

GSD INDUSTRIAL CO., LTD.

MA、LFP

潜水搅拌机



川源股份有限公司



应用范围

我公司潜水搅拌机分为混合搅拌器与低速推流器，主要运用在：

- 1.市政和工业污水处理过程中的混合、搅拌和环流：活性污泥池、生物反应池、搅拌池、贮泥井、均衡池、污水池等；
- 2.景观水环境的养护设备,创建水流；
- 3.增加水中含氧量，改善水体质量；
- 4.有效阻止悬浮物沉积。

适用条件

介质温度：≤40℃

介质pH值：5~9

介质密度：≤1150Kg/m³

潜水深度：≤20m

电源：380V，50HZ

电机：F绝缘并符合IP68，24小时连续运行

潜水搅拌机必须完全潜入水中工作

特点

1. 两道独立的机械密封，保证潜水电机长期可靠运行。
2. 高质量进口一次性润滑轴承，设计使用寿命10万小时。
3. 独特的电缆密封设计，排除了电缆漏水的隐患。
4. 电机轴采用不锈钢材质，转子经动平衡检测，运转平稳。
5. 内部设有泄漏传感器和定子绕组超温保护报警装置。
6. 混合搅拌器的不锈钢、碳钢精铸焊接叶桨，经优化设计叶片呈后掠式，效率高，具有自洁功能。
7. 低速推流器桨叶由弹性聚氨酯或铝合金制成，能承受变化的负荷，推力被平均分配，具最佳水力设计。
8. 低速推流器所有接触介质的紧固件均采用不锈钢材质。

RANGE OF APPLICATION

The submersible mixers in our company include mixing agitator and low-speed flow propeller, mainly used for ;

- 1.The purposes of mixing, agitating and making ring flows in the process of municipal and industrial sewage treatment: Activated sludge tank, bioreactor tank, mixing tank, sludge silos, equalizing reservoir, sewage tank and etc.
- 2.The maintenance equipment for the landscape water environment, creating water flow.
- 3.Increasing the oxygen content in water and improving the quality of the water body.
- 4.Effectively preventing the sedimentation of the suspended substances.

CONDITIONS OF USAGE

The highest temperature of the media shall not exceed 40℃

The pH value of the media:5~9

The density of the media shall not exceed 1150Kg/m³

The depth of submersion shall not exceed 20m

The electric power supply: 380V, 50HZ

The motor: F class insulation and in accordance with IP68, continuous operating in 24hr

The submersible mixer must operate in the complete submersion into water

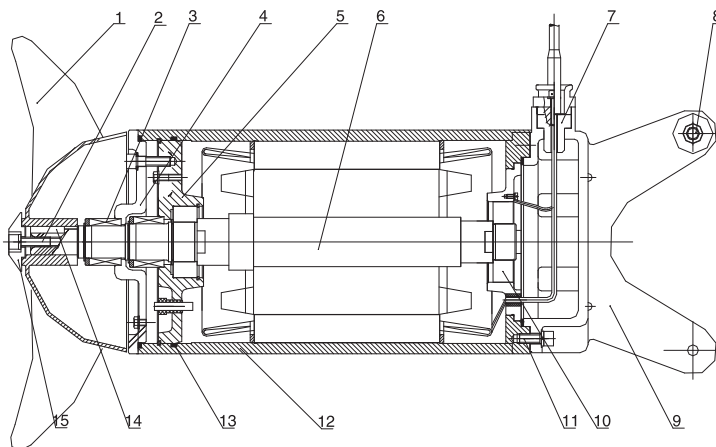
FEATURES

1. The two rows of independent mechanical sealing ensure the long-term and reliable operation of the submersible motor.
2. The imported high-quality one-service lubricated bearings have the designed service life for 100,000 hours.
3. The unique sealing design for the cables removes the hidden danger of water leakage for the cables.
4. The shaft of the motor employs the stainless steel; and the rotors are inspected with the use of dynamic balancing, leading to smooth rotation.
5. The in-built leakage sensor and the alarming device for the over-temperature protection for the windings of the stator.
6. The mixer agitator have the welded precision-cast stainless steel and carbon steel vanes, which are of the sweptback shape through the optimized design, resulting in high efficiency and self-cleaning function.
7. The vanes of the low-speed flow propeller are made of elastic PU or aluminum alloy, resulting in the ability for bearing the varying load, the propelling power is equalized distribution and the availability of the optimized hydraulic design.
8. On the low-speed flow propeller, all the tightening pieces for the contact media employ the stainless- steel material.

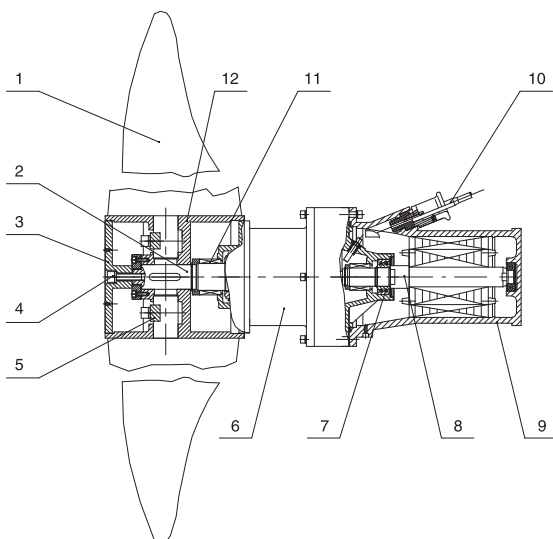
型号说明 TYPE DESCRIPTION



结构简图 CONSTRUCTION



NO.	名称 Name
1	叶桨 Propeller
2	锁紧螺钉 Lock nut
3	机械密封 Mechanical Seal
4	机封座 Mechanical Seal stand
5	前轴承座 Front bearing support
6	主轴 Main shaft
7	水密头 Watertight Head
8	滚轮 Roller
9	接线盒 Junction box
10	轴承 Bearing
11	内六角螺钉 Inner hexagonal screw
12	机壳 Sheath
13	O型橡胶密封圈 O-type sealant ring
14	普通平键 General flat key
15	叶轮压紧圈 Wheel clamp ring



