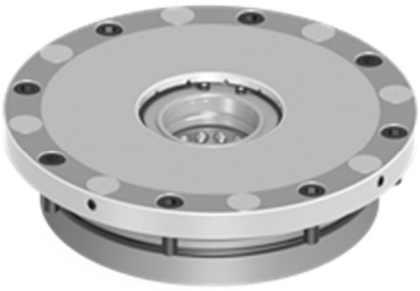
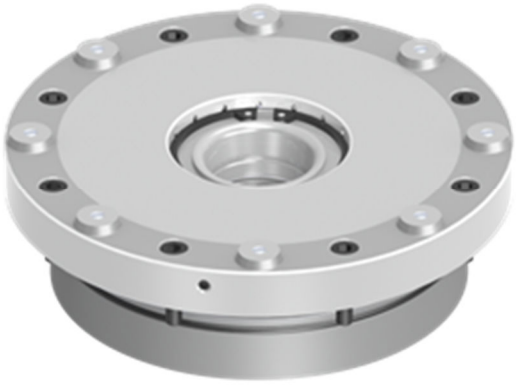
STARK.classic zero point clamping system

Operating manual
WM-020-082-11-en BA STARK.classic

STARK.classic
1 / 2 / 3
Art. no.: S704-XXX /
S801-XXX / S802-XXX
S804-XXX / S807-XXX



STARK.classic
Tornado 1 / 2 / 3
Art. no.: S802-XXX /
S804-XXX / S806-XXX
S807-XXX



STARK.classic
Twister 1 / 2 / 3
Art. no.: S804-XXX /
S806-XXX / S807-XXX

Manufacturer:

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1. Table of contents

2. Identification of the partly completed machinery

Product:	Fast closing clamp
Optional:	with clamp control
Function:	Clamping and centring of workpiece pallets or workpieces
Product group:	STARK.classic.1 / 2 / 3 & STARK.compact.1 STARK.classic.1 / 2 / 3 Tornado STARK.classic.1 / 2 / 3 Twister
Article number:	S704-, S801-, S802-, S804-, S805-, S806-, S807-, S0XXX
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	Version	Revision	Name
03/05/2012	WM-020-082-00	Creation of the operating manual	reeg
23/10/2019	WM-020-082-10	General revision	reeg
05/02/2026	WM-020-082-11	Article designation, assembly and installation updated	mafr

3.3. Referenced documents

Document	Version	Author
Assembly drawings with parts lists	-	Stark Spannsysteme GmbH
OM Mechanical Insertion Force Tester	WM-020-133-xx-xx	Stark Spannsysteme GmbH
OM Specification dimension tester	WM-020-349-xx-xx	Stark Spannsysteme GmbH
OM Media duct NW 4	WM-020-149-xx-xx	Stark Spannsysteme GmbH
OM Clamp control valve	WM-020-255-xx-xx	Stark Spannsysteme GmbH
OM Visual clamping control display unit	WM-020-413-xx-xx	Stark Spannsysteme GmbH
OM Hydraulic assembly aid	WM-020-084-xx-xx	Stark Spannsysteme GmbH
OM Air volume meter	WM-020-366-xx-xx	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. 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. Examples of improper use include:

- 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. We recommend the installation of a clamp control valve. For the safety-related link with the clamp control valve, see "WM-020-255-xx-xx OM Clamp control valve" in the operating manual. 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. Spring assembly

If the fast closing clamp is dismantled improperly, the pre-tensioned spring assembly or other parts may be slung away. For the exact procedure, see chapter 6 "Assembly and installation".

4.8.2. 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 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.

4.8.3. Hydraulic system malfunction

During operation, a malfunction in the hydraulics may cause an unintentional increase in pressure and consequently release the fast closing clamp. Particularly in rotating applications, this can result in a hazardous situation.

Possible measures to prevent accidental release:

- Mechanically disconnecting the hydraulic line (uncoupling). This means that a pressure increase is no longer possible during operation.
- Disconnecting the safety valves from the machine hydraulics. This means that a pressure increase is no longer possible during operation.
- Pressure monitoring in the release circuit of the fast closing clamp. This causes the emergency stop to be triggered when the pressure rises, resulting in an immediate stop of the machine.

4.8.4. Hazard 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".

4.8.5. 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 10 "Technical data")

4.8.6. Excess pressure hazards

Pipes or hoses bursting due to excess pressure can endanger persons.

Measure:

- Protect hydraulic lines with pressure relief valves.
- Observe the specified pressure limits.

4.8.7. Hazard due to exhaust air noise

The pneumatic system can generate loud

noises.

Measure:

- Wear ear protection

4.8.8. Influences on service life

Negative influences include:

- Insufficient filtering of the oil; observe filter mesh size < 15 my.
- Damage to components.
- External mechanical damage to functional components.
- Undefined forces or defined forces exceeded.
- Insufficient ventilation of the hydraulic circuit.
- Overloading due to sudden pressure peaks.
- Too high volume flow rates / piston speeds due to large pump delivery capacity.
- 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.

5. Description of the fast clamping device

5.1. General

The products in the STARK.classic series are fast closing clamps made from high-quality tool steel. The system is mechanically clamped with springs and released hydraulically (pneumatically). The integrated spring assembly makes the STARK.classic self-locking.

The product series is the connection between machine and clamping device for all common machining operations such as milling, grinding and eroding, and can also be used on test benches and assembly devices. Ideal for automatic loading.

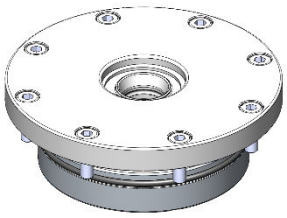
It is used for fast setting-up.

While one pallet is being processed, the other can be set up.

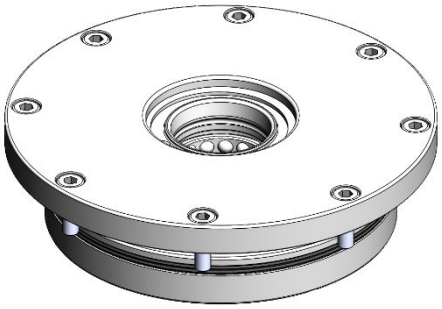
The fast closing clamp is either installed individually (single clamping, STARK.classic quadratic) or as a set. The fast closing plate (fast closing clamp support) can either be manufactured by the customer according to the specifications in the data sheets or ordered from STARK as an individual version. As an alternative to the classic fast closing plate, there are also surface-mounted housings.

5.2. Product version sizes

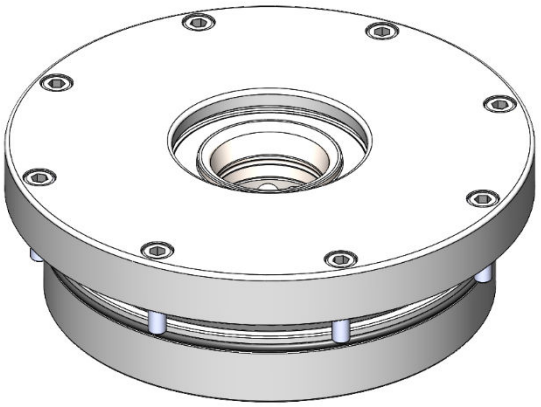
Different sizes are available depending on the total load of the components. The smallest size is the STARK.classic.1, the medium size is the STARK.classic.2 and the largest size is the STARK.classic.3. The elements differ in terms of dimensioning, insertion force, retention force, permissible lateral force and lifting force. The elements are available in both hydraulic and pneumatic versions. For data, see chapter 10 “Technical data".



STARK.classic.1
(outer Ø 105 mm)



STARK.classic.2
(outer Ø 135 mm)

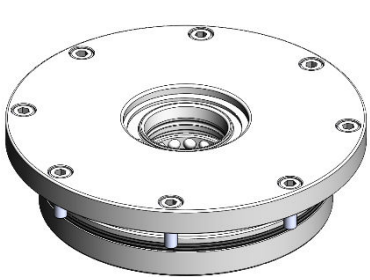
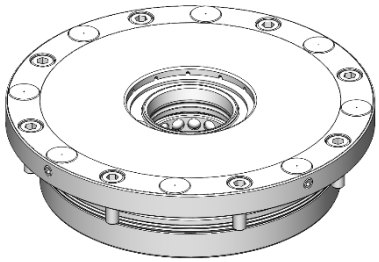
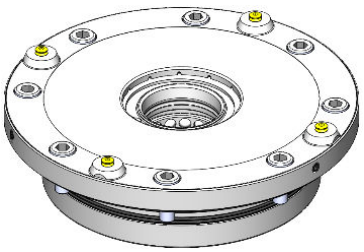
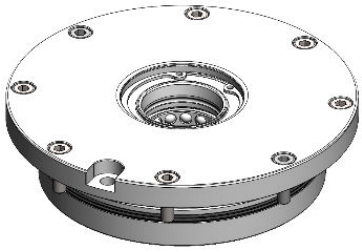
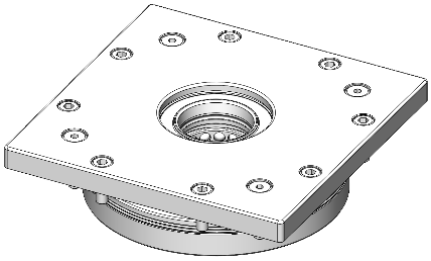
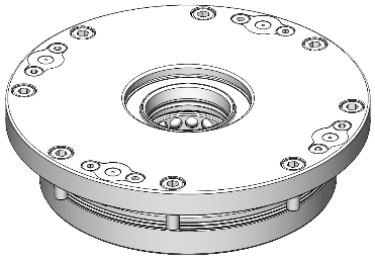
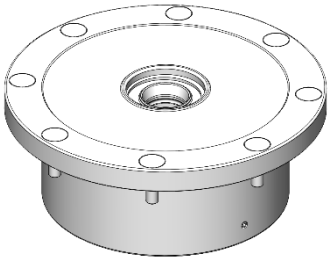
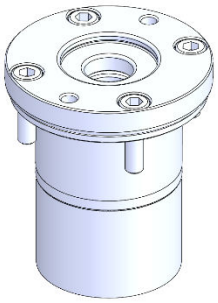


STARK.classic.3
(outer Ø 176 mm)

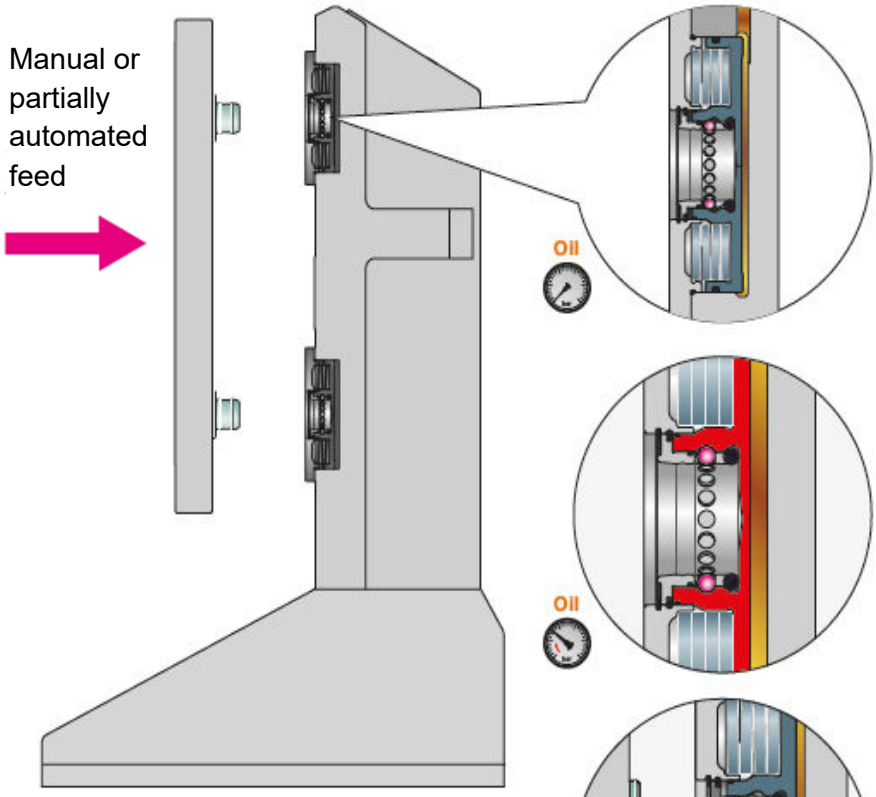
5.3. Product version designs

With the STARK.classic product, a distinction can also be made between the design versions:

- STARK.classic hydraulic or pneumatic
- STARK.classic Standard
- STARK.classic Tornado
- STARK.classic Twister
- STARK.classic with indexing
  - The fast closing clamp also has a groove for supporting the forces against the twisting and for aligning the pallet - for single clamping
- STARK.classic quadratic
  - The square shape of the disc allows the pallet to be positioned and clamped even with single clamping.
- STARK.classic with media duct
  - Fast closing clamp with integrated media duct
  - Up to 4 ducts per element are possible, nominal value 4.
    - For details, see OM WM-020-149-xx-xx
- STARK.classic with coolant drain
  - The coolant can drain through an additional centre hole in the piston
  - The prerequisite for this is the corresponding drain contour in the fast closing plate
- STARK.classic DHF
- STARK.classic Module
- STARK.compact.1
  - Ideal for narrow spacings

5.4. DHF function



The DHF function is included in selected STARK.classic elements.

The third-hand function is used to facilitate pallet handling when feeding the pallet into the clamping tower.

Holding function:

The fast closing clamp is applied with the holding pressure and is ready for the secure engagement of the pallet.

Feeding:

The pallet is fed by hand or by crane.

Engaging:

The retractable nipples are retracted and then mechanically secured.

You can release the pallet.

Positioning and clamping:

The fast closing clamp is depressurised. The pallet is now positioned, inserted and securely clamped via the cup springs.

