



ROEMHELD
HILMA ■ STARK



STARK.connect

Zero point clamping system
Single and double acting, pneumatic



ROEMHELD
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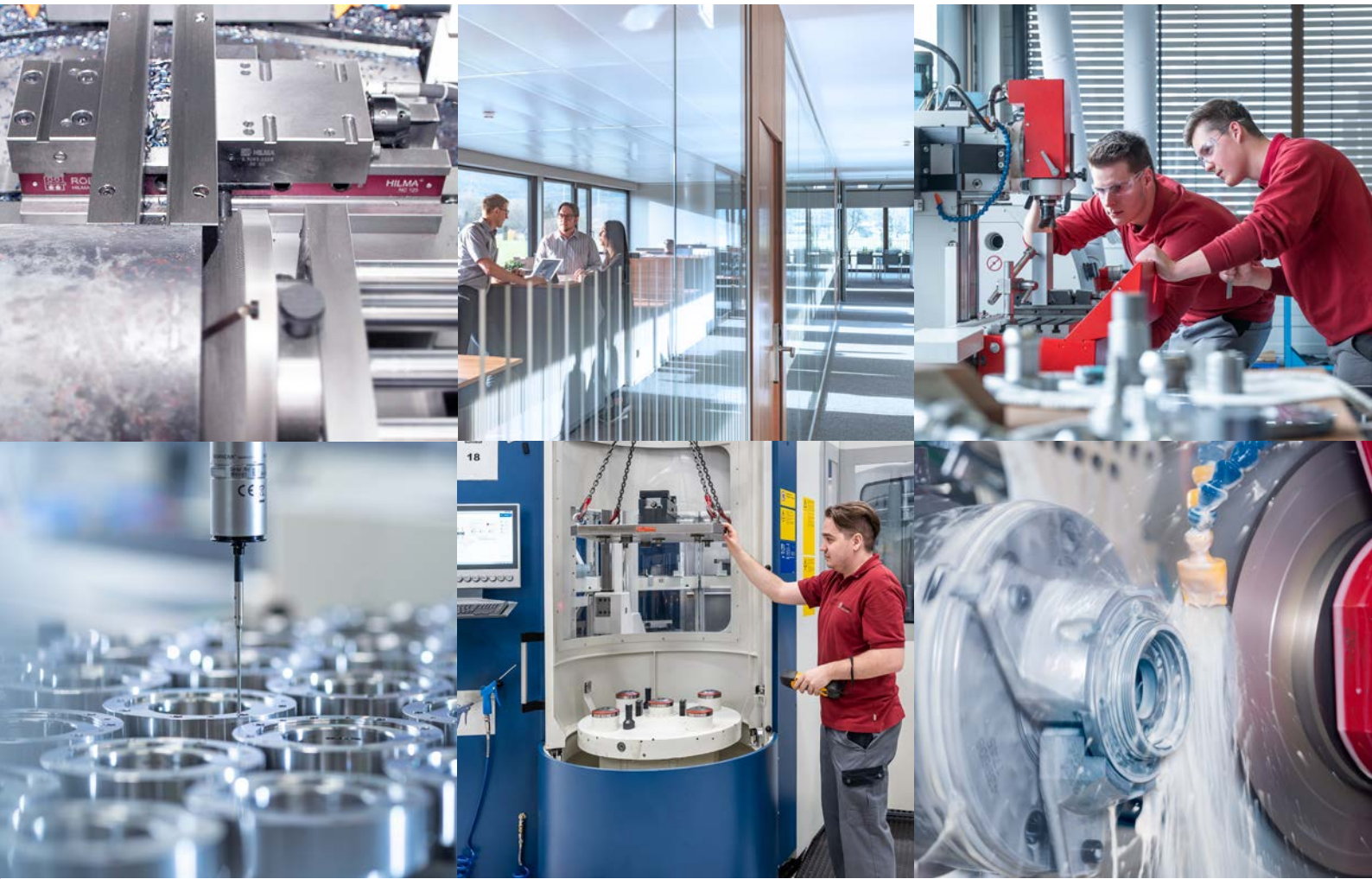


STARK
INNOVATIVE
PROFICIENT
INDIVIDUAL
RELIABLE

The high-tech company STARK Spannsysteme, founded in 1977, is regarded as a pioneer in the development and manufacture of zero point clamping systems, being the first company on the market to specialise exclusively in this technology for decades.

High quality and precision distinguish what is possibly the broadest product range available on the market in the field of highly productive work-piece clamping.

Production is more efficient and flexible with STARK components, products and systems.



AUTOMOTIVE



AVIATION



MACHINE AND TOOL
CONSTRUCTION



MEDICINE

FOCUS ON INDUSTRIES & MARKETS.

Every customer has specific requirements. Our established and extensive industry expertise allows us to offer you the best solutions, services and products for sustainable and efficient use in your market.

STARK.connect

- Process reliability:** Industry 4.0 ready
- Flexible:** various equaliser options
- Ideal:** active insertion despite small design
- Robust:** high level of resilience
- Fast:** very short clamping/release time



STARK.basic



STARK.airtec



STARK Spannsysteme

Mehr Produktivität durch:

- maximale Flexibilität in der Fertigung
- höchste Prozesssicherheit
- reduzierte Herstellkosten durch Rüstzeitoptimierung

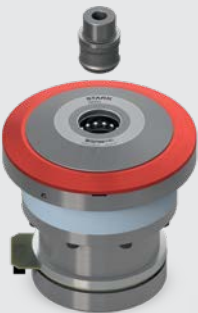
STARK.balance



STARK.hydratec



STARK.etc



STARK.sweeper



STARK.easyclick



STARK.classic



STARK.plaintec



STARK.metec



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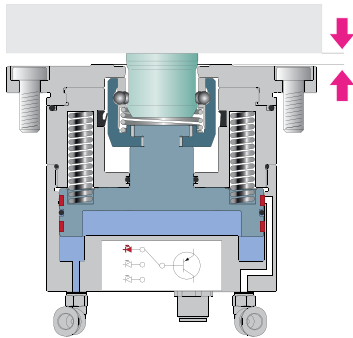
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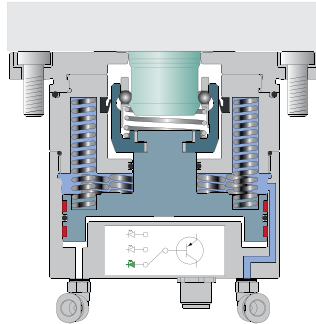
Functions

STARK.connect is a pneumatically operated zero point clamping system. A piston is held in the clamping position by springs. The piston has a double-acting pneumatic design.

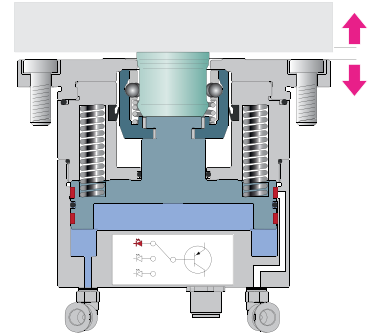
The pneumatic connections or the electrical control and visual display of the clamping state are located at the rear of the element.



