



Submersible Mixer





PAG Type Submersible Mixer

Product Description

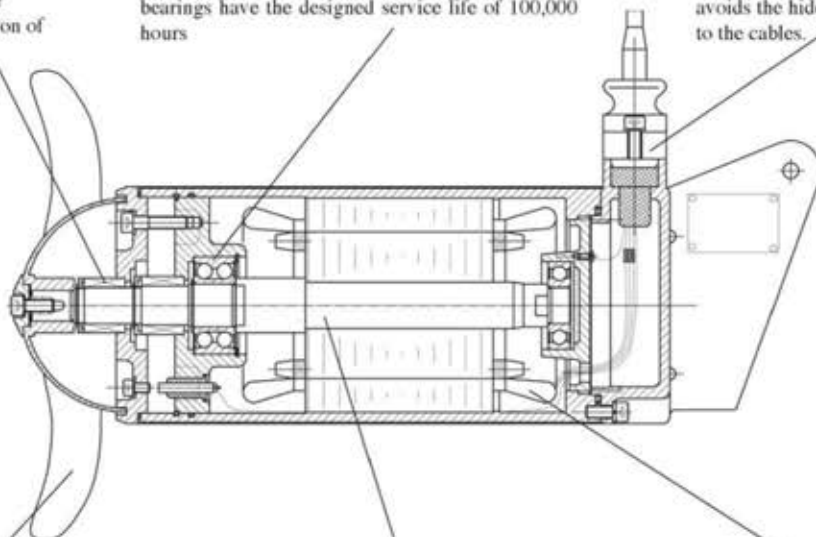
PAG type Submersible Mixer, a key equipment used in the water treatment technology, can meet the technological requirement for homogeneity and fluidity of solid-liquid two-phase flow and solid-liquid-gas three phase flow in biochemical course of the water treatment process. It is composed of the submersible motor, impeller, and installation system etc.. The submersible mixer is in direct connection structure. Comparing with the traditional high-power electric motor that retards speed by a speed reducer, it is highlighted by compact structure, low energy consumption, facile maintenance. The impeller shaped by finishing casting or punching, which has high precision, forceful thrust as well as simple, nice-looking and streamlined profiling. The series of products are applicable to the places that requires for solid-liquid agitating or mixing. The schematic drawing of the structure is shown as follows:



The two rows of independent mechanical sealing ensure the long-term and reliable operation of the submersible motor

The imported high-quality one-time lubricated bearings have the designed service life of 100,000 hours

The unique sealing designed for cables avoids the hidden danger of water infiltrating to the cables.



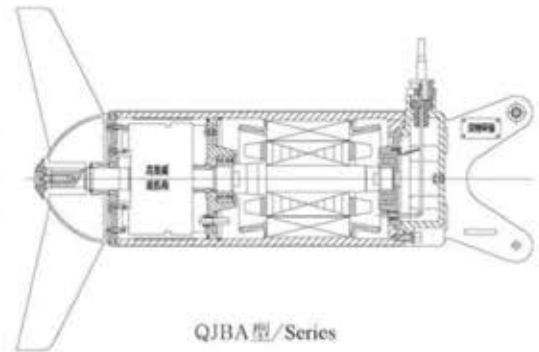
The stainless steel and carbon steel finishing-cast welded impeller has sweptback vanes after optimized design, resulted in high efficiency and self-cleaning function

The shaft of the motor uses stainless steel material. The rotors are rotated smoothly after dynamic balancing testing.

The leakage sensor and winding stator over-temperature alarming device are in built.



PAGA type submersible mixer is a type of energy saving products, supporting by the conventional four-motor and high-efficiency reducer, compared to Multi-motor can significantly reduce the power of burden, can be saving energy more than 15%.



PAGY type submersible mixer is a new product of ultra high efficiency. The self starting permanent magnet motor is used. It is asynchronous start synchronous operation, simple structure, stable operation, high power factor, and easy speed regulation. Motor efficiency can meet 1 class energy efficiency of the national standard (GB18613-2012), or IE4 energy efficiency of international standards (IEC60034-30).