5.5. Clamp control valve

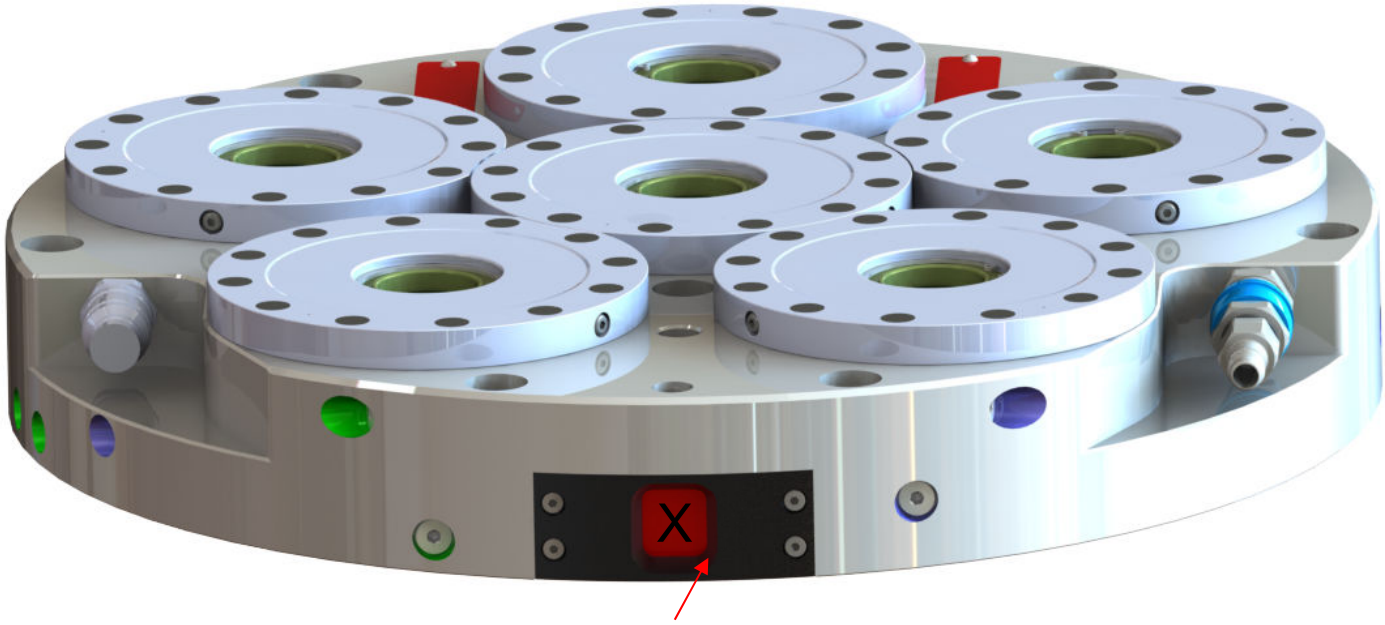
The STARK.classic elements do not have a built-in clamp control! If this is relevant to the customer, they are available as an option.

An installation aid is available for installation with the article number S504-070.

For further information, see OM Clamp control valve WM-020-255-xx-xx.

5.6. Optical clamping control

For the STARK.classic series there is an optional optical clamping control for retrofitting. The display shows either green for clamped or red for not clamped. The display works mechanically and without power. The design is either smooth (for rectangular clamping plates) or round.

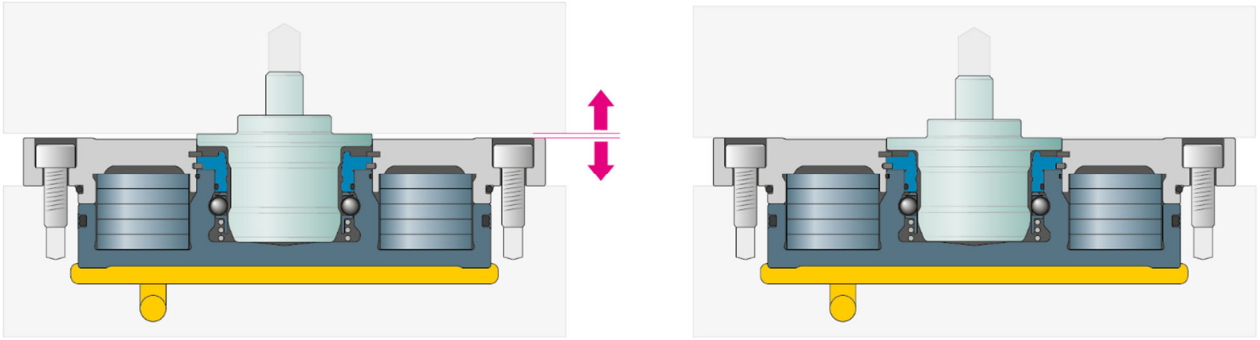


Visual clamp control display unit

For further information, see OM STARK.visual clamp control display unit WM-020-413-xx-xx.

5.7. Pallets with and without lifting

The pallet is lifted out using the normal versions of the retractable nipples (bottom left image). If no lifting is required, shortened retractable nipples can be obtained from STARK Spannsysteme GmbH (bottom right image).



5.8. Retractable nipple fasteners

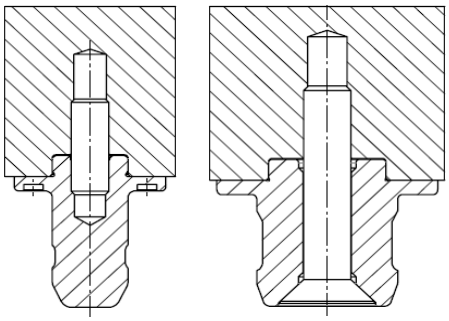
The pallet with the clamping devices is built by the operating company itself or on its behalf. There are different design versions for fastening the retractable nipples. The right version can be selected depending on the application.

The version must be in accordance with data sheet D029-1 (STARK.classic.1) or D029-2 (STARK.classic.2/3). Version for equalising retractable nipples according to D029-5.

Observe the specifications and torques!

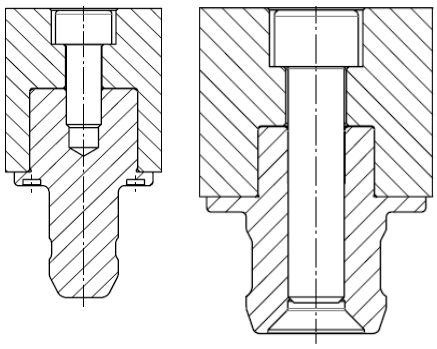
Version A

STARK.classic.1 **STARK.classic.2/3**



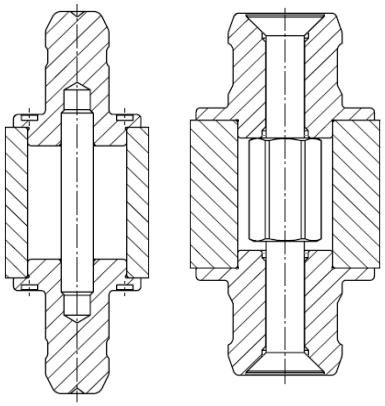
Version B

STARK.classic.1 **STARK.classic.2/3**



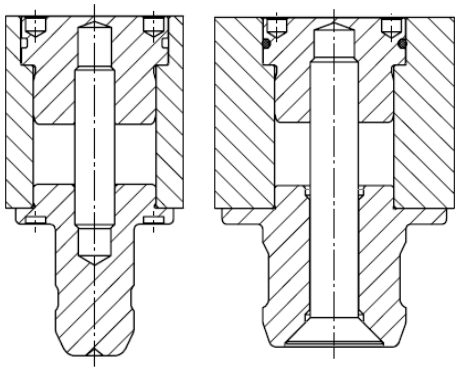
Version C

STARK.classic.1 **STARK.classic.2/3**



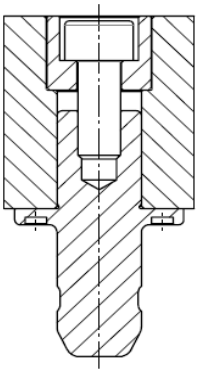
Version D

STARK.classic.1 **STARK.classic.2/3**



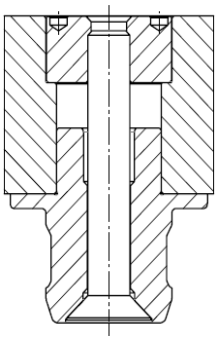
Version E

STARK.classic.1



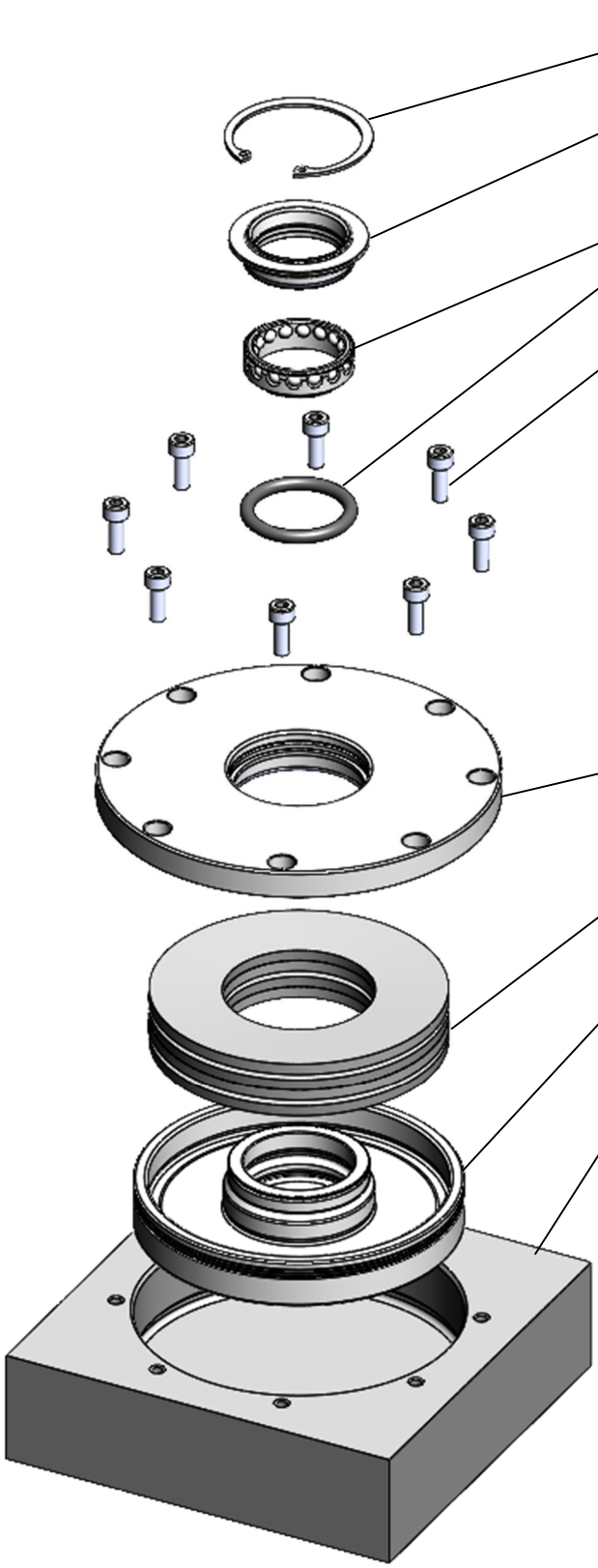
Version E.1

STARK.classic.2/3



6. Assembly and installation

Assembly and disassembly instructions:



Lock ring

Retaining ring

Ball retainer with O-ring

(Ball retainer with spring for DHF versions)

Screws DIN 912 10.9 black

STARK.classic.1
M5 10.9 - tightening torque
8.5 Nm

STARK.classic.2
M5 10.9 - tightening torque 8.5 Nm

STARK.classic.3
M6 10.9 - tightening torque 15 Nm

Disc

Cup springs

Piston

Installation contour according to data sheet:

STARK.classic.1
D020, D021, D032, D004 for Standard
D014, D015, D016, D002 for Tornado
D082 for Twister
D006 for Module

STARK.compact.1
D038

STARK.classic.2
D020, D021, D032, D001 for Standard
D013, D015, D016, D003 for Tornado
D082 for Twister
D008 for Module

STARK.classic.3
D020, D021, D032, D004 for Standard
D055, D056 for reinforced Standard
D016 for Tornado
D082 for Twister

6.1. Installation of fast closing clamp with mounting aid

1. Check installation contour for STARK.classic for dimensional accuracy and surface condition. Important: The chamfer 1.6 + 0.2 x 30° on the bore ∅80/ ∅110 / ∅150 must be dimensionally accurate. Parts must be clean, this also applies to all supply lines. (deep hole drills, etc.)

2. Grease the piston well and install it in the bore, taking care not to damage the seal.

3. Insert the cup springs (with spacer, if necessary) into the installation space, observing the layering of the springs on the instruction leaflet supplied with the respective fast closing clamp. Centre the springs by pushing in the centring part. Insert the centring pins into 2 opposite bores, then carefully pull out the centring part. Make sure that the springs do not slip. (If no assembly aid is used, the cup springs must be centred by hand).

4. Carefully insert the disc, without the retaining ring, with 2 bores in the centring pins and place it on the cup spring assembly without moving the springs. Make sure that the connection bores match.

5. On the STARK.classic.1 / 2 / 3, tighten the disc in parallel using the 4 longer DIN 912 mounting screws supplied; M5x18 for STARK.classic.1, M5x20 for STARK.classic.2, M6x25 for STARK.classic.2 Twister and M6x25 for STARK.classic.3 (each offset by 90°) until the centring collar of the disc fits into the installation contour (the disc is approx. 4mm in front of the support). Remove the two centring pins. Place the screws in the free countersinks and use them to tighten the disc until it is parallel to the system. Only use the supplied screws, or DIN 912 screws with quality 10.9. Remove the 4 mounting screws and screw in the remaining screws. Tighten all screws using a torque spanner to 8.5 Nm for M5 and 15 Nm for M6.

Note: To check the flat support around the disc, use a feeler gauge to try to penetrate between the plate and the disc. If this is successful, dismantle the fast closing clamp according to the removal instructions (items 1–4) and start again at item 3 of the installation instructions.

