Vario 1
Vario 2

Linearantrieb / Linear actuator / Vérin électrique / Motore lineare / Motor lineal

DE **Montageanleitung**
Bitte bewahren Sie die Montageanleitung auf!

EN **Operating instructions**
Please take care of the operating instructions!

FR **Instructions de montage**
Veuillez conserver les présentes instructions de montage!

IT **Istruzioni per l'uso**
La preghiamo di conservare le istrzioni per l'uso!

ES **Instrucciones de montaje**
Por favor, conserve estas instrucciones de montaje!

Stand 04/2016, TN: 2010854

DE

Die deutsche Montageanleitung ist die Originalfassung.

Alle anderssprachigen Dokumente stellen Übersetzungen der Originalfassung dar.

EN

Translation from the original German version.

All other documents in different languages are translations of the original version.

FR

Traduction à partir des instructions de montage d‘origine en langue allemande.

Tous les documents dans une autre langue sont des traductions à partir de l‘édition d‘origine.

IT

Traduzione dalla versione originale in lingua tedesca.

Tutti i documenti redatti in altre lingue sono traduzioni dalla versione originale.

ES

Traducción del original alemán.

Los documentos en otras lenguas son traducciones de la versión original en alemán.

Table of contents

1 General

1.1 Information relating to the installation instructions

The classification of the contents is based on the life stages of the linear drive (hereinafter referred to as the “device”). The manufacturer reserves the right to make changes to the technical specifications stated in these installation instructions. In detail these can differ from the respective version of the device without the factual information being fundamentally changed and without losing their validity. The current status of the technical specifications can be requested from the manufacturer at any time. Any claims arising from this cannot be asserted. Deviations from the text and pictorial statements are possible and are dependent on the technical development, equipment and accessories of the device. The manufacturer shall provide information about any differing details relating to special versions by means of the sales documentation. Other specifications shall remain unaffected by this.

1.2 Standards and guidelines

During construction the fundamental health and safety requirements were applied and provision was made for the appropriate legislation, standards, directives and guidelines. The safety element is confirmed by the Declaration of Incorporation (see section 5 “Declaration of Incorporation”). All information relating to safety in these installation instructions refers to the laws and regulations that are currently valid in Germany. All information in these installation instructions must be complied with at all times and without limitation. In addition to the safety notices and directions in these installation instructions, the regulations applicable at the place of installation with regard to accident prevention, environmental protection and occupational safety must be observed and adhered to. The guidelines and standards for safety assessment can be found in the Declaration of Incorporation.

1.3 Intended use

The device is envisaged for use in the construction of machinery. It is for the purpose of adjusting high loads. Other fields of application must be agreed in advance with the manufacturer.

The operator alone is liable for any damage arising from the non-intended use of the device. The manufacturer assumes no liability for personal injury or damage to property caused through misuse or procedural errors, improper operator control or improper start of operation.

The device must be operated only by trained and authorized skilled personnel subject to compliance with all safety notices and directions.

Safe and error-free use and operating safety of the device can only be guaranteed subject to use in compliance the intended use in accordance with the specifications set out in these installation instructions.

Intended use includes observation of and adherence to all the safety notices and directions instructions specified in these installation instructions, as well as all applicable regulations of trade associations and the valid laws in relation to environmental protection. Use in compliance with the intended use also includes adherence to the operating regulations prescribed in these installation instructions.

1.4 Foreseeable misuse

Any installation into other equipment that deviates from the purpose cleared by the manufacture applies as being a foreseeable misuse.

1.5 Warranty and liability

In principle, the General Terms & Conditions of Sale and Delivery of the manufacturer apply. The Terms & Conditions of Sale and Delivery are a component part of the sales documentation and are handed over to the plant operator at the time of delivery. Liability claims for personal injury and damage to property are excluded, if they are attributable to one or several of the following causes:

- Opening of the device by the customer (breaking the seal)
- Use not in compliance with the intended use of the device
- Improper installation, start of operation or operator control of the device
- Changes to the design and construction of the device without the written approval of manufacturer
- Operation of the device with improperly installed connections and defective or improperly attached safety and protection devices
- Non-compliance with the safety stipulations, notices and directions provided in these installation instructions
- Exceeding of the specified technical specifications

1.6 Customer service of the manufacturer

The device may be repaired only by the manufacturer in the event of a fault. The address for sending in the device to the customer service department can be found on the inside of the back cover.

