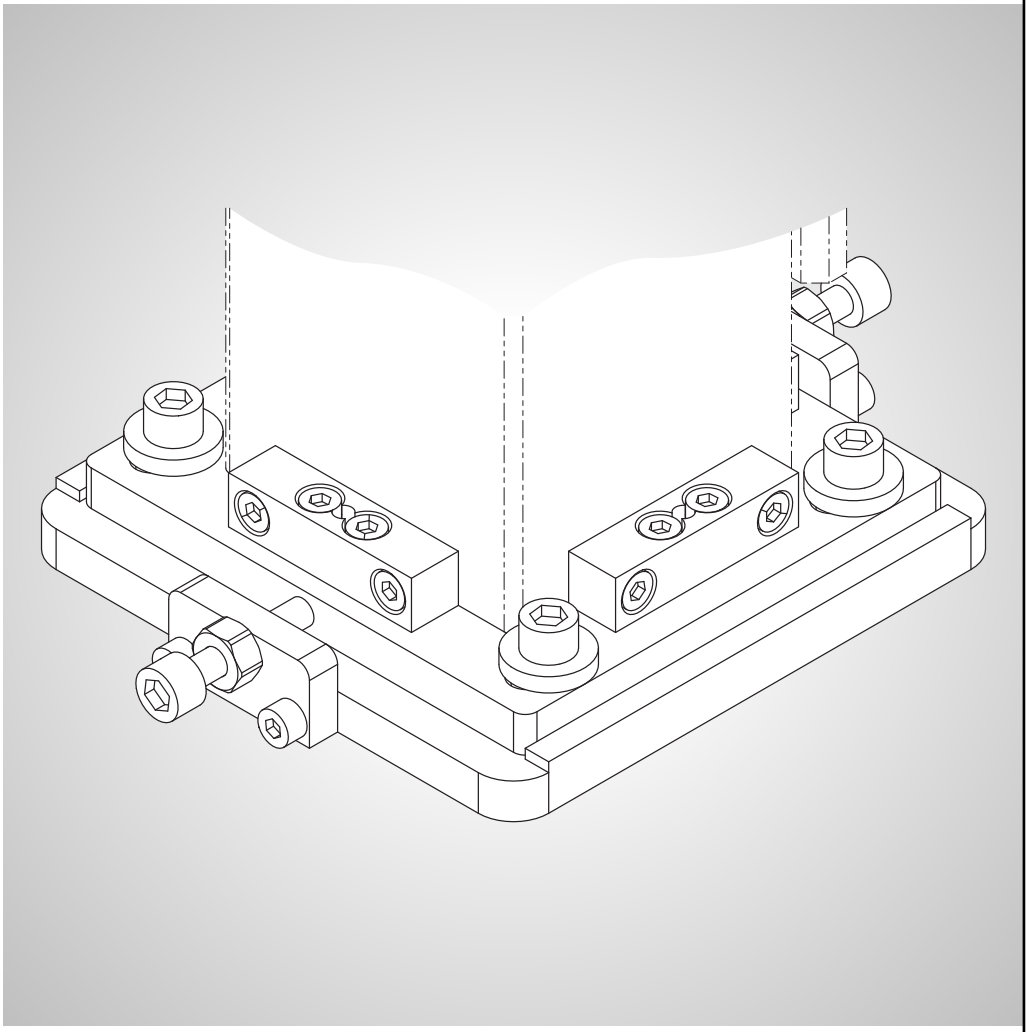
GÜDEL

SERVICE MANUAL

Z-axis X compensation



Project / Order:
Bill of materials: 10359244
Serial number:
Year of manufacture: 2017

GÜDEL

Translation of the original instructions

This manual contains standard illustrations that may deviate from the original. In the case of special models, options, or technical changes, the scope of delivery may differ from the descriptions here. Reprinting the instructions, in whole or in part, requires our permission. Subject to change due to technical improvements.