6. Fit the O-ring, ball retainer, retaining ring and lock ring.

Important: For STARK.classic.3: The balls are loose in the ball retainer! All balls must be present and move easily → visual and function check. Also make sure that the retaining ring is properly seated!

7. After installation/assembly of all fast closing clamps, pressurise the fast closing plate, observing the permissible pressure according to the instruction leaflet.

Important: Apply pressure to the fast closing clamp only when screwed on. Check the specification dimension A for each fast closing clamp, see chapter 9.1 "Check specification dimension A/B". Only when the specification dimension is complied with is proper functioning of the fast closing clamp guaranteed. If the specification dimension for one or more fast closing clamps cannot be complied with, the appropriate fast closing clamps must be removed in accordance with the removal instructions (see chapter 6.4 "Removal of fast closing clamp that is not pre-locked"), and the springs re-aligned. Repeat items 3-7 of the installation instructions.

Assembly aid

Order no.	Designation	Scope of delivery
S504-008	STARK.classic.1 assembly aid	2 pcs. Centring pin, 1 pc. Centring part, 4 pcs. Screws DIN 912 M5x18
S504-009	STARK.classic.2 assembly aid	2 pcs. Centring pin, 1 pc. Centring part, 4 pcs. Screws DIN 912 M5x20*
S504-010	STARK.classic.3 assembly aid	4 pcs. Centring pin, 1 pc. Centring part, 4 pcs. Screw DIN 912 M6x25
S704-221-M	Ball retainer assembly aid cl.2	1 pc. Sleeve
S704-224-M	Ball retainer assembly aid cl.3	1 pc. Sleeve 1 pc. Lock for ball retainer 1 pc. Screw
SV22-027	STARK.compact.1 assembly aid	1 pc. Sleeve

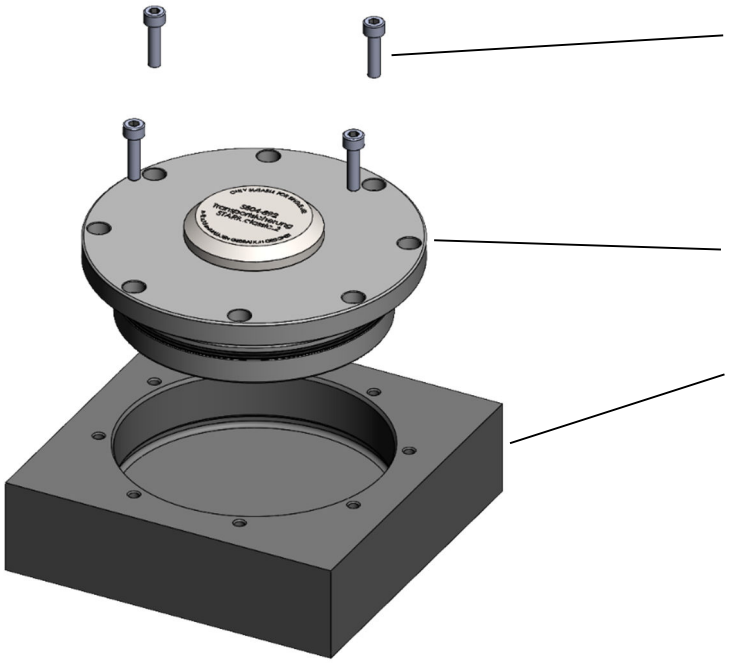
* plus 2 pcs. Centring pin and 4 pcs. Screws DIN 912 M6x25 STARK.classic.NG.2 (double set)

* for STARK.classic.2 Twister 4 pcs. Screws DIN 912 M6x20 are required (not included in scope of delivery)

Training

Stark Spannsysteme GmbH offers training courses to train your operating and service personnel. Training courses are conducted at your premises or at Stark Spannsysteme GmbH. Please contact us for more information, we will be happy to advise you.

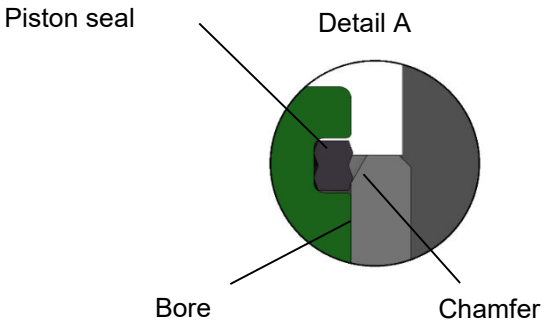
6.2. Installation of pre-locked fast closing clamp



Mounting screws DIN 912
STARK.classic.1: M5x18
STARK.classic.2: M5x20
STARK.classic.3: M6x25

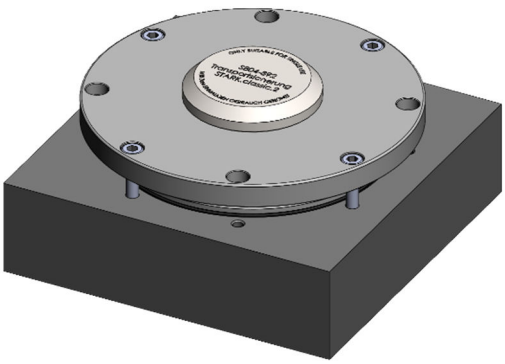
Fast closing clamp with transportation lock pre-mounted

Installation contour according to data sheet:

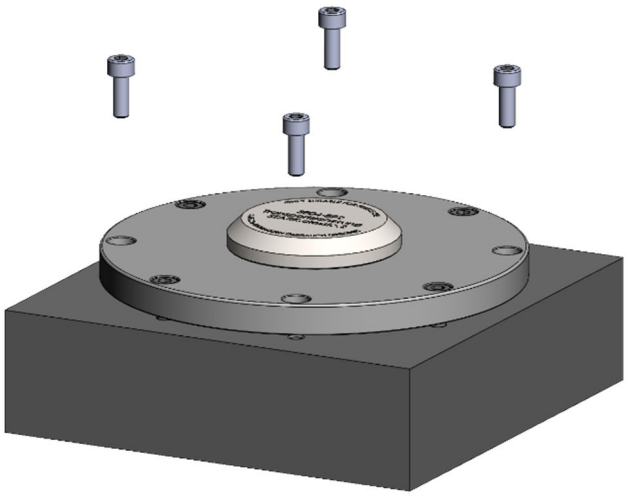


1. Insert the pre-locked fast closing clamp into the greased bore until the piston seal rests against the chamfer of the bore (detail A). Pay attention to the installation position of the connection bores. Assembly may only be carried out by hand.

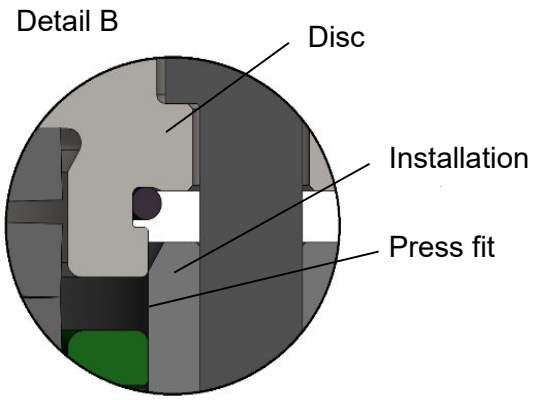
2. Screw the pre-locked fast closing clamp evenly into the bore with the mounting screws (4x each 90°) until the piston seal has passed over the chamfer of the bore. Then press the fast closing clamp further into the bore by hand.



Caution: Hazard information:
Never drive the fast closing clamp into the bore with a hammer, as this can damage the seal. Likewise, the nipple could be released in the process and the pre-locked fast closing clamp could split apart. (The cup springs are pretensioned)



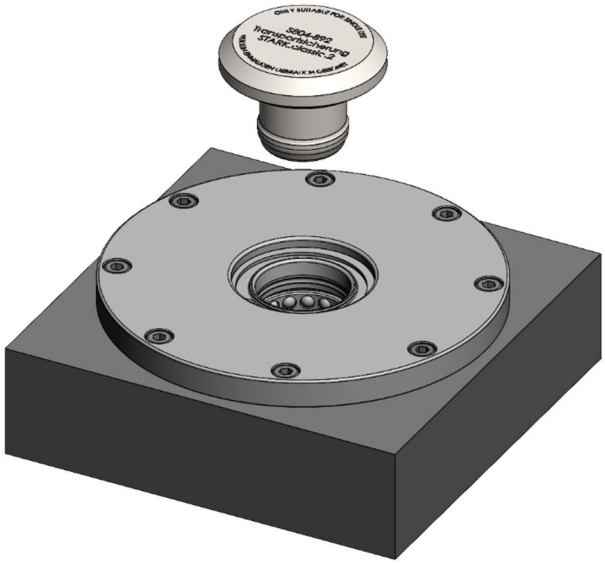
3. Replace the 4 mounting screws with the 4 fixing screws DIN 912 supplied and screw on the fast closing clamp evenly parallel to the flat support of the disc (detail B). Screw in the remaining screws and tighten all screws using a torque spanner to
8.5 Nm for M5 10.9 (STARK.classic.1),
8.5 Nm for M5 10.9 (STARK.classic.2) or
15 Nm for M6 10.9 (STARK.classic.3).
Note: Due to the cup spring preload, the clearance diameter on the disc is larger than the installation diameter. Assembly is possible as described and guarantees high precision thanks to the press fit.



4. When all fast closing clamps connected to a pressure line have been fitted, switch the system to "Release". (See also chapter 7.2 “Function check”).

5. Now the transportation lock can be removed. After removing the transportation lock, switch the system back to "Clamp".

6. Carry out a function check of the fast closing clamp as described in chapter 7 "Commissioning, handling and operation".



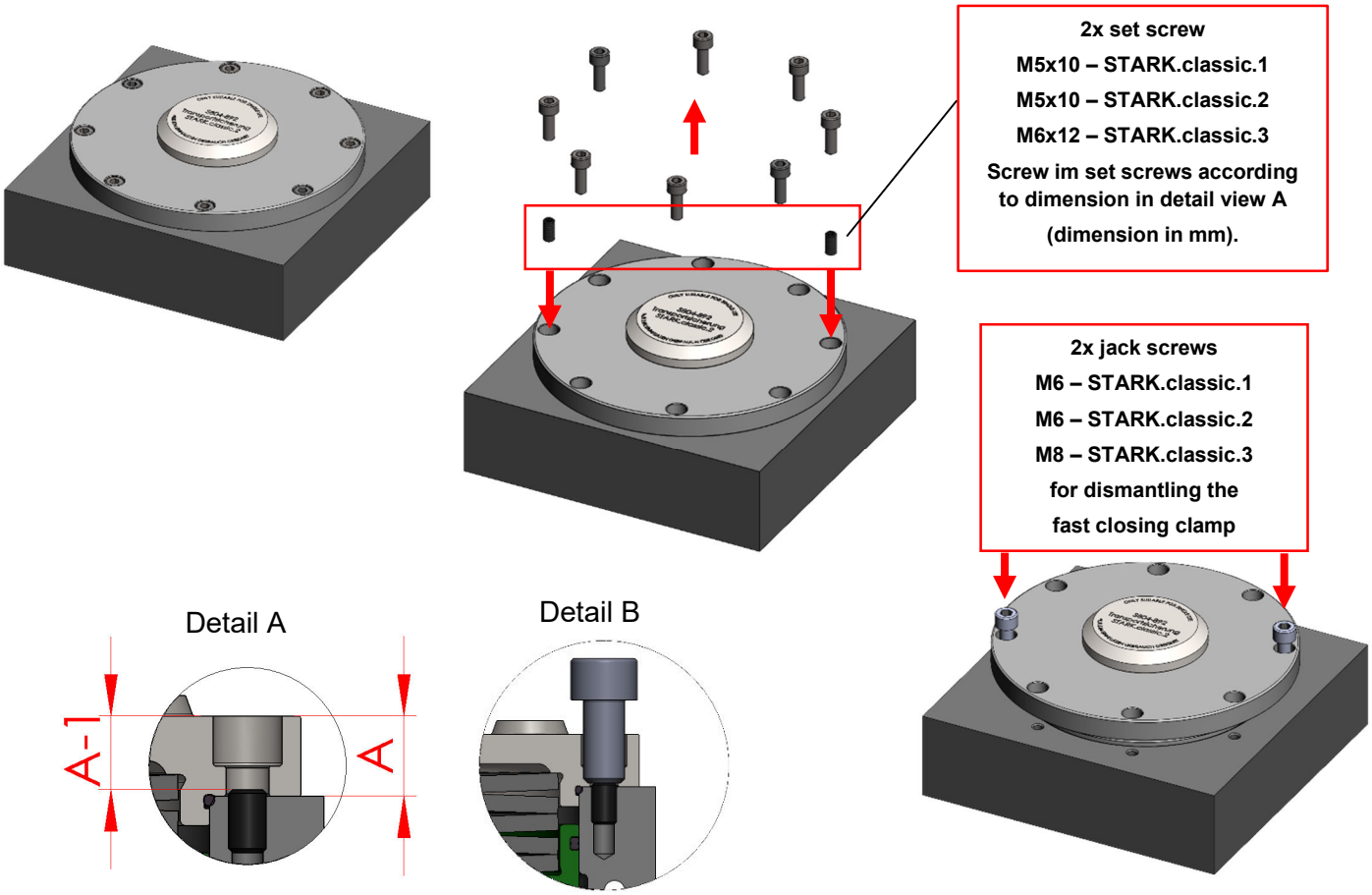
7. After ensuring the correct function of the fast closing clamp, the screw covers are inserted into the bores if necessary. To do this, insert the screw covers into the bores with the smooth side facing upwards. Using a smooth mandrel made of aluminium, tap the screw covers flush into the bore with light hammer blows. Excess material on the screw covers is peeled off in the process.

6.3. Removal of pre-locked fast closing clamp

1. Before starting disassembly, the transportation lock must be securely clamped. Afterwards, the system must be absolutely depressurised. (Disconnect the power supply to the pressure generator and vent the release line, see item 5).

