



ROEMHELD
HILMA ■ STARK

STARK.easyclick zero point clamping system

Operating Manual

WM-020-337-14-en BA STARK.easyclick

precise, fast and powerful



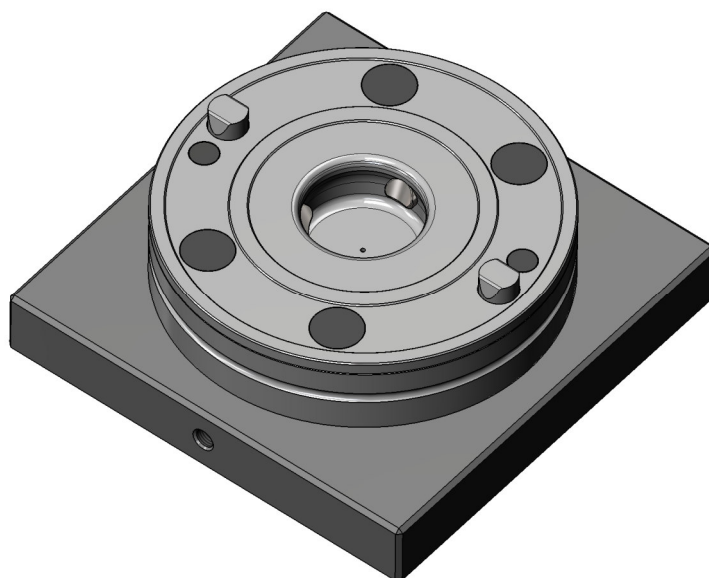
STARK.easyclick

Art. no.: S7000-019 / S7000-019-01
S7000-020 / S7000-119



STARK.easyclick

Art. no.: S7000-150 / S7000-160



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2 Identification of the partly completed machinery

Product:	Fast clamping lock
Function:	Clamping and centring of workpiece pallets or workpieces
Product group:	STARK.easyclick
Article number:	S7000-019 / S7000-019-01 / S7000-020 / S7000-119 / S7000-150 S7000-160
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 Presentation of safety instructions

Safety instructions are identified by a pictogram and a signal word. 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 instructions and the procedures described!



CAUTION

Potentially hazardous situation (minor injury or material damage). Be sure to follow these instructions and the procedures described!



INFORMATION

Tips for use and particularly useful information.



INSTRUCTION

Obligation to follow the described procedure or method for the safe use of the machine.



4 Fundamental safety instructions

4.1 Intended use



The fast clamping lock is used for clamping pallets with mounting devices for workpieces or workpieces directly.

The workpieces are intended for processing, transporting and measuring.



Extreme vibrations can cause the system to release (rattling processing, etc.)

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 use other than that specified under "Intended use" or use beyond this is considered improper use!

Risks can arise if the device is not used for its intended purpose. Improper uses include e.g.:

- exceeding the technical values specified for normal operation
- application for hoist operation and load transportation

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, a rotational speed of 20 rpm for a maximum radius of 0.3 m must not be exceeded! It must also be ensured that the permissible forces acting on the fast clamping lock are not exceeded according to the technical data.

Specialists must be consulted for the calculation and design of the fast clamping locks for rotating applications. STARK Spannsysteme GmbH 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 clamping lock without consultation with and the written approval of the manufacturer.



4.5 Spare and wear parts and auxiliary materials



If the pallets are built or purchased by the operating company itself, STARK retractable nipples must be used.

These must be installed according to the corresponding STARK data sheets.

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.

4.6 Obligations 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 & 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.

4.7 Residual risks



Attention must be paid to the existence of mechanical and pneumatic residual energies at the fast clamping device and the pressure in the cylinders and valves after switching off the fast clamping device!

For example:

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

4.7.1 Springs



The preloaded springs can be catapulted away if the fast clamping lock is improperly dismantled.

4.7.2 Design for the pallet and fast clamping locking plate



To ensure safe positioning on the fast clamping lock, make sure there is a grip point for a hand on the pallet. If such a grip point is not possible due to design reasons, make sure that no hands/fingers can get between the fast clamping lock and nipple or between the fast clamping locking plate and the pallet. When changing 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 clamping locking plate and the pallet.

4.7.3 Danger due to incorrect assembly of the fast clamping lock



Improper tightening of the fixing screws or insufficient strength of the screws may cause the pallet to come loose.

Measure:

The mounting instructions for strength class, tightening torque and arrangement must be observed.

The product-related data is shown on the enclosed drawing with parts list and in chapter "9 Technical data".



4.7.4 Danger due to changes in rotational speed



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

Measure:

Observe the specifications and regulations of Stark Spannsysteme GmbH.
(see chapter "9 Technical data")

4.7.5 Pressure hazards



Lines or hoses bursting due to excessive pressures can endanger persons.

Measure:

- Protect pneumatic lines with pressure relief valves
- Observe the specified pressure limits

4.7.6 Influences on service life

Negative influences include:

- Insufficient filtering of the compressed air filter fineness of < 15 µm must be observed.
- Damage to 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 preload position or loading position.



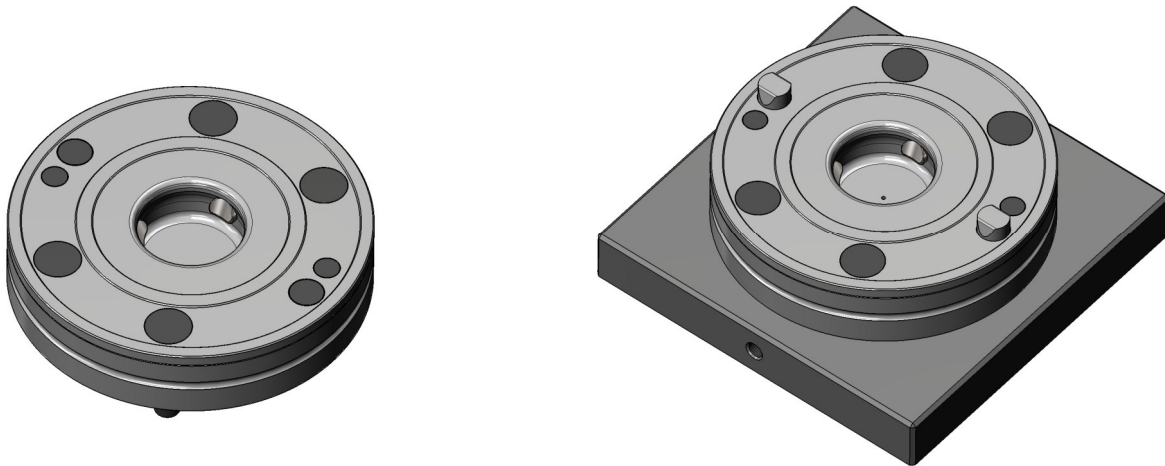
5 Description of the fast clamping device

STARK.easyclick is a single-acting pneumatic fast clamping lock that clicks in and holds immediately without an energy supply. 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.

A pneumatic connection with a pressure of 4-8 bar is required for release. STARK.easyclick is used in non-cutting and cutting machining with multiple axes. The fast clamping time allows use as a construction element in production lines. A particularly compact design allows narrow pitches. Retractable nipples of only 12 mm length ensure short excavation paths.

