

Submersible Mixer Stands

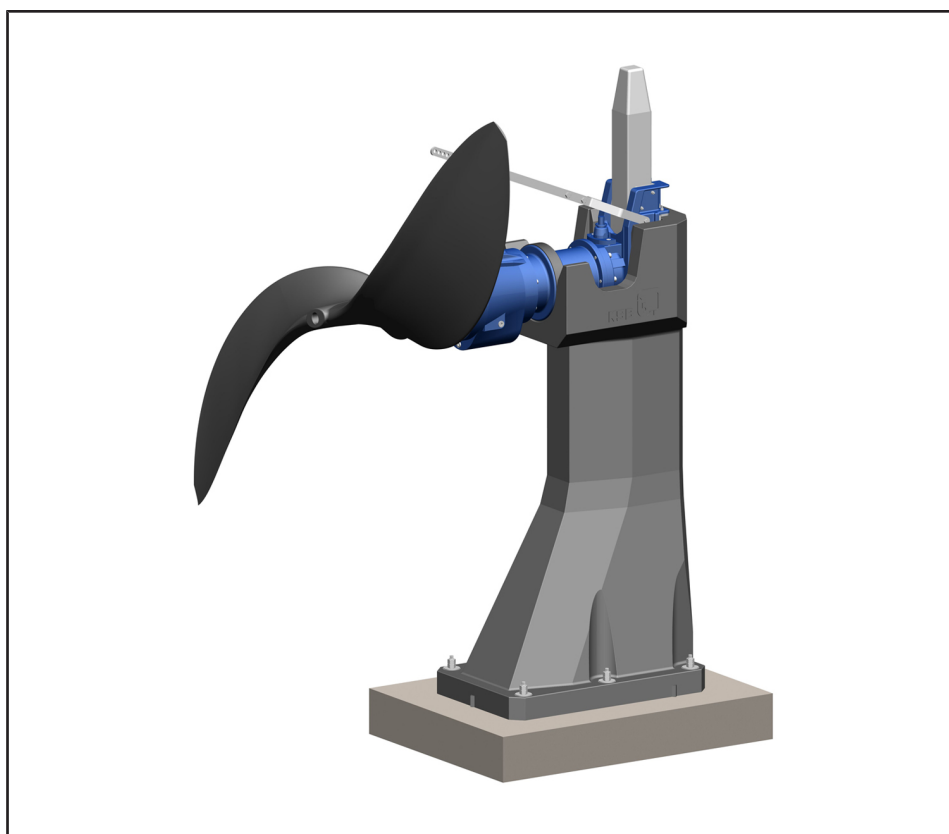
AmaRoc

Submersible mixer stand for
Amaprop submersible mixers

Installation Parts/Accessories

US market

Installation/Operating Manual



Mat. No.: 0211329

Legal information/Copyright

Installation/Operating Manual AmaRoc

Original operating manual

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Glossary

Certificate of decontamination

If a product is to be returned to the manufacturer, the customer declares in a certificate of decontamination that the product has been properly drained to eliminate any environmental and health hazards arising from components in contact with the fluid handled.

Submersible mixer

Submersible mixers are mixing units with open axial propeller hydraulics and an air-filled submersible motor.

1 General

1.1 Principles

This installation/operating manual is valid for the type series and variants indicated on the front cover. It describes proper and safe installation.

The name plate indicates the type series and size, the main operating data, the order number and the order item number. The order number and order item number clearly identify the installation part/accessories and serve as identification for all further business processes.

In the event of damage, immediately contact your nearest KSB Service center to maintain the right to claim under warranty.

1.2 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel.


1.3 Other applicable documents

Table 1: Overview of other applicable documents

| Document | Contents |
|---|---|
| Data sheet | Description of the technical data |
| General arrangement drawing/ outline drawing | Description of mating and installation dimensions |
| General assembly drawing ¹⁾ | Sectional drawing |

1.4 Symbols

Table 2: Symbols used in this manual

| Symbol | Description |
|---|--|
| ✓ | Conditions which need to be fulfilled before proceeding with the step-by-step instructions |
| ▷ | Safety instructions |
| ⇒ | Result of an action |
| ⇔ | Cross-references |
| 1. 2. | Step-by-step instructions |
|  | Note Recommendations and important information on how to handle the product |

1) If agreed to be included in the scope of supply









2 Safety

All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 Key to safety symbols/markings

Table 3: Definition of safety symbols/markings

| Symbol | Description |
|--|---|
|  DANGER | DANGER This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury. |
|  WARNING | WARNING This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury. |
|  CAUTION | CAUTION This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions. |
|  | General hazard In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury. |
|  | Electrical hazard In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage. |
|  | Machine damage In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions. |

2.2 General

This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.

The safety information in all sections of this manual must be complied with.

The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.

The contents of this operating manual must be available to the specialist personnel at the site at all times.

The operator is responsible for ensuring compliance with all local regulations which are not taken into account.

2.3 Intended use

- The submersible mixer stand must only be used in the applications described in the other applicable documents.
- Only use submersible mixer stands which are in perfect technical condition.
- Only use the submersible mixer stand in the fluid described in the data sheet or product literature.
- Consult the manufacturer about any other modes of use not described in the data sheet or product literature.
- Never exceed the permissible operating limits and use limits specified in the data sheet or product literature regarding temperature etc.
- Observe all safety information and instructions in this manual.

2.4 Personnel qualification and personnel training

All personnel involved must be fully qualified to install, operate, maintain and inspect the product this manual refers to.

The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.

Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.

Training must always be supervised by technical specialist personnel.

2.5 Consequences and risks caused by non-compliance with these operating instructions

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
 - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
 - Failure of important product functions
 - Failure of prescribed maintenance and servicing practices
 - Hazard to the environment due to leakage of hazardous substances

2.6 Safety awareness

In addition to the safety information contained in this manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws



2.7 Unauthorized modes of operation

Never operate the submersible mixer stand outside the limits stated in the data sheet and in this installation and operating manual.

The warranty relating to the operating reliability and safety of the submersible mixer stand supplied is only valid if the stand is used in accordance with its intended use.

3 Transport/Temporary Storage/Disposal

3.1 Transport

| | |
|---|---|
|  | <div style="background-color: #f4a460; padding: 5px;"> DANGER</div> <p>Improper transport Danger to life from parts falling or toppling over! Damage to the submersible mixer stand!</p> <ul style="list-style-type: none"> ▷ Attach lifting tackle only to the eyebolt provided. ▷ Never use the chains or lifting ropes included in KSB's scope of supply for lifting loads other than the KSB product supplied. ▷ Safely attach lifting ropes or chains to the eyebolt and crane. ▷ Only place submersible mixer stands, whether transported with or without a pallet, on solid and level ground. |
|---|---|

Transport Transport the submersible mixer stand in horizontal position and in its original packaging (strapped to the pallet), as shown.

Transport the submersible mixer stand with a fork-lift truck or pallet truck of sufficient load-carrying capacity. (See weight indicated on the name plate.)

