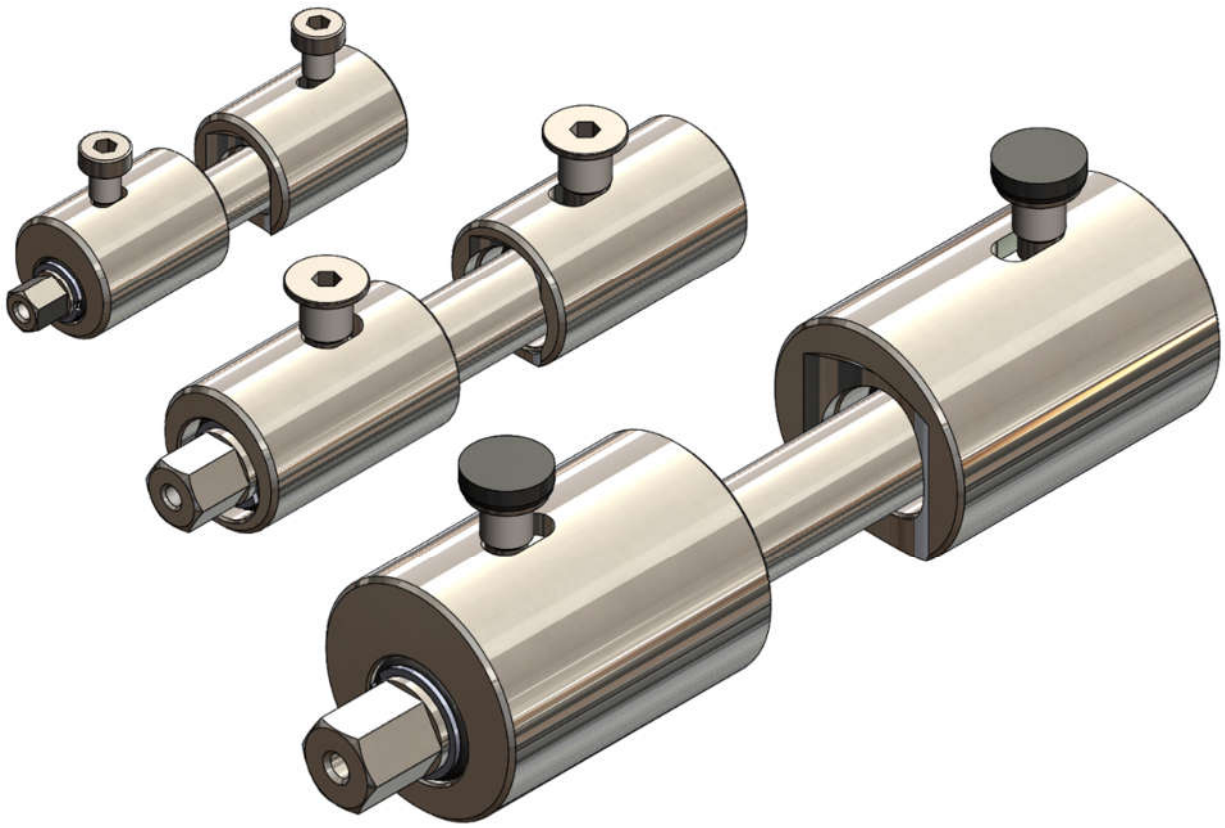
STARK.metec zero point clamping system

Translation of the original operating manual
WM-020-439-13-en STARK.metec



STARK.metec 1 / 2 / 3

Art. no.: S2000-001, S2000-001-1, S200-001-2, S2000-001-3, S2000-101, S2000-201, S2000-202, S03688

Manufacturer:

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2. Identification of the partly completed machinery

Product:	Mechanical fast closing clamp
Function:	Clamping and centring of workpiece pallets or workpieces
Product group:	STARK.metec
Article numbers:	S2000-001, S2000-001-1, S2000-001-2, S2000-001-3, S2000-101, S2000-201, S2000-202, S03688
Trade name:	Corresponds to product group, see above

3. User instructions

3.1. Purpose of the document

This operating manual

- describes the function, operation and maintenance of the fast clamping device
- gives important instructions for safe and efficient use of the fast clamping device

3.2. Revision history

Date	Revision	Name
27/01/2021	Document creation	japr
06/02/2024	S2000-202 added	lats
19/02/2024	Layout & installation diagram adapted	erkl
26/05/2025	Maintenance and repair adapted	mafr

3.3. Referenced documents

Document	Version	Author
Assembly drawings with parts lists	-	Stark Spannsysteme GmbH

3.4. Presentation of safety instructions

Safety instructions are identified by a pictogram. The illustration of the pictograms with signal word is shown. The signal word describes the severity of the impending risk.

DANGER Immediate imminent risk to life and health of persons (serious injury or death). Be sure to follow these notes and procedures!

CAUTION Potentially dangerous situation (minor injuries or damage to property). Be sure to follow these notes and procedures!

INFORMATION Tips for use and particularly useful information.

INSTRUCTION Obligation for special conduct or an activity for the safe handling of the machine.

4. Essential safety instructions

4.1. Intended use

The fast closing clamp is used for clamping pallets with mounting devices for workpieces, for workpieces directly, for vices or connecting machine or device parts. The workpieces are intended for processing, transporting and measuring. The intended use also presupposes:

- compliance with all the instructions in the operating manual
- observance of the inspection and maintenance intervals
- use of only OEM parts.

4.2. Foreseeable misuse

Any other use than or beyond that specified in chapter 4.1 "Intended use" is considered improper use!