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Revision history

Version	Date	Description
1.0	13.03.2017	Basic version

Table -1 Revision history

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Table of contents

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1 General

Read the entire manual before working with the product. The manual contains important information for your personal safety. The manual must be read and understood by all persons who work on the product in any of the product life phases.

1.1 Further applicable documentation

All documents delivered with this manual are further applicable documentation. They must be observed in addition to this operating manual for the safe handling of the product.

1.2 Purpose of the document

This manual describes the following product life phases of the product:

- Maintenance
- Service

The manual contains the information required for using the product as intended. It is an essential component of the product.

The manual must be available at the product site throughout the entire service life of the product. If the product is sold, the manual must be transferred to the new owner.

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1.3 Explanation of symbols/abbreviations

The following symbols and abbreviations are used in this manual:

Symbol/Abbreviation	Use	Explanation
➲	For cross-reference	See
🗎	Possibly for cross-reference	Page
Fig.	Designation of graphics	Figure
Table	Designation of tables	Table
	In the tip	Information or tip

Table 1-1 Explanation of symbols/abbreviations

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2 Safety

Read the Safety chapter of the superordinate manual before working with the product. It contains important information for your personal safety. The chapter must be read and understood by all persons who work on the product in any of the product's phases. You are obligated to implement the information and warnings it contains, wherever they pertain to the product.

2.1 Personnel qualifications

⚠ WARNING

Lack of safety training

Incorrect behavior of untrained or insufficiently trained security staff can result in severe or fatal injuries!

Before technicians work on safety-related aspects of the product:

- Ensure that the technicians are trained with regard to safety
- Train and instruct the technicians specifically for their area of responsibility

Only appropriately trained and authorized technicians are allowed to work on the product.

Persons are authorized if:

- they are familiar with the relevant safety regulations for their area of responsibility
- they have read and understood this manual
- they meet the requirements for an area of responsibility
- they were assigned an area of responsibility by the operator

The technician is responsible to third parties in his area of responsibility.

During a training session or instruction, the technician may only work on the product under the supervision of an experienced manufacturer's technician.

2.1.1 Fitters

The fitter:

- has very good mechanical and/or electrical knowledge
- is flexible
- has assembly experience

2.1.2 Manufacturer's technicians

The manufacturer's technician:

- is employed on site at the premises of the manufacturer or representative
- has very good mechanical and/or electrical knowledge
- has good software knowledge
- has maintenance, service and repair experience
- has experience with Güdel products

The manufacturer's technician is responsible for the following tasks:

- performing mechanical and electrical maintenance work in accordance with the manual
- performing mechanical and electrical service work in accordance with the manual
- cleaning the product
- replacing spare parts
- localizing and fixing malfunctions

2.1.3 Maintenance technicians

The maintenance technician:

- was trained by the operating company or the manufacturer
- has very good mechanical and/or electrical knowledge
- has software knowledge
- has maintenance experience
- bears responsibility for the safety of the cleaning staff

The maintenance technician is responsible for the following tasks:

- performing mechanical and electrical maintenance work in accordance with the manual
- cleaning the product
- replacing spare parts
- monitoring and instructing the cleaning staff in the safety zone during the cleaning process

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2.1.4 Service technicians

The service technician:

- was trained by the operating company or the manufacturer
- has very good mechanical and/or electrical knowledge
- has software knowledge
- has service and repair experience
- is flexible

The service technician is responsible for the following tasks:

- performing mechanical and electrical service work in accordance with the manual
- replacing spare parts

2.2 Installation instructions

Modifications

The product must never be modified or used in a manner contrary to its intended use. ➲ Chapter 3.1, 🗎 15

General rules for occupational safety

The generally accepted occupational safety rules must be observed and implemented.

2.3 Hazard symbols in the manual

2.3.1 Hazard warnings

The hazard warnings are defined for the following four types of danger levels:

⚠ DANGER

DANGER

DANGER refers to hazards with a high risk of severe physical injury or immediate fatality.