Scope of Application

The submersible mixers are mainly used for mixing, agitating and making ring flows in the process of municipal and industrial sewage treatment and can also be used for equipment maintenance of the landscape water circulation through agitation, they can achieve the function of creating water flow, improving water quality, increasing oxygen content in the water and effectively preventing the sedimentation of the suspended substances.

Conditions of Application

In order to ensure the normal operation of the submersible mixer, please make correct selection of the operating environment and the operating modes.



The highest temperature of the medium shall not exceed 40℃;

The scope of pH value of the medium:5-9;

The density of the medium shall not exceed 1150Kg/m³;

The depth of submersion shall not exceed 20m.

▲Special Warning: The submersible mixer must completely submerge in the water and cannot operate in the inflammable, explosive, highly corrosive and high-temperature environment. In line with the requirement of the special environment, our company can provide special design for the users.



Performance Parameters

The performance parameters of the submersible mixer are shown in the following table with the rated voltage of 380V and the frequency of 50Hz:

	Model	(kW/P) Motor power	(A) Rated current	(r/min) rpm of impeller	(mm) Diameter of impeller	(N) Thrust	(Kg) Weight
Standard type	PAG-0.4	4/4	1.5	1450	220	145	45
	PAG-0.75	0.75/4	1.8	1450	220	175	50
	PAG-0.85S	0.85/8	3.2	740	260	163	55/65
	PAG-1.5S	1.5/6	4	960	260	290	55/65
	PAG-2.2S	2.2/8	5.9	740	320	650	88/93
	PAG-4S	4/6	10.3	960	320	1080	88/93
	PAG-1.5S	1.5/8	5.2	740	400	600	74/82
	PAG-2.5S	2.5/8	7	740	400	800	74/82
	PAG-3S	3/8	8.6	740	400	920	74/82
	PAG-4S	4/6	10.3	960	400	1200	74/82
	PAG-4S	4/12	14	480	620	1400	190/206
	PAG-5S	5/12	18.2	480	620	1800	196/212
	PAG-7.5S	7.5/12	28	480	620	2600	240/256
	PAG-10S	10/12	32	480	620	3300	250/266
	PAG-15S	15/12	39	480	620	4000	270/286
Energy type	PAG-1.5S	1.5/4	3.7	740	400	600	74/82
	PAG-3S	3/4	6.6	740	400	920	74/82
	PAG-4S	4/4	8.6	960	400	1200	80/92
	PAG-5.5S	5.5/4	11	480	620	1800	160/176
	PAG-7.5S	7.5/4	15	480	620	2600	182/198
	PAG-11S	11/4	22	480	620	3300	224/240
	PAG-15S	15/4	30	480	620	3680	288/306
	PAG-18.5S	18.5/4	36	310	760	4600	364/382
Permanent magnet type	PAG-4S	4/12	6.7	500	620	1400	190/206
	PAG-5S	5/12	8.4	500	620	1800	196/212
	PAG-7.5S	7.5/12	12.4	500	620	2600	240/256
	PAG-10S	10/12	18	500	620	3300	250/266
	PAG-15S	15/12	24.5	500	620	4000	270/286
	PAG-18.5S	18.5/4	36	500	760	4600	364/382
	PAG-22S	22/4	42	500	760	5760	380/398

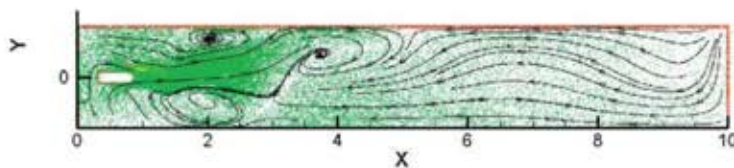
- Notes: 1, In mixing & agitating series of the above table, the value listed in the column of "Weight" contains the weight of the dome;
 2, Winding insulation class of the motor: Class F; Protective grade; IP68; Operating mode of the motor: Operation for 24 hours
 3, We can supply the motor with class H winding insulation



