10500	4	0.1-1.2	200万	Φ51	卡箍 (Olamp)
QLP-65	0.65	40-400	1560-14000	5.5-7.5	0.1-1.2	200万	Φ63	螺纹 (Thread)
QLP-80	0.80	40-400	1750-17000	5.5-7.5	0.1-1.2	200万	Φ63	
QLP-110	1.1	40-400	2400-23500	7.5-11	0.1-1.2	200万	Φ76	法兰 (Flang)
QLP-175	1.75	40-400	3800-37800	11-15	0.1-1.2	200万	Φ76	
QLP-220	2.2	40-400	4750-47500	15-18.5	0.1-1.2	200万	Φ89	
QLP-270	2.7	40-400	5800-58000	18.5-22	0.1-1.2	200万	Φ89	
QLP-365	3.65	40-400	7900-78500	22-30	0.1-1.2	200万	Φ102	
QLP-520	5.2	40-400	11300-110000	37-55	0.1-1.2	200万	Φ102	

注：对应流量按容积0.9所得，表中的“功率”，可能会因为介质的粘度与出口压力的不同而变动。

Note: The corresponding flow rate can be obtained according to volume 0.9. The “power” in the table may vary according to different medium viscosity and outlet pressure.

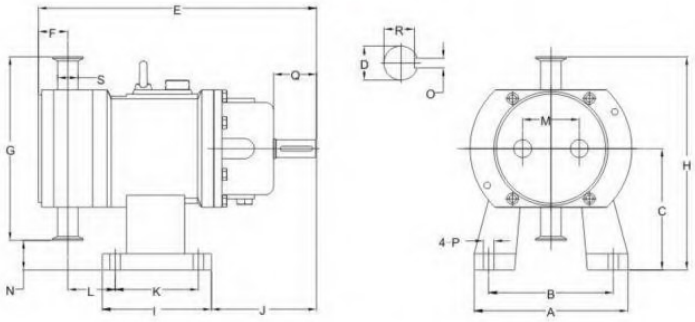
卧式卫生转子泵外形尺寸 Outline dimensions of horizontal sanitary rotor pump



技术参数 Technical parameters

型号 Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
QLP-5	174	140	94	17	267	31.5	179	169	103	110	68	40	48	70	43	5	14	14.2	25
QLP-10	174	140	94	17	280	40	179	169	103	110	68	45	48	70	43	5	14	14.2	32
QLP-15	220	185	119	22	344	36.5	227	219	144	130	108	52	70	84	53	6	14	18.5	32
QLP-20	220	185	119	22	347	39	227	219	144	130	108	52	70	84	53	6	14	18.5	32
QLP-35	240	210	133	28	372	46.5	242	242	155	132	114	59	78	94	54	8	18	23	51
QLP-45	240	210	133	28	385	52	242	242	155	132	114	66	78	94	54	8	18	23	51
QLP-65	284	246	158	38	451	52	290	300	175	177	125	72	97.5	109	83	10	18	33	63
QLP-80	284	246	158	38	465	61	290	300	175	177	125	76	97.5	109	83	10	18	33	63
QLP-110	310	270	202	46	484	59	342	372	178	170	128	102	125	139	72	14	18	41	76
QLP-175	338	300	207	50	538	62	412	399	198	190	155	110	135	140	85	14	18	44.5	76
QLP-220	338	300	207	50	556	71	412	399	198	190	155	118.5	135	140	85	14	18	44.5	89
QLP-270	372	334	224	60	609	70	442	435	244	227	188	151	152	148	85	18	18	53	89
QLP-365	372	334	224	60	634	84	442	435	244	227	188	162	158	148	85	18	18	53	102
QLP-520	400	350	285	70	719	86	512	555	220	262	170	176	196	187	115	20	20	62	102

