ROEMHELD
HILMA ▪ STARK

STARK.classic

Zero point clamping system
Single acting, hydraulic or pneumatic

STARK Spannsysteme
stark-roemheld.com

ROEMHELD
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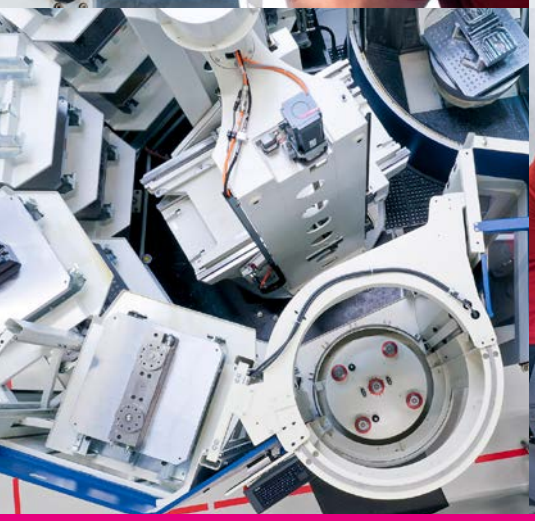


STARK

INNOVATIVE
PROFICIENT
INDIVIDUAL
RELIABLE

The high-tech company STARK Spannsysteme was established in 1977 in Rankweil, Austria. It manufactures zero point clamping systems and vises of the highest quality and precision for international clients in the automotive, aviation and medical industries, for example.

STARK Spannsysteme products are a byword for minimal set-up times, faster production and high flexibility.

HILMA vises can be complemented and combined perfectly with STARK zero point clamping systems.

SECTORS & MARKETS IN FOCUS.

AUTOMOTIVE

AVIATION

MACHINE AND TOOL CONSTRUCTION

MEDICINE

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.classic

lifting: STARK.classic lifts pallet when released
simple: easy cleaning
precise: cylindrical fit
durable: pulling bolts into the fit
versatile: clamp control, mount control, blow-off, media duct

STARK.basic

STARK.connect

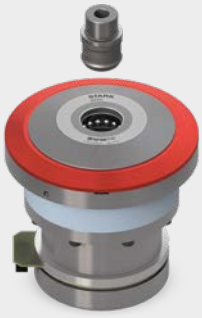
STARK.hydratec

STARK.airtec

STARK Spannsysteme

More productivity through:

- **maximum flexibility in production**
- **highest process reliability**
- **reduced manufacturing costs due to set-up time optimisation**



STARK.etec

STARK.sweeper

STARK.balance

STARK.easyclick

STARK.metec

STARK.plaintec

Table of contents

ZERO-POINT CLAMPING SYSTEM

STARK.classic

The fast closing clamps in the **STARK**.classic product family are versatile zero-point clamping systems for integration into machine pallets, plates, brackets, cubes, towers and swing bridges.

They are suitable for all common machining processes such as milling, turning, grinding, eroding as well as for testing and assembly devices. Made from high-quality tool steel, the clamping elements are clamped mechanically and released hydraulically.

STARK.classic clamping elements

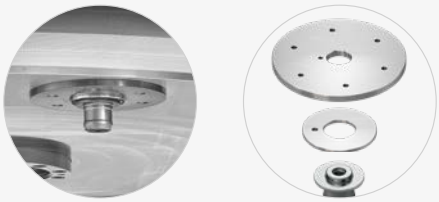
In addition to three different sizes, all elements are available with additional functions - e.g. integrated media duct, indexing, blow-out or high-precision fit.

Media transfer

Interfaces for media transfer (hydraulics, pneumatics, vacuum, electrics) integrated in the fast closing clamp or as free-standing transfer elements.

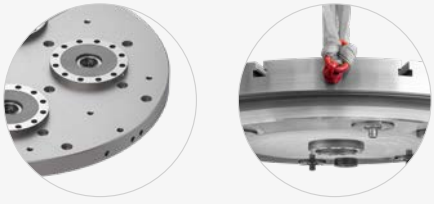
Support discs

Hardened support discs are particularly suitable for protecting soft pallets from wear during high-frequency change cycles. Also in combination with small and therefore easy-to-clean support islands (Twister).



Assembly & transport

Flexible number and positioning of fixing screws, alignment elements (e.g. king pins) and transport threads.



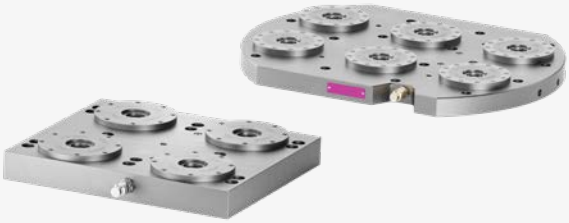
AVIATION APPLICATION

Grinding machine application

Zero point clamping system with 6 elements STARK.classic.NG.2, 3 × pre-centring, integrated media coupling, retractable nipple with support and spacers. Centring mandrel and ring with press fit for maximum repeat accuracy and lateral forces.

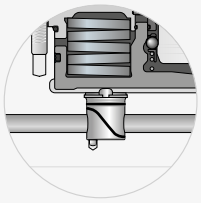
STARK Fast closing plates

Immediately available standard panels or customised solutions available at short notice.