Reference for Type Selection

The type selection of submersible mixer is a rather complicated job. The correctness of the type selection will directly affect the normal usage of the equipment. The principle for the type selection is to enable mixer to give full play to its mixing function in the appropriate volume. This standard can generally be determined by the flow velocity. In line with the different technological requirement of the sewage treatment, the optimum flow velocity for the mixer type selection shall ensure the velocity range of 0.15~0.3m/s. In case of the flow velocity lower than 0.15m/s, the effectiveness of agitation or mixing can not be achieved. In case of the flow velocity bigger than 0.3m/s, the technological effectiveness will be affected and waste will be caused. Therefore, before type selection, it is necessary to determine what kind of environment the mixer will be used in, for instance, sewage tank, slag pond or biochemical pond. Secondly, the parameters of the medium such as content of the suspended substances, temperature, pH value as well as the shape of the pond, water depth and even the mode of installation and so on will all influence the type selection. Meanwhile, it is also necessary to consider the energy-saving factor, because this will influence the operating cost of the users in the future.

For the purpose of fulfilling the optimum mixing function in different environments, we can supply multiple types of the submersible mixers to the users and provide type selection service as well. Refer to the following diagrams of the flow field of submersible mixer.





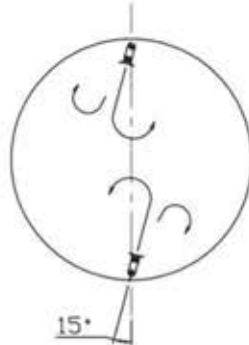
Operating Modes of Submersible Mixer

The installation and positioning of the submersible mixers will have great impact on the mixing effectiveness. In order to get twice result with the half the effort, We suggest the users follow the advice of professional designers and fully consider the pond shape, position of the water inlet and outlet, as well as the vortex resulting from the water flow from the mixer reflex to the structures, try to reduce the short-circuit circulation and dead corners, and avoid the dashing of the flow against the pond wall to retard the flow velocity.

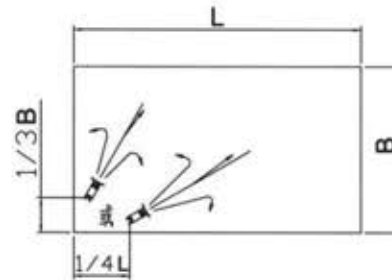


Refer to the following diagrams of operating modes, which can help you make a reasonable selection of the mixers and the installation modes.

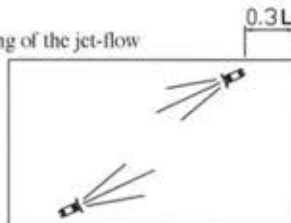
Avoiding short-circuit circulation



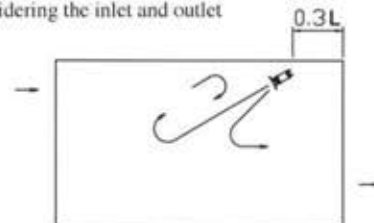
Making use of the reflection from the pond wall



