

ZW系列自吸式无堵塞排污泵

ZW Series Self-suction Type Non-clogging Sewage Pump



ZW SERIES SELF-SUCTION TYPE NON-CLOGGING SEWAGE PUMP

GENERAL

ZW 系列自吸式无堵塞排污泵是在反复研究国内外同类技术的基础上开发成功的一种结构新颖的产品。

该泵集自吸和无堵塞排污于一体，采用轴向回流外混式，并通过泵体、叶轮流道的独特设计，既可像一般自吸清水泵那样不需要安装底阀和灌引水，又可抽吸含有大颗粒固体和长纤维杂质液体。

该泵与国内同类产品相比，具有结构简单、自吸性能好、排污能力强、高效节能，使用维修方便等特点，在排污泵系列产品中各项技术性能指标居国内领先，达到国际先进水平，具有广阔的应用市场和发展前景。

A new style product successfully developed on the basis of the repeated research on the same know-how of both at home and abroad.

This pump integrates self-suction and non-clogging and uses axial-back flow outside-mixing type and, through the unique design of both pump casing and impeller gear, needs not to mount a foot valve and prime the leading water just like the common self-suction pure water pump and also can pump the liquid containing the solid of big grains and long fiber impurities.

Compared with the same domestic products, this pump features a simple structure, good self-suction performance, strong sewage draining capacity, high efficiency, energy saving and easy use and repair, with every technical performance index of it ranking first nationally among the sewage pump series products and up to the world advanced level, and holds a wide applicable market and progressive future.

RANGE OF APPLICATION

ZW 自吸式无堵塞排污泵可广泛应用于市政排污工程、河塘养殖、轻工、造纸、纺织、食品、化工、电业等行业，是抽吸纤维、浆料和混合悬浮等化工介质最理想的杂质泵。

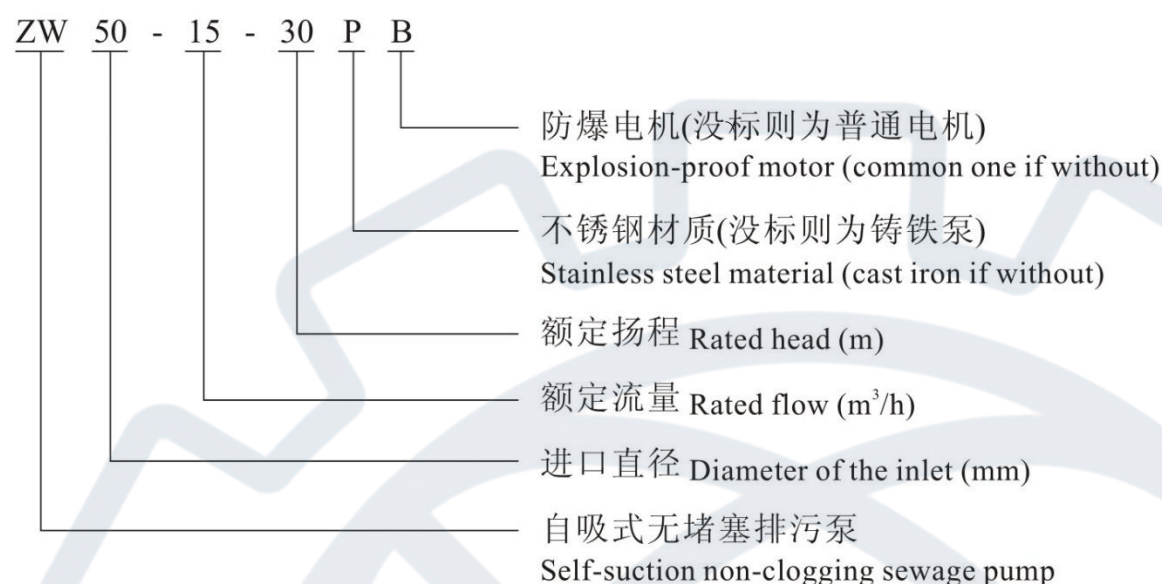
该泵环境温度 $\leq 50^{\circ}\text{C}$ ，介质温度 $\leq 80^{\circ}\text{C}$ 特殊要求可达 200°C ；介质PH值铸铁材质为6-9，不锈钢为2-13；介质重度不超过 1240kg/m^3 ；自吸高度不能超过规定值4.5-5.5米，吸入管长度为 ≤ 10 米；通过能力悬浮颗粒直径为泵口径的60%，纤维长度为泵口径的5倍。

Suitable for the sewage project in the municipal works, river aquaculture, light industry, paper-making, textile, food, chemical industry, power industry etc. and as the most ideal impurity pump to pump fiber, pulpy, mixed and suspended chemical media.

For this pump, the ambient temperature $\leq 50^{\circ}\text{C}$, the medium temperature $\leq 80^{\circ}\text{C}$, which can be up to 200°C in case of a special requirement; as of the PH value of the media, cast iron 6.9, stainless steel 2.13; the medium gravity is not over 1240kg/m^3 ; the self-suction height is not over the set value 4.5-5.5m, the length of suck-in pipe $\leq 10\text{m}$; as of the passing capacity, the suspended grains' diameter is 60% of the pump aperture and the long fiber is 5 times that of the pump aperture.

