



潜水搅拌机 Submersible Mixer



EGE

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南京贝特环保通用设备制造有限公司
Nanjing Beite Environmental Protection GE Manufacture Co., Ltd.

QJB型潜水搅拌机 QJB Type Submersible Mixer

产品介绍 Product Description

QJB型潜水搅拌机作为水处理工艺中的关键设备之一，在水处理工艺流程中，可实现生化过程中固液二相流和固液气三相流的均质、流动的工艺要求。它由潜水电机、叶轮和安装系统等组成。潜水搅拌机为直联式结构。具有结构紧凑、能耗低、便于维护保养等优点。叶轮经过精铸或冲压成型，精度高、推力大、流线型造型简洁美观，且具有防缠绕功能。该系列产品适用于需要固液搅拌、混合的场所。

QJB 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:



两道独立的机械密封，保证潜水电机长期可靠运行

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

高质量进口一次性润滑轴承，设计使用寿命100,000小时

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

独特的电缆密封设计，排除了电缆漏水的隐患

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

不锈钢、碳钢精铸或冲压焊接叶轮，经优化设计叶片呈后掠式，效率高，具有自洁功能

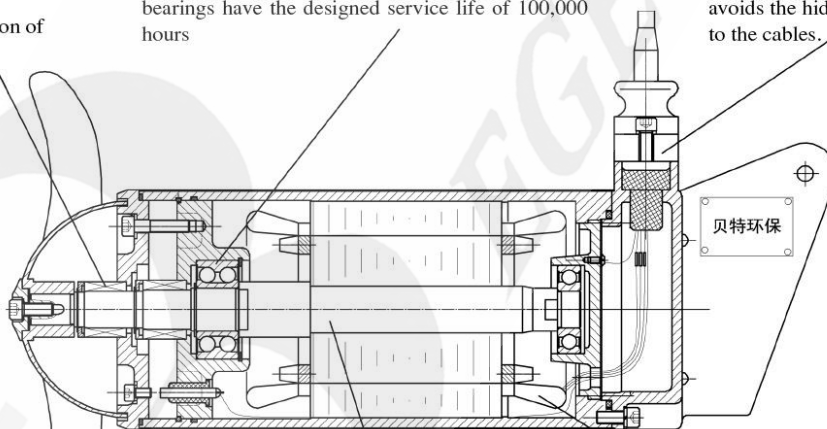
The stainless steel and carbon steel finishing-cast welded impeller has sweptback vanes after optimized design, resulted in high efficiency and self-cleaning function

电机轴采用不锈钢材质，转子经动平衡检测，运转平稳

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

内部设有泄漏传感器和定子绕组超温保护报警装置

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



QJBA型潜水搅拌机为节能型产品，采用常规四级电机配套高效一体化减速机结构的动力方案，相比多级电机可大幅减轻电网负担，节能15%以上。

QJBA 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%.

QJBY型潜水搅拌机为新一代超高效产品，采用自起动永磁电机，异步起动同步运行，结构简单，运行稳定，功率因素高，便于调速运行。电机效率可满足国家标准（GB18613-2012）中一级能效，或国际标准（IEC60034-30）中IE4能效要求。

QJBY 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).

应用范围 Scope of Application

潜水搅拌机主要运用在市政和工业污水处理过程中的混合、搅拌和环流，也可用作景观水循环的推流设备，通过搅拌达到创建水流作用，有效阻止悬浮物沉降。

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.

使用条件 Conditions of Application

为了保证潜水搅拌机的正常工作，请正确选择工作环境和运行模式。

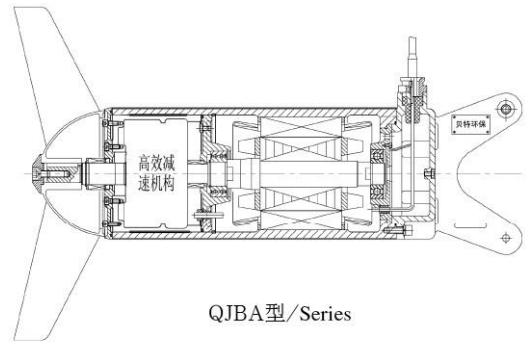
In order to ensure the normal operation of the submersible mixer, please make correct selection of the operating environment and the operating modes.