Caution! Only use unused transportation locks!
Order no.: S804-891: Transportation lock STARK.classic.1
S804-892: Transportation lock STARK.classic.2
S804-893: Transportation lock STARK.classic.3

2. Removal takes place in reverse order as described in chapter 6.2 "Installation of pre-locked fast closing clamp".
3. Remove the screw covers if necessary.
4. Loosen all screws evenly by approx. ½ turn and check whether the disc is lifted by the springs. If YES, the transport nipple is not properly clamped and the screws must be retightened. If NO, all screws can be removed. The fast closing clamp must be pressed out of the press fit by approx. 3mm with 2 or 4 screws in parallel (detail B), but the fastening threads underneath must not be damaged in the process. Position the set screw for pulling off (detail A) in the installation contour.
5. To disassemble the entire unit, ventilate the rear of the unit, otherwise a vacuum will be created when the piston is pulled out.
   Caution: Hazard information:
   Do not disassemble the fast closing clamp any further, as the transportation locks (nipples) could be released and the fast closing clamp could split apart; the cup springs are pre-tensioned! There is a risk of injury!



6.4. Removal of fast closing clamp that is not pre-locked

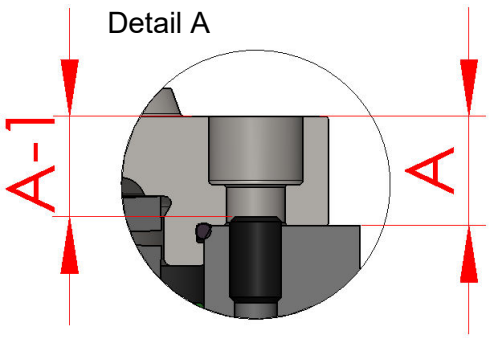
1. The system must be completely depressurised before disassembly is started.
   (Disconnect the power supply to the pressure generator and vent the release line, see item 6).

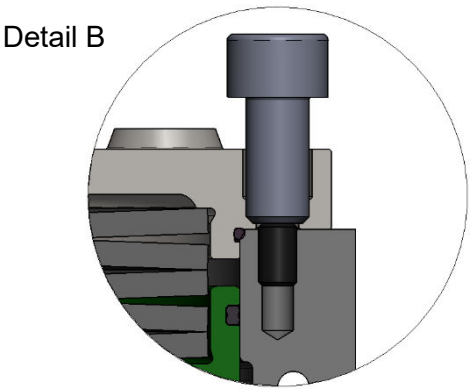
2. Dismantle the screw covers, lock ring, retaining ring and ball retainer.

3. Loosen all screws evenly by approx. ½ turn and remove 4 screws each offset by 90°.

4. For the fast closing clamp, screw the mounting screws (for dimensions, see chapter "6.1 Installation of fast closing clamp with mounting aid" or chapter "6.2 Installation of pre-locked fast closing clamp") in the 4 empty bores up to the threaded outlet (by hand - without tool). Loosen the remaining screws evenly in parallel until the disc rests against the 4 mounting screws. Remove the remaining screws. Now the 4 mounting screws can be loosened evenly in parallel until the spring tension is relieved. If the disc is stuck in the press fit, leave the 4 assembly screws screwed in and continue with item 5.

5. => Only with a fixed disc in the press fit.
   Locate the two (180° offset) or four (90° offset) pulling-off threads in the free screw holes. If they happen to be covered by the 4 mounting screws, screw in the second set of 4 mounting screws, each 90° offset, and remove the first set. Screw in set screw (STARK.classic.1 and STARK.classic.2: M5x10, STARK.classic.3: M6x12) in according to dimension in detail view A (dimensions in mm). Then pull off with 2 or 4 screws (STARK.classic.1 and STARK.classic.2: M6) and 2 or 4 screws (STARK.classic.3: M8) evenly in parallel out of the press fit (detail B). Then loosen and remove the 4 mounting screws evenly and in parallel. After removing the disc, remove the set screws again.



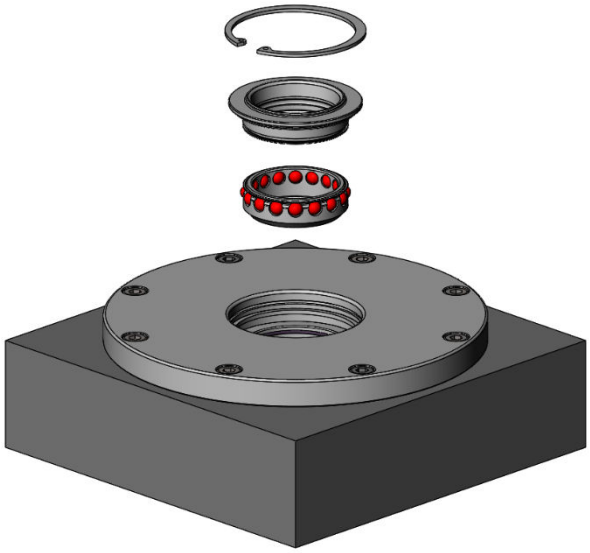


6. To disassemble the piston, ventilate the rear of the piston, otherwise a vacuum will be created when the piston is pulled out.

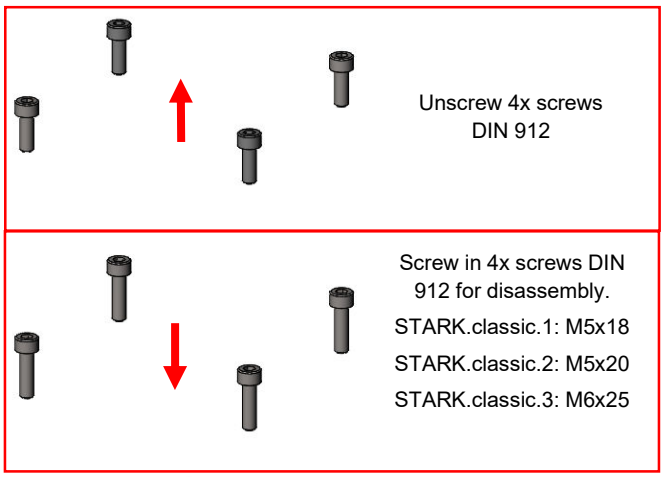
Disassembly aid

Order no.	Designation	Scope of delivery
S504-014	STARK.classic.1 disassembly aid	1 pc. Handle, 1 pc. Bolt, 1 pc. Clamping sleeve, 1 pc. Clamping nut, 1 pc. Circlip, 1 pc. Cylinder pin
S504-016	STARK.classic.2 disassembly aid	1 pc. Handle, 1 pc. Bolt, 1 pc. Clamping sleeve, 1 pc. Clamping nut, 1 pc. Circlip, 1 pc. Cylinder pin

6.5. Removal of fast closing clamp that is not pre-locked (in individual parts)

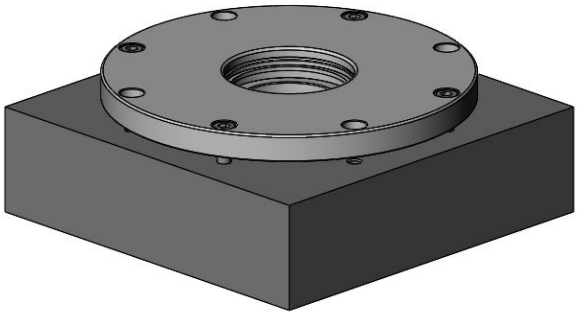


1. Dismantle lock ring, retaining ring and ball retainer.

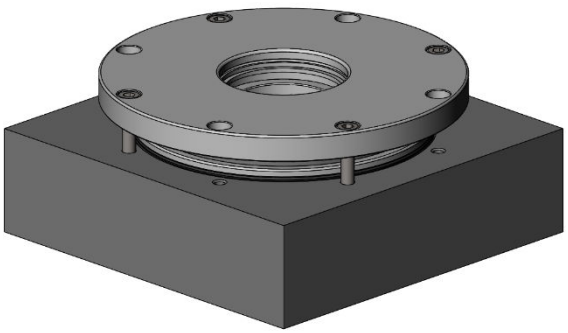


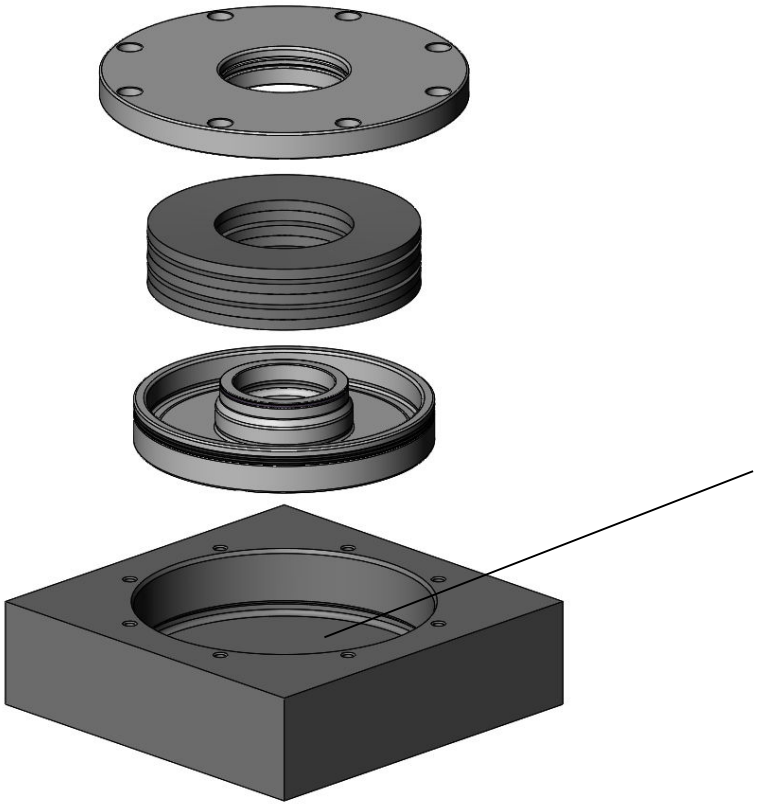
2. Then loosen all DIN912 screws evenly until there is a gap of max. 3 mm between the cover and the housing.
   Now unscrew the 4 screws and replace them with the screws for disassembly. These must be screwed in until they lie flat in the countersink. (but only slightly engaged)

Caution: Hazard information: 
For aluminium plates, the fast closing clamps may only be removed when locked with the transportation lock.



3. Now the 4 mounting screws can be loosened evenly in parallel until the spring tension is relieved.





4. After removing the 4 mounting screws, the disc, cup springs and piston can be removed by hand.

5. To disassemble the piston, ventilate the rear of the piston, otherwise a vacuum will be created when the piston is pulled out.

6.6. Possible conversion of STARK.classic.2 for DHF (third-hand function)

The STARK.classic.2 is supplied without DHF function as standard (ball retainer and O-ring).

If the "third hand" function is needed, the STARK.classic.2 can be converted at any time.

Caution: Only convert when depressurised.

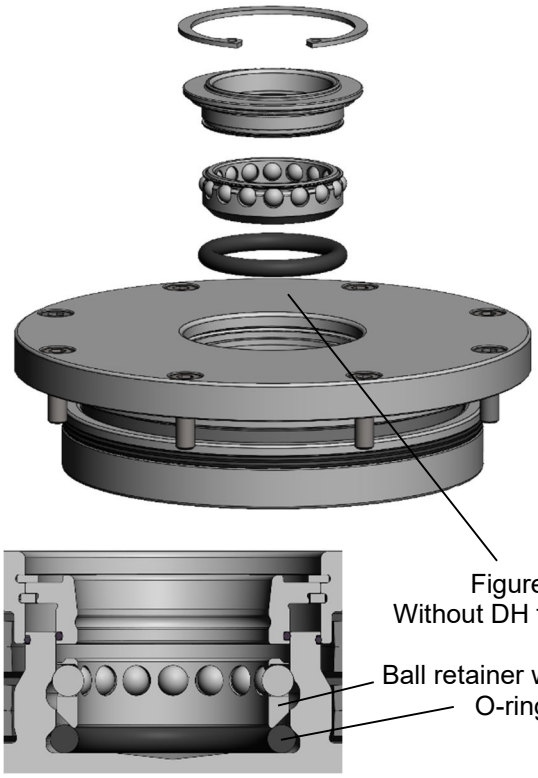


Figure:
Without DH function

Ball retainer with balls
O-ring

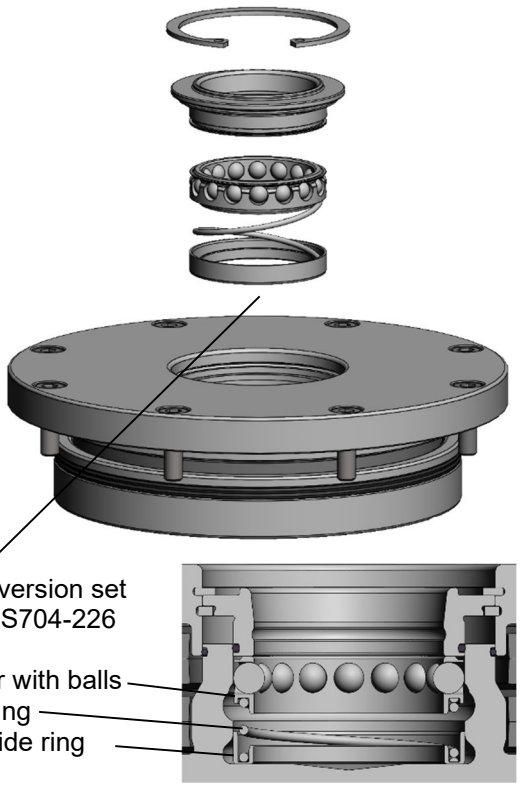


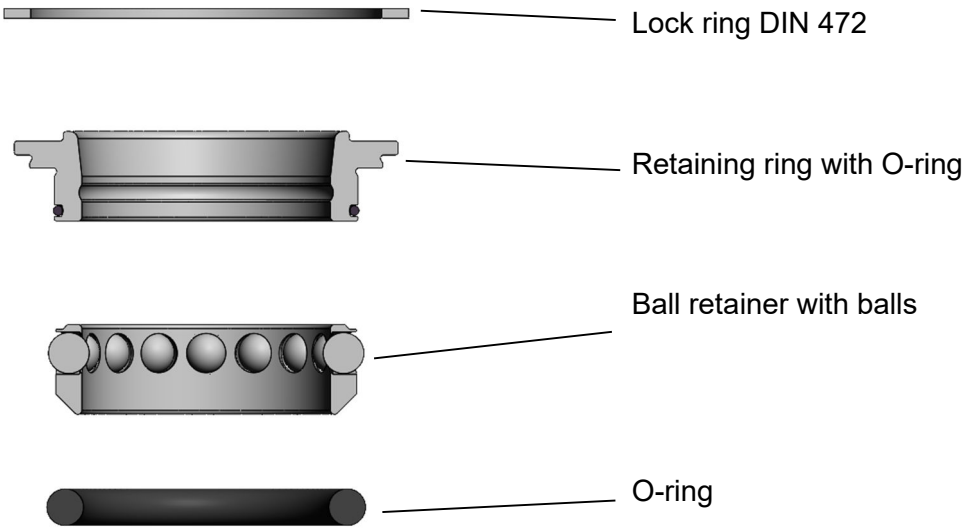
Figure: Conversion set
Order No.: S704-226

