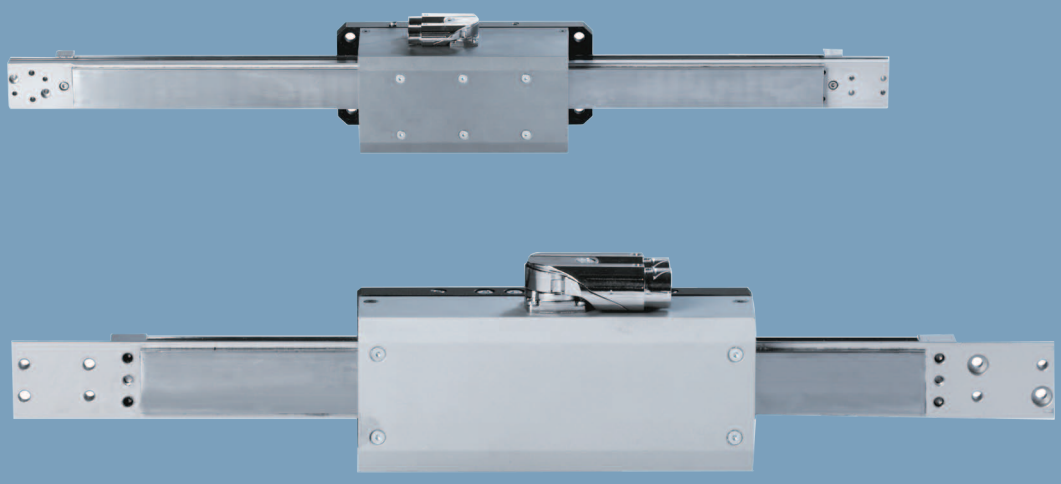
Technik, die begeistert



Installation- and operating manual

Compact linear motor shafts

HL50 - HL100

Mechanical system documentation

980-208018000 / EN 07/2011

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1 Introduction

1.1 Definition

The linear motor shaft is a Handling system with a highly dynamic, high-performance Linear motor.

The linear motor shaft is referred to as machine in the following text of this operating manual.

1.2 Correct use

The machine is a noncomplete machine conforming to Directive 2006/42/EC, Article 1g and 2g.

The machine is designed for integration in other machines, in other incomplete machines or equipment or for connection to these.

It may only be used within the limitations defined in the order characteristics.

Commissioning is forbidden until the conformity of the product in which the machine is installed with Directive 2006/42/EC and all other Directives governing use has been determined and confirmed.

Observance of the accompanying documentation and adherence to maintenance regulations are also component parts of correct use.

1.3 Incorrect use

Any use of the machine above or beyond the directions for correct use is regarded as incorrect and prohibited.

The machine must not be subjected to loads that exceed the maximum limits.

The machine is not suitable for use

- in wet or damp environments of any kind (water, oils, acids, steam or vapours, etc.).
- in an environment with gases or radiation.
- in potentially-explosive atmospheres.
- in environments which contain swarf.

1.4 Laws / EC Directives / Norms

The machine is designed and constructed to conform to

- applicable laws
- Directive 2006/42/EC (Machinery Directive)
- Low Voltage Directive, 2006/95/EC
- EMC Directive 2004/108/EC
- and the harmonised standards that we have cited

and meets state-of-the-art technological standards in terms of its construction.

1.5 EC Declaration

An EC Declaration as specified by Directive 2006/42/EC (Machinery Directive) is included with each machine at delivery.

The text of this EC Declaration is as follows:

WEISS GmbH Sondermaschinentechnik

Siemensstrasse 17

D-74722 Buchen, Germany

Declaration of incorporation of partly completed machinery
in accordance with EC Machinery Directive 2006/42/EC, Annex II B

Prohibition of commissioning

We hereby declare that the machine called Linear motor shafts HL50 - HL100 is intended for the installation into another machine or is to be assembled with other machines to a machine in terms of the directive 2006/42/EC.

Commissioning is prohibited until it has been established that the machine into which the aforementioned product should be installed satisfies the provisions of the EC Machinery Directive, and that a Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex II A has been issued.

1.6 System-dependant documentation

In addition to this manual, further documents are required to ensure safe operation of this machine. The specifications stated in these documents are to be observed.

For control system by WEISS-GmbH:

- Betriebsanleitung WAS.handling Steuerung HL50 - HL100
- Operating manual WAS.handling Windows programme
- Operating manual Hand-held grease gun (for the model with lubricating nipples)
- Operating manual automatic lubrication pump (for model with automatic lubrication)

1.7 Operating manual

This operating manual is a translation of the original operating manual and is part of the scope of delivery.

We reserve the right to undertake modifications resulting from further technological development which diverge from the data and illustrations contained in this operating manual.

The operating manual and the associated valid documentation are not subject to an automatic revision service.

Information on the respective current edition can be obtained from the manufacturer.

Local regulations must be heeded.

This operating manual describes handling of the machine and contains important instructions and information to assist you in correct use of the machine.

The operating manual is designed for trained technical personnel and instructed persons. It should be kept at the location of use of the machine at all times and read, understood and applied by all persons entrusted with work on or with the machine.

Safety instructions in individual chapters should be observed.

1.7.1 Explanation of safety instructions in this manual

This manual contains instructions which you should observe for your personal safety and to avoid material damage.

Safety instructions for your personal safety are highlighted by a sign containing a warning triangle and signal word. The associated text describes the hazard involved, avoidance options and the consequences of a failure to heed the safety instruction.

General instructions or instructions relating to possible material damage are highlighted by a sign without a warning triangle.

They are, depending on the degree of risk involved, illustrated as follows:

DANGER	***A warning triangle with the signal word DANGER indicates an immediate hazardous situation which, if not avoided, will lead to fatalities or grievous injuries.***
WARNING	***A warning triangle with the signal word WARNING indicates an potential hazardous situation which, if not avoided, can lead to fatalities or grievous injuries.***
CAUTION	***A warning triangle with the signal word CAUTION indicates an potential hazardous situation which, if not avoided, can lead to light or medium injuries.***
NOTICE	***A sign with the signal word NOTICE indicates potential material damage or provides additional information which should be observed when operating the machine.***

1.7.2 Legend

In these manual images, symbols and abbreviations with the following meaning are used for clarity:

1. Marks a numbered list.
   a) Marks the second level of a numbered list.

- Marks a list.
  - Marks the second level of a list.

📖 The book symbol before a section of text indicates additional applicable documents.

ⓘ The information symbol before a section of text marks an additional note or an important tip for use.

1.7.3 Figures

The figures used are examples. There may be differences between the illustrations and the actual delivery.

1.7.4 Index of valid pages

Pages of this operating manual including the title page: 48

1.8 Guarantee and liability

The machine is covered by a guarantee of 24 months without shift limitations.

2 Safety

2.1 Fundamental safety instructions

2.1.1 Operator‘s obligation to exercise diligence

This machine conforms to state-of-the-art technological standards and ensures a maximum level of safety.

However, this level of safety can only be attained under operating conditions if all measures necessary for this have been taken. The operator‘s obligation to exercise diligence includes planning of these measures and the inspection of their realisation.

The operator must ensure that

- the machine is only used as intended.
- the machine is only operated in faultless, functional condition and mechanical and electrical safety devices are present.
- required personal protective clothing is provided for and used by operating, maintenance and repair personnel.
- the operating manual and all other applicable documentation is maintained at all times in legible condition and is accessible at the implementation site of the machine. Ensure that all personnel who must execute activities tasks on the machine can access the operating manual at all times.
- only adequately qualified and authorised personnel maintain and repair the machine.
- such personnel are instructed regularly in all questions concerning occupational safety and environmental protection, including the operating manual and safety instructions contained therein.
- all safety instructions and warnings affixed to the product are not removed and must remain legible.
- national accident prevention guidelines and company-internal guidelines are complied with.
- VDE regulations are complied with.
- the EMC legislation is complied with during installation.

2.1.2 Requirements to be met by personnel

It is imperative that the following safety instructions be observed during all operations involving the machine. This ensures avoidance of life-threatening injuries, machine damage, other material damage and environmental damage.

Personnel must ensure that

- trainees are initially permitted to only work on the machine under the supervision of an experienced person.
- all personnel who maintain the machine read the operating manual and confirm with their signature that they have understood the operating manual.
- unauthorised persons are not in the vicinity of the machine when tasks are being performed.
- supplemental to the operating manual the operating instructions as specified in labour protection legislation and work equipment use legislation are complied with.
- the operator or supervisory personnel are informed in the event of malfunction.
- required personal protective clothing is used.

The following work described in this operating manual should only be realised by qualified personnel:

- Installation
- Commissioning
- Operating
- Maintenance

2.2 Safety equipment for the machine

There are danger signs attached to the machine. Danger signs provide information about possible hazards, which could be caused by the machine.