- 最高介质温度不超过40℃ ；
- The highest temperature of the medium shall not exceed 40℃ ；
- 介质的pH值范围：5~9；
- The scope of pH value of the medium:5~9；
- 介质密度不超过1150Kg/m³；
- The density of the medium shall not exceed 1150Kg/m³；
- 潜水深度不超过20m。
- The depth of submersion shall not exceed 20m.

▲特别提示：潜水搅拌机必须完全潜入水中工作，不能在易燃易爆和强腐蚀性及高温的环境中工作。针对特殊环境下的要求，我公司可为用户提供特殊设计。

▲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.



性能参数 Performance Parameters

潜水搅拌机在额定电压为380伏,频率为50Hz的性能参数如下表:

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

型号Model	电机功率 (kW/P) Motor power	额定电流 (A) Rated current	叶轮转速 (r/min) rpm of impeller	叶轮直径 (mm) Diameter of impeller	推力 (N) Thrust	重量 (Kg) Weight	
标准型 Standard type	QJB220/960-0.37/S	0.37/6	1.3	960	220	138	45/50
	QJB220/1400-0.55/S	0.55/4	1.6	1400	220	145	45/50
	QJB260/740-0.85/C/S	0.85/8	3.2	740	260	163	55/65
	QJB260/960-1.5/C/S	1.5/6	4	960	260	290	55/65
	QJB320/740-2.2/C/S	2.2/8	5.9	740	320	582	88/93
	QJB320/960-4/C/S	4/6	10.3	960	320	609	88/93
	QJB400/740-1.5/C/S	1.5/8	5.2	740	400	600	74/82
	QJB400/740-2.5/C/S	2.5/8	7	740	400	800	74/82
	QJB400/740-3/C/S	3/8	8.6	740	400	920	74/82
	QJB400/960-4/C/S	4/6	10.3	960	400	1200	74/82
	QJB620/480-4/S	4/12	14	480	620	1400	190/206
	QJB620/480-5/S	5/12	18.2	480	620	1800	196/212
	QJB620/480-7.5/S	7.5/12	28	480	620	2600	240/256
	QJB620/480-10/S	10/12	32	480	620	3300	250/266
	QJB620/480-15/S	15/12	39	480	620	4000	270/286
	QJB560/740-11/S	11/8	25	740	560	2900	194/209
	QJB560/740-15/S	15/8	34	740	560	3460	260/275
	QJB760/740-18.5/S	18.5/8	41	740	760	4200	276/294
QJB760/740-22/S	22/8	47.4	740	760	5400	292/310	
节能型 Energy type	QJBA400/740-1.5/S	1.5/4	3.7	740	400	600	74/82
	QJBA400/740-3/S	3/4	6.6	740	400	920	74/82
	QJBA400/960-4/S	4/4	8.6	960	400	1200	80/92
	QJBA620/480-5.5/S	5.5/4	11	480	620	1800	160/176
	QJBA620/480-7.5/S	7.5/4	15	480	620	2600	182/198
	QJBA620/480-11/S	11/4	22	480	620	3300	224/240
	QJBA620/480-15/S	15/4	30	480	620	3680	288/306
	QJBA760/310-18.5/S	18.5/4	36	310	760	4600	364/382
QJBA760/310-22/S	22/4	42	310	760	5760	380/398	
永磁型 Permanent magnet type	QJBY620/500-4/S	4/12	6.7	500	620	1400	190/206
	QJBY620/500-5/S	5/12	8.4	500	620	1800	196/212
	QJBY620/500-7.5/S	7.5/12	12.4	500	620	2600	240/256
	QJBY620/500-10/S	10/12	18	500	620	3300	250/266
	QJBY760/500-15/S	15/12	24.5	500	760	4000	270/286

