ROEMHELD
HILMA ▪ STARK

SPEEDY sweeper
zero point clamping system

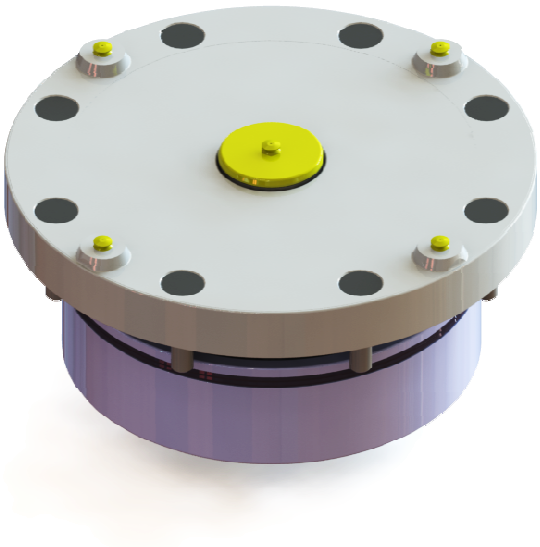
Operating Manual

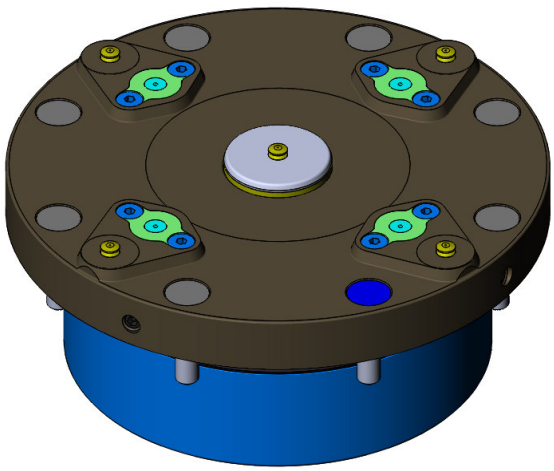
WM-020-184-11-en BA SPEEDY sweeper

precise, fast and powerful

SPEEDY sweeper

Art. no.: 809 … / S …





Manufacturer:

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1. Table of contents

2. Identification of the partly completed machinery

Product:	Fast closing clamp
Function:	Clamping and centring of workpieces and workpiece pallets
Product group:	SPEEDY sweeper (classic 4, 2000)
Article numbers:	809 108, 809 108-1, 809 109, S01968, S02616, S02933, S03024, S03025, S03751, S03752
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 closing clamp
- gives important instructions for safe and efficient use of the fast closing clamp

3.2 Target group of the document

Fitters, installers and operators who assemble, install and operate the fast closing clamps. You should be familiar with the handling of hydraulic and pneumatic elements.

3.3 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 closing clamp is used for clamping pallets with mounting devices (retractable nipples) 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 use other than that specified under “intended use” or use beyond this is considered improper use!

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

- no compliance with 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, the fast closing clamp may only be operated if it is ensured that it is securely clamped. For high machining speeds, use clamping control valves (see operating manual WM-020-255-xx)

It must also be ensured that the permissible forces acting on the fast closing clamp are not exceeded according to the technical data.

Specialists must be consulted for the calculation and design of the fast closing clamps 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 closing clamp without consultation with and the written approval of the manufacturer.

4.5 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 use original retractable nipples manufactured by STARK Spannsysteme GmbH and install according to the applicable data sheet.
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, hydraulic and pneumatic residual energies at the fast clamping device and the pressure in the cylinders and valves after switching off the fast clamping device!

4.7.1 Design for the pallet and fast closing plate

To ensure safe positioning on the fast closing clamp, make sure there is a grip point 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 closing clamp and nipple or between the fast closing plate and the pallet. Only grab the pallet at the front during change procedures.

When clamping, do not reach with your fingers into the gap between the fast closing plate and the pallet. If possible, create a gap of 2 to 4 mm or 20 mm and larger.

4.7.2 Danger due to incorrect installation of the fast closing clamp

Improper tightening of the fixing screws or insufficient strength of the screws may cause the pallet to come loose. Only firmly bolted fast closing clamps can withstand the specified forces (see technical data).

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

4.7.3 Danger 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. (see item 4.3).

Measure:
Observe the specifications and regulations of STARK Spannsysteme GmbH regarding maximum values.

4.7.4 Pressure hazards

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

Measure:
- Observe the specified pressure limits

4.7.5 Influences on service life

Negative influences include:

- External mechanical damage to functional components.
- Undefined forces or defined forces exceeded.
- Overloading due to sudden pressure peaks.
- Heavy contamination (e.g. casting or grinding dust).
- Aggressive environment, e.g. cooling lubricants which chemically attack seals / wipers.

