Operating Instructions

AK/AL

SPIETH
Aus Prinzip präziser

Original version of the operating instructions

HOISI PRECISION 凯狮精密 180 7312 9830

For	Components			
Spieth clamping sleeve (precision clamping sleeve)	AK 8.12	AL 8.12	AK 55.80	AL 55.80
	AK 10.15	AL 10.15	AK 60.85	AL 60.85
	AK 12.18	AL 12.18	AK 63.88	AL 63.88
	AK 14.20	AL 14.20	AK 65.90	AL 65.90
	AK 15.22	AL 15.22	AK 70.100	AL 70.100
	AK 16.22	AL 16.22	AK 75.105	AL 75.105
	AK 18.25	AL 18.25	AK 80.110	AL 80.110
	AK 20.32	AL 20.32	AK 85.115	AL 85.115
Series	AK 22.35	AL 22.35	AK 90.120	AL 90.120
	AK 25.37	AL 25.37	AK 95.125	AL 95.125
AK/AL	AK 28.40	AL 28.40	AK 100.130	AL 100.130
	AK 30.42	AL 30.42	AK 110.140	AL 110.140
	AK 32.48	AL 32.48	AK 120.150	AL 120.150
	AK 35.52	AL 35.52	AK 125.155	AL 125.155
	AK 40.56	AL 40.56	AK 130.160	AL 130.160
	AK 45.68	AL 45.68	AK 140.170	AL 140.170
	AK 50.72	AL 50.72	AK 150.180	AL 150.180

The Operating Instructions are also available for download at www.spieth-me.de. In case of any questions, please contact Spieth-Maschinenelemente GmbH & Co. KG directly.

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About the operating instructions for Spieth clamping sleeves

These operating instructions enable safe and efficient handling of Spieth clamping sleeves. Prior to performing any tasks, ensure that your staff have carefully read and fully understood these operating instructions.

Notices

The basic requirement for working safely is compliance with all specified safety notices. They can be identified by the following symbols:

> Caution!

In addition to the notices in these instructions, local accident prevention guidelines and national health and safety regulations also apply.

Table of contents

1 Information about Spieth Clamping Sleeves

1.1 General information

Please read these operating instructions carefully, paying special attention to our safety notices. These operating instructions are part of your product and must be kept accessible to the staff in the immediate vicinity of the product at all times. The operating instructions are also available for download at www.spieth-me.de.

In case of any questions, please contact Spieth-Maschinenelemente GmbH & Co. KG directly.

> Caution!
>
> It is mandatory to comply with the recommendations and notices in these operating instructions.
>
> Inform the end user about the contents of these operating instructions.
>
> Spieth-Maschinenelemente GmbH & Co. KG assumes no liability for damage caused by (i) misinterpreting or nonobserving the operating instructions; (ii) improper use; (iii) incorrect installation or unauthorised structural changes; or (iv) incorrectly circulating or failure to circulate the contents of these operating instructions to third parties.

These operating instructions apply on the assumption that the chosen product is valid for the use case. Please see the related design guide (available at www.spieth-me.de) for specifications, characteristics, and information on choosing Spieth clamping sleeves.

1.2 Safety notices

Spieth clamping sleeves are intended for use with friction-locked shaft-hub connections. Please follow all relevant safety notices.

> Caution!
>
> Any work carried out with or on the clamping sleeve needs to follow the "safety first" guideline!
>
> During operation, keep your hands away from the working area of the clamping sleeve!
>
> Prior to any assembly work, switch off all machine drives!
>
> Secure the machine against accidental power-up!
>
> Prior to commissioning the machine, install all safety devices!

Only expert personnel are allowed to perform assembly work on Spieth clamping sleeves. Using Spieth clamping sleeves is only admissible according to specifications. Spieth-Maschinenelemente GmbH & Co. KG assumes no liability for violations of the operating instructions or safety notices. This also applies to incorrectly interpreting or circulating these notices and to incorrect assembly or maintenance.

The clamping sleeves described here are state of the art at the time these assembly instructions are printed. Subject to changes based on evolved technologies.

For international deliveries, follow the safety regulations applicable in the target country.

1.3 Information on connecting components

In general, produce shafts according to manufacturing tolerance h5 (no more than h6 is admissible). For hub boreholes, a manufacturing tolerance of H7 (or H6 for high radial run-out requirements and/or hydraulically actuated clamping) applies. The functional surfaces of the connecting components used for clamping initiation on the clamping sleeves need to be manufactured with a run-out accuracy of 0.01 mm and/or as per IT4.

