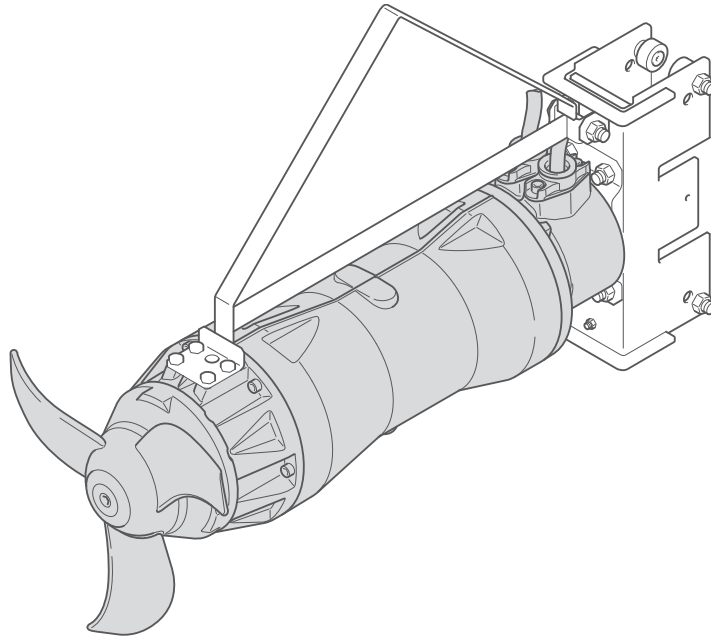




water solutions

Mixer sommerso

Submerged Mixer



Dichiarazione di conformità - Manuale di prima installazione

Declaration of Conformity - First Start Manual



*Illustrations are purely guideline and may not be an exact representation of the product supplied.
The data provided may be different from the real data. Zenit reserves the right to modify the product without notice.
For further information visit www.zenit.com.*

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For correct installation and safe use of the product, read this manual carefully and keep it safe in a clean, easily accessible place for future reference.

Misuse of the product may lead to even serious injury and damage, cause malfunctions and result in loss of warranty cover.

1. GENERAL INFORMATION

1.1 Manufacturer's details

ZENIT Italia s.r.l. - via dell'Industria, 11 - 41018 S.Cesario sul Panaro (Modena) - Italy

1.2 Key to the symbols used in the manual



Hazard for operators and product



Electrical risk



Very hot surfaces with burn hazard

WARNING! Important information to be read with special care

1.3 Safety



1.3.1 General safety regulations

- Installation operations must be carried out by skilled technical staff capable of understanding the contents of the manual;
- Not suitable for unskilled and/or incompetent persons; Keep out of reach of children;
- Do not touch the mixer propeller with parts of the body or objects when in motion;
- Do not swallow or inhale any component of the mixer;
- Before performing any procedure, ensure that the electricity supply has been disconnected and wait for the surface of the mixer to cool to ambient temperature (at least 30 minutes);
- Do not approach the mixer when in operation and do not touch the liquid in which it is submerged;
- Do not allow the free end of the electric cable to come into contact with liquids of any kind;
- Never handle or lift the mixer by the power supply cable;
- Wear regulation personal protective equipment when handling the mixer;

1.3.2 Safety Precautions

Never touch rotating parts when in operation; first disconnect the power supply and engage the protective device to prevent accidental startups. During operation, the unit must always be connected to the mast and the mast must be fixed to its holder.

The unit must always be submerged, to ensure natural cooling of the motor and mechanical seals.

Genuine Zenit spare parts and accessories are essential for compliance with safety regulations: all warranties become null and void if other parts are used.

- The mixer must ONLY be used in environments compatible with the dataplate characteristics;
- The mixer must always be disconnected from the power supply panel during handling, installation or uninstallation operations;
- If the mixer is installed in an aggressive chemical environment, contact the manufacturer before use to check whether the materials are compatible with the environment concerned;
- The electric system must have a ground connection in good working order;
- Before starting the mixer, check that the electric connection has been made correctly;
- Before connecting the electricity supply, ensure that the mixer has been installed correctly and retire to a safe distance;
- Do not use the mixer with flammable or explosive liquids;
- Do not install the mixer in enclosed environments with gases present and an explosion hazard;

- Do not use the mixer for purposes other than those for which it was designed and constructed, since the manufacturer does not accept liability for injury or damage caused by the mixer if used in contravention of the instructions in the manual, or in the event of non-compliance with the maintenance and safety recommendations;
- Do not modify the mixer or any of its parts (connections, holes, finishes, etc.) for any reason;
- In the event of damage to the mixer, stop it at once;
- Have any repairs done only by Zenit or an Authorised Service Centre and insist on the use of genuine spare parts;
- People and animals must not enter or come into contact with the liquid until the mixer has been removed from the tank;
- The user must comply with the relevant safety regulations in the country of use, as well as common-sense safety precautions, and ensure that regular cleaning and maintenance operations are carried out correctly;
- The installer is responsible for ensuring that the ambient conditions of use are suitable, to ensure health and safety;
- The customer is responsible for the staff authorised to use the mixer;
- Failure to comply with this requirement may put users at risk and lead to loss of warranty rights.



1.3.3 Safety regulations to be applied during installation and maintenance operations

To allow maintenance work to be performed in complete safety, always comply with the following rules:

- Make sure that the mixer is disconnected from the power supply system: disconnect the phase wires first and then the yellow-green ground wire;
- Remove the mixer from the tank;
- Wait for the surface of the mixer to cool to ambient temperature (at least 30 minutes);
- Replace the faulty or worn components. Always seek the manufacturer's advice before proceeding with any repair or maintenance job;
- NEVER work alone when performing any maintenance procedures;
- In the event of work on a mixer installed in an enclosed environment such as tanks, do not underestimate the risks arising from any harmful vapours. ENSURE proper ventilation before starting work;
- The people who descend into pits must be connected to safety ropes and must be able to re-ascend quickly in the event of an emergency.

1.3.4 Training of installation and maintenance staff

The staff assigned to install and maintain the product must be trained in the inevitable residual risks related to electrical equipment operating in contact with biological liquids.

They must also be capable of reading and understanding the contents of the technical documentation supplied with the product, especially the electrical wiring diagrams.

1.3.5 Personal protective equipment (PPE) to be used

Wear regulation personal protective equipment when handling the mixer.

Safety gloves, safety footwear, protective goggles enclosed at the sides and leather aprons must be worn.

Before handling the product once installed, wash it with plenty of running water and/or detergents.



1.3.6 Residual risks

The product is designed and built to ensure safe, reliable use. However, since it is intended for use with liquids that constitute a health hazard, the installation and maintenance staff must take great care and always wear regulation personal protective equipment.

During all work on the product, users must take care not to drop the mixer and must not underestimate the risks of burns, electrocution, drowning and suffocation or poisoning due to the inhalation of toxic gases.

The user is responsible for installing any appropriate lightning protection measures to reduce electrocution risks.

1.4 Intended use

These products are intended for use in municipal and industrial wastewater treatment plants, industrial processes and agriculture. They are able to mix, homogenise and suspend liquids with medium to low viscosity (< 500 mPas). They may not be used with liquids for human consumption or in potentially explosive atmospheres.

1.5 Using the mixer in sludge tanks

In sludge tanks where the depth of the contents varies, the sludge may deposit on the mast, preventing correct dismantling of the mixer. It is therefore important to check, with the tank totally or partially empty, for deposits on the mast and motor bracket.

1.6 Warranty cover

Zenit undertakes to repair or replace the product if failures are due to design, manufacturing and assembly defects and are reported to Zenit during the warranty period. The warranty does not cover failures due to:

- normal wear and tear;
- improper handling, installation and use;
- use with incorrectly connected control systems;
- work done by unskilled staff;
- use of non-genuine spare parts.

WARNING! Any modifications made to the product without the manufacturer's authorisation may cause hazards and lead to a deterioration in performance and loss of warranty cover.

1.7 Technical data

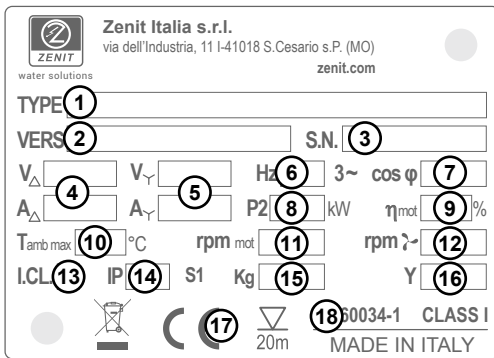
The product's technical data and characteristics are provided in the technical information.

1.8 Acoustic pressure level

The mixer's acoustic pressure level when in operation is below 70 dB.

However, in some systems this threshold may be exceeded. Check the permitted acoustic pressure level in the environment where the product is installed to avoid breaching local legal requirements.

1.9 Dataplate



- | | |
|--|----------------------------|
| ① Product type | ⑩ Max ambient temperature |
| ② Product version | ⑪ Motor rpm |
| ③ Serial number | ⑫ Propeller rpm |
| ④ Voltage and current (delta connection) | ⑬ Motor insulation class |
| ⑤ Voltage and current (Y connection) | ⑭ Casing protection rating |
| ⑥ Frequency | ⑮ Weight |
| ⑦ Power factor | ⑯ Year of manufacture |
| ⑧ Motor power output | ⑰ Max submergence |
| ⑨ Motor efficiency | ⑱ Reference standard |

1.10 Product name and description

Product type

ZMD 030C A 1,5/6 A F 010

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- | | |
|--|--|
| ① Designation | ④ Flow ring version |
| ② Transmission type
D = Direct
R = With reduction gear | ⑤ Motor power (kW) / poles |
| ③ Type of propeller
000 = Ø in mm
A..Z = Type | ⑥ Motor efficiency and version |
| | ⑦ Dimensions of electromechanical assembly |
| | ⑧ Reduction ratio |

Product version

G 1 X DD 4 1 BC 10 5 40 NN

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- | | |
|--------------------------------------|---|
| ① Case material | ⑦ Electric and electronic protection and safety accessories |
| ② Case external finish | ⑧ Power cable length |
| ③ Propeller material | ⑨ Power supply frequency |
| ④ Motor bracket/installation variant | ⑩ Power supply voltage and connection type |
| ⑤ Hoisting hook type | ⑪ Certification variant, special or custom |
| ⑥ Drive shaft material | |

2. TRANSPORT AND STORAGE

2.1 Visual inspection

Make a visual inspection of the packaging for damage.
Record any significant damage to the product in the transport documents.
Inspect the product to ensure that there are no damaged or missing parts.
If articles are missing, contact Zenit (or its dealer) or the forwarders.
Remove the packaging materials and dispose of them as required by law.
Take special care not to injure yourself with sharp tools and not to damage to the product, especially the electrical wiring.
Check that the data on the dataplate are the same as those of the product ordered.

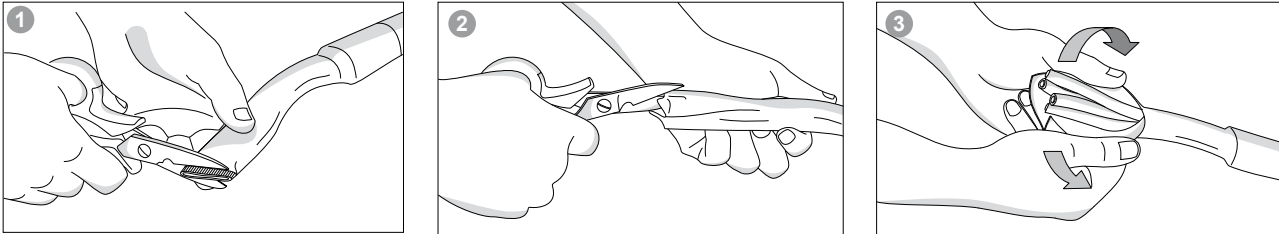
2.2 Protection of electric cables

The ends of the electric cables are protected against liquids or damp by heat-shrink sheathing.
This protection is not watertight and is only able to protect the cable from splashes of water or similar hazards (IP44).
Therefore, never submerge the ends of the cables in any liquid, even with the protections in place, and do not remove the sheathing until immediately before the electrical connection is made.

If there is a flooding risk in the storage location, take care to position the ends of the cables at a height above the maximum possible flooding level.
To remove the heat-shrink sheathing, proceed as follows:

1. cut off the end of the heat-shrink sheathing with a cross-cut;
2. make a cut along the length of the sheathing, taking care not to damage the wires inside;
3. open the edges of the sheathing to reveal the wires and pull the sheathing off the cable.

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2.3 Handling and lifting

The mixer must be lifted and handled using a chain or sling secured to the handle on top, with suitable machinery (crane, hoist, etc.). Before lifting, make a note of the weight of the product stated on the dataplate and use certified slings, chains and hooks of suitable load capacity. Ensure that the mixer is firmly secured and cannot fall, rotate or swing. The handle on top is designed to ensure that the mixer will be balanced during lifting; however, it may swing when lifted off the ground. Do not stand close to the mixer during handling. Always wear personal protective equipment.

WARNING! NEVER handle the product by means of the power supply or signalling cables.