NO.	名称 Name
1	叶桨 Propeller
2	输出轴 Output shaft
3	端盖 End Cap
4	螺栓 Bolt
5	压块 Pressed block
6	减速装置 Decelerator
7	轴承 Bearing
8	定子轴 Stator Shat
9	机壳 Sheath
10	电缆密封组件 Splicing kits for power cable
11	机械密封 Mechanical Sealing
12	轮毂 Wheel Boss

混合搅拌器均为三叶片式叶桨，低速推流器为二叶片式叶桨

Mixer agitator has three propeller vanes, and the low-speed flow propeller has two propeller vanes.



混合搅拌器(带导流罩)
Mixing agitator (With dome)



混合搅拌器(不带导流罩)
Mixing agitator (Without dome)



低速推流器
Low-speed flow propeller

性能参数 PERFORMANCE PARAMETERS

混合搅拌器 MIXING AGITATOR

型号 Model	电机功率(kW) Motor power	额定电流(A) Rated current	叶桨转速(r/min) rpm of propeller	叶桨直径(mm) Diameter of propeller	推力(N) Thrust	重量(Kg) Weight
MA0.85/8-260-740	0.85	3.2	740	260	163	55/65
MA1.5/6-260-980	1.5	4	980	260	290	55/65
MA2.2/8-320-740	2.2	5.9	740	320	582	88/93
MA4/6-320-960	4	10.3	960	320	609	88/93
MA1.5/8-400-740	1.5	5.2	740	400	600	74/82
MA2.5/8-400-740	2.5	7	740	400	800	74/82
MA3/8-400-740	3	8.6	740	400	920	74/82
MA4/6-400-980	4	10.3	980	400	1200	74/82
MA4/12-620-480	4	14	480	620	1400	190/206
MA5/12-620-480	5	18.2	480	620	1800	196/212
MA7.5/12-620-480	7.5	28	480	620	2600	240/256
MA10/12-620-480	10	32	480	620	3300	250/266

注：上表“重量”一栏两重量分别表示不带导流罩和含导流罩的重量。

In the above table, the value listed in the column of "weight" respectively contains the weight of without or with the dome.

低速推流器 LOW-SPEED FLOW PROPELLER

型号 Model	电机功率(kW) Motor power	额定电流(A) Rated current	叶桨转速(r/min) rpm of propeller	叶桨直径(mm) Diameter of propeller	推力(N) Thrust	重量(Kg) Weight
LFP1.5/4-1000-85	1.5	4	85	1000	1780	170
LFP3/4-1100-135	3	6.8	135	1100	2410	170
LFP1.5/4-1400-36	1.5	4	36	1400	696	180
LFP2.2/4-1400-42	2.2	4.9	42	1400	854	180
LFP2.2/4-1600-36	2.2	4.9	36	1600	1058	190
LFP3/4-1600-52	3	6.8	52	1600	1386	190
LFP1.5/4-1800-42	1.5	4	42	1800	1480	198
LFP3/4-1800-52	3	6.8	52	1800	1946	198
LFP4/4-1800-63	4	9	63	1800	2750	198
LFP2.2/4-2000-36	2.2	4.9	36	2000	1459	200
LFP4/4-2000-52	4	9	52	2000	1960	200
LFP4/4-2200-52	4	9	52	2200	1986	220
LFP5/4-2200-63	5	11	63	2200	2590	220
LFP3/4-2500-36	3	6.8	36	2500	2380	230
LFP4/4-2500-42	4	9	42	2500	2350	250
LFP5/4-2500-52	5	11	52	2500	3090	250
LFP7.5/4-2500-63	7.5	15	63	2500	4275	280



潜水搅拌机选型

为了满足在不同环境下都能达到最佳的搅拌功能，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，请使用方提供如下材料。

- 1.运用场所，如：污水池、污泥池、生化池等；
- 2.介质参数，如：悬浮物含量、温度、PH值等；
- 3.水池的形状，水深；
- 4.设备安装方式等。

INFORMATION FOR MODEL SELECTION

For the purpose of obtaining the optimum mixing function under the different environments, we can supply a multiple of models of the submersible mixers to the users and provide the model selection service, the information should be provided as follows:

- 1.The locations the mixer will be used in, for instance:sewage tank, slag pond or bio-chemical pond and so on.
- 2.The parameters of the media such as content of the suspended substances, temperature, pH value.
- 3.The shape of the pond, water depth.
- 4.The mode of installation and so on.