- 注: 1、上表混合搅拌系列中,“重量”一列所标的数值为含导流罩的重量与不含导流罩重量;
2、电机绕组绝缘等级: F级, 防护等级: IP68, 电机工作制式: 24小时连续工作。
3、可提供H级绝缘电机。

- 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

型号表示方式 Model of Model Denotation

QJBA/Y □/□-□/□

- 材质 (C-碳钢; S-不锈钢)
- Material (C-carbon steel; S-stainless steel)
- 电机功率(kW) power of the motor(kW)
- 额定转速 (r/min) Rated rotate speed (rpm)
- 叶轮 (桨) 直径Diameter of the blade
- QJB为潜水搅拌机字母代号, A型为节能型, Y型为永磁型
- QJB is letter code of the submersible mixer, A is energy-saving type, Y is Permanent magnet type

选型参考 Reference for Type Selection

潜水搅拌机的选型是一项比较复杂的工作, 选型方案的正确与否直接影响到设备的正常使用, 作为选型的原则就是要让搅拌机在适合的容积里发挥充分的搅拌功能, 这个标准一般可用流速来确定。根据污水处理厂的不同工艺要求, 搅拌机选型的最佳流速应保证在0.15~0.3m/s之间, 如果低于0.15m/s的流速则达不到推流搅拌的效果, 如果超过0.3m/s的流速则会影响工艺效果且造成浪费。所以在选型前, 首先要确定潜水搅拌机运用在什么场所, 如: 污水池、污泥池还是生化池; 其次是介质参数, 如: 悬浮物含量、温度、PH值等; 还有水池的形状, 水深甚至安装方式等都将对选型产生影响, 同时还应考虑到节能因素, 因为这将会影响到用户今后的运行成本。

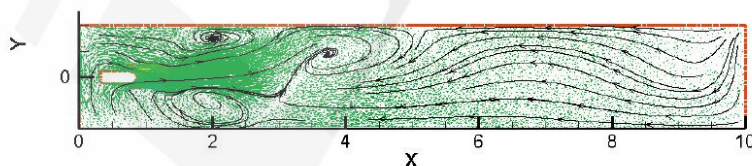
为了满足在不同环境下都能达到最佳的搅拌效果, 我们为用户提供了多种型号的潜水搅拌机, 同时可提供选型服务。可参考下面的潜水搅拌机流场图。



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.

QJB型潜水搅拌机流场分布图



潜水搅拌机运行模式 Operating Modes of Submersible Mixer

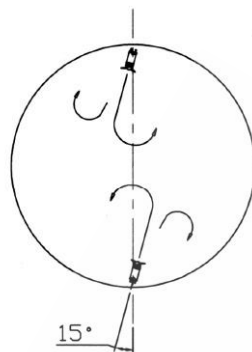
潜水搅拌机的安装定位对其搅拌效果有很大的影响，为了达到预期的运行效果，我们建议用户按照专业设计人员的要求去做，要充分考虑到水池的形状，进出水的位置以及搅拌机水流反射到构筑物后引起的涡流等情况，尽量减少短路循环和死角的存在，避免与池壁的正面撞击而降低流速。参照下面的运行模式图，可帮助您合理选择搅拌机和安装形式。



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.