2.4 Storage

The unit is assembled and packed in the factory, ready for shipment.

- If the unit is to be stored unused for lengthy periods after delivery, it must be kept indoors in a dry, dust-free place, in a well ventilated area to prevent condensation.
- Take care to prevent corrosion and do not allow the unit to dry out, since if no lubrication is left between the bearings and the mechanical seal slip surfaces these components may be damaged during operation.
- The propeller must be turned through 5 revolutions by hand at least twice a month, to prevent potential damage to the bearings and seals if it is left immobile.

If the unit is stored in its original packaging, the pack will have to be opened to perform these rotations.
If the unit is stored without the propeller, turn the shaft as instructed above.

2.4.1 Storage after installation in the tank

If the unit is not used immediately after installation, it is important to keep it submerged.

If stored in an empty tank, the unit must be covered appropriately to prevent damage due to sunlight and frost and the propeller must be turned through 5 revolutions once or twice a month depending on the ambient temperature.

If the unit is stored submerged, the propeller must still be turned as instructed above.

After use:

If the unit is not used continually, the propeller must be turned as described in the previous point by starting and stopping the unit once or twice a month.

In large plants this function can be integrated in the control system to render it automatic.

Spare components must be stored indoors, in the original pack, in a dry, dust-free place and in a non-aggressive environment.

2.5 Disposal

When the product is scrapped, it must be disposed of in accordance with the relevant local laws and regulations.

When scrapping it, drain any oil from the inside and consign it to a specialised disposal centre.

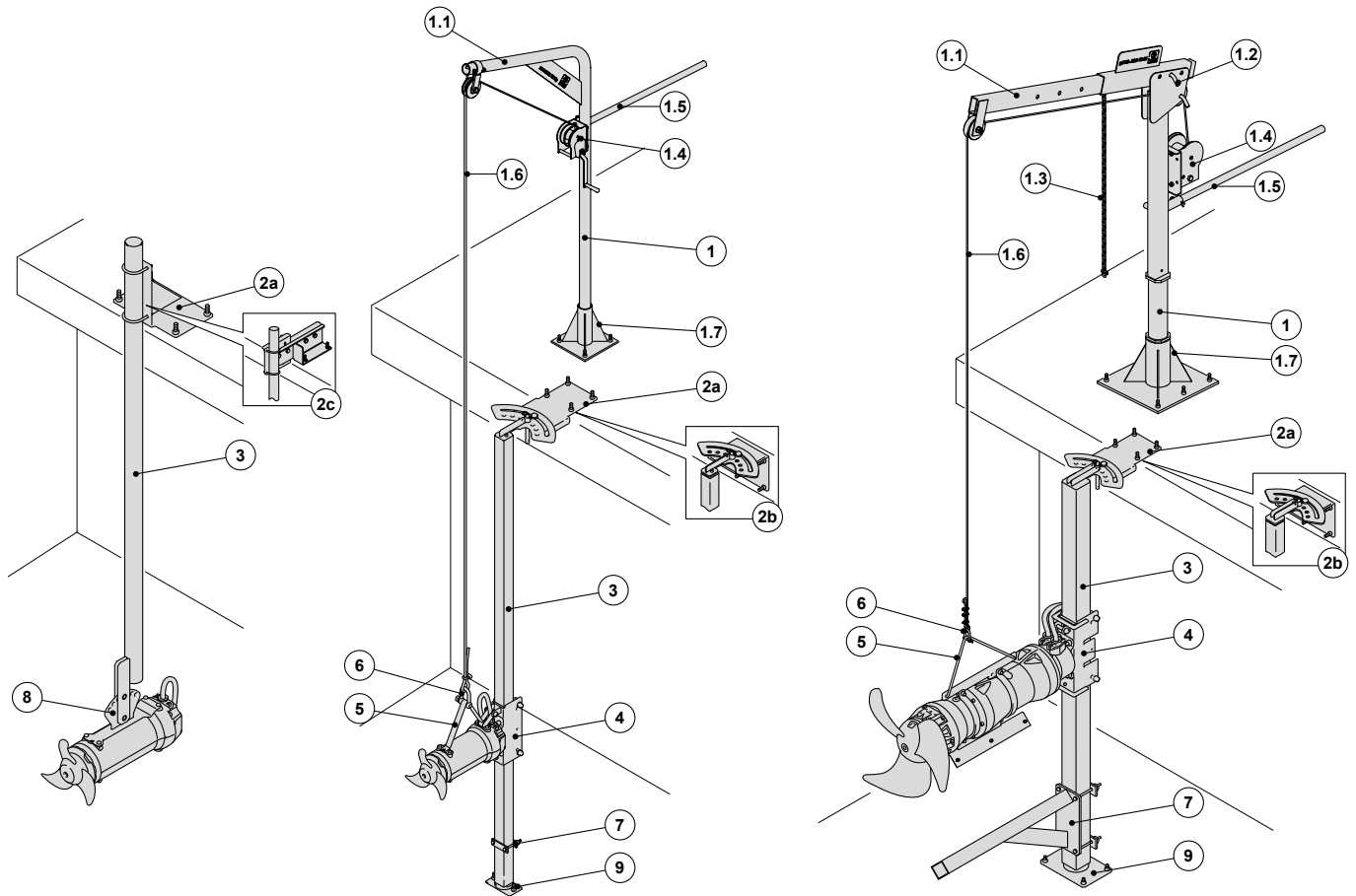
Separate the plastic and rubber parts and consign them to a specialised disposal centre.

Scrap the metal parts.

Never dump any component in the environment.

3. INSTALLATION DIAGRAM AND ESSENTIAL TERMINOLOGY

EN



1- Crane

1.1 - Crane arm

1.2 - Fixing pivot of the crane arm

1.3 - Service chain with hook

1.4 - Winch

1.5 - Rotation lever

1.6 - Lifting cable

1.7 - Crane basement

2a - Mast holder (for mounting on bridge)

2b - Mast holder (for mounting on wall)

2c - Inclinal mast holder (for mounting on bridge)

3 - Mast

4 - Motor bracket

5 - Trap clamp

6 - Shackle / Hook

7 - Stop / Support fitting

8 - Fan bracket

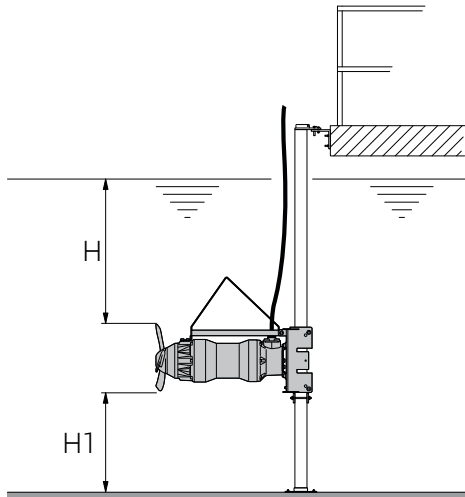
9 - Bottom guide for mast

4. POSITIONING AND INSTALLATION



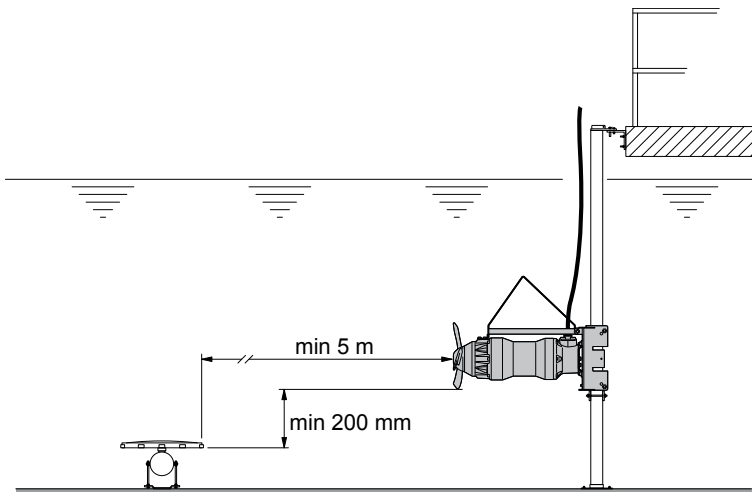
4.1 General concepts

- Read the safety procedures detailed in point 1.3 carefully before installation, and always apply them.
- Installation of the mixer and connection to the electrical mains must only be carried out by a skilled technician.
- Always check that the motor is not connected to the electrical mains before doing any work on it.
- The mixer propeller cannot be covered or protected since this would obstruct its operation.
- The ends of the cables are protected against liquids during construction. These protective sheathings must not be removed until just before the electrical connection to the mixer is made. Remember that even if it is fitted with protective sheathings, the end of the cable must not be submerged in water.



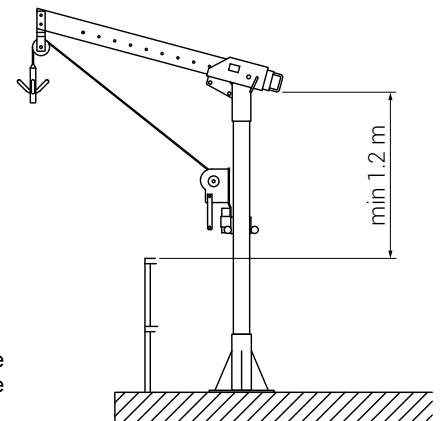
The water level must be sufficiently high above the propeller to prevent the formation of whirlpools, which cause turbulence and may lead to cavitation.

When positioning the unit, comply with the height above the bottom of the tank and minimum water level above the propeller stated in the specific technical information.



In tanks with aeration, an unaerated area of at least 5 m must be provided on the bottom at each side of the unit.

The unaerated area will ensure that the unit is able to operate correctly.



N.B.: To allow the unit to be passed over the parapet, there must be a clearance of 1.2 m between the top edges of the parapet and the crane lifting point.

5. INSTALLATION

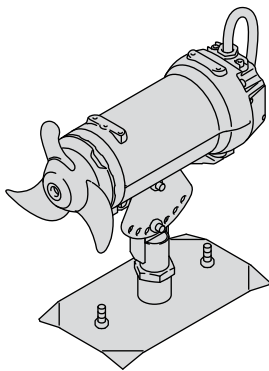
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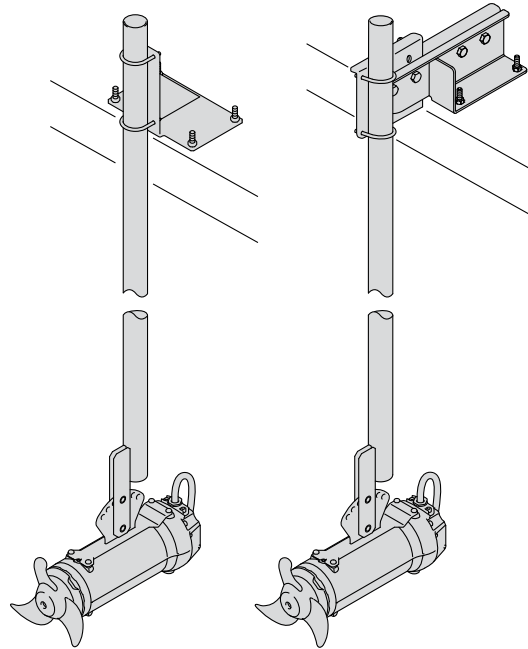
Always check the above before starting the unit. The rotation direction is clockwise viewed from the mast.



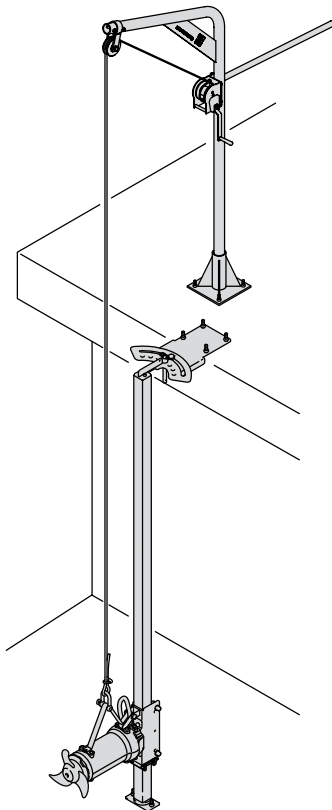
Once the unit has been installed in a closed tank, the tank access point must be closed so that people cannot fall in. Never leave the tank access point uncovered or unprotected.