Risks may occur if the product is not used as intended. Improper uses include e.g.:

- exceeding the technical values specified for normal operation
- application for hoist operation and load transportation
- use as tool holder
- use as pressing tool
- disregard of the safety guidelines according to EC Machinery Directive 2006/42/EC

The operating company bears sole responsibility for any injury or damage resulting from such improper use. The manufacturer assumes no liability.

4.3. When using rotating machine tools

For rotating applications, the fast closing clamp may only be operated if it is ensured that it is securely clamped. It must also be ensured that the permissible forces acting on the fast closing clamp are not exceeded according to the technical data.

The danger zone must be secured by suitable measures.

Specialists must be consulted for the calculation and design of the fast closing clamps for rotating applications. Stark provides this service.

4.4. Modifications or alterations

Unauthorised modifications or alterations of the fast clamping device will void any liability and warranty on the part of the manufacturer!

Therefore do not make any modifications or alterations to the fast closing clamp without consultation with and the written approval of the manufacturer.

4.5. Conduct in the event of faults

- Stop operation immediately
- Report fault to the responsible personnel
- Have the fault rectified only by qualified personnel
- Check products and machine for safe operation

4.6. Spare and wear parts and auxiliary materials

The pallets with the clamping devices are manufactured by the operating company itself or on its behalf. Only retractable nipples from STARK may be used on the pallet and must be installed according to the appropriate data sheet of STARK.

The use of spare and wear parts from third-party manufacturers can result in risks. Use only OEM parts or parts approved by the manufacturer. The manufacturer will assume no liability for any injury or damage resulting from the use of spare and wear parts and auxiliary materials not approved by the manufacturer.

4.7. Obligation of the operating company

The operating company is obliged to allow only persons to work on the fast clamping device who

- are familiar with the fundamental occupational health and safety and accident prevention regulations.
- have been instructed in the use of the fast clamping device and have read and understood this operating manual.

The requirements of EC Directive 2007/30/EC on the use of work equipment must be observed.

4.8. Residual risks

The occurrence of mechanical, hydraulic and pneumatic residual energy on the fast clamping device and the pressure in the cylinders and valves after switching off the fast clamping device must be taken into account!

For example:

- preloaded springs
- pressure locked in by non-return valve
- pressure locked in by valve lock position
- etc.

4.8.1. Design for the pallet and fast closing plate

To ensure safe positioning on the fast closing clamp, make sure there is a grip point for a hand on the pallet. If this grip point is not structurally possible, care must be taken when fitting so that hand/fingers are never between the fast closing clamp and the retractable nipple or between the fast closing plate and the pallet. During the change procedure, only grab the pallet at the front.

DIN EN 349 Safety of machinery – Minimum gaps to avoid crushing of parts of the human body must be observed.

When clamping, do not reach with your fingers into the gap between the fast closing plate and the pallet.

4.8.2. Danger due to incorrect assembly of the fast closing clamp

The pallet could come loose if the fixing screws are not tightened properly and the screws are not strong enough.

The risk potential is considerably higher for rotating applications.

Measure:

Observe the mounting instructions for strength class, tightening torque and arrangement.

The product-related data is shown on the respective enclosed drawing with parts list and in chapter "6 Assembly and installation".

4.8.3. Hazard due to changes in rotational speed

Excessive rotational speed, weight and unbalance can cause the fast closing clamp to break, resulting in the pallet being catapulted away.

Measure:

Observe the information and regulations regarding the maximum values of Stark.

(see chapter "8 Technical data")

4.8.4. Hazard due to exhaust air noise

The pneumatic system can generate loud noises.

Measure:

- Wear ear protection

4.8.5. Influences on service life

Negative influences include:

- Damage to components.
- External mechanical damage to functional components.
- Undefined forces or defined forces exceeded.
- Heavy contamination (e.g. chips, casting or grinding dust.)
- Aggressive environment, e.g. cooling lubricants or cleaning agents which chemically attack seals / wipers.
- Incorrect pre-clamping position or loading position.

4.9. Special warranty conditions

For STARK.metec products with extended spindle or when using a separate spindle extension, please note that a support for the spindle must be fitted in order to maintain the warranty. See chapter "6.4 Extended spindles and separate spindle extensions".

4.10. Choosing the right sockets

At least ½" sockets should be used with STARK.metec products. The torques are too high for ¼" sockets and can cause damage. If in doubt, check the data sheet of the socket used.

5. Description of the fast clamping device

5.1. General

STARK.metec is a mechanical clamping device that is clamped manually by means of a torque spanner. It is the connection between machine and clamping device and is used for fast and efficient set-up. While one pallet is being processed, the other can be set up.

STARK.metec is available in different versions/with different functions:

- standard
- with extended temperature range
- with extended spindle

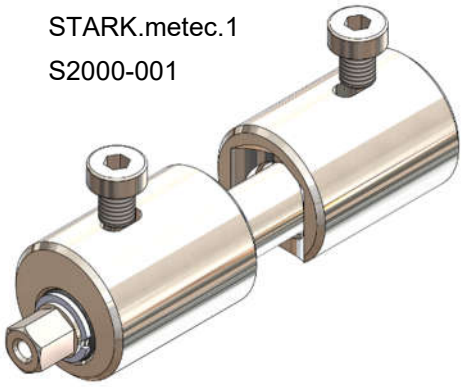
5.2. Description of the versions and functions

STARK.metec "Standard" is a clamping lock without special functions.