选型方法一

1 混合搅拌型

- 1.1 根据图1或表1确定待搅拌介质的污泥校正系数。
- 1.2 根据图2或表2确定搅拌池的池型校正系数。
- 1.3 按每立方米清水所需耗电4.8W乘以污泥校正系数，再乘以池型校正系数，得出每立方米待混合搅拌介质所需耗电的实际值，再乘以待搅拌介质的体积，得出整池待混合搅拌介质所需的功率。

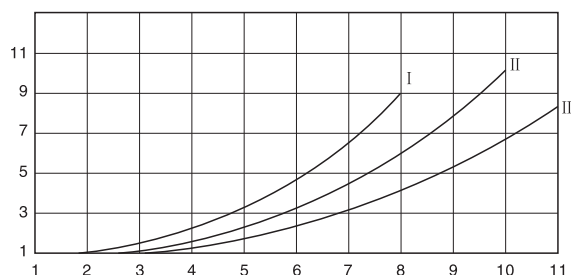
MODEL SELECTION ONE

1. Mixing agitator type

- 1.1 The sludge correction factor of the agitation medium is determined according to fig. 1 or table 1.
- 1.2 The pool type correction factor for the agitating pool is determined according to fig. 2 or table 2.
- 1.3 The actual value of power consumption of the medium to be mixed and agitated every cubic meter is calculated as follows: the supposed 4.8W power consumption by every cubic meter of water X sludge correction factor X pool type correction factor. The consumption required by the whole pool of medium to be mixed and agitated will be obtained after the consumption per cubic meter multiplied by the volume of the medium to be agitated.

固体物含量 Solid Content %	一次污泥 First Sludge	二次污泥 Second Sludge	水解污泥 Hydrolyzed Sludge	重度 Density g/cm ³
1.00	1.00	1.00	1.00	1.01
2.00	1.15	1.00	1.00	1.02
3.00	1.50	1.15	1.00	1.03
4.00	2.00	1.50	1.20	1.04
5.00	2.60	1.90	1.50	1.05
6.00	3.60	2.40	1.90	1.06
7.00	5.50	3.40	2.40	1.07
8.00	9.00	4.80	3.30	1.08
9.00	—	6.80	4.70	1.09
10.00	—	10.00	6.40	1.10
11.00	—	—	8.40	1.11

表1 污泥校正系数表
Table 1 Sludge correction factors



I - 一次淤泥; II - 二次淤泥; III - 水解淤泥
I-First Sludge II-Second Sludge III-Hydrolyzed Sludge

图1 淤泥校正系数曲线
Fig. 1 Sludge Calibration Curve

2 低速推流型

- 2.1 根据图1 或表1确定待搅拌介质的污泥校正系数。
- 2.2 根据图2 或表2确定搅拌池的池型校正系数。
- 2.3 根据搅拌介质初始流速V。通过图3确定单位流量的耗功。
- 2.4 用搅拌介质初始流速V乘以叶浆旋转时所形成的截面积计算出搅拌机的流量。
- 2.5 用搅拌机的流量乘以单位流量的耗功，再乘以污泥校正系数和池型校正系数，即可得整池介质所需的功率。

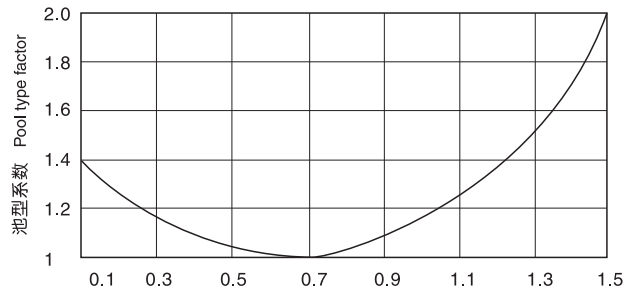
2.Low-speed flow propeller type

- 2.1 The sludge correction factor of the agitation medium is determined according to fig. 1 or table 1.
- 2.2 The pool type correction factor for the agitating pool is determined according to fig. 2 or table 2.
- 2.3 According to initial speed V of the agitation medium, and based on table 3, determine the power consumed by unit flow rate.
- 2.4 The flow rate of the agitator will be acquired after the initial speed V of the agitation medium is multiplied by the sectional area covered when rotating the propeller.
- 2.5 The consumption required by the whole pool of medium will be obtained after the flow rate of the agitator is multiplied by the consumption of unit flow rate, and then multiplied by the sludge correction factor, and the pool type correction factor.

深度/直径 Depth/Diameter	池型系数 Pool Type Factor	深度/直径 Depth/Diameter	池型系数 Pool Type Factor
0.10	1.40	0.85	1.05
0.15	1.31	0.90	1.08
0.20	1.25	0.95	1.11
0.25	1.19	1.00	1.15
0.30	1.14	1.05	1.19
0.35	1.10	1.10	1.25
0.40	1.08	1.15	1.32
0.45	1.05	1.20	1.40
0.50	1.04	1.25	1.48
0.55	1.03	1.30	1.58
0.60	1.01	1.35	1.68
0.65	1.00	1.40	1.78
0.70	1.00	1.45	1.89
0.75	1.01	1.50	2.00
0.80	1.03		

注：矩形池，表中直径取池宽。
Note: For rectangular pools, diameter shall be substituted by width.

