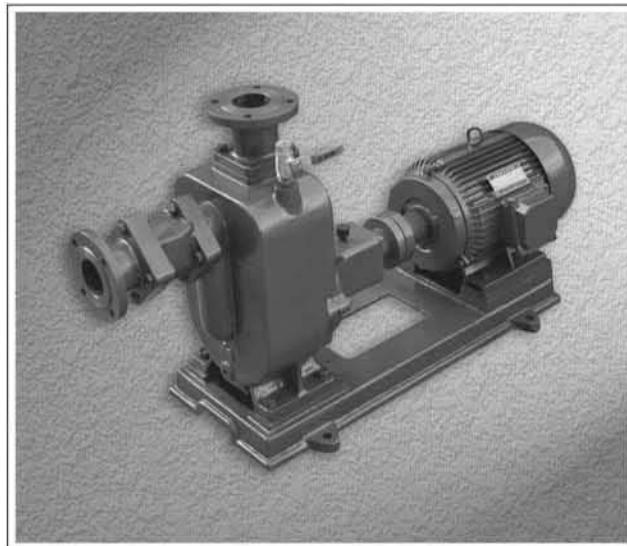


Operation installation

ZW Series Self-suction Type Non-clogging Sewage Pump



Please carefully read the operation instructions before use of the product.

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GENERAL

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.

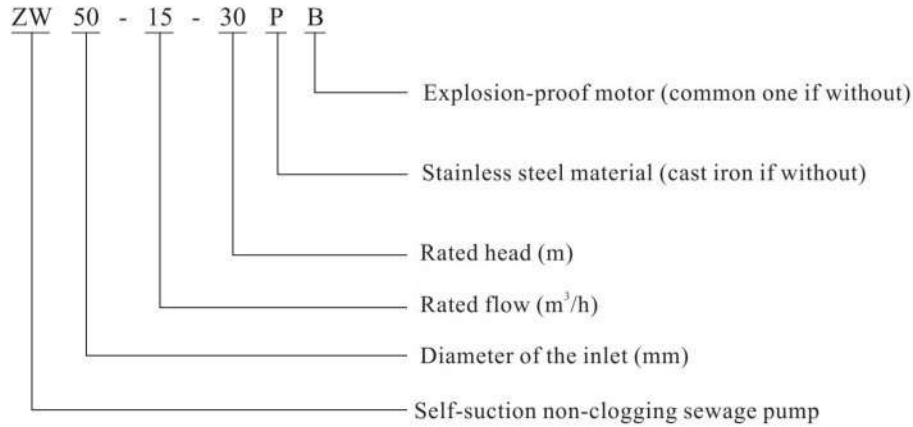
Compared with the same domestic products, this pump features a simple structure, good self-suction performance, strong sewage draining capacity, high efficiency, energy saving and easy use and repair, with every technical performance index of it ranking first nationally among the sewage pump series products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

RANGE OF APPLICATION

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.

MODEL MEANING



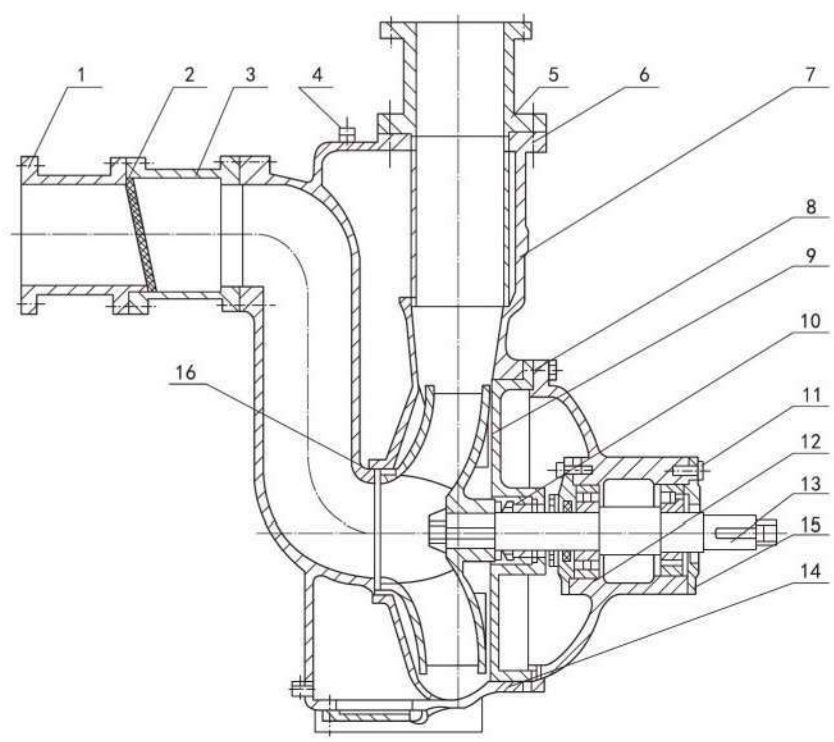
ABOUT THE STRUCTURE

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.

