# WASTEX SUBMERSIBLE MIXER

# WASTEX

## Submersible Mixer

### Main industries

'QJB' Submersible mixers are widely used in municiapal applications, as well as industries like textiles, pharmaceuticals, chemicals, tanneries, sugar, food processing etc.,

### Main application

'QJB' Submersible mixers find application in sewage treatment plants, water treatment plants etc. where these mixers are used for mixing, agitating, blending or dissolving of suspended solids.

- Mixing and stirring applications in sewage treatment plants and industrial areas such as:

1. Equalization of sewage
2. Biological processes (aerobic, anoxic and anaerobic)
3. Selector (contact zone)

- Applicable for homogenization highly concentrated sludge and slurries such as:

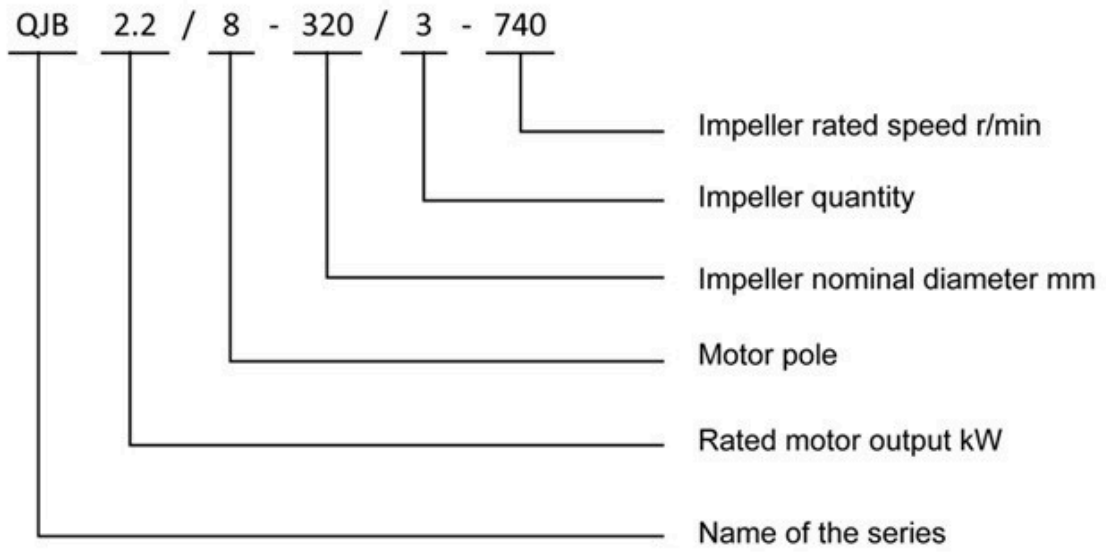
1. Primary, secondary and digested sludge in storage and buffer tanks

### Working conditions

'QJB' Submersible Mixers can run continuously in following conditions.

1. Maximum allowable temperature of the medium for continuous operation is 40 °C [104 °F).
2. The pH value of the medium is between 5-9.
3. The density of the medium does not exceed 1150 kg/m3.
4. During long-term diving operation, the maximum diving depth is 20 meters.

### Model Meaning



# WASTEX

## Submersible Mixer

### Specifications

tebel 1

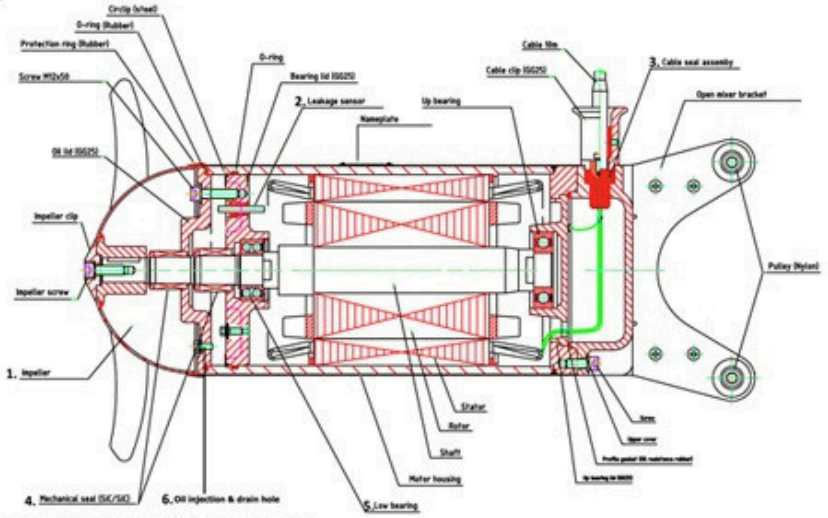
| Model | Power (KW) | Current (A) | Impeller Dia (mm) | Speed (rpm) | Weight | Installation System Type | Thrust (N) |
|---|---|---|---|---|---|---|---|
| QJB0.37/6-220/3-980 | 0.37 | 1.3 | 220 | 980 | 39 | I | 135 |
| QJB0.55/6-220/3-980 | 0.55 | 2.1 | 220 | 980 | 41 | I | 140 |
| QJB 0.85/8-260/3-740 | 0.85 | 3.1 | 260 | 740 | 55 | I | 160 |
| QJB 1.5/6-260/3-980 | 1.5 | 4 | 260 | 980 | 55 | I | 290 |
| QJB 2.2/8-320/3-740 | 2.2 | 5.9 | 320 | 740 | 110 | II | 580 |
| QJB 4/6-320/3-960 | 4 | 10.3 | 320 | 960 | 115 | II | 609 |
| QJB 1.5/8-400/3-740 | 1.5 | 5.4 | 400 | 740 | 70 | II | 600 |
| QJB 2.5/8-400/3-740 | 2.5 | 9 | 400 | 740 | 70 | II | 800 |
| QJB3/8-400/3-740 | 3 | 8 | 400 | 740 | 70 | II | 850 |
| QJB 4/6-400/3-980 | 4 | 14 | 400 | 980 | 184 | II | 1200 |
| QJB 4/12-620/3-480 | 4 | 12 | 620 | 480 | 73 | III | 1400 |
| QJB 5/12-620/3-480 | 5 | 18.2 | 620 | 480 | 184 | III | 1800 |
| QJB 7.5/12-620/3-480 | 7.5 | 27 | 620 | 480 | 245 | III | 2600 |
| QJB10/12-620/3-480 | 10 | 29.3 | 620 | 480 | 250 | III | 3300 |
| QJB15/12-620/3-480 | 15 | 39 | 620 | 480 | 261 | III | 3500 |
| QJB18.5/12-620/3-480 | 18.5 | 55 | 620 | 480 | 315 | III | 4200 |
| QJB22/12-620/3-480 | 22 | 65 | 620 | 480 | 335 | III | 5400 |

### Submersible Mixer Structure

2. Thermal sensors embedded in the stator windings prevent over-heating. Leakage sensors are available as options.

1. Available with differ-ent blade angles, thin double-curved propeller optimizes mixing efficiency. Wide-hub design deflects fibrous material.

3. Cable entry Compressible bush-ing and strain relief on the cable prevent leakage into the motor, providing a reliable installation.