⚠ WARNING

WARNING

WARNING refers to hazards with a moderate risk of severe physical injury or potential fatality.

⚠ CAUTION

CAUTION

CAUTION refers to hazards with a slight risk of moderate physical injury.

NOTE

NOTE

NOTE refers to hazards that can lead to property damage.

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2.3.2 Explanation of warning symbol

Hazard warnings for personal injuries contain the symbol of the corresponding hazard.

Symbol	Explanation of symbols
	Hazards due to general causes
	Hazards resulting from automatic startup
	Hazards due to falling axles
	Hazards due to heavy components

2.4 Product-specific hazards

⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

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3 Product description

3.1 Use

3.1.1 Intended use

This product is intended exclusively for aligning and finely adjusting loads in the horizontal direction.

Any other or additional use is not considered to be use in the intended manner. The manufacturer assumes no liability for any resulting damage. All risks are borne solely by the user!

3.1.2 Non-intended use

The product is not intended:

- for the movement of toxic goods
- for the movement of explosive goods
- for operation in potentially explosive areas

Any use other than the specified intended use will be considered improper use and is prohibited!

Do not make any modifications to the product.

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4 Design, function

4.1 Design

The product consists of the following components:

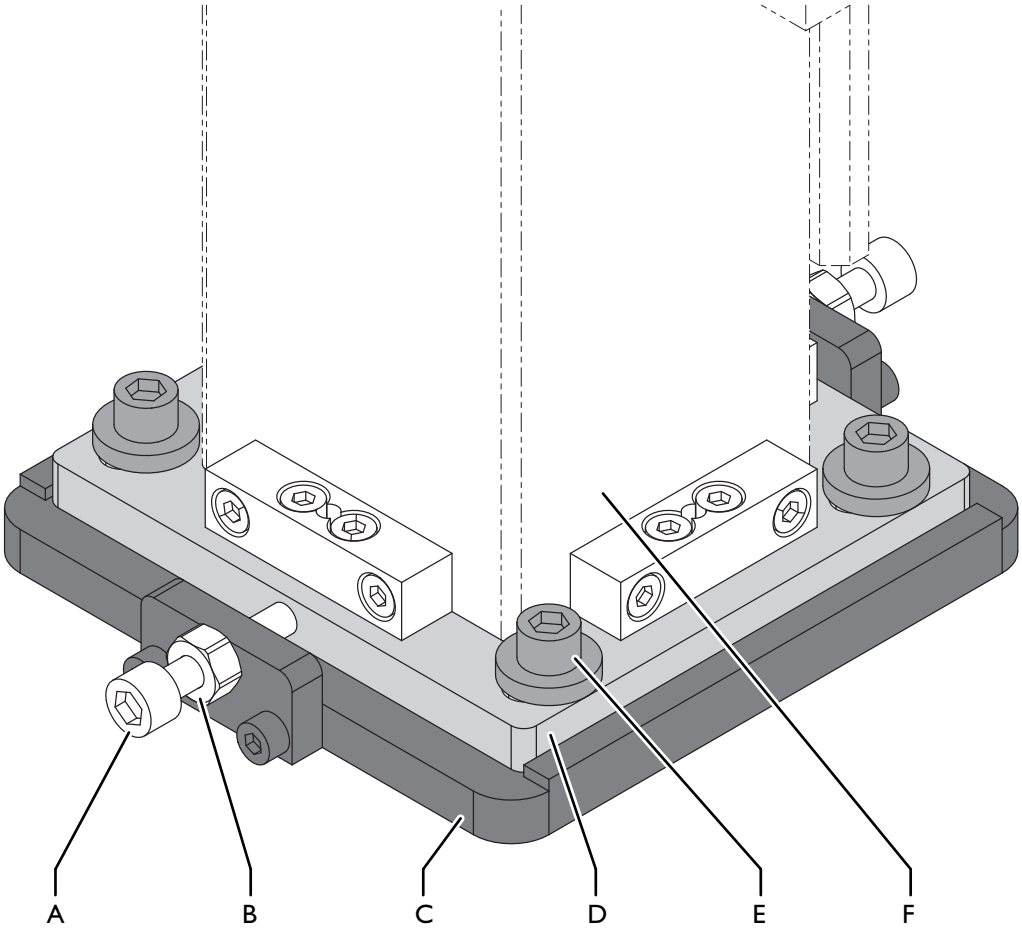

Fig. 4-1 *Z-axis X compensation assembly*

A	*Set screw*	*D*	*Base plate*
B	*Lock nut*	*E*	*Fastening screw*
C	*Guide plate*	*F*	*Z-axis (not included in the scope of delivery)*

4.2 Function

This product is intended for aligning and finely adjusting loads in the horizontal direction.

4.2.1 Aligning load

⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

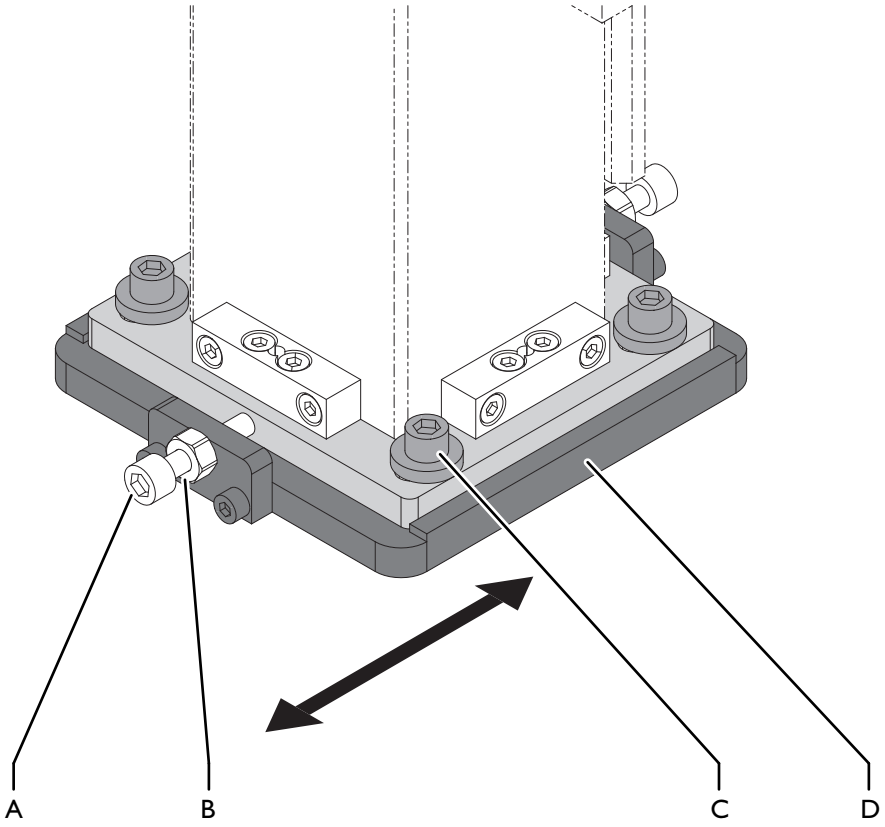

Fig. 4-2 *Z-axis X compensation function*

A	*Set screw*	*C*	*Fastening screw*
B	*Lock nut*	*D*	*Guide plate*

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Align the load as follows:

1 Loosen fastening screws
2 Loosen lock nuts
3 Loosen set screws
4 Use set screws to align the load
5 Tighten lock nuts
6 Tighten the fastening screws

The load has been aligned.

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5 Maintenance

When operated under normal conditions the product is maintenance-free.