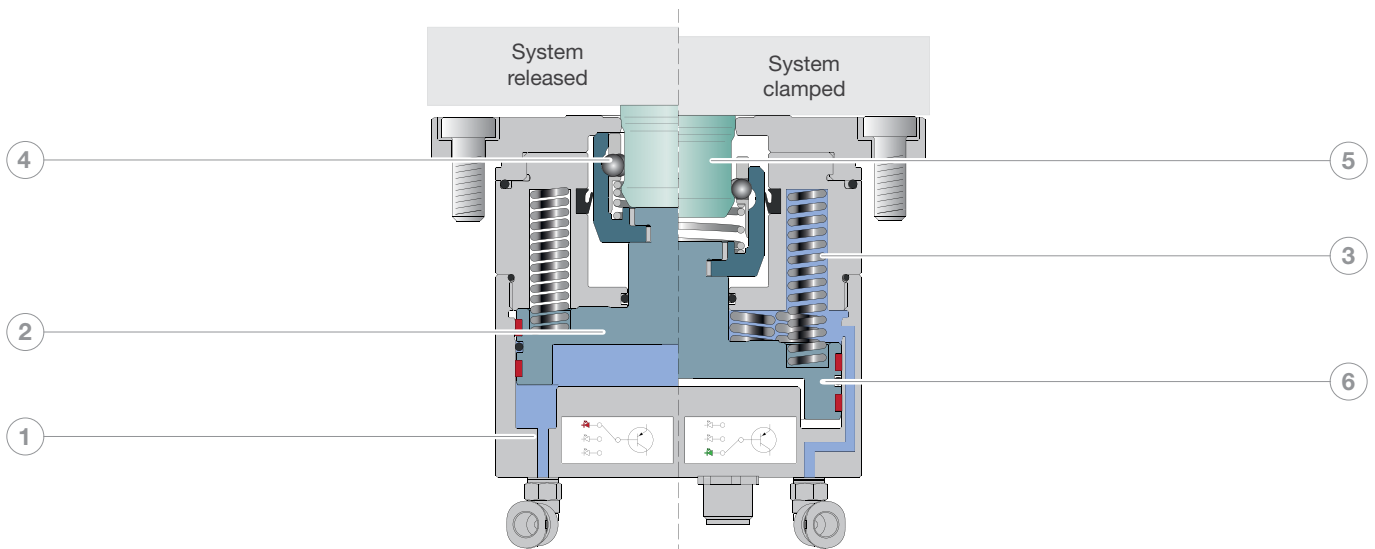
Safe clamping from 4.5 mm



Retracted, clamped and positioned with high force



Released with/without lifting



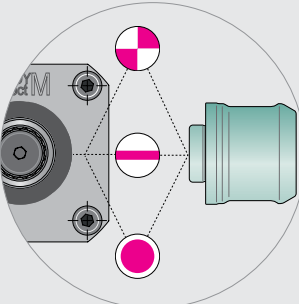
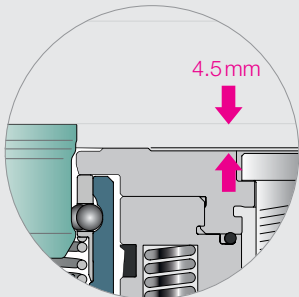
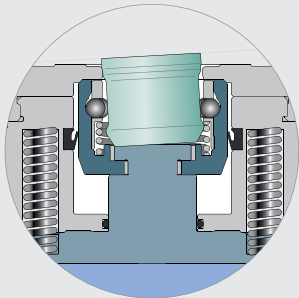
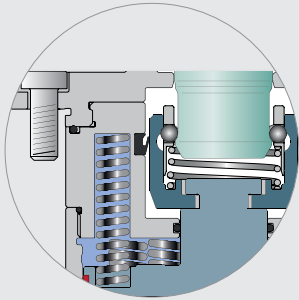
Release:

- The piston (2) is subjected to the release pressure (1) and moves upwards. The springs (3) are pressed together.
- The balls (4) move to the parking position.
- The retractable nipple (5) is lifted – "released" signal.

Clamp:

- The release pressure (1) is relieved and drops to 0 bar.
- The spring pre-tensioning force is initiated via the piston (2), which moves down.
- The balls (4) are pressed inwards by the clamping contour, enclose the retractable nipple (5) and pull it on the flat support – "clamped with retractable nipple" signal.
- If there is no retractable nipple in the pull-in mechanism, the piston (2) moves to the stop position – "clamped without retractable nipple" signal.
- The piston (2) can be additionally subjected to clamping pressure (6), thus increasing the insertion force.

Benefits



DESIGN

- Compact design with high clamping forces
- Pneumatic double-acting system with clamping force support
- Simple installation contour
- Easy to maintain – simple installation and cleaning
- Made of high-quality, stainless materials

FLOATING SUPPORT

- Clamping mechanism can move sideways (e.g. temperature variation)
- Inclined entry and exit possible
- Optimal for automated applications

ACTIVE INSERTION & OPTIONAL LIFTING

- Active insertion force for optimum flat support
- Maximum catch range with 4.5 mm travel
- Vibrations are damped and the quality of the workpieces is thus increased
- Easy robot feeding and removal
- Flexible handling with and without lifting of 1.5 mm from the fit

FLEXIBLE EQUALISER OPTIONS

- Equalisation possible via fast closing clamp or retractable nipple
 - Tolerance range with retractable nipple AG ± 0.05 mm / OZ ± 0.2 mm
 - Tolerance range with fast closing clamp ± 0.75 mm
- Flexible option to compensate for tolerances for material mix, temperature variation or large designs

FULLY INTEGRATED SENSORS

- Unambiguous recording of the clamping state
- Direct rear signalling via LEDs
- Digital outputs for simple further processing in the higher-level control system
- High level of robustness and usability in welding environments

Properties

The products of the STARK.connect series are fast closing clamps made of high-quality tool steel and housings made of anodised, high-strength aluminium with very small space requirements due to compact external dimensions. The system is mechanically tensioned with springs, pneumatically power-enhanced and pneumatically released. The integrated spring assembly makes the STARK.connect self-locking.

Optionally, this function can also be pneumatically double-acting, which allows even higher values to be achieved. The STARK.connect.LK versions (element with LOCK function) also have an integrated lock. As a result, higher insertion or clamping forces are achieved even in a depressurised state.

The integrated querying unit detects and signals the clamping state using three/five signals (clamped, released, incorrectly clamped, additionally locked/unlocked for the STARK.connect.LK versions) via LEDs directly on the rear of the element and digitally for transmission to a higher-level control system. The query is designed to be fail-safe and suitable for use in welding systems.

The product series is designed for installation in systems for vehicle shell construction, assembly systems and for connecting machine elements. It is suitable for use in welding environments (weld-proof). Depending on the required accuracies, it can also be used for all common machining processes such as milling, grinding as well as on test benches and assembly devices. Ideal for automatic loading.

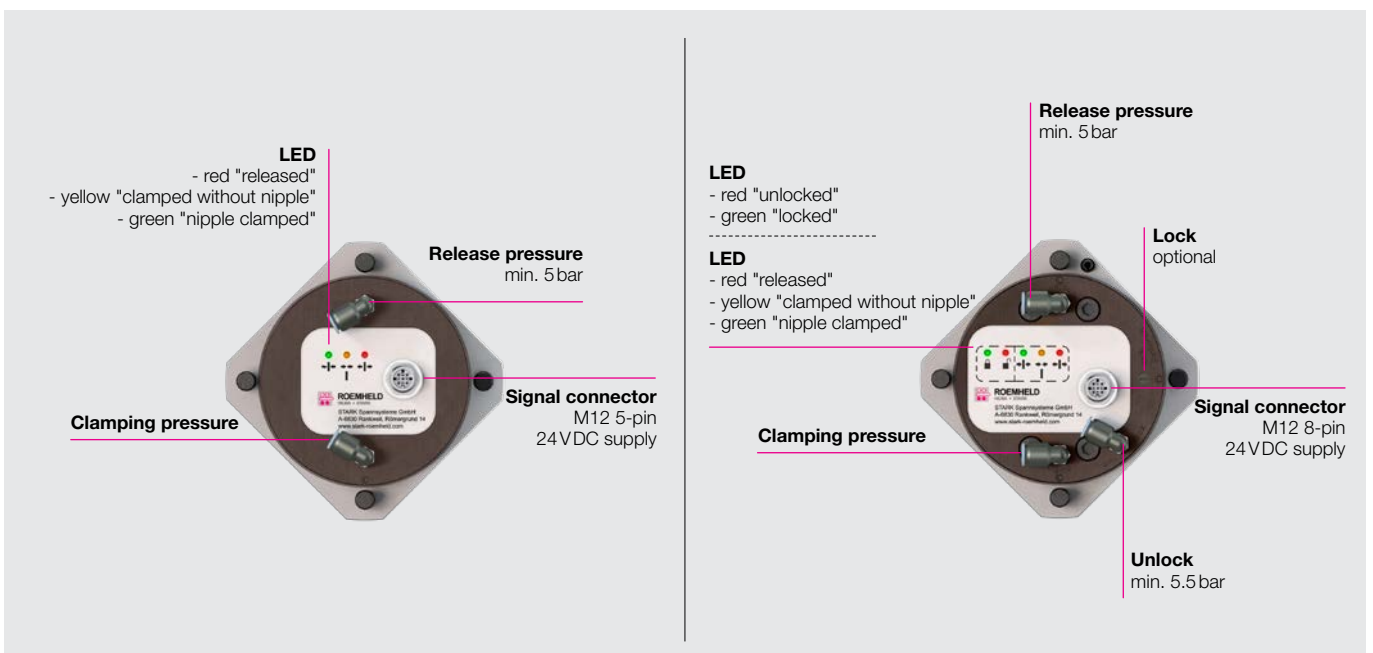
STARK.connect



STARK.connect.LK



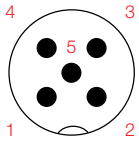
Connections



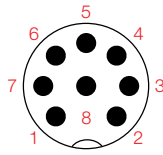
Pin assignment

The integrated querying unit must be supplied with a nominal voltage of +24 VDC. The respective clamping state is indicated by a distinct signal ((clamped/released/incorrectly clamped, additionally locked/unlocked for

the STARK.connect.LK versions). The signal lines are designed as PNP outputs with a 10 kΩ pull-down resistor.