立式卫生转子泵外形尺寸 Outline dimensions of vertical sanitary rotor pump



技术参数 Technical parameters

型号 Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
QLP-5	160	120	130	17	267	31.5	179	209	120	110	90	40.5	48	30	5	14	43	14.2	25
QLP-10	160	120	130	17	280	40	179	209	120	110	90	46	48	30	5	14	43	14.2	32
QLP-15	190	154	150	22	344	36.5	227	264	135	130	103	58	70	36.5	6	14	53	18.5	32
QLP-20	190	154	150	22	347	39	227	264	135	130	103	59	70	36.5	6	14	53	18.5	32
QLP-35	210	170	160	28	372	46.5	242	281	145	133	115	65	78	39	8	18	54	23	51
QLP-45	210	170	160	28	385	52	242	281	145	133	115	71	78	39	8	18	54	23	51
QLP-65	280	230	210	38	451	52	290	355	178	178	138	63	97.5	65	10	18	83	33	63
QLP-80	280	230	210	38	465	61	290	355	178	178	138	67	97.5	65	10	18	83	33	63
QLP-110	310	260	250	46	484	59	342	422	185	170	135	95	125	80	14	18	72	41	76
QLP-175	340	290	300	50	538	62	412	502	200	190	150	111	135	90	14	18	85	44.5	76
QLP-220	340	290	300	50	556	71	412	502	200	190	150	120	135	90	14	18	85	44.5	89
QLP-270	370	320	350	60	609	70	442	542	244	227	188	151	152	100	18	18	85	53	89
QLP-365	370	320	350	60	634	84	442	542	244	227	188	162	158	100	18	18	85	53	102
QLP-520	400	350	350	70	719	86	512	615	220	262	170	176	196	103	115	20	20	62	102

YAR应用领域 Applications

应用领域 Applications	分类 Classification
食品 Foods	牛奶、酸奶、蜂蜜 、饴糖、麦芽糖浆、果脯糖浆、三氯蔗糖脂、巧克力、冰淇淋、果酱、花生酱、芝麻酱、番茄酱、大豆蛋白溶液、玉米油、奶油、奶酪、黄油、蛋液、面浆、豆乳、酵母等。 Milk, yogurt, honey, caramel, malt syrup, fruit syrup, sucralose butter,chocolate, ice cream, jam, peanut butter, sesame paste, tomato sauce, soy protein solution, corn oil, butter, cheese, butter, egg liquid, batter, soybean milk, yeast, etc.
日用化工 Daily Chemical Industry	AES、AEO2、AOS、LAS、K12、APG、甘油、山梨醇、洁面膏、洗面奶、洗发精、洗洁精、洗手液、沐浴露、护肤霜、牙膏、肥皂剂、洗衣液，洗衣粉料浆等。 AES, AEO2, AOS, LAS, K12,APG, Glycerin, sorbitol, cleansing cream, facial cleanser, shampoo, detergent, hand sanitizer, shampoo, skin cream, toothpaste, soap, laundry detergent, washing powder slurry, etc.
精细化工 Fine Chemical Industry	染料、颜料、化工助剂、印染助剂、皮革助剂、硅油、粘胶剂、皮革油、白乳胶等。 Dyes, pigments, chemical additives, printing and dyeing auxiliaries, leather auxiliaries, silicone oil, adhesive, white latex, leather oil, etc.
石油化工 Petrochemical Industry	稠油、重油、沥青、油脂、润滑油、多元醇、乙氰酸酯等。 Heavy oil, heavy oil, bitumen, oil, lubricating oil, polyols, b cyanate ester, etc.
涂料 Coating	油漆、涂料、油墨、绝缘漆、树脂、助剂、有机溶剂等。 Paint, coating, ink, varnish, resin, additives, organic solvents, etc.
化纤 Chemical fiber	粘胶、浆粥、PVA、维纶浆料、腈纶浆料、胺纶浆料、涤纶、丙纶、人造纤维、功能纤维等。 Viscose, porridge, PVA, Whalen pulp, acrylic,nylon, polyester, polypropylene paste, artificial fiber, functional fiber,etc.
造纸 Paper making	聚丙烯酰胺、碳酸钙、淀粉胶、丙苯胶乳、松香、松香胶、纸浆、干强剂、施胶剂、消泡剂、AKD等。 Polyacrylamide, calcium carbonate, starch gum rosin and rosin, propyl benzene latex, rubber, paper, dry strength agent, sizing agent, defoaming agent, AKD etc.
制药 Pharmacy	植物提取素、甘油、药膏、浸膏、药乳液、药剂等。 Plant extract, glycerin, ointment, extract,emulsion, reagents, etc.