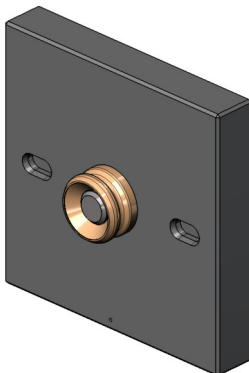
STARK.easyclick is available in different versions / with different functions:

- standard
- with extended temperature range
- with damping (e.g. for assembly devices)
- with blow-out and mount control
- with pre-assembled base plate and locking

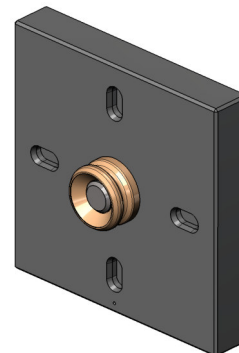


In addition to the elements, pallets in two different versions can also be used for single clamping – see figure.

Pallet art. no.: S7000-151
180° indexing



Pallet art. no.: S7000-152
90° indexing





5.1 Description of the versions and functions

STARK.easyclick “**Standard**” is a fast clamping lock without special functions.

STARK.easyclick “**with extended temperature range**” is a fast clamping lock that is fitted exclusively with Viton seals. These can be used at higher temperatures than standard seals. Temperature range +10°C to +150°C.

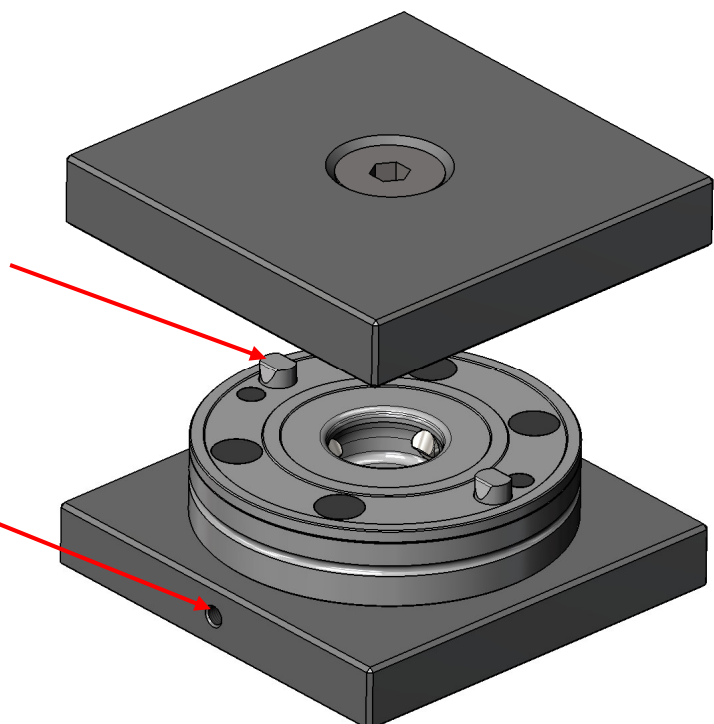
STARK.easyclick “**with damping**” is a fast clamping lock with damping, e.g. for assembly devices. For assembly devices, impact can occur which has a negative effect on the clamped condition of the fast clamping lock. The fast clamping lock can open depending on the strength of the impact. In order to minimise this, additional damping elements are installed for the clamping fingers.

STARK.easyclick “**with blow-out and mount control**” is a fast clamping lock with an additional bore in the housing base. This bore is used for the blow-out and mount control. Caution: A maximum of 4 STARK.easyclicks may be connected in one clamping circuit. Otherwise, the operating pressure will be too low and the clamping or retention force will no longer be guaranteed.

STARK.easyclick “**with pre-assembled base plate and locking**” is a fast clamping lock with base plate and 2 locking pins. The base plate is used for flexibility and is clamped using clamping claws, for example, or screwed on using bores, see chapter “5.5 Design with base plate”. The locking pins serve as anti-twist protection.

Spring-loaded pins with mould incline on the upper side to lock the pallet in place

Air connection via M5 ∇ 8
 Release pressure, see chapter
 “9 Technical data”





5.2 Mount control

Important notes:

- Only possible for Art. no.: S7000-119 & S7000-160.
- The release pressure must be applied as quickly as possible and it must be ensured that the volume flow is sufficiently high. (Release pressure, see chapter "9 Technical data").
- A maximum of 4 STARK.easyclicks may be connected in one clamping circuit.
- No pressure may be applied to the STARK.easyclick during processing.
- If the clamping nipples are in the STARK.easyclick, the release pressure should not be applied for more than 3 minutes → within this period of time the clamping nipples should be removed from the STARK.easyclick.

5.2.1 Mount control with dynamic pressure measurement

Design/setting of the mount control

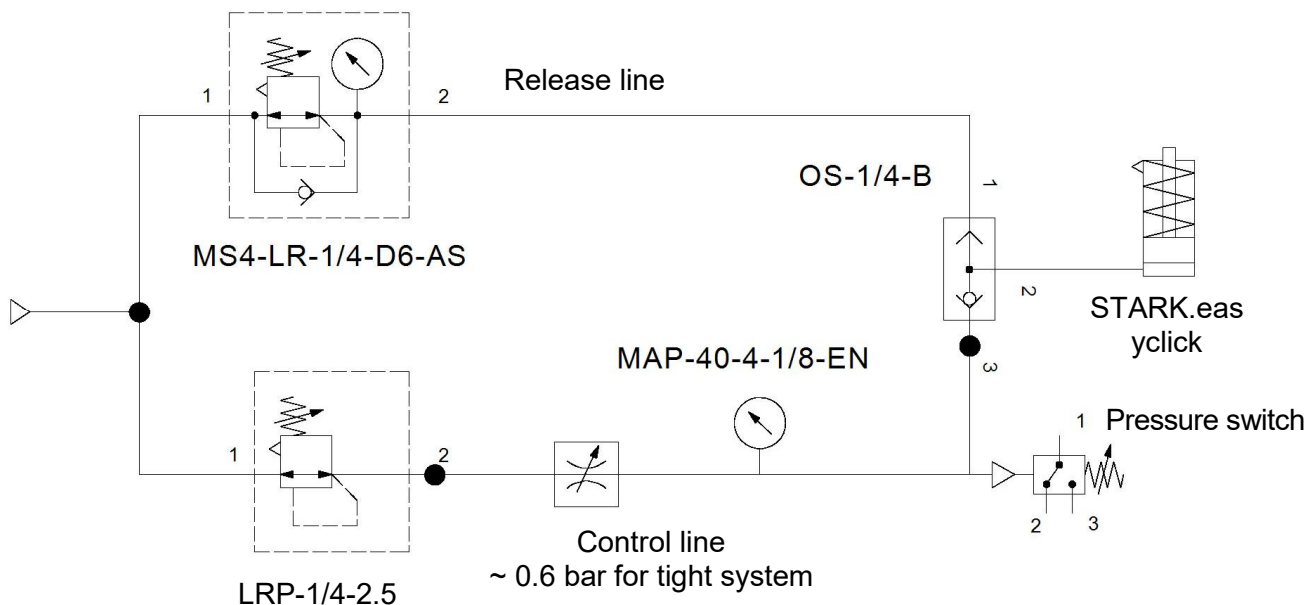


Figure1: Mount control with dynamic pressure measurement diagram

- Design of the pneumatic circuit according to the above diagram, all numbers given are Festo order codes and are to be regarded as examples only.
- The control pressure must be set to approx. 0.6 bar when the system is tight (all pallets cleanly clamped, no air leakage).
- Afterwards release all STARK.easyclicks and remove the clamping nipples.
- Now the flow in the control line is reduced by a throttle valve to such an extent that the existing dynamic pressure settles at approx. 0.3 bar (without changing the pressure controller). This pressure represents the lower limit value.
- The switching threshold for good support is between 75-95% of the dynamic pressure set above. The pressure range between the lower and upper limit values is approx. 0.3 – 0.5 bar for 4 STARK.easyclick units. The pressure difference is 0.08 – 0.12 bar for an individual STARK.easyclick. Therefore a precise pressure controller as well as a precise pressure switch is required.
- The final adjustment can only be made on the real system, as factors such as cable length, number of STARK.easyclicks, etc. influence the parameters.