Clamping and release control

Secure clamping is essential both in pure turning applications and in mill-turn machining. The clamping states are created flexibly and can be processed on the machine side or visualised.



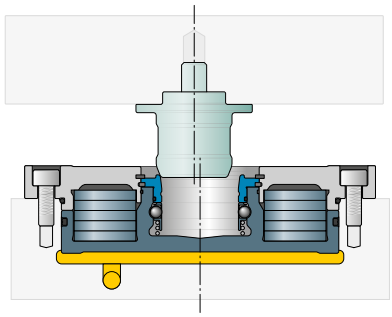
Pre-centring

Reliable handling of heavy workpiece carriers (e.g. for crane loading). The pallet is caught in advance and guided precisely into the clamping system.

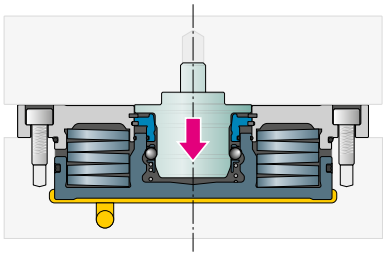
Control

The fast closing plate and its monitoring functions can be controlled either via side connections or directly via the machine table.

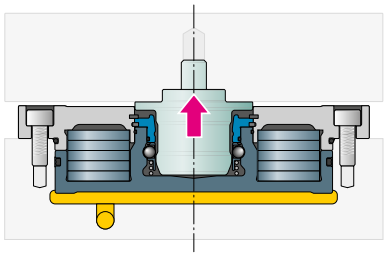
Functions and benefits



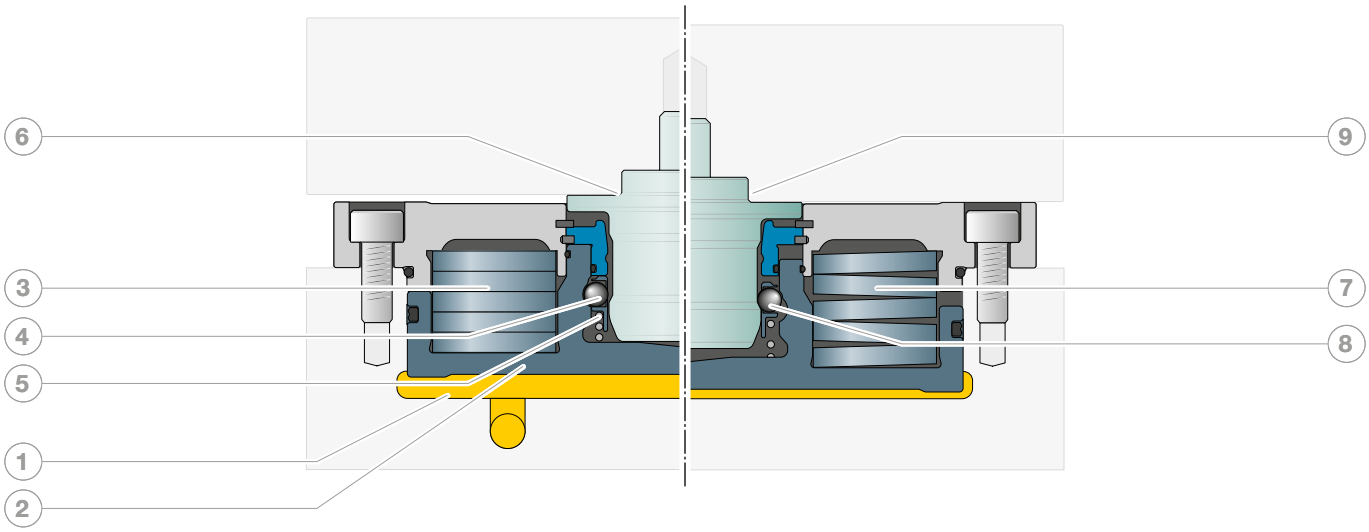
Retracting and pre-positioning



Positioning and clamping



Release and lift



Hydraulic release

- The piston (2) is subjected to the hydraulic pressure (1) and moves upwards. The spring assembly (3) is compressed.
- The balls (4) in the ball retainer (5) move outwards to the parking position.
- The retractable nipple (6) moves into the fast closing clamp until it rests against the piston crown.
- The retractable nipple (6) is pre-positioned.

Mechanical clamping

- The hydraulic system is relieved, the oil pressure drops to 0 bar.
- The spring pre-tensioning force is initiated via the piston (2) which moves down.
  The fit is joined and the retractable nipple (9) is positioned with high precision.
- The balls (8) lie form-fitted between the piston and the retractable nipple in the contour provided.
- The pre-tensioning force of the springs (7) now acts directly and permanently downwards on the retractable nipple.

