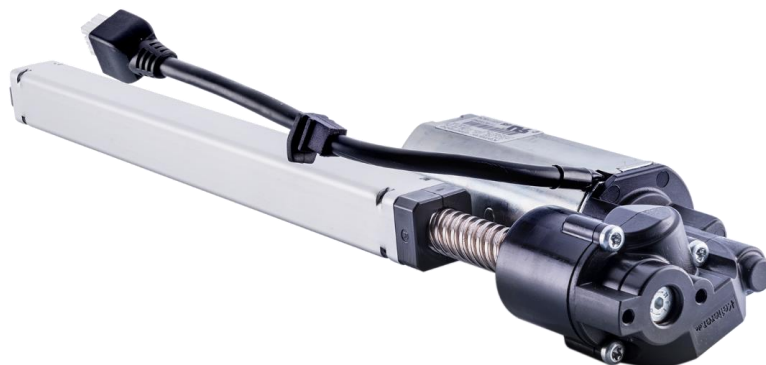


General operating instructions for Ketterer geared motors and spindle drives



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Compilation of technical documents

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Table of contents

1	Introduction	2
1.1	Foreword	2
1.2	Scope	2
1.3	Warranty and liability	3
1.4	Definition of terms	4
1.5	Standards and directives	4
1.6	Target group and prior knowledge	4
1.7	Important information for resellers	5
1.8	Use	5
	1.8.1 Proper use	5
	1.8.2 Type-dependent exclusion	5
	1.8.3 Possibilities for intervention and foreseeable misuse	6
1.9	Signs and symbols of these instructions	6
	1.9.1 Safety signs	7
	1.9.2 Pictogram Description	7
	1.9.3 Safety/Warning information - classification of signal words	8
2	Safety	9
2.1	Personnel - qualification and obligations	9
	2.1.1 Authorized staff must:	10
	2.1.2 Observe the following information:	10
	2.1.3 Personal protective equipment	10
	2.1.4 Residual risks	11
2.2	Safety/Warning information	12
	2.2.1 Thermal hazards	12
	2.2.2 Mechanical hazards	13
	2.2.3 Electrical hazards	14
	2.2.4 Other hazards	14
2.3	General notes	16
	2.3.1 Maintenance/repair	16
	2.3.2 Changes and modifications	16
	2.3.3 Transport/storage	16
	2.3.4 Disposal	16
3	Installation and operation	17
3.1	Assembly	17
3.2	Commissioning & operation	19
3.3	Standstill	24
3.4	Dismantling	24
3.5	Maintenance	24
3.6	Disposal	25
3.7	Malfunctions: Causes and remedies	26
4	General requirements on the control box	27
5	Technical data	27

1 Introduction

1.1 Foreword



Dear user,

These instructions are not intended for the end user, but as a source of information for the device and system manufacturer.

It is the responsibility of the manufacturer to deliver operating instructions with relevant safety information from these instructions to the end user.

These instructions are part of every Ketterer standard drive/spindle drive and must always be considered together with the product-specific assembly instructions.

Please read these instructions carefully and adhere strictly to the safety information.

Depending on the version or the revision status of the products, there could be deviations from these instructions. The user must check this before use and take the deviations into account if necessary.



Information

These instructions together with the product-specific assembly instructions must be kept in a well-known and easily-accessible location and must be consulted even if there is the slightest doubt.

If you have questions about the products, please do not hesitate to contact our employees.

Sincerely,

B. Ketterer Söhne GmbH & Co. KG

1.2 Scope

Assuming nothing to the contrary is found in the product-specific assembly instructions, these instructions apply for all Ketterer drives, namely:

- Gear motors
- Spindle drives

1.3 Warranty and liability

For products and individual parts, we grant a warranty period in accordance with the legal warranty regulations from the time of delivery of the goods.

Within this warranty period, we replace all spare parts with manufacturer or material defects free of charge (provided the products have not been resold in the interim).