Mechanically secure the machine before dismantling the device.
The device must not be separated from the machine by force.

The serial number must be at hand, if you request customer service. This can be found in the top right-hand half of the type plate.

2 Safety

2.1 General safety notices and directions

These installation instructions contain all the safety notices and directions that must be observed in order to avoid and prevent dangers when working with the device in the individual life cycles. Safe use of the device is guaranteed when all the specified safety notices and directions are complied with.

2.1.1 Formulation of the safety notices and directions

The safety notices and directions in this document are marked with safety symbols and formulated in accordance with the SAFE principle. They contain specifications relating to the type and source of danger, the possible consequences, as well as the prevention of the danger.
The following table defines the representation and description of the levels of danger with possible physical injury, as used in these installation instructions.

Symbol	Keyword	Meaning
	DANGER	Warns of an accident that will occur if the instructions are not followed, which can lead to life-threatening, irreversible injuries or death.
	WARNING	Warns of an accident that may occur, if the instructions are not followed, which can lead to serious, perhaps life-threatening, irreversible injuries or death.
	CAUTION	Warns of an accident that can occur, if the instructions are not followed, which can lead to minor, reversible injuries.

The following table describes the symbols used in these installation instructions for the graphic display of danger situations in connection with the symbol for the danger level.

Symbol	Meaning
	Danger due to an electrical voltage, electric shock: This symbol refers to dangers associated with electrical currents.
	Danger of crushing and killing people: This symbol refers to dangers due to which the entire body or individual limbs can become crushed or injured.

The following table defines the representation and description used in the installation instructions for situations in which damage can occur to the product or draws attention to important facts, statuses, tips and information.

Symbol	Keyword	Meaning
	*CAUTION*	This symbol warns of possible damage to property.
		This symbol draws attention to important facts and statuses, as well as to further information in these installation instructions. Furthermore, it refers to specific instructions which give additional information on or provide assistance in how to perform a procedure more easily.

The following is an example of the structure of a safety notice:

DANGER

Type and source of danger

Explanation of the type and source of danger

- Measures to avert danger.

2.2 Safety principles

The device is built according to state-of-the-art technology and the generally accepted rules of safety and it is safe to operate. The basic safety and health requirements of the applicable laws, standards, directives and guidelines have been applied in the construction of the device. The safety of the device is confirmed by the Declaration of Incorporation.

All specifications pertaining to safety relate to the currently valid regulations of the European Union. In other countries it must be ensured by the plant operator that the applicable laws and national regulations are complied with.

In addition to the safety notices and directions in these installation instructions, the generally applicable regulations regarding accident prevention and environmental protection must be observed and complied with.

The device must only be used when in perfect working order, for its intended use, and in compliance with the safety notices and directions in these installation instructions. The device is designed for the application in accordance with the section “Intended use”. In the event of use that is not in compliance with the intended use, injury to the life and limb of the user or third parties or impairments to the device and other property can arise. Any accidents or almost accidents during the use of the device that lead to or could have led to personal injuries and/or damage in the working environment must be reported directly and without delay to the manufacturer.

All safety notices and directions specified in the installation instructions and on the device must be adhered to. In addition to these safety notices and directions, the operator must ensure that all national and international regulations applicable in the respective country of use, as well as other binding regulations relating to operational safety, accident prevention and environmental protection are complied with. All work on the device must be performed only by trained, safety instructed and authorized personnel.

2.3 General duties of the plant operator

- ❏ The plant operator is obligated to use the device only in perfect and operationally safe condition. He must ensure that, in addition to the safety notices and directions in the installation instructions, the generally accepted safety and accident prevention regulations, the specifications of DIN VDE 0100 and the provisions relating to environmental protection of the respective country of use, are heeded and complied with.
- ❏ The plant operator is responsible that all work with the device is performed only by trained, safety instructed and authorized personnel.
- ❏ Ultimately responsible for accident-free operation is the plant operator of the device or the personnel authorized by the plant operator.
- ❏ The plant operator is responsible for compliance with the technical specifications, in particular for compliance with the static loads.
  Non-compliance with the static loads may cause loss of the support or holding function.