Danger sign	Meaning
	Beware of magnetic field ASR A1.3 Annex 1; DIN 4844-2: 2001-02 and DIN 4844-2/A1:2004-05; 92/58/EEC directive regarding safety signs
	Beware of hot surface ASR A1.3 Annex 1; DIN 4844-2: 2001-02 and DIN 4844-2/A1:2004-05

The operator is responsible for ensuring that a suitable safety concept is developed and applied for the safe operation of the machine.

The operator must take all measures to protect his personnel against injury by the machine.

These include:

- Safety housing with monitored safety door
- Emergency stop circuit
- Light barriers or switch mats
- Warning indicators
- Attach danger sign at the access point of the entire machine

Danger sign	Meaning
	Prohibited for persons with pacemakers ASR A1.3 Annex 1; DIN 4844-2:2001-02 and DIN 4844-2/A1:2004-05; ISO/FDIS 7010: 2003; ISO 7010

ⓘ We also recommend that the danger signs shown in chapter 2.2 are attached in an enlarged form at the access points to the protection area of the entire machine.

2.3 Residual hazards

WARNING

Strong magnetic fields

Strong magnetic fields are emitted from the permanent magnets of the secondary part. Assembly, commissioning and maintenance only by qualified, trained and instructed personnel.

Pacemakers and/or medical The functioning of metal implants can be compromised. Persons with pacemakers and/or medical implants made of metal may not handle the machine under any circumstances. Danger of severe to fatal injuries.

Objects made of magnetisable materials such as jewellery, watches or tools can be attracted. Do not wear any magnetisable materials when handling the machine. Handle tools carefully. Injuries caused by being pulled in.

Missing safety equipment

Operation without safety equipment is dangerous. The realisation of a suitable The operator is responsible for the safety concept. The operator must provide for sufficient safety measures such as protective grating, light grids, emergency stop button, covers, warning notices, etc. Operation without safety equipment is prohibited. Injuries caused by squeezing, impact, magnetism.

Missing danger signs

Damaged or illegible danger signs no longer fulfil their purpose. Make sure the danger signs are complete and legible. Replace damaged danger signs.

Danger of explosion

Danger of explosion during operation in a potentially explosive atmosphere. Operation in a potentially explosive atmosphere is prohibited according to correct use. Only correct use is permitted. Injuries caused by an explosion.

Incorrect spare pats / mounting of ancillary equipment

The use of incorrect spare parts or the mounting of unauthorised ancillary equipment can lead to subsequent damage with the risk of injury. Only use spare parts from our spare parts list or spare parts we have approved. The mounting of ancillary equipment must be coordinated with us. Injury of persons due to subsequent damage.

Impermissible modifications

Impermissible modifications can lead to subsequent damage with risk of injury. Modifications on the machine are prohibited. Injury of persons due to subsequent damage.

Electric shock

Power and control connections may still conduct electricity after the machine has been deactivated and is stationary. Energised capacitors inside the servo amplifier may still be charged, despite the power supply being deactivated. Work on electrical equipment should only be realised by skilled electrical personnel and under observance of specifications in the electrical operating manual. Electrical connections for the machine should only be loosened or plugged in when the power supply is deactivated and secured against reactivation. The status of capacitor charging should be measured prior to working on machine electrical equipment. The procedure for measuring charges is described in the electrical operating manual. Touching energised components can lead to serious or even fatal injuries.

Squeezing or pulling in

The secondary part of the machine moves at a very high speed. Extremities can be crushed or pinched when interfering with the motion sequence. Never put hands into the work area of the machine. Injuries caused by squeezing.

3 Product description

3.1 Structure

The freely programmable, compact linear motor shaft HL consists of a primary and secondary part. The primary part is the stable base body [A] made of steel (optionally made of aluminium) with the electric connections. The secondary part is is the movable guide rail [B] with the permanent magnets and the adapter plates [C].

The machine can be supplied in two installation sizes each with different stroke lengths

Each stroke length can be supplied without brake, with one brake or with two brakes.

A gripper or other epqipment can be mounted at the adapter plate [C] of the secondary part by the operator. Mounting position is left or right.

The electric connections are made via a multi-purpose plug. One connection for a lubrication unit for automatic lubrication is available (see chap. 3.6 „Lubrication“ on page 26).

Multi-purpose plug and connection for a lubrication are mounted freely accessible at the secondary part.

An incremental magnetic length-measuring system is employed.

The reference motion involves moving towards one fixed stop of the machine.

An absolute measuring system can be optionally applied for travelling distances up to 500 mm.

The following parameters of the machine are variable:

- maximum stroke
- Design with brake/brakes
- Adaption grippers
- Measuring system
- Design of the lubrication connections

Fig. 1: General view of the linear motor shaft

3.2 Function

The secondary part conducts linear movements across the indicated stroke length.

The motor of the machine is controlled via servo amplifier. A high level of positional accuracy and repeat accuracy are achieved through the integrated measuring system.

The positional accuracy describes the acceptable tolerance of the linear unit for an operating command involving movement to a specified position. It is determined by mechanical tolerances and the accuracy of the measurement system. Furthermore, the positional accuracy is influenced by external and internal temperature changes. The specified positional accuracy is attained for temperatures within a range of +/-15°C.

The repeat accuracy describes the deviation of the linear unit, which is permissible for the repeated movement to the same position - even after repeated switch on and off. It is influenced by external and internal temperature changes as well as the condition of the mechanical stops for the referencing. The specified repeat accuracy only applies at a constant temperature of +20°C and without any external strain.

3.3 Technical data

Linear motor shaft	**HL50**	**HL100**
Max. driving force	180 N	360 N
Nominal force	65 N	120 N
Max. speed	4 m/s	4 m/s
Max. acceleration	40 m/s²	40 m/s²
Max. payload	3,5 kg	8,0 kg
Nominal voltage	230 V	230 V
Nominal current	1 A	3 A
Peak current	2,5 A	9 A
Temperature control	PTC-switch	
Repeat accuracy	0,01 mm	0,01 mm
	The accuracy applies at a constant ambient temperature of 20 °C.	
Available strokes	150 - 300 mm	150 - 300 - 450 mm
Max. surface temperature	75 °C	
Max. ambient temperature	depending on the load	
Brake		
Holding power per clamp unit	200 N	

3.3.1 Measuring system

Linear motor shaft	HL50	HL100
Incremental measuring system		
Type	EHP 1	
Voltage supply	+5 V ±5 %, 35 mA	
Incremental signals	sin / cos 1 Vss	
Signal period	1 mm	
Resolution	0,244 µm (bei 4096times-Interpolation)	
Accuracy measuring system	10 µm (transmitter + tape measure) at 20 °C	
Reference marks	none	
Measuring system absolute - BISS - C mode		
Type	AHP 1	
Voltage supply	+5 V ±5 %, 80 mA max.	
Absolute signals	BISS - C	
Measuring length (max.)	512 mm	
Resolution	19 bits	
Standardisation	1024/mm	
Accuracy measuring system	± 5 µm (transmitter + tape measure) at 20 °C	
Measuring system absolute - BISS - C mode		
Type	AHP 1	
Voltage supply	+5 V ±5 %, 80 mA max.	
Absolute signals	SSI	
Baud rate (adjustable)	1000 kHz; 500 kHz; 125 kHz; 62,5 kHz	
Measuring length (max.)	512 mm	
Resolution	19 bits	
Standardisation	1024/mm	
Incremental signals	SIN / COS 1 Vpp	
Signal period	1 mm	
Accuracy measuring system	± 5 µm (transmitter + tape measure) at 20 °C	

3.3.2 Scope of delivery

The scope of delivery of the machine depends on the order involved. Please refer to the ordering information or order characteristics for individual components.

3.3.3 Sound level

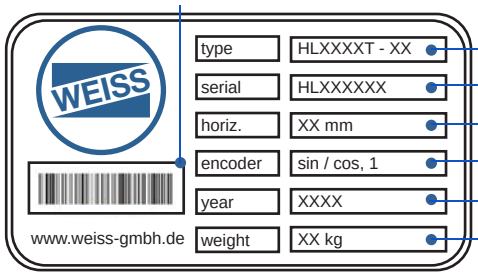
The A-weighted emission sound pressure level do not exeed the allowable peak.

3.3.4 Type plate

The type plate is fitted to the housing of the machine and contains the details described in the illustration.

NOTICE ***The illustrated type plate is merely an example of any machine and is not identical to the actual type plate of the described product.***

A second type plate is included in the scope of delivery. This second plate can be mounted at a clearly-visible location on the machine to allow viewing of performance data if the type plate fitted by the manufacturer is concealed by any other structures.



Additional barcode serial number	
	Type
	Serial Number
	Stroke
	Measurement system*
	Year of construction
	Weight
* sinus / cosinus measurement system with pole pitch of 1 mm	

Fig. 2: Example of a type plate

3.3.5 Ambient conditions

Humidity	5 % to 95 %, non-condensing
Allowable temperature range	Storage: +5 °C to +55 °C Operation: +15 °C to +45 °C
Environment	It is not permissible to use the machine in environments that contain abrasive dusts.

