ROEMHELD
HILMA ▪ STARK

Zero point clamping system SPEEDY classic

Operating Manual

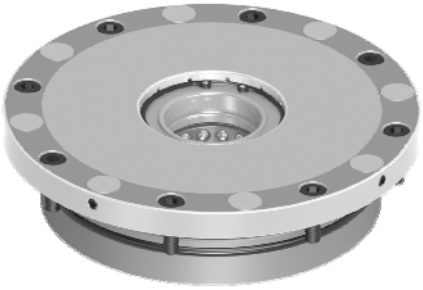
WM-020-082-10-en BA SPEEDY classic

SPEEDY classic 1 / 2 / 3

Art. No.: 704… / 807 …

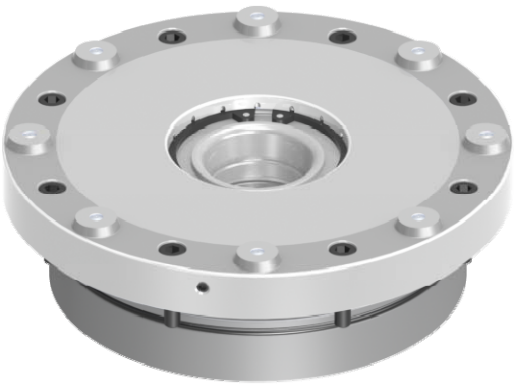
SPEEDY classic Tornado 1 / 2 / 3

Art. No.: 804… / 806… / 807…



SPEEDY classic Twister 1 / 2 / 3

Art. No.: 804 …



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1 Table of Contents

2 Identification of the partly completed machinery

Product:	Fast closing clamp
Optional:	With clamp control valve
Function:	Clamping and centring workpiece pallets
Product group:	SPEEDY Flush Mount 1 / 2 / 3
Article number:	704 …, 804 …, 805 …, 806 …, 807 …, S ….., 048- …, 055- …, 058- …

Trade name: As per product group, see above

3 User information

3.1 Purpose of the document

This operating manual

- Describes the principle of operation, the operation and the maintenance of the fast closing clamping device
- Provides important information for the safe and efficient usage of the fast closing clamping device

3.2 Depiction of safety instructions

Safety instructions are marked with a pictogram and a signal word. The signal word describes the severity of the impending risk.

DANGER	**Immediate** risk for the life and the health of persons (serious injuries or fatality). It is imperative you follow these instructions and procedures!
CAUTION	**Possibly** hazardous situation (minor injuries or damage). It is imperative you follow these instructions and procedures!
INFORMATION	Application tips and particularly useful information
INSTRUCTION	Obligation related to specific conduct or to undertake an activity for the safe usage of the machine.

4 Essential safety instructions

4.1 Proper use

The fast closing clamp is used for clamping pallets with mounting fixtures for workpieces.
The workpieces are intended to be machined, transported and measured.

Proper use also includes:

- Following all instructions in this operating manual
- Undertaking the inspection and maintenance work
- The exclusive usage of genuine parts.

4.2 Foreseeable misuse

Use other than that defined in "Proper use" or use beyond that defined is considered improper use!

In case of improper use risks may arise. Improper use is, e.g.:

- Exceeding the technical data defined for normal operation
- Usage as lifting gear and for load transport

The operating organisation bears the sole responsibility for damage due to improper use. The manufacturer will not accept any liability whatsoever.

4.3 On the usage of rotating machine tools

In a rotating application the fast closing clamp is only allowed to be operated if it has been ensured that it is securely clamped. We recommend the installation of a clamp control valve. For the safety-related link to the clamp control valve see the operating manual "WM-020-255 de BA Spannkontrollventil" (Operating manual clamp control valve). It is also to be ensured that the permissible fast closing clamp forces occurring according to the specifications are not exceeded.
Specialist help is required to calculate and design fast closing clamps for rotating use. Stark offers this service.

4.4 Modifications or changes

In case of unauthorised modifications or changes to the fast closing clamping device, any liability or warranty on the part of the manufacturer will be rendered void!

For this reason do not make any changes or additions to the fast closing clamp without consultation with and the written agreement of the manufacturer.

4.5 Spare parts and wearing parts, as well as auxiliary materials

The pallets with the clamping jigs are manufactured by the operating organisation or on behalf of the operating organisation. Only retractable nipples manufactured by STARK are allowed to be used on the pallet and they must be mounted in accordance with the related data sheet issued by STARK.

The usage of spare parts and wearing parts from other manufacturers can result in risks. Only use genuine parts or parts approved by the manufacturer. The manufacturer accepts no liability for damage resulting from the usage of spare parts, wearing parts or auxiliary materials not approved by the manufacturer.

4.6 Obligation on the operating organisation

The operating organisation undertakes the obligation only to allow to work on the fast closing clamping device persons who

- Are familiar with the essential health and safety regulations
- Have been instructed on the operation of the fast closing clamping device and have read and understood this operating manual.

The requirements of the EC directive on the usage of work equipment at work 2007/30/EC are to be met.

4.7 Residual risks

Attention is to be paid to the occurrence of mechanical, hydraulic and pneumatic residual energy on the fast closing clamping device as well as the pressure in cylinders and valves after switching off the fast closing clamping device!

For example:

- Pre-loaded springs
- Pressure retained by non-return valve
- Pressure retained by valve in closed position
- etc.

4.7.1 Spring assembly

In case of incorrect dismantling of the fast closing clamp, the pre-loaded spring assembly may be thrown out. For exact procedure see section 7 "Mounting and installation"

4.7.2 Design of the pallet and fast closing clamp plate

During the design of the pallet ensure there is a defined point for the hand to grip the pallet to ensure it can be placed on the fast closing clamp without hazard. If it is not possible to provide this grip in the design, on putting in place it must be ensured the hand/fingers are never placed between the fast closing clamp plate and nipple or between the fast closing clamp plate and pallet. Only grip the pallet on the front during the changing process!

DIN EN 349 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body.

During clamping do not reach with the fingers into the gap between the fast closing clamp plate and pallet.

4.7.3 Malfunction in the hydraulics

During operation an unintentional pressure increase may occur due to a malfunction in the hydraulics and as a consequence the fast closing clamp may be released. Especially in a rotating application a hazardous situation may arise.

Possible measures to prevent unintentional release:

- Mechanical disconnection of the hydraulic pipe (de-coupling). As a result a pressure increase during operation is then no longer possible.
- Uncoupling of the safety valves from the machine's hydraulics. As a result a pressure increase during operation is then no longer possible.

- Monitoring of the pressure in the release circuit for the fast closing clamp. In this way an emergency stop is triggered in the event of a pressure increase resulting in the immediate stop of the machine.

4.7.4 Hazard due to incorrect mounting of the fast closing clamp

The pallet may be released due to incorrect tightening of the fastening screws and insufficient screw strength.

