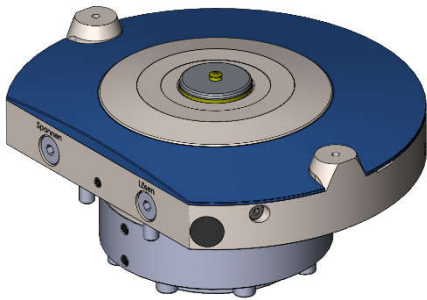


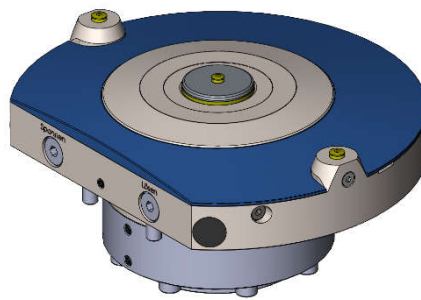


STARK.hydratec zero point clamping system

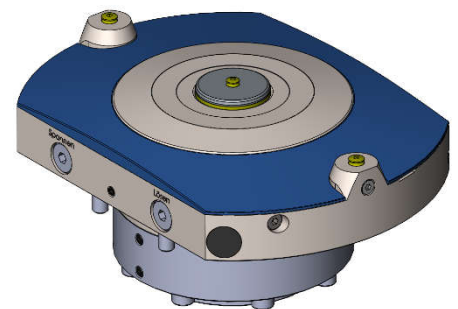
Translation of the original operating manual supplement
WM-020-343-10-en BA STARK.hydratec supplement



Art. no.:
S6000-014 / S6000-015



Art. no.:
S6000-012 / S6000-013



Art. no.:
S6000-013-01

STARK.hydratec

Manufacturer:

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2. Identification of the partly completed machinery

Product: Fast closing clamp
Function: Clamping and centring of workpiece pallets or workpieces
Product group: STARK.hydratec
Article number: S6000-012 to S6000-015
Trade name: corresponds to product group, see above

3. User instructions

3.1. Purpose of the document

This operating manual is only complete with operating manual WM-020-205-xx-en.

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

3.2. Revision history

Date	Version	Revision	Name
20/11/2012	WM-020-343-00	Creation of the operating manual	reeg
12/09/2014	WM-020-343-01	General revision	reeg
02/12/2025	WM-020-343-10	Product versions added and article number updated	mafr

3.3. Referenced documents

Document	Version	Author
Assembly drawings with parts lists	-	Stark Spannsysteme GmbH
OM STARK.hydratec	WM-020-205-xx-en	Stark Spannsysteme GmbH

3.4. Presentation of safety instructions

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

**DANGER**

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

**CAUTION**

Potentially dangerous situation (minor injuries or damage to property).

Be sure to follow these notes and procedures!

**INFORMATION**

Tips for use and particularly useful information.

**INSTRUCTION**

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

4. Essential safety instructions

4.1. Intended use



The fast closing clamp is used for clamping pallets with mounting devices for workpieces. The workpieces are intended for processing, transporting and measuring. The intended use also presupposes:

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

4.2. Foreseeable misuse



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

Risks may occur if the product is not used as intended. Examples of improper use include:

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

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

4.3. When using rotating machine tools



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

The danger zone must be secured by suitable measures.

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

4.4. Modifications or alterations



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

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

4.5. Conduct in the event of faults



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

4.6. Spare and wear parts and auxiliary materials



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

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

4.7. Obligation of the operating company



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

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

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

4.8. Residual risks



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

For example:

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

4.8.1. Design for the pallet and fast closing plate



To ensure safe positioning on the fast closing clamp, make sure there is a

grip point for a hand on the pallet. If this grip point is not structurally possible, care must be taken when fitting so that hand/fingers are never between the fast closing clamp and the nipple or between the fast closing plate and the pallet.