常见介质的粘度资料及数据参考表
Common medium viscosity information and data reference table

粘度测量单位常用的有厘泊cP，泊 P 等，其换算过程：

1厘泊(1cP)=1毫帕斯卡.秒(1mPa.s)　　100厘泊(100cP)=1泊(1P)

1000毫帕斯卡.秒(1000mPa.s)=1帕斯卡.秒(1Pa.s)

The commonly used viscosity measurement units include cP, P, etc. with the conversion as follows:

1cP=1mPa.s　　100cP=1P

1000mPa.s=1Pa.s

液体介质 Liquid medium	绝对粘度(cP) Absolute viscosity	温度（℃） Temperature
水 Water	1	20
空气 Air	0.0178	20
酒精 Alcohol	1.2	20
四氯化碳 Carbon tetrachloride	0.9	20
苯 Benzene	0.6	20
乙醚 Ether	0.2	20
酸奶 Yogurt	152	40
鸡蛋 Eggs	150	4
牛奶 Milk	3	18
乳清48%糖 Whey 48% sugar	180-1500	38
奶油30%脂肪 Cream 30% fat	14	16
奶油40%脂肪 Cream 40% fat	48	16
奶油50%脂肪 Cream 50% fat	112	16
奶油50%脂肪 Cream 50% fat	55	32
啤酒 Beer	1.1	4.5
巧克力 Chocolate	17000	49
巧克力 Chocolate	25000	21
巧克力奶 Chocolate milk	280	49
葡萄糖 Glucose	4300-8600	75-85
果汁 Fruit juice	55-75	19
蜂蜜 Honey	10000	21
糖蜜 Molasses	1760	20
梨浆 Pear pulp	4000	70
浓缩桔汁 30Brix Concentrated orange juice 30Brix	630	21
浓缩桔汁 30Brix Concentrated orange juice 30Brix	91	79
浓缩桔汁 50Brix Concentrated orange juice 50Brix	2410	21
色拉酱 Salad dressing	1300-2600	19

液体介质 Liquid medium	绝对粘度(cP) Absolute viscosity	温度（℃） Temperature
番茄酱 Ketchup	50000	21
西红柿膏30% Tomato cream 30%	195	19
酵母浆 Yeast pulp	20	19
食用油 Edible oil	65	21
止咳糖浆 Cough syrup	190	29
洗涤剂 Detergent	1470	20
面霜 Cream	10000	21
头油 Hair oil	5000	21
乳液 Emulsion	200	21
香波 Shampoo	3000	35
皂液 Soap	82	60
纸胶水 Paper glue	3000	22
甘油 Glycerin	1500	20
半转化糖浆 Semi-inverted syrup	2400	20
180#重油 180# heavy oil	180	20
酸奶油 Sour cream	15200	20
嘉实多机油 Castrol oil	1000	21
工业糖浆 Industrial syrup	5000	21
芥末 Mustard	70000	21
乳膏 Cream	100000	21
花生酱 Peanut butter	250000	21
明胶 Gelatin	500	71
人造奶油 Margarine	3000	29
农场奶酪 Farm cheese	900	21
洗发水 Shampoo	5000	21
花生油 Peanut oil	1000	21
豌豆蛋白 Pea protein	10000	35

注：表中数据仅供参考，如要求特别严格，请按照实际情况来界定。

Note: The data in the table are only for reference. If the requirements are particularly strict, please define it according to the actual situation.

食品外径管件与配件的损失摩擦表
Loss and friction table of food outside diameter pipes and pipe fittings