Workflow description

1. Briefly activate the release pressure for blow-out in order to blow out the nipple bore of the STARK.easyclick.
2. Depressurise so that the clamping fingers of the STARK.easyclick move into the clamping position.
3. Apply pressure to the control line.
4. The "incorrect voltage" signal must be output (customer-side query).
5. Click the pallet with all retractable nipples into the STARK.easyclick.
6. Signal changes to "voltage OK" (customer-side query). Otherwise, depressurise the control line, release STARK.easyclick and reclamp.
7. Depressurise the control line again to achieve the full clamping force of the STARK.easyclick.
8. Workpiece processing.
9. After processing, the release pressure can be applied.
10. All retractable nipples can be removed from the STARK.easyclick within three minutes.

5.2.2 Mount control with flow sensor

Design/setting of the mount control

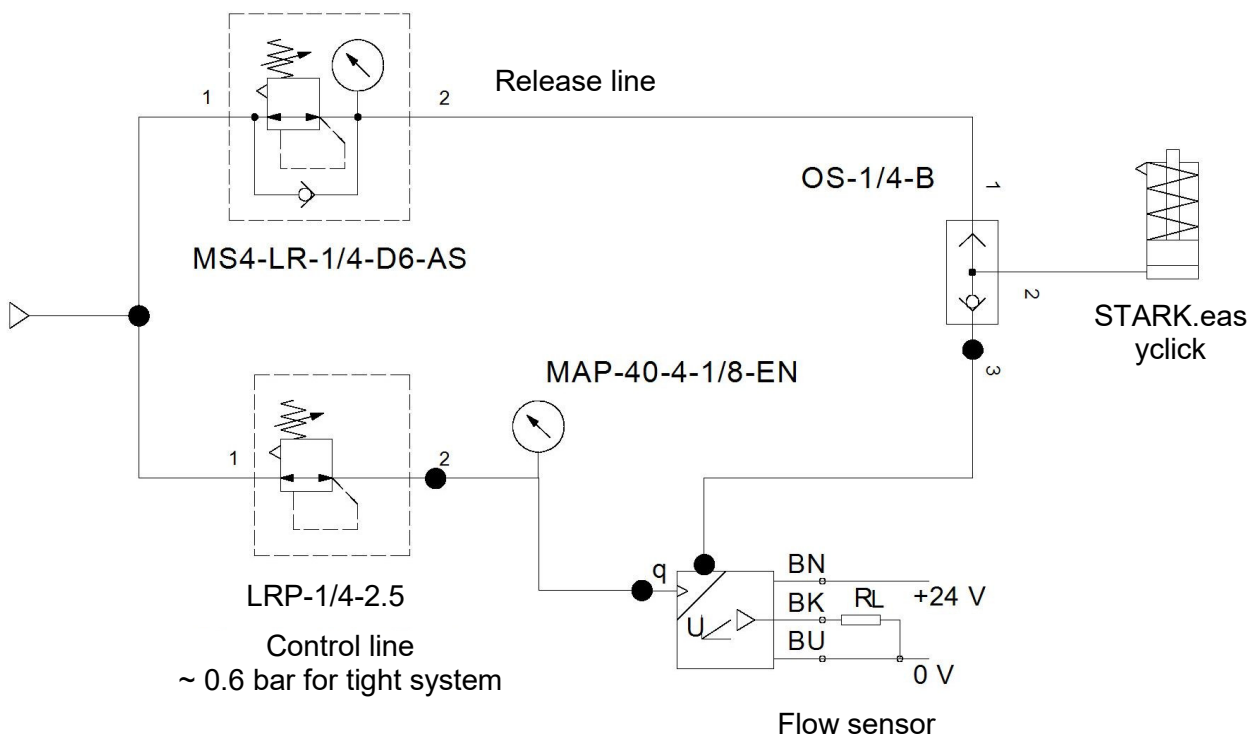


Figure2: Mount control with flow sensor diagram

- Design of the pneumatic circuit according to the above diagram, all numbers given are Festo order codes and are to be regarded as examples only.
- The control pressure must be set to approx. 0.6 bar when the system is tight (all pallets cleanly clamped, no air leakage).
- Release all STARK.easyclicks, remove the retractable nipples.
- Then, for example, simulate a gap with precision gauge tape, starting at 0.02 mm on a STARK.easyclick, and clamp the remaining retractable nipples without a gap. Increase the gap until



the flow sensor reliably outputs a value. Depending on the quality of the flow sensor, it is possible that an air leakage is already acoustically perceptible before the sensor can detect the volume flow.

- The value or gap thus determined represents the threshold for the voltage OK / NOK distinction. The more precise the pressure controller or flow sensor used, the more accurate the mount control will be.
- The final adjustment can only be made on the real system, as factors such as cable length, number of STARK.easyclicks, etc. influence the parameters.

Workflow description

1. Briefly activate the release pressure for blow-out in order to blow out the nipple bore of the STARK.easyclick.
2. Depressurise so that the clamping fingers of the STARK.easyclick move into the clamping position.
3. All retractable nipples must be clicked into the corresponding STARK.easyclick.
4. Apply pressure to the control line.
5. "Voltage OK" signal (customer-side query) must be output. Otherwise, depressurise the control line, release STARK.easyclick and reclamp.
6. Depressurise the control line again to achieve the full clamping force of the STARK.easyclick.
7. Workpiece processing.
8. After processing, the release pressure can be applied.
9. All retractable nipples can be removed from the STARK.easyclick within three minutes.

In general, mount control using dynamic pressure measurement is less sensitive to fluctuations in the pneumatic system and is therefore preferable.

NOTE



CAUTION: The seat check or mount check is not a clamp control. The STARK.easyclick has no clamp control.