Measure:
The mounting data on property class, tightening torque and arrangement are to be followed.
The product-related information can be found on the enclosed related drawing with parts list and in chapter 6 Mounting and installation.

4.7.5 Hazard due to changes in the peripheral speed

The fast closing clamp may fracture due to overspeed, excess weight or imbalance and the pallet thrown off.

Measure:
Data and information on the maximum values from Stark are to be observed.
(see chapter „**Fehler! Verweisquelle konnte nicht gefunden werden.** Technical Data")

4.7.6 Hazard due to overpressure

Pipes or hoses bursting due to overpressure can place personnel at risk.

Measure:
- Protect hydraulic lines with overpressure valves
- Observe data on pressure limits

4.7.7 Aspects that may affect the service life

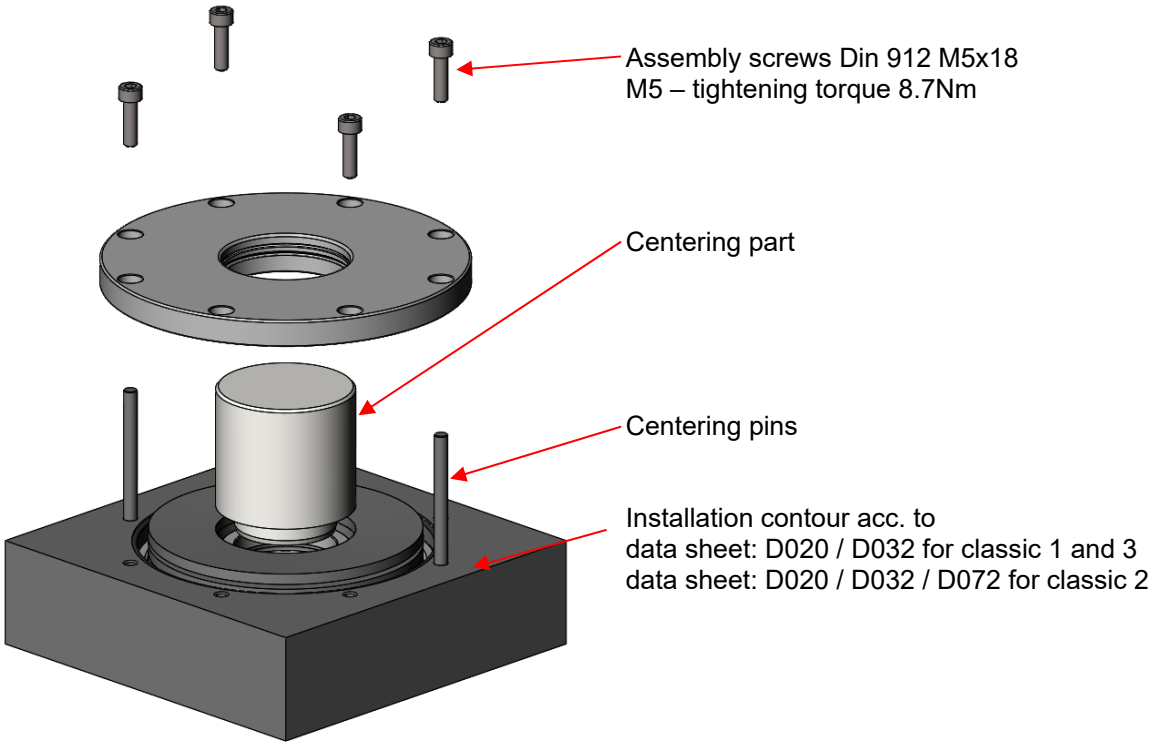
Negative aspects may be:
- Inadequate filtering of the oil, filter fineness of < 15my is to be observed.
- Damage to parts.
- External mechanical damage to functional components.
- Undefined forces or stated forces exceeded.
- Inadequate bleeding of the hydraulic circuit.
- Overload due to sudden pressure spikes.
- Excessively high flow rates / piston velocities due to excessively high pump capacity.
- Heavy soiling (e.g. swarf, dust from casting or grinding).
- Aggressive environment, e.g.: cooling lubricants, cleaning agents that chemically attack seals / scrapers.
- Incorrect pre-load setting or loading position

5 Description of the fast closing clamping device

The fast closing clamp is the connection between the machine and the means of clamping the workpiece. It is used for quick setting-up.
While machining is in progress on one pallet, another can be set-up in parallel.

6 Mounting and installation

Installation and removal instructions for SPEEDY classic 1 / 2 / 3



6.1 Assembly of fast closing clamp using assembly aid

1. Check installation contour for Speedy for dimensional accuracy and surface finish. Important: the chamfer 1.6 +0.2 x 30° on the ∅80 / ∅110 / ∅150 bore must be dimensionally correct. All parts must be clean, this statement also applies to all supply lines. (Deep bores, etc.)

2. Thoroughly grease piston and insert in the bore during this process ensure the seal is not damaged.

3. Place spacer washer (*not required for SPEEDY 2* / 3) and plate springs in the installation cavity, during this process pay attention to the arrangement of the layers of springs depending on the insertion force. (Refer to information slip enclosed.) Centre the springs by inserting the centring piece. Insert centring pins in 2 opposing bores, then carefully extract the centring piece. It is to be ensured the springs do not slip, (if an assembly aid is not used, the plate springs must be centred by hand).

4. Carefully fit 2 bores on the cover, without the retaining ring, over the centring pins and the plate spring package, without moving the springs in the process. Pay attention to the alignment of the connection bores.

5. In the case of SPEEDY 1 and 2, tighten the cover using 4 screws DIN 912 M5x18 or M6x18 for the TWISTER classic 2 parallel to the plate until a gap of approx. 4mm is achieved between the cover and plate, then remove the centring pins and fit the screws DIN 912 M5x14 or M6x14 in the 4 empty bores; using these screws tighten the cover while maintaining it parallel until it is in flat contact. Remove the 4 assembly screws and screw in the remaining 4 screws. Tighten all 8 screws to 8.7Nm using torque wrench.

   On the SPEEDY 3 tighten cover evenly until it is contact using the screws DIN 912 M6x25 supplied. Only use the screws supplied, or screws DIN 912 with the quality 10.9.

6. In the case of the SPEEDY 1 / 2 remove the 4 screws DIN 912 M5x18 (M6x18) and fit the screws DIN 912 M5x14 or M6x14 for the TWISTER classic 2.
   Tighten all 8 screws using torque wrench: M5 to 8.5Nm or M6 to 12Nm.
   Note: to check the cover is contact all-round, attempt to insert a feeler gauge between the plate and cover. If it is possible to insert a feeler gauge, remove Speedy according to removal instructions point 1 – 4 and start again at point 1 of the mounting instructions.