4.7.6 Training

STARK 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.

5. Fast closing clamp installation instructions

5.8 Use

The SPEEDY sweeper is designed for use in automated systems. Due to the locking or closing mechanism of the centre bore, chips cannot enter when blow-out is activated.

5.9 Blow-out

Blow-out serves to clean the fast closing clamp. Contamination on the retractable nipples or pallets must be prevented or removed.

5.10 Ageing wear

When the maximum number of clamping cycles has been reached (see technical data), the insertion force decreases or in case of other problems, please contact the customer service of STARK Spannsysteme GmbH or replace the whole element and have the removed element overhauled by STARK Spannsysteme GmbH.

5.11 Misuse

Only fast closing clamps with the same lifting may be installed in a fast closing clamping plate.

5.12 Parts

Check the following:

- Are all parts available according to the packing list?
- Are any parts damaged?
- Are all parts clean?
- Is the installation contour manufactured according to the corresponding data sheet?
- Check dimensional accuracy and surface condition.
- Is the hydraulic or pneumatic pressure generator set to the correct release pressure?

Only undamaged and clean parts may be installed. The installation contour and the supply lines for the hydraulics and pneumatics must be thoroughly deburred and cleaned.

5.13 Contamination

Dirt particles can cause a premature failure of the clamping elements and absolve us from all warranty claims.

5.14 Repair

Improper repair of the elements and assembly without appropriate training and equipment is prohibited and will result in the loss of all liability, warranty and guarantee claims.

6. Description of the fast clamping device

The fast closing clamp connects the machine and the clamping device.
It is used for fast setting-up.
While one pallet is being processed, the other can be set up.

7. Assembly and installation of the fast closing clamp

Installation and removal instructions for SPEEDY sweeper

Closing mechanism can be removed from

Closing mechanism with clamping screw

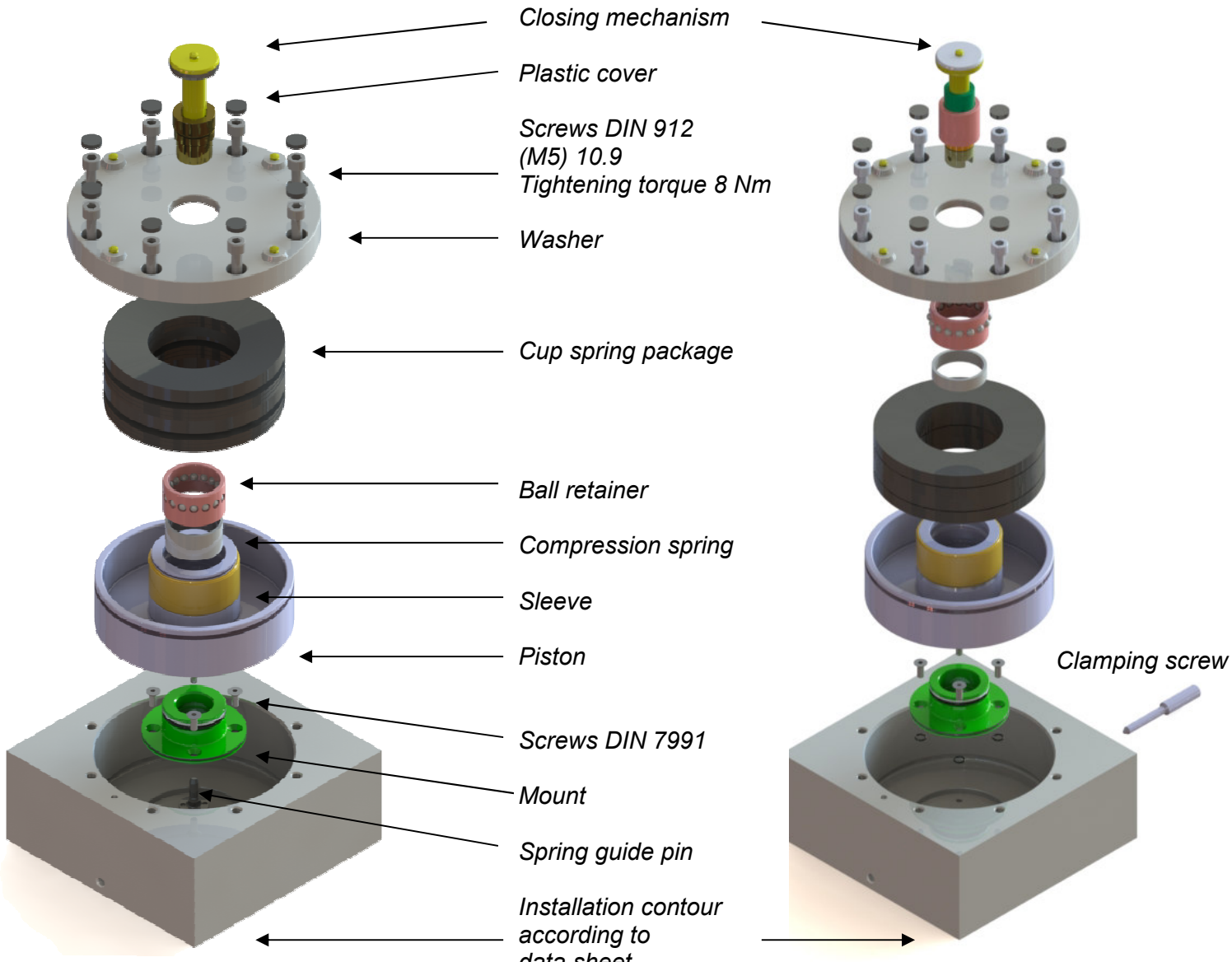
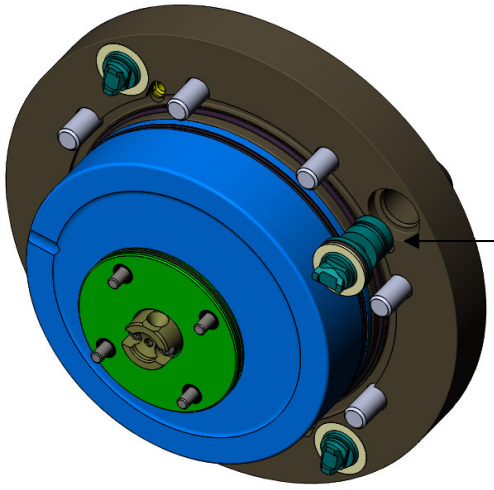
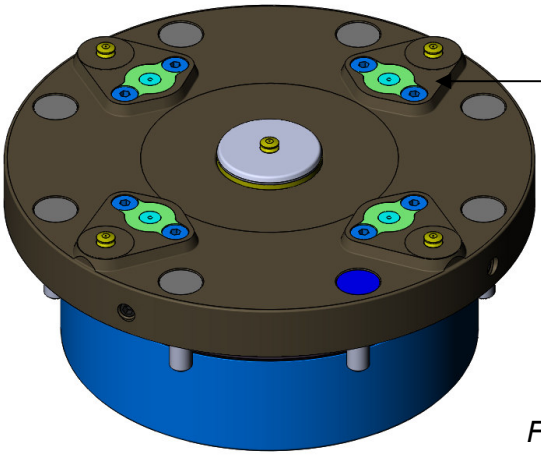