表2 池型校正系数表
Table 2 Pool type correction factor method



对于矩形池，池宽=池直径
For rectangular pool, width=diameter

图2 池型校正系数曲线
Fig. 2 Pool type Calibration Curve

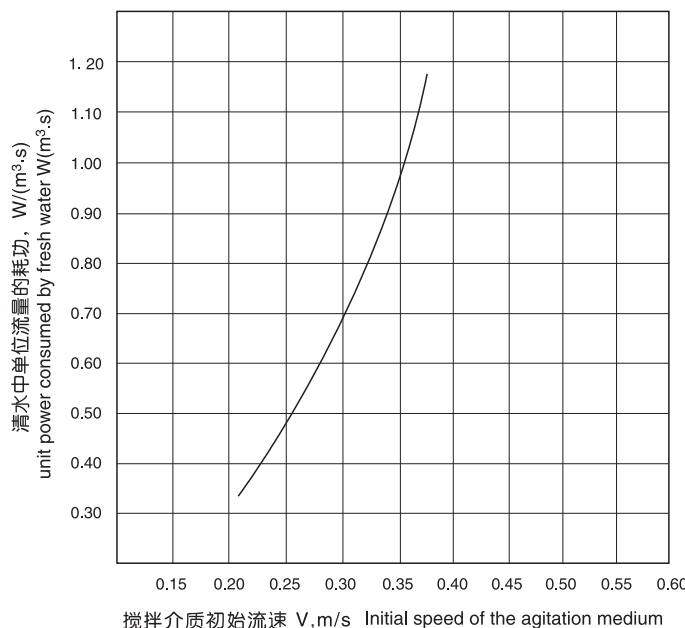


图3 推流单位流量介质耗能曲线
Fig. 3 Power Consumption Curve of Unit Flow Rate Medium of Plug Flow

选型方法二 MODEL SELECTION TWO

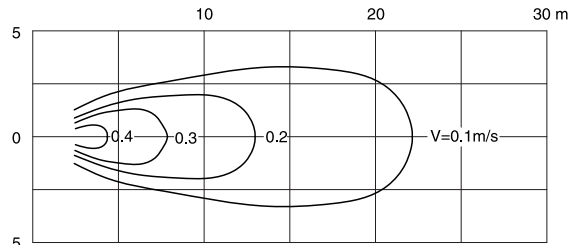
根据流场图选型 Select according to the flow field diagram

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。

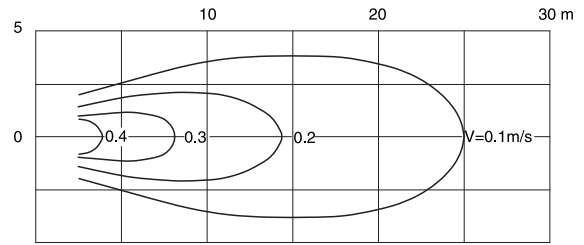
In line with the different technological requirement of the sewage treatment, the optimum flow velocity for the mixer model selection shall ensure the velocity range of 0.15~0.3m/s. In case of the flow velocity lower than 0.15m/s, the effect of agitation or mixing can not be achieved. In case of the flow velocity greater than 0.3m/s, the technological result will be affected and waste will be caused.

该流速是在清水中边界水流速 $V=0.1\text{m/s}$

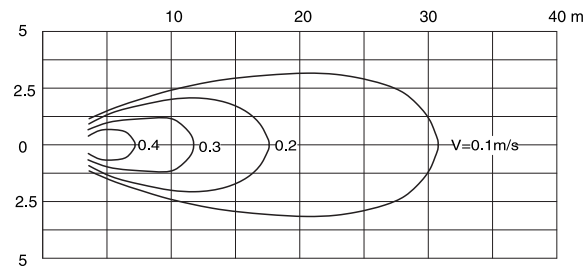
the flow velocity fields are located in the clear water with the boundary water flow velocity $v=0.1\text{m/s}$



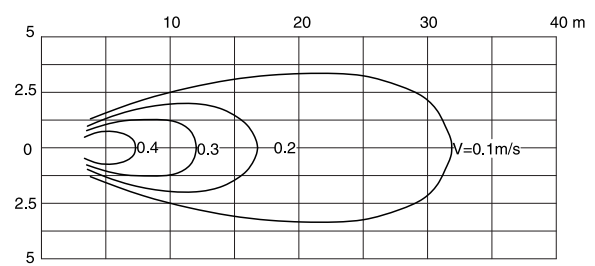
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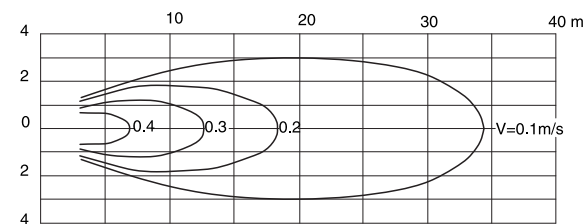
MA1.5/8-260-980 MA1.5/8-400-740



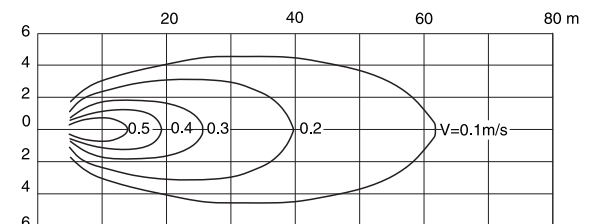
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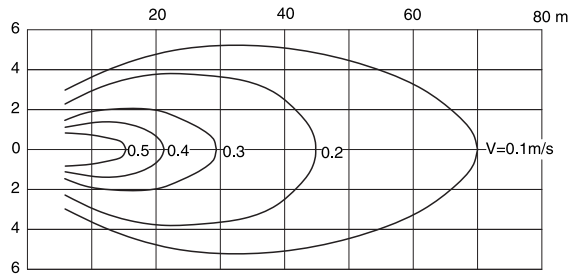
MA2.5/8-400-740 MA3/8-400-740



