Operating and maintenance instructions

for rotary current induction motors with short-circuit rotor

designed in conformity with the

CE guideline on machines

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1. Machine identification

Machine model :	
Client :	
Article number of machine:	
Capacity :	
Synchronous speed :	
Asynchronous speed :	
Voltage :	
Frequency :	
Power factor cosφ :	
Circuit :	
Nominal current :	
Protective system :	
Insulation class :	
Structural shape :	
Operating mode :	

1.1 Notes on maintenance details (address of importing firm, addresses of service companies etc.)

Should service be required, it should be carried out by the responsible importing firm :

or by the manufacturer:

Company: E. KRETZSCHMAR
Antriebs- und Verfahrenstechnik
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2. Standards and regulations

The rotary current induction motors with short-circuit rotor referred to in the present operating and maintenance instructions comply with the provisions governing revolving electric machines and with German industrial standards, especially DIN VDE 0530 and IEC 34.

Heading	DIN VDE	IEC
Nominal operation and ratings for revolving electric machines	DIN VDE 0530, T 1	34 -1 85
Protective systems of electric revolving machines	DIN VDE 0530, T 5	34 -5
Cooling systems for electric revolving machines	DIN IEC 34, T 6	34 -6
Structural shapes of electric revolving machines	DIN IEC 34, T 7	34 -7
Wiring designation and direction of rotation of electric machines	DIN VDE 0530, T 8	34 -8
Surface cooled induction motors for intermittent service - assembly dimensions	DIN 42 681	72 -1
Cylindrical shaft ends for electric machines	DIN 748, T 3	72
Conic shaft ends for electric machines	DIN 1448	
Noise emission - limit values	DIN VDE 0530, T 9	34 -9
Integrated thermal protection		34 -11
Fitting flanges for electric machines	DIN 42 948	72 -2
Degree of vibration of electric revolving machines	DIN ISO 2373	34 -14
Regulations on electro-magnetic appliances	DIN VDE 0580	
(Radial) deep groove ball bearings	DIN 625	
(Radial) angular ball bearings	DIN 628	
Cylinder roller bearings	DIN 5412	

3. Operating conditions

3.1 Use in accordance with destination

Regarding the use in accordance with destination of rotary current induction motors with short-circuit rotors, E. KRETZSCHMAR GmbH assumes the operating conditions that correspond to the technical specifications previously defined by the customer.

The present operating and maintenance instructions include notes and recommendations regarding the use of the motors in order to guarantee or to promote:

- safety of persons and materials
- the preservation of the functional capacities
- ease of maintenance.

3.2 Working station and operating staff

The design of working stations and the qualification of the operating staff as a prerequisite for the orderly functioning of the motors are the user's liability.

The rotary current induction motors with short-circuit rotor manufactured by our Company comply with the DIN VDE 3100 (device safety) and with DIN EN 292 regulations.

The motors are so designed or constructed that they will not exceed the gauge readings that are determined in the relevant equipment standards and other documents specifying magnetic compatibility (EMV).

4. Delivery

Upon receipt of the motors, they must be checked immediately for visible shipping damages. Any damages should be noted down in the waybill and confirmed by the driver's signature.
Furthermore, the forwarder must be advised immediately and accordingly, with copy to the E. KRETZSCHMAR GmbH.

Upon clients' request, large current rotary induction motors with sensitive rotors will be equipped ex works with a rotor fitting in order to protect the bearings from damages caused by shocks and vibrations during transportation. This should not be removed until just prior to winding-up of the motor elements.

Insofar as provided, the lifting screws or eyelets mounted to the lifting bars of the casing body are to be used for hoisting of the motors. It is imperative to make sure that, when lifting the motor, ancillary elements such as ventilator caps, separate fans, tacho generators, surge generators etc. suffer no damages.

No carrying ropes may be wound around shafts, pillow blocks, couplings, protective caps or similar elements. Machines or aggregates mounted onto base frames must be hoisted using the suspension fittings in the base frame - never use the lifting eyelets of the individual machine !