Figure 1

7.1 Media feedthroughs / coupling mechanism *(optional)*

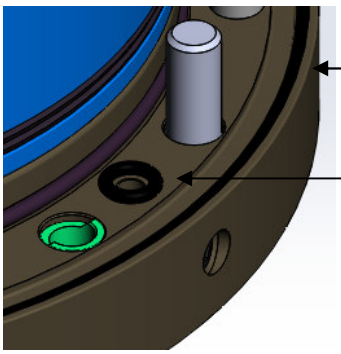


Coupling mechanics Operating Manual F9.428



Media feedthroughs Operating Manual WM-020-149

Figure 2



Support surface disc

O-ring seal

O-ring in the installation contour

Figure 3

7.2 Installation of pre-locked fast closing clamp

1. Check installation contour for SPEEDY for dimensional accuracy and surface condition (see data sheet). Important: The chamfer 1.6 +0.2 x 30° at bore ∅110 must be dimensionally accurate, otherwise the installation space for the O-ring is too small. (strong curvature of the cover, no flat support of the cover). All parts must be clean; this also applies to all supply lines. (deep hole drills, etc.)

2. Insert the spring guide pin (for closing mechanism "removable from above") into the mounting hole (see chapter 7, figure 1).

3. Grease the four O-rings ø5x1 (see chapter 7.1, figure 3) and insert them into the bottom of the support. Then insert both into the greased installation contour and fasten with the four screws DIN7991. It should be noted that One support ring and one O-ring must be available for installation.

4. Prefit the piston of the sweeper and grease when installed.

5. Apply a thin layer of grease to the outer surface of bore ∅110.

6. In the case of clamping elements with seals on the support surface of the disc, also grease the O-ring (see chapter 7.1, figure 3) and insert it into the groove on the underside of the disc.

7. For clamping elements with couplings (optional), the coupling mechanisms (see chapter 7, figure 1) and any blanking plugs (1–4 depending on the disc version) are inserted from below into the desired bores in the disc.