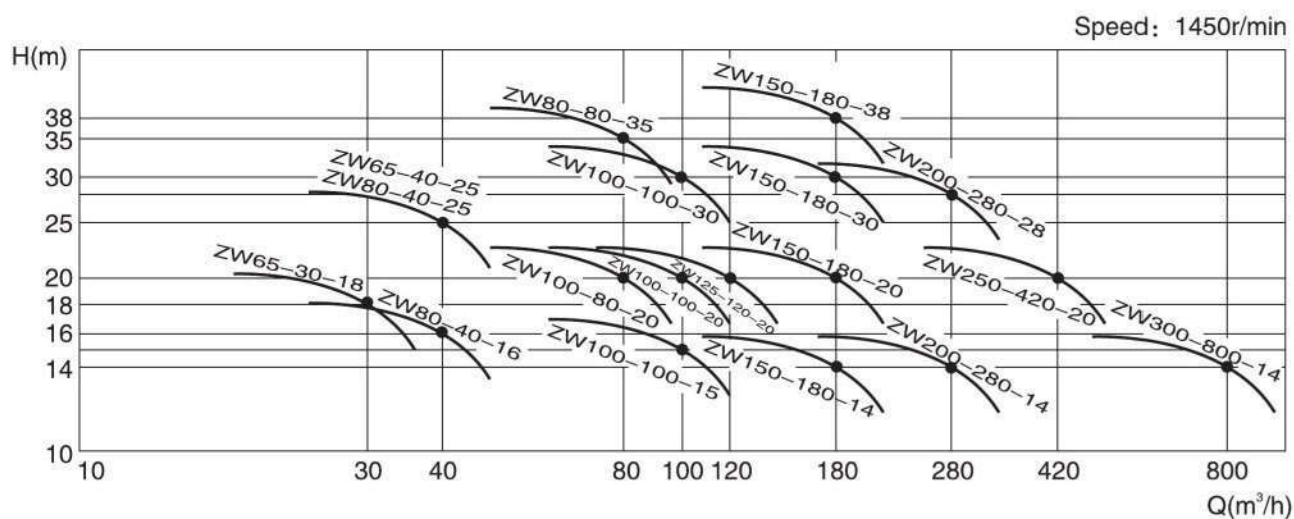
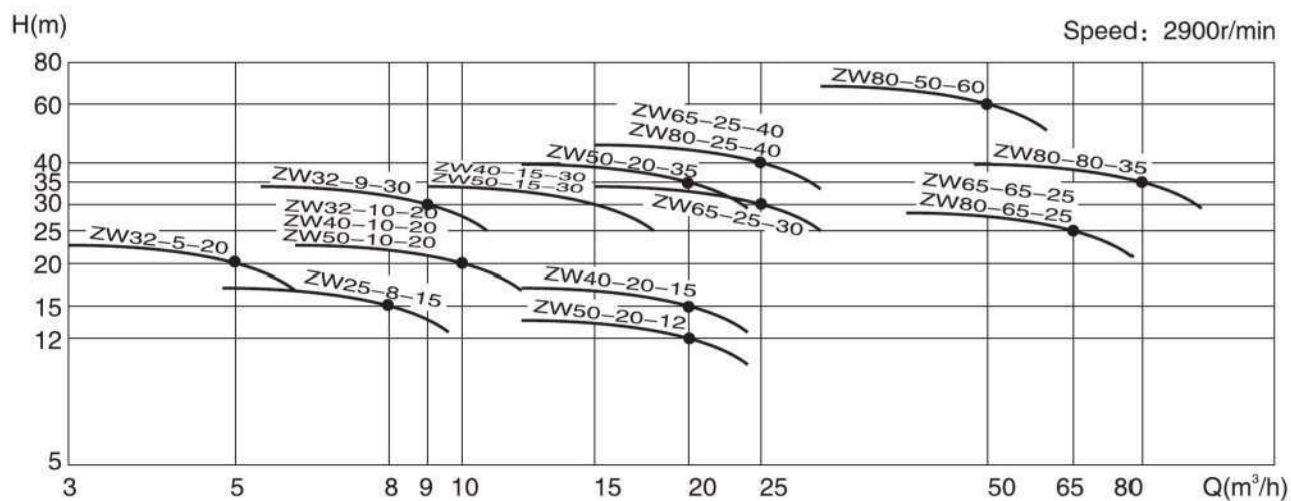
Liquid of a certain volume has been stored in the storing cavity after the pump stops working and, under the action of the impeller when the pump starts, is thrown out upwards with air and then flows back to the working cavity through the grids of the air-liquid separating pipe, the air is exhausted out of the pump to have a certain vacuum formed inside of the pump so as to get the self-suction action.