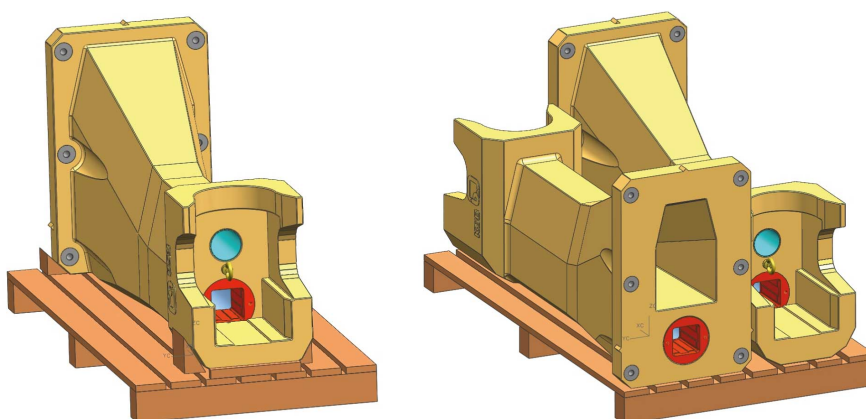



Fig. 1: Transporting the submersible mixer stand

Placing in upright position Use a crane of sufficient load-carrying capacity to place the submersible mixer stand in upright position. (See weight indicated on the name plate.)

| | |
|---|--|
|  | <div style="background-color: #f4a460; padding: 5px;"> DANGER</div> <p>Load may swing when pulled upright Danger to life from parts falling or toppling over!</p> <ul style="list-style-type: none"> ▷ Place the submersible mixer stand on solid and level ground only. ▷ Keep lifting gear attached. |
|---|--|

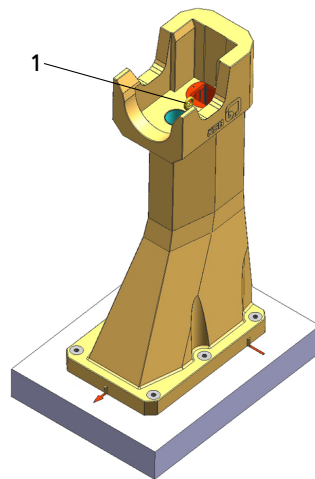



Fig. 2: Pulling the submersible mixer stand upright

1. Attach the lifting rope or chain to eyebolt 1 and the crane.
2. Pull the lifting rope or chain taut.
3. Pull the submersible mixer stand upright.

3.2 Storage and preservation

If commissioning is to take place some time after delivery, we recommend that the following measures be taken:

| | |
|---|--|
|  | <p>CAUTION</p> <p>Damage during storage by humidity, dirt or vermin Contamination of the submersible mixer stand!</p> <p>▷ For outdoor storage cover the submersible mixer stand and accessories with waterproof material.</p> |
|---|--|

- Store the submersible mixer stand under dry and vibration-free conditions, if possible in its original packaging.
- Protect against ingress of rain water and dirt.
- Protect against frost.
- Avoid storing in direct sunlight.
(Material properties may be affected)

Table 4: Ambient conditions for storage

| Ambient conditions | Value |
|---------------------|--------------------------------------|
| Relative humidity | 5 % to 85 % (non-condensing) |
| Ambient temperature | 14 °F to 112 °F [- 10 °C to + 50 °C] |

3.3 Return to supplier

1. Always flush and clean the submersible mixer stand, particularly if it has been used in noxious, explosive, hot or other hazardous fluids.
2. If the submersible mixer stand has been used in fluids leaving residues which might lead to corrosion when coming into contact with atmospheric humidity, or which might ignite when coming into contact with oxygen, the submersible mixer stand must also be neutralized and treated with anhydrous inert gas for drying purposes.
3. Always complete and enclose a certificate of decontamination when returning the submersible mixer stand.
Always indicate any safety and decontamination measures taken.

**NOTE**

If required, a blank certificate of decontamination can be downloaded from the KSB web site at: www.ksb.com/certificate_of_decontamination

3.4 Disposal**WARNING****Fluids posing a health hazard**

Hazardous to persons and the environment!

- ▷ Submersible mixer stands used in fluids posing a health hazard must be decontaminated.
- ▷ Collect and dispose of any flushing liquid.
- ▷ Wear safety clothing and a protective mask, if required.
- ▷ Observe all legal regulations on the disposal of harmful substances.

1. Dismantle the submersible mixer stand.
Collect greases and other lubricants during dismantling.
2. Separate and sort the materials, e.g. by:
 - Metals
 - Plastics
 - Mineral substancesThe stand can be shredded and the mineral substances disposed of as construction waste.
3. Dispose of materials in accordance with local regulations or in another controlled manner.

4 Description

4.1 General description

- Submersible mixer stand

Submersible mixers are used in waste water treatment plants for handling municipal and industrial waste water and sludges. The submersible mixer is installed near the tank floor on the submersible mixer stand.

Installation types

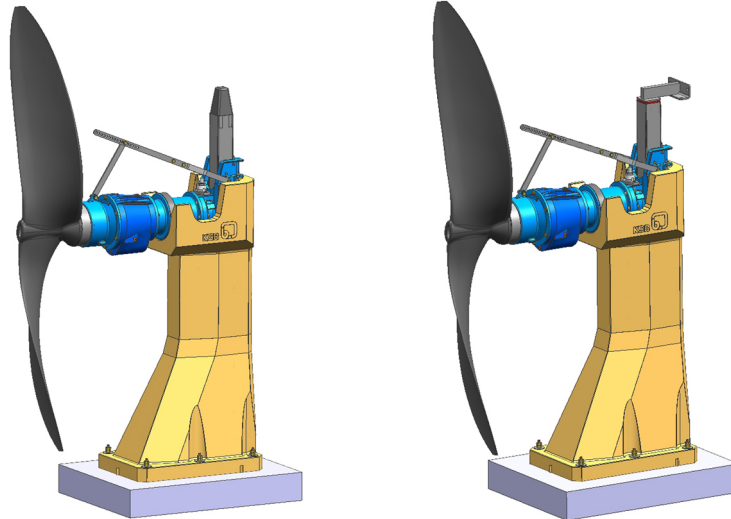


Fig. 3: Installation types

1. Free-standing, without upper holder (for square guide rails < 23 ft [7 m])
2. With upper holder mounted on the tank wall or bridge (generally required for square guide rails \geq 23 ft [7 m]; optional for square guide rail lengths < 23 ft [7 m])

4.2 Designation

The submersible mixer stand is clearly identified by the KSB material number stated on the name plate.

4.3 Name plate

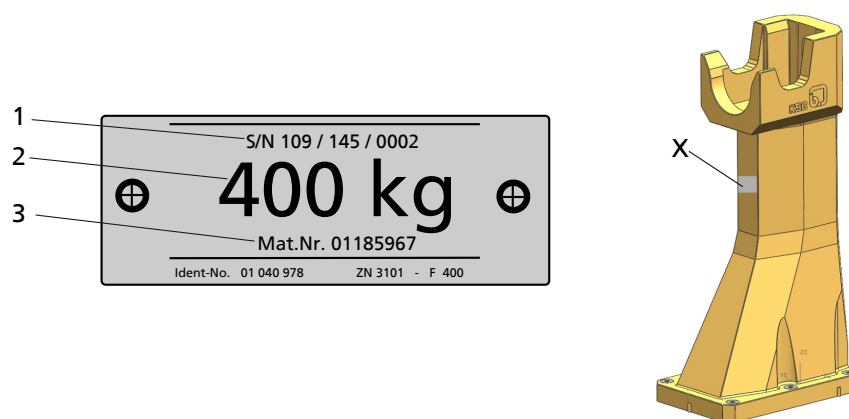


Fig. 4: Name plate (example) and position of name plate (X)

| | | | |
|---|------------------------------|---|--------------------------------------|
| 1 | Manufacturer's serial number | 2 | Weight [400 kg = 881.849 lbm(lb)] |
| 3 | KSB material number | | |

4.4 Design details

Design

- Monolithic submersible mixer stand made of NoriRoc cast polymer concrete
- Integrally cast metal bushes (for fastening the stand to the tank floor) and flexible locating bushes (for holding the square guide rail)

Fastening

- The submersible mixer stand is fastened on the tank floor with chemical anchors

Guide rail

- Wall thickness:
 - $\frac{1}{8}$ " [3 mm] (for guide rail lengths < 30 ft [9 m])
 - $\frac{3}{16}$ " [5 mm] (for guide rail lengths \geq 30 ft [9 m])
- Cross-section $3\frac{15}{16} \times 3\frac{15}{16}$ " [100 × 100 mm]
- Material A 276 Type 304 or A 276 Type 316 Ti [material 1.4301 or 1.4571]