Data sheets and 3D data: www.stark-roemheld.com
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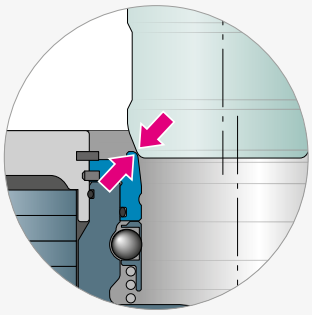
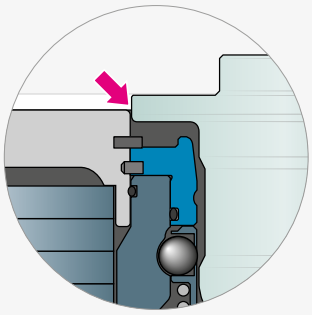


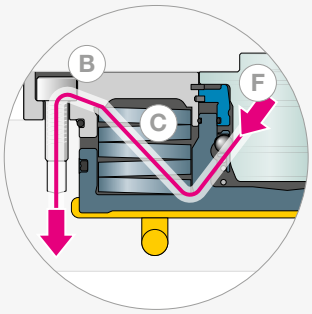
WEAR-RESISTANT RETRACTING AND PRE-CENTRING

- Due to the special retractable nipple contour, the fitting diameter is not damaged when retracting in the clamping element.
- High alloy tool steel provides wear resistance.



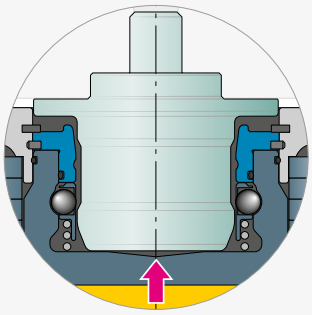
MATCHED RADII ON THE FITTING DIAMETER

- Matched radii on the clamping element and on the retractable nipple result in exact pre-positioning.
- The fit is joined by retracting the pallet.
  The operator only has to put down or remove the pallet.
- No chips can be trapped in the cylindrical bore.



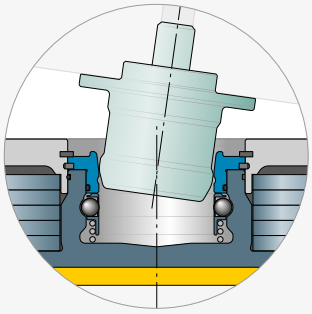
OPTIMAL FORCE DISTRIBUTION — NO BENDING OR LIFTING

- Spring force permanently fixes the retractable nipples in a form-fit and highly precise manner. This has a vibration-damping effect and increases the quality of the surface to be processed as well as the service life of the tools.
- The spring force (F) acts in the immediate vicinity of the fixing screw (B).
  This means that there is no deflection on the disc (C).



LIFTING OUT OF THE FIT

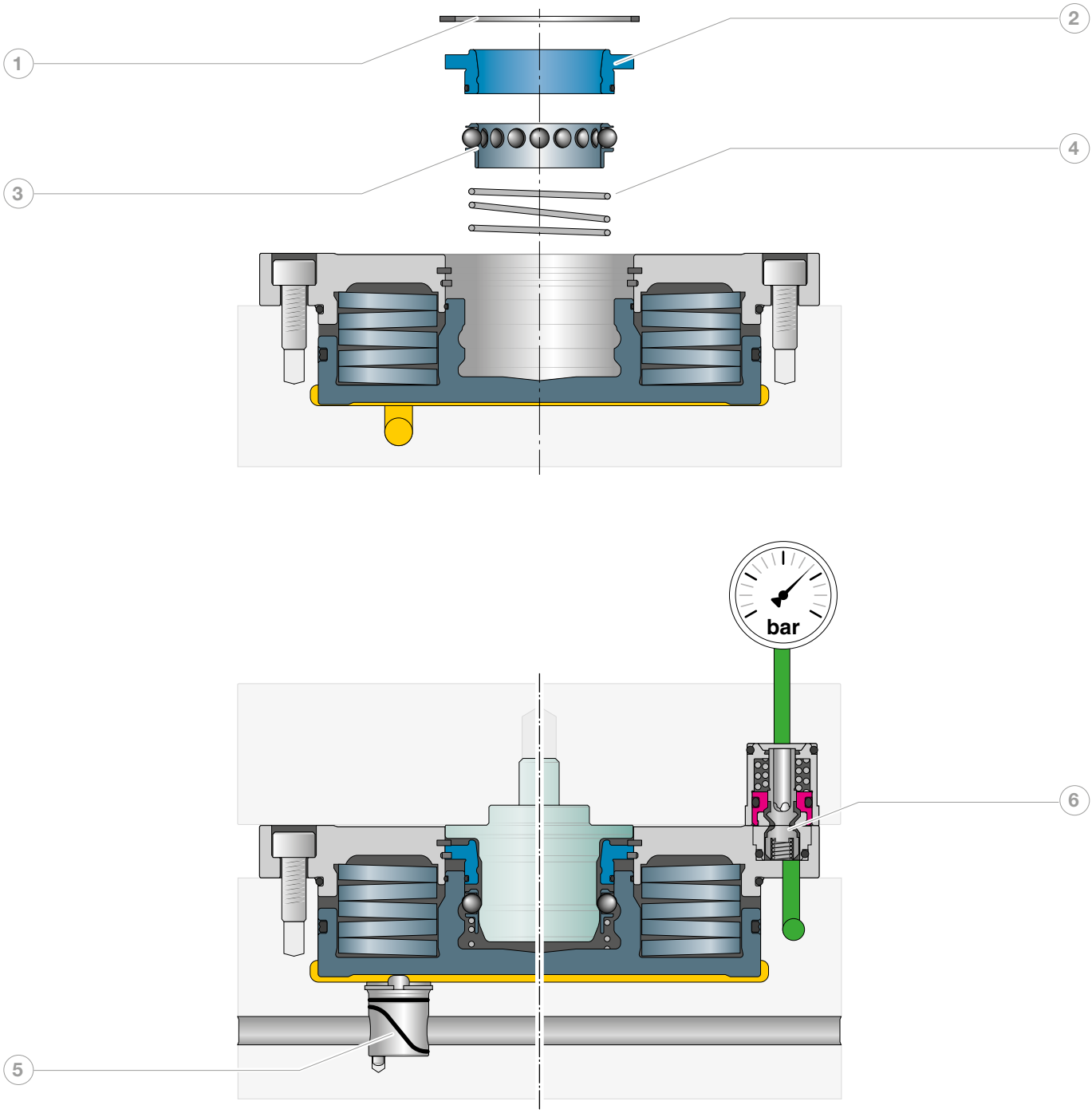
When releasing, the retractable nipple is lifted out of the fit in a controlled manner and the operator recognises that the system is released. This makes handling safe and extremely simple.