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MODEL MEANING



ABOUT THE STRUCTURE

ZW 系列自吸式无堵塞排污泵，主要由泵体、叶轮、后盖、机械密封、泵轴、轴承座、进口阀、气液分离管、加水阀门、进、排接管等组成。

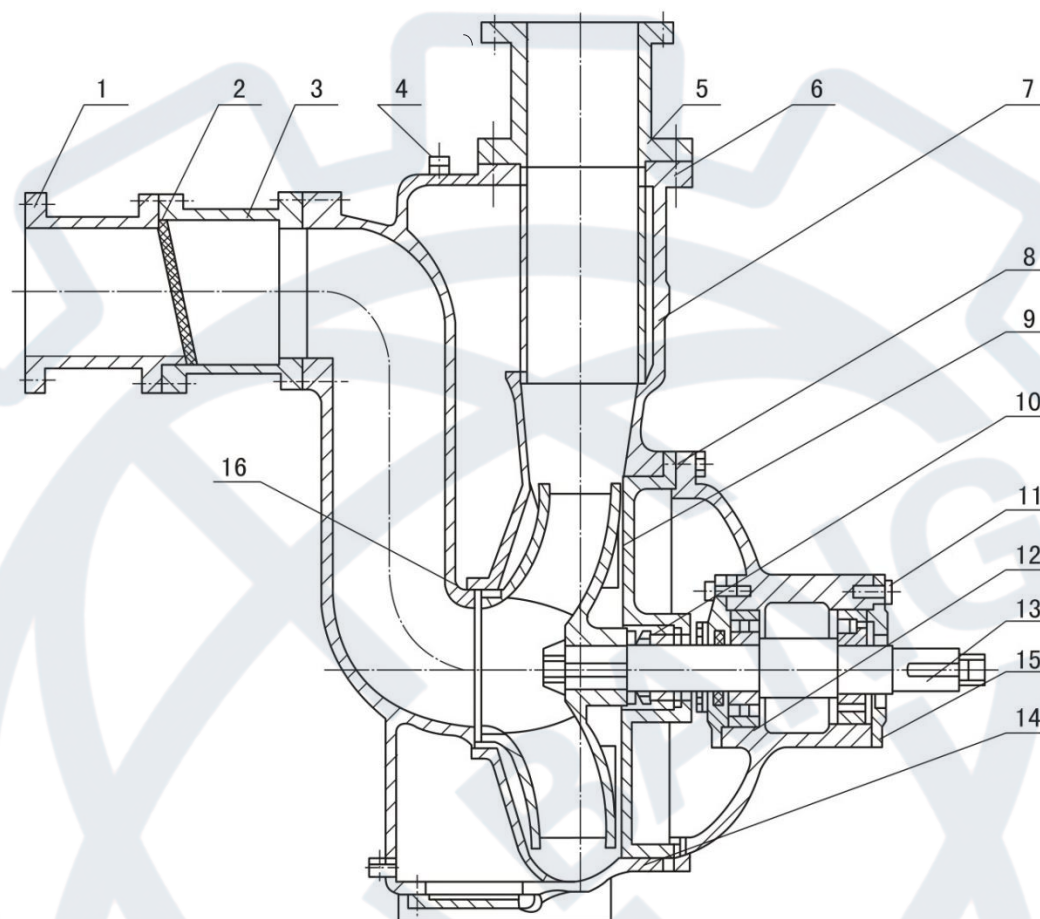
泵体内设有储液腔，并通过上方的回流孔和下方的循环孔与泵工作腔相通，构成泵的轴向回流外混式系统。泵停止工作后，泵内腔已储有一定容积的液体。当泵启动时，泵内的储液在叶轮的作用下，夹带着空气被向上抛出，液体通过气液分离管的网格回流到工作腔，气体被排出泵外，使泵内形成一定的真空度，达到自吸的作用。

This pump consists of pump casing, impeller, rear cover, mechanical seal, shaft, bearing seat, inlet valve, air-liquid separating pipe, water filling valve, inlet and drain-out nipples etc.

A liquid storing cavity is set inside of the pump casing and connected to the working cavity through the back-flow hole on the upper and the cycling hole on the lower to form the axial-back flow outside mixing type system of the pump. Liquid of a certain volume has been stored in the storing cavity after the pump stops working and, under the action of the impeller when the pump starts, is thrown out upwards with air and then flows back to the working cavity through the grids of the air-liquid separating pipe, the air is exhausted out of the pump to have a certain vacuum formed inside of the pump so as to get the self-suction action.