6 Installation/removal of fast clamping lock

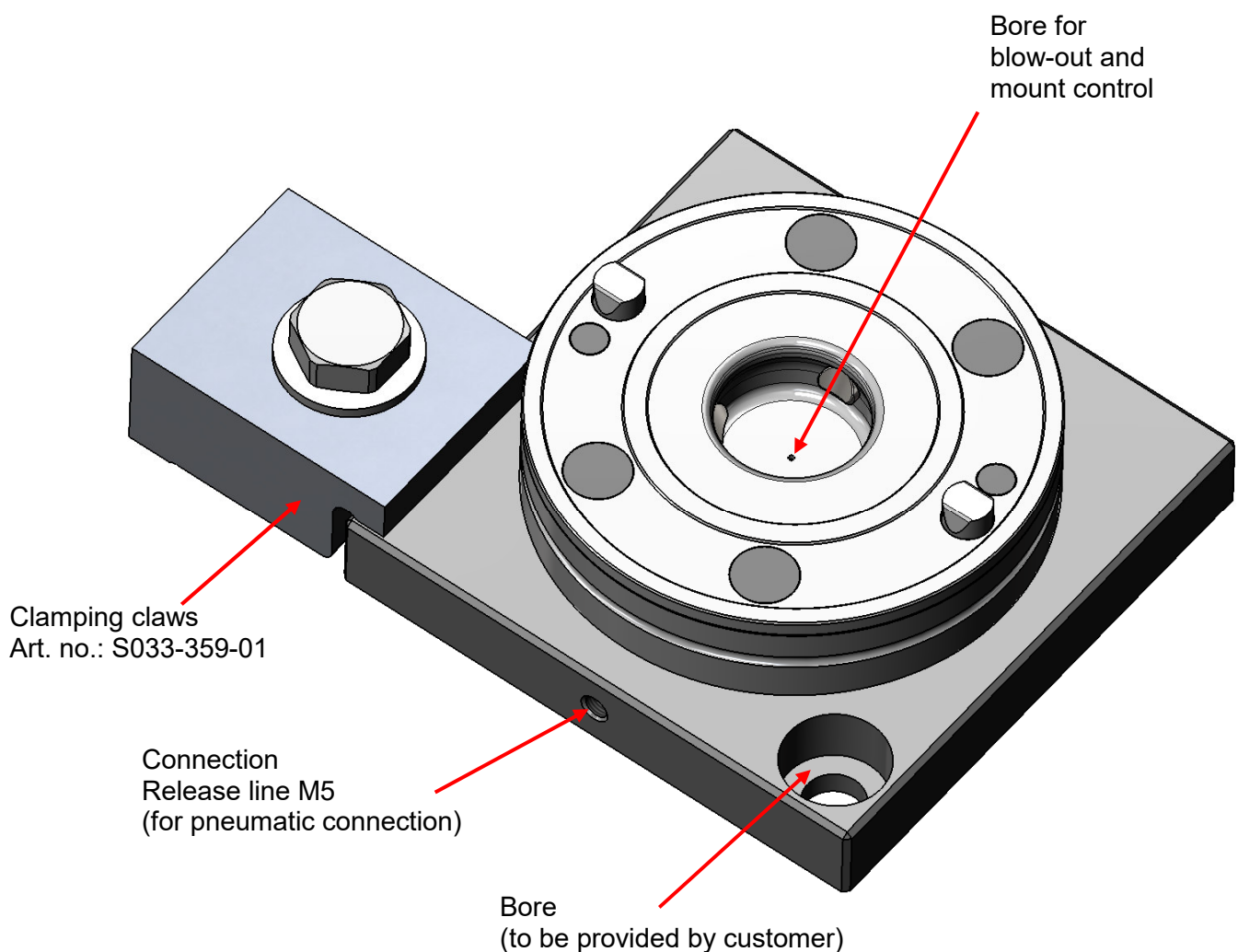
The fast clamping lock can basically be installed in two ways; either directly via the element (e.g. on a base plate) or optionally via a fast clamping plate – these are described in the following two chapters.

6.1 Design with base plate

If a base plate is used for fastening, it can be clamped using clamping claws, for example, or screwed on using bores (to be drilled by the customer). The release line is connected via a lateral M5 connection.

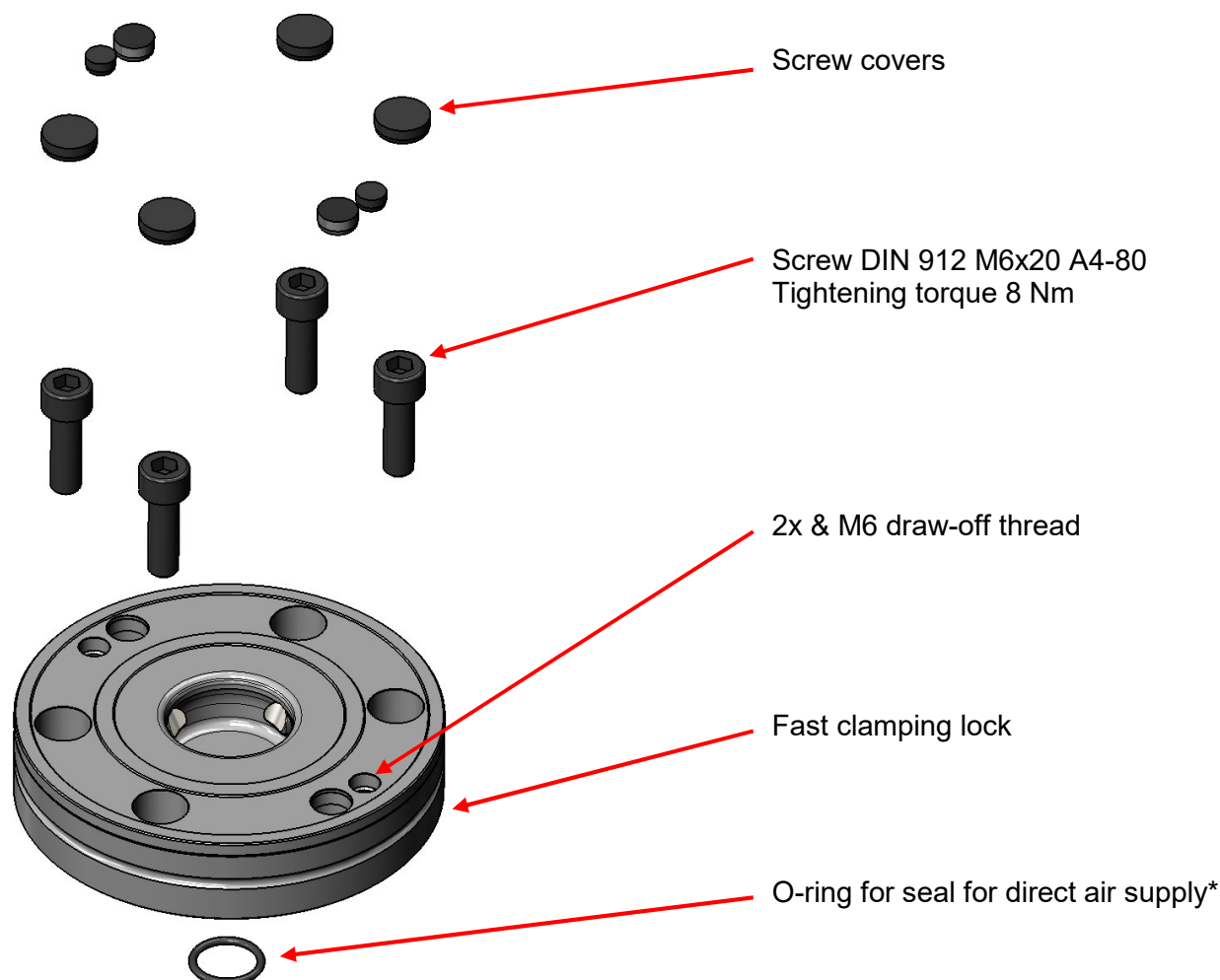
STARK.easyclick with locking Art. no.: S7000-150 or S7000-160

(Please note: the fixing material is not included in the scope of delivery!)