The general conditions terms and conditions for guarantee and warranty of **B. Ketterer Söhne GmbH & Co. KG** apply. The contractual warranties as well as liability claims for personal injury or property damage are excluded if they were caused by one or several of the following:

- Improper use of the products.
- Improper or incorrect assembly of the products.
- Operation with inoperable safety devices or those which were not properly installed.
- Non-observance of the safety information and notes in these instructions and the product-specific assembly instructions.
- Repair or manipulation performed by persons who are neither authorized nor trained to do so.
- Unauthorized structural changes and modifications.
- Process materials, accessories, spare parts and additives which are the cause of damage and for which the manufacturer has not issued a release. The manufacturer does not assume liability for follow-up damage caused in this way.
- Exceedance of the performance limits. Catastrophes, influence of foreign objects and force majeure.



Information

Please refrain from interfering with or changing the components not authorized by us as this would result in the repeal of submitted declarations concerning EC Directives.

1.4 Definition of terms

Electric motors with gears are only referred to as drives in the following. A lifting unit is a mechanical spindle assembly with or without a gear head. A spindle drive is a gear motor with a permanently installed lifting unit.

1.5 Standards and directives

- The drive is not subject to Low-Voltage Directive 2014/35/EU as the nominal operating voltage is not within the voltage range of 75 V DC and 1500 V DC.
- The MRL Machinery Directive is applicable since the drive/spindle drive is an "incomplete machine" in accordance with section 2, paragraph g), MRL 2006/42/EC. A CE marking does not have to be made on the type plate. An installation declaration in accordance with appendix II, part 1, section B, MRL 2006/42/EC is available and provided on request. On the basis of the MRL, the machine manufacturer is responsible for checking and ensuring compliance with the basic requirements of the MRL before putting the product into circulation.
- All current products are designed in compliance with the 2011/65/EU (RoHs). All older products which do not yet comply with the requirements of this directive or parts thereof are thoroughly subjected to a redesign and verification can be provided on request.
- The drives/spindle drives, since they are sold to processing customers and not to the end user, do not fall under the range of application of EMC Directive 2014/30/EU in accordance with the definition in section 3, para. (2)1. Ketterer points out that, when selecting the power supply and installing into and using in devices in compliance with EMC, the system manufacturer must provide suitable EMC wiring.

1.6 Target group and prior knowledge

The products are designed for use by processing customers.

These operating instructions are intended exclusively for qualified staff who, due to their professional training, knowledge and experience as well as familiarity with the relevant provisions, are able to perform the work assigned to them and independently identify and prevent hazards.

➤ 3 Installation and operation

1.7 Important information for resellers



Information

We define resellers as companies which purchase the drive/spindle drive from Ketterer and install them into their own products.

- For reasons of EU conformity and product safety, we recommend providing the user of your products with operating instructions in the respective official EU language. Include operating instructions with the end product which contain all the safety information the consumer needs to safely handle the product.
- Disassembly by the end customer is not permitted. Disassembly can only be carried out by qualified staff.

1.8 Use

1.8.1 Proper use

The drives with rotary movement as well as the spindle drives for linear adjustment are intended for commercial systems, for installation in machines in terms of MRL 2006/42/EC.

In accordance with the purpose of use of the machine or the device in which the components are installed, in addition to the named directive, additional product-specific and product-independent guidelines and standards apply with which the manufacturer of the machine or device is responsible for complying.

Commissioning is not allowed until conformity of the end product with these directives and/or other directives and standards applicable to the products has been determined. Determining conformity of the end product with the respective directives and standards is not the responsibility of Ketterer. The permitted operating data must be upheld. In case of doubt, the drive or spindle drive must not be put into operation.

The products correspond with state-of-the-art technology and the relevant safety regulations relevant at the time they are put onto the market within the scope of their proper use.

1.8.2 Type-dependent exclusion

Depending on the type, use of the drive is excluded in the following areas of application and can cause hazards and device damage:

- In the event of special requirements on failsafe performance.
- In aircraft and spacecrafts.

- In railway and motor vehicles.
- In ships.
- In explosive areas (explosion-risk areas).
- When operating near combustible materials or components.
- When using safety-technical components or taking on safety-relevant functions.

If the drive is operated under operating conditions which deviate from those named in 1.8.1, previous consultation with the manufacturer is required.

If the event of improper use, operation is forbidden.

1.8.3 Possibilities for intervention and foreseeable misuse

Intervention into the components or the system is only intended during assembly by authorized personnel or during transport. No intervention is intended during operation.

The drive or the system for linear adjustment must be installed according to the assembly instructions. The installation direction of the drive in line with the product-specific requirements must be observed. The permitted operating data of the product must be upheld.