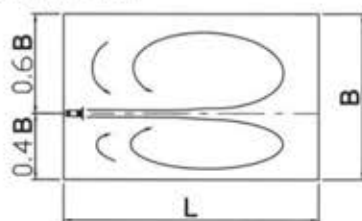
Inter-crossing of the jet-flow



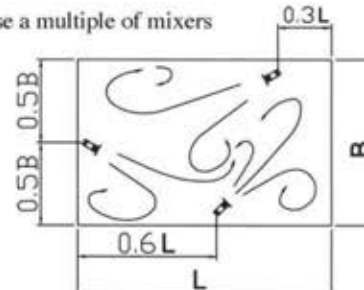
Considering the inlet and outlet



Pond width less than 5 times diameter of the vanes



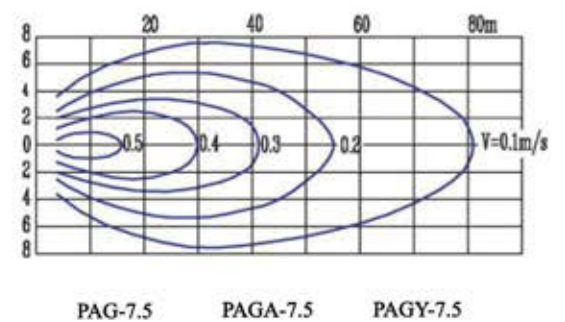
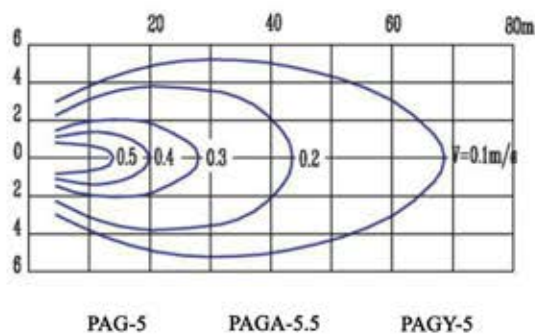
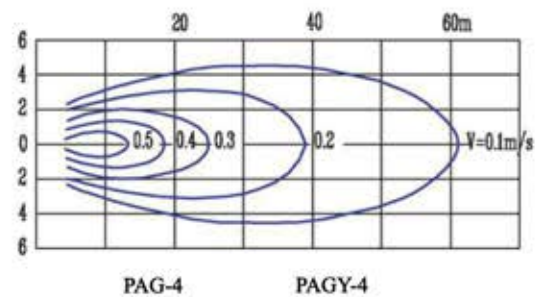
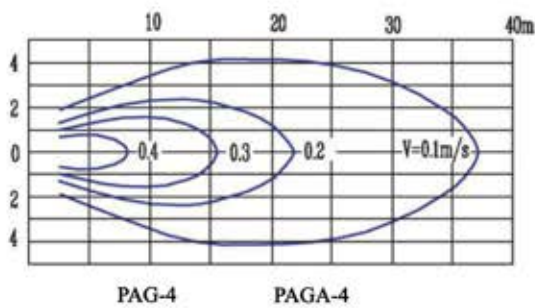
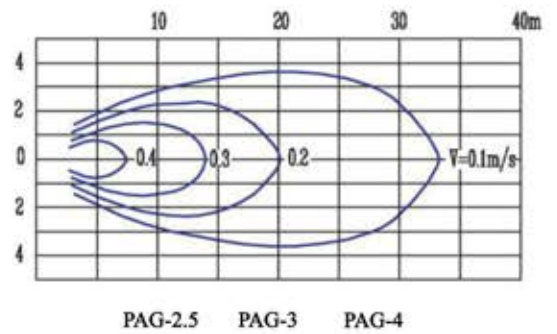
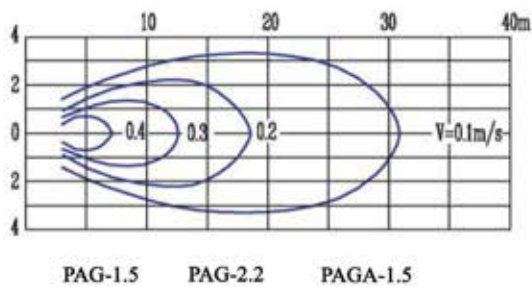
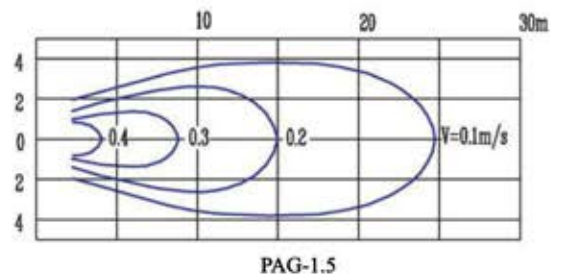
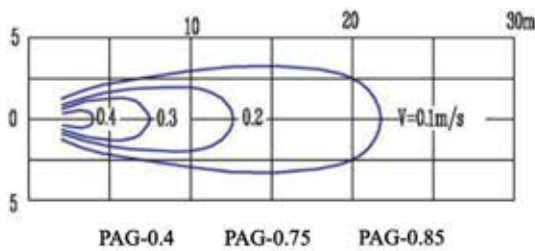
Use a multiple of mixers