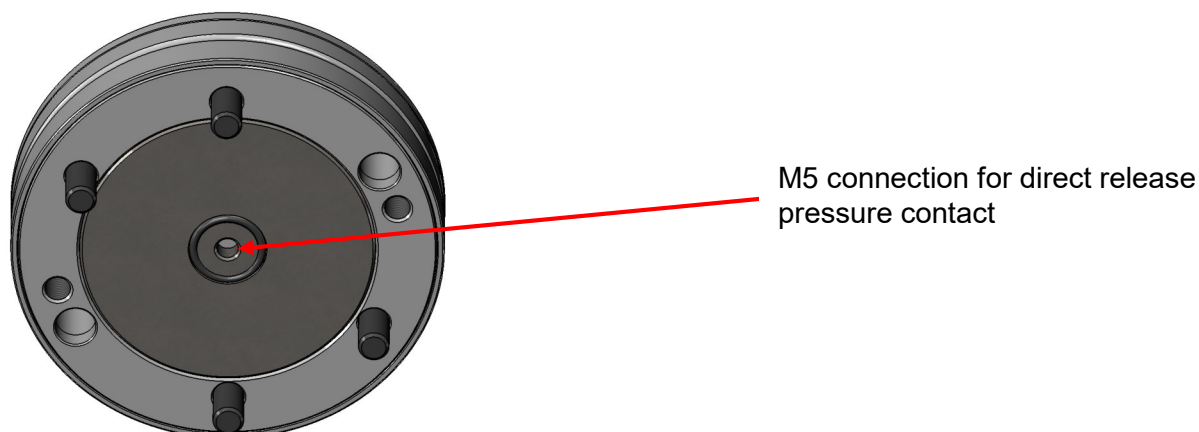


6.2 Fastening the element directly

The STARK.easyclick is fastened with four M6x20 screws – details can be found in the corresponding data sheet D113.



*) if installation is carried out via the base plate or if the M5 thread is used directly on the underside, the O-ring can be omitted.





Assembly procedure

1. Attaching the air supply:
 - Version with O-ring Grease the O-ring and insert it at the bottom into the groove of the fast clamping lock.
 - Version with M5 connection: Screw on connector (not included in scope of delivery).
2. Position the fast clamping lock, see installation versions, see data sheet D113.
3. Tighten the STARK.easyclick parallel to the system using the supplied DIN 912 M6x20 A4-80 screws. Only use the DIN 912 M6x20 A4-80 supplied screws or DIN 912 screws with quality 12.9. Tighten all four screws for the STARK.easyclick to 8 Nm (A4-80) or 15 Nm (12.9) using a torque wrench.

Note: To check the flat support around the cover, use a feeler gauge to try to penetrate between the plate and the cover. If this is successful, dismantle the STARK fast clamp according to removal instructions, points 1 to 3 and start again at point 1 of the installation instructions.
4. Close the open bores with the appropriate screw covers.

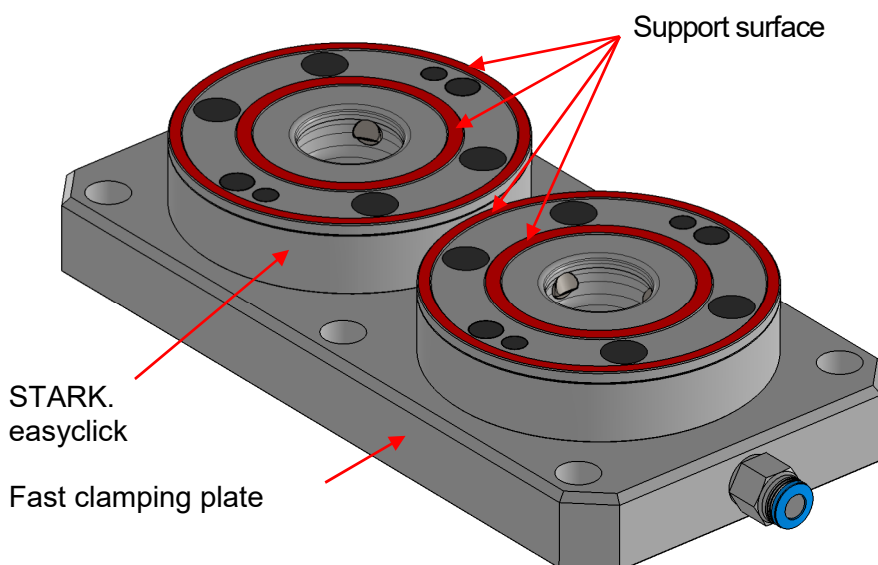
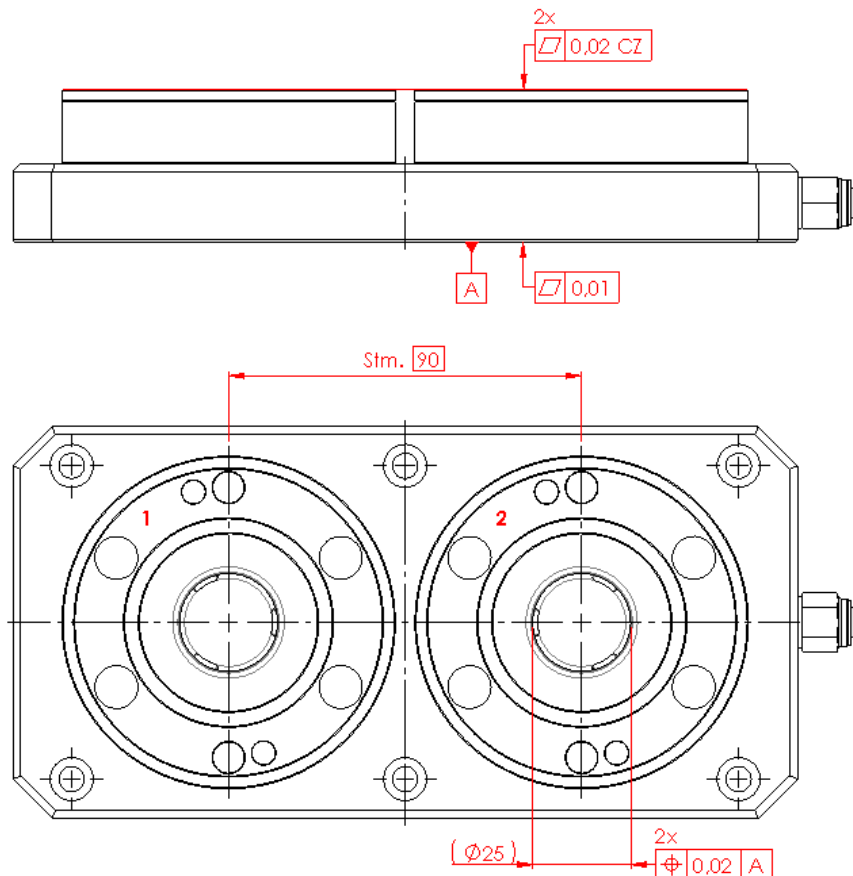
6.3 Removing the fast clamping lock