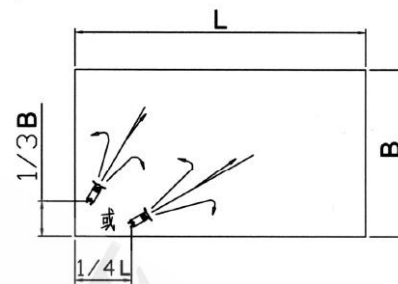
避免短路循环

Avoiding short-circuit circulation



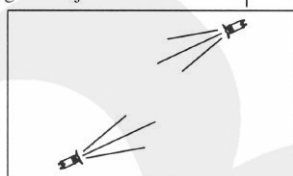
利用池壁反射

Making use of the reflection from the pond wall



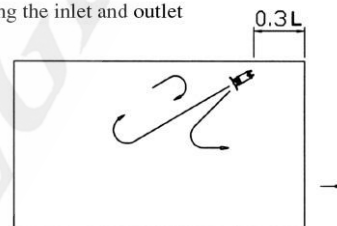
射流的交叉

Inter-crossing of the jet-flow



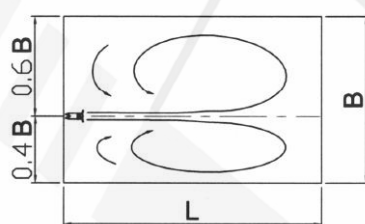
进出水口

Considering the inlet and outlet



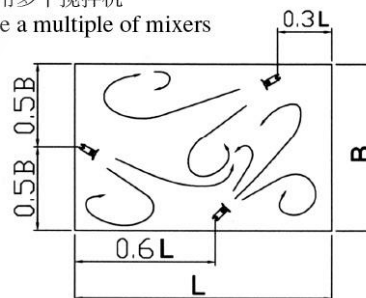
池宽小于5倍的叶轮直径

Pond width less than 5 times diameter of the vanes



使用多个搅拌机

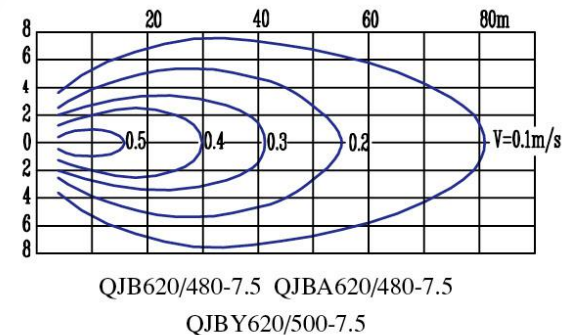
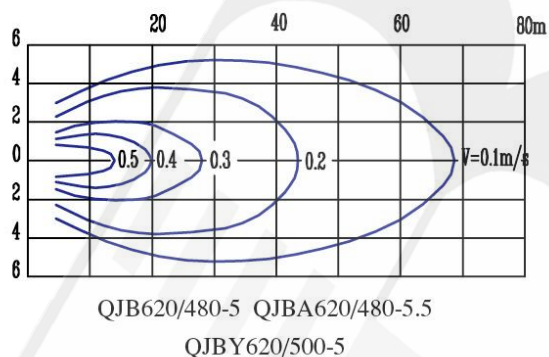
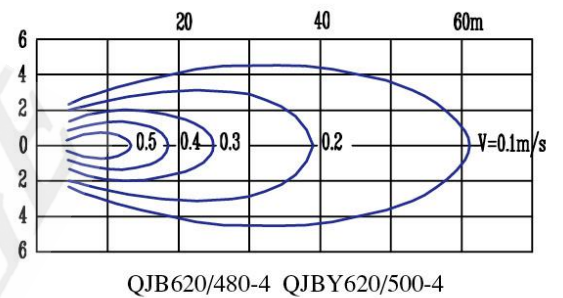
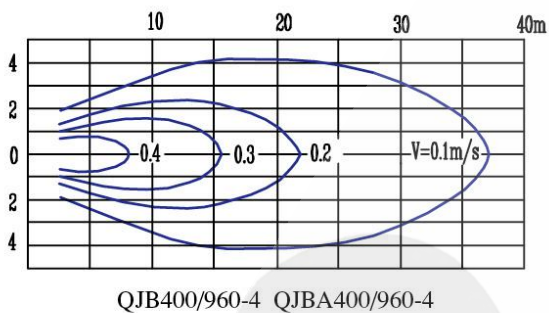
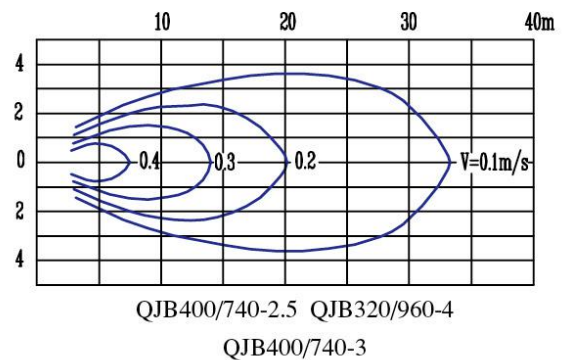
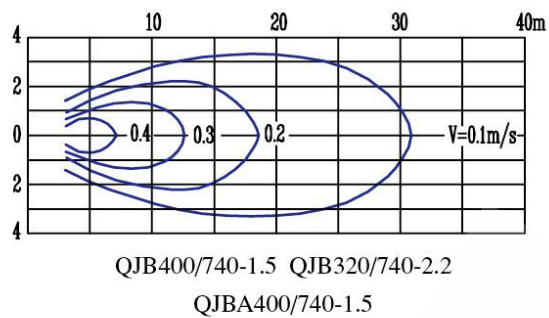
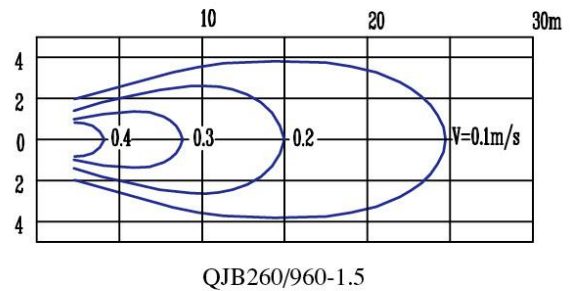
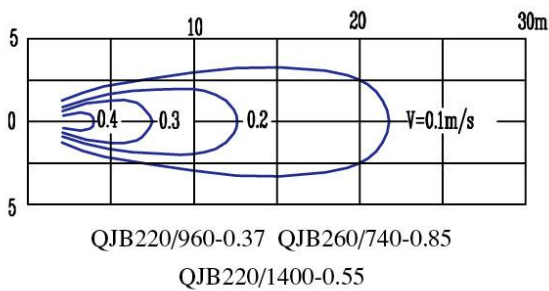
Use a multiple of mixers