Safe operation of the device is not ensured if these points are disregarded.

1.9 Signs and symbols of these instructions



The signs and symbols in these instructions should help you use the instructions and the product quickly and safely.

Information





Information helps you make the most effective and practical use of the device and these instructions.

1.9.1 Safety signs

The safety sign illustrates a source of danger. The safety signs in the entire technical documentation correspond with ANSI Z535.3 (Criteria for Safety Symbols) and Z535.6 (Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials).








The following symbols are used in this manual:

1.9.2 Pictogram Description

Pictogram	Description
	<p>Warning of general danger</p> <p>This warning sign is shown before activities during which several causes could lead to hazards.</p>
	<p>Warning of danger due to shearing action</p> <p>This warning sign is shown before activities during which hazards exist due to the shearing of limbs, with possible deadly consequences.</p>
	<p>Warning of dangerous electrical voltage</p> <p>This warning sign is shown before activities during which there is a risk of electric shock, possibly with deadly consequences.</p>
	<p>Warning of suspended loads</p> <p>This warning sign is shown before activities during which hazards exist due to falling objects, with possible deadly consequences.</p>

1.9.3 Safety/Warning information - classification of signal words

The following levels of danger are used in this manual to point out potentially hazardous situations and important safety regulations:

Level of danger	Description
 	Refers to a dangerous situation which, if not prevented, will lead to death or serious, irreversible injuries.
 	Refers to a dangerous situation which, if not prevented, could lead to death or serious, irreversible injuries.
 	Refers to a dangerous situation which, if not prevented, could lead to slight or moderate injuries.
 <i>Information</i>	Refers to important information.

2 Safety



Information

The products listed in these instructions, individually and as a whole, satisfy the currently valid safety standards in accordance with the requirements of EC Machinery Directive 2006/42/EC. The products are safe when used properly and when the safety information and requirements in this documentation are observed.



Carefully read the following safety information and specifications for safe operation before you start work. Familiarize yourself with all functions. Keep this manual in a safe place and, if necessary, give it to others.

For your safety, it is very important that you have understood all sections on safety and comply with them.

On the topic of safety, read and observe

- Chapter 2.2 Safety/Warning information,
- The special warning information regarding hazardous activities
- The safety data sheets at the workstation
- The work instructions at the workstation

Non-observance can result in danger of death and health risk to persons, environmental damage and/or extensive property damage.

Observing the safety information helps prevent hazards.

2.1 Personnel - qualification and obligations



Information

All activities on the machine must only be done by authorized staff.

2.1.1 Authorized staff must:

- Have completed their 18th year
- Know and be able to apply the accident prevention regulations and safety information for the machine
- Be trained and instructed in accordance with the codes of conduct in the event of a malfunction
- Have the physical and mental capabilities to perform the responsibilities, tasks and activities on the machine
- Be trained and instructed in accordance with the responsibilities, tasks and activities on the machine
- Understand and be able to implement the information in the technical documentation regarding the responsibilities, tasks and activities on the machine

2.1.2 Observe the following information:

- Familiarize yourself with the Ketterer components and your work area.
- Only use the Ketterer components for their intended purpose.
- Use suitable lifting tools for the transport and attachment of heavy accessory parts.
- Wear your protective equipment, such as safety gloves and hearing protection.
- If safety device defects or other defects are identified, immediately inform the responsible staff.

2.1.3 Personal protective equipment

All parts of the personal protective equipment must be worn for all activities in the machine area described in these instructions. These include, for example:

- Suitable safety shoes, safety shoes in accordance with GUV-R 191, safety shoes with a protective class of at least S1.
- Suitable safety gloves
- Suitable hearing protection
- Suitable safety goggles
- The respective country and local regulations for personal protective equipment (e.g. helmets) must be observed.

2.1.4 Residual risks

The product-specific documentation refers to all existing residual risks.

Existing residual risks can be prevented with the practical implementation and observance of these guidelines:

- The safety information and warning notes in these instructions.
- The operating instructions of the operator.