When setting the motors down, make sure they are lowered gently on the ground. Flange motors must be protected from rolling off.

5. Storage

If no immediate commissioning of the motors is scheduled or if they are put out of operation for an extended period, they must be stored on a dry site free from dust and vibrations.

Electric motors should not be stored indoors without packing. If stored outdoors, they must be equipped with a protective cover against precipitation.

In case of strong fluctuations of temperature or high air humidity, it is recommended that the integrated stop period heating be switched on (if required, subsequent installation to be ordered from the E. KRETZSCHMAR GMBH).

Measures against the forming of condensation must be taken. Polished shaft ends are to be protected from corrosion by means of varnish or grease.

Where larger motors without transport safety (shaft fixing) are involved, we recommend that the rotor be turned a little from time to time.

This prevents stop period indents on the rotor surfaces owing to high local bearing loads. It is recommended that vibration-damping underlays, e.g. rubber mats, be used.

6. Set-up

6.1 Set-up site

The motors must be affixed to a vibration-free foundation.

ATTENTION : All base fixing elements must be level. Possible height differences are to be compensated for by underlay sheets, only then can the fitting screws be tightened. Otherwise there is a risk of deformation and breaking of the motor casing.

More specifically where the motor is mounted onto a steel structure, adequate bracings must be planned against inadmissible vibrations coming from resonance. These problems are particularly evident with high-speed rotors (2-/4- pole).

Sufficient feed in terms of cooling air intake must be ensured. Where fan ventilation is concerned, the volume of cooling air specified on the rating plate must be made available, while also the possibly advised pressure drop must be taken into account.

Especially where measures are taken to ensure attenuation (e.g. set-up inside a sound absorbing casing), sufficient cooling air feed must be provided. To perform this, an efficient cooling air monitoring system (mechanical or thermal) is recommended.

The protective and cooling mode of the motors must be selected by the customers in accordance with conditions prevailing at the set-up site.

In case of doubt, please check back with E. KRETZSCHMAR GMBH.

6.2 Fitting of motor elements

Where machines that were not delivered in assembled condition are involved, only such components as are marked as matching may be used.

Prior to winding up transmission elements (couplings, pulleys etc.) the shaft end must be carefully cleaned (remove anti-corrosion varnish), lubricated or be rubbed with a paste.

Furthermore, should transport locking be provided (shaft locking) or otherwise screws or clamping pieces have been utilized, depending upon design these must be removed; if applicable, please observe special notes.

It is recommended that prior to assembly of the transmitting elements, the adapters to be wound up be heated so as to be able to push them onto the shaft without too much effort and with appropriate equipment.

At all times, strong shocks or impacts are to be avoided, as otherwise bearing damage can be expected. Please observe the assembly notes of the coupling manufacturer.

6.3 Balancing level

As a basic principle, only couplings with trouble-free, i.e. smooth, carrier division should be utilized. Regarding the entire set of elastic transmission elements, special attention should be given to equal elasticity factor and quality level.

Every irregularity, especially with high rotary moment and owing to cranking forces in the shaft sector, will cause bending vibrations entailing a risk for serious motor damages by grinding of the rotor within the stator bundle of laminations. Please observe manufacturer notes on assembly and adjustment, particularly where special couplings are involved. Adapters etc. must be balanced dynamically and, if at all possible, under operating speed.

Where coupling operation is involved, shafts must be mutually adjusted, axially and radially. The assembly instructions of the couplings manufacturer in terms of methods, tolerances etc. must be strictly observed.

Where the belt-drive is concerned, it is important to make sure that both matching disks are flush, i.e. both shafts must be located in parallel position and the connection line between the disk centres must form a right angle with the shafts. Also make sure that the belt pre-tension is performed in accordance with the guidelines of the belt manufacturer. Unnecessarily high pre-tension comprises a risk for shafts and bearings.