4. Offers increased sealing reliability and zero leakage into the motor, thereby reduc-ing the risk of bearing and stator failure.

6. Large barrier fluid volume lubricates and cools the seal thereby prolonging service life.

5. All bearings are lubricated-for-life and maintenance-free, with a calculated life time of more than 100 000 h.

fig 1

# WASTEX

## Submersible Mixer

### Installation system instructions

There are a variety of installation techniques available for installing submersible mixers. The most common, most convenient and fastest installation method is provided below. This special installation system can quickly install and dismantle the submersible mixer without draining the sewage in the pool. We can also provide guidance on other installation methods. The diving depth of the submersible mixer can be adjusted vertically as needed. The connections between the hanger seat, support frame and lower bracket and the pool are all fixed by welding with embedded parts. When ordering, please provide the pool depth H so that our company can determine the size of the guide rod and the number of support frames during processing. The material of the installation system is made of stainless steel (or carbon steel). In addition to the hanger base, the lifting device can be shared by several mixers. In order to facilitate the installation and lifting of the mixer, a movable door should be opened on the guardrail at the lifting position. Generally, each specification of mixer corresponds to one type of installation system (see table 2). If the user has special needs, other types of installation systems can be configured. Each type of installation system has a different structure.

### Installation note

1. The guide rod should be perpendicular to the horizontal plane and can be corrected with a plumb bob.
2. When lifting the submersible mixer, the impeller end should be raised 2-5 degrees higher than the horizontal plane.
3. The lifting center and the lifting center of gravity of the submersible mixer should be on the same vertical line.
4. The guide rods and support frames should be welded firmly to the embedded parts at the bottom of the pool.
5. The distance from the center of the guide rod to the center of the lift bracket base should be ensured to meet the requirement.
6. When the stirrer is lifted, the lift loop chain should not be twined, and the chain slot of the chain block should be set towards the lifting personnel.
7. The cable should be not fixed too tightly to damage the cable, but not too loosely to cause the cable to be drawn into the impeller to be damaged

# WASTEX

## Submersible Mixer

### Installation system model description

The installation system is divided into four types: installation system I, II, III and IV according to the structural characteristics of the mixer and the installation and operation type. The installation system I is divided into two types: 1-1 and 1-2. Generally, each model mixer corresponds to one type of installation system. If the user has special requirements, other types of installation systems can be configured. Installation system 1-1 (This system is only suitable for QJB0.85/8-260/3-740, QJBI.5/6-260/3-980)

As shown in Figure 2, the installation system 1-1 mainly consists of a hand chain hoist, a lifting column, a lifting chain (the above accessories are not available when the pool depth is 3 meters), a guide rod, an upper tumtable, a support frame, a support plate and a lower turntable. The guide rod is fixed on the upper support frame through the upper turntable. The submersible mixer can be installed at a certain inclination angle between the vertical plane and the horizontal plane by changing the position of the connecting bolts on the lower turntable. The submersible mixer can also rotate 120° around the axis of the upper turntable by changing the position of the connecting bolt between the upper turntable and the guide rod to adapt to mixing or pushing flow in different directions, eliminating dead zones in the pool and keeping the water flow in optimal operating conditions. The conventional installation of this type of installation system can be fixed by expansion bolts, or it can be installed with embedded parts. The size and position of the embedded parts should be arranged according to the diagram.