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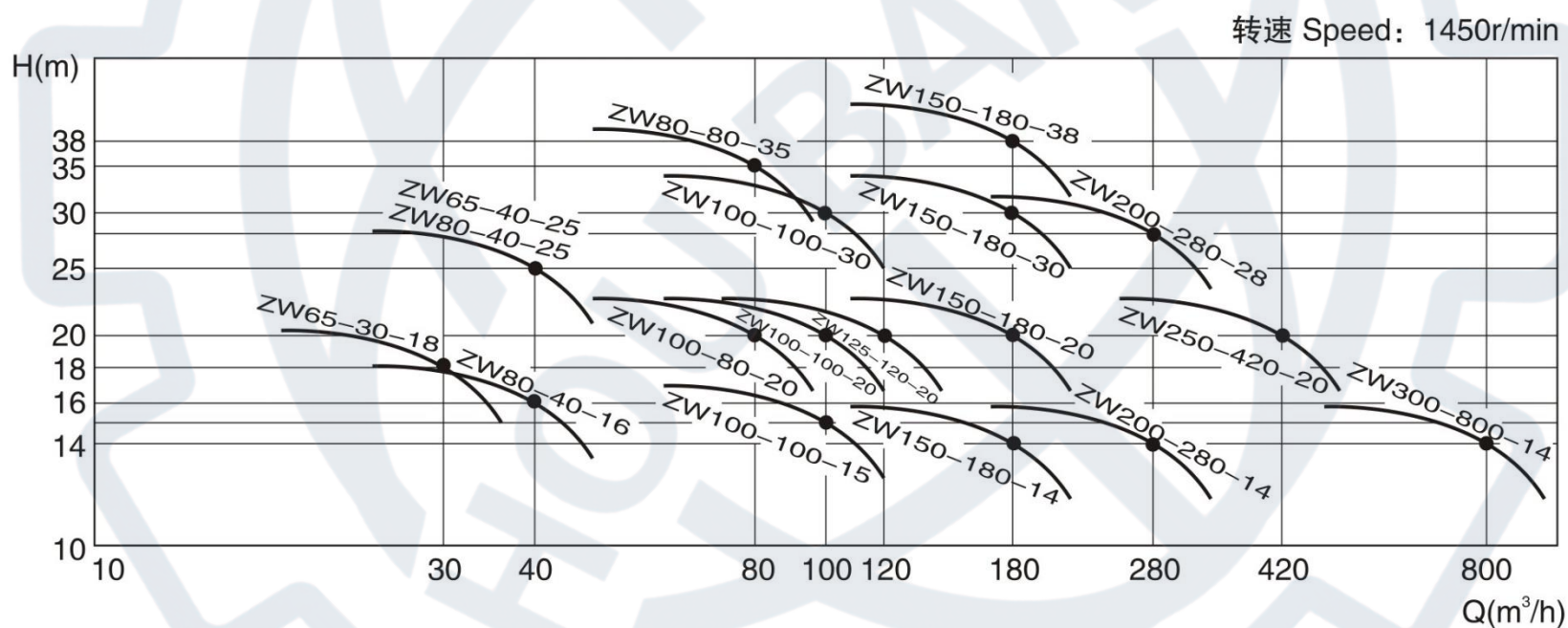
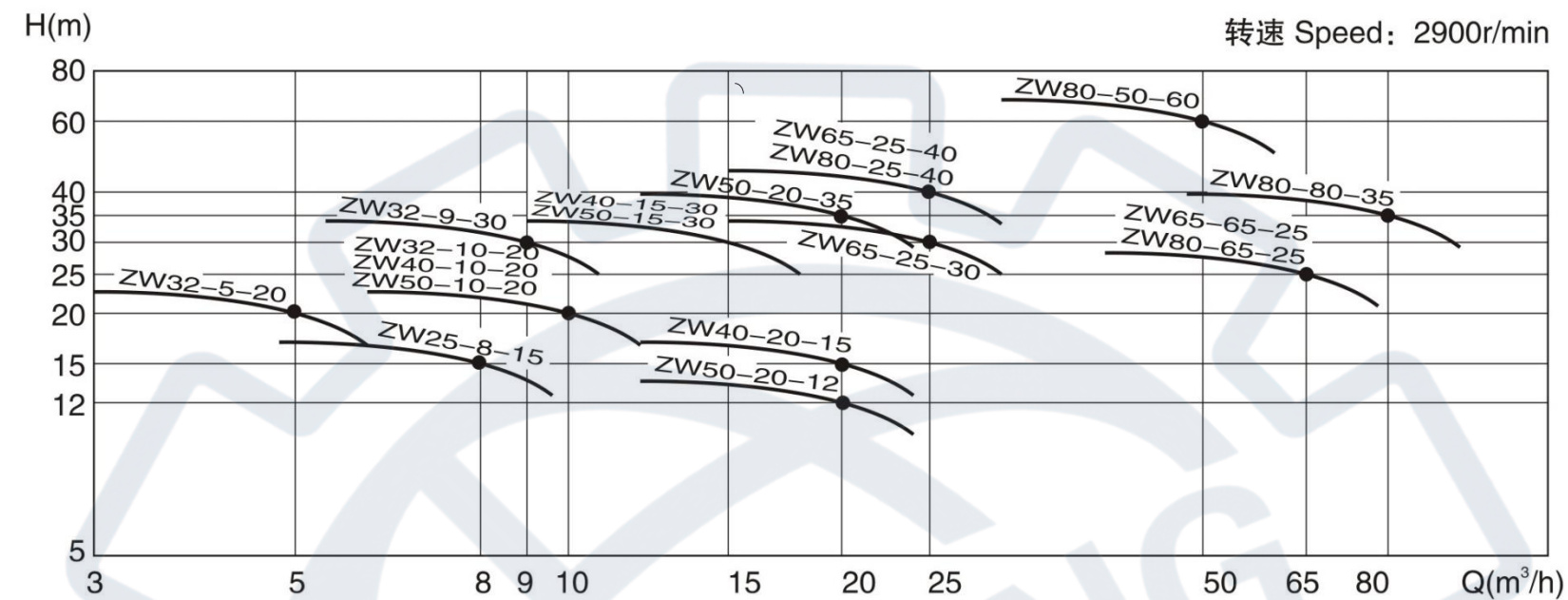
BRIEF DIAGRAM OF STRUCTURE



序号 No	名称 Name	序号 No	名称 Name	序号 No	名称 Name	序号 No	名称 Name
1	进口接管 Inlet nipple	5	出口接管 Outlet nipple	9	叶轮 Impeller	13	泵轴 Pump shaft
2	进口法兰 Inlet flange	6	泵体 Pump casing	10	机械密封 Mechanical seal	14	轴承盖 Bearing cover
3	进口阀座 Inlet valve seat	7	气液分离管 Air-liquid separating pipe	11	挡水圈 Water baffle	15	底盖板 Bottom cover-plate
4	加水螺栓 Water filling bolt	8	后盖 Rear cover	12	轴承座 Bearing seat	16	口环 Oral ring