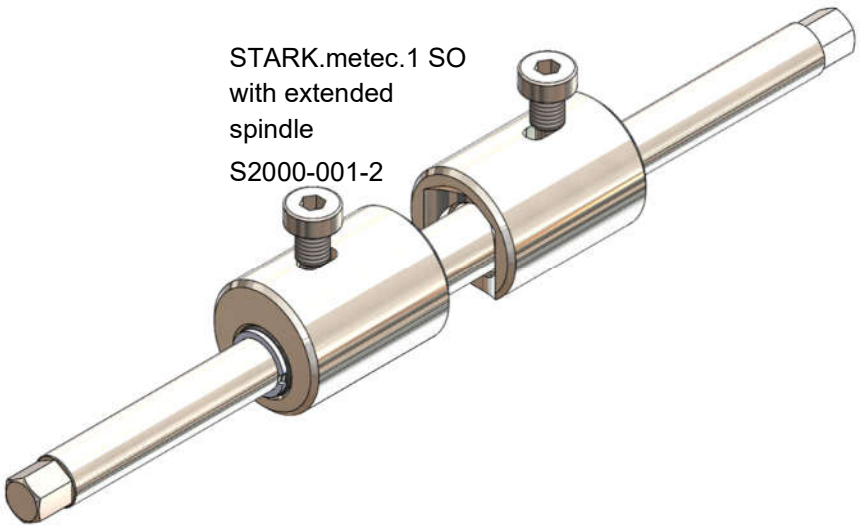
STARK.metec "with extended temperature range" is a clamping lock that is exclusively made with FKM seals. These can be used at higher temperatures than standard seals. Temperature range +10°C to +150°C.

STARK.metec "with extended spindle" is a clamping lock suitable for larger clamping lock plates. Individual customer-specific designs are listed as examples. Other versions of STARK.metec products with extended spindle are available on request.

STARK.metec.1
S2000-001



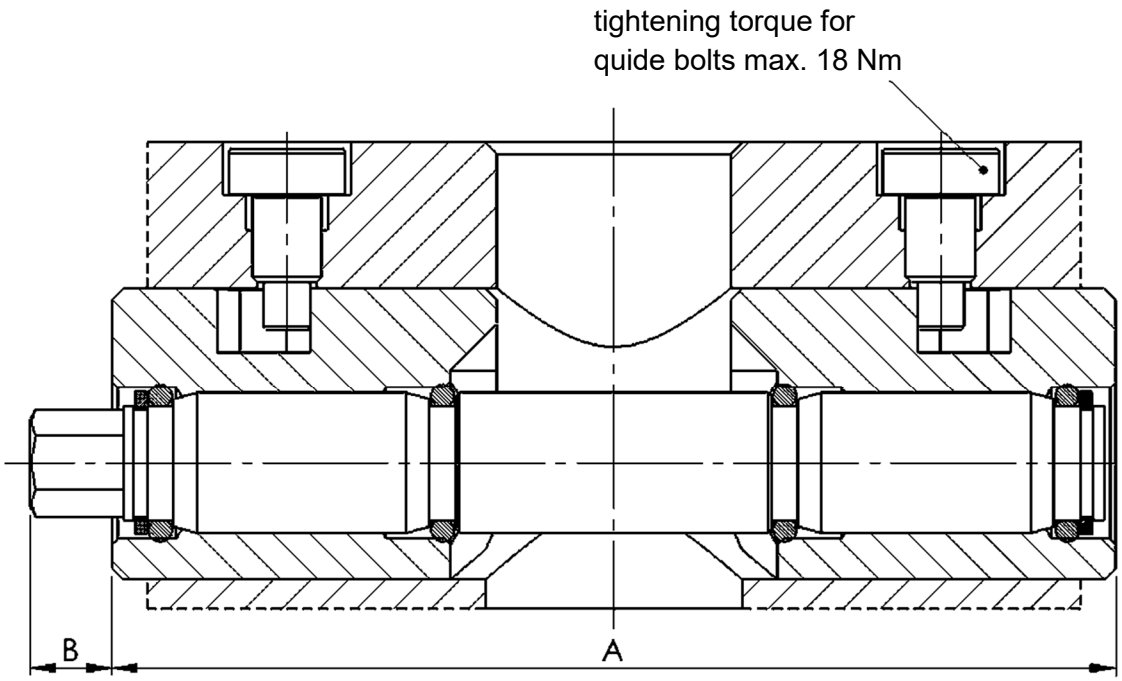
STARK.metec.1 SO
with extended
spindle
S2000-001-2



6. Assembly and installation

6.1. Installation of the fast closing clamp

For installation, the dimensions listed in the respective data sheet (D034, D045 or D078) must be set. Then insert the clamping lock into the cleaned installation hole. The STARK.metec is positioned using the supplied guide screws. Refer to chapter "8 Technical data" for the tightening torques.

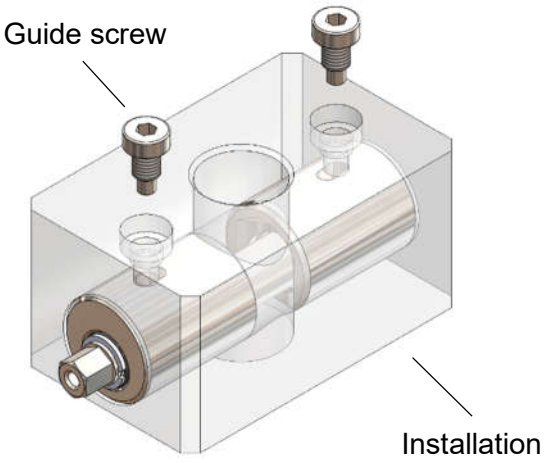


	A max.	B
STARK.metec.1	86	7
STARK.metec.2	131	9
STARK.metec.3	201	14,3

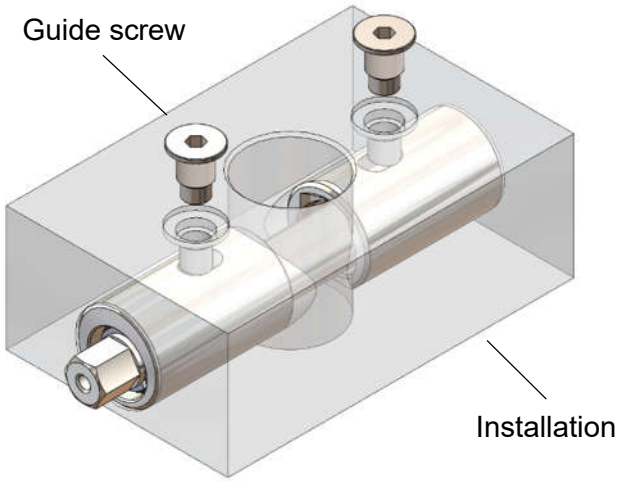
Attention:
to install the metec set dimensions A and B!