2.4 Requirements of the personnel

- ❏ Each person who is charged with performing work on the device must have read and understood the complete operating instructions before he performs the corresponding work. This also applies, if the relevant person has previously worked with such a device or was trained to do so.
- ❏ All work on the device must be performed only by trained, safety instructed and authorized personnel. Prior to the commencement of all activities the personnel must have been made familiar with the dangers that exist while handling the device.
- ❏ All personnel may perform only work that is in accordance with their qualifications. The areas of responsibility of the respective personnel must be clearly defined.
- ❏ Any personnel charged with working with the device must have no physical limitations that temporarily or permanently restrict their attentiveness or judgement (e.g. due to overtiredness).
- ❏ Minors or persons who are under the influence of alcohol, drugs or medication are prohibited from working with the device, as well as performing any installation, dismantling or cleaning work.
- ❏ Personnel must wear suitable personal protective personal protective equipment appropriate to the work incurred and prevailing working environments.

2.5 Safety notices and directions relating to the technical condition

- ❏ The device must be checked before installation for damage and proper condition.
- ❏ The plant operator is obligated to operate the device only in perfect and operationally safe condition. The technical condition must comply with the legal requirements at all times.
- ❏ If dangers to personnel or changes in operating behaviour are recognized, the device must be shut down immediately and the incident reported to your superiors or to the plant operator.
- ❏ The device may only be connected to the energy supply intended and designed for this purpose. Please refer to the type plate for the permissible type of voltage and operating voltage.
- ❏ No changes, attachments or conversions may be performed on the device without the authorization of the manufacturer.

2.6 Safety notices and directions relating to transport, assembly, installation

The relevant transport company is fundamentally responsible for the transport of the device. The following safety requirements must be complied with during transport, erection and installation of the device.

- ❏ During transport the device has to be secured in accordance with the regulations of the auxiliary transport means being used.
- ❏ For transport only hoist and slings may be used that are dimensioned so that they can safely bear the forces that occur during loading, unloading and installation of the device.
- ❏ Only the points defined on the pallet and device are allowed to be used as lifting and hoisting points:
- ❏ If work is required on lifted parts or work devices, these must be secured against falling by means of suitable devices. Work equipment for the lifting of loads must prevent loads from shifting unintentionally, falling unhindered and unhooking unintentionally.
- ❏ Standing under suspended loads is prohibited.
- ❏ A hard hat must be worn during loading work with hoists.
- ❏ The erection and installation work may be performed fundamentally only by trained and instructed skilled personnel.

2.7 Safety instructions relating to operation

- ❏ The operator of the device is obligated to ensure the safe and proper state of the device before the initial start of operation.
- ❏ This is also necessary during operation of the device at regular intervals to be determined by the plant operator.

2.8 Safety notices and directions relating to the electrical installation

- ❏ All work on the electrical system must be performed only by authorized skilled electricians in accordance with the applicable rules and stipulations of the trade association, in particular the stipulations of DIN VDE 0100. Furthermore, the national statutory regulations of the respective country of use must be observed.
- ❏ In the event of any defects, such as loose connections or defective or damaged cables, the device must not be put into operation.
- ❏ In the event of faults with the electrical equipment, the device must be switched off immediately.
- ❏ The device must be switched off to de-energized before any inspection, installation or dismantling work.
- ❏ The device must not be hosed down with a high-pressure cleaner or steam jet.

The following must be checked before connecting the device to the power supply:

- ❏ Are all electrical connections, safety devices, fuses, etc. properly installed, connected and earthed?
- ❏ Is the power connection provided in accordance with the specifications in the electrical circuit diagram (voltage type, voltage level)?
- ❏ Has the supply line been de-energized?

3 Product description

3.1 General

The device is an electromechanical linear drive. It performs linear movements.

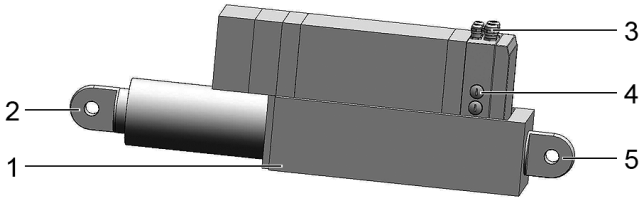

Abb. 1 Components of the device

1 Housing
2 Fastening on piston side
3 Connections for the connecting cable
4 Sensor for the electronic limit switch
5 Fastening on housing side

3.2 Product variants

The device can be obtained in various configurations.
You can refer to the order confirmation for the exact configuration of your device.

3.3 Technical specifications

All information in this section relates to an ambient temperature of 20°C.

