Operating Manual – Electric Agitator

Sustainable water solutions

Operating manual – Electric Agitator

Safety instructions

> **The mixer is not approved for mixing inflammable liquids classified AI, AII and B.**

> **Only use the mixer for its designed purpose.**

> **Install the mixer so it cannot fall in the container.**

> **Comply with all working procedures.**
> **Wear personal protective equipment.**
(Face protection, safety goggles, safety gloves, safety clothing etc.)

> **Observe the electrical connection schematic from the motor.**
The schematic is located in the junction box of the motor.

> **For outdoor use, equip the motor with a weather shield.**

> **The mixer motor or parts of it shall not be immerged in corrosive substances nor stored or installed unprotected over or in the vicinity of corrosive vapor.**

> Before switching on the motor, make sure the impeller is entirely immerged.

> **Comply with the operating manual when using spare parts or loose parts. The warranty is void if damage occurs due to inappropriate installation, handling or maintenance!**

> **Do not switch on the mixer if others are present in or in the vicinity of the danger zone. The operator and others must be protected from dangerous hazards, which may occur from mechanical actions and motions.**

> **Safeguards are essential for protecting operators and others in the vicinity from preventable injuries. The safeguard must prevent hands, arms, and any other part of an operator's body from making contact with dangerous moving parts. If necessary, install safeguards for example, a protection hood or adapt the construction.**

> Prior to the commissioning of the mixer, the EC label must be delivered to the whole plant.

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Transport & Storage

> The mixer is shipped in several pieces and must be assembled on site. Pay attention to the Operating Manual, pages 6 to 9.

> Handle the mixer with care. Make sure the mixer cannot fall, tumble, slide etc.

> Only unpack the mixer shaft before use. Keep the mixer shaft as long as possible in the original packing.

> The mixer shaft should be stored or laid on a flat hard and clean surface. Incorrectly storing or laying of shafts, especially long mixer shafts or assembled shafts could result in bent shafts. Do not apply any side force to the mixer shaft to avoid out-of-round in operation. Beware of any sharp or pointy item when handling mixer shafts with protection coating. A damaged coating will lead to early failure of the mixer!

Electric Motor

> Only qualified personal are allowed to perform installation work on the electrical motor.

> Always use a motor breaker for the motor.

> The power supply i.e. voltage and frequency must match the data on the motor rating plate.

> Check the rotation direction of the motor. The arrow on the motor indicates the right direction of rotation.

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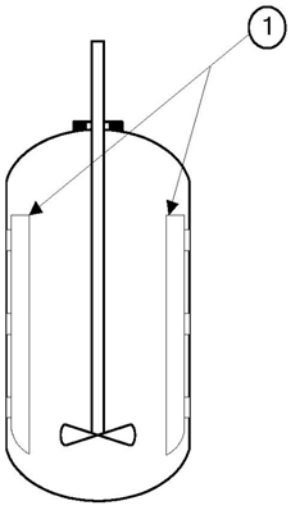
Installation Indication

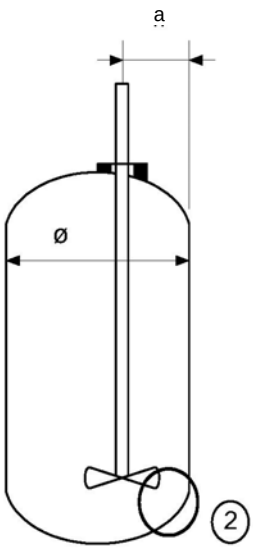
> To avoid a strong vortex of the liquid in a cylindrical container, place at least two plates Pos.1 on the wall as shown in picture A.

> Installing the mixer in a vertical and eccentric position may be sufficient to avoid a strong vortex, see picture B. Use the rule below to determine the position.

Picture A



Picture B



$$\text{Distance to the wall [a]} = \frac{\text{Diameter [ø]}}{3{,}5}$$

> Caution: pay attention to the wall distance and the impeller diameter. See picture B Pos.2