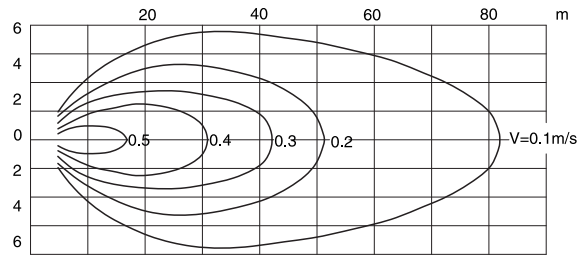
MA4/6-320-980 MA4/6-400-980



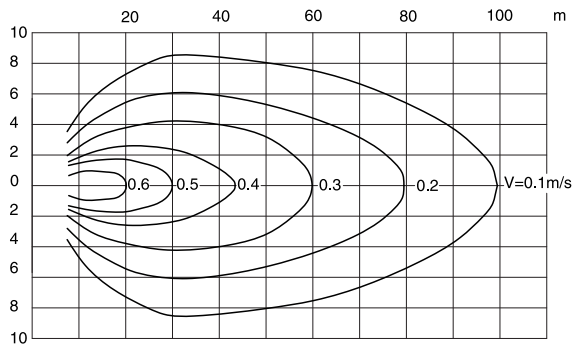
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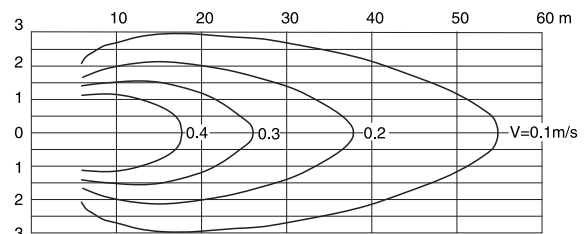
MA5/12-620-480



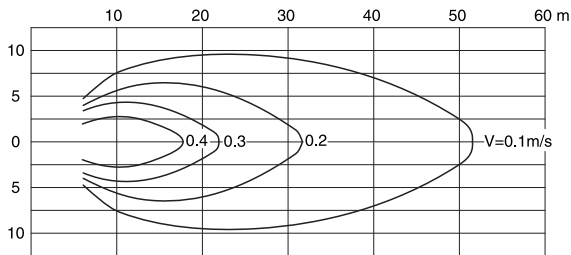
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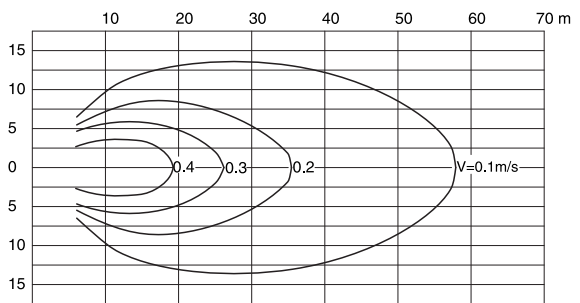
MA10/12-620-480



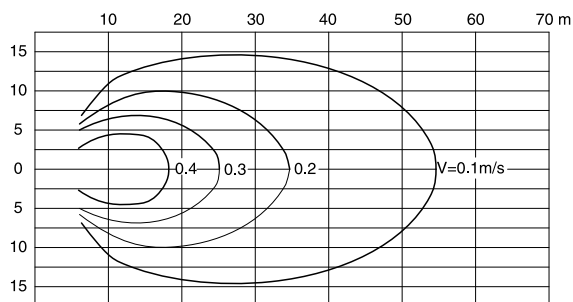
LFP1.5/4-1000-85 LFP1.5/4-1400-36



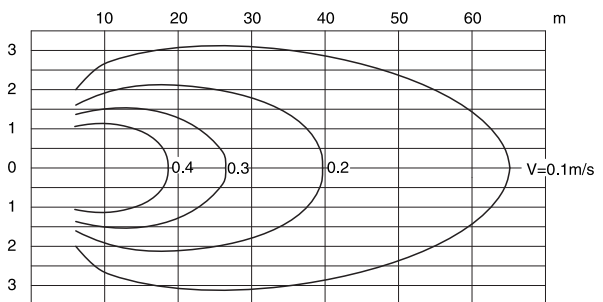
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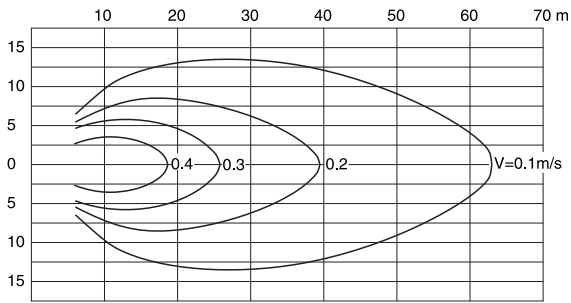
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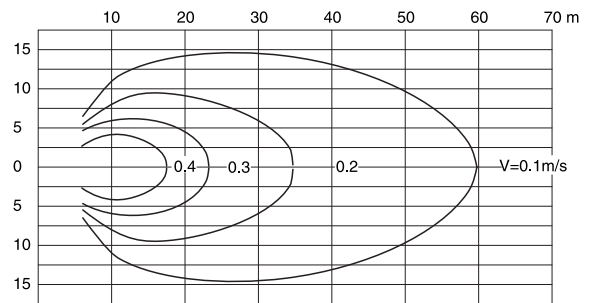
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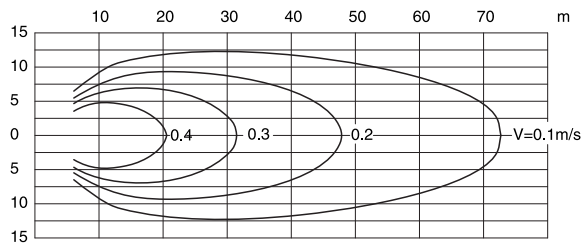
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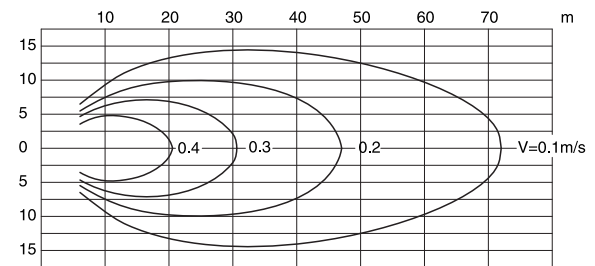
LFP3/4-1600-52 LFP3/4-1800-52