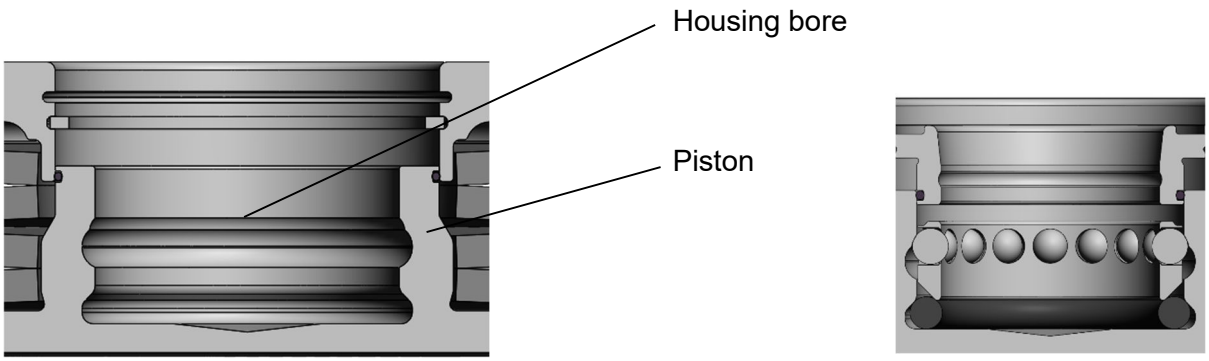
Ball retainer with balls
Spring
Steel guide ring

6.7. Installation and removal of ball retainer with O-ring

Necessary tools and aids:

1. Lock ring pliers (order no. S504-006)
2. Specification dimension tester
3. Retractable nipple or transportation lock
4. Ball retainer assembly aid for STARK.classic.2: Order no. S704-221-M
5. Ball retainer assembly aid for STARK.classic.3: Order no. S704-224-M





1. Remove lock ring DIN 472 with pliers
2. Carefully pull off the retaining ring
3. Remove ball retainer, do not lose any balls

→ For STARK.classic.2 and STARK.classic.3, observe installation and removal instructions for ball retainer assembly aid S704-221-M or S704-224-M

Info: The assembly aid for the ball retainer is generally only required for clamping towers.

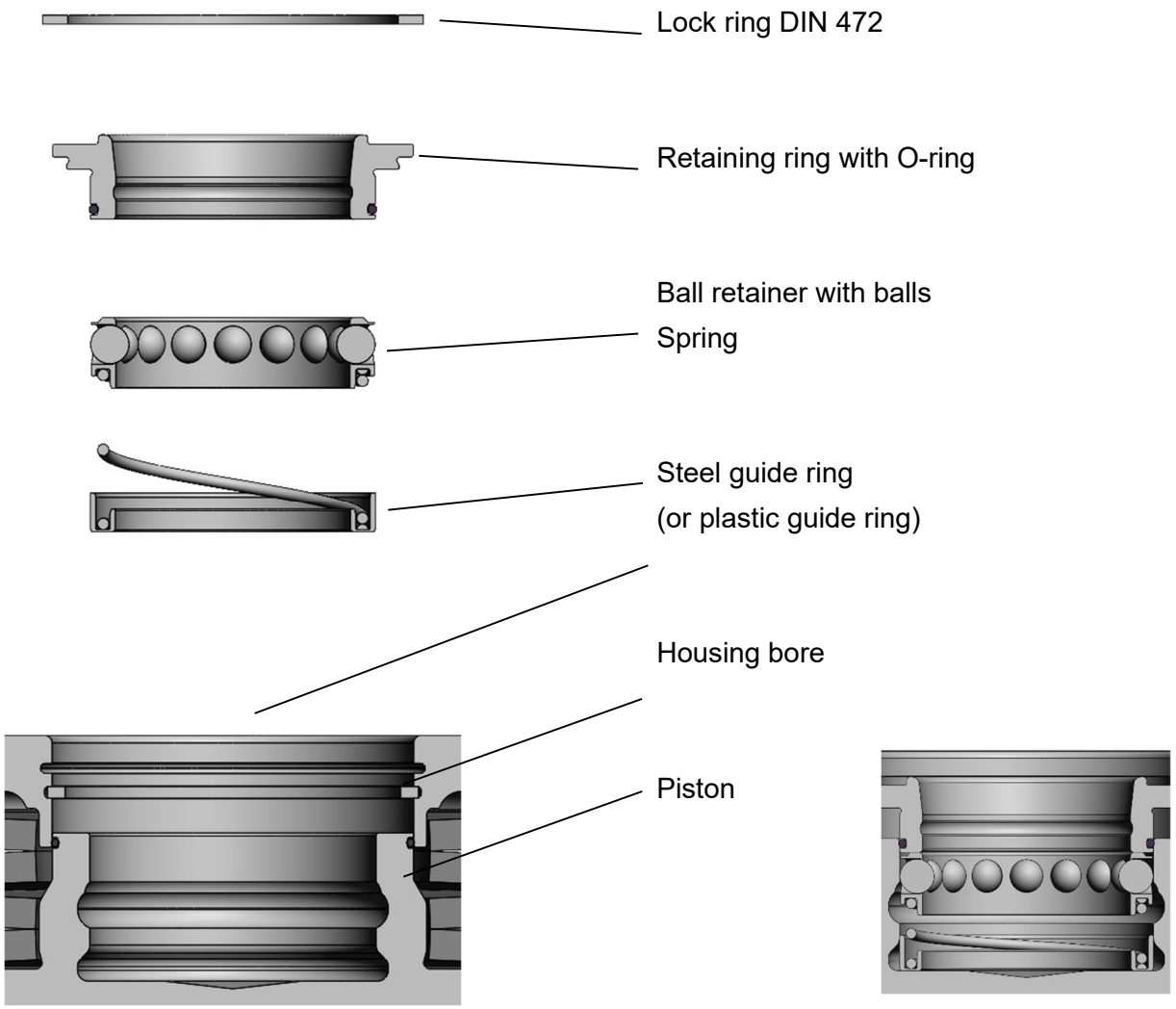
4. Remove O-ring
5. Clean the dismantled parts incl. the housing bore, check for damage and replace if necessary.
6. Reassemble all parts in reverse order. Ensure that the lock ring DIN 472 is correctly seated!
7. Measure specification dimension A (see chapter 9.1 “Check specification dimension A/B")
8. Check function by means of single retractable nipple or transportation lock

Caution: Only convert when depressurised.

6.8. Installation and removal of ball retainer and guide ring

Necessary tools and aids:

1. Lock ring pliers (order no. S504-006)
2. Specification dimension tester
3. Retractable nipple or transportation lock
4. Ball retainer assembly aid for STARK.classic.2: Order no. S704-221-M
5. Ball retainer assembly aid for STARK.classic.3: Order no. S704-224-M



1. Remove lock ring DIN 472 with pliers
2. Carefully pull off the retaining ring
3. Remove ball retainer, do not lose any balls

→ For STARK.classic.2 and STARK.classic.3, observe installation and removal instructions for ball retainer assembly aid S704-221-M or S704-224-M

Info: The assembly aid for the ball retainer is generally only required for clamping towers.

4. Remove spring and steel guide ring (or plastic guide ring)
5. Clean the dismantled parts incl. the housing bore, check for damage and replace if necessary.
6. Reassemble all parts in reverse order. Ensure that the lock ring DIN 472 is correctly seated!
7. Measure specification dimension A (see chapter 9.1 “Check specification dimension A/B") 8. Check function by means of single retractable nipple or transportation lock

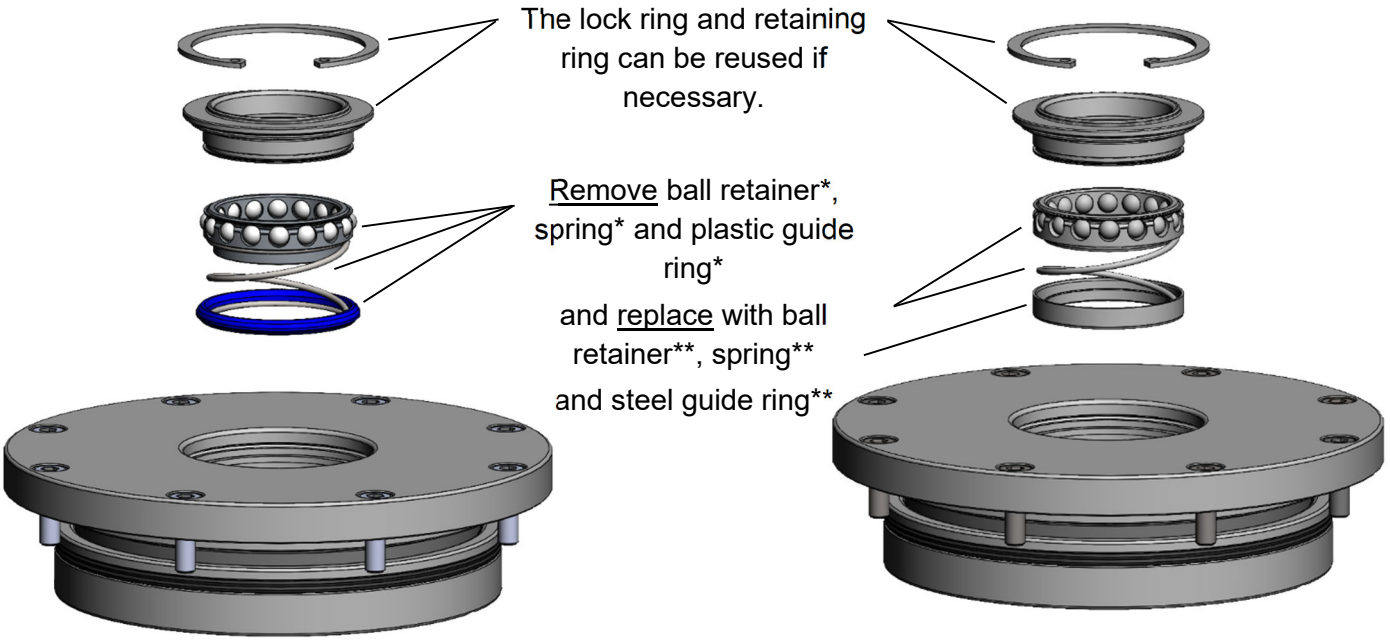
Caution: Only convert when depressurised.

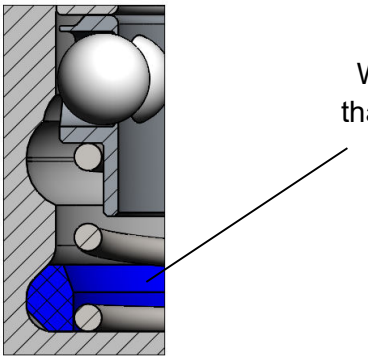
6.9. Ball retainer conversion instructions (new generation of spring and guide ring)

The ball retainer of the STARK.classic.2 with spring and guide ring (order no. S704-226) has been redesigned and modified. The spring guide has been improved in the new generation with **change index A**.

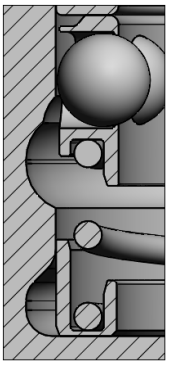
The following points must be taken into account when converting to the new generation.

For further information: **Data sheet D157 (Ball retainer conversion instructions)**





When converting, ensure that the plastic guide ring in the piston has been removed.



* Ball retainer, spring and plastic guide ring of previous generation

Order no. S704-226

** Ball retainer, spring and plastic guide ring of new generation

Order no. S704-226

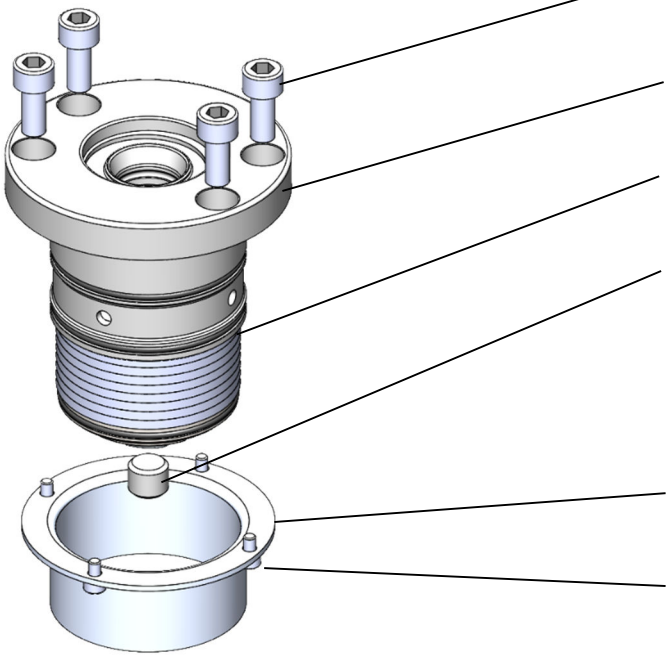
Change index A

The components of the STARK.classic.2 ball retainer with spring and steel guide ring (order no. S704-226) of the new generation must not be mixed with those of the “previous generation”. Ball retainer and guide ring not compatible.