Selection table

Type	Shaft length	Shaft-material*	Propeller	Model No	Power
0.12KW	500	Stainless steel	Stainless steel/PVDF	WSP5012S	220V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP5012V	
		Stainless steel	Stainless steel/PVDF	WSP5012S-110	110V/1Ph/50/60Hz.
0.12kw	700	Stainless steel	Stainless steel/PVDF	WSP7012S	220V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP7012V	
		Stainless steel	Stainless steel/PVDF	WSP7012S-110	110V/1Ph/50/60Hz.
0.12kw	800	Stainless steel	Stainless steel/PVDF	WSP8012S	220V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP8012V	
		Stainless steel	Stainless steel/PVDF	WSP8012S-110	110V/1Ph/50/60Hz.
0.12kw	900	Stainless steel	Stainless steel/PVDF	WSP9012S	220V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP9012V	
		Stainless steel	Stainless steel/PVDF	WSP9012S-110	110V/1Ph/50/60Hz.
0.37kw	1000	Stainless steel	Stainless steel/PVDF	WSP1037S	220V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP1037V	
		Stainless steel	Stainless steel/PVDF	WSP1037S-110	110V/1Ph/50/60Hz.
0.12kw	500	Stainless steel	Stainless steel/PVDF	WTP5012S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WTP5012V	
0.12kw	700	Stainless steel	Stainless steel/PVDF	WTP5012S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WTP5012V	
0.12kw	800	Stainless steel	Stainless steel/PVDF	WTP5012S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WTP5012V	
0.12kw	900	Stainless steel	Stainless steel/PVDF	WTP5012S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WTP5012V	
0.37kw	1000	Stainless steel	Stainless steel/PVDF	WTP5037S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WTP5037V	
0.75kw	1000	Stainless steel	Stainless steel/PVDF	WSP5075S	380V/1ph/50/60Hz
		PVDF-coated	PVDF	WSP5075V	

Electric Motor :

Installation, Operating and Maintenance Instructions
Single-Phase Squirrel-Cage Induction Motors, Standard Version

General

To avoid damage to the motors and equipment to be driven, the operating and maintenance instructions must be observed. In particular, the separately attached safety instructions must be strictly observed to avoid hazardous situations. In the interest of clarity, the present instructions cannot provide information on any conceivable special fields of applications and areas and special requirements associated therewith. Therefore, when installing motors, the user will have to take himself appropriate safety precautions as will be needed in his specific application. Additional the Operating and Maintenance Instructions Three-Phase Squirrel-Cage Induction Motors have to be paid in attention!

Description

The motors conform to IEC 34-1, DIN EN 60034-1, DIN VDE 0530 as well as other applicable DIN norms. Additional separate instructions apply to the following motor versions:

- Brake motors
- Motors with separately driven fans
- Motors with integral sensors

Degree of protection

The degree of protection of the motors is indicated on the rating plate. The degree of protection of attachments may differ from that of the motor. This shall be taken into account when installing the motors. For motors to be installed outdoors (degree of protection = IP 44), bear in mind that the motors must be protected from direct atmospheric exposure (fan may freeze when directly exposed to rain, snow and ice).

Types of construction

The type of construction of motors is indicated on the rating plate. Any use in types of construction deviating therefrom shall be subject to the manufacturer's approval and may possibly be permissible only following modification according to the manufacturer's instructions. The user shall make sure that no foreign items can fall into the fan cowl, in particular, in types of construction where the shaft end points upwards.

Transport and storage

The motors should be stored in a closed, dry room. Storage in roofed outdoor areas is permissible only for a short period of time. In such a case, appropriate measures must be taken to protect the motors from any harmful environmental action. They must also be protected from mechanical damage. The motors may neither be transported nor stored on the fan cowls. For handling the motors, use the eye-bolts of the motors as well as suitable lifting tackle. The eye-bolts are designed only for lifting the motors without any additional attachments such as base plates, gearboxes etc. If the eye-bolts are removed after installation, the threaded holes must be permanently sealed in accordance with the degree of protection.

Installation

Since the surface of electric motors can reach high temperatures of over 100°C during normal operation,
take precautions to prevent contact if the motors are installed in accessible areas. Similarly, no temperature-sensitive items should be attached to or touching these surfaces. Ventilation openings and cooling ribs must be kept clear, and the minimum distances specified in the dimension sheets must be kept so that the flow of cooling air will not be obstructed. Also make sure that the discharged heated cooling medium will not be drawn in again.

With types of construction IMB14 and IMB34, be sure that the maximum usable screw-in depth indicated in the catalogue will not be exceeded (damage to winding!).

The featherkey in the shaft end is protected by the shaft end guard only for transportation and storage.Carrying out commissioning or a trial run with the featherkey being secured only by the shaft end guard is strictly forbidden because of the risk that the featherkey will be thrown out.