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MODEL SPECTRUM



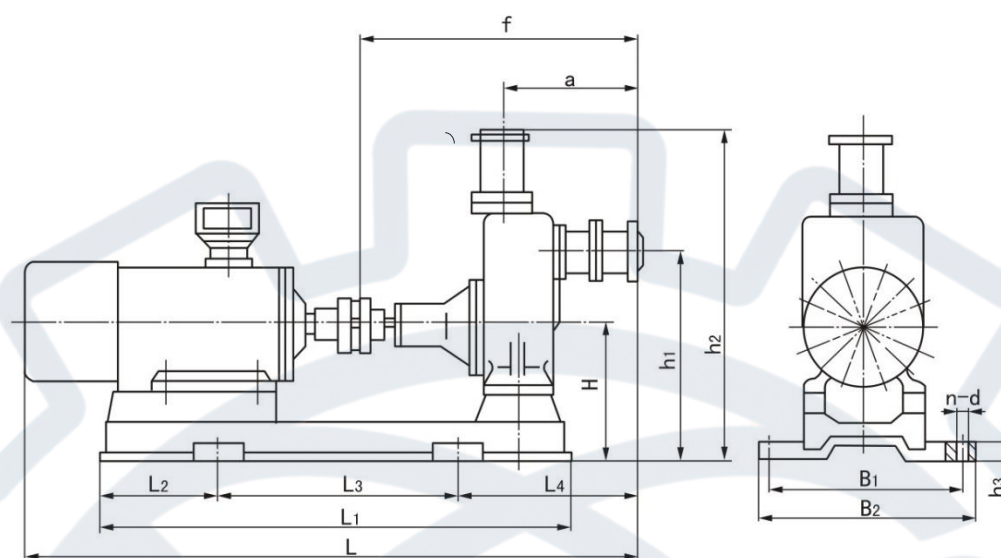
ZW SERIES SELF-SUCTION TYPE NON-CLOGGING SEWAGE PUMP

TABLE OF PERFORMANCE PARAMETERS

型号 Model	流量 Flow (m ³ /h)	扬程 Head (m)	转速 Speed (r/min)	功率 Power (kW)	效率 Eff. (%)	汽蚀余量 NPSHr (m)	自吸高度 Self-suction height (m)	自吸时间 Self-suction time (min/5m)	重量 Weight (kg)
ZW25-8-15	8	15	2900	1.5	45	2.0	5.5	3	100
ZW32-5-20	5	20	2900	2.2	45	2.5	5.5	3	100
ZW32-10-20	10	20	2900	2.2	45	2.5	5.5	3	100
ZW32-9-30	9	30	2900	3	48	2.5	5.5	3	120
ZW40-10-20	10	20	2900	2.2	45	2.5	5.5	3	100
ZW40-20-15	20	15	2900	2.2	45	2.5	5.5	3	100
ZW40-15-30	15	30	2900	3	48	2.5	5.5	3	120
ZW50-10-20	10	20	2900	2.2	45	2.5	5.5	3	100
ZW50-20-12	20	12	2900	2.2	45	2.5	5.5	3	100
ZW50-15-30	15	30	2900	3	48	2.5	5.5	3	120
ZW50-20-35	20	35	2900	5.5	48	2.5	5.5	3	150
ZW65-30-18	30	18	1450	4	45	2.5	5.5	3	200
ZW65-25-30	25	30	2900	5.5	50	3.0	5.5	3	200
ZW65-25-40	25	40	2900	7.5	50	3.0	5.5	2	200
ZW65-40-25	40	25	2900	7.5	50	3.0	5.5	2	200
ZW65-65-25	65	25	2900	7.5	52	3.0	5.5	2	240
ZW80-40-16	40	16	1450	4	50	3.0	5.0	3	240
ZW80-40-25	40	25	2900	7.5	50	3.0	5.5	2	200
ZW80-25-40	25	40	2900	7.5	50	3.0	5.5	2	200
ZW80-65-25	65	25	2900	7.5	52	3.0	5.5	2	240
ZW80-80-35	80	35	2900	15	45	3.0	5.5	3	285
ZW80-80-35	80	35	1450	15	50	3.0	5.5	2	450
ZW80-50-60	50	60	2900	22	55	3.0	5.0	3	340
ZW100-100-15	100	15	1450	7.5	50	4.0	5.5	3	300
ZW100-80-20	80	20	1450	7.5	53	4.0	5.5	3	300
ZW100-100-20	100	20	1450	11	53	4.0	5.5	3	340
ZW100-100-30	100	30	2900	22	53	4.0	5.5	2	510
ZW125-120-20	120	20	1450	15	55	4.5	5.5	2	500
ZW150-180-14	180	14	1450	15	60	5.0	5.5	3.5	500
ZW150-180-20	180	20	1450	22	60	5.0	5.0	3	570
ZW150-180-30	180	30	1450	37	65	5.0	5.0	3	680
ZW150-180-38	180	38	1450	55	45	5.0	5.0	3.5	800
ZW200-280-14	280	14	1450	22	65	5.0	5.0	3	700
ZW200-280-28	280	28	1450	55	55	4.8	5.2	3	940
ZW250-420-20	420	20	1450	55	61	6.0	4.5	2.5	1150
ZW300-800-14	800	14	1450	55	65	6.0	4.5	2.5	1400