Caution: Only convert when depressurised.

6.10. STARK.compact.1 assembly instructions

Assembly and disassembly instructions:



Screws M6 DIN 912 8.8 black
Tightening torque 10 Nm

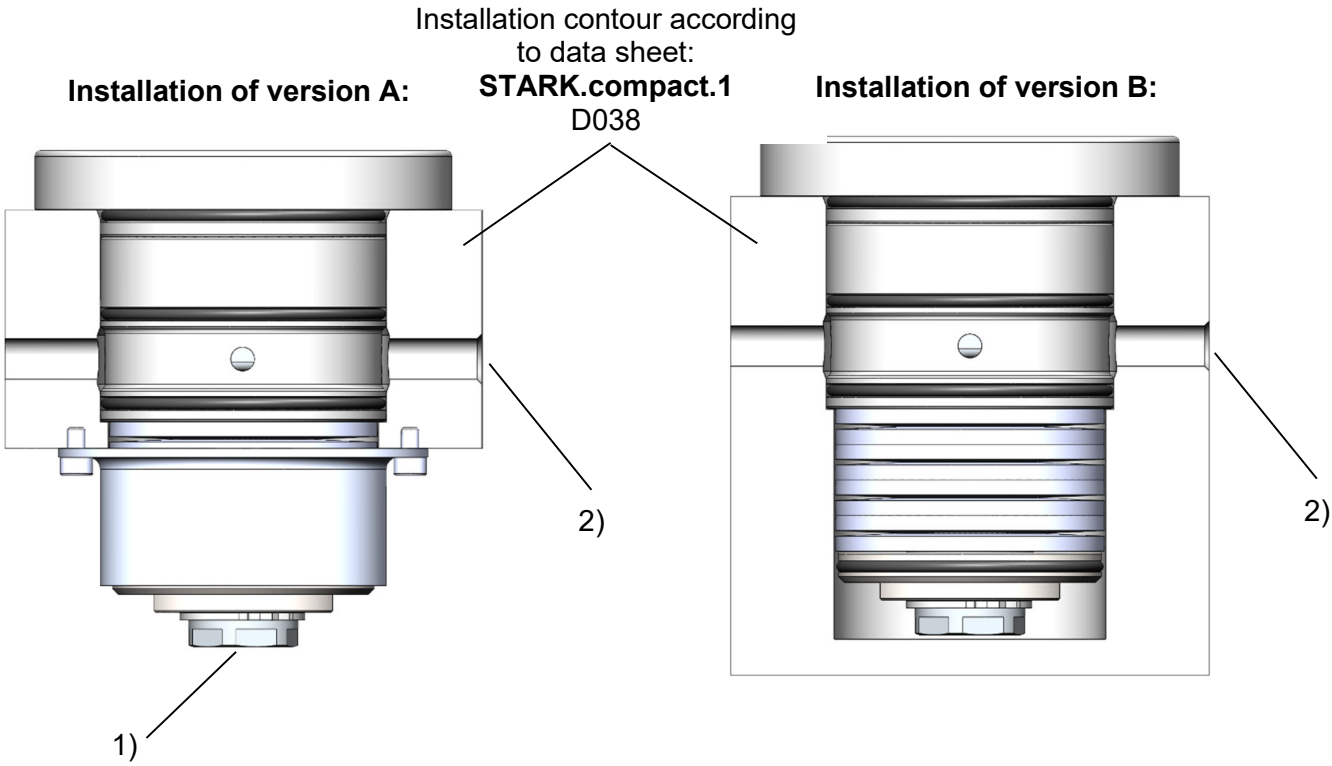
STARK.compact.1

Cup spring package

Screw plug G1/8
When using versions 1 or 3 according to data sheet D038, glue tightly.
Recommendation: Loctite 222

Sleeve (not applicable for installation version B)

Screws M3 DIN 912 8.8 black
Tightening torque 1 Nm
(not applicable for installation version B)



Release connection versions:

1) Hydraulic connection via G1/8 thread

2) Hydraulic connection via deep holes

6.11. Surface-mounted elements for STARK.classic.1 and STARK.classic.2

The surface-mounted elements enable construction with spacings. Optionally available with centring pins for centring on hole grid pallets.

Clamping claws are required to secure the surface-mounted elements.

There are three clamping claws to choose from, which can be combined with each other (see Figure 1).
Thanks to the special shapes of the clamping claws, the fast closing clamps can be attached to standard T-slot tables and hole grid pallets.

Only firmly bolted fast closing clamps can withstand the specified forces (see chapter 10 "Technical data"). The screws must be tightened to the correct torque depending on their strength class. For secure fastening, use three to four fixing screws per fast closing clamp.

Ensure that the screws are fastened symmetrically. If possible, fasten fast closing clamps diagonally across the centre.

The fast closing clamp may only be pressurised or put into operation when screwed in place. Failure to observe this will result in deformation or damage to the body housing.

Clamping options:

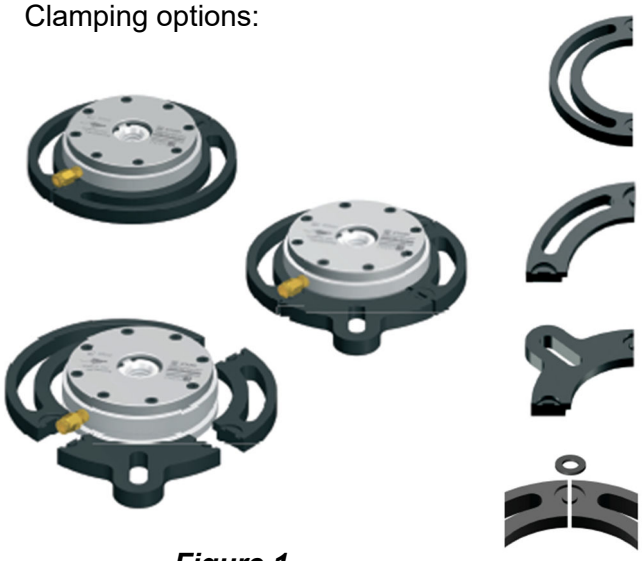


Figure 1

Clamping jaw shape 1:
STARK.classic.1 - order no. S804-354
STARK.classic.2 - order no. S804-456

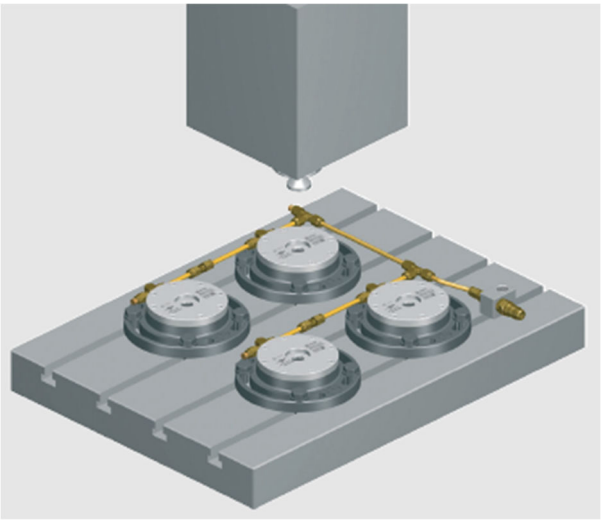
Clamping jaw shape 2:
STARK.classic.1 - order no. S804-355
STARK.classic.2 - order no. S804-457

Clamping jaw shape 3:
STARK.classic.1 - order no. S804-356
STARK.classic.2 - order no. S804-458

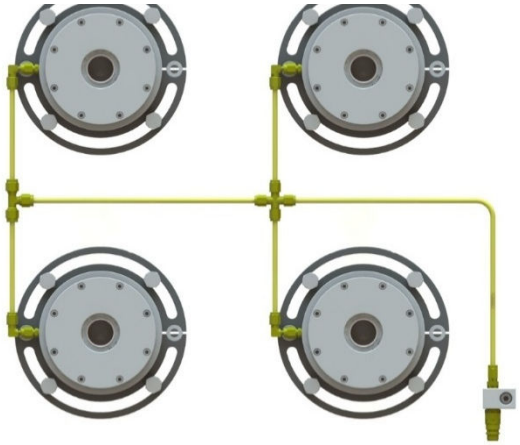
Connecting disc:
STARK.classic.1 & 2 - order no. S938-006

Piping or tubing of the surface-mounted elements.

The fast closing clamps are loosened via the piping or tubing of the individual surface-mounted elements. The fast closing clamps must be controlled differently depending on their design.



Piping plan example:



Positioning of the surface-mounted elements with positioning nipples.

1. Clamp the positioning nipple into the machine spindle using a clamping spigot.
2. The concentricity is set to 0.01 mm on the reference diameter. (Example with dial gauge)
3. After the concentricity test, the machine is moved to the desired X and Y position for the first fast closing clamp.
4. The machine is then moved into the fitting bore with a small feed in the Z-axis (see Figure 2). Be careful not to damage the fitting bore. It is important to ensure that no force is applied to the lock ring. The distance between the lock ring and the positioning nipple should be 0.3 mm.
5. Now attach the clamping claws and fasten them with fixing screws according to the tightening torques. Then check the spacings for a tolerance of ±0.01 mm.
6. For all other fast closing clamps, repeat steps 1-5.

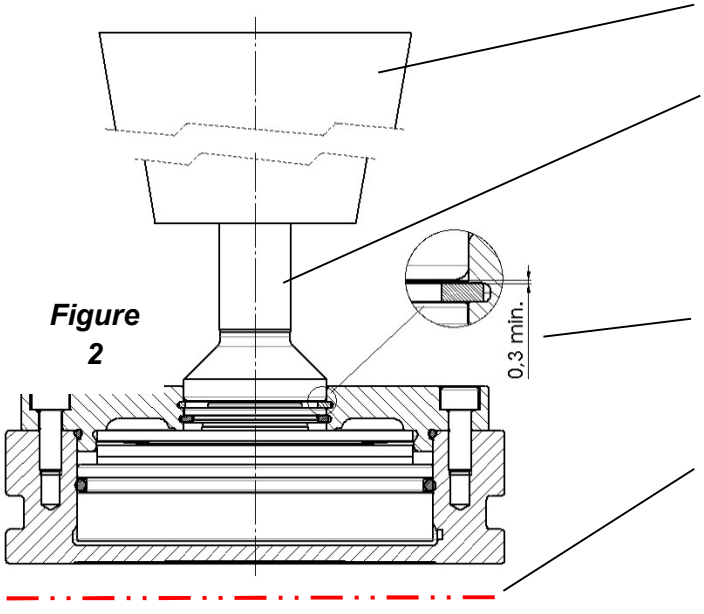


Figure 2

Machine spindle

Positioning nipple
STARK.classic.1 - order no. S804-259
STARK.classic.2 - order no. S804-258
STARK.classic.3 - order no. S804-260

Caution:
No force may be applied to the lock ring.
Maintain a minimum distance of +0.3 mm.

Caution:
The surface-mounted element must be fully supported and fastened with clamping jaws.
The maximum permissible continuous groove width under the surface-mounted element is 22 mm.

7. Commissioning, handling and operation

7.1. During initial commissioning

- Carry out a visual inspection of the entire machine or system and the fast closing clamp.
- Check the filling levels of the hydraulic oil.
- Check the fast closing clamp for hydraulic or pneumatic tightness.
- Check the release pressure of the fast closing clamp. (Clamping time/release time min. 2 sec.)

7.2. Function check

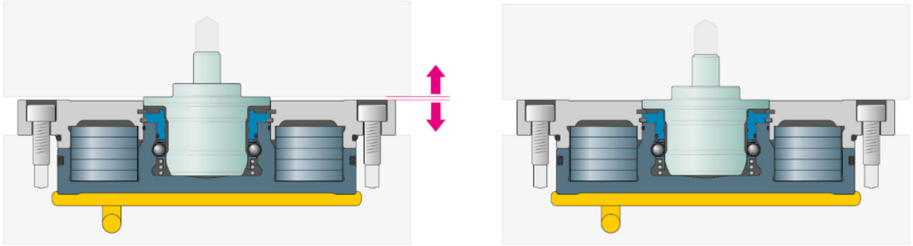
- Once all fast closing clamps connected to the same circuit have been installed as described above and tightened with the appropriate tightening torque, the hydraulic pressure generator can be connected to the circuit and this can be vented.
- Release: Slowly and carefully increase the hydraulic pressure to the release pressure. (clamping time/release time min. 2 sec.). Check the fast closing clamps for leaks, switch off the pressure generator immediately if necessary and eliminate the leak. Check specification dimension A. (see chapter 9.1 "Check specification dimension A/B")
- Check the blow-off and seat check, see chapter 7.4 "STARK.classic with blow-off (Tornado, Twister)".
- Test the proper function of the clamp control valve, if present. (see "WM-020-255-xx-xx OM Clamp control valve")

7.3. Operation

The speed when retracting the retractable nipples into the fast clamping elements must be less than 100 mm/s, otherwise the retractable nipples and fast clamping elements may be damaged.

Loading / Feed:
Insert the nipple into the clamping system until it hits the inner stop. Then the clamping system is set to clamped. It must be ensured that the nipple can be retracted without force, either by its own weight or by tracking. The tracking can be achieved by overpressing a spring assembly or a force-controlled feed. The area that needs to be overpressed must be greater than 1.5 mm. The tracking force should not exceed the stiffness of the loading arm to prevent tension during insertion and removal.

Unloading / removal:
The pallet or workpiece with the nipples are gripped by the loading arm in the clamped position. Then, the fast closing clamp is set to release. The fast closing clamp will push the loading arm back by more than 1 mm. The release force depends on the hydraulic pressure. This lifting should be bridged via the spring assembly or the force-controlled feed without causing deformation or bending of the loading arm. This causes jamming during removal, damaging the fit in the fast closing clamp.