**WASTEX**
**SUBMERSIBLE MIXER**
**เครื่องกวนผสมน้ำเสีย**
**แบบ จุ่มใต้น้ำ (ใต้น้ำตลอดเวลา)**

# WASTEX

## Submersible Mixer

### Installation system dimension

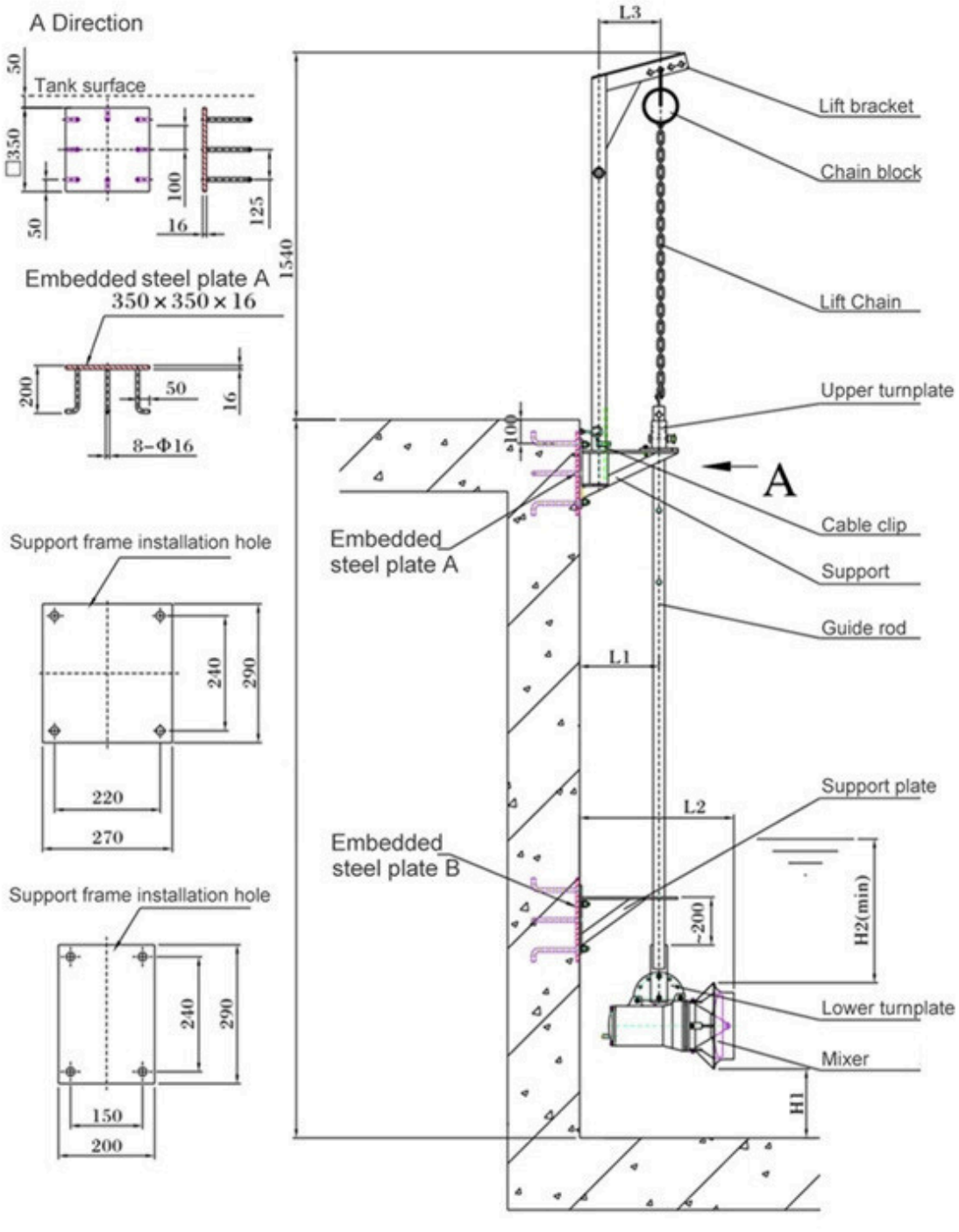
**tabel 2**

| Model | H1 (mm) | H2 (mm) | L1 (mm) | L2 (mm) | L3 (mm) | Installation System Type |
|---|---|---|---|---|---|---|
| QJB 0.85/8-260/3-740 | 100 | 500 | 330 | 650 | 400 | I |
| QJB 1.5/6-260/3-980 | 100 | 600 | 330 | 650 | 400 | I |
| QJB 2.2/8-320/3-740 | 200 | 600 | 317 | 900 | 550 | II |
| QJB 4/6-320/3-960 | 200 | 600 | 317 | 900 | 550 | II |
| QJB 1.5/8-400/3-740 | 200 | 700 | 317 | 940 | 550 | II |
| QJB 2.5/8-400/3-740 | 200 | 700 | 317 | 940 | 550 | II |
| QJB3/8-400/3-740 | 200 | 700 | 317 | 940 | 550 | II |
| QJB 4/6-400/3-980 | 200 | 700 | 317 | 940 | 550 | II |
| QJB 4/12-620/3-480 | 350 | 1100 | 317 | 1175 | 1050 | III |
| QJB 5/12-620/3-480 | 350 | 1100 | 317 | 1175 | 1050 | III |
| QJB 7.5/12-620/3-480 | 350 | 1100 | 317 | 1250 | 1050 | III |
| QJB10/12-620/3-480 | 350 | 1100 | 317 | 1250 | 1050 | III |
| QJB12/12-620/3-480 | 350 | 1100 | 317 | 1250 | 1050 | III |
| QJB15/12-620/3-480 | 400 | 1500 | 317 | 1650 | 1350 | III |
| QJB18.5/12-620/3-480 | 400 | 1500 | 317 | 1650 | 1350 | III |
| QJB22/12-620/3-480 | 400 | 1500 | 317 | 1650 | 1350 | III |

# WASTEX

## Submersible Mixer

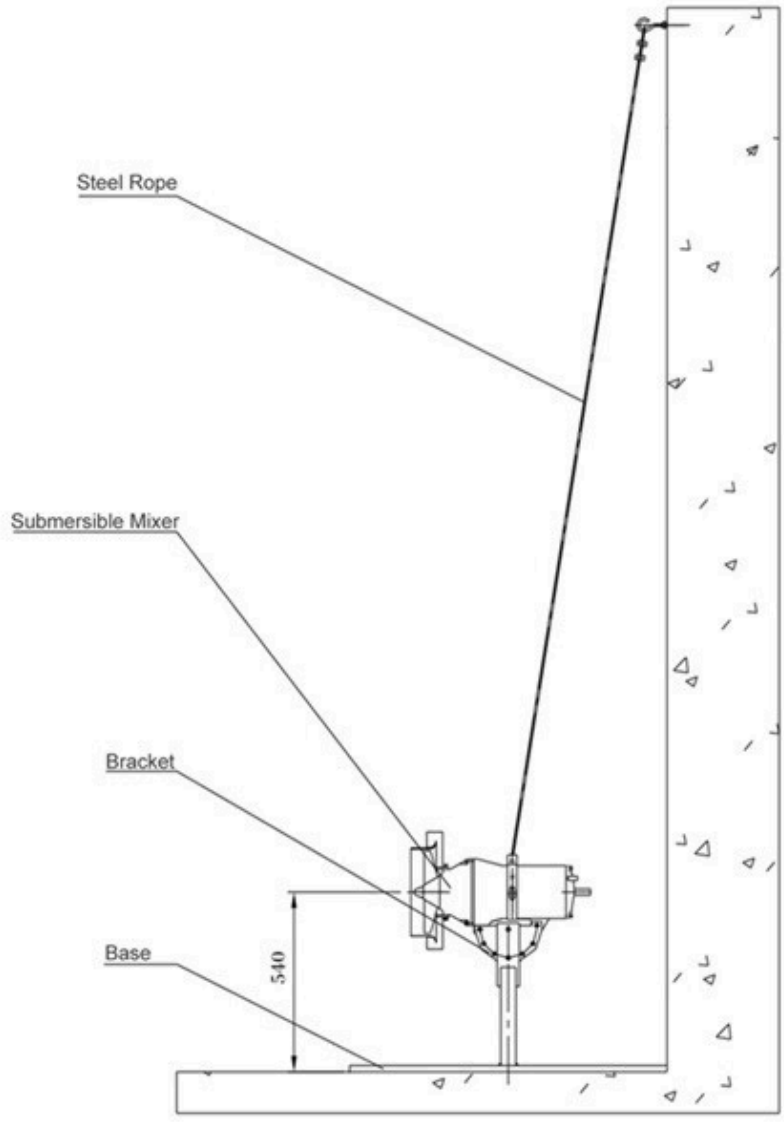
## installation system I




installation system I

## installation system I

Installation system 1-2 (this system is only applicable to QJB0.85/2-260/3-740, QJB1.5/6-260/3-980) As shown in Figure 3, the installation system 1-2 is a mobile installation and mainly consists of a mixer, turntable, base, etc. The base has good contact with the bottom of the pool and is close to the pool wall, and the angle can be adjusted in the plane direction.