M12 connector, male, 5-pin, A-coding



M12 connector, male, 8-pin, A-coding

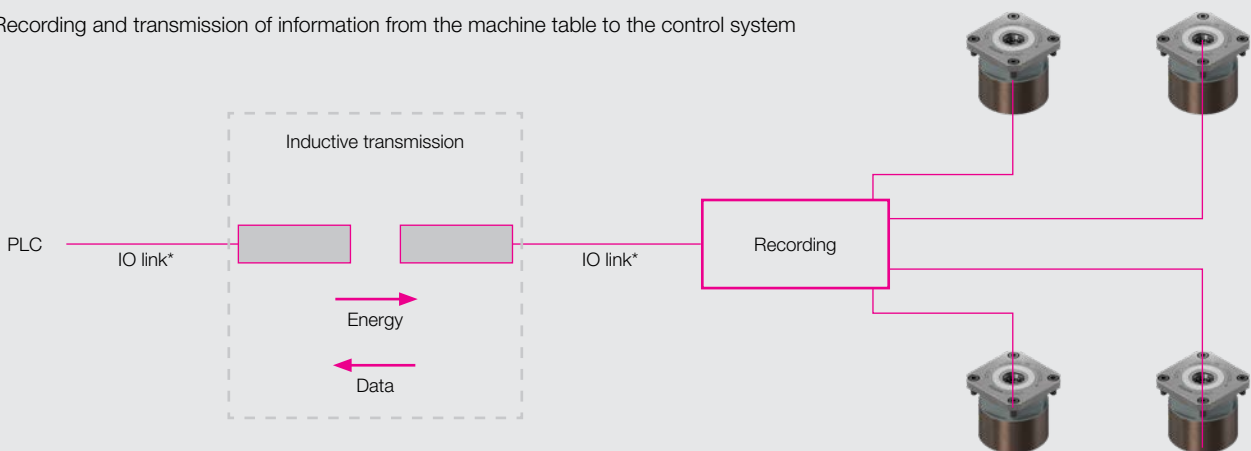
Assignment for STARK.connect	Assignment for STARK.connect.LK	Description	Signal type	Display (rear)
Pin 1	Pin 1	+24 V DC	Supply	
Pin 2	Pin 2	Signal "clamped without nipple"	PNP	LED yellow
Pin 3	Pin 3	GND	Supply	
Pin 4	Pin 4	Signal "nipple clamped"	PNP	LED green
Pin 5	Pin 5	Signal "released"	PNP	LED red
	Pin 6	Not applied		
	Pin 7	"Locked" signal	PNP	LED green
	Pin 8	"Unlocked" signal	PNP	LED red
Shield	Shield	Not applied		

Topology

INFO

Possible application of digital status recording

Recording and transmission of information from the machine table to the control system



* instead of an IO link, transmission with digital signals can also be implemented.

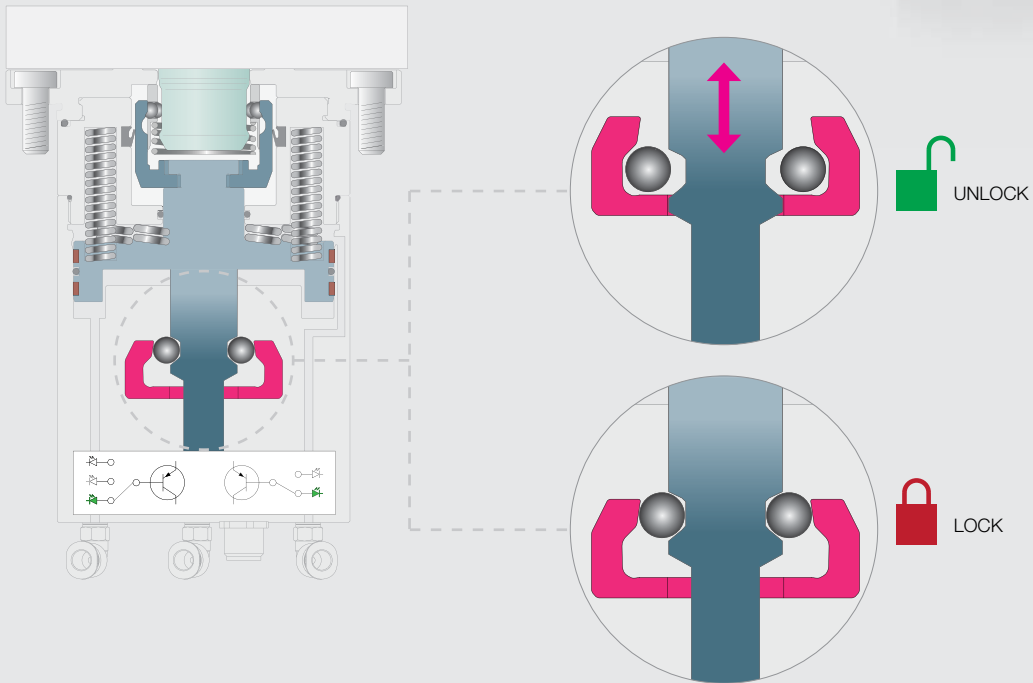


LOCK function

INFO

LOCK function with integrated lock

Elements with LOCK function have an integrated lock with a locking force of 10 kN. The LOCK function achieves high clamping forces in addition to the insertion force in the unpressurized state.



Functions: clamped - released - locked

The following table shows the functions that must be activated and those that can be used optionally.

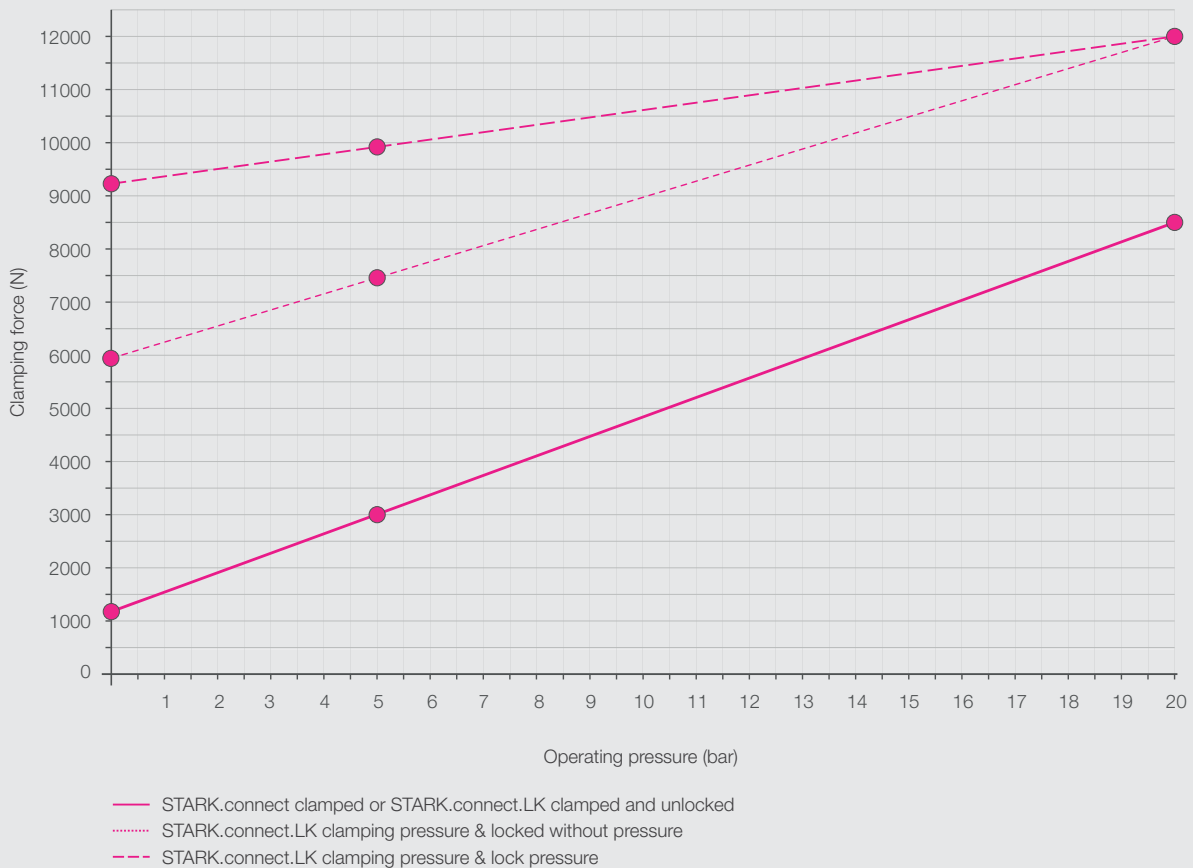
	CLAMP with spring force	CLAMP with spring force pneumatically power-enhanced	RELEASE pneumatic	LOCK with spring force	LOCK with spring force pneumatically power-enhanced	UNLOCK pneumatic
STARK.connect	✓	✓	✓			
STARK.connect.LK	✓	✓	✓	✓	✓	✓