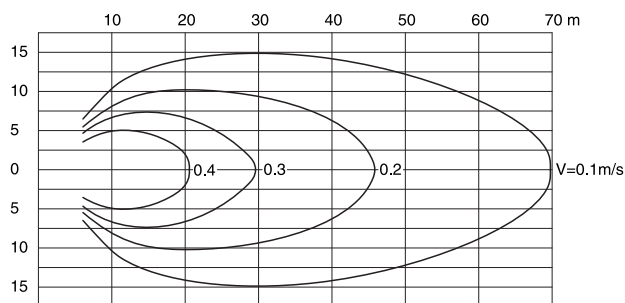
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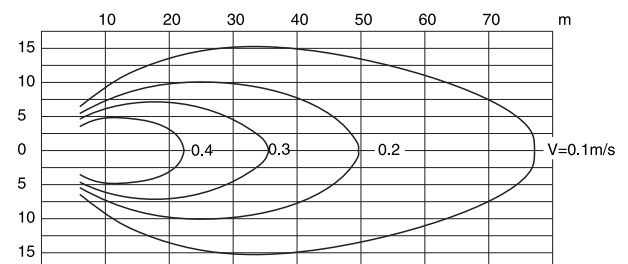
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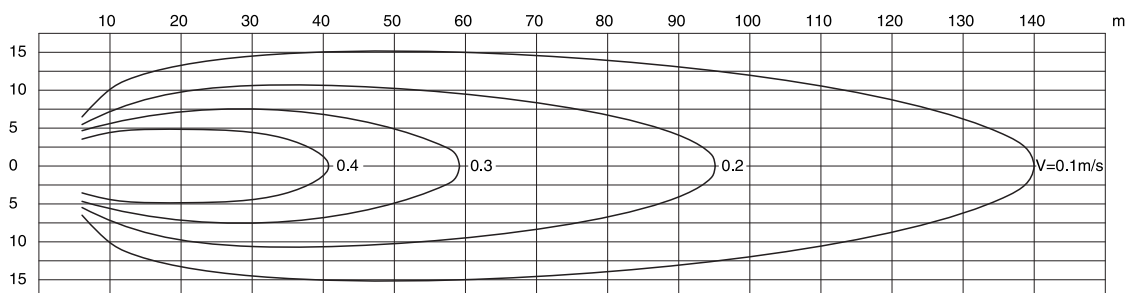
LFP4/4-2000-52 LFP4/4-2200-52



LFP4/4-2500-42



LFP5/4-2200-63 LFP5/4-2500-52



LFP7.5/4-2500-63



安装方式及尺寸

潜水搅拌机可以有多种安装方式，这里提供四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。

INSTALLATION MODES AND DIMENSIONS

The submersible mixers can be installed in a multiple of modes. Here are four 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.

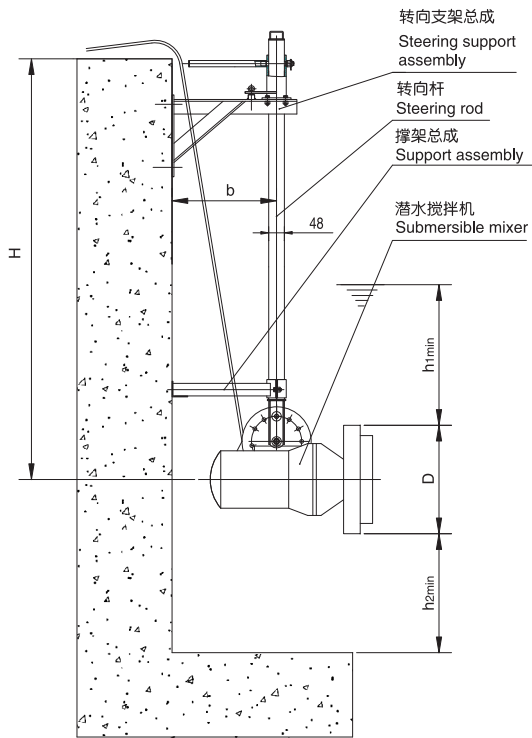
型号 Model	A	D	b	L	H _{1min}	H _{2min}	安装系统 Installation system
MA0.85/8-260-740	Ø48	360	330	630	500	110	I
MA1.5/6-260-980	Ø48	360	330	630	500	110	I
MA2.2/8-320-740	Ø70	460	320	970	800	150	II
MA4/6-320-960	Ø70	460	320	970	800	150	II
MA1.5/8-400-740	Ø70	530	320	960	500	200	II
MA2.5/8-400-740	Ø70	530	320	960	500	200	II
MA3/8-400-740	Ø70	530	320	1010	800	200	II
MA4/6-400-980	Ø70	530	320	1010	800	300	II
MA4/12-620-480	Ø100	820	335	1150	1100	300	III
MA5/12-620-480	Ø100	820	335	1150	1100	300	III
MA7.5/12-620-480	Ø100	820	335	1280	1500	300	III
MA10/12-620-480	Ø100	820	335	1280	1500	300	III
LFP1.5/4-1000-85	Ø100	1000	200	1240	1000	185	IV
LFP3/4-1100-135	Ø100	1100	200	1240	1000	185	IV
LFP1.5/4-1400-36	Ø100	1400	200	1212	750	85	IV
LFP2.2/4-1400-42	Ø100	1400	200	1212	750	85	IV
LFP2.2/4-1600-36	Ø100	1600	200	1212	750	85	IV
LFP3/4-1600-52	Ø100	1600	200	1250	800	85	IV
LFP1.5/4-1800-42	Ø100	1800	200	1212	800	85	IV
LFP3/4-1800-52	Ø100	1800	200	1250	800	85	IV
LFP4/4-1800-63	Ø100	1800	200	1250	900	85	IV
LFP2.2/4-2000-36	Ø100	2000	200	1340	750	85	IV
LFP4/4-2000-52	Ø100	2000	200	1370	800	85	IV
LFP4/4-2200-52	Ø100	2200	200	1370	800	85	IV
LFP5/4-2200-63	Ø100	2200	200	1370	800	85	IV
LFP3/4-2500-36	Ø100	2500	200	1340	750	85	IV
LFP4/4-2500-42	Ø100	2500	200	1370	800	85	IV
LFP5/4-2500-52	Ø100	2500	200	1370	800	85	IV
LFP7.5/4-2500-63	Ø100	2500	200	1430	850	85	IV