潜水搅拌机流场图 Diagrams of the Flow Field Submersible Mixer

该流速场是在清水中边界流速 $V=0.1\text{m/s}$

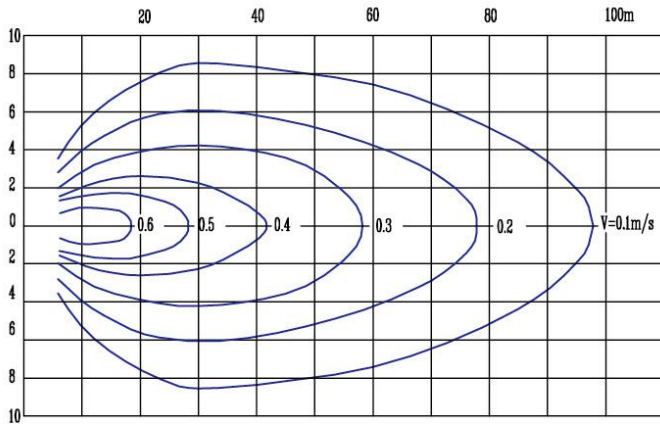
This flow velocity fields are located in the clear water with the boundary water flow velocity of $V=0.1\text{m/s}$



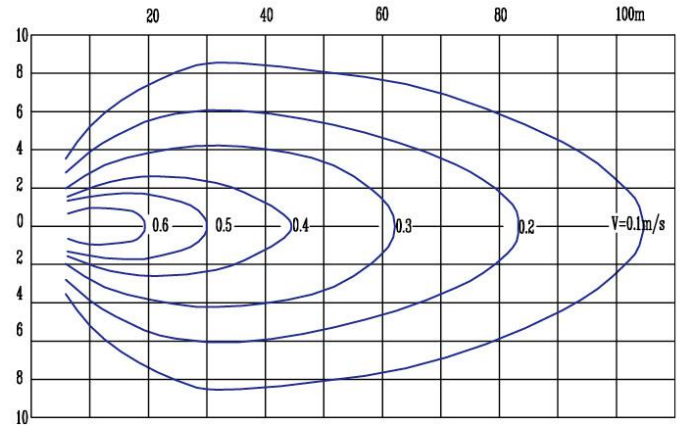
潜水搅拌机流场图 Diagrams of the Flow Field Submersible Mixer