✓ Standard function
 ✓ optional use

INFO

Variable insertion force with STARK.connect

Depending on the clamping pressure, the clamping force is as indicated:





Technical data

			STARK.connect.M	STARK.connect.LK.M
Order number - element with zero point (NP)		NP	S9000-001	S9000-031
Order number - element with equaliser (AG)		AG	S9000-002	S9000-032
Order number - element without centring (OZ)		OZ	S9000-003	S9000-032
Maintenance interval ^(max. number of clamping cycles)		Cycles	2,000,000	
Insertion force ¹	depressurised	[N]	1,200	
	at 5 bar (20 bar) clamping pressure/unlocked		3,000 (8,500)	
Clamping force ¹	at 0 bar clamping pressure/locked	[N]	-	6,000
	at 5.5 bar (20 bar) clamping pressure/locked		-	7,500 (12,000)
	at 5.5 bar (20 bar) clamping pressure/lock pressure		-	10,000 (12,000)
Retention force ²		[N]	10,000	30,000
Min. release pressure		[bar]	5	5.5
Max. operating pressure		[bar]	10 / 20**	
Lifting force at 5 bar		[N]	500	
Lifting path*		[mm]	1.5	
Total retraction path*			4.5	
Max. permitted lateral forces ³		[N]	NP	7 000
			AG	7 000***
			OZ	-
Air volume ^(release/clamp)		[cm ³]	64	
Operating temperature		[°C]	+ 10 to +80	
Min. permitted clamping time / release time		[s]	0.5	
Radial pre-positioning ⁴		[mm]	± 1	
Max. axial pre-positioning ⁵		[mm]	-3	
Max. loading angle		[°]	± 1.5	
Repeat accuracy ⁶		[mm]	< 0.05	
System accuracy ⁷		[mm]	< 0.1	
Weight		[kg]	1.8	3.2
Air connection		[mm]	M5	
Electrical connection		[mm]	M12 5-pin	M12 8-pin
Voltage range		[VDC]	24 (18 to 34)	
Protection class		[IP]	67	
Typ. current consumption		[mA]	25	
Max. continuous direction per output		[mA]	200	
Reverse polarity protection		[-]	Yes	

* Other lifting/retraction paths possible on request

** with plug-in fitting S953-273, S953-272

*** 90 degrees in equalising direction

¹ *Insertion force or clamping force:* This is the load up to which the zero point is guaranteed. The retractable nipple is actively retracted 4.5 mm with this force. The insertion force acts on the retraction path and the clamping force as soon as the system has been reached.

² *Retention force:* This is the maximum overload at which the nipple is still held but the zero point has already been left.

³ *Lateral force:* The permitted force only applies to retractable nipples with zero point and retractable nipples with equaliser 90° to the equaliser direction.

⁴ *Radial pre-positioning:* The loading device must be powerless and flexible for manual and automated loading.

⁵ *Axial pre-positioning:* The max. distance between the retractable nipple and the piston crown (limit stop before clamping) so that clamping occurs with a form fit. Within this tolerance, the retractable nipple is retracted with the specified insertion force on the flat support.

⁶ *Repeat accuracy:* This usually indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface.

⁷ *System accuracy:* This refers to the accuracy resulting from changing several pallets, e.g. on different machines.

Tilting moment calculation example

INFO

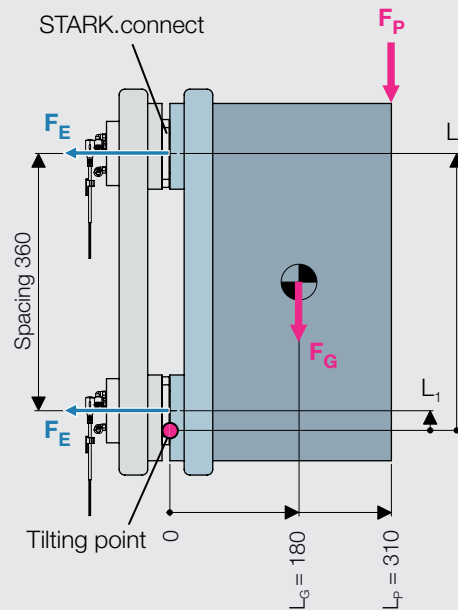
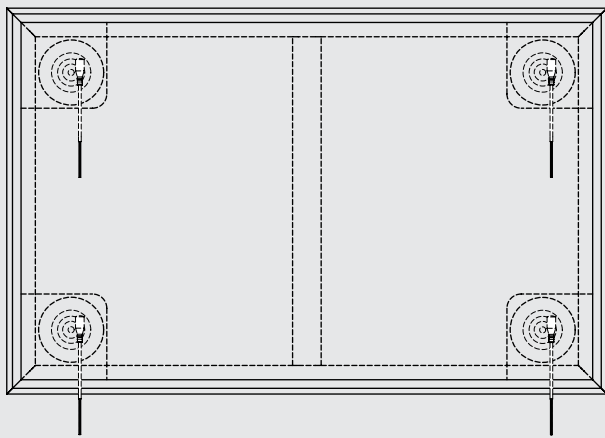
Tilting moment calculation example (fictitious numerical values)

Calculation example, tilting torque (fictive figures):

4 STARK.connect.M on a frame structure, fitted horizontally

Question:

Insertion moment $M_E > 2 \times$ load moment M_L ? (safety factor 2)



- M_E : Moment from insertion force
- M_L : Moment from load
- F_P : Process force = 2000 N
- F_E : Insertion force = 3000 N (bei 5 bar)
- F_G : Force due gravity, workpiece + pallet = $300 \text{ kg} \times 9.81 \text{ m/s}^2 = 2943 \text{ N}$
- Spacing = 660 x 360

Solution:

- Contact diameter = 55 mm
- $L_1 = 55 \text{ mm} / 2 = 27.5 \text{ mm} = 0.0275 \text{ m}$
- $L_2 = (55 \text{ mm} / 2 = 27.5 \text{ mm}) + 360 \text{ mm} = 0.3875 \text{ m}$
- $M_E = 2 \times (F_E \times L_1 + F_E \times L_2) = 2 \times (3000 \text{ N} \times 0.0275 \text{ m} + 3000 \text{ N} \times 0.3875 \text{ m})$
- $M_E = \mathbf{2490 \text{ Nm}}$
- $M_L = M_G + M_P$
- $M_L = (F_G \times L_G) + (F_P \times L_P) = (2943 \text{ N} \times 0.18 \text{ m}) + (2000 \text{ N} \times 0.31 \text{ m})$
- $M_L = \mathbf{1149.7 \text{ Nm}}$

- $M_E/M_L > 2?$
- $M_E/M_L = 2490 \text{ Nm} / 1149.7 \text{ Nm}$
- $M_E/M_L = \mathbf{2.17 > 2}$
- With this design there is a safety factor of around two.