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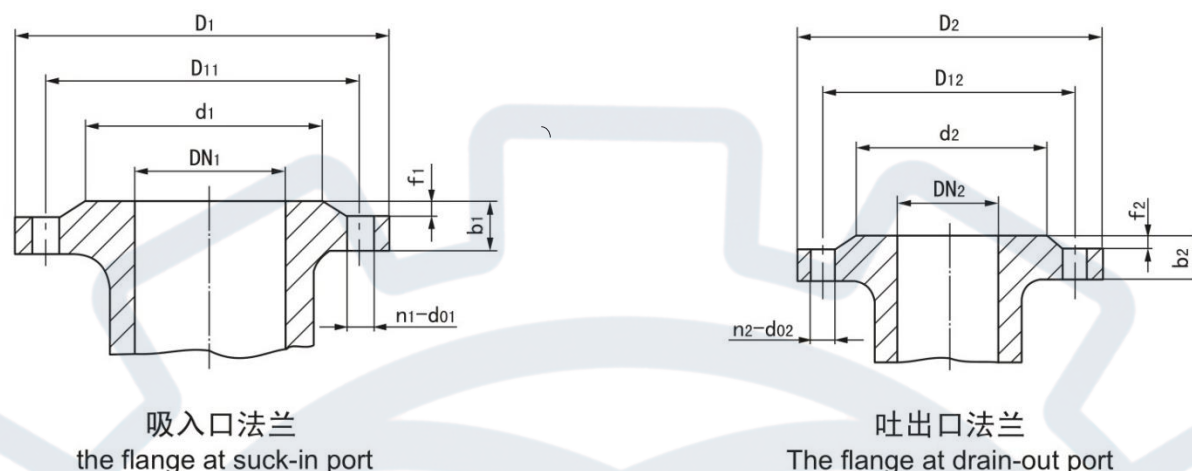
DIAGRAM AND TABLE OF OUT-FORM AND INSTALLATION DIMENSIONS



型号 Model	L	L ₁	L ₂	L ₃	L ₄	a	f	B ₁	B ₂	H	h ₁	h ₂	h ₃	n×d
ZW25-8-15	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW32-5-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW32-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW32-9-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4×φ18
ZW40-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW40-20-15	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW40-15-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4×φ18
ZW50-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW50-20-12	850	680	115	450	240	255	510	310	370	228	410	625	24	4×φ18
ZW50-15-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4×φ18
ZW50-20-35	980	750	125	450	240	250	480	380	450	238	410	630	24	4×φ18
ZW65-30-18	1040	760	135	500	340	350	650	380	450	265	485	760	25	4×φ18
ZW65-25-30	1230	850	135	580	340	350	700	370	520	270	480	720	25	4×φ18
ZW65-25-40	1230	850	135	580	340	350	700	370	520	270	480	720	25	4×φ18
ZW65-40-25	1165	850	135	580	340	350	650	370	430	265	485	760	25	4×φ18
ZW65-65-25	1300	940	150	640	350	350	700	430	485	270	480	720	25	4×φ18
ZW80-40-16	1040	760	135	500	340	350	650	380	450	265	485	760	25	4×φ18
ZW80-40-25	1165	850	135	580	340	350	650	370	430	265	485	760	25	4×φ18
ZW80-25-40	1230	850	135	580	340	350	700	370	520	270	480	720	25	4×φ18
ZW80-65-25	1300	940	150	640	350	350	700	430	485	270	480	720	25	4×φ18
ZW80-80-35	1300	1020	190	640	360	350	700	450	520	270	480	720	25	4×φ23
ZW80-80-35	1365	1180	190	640	330	370	760	480	540	350	600	890	25	4×φ23
ZW80-50-60	1360	1020	190	640	400	350	650	450	590	280	495	770	25	4×φ23
ZW100-100-15	1230	920	140	630	375	400	730	450	510	330	630	920	28	4×φ23
ZW100-80-20	1230	920	140	630	375	400	730	450	510	330	630	920	28	4×φ23
ZW100-100-20	1320	1020	200	625	420	400	730	450	510	330	630	920	28	4×φ23
ZW100-100-30	1650	1300	320	730	480	460	900	480	550	330	570	870	30	4×φ23
ZW125-120-20	1600	1170	175	820	450	510	880	480	540	330	665	990	30	4×φ23
ZW150-180-14	1600	1170	175	820	450	510	880	480	540	330	650	990	30	4×φ23
ZW150-180-20	1580	1300	200	730	500	490	870	480	550	350	700	1030	30	4×φ23
ZW150-180-30	1690	1370	235	800	500	490	870	520	600	350	700	1030	30	4×φ23
ZW150-180-38	1920	1570	245	1080	400	490	870	580	660	350	700	1020	30	4×φ23
ZW200-280-14	1920	1470	270	970	520	650	1090	520	565	350	700	1090	30	4×φ23
ZW200-280-28	2020	1570	245	1080	500	650	1090	580	660	350	700	1090	30	4×φ23
ZW250-420-20	2180	1600	325	950	720	800	1330	610	670	430	800	1200	30	4×φ23
ZW300-800-14	2580	1880	300	1280	800	1030	1500	610	655	530	900	1350	30	4×φ23

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DIAGRAM AND TABLE OF FLANGE DIMENSION