在$m^3/hr.$的容量 Volume at $m^3/hr.$	在外径管件尺寸 Size at outside diameter pipe																	
	1"			1-1/2"			2"			2-1/2"			3"			4"		
	管件 Pipe	弯管 Bend	三通 Tee	管件 Pipe	弯管 Bend	三通 Tee	管件 Pipe	弯管 Bend	三通 Tee	管件 Pipe	弯管 Bend	三通 Tee	管件 Pipe	弯管 Bend	三通 Tee	管件 Pipe	弯管 Bend	三通 Tee
0.5	0.01	0.003	0.030															
1.0	0.025	0.006	0.061															
1.1	0.035	0.008	0.076															
2.3	0.12	0.018	0.021	0.02	0.003	0.045	0.005	0.005	0.030									
3.4	0.25	0.030	0.242	0.04	0.006	0.076	0.013	0.006	0.045									
4.5	0.43	0.067	0.455	0.06	0.009	0.091	0.02	0.008	0.061	0.005	0.006	0.030	0.003	0.006	0.018			
5.7	0.66	0.021	0.697	0.08	0.012	0.121	0.025	0.009	0.076	0.006	0.009	0.045	0.004	0.009	0.024			
6.8	0.93	0.212	1.000	0.105	0.018	0.167	0.035	0.015	0.091	0.008	0.015	0.061	0.005	0.012	0.030			
8.0	1.22	0.379	1.576	0.135	0.027	0.242	0.04	0.018	0.121	0.011	0.018	0.076	0.006	0.015	0.039			
9.1				0.17	0.033	0.303	0.05	0.024	0.152	0.015	0.021	0.091	0.007	0.018	0.045			
10.2				0.21	0.048	0.394	0.063	0.030	0.182	0.02	0.027	0.106	0.008	0.020	0.055			
11.4				0.25	0.061	0.485	0.073	0.036	0.212	0.022	0.030	0.121	0.01	0.021	0.061			
13.6				0.34	0.106	0.667	0.1	0.055	0.273	0.03	0.036	0.136	0.015	0.024	0.076			
18.2				0.57	0.230	1.121	0.16	0.091	0.455	0.05	0.045	0.167	0.02	0.030	0.121			
22.7				0.85	0.409	1.758	0.23	0.133	0.697	0.075	0.055	0.182	0.03	0.033	0.152	0.008	0.012	0.030
27.3				1.18	0.621	2.758	0.32	0.194	1.000	0.105	0.064	0.303	0.04	0.039	0.182	0.01	0.015	0.045
31.8							0.42	0.258	1.364	0.14	0.070	0.379	0.05	0.048	0.242	0.013	0.018	0.061
36.4							0.54	0.342	1.758	0.17	0.085	0.485	0.07	0.061	0.333	0.015	0.021	0.076
40.9							0.67	0.439	2.242	0.205	0.094	0.606	0.08	0.064	0.394	0.02	0.024	0.091
45.5							0.81	0.552	2.727	0.245	0.106	0.758	0.1	0.079	0.485	0.025	0.027	0.121
50.5							0.95	0.673	3.333	0.29	0.124	0.909	0.12	0.091	0.576	0.028	0.030	0.152
54.5										0.39	0.161	1.364	0.165	0.118	0.758	0.04	0.035	0.182
63.6										0.45	0.185	1.606	0.19	0.127	0.848	0.045	0.036	0.197
68.2										0.515	0.212	1.879	0.22	0.152	0.939	0.05	0.039	0.212
79.5										0.68	0.318	2.576	0.28	0.203	1.242	0.07	0.045	0.273
90.9										0.86	0.470	3.333	0.36	0.267	1.576	0.85	0.055	0.364
102.3										1.05	0.682	4.091	0.44	0.333	2.000	0.105	0.061	0.455
113.6													0.54	0.424	2.424	0.13	0.070	0.530
125.0													0.64	0.515	2.879	0.15	0.082	0.636
136.4													0.75	0.621	3.091	0.175	0.091	0.758
147.7													0.87	0.730	3.939	0.2	0.103	0.848
159.1													1.0	0.848	4.545	0.23	0.121	1.030
170.5																0.26	0.130	1.152
181.8																0.3	0.152	1.333
193.2																0.33	0.170	1.515
204.5																0.37	0.188	1.727
215.9																0.41	0.212	1.909
227.3																0.45	0.242	2.121
250.0																0.53	0.321	2.606

注：上列表格为显示因摩擦的损失。

Note: The above table shows the loss caused by friction.