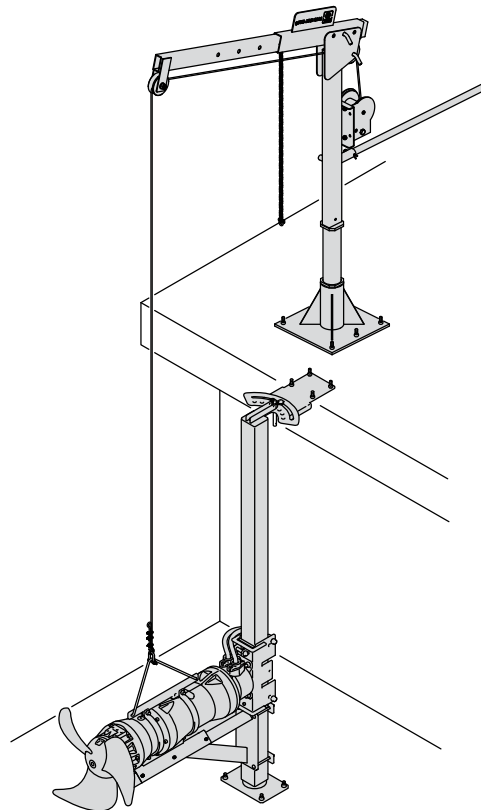
BOTTOM INSTALLATION



PENDULAR INSTALLATION

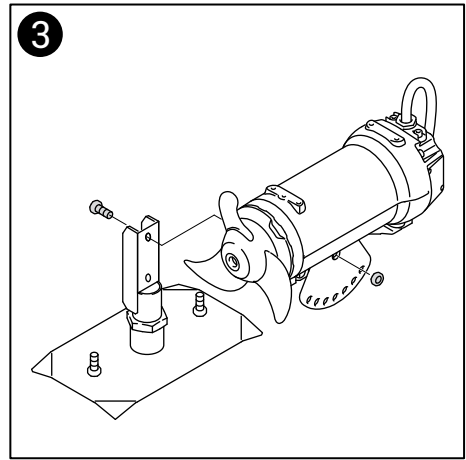
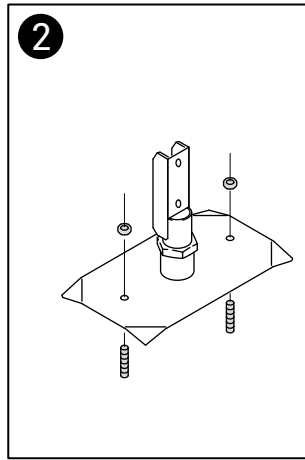
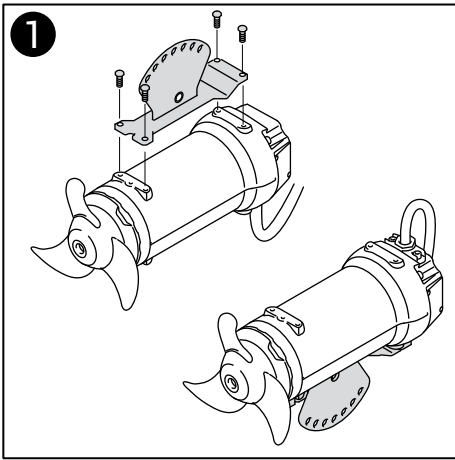


MAST 60x60 INSTALLATION

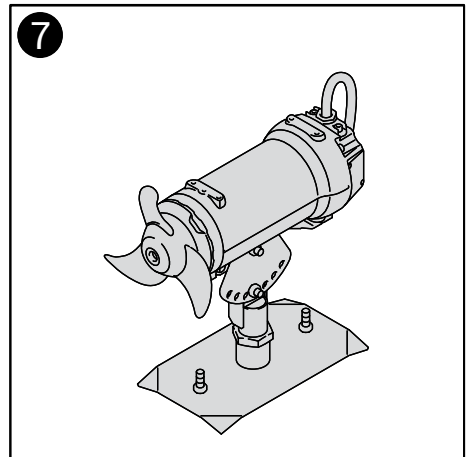
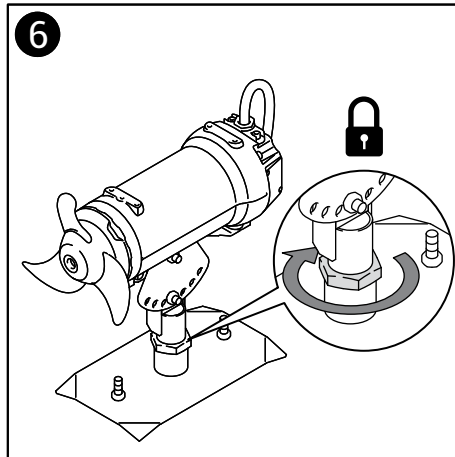
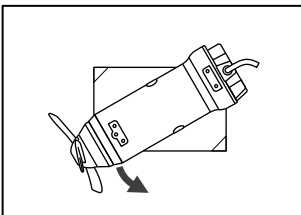
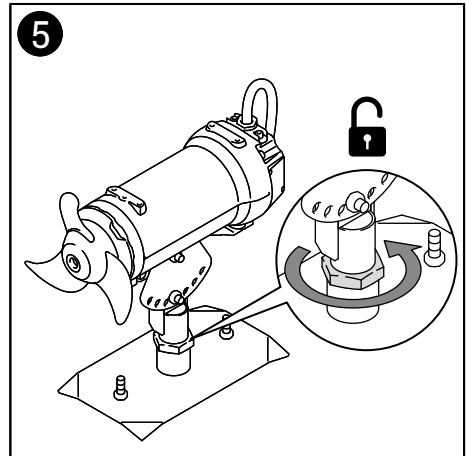
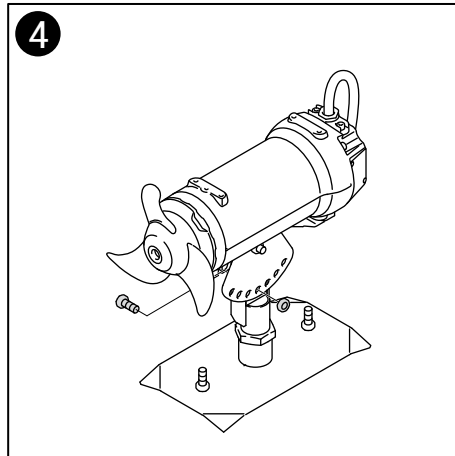
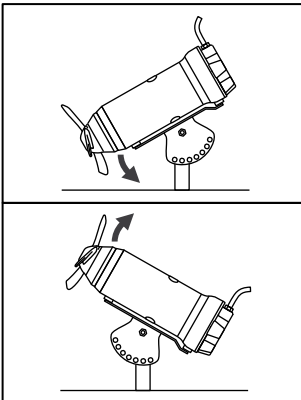


MAST 100x100 INSTALLATION

5.1 BOTTOM INSTALLATION

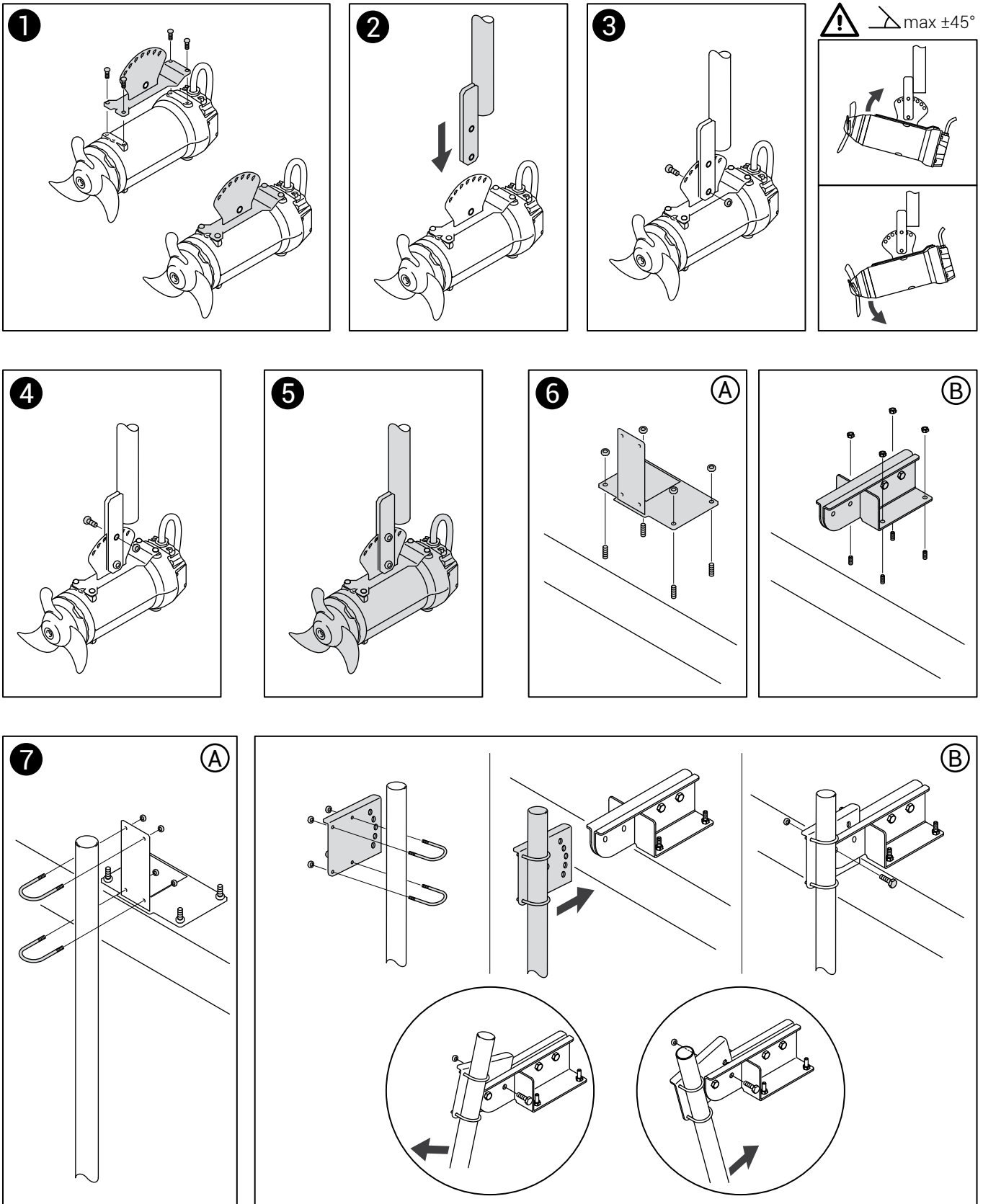


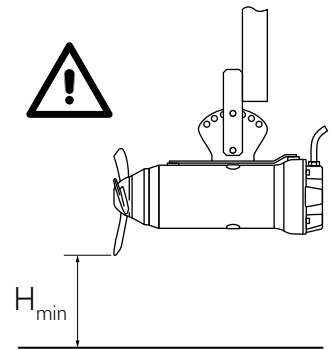
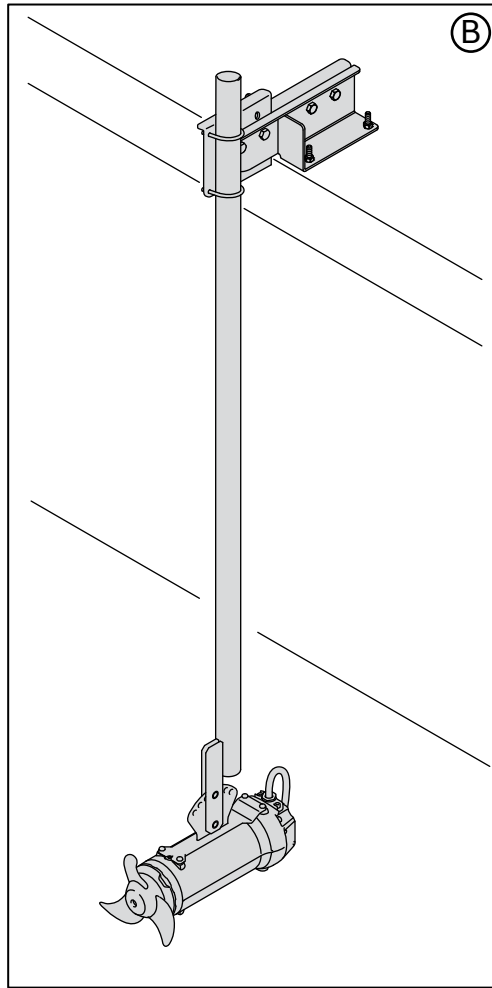
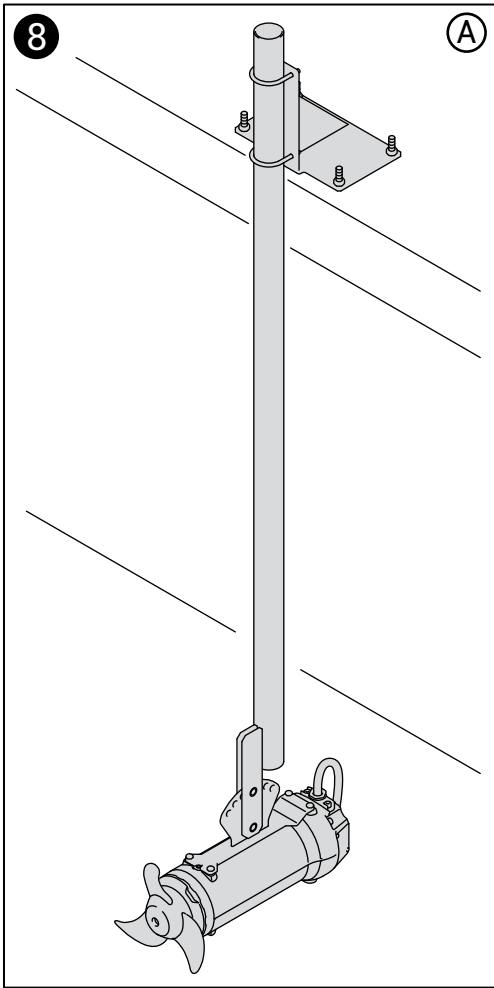
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5.2 PENDULAR INSTALLATION