The STARK.metec.3 also has screw covers that should only be fitted after a functional test.

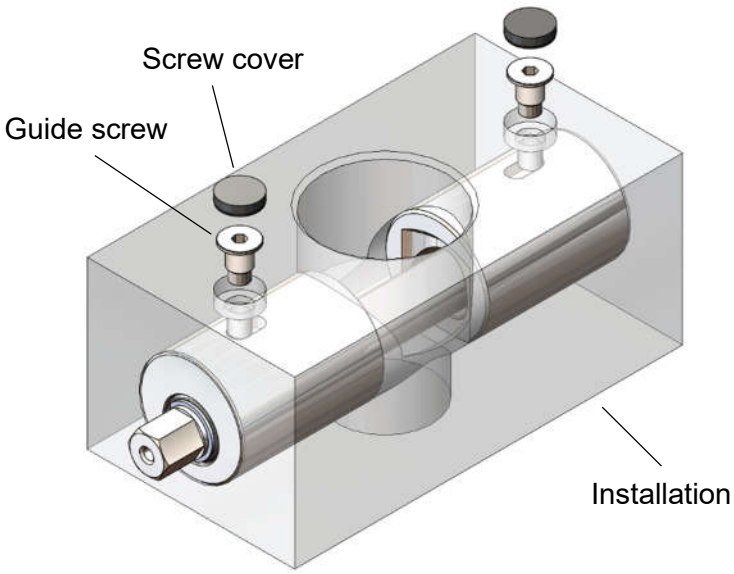
STARK.metec.1
S2000-001



STARK.metec.2
S2000-101

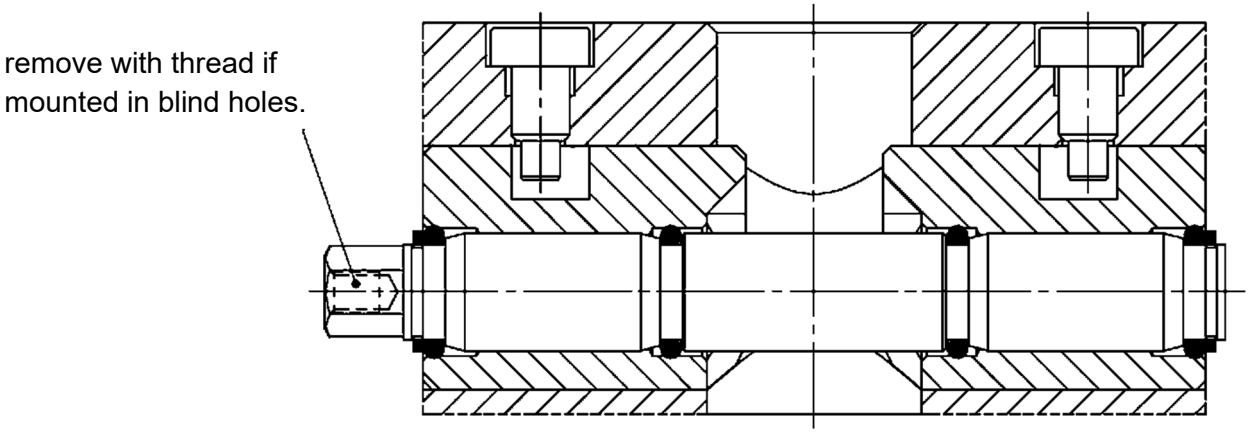


STARK.metec.3
S2000-201, S2000-202



6.2. Removing the fast closing clamp

For removal, first remove the guide screws. The clamping lock is then pushed out through the installation hole. In case of installation in a blind hole, the pulling-off thread in the spindle can be used to pull out the STARK.metec.