If at the time when the motor is ordered, the use of belt or pinion drive has not been discussed, an inquiry with E. KRETZSCHMAR GMBH indicating the technical transmission data inclusive of dimensions is a must with regard to clarifying the solidity proof for shaft and bearings loads.

For high radial belt tension, the use of an additional shaft for motor relief may be required under special circumstances.

We should also be informed regarding possible axial pressure/ axial tension loads to enable us to check the bearing design.

The balancing level of the motor has been defined taking into account the DIN ISO 8821 standard (balancing of rotors and related parts) and the DIN ISO 2372 standard, in addition to customers' requirements.

- motors that have been gauged in accordance with the "full gauge spring" agreement receive no identification.
- motors that have been balanced in accordance with the "half gauge spring" agreement are identified by the letter H near the nut (front side of the shaft).
- motors that have been balanced in accordance with the "no gauge spring" agreement are identified by the letter N near the nut (front side of the shaft).

Depending on the balancing level of the motor, transmission elements balanced accordingly must be applied !
Our motors are balanced and checked taking the DIN ISO 8821 standard into consideration as well as the VDI 2056 assessment scale.

In case of doubt, please clarify with the E. KRETZSCHMAR GMBH in order to guarantee vibration-free functioning and optimal working life.

6.4 Motors with cylindrical roller bearings

In certain circumstances, unwinding malfunctions can occur with rotary current induction motors with reinforced bearing (cylinder roller bearing drive-side). More frequently, such problems arise with fast running (4-/2-pole) motors of small to average construction size under reduced radial load. Unexpected increase of the bearing temperature is the consequence. Remedial measures can consist of a different choice of bearing, after consultation with E. KRETZSCHMAR GMBH.

It is the entire motor concept that is essential for the bearing decision, taking into account thermal length expansion of the shafts as well as radial/axial loads.

Warning ! Safety notes !

- improper set-up leads to material damages and personal injuries!
- connecting, installing and grounding must be performed in accordance with national regulations !
- in any potentially explosive environment, the relevant special provisions must be observed!

7. Commissioning

7.1 Insulating resistance test

The insulating resistance of the winding against mass as well as the wound parts in relation to one another must be measured prior to commissioning or to re-commissioning after lengthy storage periods and must comply with the regulations in force in accordance with use. Test voltage : 1000 V (DC).

The minimum requirement for operating readiness is 300 MOhm, referring to a 20° C winding temperature.

Clean, dry windings show a multiple of the indicated limit values. For comparison purposes: smaller motors must show higher values than large motors, owing to shorter creep distances.
In case of doubt, please contact E. KRETZSCHMAR GMBH prior to commissioning of the motors.

The measuring of the insulating resistance should be carried out while the motor is disconnected; the motor and the interior of the terminal box must be clean.

For larger rotary current induction motors, the polarisation index (PI) can be used for further assessment of the winding insulation. The insulating resistance or the loading power is measured after one minute and again after 10 minutes. The 10-minute value is then divided by the one-minute value. The result should come to at least 1.5.

ATTENTION: If the indicated limit values of the insulating resistance fall short owing to humidity, careful subsequent drying of the winding should be performed only after consultation with E. KRETZSCHMAR GMBH!

The subsequent drying process can be completed e.g. by means of winding heating using direct current (e.g. welding motor-generator). During the process, the electric power may not exceed half the winding nominal current and the winding temperature must be permanently supervised in accordance with the relevant insulation material category (possibly on the basis of the measurement of the copper-resistance increase).
The winding phases will need to be changed from time to time!

For the subsequent drying of short circuit rotor motors, the use of rotary current feed with correspondingly reduced voltage (approx. 5 to 6% of the machine nominal voltage) with locked rotor is also possible. This procedure could cause problems owing to inductive additional heating where welding rings with winding steel bands are involved. It is also imperative that the forming of power transition indentations on the rings be prevented while the rotor is inactive!