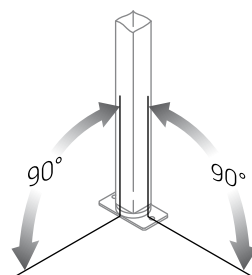
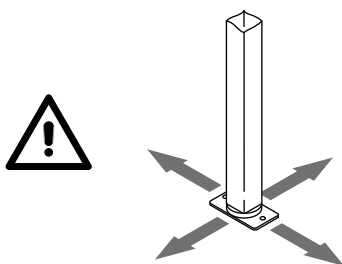
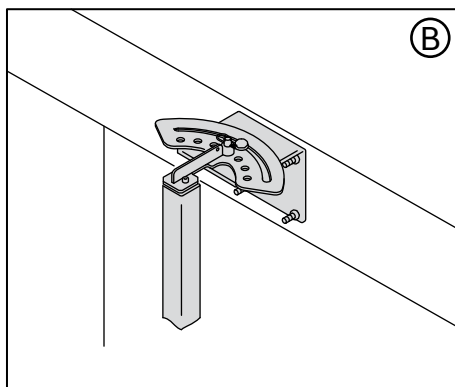
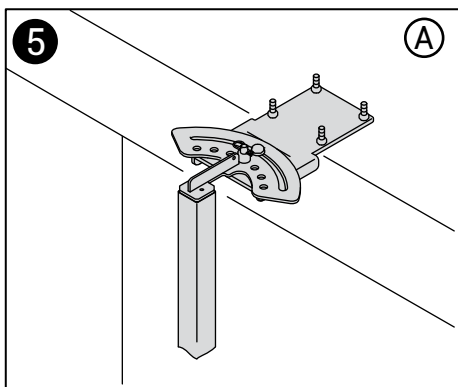
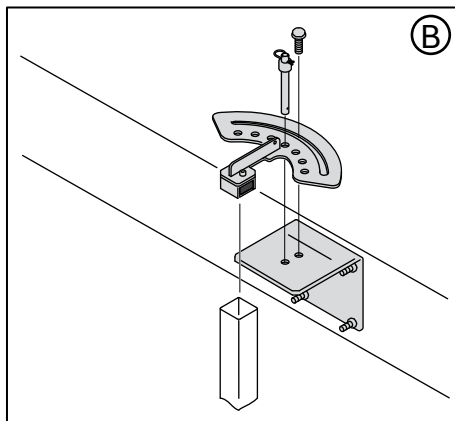
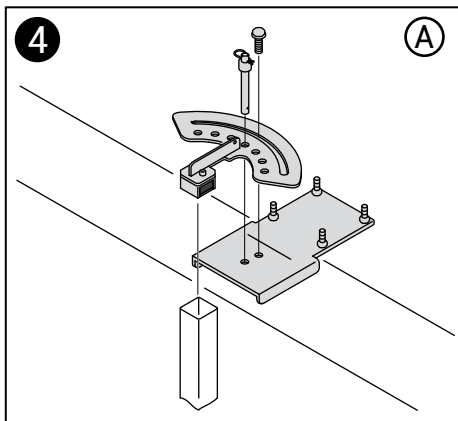
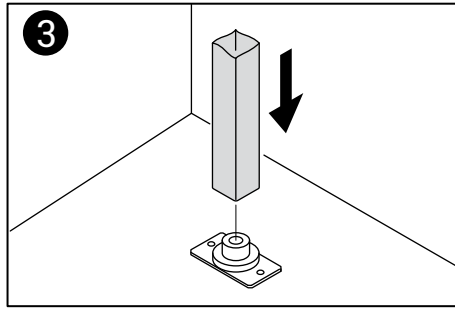
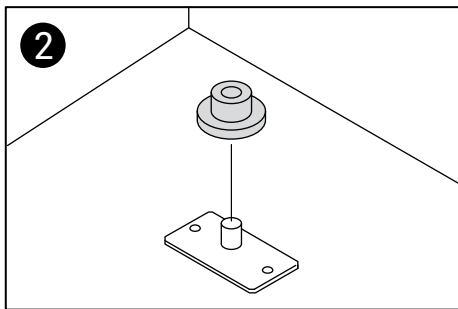
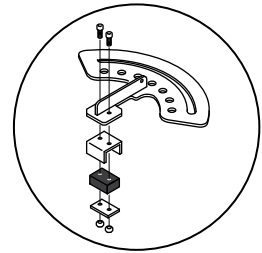
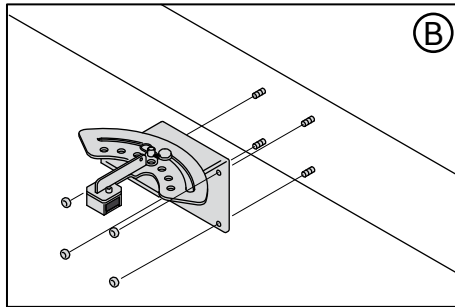
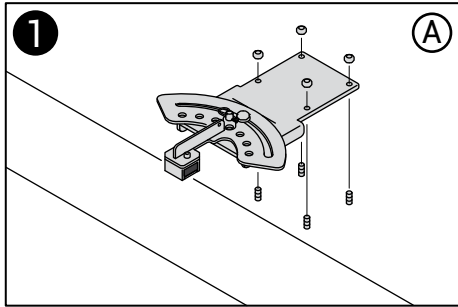
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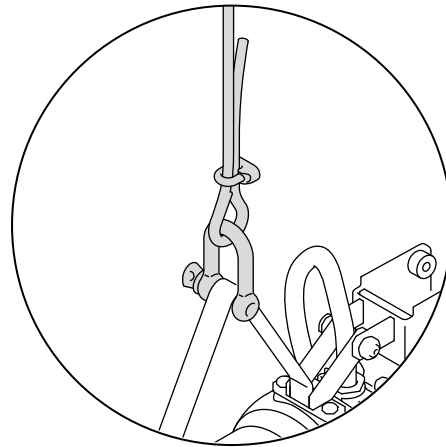
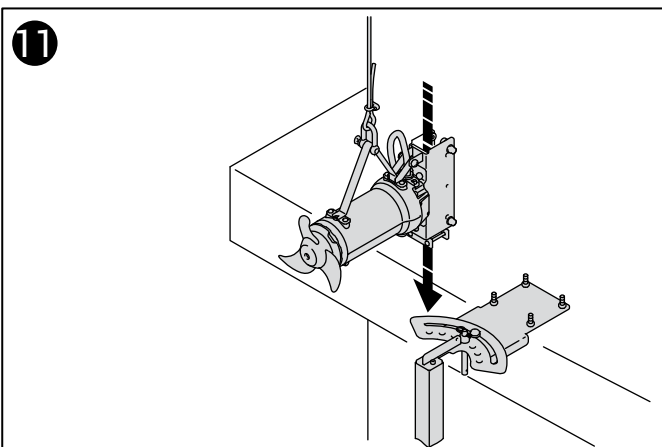
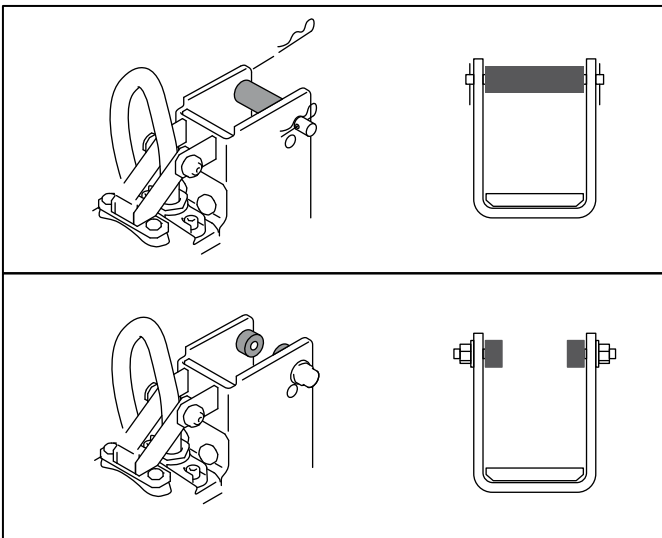
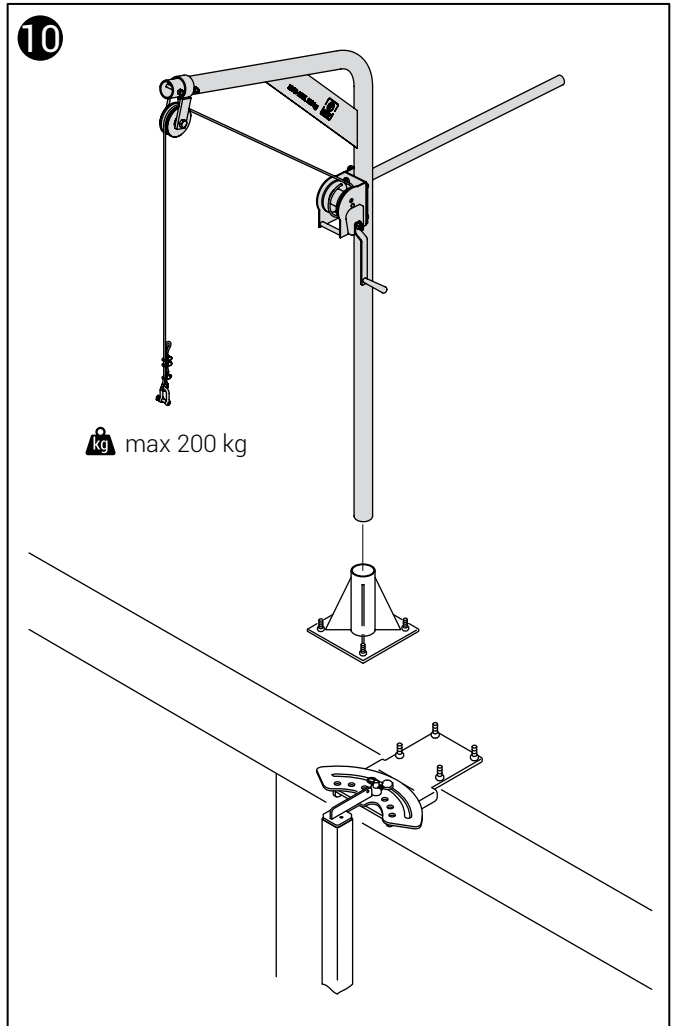
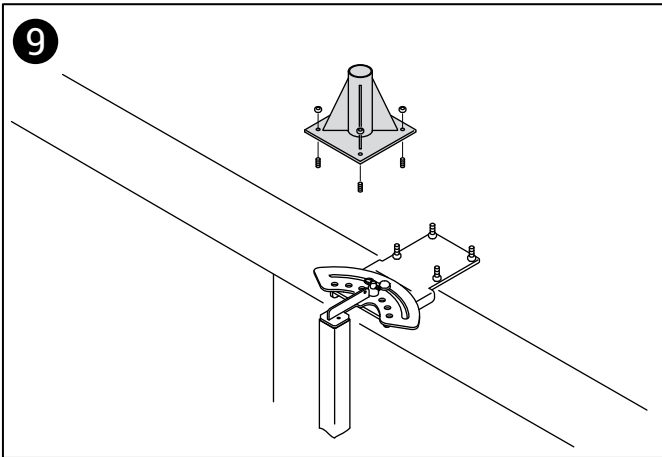
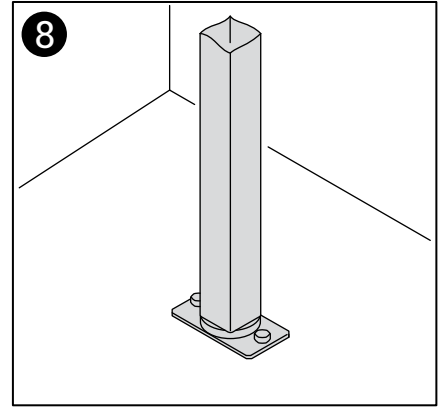
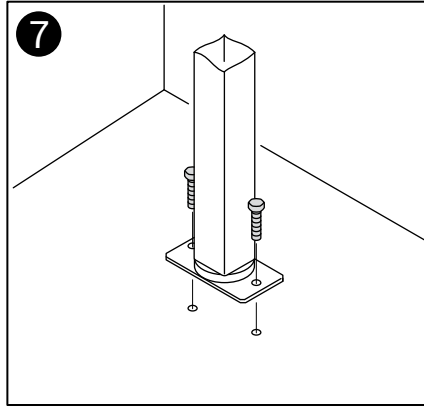
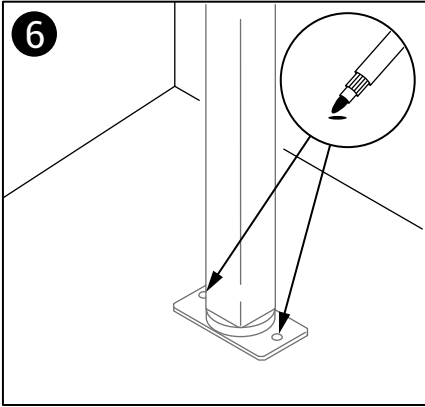