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6 Repairs

6.1 Introduction

Work sequences

Perform the work sequences in the order described. Perform the described tasks at the specified times. This ensures a long service life for your product.

Original spare parts

Only use original spare parts. ➲ 29

Tightening torques

Unless otherwise indicated, adhere to the tightening torques of Güdel.
➲ Chapter 8, 33

6.1.1 Safety

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 9
It concerns your personal safety!

⚠ WARNING

Automatic startup

During work on the product, there is danger of the machine starting up automatically. This can lead to severe or fatal injuries!

Before working in the danger area:

- Secure vertical axes (if equipped) against falling.
- Switch off the superordinate main power supply. Secure it against being switched on again (main switch for the complete system)
- Before switching on the system again, make sure that no one is in the danger area

⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

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⚠ WARNING

Heavy components

Components can be very heavy. Improper handling can cause severe or fatal injuries!

- Use appropriate lifting units
- Use suitable means to secure the components against tipping over
- Only remove the safety devices after the product has been completely assembled

6.1.2 Personnel qualifications

Only appropriately trained and authorized technicians are allowed to work on the product.

6.2 Tasks to perform after a crash

Güdel strongly recommends that the work be performed by Güdel technicians. Damage to the product can often only be found by experience. For this reason, the following tasks should not be regarded as conclusive.

Carry out the following tasks after a crash:

1 Perform a general inspection in the form of a fine check, in accordance with the Maintenance chapter

The tasks have been performed.

6.2.1 General inspection

Perform the general inspection according to superordinate operating manual.

6.2.2 Replacing Z-axis X compensation

⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

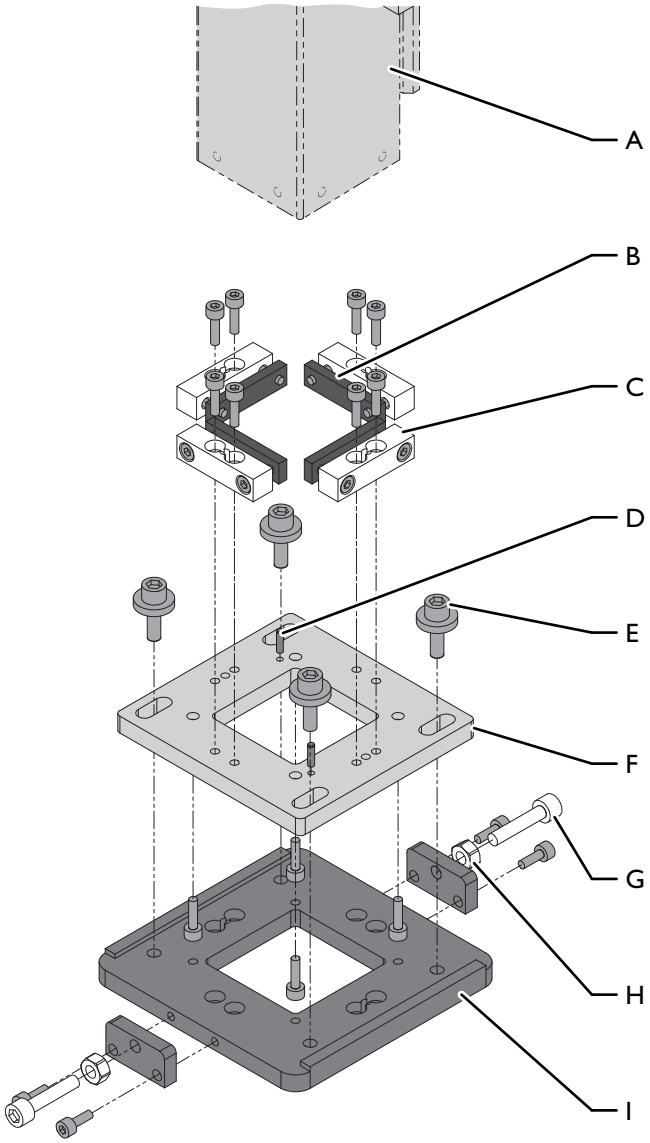

Fig. 6-1 *Replacing Z-axis X compensation*

A	*Z-axis*	*F*	*Base plate*
B	*Threaded anchor plate*	*G*	*Set screw*
C	*Holder*	*H*	*Lock nut*
D	*Pin*	*I*	*Guide plate*
E	*Fastening screw*		