Danger of death/risk of injury can result for persons at the machine due to:

- Misuse
- Improper handling
- Transport
- Missing safety equipment
- Defective or damaged components
- Handling/use by untrained, uninstructed staff

Damage to the machine can be caused by:

- Improper handling
- Not following operating and maintenance guidelines
- Unsuitable operating materials

Damage to other assets in the operating area of the machine can be caused by:

- Improper handling

Limits on performance and functioning of the machine can be caused by:

- Improper handling
- Improper maintenance or repair
- Unsuitable operating materials

2.2 Safety/Warning information

General legal regulations or directives regarding occupational safety, accident prevention regulations and environmental legislation must be observed, for example the Industrial Safety Regulation (German BetrSichV) or the nationally applicable regulations.

When it must be assumed that danger-free operation is no longer possible, the machine must be switched off immediately.

Danger-free operation is no longer possible if, for example:

- Malfunctions in the control system lead to uncontrolled movements
- Damage to machine parts can be identified

After installation into the customer application, the risks originating from the drive must be assessed again.

Unauthorized changes and improvements to the product by the customer or third parties without the express written consent of B. Ketterer Söhne GmbH & Co. KG result in the termination of all liability claims.

2.2.1 Thermal hazards



CAUTION

Danger due to hot surfaces!

Surfaces of the drive and components can be hot and cause burns.

- ▶ Wear personal protective equipment.
- ▶ Inching mode (full load) 20 second operation with 4 minute break.
- ▶ It may be necessary for the operator to provide touch guards or heat insulation.



WARNING

Risk of explosion due to dust deposits!

Dust deposits with a thickness of > 5 mm could ignite on hot surfaces or cause fires or explosions!

- ▶ Do not use the machine in environments at risk of explosion.
- ▶ Clean the machine regularly so that no dust gets stirred up.

2.2.2 Mechanical hazards

CAUTION



Danger due to falling objects during transport!

Lost of stability when transporting the cardboard packaging, risk of impact or pinch points due to falling cardboard packaging.

- ▶ Do not stand under suspended loads.
- ▶ Only set down on flat surfaces.
- ▶ Observe the stack height
- ▶ Observe the packaging regulation

DANGER



Danger caused by breakage!

Incorrect assembly of the parts can cause the drive or spindle drive to break. Falling parts can cause impact or pinch points.

- ▶ Observe the product-specific assembly instructions for correct assembly.
- ▶ No-load functional test following assembly by specialist personnel: Starting the end positions without load.

WARNING



Danger of being pulled in by moving parts

The device does not differentiate between input signals. As soon as voltage is applied to the drive, it starts.

- ▶ Use is only permitted in combination with a suitable control device.
- ▶ Freely-accessible parts must be provided with a fixed safety guard (enclosure).
- ▶ Restarting is possible after a power failure.
- ▶ Disconnecting the power supply causes a standstill.

WARNING



Danger due to uncontrolled movement!

The use of an unsuitable control device or loading the spindle drive system past the maximum load can cause the spindle drive system to lower if the energy supply is disconnected.

- ▶ Only use a suitable control device.
- ▶ Observe the maximum load.

WARNING**Danger due to pinch or shear points!**

If the motor drive is blocked, the spindle drive could reverse or move in the opposite direction.

- ▶ Observe the installation position of the spindle drive.
- ▶ Observe the maximum load.
- ▶ No-load functional test following assembly by specialist personnel: Starting the end positions without load.

2.2.3 Electrical hazards**WARNING****Danger due to electrical voltage!**

Electrical hazards could result from faulty assembly or damage to the power-supplying cable during assembly.

- ▶ Have an electrician check the electrical equipment in accordance with DIN EN 60204-1 as well as compliance with the requirements of DIN EN 60204-1.

WARNING**Danger due to radiation or radiation from outside caused by electromagnetic influences!**

Electromagnetic fields can be created by the use of the motor drive.

- ▶ An electromagnetic test is done with Ketterer standard controls.
- ▶ The CE Declaration of Conformity is delivered on request.
- ▶ EMC capability in the end device/installation state is to be ensured by the manufacturer of the machine.

2.2.4 Other hazards**WARNING****Danger due to materials and substances!**

Hazards could result from materials and substances if non-RoHs-compliant components are used.

- ▶ Verification in the context of the RoHs Directive is possible in accordance with the Ketterer reporting requirement.
- ▶ Do not use any other materials.

DANGER



Combination of hazards!

Incorrect assembly and/or improper use of the drive can result in various hazards or combinations of hazards, such as short circuits, hot surfaces and others.