3.3.6 Installation positions

Permissible installation positions for the machine are:

- horizontal and vertical at any angles.

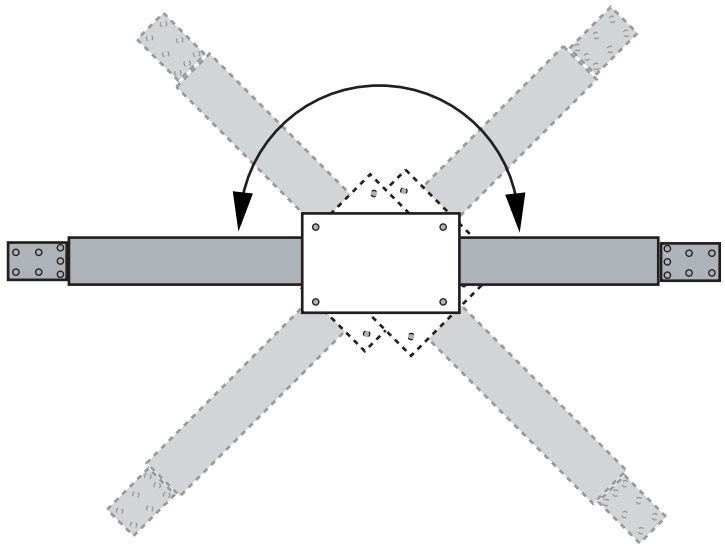
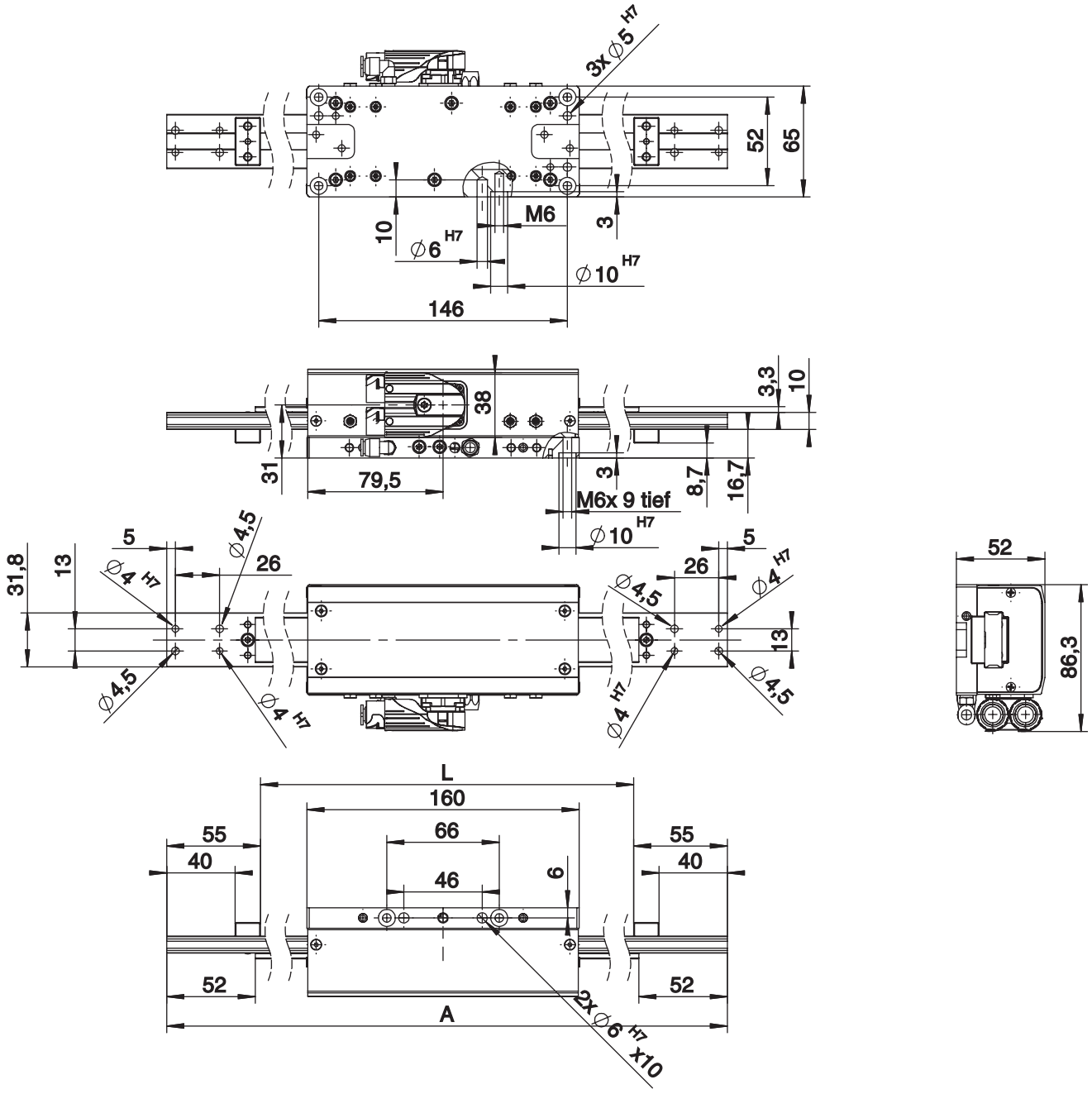


Fig. 3: Installation positions

NOTICE ***At all non-horizontal installation positions an appropriate brake application has to be privided.***

3.3.7 Dimensions

3.3.7.1 Linear motor shaft HL50



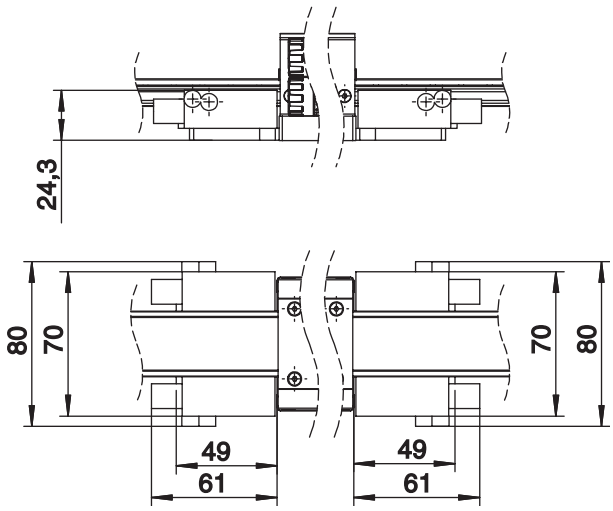
Tolerance of the drill holes and pinholes: ± 0.02 mm

Measurement table:

Dimensions in mm

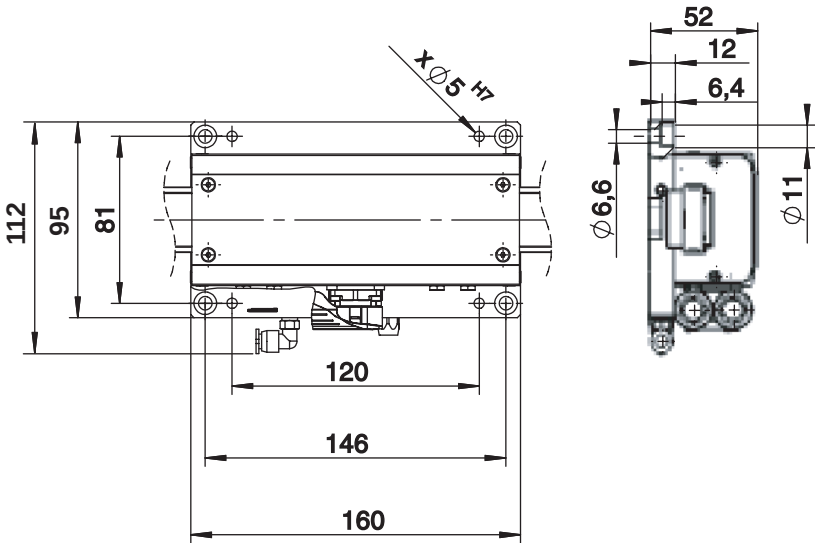
Stroke	L			A
	at numbers holding brake			
	0	1	2	
150 300	Hub + 160	Hub + 209	Hub + 258	L + 110