该流速场是在清水中边界流速 $V=0.1\text{m/s}$

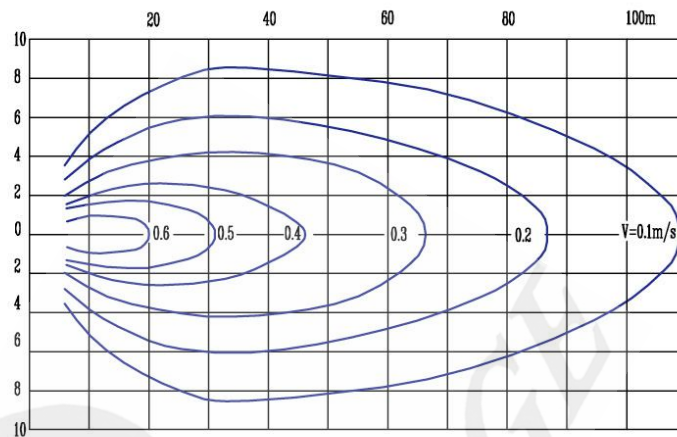
This flow velocity fields are located in the clear water with the boundary water flow velocity of $V=0.1\text{m/s}$



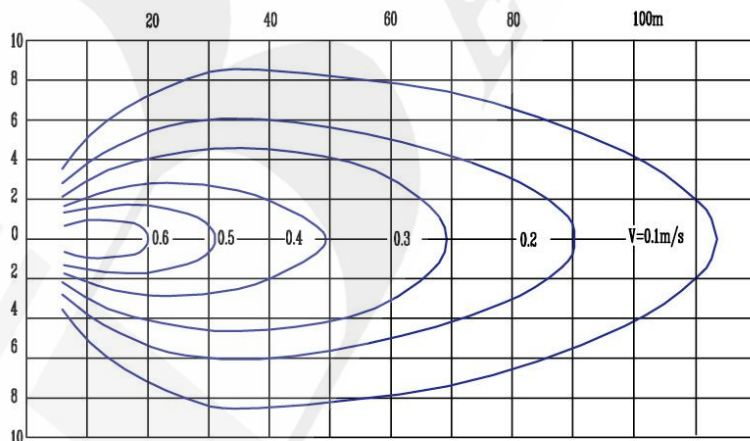
QJB620/480-10 QJB560/740-11
QJBA620/480-11 QJBY620/500-10



QJB560/740-15 QJB620/480-15
QJBA620/480-15 QJBY620/500-15



QJB760/740-18.5 QJBA760/310-18.5



QJB760/740-22 QJBA760/310-22

安装方式及尺寸 Installation Modes and Dimensions

潜水搅拌机可以有多种安装方式，这里提供三种最通用的方式供选择，尺寸可参考下表。我公司还可以根据用户的要求作特殊设计。

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.