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

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

4.8.2. Hydraulic system malfunction



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

Possible measures to prevent accidental release:

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

4.8.3. Hazard due to incorrect assembly of the fast closing clamp



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



The risk potential is considerably higher for rotating applications.

Measure:

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

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

4.8.4. Hazard due to changes in rotational speed



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

Measure:

Observe the information and regulations regarding the maximum values of Stark. (see chapter "10 Technical data")

4.8.5. Excess pressure hazards



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

Measure:

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

4.8.6. Hazard due to exhaust air noise

The pneumatic system can generate loud noises.



Measure:

- Wear ear protection

4.8.7. Influences on service life

Negative influences include:

- Insufficient filtering of the oil; observe filter mesh size < 15 μ m.
- Damage to components.
- External mechanical damage to functional components.
- Undefined forces or defined forces exceeded.
- Insufficient ventilation of the hydraulic circuit.
- Overloading due to sudden pressure peaks.
- Too high volume flow rates / piston speeds due to large pump delivery capacity.
- Heavy contamination (e.g. chips, casting or grinding dust).
- Aggressive environment, e.g. cooling lubricants or cleaning agents which chemically attack seals / wipers.
- Incorrect pre-clamping position or loading position.

5. Description of the fast clamping device

5.1. General

The products in the STARK.hydratec module series are fast closing clamps made from high-quality tool steel. The system is hydraulically double-acting (clamping/releasing).