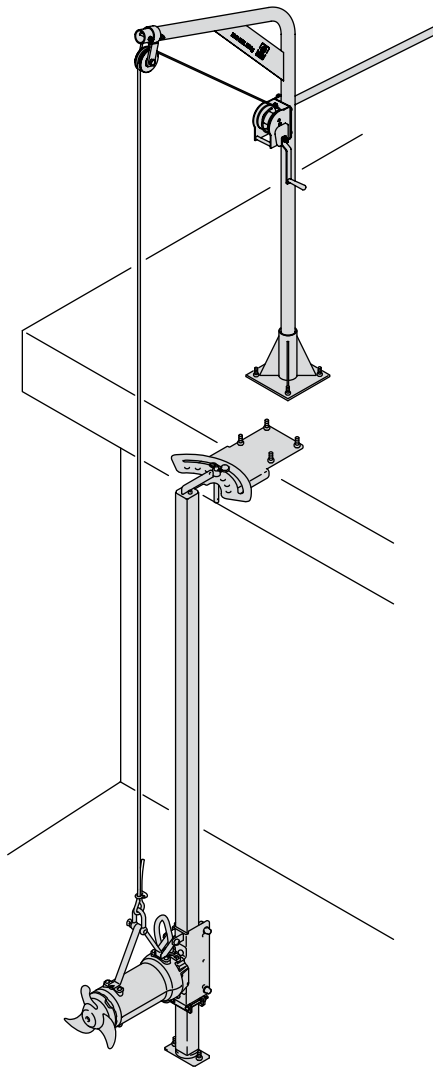
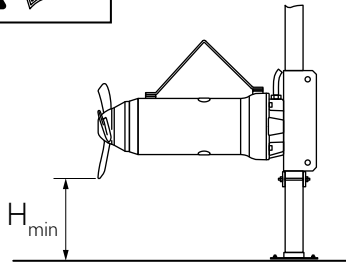
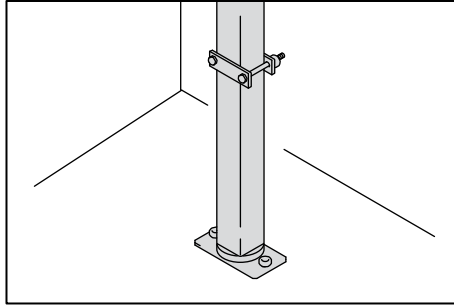
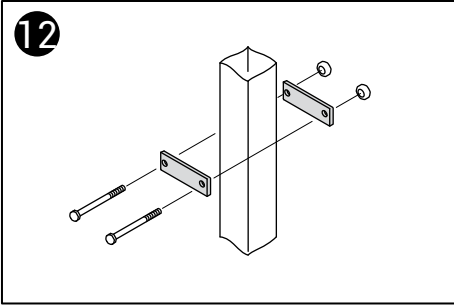


5.3 MAST 60x60 INSTALLATION

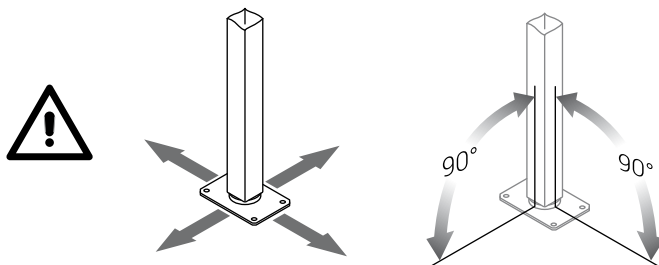
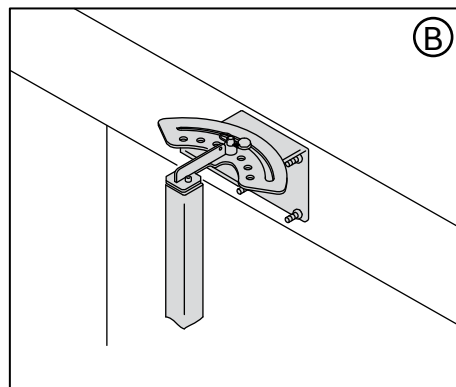
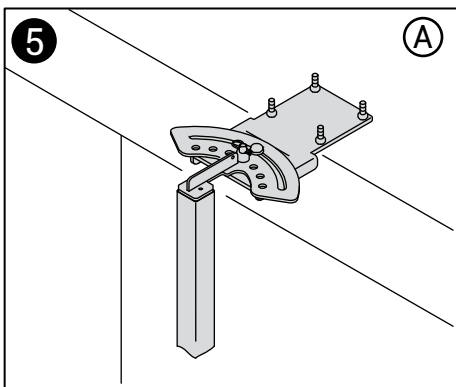
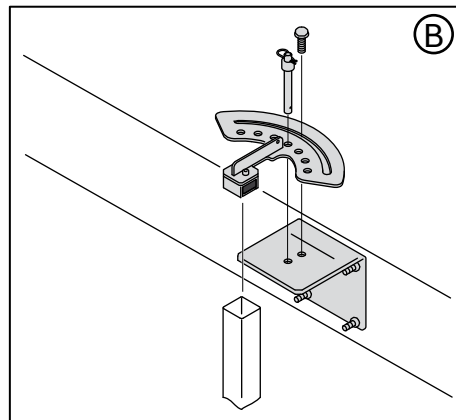
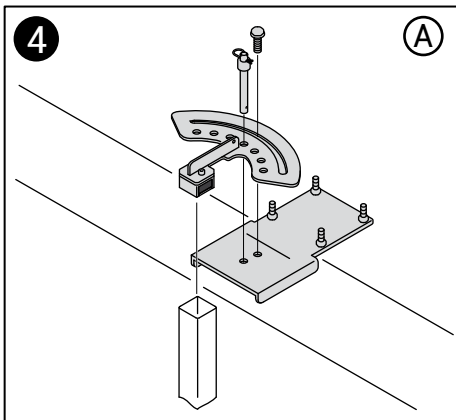
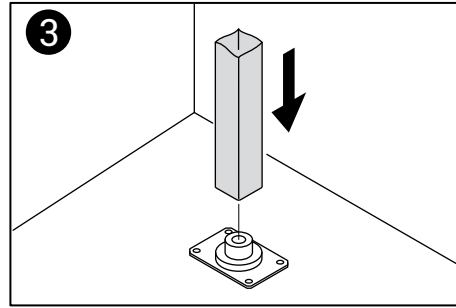
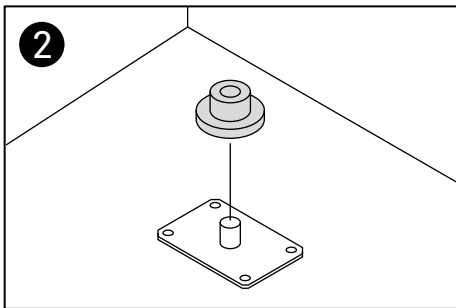
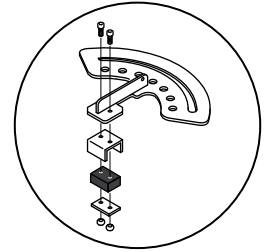
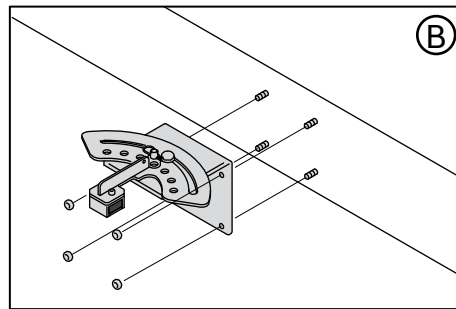
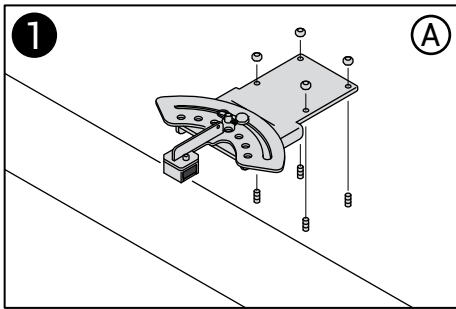
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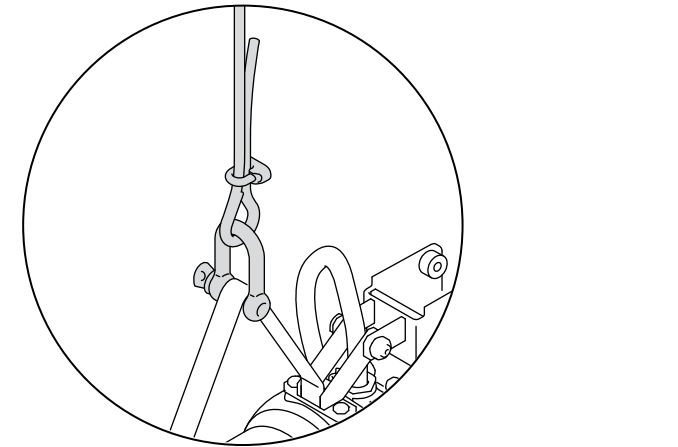
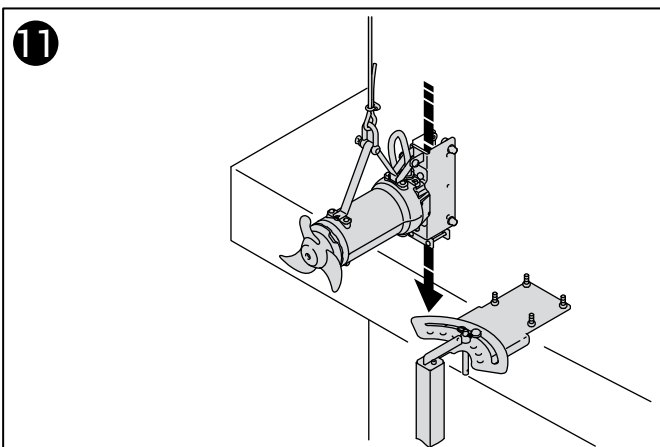
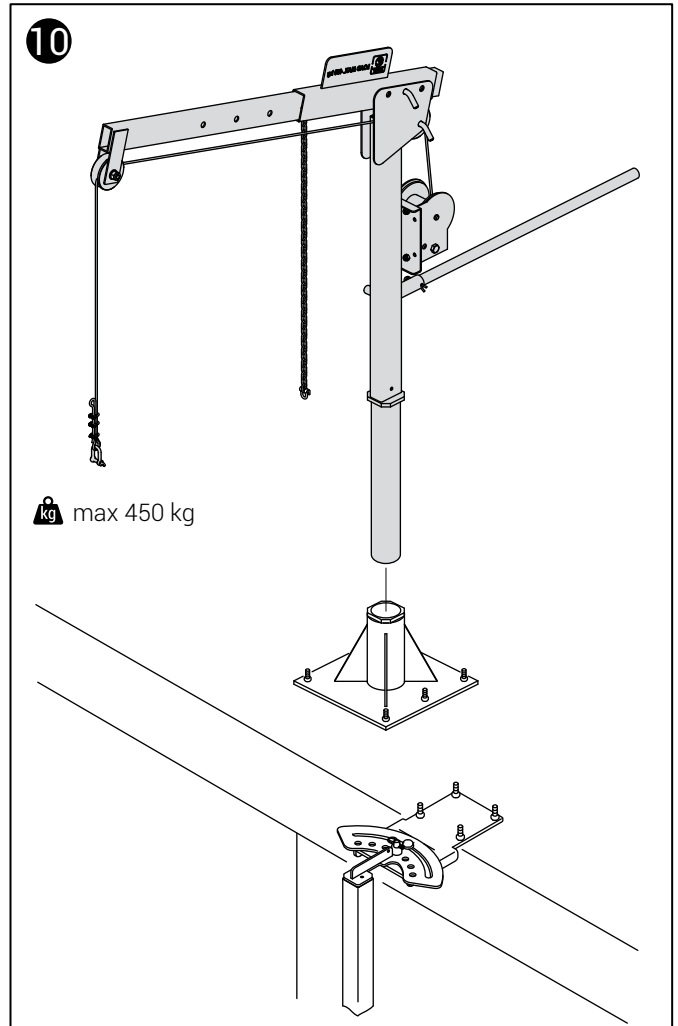
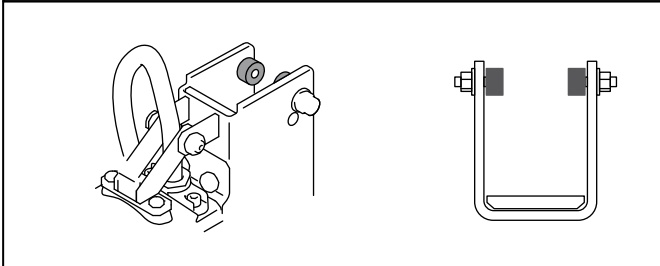
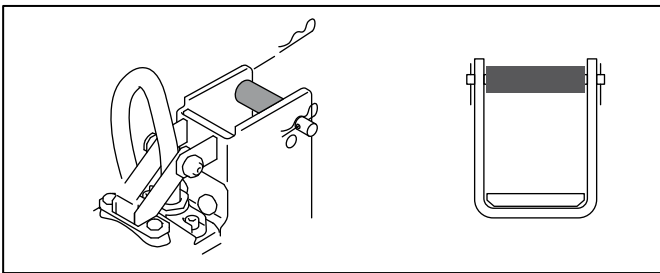
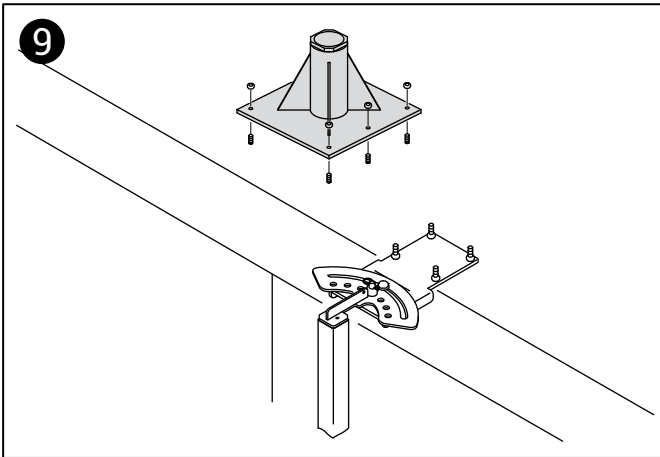
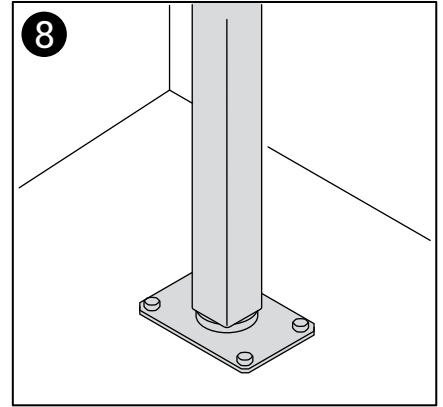
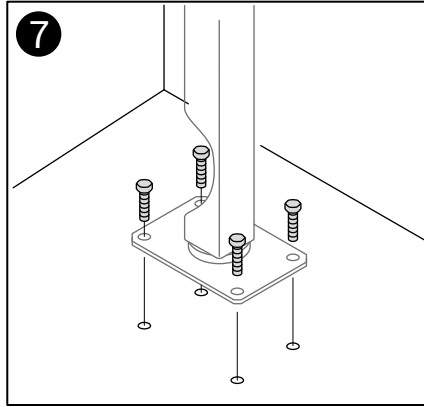
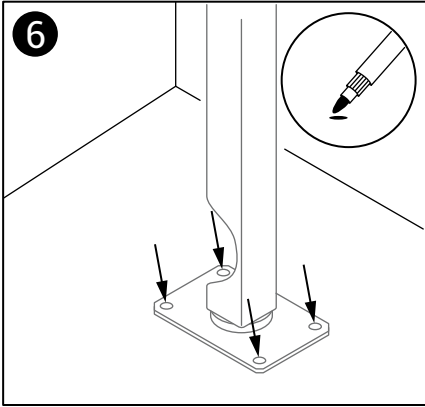