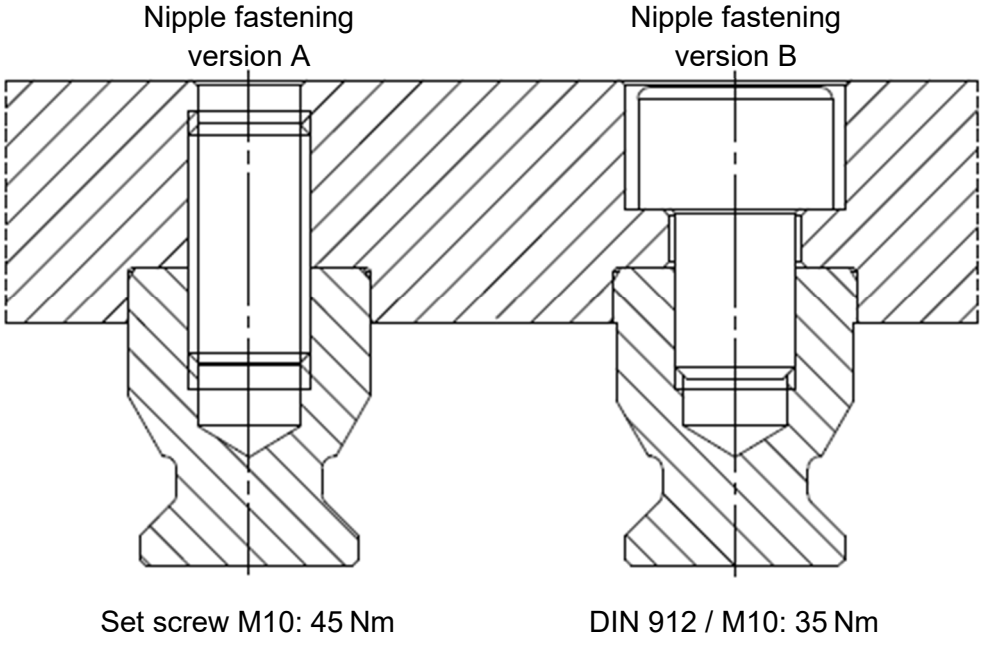


6.3. Retractable nipple

The pallets with the clamping devices are built by the operating company itself or on its behalf. Only original retractable nipples from STARK Spannsysteme GmbH may be used for the pallet. The locating bores must be manufactured according to data sheet D029-3 and assembly must be carried out according to the STARK data sheet specifications (D035 and D029-3).

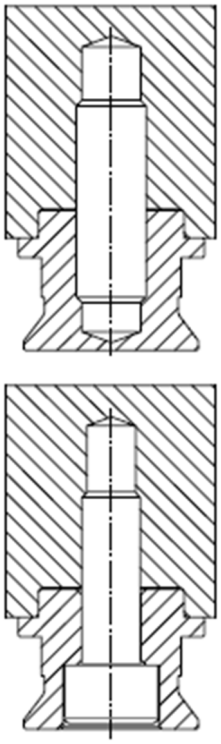
Glue in set screws with Loctite 222, use set screws, strength 10.9, without hexagon socket.

STARK.metec.1



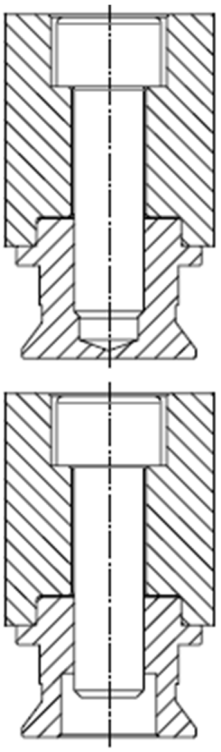
Retractable nipple STARK.metec.1 max. screw-in depth 10 mm.