注：

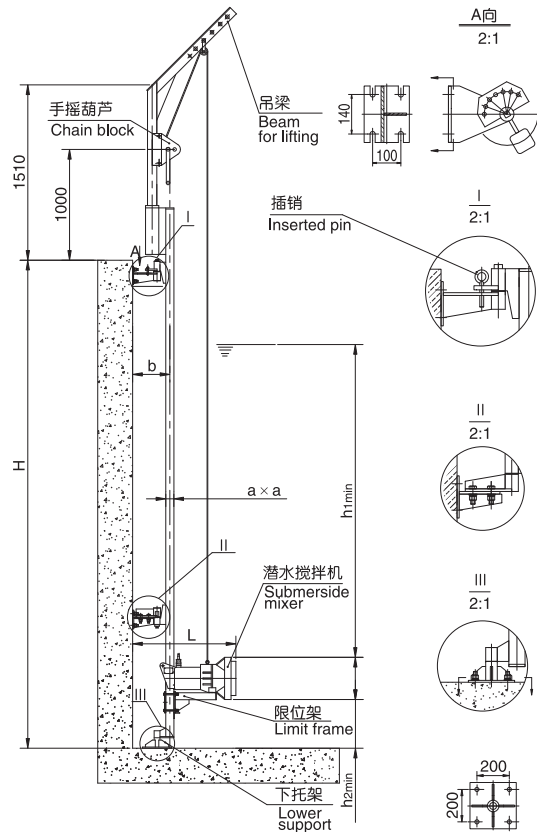
1. 潜水搅拌机的专用安装系统，可在无需排出池中污水的情况下，快速安装和拆卸潜水搅拌机；
2. 安装系统 I 只适用于机型为MA0.85/8和MA1.5/6，且可在水平方向和垂直方向调节角度；
3. 安装系统 II、III 导杆可沿水平方向绕导杆轴线旋转，最大转角为 ±60°；
4. 当 H>4m 时需在导杆中间添加一支撑架；
5. 支撑架和下托架与池壁、池底均用膨胀螺栓或化学锚栓固定，无需预留孔；
6. 客户定货时，请提供池深 H 及池型图，以便确定导杆尺寸和支撑架个数；
7. 多台搅拌机可共用一套起吊系统；
8. 安装系统材质选择采用不锈钢和碳钢防腐可供选择。

Notes:

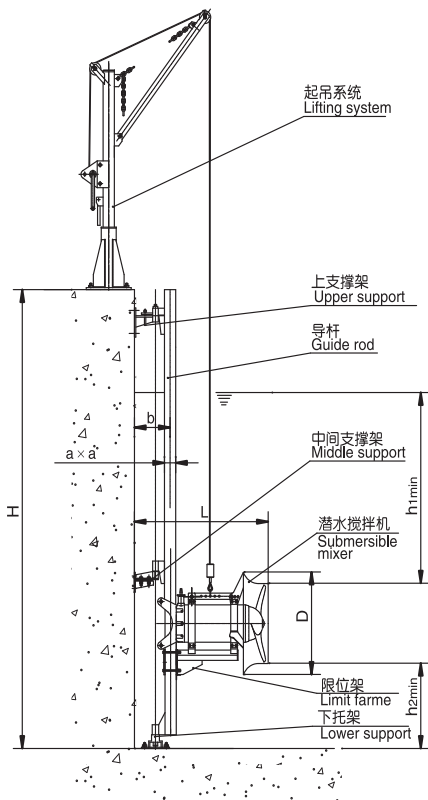
1. The special installation systems for the submersible mixers can facilitate the quick installation and dismantling of the submersible mixers under the conditions of no need for draining off sewage from the pond.
2. Installation System I is Only suitable for the mixer models of MA0.85/8 and MA1.5/6 and with the possibility of adjusting the angles in both the horizontal and longitudinal directions.
3. For installation systems II and III, the guide rod can rotate round the axial line of the guide rod along the horizontal direction with the maximum angle of rotation ±60°.
4. If 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 the use of expansion bolts or chemical anchors, any pre-prepared holes can be dispensed with.
6. While placing an order by customer, please supply the pond depth H and the drawing of the pond shape so as to determine the dimensions of the guide rod and the number of the supporting frames.
7. A multiple of mixers can share one lifting system.
8. The installation systems may employ the material of stainless steel or carbon steel for the selection of the corrosion-resisting properties.



