

Operating and Assembly Instructions

Hollow shaft absolute encoder ASEH 60

Singleturn with EtherCAT® interface

Read the Operating and Assembly Instructions prior to assembly, starting installation and handling!
Keep for future reference!

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Manufacturer / publisher

Johannes Hubner
Fabrik elektrischer Maschinen GmbH
Siemensstraße 7
35394 Giessen

Germany

Phone: +49 641 7969 0

Fax: +49 641 73645

E-Mail: info@huebner-giessen.com
www.huebner-giessen.com

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Directory

1	General.....	5
1.1	Information about the Operating and Assembly Instructions	5
1.2	Scope of delivery	5
1.3	Explanation of symbols	5
1.4	Disclaimer.....	6
1.5	Copyright.....	6
1.6	Guarantee terms	6
1.7	Customer service	6
2	Safety	6
2.1	Responsibility of the owner	6
2.2	Intended use	6
2.3	Improper use	7
2.4	Personal protective equipment	7
2.5	Personnel	7
2.6	Special dangers	7
2.6.1	Electrical current	7
2.6.2	Rotating shafts / Hot surfaces	7
2.6.3	Safeguarding against restart	7
3	Technical Data.....	8
3.1	Type plate example	8
3.2	Type key	9
3.3	Electrical and mechanical data	10
4	Transport, packaging and storage.....	11
4.1	Safety information concerning transport	11
4.2	Goods inward inspection.....	11
4.3	Packaging (disposal).....	11
4.4	Storing packages (devices).....	11
5	Installation and commissioning	12
5.1	Safety instructions	12
5.2	Technical information	12
5.3	Required tools	12
5.4	Mounting preparations	13
5.5	Mounting of hollow shaft absolute encoder.....	13
6	Dismantling.....	15
6.1	Safety instruction.....	15
6.2	Dismantling of hollow shaft absolute encoder.....	15
7	Inspections	16
7.1	Safety instructions	16
7.2	Maintenance information.....	16
7.3	Inspection schedule	16
8	Disposal	16
8.1	Disposal procedure	16

9	Replacement parts	17
10	Dimension drawings	18

1 General

1.1 Information about the Operating and Assembly Instructions

These Operating and Assembly Instructions provide important instructions for working with the device. They must be carefully read prior to starting all tasks, and the instructions contained herein must be followed.

In addition, applicable local regulations for the prevention of industrial accidents and general safety regulations must be complied with.

1.2 Scope of delivery

Scope of delivery includes the hollow shaft absolute encoder ASEH 60, the Operating and Assembly Instructions.

1.3 Explanation of symbols

Warnings are indicated by symbols in these Operating and Assembly Instructions. The warnings are introduced by signal words that express the scope of the hazard.

The warnings must be strictly heeded; you must act prudently to prevent accidents, personal injury, and property damage.



WARNING!

Indicates a possibly dangerous situation that can result in death or serious injury if it is not avoided.



CAUTION!

Indicates a possibly dangerous situation that can result in minor injury if it is not avoided.



CAUTION!

Indicates a possibly dangerous situation that can result in material damage if it is not avoided.



NOTES!

Indicates useful tips and recommendations as well as information for efficient and trouble-free operation.



NOTES!

Do not use a hammer or similar tool when installing the device due to the risk of damage occurring to the bearings or coupling!



DANGER!

Life-threatening danger due to electric shock!

Indicates a life-threatening situation due to electric shock. If the safety instructions are not complied with there is danger of serious injury or death. The work that must be executed should only be performed by a qualified electrician.

1.4 Disclaimer

All information and instructions in these Operating and Assembly Instructions have been provided under due consideration of applicable guidelines, as well as our many years of experience.

The manufacturer assumes no liability for damages due to:

- Failure to follow the instructions in the Operating and Assembly Instructions
- Non-intended use
- Deployment of untrained personnel
- Opening of the device or conversions of the device

In all other aspects the obligations agreed in the delivery contract as well as the delivery conditions of the manufacturer apply.

1.5 Copyright



NOTE!

Content information, text, drawings, graphics, and other representations are protected by copyright and are subject to commercial property rights. It is strictly forbidden to make copies of any kind or by any means for any purpose other than in conjunction with using the device without the prior written agreement of the manufacturer. Any copyright infringements will be prosecuted.