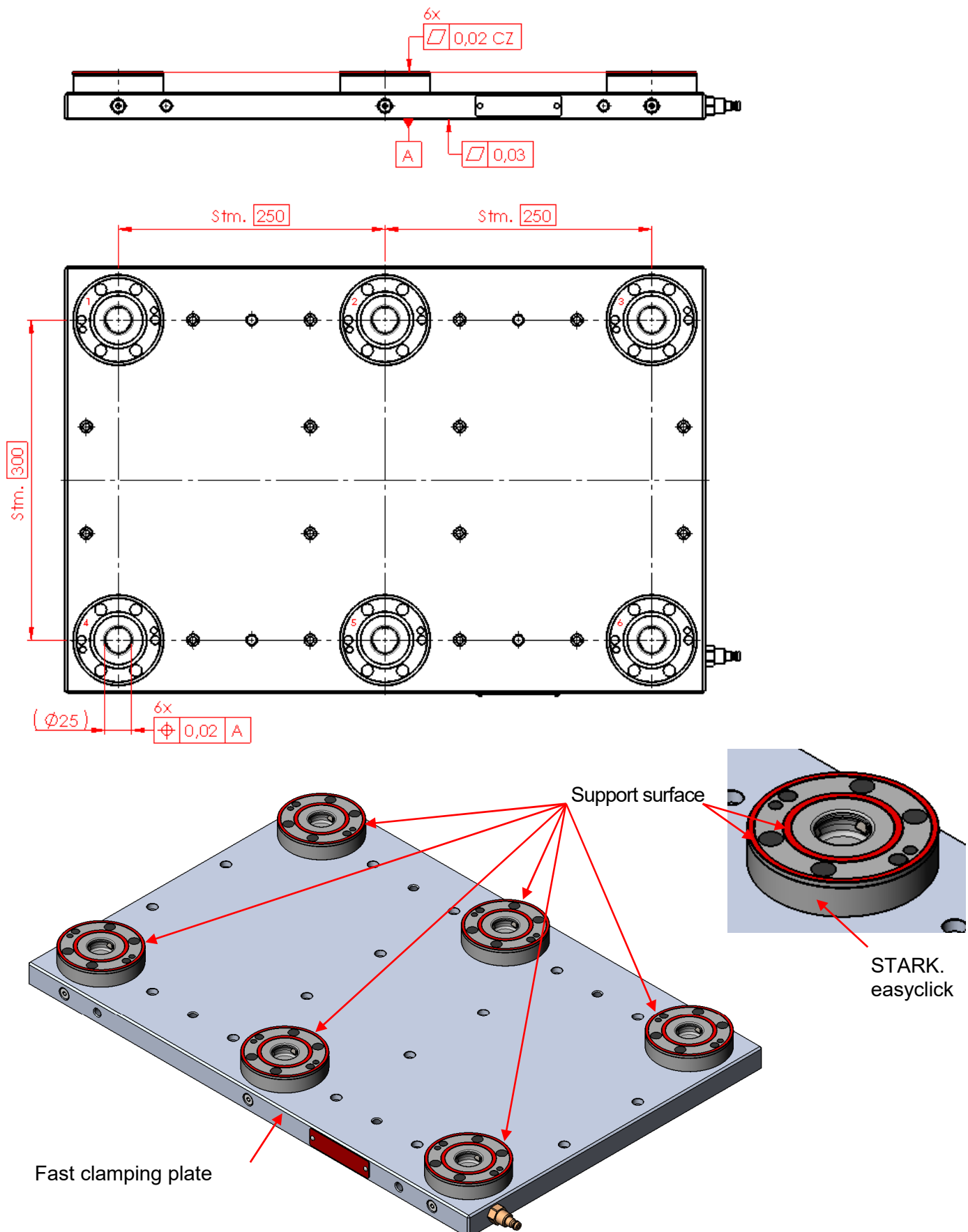
1. The system must be completely depressurised before disassembly is started.
2. Remove the screw covers. (they are unusable after disassembly).
3. Undo and remove all screws.
4. Using 2x M6x30 screws, press the STARK.easyclick evenly out of the fit at both draw-off threads.

6.4 Flatness of the support surface for fast clamping plates (SVP)

Flatness of **0.02 CZ** (combined zone) of the **support surface** (surfaces marked in red) STARK.easyclick must be complied with to ensure the function. The flatness of the surfaces resting on the STARK.easyclick must be produced with the specified flatness. This applies to all pallet sizes.

Example 1 (SVP 2x):



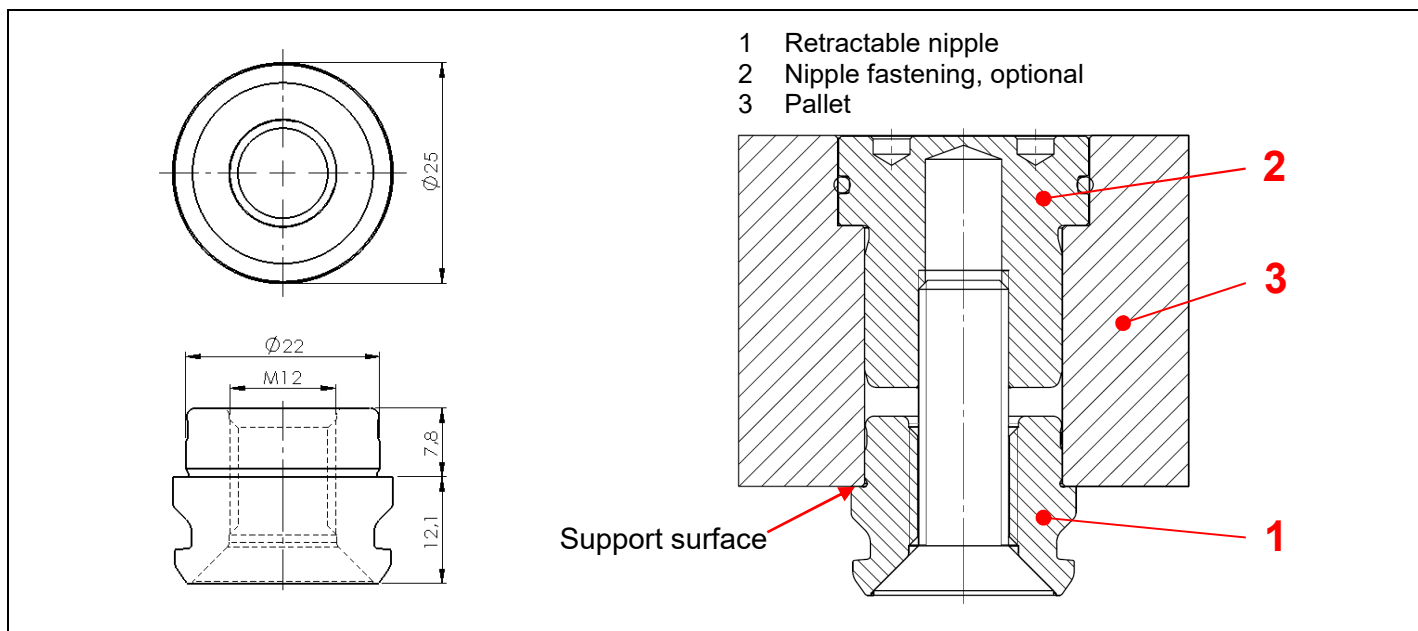

Example 2 (SVP 6x):




6.5 Retractable nipple

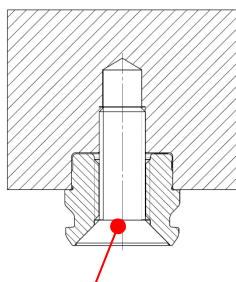
The pallets with the clamping devices are built by the operating company itself or on its behalf. Only original retractable nipples from STARK Spannsysteme GmbH may be used for the pallet. The locating bores must be manufactured according to data sheet D110 (nipple $\varnothing 22$) und D185 (nipple $\varnothing 16$) and assembly must be carried out according to the STARK catalogue specifications. Approved retractable nipples from STARK Spannsysteme GmbH:

Installation instructions for retractable nipples $\varnothing 22$: Order no. S7000-100, S7000-101 and S7000-102.