7. Mount O-ring, ball cage, retaining ring and locking ring.

Important: ensure the locking ring is correctly seated!

8. After mounting all SPEEDY's, place the fast closing clamp plate under pressure, during this process observe permissible pressure as per information sheet.

Important: only apply pressure to fast closing clamp plate in the assembled state. Check the check dimension A on each SPEEDY's as per point 8.1. Only on achieving the check dimension is the correct function of the SPEEDY's ensured. If the check dimension is not achieved on one or more SPEEDY's, the related SPEEDY's must be removed as per the removal instructions 6.3. point 1 – 4 and the springs re-aligned. Repeat point 3 – 8 of the mounting instructions 6.1.

Assembly aid

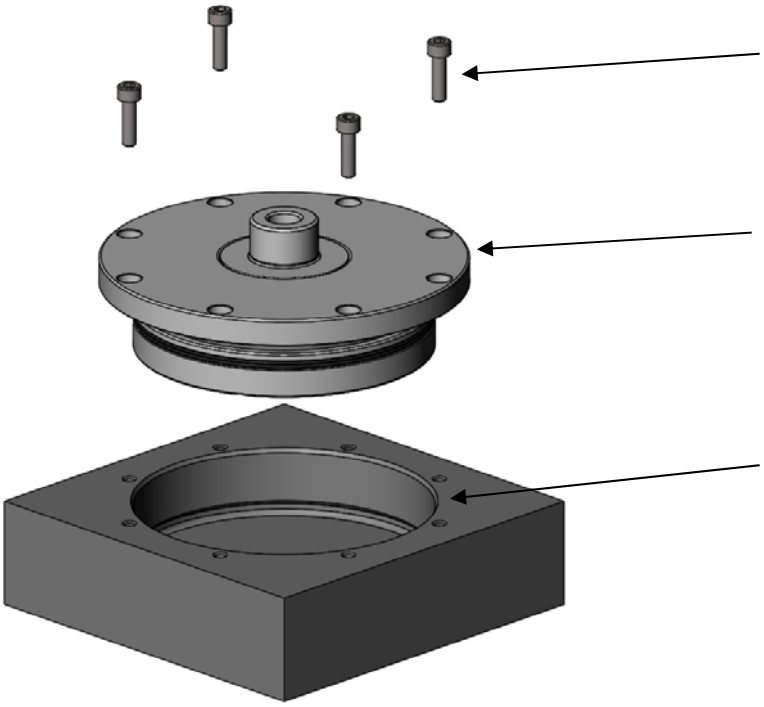
Order no.	Description	Items supplied
504 008	Assembly aid classic 1	2 pcs. centring pin, 1 pc. centring piece, 4 pcs. screws DIN 912, M5x18
504 009	Assembly aid classic 2	2 pcs. centring pin, 1 pc. centring piece, 4 pcs. screws DIN 912, M5x18, M6x18
504 010	Assembly aid classic 3	

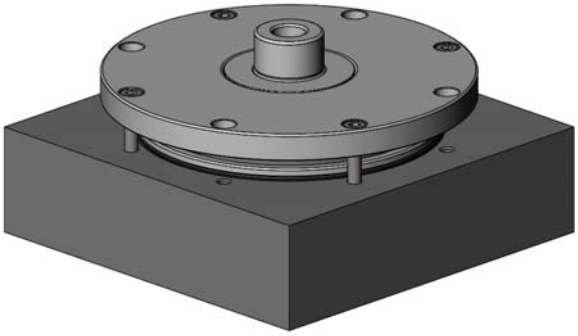
You will find the installation data sheets on the SPEEDYs on the web site:
http://www.stark-inc.com/English/downloads/index.php
Simply register on the "Build sizes" page and you will quickly receive your user name and password by e-mail.

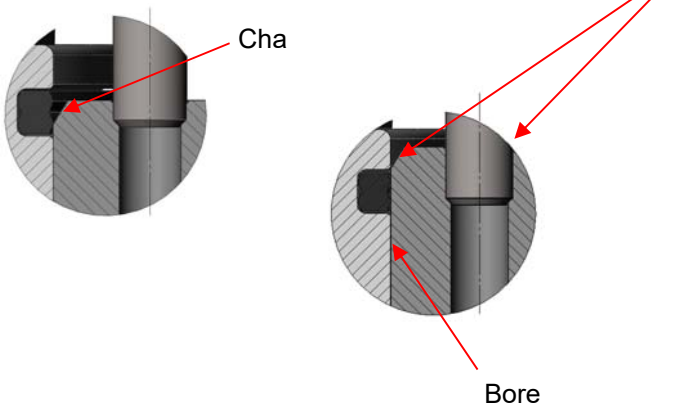
Training courses

STARK Spannsysteme GmbH provides training courses to train your operators and service personnel. Training courses are held on site or at STARK Spannsysteme GmbH. Please ask for information, we would be pleased to advise you.

6.2 Installation of pre-locked fast closing clamp



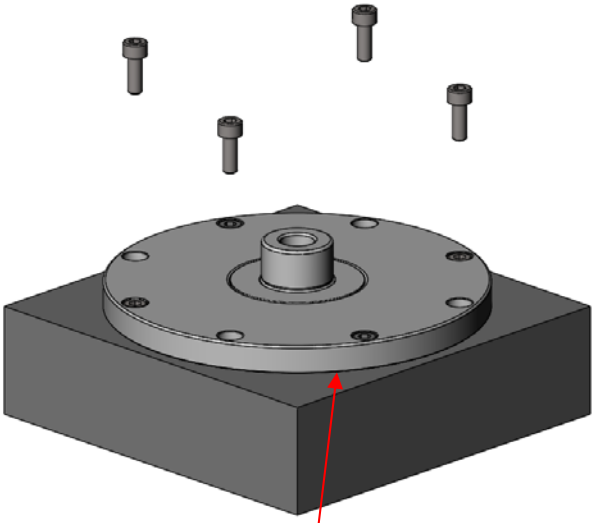




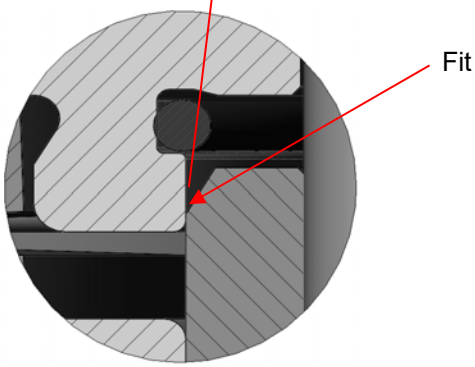
Fit the pre-locked SPEEDY in the greased bore until the piston seal is in contact with the chamfer in the bore (detail -A). Pay attention to the installation position of the connection bores. Only fit by hand.

Screw the pre-locked SPEEDY evenly into the bore using the assembly screws until the piston seal has entered the bore. Then press the SPEEDY further into the bore by hand.