1.6 Guarantee terms

The guarantee terms are provided in the manufacturer's terms and conditions.

1.7 Customer service

For technical information personnel is available that can be reached per telephone, fax or email. See manufacturer's address on page 2.

2 Safety



DANGER!

This section provides an overview of all the important safety aspects that ensure protection of personnel, as well as safe and trouble-free device operation. If these safety instructions are not complied with significant hazard can occur.

2.1 Responsibility of the owner

The device is used in commercial applications. Consequently the owner of the device is subject to the legal occupational safety obligations, and subject to the safety, accident prevention, and environmental protection regulations that are applicable for the devices area of implementation.

2.2 Intended use

The device has been designed and constructed exclusively for the intended use described here. The hollow shaft absolute encoder ASEH 60 is used for position measurement. Claims of any type due to damage arising from non-intended use are excluded; the owner bears sole responsibility for non-intended use.

2.3 Improper use

- Do not use the device in potentially explosive areas.
- The device must not be subjected to mechanical loads in addition to its own weight and unavoidable vibration and shock loads that arise during normal operations.
Examples for non-permitted mechanical loads (incomplete list):
 - Fastening transport or lifting tackle to the device, for example a crane hook to lift a motor.
 - Fastening packaging components to the device, for example ratchet straps, tarpaulins etc.
 - Using the device as a step, for example by people to climb onto a motor.
- The device may not be used in nuclear arrangements and airplanes.

2.4 Personal protective equipment

Wear personal protective equipment such as safety shoes and safety clothing to minimise risks to health and safety when carrying out work such as installation, disassembly or commissioning. Adhere to all applicable statutory regulations as well as the rules and standards determined by the owner.

2.5 Personnel

Installation and commissioning as well as disassembly routines must be carried out by skilled technical staff only.

2.6 Special dangers

Residual risks that have been determined based on a risk analysis are cited below.

2.6.1 Electrical current



DANGER!

Life-threatening danger due to electrical shock!

There is an imminent life-threatening hazard if live parts are touched. Damage to insulation or to specific components can pose a life-threatening hazard.

Therefore:

Immediately switch off the device and have it repaired if there is damage to the insulation of the power supply.

De-energize the electrical equipment and ensure that all components are connected for all tasks on the electrical equipment.

Keep moisture away from live parts. Moisture can cause short circuits.

2.6.2 Rotating shafts / Hot surfaces



WARNING!

Danger of injury due to rotating shafts!

Touching rotating shafts can cause serious injuries.

Therefore:

Do not reach into moving parts/shafts or handle moving parts/shafts during operation.

Do not open covers during operation. Prior to opening the covers ensure that all parts have come to a standstill.

The encoder can become hot during prolonged use.

In case of contact risk of burns is existing.

2.6.3 Safeguarding against restart



DANGER!

Life-threatening danger if restarted without authorization!

When correcting faults there is danger of the power supply being switched on without authorization.

This poses a life-threatening hazard for persons in the danger zone.

Therefore:

Prior to starting work, switch off the system and safeguard it from being switched on again.