Attention: acceleration forces due to handling operations are to be considered separately!
All variables are to be stated in SI units (metre, newton).

STARK.connect M

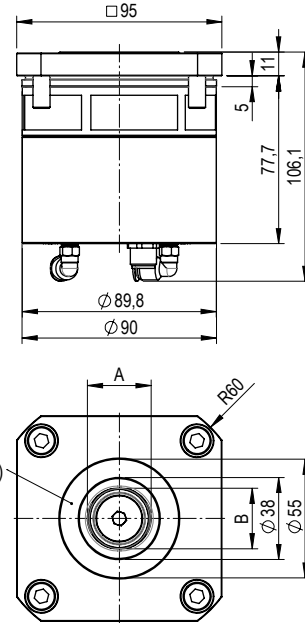


Fast closing clamp made of high quality tool steel or hard anodised aluminium. System is pneumatically single-acting (clamping via spring force) and optional pneumatic clamping force increase.

Version in a module design 95x95 mm with support ring. Integrated electrical query of the clamping state M12 connector, 5-pin, 24VDC.

- Retention force: 10,000 N
- Insertion force: 3,000 N (at 5 bar clamping pressure)
- Repeat accuracy: < 0.05 mm
- Min. release pressure: 5 bar
- Max. operating pressure: 10 bar / 20 bar*
- Weight: 1.8 kg
- Operating temperature: + 10 to + 80 °C
- Installation according to data sheet D169
- Operating manual WM-020-417-xx-xx

*with plug-in fitting S953-273, S953-272



Z_S9000-002_01

- 1) Hardened support surface
- Cylinder screws DIN 6912 with ISK M8 x 20 mm S931-978-02 enclosed separately
- L-push-in fittings S953-171 enclosed separately

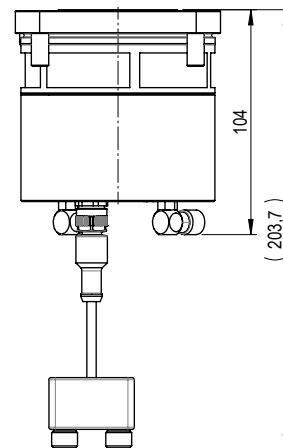
Order number	Article designation	Function	Material
S9000-001	SM KM P 030 G095 ST NP	with zero point	Tool steel, aluminium, NBR
S9000-002	SM KM P 030 G095 ST AG	with equaliser ±0.75 mm	Tool steel, aluminium, NBR
S9000-003	SM KM P 030 G095 ST OZ	without centring ±0.75 mm	Tool steel, aluminium, NBR

STARK.connect M - Set



Delivery set with pre-assembled angle connections, as well as Y-cable for connecting two M12 4-pin sensor cables.

- 1x STARK.connect.M (Part. No. S9000-00x)
- 2x angle-connection, rotating M5/AD6 (Part. No. S953-419)
- 1x Y-cable 113 mm, M12 socket 5-pin on 2x M12 connector 4-pin (Part. No. S958-153)
- Weight: 1.9 kg
- Installation according to data sheet D169
- Operating manual WM-020-417-xx-xx



Z_S9000-022_01

- Cylinder screw DIN 6912 with ISK M8 x 20 mm S931-978-02 enclosed separately
- L-push-in fittings S953-419 enclosed separately
- Y-cable 113 mm, M12 socket 5-pin on 2x M12 connector 4-pin S958-153, enclosed separately
- Missing dimensions, see S9000-00x

Order number	Article designation	Function	Element
S9000-021	SM KM P 030 G095 ST NP Set	with zero point	STARK.connect M (S9000-001)
S9000-022	SM KM P 030 G095 ST AG Set	with equaliser ±0.75 mm	STARK.connect M (S9000-002)
S9000-023	SM KM P 030 G095 ST OZ Set	without centring ±0.75 mm	STARK.connect M (S9000-003)

STARK.connect.LK.M

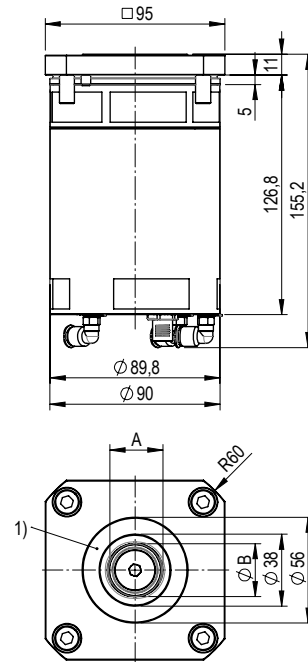


Fast closing clamp made of high quality tool steel or hard anodised aluminium. System is pneumatically single-acting (clamping via spring force) with lock (LOCK function) and optional pneumatic clamping force increase.

Version in a module design 95x95 mm with support ring. Integrated electrical query of the clamping state M12 connector, 8-pin, 24VDC.

- Retention force: 30,000 N
- Clamping force: 7.500 N (at 5.5 bar clamping pressure/locked)
- Repeat accuracy: < 0.05 mm
- Min. release pressure: 5.5 bar
- Max. operating pressure: 10 bar / 20 bar*
- Weight: 3.2 kg
- Operating temperature: + 10 to +80 °C
- Installation according to data sheet D169
- Operating manual WM-020-417-xx-xx

*with plug-in fitting S953-273, S953-272



Z_S9000-032_02

1) Hardened support surface
 - Cylinder screws DIN 6912 with ISK M8 x 20 mm S931-978-02 enclosed separately
 - L-push-in fittings S953-171 enclosed separately

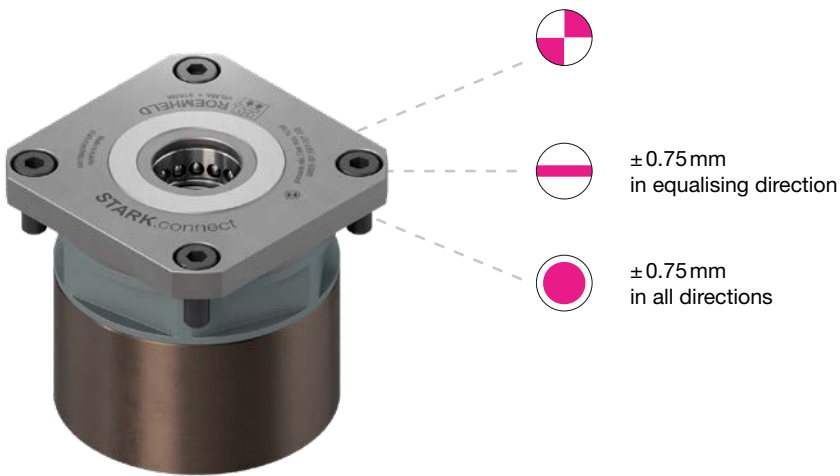
Order number	Article designation	Function	Material
S9000-031	SM KO P 100 G095 ST NP	with zero point	Tool steel, aluminium, NBR
S9000-032	SM KO P 100 G095 ST AG	with equaliser ±0.75 mm	Tool steel, aluminium, NBR
S9000-033	SM KO P 100 G095 ST OZ	without centring ±0.75 mm	Tool steel, aluminium, NBR

Equaliser options

Depending on the requirement, there are many possibilities to equalise tolerances with different materials and device sizes. In principle, the compensation can be carried out via the fast clamping lock or retractable nipple.