Flow Field Submersible Mixer

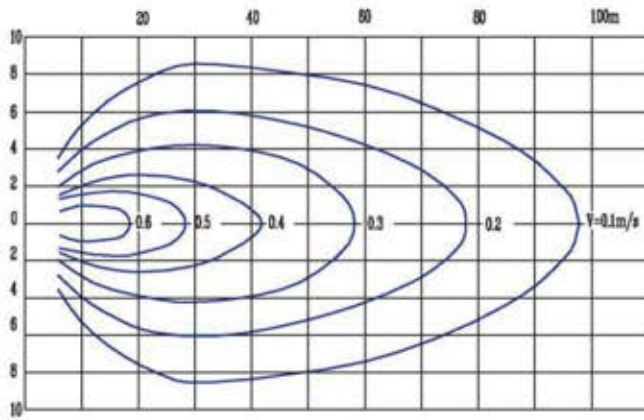
This flow velocity fields are located in the clear water with the boundary water flow velocity of $V=0.1\text{m/s}$



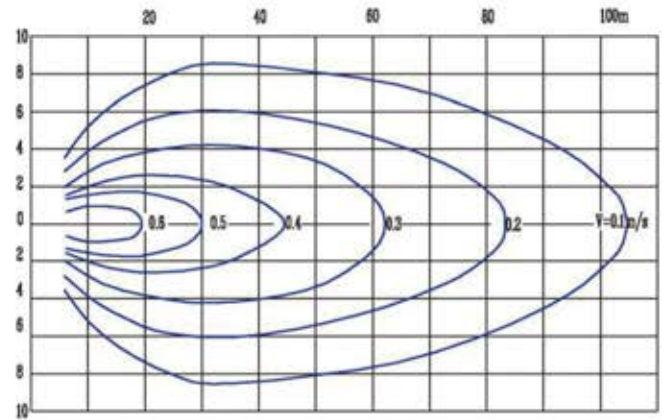


Diagrams of the Flow Field Submersible Mixer

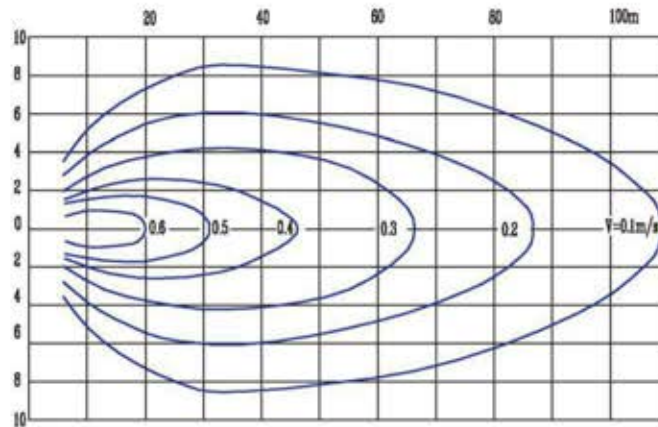
This flow velocity fields are located in the clear water with the boundary water flow velocity of $V=0.1\text{m/s}$



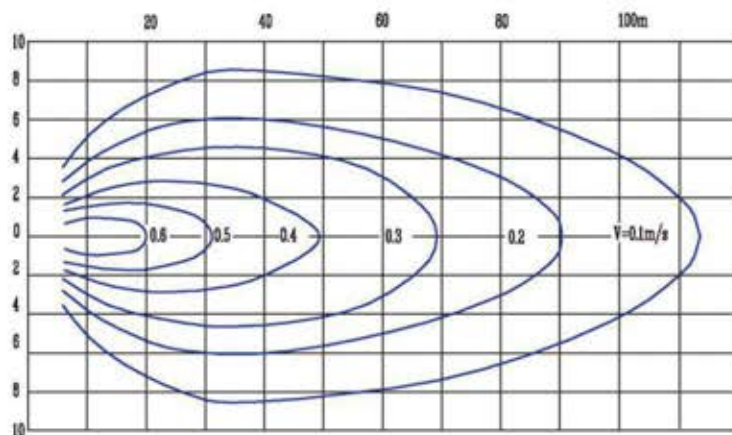
PAG-10 PAGA-11 PAGY-10



PAGY-15 PAGA-15 PAGY-15



PAGA-18.5 PAGY-18.5



PAGA-22 PAGY-22



Installation Modes and Dimensions

The submersible mixers can be installed in a multiple of modes. Here are three generally accepted modes of installation for selection with reference made to the following table, Our company can also provide the special designs in accordance with the demand of the users.