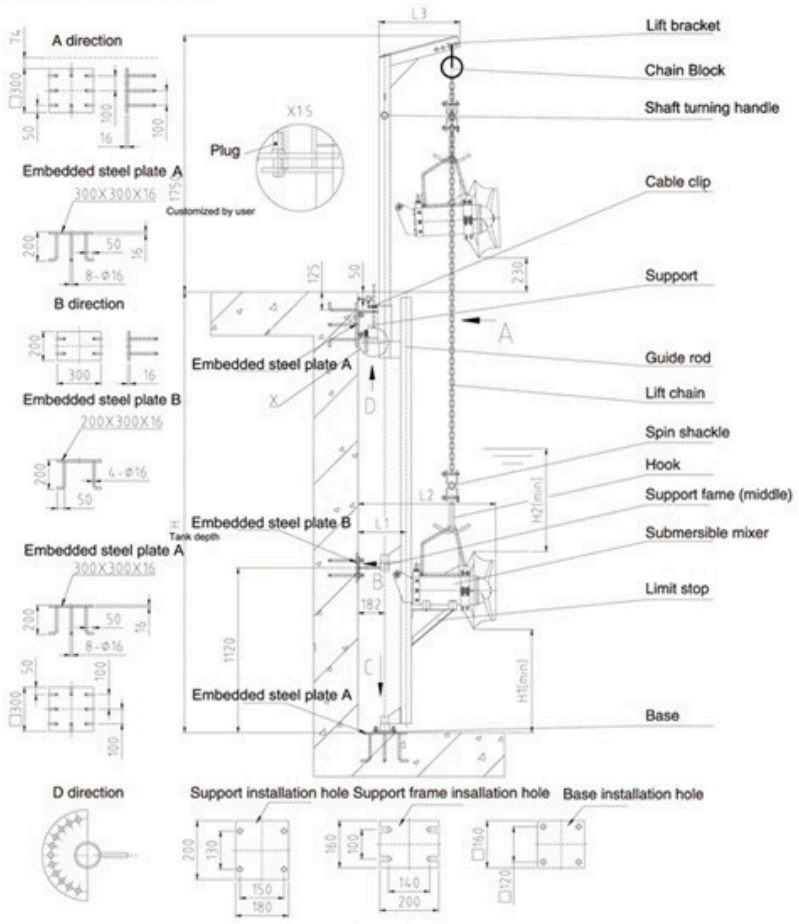



installation system I-2

## installation system II

As shown in Figure 4, the installation system II mainly consists of a hand chain hoist, a lifting frame, a lifting chain, a hook, a rotating shackle, a support, a guide rod, an middle support frame (not available when the pool depth is less than 4.5 meters), and a limit stop, base, etc. The guide rod positions the support, the middle support frame, and the base on the concentric axis through the hinge axis welded to the body, and can rotate ±60° in the horizontal plane to adapt to stirring or pushing flow in different directions, eliminating dead zones in the pool. The submersible mixer moves up and down along the guide rod through the guide wheel. The lifting frame can be installed on the support and rotated 360° around its positioning axis to facilitate installation and maintenance. The limit frame can be welded on the guide rod before leaving the factory or during on-site installation. This type of installation system can be fixed by expansion bolts, or it can be installed with embedded parts.

installed with embedded parts.



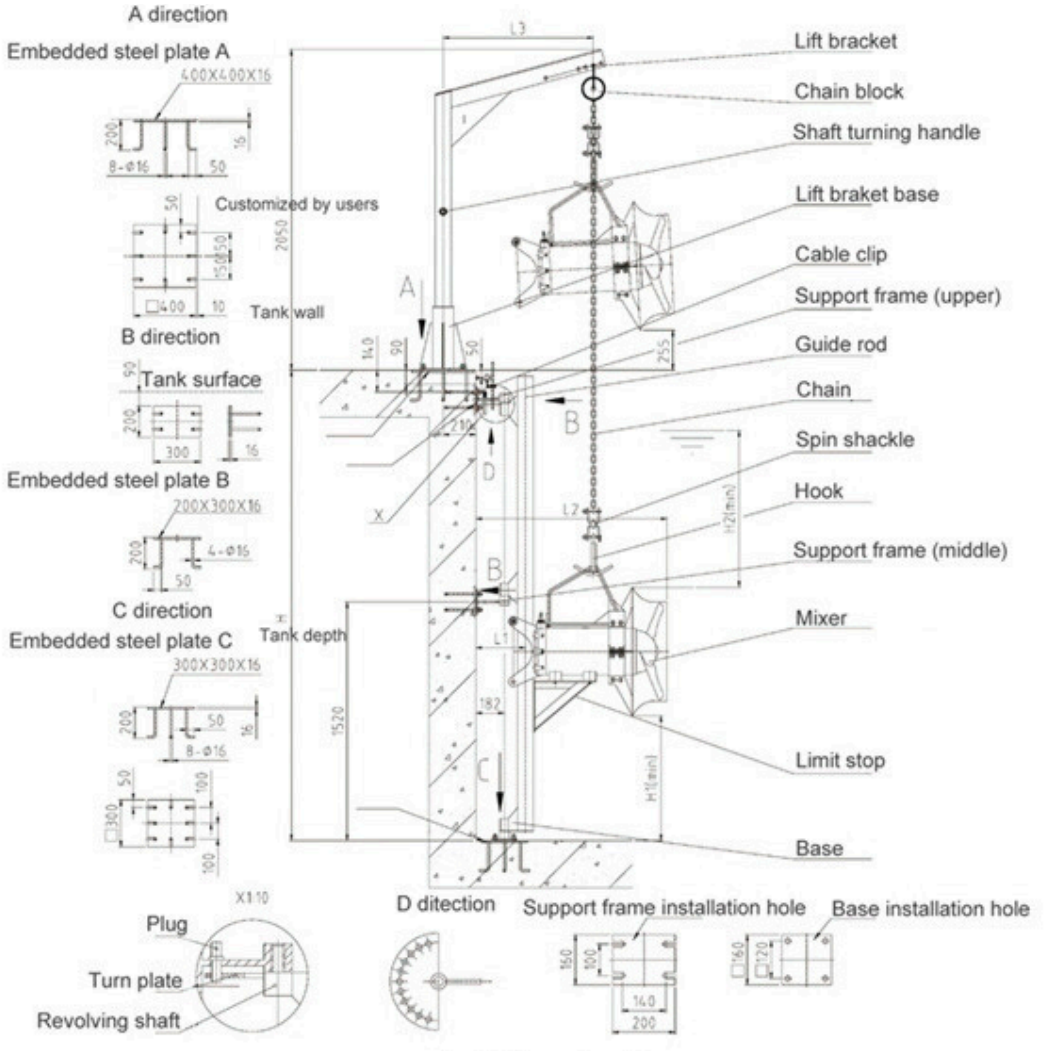

installation system II

# WASTEX

## Submersible Mixer

## installation system III

As shown in Figure 5, the installation system III mainly consists of a hand chain hoist, a lifting frame, a hanging frame base, a lifting chain, a hook, a rotating shackle, an upper support frame, a guide rod, and an intermediate support frame (not available when the pool depth is less than 4.5 meters), limit stop, base, ect. The submersible mixer moves up and down along the guide rod through the guide wheel. The lifting frame is installed on the hanging frame base and can rotate 360° around its positioning axis. The hanger base is installed on the ground to facilitate installation and maintenance. The limit frame can be welded on the guide rod before leaving the factory or during on-site installation. If the user has no special requirements, it is usually welded before leaving the factory. This type of installation system is usually connected to the foundation by welding and welding embedded steel plates.




installation system III

# WASTEX

## Submersible Mixer

## installation system III

### Submersible flow propeller introduction

QDT type Submersible flow propeller is extensively used for the oxidizing flow propelling and agitation in various types of biochemical tanks during the water treatment process, also can be used for river frost protection and, landscape water circulation etc.. The low-speed flow propeller consists of submersible motor, speed-reducing device, blades, and installation system etc.

The product is characterized by low power (1.5-9KW), low rotate speed 1100-3000 (34-85rpm), large diameter of the blades (1100-3000mm), low-speed rotation, production of large-volume flow field and wide scope of service. The sweptback, banana- shaped blades have self-cleaning function, which is finishing cast with PU or glass fibre reinforced plastics and highlighted by light weight, high strength, and good anticorrosion etc. The excellent frictional property can ensure the a good damping effectiveness with the fluid in low speed movement status to produce gradual water flow. Besides the flow propelling and producing water flow, this series of products also have mixing function as shown in the drawing.

### Working conditions

'QDT' Low-speed Submersible propeller can run continuously in following condions.