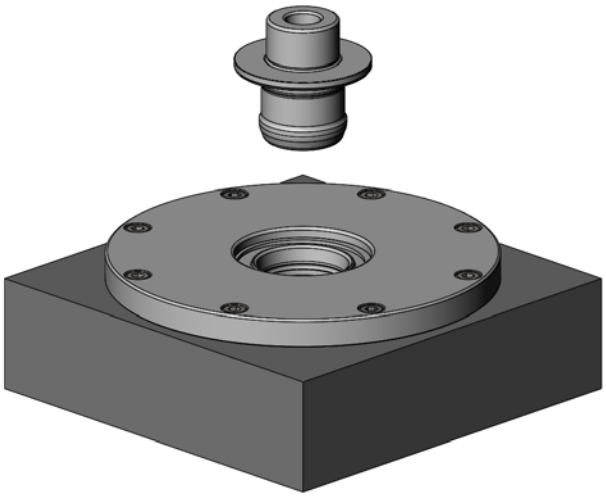
Attention, hazard:
Under no circumstance drive the SPEEDY into the bore by hitting it with a hammer, as in this way the seal may be damaged. The nipple may also be released and the SPEEDY may spring apart. (The plate springs are pre-loaded)



Replace the 4 pcs. assembly screws with 4 pcs. fastening screws DIN 912 supplied and evenly fasten the SPEEDY while maintaining it parallel. Fit the remaining 4 screws and tighten all 8 screws to 8.7 Nm using a torque wrench.



Once all SPEEDY's that are connected to a pressure line have been fitted, switch the system to "release" "(on this topic see chapter „7.2 Function check“).. The transport nipple can now be removed. After removing the transport nipple, switch the system back to "clamp".



Undertake a function check on the SPEEDY as described in chapter „**Fehler! Verweisquelle konnte nicht gefunden werden.** Placing in operation“, operating and operation“.

Once the correct function of the SPEEDY is ensured, the screw covers are placed in the bores. For this purpose place the screw covers in the bores with the smooth side up. Using a flat aluminium mandrel, lightly tap the screw covers into the bore with a hammer so they are flush. During this process excess material on the screw covers will be sheared off.

6.3 Removal of fast closing clamp

1. Prior to starting removal, the system must be completely de-pressurised. (Interrupt supply of power to the source of pressure and vent the release line, see point 5)

2. Remove screw covers, retaining ring and ball cage.

3. Evenly undo all 8 screws approx. ½ turn and remove 4 screws offset by 90°

4. Remove every 2nd screw and evenly loosen the remaining 4 screws until a distance of approx. 4mm is achieved between the cover and plate, then fit the screws DIN 912 in the 4 empty bores until they are in contact and remove the other 4 screws. Now the screws can be evenly undone until the spring tension is fully relieved.
   Evenly loosen all screws on the SPEEDY until the spring tension is fully relieved.

5. To remove the piston, the rear of the piston must be vented, as otherwise a vacuum will be produced on pulling out the piston.

Disassembly aid

Order no.	Fast closing clamp	Description
504 014	classic 1	Disassembly aid for piston
504 016	classic 2	Disassembly aid for piston

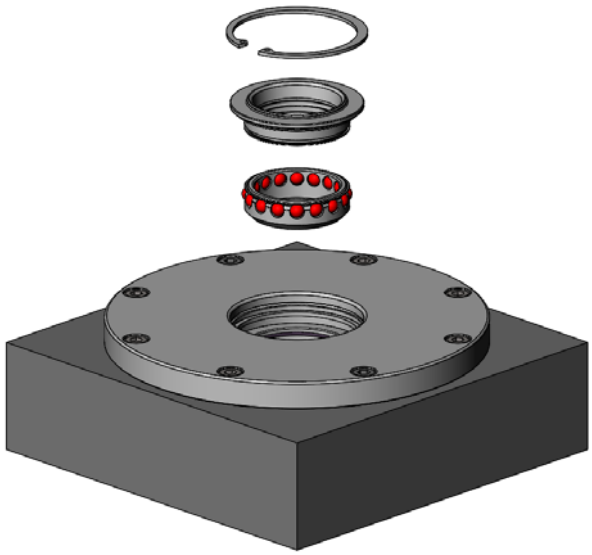
6.4 Removal of pre-locked fast closing clamp

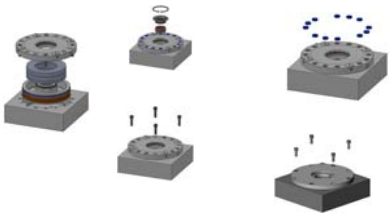
1. Prior to starting removal, the system must be completely de-pressurised. (Interrupt supply of power to the source of pressure)

2. Removal is undertaken in the reverse of the order given in section "6.2 Installation of pre-locked fast closing clamp"

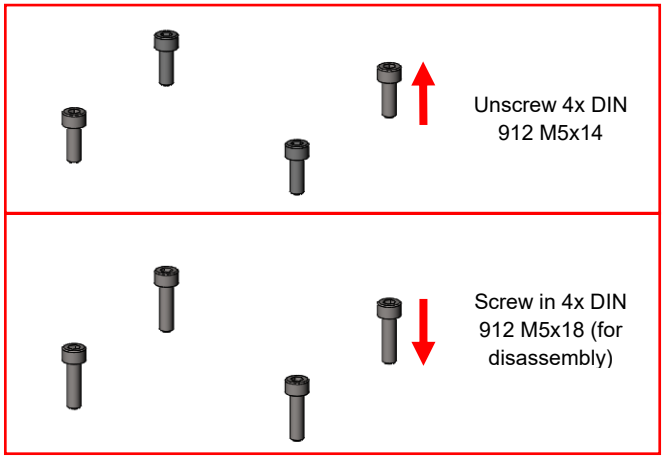
3. To remove the entire unit, the rear of the unit must be vented, as otherwise a vacuum will be produced on pulling out the piston.

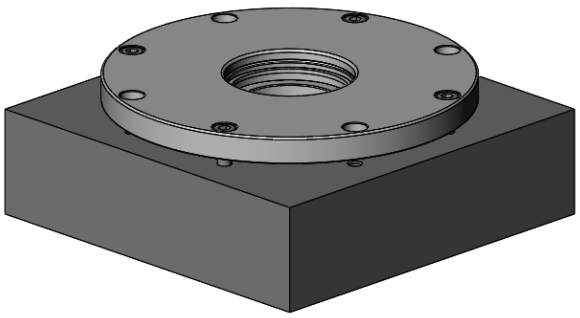
6.5 Removal of pre-locked fast closing clamp





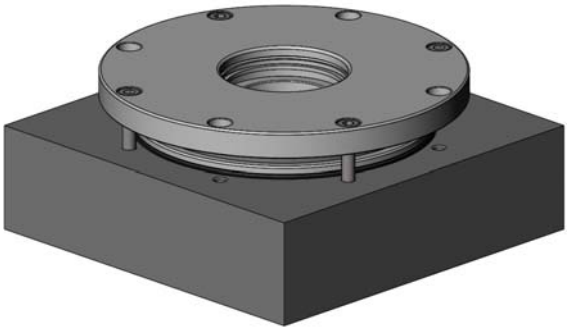
First the locking ring, retaining ring and ball cage are removed.