Closed construction shapes must be opened by removal of possible coolers or at least in the area of service traps, air gap measurement openings, clamping plates or blind covers, in order to allow for air exchange (if necessary, blow dry air through).

PTC resistor temperature sensor

With rotary current induction motors with thermal winding protection by means of resistors, special attention must be paid to the drying temperature that needs to be below the authorised temperature of the relevant insulating category of the motor. PTC resistors may only be tested applying a measuring voltage of less than 2.5 V (DC).

PT 100 platinum measuring resistances

Pt 100 measuring resistances (100 Ohm at 0° C), in conjunction with the test amplifiers and display units that are gauged accordingly, allow for correct winding thermometry. Monitoring is also possible by means of a resistance bridge or an ohmmeter with low holding-wire current (resistance alteration = 0.385 Ohm/K, i.e. 138.5 Ohm measured e.g. = winding temperature of 100° C).

7.2 Initial commissioning

VERY IMPORTANT: PRIOR TO INITIAL COMMISSIONING OF THE MOTOR, PLEASE READ OPERATING AND MAINTENANCE INSTRUCTIONS CAREFULLY!

Prior to commissioning, turn the rotor by hand and listen to hear whether any unusual noises can be heard.
E. KRETZSCHMAR GMBH recommend that the motor be kept running, to begin with, for approximately one hour in unloaded state, i.e. uncoupled from the working machine. Correct running is given when no unacceptable vibrations or irregular bearing noises are noted.

Smoothness of running

The rotary current induction motors manufactured by E. KRETZSCHMAR GMBH have been tested with regard to smoothness of running prior to delivery. Should inexplicable vibrations occur, however, the motor must be uncoupled from the working machine and be started again to determine the cause of the vibrations.

If the running smoothness remains unsatisfactory, the cause could be a different balancing level of the components (coupling, pulley etc.) or the proper sequence of the fundament is located too near the motor revolving frequency. Experience has shown that proper frequency problems as a rule arise only with 2-pole motors. In order to check the kinetic quality of the motor alone, it must be run without composite parts and with the indicated kinetic agreement (agreement: "full gauge spring", "half gauge spring" "without gauge spring"), on neutral underlay (e.g. rubber mats or vibrating metals), and the vibrating speeds (mm/sec) measured.

Motors in coupling operation, i.e. with reduced radial load, show unexpected vibrations regardless of correct balancing. One reason might be a "jumping" of the rotor owing to increased storage air. Where bearings with reduced storage air are involved, these problems can be solved.
For motors with 2-groove ball bearings, the movable bearing should be pre-stressed (e.g. by means of disk springs).

Bearing noises

Tapping or knocking noises emerging from the bearing chambers indicate bearing damages. Bearing damages can arise from shipping, extensive storage periods etc. Screeching noises indicate skidding rollers inside the cylinder roller bearings. The cause could be a lubrication film that has not yet been fully built up (occasionally observed while roller bearings are unloaded).
In addition to a sonar rod or a stethoscope for subjective assessment by an expert, portable SPM 43 A or T 2000 testing devices can be used for bearing tests.

For any and all running noises, the differing design types of the motor casing must be taken into account with regard to loudness. (Cast casings always seem to be quieter than welded steel structures with tube coolers, for example.)

Lubrication

The lubrication and maintenance instructions are to be strictly observed!
Anti-friction bearings are provided, prior to delivery, with the required amount of lubricants for initial lubrication. (If necessary, please request specifications from E. KRETZSCHMAR GMBH).

The temperature of the anti-friction bearings may exceed the ambient temperature of 40° C by up to 50 K, higher temperatures may be acceptable, but are subject to certain conditions.

Electric wiring

Attention: Please compare the mains and desired operating data with the specifications on the motor rating plate!
NOTE THE WIRING MODE!

In regards to the admissible voltage fluctuations, the DIN VDE 0530 standard is applicable to electric machines; it is harmonised with the IEC 34-1 and standardises a tolerance of ± 5 %. The reference value is the nominal voltage indicated on the rating plate.