- Equalisation via fast closing clamp ± 0.75 mm
- Equalisation via retractable nipple AG ± 0.05 mm / OZ ± 0.2 mm

Equalisation via fast closing clamp

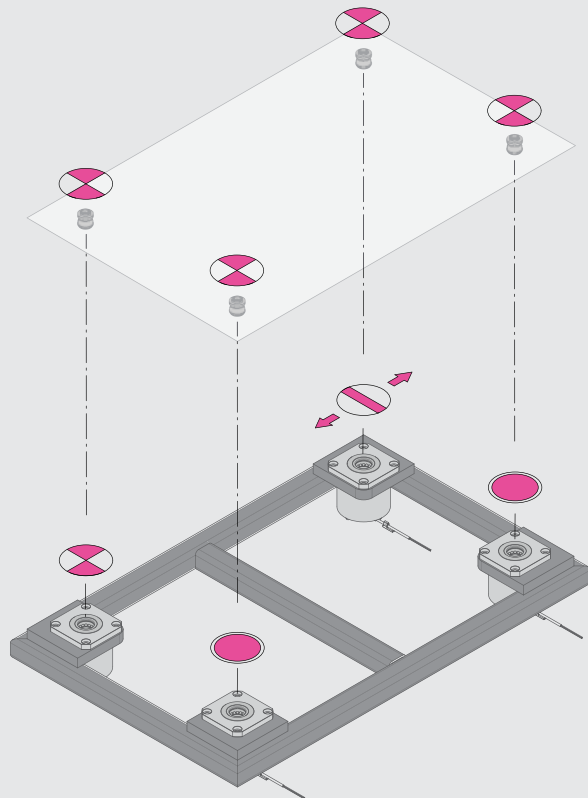


INFO

Equalisation via fast closing clamp

Area of application

- Different materials between pallet and plate
- Pallets with the same retractable nipple
- For a large number of pallets and direct tool clamping
- Tolerance range ± 0.75 mm



Symbols



with zero point (NP)

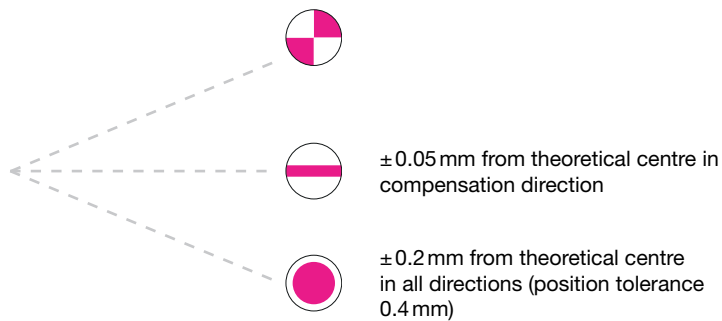


with equaliser (AG)



without centring (OZ)

Equaliser via retractable nipple

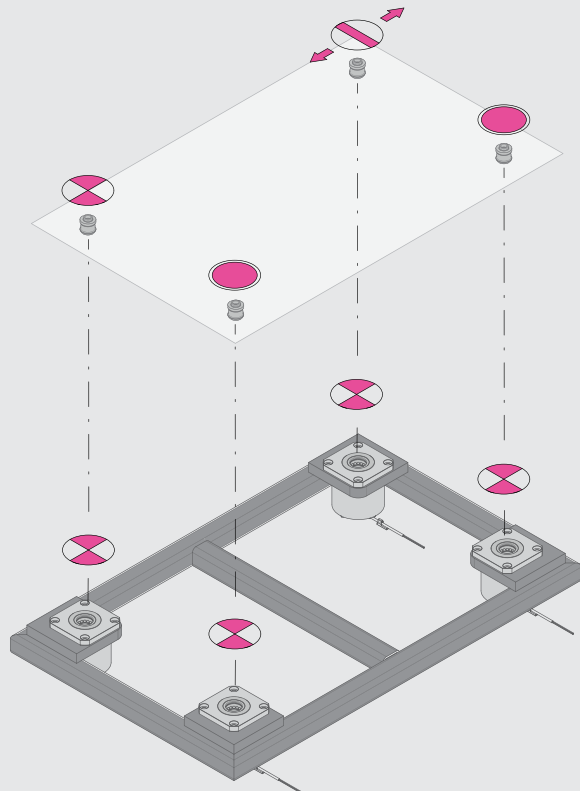


INFO

Equaliser via retractable nipple

Area of application

- Different materials between pallet and plate
- Flexible for different pallet sizes
- Tolerance range AG ± 0.05 mm / OZ ± 0.2 mm

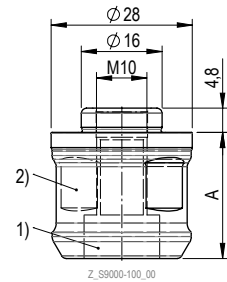


Retractable nipple STARK.connect with zero point



Retractable nipples suitable for all fast closing clamps of the STARK.connect family.

- Retractable nipple with zero point
- Collar: $\varnothing 16$ mm / 4.8 mm
- Material: Tool steel
- Weight: 0.05 kg
- Installation according to data sheet D170
- Operating manual WM-020-417-xx-xx



1) Countersink for M8 screw
2) Width across flats SW 24

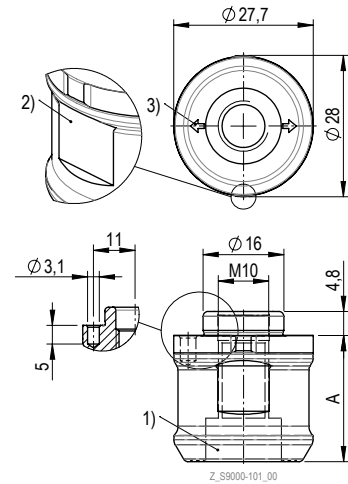
Order number	Article designation	Version	Length A / B
S9000-100	EB KM NP 160 10 048	standard	16.4 mm / 25 mm
S9000-103	EB KM NP 160 10 048 SO	shortened, without lifting	14.8 mm / 23.4 mm

Retractable nipple STARK.connect with equaliser



Retractable nipples suitable for all fast closing clamps of the STARK.connect family.

- Retractable nipple with equalisation and pre-assembled indexing pin ($\varnothing 3$ mm)
- Collar: $\varnothing 16$ mm / 4.8 mm
- Material: Tool steel
- Weight: 0.05 kg
- Installation according to data sheet D170



1) Countersink for M8 screw
2) Width across flats SW 24
3) Equalisation direction labelled
- Clamping pin $\varnothing 3.0 \times 8$ mm S936-333, enclosed separately

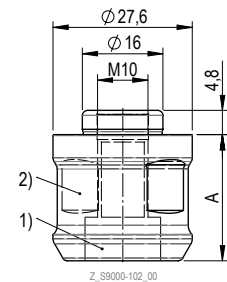
Order number	Article designation	Version	Length A / B
S9000-101	EB KM AG 160 10 048	standard	16.4 mm / 25 mm
S9000-104	EB KM AG 160 10 048 SO	shortened, without lifting	14.8 mm / 23.4 mm

Retractable nipple STARK.connect without centring



Retractable nipples suitable for all fast closing clamps of the STARK.connect family.

- Retractable nipple without centring
- Collar: $\varnothing 16$ mm / 4.8 mm
- Material: Tool steel
- Weight: 0.05 kg
- Installation according to data sheet D170
- Operating manual WM-020-417-xx-xx



1) Countersink for M8 screw
2) Width across flats SW 24

Order number	Article designation	Version	Length A / B
S9000-102	EB KM OZ 160 10 048	standard	16.4 mm / 25 mm
S9000-105	EB KM OZ 160 10 048 SO	shortened, without lifting	14.8 mm / 23.4 mm

Flexible handling with and without lifting from the fit

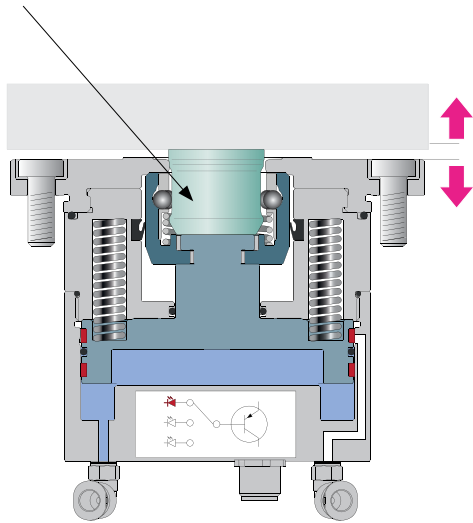
The release cycle of the STARK.connect series can be carried out with or without lifting from the fit. The release cycle with lifting (1) is achieved with "standard" retractable nipple. The release cycle without lifting (2) is carried out with "shortened" retractable nipple.

When is the "shortened" retractable nipple used?