3.3.1 Summary of the technical parameters

Technical specifications	Vario 1	Vario 2
Rated voltage	400 V 3 AC, 50 Hz	
Control power supply	24 V DC [1]	
Force, dynamic	up to 40,000 N	up to 100,000 N
Force, static	up to 40,000 N	up to 100,000 N
Stroke speed	approx. 1 to 70 mm/s	
Stroke length	up to 800 mm	up to 1000 mm
Rated current	up to 3 A [2]	up to 6 A [2]
Power	up to 2,100 VA	up to 4,200 VA
Duty cycle	S 3 15%	
Length of the control and connection cables	1.50 m [3]	
Protection class	IP 54	
Operating temperature range	- 10°C to + 50 C	
Airborne noise emission	> 70 dB (A) [4]	> 70 dB (A) [4]
Weight	up to 70 kg	up to 100 kg

Tab. 1 Technical parameters

1) Special version with 230 V 1 AC possible

2) If overcurrent devices are being used, the exact current consumption of the device has to be determined before installation.

3) At the customer's option, possible between 1.5 m and 10.0 m

4) 1 m distance; 1.6 m above the device; nominal operation, measuring uncertainty 10%

You can refer to the type plate for the variant-dependent values of your device.

3.3.2 Information relating to the self-locking facility

WARNING

Danger of injury through loss of the self-locking facility.
Crushing and fatal injuries are possible.

- Use device with a brake.

CAUTION

Possible damage to the device or customer's machine through loss of the self-locking facility.

- Use device with a brake.

With the devices it is differentiated between dynamic and static self-locking. Dynamic self-locking arises from movement and static self-locking when the device is at a standstill. The self locking facility on the devices is dependent on various factors, e.g.:

- Flight angle of the spindle and nut
- Surface roughness of the flanks of the spindle and nut
- Running speed

The self-locking facility can be negatively influenced by a multitude of factors, e.g. by:

- Shocks and vibrations
- Loads
- Heating

A theoretically self-locking spindle is no replacement for a brake. For this reason the assumption of any warranty obligations relating to self-locking is excluded.

Self-locking is NOT for the purpose of fulfilling any safety-related properties.

In order to minimize any further dangers, observe the duty of care that is normal for technical products.

4 Installation

WARNING

Danger of injury due to weathering influences.

The skin may suffer frostbite or burns.

- Wear personal protective equipment.

WARNING

Danger of injury due to incorrectly dimensioned mountings.

Crushing and fatal injuries are possible.

- Use only fastening materials that are suitable for the dimensions of the mountings.
- The counter-mountings (provided by customer) must be rated at least for the forces for which the device was designed.

WARNING

Danger of injury through loss of the support and holding function.

Crushing and fatal injuries are possible.

- Pay attention to static loads.

WARNING

Danger of injury due to electric current.

Electric shock possible.

- Have any electric work performed only by an authorized skilled electrician.

WARNING

Danger of life-threatening injury due to faulty electrical connection.

Electric shock possible.

- Check the proper connection of the PE conductor prior to initial start of operation.

CAUTION

Damage to the device due to radial and/or torsional forces.

- The device must be designed in such a way that no radial and/or torsional forces can act on the device.

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CAUTION

Damage to the device due to the connecting rod jamming.

- The linear path of the piston must be freely moveable at all times.
- The pivoting range of the device must be kept free.

CAUTION

Damage to the device due to loss of the support and holding function.

- Pay attention to static loads.

CAUTION

Damage to the device due to wrong operation.

- The thermal protection switch must not be used as a regular overload switching device.
- Fast polarity reversal of the traversing direction of the drive is not permissible.
- The drive must come to a complete standstill before changing the direction of movement.

The device was manufactured with the circuit diagram ordered by you. The designation can be found in the sales documentation or the circuit diagram enclosed with the delivery.

In delivery condition (factory setting), the connecting rod is already slightly extended. Please refer to the sales documents for the minimum and maximum dimensions.

4.1 Mechanical fastening

CAUTION

Damage to the device due to torsional forces.

- No torsional forces may be allowed to act on the device.

CAUTION

Damage to the electrical leads due to crushing or a tensile load.

- All electrical leads have to be laid so that they are not exposed to any crushing or tensile loads.

Fasten the device only by the fastening elements provided for this purpose. These are located on the housing side and on the connecting rod (see Fig. 1 “Components of a device”).

If designed with a pivot pin (optional) or with threaded holes (optional) the fastening on the housing side is replaced.