Use suitable mounting devices for fitting the transmission element (e.g. coupling, pinion or pulley), or heat the part to be fitted. To facilitate fitting, the shaft ends are provided with tapped centre holes according to DIN 332 Part 2. For fitting transmission elements on the shaft, never strike on them, because this may cause damage to the shaft, bearings and other parts of the motor.
All elements to be fitted on the shaft end must be carefully dynamically balanced in accordance with the balancing system used for the motor (full or half featherkey). The rotors of the motors have been balanced with half featherkey as is indicated by the letter H after the motor No. on the rating plate. Motors for which the letter F is indicated after the motor No. have been balanced with full featherkey.

The motors should be installed such that they will be free from vibrations to the greatest possible extent. For precision-balanced motors, special instructions shall be observed. Following completion of installation, the u ser must take appropriate steps for protecting all moving parts and ensuring a reliable operation.

If a motor is to be directly coupled to the driven machine, it must be particularly carefully aligned. The axes of both machines must be in exact alignment. Use appropriate shims for bringing the axial height of the motor in exact alignment with that of the driven machine.

With belt drives, the motor is exposed to relatively high radial forces. When dimensioning belt drives, take into account, apart from the regulations and calculation programmes of the belt manufacturer, that the radial force permitted according to our specifications at the shaft end of the motor will not be exceeded by the cantilever load and initial tension of the belt. Be sure, in particular, that the initial tension will be exactly set in accordance with the belt manufacturer’s instructions when installing the motor.

Insulation test and bearing replacement

Prior to initial start up of the motor or after long periods of storage, measure the insulation resistance of the winding to ground and between the phases. The voltage applied may be 500 V maximum. While the measurement is being taken and immediately afterwards, the terminals carry dangerous voltages and must not be touched. Precisely follow the operating instructions supplied for the insulation measuring instrument! Dependent on the rated voltage UN, the values determined at a winding temperature of 25 °C must not be lower than the following minimum values:
If the values found are lower than the minimum values, properly dry the winding until the insulation resistance meets the specified value.
After a storage time of four years, the bearings must be replaced by new ones of the same type.

Commissioning

In all commissioning operations, the information on safety must be strictly observed. Before carrying out any work on the motor, disconnect the motor from the power supply. The installation must be carried out by appropriately trained qualified personnel in accordance with the applicable regulations.
Make sure that the system data (voltage and frequency) are in agreement with the data given on the rating plate of the motor. The connecting leads must be sized in accordance with the rated motor currents.
The coding of the electrical connections of the motor conforms to DIN EN 60034 Part 8. Carry out the connection in accordance with the circuit diagrams shown in section 16 of the present instructions. These are the diagrams applying in most cases to the basic version of single-phase motors.

For other versions, special circuit diagrams are supplied, which are glued onto the inside of the terminal box cover or enclosed. An additional terminal box may be provided for connecting auxiliary and protective devices (e.g. separately driven fan). In respect of this terminal box, the same regulations apply as to the main terminal box.
The motor must be started with an overcurrent protective device which is set according to the 1.05- fold rated data of the motor. Otherwise, no warranty claims for winding damage will be accepted. Before switching the motor on for the first time, it is advisable to check the insulation resistances between winding and ground and between the phases (see section 7). After long periods of storage, it will always be necessary to measure the insulation resistance. Before coupling the driven machine, check the direction of rotation of the motor to avoid damage to the machine. The permissible tightening torques for the terminal board bolts can be seen from the following table:
Before closing the terminal box, always check that
• connections have been made according to the terminal diagram
• all terminal box connections have been firmly tightened
• all minimum clearances are kept (greater than 8 mm for up to 500 V, greater than 14 mm for up to 1000 V)
• the interior of the terminal box is clean and free from foreign items
• nused cable entries are closed and the screw plugs with gasket are firmly tightened
• the gasket in the terminal box cover is clean and all sealing surfaces are in a condition meeting the requirements of the degree of protection.
Before switching on the motor, check that all safety regulations are complied with, the machine has been properly installed and aligned, all fastening elements and earthing connections are firmly tightened, auxiliary and additional devices are in working order and properly connected, and that the featherkey of a possibly existing second shaft end is secured so that it will not be thrown out.
If possible, the motor should be switched on without load. If it runs smoothly and without emitting abnormal

noises, you can load it by operating it together with the driven machine. When commissioning the motor, it is advisable to monitor the amps drawn while the motor is operated together with the driven machine so that any overloading will be immediately detected. The safety information must be observed both during operation and when switching the motor off.

Maintenance

We expressly emphasise the need to observe the safety information, in particular, the information in respect of disconnection from the power supply, securing against reconnection, checking that all parts connected to a voltage source are dead.
If the motor has to be disconnected from the power supply for the purpose of maintenance operations, be sure that any possibly existing auxiliary circuits such as anti-condensation heaters, separately driven fans, brakes are also disconnected from the power supply.