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Replace the Z-axis X compensation as follows:

1 Remove the set screws and lock nuts
2 Remove the fastening screws
3 Remove the base plate
4 Remove the pins
5 Remove the threaded anchor plate and holder
6 Replace components
7 To install the components, reverse the disassembly steps
8 Align load ➲ Chapter 4.2.1, 🗎 18

The Z-axis X compensation has been replaced.

6.2.3 Referencing the axes

Reference the axes in accordance with the documentation for the complete system.

6.3 Service departments

If you have questions, please contact the service departments. ➲ 🗎 29

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7 Spare parts supply

7.1 Service departments

For service queries, please use the service form at www.gudel.com or contact the offices in the appropriate country:

Austria:	+43 7226 20690-0
China:	+86 21 5055 0012
Czech Republic:	+420 602 309 593
Germany:	+49 6291 6446 792
France:	+33 1 30091545
India:	+91 20 6791 0221
Italy:	+39 02 9217021
South Korea:	+82 32 858 05 41
Mexico:	+52 81 8374 2500 x-103
Poland:	+48 33 819 01 25
Thailand:	+66 2 374 0709
United Kingdom:	+44 2476 695 444
USA:	+1 734 214 0000
Spain:	+34 93 476 0380
The Netherlands:	+31 541 66 22 50
Turkey:	+90 532 316 94 44
Russia:	+7 8482 735544
All other countries and Switzerland:	+41 62 916 91 70

Table 7-1 *National agencies*

For urgent service inquiries, our help desk provides after-hour assistance (24-hour support)

Europe/Asia:	+41 62 916 91 70	service@ch.gudel.com
USA:	+1 734 214 0000	service@us.gudel.com

Table 7-2 *24-hour Hotline*

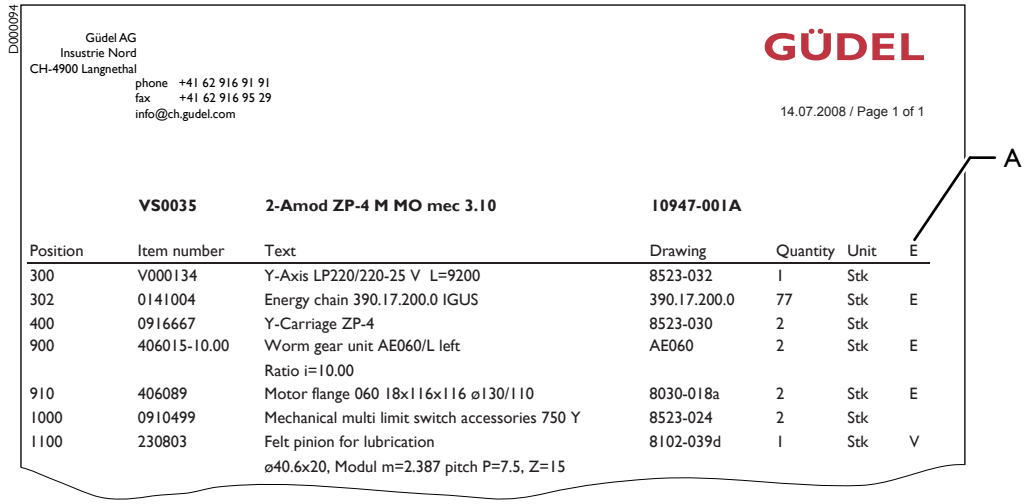
Please have the following information at hand, as labeled on the type plate

- Product, type
- Project, sales order
- Serial number (parts list)
- Drawing number, if applicable

7.2 Explanations regarding the spare parts list

7.2.1 Parts list

The parts list contains all parts of your product. The spare parts and wear items are indicated as described in the explanation of symbols.