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

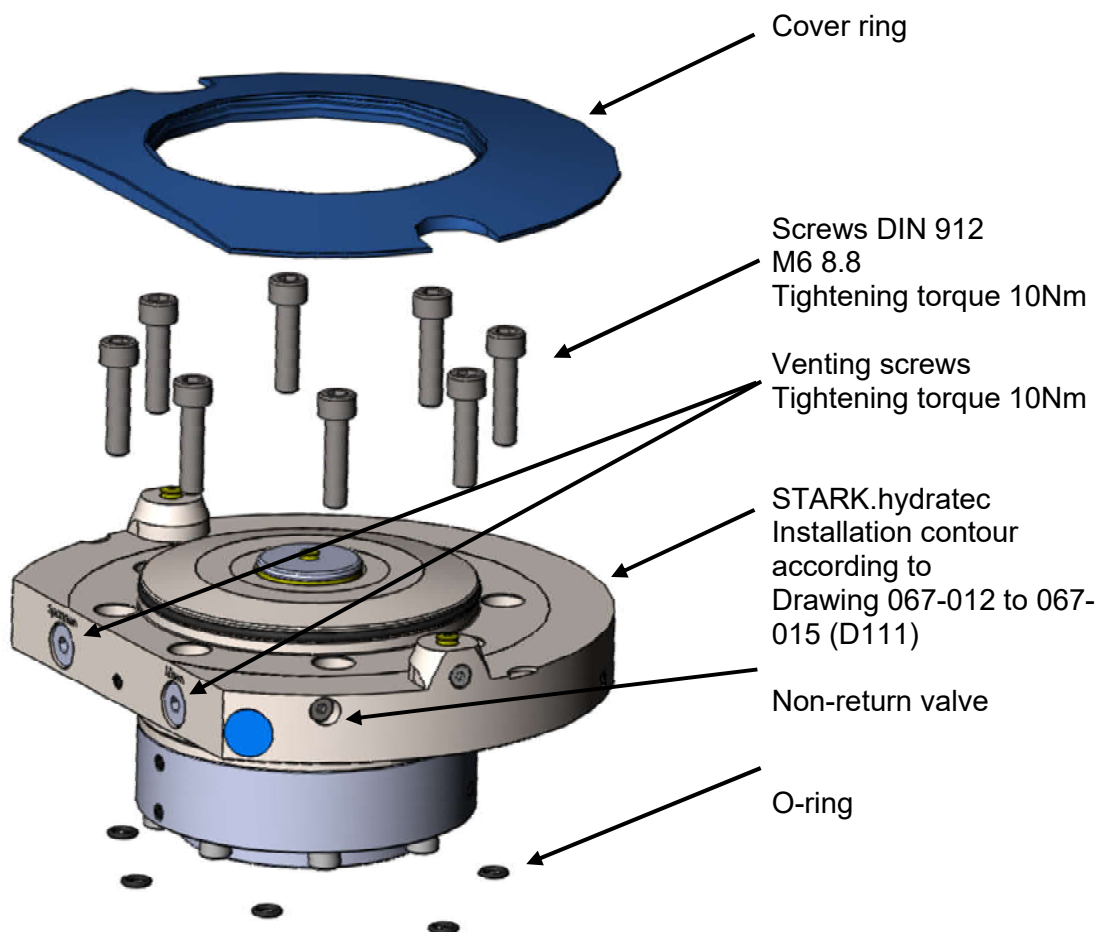
5.2. Product versions

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

- STARK.hydratec module product with water flushing, capped on one side
- STARK.hydratec module product with blow-off, capped on one side
- STARK.hydratec module product with blow-off, capped on both sides

6. Assembly and installation

Installation and removal instructions for STARK.hydratec module product



7. Commissioning, handling and operation

7.1. During initial commissioning

- Carry out a visual inspection of the entire machine or system and the fast closing clamp.
- Check the filling levels of the hydraulic oil.
- Test the proper function of the non-return valve.
- Check the fast closing clamp for hydraulic or pneumatic tightness.
- (Optional) check the inflow and outflow of the coolant flush and its functions.

7.2. Function check

- Once all fast closing clamps connected to the same circuit have been installed as described above and tightened with the appropriate tightening torque, the hydraulic pressure generator can be connected to the circuit and this can be vented.
- Release: Slowly and carefully increase the hydraulic pressure to the release pressure. (clamping time/release time min. 0.5 sec.). Check the fast closing clamps for leaks, switch off the pressure generator immediately if necessary and eliminate the leak. Check specification dimension A. (see chapter "10 Technical data")
- Switch on the blow-out air and check whether sufficient air is flowing out of the nozzles and the closing piston. Check the nozzle(s) for ease of movement.
- **Release control option:**
- Set the control pressure for the pressure controller to 2–2.5 bar when the line is closed. (for short switching times, set to 2.5 bar)
- Move the fast closing clamps to clamping position.
- Switch on the release control. The air must be able to escape unhindered at the control exit.
- Adjust the volume flow with the throttle so that the pressure switch shows approximately 0.3–0.8 bar dynamic pressure. (Recommendation: 0.5 bar; for short switching preferably 0.8 bar)
- Move the fast closing clamps to release position.
- When the release position of all fast closing clamps is reached, 1.7–2.5 bar dynamic pressure must be displayed on the pressure switch.
- If the dynamic pressure is below 1.7 bar, the proper function of the fast closing clamps must be checked, e.g.: Check specification dimension A.
- **Clamp control option:**
- For the first 4 points, proceed in the same way as for the release control, except that the fast closing clamps must be in the release position to set the volume flow.
- Place an adapter plate with retractable nipples on the loosened fast closing clamps and then clamp.
- When the adapter plate is clamped, 1.7–2.5 bar dynamic pressure must be displayed on the pressure switch.
- If the dynamic pressure is below 1.7 bar, check the proper function of the fast closing clamp and/or the retractable nipples and the adapter plate.
- Move the fast closing clamps to the release position and remove the adapter plate.
- Move the fast closing clamps without adapter plate to the clamping position.
- When the clamping position (without adapter plate) is reached, 0.3–0.8 bar dynamic pressure must be displayed on the pressure switch. The air escapes at the control outlet.
- If an adapter plate is clamped on only one fast closing clamp, only 0.3–0.8 bar dynamic pressure may be displayed. The air escapes at the control outlet.