Option: Holding brake



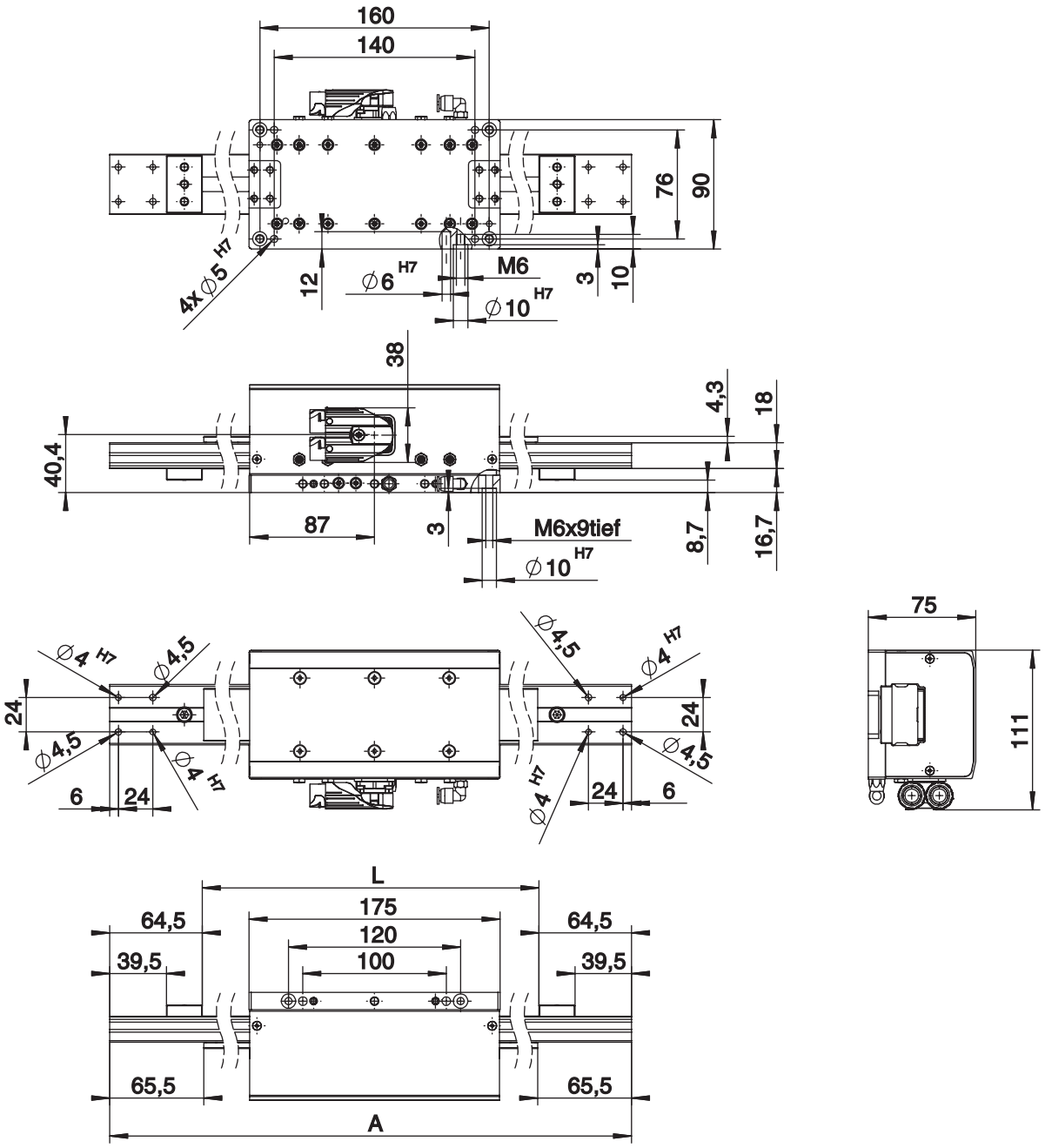
Tolerance of the drill holes and pinholes: ± 0.02 mm

Alternative: Mounting flange wide



Tolerance of the drill holes and pinholes: ± 0.02 mm

3.3.7.2 Linear motor shaft HL100



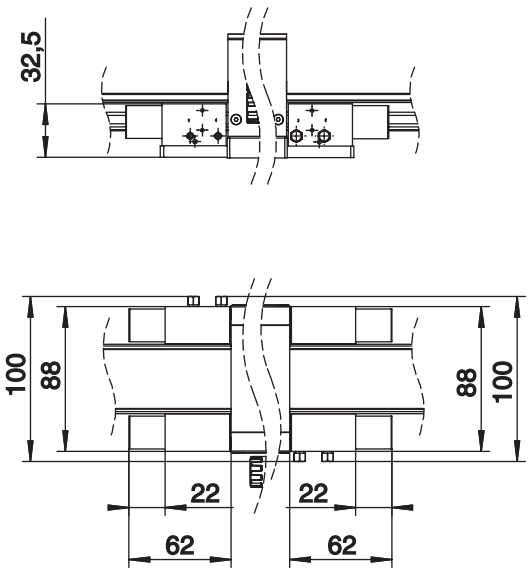
Tolerance of the drill holes and pinholes: ± 0.02 mm

Measurement table:

Dimensions in mm

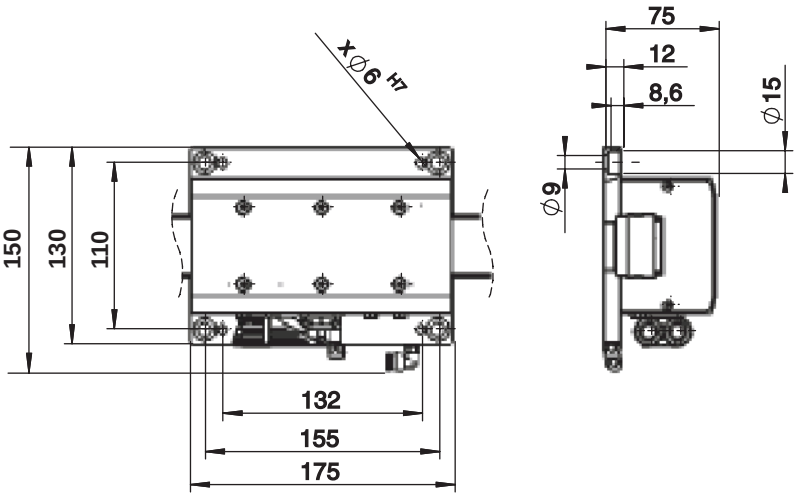
Stroke	L			A
	at numbers holding brake			
	0	1	2	
150	Hub + 175	Hub + 215	Hub + 255	L + 129
300				
450	0	1	2	

Option: Holding brake



Tolerance of the drill holes and pinholes: ± 0.02 mm

Alternative: Mounting flange wide



Tolerance of the drill holes and pinholes: ± 0.02 mm

3.4 Electrical connections

The servo amplifier and the ready-made electric cables are included in delivery when the machine is supplied with the electrical package.

3.4.1 Plug-in connections

The multi-purpose plug for motor cable and measuring system are mounted in an easily accessible and rotatable manner on the primary part of the machine.

A connector [A] to connect a 24 Volt holding brake is available.