3 Technical Data

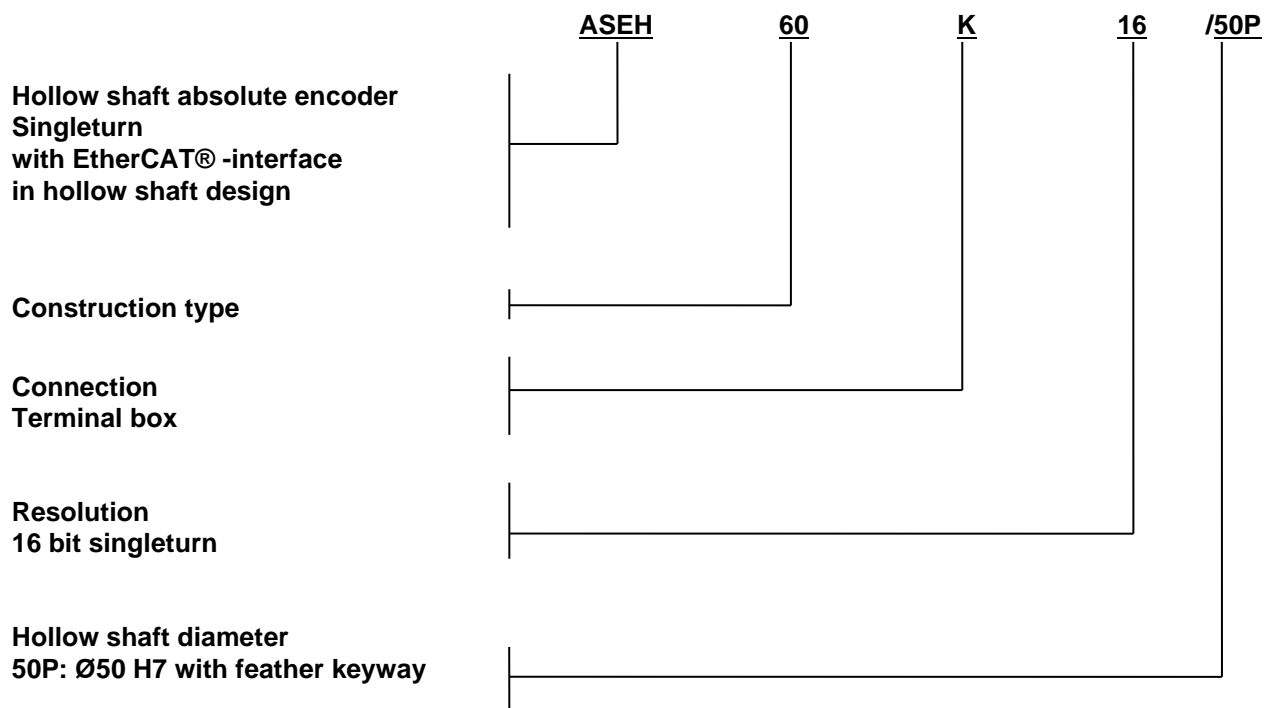
3.1 Type plate example

Siemensstrasse 7 35394 Giessen / Germany www.huebner-giessen.com			
JOHANNES HÜBNER CE GIESSEN			
Absolutwert Drehgeber / <i>Absolute encoder</i> ASEH 60			max. Drehzahl <i>max. speed</i> 4000 rpm
S/N 123456	ID 12345	Bj./Y 2018	IP55
Versorgungsspg. <i>Supply voltage</i> 12...30 V DC max. 4 W	Interface EtherCAT® Singleturn 16 bit		

The type plate is located on the side of the housing and contains the following information:

- Manufacturer, address
- Type, year of construction
- CE mark
- Serial number (S/N)
- Item (ID)
- Max. Speed
- Degree of protection (IP 54)
- Supply voltage:
- Singleturn-resolution
- Interface

3.2 Type key



3.3 Electrical and mechanical data



Type	ASE			
Interface	Ethernet 100MBit			
Protocol	EtherCAT®			
Connected loads				
Supply voltage	12 V ... 30 V DC			
Power consumption	Max. 4 W			
Supply voltage (1): M 12 connector, male	A-coded			
Pin 1:	Operating voltage Pin 1:			
Pin 2:	Not connected			
Pin 3:	Ground			
Pin 4:	Not connected			
Network output (2): M 12 Buchse	D-Coded			
Pin 1:	TxD+			
Pin 2:	RxD+			
Pin 3:	TxD-			
Pin 4:	RxD			
Network Input (3): M 12 connector, female				
Pin 1:	TxD+			
Pin 2:	RxD+			
Pin 3:	TxD-			
Pin 4:	RxD-			
Device temperature range				
Standard	-25°C ... + 85°C			
Degree of protection acc. to DIN EN 60529	Sealing	Mechanically permissible speed	Rotor moment of inertia	Breakaway torque
IP 55	Standard	4000 rpm	Approx.. 28 Kgcm ²	Approx.. 30 Ncm
Weight	Typ K			Approx.. 7 kg

4 Transport, packaging and storage

4.1 Safety information concerning transport

**CAUTION!****Material damage caused by improper transport!**

Observe the symbols and information on the packaging:

- Do not throw - risk of breakage
- Keep dry
- Do not expose to heat above 40 °C or direct sunlight.