INCLINED RETRACTING AND EXTENDING

Changing workpieces, devices or pallets without tilting.
Particularly suitable for asymmetrical weight distribution above the pallet with STARK.classic size 2 and 3.

Functions and benefits



1) Lock ring
2) Retaining ring
3) Ball retainer
4) Spring (or O-ring)
5) Clamp control valve
6) Integrated media duct

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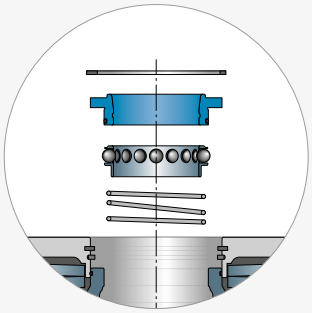
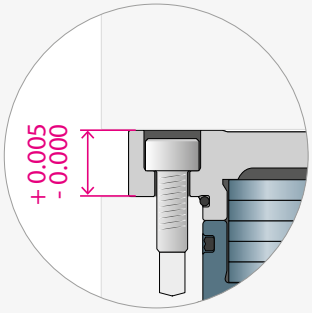


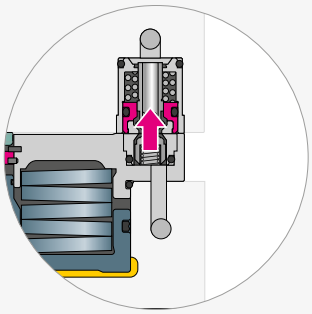
EASY CLEANING

- In machining production, contamination of the clamping system is unavoidable in the long term. Therefore, an easy cleaning option is very important.
- For the STARK.classic fast closing clamp, the retaining ring (2), ball retainer (3) and spring (4) can be easily removed, cleaned and used again after the lock ring (1) has been removed. This enables easy maintenance and the lowest possible downtimes.
- Easy to exchange due to highly accurate tolerances – no need for set-up or tuning.



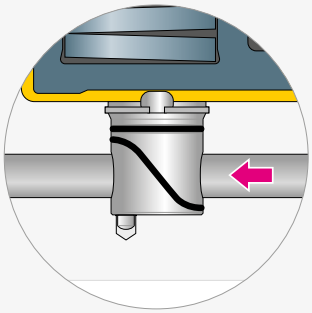
PRECISE SUPPORT

- For special requirements, the Twister design can be supplied with a tolerance of 2 µ – particularly advantageous for high-precision, matched systems (e.g. clamping element changeover).
- Highest accuracy to reduce tolerance errors.
- The standard tolerance for the disc height of STARK clamping elements is 5 µ.



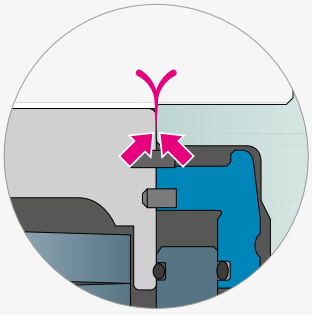
INTEGRATED MEDIA DUCT

- For the passage of media such as oil, air, water, etc., STARK.classic can be equipped with integrated media ducts (6) on request. These are automatically positioned and coupled during clamping.
- This allows, for example, clamping fixtures mounted on machine pallets to be supplied with energy (hydraulics, pneumatics, etc.). The coupling force is applied by the clamping element. With extremely simple handling, the pallet is positioned, clamped and coupled fully automatically.



CLAMP CONTROL

- For safety reasons, a clamp control is strongly recommended for all high-speed applications. STARK.classic i can be optionally equipped with a mechanical clamp control valve (6) for this purpose.
- The evaluation of the clamp control can be integrated directly into the machine control system or can be displayed by means of a visual clamp control. Existing machines can also be retrofitted with a corresponding hydraulic unit and suitable control system.