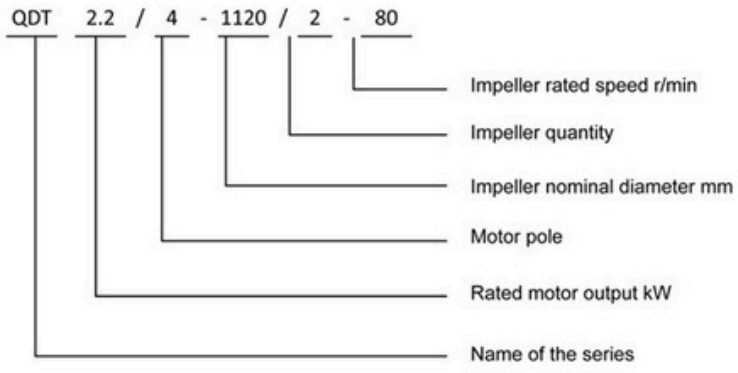
1.Maximum allowable temperature of the medium for continuous operation is 40 "C [104 FJ.

2.The pH value of the medium is between 5-9.

3. The density of the medium does not exceed 1150 kg/m3.

4.During long-term diving operation, the maximum diving depth is 20 meters.

### Model Meaning



# WASTEX

## Submersible Mixer

### Specification

| Model | Power (KW) | Current (A) | Impeller Dia (mm) | Speed (rpm) | Weight | Installation System Type | Thrust (N) |
|---|---|---|---|---|---|---|---|
| QDT1.5/4-1100/2-60 | 1.5 | 3.7 | 1100 | 60 | 150 | IV | 680 |
| QDT2.2/4-1100/2-80 | 2.2 | 5.3 | 1100 | 80 | 160 | IV | 1970 |
| QDT3/4-1100/2-100 | 3 | 7.2 | 1100 | 100 | 160 | IV | 2410 |
| QDT4/4-1100/2-130 | 4 | 9.2 | 1100 | 130 | 165 | IV | 2930 |
| QDT1.5/4-1400/2-43 | 1.5 | 3.9 | 1400 | 43 | 150 | IV | 1200 |
| QDT2.2/4-1400/2-50 | 2.5 | 5.3 | 1400 | 50 | 160 | IV | 1640 |
| QDT3/4-1400/2-65 | 3 | 6.7 | 1400 | 65 | 160 | IV | 2180 |
| QDT4/4-1400/2-75 | 4 | 8.62 | 1600 | 75 | 172 | IV | 1320 |
| QDT1.5/4-1600/2-39 | 1.5 | 3.65 | 1600 | 39 | 155 | IV | 1320 |
| QD2.2/4-1600/2-43 | 3 | 7.2 | 1600 | 43 | 184 | IV | 2140 |
| QDT3/4-1600/2-51 | 3 | 7.2 | 1600 | 51 | 184 | IV | 2140 |
| QDT4/4-1600/2-62 | 4 | 9.2 | 1600 | 62 | 184 | IV | 2520 |
| QDT1.5/4-1800/2-34 | 1.5 | 3.9 | 1800 | 34 | 186 | IV | 1480 |
| QDT2.2/4-1800/2-39 | 2.2 | 5.3 | 1800 | 39 | 186 | IV | 1880 |
| QDT3/4-1800/2-44 | 3 | 7.2 | 1800 | 44 | 186 | IV | 2365 |
| QDT4/4-1800/2-52 | 4 | 9.2 | 1800 | 52 | 186 | IV | 2750 |
| QDT5.5/4-1800/2-62 | 5.5 | 11.7 | 1800 | 62 | 280 | IV | 2420 |
| QDT2.2/4-2200/2-30 | 2.2 | 5.3 | 2200 | 30 | 210 | IV | 1810 |
| QDT3/4-2200/2-34 | 3 | 7.2 | 2200 | 34 | 210 | IV | 2140 |
| QDT4/4-2200/2-38 | 4 | 9.2 | 2200 | 38 | 210 | IV | 2780 |
| QDT5.5/4-2200/2-43 | 5 | 11.9 | 2200 | 43 | 210 | IV | 2960 |
| QDT3/4-2500/2-29 | 3 | 7.2 | 2500 | 29 | 220 | IV | 2090 |
| QDT4/4-2500/2-33 | 4 | 9.2 | 2500 | 33 | 220 | IV | 2850 |
| QDT5.5/4-2500/2-39 | 5 | 11.9 | 2500 | 39 | 220 | IV | 3090 |
| QDT7.5/4-2500/43 | 7.5 | 16.6 | 2500 | 43 | 220 | IV | 4330 |