4.5 Configuration and function

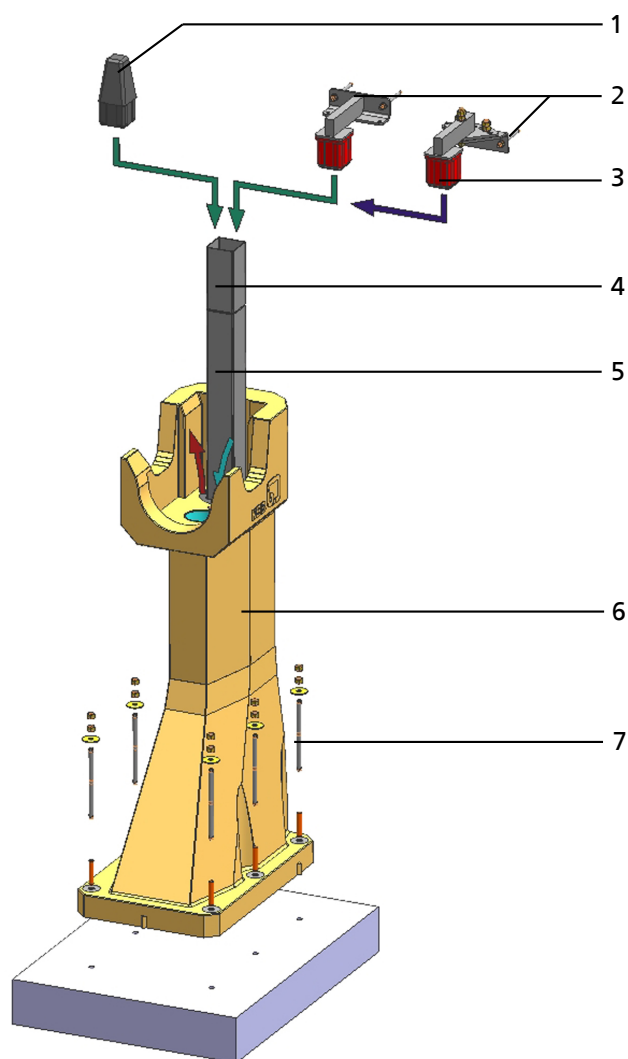


Fig. 5: Illustration of AmaRoc

| | | | |
|---|-------------------|---|-------------------------|
| 1 | Upper holder | 2 | Flexible pipe part |
| 3 | Square guide rail | 4 | Submersible mixer stand |

| | | | |
|---|---|---|---|
| 5 | Chemical anchor | 6 | Square guide rail extension (if required) |
| 7 | Insert sleeve (on free-standing models) | | |

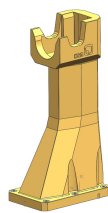
Design AmaRoc is a monolithic submersible mixer stand made of NoriRoc material with excellent damping characteristics, with integrally cast metal bushes for floor mounting and flexible locating bushes for the square guide rail (cross-section $3^{15}/_{16} \times 3^{15}/_{16}$ " [100 x 100 mm]).

Function The submersible mixer stand is designed to absorb all forces and moments generated during mixer operation and transfer them to the foundation.

4.6 Scope of supply

Depending on the model, the following items are included in the scope of supply:

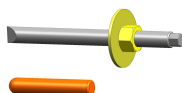
- Submersible mixer stand



- Square guide rail / square guide rail extension, if necessary



- Chemical anchor (6 pcs.)



- Installation accessories



- Locking pin for square guide rail



- 1 x bolt M16 x 30 and 1 x washer

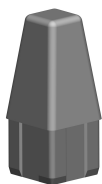


- 5 x UPAT chemical mortar

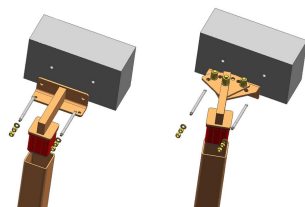


Optional:

- Insert sleeve





- Upper holder

**4.7 Dimensions and weights**

For dimensions and weights please refer to the general arrangement drawing/outline drawing and data sheet of the submersible mixer.

5 Installation at Site

5.1 Safety regulations

| | |
|---|--|
|  |  DANGER |
| | <p>Improper installation in potentially explosive atmospheres Explosion hazard! Damage to the submersible mixer!</p> <ul style="list-style-type: none"> ▷ Comply with the applicable local explosion protection regulations. ▷ Observe the information given in the data sheet and on the name plate. |



5.2 Prerequisites

Installation of the submersible mixer stand requires:

- At least two fitters
- Suitable lifting equipment of sufficient load-carrying capacity with approved lifting tackle
- Applicator gun for commercial cartridges
- Compressed air for cleaning the drilled holes
- Portable drill with hard metal drill bit (better: core drill bit)
 - Ø 3/4" [18 mm], hole depth 4¹⁵/₁₆" [125 mm] - for mounting the stand on the floor
 - Ø 9/16" [14 mm], hole depth 4⁵/₁₆" [110 mm] - for mounting the upper guide rail holder
- Metal drill bit
 - Ø 3/8" [10 mm] - for locking the square guide rail in position
- Open-jawed or ring spanner for hexagon head bolt 1/2" (3/4") [M12 (WAF 19)], 5/8" (1") [M16 (WAF 24)]
- Torque wrench
- Cut-off grinder for cutting the square guide rail to length
- Welding unit for welding on a guide rail extension (if required)

5.3 Checks to be carried out prior to installation

5.3.1 Preparing the place of installation

| | |
|---|---|
|  |  WARNING |
| | <p>Installation on foundations which are unsecured and cannot support the load Personal injury and damage to property!</p> <ul style="list-style-type: none"> ▷ Make sure the foundation concrete is of sufficient strength (min. 3000 psi [class C25/30 to DIN 1045]). ▷ Only place the submersible mixer stand on a foundation whose concrete has set firmly. ▷ Refer to the weights given in the data sheet/on the name plate. |

1. Check the structural requirements.
All structural work required must have been prepared in accordance with the dimensions stated in the outline drawing/general arrangement drawing.
2. Clean the concrete surface; if required, clean with a broom to remove any loose particles.

5.4 Installing the submersible mixer stand



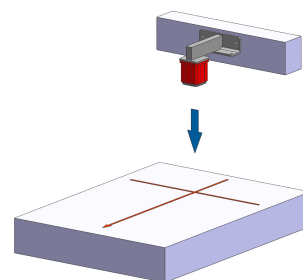
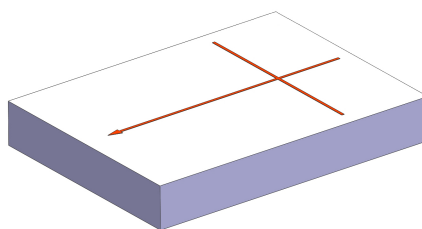
NOTE

For free-standing models, the square guide rail needs to be fitted on the submersible mixer stand first.

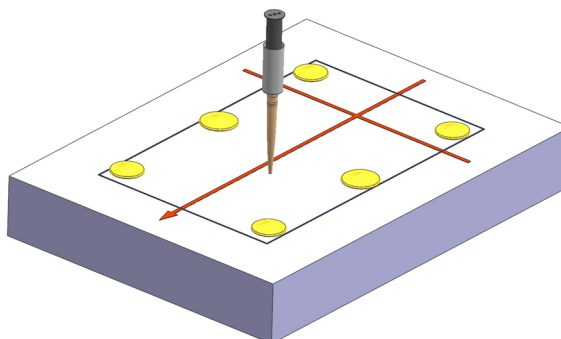
5.4.1 Preparing the foundation

1. Mark the installation position inside the tank as shown in the site layout drawing. Mark the outline of the submersible mixer stand and the fixing points. Use a template, if required.

Models installed with an upper holder: Make sure the square guide rail is correctly aligned in relation to the concrete wall or bridge.