BRIEF DIAGRAM OF STRUCTURE



No	Name	No	Name	No	Name	No	Name
1	Inlet nipple	5	Outlet nipple	9	Impeller	13	Pump shaft
2	Inlet flange	6	Pump casing	10	Mechanical seal	14	Bearing cover
3	Inlet valve seat	7	Air-liquid separating pipe	11	Water baffle	15	Bottom cover-plate
4	Water filling bolt	8	Rear cover	12	Bearing seat	16	Oral ring

MODEL SPECTRUM

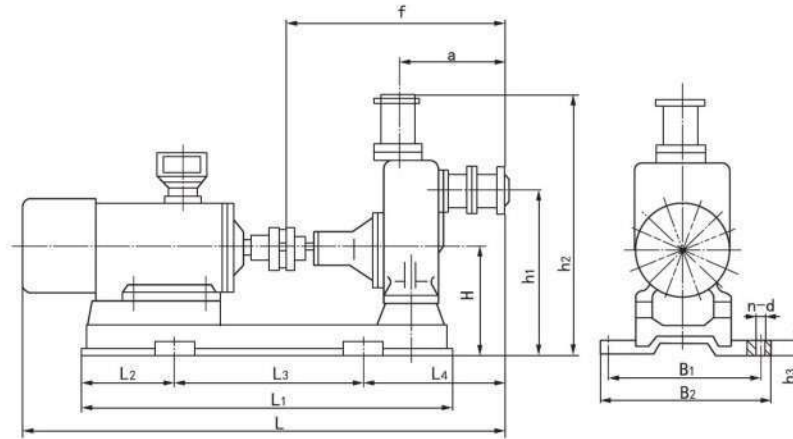


ZW SERIES SELF-SUCTION TYPE NON-CLOGGING SEWAGE PUMP

TABLE OF PERFORMANCE PARAMETERS

Model	Flow (m ³ /h)	Head (m)	Speed (r/min)	Power (kW)	Eff. (%)	NPSHr (m)	Self-suction height (m)	Self-suction time(min/5m)	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