HG – HIGH-PRECISION DUE TO PRESS FIT

- High accuracy due to press fit between clamping element and retractable nipple.
- Used in high precision applications in 5-axis or rotary applications in the centre of the fast closing plate, e.g. turbine engine parts.
- This ensures that the axis of rotation is always precisely in the centre. This high accuracy ("aeronautical accuracy") is achieved by a press fit between the retractable nipple and the clamping element. The use of a press fit is made possible by the active insertion and lifting of the STARK.classic system.

Technical data STARK.classic.NG

		STARK.classic.NG.1	**STARK**.classic.NG.2	**STARK**.classic.NG.3
Maintenance interval	Cycles		40,000	
Insertion force [1]	[N]	8,000	22,000	38,000
Retention force [2]	[N]	25,000	38,000	55,000
Min./max. release pressure	[bar]		40/80	
Lifting force at 50 bar / 60 bar	[N]	4,900/9,100	13,900/21,700	17,000/31,500
Lifting	[mm]	1.2		1.5
Insertion	[mm]	1.2		1.5
max. permitted lateral forces (90 degrees in the equalising direction)	[N]	7,000	9,000	10,500
Release oil volume	[cm³]	20	40	124
Min. permitted clamping time	[s]		2	
Min. permitted release time	[s]		2	
Radial pre-positioning [3]	[mm]	±3	±2.5	±4.5
Axial pre-positioning [4]	[mm]		−0.3	
Repeat accuracy [5]	[mm]		< 0.005 / < 0.001*	
System accuracy [6]	[mm]		< 0.01	

[1] *Insertion force:* *The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded.*

[2] *Retention force:* *This is the maximum overload up to which the retractable nipple is still held but the zero point has already been left.*

[3] *Radial pre-positioning:* *The loading device must be compliant for automated loading.*

[4] *Axial pre-positioning:* *Retractable nipple is in contact with the piston crown before the clamping process. A gap of max. 0.3 mm is permissible.*

[5] *Repeat accuracy:* *This indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).*
** Repeat accuracy for high-precision (HG) clamping elements*

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

INFO Article designation and functions

The article designation for clamping elements and retractable nipples are compiled according to a function code.

Example:

STARK.classic.NG.2, Standard
SE N2 H 220 D139 ST NP DH

SE *STARK installation element*
N2 *STARK.classic.NG.2*
H *Hydraulic element*
220 *Insertion force 22,000 N*
D139 *Disc diameter 139 mm*
ST *Standard*
NP *with zero point*
DH *Third-hand function*

N1	STARK.classic.NG.1	NP	with zero point
N2	STARK.classic.NG.2	AG	with equaliser
N3	STARK.classic.NG.3	OZ	without centring
C1	STARK.classic.1	IN	Indexing
C2	STARK.classic.2	KA	Coolant outlet
C3	STARK.classic.3	HG	High precision (Ø)
H	Hydraulic element	2M	2µ (disc)
P	Pneumatic element	DH	Third-hand function
ST	Standard	MD1	1× media duct
TW	Twister	MD2	2× media duct
TO	Tornado	MD3	3× media duct
		MD4	4× media duct

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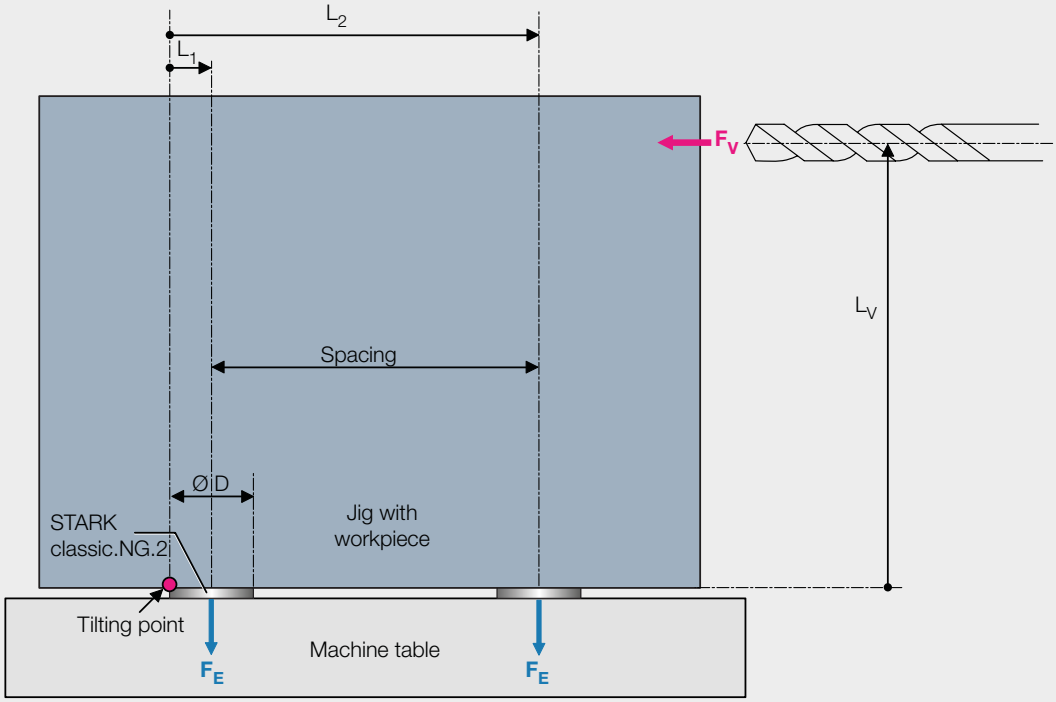
Tilting moment calculation example