Seat check option:

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

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

7.3. Operation



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



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

- Set the release pressure of the fast closing clamps (see chapter "10 Technical data")
- Monitor the max. operating pressure of the fast closing clamps. Set the excess pressure safety valve to max. 5 bar above the max. operating pressure (see chapter "10 Technical data")
- The non-return valve, which acts as a fail-safe device in the event of a pressure drop, only provides temporary protection for a maximum of 1–2 hours. Afterwards, this pressureless state must be eliminated or the clamped workpiece must be secured.



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

7.4. Fast closing clamps with blow-off

Blow-out serves to clean the fast closing clamp.

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

7.5. Preventing damage to components

The product must not be cleaned with:



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

The fast closing clamps must be kept clean and cleaned immediately if soiled. In particular, the piston or closing mechanism - housing, support surfaces and centring bore areas must be cleaned of chips and other liquids.

In case of heavy contamination, cleaning must be carried out at shorter intervals.

7.6. Lubricants and oils (hydraulic oil)



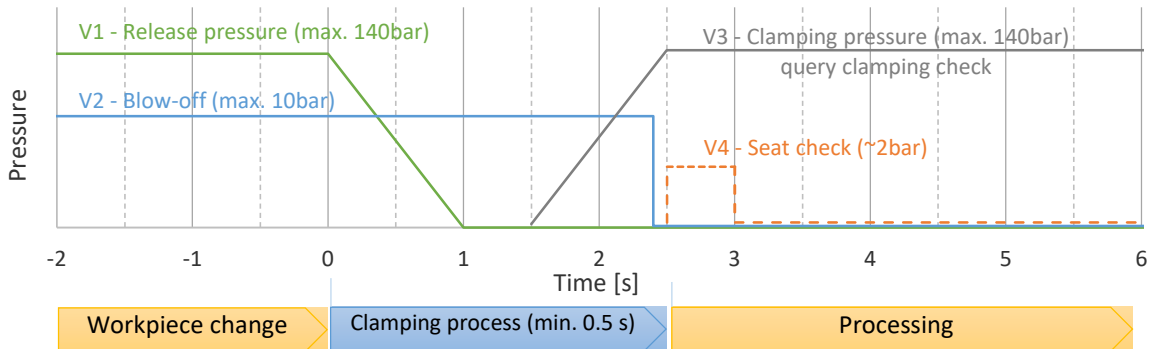
Unsuitable lubricants and oils can damage the seals and have a significant negative impact on their service life.

CAUTION: Mixing of oils is not permitted.

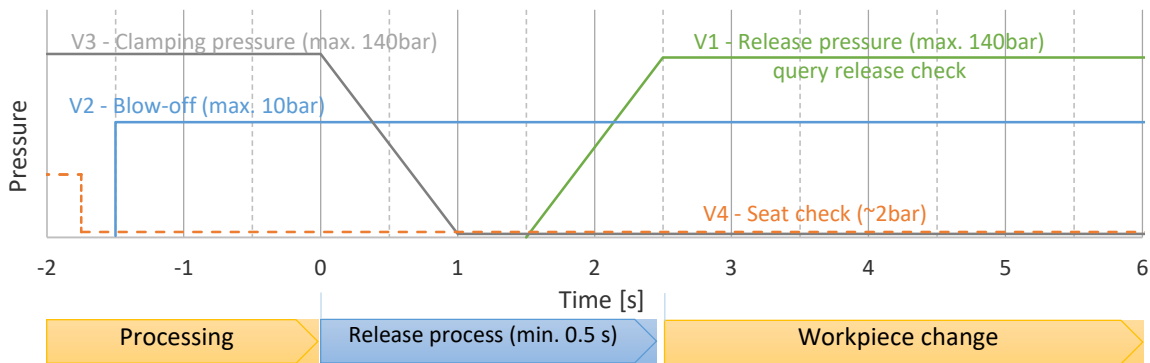
Recommendation: Hydraulic oil Castrol Hyspin AWS 32 or Castrol Hyspin AWS 46

8. Sequence diagram

Time sequence of the clamping process:



Time sequence of the release process:



9. Maintenance and repair

9.1. Cleaning surfaces

In principle, no contamination is permitted in the fast closing clamp. Cleaning depends on the application and replacement interval.