型号 Model	吸入口法兰尺寸 Dimension of the flange at suck-in port							吐出口法兰尺寸 Dimension of the flange at drain-out port						
	DN ₁	D ₁	D ₁₁	d ₁	b ₁	f ₁	n ₁ -d ₀₁	DN ₂	D ₂	d ₁₂	d ₂	b ₂	f ₂	n ₂ -d ₀₂
ZW25-8-15	25	100	75	60	14	2	4×φ14	25	100	75	60	14	2	4×φ14
ZW32-5-20	32	120	90	70	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW32-10-20	32	120	90	70	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW32-9-30	32	120	90	70	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW40-10-20	40	130	100	80	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW40-20-15	40	130	100	80	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW40-15-30	40	130	100	80	14	2	4×φ14	32	120	90	70	14	2	4×φ14
ZW50-10-20	50	140	110	90	14	2	4×φ14	40	130	100	80	14	2	4×φ14
ZW50-20-12	50	140	110	90	14	2	4×φ14	40	130	100	80	14	2	4×φ14
ZW50-15-30	50	140	110	90	14	2	4×φ14	40	130	100	80	14	2	4×φ14
ZW50-20-35	50	140	110	90	14	2	4×φ14	40	130	100	80	14	2	4×φ14
ZW65-30-18	65	160	130	110	14	2	4×φ14	65	160	130	110	14	2	4×φ14
ZW65-25-30	65	160	130	110	14	2	4×φ14	65	160	130	110	14	2	4×φ14
ZW65-25-40	65	160	130	110	14	2	4×φ14	65	160	130	110	14	2	4×φ14
ZW65-40-25	65	160	130	110	14	2	4×φ14	65	160	130	110	14	2	4×φ14
ZW65-65-25	65	160	130	110	14	2	4×φ14	65	160	130	110	14	2	4×φ14
ZW80-40-16	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-40-25	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-25-40	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-65-25	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-80-35	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-80-35	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW80-50-60	80	190	150	125	15	2	4×φ18	65	160	130	110	14	2	4×φ14
ZW100-100-15	100	210	170	145	15	3	4×φ18	80	190	150	125	15	2	4×φ18
ZW100-80-20	100	210	170	145	15	3	4×φ18	80	190	150	125	15	2	4×φ18
ZW100-100-20	100	210	170	145	15	3	4×φ18	80	190	150	125	15	2	4×φ18
ZW100-100-30	100	210	170	145	15	3	4×φ18	80	190	150	125	15	2	4×φ18
ZW125-120-20	125	240	200	175	20	3	8×φ18	125	240	200	175	20	3	8×φ18
ZW150-180-14	150	265	225	200	20	3	8×φ18	125	240	200	175	20	3	8×φ18
ZW150-180-20	150	265	225	200	20	3	8×φ18	125	240	200	175	20	3	8×φ18
ZW150-180-30	150	265	225	200	20	3	8×φ18	125	240	200	175	20	3	8×φ18
ZW150-180-38	150	265	225	200	20	3	8×φ18	125	240	200	175	20	3	8×φ18
ZW200-280-14	200	320	280	255	22	3	8×φ18	150	265	225	200	20	3	8×φ18
ZW200-280-28	200	320	280	255	22	3	8×φ18	150	265	225	200	20	3	8×φ18
ZW250-420-20	250	375	335	310	24	3	12×φ18	200	320	280	255	22	3	8×φ18
ZW300-800-14	300	435	395	362	24	4	12×φ23	250	375	335	310	24	3	12×φ18

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PUMP INSTALLATION

1、在泵与电动机联轴传动时，应注意泵轴与电动机输出的同轴度；泵安装的准确与否对泵的运行平稳性和使用寿命有较大的影响，因此必须仔细认真地安装和校正。

2、泵联轴器必须用螺母紧固好，并锁紧螺母，谨防螺母松动，否则易引起叶轮窜动，造成机械故障。

3、为使泵体内能够保持一定的储存液，以达到较好的自吸能力和防止机械密封的干磨擦，必须使泵的进口高于泵轴中心线。

4、吸入管路的安装应注意：

A、吸入口的安装高度不能超过泵自吸性能高度，在条件许可时，吸入口的安装高度应尽可能地低于水池最低储水面，并尽量缩短吸入管的长度，少装弯头，这样有利于缩短自吸时间，提高自吸功能。

B、吸入管路中的阀门、法兰等应严防漏气或渗漏液体，即吸入管路不允许有漏气现象存在。

C、吸入管路和吐出管路应有自己的支架，泵体本身不允许承受管路的负荷。

5、水泵在安装时，应使泵及管路的静电接地电阻达到其规定要求。

6、校正泵联轴器及电动机联轴器的安装间隙及同轴度，其不同轴度允许偏差为0.1毫米。泵轴和电动机轴的高度差可在底脚上垫铜皮或铁皮调整。

7、在机组实际运转3-4小时后，作最后检查，如无不良现象，则认为安装已妥，在试运转中应检查轴承的温度，轴承体的温度不宜超过70℃。

8、在泵的出口管路上如装有单向阀而在自吸过程中不能使泵顺利地排出气体时，应在泵的出口处加接排气小管及阀。

1. With the shafts of both pump and motor linked in actuation, pay attention to the concentricity between the pump shaft and the motor's output; and carefully mount and calibrate the pump as which will leave a bigger affection to the running stability and duration of it.

2. Fasten the nut on the pump's clutch, or the impeller may be made easily movable to cause a mechanical failure.

3. Have the pump inlet higher than the central line of the pump shaft so as to have a certain volume of liquid kept inside of the pump to get a better self-suction capacity and prevent the mechanical seal from drying friction.

4. Cautions for the installation of the suck-in pipeline:

A. The installation height of the suck-in port shall not be higher than the self-suction height and shall be lower than the lowest stored water level in the water pool as can as possible, the suck-in pipe shall be as short as possible and mount less elbows so as to shorten the self-suction time and raise the self-suction function.

B. The valve, flange etc. inside of the suck-in pipeline shall be prevented from air or liquid leaking, that means no air-leaking is allowed inside of it.

C. Get both suck-in and vomiting pipelines a stand of their own and do not let the pump bearing any pipeline.

5. During installation of the pump, make the static grounding resistance of it and the pipeline up to the set requirement.