8. For clamping elements with media feedthroughs (optional) (see chapter 7.1, figure 2), insert the O-rings into the corresponding recesses in the installation contour of the fast closing plate.

9. The prefitted fast closing clamp is now installed in the installation contour. Pay attention to the mounting position (position of connections, support islands, couplings and media feedthroughs). Before installation, make sure that all seals are fitted.

10. Never drive the fast closing clamp into the bore with a hammer, as this can damage the seals and surfaces. The transport nipple could also be loosened and the SPEEDY could spring apart (disc springs are preloaded).

11. If you have followed the steps up to now, you can tighten the 8 fixing screws according to the tightening torque. (see chapter 7, figure 1)

7.3 Removal of pre-locked fast closing clamp

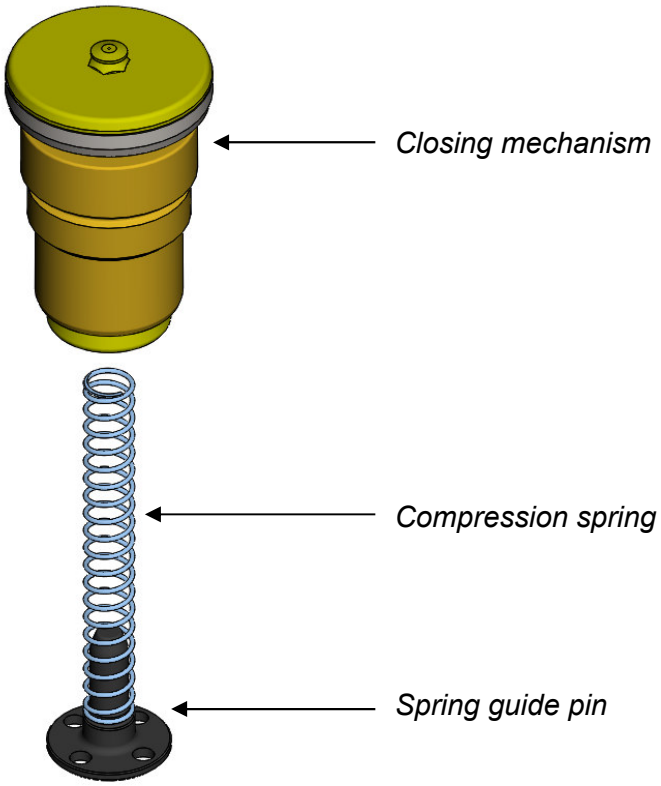
1. The system must be completely depressurised before disassembly is started (disconnect the energy supply to the pressure generator).
2. Removal takes place in reverse order as described in chapter 7.2
3. To disassemble the entire unit, ventilate the rear of the unit, otherwise a vacuum will be created when the piston is pulled out.

8. Description of the closing mechanism *"removable from above"*

The SPEEDY sweeper is designed for use in automated systems. Due to the closing mechanism of the centre bore, chips cannot enter when blow-out is activated.

8.1 Assembly and installation

Installation and removal instructions for closing mechanism



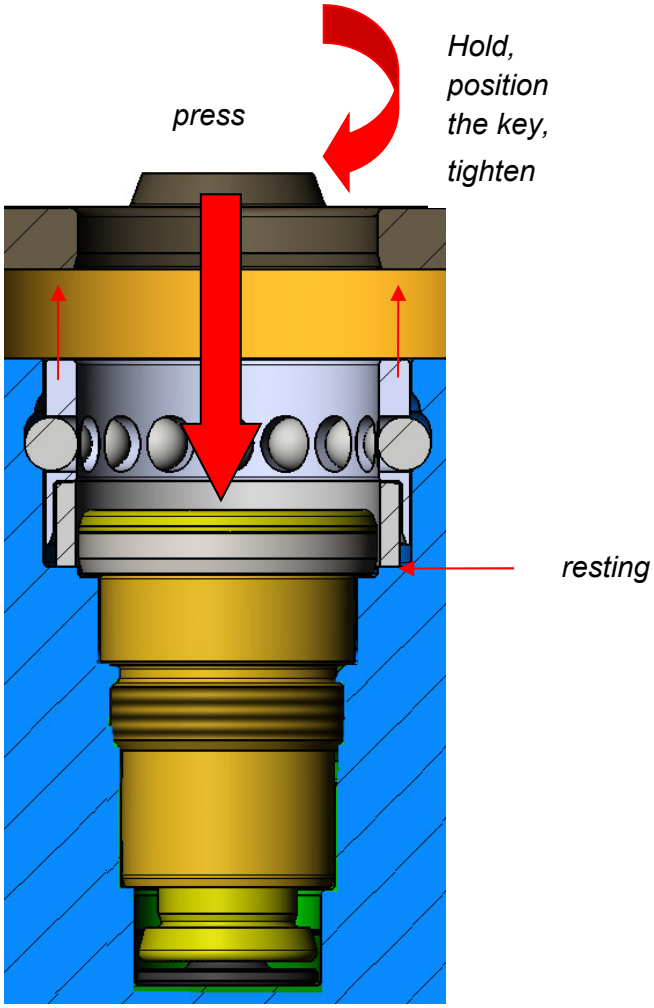
If the closing mechanism is pressed into the central bore in the clamping position (pressureless), the fast closing clamp must be released (under pressure) so that the closing mechanism can extend again.