STARK.metec.2 and STARK.metec.3



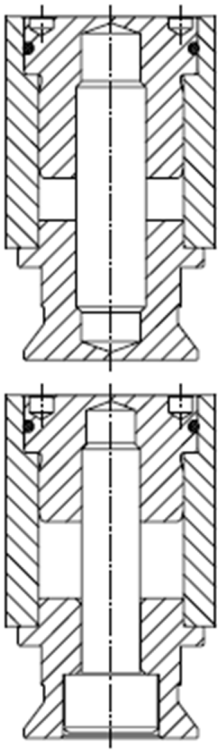
Nipple fastening version A

Set screw M12: 85 Nm
DIN 912 / M10: 45 Nm
DIN 912 / M16: 200 Nm



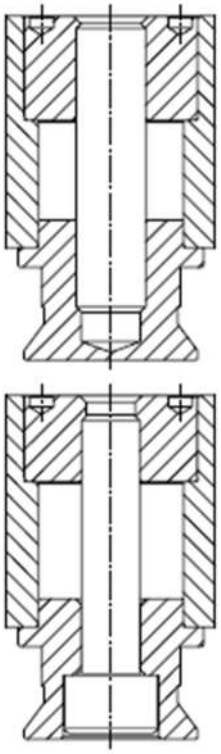
Nipple fastening version B

DIN 912 / M10: 45 Nm
DIN 912 / M16: 200 Nm



Nipple fastening version D

Set screw M12: 85 Nm
DIN 912 / M10: 45 Nm
DIN 912 / M16: 200 Nm



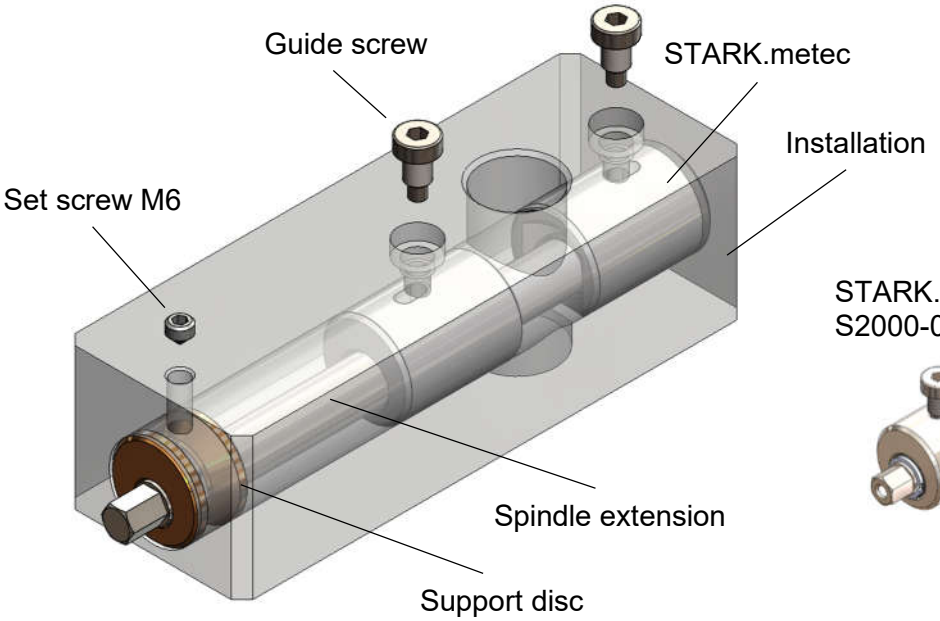
Nipple fastening version E.1

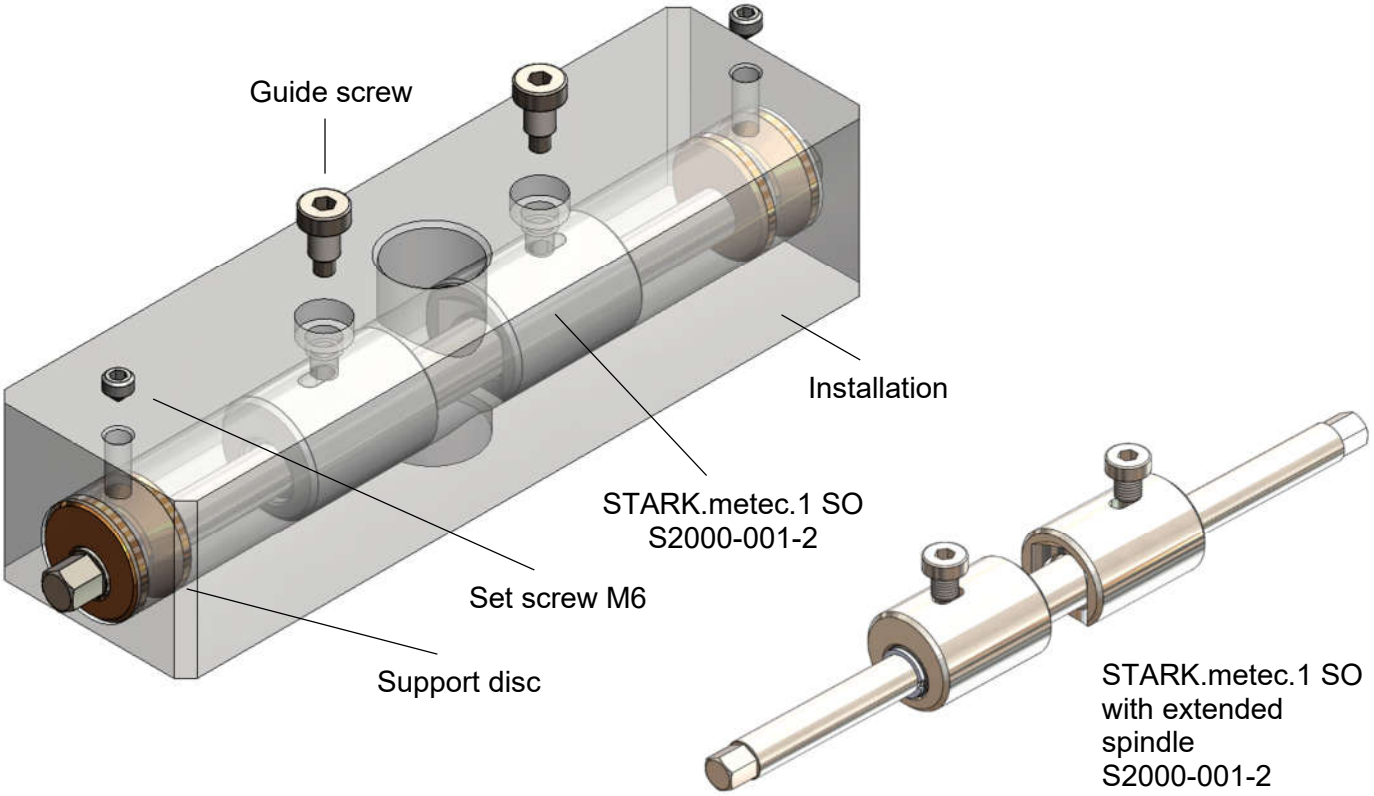
Set screw M12: 85 Nm
DIN 912 / M10: 45 Nm
DIN 912 / M16: 200 Nm