6. Calibrate the installation space and the concentricity between the clutches of both pump and motor, with the allowed deviation of the concentricity at 0.1mm, and put a copper or iron sheet under the foot to adjust the height difference between the shafts of both pump and motor.

7. Take a final check after the unit actually runs for 3-4h and it is deemed for the installation to have been well done if non-bad condition. Check the bearing temperature during trial, which shall not be over 70° C.

8. If the pump can not be made to successfully exhaust during the self-suction process with a single-way valve mounted on the pump's outlet pipeline, connect a small exhausting pipe and valve at the pump outlet.

USE OF THE PUMP

(一) 起动前的准备及检查工作

1、本系列自吸泵，根据泵的工作运转状况，分别采用优质钙基黄油和10号机油进行润滑，如果采用黄油润滑的泵应定期向轴承箱内加注黄油，采用机油润滑的泵，如果油位不足，则加足之。

2、检查泵壳内的储液是否高于叶轮的上边缘，如若不足，可以从泵壳上的加液口处直接向泵体内注入储液，不应在储液不足的情况下启动运转，否则泵不能正常工作，且易损坏机械密封。

3、检查泵的转动部件是否有卡住磕碰现象；检查泵体底脚及各联结处螺母有无松动现象；检查泵轴与电动机主轴的同轴度或平行度；检查进口管路是否漏气，如有漏气，必须设法排除；打开吸入管路的阀门，稍开(不要全开)出口控制阀。

(二) 起动及操作

1、起动自吸泵，注意泵轴的转向是否正确；注意转动时有无不正常的声响和振动。

2、注意压力表及真空表读数，起动后当压力表及真空表的读数经过一段时间的波动而指定稳定后，说明泵内已经上液，泵进入正常输液作业。在泵进入正常输液作业前即自吸过程中，应特别注意泵内水温升高情况，如果这个过程过长，泵内水温过高，则停泵检查其原因。

3、如果泵内液体温度过高而引起自引困难，那行可以暂时停机，利用吐出管路中的液体倒流回泵内或向泵体上的加储液口处直接下来向泵内补充液体，使泵内液体降温，然后起动即可。

Preparations and checks prior to starting

1. According to the running states, this series self-suction pumps are lubricated with quality calcium-based grease and 10# engine oil separately. For those lubricated with grease, fill grease into the bearing box in a periodic time and, for those with engine oil, fill it fully when the oil level is insufficient.

2. Check if the stored liquid inside of the pump casing is above the upper edge of the impeller and, if not, prime liquid directly from the filling port on the casing. Do not start the pump in case of an insufficient stored liquid, or the pump would not work normally and the mechanical seal would be easily damaged.

3. Check if the moving parts of the pump are jammed or collided; if the foot on the pump bottom and the nuts on the joints are loose; check the concentricity or the parallelism between the shafts of both pump and motor; check if there is air-leaking with the inlet pipeline and settle it if any; open the valve on the suck-in pipeline and slightly open (not fully) the outlet control valve.

Start and operation

1. Pay attention to the pump shaft to see if it moves in the correct direction when to start the self-suction pump; and if there is abnormal sounds and vibration when it moves.

2. Pay attention to the readings on both pressure gauge and vacuum meter, when the indications of which get stable after a periodic time fluctuation after the pump is started, that means liquid has been primed into the pump and the pump gets into the normal liquid transportation. Before the pump gets into the normal liquid transportation, e.g. during the self-suction process, pay special attention to the temperature rise of the liquid and stop the pump to check the cause if this process is too long and the temperature is so caused too high.

3. Temporarily stop the pump in case of a difficult self-suction caused due to too high liquid temperature and make it lower by means of the back flow into the pump of the liquid in the vomiting pipeline or supplementing liquid directly from the filling port on the pump casing, then start the pump again.

ZW系列自吸式无堵塞排污泵

4、泵在工作过程中如发生强烈振动和噪声，有可能是泵发生汽蚀所致，汽蚀产生的原因有两种：一是进口管流速过大，二是吸程过高。流速过大时可调节出口控制阀，升高压力表读数，在进口管路有堵塞时则应及时排除；吸程太高时可适当降低泵的安装高度。

5、泵在工作过程中因故停泵，需再启动时，出口控制阀应稍开(不要全开)，这样既有利于自吸过程中气体从吐出口排出，又能保证泵在较轻的负荷下启动，同时，注意检查管路系统有无渗漏现象。

(三)停泵

- 1、首先必须关闭吐出管路上的阀门。
- 2、使泵停止转动。
- 3、在寒冷季节，应将泵体内的储液和轴承体冷却室内的水放空，以防冻裂机件。

4. It is possible for an air erosion to occur with the pump that causes a severe vibration and noise during the work of the pump and the air erosion occurs with two causes: one is too quick flow rate in the inlet pipe and the other is too high suction travel. For the former, adjust the outlet control valve, raise the reading on the pressure gauge and remove it in case of block-up in the inlet pipeline; for the latter, properly lower the pump's installation height.

5. When the pump is stopped because of something during work and started again, slightly (not fully) open the outlet control valve. This is benefit for the air to be exhausted on-time from the vomiting port during the self-suction process and also ensures the pump is started with a lighter load. Meanwhile, pay attention to checking if there is a leak from the pipeline system.

Stop

1. First close the valve on the vomiting pipeline.
2. Have the pump stopped running.
3. In cold seasons, drain out the liquid stored inside of the pump casing and the water inside of the bearing's cooling chamber completely to prevent any parts from being frozen to crack.