INFO

Tilting moment calculation example

Example:
Fast closing clamp plate 4 STARK.classic.NG.2 with spacing 400 x 400 and max. feed force of 10 kN with distance of 1000 mm.

Question:
Due to the predominance of roughing work, the system is to be checked for a double safety factor.
Is the insertion force, the number of fast closing clamps and the spacing selected adequate?



Solution:
$M_E > 2 \times M_V$?

$M_V = F_V \times L_V = 10{,}000\ N \times 1.0\ m$
M_V = **10.000 Nm**
$M_E = 2 \times (F_E \times L_1) + 2 \times (F_E \times L_2)$
$M_E = 2 \times F_E \times (L_1 + L_2)$
$L_1 = Ø\,D / 2$
$L_2 = Ø\,D / 2 + \text{Spacing}$
$L_1 + L_2 = Ø\,D + \text{Spacing}$
$L_1 + L_2 = 0.139\ m + 0.40\ m = 0.539\ m$
$M_E = 2 \times F_E \times (L_1 + L_2) = 2 \times 22{,}000\ N \times 0.539\ m$
M_E = **23,716 Nm**

$M_E / M_V > 2$?
$M_E / M_V = 23{,}716\ Nm / 10{,}000\ Nm$
M_E / M_V = **2.37 > 2**

With this design there is a safety factor of 2,37

(Enter all variables in SI units (metres, newtons))

M_V : Moment from feed force
M_E : Moment from insertion force
F_V : Feed force (10,000 N)
F_E : Insertion force (22,000 N)
Spacing = 400 mm = 0.40 m
Ø D (bearing rng) : 139 mm = 0.139 m
L_V : 1,000 mm = 1.0 m

CLAMPING ELEMENTS STARK.classic.NG.1

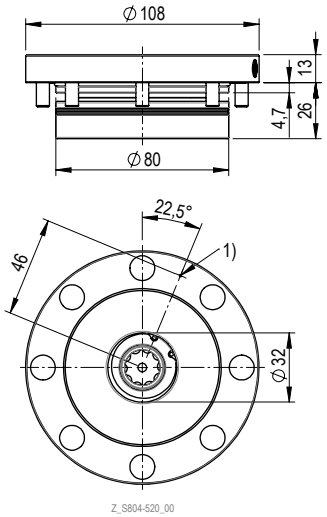
STARK.classic.NG.1, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø 108 mm, Standard
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 25,000 N
- Insertion force: 8,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 1.55 kg
- Pre-mounted incl. transportation lock + 0.14 kg
- Operating manual: WM-020-332-xx-xx



1) Seat check
- Screw covers M6 S704-231 enclosed separately
- Cylinder screws with hexagon socket M6 x 16 mm S931-139, enclosed separately
- O-ring Ø 5 × 1.5 mm S933-051, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-520	SE N1 H 080 D108 ST NP DH	Standard, third-hand function *1	< 0.005 mm	D160, D032, D072
S804-521	SE N1 H 080 D108 ST NP HG	Standard, high-precision *2	< 0.001 mm	D160, D032, D072
S804-525	SE N1 H 080 D108 ST NP MD1	Standard, 1× media duct *3	< 0.005 mm	D160, D032, D072, D021
S804-526	SE N1 H 080 D108 ST NP MD2	Standard, 2× media duct *3	< 0.005 mm	D160, D032, D072, D021
S804-527	SE N1 H 080 D108 ST NP MD3	Standard, 3× media duct *3	< 0.005 mm	D160, D032, D072, D021
S804-528	SE N1 H 080 D108 ST NP MD4	Standard, 4× media duct *3	< 0.005 mm	D160, D032, D072, D021

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
*3 Media duct functional description – see page 38
Element overview with additional functions – see Element Matrix, page 20

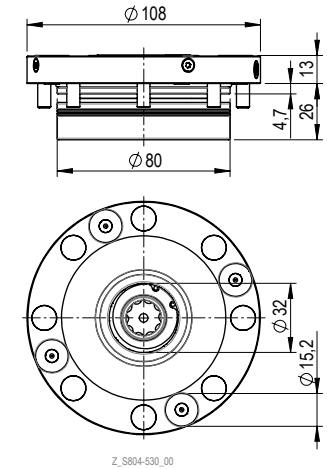
STARK.classic.NG.1, Tornado

Fast closing clamp made of high-quality tool steel

- Installation element Ø 108 mm, Tornado with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 25,000 N
- Insertion force: 8,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 1.55 kg
- Pre-mounted incl. transportation lock + 0.14 kg
- Operating manual: WM-020-332-xx-xx