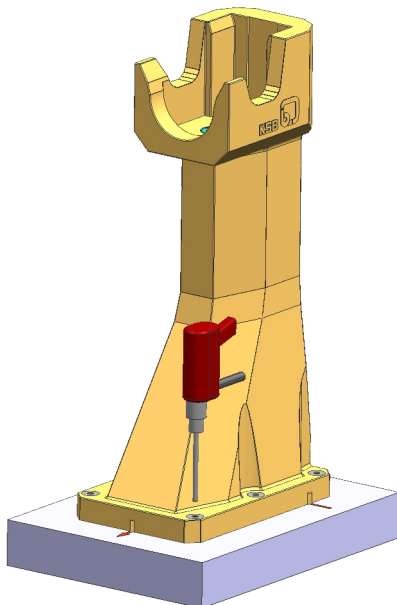


2. Mark the flow direction.
3. To ensure optimum contact between the submersible mixer stand and the concrete floor, apply the chemical mortar as shown below, using a commercial applicator gun. Work quickly, bearing in mind the curing time of the chemical mortar! Observe the manufacturer's application instructions!

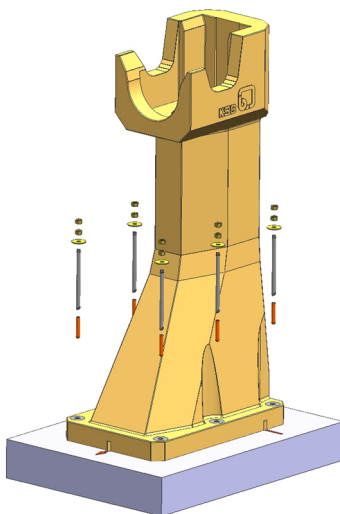


5.4.2 Setting up the submersible mixer stand

- ✓ The submersible mixer stand has been removed from the pallet, pulled upright and set down, securely attached to a crane (taut rope), on solid ground directly next to the place of installation.
- 1. Place the submersible mixer stand into the soft chemical mortar in the marked out area.
- 2. Drill the holes.
Diameter: $\frac{3}{4}$ " [18 mm], depth: $4\frac{15}{16}$ " [125 mm] from upper concrete edge
(Use the bushes integrated at the fixing points as drilling templates.)

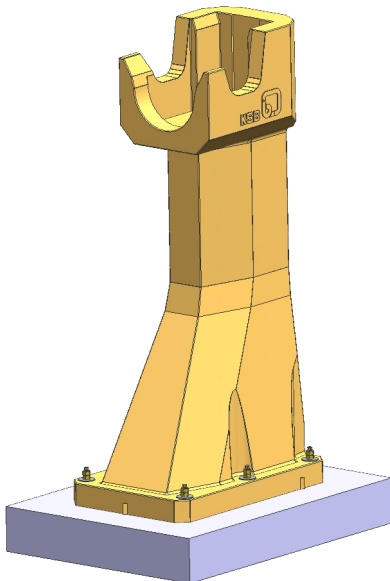



- 3. Thoroughly clear the holes of any drilling dust.
- 4. Insert the mortar cartridges into the drilled holes (two cartridges per hole).
- 5. Crack the fitted mortar cartridges open with a threaded rod.
Work quickly, bearing in mind the curing time of the chemical mortar! Observe the manufacturer's application instructions!
- 6. Insert the threaded rods with a drill and clamping chuck.
Observe the processing time of the two-part resin! Also refer to the instructions given on the packaging of the mortar cartridges.



- 7. Tighten the chemical anchors. Tightening torque: 44.3 lbf ft [60 Nm]

8. Screw on and tighten the locknuts.

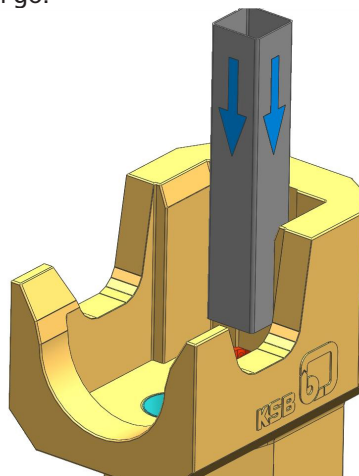


| | CAUTION |
|---|--|
|  | <p>Failure to remove the eyebolt (attachment point for transport)</p> <p>Contact between eyebolt and submersible mixer</p> <p>Incorrect operating position of submersible mixer!</p> <p>► Replace eyebolt with hexagon head bolt.</p> |

9. Free-standing model: Remove the eyebolt and replace with hexagon head bolt $\frac{5}{8} \times 1\frac{3}{16}$ [M16x30] and washer.

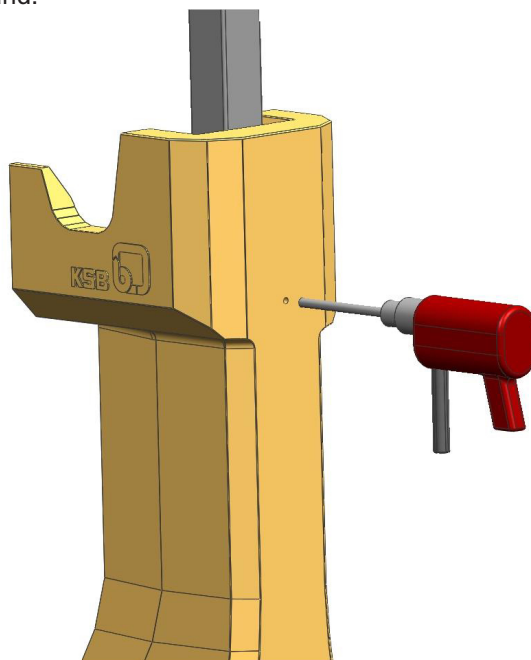
5.4.3 Fitting the square guide rail

1. Cut square guide rail to length and deburr.
Length for free-standing installation: end of guide rail max. 20" [0.5 m] above the water surface
Length for installation with upper holder: fixing points of upper holder at least $4\frac{3}{4}$ " [120 mm] below the tank edge
2. Weld together the square guide rail and the square guide rail extension, if required.
3. Insert the square guide rail into the locating sleeve of the submersible mixer stand as far as it will go.



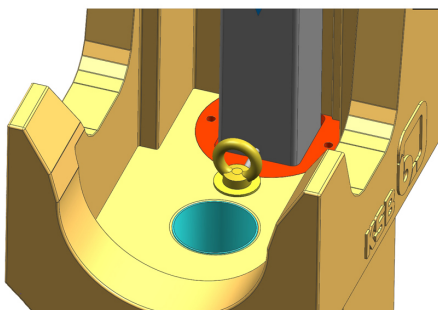
4. Remove the eyebolt.

5. Lock the square guide rail in place so that it cannot be pulled out. To this end, drill a hole into the submersible mixer stand and the square guide rail, using a metal drill bit $\varnothing \frac{3}{8}$ " [10 mm]. Position the hole as indicated by the marking on the submersible mixer stand.

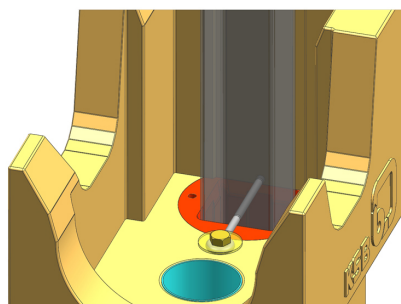


6. Insert the locking pin to lock the square guide rail in place.
Free-standing model: Provisionally use the eyebolt and a washer to lock the pin (a).
Models installed with an upper holder: Use the hexagon head bolt $\frac{5}{8}$ x $1\frac{3}{16}$ " [M16x30] and washer to lock the pin (b).