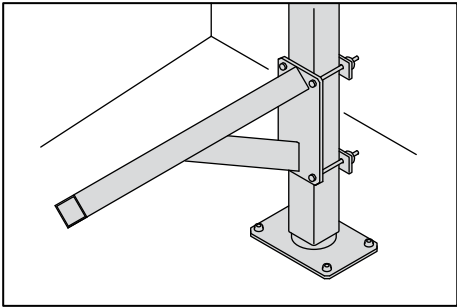
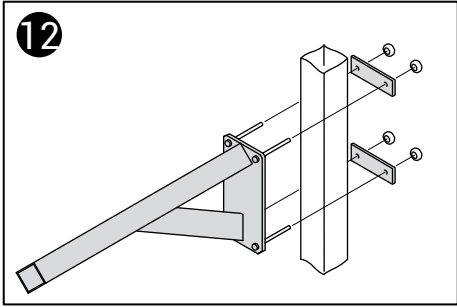


5.4 MAST 100x100 INSTALLATION

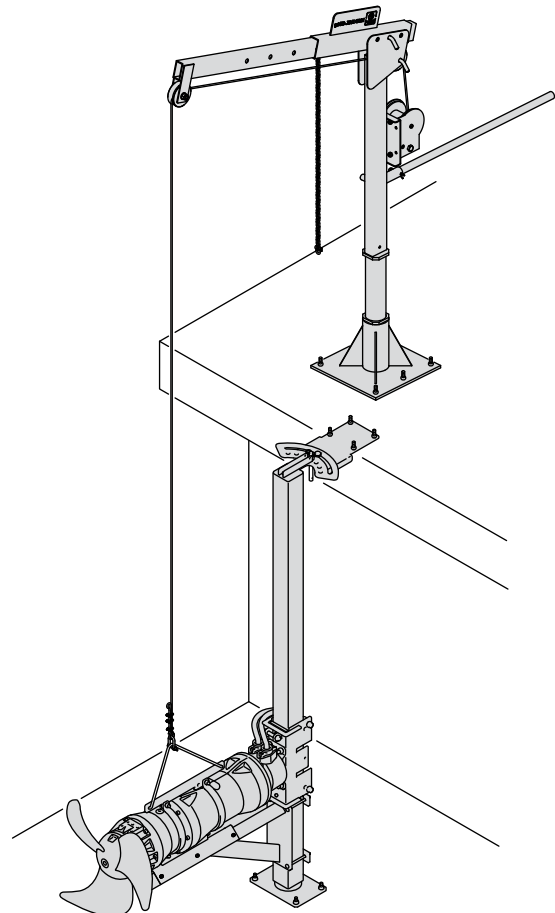
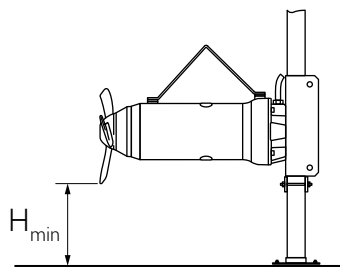
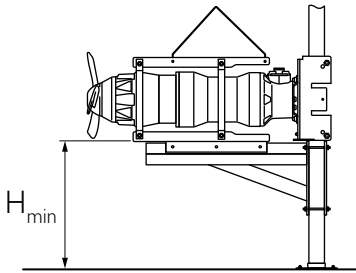
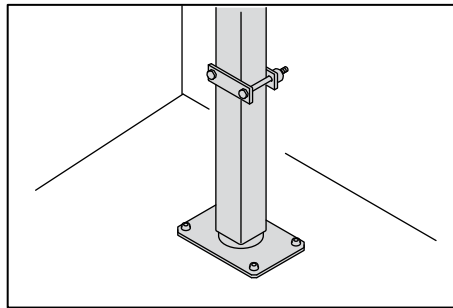
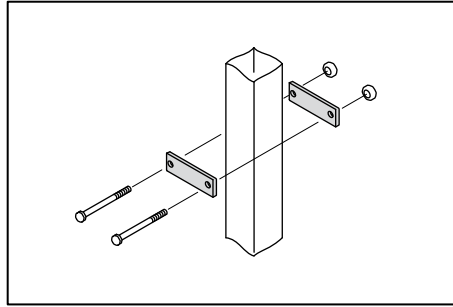




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6. ELECTRICAL CONNECTIONS



6.1 General safety precautions

- All the procedures involved in connecting the unit to the electrical mains must be carried out by a skilled electrician in accordance with the relevant regulations.
- Incorrect electrical connections may cause fires and an electrocution hazard, or the risk of damage to the product.
- Before putting the unit into service, make sure that electrical protection measures have been adopted (e.g. ground connection, residual current devices, etc.) in accordance with all relevant local and/or national regulations, laws and standards and that the skilled electrician has certified that the system is operating correctly.
- Before carrying out any operation, make sure that the mixer and electrical panel are disconnected from the electrical mains and cannot be accidentally powered up.
- Before installation, make sure that the power supply line voltage and frequency are as stated on the dataplate and that the supply line is suitably rated in terms of both capacity and voltage drops.
- The fuses and circuit breakers must be of suitable rating for the system's characteristics.
- The rating of fuses and cables must comply with local laws and regulations.
- The mixer must be protected to an overload protection device (motor protection switch) calibrated for the rated current stated on the dataplate.
- If a VFD (Variable Frequency Drive) is used, the cable must comply with the relevant local regulations.
- Make sure that the mixer's thermal protection devices are always correctly connected to the power supply panel: apart from leading to forfeiture of warranty cover, failure to connect them may constitute a hazard.
- All unused conductors must be electrically insulated.
- Electrical operation and safety are guaranteed for the configuration supplied by the manufacturer: any changes (e.g. addition of extra lengths of cable to the original power lead) may cause a deterioration in the mixer's characteristics.

WARNING! Do not install the starting device in an explosive area unless it is certified as explosion-proof.

6.2 Checking the power voltage

- Check that the unused conductors are properly insulated and secured inside the electrical panel.

The motor's operating voltage must be as stated on the dataplate.

If the voltage is too low, electricity consumption and thus running costs will be higher.

- The maximum permitted variation on the rated dataplate voltage is:
 - ±10% for intermittent duty S3;
 - ± 5% for continual duty S1.
- Permitted voltage imbalance between phases: max 2%. This must be checked with the unit in operation. For example a 3.5% difference in the phase voltage may increase the motor's temperature by as much as 25%.
In the event of variations in voltage in excess of the above limits, the motor's lifetime is shortened considerably.

6.3 Cables

- Make sure that the electrical cables are not damaged in any way and the free ends have not been exposed to damp and/or immersed in water.
- The cable's free ends must be connected to a regulation control panel with a degree of insulation suitable for the installation environment.
- Secure the electric cables so that they cannot be twisted, torn and/or crushed.
- All damaged cables must be replaced. Contact Zenit or an Authorised Service Centre

6.4 Ground connection

- All electrical equipment must be connected to ground. Check that the ground wire is correctly connected. Check regularly that the ground system and residual current device are in good working order.
- Check that the ground conductor is about 150 mm longer than the other conductors so that it will be the last to become disconnected from the panel in the event of accidental tugs.

6.5 Motor thermal protection (standard version)

In the standard version, the motor is protected against overheating by three series-connected bimetal thermal switches incorporated in the stator winding, one for each phase.

Apart from leading to forfeiture of warranty cover, failure to connect the thermal protection may cause a hazard.

When the maximum winding temperature is reached, the switch breaks the circuit and stops the motor.

Once the windings have returned to the normal temperature, the switch resets automatically, closing the circuit and allowing the unit to restart.

The electrical panel must be designed so that the mixer cannot restart automatically; it must only be restarted by the user, after the causes of the problem have been removed.

The thermal protection cables are marked with a label stating "**PROTEZIONE TERMICA - THERMAL PROTECTION**" and must be connected to the corresponding terminals of the control panel.

Technical characteristics

Rated voltage: 250 V

Max. switching current: 2.5 A at $\cos \varphi = 1$

Rated disconnection temperature: 150 °C

6.6 Water sensor (standard version)

The mixer is equipped as standard with a single-signal dual probe, to detect the presence of water or humidity in the oil chamber of the mechanical seal and in the motor.

The sensor is of single electrode type and uses the ground conductor to close the circuit.

In order to allow seepage water monitoring, the electrical panel must contain a relay activated when the electrical resistance of the water/oil mixture falls below 30 kΩ.

When the relay is activated, it must shut down the mixer immediately and turn on a warning light.

Contact an Authorised Service Centre to have the unit checked.