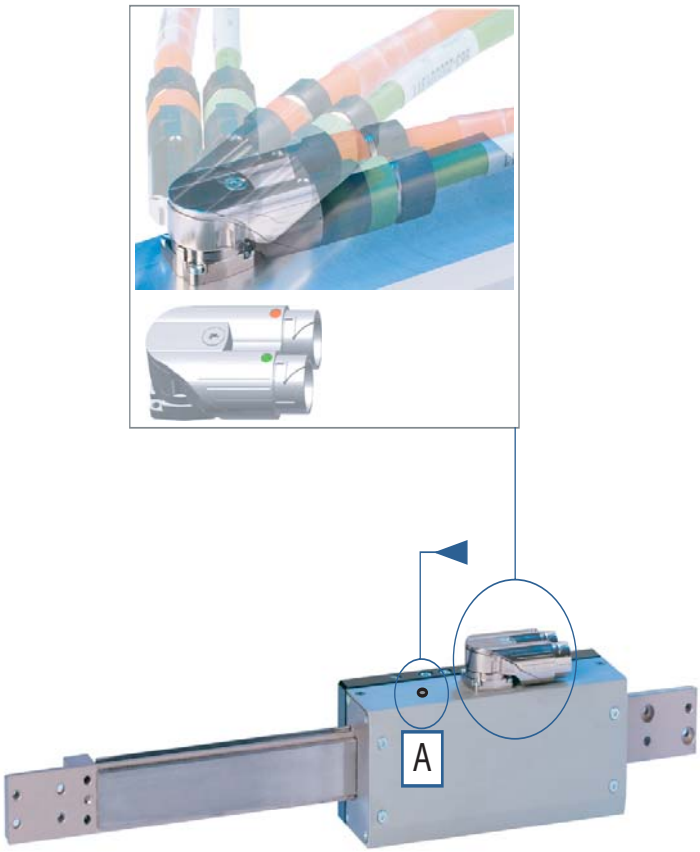
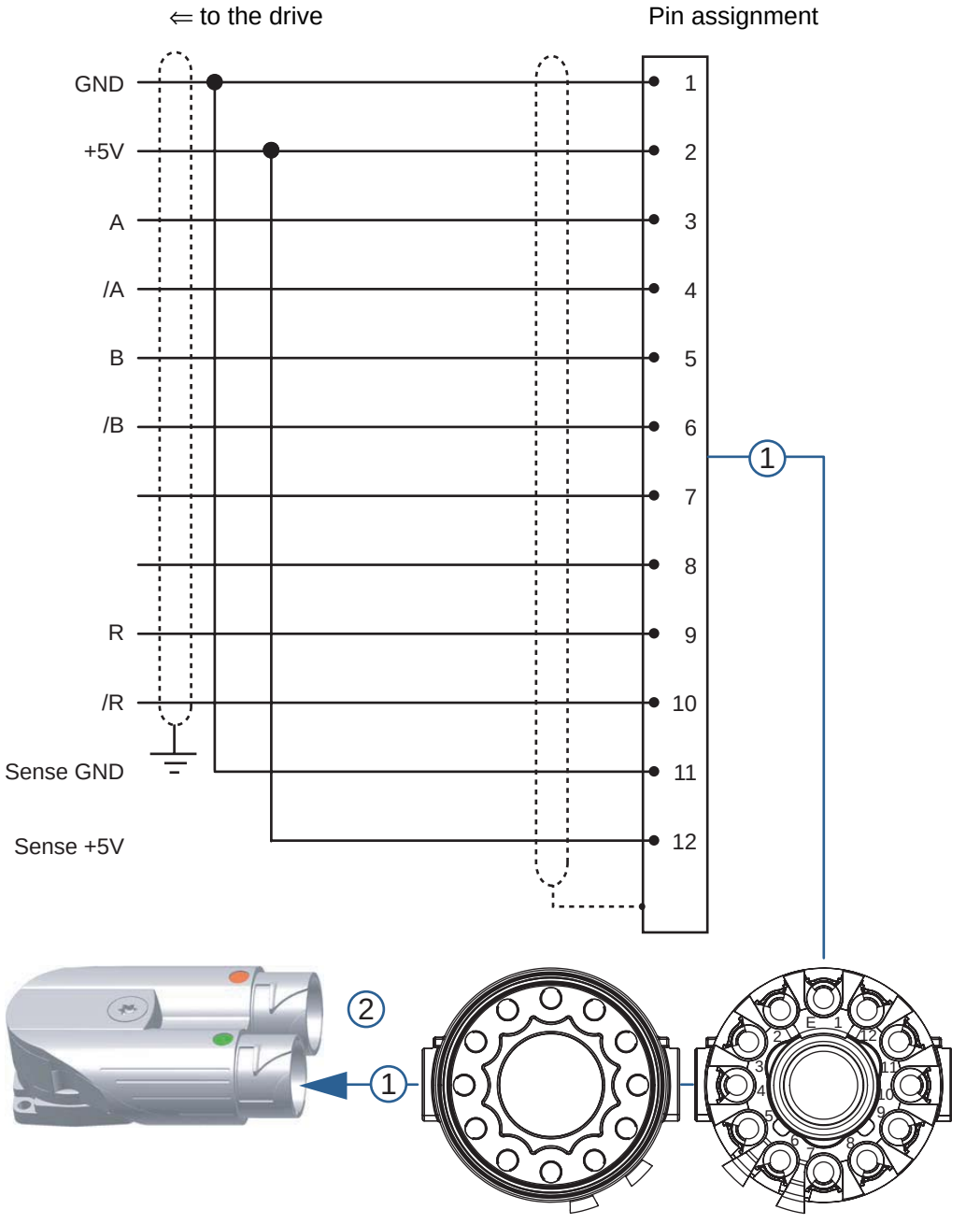


Fig. 4: Plug-in connections

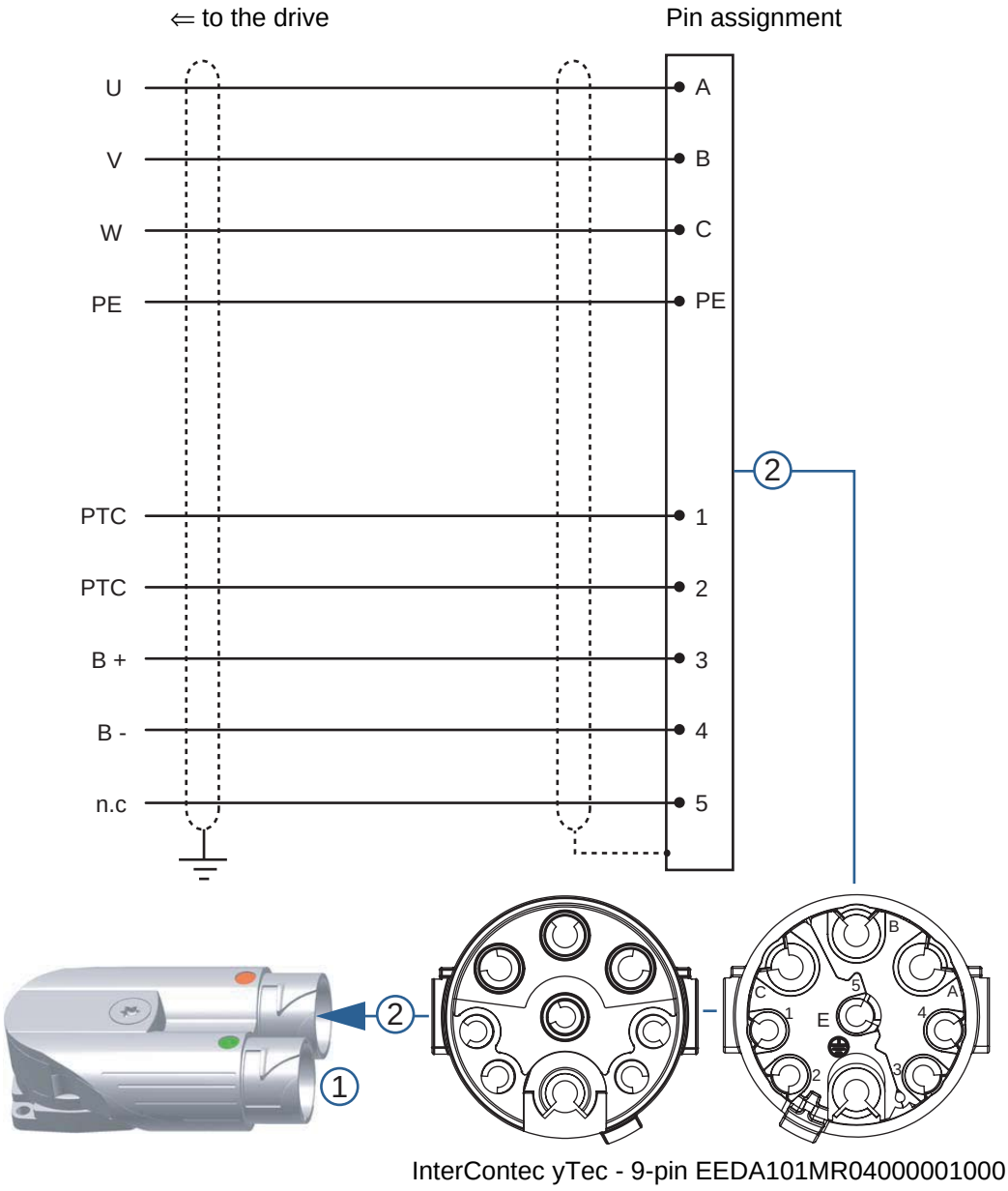
3.4.2 Connector pin assignment

3.4.2.1 Encoder connection



InterContec yTec - 12-pin EEDA101MR04000001000

3.4.2.2 Motor connection



InterContec yTec - 9-pin EEDA101MR04000001000

3.5 Option with tool connector

The machine can be optionally delivered with a tool connector. With this, the pneumatic and electrical supply up to the gripper is prepared.

The tool connector consists of the following components:

- Aluminium flange
- Sensor actuator box incl. connection lead
- Corrugated hose

Tool connector weight: 0.35 kg.

The tool connector is equipped with a sensor actuator box from Lumberg Typ SBS4/LED.

Alternativ a sensor actuator box from Balluff, Typ BPI 4M303P-2K-00-SM48T is used.

Sensors provided the customer are connected via a 3-pin M8 plug [1] (e.g. RSMCK3 type).