Widespread practice!

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



Correct and better!

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



9.2. General cleaning

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

The product must not be cleaned with:



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

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

9.3. Storage

Until first use:

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

Long period of storage after use:

Before storage, clean the fast closing clamp (see chapter "9.2 General cleaning") and carry out suitable measures for corrosion protection.

After a long period of storage:

After a long period of storage (approx. 3 years), the seals must be replaced before the system is used again.

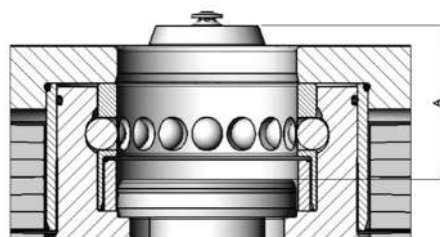
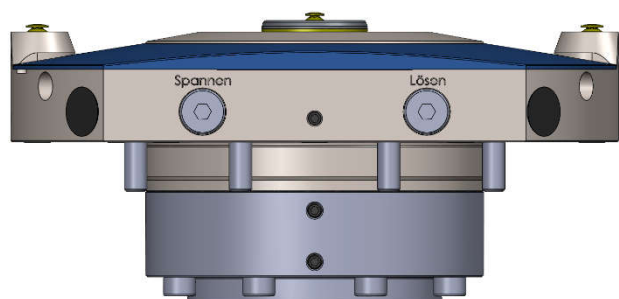
This must always be done by STARK Spannsysteme GmbH.

9.4. Disposal / recycling

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

10. Technical data

Art. no.:	S6000-012 / S6000-013 / S6000-013-01 / S6000-014 / S6000-015
Specification dimension A	23 mm (+0.2 mm)
Insertion	2 mm
Lifting	2 mm
Repeat accuracy	< 0.005 mm
System accuracy	< 0.01 mm
Insertion force ¹	20 kN
Retention force ²	38 kN
Max. lateral force	7 kN
Lifting power	20 kN (at 140 bar release pressure)
Max. operating pressure	140 bar
Release pressure ³	min. 20 bar / max. 140 bar
Min. blow-off	80 l/min (100 l/min in the case of island blow-out)
Default clamping time	min. 0.5 sec.
Default release time	min. 0.5 sec.
Radial pre-positioning ⁴	±0.3 mm / ±2 mm
Axial pre-positioning	-0.3 mm (consider retraction path)
Temperature range	+10°C to 80°C
Maintenance cycles ⁵	750000
Oil volume	16 cm ³
Hydraulic oil	according to DIN 51524 (HLP 32 or HLP 46)
Filter class	Quality class 4
Sealing material	NBR; other materials on request



¹ Insertion force at 120 bar. This insertion force is the load up to which the zero point is guaranteed.

² This is the maximum overload at which the retractable nipple is still held but the zero point has already been left.

³ Set the excess pressure safety valve to max. 5 bar above the max. release pressure.

⁴ The fast closing clamp allows radial offset of the retractable nipples:

with rigid feed ±0.3 mm;

with low-force, movable feed ±2 mm

⁵ Only under optimal conditions



11. Declaration of Incorporation

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

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

Authorised representative to compile the technical documentation:

Mr. Martin Greif, Managing Director, address: See manufacturer.

Product: Fast closing clamp
Function: Clamping and centring of workpiece pallets or workpieces
Product group: STARK.hydratec
Article number: S6000-012 to S6000-015
Trade name/
general designation: Fast closing clamp

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

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

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

Stark Spannsysteme GmbH

Rankweil, 02/12/2025

Martin Greif
Managing Director

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

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

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

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

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



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



Alle derzeit verfügbaren Sprachen finden Sie unter:

All currently available languages can be found at:

<https://www.stark-roemheld.com/download>