- Screw covers M6 S704-231 enclosed separately
- Cylinder screws with hexagon socket M6 x 16 mm S931-139, enclosed separately
- O-ring Ø 5 × 1.5 mm S933-051, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-530	SE N1 H 080 D108 TO NP DH	Tornado, third-hand function *1	< 0.005 mm	D179, D072
S804-531	SE N1 H 080 D108 TO NP HG	Tornado, high-precision *2	< 0.001 mm	D179, D072

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
Element overview with additional functions – see Element Matrix, page 20

Data sheets and 3D data: www.stark-roemheld.com
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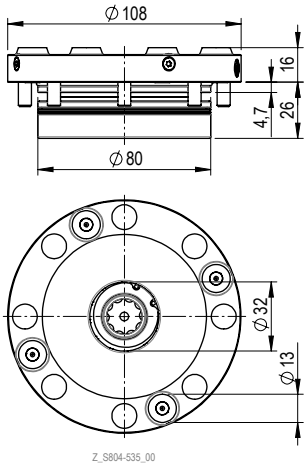
STARK.classic.NG.1, Twister

Fast closing clamp made of high-quality tool steel

- Installation element Ø 108 mm, Twister with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 25,000 N
- Insertion force: 8,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 1.55 kg
- Pre-mounted incl. transportation lock + 0.14 kg
- Operating manual: WM-020-332-xx-xx



Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-535	SE N1 H 080 D108 TW NP DH	Twister, third-hand function *1	< 0.005 mm	D179, D072
S804-536	SE N1 H 080 D108 TW NP HG	Twister, high-precision *2	< 0.001 mm	D179, D072
S804-533	SE N1 H 080 D108 TW NP 2M DH	Twister, 2 µ *3, third-hand function *1	< 0.005 mm	D179, D072, D189
S804-534	SE N1 H 080 D108 TW NP HG 2M	Twister, high-precision *2, 2 µ *3	< 0.001 mm	D179, D072, D189

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
*3 2 µ functional description, see page 31
Element overview with additional functions – see Element Matrix, page 20

CLAMPING ELEMENTS STARK.classic.NG.2

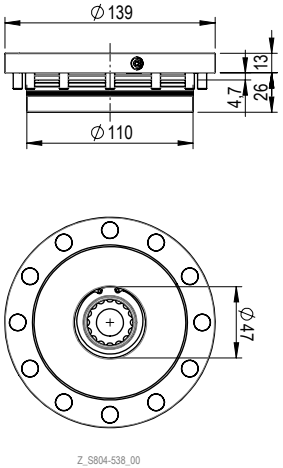
STARK.classic.NG.2, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø 139 mm, Standard
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 38,000 N
- Insertion force: 22,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 2.5 kg
- Pre-mounted incl. transportation lock + 0.33 kg
- Operating manual: WM-020-332-xx-xx



Z_S804-538_00

1) Seat check
- Plastic covers M6 S999-408 enclosed separately
- Cylinder screw with hexagon socket M6 × 16 mm S931-138, enclosed separately
- O-rings ø 7 × 1.5 mm S933-043, enclosed separately
- O-ring ø 5 × 1.5 mm S933-051, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-538	SE N2 H 220 D139 ST NP DH	Standard, third-hand function *1	< 0.005 mm	D134, D032, D072
S804-538-02	SE N2 H 220 D139 ST NP HG	Standard, high-precision *2	< 0.001 mm	D134, D032, D072
S804-545	SE N2 H 220 D139 ST NP MD1	Standard, 1× media duct *3	< 0.005 mm	D134, D032, D072, D021
S804-546	SE N2 H 220 D139 ST NP MD2	Standard, 2× media duct *3	< 0.005 mm	D134, D032, D072, D021
S804-547	SE N2 H 220 D139 ST NP MD3	Standard, 3× media duct *3	< 0.005 mm	D134, D032, D072, D021
S804-548	SE N2 H 220 D139 ST NP MD4	Standard, 4× media duct *3	< 0.005 mm	D134, D032, D072, D021

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
*3 Media duct functional description – see page 38
Element overview with additional functions – see Element Matrix, page 20

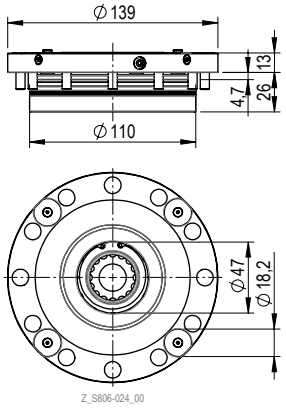
STARK.classic.NG.2, Tornado

Fast closing clamp made of high-quality tool steel

- Installation element Ø 139 mm, Tornado with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 38,000 N
- Insertion force: 22,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 2.5 kg
- Pre-mounted incl. transportation lock + 0.33 kg
- Operating manual: WM-020-332-xx-xx