The electrical signals are applied as follows:

- M8 - Bush 1: E1 - Input 1
- M8 - Bush 2: E2 - Input 2
- M8 - Bush 3: E3 - Input 3
- M8 - Bush 4: E4 - Input 4

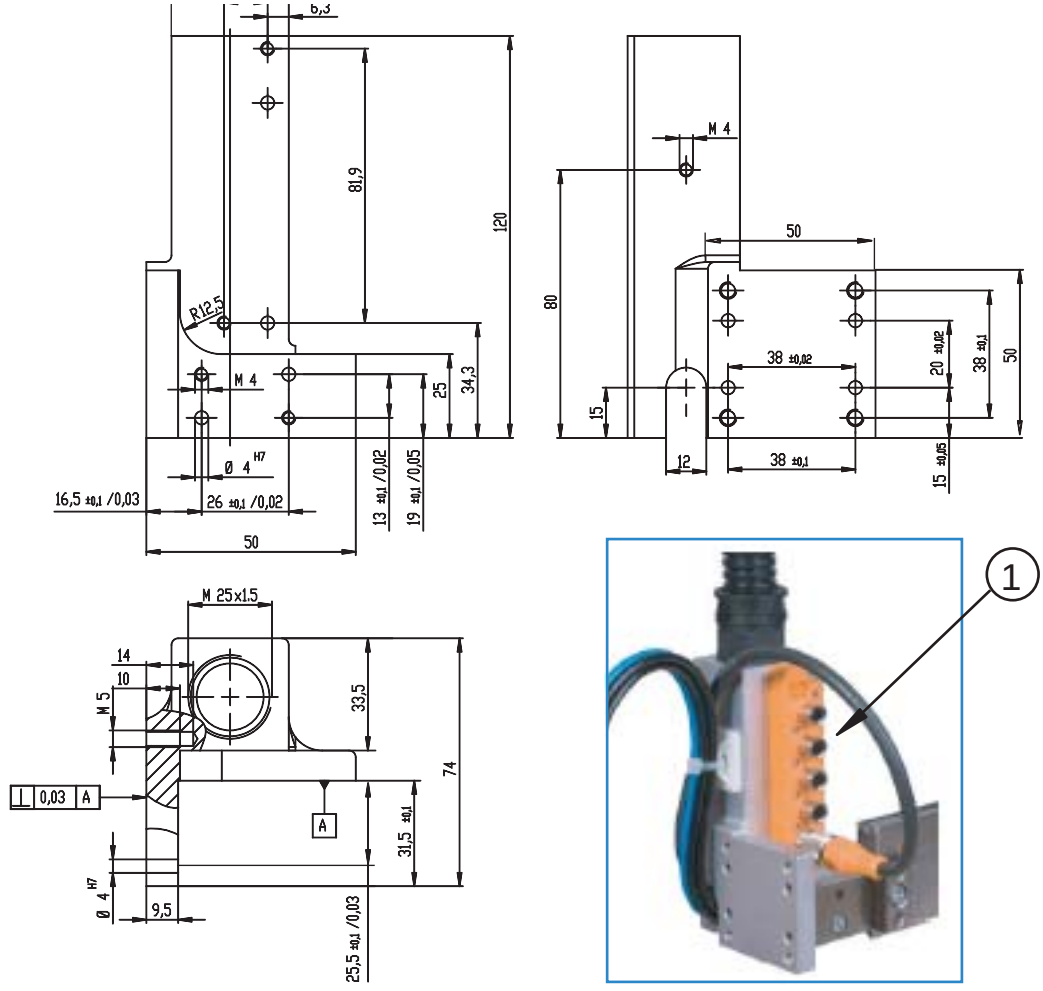


Fig. 5: Tool connector

3.6 Lubrication

In the standard version the machine is equipped with lubricating nipples for relubricating via a hand-held grease gun in periodic intervalls (see chap. 9.4.1 „Grease the machine“ on page 39).

Version with automatic lubrication:

Instead of the lubrication nipples, there is a connection with an automatic lubrication built in.

Specifications for the automatic lubrication are described in the respective documentation.

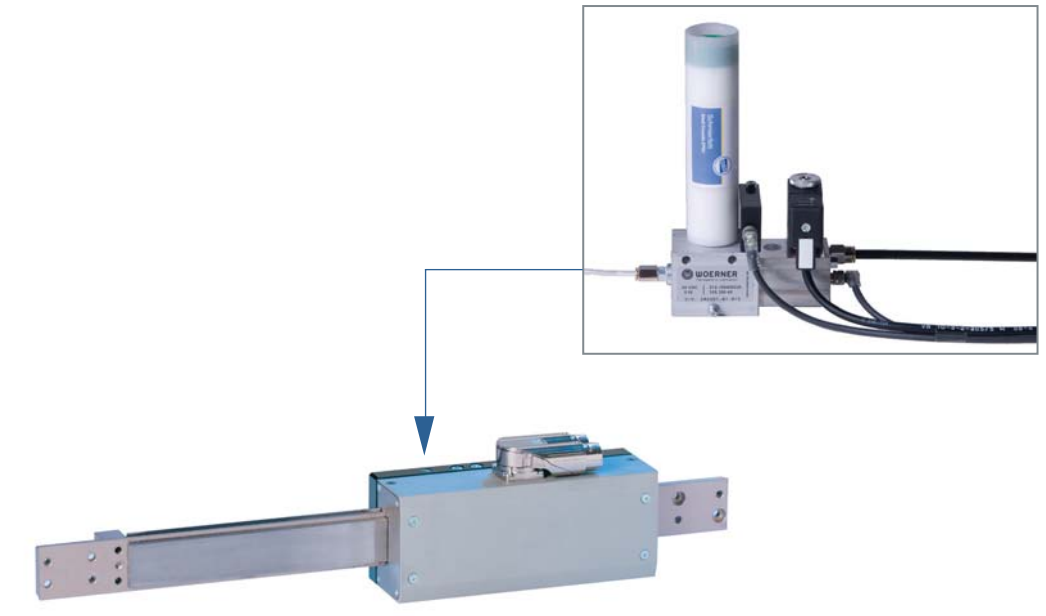


Fig. 6: Connection automatic lubrication

4 Transportation

WARNING

Strong magnetic fields

Strong magnetic fields are emitted from the permanent magnets of the secondary part. The magnetic pull increases very strongly at close range (< 150 mm). Magnetisable materials but also linear motor shafts mutually, are attracted with a great force.

Only carry the shafts individually. Do not place the shafts on top of each other. Keep separating tools at hand for emergencies. Danger of severe crushing or pinching.

NOTICE

The machine must be protected against impermissible strains (mechanical strain, temperature, humidity, aggressive atmospheres) during transport and when being stored. The secondary part of the machine must be protected against contact with magnetic or metal objects. Do not bring any other magnets in contact with the secondary part. Otherwise the measuring system would lose its function, i.e. the control of the shaft would no longer be possible.

- Transport work may only be conducted by specialised personnel, who take the safety instructions into account.
- Note that projecting sharp edges can cause injuries.
- The transport path must be cordoned off and safeguarded in such a manner that unauthorised personnel cannot enter the danger zone.
- The parts must be safeguarded against tipping or falling.

4.1 Transportation damage

The delivery should be inspected for damage immediately after receipt. The contents of the delivery should be checked for damage if damage to the packaging is detected, which could indicate damage to the contents. Details of the scope of delivery are provided in Chapter 3.3.2.

Damage detected should be immediately reported to and confirmed by the transportation company.

4.2 Intermediate storage

The storage conditions detailed in the table should be observed if intermediate storage over a longer period of time is planned.

Climatic zone	Packaging	Storage location	Storage duration
All	Packed in containers With moisture absorbers and humidity indicator sealed in film Protect against insect damage and mould formation through chemical treatment	Roofed over Protected against rain Not exposed to vibrations	Max. 3 years with regular inspection of packaging
	Open	Roofed over and sealed at a constant temperature and air humidity (5 °C < T < 60 °C, 50% relative humidity) No sudden temperature fluctuation and controlled ventilation with filter (free of dirt and dust) No aggressive vapours and no vibrations Protected against insect damage	2 years and longer with regular inspection. Check for cleanliness and machine damage during inspection. Check that anticorrosion protection is unspoiled.

5 Installation

5.1 Safety during installation

WARNING

Strong magnetic fields

Strong magnetic fields are emitted from the permanent magnets of the secondary part. The magnetic pull increases very strongly at close range (< 150 mm). Magnetisable materials but also linear motor shafts mutually, are attracted with a great force.

Assembly may only be conducted by qualified, trained and instructed personnel. There must always be a second person present during assembly. Do not remove the attached protective cover until the shaft is firmly assembled. Do not bring any magnetisable objects in the vicinity of the shaft. Keep separating tools at hand for emergencies. Danger of severe crushing or pinching.

Injuries caused by incorrect installation.

The dimensions of the supporting ground and fastening equipment must sufficient, so that they can withstand the stresses produced during operation.

Work should only be assigned to auxiliary personnel by company installation personnel.

Create a proper electrical grounding.

Particularly ensure that:

- only authorised persons are in the work area and that no other persons are endangered by the assembly work.
- no components are damaged and are only installed in a clean, functional condition.
- all components are installed according to the described instructions.
- specified starting torques are adhered to.
- the key aspect of the structural components is taken into consideration.

5.2 Installation prerequisites

Check prior to installation whether the dimensions of the installation site and building conditions correspond to the necessary prerequisites and measurement specification in the drawing documents.

Particularly ensure that:

- The supporting floor is level and rigid.
- The dimensions of the supporting structure at the installation location must be sufficient to withstand the dynamic forces that occur.