If the STARK.connect is released, the "released" signal only occurs when the piston has reached the end position and the retractable nipple

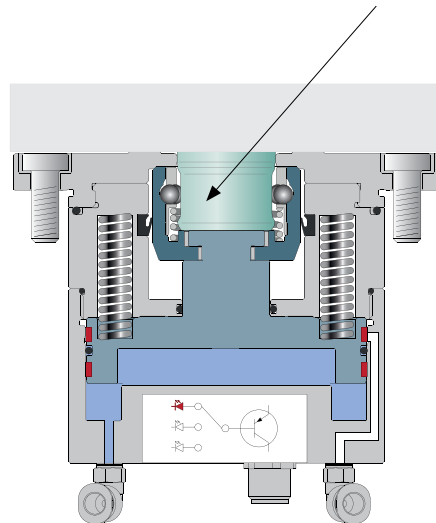
has been lifted. If lifting during release is not possible, e.g. due to the handling situation (the force acting against the lifting force is greater than the lifting force), the "released" piston position is not reached. This is avoided with the shortened retractable nipple. The piston reliably reaches the "released" position without the retractable nipple affecting the piston's freedom of movement.

"Standard" retractable nipple



(1) Released with lifting (1.5 mm)

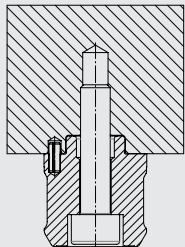
"Shortened" retractable nipple



(2) Released without lifting

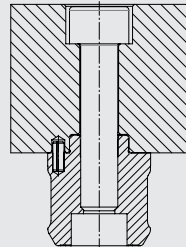
INFO

Application example



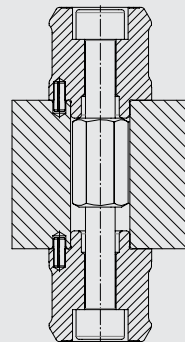
Version A

For applications where nipple bores are not permitted on the surface (e.g. pallet top) or for direct clamping of workpieces.



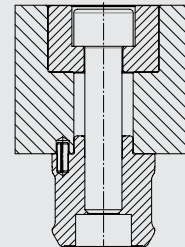
Version B

Simple nipple fastening from above.



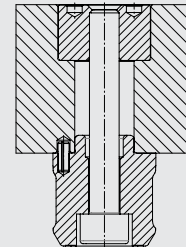
Version C

Ideal fastening version for clamping in laterally inverted manufacturing. Highest level of accuracy is guaranteed because the nipples are fastened in the same locating bore.



Version E

The fitting bores for the nipples and all necessary positioning bores on the pallet can be produced in one operation. This results in the highest level of accuracy of the positions to each other.



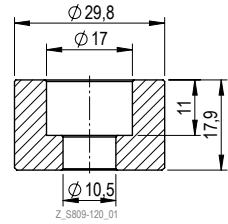
Version E.1

Nipple fastening E



Counterpart for assembling the retractable nipple according to the version "E".

- Allows to make the nipple fastening with one clamping
- Operating manual WM-020-168-xx-xx



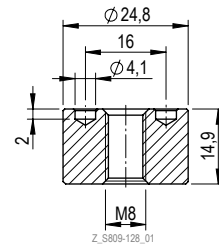
Order number	Article designation	Fastening bore	Installation according to data sheet	Weight
S809-120	NB 30 18 00 00 F10 NI E	M10	D170	0.05 kg

Nipple fastening E.1



Counterpart for assembling the retractable nipple according to fastening option "E.1"

- Allows to make the nipple fastening with one clamping mounting key or face wrench recommended for counterholding.
- Operating manual WM-020-168-xx-xx



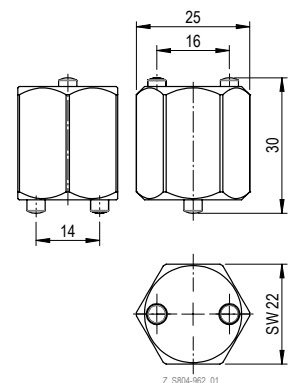
Order number	Article designation	Installation according to data sheet	Weight
S809-128	NB 25 15 00 00 M08 NI E1	D170	0.05 kg

Key for nipple fastening E.1



For mounting and dismounting the retractable nipples according to version "E.1".

- Width across flats SW22 for 16 and 18
- For tightening torque, see retractable nipple installation data sheets

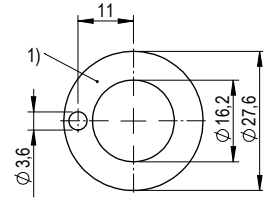


Order number	Article designation	Weight
S804-962	Key for nipple fastening M8	0.03 kg

STARK.connect - shim



Shim for the retractable nipple of the STARK.connect family to correct the z-position.



Z_S9000-902_00 1) Material thickness 0.1mm

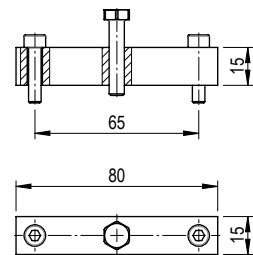
Order number	Article designation	Dimensions	Weight
S9000-902	STARK.connect - shim 0.1 mm	ø27.6mm / 0.1 mm	0.0003 kg

Bridge for unlocking



Bridge for the mechanical unlocking (in case of service – see operating manual) of the fast closing clamps STARK.connect and STARK.airtec with integrated querying.

- 1x bridge 80 mm x 15 mm
- 2x M5x22mm fixing screw
- 1x M6x30mm screw for lifting off



Z_S9000-900_00

Order number	Article designation	Weight
S9000-900	Bridge for unlocking STARK.airtec/connect	0.07 kg

Push-in fittings



Pneumatic M5 push-in fitting suitable for the STARK.connect and STARK.airtec fast closing clamps.

- In straight or angled version for 12 bar or 20 bar maximum pressure

Order number	Article designation	Version	Weight
S953-160	Push-in fitting QSM-M5-6	M5 Ø 6 mm – straight / 0° – max. 12 bar	0.005 kg
S953-273	Push-in fitting NPQH-D-M5-Q6-P10	M5 Ø 6 mm – straight / 0° – max. 20 bar	0.013 kg
S953-171	L-push-in fitting QSML-M5-6	M5 Ø 6 mm – angled / 90° – max. 12 bar	0.005 kg
S953-272	L-push-in fitting NPQH-L-M5-Q6-P10	M5 Ø 6 mm – angled / 90° – max. 20 bar	0.013 kg
S953-419	Angle connection, pivoted M5-AD6	M5 Ø 6 mm – angled / 90° – max. 16 bar	0.02 kg

Sensor cable

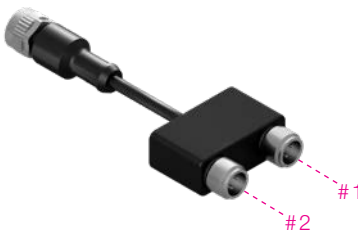


5- & 8-pin M12 sensor cable suitable for fast closing clamps STARK.connect and STARK.airtec

- M12 connector in straight or angled version, second side with open end in 2m or 5m length

Order number	Article designation	Version	Weight
S999-700	Sensor cable M12 2m open end 0°	5-pin sensor cable, l = 2m, M12 connector 0°, open end	0.05 kg
S999-701	Sensor cable M12 5m open end 0°	5-pin sensor cable, l = 5m, M12 connector 0°, open end	0.15 kg
S999-702	Sensor cable M12 2m open end 90°	5-pin sensor cable, l = 2m, M12 connector 90°, open end	0.05 kg
S999-703	Sensor cable M12 5m open end 90°	5-pin sensor cable, l = 5m, M12 connector 90°, open end	0.15 kg
S958-202	Sensor cable M12 2m open end 90°	8-pin sensor cable, l = 2m, M12 connector 90°, open end	0.05 kg

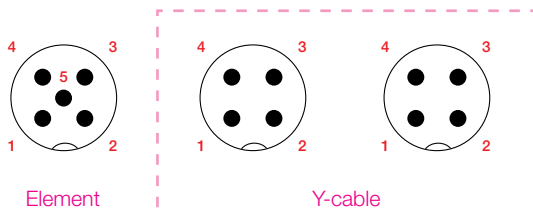
Y-cable & pin assignment



For connecting and evaluating the integrated sensor unit.