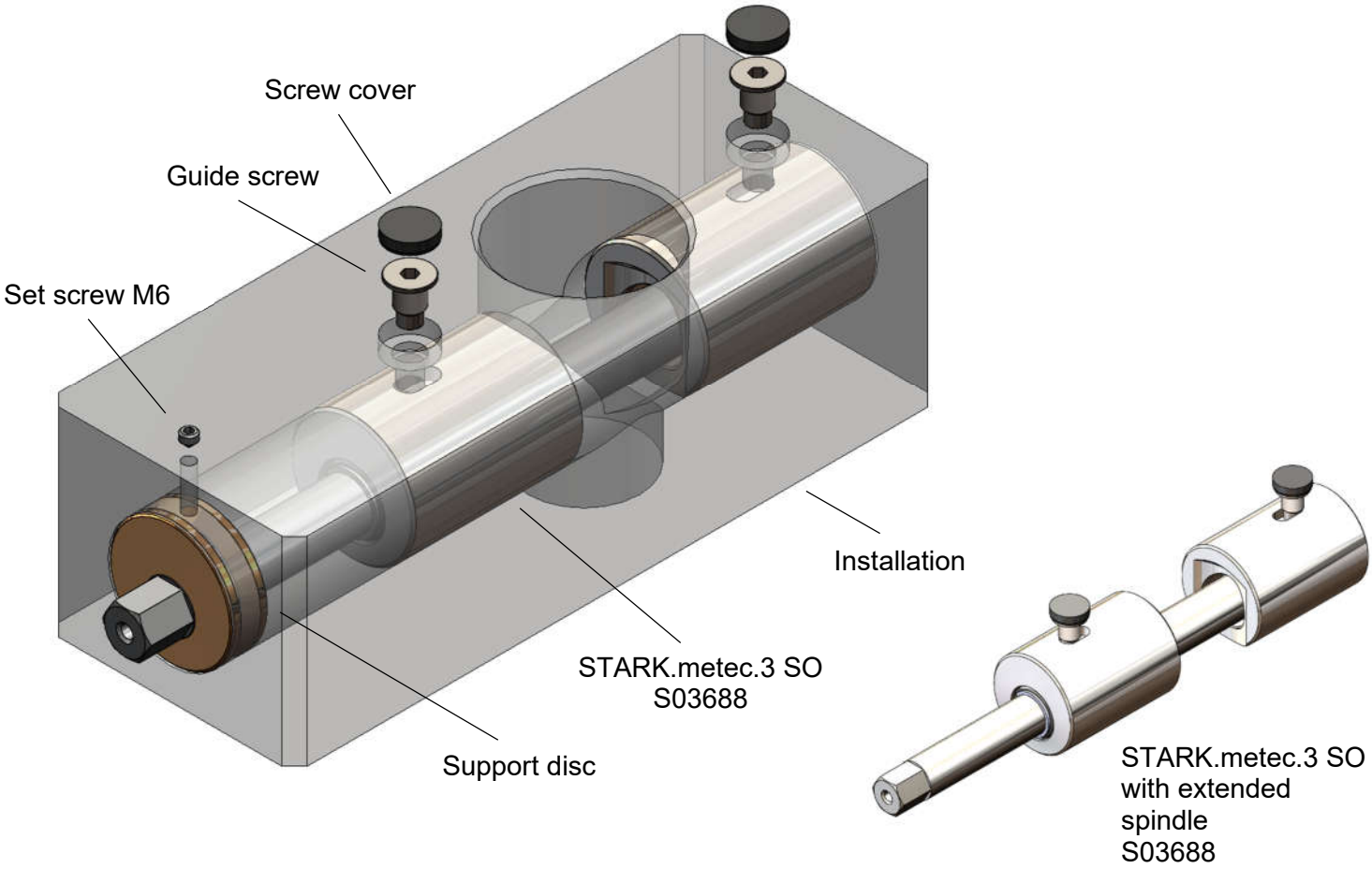
Retractable nipple Stark.metec.2 with blind hole – max. screw-in depth 16 mm.

6.4. Extended spindles and separate spindle extensions

For STARK.metec products with an extended spindle, a support for the spindle must be fitted. For the STARK.metec products, there is an optional separate spindle extension with support disc, which can be combined with the STARK.metec product. The supports should ideally be placed in the front third of the extensions and are necessary to maintain the warranty of the products. To prevent dirt build-up, it is recommended that the installation contour is flush with the support disc.





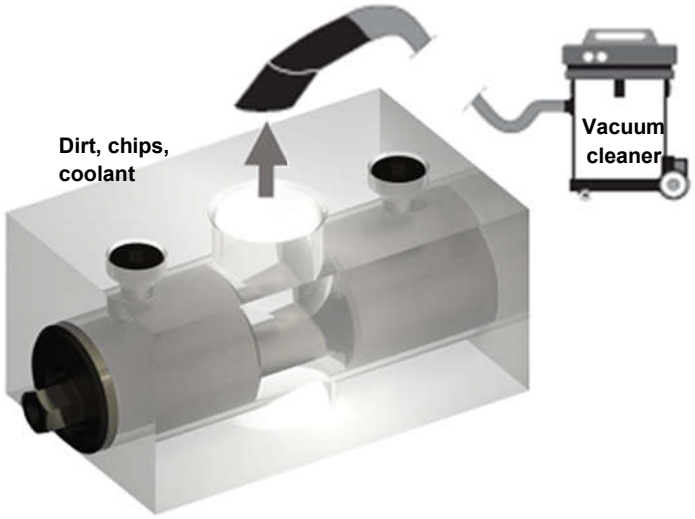


Other versions of STARK.metec products with extended spindle available on request.

7. Maintenance and repair

7.1. Cleaning surfaces

Correct!
Extraction and suction of chips, dirt and coolant from the clamping lock.



Possible!
The clamping lock may be blown off or wiped with compressed air.

As a matter of principle, no contamination is permitted in the clamping lock.
Cleaning depends on the application and replacement interval.

7.2. General cleaning

For general cleaning, the entire area of the retractable nipple as well as the clamping area and the support surfaces must be cleaned of all dirt.
Only an authorised service technician may carry out installation work on the clamping locks. The necessary safety measures must be observed in full and without exception during all work.

Damage to components!

The product must not be cleaned with:

- corrosive or caustic components or
- organic solvents such as halogenated or aromatic hydrocarbons and ketones (nitro thinner, acetone etc.), as this can destroy the seals.

The element must be cleaned at regular intervals. In particular, the area of the piston or bolt housing must be cleaned of chips and other liquids.
In case of heavy contamination, cleaning must be carried out at shorter intervals.

7.3. Storage

Until installation:
If you do not use the fast closing clamp immediately, please store it dry and dust-free in its original packaging.

Long period of storage after use:
Before storage, clean the fast closing clamp (see chapter "7.2 General cleaning") and take measures for corrosion protection.

After a long period of storage:
After a long period of storage (approx. 3 years), replace the O-rings before use.

7.4. Disposal / recycling

All parts, auxiliary materials and process media of the fast clamping device must be separated according to type and disposed of in accordance with the local regulations and directives.