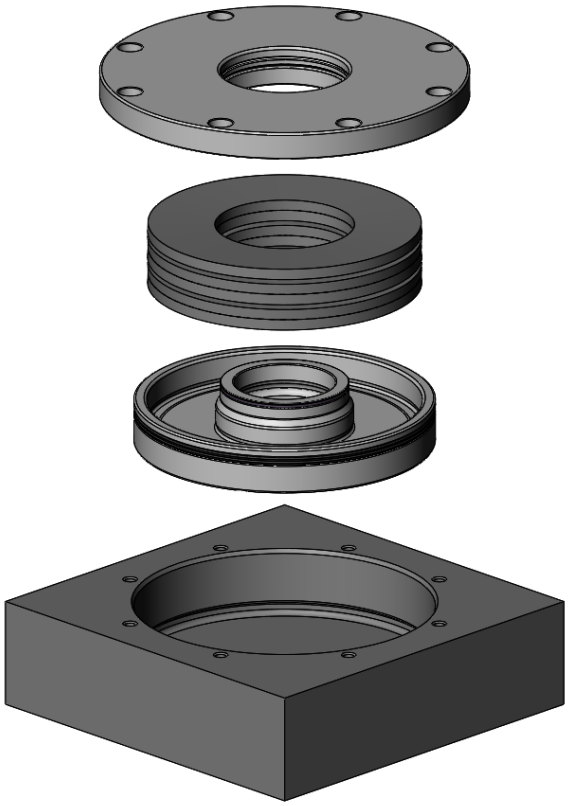


Then all screws DIN912 are loosened evenly until there is a gap of max. 3mm between the cover and housing. Now 4 screws are unscrewed and replaced with the screws for disassembly. These must be screwed in until they are in contact with the counterbore. (However only in light contact)

!!Attention!! With an aluminium plate the SPEEDY's are only allowed to be removed while locked with a transport nipple.

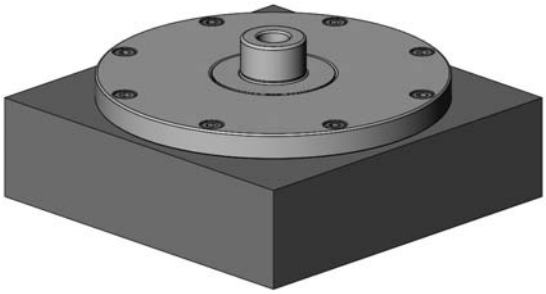


The remaining screws are removed, then evenly loosen the disassembly screws until the spring assembly is relieved.

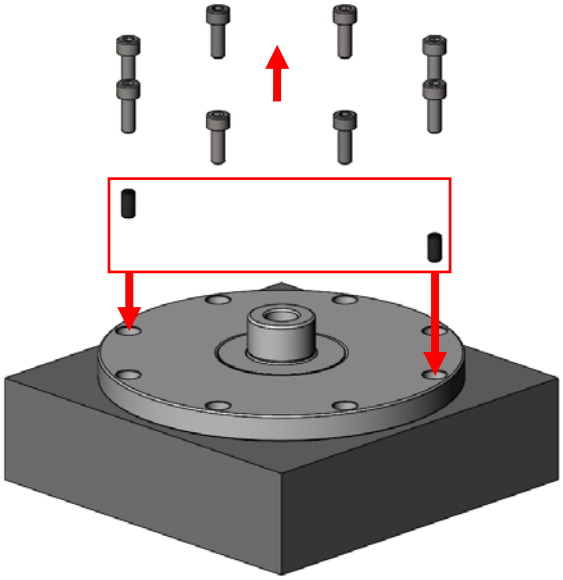


Then the cover, plate springs and piston can be removed by hand.
(To remove the piston it is necessary to vent the release line, as otherwise a vacuum will be formed)

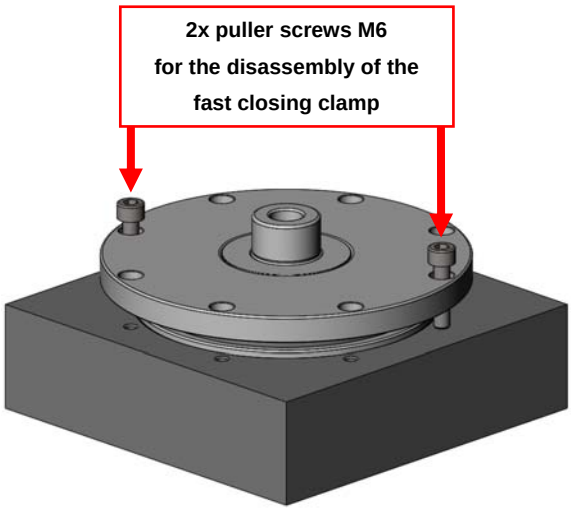
6.6 Removing the fast closing clamp in the locked state (clamped with transport nipple)



First the transport nipple is locked in the fast closing clamp and all sources of pressure de-pressurised.



Then all screws DIN 912 M5x14 are undone.
It is now necessary to screw in two setscrews DIN913 M5x10 into the thread under the puller threads.



Then the fast closing clamp can be pressed off by evenly screwing in 2 M6x25 into the puller threads.

7 Placing in operation, operating and operation

7.1 On placing in operation for the first time:

- Visually inspect the entire machine and the fast closing clamp
- Instruct unauthorised personnel to leave the machine
- Check the hydraulic oil levels
- Once all clamping elements that are connected to the same circuit have been installed as described previously and tightened to the appropriate tightening torque, the source of hydraulic pressure can be connected to the circuit and bled.
- Releasing: slowly and carefully increase the hydraulic pressure to the release pressure. During this process check the clamping elements for leaks, if necessary immediately switch off source of pressure and rectify the leak. Check the check dimension A
  (see chapter „8.1 Checking dimension A")
- Test the clamp control valve for correct function, if fitted (see operating instructions "WM-020-255 de BA Clamp control valve")
- Optional release check:
  - On the pressure regulator set the check pressure to 2 – 2.5 bar with the line closed
  - Place the clamping elements in clamped position
  - Switch on the release check. The air must be able to escape unhindered at the check outlet
  - Adjust the flow rate using the throttle such that a dynamic pressure of 0.3 - 0.8bar is displayed at the pressure switch. (Recommendation 0.5 bar, for short switching times better 0.8 bar)
  - Place the clamping elements in released position
  - On reaching the released position on all clamping elements, a dynamic pressure of 1.7 – 2.5bar must be displayed at the pressure switch
  - If the dynamic pressure is less than 1.7bar, the correct function of the clamping elements must be checked, e.g.: Check the check dimension A.