4.2 Goods inward inspection

Check the delivery immediately upon receipt for transit damage or short delivery.

Inform the carrier immediately on receipt if you determine that damage has occurred during transit (take photos as proof).

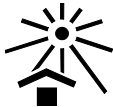
4.3 Packaging (disposal)

The packaging is not taken back; dispose of according to the respective valid statutory provisions and local regulations.

4.4 Storing packages (devices)

**Keep dry**

Keep packages dry and free from dust; protect from moisture.

**Protect against heat**

Protect packages from heat above 40 °C and direct sunlight.

If you intend to store the device for a longer period of time (> 6 months) we recommend you use protective packaging (with desiccant).

**NOTES!**

Turn the shaft of the device every 6 month to prevent the bearing grease solidifying!

5 Installation and commissioning

5.1 Safety instructions

**NOTES!**

Observe the safety instructions contained in **Chapter 2** when installing or working on the device!

Personnel

Installation and commissioning must be carried out by skilled technical staff only.

5.2 Technical information



Do not use a hammer or similar tool when installing the device due to the risk of damage occurring to the bearings or coupling!

Ambient temperature

The max. permissible ambient temperature depends on the speed and degree of protection of the device, the signal frequency, the length of the signal cable and the place of installation (please refer to Chapter 3.3).

Deep groove ball bearings

The hollow shaft absolute encoder ASEH 60 is fitted with maintenance-free, greased "for-life" deep groove bearings. Bearings must be changed by the manufacturer only. Opening the encoder renders the guarantee null and void.

Screw retention

We recommend using Loctite® 243 threadlocker (medium strength) on all fastening screws to prevent loosening.

5.3 Required tools

- | | |
|----------------------------|--------------------------------|
| • Spanners: | Hex. size 10 mm |
| • Allen keys: | 3 mm |
| • Flat-blade screwdrivers: | |
| • Assembly grease | (acid-free) |
| • Loctite® 243 | (medium strength threadlocker) |

5.4 Mounting preparations

1. Ensure all accessories are available (please refer to Chapter 10 dimension drawings).

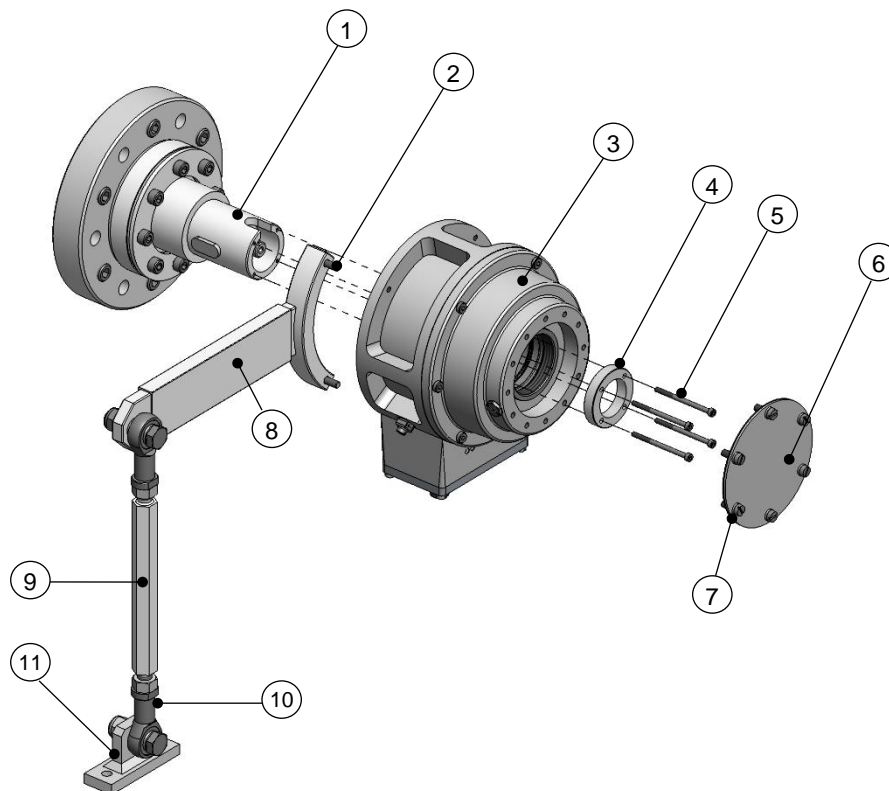


NOTES!