2 Description of Spieth Clamping Sleeves

2.1 Structure

Spieth clamping sleeve

Identifying features
(for original Spieth clamping sleeves)

Spieth logo
Name
Batch number

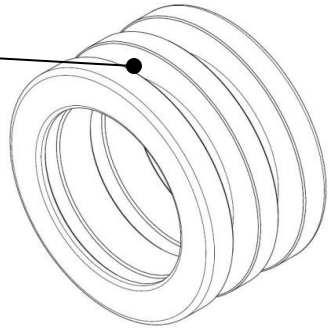

Fig. 1: Schematic representation similar to Spieth AK/AL series clamping sleeves

Spieth AK/AL series clamping sleeves have been designed for use on shafts with h5-tolerance zone. The clamping sleeve has been designed for external clamping initiation starting from the housing. In contrast to tapered clamping sets, the one-piece cylindrical clamping sleeve has no joints and can therefore achieve a high degree of precision. Using connecting components to initiate axial clamping achieves a uniform lateral contraction thanks to the base body's special geometry. This results in a simple, safe, and rigid centering effect.

2.2 Mode of action

Spieth clamping sleeves are precision clamping sleeves. Due to their design, they provide a maximum of precision, combined with utmost resilience.

Spieth AK/AL series clamping sleeves have been designed as all-purpose precision clamping sleeves. This makes them an ideal solution for applications with a high level of replacements and adjustments.

Despite their compact design they can ensure continuous load transmission and rigid connections together with precise, centering and optimum concentricity for applications with high torques and axial forces.

Fig. 2: Illustration similar to Spieth AK/AL clamping sleeves

Spieth AK/AL series clamping sleeves are classified as friction-locked shaft-hub connections. They have been designed for external clamping initiation starting from the housing. Axial clamping initiation achieves a uniform lateral contraction thanks to the base body's special geometry. The diaphragms are raised, widening the outer diameter and reducing the inner diameter, to create the required contact with shaft and hub for transmitting torques and axial forces. Thanks to this diaphragm principle, the connection is easy to assemble and quick to undo without the need for applying additional force.

2.3 Intended use

Spieth clamping sleeves are recognised state of the art. They are intended for use as reliable high-quality shaft-hub connections. Any other usage is regarded as improper use.

Spieth-Maschinenelemente GmbH & Co. KG reserves the right to technical changes. In case of any questions or technical issues, please contact Spieth-Maschinenelemente GmbH & Co. KG.

> Caution!
>
> Only expert personnel are allowed to choose, assemble, operate, and service Spieth clamping sleeves.

Use Spieth clamping sleeves only according to product-specific specifications. To ensure proper functioning of the Spieth clamping sleeves, it is mandatory to comply with the specifications of the connecting components. Detailed information on the above items can be found in the Design Guide. Operating conditions, e.g. speeds and temperatures at which the Spieth clamping sleeves are used must not exceed common standards.

> Caution!
>
> The user assumes responsibility for proper shaft and hub design, for determining the operating loads and meeting permissible operating conditions. In case of any questions or technical issues, please contact Spieth-Maschinenelemente GmbH & Co. KG.

In case operating conditions change, it is mandatory to check if the clamping sleeve is still suitable for further use.

Spieth clamping sleeves need to be handled with care, assembled correctly, and used as intended to achieve their full functional potential. Prior to working with our clamping sleeves, please read these operating instructions carefully. In particular, please follow all relevant safety notices.

> Caution!
>
> It is mandatory to comply with the instructions for use and the general safety notices!
>
> Handle clamping sleeves with care before and during assembly; assemble them according to these operating instructions and/or the according assembly instructions. Use only stipulated tools for assembling clamping sleeves.
>
> Incorrect handling or the use of inadequate aids can severely limit, damage, or destroy the machine element and/or the machine in its functionality.

Spieth clamping sleeves are not meant to be repaired; if repairs are necessary in exceptional cases, only the manufacturer is allowed to perform them.

3 Delivery Contents and Storage of Spieth Clamping Sleeves

3.1 Delivery contents of the Spieth Clamping Sleeves

Spieth AK/AL series clamping sleeves have been treated and packaged with a preservative. Opening the cover or removing the component can reduce the duration of the corrosion protection even if the component is later repackaged.

In case of complaints, please contact Spieth-Maschinenelemente GmbH & Co. KG with your multi-digit picking number at hand. In case you have to return the component, please package it with care, affix a shipping label, and send it to Spieth-Maschinenelemente GmbH & Co. KG.

If functional surfaces exhibit thin blank lines, then they have been created during our quality assurance process when measuring the components. They do not impact the functionality of the components and constitute no defects.

3.2 Storage and shelf life of the Spieth Clamping Sleeves

In our experience, the corrosion protection is effective for up to two years, provided you bear the following in mind during the storage period:

- The storeroom is clean and enclosed
- Packaged parts are protected from mechanical influences
- The storeroom is dry (rel. humidity < 65%)
- The temperature range is 0°C to 40°C
- No corrosive media such as gases, vapors, or liquids can act

4 Assembling Spieth Clamping Sleeves

4.1 Preparing for assembly

Remove Spieth clamping sleeves from their packaging right before assembly. As hand perspiration can cause corrosion, ensure to keep your hands dry and clean and/or to always wear protective gloves for assembly.

> Please note:
>
> For environmental reasons, please comply with applicable statutory regulations and guidelines when disposing of packaging materials.