7.2 Function check:

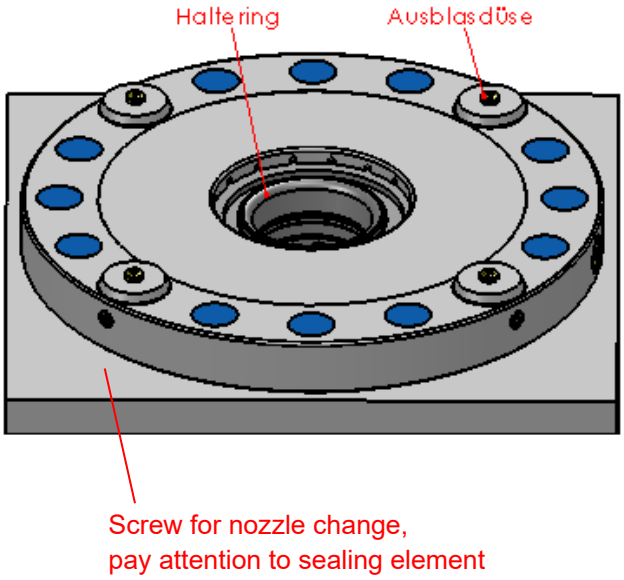
- Check the fast closing clamp for hydraulic and pneumatic leaks.
- Release the SPEEDY and check the check dimension A (see chapter „8.1 Checking dimension A")
- Check the release check (see chapter „7.1 Optional release check")
- Check clearing device and mount control (see chapter „7.4 SPEEDY with blow-out function".)
- Check clamp control valve (see operating manual "WM-020-255-de Clamp control valve").

7.3 Operating and operation:

- Adjust the release pressure for the fast closing clamps at the source of pressure
  (see chapter "9 Technical Data")
- Only pressurise the fast closing clamp for the changing process
  Note: ***do not*** leave continuously pressurised
- Set the overpressure safety valve to max. 5 bar above the max. operating pressure
  (see chapter "**Fehler! Verweisquelle konnte nicht gefunden werden.** Technical Data")

7.4 SPEEDY with blow-out function:

Switch on the clearing air and check if enough air flows out of the nozzles and the centring bore (see chapter „**Fehler! Verweisquelle konnte nicht gefunden werden.** Technical Data"). Check the nozzles for freedom of movement. Use personal protective equipment, e.g.: safety glasses, …



Procedure on pallet change:

- First switch on clearing air
- After approx. 3 s release SPEEDY
- Change pallet / clamp SPEEDY
- Clamp new pallet using SPEEDY
- Only now switch off clearing air
- Poll mount control, optional
- Switch on mount control air
- Poll dynamic pressure
- Switch off mount control air

Do not allow dirt to enter from pallets or retractable nipples
Ensure an adequate air supply is provided.

Type:	Air flow rate l/min
SPEEDY Classic 1 Tornado and Twister	80
SPEEDY Classic 2 Tornado and Twister	80- 100
SPEEDY Classic 3 Tornado and Twister	100

7.5 Preventing damage to parts:

The nipple insertion velocity on inserting the nipple in the element must be lower than 100 mm/s, as otherwise the nipple and element may be damaged.

The product is not allowed to be cleaned with:

- Corrosive or caustic constituent elements or
- Organic solvents such as halogenated or aromatic hydrocarbons and ketones (thinners, acetone etc.), as these substances can irreparably damage the seals.

The element must be kept clean and cleaned immediately if soiled. During this process, in particular the areas of the piston or bolt housing, bearing surfaces and centring bore must be cleaned of swarf or other liquids.
In case of heavy soiling the cleaning must be undertaken at short intervals.

7.6 Lubricants and oils (hydraulic oil)

Unsuitable lubricants and oils can damage the seals and very seriously reduce the service life.
ATTENTION: it is not allowed to mix oils.

Recommendation: "Castrol Hyspin AWS 32" or "Castrol Hyspin AWS 46" hydraulic oil

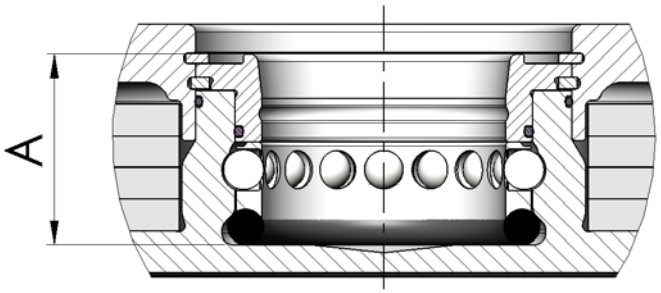
8 Maintenance and service

8.1 Checking dimension A

The check dimension A must be checked once a month.

Checking for correct function via the check dimension A in the released state.
On compliance of the depth A with the table the fast closing clamp is functioning correctly.

To measure the check dimension a suitable check dimension tester is available for each size. The testers can be procured from STARK Spannsysteme GmbH.



Check dimension	Check dimension A	Check dimension tester
SPEEDY classic 1 (SPEEDY 1000)	25.3 mm ± 0.2	Order no. 504 021
SPEEDY classic 2 (SPEEDY 2000)	24.0 mm ± 0.2	Order no. 504 022
SPEEDY classic 3 (SPEEDY 3000)	38.5 mm ± 0.2	Order no. 504 023

If check dimension A is exceeded, service by an authorised service engineer is required without delay.
If servicing is not undertaken, it will no longer be possible to safely clamp the retractable nipple. There is a risk of accident

8.2 Checking clamping force

After every 5000 clamping cycles, or at least once a year, the clamping force must be checked.

Measure the insertion force on the fast closing element. To measure the insertion force a suitable mechanical insertion force tester can be procured (order no. 504 000)
from STARK Spannsysteme GmbH.
The permissible deviation on the insertion force is ±15 % (see chapter „**Fehler! Verweisquelle konnte nicht gefunden werden.** Technical Data").
If the value measured is below the minimum insertion force, the plate springs must be replaced, see chapter „8.3 Replacing plate springs".

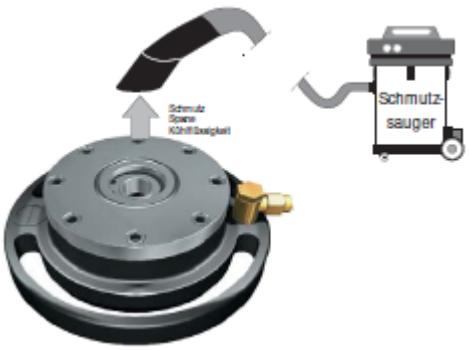
8.3 Replacing plate springs

After reaching the clamping cycles or dropping below the minimum insertion force it is necessary to change the plate springs (see chapter „9 Technical Data" the maximum clamping cycles for the fast closing clamps).