5.2.1 Installation preparation

- Open the packaging unit prior to the assembly and remove the machine from the packaging unit.
- The customer's bores must be made based on the hole pattern in Chapter 3.3.7.
- The attachment screws must be at hand.

5.2.2 Operating media / Auxiliary media / Tools

The following are required for installation of the machine:

- One set of spanners
- One torque wrench
- One set of screwdrivers
- Separating tools (1 hammer approx. 3 kg, 2 pointy wedges made of hardwood or plastic)
- Screw securing agent (e.g. Loctite ® 243)
- Screws which are at least have a property class of 8.8

5.3 Assemble machine

NOTICE

Damage to the machine

Contact of the secondary part to magnetised objects or blows to the secondary part destroy the magnetic measuring system. When assembling more than one machine, please observe that the secondary parts do not come in contact with each other.

The secondary part is not fixed and can move. Therefore the machine could tilt over and be damaged when placed at the installation locations due to loss of balance. The machine must be held or secured against tilting until it is screwed to the mounting surface.

5.4 Assembly suggestions

5.4.1 Option 1- firm pinning

1. Set up the machine at the assembly position.
2. Tighten the attachment screws however, not all the way.
3. Drive dowel pin into each pinhole.
4. Tighten the attachment screws all the way.
5. Make electrical connections in accordance with the circuit diagrams.

5.4.2 Variante 2- Movable via groove

1. Set up the machine at the assembly position.
2. Tighten the attachment screws however, not all the way.
3. Drive a dowel pin into each of the two front pin holes.
4. Align the machine in the groove.
5. Tighten the attachment screws all the way.
6. Make electrical connections in accordance with the circuit diagrams.

5.4.3 Mounting of attachment parts

NOTICE ***The existing drill holes must be used to attach the attachment parts on the secondary part. You may not make additional drill holes. Damage to the machine.***

5.5 Weiss Tool-Connector

5.5.1 Adaption gripper on front side

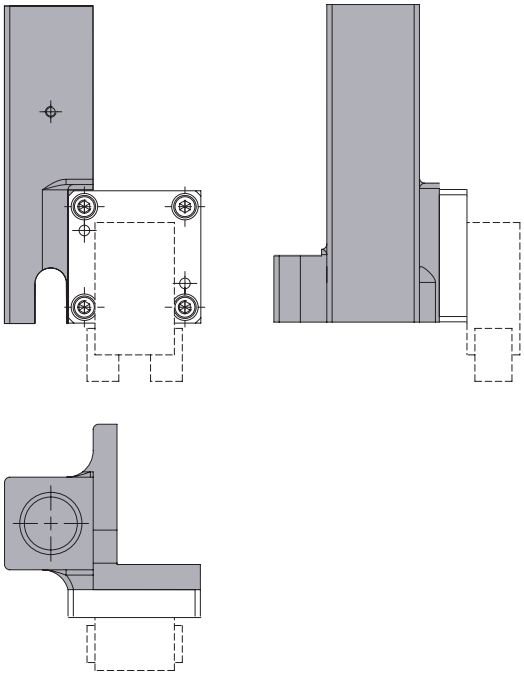


Fig. 7: Gripper front side

5.5.2 Adaption gripper left

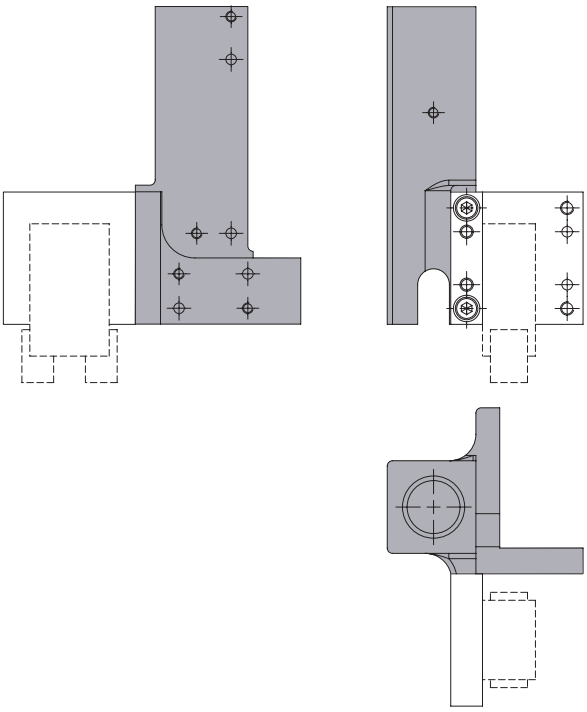


Fig. 8: Gripper left

5.5.3 Adaption gripper right

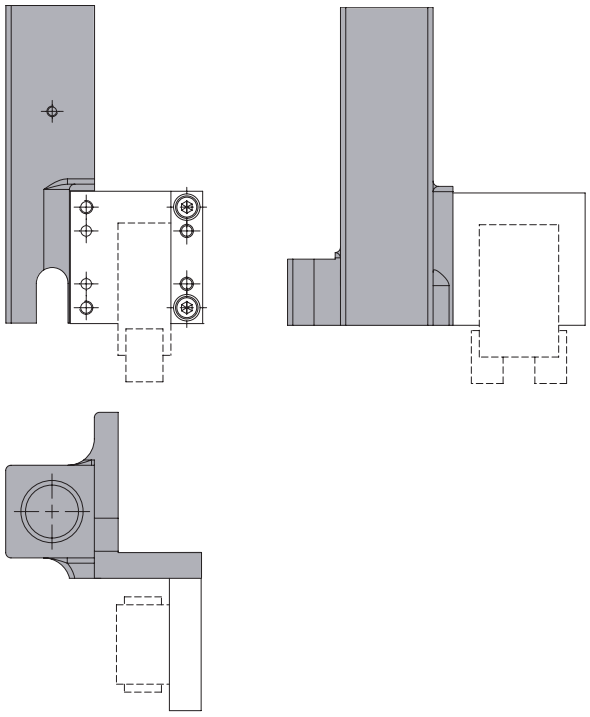


Fig. 9: Gripper right

5.6 Installing the safety equipment

The operator is responsible for providing for safety equipment and emergency stop buttons. The machine may not be operated without suitable safety equipment.

5.7 Instructions on disposal of packaging material

Packaging materials should be reused or disposed of correctly in compliance with national regulations.

6 Commissioning

6.1 Safety during commissioning

WARNING

Injuries emanating from unexpected activation.
Incorrectly-established connections or external influences on electrical equipment can cause unexpected activation of the machine or uncontrolled movement. Ensure that nobody is present in the hazardous zone around the machine. Activate and check all safety equipment and emergency stop circuits prior to commissioning.

- Ensure that the machine is only commissioned by qualified personnel in compliance with the safety instructions.
- Ensure that only authorised personnel are in the work area, and that no one could be injured due to the commissioning process.

The following prerequisites must be met prior to commissioning the machine:

- The machine is correctly mounted.
- The electrical equipment for the power supply is available and correctly fitted.
- All cables are laid properly and correctly connected in compliance with valid electrical circuit documents.
- The shielding of the motor wires is in place.
- The static discharge must be conducted properly.
  - The shunt resistance must be measured and have a value of < 10 MOhm.
  - The measurement must be recorded in a log.
- The required safety equipment and emergency stop circuits are available and functioning correctly.

Prior to commissioning the machine, check whether

- the drive is undamaged and not blocked.
- all connections have been correctly established.
- no other hazard sources are present.
- no foreign materials, tools or other objects are lying in the operating area of the machine.

The following should be checked during commissioning

- that the secondary part is working flawlessly.
  - A jerking of the secondary part can be a sign for incorrect regulator parameters.
- no excessive noise development is detected.
  - A strong development of noise may indicate improper assembly or incorrect control parameters.

6.2 Initial commissioning

When the machine is delivered with servo amplifier and software, the start-up is conducted via the Weiss Application software WAS.handling Windows programme.

📖 More information is also contained in the operating manual WAS.handling Control HL, which is included in delivery.

6.3 Recommissioning

⚠WARNING ***Risk of injury emanating from an operationally unsafe machine.***
An operationally unsafe machine can cause injuries and material damage. Recommissioning should only be realised after it has been ascertained that the machine is in a functionally reliable condition and no risk emanate from it during operation.

A visual inspection of the machine should be conducted prior to re-commissioning. The following should be checked and ensured in this regard:

- No damage is present on the machine.
- No foreign materials, tools or other objects are lying in the operating area of the machine.
- All supply units are connected and operating.
- Safety equipment is ready for operation.

7 Operation

7.1 Safety during operation

WARNING

Risk of injury due to incorrect alteration of operating parameters.
Improper changes of operating parameters can cause unforeseeable system behaviour. Operating parameters should only be changed by authorised personnel. Altered operating parameters should be checked in a test. Incorrect parameters can cause consequential damage and thus injuries.

7.2 Operating the machine

The machine is designed for integration in other machines, in other incomplete machines or equipment or for connection to these.