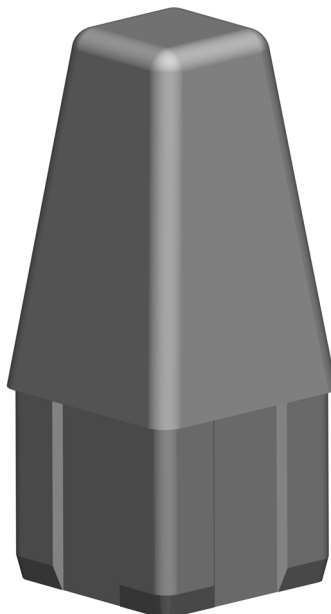
a)



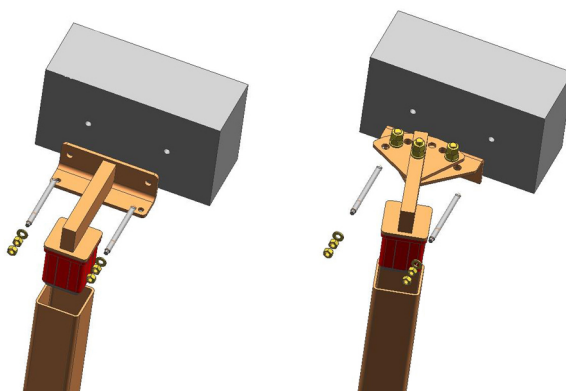
b)



7. Free-standing model: Place the insert sleeve into the square guide rail.



8. Models installed with an upper holder: Place the upper holder into the square guide rail.



9. Bolt the upper holder to the tank wall.

For concrete walls:

Drill holes. Diameter $\frac{9}{16}$ " [14 mm], depth: $4\frac{15}{16}$ " [110 mm] for chemical anchors $\frac{1}{2} \times 6\frac{5}{16}$ " [M12 x 160]

Tightening torque: 25.8 lbf ft [35 Nm]

For walls or bridges made of steel:

Mount the upper holder with site-supplied $\frac{1}{2}$ " [M12] bolts, depending on the structural requirements. Tightening torque: 44.3 lbf ft [60 Nm]

10. Tighten the $\frac{5}{8}$ " [M16] bolts (for upper holder with swivelling option).

Tightening torque 110.6 lbf ft [150 Nm].

5.5 Mounting the submersible mixer on the submersible mixer stand

5.5.1 Fitting the lifting bail

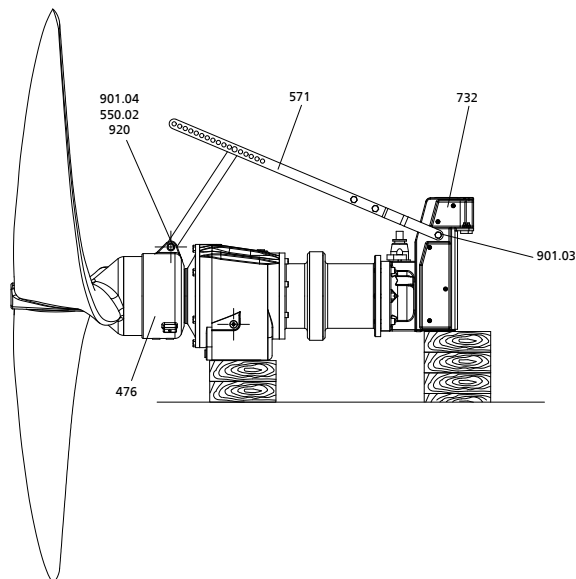




Fig. 6: Fitting the lifting bail

The mixer normally comes with the lifting bail 571 already fitted in center of gravity position.

1. Position the submersible mixer as shown.
2. Fit the lifting bail to guide bracket 732 using hexagon head bolts 901.03.
3. Use hexagon head bolt 901.04, disc 550.02 and nuts 920 to fasten the lifting bail to mating ring carrier 476.

5.5.2 Transporting the submersible mixer

| | |
|---|--|
|  | <div style="background-color: #e67e22; color: white; padding: 5px; border: 1px solid black;">  DANGER </div> <p>Improper transport Danger to life from falling parts! Damage to the submersible mixer!</p> <ul style="list-style-type: none"> ▷ Use the attachment point provided on the lifting bail for attaching lifting accessories. ▷ Never suspend the submersible mixer by its power cable. ▷ Never use the chains or lifting ropes included in KSB's scope of supply for lifting loads other than the KSB product supplied. ▷ Safely attach lifting ropes or chains to the submersible mixer and crane. |
|---|--|

Transport the submersible mixer as shown.

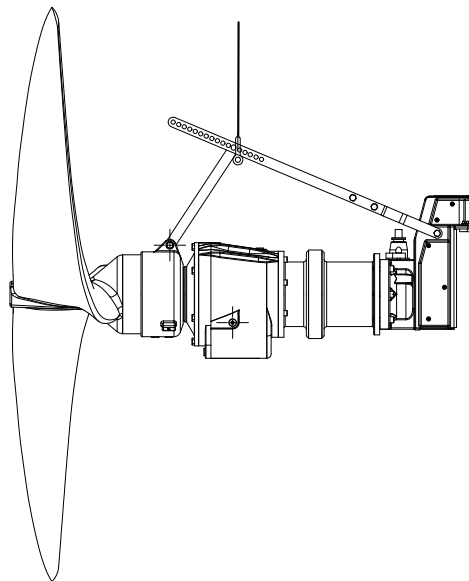


Fig. 7: Transporting the submersible mixer

5.5.3 Adjusting the attachment point

The correct attachment point must be selected in order to ensure reliable installation and problem-free lifting and lowering of the submersible mixer on the submersible mixer stand.

Amaprop 1200 - 2500

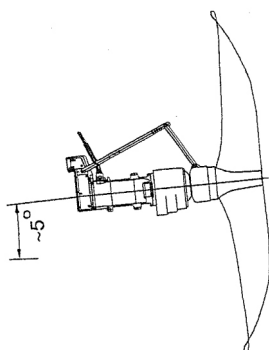


Fig. 8: Inclination angle approx. 5°

For trouble-free lifting and lowering, an inclination angle of approx. 5° must be maintained (higher end = propeller end) when the mixer is suspended by the lifting bail. If the angle deviates from the requirements, the attachment point must be adjusted.

Correcting the attachment point:

1. Slightly loosen bolts 901.03 on guide bracket 732 and bolt 901.04 on mating ring carrier 476.
2. Undo the upper bolted connection on the lifting bail.
3. Select the correct hole in the lifting bail, depending on the required inclination of the mixer.



CAUTION

Loose or insufficiently tightened screwed connections

Damage to the installation parts during operation

- ▷ Observe the tightening torques.

4. Re-tighten all bolts.

5. Repeat attachment procedure.

⇒ If the angle of inclination is approx. 5°, the correct center of gravity position has been found.

5.5.4 Lifting hook



NOTE

Lifting hooks can only be used in low-viscosity substrates.

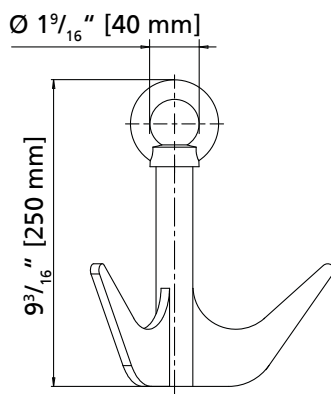


Fig. 9: Lifting hook

The lifting hook has a maximum load-carrying capacity of 1100 lbs [500 kg].

For lifting/lowering with a lifting hook, the lifting hook is attached to the lifting rope of the lifting equipment (crane) with a shackle.

5.5.5 Lifting rope

For lifting/lowering with lifting equipment, the lifting rope can also be attached directly at the attachment point. It can remain attached during operation.