4.2 Electrical connection

WARNING

Danger of life-threatening injury due to faulty electrical connection.

Electric shock possible.

- Check the proper connection of the PE conductor prior to initial start of operation.

CAUTION

Damage to the device due to faulty electrical connection.

- Take note that the motor and control unit have different supply voltages.

CAUTION

Damage to the device due to mishandling.

- Operation must not take place without integration into and evaluation of the limit switches in the control unit.

CAUTION

Damage to the device due to faulty electrical connection.

- Always connect the monitor cable to a right-hand rotary field.

CAUTION

Damage to the device due to the use of a non-fitting or unsuitable drive control unit.

- The control unit must support all the options attached to the device.
- Connect all the marked cable conductors.
- Do not connect any conductors that are not marked.

No circuit diagrams are listed below on account of the multitude of configuration possibilities.

The device has to be connected in accordance with the circuit diagram enclosed with the delivery.

Please refer to the following pages or the circuit diagram enclosed with the delivery for connection of the option selected by you.

4.3 Optional attachments

4.3.1 Optional brake

CAUTION

Damage to the device due to incorrect connection of the brake.

- Operate the device only when the brake is released.
- Do not tap the brake voltage parallel to the motor.

With the integrated brake you can decelerate the stroke movement of the connecting rod faster and optimize the static safety.

To release the brake, connect the brake coil with conductor codes X1 and X2 to the rated voltage of the brake in accordance with the type plate.

In the case of the design version with a rectifier (recognizable by the 4-conductor connecting cable X1 to X4) you must additionally connect the conductors X3 and X4 to cancel out the braking effect. This can take place by means of an auxiliary contact of the control unit.

The braking effect does not set in until the operating voltage is missing at X1 and X2.
In the case of versions with a rectifier the braking effect does not set in until the operating voltage is missing at X1 and X2 (long reaction time) or the connection X3 and X4 is opened (short reaction time).

4.3.2 Optional shaft encoder

The integrated shaft encoder supplies information about the movement of the connecting rod. Please refer to the following table for the parameters necessary for operation.

Electrical parameters	
Output switching	Push-pull
Rated voltage (U_B)	5 – 24 V DC
Current consumption (no load)	max. 50 mA
Permissible load per channel	max. 50 mA
Signal level high	min. U_B - 2.5 V

Electrical parameters	
Signal level low	max. 0.5 V
Rise time t_r	max. 1 µs
Fall time t_r	max. 1 µs
Short-circuit resistant outputs	Yes
CE conformity in compliance with EN 50081-2 and EN 55011 class B	

Tab. 2 Electrical parameters of the shaft encoder

Signal	0 V	+U_B	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$
Conductor colour	WH	BN	GN	YE	GY	PK	BU	RD

Tab. 3 Connection assignment of the shaft encoder

All unused conductors have to be insulated before start of operation.

The screening must be applied by the customer.

4.3.3 Optional analog output (0 – 10 V)

The integrated analog output supplies information about the movement and current position of the connecting rod to the control unit.

The analog output is electrically isolated from the limit switch electronics of the device and therefore requires a separate voltage supply of 24 V DC.

However, to operate the analog output it is necessary that both voltages are connected, i.e. the limit switch electronics as well (24 V DC or 230 VAC).
The output voltage increases linearly to extend the connecting rod.

The output voltage of 0 – 10 V relates to the maximum stroke..

The screening must be applied by the customer.

4.3.4 Optional programmable intermediate position

Teach-in of the intermediate position is not possible until both limit positions have been taught in.

The red button is used to teach in the intermediate position.

1. Traverse the drive to the desired intermediate position.
2. Hold down the red button for at least 3 s.

   ✓ The red button lights up.

3. Save the position by briefly pressing the red button.

   ✓ The red button goes out.
   The intermediate position is taught in.

Due to the design the switching point is subject to a certain degree of hysteresis.
The teach-in of the intermediate position can be repeated at any time.

4.4 Setting the electronic limit switches

CAUTION
Damage to the device due to a voltage failure during the programming procedure.

- After a voltage failure during programming, check whether the limit positions have been deleted.

The electronic limit switch is integrated into the drive.

The device has non-adjustable absolute limit positions that have been programmed at the factory.
These are programmed to the designed stroke of the device. The electronic non-adjustable safety limit switches, which can only be reached in the event of a defect and which switch off the device, are located a short distance behind these absolute limit positions.