Only pressurise the fast closing clamp for the actual change procedure.
Do ***not*** leave under permanent pressure (released)!

- Set the release pressure of the fast closing clamps (see chapter 10 "Technical data")
- Monitor the max. operating pressure of the fast closing clamps. Set the excess pressure safety valve to max. 5 bar above the max. operating pressure (see chapter 10 "Technical data")

In order to ensure that the elements function permanently, an appropriate **air quality** must be provided. STARK's data therefore refer to a purity according to ISO 8573-1:2010 [7:4:4].

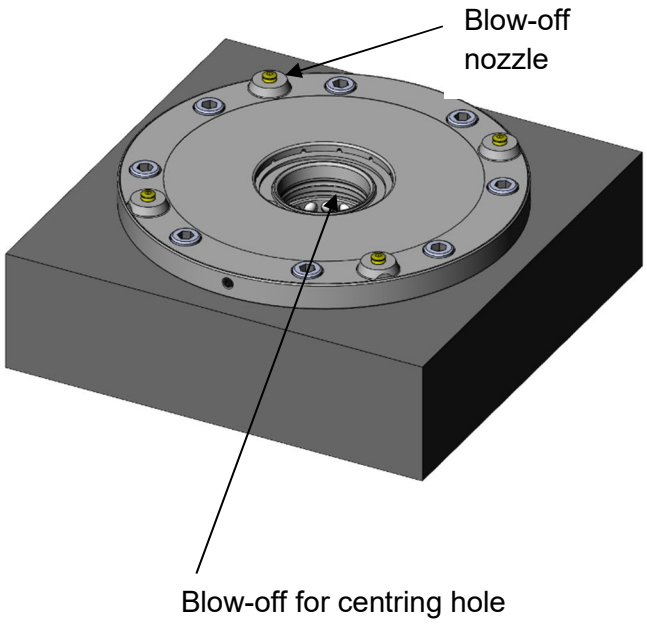
7.4. STARK.classic with blow-off (Tornado, Twister)

Blow-out serves to clean the fast closing clamp.

Switch on the blow-off air and check whether sufficient air is flowing out of the nozzles and the centring hole. (see chapter "10 Technical data"). Check the nozzles for ease of movement. Use personal protective equipment e.g. Safety goggles, etc.

Procedure for pallet change:

- Switch on the blow-off air first
- Release fast closing clamp after approx. 3 seconds
- Change pallet
- Clamp new pallet with fast closing clamp
- Only now turn off the blow-off air
- Query seat check, optional
- Switch on seat check air
- Query dynamic pressure
- Switch off seat check air
- Query clamp control, optional
- Switch on clamp control air
- Query dynamic pressure
- Switch off clamp control air



Do not introduce dirt through pallets and retractable nipples.

Ensure sufficient air supply.

System:	Air volume l/min
STARK.classic.1 Tornado and Twister	100
STARK.classic.2 Tornado and Twister	100
STARK.classic.3 Tornado and Twister	100

Optional seat check for Twister:

- Set the control pressure for the pressure controller to 2-2.5 bar when the line is closed.
- The air must be able to escape unhindered at the control exit.
- Adjust the volume flow with the throttle so that the pressure switch shows approximately 0.3-0.8 bar dynamic pressure. (Recommendation: 0.5 bar; for short switching preferably 0.8 bar)
- If the adapter plate is correctly clamped, the set pressure (2-2.5 bar) must be displayed as dynamic pressure on the pressure switch. The switching point of the pressure switch must be set according to the accuracy requirement.

  The specified setting values must be adapted to the respective machine conditions. Important influences such as the sensitivity of the pressure switches, line lengths and cross-sections, tightness of the entire system, etc. can affect the setting values and switching times of the control queries.

7.5. Preventing damage to components

The speed when retracting the retractable nipples into the fast clamping elements must be less than 100 mm/s, otherwise the retractable nipples and fast clamping elements may be damaged.

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 fast closing clamps must be kept clean and cleaned immediately if soiled. In particular, the areas of the piston or bolt housing, support surfaces and centring hole must be cleaned of chips and other liquids. In case of heavy contamination, cleaning must be carried out at shorter intervals.

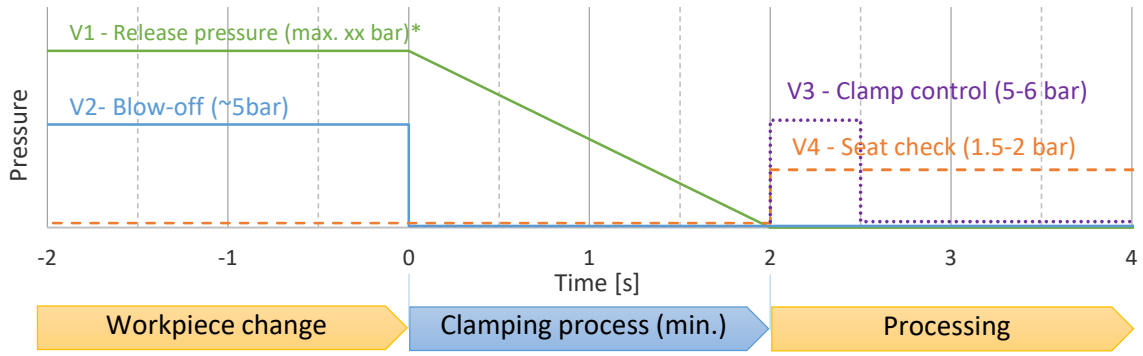
7.6. Lubricants and oils (hydraulic oil)

Unsuitable lubricants and oils can damage the seals and have a significant negative impact on their service life.
CAUTION: Mixing of oils is not permitted.

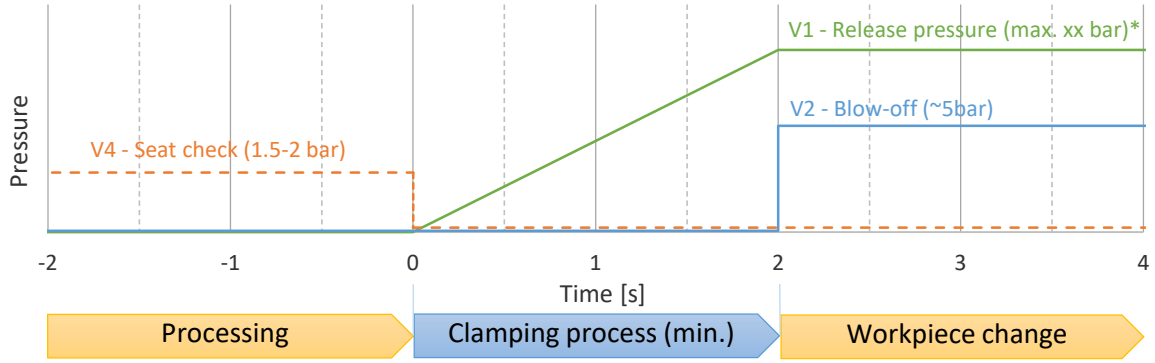
Recommendation: Hydraulic oil Castrol Hyspin AWS 32 or Castrol Hyspin AWS 46

8. Sequence diagram

Time sequence of the clamping process:



Time sequence of the release process:



* V1

- Release pressure for pneumatic elements max. 10 bar
- Release pressure for hydraulic elements, see chapter 10 “Technical data”

When building up and reducing the release pressure, no abrupt pressure changes are permitted, as this can lead to damage to the components. The pressure change should take place over a period of 2 seconds.

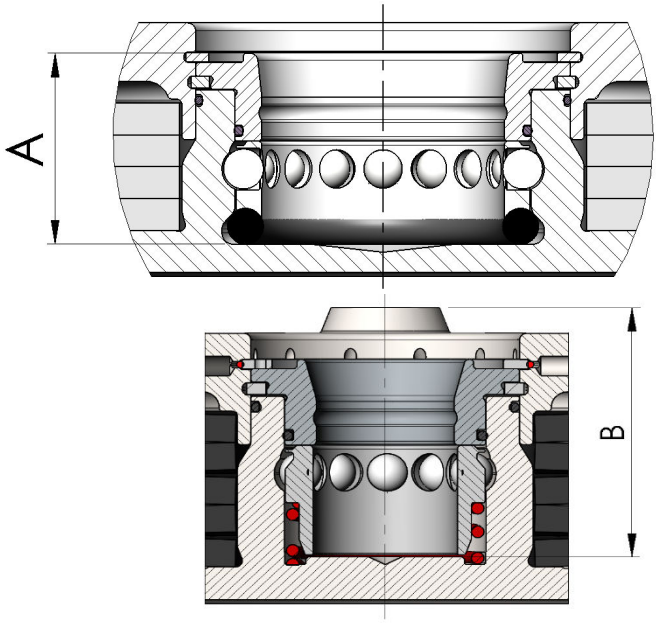
9. Maintenance and repair

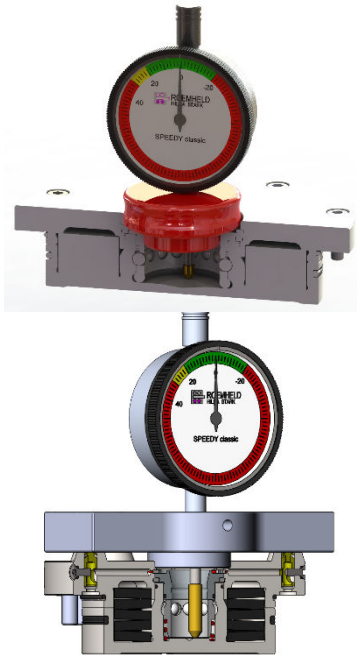
9.1. Check specification dimension A/B

Specification dimension A or B must be checked once a month.

Check for proper function via specification dimension A in the released state.
The fast closing clamp will only function properly if the depth A (STARK.classic and Tornado) or B (STARK.classic Twister) according to the table is observed.

For measuring the specification dimension, there is a suitable specification dimension tester for each size. This is available from Stark Spannsysteme GmbH:





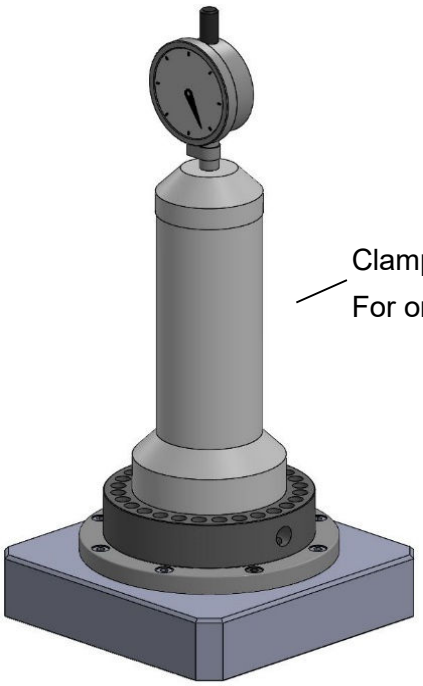
System	Release pressure	Specification dimension A/B	Specification dimension tester
STARK.classic.1 ST/TO/TW	40 bar	25.3 mm ± 0.2	Order no. S504-021
STARK.classic.1 (10 kN)	80 bar	25.3 mm ± 0.2	Order no. S504-021
STARK.compact.1	180 bar	25.3 mm ± 0.2	Order no. S504-021
STARK.classic.2 ST/TO/TW	40 bar	24.0 mm ± 0.2	Order no. S504-022
STARK.classic.3 ST/TO/TW	35 bar	38.5 mm ± 0.2	Order no. S504-023

System	Holding pressure DHF*	Specification dimension A/B*	Specification dimension tester
STARK.classic.1 ST/TO/TW	17 bar	26.3 mm ± 0.4	Order no. S504-031
STARK.classic.1 (10 kN)	50 bar	26.3 mm ± 0.4	Order no. S504-031
STARK.compact.1	90 bar	26.3 mm ± 0.4	Order no. S504-031
STARK.classic.2 ST/TO/TW	25 bar	25.8 mm ± 0.4	Order no. S504-032
STARK.classic.3 ST/TO/TW	19 bar	41.4 mm ± 0.4	Order no. S504-033

* The holding pressure DHF is only a guide value. DHF must be adapted individually to the system.
* The holding pressure DHF may have to be adjusted over the service life of the cup springs!

If the dimension A or B is exceeded (red area), service must be carried out immediately by an authorised service technician.
If no service is performed, safe clamping of the retractable nipple is not possible. There is a risk of accident. For specification dimension A or B in relation to the DHF function, it may only be necessary to readjust the system. Further information and a complete compatibility overview can be found under OM Specification dimension tester WM-020-349-xx-xx.

9.2. Checking the clamping force



The clamping force must be checked after every 5000 clamping cycles or at least once a year.

Measure the insertion force of the fast clamping element. To measure the insertion force, a suitable mechanical clamping force tester can be obtained from Stark Spannsysteme GmbH.

The permissible deviation of the insertion force is ±15% (see chapter 10 "Technical data"). If the measured value falls below the minimum insertion force, the cup springs must be replaced, see chapter 9.3 "Replacing the cup springs".

For further information, see OM Mechanical Insertion force tester WM-020-133-xx-xx.