8.2 Installation of the closing mechanism *"removable from above"*

Observe the installation instructions on page 14.

1. The closing mechanism can only be mounted with the fast closing clamp in unpressurised state.
2. Insert the compression spring into the centre bore. The spring is guided by the spring guide pins.
3. Slide the closing mechanism assembly and ball retainer into the centre bore while pressing down and holding. The spring must not bend.
4. The balls of the ball retainer snap into the park contour.
5. Now you can position the key (art. no: 804 958) in the hexagon socket of the shaft.
6. Turn the closing mechanism until the hexagon socket of the shaft engages the hexagon socket of the screw sleeve.
7. Then turn the closing mechanism up to the stop of the screw sleeve and fasten with 12 Nm.
8. Remove the key. The closing mechanism moves upwards and stops under the balls.

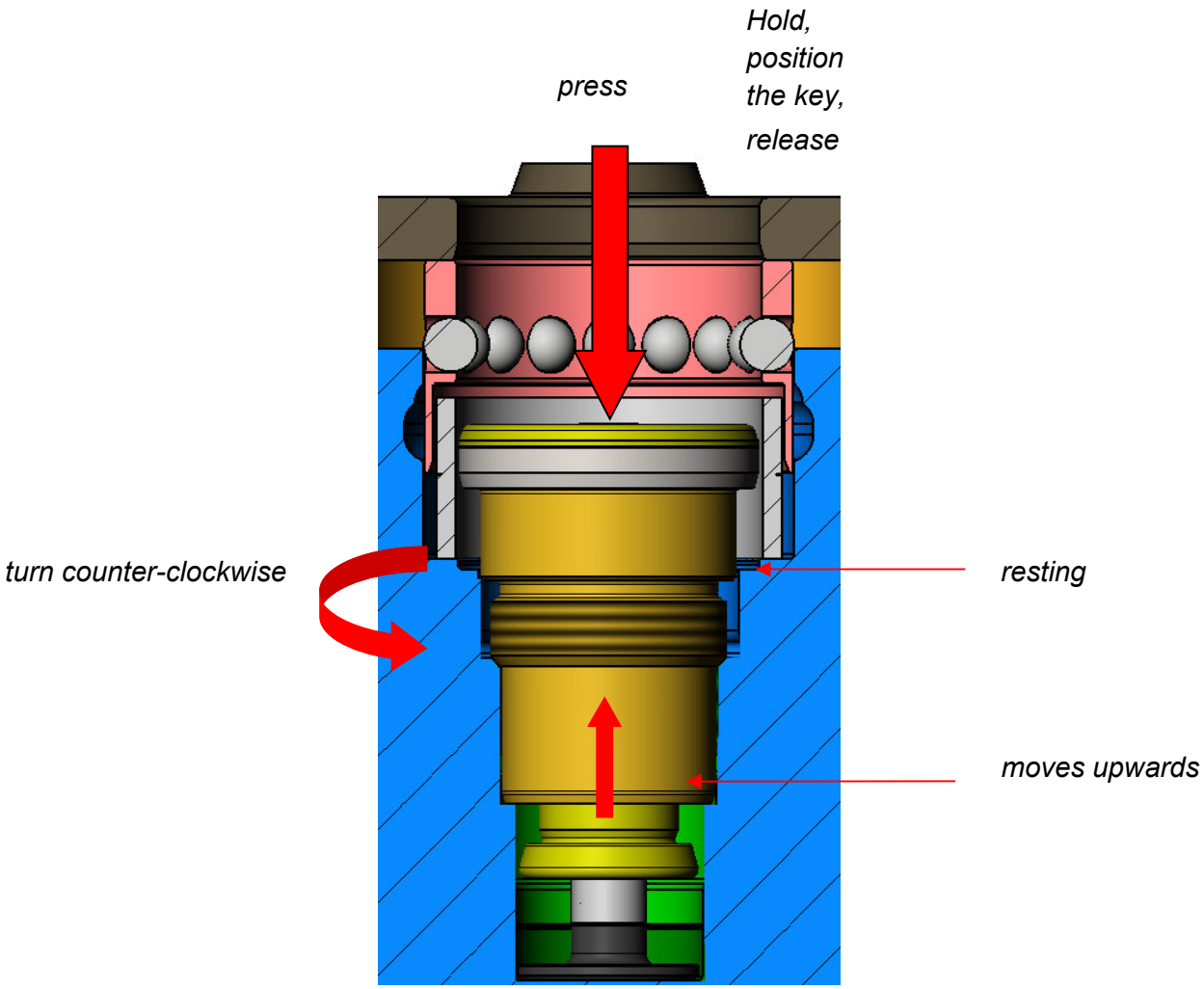
9. Now the fast closing clamp can be pressurised or released.
10. The closing mechanism jumps upwards.