Type number	a	D	b	L	H ₁ min	H ₂ min	Installation system
PAG-0.4	φ 40	340	330	520	500	110	I
PAG-0.75	φ 40	340	330	520	500	110	I
PAG-0.85S	φ 48/□150	360	330/235	630/960	500/800	110/150	I/ II
PAG-1.5S	φ 48/□150	360	330/235	630/960	500/800	110/150	I/ II
PAG-2.2S	□170	460	320	970	800	150	II
PAG-4S	□170	460	320	970	800	150	II
PAG-1.5S	□170	500	320	960	800	200	II
PAG-2.5S	□170	500	320	960	800	200	II
PAG-3S	□170	500	320	1010	800	200	II
PAG-4S	□170	500	320	1010	800	300	II
PAG-4S	□100	760	335	1150	1100	300	III
PAG-5S	□100	760	335	1150	1100	300	III
PAG-7.5S	□100	760	335	1280	1500	300	III
PAG-10S	□100	760	335	1280	1500	300	III
PAG-15S	□100	760	335	1330	1500	300	III
PAGA-1.5S	□170	500	320	1020	800	200	II
PAGA-3S	□170	500	320	1010	800	200	II
PAGA-4S	□170	500	320	1020	800	300	II
PAGA-5.5S	□100	760	335	1250	1500	300	III
PAGA-7.5S	□100	760	335	1360	1500	300	III
PAGA-11S	□100	760	335	1360	1500	300	III
PAGA-15S	□100	760	335	1380	1500	300	III
PAGA-18.5S	□100	960	335	1480	1500	300	III
PAGA-22S	□100	960	335	1480	1500	300	III





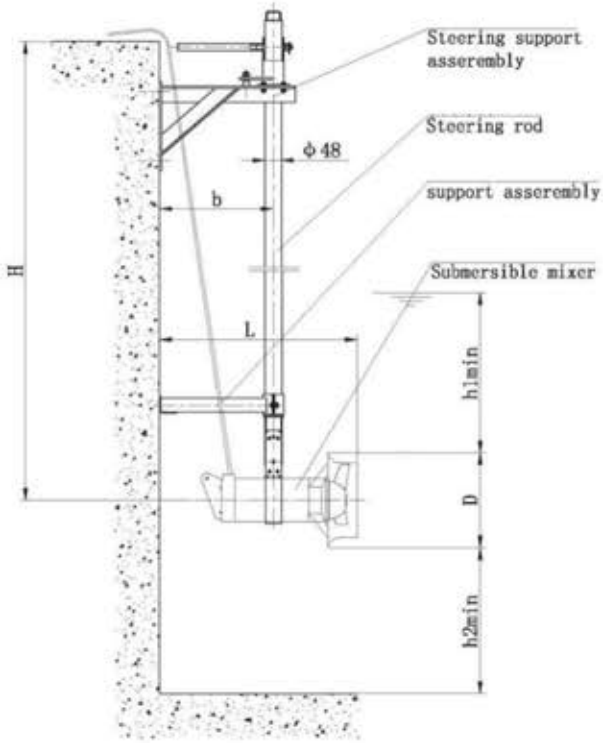
Notes:

1. The special installation systems for the submersible mixers can quickly install and dismantle the submersible mixers under the conditions of no need for draining off sewage from the pond.
2. Installation System I is only applicable to pond depth < 3m, mixer type of PAG-0.37, PAG-0.55, PAG0.85 and PAG-1.5 and with the possibility of adjusting the angles in both of horizontal direction and longitudinal direction.
3. For installation systems II and III, the guide rod can rotate around the axial line of the guide rod along the horizontal direction with the maximum turn angle of $\pm 60^\circ$;
4. With $H > 4m$, it is necessary to add a supporting frame between the guide rods.
5. The supporting frame and the lower support shall be fixed onto the pond wall and the pond bottom with expansion bolts or chemical anchors; unnecessary to reserve any hole.
6. While placing an order by customer, Please provide the pond depth H and the drawing of pond shape so as to determine the dimensions of the guide rod and the number of the supports.
7. The installation systems may employ the material of stainless steel or carbon steel for the selection of the corrosion resisting properties.
8. A multiple of mixers can share one lifting system

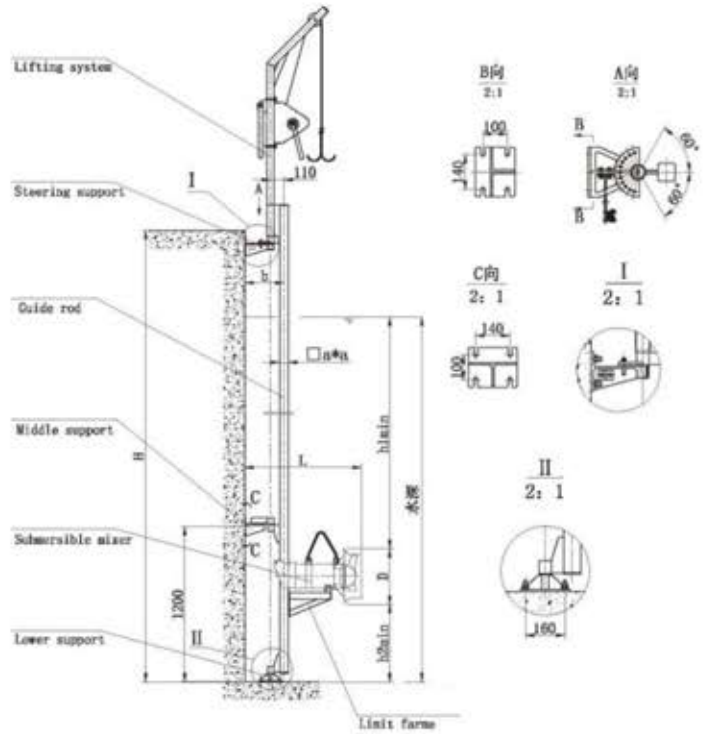




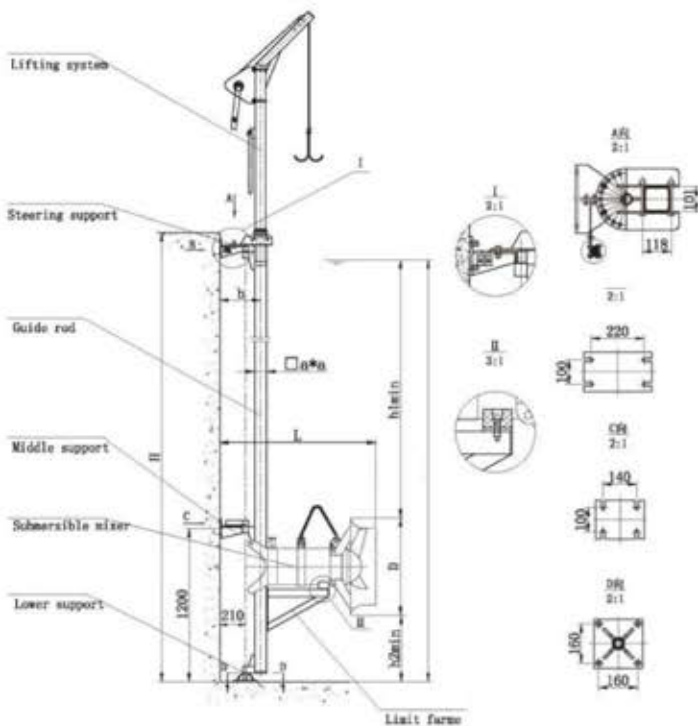
Installation diagram of Submersible Mixer



/Type



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Type