- ▶ Observe the product-specific assembly instructions for correct assembly.
- ▶ The products are to be used correctly and in accordance with the product specifications. These can be found in the product-specific assembly instructions.

2.3 General notes

2.3.1 Maintenance/repair

- Drives/spindle drives are maintenance-free throughout their entire service lives.
- Have repairs to the product done by Ketterer.
- When cleaning, observe the IP protection class of the product without fail!

2.3.2 Changes and modifications

Only operate the device in its original and perfect state. Retrofits, changes and modifications to the drive are in principle forbidden. If you want to make changes, always consult with Ketterer.

Changes and modifications not expressly approved by us result in the loss of any liability claims against us. This also affects damage caused by operation outside of the technical specifications of the product.

2.3.3 Transport/storage

- Only transport the drive in the original packaging.
- Secure the transport goods.
- Do not exceed the temperature or climate ranges during the entire transport: -20°C to +70°C.
- Store drives in their original packaging and protected in a clean, dry environment.
- Store drives at -20°C to +70°C degrees for no longer than 24 months.
- Please note that we issue a warranty of 12 months from delivery in accordance with our general terms and conditions of sale and delivery. That is why we recommend keeping the storage time to a minimum.

2.3.4 Disposal

During disposal, observe all legal and local rules and regulations applicable in your country.

The drives and components are installed as parts of machines and devices. As individual parts for use in industry, these are not subject to the scope of the Electrical and Electronic Equipment Act. If the drives and components are installed in end products which are subject to the scope of this act, the manufacturer of the end product is responsible for complying with the legal regulations.



3 Installation and operation

3.1 Assembly

WARNING



Danger due to electrical voltage!

Electrical hazards could result from faulty assembly or damage to the power-supplying cable during assembly.

- ▶ Have an electrician check the electrical equipment in accordance with DIN EN 60204-1 as well as compliance with the requirements of DIN EN 60204-1.

DANGER



Electrical voltage and current

Regularly check the product equipment.

- ▶ Immediately fix loose connections and defective cables.
- ▶ Electrical contact may only be applied to connections when no voltage is present.

DANGER



Safety and protective functions

Dangerous movements

- ▶ Make sure the devices/systems have sufficient protective devices since faulty motor control causes dangerous movements.

Possible remedies are:

- ▶ Do not stand in the area of movement of the devices or systems.
- ▶ Ensure the (protective) covers and housing have sufficient resistance to the maximum movement and rotation energy.
- ▶ Before opening the devices or entering the hazardous area, bring all drives to a safe stop and secure them from switching back on.

DANGER

Mechanical movement

Self-running product

If voltage is present, the device, depending on the version, can automatically start up back after a power failure, overvoltage, undervoltage or blockage.



- ▶ Do not stand in the hazardous area of the product.
- ▶ When working on the product, switch off the supply voltage and secure it from being switched back on.

DANGER

Danger due to falling parts!

Incorrect assembly of the parts can cause the motor drive, gear unit or spindles to break. Falling parts can cause impact or pinch points.



- ▶ Observe the assembly instructions!
→ See chapter "Assembly" in the product-specific assembly instructions.
- ▶ Operation is only permitted with a suitable controller
- ▶ A functional test must be carried out by the fitter by approaching the two end positions without load.
- ▶ When working on setup, it is not permitted for any persons to be located in the movement range of the overall system.

WARNING

Do not make any changes to the product

Impermissibly high stress



- ▶ After an impermissible stress (e.g. impact, heat, overvoltage, axial or radial stress), the product can be damaged. It must be put out of operation immediately and checked for proper condition before it is recommissioned.

CAUTION



Establishing mechanical contact

Risk of cutting and crushing when removing the product from the packaging and during assembly

- ▶ Carefully lift the product out of the packaging using the housing. Avoid impacts at all costs.
- ▶ Wear safety shoes and cut-resistant gloves.
- ▶ Use suitable assembly devices.

DANGER



Establishing electrical connection

The electrical connection is established **after** mechanical installation.

Danger of death due to electric shock when touching live parts

- ▶ Only have work done by an electrician.
- ▶ Ensure that the connection cables are voltage-free.
- ▶ Secure the operating voltage from switching back on.
- ▶ Never work on live parts.