8.3 Removal of the closing mechanism *"removable from above"*

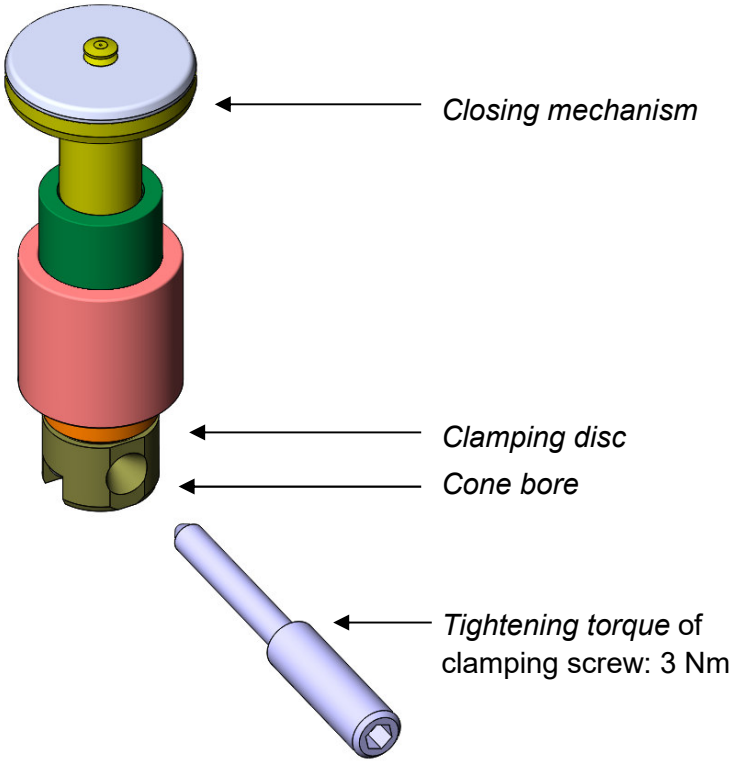
Observe the removal instructions.

1. The closing mechanism can only be removed with the fast closing clamp in unpressurised state.
2. Push down and hold the closing mechanism and the ball retainer simultaneously.
3. The balls of the ball retainer snap into the park contour.
4. Now you can position the key (art. no: 804 985) in the hexagon socket of the shaft.
5. Turn the closing mechanism until the hexagon socket of the shaft engages the hexagon socket of the screw sleeve.
6. Then turn the key counter-clockwise to release the closing mechanism.
7. After the release process, the closing mechanism remains under the balls.
8. Put the fast closing clamp under pressure and release.
9. Caution: The closing mechanism jumps upwards; hold it and then remove it accordingly.



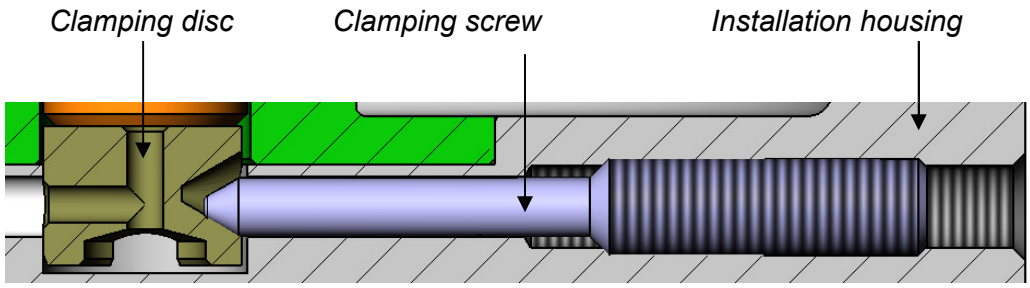
9. Description of the closing mechanism *"with clamping screw"*

The SPEEDY sweeper is designed for use in automated systems.
Due to the closing mechanism of the centre bore, chips cannot enter when blow-out is activated.