Fastening screws and earth cable are not included in the range of supply.

2. Preparing the place of attachment: Clean the (motor) shaft, centering, bolting surfaces and fastening threads; check for damage. Repair any damage!

5.5 Mounting of hollow shaft absolute encoder



NOTES!

Follow with the assembly to the scope of supply of the adapter shaft belonging assembly instructions. It contains tips to the alignment and to the necessary cultivation exactness of the adapter shaft.

1. Lightly grease the adapter shaft (1).
2. Secure the torque bracket (8) to the hollow-shaft device (3) with 2 tensilock screws (2).



NOTES!

When fitting to the device it is possible to align the torque bracket in four different directions. If possible fit the device in a manner that ensures the cable gland points downwards!

3. Mount the hollow-shaft device to the adapter shaft.
4. Secure the hollow-shaft device with the aid of the axial tensioning disc (4) and 4 hexagon socket head cap screws (5).
5. Close the hollow shaft encoder with cover plate (6) and 6 cheese-head screws (7).
6. Fastening the torque bracket:

Fastening without base plate:

Secure the link rod head (10) of the link rod (9) to a fixed point (for example on the motor housing).

Fastening with base plate:

Secure the base plate (11) to a fixed point (for example on the motor housing or the foundations).



NOTES!

Observe with the assembly of the torque bracket also the information of the brochure "Considerations for the choice of the torque arms".

Once fitted the link rod must rotate easily around the link rod heads! Failure to observe this point may result in damage to the bearings!

The link heads are maintenance free. However, ensure they remain free from soiling and paint!

6 Dismantling

6.1 Safety instruction

Personnel

Dismantling must be carried out by skilled technical staff only.



Observe the safety instructions contained in **Chapter 2** when dismantling the device!



Do not use a hammer or similar tool when dismantling the device due to the risk of damage occurring to the bearings or coupling!

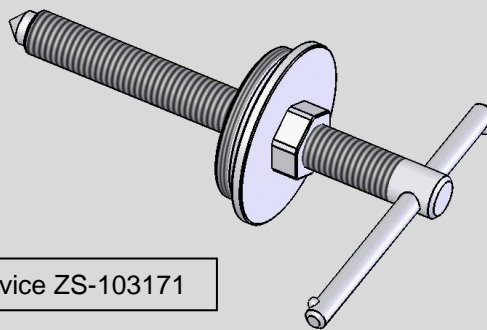
6.2 Dismantling of hollow shaft absolute encoder

To dismantle the hollow shaft device follow the instructions in Chapter 5.5 in the reverse order.



NOTES!

Use the withdrawal device ZS-103171 (available as an accessory) if you are unable to remove the device manually from the adapter shaft after having removed the axial tensioning disc!



withdrawal device ZS-103171

Using the withdrawal device, which is screwed into the withdrawal thread of the hollow shaft allows you to remove the hollow shaft absolute encoder from the adapter shaft without risking damage of the bearings.

7 Inspections

7.1 Safety instructions

**Personnel:**

Skilled technical staff only are permitted to inspect the device and its installation.

Observe the safety instructions contained in **Chapter 2** when inspecting or working on the device!

7.2 Maintenance information

The device is maintenance-free. However, to guarantee optimum fault-free operations we recommend that you carry out the following inspections.

7.3 Inspection schedule

Interval	Inspections
Yearly	Ensure the fastening screws are properly tightened
	Ensure cable connections and connection terminals are properly tightened
After approx. 16 000 – 20 000 hours of operation or higher levels of continuous load	Check deep groove ball bearings for noise, running smoothly. Bearings must be replaced by the manufacturer only.

8 Disposal

8.1 Disposal procedure

The manufacturer is not obligated to take back electronics waste. The device consists of hybrid components, and in part must be disposed of as special waste (electronic scrap) according to country-specific legislation.

Local municipal authorities or specialized disposal companies provide information on environmentally responsible disposal.

9 Replacement parts

The replacement parts listed below can be obtained via the service address on page 2.