Bearings and lubrication

The rolling-contact bearings of the standard motors are provided by the bearing manufacturer (or factory) with rolling-contact bearing grease to DIN 51825 in accordance with the following table:
Unless agreed otherwise, the grease quality will allow a 2-pole motor at full utilisation to be operated without a renewal of the rolling-contact bearing grease for about 10,000 operating hours and a multipole motor for about 20,000 operating hours. The operating hour numbers given apply only to an operation at nominal speed.

Condensate drain (optional)

In applications where condensation and, thus, condensed water will have to be expected inside the motor, the condensed water which has accumulated at the lowest point of the endshield must be drained at regular intervals and the opening then closed again.

Cleaning

To ensure adequate cooling, all parts of the motor must be cleaned at regular intervals. In most cases, blowing away the dirt with water- and oil-free compressed air will suffice. In particular, the ventilation openings and spaces between ribs must be kept clean. It is advisable to include also the electric motors in the regular inspections of the driven machine.

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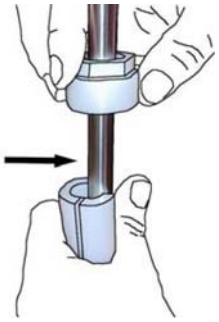
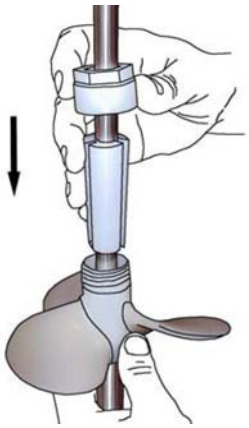
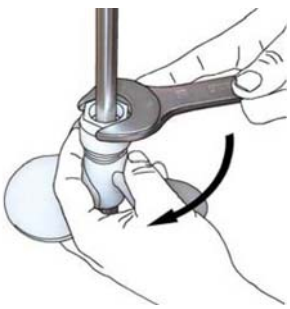
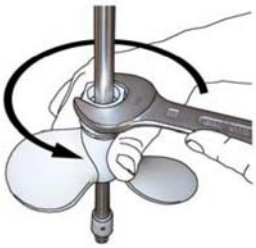
Assembly

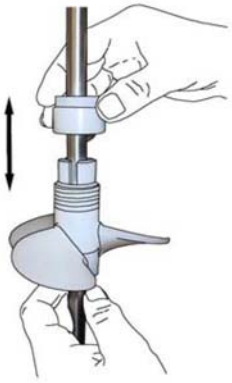






Adjustment





Operating manual – mixer

Commissioning

> Be cautious of rotating and driven parts.

> Pay attention to gas and odors emanating from the liquid. Always follow safety procedures.

> After maintenance or overhaul of the mixer, proceed to assembly and commissioning.

Normal Operation

(1) Safeguards are essential for protecting operators and others in the vicinity from preventable injuries. The safeguards must prevent hands, arms, and any other part of an operator's body from making contact with dangerous moving parts. If necessary, install safeguards for example, a protection hood or adapt the construction.

(2) Insure that the rotating parts of the mixer, such as the shaft and the coupling cannot be accessed to prevent accidental contact with it.

(3) The mixer's container must be steady on the ground.

(4) If the mixer is installed on a movable actuated lid, it is necessary to provide safeguards to avoid injury, which may occur when the lid is moved onto the container.
The control and surveillance system must include the 2 following safety measures:

1. Two hand control with self-surveillance and control of the simultaneous action of the controller's input.

2. Control system with a reset outside the danger zone or a switching device affixed to the lid.

(5) Mixers where the impeller can be moved out of the liquid or the container moved away must be equipped with safeguards, which enables switching on only when the impeller is in the container.

(6) Ensure that the mobile mixer cannot be switched on unintentionally.

(7) The controller of the machines in paragraph 3, 4 and 5 must comply with the current regulations.

Be cautious of any odors and gases from liquids. Always observe safety and protection procedures.

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Disassembling

> Beware of released heavy loads when loosening screws! Physical injury and damage to equipment such as impeller, container, mixer shaft etc. may occur.

> Be cautious of any odors and gases from liquids. Always observe safety and protection procedures.

Disposal

➢ The local waste treatment regulations are to be followed. The nature of the material is declared on the shipping documents. Depending on the use of the mixer, parts or the entire mixer must be considered as hazardous waste.