3.2 Commissioning & operation

If nothing to the contrary is specified in the product-specific data sheet, the drives are suitable for an interior area with ambient temperatures from 0 to +40 degrees. They are designed for inching mode.



Information

Prerequisites for connection and commissioning:

- ▶ Before you connect the product, make sure that the supply voltage matches the product voltage.
- ▶ Operation is only intended with a suitable control (see chap. 4 General requirements on the control, page 27) or with a power supply with an appropriate EMC filter. Observe the type plate and detailed specifications.
- ▶ Only use cables designed for the current strengths in accordance with the type plate and the respective ambient conditions. Ensure mechanical protection of the electrical connection.

WARNING



Danger due to electrical voltage!

Electrical hazards could result from faulty assembly or damage to the power-supplying cable during assembly.

- ▶ Have an electrician check the electrical equipment in accordance with DIN EN 60204-1 as well as compliance with the requirements of DIN EN 60204-1.

DANGER



Electrical voltage and current

Regularly check the product equipment.

- ▶ Immediately fix loose connections and defective cables.
- ▶ Electrical contact may only be applied to connections when no voltage is present.

WARNING



Electromagnetic radiation

When integrating the product into the system, influences caused by interaction can occur due to electromagnetic compatibility (EMC). Make sure the entire system is EMC-compatible.

WARNING

Danger due to radiation or radiation from outside caused by electromagnetic influences!

Electromagnetic fields can be created by the use of the motor drive.



- ▶ An electromagnetic test is done with Ketterer standard controls.
- ▶ The CE Declaration of Conformity is delivered on request.
- ▶ EMC capability in the end device/installation state is to be ensured by the manufacturer of the machine.

WARNING

Danger due to pinch or shear points!

If the motor drive is blocked, the drive could reverse or move in the opposite direction.



- ▶ Observe the installation position of the motor drive.
- ▶ Observe the maximum load.
- ▶ No-load functional test following assembly by specialist personnel: Starting the end positions without load.

WARNING

Moving parts (shaft/rotor)

Objects, such as long hair, low-hanging clothing and jewelry, can get caught in rotating/moving parts.

Risk of injury!



- ▶ Do not wear loose or low-hanging clothing or jewelry or other objects when working on moving parts.
- ▶ Protect long hair with a hairnet.

DANGER

Safety and protective functions

Dangerous movements

- ▶ Make sure the devices/systems have sufficient protective devices since faulty motor control causes dangerous movements.



Possible remedies are:

- ▶ Do not stand in the area of movement of the devices or systems.
- ▶ Ensure the (protective) covers and housing have sufficient resistance to the maximum movement and rotation energy.
- ▶ Before opening the devices or entering the hazardous area, bring all drives to a safe stop and secure them from switching back on.

WARNING

Do not make any changes to the product

Impermissibly high stress

- ▶ After an impermissible stress (e.g. impact, heat, overvoltage, axial or radial stress), the product can be damaged. It must be put out of operation immediately and checked for proper condition before it is recommissioned.



DANGER

Danger due to falling parts!

Incorrect assembly of the parts can cause the motor drive, gear unit or spindles to break. Falling parts can cause impact or pinch points.

- ▶ Observe the assembly instructions!
→ See chapter "Assambly" in the product-specific assembly instructions.
- ▶ Operation is only permitted with a suitable controller
- ▶ A functional test must be carried out by the fitter by approaching the two end positions without load.
- ▶ When working on setup, it is not permitted for any persons to be located in the movement range of the overall system.



WARNING

Danger of being pulled in by moving parts

The device does not differentiate between input signals. As soon as voltage is applied to the drive, it starts. Attention, an uncontrolled restart may occur after a power failure!



- ▶ Use is only permitted in combination with a suitable control device.
- ▶ Freely-accessible parts must be provided with a fixed safety guard (enclosure).
- ▶ Restarting is possible after a power failure.
- ▶ Disconnecting the power supply causes a standstill.

WARNING

Danger due to uncontrolled movements!

The use of an unsuitable control device or loading the table past the maximum load can cause the table to lower if the energy supply is disconnected.



- ▶ Only use a suitable control device.
→ Chapter "General requirements on the control box".
- ▶ Observe the maximum load.

CAUTION

Danger due to hot surfaces!

Surfaces of the drive and components can be hot and cause burns.