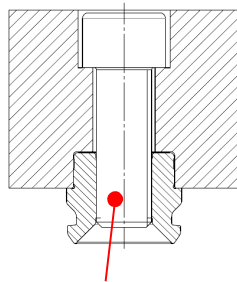
Installation versions for STARK.easyclick retractable nipples $\varnothing 22$:

Version A



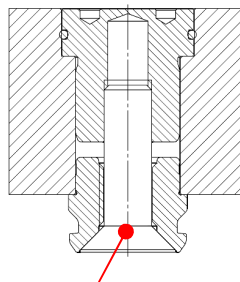
Countersunk screw
M10 / DIN 7991 / 10.9
35 Nm tightening torque

Version B



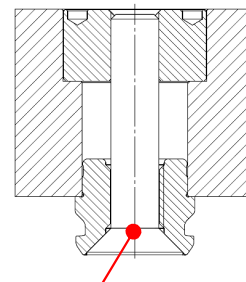
Cylinder screw with Allen screw
M12 / DIN 912 / 10.9
45 Nm tightening torque

Version D



Countersunk screw
M10 / DIN 7991 / 10.9
35 Nm tightening torque

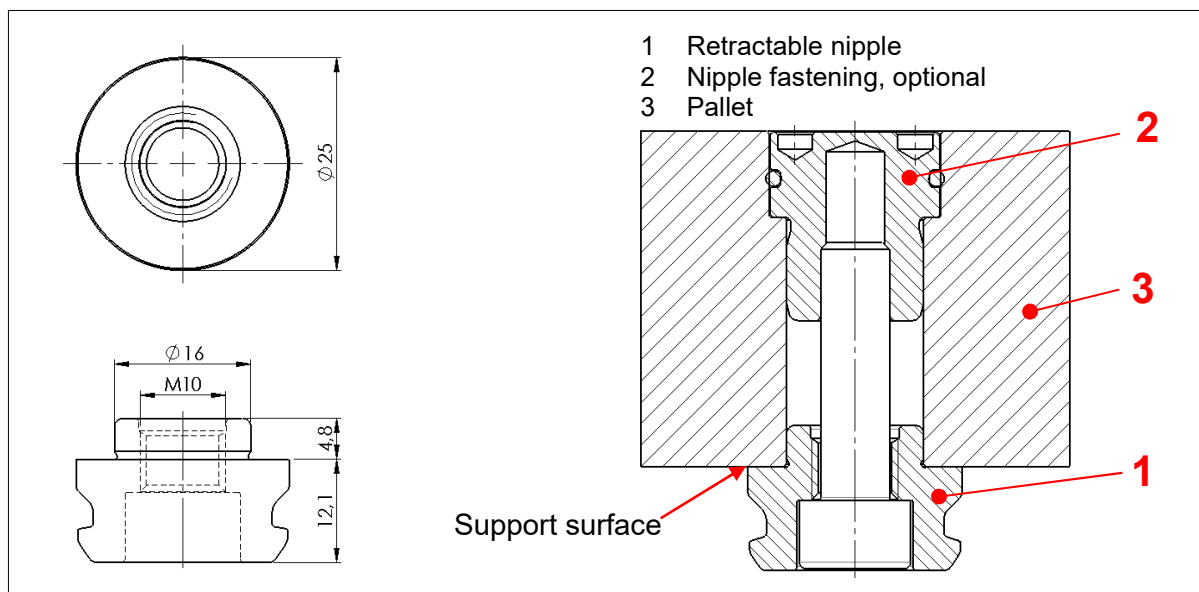
Version E.1



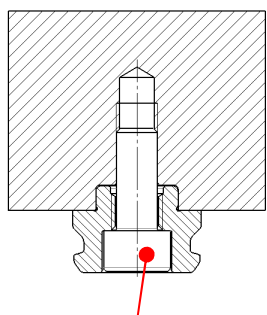
Countersunk screw
M10 / DIN 7991 / 10.9
35 Nm tightening torque



Installation instructions for retractable nipples $\varnothing 16$: Order no. S7000-103, S7000-104 and S7000-105.



Version A

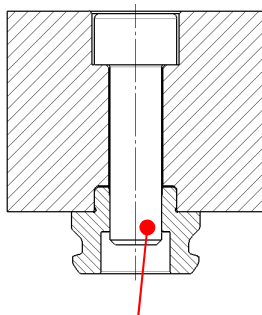


Cylinder screw with Allen screw

M8 / DIN 912 / 10.9

35Nm tightening torque

Version B

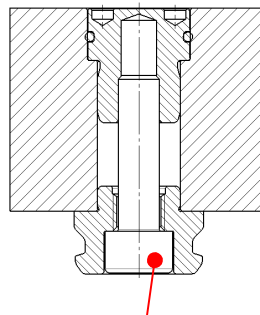


Cylinder screw with Allen screw

M10 / DIN 912 / 10.9

45Nm tightening torque

Version D

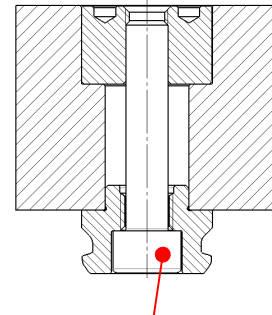


Cylinder screw with Allen screw

M8 / DIN 912 / 10.9

35Nm tightening torque

Version E.1



Cylinder screw with Allen screw

M8 / DIN 912 / 10.9

35Nm tightening torque

NOTE



It is recommended that the pallets be made of steel. When using aluminium (Al), it is recommended to use high-strength, hard anodised aluminium (e.g. 3.4365). The specified tightening torques must not be exceeded. If the maximum tightening torques are not adhered to, there is a risk that the retractable nipples will sink into the pallet, thus endangering the function of the STARK.easyclick.



7 Commissioning, handling and operation

7.1 During initial commissioning:

- Perform a visual inspection of the entire machine and fast clamping lock.
- Remove any unauthorised persons from the vicinity of the machine.
- Test the faultless function of the clamp control valve (if present).
- Check the fast clamping lock for pneumatic tightness.