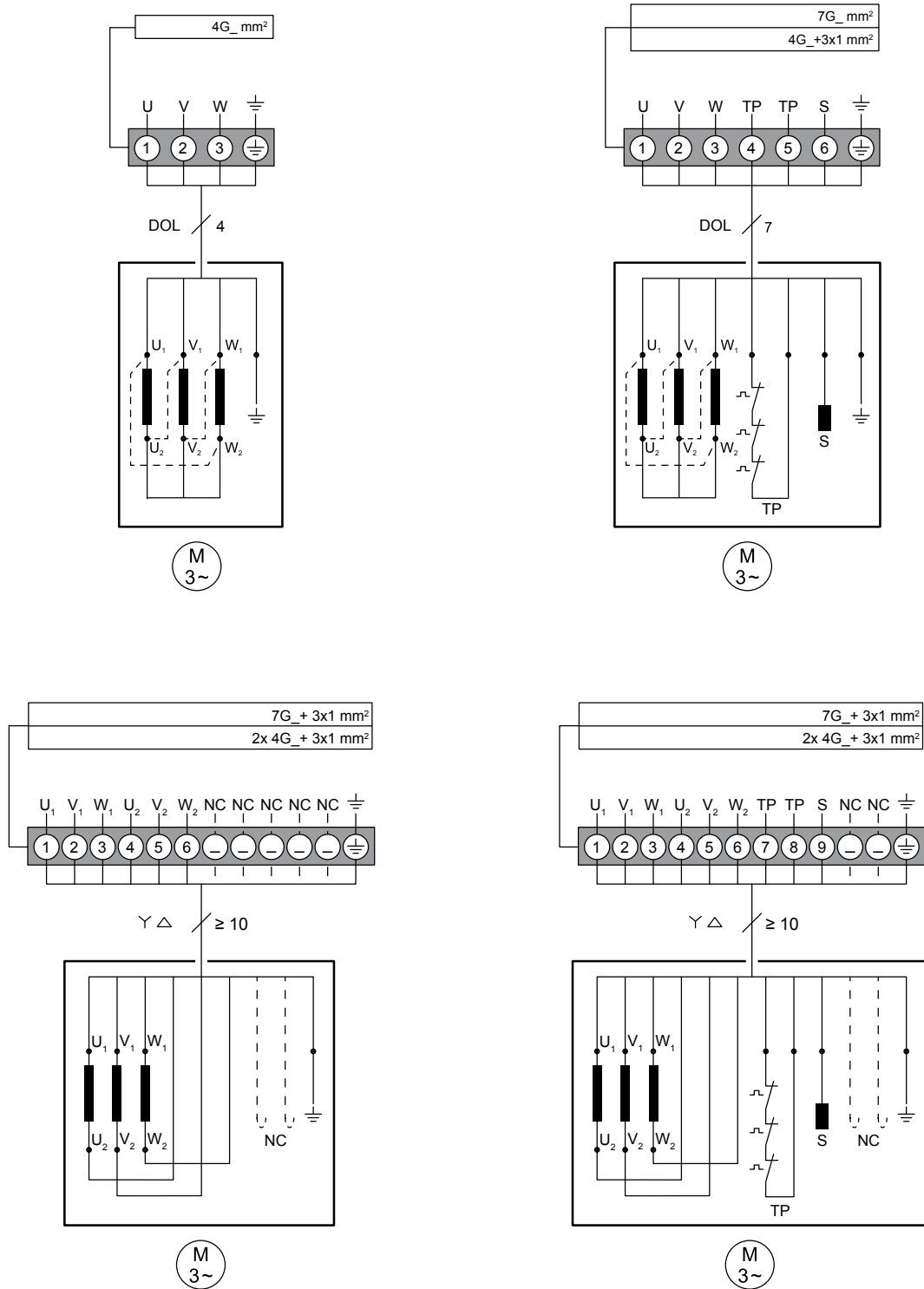
The conductor is marked with a label with the letter "**S**" and must be connected to the corresponding terminal of the relay.

6.7 Electrical connections (standard version)

To make the electrical connection to the mixer, proceed as follows:

1. Check the type of electrical connection required on the dataplate (direct starting or Y/D);
2. Remove the protective heat-shrink sheathing as described in point 2.2;
3. First connect the power ground conductor to the relative control panel terminal in accordance with the wiring diagram;
4. Connect the power supply conductors to the relative control panel terminals in accordance with the wiring diagram;
5. Connect the control device conductors to the terminals of the relative panel.

N.B.: COMPLY CAREFULLY WITH THE CONNECTIONS SHOWN IN THE ELECTRICAL PANEL DIAGRAM



6.8 Non-standard sensors and protective devices

Please refer to the specific documentation supplied with the unit.

7. START-UP



7.1 General safety precautions

Mixers are unable to operate unless they are completely submerged.
The liquid must flow silently.

The mixer must not vibrate excessively. Insufficient immersion may trigger air turbulence, leading to harmful vibrations.

5.2 Rotation direction (Fig. 10)

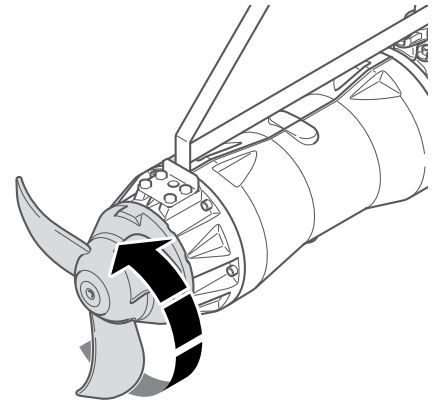
The propeller must turn to the right (clockwise) when viewed from the motor side.
The liquid must be pushed towards the front of the unit.

To check that the rotation direction is correct proceed as follows:

1. Temporarily connect the yellow-green wire to the system ground connector and then connect the power supply wires to the electrical panel.
2. Make sure there are no people or objects within a distance of at least 2 metres of the mixer.
3. Operate the start switch, power up the mixer for a few seconds and then shut off the power by flicking the stop switch.
4. Check that the rotation direction is correct.

If the mixer is rotating in the wrong direction, invert two of the mixer's three power supply phases and try again, repeating the procedure described.

Once the connection which provides the correct rotation direction has been obtained, MARK the precise order in which the wires have been connected to the system, DISCONNECT the power supply wires from the mixer and proceed with definitive installation.



5.3 Starting the unit

Once installation is complete, the system should be tested to ensure that it is fully operational. Use an ammeter to check that the power absorption is within the limit stated on the dataplate. Check that the voltage is correct.

WARNING!

The maximum permitted number of starts per hour is stated in the technical information and must be complied with to prevent damage to the motor.

8. MAINTENANCE

8.1 General concepts

Maintenance intervals depend on the type of installation, the workload to which the unit is subjected and the type of liquid in which it is immersed. During planned maintenance or in any circumstances when the mixer's performance deteriorates or its vibrations and noise level increase, the parts subject to wear and tear must be inspected; have this done by an Authorised Service Centre.

Do not use the mixer if malfunctioning because sudden failure of the rotating parts may cause hazardous situations or damage to the motor.



8.2 General safety precautions

- Before cleaning and/or maintenance procedures, a skilled technician must disconnect the mixer from the power supply and ensure that it cannot start up accidentally.
- Always disconnect the phase wires first and then the yellow-green ground wire.
- Ensure that the mixer cannot fall or roll, causing injury or damage.
- Wash the surface of the mixer thoroughly with clean water and/or specific detergent before doing any work on it.
- After prolonged use, the surface of the mixer may become very hot: allow it to cool sufficiently to avoid burns.
- Always comply with the safety regulations in force in the place of installation, any local regulations and the dictates of common sense.

8.3 Cleaning

If the unit is to be removed from the tank for a long period of time, it should be sluiced down to prevent corrosion and ensure that residues cannot set on its surface, preventing it from cooling normally when returned to service.

8.4 Inspecting the electric cable

Check that the electric cable is intact with no signs of pulling, cuts or other signs of misuse. A faulty cable may enable liquids to enter the unit. Check that the cable gland is intact. Faulty parts must be replaced immediately.

8.5 Inspecting the lifting equipment

Check the winches, hooks and chains for signs of failure or wear at least every six months. Clean or lubricate them if necessary and replace any damaged components.

8.6 Bearings

All bearings are of rolling type, with balls and rollers depending on the size of the electromechanical assembly, all designed for a working lifetime of 100,000 hours in normal working conditions.

8.7 Mechanical seals

The estimated safe operating lifetime of the mechanical seals is 20000 hours of duty in normal conditions and 7000 hours in abnormal conditions (with heavily soiled liquids), after which they must be replaced.

8.8 Oil

If the unit is supplied with leakage control system, the oil must be changed every 36 months.

If does not not have a leakage control system, the oil must be checked every 12 months and changed if necessary.
 If the oil contains too much water (oil is white with a lot of water on the bottom) or if the oil level has fallen by more than 20%, check the mechanical seal and replace it if necessary.
 Repairs must always be carried out by Zenit or an Authorised Service Centre.

8.9 Changing the oil

1. Ensure that the mixer is disconnected from the electrical mains and cannot start accidentally.
2. Secure the mixer to a flat, surface strong enough to support its weight. Wear regulation personal protective equipment;
3. Unscrew the oil cap (A);

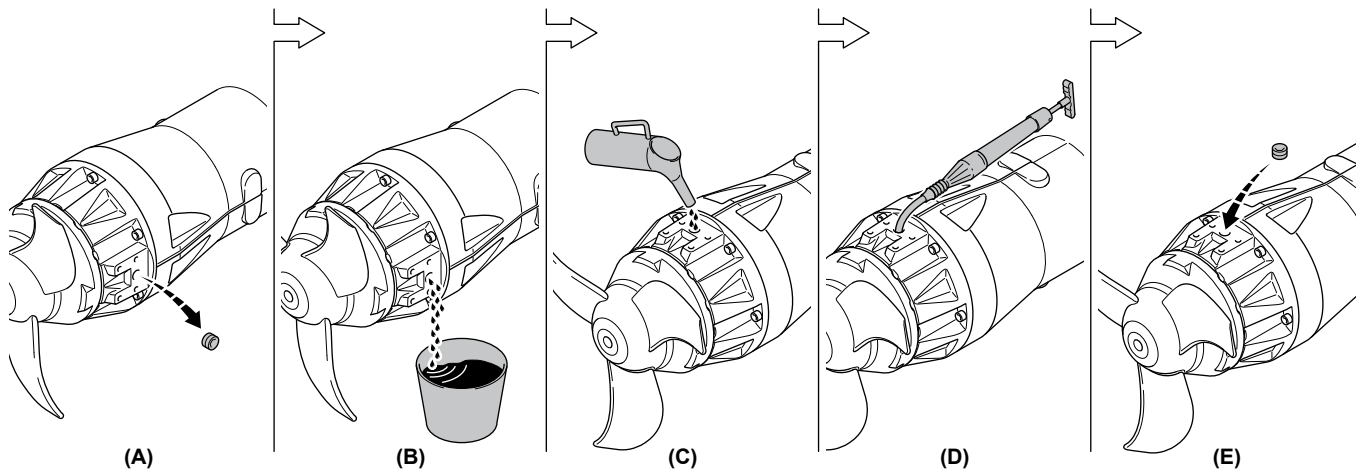
WARNING! Possible excess pressure in the oil chamber: take care when unscrewing the cap

4. Drain the oil into a suitable vessel (B). Do not dump oil in the environment, but consign it to a specialist disposal centre;
5. Using a graduated container, completely fill the chamber (C) with oil;
6. Use an oil vacuum extractor to remove 14% of the volume of oil poured in, to ensure that the correct amount of air is left inside the chamber (D).
7. Screw the cap back on to close the oil chamber (E) and tighten it to the torque stated in **Table 1**.

OIL TYPE:

Mechanical seal chamber: CASTROL PRODUCT L 320 or equivalent.

Reduction gear compartment (if installed): Texaco PINNACLE EP 220 OIL or equivalent.



8.10 Planned maintenance

Frequency	Every 12 months	Every 36 months
Oil change/Oil check	Unit without active leakage control system: Remove the oil drain plug. Check the oil level and quality. (The oil must not be white) Also remove the motor oil drain plug to eliminate any traces of oil or condensate. The cap tightening torques are provided in Table 1.	Unit with active leakage control system: Change the oil. Drain the oil from the drain plug. Remove the filler cap to drain out all the oil. The cap tightening torques are provided in Table 1.
Cable, hoist and winch	Clean, lubricate and inspect for any damage.	
Electrical cable and regular inspection	Inspect for any signs of wear and failure. Tighten screws and nuts.	
Mechanical seal		Inspect/replace the mechanical seal. If it is in good condition, check it again annually until replacement is necessary.
Bearings		Inspect/replace the bearings. If they are in good condition, check them again annually until replacement is necessary.

8.11 Changing the propeller

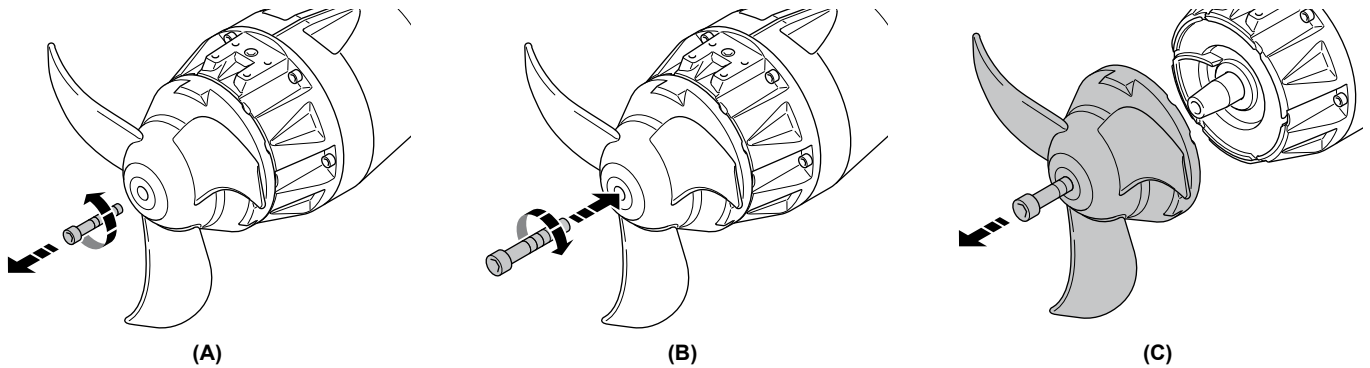


A damaged or worn propeller must be replaced immediately.