### Structure introduction

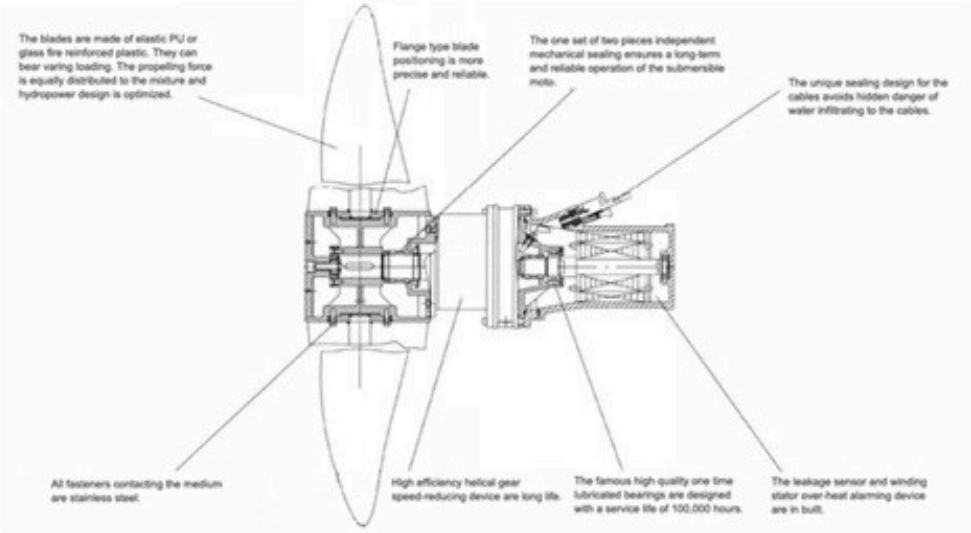


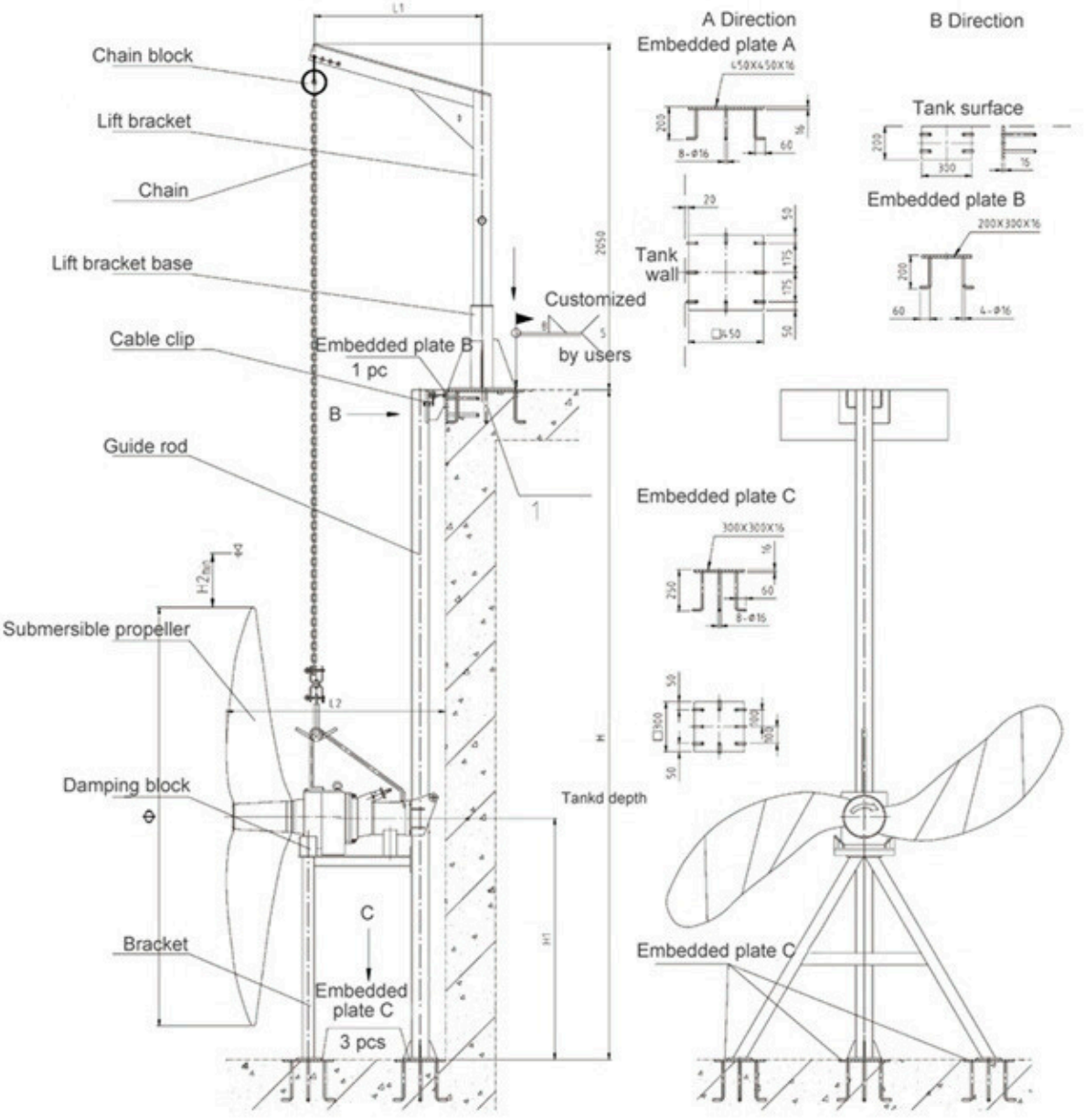

fig 6

# WASTEX

## Submersible Mixer

## installation system IV

The submersible flow propellers have multiple installation types. Here are two generally accepted types of installation for selection with reference to following table. Our company can also provide the special designs in accordance with the requirements of the users.




installation system IV

# WASTEX

## Submersible Mixer

## installation system IV

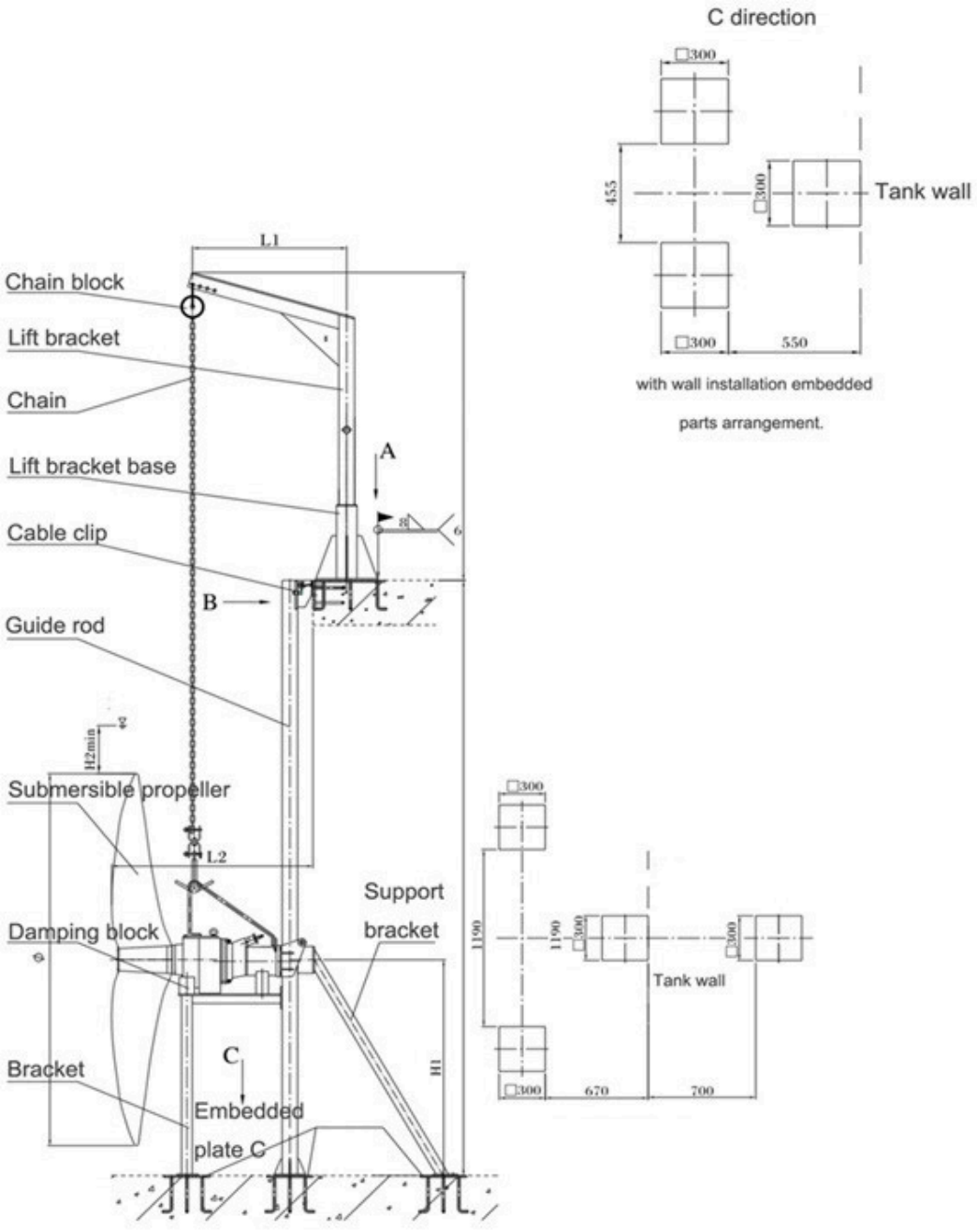



fig 8 Bridge type installation embedded parts arrangement.

installation system IV

# WASTEX

## Submersible Mixer

### Installation system model description

The installation system IV mainly consists of a hand chain block, lifting bracket, lift bracket holder, lifting chain, hook, rotating shackle, guide rod, bracket, etc. The submersible propeller is guided along the rod and moves up and down. The lifting bracket is installed on the bracket base and can rotate 360°. In order to increase the reliability and slow down the vibration of the submersible propeller during operation, the side of the bracket is directly welded to the guide rod. During welding, it must be ensured that the center line of the bracket is perpendicular to the center line of the guide rod and in the same plane. The submersible flow propellers have multiple installation types. Here are two generally accepted types of installation for selection with reference to following table. Our company can also provide the special designs in accordance with the requirements of the users.