The data on the rating plate relate to (with tolerances) a maximum ambient temperature of 40° C, unless otherwise specified, with a maximum set-up altitude of 1000 m above sea level.

The connection must be performed using cables conforming to regulations, in expert fashion and in accordance with the local set-up regulations.

All connecting clamps must be firmly tightened, otherwise strong warming-up and subsequent destruction of the insulating material may be expected.

Connections of possible temperature monitoring devices (Pt 100- measuring resistances, PTC-resistors, bi-metallic temperature monitors) for winding and bearings as well as for out-of-service heating etc. are either located in an additional auxiliary terminal box or in the master terminal box, inclusive of wiring diagram and technical data. The use of these appliances is required for operating safety purposes.

For the grounding of casings, the terminal points are either located inside the terminal box or below, on the motor pedestal.

In order to prevent damages caused by wrong connections that might turn out to be serious, please get in touch with us as necessary.

The wiring diagram inside the cover of the terminal box must be observed. Special care is required with motors that are voltage- or pole-changing.

Where star/delta starting is involved, the change-over time relay must be adjusted so that the relaying star to delta switching occurs only after the tilting moment has been exceeded (after fade of the star starting power). Only in exceptional cases can differing conditions be scheduled after discussion and testing of the run-up period (e.g. with ventilated drives with higher mass number).

Furthermore, the thermal circuit breakers must grasp the winding lane current in the delta connections between motor and switch (contactor) where start switching of rotary current induction motors with short-circuit rotor are involved; they must therefore be adjusted to the lower star power (=0.577 x motor nominal current).

For the line-side motor protection, a switching device must be used in conjunction with a short-circuit fast release designed for the motor and the thermal releases adapted to the winding nominal power.

If the connection of the net phases L1 L2 L3 (RST) to the motor clamps U1 V1 W1 is in the same direction, the motor shaft will revolve in right-hand direction viewed from the outside toward the shaft bolt (revolving in clock-wise direction). If left-hand revolving is desired, two phases have to be exchanged.

Where motors are suitable for only one direction, because of the direction of rotation dependent ventilators or external ventilators, an appropriate identification in the form of a direction arrow is affixed to the motor casing or to the ventilator cap. An opposite direction is unacceptable, as overheating caused by the lack of cooling air would occur. In such an event change of direction can be carried out only by means of new or modified ventilators, re-balancing of the rotor will probably also be required!

In frequency converter operation, the instructions of the frequency converter manufacturer must be observed.

WARNING ! SAFETY INSTRUCTIONS !

- Voltage and revolving machine elements mean danger to life!
- Inexpert set-up, operation and maintenance lead to material damage and personal injury!
- Connecting must be performed in accordance with national regulations!
- Prior to commissioning, all supervisory and protective equipment must be completely mounted and checked to see that it functions !
- The electric motor may be operated only in compliance with rating plate indications!
- Cooling must be reliably guaranteed during the entire operating time!

- Casing temperature increase during operation can cause burning!
- Flammable materials must be kept away from the machine!

7.3 Re-commissioning

If the machine is re-commissioned after extensive idle periods, the process is the same as under item 7.1 Insulating resistance test and item 7.2 Initial commissioning.

7.4 Switching-on

The electric wiring of the motor must be such that the switch-on can be operated only via deliberate activation of a command device expressly provided. Upon direct switch-on, the safety equipment must be applied so that upon switching all external conductors are disconnected.
Any danger to persons must be excluded in accordance with DIN EN 292.

7.5 Overload release protective device

Placing an unacceptably high power load on the motor is prohibited!

Depending on power, retarding releases or relays must be adjusted to the motor nominal power. Furthermore, they must be so selected that the motor is thermally protected even in the event of a short-circuit (i.e. with locked rotor). This requirement is assumed as complied with if the release period that can be seen from the release characteristic curve (starting temperature 20° C) for the ratio I_A/I_N does not exceed the heating time t_E indicated for the relevant temperature brackets.