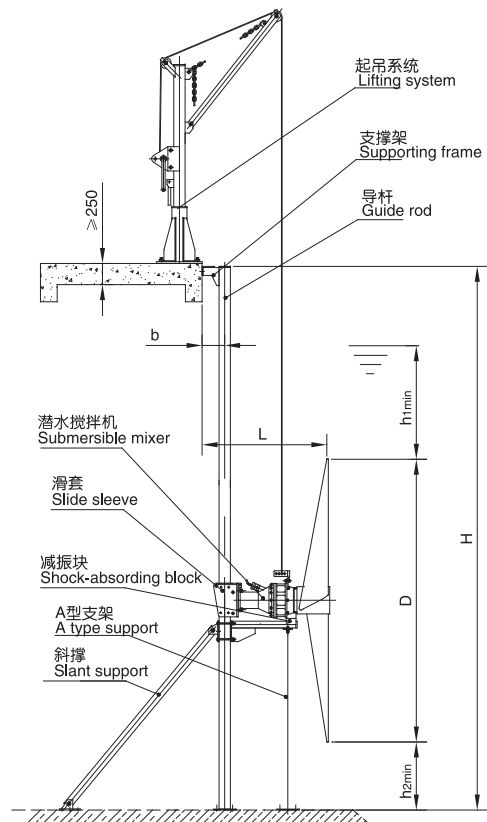
System I



System II



System III



System IV

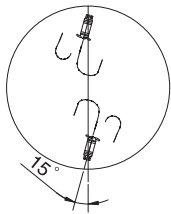
配置示意图

潜水搅拌机的安装定位对其搅拌效果有很大的影响，为了达到事半功倍的运行效果，我们建议用户按照专业设计人员的要求去做，要充分考虑水池的形状，进出水的位置以及搅拌机的水流反射到构筑物而引起的涡流等情况，尽量减少短路循环和死角的产生，避免与池壁的撞击而降低流速。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。

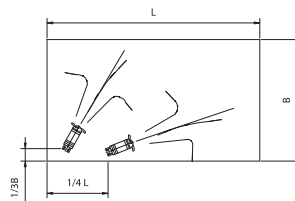
ARRANGING SKETCH MAP

The installation and positioning of the submersible mixers will produce a great impact on the effect of mixing. In order to obtain the double operating result with the half effort, it is suggested that the advice of the specialized designers shall be followed and full consideration given to the shape of the pond, position of the water inlet and outlet, the vortex resulting from the outflow from the mixer onto the structures and some other conditions. Every effort shall be made to reduce the short-circuit circulation and the occurrence of dead corners and avoid the dashing of the flow against the pond wall for lowering the flow velocity. Making reference to the diagrams of operating modes below will help you to make a reasonable selection of the mixers and their installation modes.

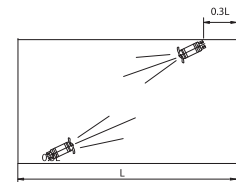
混合搅拌器 MIXING AGITATOR



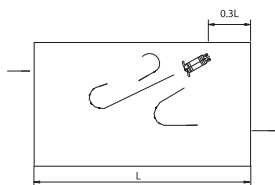
为避免短路循环，可按上图安装
Avoiding short-circuit circulation,
Install as above



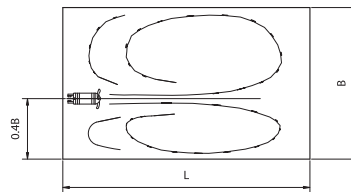
利用池壁反射
Making use of the reflection from
the pond wall



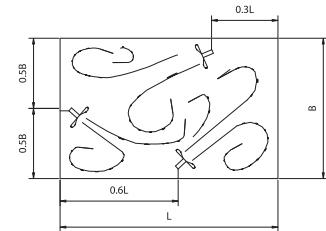
可形成射流的交叉
Forming inter-crossing of the jet-flow



利用进出口
Making use of the inlet and outlet

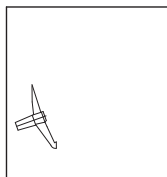


在池宽小于5-8倍的叶轮直径的情况下，
可按上图安装
Pond width less than 5-8 times diameter of
the vanes. Install as above

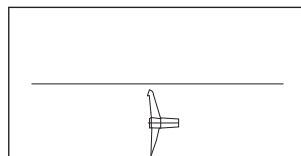


使用多个搅拌器
Using a multiple of mixers

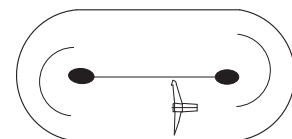
低速推流器 LOW-SPEED FLOW PROPELLER



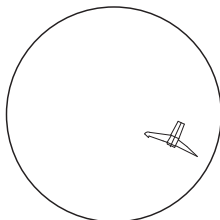
方形池 Square pond



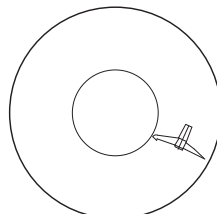
矩形池 Rectangular pond



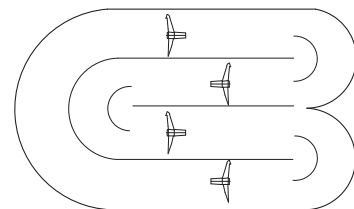
跑道形池 Track-shaped pond



圆形池 Circular pond



环形池 Ring-shaped pond



S曲线形池 S-shaped pond