A damaged propeller is unbalanced and may damage the unit and the bearings, making repair work necessary.

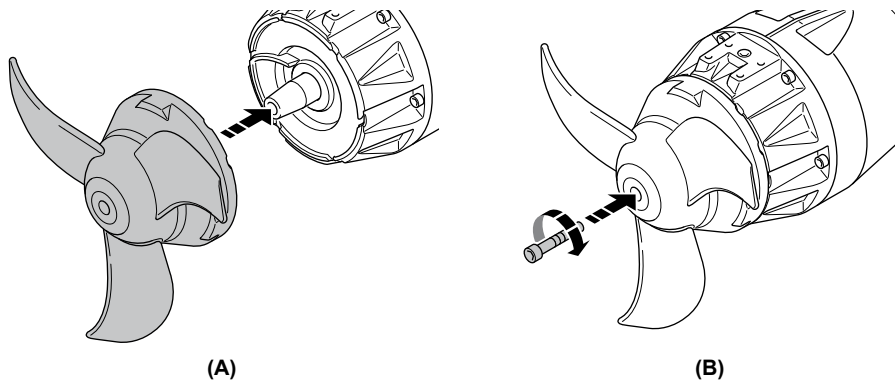
8.11.1 How to remove the propeller:

1. Ensure that the mixer is disconnected from the electrical mains and cannot start accidentally.
2. Secure the mixer to a flat, surface strong enough to support its weight. Wear regulation personal protective equipment;
3. Unscrew the propeller fixing screw and remove it (A);
4. Fix the propeller so that it cannot turn. Screw a screw into the threaded hole in the propeller (B). This pushes the propeller outward, making it easy to disconnect it from the shaft (C).



8.11.2 Fitting the propeller:

1. Ensure that the mixer is disconnected from the electrical mains and cannot start accidentally.
2. Secure the mixer to a flat, surface strong enough to support its weight. Wear regulation personal protective equipment;
3. Connect the propeller to the tapered shaft (A);
4. Secure the propeller with the fixing screw (B).
5. Fix the propeller so that it cannot turn and fully tighten the fixing screw.



WARNING! Comply with the tightening torques.

If the torque is insufficient, the propeller may become loose.

If the torque is excessive, the screw may become misshapen, reducing the traction force it applies and allowing the propeller to become loose.

Table 1. Tightening torques

M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
2.7	5.4	9.0	22	44	76	187	364	629	1240

9. TROUBLESHOOTING GUIDE

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The unit does not start

POSSIBLE CAUSE	CHECK AND REPAIR
Electrical power blackout or electrical panel failure	Contact a skilled electrician.
Break in motor cable	Contact a skilled electrician.
Propeller is jammed	Check that the propeller is clean and can turn freely. Clean the propeller and check for unusual noises.
Motor cut out due to overheating	Check that there is nothing preventing the unit from cooling normally (surfaces unobstructed and totally submerged). Contact Zenit or an Authorised Service Centre.
Stator burnt out or damaged	Contact Zenit or an Authorised Service Centre.
Seepage detection sensor tripped	Contact Zenit or an Authorised Service Centre.
Overload protection device faulty or set too low	Contact a skilled electrician.

The unit starts but the motor switch is tripped immediately (Checks and corrective work must only be performed by skilled electricians)

POSSIBLE CAUSE	CHECK AND REPAIR
Voltage too low	Contact a skilled electrician.
Electrical phases not balanced	Contact a skilled electrician.
Overload protection device faulty or set too low	Contact a skilled electrician.

The unit works but operation is unsatisfactory, uneven or noisy

POSSIBLE CAUSE	CHECK AND REPAIR
Propeller turning wrong way	Check the propeller rotation direction (point 5.2). Call in a skilled technician if the rotation direction is not correct.
The propeller/hub assembly has jammed.	Clean propeller and hub.
The propeller is loose, worn or partially damaged.	Check that the propeller is fixed correctly. Tighten it if necessary. Check the propeller if worn.
Electrical phase missing	Contact a skilled electrician.
Worn or damaged internal parts	Contact Zenit or an Authorised Service Centre.
Oscillation caused by the installation (resonance)	Check the installation structure

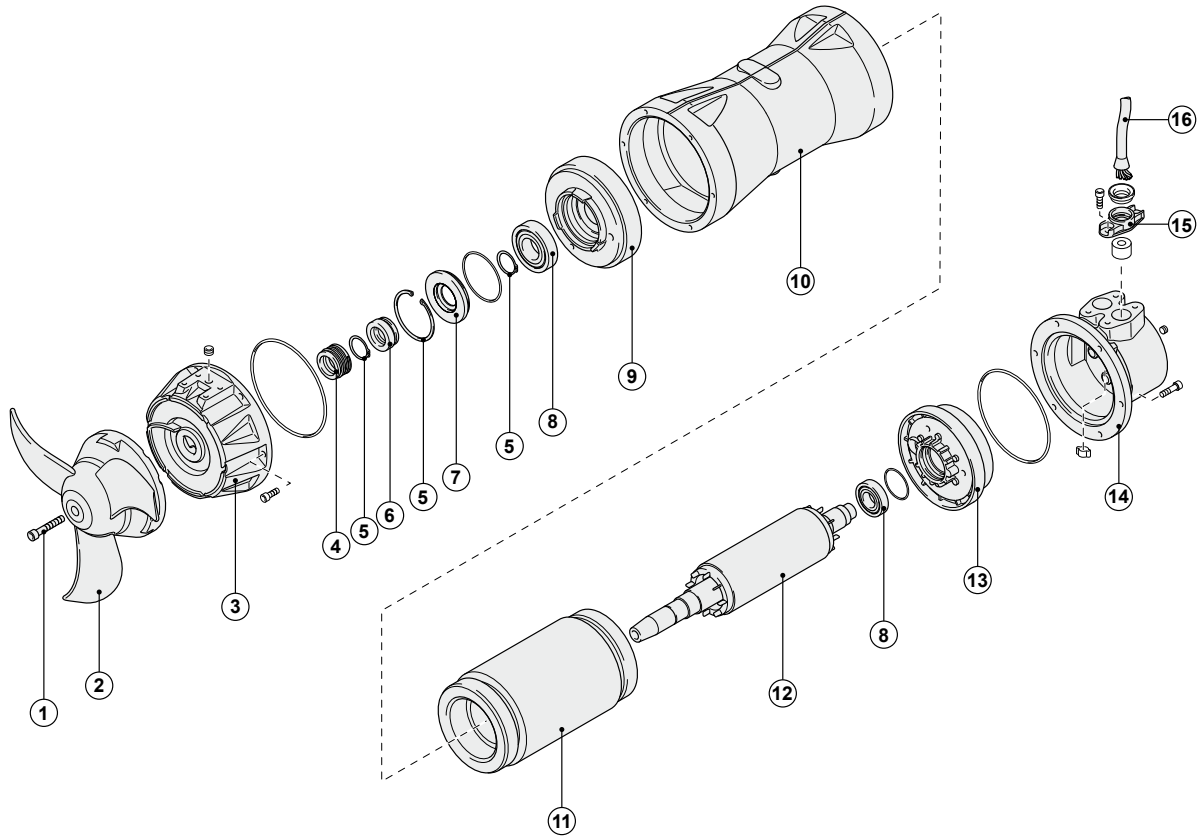
High current drawdown

POSSIBLE CAUSE	CHECK AND REPAIR
Incorrect power supply voltage	Contact a skilled electrician.
Propeller jammed	Remove the cause of the jam and clean the propeller thoroughly
The mixer is running on two electrical phases	Contact a skilled electrician.
Worn or damaged internal parts	Contact Zenit or an Authorised Service Centre.

10. DESCRIPTION OF MAIN COMPONENTS

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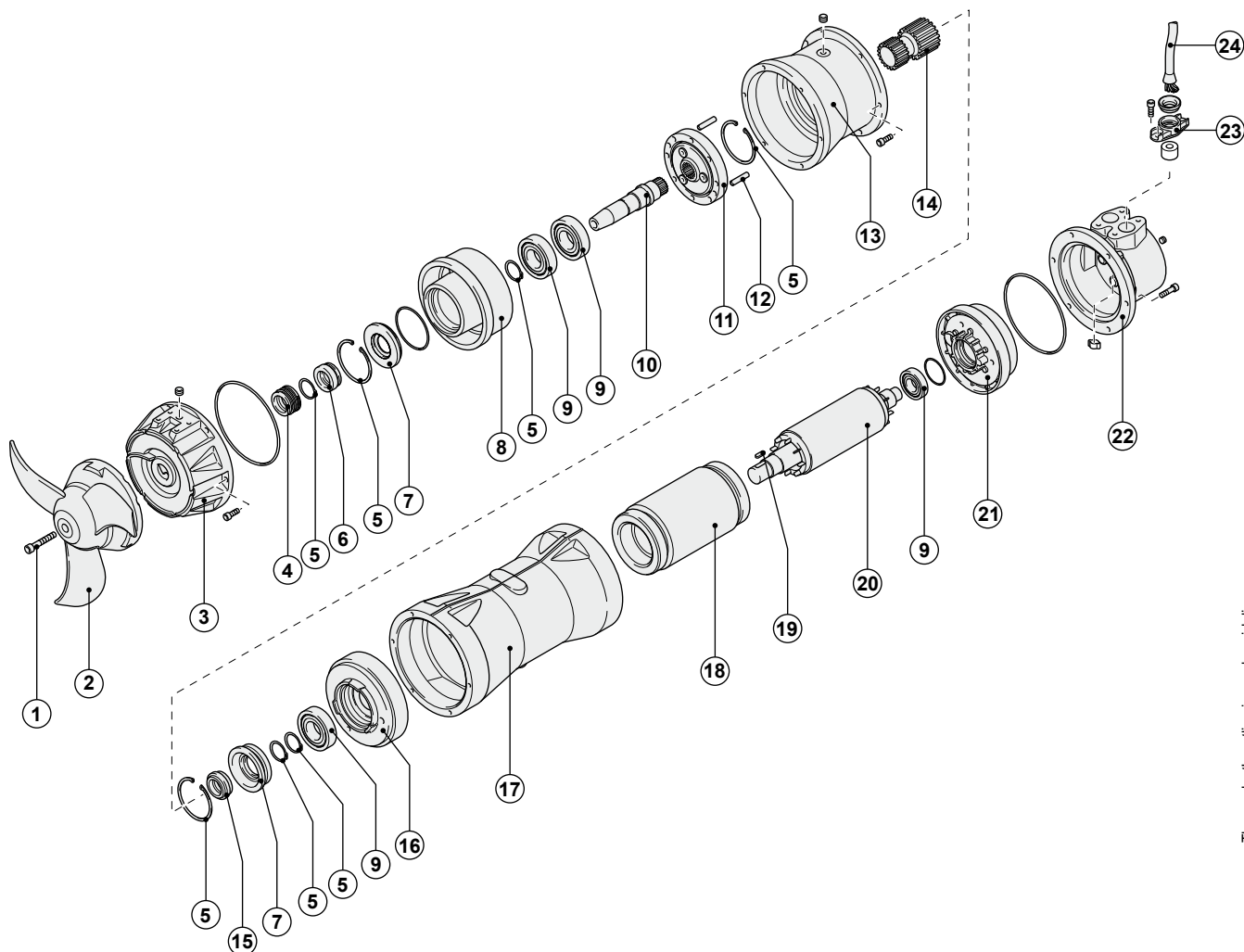
10.1 DIRECT TRANSMISSION models



- | | | | |
|---|------------------------|----|-----------------------|
| 1 | Propeller fixing screw | 9 | Front bearing support |
| 2 | Propeller | 10 | Motor case |
| 3 | Front motor cover | 11 | Stator |
| 4 | First mechanical seal | 12 | Shaft with rotor |
| 5 | Seeger | 13 | Rear bearing support |
| 6 | Second mechanical seal | 14 | Rear motor cover |
| 7 | Bushing | 15 | Cable gland |
| 8 | Bearing | 16 | Cable |

The product's outline is purely guideline

10.2 Models with REDUCTION GEARBOX



- 1 Propeller fixing screw
- 2 Propeller
- 3 Front motor cover
- 4 First mechanical seal
- 5 Seeger
- 6 Second mechanical seal
- 7 Bushing
- 8 Front bearing support

- 9 Bearing
- 10 Reduction gearbox shaft
- 11 Reduction gearbox body
- 12 Pin
- 13 Reduction gearbox case
- 15 Third mechanical seal
- 16 Front bearing support

- 17 Motor case
- 18 Stator
- 19 Key
- 20 Shaft with rotor
- 21 Rear bearing support
- 22 Rear motor cover
- 23 Cable gland
- 24 Cable

The product's outline is purely guideline

11. SILVER DECAL

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