密封件物理特性表
Physical properties table of seals

物理特性 Physical Characteristics	三元乙丙橡胶 EPDM/70±5	硅橡胶 VMQ/±5	氢化丁腈橡胶 HNBR/70±5	氟化橡胶 FPM/70±5	聚四氟乙烯 PTFE
延伸性 Strength	良好 Good	极好 Excellent	良好 Good	良好 Good	极好 Excellent
电气性 Electric	极好 Excellent	极好 Excellent	不足 Insufficient	良好 Good	极好 Excellent
耐臭氧 Ozone	极好 Excellent	极好 Excellent	不足 Insufficient	极好 Excellent	极好 Excellent
耐热 Hot	极好 Excellent	极好 Excellent	良好 Good	极好 Excellent	极好 Excellent
耐寒 Cold	良好 Good	极好 Excellent	良好 Good	良好 Good	尚可 OK
耐蒸汽 Steam	良好 Good	不足 Insufficient	不足 Insufficient	不足 Insufficient	极好 Excellent
剪切强度 Cutting Intensity	良好 Good	良好 Good	良好 Good	尚可 OK	极好 Excellent
耐磨性 Grind	良好 Good	良好 Good	良好 Good	良好 Good	极好 Excellent
耐酸性 Acid	良好 Good	不足 Insufficient	良好 Good	良好 Good	极好 Excellent
抗石油溶剂制品 Oil Impregrant	无此特性 Without	不足 Insufficient	良好 Good	极好 Excellent	极好 Excellent
耐明火 Bright Fire	不足 Insufficient	不足 Insufficient	不足 Insufficient	良好 Good	极好 Excellent
耐植物油 Plant Oil	不足 Insufficient	良好 Good	极好 Excellent	极好 Excellent	极好 Excellent
抗氧化 Oxidation	极好 Excellent	极好 Excellent	不足 Insufficient	极好 Excellent	极好 Excellent
阀压试验 Valve Pressure	良好 Good	极好 Excellent	良好 Good	良好 Good	
蒸汽消毒 Steam Disinfeceion	良好 Good	良好 Good	不足 Insufficient	良好（循环） Good Circle	

各类密封材质主要特性
Main features of various seal materials

EPDM 橡胶（三元乙丙橡胶）

EPDM橡胶对大部分食品都稳定，因此广泛用于食品工业。另一个优点是它可以使用的推荐温度为140℃(244℉)。但也存在一个限制，EPDM不耐有机油、无机油和脂肪。耐臭氧性极优。

EPDM Rubber(Ethylene Propylene)

EPDM rubber is widely used within the food industry as it is resistant to most products used in this sector. Another advantage is that it may be used to a recommend max, temperatures of 140℃ (244℉). However,there is one essential limitation, EPDM is not resistant to organic and non-organic oils and fats. The resistance to ozone is excellent.

硅橡胶，Q

硅橡胶最显著的品质特点是它能够应用的温度为-50℃(-58℉)到大约+180℃(356℉)，而且仍然能够保持其弹性。化学稳定性可满足大多数产品的要求。但是，纯碱液和酸以及热水和蒸汽可能会损坏硅橡胶。耐臭氧性好。

Silicone Rubber , Q

The most significant quality of silicon rubber is that it can be applied from temperatures below -50℃ (-58) to approx. +180℃ (356℉) and still keep its elasticity. The chemical resistance is satisfactory to most products. However, undiluted lye and acids as well as hot water and steam may destroy silicone rubber. The resistance to ozone is good.

丁腈橡胶，NBR

NBR是一种经常用于技术用途的橡胶类型。它对大多数碳氢化合物(例如：油、油脂和脂肪)都非常稳定，对于稀碱和硝酸也十分稳定，它可以使用的推荐最高温度是95℃(203℉)。由于NBR会被臭氧破坏，因此它不能暴露于紫外线下应该避光保存。

Acrylonitrile Butadiene Rubber, NBR

NBR is the rubber type most frequently used for technical purposes. It is quite resistant to most hydrocarbons, e.g oil, grease and fat, It is sufficiently resistant to diluted lye and nitric acid and may be used to a recommend max. 95℃(203℉). As NBR is attacked by ozone it may not be exposed to ultraviolet rays and should thus consequently be stored so that this is avoided.

氟化橡胶，FPM

在其他类型的橡胶不适合时，尤其是在高达180℃(356℉)的高温时，通常会使用FPM。对于大多数产品的化学稳定性都很好，但是应该避免热水、蒸汽、碱液、酸和酒精。耐臭氧性好。

Fluorine Rubber, FPM

FPM is often used when other rubber types are unsuited, especially at high temperatures up to approx. 180℃ (356℉). The chemical resistance is good to most products, however hot water, steam, lye, acid and alcohol should be avoided. The resistance to ozone is good. Hydrogenated actylonitrile Butadiene Rubber.

PTFE对各类化学制剂有良好耐受性

工作温度：-25℃至250℃

PTFE has excellent tolerance propety to all kinds of chemical reagent.

temperature of work:-25℃～250℃