MAINTENANCE, DISASSEMBLY AND ASSEMBLY OF THE PUMP

该泵的特点是结构简单可靠，经久耐用。在泵正常情况下，一般不需要经常拆开保养。当发现故障后，随时给予排除即可。

(一) 维护该泵时应注意

当泵长期运行后，滚动轴承，前、后密封环磨损到一定程度时，须进行更换；机械密封在不漏液的情况下，一般不应拆开检查。若轴承体下端泄漏口处产生严重泄漏时，则应对机械密封进行拆检。装拆机械密封时，必须轻取轻放，注意配合面的清洁，保护好静环和动环的镜面，严禁敲击碰撞。因机械密封而产生泄漏的原因主要是磨擦付镜面拉毛所致。其修复办法，可对磨擦付端面进行研磨使恢复镜面。机械密封产生泄漏的另一原因是“O”形橡胶密封圈(或缓冲垫)安装不当，或者变形老化所致。此时则需调整或更换“O”形密封圈进行重新装配。

(二) 泵拆装顺序

- A、拆下电动机或脱出联轴器。
- B、拆出轴承体总成，检查叶轮和前口环的径向间隙，检查叶轮螺母有无松动。
- C、拆下叶轮螺母，拉出叶轮，检查叶轮和后密封环的径向间隙。
- D、松出机械密封的紧定螺钉，拉出机械密封的动环部分，检查动、静环端面的贴合情况，检查“O”形密封圈(或缓冲垫)的密封情况。
- E、旋出联轴器的紧定螺母，拉出联轴器。
- F、拆下轴承端盖，拆出泵轴和轴承。
- G、安装时以相反顺序进行装配即可。

This pump features a simple and reliable structure, durability and is generally unnecessary to be disassembled often for maintenance if working normally. Troubleshoot it in case of a failure.

Cautions at maintenance

When the rolling bearing and both front and rear seal rings are worn out to a certain degree after a long time running of the pump, replace them; the mechanical seal does not need to be removed for a check provided that no liquid leak with it while does when there is a serious leak from the leaking port on the lower side of the bearing. Take care of the mechanical seal during disassembly and assembly, clean the fitted face, properly keep the mirrors of both static and dynamic rings and do not knock on them and get them collided, as the cause for the leaking of it is mainly at the burrs on the frictional pair mirrors. To repair it, grind the mirrors to have it recovered. Another cause for the mechanical seal to leak is the “O”-type rubber seal ring (or buffering gasket) improperly mounted or deformed or aged, then adjust or replace it.

Pump disassembly and assembly sequences

- A. Remove the motor or take out the clutch.
- B. Remove the bearing assembly, check the radial space between the impeller and the front oral ring and check if the impeller nut is loose.
- C. Screw out the impeller nut, pull out the impeller and check the radial space between the impeller and the rear seal ring.
- D. Loosen the fixing screw on the mechanical seal, pull out the dynamic ring and check the fitting state between the end-faces of both static and dynamic rings and the sealing state of the “O”-type seal ring (or the buffering gasket).
- E. Screw out the fixing nut on the clutch and pull out the clutch.
- F. Remove the end cover on the bearing to remove both pump shaft and bearing.
- G. Take reversed sequences for assembly.

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故障原因及排除方法 FAILURES CAUSES AND TROUBLESHOOTING

故障现象 Failure	可能产生的原因 Possible causes	排除方法 Troubleshooting
1、水泵不出水 No water out of pump	a、泵壳内未加储液或储液不足 No or insufficient liquid stored inside of pump casing b、吸入管路漏气 Air leaks from suck-in pipeline c、转速太低 Too slow speed d、吸程太高或吸入管路过长 Too high suction travel or too long suck-in pipeline e、机械密封泄漏量过大 Too severe leakage from mechanical seal f、吸入管路气体不能从出口排出 Air inside of suck-in pipeline unable to be exhausted from the outlet	a、加足储液 Fill sufficient liquid b、检查并排除漏气现象 Check and settle the air leak c、调整转速 Adjust the speed d、降低吸程或缩短吸入管路 Lower suction travel or shorten suck-in pipeline e、修复或更换 Repair or replace it f、打开出口阀门，使气体排出 Open the outlet valve to let air out
2、杂音和振动较大 Bigger noise and vibration	a、底脚不稳 Foot unstable b、泵轴弯曲 Pump shaft bent c、汽蚀现象 Steam erosion d、轴承磨损严重 Bearing seriously worn out e、进口管路内有杂物 Impurities exist inside of inlet pipeline f、泵与电动机两者主轴不同心 Shafts of both pump and motor is not concentric	a、加固 Solidify it b、更换或校正 Replace or correct it c、调整工况 Adjust working conditions d、更换轴承 Replace it e、清除杂物 Get rid of impurities f、调整同轴度 Adjust them to be concentric
3、出水量不足 Insufficient water-out quantity	a、杂物进入吸入管或叶轮流道堵塞 Impurities get into suck-in pipe or impeller geat blocked up b、转速太低 Too slow speed c、叶轮或叶轮密封磨损严重 Impeller or impeller seal seriously worn out	a、排除堵塞物 Get rid of impurities b、调至额定转速 Adjust the speed to the rated one c、更换口环 Replace oral ring
4、轴功率消耗过大 Too big consumption of shaft power	a、流量过大 Too heavy flow b、转速太高 Too quick speed c、泵轴弯曲或叶轮卡碰 Pump shaft bent or impeller jammed or collided d、泵内流道堵塞或被卡住 The geat inside of the pump blocked-up or jammed	a、升高出口压力 Raise the outlet pressure b、适当降低 Properly lower it c、更换或校正 Replace or correct d、排除堵塞物 Get rid of blocking matters