型号 Type number	a	D	b	L	H _{1min}	H _{2min}	安装系统 Installation system
QJB220/960-0.37/S	φ 40	340	330	520	500	110	I
QJB220/1400-0.55/S	φ 40	340	330	520	500	110	I
QJB260/740-0.85/C/S	φ 48/口50	360	330/235	630/960	500/800	110/150	I/II
QJB260/960-1.5/C/S	φ 48/口50	360	330/235	630/960	500/800	110/150	I/II
QJB320/740-2.2/C/S	口70	460	320	970	800	150	II
QJB320/960-4/C/S	口70	460	320	970	800	150	II
QJB400/740-1.5/C/S	口70	500	320	960	800	200	II
QJB400/740-2.5/C/S	口70	500	320	960	800	200	II
QJB400/740-3/C/S	口70	500	320	1010	800	200	II
QJB400/960-4/C/S	口70	500	320	1010	800	300	II
QJB620/480-4/S	口100	760	335	1150	1100	300	III
QJB620/480-5/S	口100	760	335	1150	1100	300	III
QJB620/480-7.5/S	口100	760	335	1280	1500	300	III
QJB620/480-10/S	口100	760	335	1280	1500	300	III
QJB620/480-15/S	口100	760	335	1330	1500	300	III
QJB560/740-11/S	口100	720	335	1280	1500	300	III
QJB560/740-15/S	口100	720	335	1360	1500	300	III
QJB760/740-18.5/S	口100	960	335	1480	1500	300	III
QJB760/740-22/S	口100	960	335	1480	1500	300	III
QJBA400/740-1.5/S	口70	500	320	1020	800	200	II
QJBA400/740-3/C/S	口70	500	320	1010	800	200	II
QJBA400/900-4/S	口70	500	320	1020	800	300	II
QJBA620/480-5.5/S	口100	760	335	1250	1500	300	III
QJBA620/480-7.5/S	口100	760	335	1360	1500	300	III
QJBA620/480-11/S	口100	760	335	1360	1500	300	III
QJBA620/480-15/S	口100	760	335	1380	1500	300	III
QJBA760/310-18.5/S	口100	960	335	1480	1500	300	III
QJBA760/310-22/S	口100	960	335	1480	1500	300	III

注：QJBY型安装尺寸与QJB型相同 QJBY type and QJB type is same installation dimension

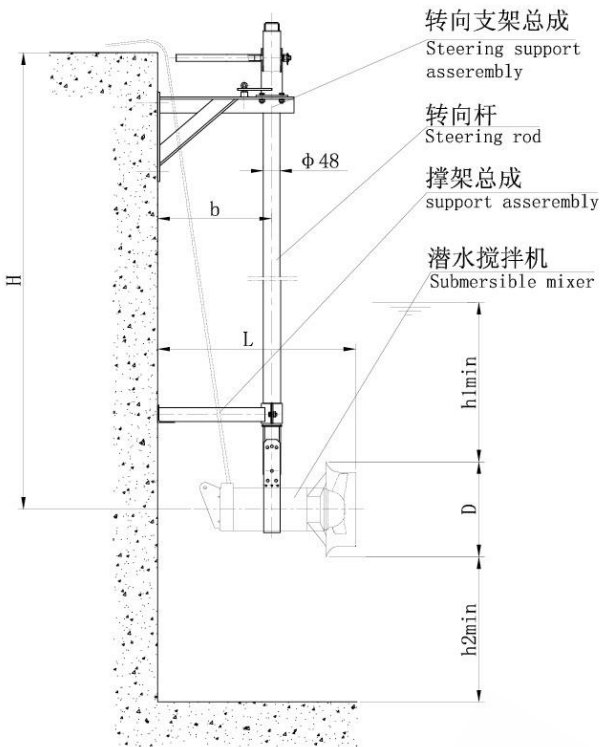
- 注： 1、潜水搅拌机的专用安装系统，可在无需排出池中污水的情况下，快速安装和拆卸潜水搅拌机；
- 2、安装系统I只适用于池深<3m，机型为QJB220/960-0.37、QJB220/1400-0.55、QJB260/740-0.85和QJB260/960-1.5，且可在水平方向和垂直方向调节角度；
- 3、安装系统II、III导杆可沿水平方向绕导杆轴线旋转，最大转角为 $\pm 60^\circ$ ；
- 4、当H>4m时需在导杆中间添加一支撑架；
- 5、支撑架和下托架与池壁、池底均用膨胀螺栓或化学锚栓固定，对于大直径叶轮和大功率搅拌机最好采用预埋件；
- 6、客户定货时，请提供池深H及池型图，以便确定导杆尺寸和支撑架个数；
- 7、安装系统材质采用不锈钢和碳钢防腐可供选择；
- 8、多台搅拌机可共用一套起吊系统。