The submersible flow propellers have multiple installation types. Here are two generally accepted types of installation for selection with reference to following table. Our company can also provide the special designs in accordance with the requirements of the users.

### Installation system dimension

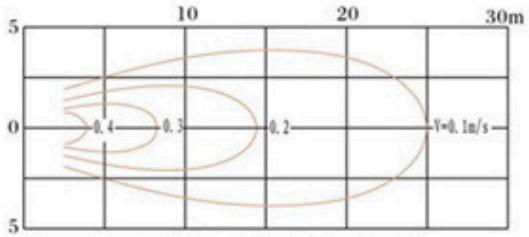
**table 4**

| Model | H1 (mm) | H2 (mm) | L1 (mm) | L2 (mm) | Installation System Type |
|---|---|---|---|---|---|
| QDT1.5/4-1100/2-60 | 750 | 1000 | 810 | 1100 | IV-1 |
| QDT2.2/4-1100/2-80 | 750 | 1000 | 840 | 1130 | IV-1 |
| QDT3/4-1100/2-100 | 750 | 1000 | 840 | 1130 | IV-1 |
| QDT4/4-1100/2-130 | 750 | 1000 | 840 | 1130 | IV-1 |
| QDT1.5/4-1400/2-43 | 900 | 900 | 910 | 1100 | IV-2 |
| QDT2.2/4-1400/2-50 | 900 | 900 | 940 | 1130 | IV-2 |
| QDT3/4-1400/2-65 | 900 | 900 | 940 | 1130 | IV-2 |
| QDT4/4-1400/2-75 | 900 | 900 | 940 | 1130 | IV-2 |
| QDT1.5/4-1600/2-39 | 1100 | 850 | 910 | 1100 | IV-2 |
| QD2.2/4-1600/2-43 | 1100 | 850 | 940 | 1130 | IV-2 |
| QDT3/4-1600/2-51 | 1100 | 850 | 940 | 1130 | IV-2 |
| QDT4/4-1600/2-62 | 1100 | 850 | 940 | 1130 | IV-2 |
| QDT1.5/4-1800/2-34 | 1100 | 850 | 910 | 1230 | IV-3 |
| QDT2.2/4-1800/2-39 | 1100 | 850 | 940 | 1280 | IV-3 |
| QDT3/4-1800/2-44 | 1100 | 850 | 940 | 1280 | IV-3 |
| QDT4/4-1800/2-52 | 1100 | 850 | 940 | 1310 | IV-3 |
| QDT5.5/4-1800/2-62 | 1100 | 850 | 940 | 1350 | IV-3 |
| QDT2.2/4-2200/2-30 | 1450 | 800 | 940 | 1280 | IV-4 |
| QDT3/4-2200/2-34 | 1450 | 800 | 940 | 1280 | IV-4 |
| QDT4/4-2200/2-38 | 1450 | 800 | 940 | 1310 | IV-4 |
| QDT5.5/4-2200/2-43 | 1450 | 800 | 940 | 1350 | IV-4 |
| QDT3/4-2500/2-29 | 1450 | 800 | 940 | 1280 | IV-4 |
| QDT4/4-2500/2-33 | 1450 | 800 | 940 | 1310 | IV-4 |
| QDT5.5/4-2500/2-39 | 1450 | 800 | 940 | 1350 | IV-4 |
| QDT7.5/4-2500/2-43 | 1450 | 800 | 940 | 1350 | IV-4 |

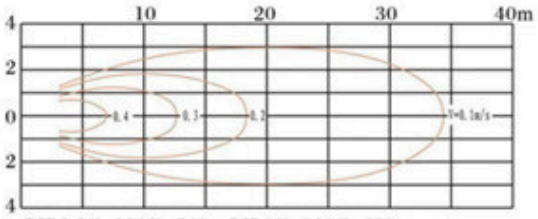
# WASTEX

## Submersible Mixer

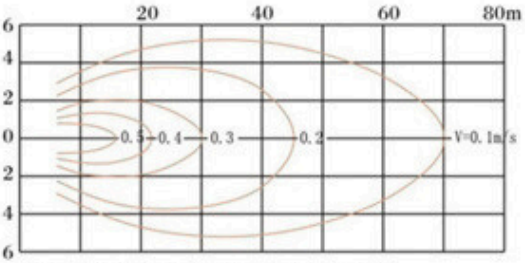
## Flow field figure



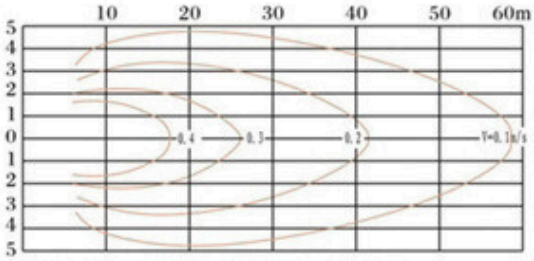

QJB0.85/8-260/3-740、QJB1.5/6-260/3-980、
QJB1.5/8-400/3-740



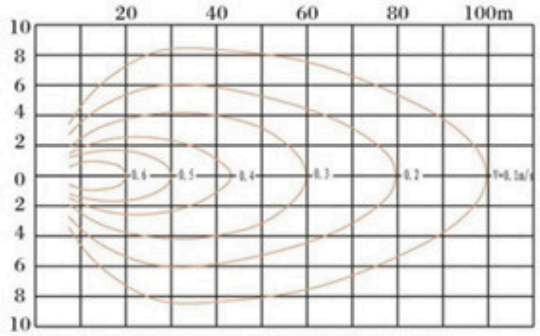

QJB2.2/8-320/3-740、QJB4/6-320/3-980、
QJB2.5/8-400/3-740、QJB3/8-400/3-740、
QJB4/6-400/3-980



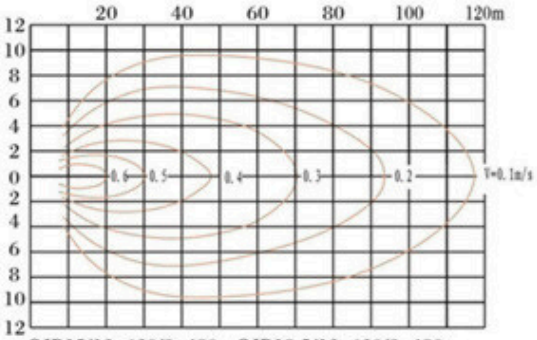

QJB4/12-620/3-480、QJB5/12-620/3-480



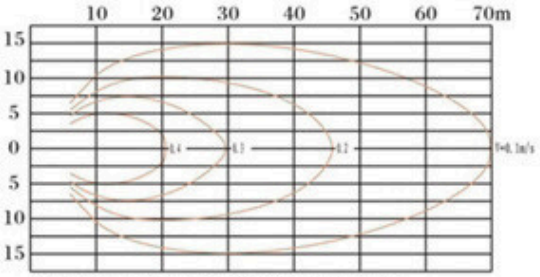

QJB1.5/4-1100/2-60、QJB2.2/4-1100/2-80、
QJB3/4-1100/2-100、QJB4/4-1100/2-130、
QJB1.5/4-1400/2-43、QJB2.2/4-1400/2-50、
QJB3/4-1400/2-65、QJB4/4-1400/2-75、
QJB1.5/4-1600/2-39、QJB2.2/4-1600/2-43、
QJB1.5/4-1800/2-34、QJB2.2/4-1800/2-39