The adjusting buttons are located on the side of the housing and are covered by dummy screw unions (see Fig. 1 “Components of a device”). Before the programming or adjustment of the limit positions you must remove the dummy screw unions with a standard screwdriver.

The electronic limit switch has the function of monitoring the position of the connecting rod and switching the corresponding relay contacts when the taught-in positions are reached. These must be evaluated by your control unit and must lead to the immediate switching-off of the motor. In the case of the optional brake, it must be switched simultaneously (see section 4.3.1 “Optional brake”).

Furthermore, a third relay contact is provided for the display of an intermediate position that can be randomly taught in. If the intermediate position is overrun the relay contact changes its switching status.

Permissible adjusting range of the limit switches:
The limit switches “Retracted” and “Extended” can be adjusted via the total stroke. You have the possibility of setting the limit positions between 0 and maximum stroke. In doing so, a minimum stroke of 10 mm has to be maintained.

4.4.1 Teach-in of the limit positions

Factory setting:
The limit positions have been preset to the dimensions defined in the order confirmation.

If any other dimensions are required, proceed as described below.

Deletion of the limit positions:

Two limit positions are always deleted when deletion is performed and both of them have to be taught in again afterwards.

1. Keep the two buttons for the electronic limit switch pressed simultaneously for at least 3 s.

   ✓ Both buttons flash.
   The positions of the limit switches are deleted.

Red button: limit position “Extended”
Green button: limit position “Retracted”

Teach-in of the limit position “Extended” (red button):

2. Traverse the drive to the desired position.
3. Save the position by briefly pressing the red button.

   ✓ The red button lights up.
   The limit position “Extended” is taught in.

4. The red button goes out, when the piston is moved away from the limit position.

Teach-in of the limit position “Retracted” (green button):

5. Traverse the drive to the desired position.
6. Save the position by briefly pressing the green button.

   ✓ The green button lights up.
   The limit position “Retracted” is taught in.

7. The green button goes out, when the piston is moved away from the limit position.

Precision adjustment of the limit positions:

A precision adjustment of the limit positions is not possible until both limit positions have been taught in. The precision adjustment can be performed or corrected several times. The drive must be located in the relevant limit position.

1. Traverse the device to the corresponding limit position until the red or green button lights up.
2. To adjust the exact position of the limit position press the corresponding button once or several times.

Red button: increases the traversing range
Green button: decreases the traversing range
Each press of the button represents approximately 0.3 mm.
Press the button a maximum of eight times. The position then has to be reapproached.

3. Approach the position again to check the precision adjustment.

4.4.2 Displays in the event of errors

The error situations described below are signalled by the flashing of the red and green buttons. If the display is flashing, the device can no longer traverse for safety reasons.

Green button flashing fast (> 3 Hz):

- The drive has overrun a limit position and has stopped on the safety limit switch.
- Under normal operating conditions the drive cannot be traversed again to an operational position.
- To do so, please contact our technical customer service department (see section 1.6 “Customer service of the manufacturer”).

The green and red buttons are flashing alternately:

- An internal error has occurred in the electronic path acquisition.
- To reset the error, briefly switch off the control voltage.
- When the control voltage is reconnected the error will be reset.
- If the alternate flashing occurs again, contact our technical customer service on this subject (see section 1.6 “Customer service of the manufacturer”).

Green or red button flashing slowly:

- The programming is not complete (only one limit position has been taught in).
  Caution: Applies to the green button only, if the device is within the permissible traversing range.

4.5 Dimensions sheet

On account of the multitude of configuration possibilities no dimensions sheets are listed below.
You can request from the manufacturer an exact dimensions sheet for the device supplied, if required.

5 Declaration of incorporation

The complete declaration of incorporation can be downloaded from our website: www.elero-linear.de/downloads.

6 Waste disposal

6.1 Scrapping

When scrapping the device, comply with the internationally, nationally and regionally specific laws and regulations valid at that point in time.

Ensure that the recycling capability, dismantling capability and separation capability of the materials and subassemblies as well as the environmental and health dangers are all taken into consideration for the recycling and waste disposal.

Material groups, such as plastics and metals of different types, must be sorted before submitting to the recycling and waste disposal process.

6.2 Disposal of waste electrical and electronic components

The disposal and recycling of waste electrical and electronic components must take place in compliance with the relevant laws and national regulations.

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