7.6 Temperature monitoring

Upon client request, temperature monitoring can be ensured by means of PTC resistors (according to DIN 44081 or 44082), bi-metallic temperature monitors (according to VDE 0631) or Pt 100 platinum measuring resistances (according to DIN IEC 751).

If the temperature monitoring consists of PTC resistor temperature sensors, the motor is identified by an adequate additional plate "resistor temperature sensor").

8. Maintenance and inspection

The maintenance concerns mainly the bearing materials, the insulating materials and the cleaning in conformity with operating conditions.

The observance of the operating conditions and the putting into practice of the maintenance, inspection and revision recommended by the manufacturer and completed by the user has decisive influence on the motors' working life.

For this purpose, our lubrication and maintenance instructions for anti-friction bearings as well as the notes contained in the specific set-up, operating and maintenance instructions are to be observed. If necessary, please get in touch with E. KRETZSCHMAR GMBH.

8.1 Cleaning

The cleaning of dust deposits from motors should be performed with a vacuum cleaner or bellows. In no circumstance may compressed air containing oil or water be used.

It is imperative that dirt be prevented from being blown inside the motors.

Motors with tube coolers require special care so that no dirt can block up the tubes. The tubes can be easily cleaned with a brush.

Motors that stand still for an extensive period under extreme climatic conditions with an ambient temperature exceeding 40° C and relative air humidity exceeding 95%, can still be commissioned provided their insulating resistance is located slightly below the restrictive value of 300 MOhm, and they are in clean condition.

In all events, consultation with E. KRETZSCHMAR GMBH is required.

8.2 Outdoor operation

Where the motors are operated outdoors without a protective roof (possible only for motors of IP 44 minimum protective type and in normal climate), an increased maintenance effort is required, particularly where extensive standstill periods are involved.

The motors operated outdoors should be taken into operation at least one hour per month to limit corrosion risk from condensation and precipitation. Where motors stand still during winter time, blocking of the external ventilator by snow and ice must be prevented.

WARNING ! SAFETY INSTRUCTIONS!

- Inexpert maintenance leads to material damage and personal injury!
- All work with the motor, excepted for re-lubrication, may be performed only during out-of-service periods, in a disconnected state and protected from inadvertent switching-on.
- Assembly and maintenance activities as well as operation may be performed only by specially trained staff!
- The operating and maintenance instructions are to be observed.

8.3 Lubrication and maintenance instructions for anti-friction bearings

General

Anti-friction bearings are precision parts. Appropriate lubrication is imperative to ensure long operation.
A low-vibration run and keeping to the relevant admitted loading capacities are a must for a long working life.

The proper lubrication type as indicated on the index plates for re-lubrication is a must. This will avoid damages to the bearings owing to use of wrong lubricants. The indicated lubrication intervals must be observed; excessive lubrication of the bearings can entail damages.

Unfavourable operating conditions could make corrections to the lubrication instructions necessary - if required, please consult us.

ATTENTION: The bearing grease loses its good lubricating features when the machine has been inoperative for some time, under unfavourable conditions and environmental influences!
If in doubt, please consult the manufacturer of bearings, of lubricants or of the motors.

Motors without re-lubrication device

As a rule, the initial lubrication will be enough for the entire service life of the designed bearings, as motors without re-lubrication equipment are provided with a “for life” lubrication, i.e. the usable life of the grease exceeds the durability of the bearings.

The “for life” lubricated bearings are filled 30% to 40% of the available space with appropriate grease ex works.

A change of grease or an exchange of bearings where bearings with face-and-back sealing discs are concerned, is required where - owing to higher temperatures, influence of pollution (water, aggressive media) or from high dynamic-mechanical charges of grease film on the functioning surfaces - the usable life of the grease is considerably shorter than the anticipated durability of the grease bearings.