5.5.6 Fitting the protective cable sheath on the submersible mixer

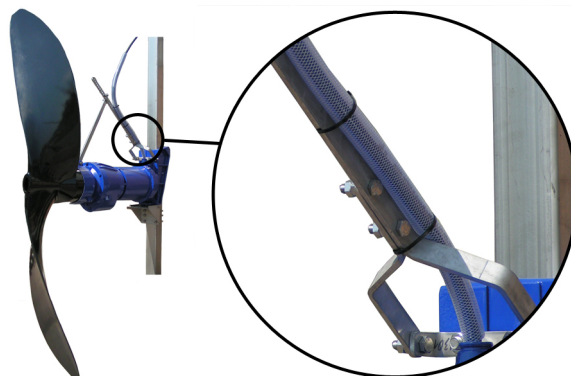
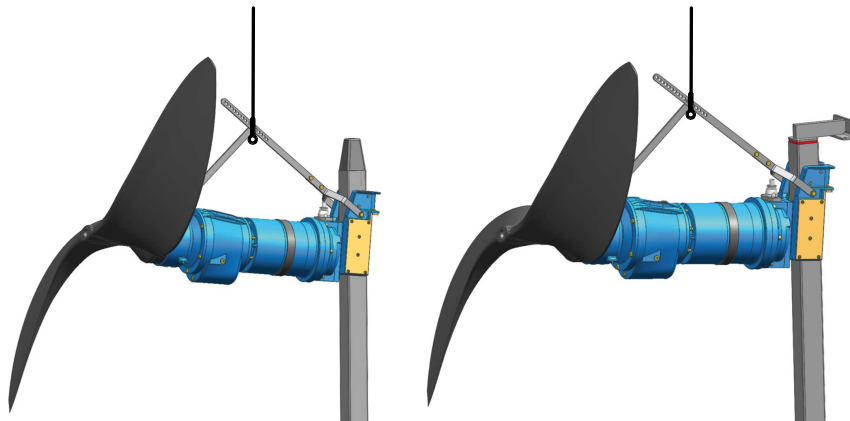


Fig. 10: Fitting the protective cable sheath

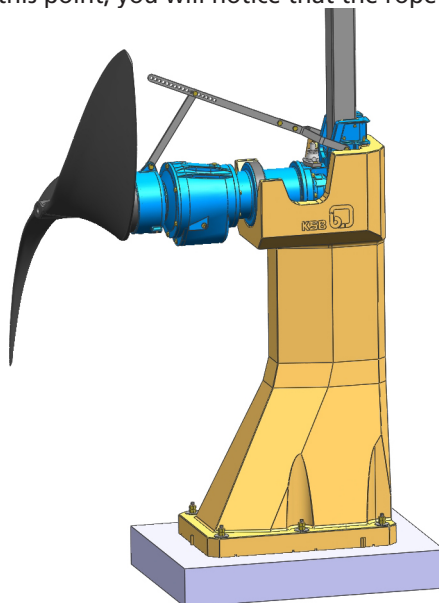
1. To protect the power cable, slip protective cable sheath 719 over the cable end, and slide it all the way up against the bushing.
2. Fasten the protective cable sheath to bail 571 with cable ties 81-7.

5.5.7 Fitting the submersible mixer to the submersible mixer stand

- ✓ The lifting bail has been fitted on the submersible mixer.
 - ✓ Center of gravity position has been ensured.
1. Suspend the submersible mixer from the lifting gear and position it over the square guide rail.
 2. Lower the submersible mixer onto the square guide rail.
The pyramid-shaped insert sleeve at the top end of the square guide rail (on free-standing models only) facilitates guiding the submersible mixer onto the square guide rail.



3. Lower the submersible mixer down into the tank along the square guide rail, until the flexible rubber base of the motor housing bottoms in the bowl-shaped mixer bracket.
Prior to that, the plastic plates of the guide bracket touch down on the top edge of the mixer bracket and the unit tilts into the horizontal installation position.
At this point, you will notice that the rope slackens a little.





4. If a lifting hook is used, lower the rope a little bit further until the lifting hook comes off the lifting bail (571) and the rope can be pulled in.



NOTE

To make it easier to locate the position of the submersible mixer at a later point, the rope should be marked at the railing level.

5.5.8 Fastening and tensioning the power cable

| | |
|---|---|
|  | <div style="background-color: #f4a460; padding: 5px;">⚠ DANGER</div> <p>Power cable not properly routed Risk of personal injury! Risk of falling!</p> <ul style="list-style-type: none"> ▷ Route the power cable in such a way that it cannot pull down any persons if the pump set falls down or is lowered down. |
|  | <div style="background-color: #f4d03f; padding: 5px;">CAUTION</div> <p>Power cable routed with too much slack Damage to power cable by propeller blades!</p> <ul style="list-style-type: none"> ▷ Pull the cable taut before fastening it at the tank edge. |

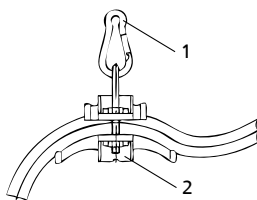



Fig. 11: Fastening and tensioning the power cable

| | | | |
|---|---------------|---|---------------|
| 1 | Carabine hook | 2 | Cable support |
|---|---------------|---|---------------|

If possible, the power cable should be fastened to the tank edge at a distance of approx. 31 1/2" [0.8 m] from the side of the guide rail to prevent chafing on the guide rail, which would damage the power cable.

1. Fit the cable support to the power cable at the tank edge and use a carabine hook to attach it to an appropriate point (e.g. railing or eyebolt).
2. Pull the cable taut before tightening the cable support bolts.
Prevent chafing of the power cable (use appropriate pads at the tank edge, if necessary).

5.5.9 Fastening the lifting rope

| | |
|---|--|
|  | <div style="background-color: #f4d03f; padding: 5px;">CAUTION</div> <p>Slack lifting ropes Damage to lifting ropes by propeller blades!</p> <ul style="list-style-type: none"> ▷ When using a stationary crane mounted at the mixer's installation position, ensure that the rope is routed up to the winch with a minimum of slack during mixer operation. |
|---|--|



6 Commissioning/Start-up/Shutdown

6.1 Commissioning/start-up

Before start-up, the following requirements must be met:

- The submersible mixer stand has been installed as specified in this manual.
- All screws and bolts have been tightened as specified in this manual.
- Compliance with all items of the operating manual of the submersible mixer has been verified.

6.2 Shutdown

| | |
|---|--|
|  | <div data-bbox="507 577 702 622"> WARNING</div> <p data-bbox="496 645 829 672">Fluids posing a health hazard</p> <p data-bbox="496 680 994 707">Hazardous to persons and the environment!</p> <ul data-bbox="518 721 1347 860" style="list-style-type: none">▷ Submersible mixer stands used in fluids posing a health hazard must be decontaminated.▷ Wear safety clothing and a protective mask, if required.▷ Observe all legal regulations on the disposal of harmful substances. |
|---|--|










Submersible mixer stand is taken out of service



- ✓ All safety regulations are observed.
1. Clean the submersible mixer stand.
 2. Carry out maintenance work.

7 Servicing/Maintenance

7.1 Safety regulations

The operator ensures that all maintenance, all inspections and all installation work is performed by authorized, qualified specialist personnel who are thoroughly familiar with the manual.

| | |
|---|---|
|  | <div data-bbox="507 414 683 459"> DANGER</div> <p>Sparks produced during maintenance work Explosion hazard!</p> <ul style="list-style-type: none"> ▷ Always perform maintenance work on explosion-proof submersible mixers outside potentially explosive atmospheres only. |
|  | <div data-bbox="507 649 683 694"> DANGER</div> <p>Improper transport Danger to life from falling parts! Damage to the submersible mixer!</p> <ul style="list-style-type: none"> ▷ Use the attachment point provided (lifting lug or bail) for attaching lifting accessories. ▷ Never suspend the submersible mixer by its power cable. ▷ Never use the lifting ropes included in KSB's scope of supply for lifting loads other than the KSB product supplied. ▷ Safely attach lifting ropes to the submersible mixer and crane. ▷ Protect the power cable against damage. ▷ Maintain adequate safety distance during lifting operations. |
|  | <div data-bbox="507 1153 702 1198"> WARNING</div> <p>Submersible mixer started up unintentionally Risk of injury by moving parts!</p> <ul style="list-style-type: none"> ▷ Always make sure the electrical connections are disconnected before carrying out work on the submersible mixer. ▷ Make sure that the submersible mixer cannot be started up unintentionally. |
|  | <div data-bbox="507 1433 702 1478"> WARNING</div> <p>Fluids handled and supplies posing a health hazard or hot fluids handled and supplies Risk of injury!</p> <ul style="list-style-type: none"> ▷ Observe all relevant laws. ▷ Take appropriate measures to protect persons and the environment. ▷ Decontaminate submersible mixers used in fluids posing a health hazard. |
|  | <div data-bbox="507 1747 587 1792">NOTE</div> <p>Special regulations apply to repair work on explosion-proof submersible mixers. Modification or alteration of the submersible mixers can affect explosion protection and is only permitted after consulting the manufacturer.</p> |

| | |
|---|---|
|  | <p>NOTE</p> <p>A regular maintenance schedule will help avoid expensive repairs and contribute to trouble-free, reliable operation with a minimum of maintenance expenditure and work.</p> |
|  | <p>NOTE</p> <p>All maintenance work, service work and installation work can be carried out by KSB Service or authorized workshops. Find your contact in the attached "Addresses" booklet or on the Internet at "www.ksb.com/contact".</p> |

Never use force when dismantling and reassembling the submersible mixer.