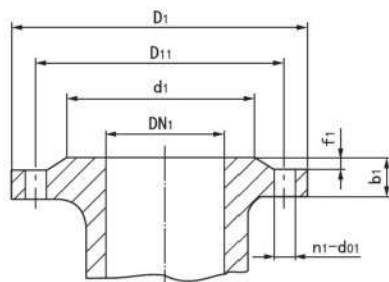
DIAGRAM AND TABLE OF OUT-FORM AND INSTALLATION DIMENSIONS



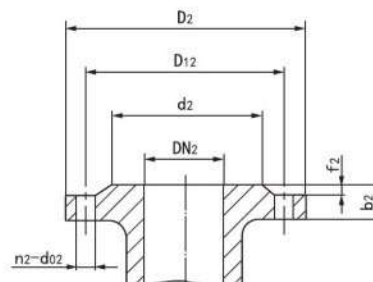
Model	L	L ₁	L ₂	L ₃	L ₄	a	f	B ₁	B ₂	H	h ₁	h ₂	h ₃	n × d
ZW25-8-15	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW32-5-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW32-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW32-9-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4 × φ 18
ZW40-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW40-20-15	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW40-15-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4 × φ 18
ZW50-10-20	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW50-20-12	850	680	115	450	240	255	510	310	370	228	410	625	24	4 × φ 18
ZW50-15-30	890	710	130	450	240	260	510	310	370	238	410	630	24	4 × φ 18
ZW50-20-35	980	750	125	450	240	250	480	380	450	238	410	630	24	4 × φ 18
ZW65-30-18	1040	760	135	500	340	350	650	380	450	265	485	760	25	4 × φ 18
ZW65-25-30	1230	850	135	580	340	350	700	370	520	270	480	720	25	4 × φ 18
ZW65-25-40	1230	850	135	580	340	350	700	370	520	270	480	720	25	4 × φ 18
ZW65-40-25	1165	850	135	580	340	350	650	370	430	265	485	760	25	4 × φ 18
ZW65-65-25	1300	940	150	640	350	350	700	430	485	270	480	720	25	4 × φ 18
ZW80-40-16	1040	760	135	500	340	350	650	380	450	265	485	760	25	4 × φ 18
ZW80-40-25	1165	850	135	580	340	350	650	370	430	265	485	760	25	4 × φ 18
ZW80-25-40	1230	850	135	580	340	350	700	370	520	270	480	720	25	4 × φ 18
ZW80-65-25	1300	940	150	640	350	350	700	430	485	270	480	720	25	4 × φ 18
ZW80-80-35	1300	1020	190	640	360	350	700	450	520	270	480	720	25	4 × φ 23
ZW80-80-35	1365	1180	190	640	330	370	760	480	540	350	600	890	25	4 × φ 23
ZW80-50-60	1360	1020	190	640	400	350	650	450	590	280	495	770	25	4 × φ 23
ZW100-100-15	1230	920	140	630	375	400	730	450	510	330	630	920	28	4 × φ 23
ZW100-80-20	1230	920	140	630	375	400	730	450	510	330	630	920	28	4 × φ 23
ZW100-100-20	1320	1020	200	625	420	400	730	450	510	330	630	920	28	4 × φ 23
ZW100-100-30	1650	1300	320	730	480	460	900	480	550	330	570	870	30	4 × φ 23
ZW125-120-20	1600	1170	175	820	450	510	880	480	540	330	665	990	30	4 × φ 23
ZW150-180-14	1600	1170	175	820	450	510	880	480	540	330	650	990	30	4 × φ 23
ZW150-180-20	1580	1300	200	730	500	490	870	480	550	350	700	1030	30	4 × φ 23
ZW150-180-30	1690	1370	235	800	500	490	870	520	600	350	700	1030	30	4 × φ 23
ZW150-180-38	1920	1570	245	1080	400	490	870	580	660	350	700	1020	30	4 × φ 23
ZW200-280-14	1920	1470	270	970	520	650	1090	520	565	350	700	1090	30	4 × φ 23
ZW200-280-28	2020	1570	245	1080	500	650	1090	580	660	350	700	1090	30	4 × φ 23
ZW250-420-20	2180	1600	325	950	720	800	1330	610	670	430	800	1200	30	4 × φ 23
ZW300-800-14	2580	1880	300	1280	800	1030	1500	610	655	530	900	1350	30	4 × φ 23

ZW SERIES SELF-SUCTION TYPE NON-CLOGGING SEWAGE PUMP

DIAGRAM AND TABLE OF FLANGE DIMENSION



the flange at suck-in port



The flange at drain-out port

Model	Dimension of the flange at suck-in port							Dimension of the flange at drain-out port						
	DN1	D1	D11	d1	b1	f1	n1-d01	DN2	D2	d12	d2	b2	f2	n2-d02
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

PUMP INSTALLATION

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

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.

USE OF THE PUMP

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

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.

FAILURES CAUSES AND TROUBLESHOOTING

Failure	Possible causes	Troubleshooting
1、No water out of pump	a、No or insufficient liquid stored inside of pump casing b、Air leaks from suck-in pipeline c、Too slow speed d、Too high suction travel or too long suck-in pipeline e、Too severe leakage from mechanical seal f、Air inside of suck-in pipeline unable to be exhausted from the outlet	a、Fill sufficient liquid b、Check and settle the air leak c、Adjust the speed d、Lower suction travel or shorten suck-in pipeline e、Repair or replace it f、Open the outlet valve to let air out
2、Bigger noise and vibration	a、Foot unstable b、Pump shaft bent c、Steam erosion d、Bearing seriously worn out e、Impurities exist inside of inlet pipeline f、Shafts of both pump and motor is not concentric	a、Solidify it b、Replace or correct it c、Adjust working conditions d、Replace it e、Get rid of impurities f、Adjust them to be concentric
3、Insufficient water-out quantity	a、Impurities get into suck-in pipe or impeller gear blocked up b、Too slow speed c、Impeller or impeller seal seriously worn out	a、Get rid of impurities b、Adjust the speed to the rated one c、Replace oral ring
4、Too big consumption of shaft power	a、Too heavy flow b、Too quick speed c、Pump shaft bent or impeller jammed or collided d、The gear inside of the pump blocked-up or jammed	a、Raise the outlet pressure b、Properly lower it c、Replace or correct d、Get rid of blocking matters