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A

VS0035 **2-Amod ZP-4 M MO mec 3.10** **10947-001A**

Position	Item number	Text	Drawing	Quantity	Unit	E
300	V000134	Y-Axis LP220/220-25 V L=9200	8523-032	1	Stk	
302	0141004	Energy chain 390.17.200.0 IGUS	390.17.200.0	77	Stk	E
400	0916667	Y-Carriage ZP-4	8523-030	2	Stk	
900	406015-10.00	Worm gear unit AE060/L left Ratio i=10.00	AE060	2	Stk	E
910	406089	Motor flange 060 18x116x116 ø130/110	8030-018a	2	Stk	E
1000	0910499	Mechanical multi limit switch accessories 750 Y	8523-024	2	Stk	
1100	230803	Felt pinion for lubrication ø40.6x20, Modul m=2.387 pitch P=7.5, Z=15	8102-039d	1	Stk	V

Fig. 7-1 *Explanation of symbols*

A *Spare part status*

Spare part status (column E): E = Spare part
V = Wear item

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7.2.2 Position drawings

The positions of the spare parts can be seen on the drawings. These are standard drawings. Individual positions or images might differ from your product.

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8 Torque tables

8.1 Tightening torques for screws

NOTE

Vibrations

Screws without screw lock become loose.

- Secure screw connections on moving parts Loctite medium strength 242.
- Apply the adhesive on the nut thread, not on the screw!

8.1.1 Zinc plated screws

Unless otherwise specified, the following tightening torques apply for zinc-plated screws lubricated with Molykote (MoS2) grease or secured with Loctite 242:

Thread size	Tightening torque [Nm]		
	8.8	10.9	12.9
M3	1.1	1.58	1.9
M4	2.6	3.9	4.5
M5	5.2	7.6	8.9
M6	9	13.2	15.4
M8	21.6	31.8	37.2
M10	43	63	73
M12	73	108	126
M14	117	172	201
M16	180	264	309
M20	363	517	605
M22	495	704	824
M24	625	890	1041
M27	915	1304	1526
M30	1246	1775	2077
M36	2164	3082	3607

Table 8-1 *Torque table for zinc-plated screws lubricated with Molykote (MoS2) grease*

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8.1.2 Black screws

Unless otherwise specified, the following tightening torques apply for black oiled and non-lubricated screws, or screws secured with Loctite 242:

Thread size	Tightening torque [Nm]		
	8.8	10.9	12.9
M4	3	4.6	5.1
M5	5.9	8.6	10
M6	10.1	14.9	17.4
M8	24.6	36.1	42.2
M10	48	71	83
M12	84	123	144
M14	133	195	229
M16	206	302	354
M20	415	592	692
M22	567	804	945
M24	714	1017	1190
M27	1050	1496	1750
M30	1420	2033	2380
M36	2482	3535	4136

Table 8-2 *Torque table for black oiled and non-lubricated screws*

8.1.3 Stainless steel screws

Unless otherwise specified, the following tightening torques apply for stainless steel screws lubricated with Molykote (MoS2) grease or secured with Loctite 242:

Thread size	Tightening torque [Nm]		
	50	70	80
M3	0.37	0.8	1.1
M4	0.86	1.85	2.4
M5	1.6	3.6	4.8
M6	2.9	6.3	8.4
M8	7.1	15.2	20.3
M10	14	30	39
M12	24	51	68
M14	38	82	109
M16	58	126	168
M20	115	247	330
M22	157	337	450
M24	198	426	568
M27	292	—	—
M30	397	—	—
M36	690	—	—

Table 8-3 *Torque table for stainless steel screws lubricated with Molykote (MoS2) grease*

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