7.2 Servicing/Inspection

Visual inspection Visual inspection of submersible mixer stand and secure floor mounting (chemical anchors).

When tank is filled:

- Check the upper holder
- Check the flexible pipe part (if fitted)

When tank is empty:

- Visually inspect the submersible mixer stand
- Visually check that the lifting rope is securely fastened
- Visually inspect the power cable
- Check all screws/bolts and chemical anchors
- Check secure floor mounting with chemical anchors and locknuts
- Check the condition of the guide rail and the surfaces supporting the mixer

Verifying the tightening torques Verify that all screws and bolts have been tightened to the torques specified in the manual.

7.3 Tightening torques



Table 5: Tightening torques for chemical anchors

| Thread | [lbf ft] | [Nm] |
|------------|----------|------|
| 1/2" [M12] | 25,8 | 35 |
| 5/8" [M16] | 44,3 | 60 |

Table 6: Tightening torques for metric screws/bolts

| Thread | [lbf ft] | [Nm] |
|------------|----------|------|
| 1/2" [M12] | 44,3 | 60 |
| 5/8" [M16] | 110,6 | 150 |

8 Trouble-shooting

| | |
|---|--|
|  | <div style="background-color: #f4a460; padding: 5px; border: 1px solid black; margin-bottom: 5px;">  WARNING </div> <p>Improper remedial work Risk of personal injury!</p> <p>► For any work performed in order to remedy faults observe the relevant information given in this operating manual and/or the product literature provided by the accessories manufacturers.</p> |
|---|--|

If problems occur that are not described in the following table, consultation with KSB's customer service is required.

- A** Submersible mixer does not generate flow
- B** Insufficient flow
- C** Excessive current/power input
- D** Vibrations and noise during mixer operation

Table 7: Trouble-shooting

| A | B | C | D | Possible cause | Remedy |
|---|---|---|---|---|--|
| - | ✗ | - | ✗ | Free-standing models: Submersible mixer has been installed displaced by 180°; submersible mixer is not seated on the supporting surface of the submersible mixer stand. | Check installation. Install in correct flow direction. |
| - | - | - | ✗ | Free-standing models: Severe oscillation of the free-standing guide rail as a result of incorrect floor mounting | Check and correct; tank needs to be drained. |
| - | - | - | ✗ | Incorrect floor mounting | Check and correct; tank needs to be drained. |

9 Related Documents

9.1 General assembly drawing showing individual components

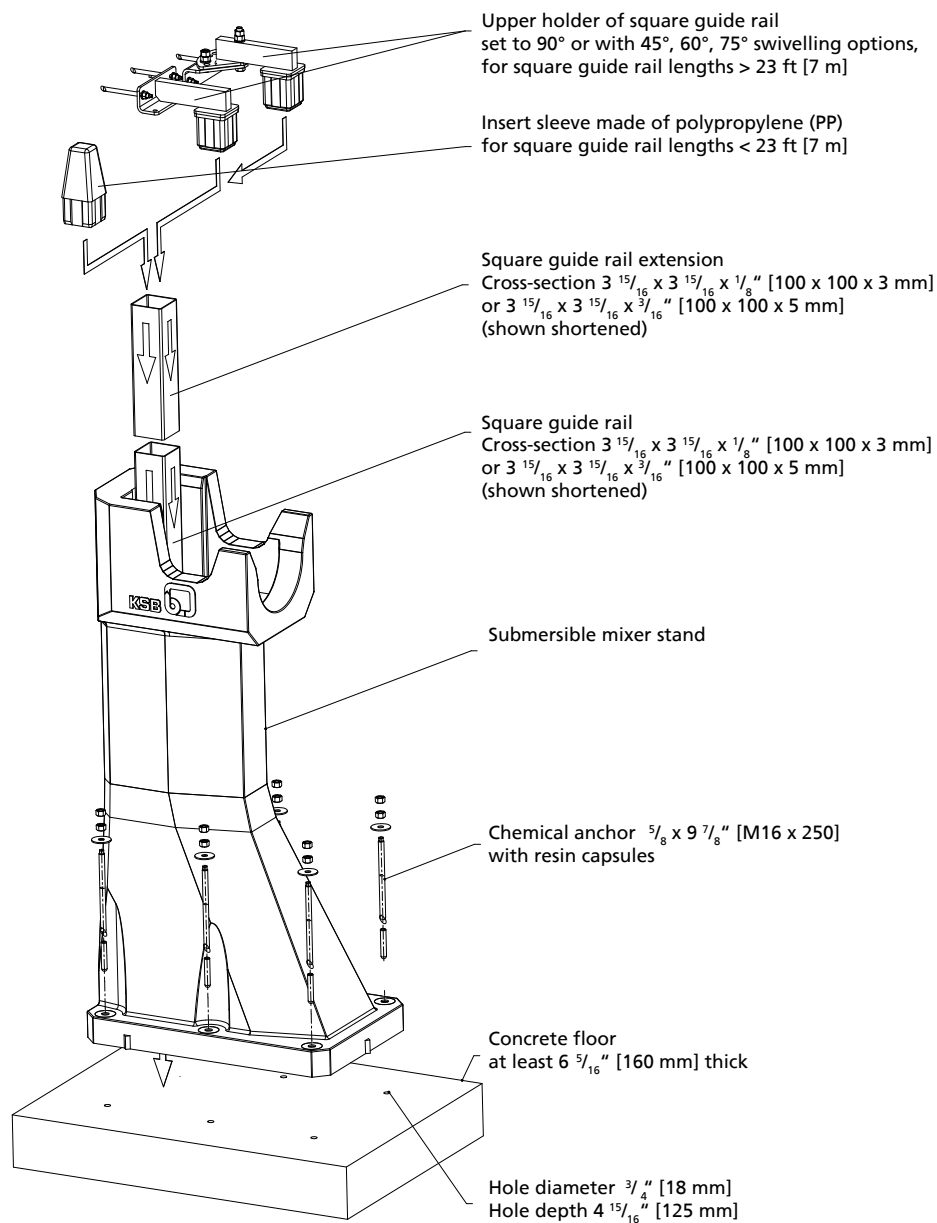


Fig. 12: General assembly drawing

9.2 General arrangement drawing

Standard model - shaft center height 57 1/8" [1450 mm]

For dimensions S and L please refer to the operating manual of the submersible mixer