Notes:

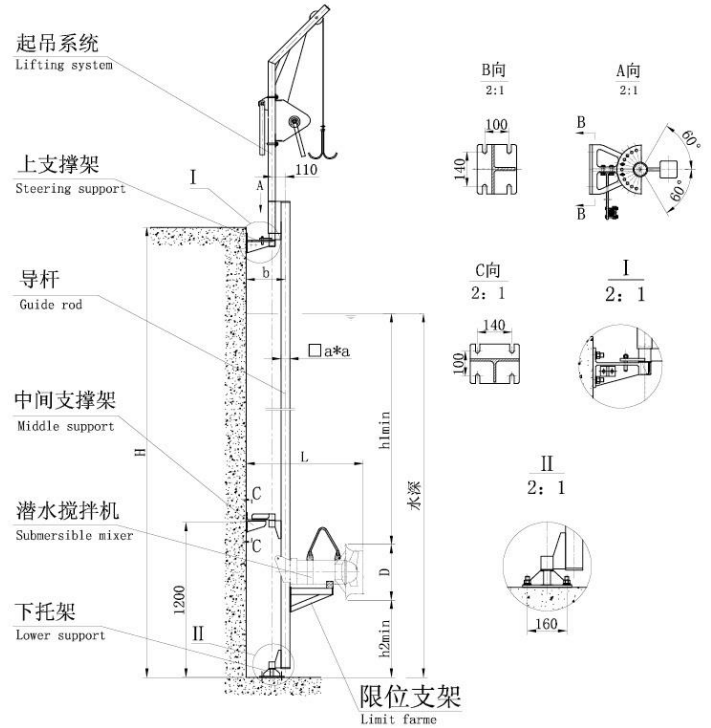
1. The special installation systems for the submersible mixers can quickly install and dismantle the submersible mixers under the conditions of no need for draining off sewage from the pond.
2. Installation System I is only applicable to pond depth<3m, mixer type of QJB210/1460-0.37,QJB230/1400-0.55,QJB260/740-0.85and QJB260/980-1.5 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



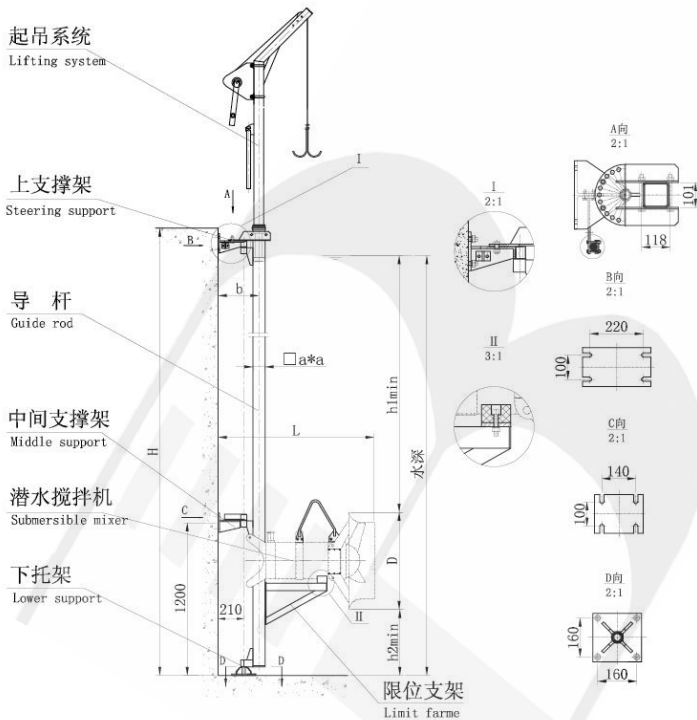
潜水搅拌机安装示意图 Installation diagram of Submersible Mixer



I 型/Type



II 型/Type



III 型/Type