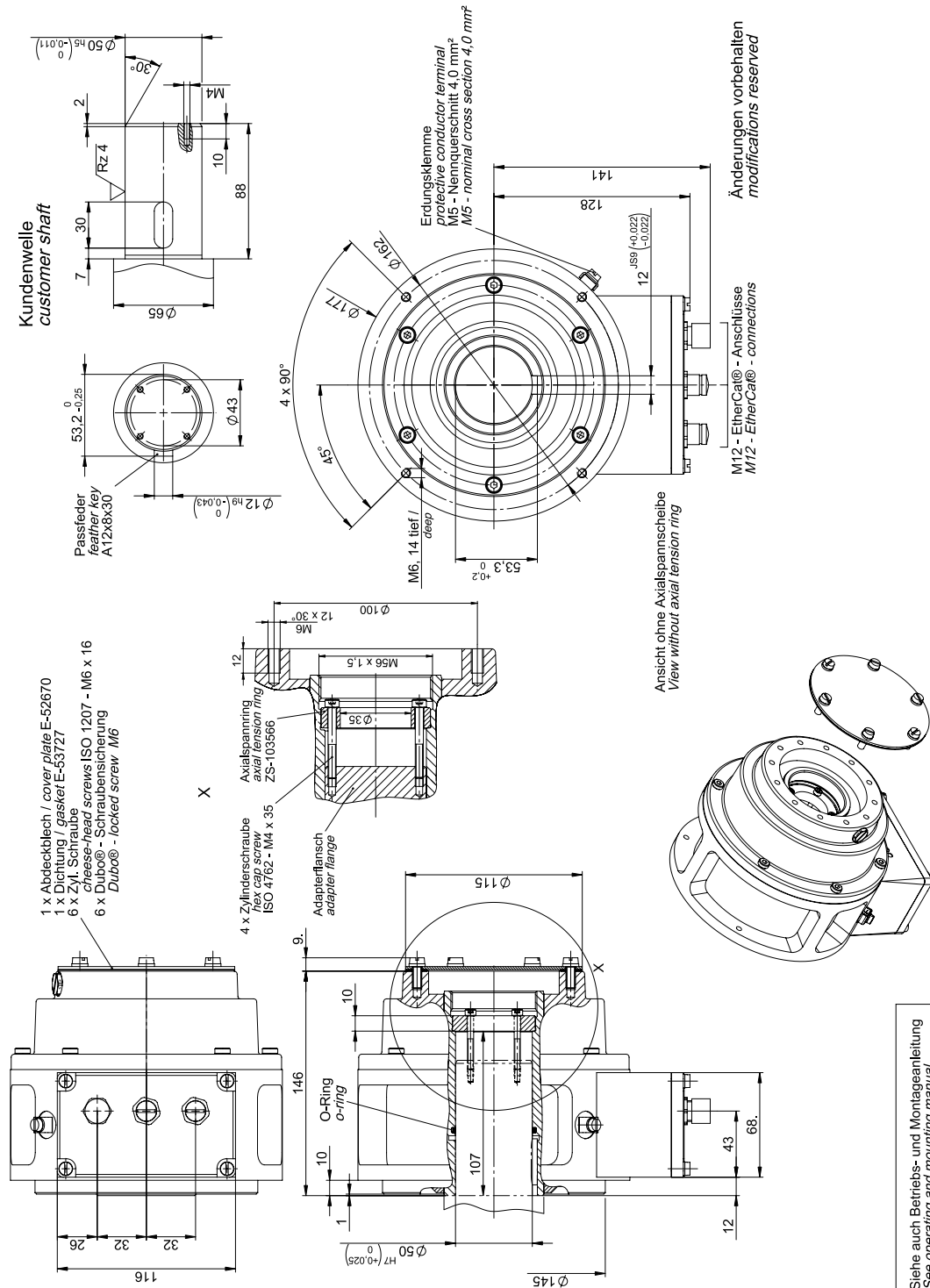
Replacement Part	Comment
Cover	Cover for the 2 nd shaft end or for the hollow shaft bore (NDE)
Axial tensioning disk/ring	Including screws
Terminal box – screw plug	To seal unused cable gland threads
Screw plug	To close of the access to the coupling
O-ring for hollow shaft	



NOTES!