7.2 Functional check:

- If all clamping elements connected to the same circuit are installed as described above and tightened with the appropriate torque, the pneumatic pressure generator can be connected to the circuit.
- Slowly and carefully increase the pneumatic pressure to the release pressure. When doing so, check the clamping elements for leaks, switch off the pressure generator immediately if necessary and eliminate the leakage.
- Release visual functional check (see chapter 8.1).
All clamping fingers must be in the release position.
Clamp: All clamping fingers must be in the release position.
Important: Only now may a single retractable nipple be clamped and released.
If the result is positive, the nipple pallet can be used.

7.3 Operation:

- Apply pressure to fast clamping lock only for the release procedure
Note: do **not** leave under continuous pressure.
- Set the release pressure of the excess pressure safety valve of the fast clamping locks to max. 8 bar (see chapter "9 Technical data").
- Set operating pressure of the fast clamping locks (see chapter "9 Technical data").
- Clicking in (clamping) can take place both in the release position (see chapter 8.1) and in the clamping position (see chapter 8.1).
In the clamping position, i.e. with visible clamping fingers, a clear clicking noise can be heard.



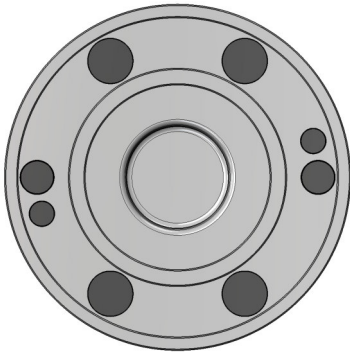
8 Maintenance and repair

8.1 Functional check



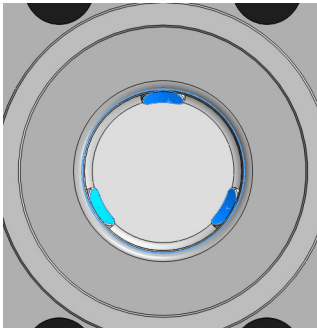
Check for proper function during the release procedure: When releasing, all clamping fingers must be in the release position. If the release pressure is interrupted, all clamping fingers must reach the maximum clamping position.

Release position:



When viewed vertically from above, no clamping fingers may be visible.

Maximum clamping position:



When viewed vertically from above, all clamping fingers must be visible.



If the release position and maximum clamping position are not reached, the fast clamping lock must be replaced. The elements can be sent to STARK Spannsysteme GmbH for service or to an authorised service technician. If no service is performed, safe clamping is no longer possible. There is a risk of accident.

Monthly:

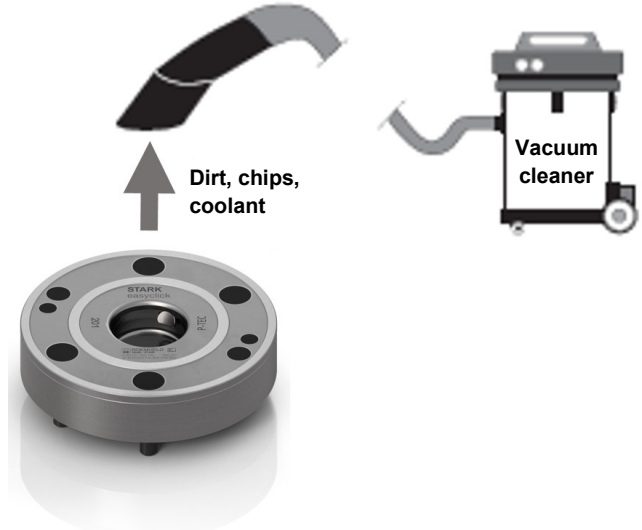
Perform functional check

8.2 Surface cleaning



Correct!

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



Possible!

The fast clamping lock may be blown off with compressed air and wiped.



No contamination is permitted in the fast clamping lock. Cleaning depends on the application and replacement interval.



8.3 General cleaning



For general cleaning, the entire area of the nipple, the clamp area and the supporting surface must be cleaned of all dirt.

Only an authorised service technician may carry out installation work on the fast clamping locks.

The necessary safety measures must be observed in full and without exception during all work.

Hazard information!



The fast clamping lock is permanently under spring pressure. Do not disassemble it!

Damage to components!



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

The product may not be cleaned with:



- corrosive or caustic components or
- organic solvents such as halogenated or aromatic hydrocarbons and ketone (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.

8.4 Storage:

Until installation:

If you do not use the fast clamping lock immediately, please store it dry and dust-free in its original packaging.

Long period of storage after use:

Before storage, clean the fast clamping lock (see chapter "8.3 General cleaning") and take suitable measures for corrosion protection.

After long period of storage:

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

8.5 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.



9 Technical data

	Standard	with extended temperature range	with damping (e.g. for assembly devices)	with blow-out and mount control	with base plate and locking	with base plate, locking and blow-out
Article number:	S7000-019	S7000-019-01	S7000-020	S7000-119	S7000-150	S7000-160
Designation:	STARK. easyclick	STARK. easyclick	STARK. easyclick	STARK. easyclick	STARK. easyclick	STARK. easyclick
Repeat accuracy:	<0.01 mm	△	△	△	△	△
Clamping force:	5 kN	△	△	△	△	△
Retention force:	10 kN	△	△	△	△	△
Release pressure:	4 bar	4 bar	4 bar	5.5 - 6 bar	4 bar	5.5 - 6 bar
Max. operating pressure:	8 bar	△	△	△	△	△
Specified clamping time:	<. 0.1 s	△	△	△	△	△
Specified release time:	approx. 0.1 s	△	△	△	△	△
Nipple radial pre-positioning:	±0.4 mm (with moving feed)	△	△	△	△	△
Temperature range:	+10°C to +80°C	+10°C to +150°C	+10°C to +80°C	+10°C to +80°C	+10°C to +80°C	+10°C to +80°C
Maintenance cycles ¹ :	500,000	△	△	△	△	△
Air volume:	8 cm ³ release	△	△	△	△	△
Filter class:	Quality class 4	△	△	△	△	△
Seal material:	NBR / FKM other materials on request	△	△	△	△	△

1 Only with optimum operating conditions

Info: New order numbers!

In the course of a system modification within the ROEMHELD Group, the order numbers for STARK Spannsysteme have been adapted and standardised.

- NEW: all order numbers start with **S**
- NEW: hyphen – instead of blank space

S7000-019
instead of
7000 019

Examples

New order number	Old order number	Modifications
S04342	S04342	No modification
S7000-019	7000 019	S as prefix, hyphen – instead of blank space



10 Manufacturer's declaration

Declaration of Conformity Konformitätserklärung

We / Wir

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

declare under our sole responsibility that the product
erklären in alleiniger Verantwortung, dass das Produkt

Type: STARK.easyclick

**No.: S7000-019 / S7000-019-01 / S7000-020 / S7000-119 / S7000-150
S7000-160**

to which this declaration relates, corresponds to the following standards
auf das sich diese Erklärung bezieht, mit den folgenden Normen übereinstimmt

2006/42/EC Machines, Addendum II A

and the following standards were applied.
und dass die folgenden Normen zur Anwendung gelangten.

EN 292-1/2 Safety of Machinery, devices and equipment
Sicherheit von Maschinen, Geräten und Anlagen

A technical documentation exists completely. The instruction manual for the product is available.
Eine technische Dokumentation ist vollständig vorhanden. Die zum Produkt gehörende Betriebsanleitung liegt vor.

STARK Spannsysteme GmbH

Rankweil, 19/11/2020

Martin Greif
Managing director / Geschäftsführer