- For use with 4-pin sensor-cable with M12 connector

Order number	Article designation	Version	Weight
S958-153	Y-cable	Cable 113 mm, M12 socket 5-pin to 2x M12-connector 4-pin	0.03 kg



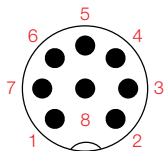
Assignment	Assignment #1	Assignment #2	Description	Signal type	Display (rear)
Pin 1	Pin 1	not assigned	24VDC	Supply	
Pin 2	Not assigned	Pin 2	Signal "clamped without nipple"	PNP	LED yellow
Pin 3	Pin 3	Pin 3	GND	Supply	
Pin 4	Pin 4	not assigned	Signal "nipple clamped"	PNP	LED green
Pin 5	Not assigned	Pin 4	Signal "released"	PNP	LED red
Shield	Not applied	Not applied	Not applied		

Distributor & pin assignment



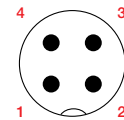
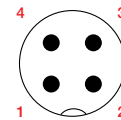
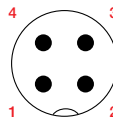
STARK.connect.LK distributor with 3 or 5 m connection cable, with which the 5 signals can be distributed to three 4-pin M12 sensor cables.

Order number	Article designation
S958-203	Distributor STARK.connect.LK with 3 m connection line
S958-215	Distributor STARK.connect.LK with 5 m connection line



Element

Pin No	Assignment
Pin 1	24VDC
Pin 2	Element clamped empty
Pin 3	GND
Pin 4	Element clamped
Pin 5	Element released
Pin 6	not assigned
Pin 7	locked
Pin 8	unlocked



Distributor

Pin No	Assignment #1	Assignment #2	Assignment #3
Pin 1	24VDC	24VDC	24VDC
Pin 2	Element clamped	locked	Element clamped empty
Pin 3	GND	GND	GND
Pin 4	Element released	unlocked	not assigned

Programming aid

The programming aid serves to support the teach-in of a work cycle with a robot. The programming aid case contains three sets for the STARK.airtec and STARK.connect. One set consists of a 50 mm attachment for the side of the retractable nipple and a 50 mm attachment for

the side of the fast closing clamp. Both attachments together thus result in a distance of 100 mm. After successful determination of the coordinates, the 2x 50 mm can be corrected again in the programming.



One set consists of a 50 mm attachment for the side of the retractable nipple and a 50 mm attachment for the side of the fast closing clamp.

Programming aid for teaching in a robot



Programming aid for fast closing clamps locks STARK.connect and STARK.airtec

- Case with foam insert and associated tools
- 3x nipple side (turning attachment STARK.airtec / STARK.connect)
- 3x element side with pre-assembled STARK.connect nipple with zero point
- 3x nipple for STARK.airtec with zero point

Order number	Article designation	Weight
S9000-901	Programming aid STARK.airtec/connect	5kg



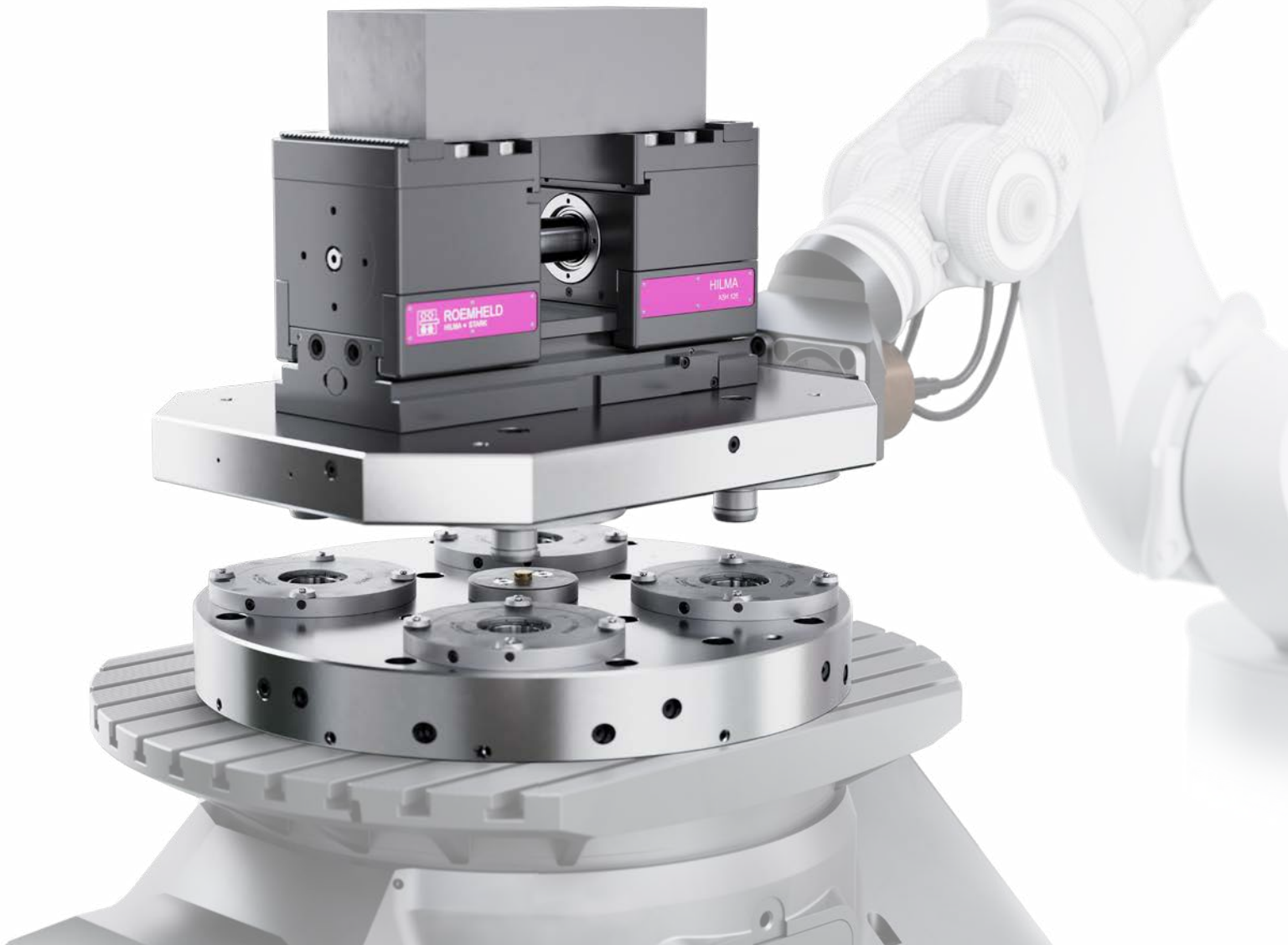
STARK.connect list of order numbers

S804-962	20	S9000-002	14
S809-120	20	S9000-003	14
S809-128	20	S9000-021	14
S953-160	21	S9000-022	14
S953-171	21	S9000-023	14
S953-272	21	S9000-031	15
S953-273	21	S9000-032	15
S953-419	21	S9000-033	15
S958-153	22	S9000-100	18
S958-202	22	S9000-101	18
S958-203	23	S9000-102	18
S958-215	23	S9000-103	18
S999-700	22	S9000-104	18
S999-701	22	S9000-105	18
S999-702	22	S9000-900	21
S999-703	22	S9000-901	24
S9000-001	14	S9000-902	21



HILMA VICES CAN BE COMPLEMENTED AND COMBINED PERFECTLY WITH STARK ZERO POINT CLAMPING SYSTEMS.

UTILIZE SYNERGIES



- ▶ Automation clamping system HILMA.ASH 125 on STARK zero point clamping system
- ▶ STARK fast closing plate with 4 elements STARK.classic.NG.2 Twister and media duct for clamping/releasing the vice
- ▶ Coupling unit with zero point clamping system (fixture pallet - handling system); 2 STARK.airtec elements with integrated query

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STARK Spannsysteme

The ROEMHELD Group is represented in Germany and Austria with different products and orientations. With numerous subsidiaries, sales partners and service companies on all continents and in more than 50 countries, rapid and intensive customer support is provided in the mechanical engineering, medical technology, automotive, aviation and agricultural industries.

As part of the ROEMHELD Group, STARK benefits from the security and experience of a family-run traditional company as well as from the worldwide sales and service network. At the same time, this background provides the independence to pursue dynamic and innovative goals for new market-driven developments and customer-specific solutions with which STARK maintains its leading technological position.



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