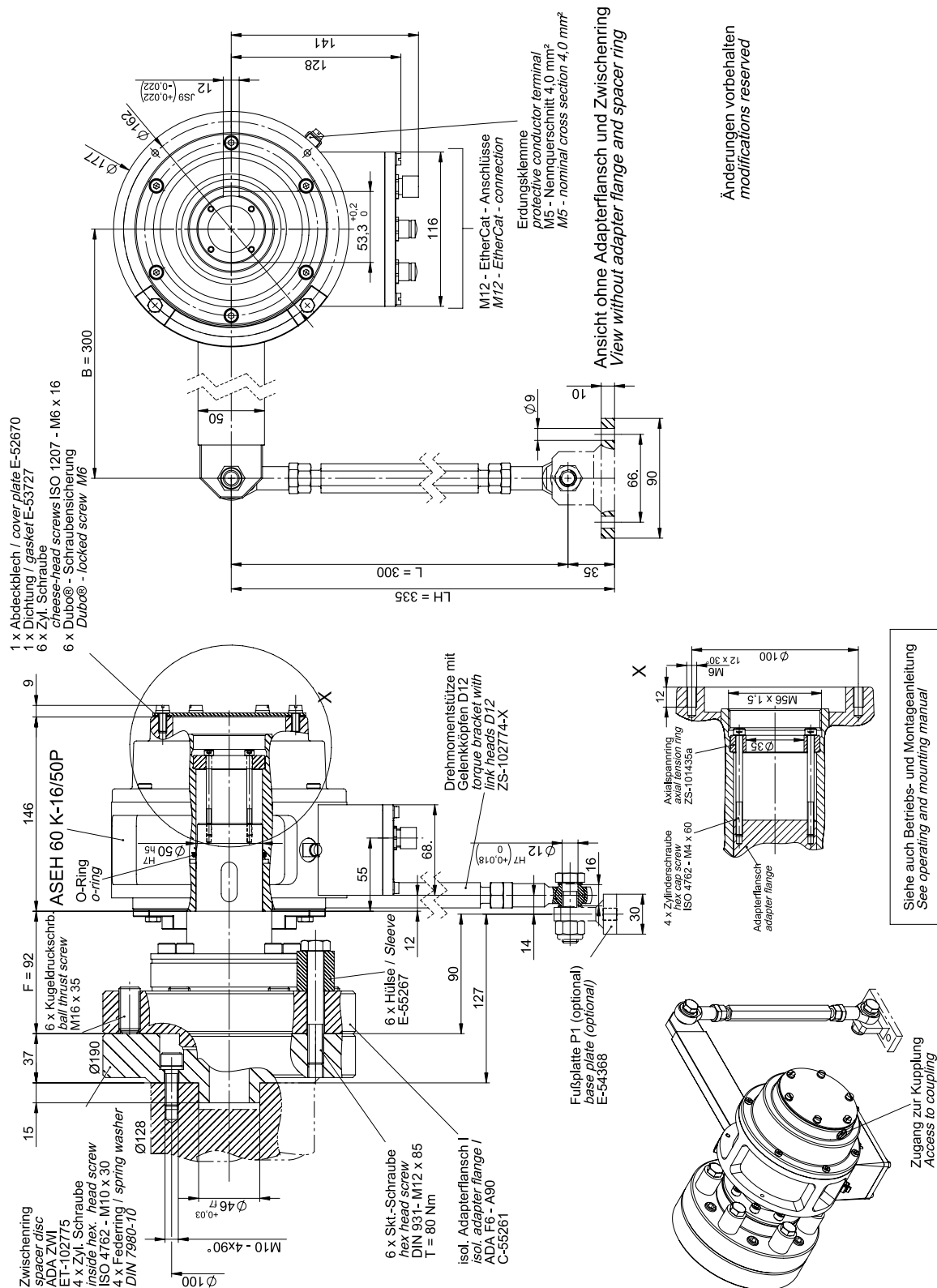
When ordering replacement parts always specify the serial number of the device!

10 Dimension drawings



ASEH 60 K -16/50P

HM 10 M 102772a



ASEH 60 K -16/50P

With isol. ADA F6-A90 + ADAZWI

HM 10 M 102776a