9.1 Installation of the closing mechanism "with clamping screw"

1. The closing mechanism can only be mounted with the fast closing clamp in unpressurised state.
2. Slide the closing mechanism assembly and ball retainer into the centre bore while pressing down and holding.
3. Note: The cone bore of the clamping disc is aligned with the bore for the clamping screw.
4. Then fasten with the clamping screw (tightening torque 3 Nm).



9.2 Blow-out of losing mechanism and support islands

Blow-out serves to clean the fast closing clamp. Contamination on the retractable nipples or pallets must be prevented or removed.

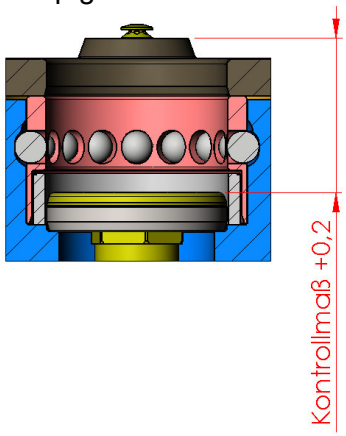
1. Switch on the blow-out air and check whether sufficient air is flowing out of the nozzles and the closing mechanism (100 l/min at 3–6 bar depending on the size of the supply line).

2. Check the nozzles for ease of movement. When proper functioning of the fast closing clamp has been ensured, drive the plastic covers evenly into the screw countersink.

10. Specification dimension

Press down the closing mechanism when released (under pressure) and check the specification dimension (see table) for all fast closing clamps.

Only when the specification dimension is complied with is proper functioning of the fast closing clamp guaranteed.



Order No.:	Design reference no.:	Media feedthroughs / couplings	Installation data sheets	Lifting height	Specification dimension "A"
809 108	062-007	with 4 media feedthroughs	D069	2.5	25.5
809 108-1	062-046-04	with 4 media feedthroughs	D069	2	26
809 109	062-022	with 4 Römheld couplings	D067	4	24
S01968	062-008	SPEEDY sweeper installation 2000	D068	2.5	25.5
S02616	062-018-04	with 4 Römheld couplings	D067	4	24
S02628	062-018-02	with 2 Römheld couplings	D067	4	24
S02629	062-018-03	with 3 Römheld couplings	D067	4	24
S02933	062-021	SPEEDY sweeper installation 2000	D068	4	24
S03024	062-025	with 1 Römheld couplings	D067	4	24
S03025	062-026	without blow-out/ without media feedthrough	D068	4	24
S03844	062-058	SPEEDY sweeper installation 2000	D130	4	24
S03751	062-051	SPEEDY sweeper installation 2000 AG	D112	4	24
S03752	062-050	SPEEDY sweeper installation 2000 OZ	D112	4	24

If the specification dimension is not complied with one or more SPEEDY sweepers, the pressure generator must be set to the clamping position (unpressurised) and then the release pressure must be increased again.

If the specification dimension is still not complied with, the closing mechanism must be removed from the SPEEDY sweeper installation (see " 8.3 Removal of the closing mechanism *"removable from above"* ").

Insert the transport nipple and switch the pressure generator to clamping position (depressurised) and then uncouple. The corresponding SPEEDY sweeper must be removed and checked. Also check installation contour, hydraulic pressure generator and supply lines.

11. Commissioning, handling and operation

Apply pressure to the fast closing plate only when screwed on. Check specification dimension A for each SPEEDY. Only when the specification dimension is complied with proper functioning of the SPEEDYs is guaranteed. If the specification dimension for one or more SPEEDYs cannot be complied with, the SPEEDYs concerned must be removed according to the removal instructions (items 1–4) and sent to the STARK Spannsysteme GmbH service.

Complete the installation by evenly driving in the plastic screw covers

11.1 During initial commissioning

- Perform a visual inspection of the entire machine and fast closing clamp.
- Expel any unauthorised persons from the vicinity of the machine.
- Check the filling levels of the hydraulic oil.
- Test the faultless function of the clamp control valve (if present).
- Check depth gauge A (see "10 Specification dimension").
- Check the fast closing clamp for hydraulic and pneumatic tightness.

11.2 Function check

- If all fast closing clamps connected to the same circuit are installed as described above and tightened with the appropriate torque, the hydraulic pressure generator can be connected to the circuit.
- Slowly and carefully increase the hydraulic pressure to operating pressure. When doing so, check the clamping elements for leaks, switch off the pressure generator immediately if necessary and eliminate the leakage.
- After reaching the release pressure, the transport nipples must be lifted by the appropriate lifting and can be removed. Check again for leakage.
- If the transport nipple does not reach the corresponding lifting or cannot be removed despite reaching the release pressure, the pressure generator must be released from the clamping position (unpressurised) and then the release pressure increased again.
- If the lifting is still not reached or the transport nipple still cannot be removed, the pressure generator must be switched to the clamping position (depressurised) and then disconnected. The corresponding SPEEDY sweeper must be locked with the transport nipple, removed and checked. Also check installation contour, hydraulic pressure generator and supply lines.
- Switch on the blow-out air and check whether sufficient air is flowing out of the nozzles and the closing mechanism. Check the nozzle(s) for ease of movement.