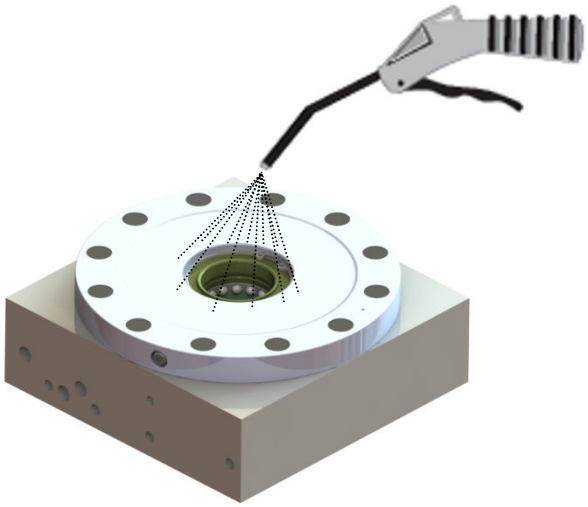
Order no.	Compatibility:
S504-000	STARK.classic.1; STARK.classic.2; STARK.classic.3 (rental case)
S504-001	STARK.classic.1
S504-002	STARK.classic.2
S504-004	STARK.classic.3

9.3. Replacing the cup springs

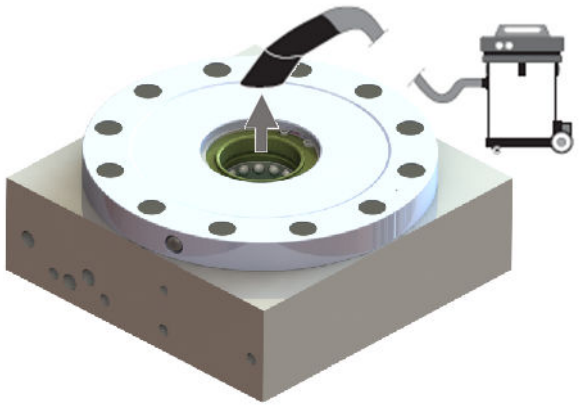
After reaching the maximum clamping cycles or falling below the minimum insertion force, the cup springs must be replaced (see chapter 10 "Technical data").

The fast closing clamp must be dismantled for the cup spring replacement.
Only an authorised service technician may carry out assembly work on the fast closing clamps. The necessary safety measures must be observed in their entirety and without exception during all work.

9.4. Cleaning surfaces



Possible!
The fast closing clamp may be blown out and off with compressed air.



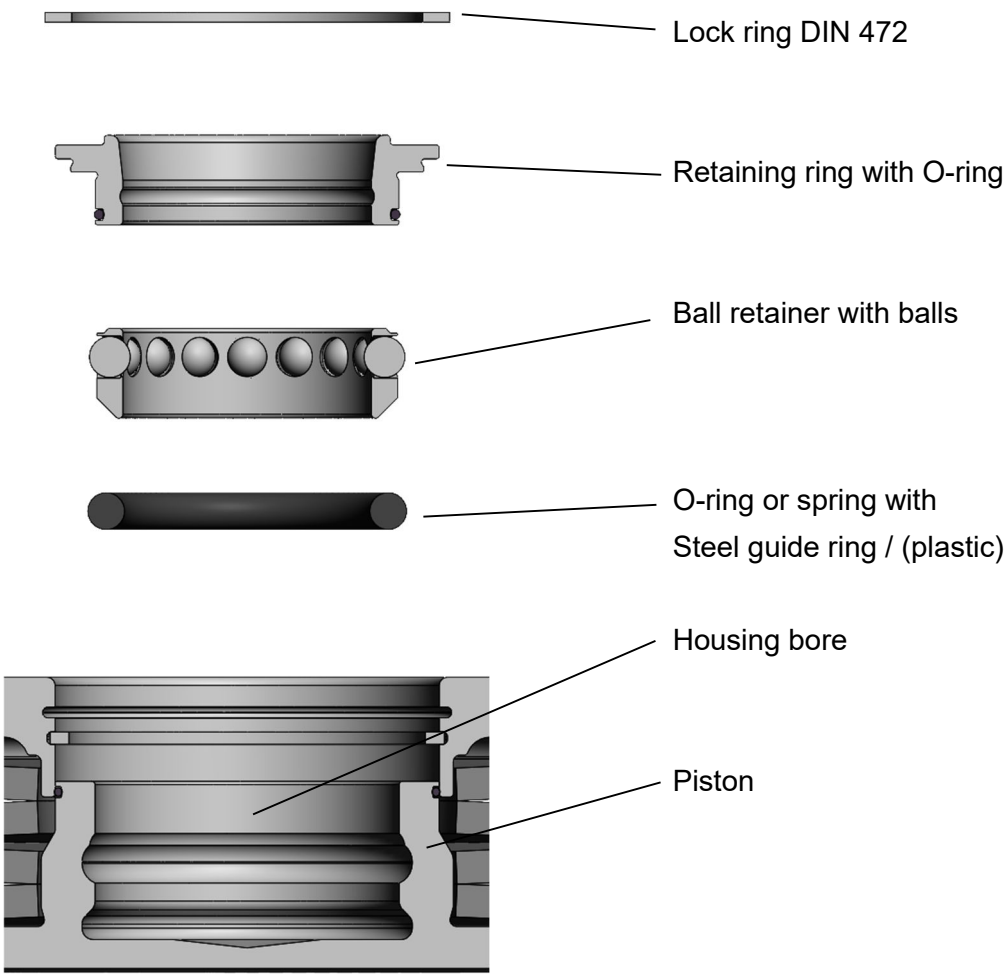
Correct and better!
Extraction and suction of chips, dirt and coolant from the fast closing clamp.

No contamination is permitted in the fast closing clamp. Cleaning depends on the application and pallet replacement interval. Observe max. clamping cycles. When this is reached: maintenance only by instructed personnel.

9.5. Parts that are dismantled for cleaning

Necessary tools and aids:

1. Lock ring pliers (order no. S504-006)
2. Specification dimension tester
3. Retractable nipple or transportation lock
4. Ball retainer assembly aid for STARK.classic.2: Order no. S704-221-M
5. Ball retainer assembly aid for STARK.classic.3: Order no. S704-224-M



1. Remove lock ring DIN 472 with pliers
2. Carefully pull off the retaining ring
3. Remove ball retainer, do not lose any balls

→ For STARK.classic.2 and STARK.classic.3, observe installation and removal instructions for ball retainer assembly aid S704-221-M or S704-224-M

Info: The assembly aid for the ball retainer is generally only required for clamping towers.

4. Remove O-ring
5. Clean the dismantled parts incl. the housing bore, check for damage and replace if necessary.
6. Reassemble all parts in reverse order. Ensure that the lock ring DIN 472 is correctly seated!
7. Measure specification dimension A (see chapter 9.1 “Check specification dimension A/B")
8. Check function by means of single retractable nipple or transportation lock

Caution: Only convert when depressurised.

9.6. General cleaning

For general cleaning, the fast closing clamp must be dismantled. Assembly work may only be carried out by STARK Spannsysteme GmbH. The necessary safety measures must be observed in their entirety and without exception during all work.

Hazard information: The fast closing clamp is permanently under spring pressure! Do not open the housing. There is a risk of personal injury or material damage!

The product must not be cleaned with:

- corrosive or caustic components
- organic solvents such as halogenated or aromatic hydrocarbons and ketone (nitro thinner, acetone etc.) These substances would destroy the seals.

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

9.7. Storage

Until first use:
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 9.4"Cleaning surfaces" and take measures for corrosion protection.

After a long period of storage:
After a long period of storage (approx. 3 years), replace all seals before use. Sealing sets are available on request from Stark Spannsysteme GmbH

The fast closing clamp must be dismantled for the seal replacement.
Only an authorised service technician may carry out assembly work on the fast closing clamps.
The necessary safety measures must be observed in their entirety and without exception during all work.

9.8. 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.

Hazard information: The fast closing clamp is permanently under spring pressure! Do not open the housing. There is a risk of personal injury or material damage!

10. Technical data

Designation:	**STARK.classic.1 / STARK.compact.1**					
Version:	**Standard**	**Standard**	**Tornado**	**Tornado**	**Twister**	**compact**
Specification dimension A:	25.3 mm ± 0.2					
Move-in / lifting:	1.2 mm					
Repeat accuracy[1]:	< 0.005 mm					
System accuracy[2]:	< 0.01 mm					
Insertion force[3]:	6.7 kN	10 kN	6.7 kN	10 kN	6.7 kN	6.5 kN
Retention force[4]:	25 kN					
Max. lateral force:	7 kN					
Twisting moment[5]:	300 Nm				-	-
Lifting power:	10 kN (at max. release pressure)					
Release pressure[6]:	35-40 bar	75-80 bar	35-40 bar	75-80 bar	35-40 bar	175-180
Max. operating pressure[7]:	80 bar					180 bar
Min. blow-off:	-	-	100 l/min	100 l/min	100 l/min	-
Preset clamping time:	min. 2 sec.					
Default release time:	min. 2 sec.					
Nipple pre-positioning radial[8]:	±0.3 mm / ±3 mm					
Nipple pre-positioning axial:	-0.3 mm (consider retraction path)					
Distance tolerance:	±0.01 mm (for fast closing clamp side and retractable nipple side)					
Temperature range:	+10°C to 80°C / extended temperature range on request					
Maintenance cycles[9]:	100000	20000	100000	20000	100000	15000
Weight:	1.5 kg / 3 kg (Module)					1.2 kg
Oil volume:	20 cm³					7 cm³
Hydraulic oil:	According to DIN 51524 (HLP 32 or HLP 46)					
Filter class:	Quality class 4					
Sealing material:	NBR; other materials on request					
Designation:	**STARK.classic.2**					

[1] This indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).
[2] This refers to the accuracy resulting from changing several pallets on different machines.
[3] Insertion force will fall below this value with increasing clamping cycles. The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded. The permissible deviation of the insertion force is ±15%.
[4] This is the maximum overload at which the retractable nipple is still held but the zero point has already been left.
[5] Only for quadratic fast closing clamps.
[6] Only pressurise the fast closing clamp for the change procedure - do not leave it pressurised for a longer period of time.
[7] Set the excess pressure safety valve to max. 5 bar above the max. operating pressure.
[8] The fast closing clamp allows radial offset of the retractable nipples:
with rigid feed ±0.3 mm;
with low-force, movable feed ±3 mm
[9] Only under optimal conditions.

Version:	**Standard**	**Tornado**	**Twister**
Specification dimension A:	24.0 mm ± 0.2		
Move-in / lifting:	1.2 mm		
Repeat accuracy[10]:	< 0.005 mm		
System accuracy[11]:	< 0.01 mm		
Insertion force[12]:	20 kN		
Retention force[13]:	38 kN		
Max. lateral force:	9 kN		
Twisting moment[14]:	800 Nm	-	-
Lifting power:	10 kN (at max. release pressure)		
Release pressure[15]:	35-40 bar		
Max. operating pressure[16]:	40 bar		
Min. blow-off:	-	100 l/min	
Preset clamping time:	min. 2 sec.		
Default release time:	min. 2 sec.		
Nipple pre-positioning radial[17]:	±0.3 mm / ±2.5 mm		
Nipple pre-positioning axial:	-0.3 mm (consider retraction path)		
Distance tolerance:	±0.01 mm (for fast closing clamp side and retractable nipple side)		
Temperature range:	+10°C to 80°C / extended temperature range on request		
Maintenance cycles[18]:	40000		
Weight:	2.5 kg / 4 kg (module)		
Oil volume:	40 cm³		
Hydraulic oil:	According to DIN 51524 (HLP 32 or HLP 46)		
Filter class:	Quality class 4		
Sealing material:	NBR; other materials on request		
Designation:	**STARK.classic.3**		

Version:	**Standard**	**Standard***	**Tornado**	**Twister**
Specification dimension A:	38.5 mm ± 0.2			

[10]This indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).
[11]This refers to the accuracy resulting from changing several pallets on different machines.
[12] Insertion force will fall below this value with increasing clamping cycles. The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded. The permissible deviation of the insertion force is ±15%.
[13] This is the maximum overload at which the retractable nipple is still held but the zero point has already been left.
[14] Only for quadratic fast closing clamps.
[15] Only pressurise the fast closing clamp for the change procedure - do not leave it pressurised for a longer period of time.
[16] Set the excess pressure safety valve to max. 5 bar above the max. operating pressure.
[17] The fast closing clamp allows radial offset of the retractable nipples:
with rigid feed ±0.3 mm;
with low-force, movable feed ±3 mm
[18] Only under optimal conditions.

Move-in / lifting:	1.5 mm			
Repeat accuracy[19]:	< 0.005 mm			
System accuracy[20]:	< 0.01 mm			
Insertion force[21]:	30 kN			
Retention force[22]:	55 kN			
Max. lateral force:	10.5 kN			
Twisting moment[23]:	2,000 Nm		-	-
Lifting power (at max. release pressure):	15 kN	25 kN	15 kN	
Release pressure[24]:	30-35 bar	40-45 bar	30-35 bar	
Max. operating pressure[25]:	35 bar	45 bar	35 bar	
Min. blow-off:	-	-	100 l/min	
Preset clamping time:	min. 2 sec.			
Default release time:	min. 2 sec.			
Nipple pre-positioning radial[26]:	±0.3 mm / ±4 mm			
Nipple pre-positioning axial:	-0.3 mm (consider retraction path)			
Distance tolerance:	±0.01 mm (for fast closing clamp side and retractable nipple side)			
Temperature range:	+10°C to 80°C / extended temperature range on request			
Maintenance cycles[27]:	40000			
Weight:	6.2 kg 7.9 kg**	6.65 kg	6.35 kg 8.25 kg (module)	6.35 kg
Oil volume:	124 cm³			
Hydraulic oil:	According to DIN 51524 (HLP 32 or HLP 46)			
Filter class:	Quality class 4			
Sealing material:	NBR; other materials on request			

[19]This indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).
[20]This refers to the accuracy resulting from changing several pallets on different machines.
[21] Insertion force will fall below this value with increasing clamping cycles. The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded. The permissible deviation of the insertion force is ±15%.
[22] This is the maximum overload at which the retractable nipple is still held but the zero point has already been left.
[23] Only for quadratic fast closing clamps.
[24] Only pressurise the fast closing clamp for the change procedure - do not leave it pressurised for a longer period of time.
[25] Set the excess pressure safety valve to max. 5 bar above the max. operating pressure.
[26] The fast closing clamp allows radial offset of the retractable nipples:
with rigid feed ±0.3 mm;
with low-force, movable feed ±3 mm
[27] Only under optimal conditions.

Increased lifting force: * STARK.classic.3 Standard / weight: ** STARK.classic.3 Standard quadratic

11. 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.classic
Article number:	S704-xxx, S804-xxx, S806-xxx, S807-xxx, S0xxxx
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, 05/02/2026

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.

	not relevant: ↓	fulfilled on the part of the system manufacturer: ↓	to be fulfilled by the system integrator: ↓
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

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