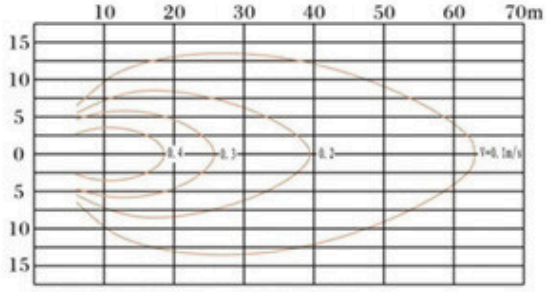

QJB7.5/12-620/3-480、QJB10/12-620/3-480、
QJB12/12-620/3-480、




QJB15/12-620/3-480、QJB18.5/12-620/3-480、
QJB22/12-620/3-480




QJB5.5/4-1800/2-62、QJB3/4-2200/2-34、
QJB4/4-2200/2-38、QJB5.5/4-2200/2-43、
QJB3/4-2500/2-29、QJB4/4-2500/2-33、
QJB5.5/4-2500/2-39、QJB7.5/4-2500/2-43




QJB3/4-1600/2-51、QJB4/4-1600/2-62、
QJB3/4-1800/2-44、QJB4/4-1800/2-52、
QJB2.2/4-2200/2-30

# WASTEX

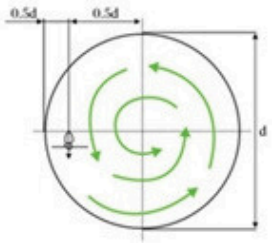
## Submersible Mixer

Example of applications

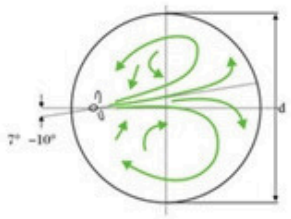
Compared with traditional long-shaft mixers, the advantage of the QJB submersible mixer is that it can produce different flow directions. Various flow patterns with different effects can be obtained by different installation positions of the mixer. This creates a better flow pattern in the pool and eliminates mixing dead spots. The matching power required by the mixer is determined by the volume of the eucalyptus tank, the density of the medium, the viscosity and the size of the tank, etc. One or more mixers should be selected according to the specific situation. In order to ensure that the mixer operates in different pool types to achieve efficient and energy-saving effects, please refer to the following typical installation forms.

## Mixing agitating series

### Round pool

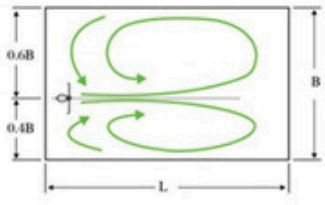



This rotary flow mode is the simplest one and can create high flow velocity in a shorter time. This is an efficient method of agitating in media with a high content of insoluble solids. However, it must be noted that heavier materials may settle in the center of the tank bottom.

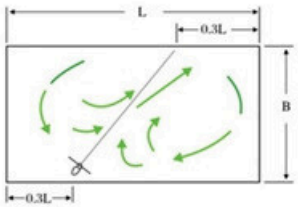



If the mixer axis is installed at 7-10° from the centerline of the pool, full-pool mixing can be achieved without rotation. The depth of the liquid in the pool should be between 0.3-1 times the diameter of the pool.

### Rectangle pool




In the case of an impeller with a pool width less than 5-8 times, it can be installed as shown in the figure above

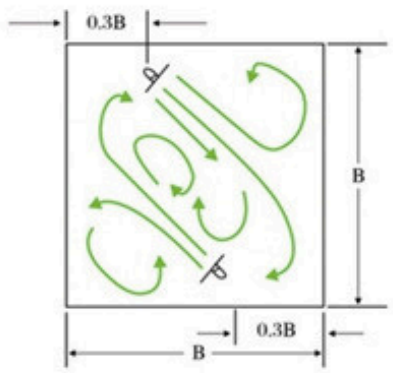



In larger pools, the mixing should be installed as shown above

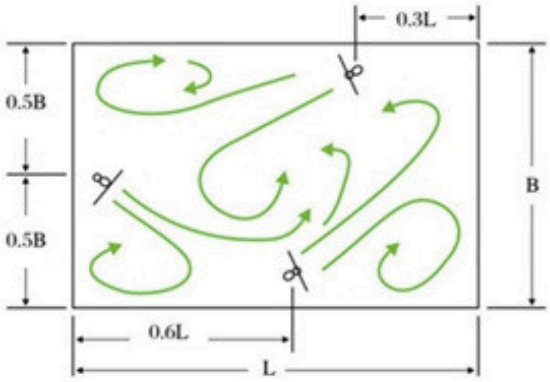
# WASTEX

## Submersible Mixer

### Submersible Mixer and Propeller




Square pool

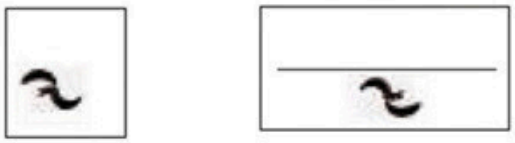



Rectangle pool

When using multiple mixers, it is recommended to use the installation method as shown above.

### Low-velocity propeller series

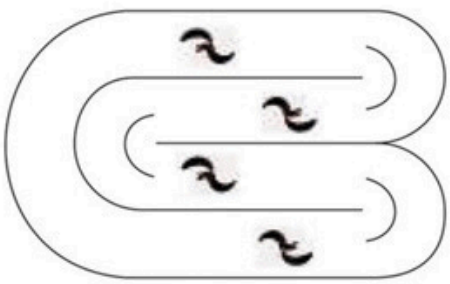
The installation and positioning of the submersible propeller has a great impact on the mixing effect. In order to achieve the expected operating effect, we recommend that users follow the requirements of professional designers and fully consider the shape of the pool, the location of the water in and out, and the flow of the mixer. The eddy current caused by reflection to the structure should be minimized to minimize the occurrence of short circuit circulation and dead ends, and avoid frontal collision with the pool wall to reduce the flow rate. Refer to the following operating modes to help you choose the propeller and installation method reasonably



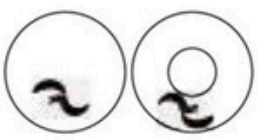
Square pool



Rectangle pool

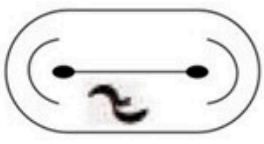


S shaped pool



Round pool

Annular pool



Runway shaped pool

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