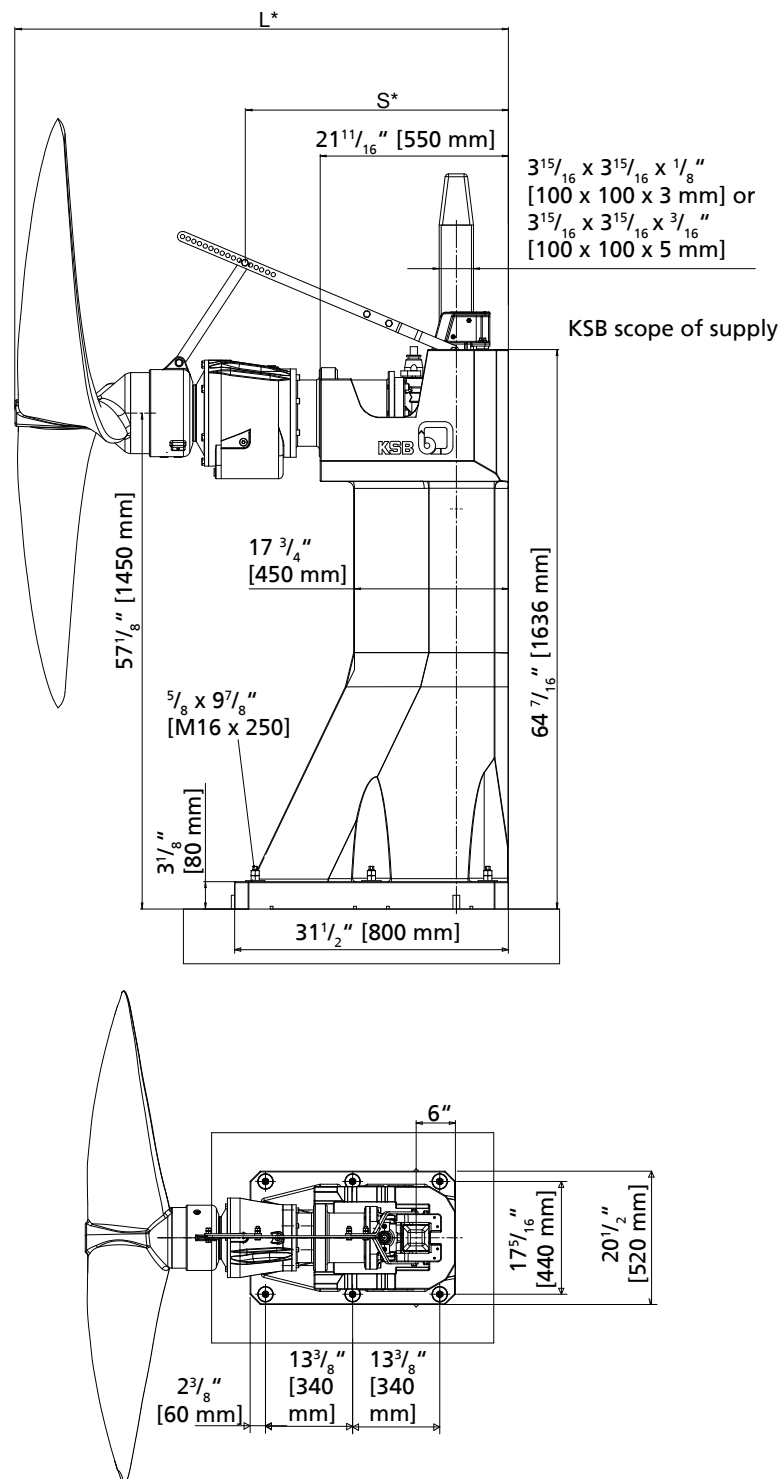


Fig. 13: Installation height 57 1/8" [1450 mm]

9.3 General arrangement drawing - Special models

Special models - shaft center heights $43\frac{5}{16}$ " [1100 mm] and $70\frac{7}{8}$ " [1800 mm]

For dimensions S and L please refer to the operating manual of the submersible mixer

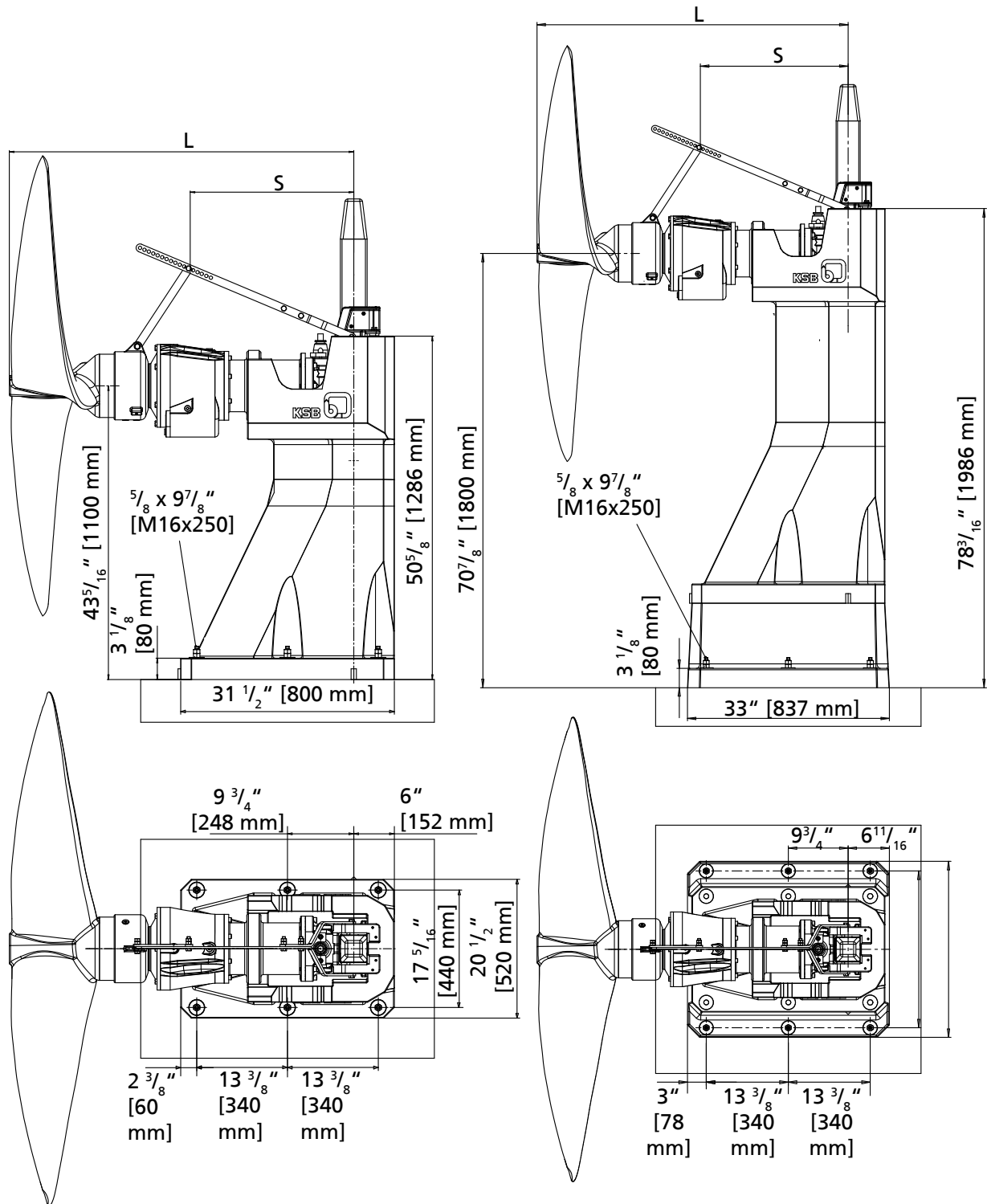


Fig. 14: Special models - shaft center heights $43\frac{5}{16}$ " [1100 mm] and $70\frac{7}{8}$ " [1800 mm]

10 Certificate of Decontamination

Type:
 Order number/
 order item number²⁾:
 Delivery date:
 Field of application:
 Fluid handled²⁾:

Please check where applicable²⁾:



Radioactive



Explosive



Corrosive



Toxic



Harmful



Bio-hazardous



Highly flammable



Safe

Reason for return²⁾:
 Comments:

The product/accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch/
 placing at your disposal.

We herewith declare that this product is free from any hazardous chemicals as well as from biological and radioactive
 substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been
 removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern,
 leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at
 the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has
 been removed.

- ☐ No special safety precautions are required for further handling.
☐ The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the
 relevant legal provisions.

.....
 Place, date and signature

.....
 Address

.....
 Company stamp

2) Required fields

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