The fast closing clamp must be dismantled to replace the plate springs.
In principle, only an authorised service engineer is allowed to undertake installation work on the fast closing clamps. During all work the necessary safety measures are to be followed without exception and in their entirety.

8.4 Surface cleaning

Correct!
The fast closing clamp is allowed to be blown out and blown off using compressed air.



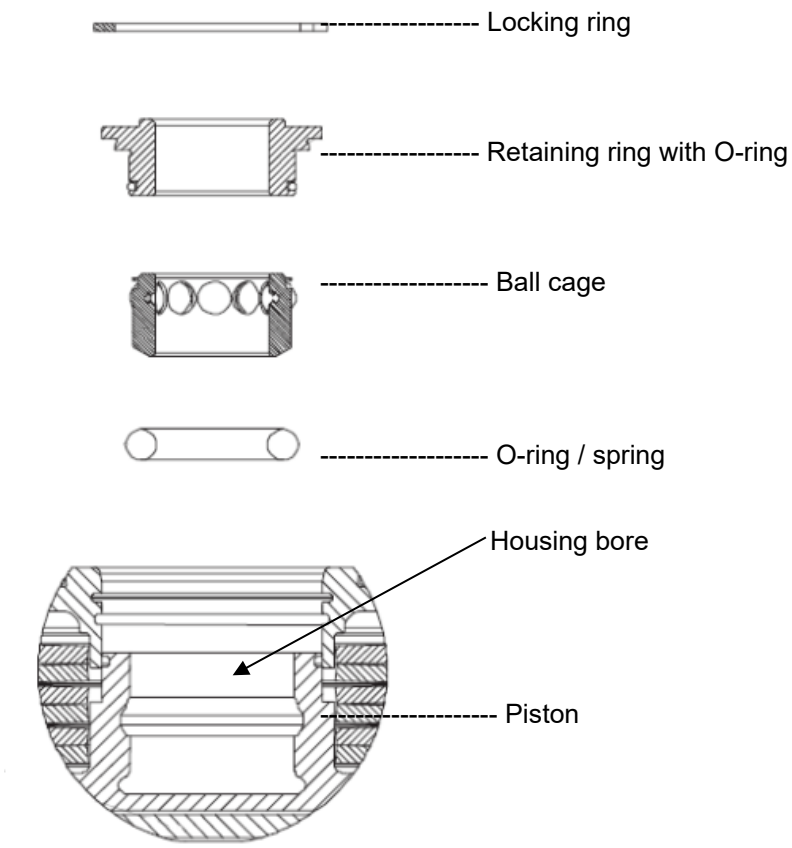
Correct and better!
Vacuum cleaning of the swarf, dirt and coolant from the fast closing clamp.

In principle, soiling inside the fast closing clamp is not allowed. Clean based on the application and time between changes. Pay attention to max. clamping cycles. On reaching: servicing only by suitably instructed personnel.

8.5 Overview of the parts that are removed for the cleaning:

Necessary tools and parts:

a) Locking ring pliers (order no.. 504 006)
b) Check dimension tester
c) Retractable nipple



1. Remove locking ring DIN472 using pliers
2. Carefully pull off retaining ring
3. Remove ball cage, do not lose any balls
4. Remove O-ring or spring
5. Clean the parts removed incl. housing bore, check for damage and replace if necessary
6. Re-fit all parts in the reverse order of removal. Ensure the locking ring DIN 472 is correctly seated!
7. Measure check dimension A (see chapter „8.1 Checking dimension A")
8. Check function using an individual retractable nipple

8.6 General cleaning

For general cleaning the fast closing clamp must be dismantled.
In principle, only an authorised service engineer is allowed to undertake installation work on the fast closing clamps. During all work the necessary safety measures are to be followed without exception and in their entirety.

Hazard: the fast closing clamp is permanently under pressure from the springs. Under no circumstances undo the screws on the fast closing clamp!

8.7 Storage:

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

Extended storage after usage:
Prior to storage, clean the fast closing clamp (see chapter „8.4 Surface cleaning“) and take measures to protect against corrosion.

After extended storage:
After extended storage (approx. 3 years), change seals prior to use.
Seal sets are available from STARK Spannsysteme GmbH on request.

The fast closing clamp must be dismantled to replace the seals.
In principle, only an authorised service engineer is allowed to undertake installation work on the fast closing clamps. During all work the necessary safety measures are to be followed without exception and in their entirety.

8.8 Disposal / recycling:

All parts and substances in the fast closing clamping device are to be separated by material and disposed of in accordance with local regulations and guidelines.

9 Technical Data

Classic 1

		Standard with increased clamping cycles	Standard	Tornado with increased clamping cycles	Tornado	Twister	Compact
Spring assembly maintenance interval		100,000	20,000	100,000	20,000	100,000	15,000
Insertion force 1	[N]	6,700	10,000	6,700	10,000	6,700	6,500
Retention force 2	[N]	25,000	25,000	25,000	25,000	25,000	25,000
Release pressure	[bar]	35-40	75-80	35-40	75-80	35-40	175-180
Max. pressure *	[bar]	80	80	80	80	80	180
Lifting force at max release pressure	[N]	10,000	10,000	10,000	10,000	10,000	10,000
Max. lateral forces allowed	[N]	7,000	7,000	7,000	7,000	7,000	7,000
Tilting torque	[Nm]	250	350	250	350	250	150
Twisting torque **	[Nm]	300	300	300	300	300	---
Oil volume	[cm3]	20	20	20	20	20	7
Operating temperature	[°C]	10-80	10-80	10-80	10-80	10-80	10-80
Min. clamping time allowed	[s]	approx. 2	approx. 2	approx. 2	approx. 2	approx. 2	approx. 2
Min. release time allowed	[s]	approx. 2	approx. 2	approx. 2	approx. 2	approx. 2	approx. 2
Radial pre-positioning 3	[mm]	± 3	± 3	± 3	± 3	± 3	± 3
Max. axial pre-positioning automated loading	[mm]	- 0.3	- 0.3	- 0.3	- 0.3	- 0.3	- 0.3
Repeatability 4	[mm]	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
System accuracy 5	[mm]	< 0.01 ***	< 0.01 ***	< 0.01 ***	< 0.01 ***	< 0.01 ***	< 0.01 ***
Weight	[kg]	approx. 3	approx. 3	approx. 3	approx. 3	approx. 3	approx. 1.5

Note:
Spacing tolerance: ±0.01mm for SPEEDY side and retractable nipple side
Procedure for SPEEDY with blow-out: first apply air, after approx. 3 s release SPEEDY/change pallet/clamp SPEEDY, switch off air. Ensure pallets are clean (retractable nipple). Ensure an adequate air supply is provided.
Only place fast closing clamp under pressure for the changing process – do not leave under pressure for an extended period.