In case of damage to packaging components, check the clamping sleeves for damage and remove any contamination.

The preservative used is compatible with all conventional machine oils. If in doubt, check the preservative's compatibility.

For an optimum mode of action of Spieth clamping sleeves, remove the thin wax-like film of preservative from the contact surfaces using a lint-free cloth. Directly afterwards, use machine oil without friction-reducing additives to lightly oil the component and protect it from corrosion.

4.2 Ambience

During assembly, ensure that...

- the assembly location is free from dust and clean,
- the components have no contact with corrosive media,
- foreign bodies such as sand, sawdust, fluff, etc. are kept away from the component,
- metal filings (in particular from machining tools such as files, etc.) are kept away from the component.

> Caution!
>
> Contamination can significantly impact the functionality and service life of Spieth clamping sleeves.

For best results, use a suitable, enclosed space for assembly and proceed swiftly. If this is not possible, make sure to protect the components from ambient contamination and from damage.

4.3 Assembly process

Essentially, assembly is a 3-step process:

- 1. Cleaning and oiling
- 2. Joining
- 3. Clamping initiation

For an optimum mode of action of Spieth clamping sleeves, perform all three assembly steps in the specified order.

> Caution!
>
> Spieth clamping sleeves require friction-controlled clamping. The clamping force cannot be applied in relation to the clamping path. To avoid premature jamming, ensure you have a "free" functional path "C" (see design guide).

> Caution!
>
> Initiate clamping only if borehole and outer surface of the clamping sleeve are fully covered by the connecting components and/or project within admissible limits (see design guide).
>
> Otherwise, damage such as plastic deformation may occur on the clamping sleeve and render it unusable.
>
> In such a case, Spieth-Maschinenelemente GmbH und Co. KG assumes no liability or warranty.

Use only the following assembly process for assembling Spieth AK/AL series clamping sleeves:

4.3.1 Cleaning and oiling:

For optimum application, carefully clean clamping sleeve, shaft and hub borehole and lightly dab them with conventional fluid machine oil without friction-reducing additives.

4.3.2 Joining:

Join clamping sleeve and connecting components without applying too much force to ensure that the clamping set contact surfaces are fully covered.

4.3.3 Clamping initiation:

Initiate clamping force. Tension Spieth clamping sleeves only if borehole and outer surface of the clamping sleeve are fully covered by shaft and hub and/or project within admissible limits (see design guide).

> Please note:
>
> The AK series clamping sleeves are available as low-thrust models; their transmittable torques and axial forces are, however, only up to 0.5 times the table values (see design guide).

Following specified assembly, Spieth clamping sleeves are ready for use immediately.

4.4 Automated operation

In automatic mode using, e.g., hydraulic actuation, the system's actual values may deviate from the table values because of a number of different parameters. For this application scenario, we strongly recommend that you verify the force or torque values required. In this application, care must be taken to ensure that the installation is completely free of axial clearance. To prevent fatigue failure and due to fretting corrosion risk, tension the clamping sleeve at a high clock frequency with a max. force of $0.75xF_{max}$.

Please see the relevant assembly instructions, available at www.spieth-me.de, for more information on assembly.

5 Using Spieth Clamping Sleeves

Spieth clamping sleeves are maintenance-free. During general maintenance work, we nevertheless recommend a visual inspection. If used as intended, Spieth clamping sleeves and their high level of concentricity accuracy result in a friction-locked shaft-hub-connection for high torque values and axial forces.

We recommend periodic visual inspections of the clamping sleeves for potential damage.

Follow general safety notices when using Spieth clamping sleeves.

> Caution!
>
> Never touch actively rotating components. Take protective measures against accidental contact.

If you notice irregularities with the Spieth clamping sleeves during operation, immediately switch off the machine's drive.

6 Disassembling Spieth Clamping Sleeves

If handled correctly, Spieth clamping sleeves can be reused several times. Undo the clamping initiation to return the cylindrical clamping sleeve into its original shape.

In case you used a Spieth clamping sleeve to friction-lock a shaft and a hub, due to the adjustments made you can only reconnect these two components after they have been disassembled.

To disassemble, proceed in reverse assembly order.

- 1. Release the clamping force.
- 2. The clamping sleeve relaxes and resumes its original shape. All the parts are once again freely movable. Due to the many possible ways of initiating the clamping force, this description can only be formulated in general terms.

To enable later reuse, clean, preserve, and store Spieth clamping sleeves correctly. Prior to reuse, proceed as detailed in Section 4.1, "Preparing for assembly" ff.

If non-original Spieth spare parts are used, Spieth-Maschinenelemente GmbH & Co. KG assumes no liability or warranty.

7 Disposing of Spieth Clamping Sleeves

You can easily reorder Spieth clamping sleeves by entering the component designation imprinted on the clamping sleeve and the batch number.

Spieth clamping sleeves are made of steel. At the end of their operating life, clean metal parts and dispose of them as scrap metal.

> Please note:
>
> For environmental reasons, please comply with applicable statutory regulations and guidelines when disposing of these products.