- ▶ Wear personal protective equipment.
- ▶ Inching mode (full load) 20 second operation with 4 minute break.
- ▶ It may be necessary for the operator to provide touch guards or heat insulation.

WARNING

Risk of explosion due to dust deposits!

Dust deposits with a thickness of > 5 mm could ignite on hot surfaces or cause fires or explosions!



- ▶ Do not use the machine in environments at risk of explosion.
- ▶ Clean the machine regularly so that no dust gets stirred up.



Information

For testing, the upper and lower end position must be started without load.

- ▶ Inching mode at nominal torque of the drive:
20 seconds of runtime after a break of 4 minutes.

3.3 Standstill

- ▶ The motor drive is brought to a standstill by disconnecting the power supply.

3.4 Dismantling



Information

Dismantling is only to be carried out by trained, specialist personnel.

- ▶ Disconnect the power supply.
- ▶ Disconnect the motor drive from the system.

3.5 Maintenance



Electrical voltage on the drive

Do not open the device until the motor is at a standstill and after disconnecting the voltage at all poles.



Risk of explosion due to dust deposits!

Dust deposits with a thickness of > 5 mm could ignite on hot surfaces or cause fires or explosions!

- ▶ Do not use the machine in environments at risk of explosion.
- ▶ Clean the machine regularly so that no dust gets stirred up.

The motor drive is maintenance-free, but the surface must be cleaned on a regular basis.

3.6 Disposal



Information

The operating firm is responsible for correct disposal. In this process, the sector-specific and local regulations must be observed for the disposal of the various materials.

3.7 Malfunctions: Causes and remedies

► Do not do product repairs yourself.

Fault	Cause	Remedy
Drive will not start or turn over	No power supply	Connect the power supply
	The fuse in the controller is faulty	Replace the fuse
	The cable is damaged	Send in drive for repair
	Mechanical blockage	Switch off, disconnect from voltage and remove mechanical blockage
	Mains voltage faulty	Check mains voltage, restore voltage supply
	Connection faulty	Correct connection, see terminal assignment
	Drive is too hot	Cool off motor, find cause of error
	Ambient temperature too high	Lower ambient temperature
Increased power consumption		Send in drive for repair
Motor is running but the spindle is not moving	Gearwheel or spindle damaged	Send in drive for repair
Drive cannot lift the full load	Inadequate power supply	Increase the power supply
	Voltage drop in the cable	Use a thicker cable
	Motor damaged	Send in drive for repair
Motor running too slowly or not at full power	Inadequate power supply	Increase the power supply
	Voltage drop in the cable	Use a thicker cable



Information

If there are additional malfunctions and unusual operating noises, please contact Ketterer. Have the following information ready:

- Type plate data
- Type and degree of malfunction
- Circumstances surrounding the malfunction
- Application data (torque cycle, speed, loads, ambient conditions, etc.)

4 General requirements on the control box

The firm Ketterer supplies motor drives as well as connector rods and spindle systems to machine manufacturers. These are machine manufacturers conforming to Machinery Directive 2006/42/EC and are not responsible for fulfilling the requirements for machines in accordance with Machinery Directive 2006/42/EC.

The firm Ketterer defines in the following requirements for the controller being used for inching operation of the motor drive. These are used as the basis for safe operation of the motor drive. This list is not a conclusive list because while Ketterer is able to define proper use, as well as appropriate, foreseeable use, the place of use cannot be fully evaluated. The manufacturer of the machine is to determine all hazards as part of its risk assessment and to evaluate or minimize these hazards.

The motor drive is to be operated with a DC voltage in line with the motor specifications and supply of the Hall sensors of max. 24V (max. 12V with 12V drives) but ideally at 5V.

The control must offer the following options:

- Detection of the upper and lower end position (preferably half the rated output per motor channel) and does not cause damage to the drive. The safety distance to the upper and lower end position must be observed.
- Regulation/monitoring of speed, position and current by the control. The max. current consumption must be set in accordance with the motor type.
- Monitoring/Limitation of the duty cycle.
- Monitoring of the I²t.

The control must comply with the general EC directives.

5 Technical data

In principle, the technical specifications from the product data sheet or the data and operating parameters agreed upon in the delivery contract apply for the product you have purchased.

The specifications of the technical data as well as the electrical connection of the drive (circuit diagram) can be found in the current catalog or in the Internet at www.ketterer.de.