* Provide overpressure safety valve

** Only in case of square design

*** In case of corresponding design, accuracies in the µ range are possible with adjustment.

1 Insertion force	The insertion force (pre-load force from the spring assembly) is the load up to which the zero point is guaranteed. The insertion force stated is not allowed to be exceeded,
2 Retention force	The retention force is the max. overload at which the nipple will still be retained, but has already been left the zero point (designed for M8 screw).
3 Radial pre-positioning	The loading device must be yielding in case of automated handling.
4 Repeatability	In general the repeatability is the accuracy referred to the changing of the same position-orientated pallet on the same interface.
5 System accuracy	The system accuracy is the accuracy resulting from changing several pallets, e.g., on different machines.

Maintenance: The permissible insertion force is ±15%

Classic 2

		Standard	Tornado	Twister
Spring assembly maintenance interval		40,000	40,000	40,000
Insertion force 1	[N]	20,000	20,000	20,000
Retention force 2	[N]	38,000	38,000	38,000
Release pressure	[bar]	35-40	35-40	35-40
Max. pressure *	[bar]	40	40	40
Lifting force at max release pressure	[N]	10,000	10,000	10,000
Max. lateral forces allowed	[N]	9,000	9,000	9,000
Tilting torque	[Nm]	1,000	1,000	1,000
Twisting torque **	[Nm]	800	800	800
Oil volume	[cm3]	38	38	38
Operating temperature	[°C]	10-80	10-80	10-80
Min. clamping time allowed	[s]	approx. 2	approx. 2	approx. 2
Min. release time allowed	[s]	approx. 2	approx. 2	approx. 2
Radial pre-positioning 3	[mm]	± 2.5	± 2.5	± 2.5
Max. axial pre-positioning automated loading	[mm]	- 0.3	- 0.3	- 0.3
Repeatability 4	[mm]	< 0.005	< 0.005	< 0.005
System accuracy 5	[mm]	< 0.01 ***	< 0.01 ***	< 0.01 ***
Weight	[kg]	approx. 5	approx. 5	approx. 5

Note:
Spacing tolerance: ±0.01mm for SPEEDY side and retractable nipple side
Procedure for SPEEDY with blow-out: first apply air, after approx. 3 s release SPEEDY/change pallet/clamp SPEEDY, switch off air. Ensure pallets are clean (retractable nipple). Ensure an adequate air supply is provided.
Only place fast closing clamp under pressure for the changing process – do not leave under pressure for an extended period.

* Provide overpressure safety valve

** Only in case of square design

*** In case of corresponding design, accuracies in the µ range are possible with adjustment.

1 Insertion force	The insertion force (pre-load force from the spring assembly) is the load up to which the zero point is guaranteed. The insertion force stated is not allowed to be exceeded,
2 Retention force	The retention force refers the max. overload at which the nipple will continue to be retained, but the zero point has already been left (designed for M10 screw).
3 Radial pre-positioning	The loading device must be yielding in case of automated handling.
4 Repeatability	In general the repeatability is the accuracy referred to the changing of the same position-orientated pallet on the same interface.
5 System accuracy	The system accuracy is the accuracy resulting from changing several pallets, e.g., on different machines.

Maintenance: The permissible insertion force is +15% / -30%

Classic 3

		Standard	Standard with increased lifting force	Tornado	Twister
Spring assembly maintenance interval		40,000	40,000	40,000	40,000
Insertion force 1	[N]	30,000	30,000	30,000	30,000
Retention force 2	[N]	55,000	55,000	55,000	55,000
Release pressure	[bar]	30-35	40-45	30-35	30-35
Max. pressure *	[bar]	35	45	35	35
Lifting force at max. release pressure	[N]	15,000	25,000	15,000	15,000
Max. lateral forces allowed	[N]	10,500	10,500	10,500	10,500
Tilting torque	[Nm]	2,000	2,000	2,000	2,000
Twisting torque **	[Nm]	2,000	2,000	2,000	2,000
Oil volume	[cm3]	124,000	124,000	124,000	124,000
Operating temperature	[°C]	10-80	10-80	10-80	10-80
Min. clamping time allowed	[s]	approx. 2	approx. 2	approx. 2	approx. 2
Min. release time allowed	[s]	approx. 2	approx. 2	approx. 2	approx. 2
Radial pre-positioning 3	[mm]	± 4	± 4	± 4	± 4
Max. axial pre-positioning automated loading	[mm]	- 0.3	- 0.3	- 0.3	- 0.3
Repeatability 4	[mm]	< 0.005	< 0.005	< 0.005	< 0.005
System accuracy 5	[mm]	< 0.01 ***	< 0.01 ***	< 0.01 ***	< 0.01 ***
Weight	[kg]	approx. 4.6	approx. 5.0	approx. 4.7	approx. 4.7

Note:
Spacing tolerance: ±0.01mm for SPEEDY side and retractable nipple side
Procedure for SPEEDY with blow-out: first apply air, after approx. 3 s release SPEEDY/change pallet/clamp SPEEDY, switch off air. Ensure pallets are clean (retractable nipple). Ensure an adequate air supply is provided.
Only place fast closing clamp under pressure for the changing process – do not leave under pressure for an extended period.

* Provide overpressure safety valve

** Only in case of square design

*** In case of corresponding design, accuracies in the µ range are possible with adjustment.

1 Insertion force	The insertion force (pre-load force from the spring assembly) is the load up to which the zero point is guaranteed. The insertion force stated is not allowed to be exceeded,
2 Retention force	The retention force refers the max. overload at which the nipple will continue to be retained, but the zero point has already been left (designed for M10 screw).
3 Radial pre-positioning	The loading device must be yielding in case of automated handling.
4 Repeatability	In general the repeatability is the accuracy referred to the changing of the same position-orientated pallet on the same interface.

5 System accuracy The system accuracy is the accuracy resulting from changing several pallets, e.g., on different machines.

Maintenance: The permissible insertion force is +15% / -20%

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: SPEEDY 1000 / 2000 / 3000

No: 704…, 804…, 805…, 806…, S…, 048-…, 055-…, 058-…,

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

2006/42/EG	Machinery, Annex II A / Maschinen, Anhang II A

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

DIN EN ISO 4413	Safety of Machinery - Safety Requirements for Fluid Power Systems and Their Components - Hydraulics Sicherheit von Maschinen - Sicherheitstechnische Anforderungen an fluidtechnische Anlagen und deren Bauteile – Hydraulik

Complete technical documentation exists. 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, am 08.02.2019

Martin Greif
Managing director / Geschäftsführer