8. Technical data

	S2000-001, S2000-001-x	S2000-101	S2000-201, S2000-202, S03688
max. retention force	12 kN	20 kN	50 kN
Tightening torque	60 Nm	80 Nm	70 Nm
Operation	2.5 revolutions	2.5 revolutions	3.5 revolutions
Width across flats	AF 8	SW 13	SW 17
min. plate thickness	min. 40 mm	min. 45 mm	min. 80 mm
Guide screw tightening torque	18 Nm	18 Nm	18 Nm
Sealing material	NBR / FKM*	NBR	NBR
Temperature range	+10 ° to +80 °C / +10 ° to +150 °C*	+10 ° to +80 °C	+10 ° to +80 °C

*S2000-001-1

9. Declaration of Incorporation

This document refers to the Declaration of Incorporation according to Machinery Directive 2006/42/EC Annex II No. 1 letter B:

Manufacturer: **STARK Spannsysteme GmbH**
Römergrund 14
A-6830 Rankweil
Austria

Authorised representative to compile the technical documentation:
Mr. Martin Greif, Managing Director, address: See manufacturer.

Product:	Fast closing clamp
Function:	Clamping and centring of workpiece pallets or workpieces
Product group:	STARK.metec
Article numbers:	S2000-001, S2000-001-1, S2000-001-2, S2000-001-3, S2000-101, S2000-201, S2000-202, S03688
Trade name/ general designation:	Fast closing clamp

The manufacturer undertakes to provide the specific technical documentation relating to the incomplete machinery to national authorities in electronic or written form upon justified request.

Before it is established that the complete machine complies with the provisions of the Machinery Directive 2006/42/EC, it is prohibited to put the incomplete machinery into service.

If applicable, there are additional guidelines for the machine integrator, among others, to observe and implement completely and correctly before commissioning:
EN ISO 12100; EN ISO 4413
- in the respective valid version of the statutory date.

Stark Spannsysteme GmbH Rankweil, 05.06.2025

Martin Greif
Managing Director

The following part of the Declaration of Incorporation according to the Machinery Directive 2006/42/EC Annex II No. 1 letter B describes which parts of the Machinery Directive 2006/42/EC have already been fulfilled for the system used at the time of handover of the product(s) or still have to be fulfilled subsequently by the integrator of the complete machine. The list is drawn up in accordance with the Machinery Directive 2006/42/EC Annex I.

If a superordinate provision is marked and the sub-items are not indicated, this shall apply collectively to all subordinate provisions which are thus to be fulfilled or have already been fulfilled.

If individual aspects are not relevant to the system described in this document by the manufacturer or distributor, this does NOT necessarily mean that the integrator of the complete machine does not have to consider these aspects in general.

If two columns are marked, this means that parts of the provisions have already been partially or fully complied with, but the integrator is responsible for full compliance.

	To be fulfilled by the system integrator: ↓	Fulfilled on the part of the system manufacturer: ↓	not relevant: ↓
1.	Essential health and safety requirements			
1.1.	General remarks			
1.1.1.	Definitions		X	X
1.1.2.	Principles of safety integration		X	X
1.1.3.	Materials and products		X	X
1.1.4.	Lighting			X
1.1.5.	Design of machinery to facilitate its handling		X	X
1.1.6.	Ergonomics			X
1.1.7.	Operating positions			X
1.1.8.	Seating			X
1.2.	Control systems			X
1.3.	Protection against mechanical hazards			
1.3.1.	Risk of loss of stability			X
1.3.2.	Risk of break-up during operation		X	
1.3.3.	Risks due to falling or ejected objects			X
1.3.4.	Risks due to surfaces, edges or angles		X	
1.3.5.	Risks related to combined machinery			X
1.3.6.	Risks related to variations in operating conditions			X
1.3.7.	Risks related to moving parts			X
1.3.8.	Choice of protection against risks arising from moving parts			X
1.3.8.1.	Moving transmissions parts			X
1.3.8.2.	Moving parts involved in the process			X
1.3.9.	Risk of uncontrolled movements			X
1.4.	Required characteristics of guards and protective devices			X
1.5.	Risks due to other hazards			
1.5.1.	Electricity supply			X
1.5.2.	Static electricity			X
1.5.3.	Energy supply other than electricity			X
1.5.4.	Errors of fitting		X	X
1.5.5.	Extreme temperatures			X
1.5.6.	Fire	X		
1.5.7.	Explosion	X		

1.5.8.	Noise			X
1.5.9.	Vibrations	X		
1.5.10.	Radiation	X		
1.5.11.	External radiation	X		
1.5.12.	Laser radiation	X		
1.5.13.	Emissions of hazardous materials and substances			X
1.5.14.	Risk of being trapped in a machine			X
1.5.15.	Risk of slipping, tripping or falling			X
1.5.16.	Lightning			X
1.6.	Maintenance			X
1.7.	Information			
1.7.1.	Information and warnings on the machinery		X	X
1.7.1.1.	Information and information devices			X
1.7.1.2.	Warning devices			X
1.7.2.	Warning of residual risks			X
1.7.3.	Machinery marking			X
1.7.4.	Instructions		X	X
1.7.4.1.	General principles for the drafting of instructions		X	X
1.7.4.2.	Content of the instructions		X	X
1.7.4.3.	Sales literature		X	X
2.	Supplementary essential health and safety requirements for certain categories of machinery			X
3.	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery			X
4.	Supplementary essential health and safety requirements to offset hazards due to lifting operations			X
5.	Supplementary essential health and safety requirements for machinery intended for underground work			X
6.	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons			X

Alle derzeit verfügbaren Sprachen finden Sie unter:
All currently available languages can be found at:
https://www.stark-roemheld.com/download