Safe operation and control are the responsibility of the operator.

7.3 Operating personnel workstations

The operating personnel workstations are determined by the operator of the plant or product in which the machine is integrated.

8 Malfunctions

8.1 Safety when remedying malfunctions

WARNING

Injury of non-authorised personnel.
Malfunctions should only be remedied by instructed personnel provided by the operator who have been trained in and are authorised to perform these tasks. The machine should be deactivated with the main switches and secured against unintentional reactivation prior to remedy. The radius of action of moving machine parts should be secured.

8.2 Errors / Cause / Remedy

📖 Information on malfunctions and their elimination are contained int the operating manual WAS.handling Control HL.

8.3 Customer Service

Please provide the following details if you require the assistance of our Customer Service:

- Serial number of the machine
- Description of the malfunction that has occurred
- Time and attendant circumstances of the malfunction that has occurred
- Assumed cause

You can contact our Customer Service from Monday to Friday between 08:00 and 17:00 at the

Service number +49 (0) 6281 - 5208-0

or at service@weiss-gmbh.de

An answering machine will provide you with information outside of the abovementioned hours.

9 Maintenance

9.1 Safety during maintenance

WARNING

Strong magnetic fields

Strong magnetic fields are emitted from the permanent magnets of the secondary part. Maintenance only by qualified, trained and instructed personnel.

Objects made of magnetisable materials such as jewellery, watches or tools can be attracted. Do not wear any magnetisable materials when handling the machine. Handle tools carefully. Injuries caused by being pulled in.

Injuries caused by the power supply and residual energy.

All power sources should be deactivated prior to carrying out maintenance work, and secured against unintentional reactivation and marked with a sign indicating that maintenance work is in progress. All moving parts should be stationary. Loads should be secured against sagging or slipping. All components energized with electrical power should be de-energized (Extinguished LED's on the servo amplifier do not mean that all components have been completely de-energised). Check by measuring to ensure that all components are de-energised. Work on electrical equipment may only commence if the voltage is less than 42 VDC.

Injury of non-authorised personnel.

Maintenance work should only be realised by instructed personnel who have been authorised to perform these tasks. The operating instructions laid down by the operator must be rigidly adhered to.

Injuries resulting from maintenance work which has not been announced.

The working area should be secured over a wide area prior to realising maintenance work and marked with warning signs. Operating personnel must be informed that maintenance work is being carried out.

Injuries caused by the use of incorrect components or incorrect operating media.

Only spare parts, which are listed in our spare parts list, may be used. Subsequent modifications on the machine are prohibited. Only the specified operating materials may be used.

CAUTION

Hot surfaces

The temperature of the housing and the axle can reach up to 80 °C during operation. Prior to carrying out any work on these components, the machine must first cool down sufficiently, to avoid any risk of burning through contact. Burn injuries will arise from contact with hot components.

- Ensure that only qualified electricians perform all tasks on the electrical equipment.
- Ensure that all work steps for maintenance are performed in the specified sequence.
- Ensure that specified tightening torques are observed.
- Ensure that all foreign objects are removed from the work area after the maintenance.

9.2 Maintenance work

Maintenance includes tasks for the purpose of:

- Inspection
- Maintenance
- Repair

9.3 Inspections

9.3.1 Every 6 months check secondary part

Move the secondary part manually across a full stroke and check the

- free movement.
- running noise;

9.3.2 Conducting a six-monthly visual inspection

Conduct a visual inspection for

- loose bolt or pin connections.
- damage to wires and compressed-air hoses.
- excessive lubricants on the secondary part. Wipe off excessive lubricants with a soft rag.
- Damages to the primary and secondary part.
- For the model with automatic lubrication: Damage to the hose for the automatic lubrication. The hose may not conduct any air.

9.4 Maintenance

9.4.1 Grease the machine

NOTICE ***The lubrication must be carried out after a service performance of 600 km, at the latest however, once a year. The respective service performance can be seen via the WAS software in the menu Extras/Parameters. There is also the alternative (as described in the documentation WAS.handling Windows programme) of reading out and resetting the value via different interfaces.***

1. Place a hand-held grease gun on each existing tapered lubrication nipple and insert the required amount of grease.
   - Während des Schmiervorgangs das Sekundärteil von Hand etwa 40 mm bewegen.
   - The pump stroke for the hand-held grease gun from Weiss is approx. 0.8 cm³.
2. Wipe off leaked excess grease with a soft cloth.

📖 For further information on the hand-held grease gun from Weiss see the operating manual for the hand-held grease gun (Art.-No. LUBEMAN-0800-00-0).

9.4.1.1 Grease

a) First lubricating by the factory and re-lubricating with LE special grease Synth EP2 with qualities as follows:

- Standard for cleanness by FDA guideline 21 CFR 178.3570
- Clearance by NSF H1 (National Sanitary Foundation)

Type of thickener	Al-Complex
Operating temperatur for long-term lubrication	-45 °C bis +160 °C
Short time admissible temperature peak value	+200 °C
Drop point (ASTM D 2265)	> 250 °C
Worked penetration (ASTM D 217)	265 - 295
Type od base oil	synthetic
Base oil viscosity at 40 °C (ASTM D 445)	350 mm²/s
Water resistance (DIN 51807 T1)	0 - 90
SKF Emcor Test (DIN 51802)	Corrosion degree 0/0
Designation (DIN 51502)	KPFHC 2 P-40

Alternative the use of a comparable grease is possible.

b) Use of grease without FDA-Certifikation

- DIN 51502: KP2K-30
- ISO 6743-9: ISO-L-X-CCEB 2

NOTICE ***In this case the original grease has to be pressed out of the bearings completely. Do not mix greases.***

9.4.1.2 Amount of grease

- 1,0 cm³ per lubricating nipple

9.4.2 Replace the grease cartrige

Only for the model with automatic lubrication:

📖 For the replacement of the grease cartridge, please see the operating manual for automatic lubrication, which is included in delivery.

9.5 Repair

The operator should not perform any maintenance or repair work on the machine.

Should maintenance or repair work become necessary, the customer service of WEISS GmbH is to be contacted.

10 Decommissioning / Dismantling / Disposal

10.1 Safety during decommissioning and dismantling

WARNING

Strong magnetic fields

Strong magnetic fields are emitted from the permanent magnets of the secondary part. The magnetic pull increases very strongly at close range (< 150 mm). Magnetisable materials but also linear motor shafts mutually, are attracted with a great force.

Disassembly only by qualified, trained and instructed personnel. A second person must always be present during disassembly. Transport disassembled machines individually. Do not stack disassembled machines. Do not bring any magnetisable objects near the machine. Keep separating tools at hand for emergencies. Danger of severe crushing or pinching.

Injury of unauthorised persons.

Ensure that decommissioning and dismantling is only realised by persons trained, instructed and authorised for this purpose. These persons should be familiar with the operating manual and act in accordance with it.

10.2 Decommissioning

10.2.1 Temporary decommissioning

The machine should be deactivated for decommissioning and secured against unintentional reactivation.

The machine should be fitted with a sign that clearly indicates that it is temporarily decommissioned.

NOTICE ***For recommissioning, comply with the instructions in chapter 6.3.***

10.2.2 Ultimate decommissioning

For ultimate decommissioning and shutdown:

- Turn off the machine according to specifications.
- Secure the machine against unintended reactivation.
- Provide the machine with a notice which clearly indicates that the the machine is ultimately shut down.

10.3 Dismantling and disposal

⚠ CAUTION ***Injuries can occur during disassembly through falling components.***
The following points must be observed to avoid injuries and/or environmental damage during dismantling and disposal:

- In order to avoid injury, ensure that suitable tools are used and that dismantled machine components are stable.
- Wear personal protective clothing and protective equipment.

10.3.1 Disposal of components

NOTICE ***Modules should be disposed of correctly!***
Incorrect disposal of modules can cause environmental damage and will be prosecuted!
Dispose of modules in compliance with valid local regulations. Ensure that auxiliary operational media are disposed of in compliance with environmental protection regulations. Local regulations governing the correct recycling and disposal of waste should be observed.

The machine consists of:

- steel and aluminium (housing, axles)
- copper (motor, electric wires)
- plastic (electric wires, hoses)
- Electronic components (servo amplifiers, boards)

11 Service and spare parts

11.1 Ordering spare parts

Please supply us with the following details when ordering spare parts:

- Serial number of the machine
- Order number of the spare part obtained from the spare parts list
- Number of spare parts required

Please send your spare parts order to

WEISS GmbH
Sondermaschinentechnik
Siemensstraße 17
D-74722 Buchen/Odw.

Tel: +49 (0) 6281 - 5208-0
Fax: +49 (0) 6281 - 5208-99
eMail: service@weiss-gmbh.de
Internet:http://www.weiss-gmbh.de

All our representative addresses can be obtained on our website.

12 Appendix

12.1 Index

12.2 Personal notes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