11.3 Operation

- Set the excess pressure safety valve to max. 5 bar above the max. operating pressure (see chapter "14 Technical data")
- Set the operating pressure of the fast closing clamp. (see chapter "14 Technical data")

11.4 SPEEDY with blow-out function

- First, apply pressurised air.
- Release SPEEDY after approx. 3 seconds.
- Change pallet / clamp SPEEDY.
- Only now turn off the air.

Ensure sufficient air supply.

12. Maintenance and repair

12.1 Specification dimension A

Check that the specification dimension A functions correctly. See table in chapter "10 Specification dimension").
Only if depth A is adhered to according to the enclosed description will the fast closing clamp function properly.

If the specification dimension A is exceeded, service must be carried out immediately by an authorised service technician. If the maximum number of clamping cycles has been reached, this element must be replaced. The elements can be sent to STARK Spannsysteme GmbH for overhaul.
If no service is performed, safe clamping of the retractable nipple is not possible. There is a risk of accident.

Weekly:
Check the nozzle(s) and closing piston for ease of movement.

Monthly:
Check the specification dimension when the clamping element is released.

Yearly:
Measure the insertion force of the fast clamping element. A suitable mechanical clamping force tester (order no. 504 003 operating manual WM-020-133) can be ordered from STARK Spannsysteme.

12.2 Surface cleaning

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

Possible!
The fast closing clamp may be blown off with compressed air or wiped off but only if the blow-out of the fast closing clamp is active at full pressure.

No contamination is permitted in the fast closing clamp. This is particularly true in the area of the closing mechanism. Dirt must not get under the closing mechanism during cleaning.
Cleaning depends on the application and replacement interval.

13. Damage to components

The nipple must be inserted into the elements at a speed of less than 100 mm/s (only in automated applications), 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 ketones (nitro thinner, acetone, etc.), as this can cause the gaskets to be damaged .

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.

Lubricants and oils

Unsuitable lubricants and oils can damage the seals and will drastically shortly the service life.
CAUTION: Mixing of oils is not permitted.

13.1 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 "12.2 Surface cleaning") and take measures for corrosion protection.

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

13.2 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.

14. Technical data

Article numbers:	809 …, … S01968, S02616, S02933, S03024, S03025, S03751, S03752
Drawing number:	062-0.., …
Designation:	SWEEPER
Specification dimension:	depending on type see chapter "10 Specification dimension"
Lifting:	depending on type see chapter "10 Specification dimension"
System accuracy:	<0.01 mm
Repeat accuracy:	<0.005 mm
Spring retraction force[1]:	20 kN
Lifting power:	8.5 kN
Max. operating pressure:	60 bar
Release pressure[2]:	50 bar
Blow-off:	100 l/min at 3-6 bar
Preset clamping time:	approx. 3.0 s
Default release time:	approx. 3.0 s
Nipple prepositioning, radial[3]:	±2 mm
Nipple prepositioning, axial:	±0.1 mm (consider retraction path)
Temperature range:	+10 °C to +80 °C
Maintenance cycles[4]:	150.000 / *500.000
Total oil volume:	66 cm³
Release/clamp oil volume:	55 cm³
Hydraulic oil:	according to DIN 51524 (HLP 32 or HLP 46)
Filter class:	Quality class 4
Sealing material:	NBR; other materials on request

1 "The retraction force can be up to minus 25% nominal."

2 Set overpressure safety valve to max. operating pressure

3 The SPEEDY sweeper clamping element permits radial misalignment of the nipples of: ±0.3 mm with rigid feed; ±2 mm with low-force moving feed

4 Only with optimum operating conditions

15. 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: SPEEDY sweeper

No.: 809 … / S …

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
2006/95/EC	Low voltage
2004/108/EG	Electromagnetic compatibility / Elektromagnetische Verträglichkeit

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

EN 292-1/2	Safety of machines, devices and equipment Sicherheit von Maschinen, Geräten und Anlagen
EN 60204-1	Electric equipment of industrial machines Elektrische Ausrüstung von Industriemaschinen
EN 414	Safety principles Sicherheitsgrundsätze

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, 11 April 2019

Martin Greif
Managing director / Geschäftsführer