Should a new lubrication - also after extensive down time - be required, the old grease must be entirely removed, while the bearing cover and the bearing must be washed carefully, using petrol or cold cleaner. Then spread fresh grease on roll bearings and fill both bearing covers up to two thirds level grease.
Should you require clarification, please get in touch with E. KRETZSCHMAR GMBH.

Overfilling the grease causes inadmissible heating of the anti-friction bearings and must therefore be avoided! If possible, after the bearing covers have been replaced, check the smooth running of the motor by hand.

When re-commissioning is started, monitoring the motor is recommended. Noises and strongly increased heating suggest malfunctions. A careful examination of the procedure of re-lubrication must be undertaken in this event. Should you require clarification, please get in touch with E. KRETZSCHMAR GMBH

Motors with re-lubrication device

At every lubrication point of the motor a re-lubrication index plate is mounted, specifying the grease amount and the deadlines for re-lubrication. After re-lubricating three times, the external bearing covers must be dismounted and the old grease deposits removed from the inside. The bearing covers are then fitted again in cleaned and grease-free state.

After the bearing covers have been re-fitted, please check the smooth running of the motor by hand.

ATTENTION: Re-lubrication should always be carried out while motor is running, if necessary, provide lubricating pipe extensions. The pipes need to be always filled with grease.

Motors with re-lubricating device and automated grease volume governor

Re-lubrication should be carried out while the motor is running. Re-lubrication index plates are also installed for your information. The grease collectors are identified by special note plates.

An integrated centrifugal disk ejects the old grease that has been pressed out of the anti-friction bearings and that is then collected in a chamber. The chamber is arranged in conformity with the table below; it is emptied after several re-lubrication processes in the indicated manner. A check-up must be performed after 2 to 3 hours

ATTENTION: If an excessive grease volume is re-pressed in one process, that could lead to considerable bearing heating, as the excess amount of grease will be ejected only after hours.

Arrangement of the grease chamber	Evacuating procedure
Grease chamber below the ventilator cap - drive-side	Loosen screws, remove grease chamber, and empty
Grease chamber below the external bearing cover	Pull out slide, empty chamber
Grease chamber below the internal bearing cover	Reach into the bearing shield opening, pull out slide, empty chamber
Horizontal tubes below the ventilator cap - drive-side	Unscrew both stoppers, push out old grease with a rod

The notes apply correspondingly to different constructions.

Notes on re-lubrication

Prior and subsequent to every re-lubrication process, make sure the motor is running smoothly by applying a listening rod or a SPM measuring device to it.

If the indicated grease or grease showing the same soaping criteria is not available for motors with re-lubrication device, the bearings must be opened and the grease they contain be completely removed. A cleaning and new lubrication (as described in paragraph "motors without re-lubrication device") must be performed using a lubricant of equal quality.

A mixing of anti-friction bearing greases with differing soaping criteria is not acceptable, as the lubricity of the greases is definitely impaired by the mixing process. A regular maintenance of the anti-friction bearings in the outlined manner helps avoid anti-friction bearing damages.

Grease, grease quantity and relubrication intervals

The lubrication and maintenance instructions are to be stictly observed!
Motors with lubricating devices must be lubricated at the set intervals using the specified grade and quantity of grease. The relevant details are stated on the plates next to the lubricating points, or evident at lubrication specification.

Motor-type	Bearing:	Grease:	Re-lubrication interval: [h]	Grease quantity: [g]
			-	-
		-	-	-

The re-lubrication interval is suitable for the application for operating duty which is in accordance with the manufacturer instructions. For other operating duties consult with the E. KRETZSCHMAR GMBH.

8.4. Spare parts

It is recommended that a spare parts list be requested from E. KRETZSCHMAR GMBH. When ordering spare parts, the rating plate data and the serial number of the motor must be indicated, specifically the entire type denomination inclusive of all additional letters and figures. If a spare parts list is on hand, the spare parts designation and their current number according to list should be indicated.

In case rotating parts of the machine have been exchanged, particularly of machines with high revolving speed, a dynamic re-balancing must be performed under observation of the applied balancing agreement.