Z_S806-024_00

- Plastic covers M6 S999-408 enclosed separately
- Cylinder screw with hexagon socket M6 × 16 mm S931-138, enclosed separately
- O-rings ø 7 × 1.5 mm S933-043, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S806-024	SE N2 H 220 D139 TO NP DH	Tornado, third-hand function *1	< 0.005 mm	D115, D072
S806-025	SE N2 H 220 D139 TO NP HG	Tornado, high-precision *2	< 0.001 mm	D115, D072

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
Element overview with additional functions – see Element Matrix, page 20

Data sheets and 3D data: www.stark-roemheld.com
STARK Spannsysteme | +43 5522 37400 | info@stark-roemheld.com
Subject to modification | WM-020-450-00-en

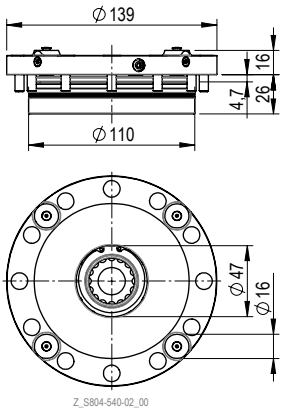
STARK.classic.NG.2, Twister

Fast closing clamp made of high-quality tool steel

- Installation element Ø 139 mm, Twister with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 38,000 N
- Insertion force: 22,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 2.5 kg
- Pre-mounted incl. transportation lock + 0.33 kg
- Operating manual: WM-020-332-xx-xx



- Plastic covers M6 S999-408 enclosed separately
- Cylinder screw with hexagon socket M6 x 16 mm S931-138, enclosed separately
- O-rings Ø 7 × 1.5 mm S933-043, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-540-02	SE N2 H 220 D139 TW NP DH	Twister, third-hand function *1	< 0.005 mm	D115, D072
S804-540-01	SE N2 H 220 D139 TW NP HG	Twister, high-precision *2	< 0.001 mm	D115, D072
S804-540-12	SE N2 H 220 D139 TW NP 2M DH	Twister, 2 µ *3, third-hand function *1	< 0.005 mm	D115, D117, D072
S804-540-11	SE N2 H 220 D139 TW NP HG 2M	Twister, high-precision *2, 2 µ *3	< 0.001 mm	D115, D117, D072

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
*3 Media duct functional description – see page 38
Element overview with additional functions - see Element Matrix, page 20

CLAMPING ELEMENTS STARK.classic.NG.3

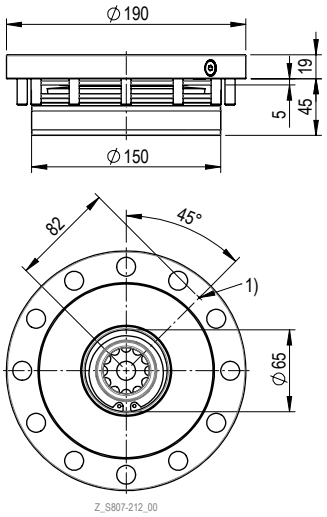
STARK.classic.NG.3, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø 190 mm, Standard
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 55,000 N
- Insertion force: 38,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 7.6 kg
- Pre-mounted incl. transportation lock + 0.72 kg
- Operating manual: WM-020-332-xx-xx



1) Seat check
- Plastic covers M8 S999-365 enclosed separately
- Cylinder screws with hexagon socket M8 x 30 mm S931-284, enclosed separately
- O-rings ø 7 × 1.5 mm S933-043, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S807-212	SE N3 H 380 D190 ST NP DH	Standard, third-hand function *1	< 0.005 mm	D106, D032, D072
S807-212-01	SE N3 H 380 D190 ST NP HG	Standard, high-precision *2	< 0.001 mm	D106, D032, D072
S807-214	SE N3 H 380 D190 ST NP MD1	Standard, 1× media duct *3	< 0.005 mm	D106, D032, D072, D021
S807-215	SE N3 H 380 D190 ST NP MD2	Standard, 2× media duct *3	< 0.005 mm	D106, D032, D072, D021
S807-216	SE N3 H 380 D190 ST NP MD3	Standard, 3× media duct *3	< 0.005 mm	D106, D032, D072, D021
S807-217	SE N3 H 380 D190 ST NP MD4	Standard, 4× media duct *3	< 0.005 mm	D106, D032, D072, D021

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
*3 Media duct functional description – see page 38
Element overview with additional functions – see Element Matrix, page 20

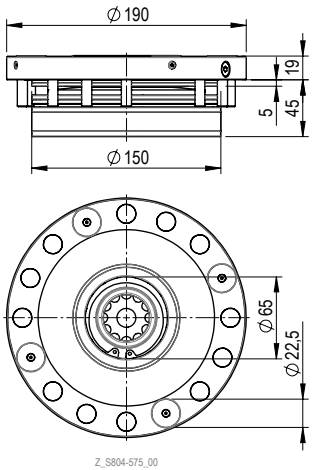
STARK.classic.NG.3, Tornado

Fast closing clamp made of high-quality tool steel

- Installation element Ø 190 mm, Tornado with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 55,000 N
- Insertion force: 38,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 7.6 kg
- Pre-mounted incl. transportation lock + 0.72 kg
- Operating manual: WM-020-332-xx-xx



- Plastic covers M8 S999-365 enclosed separately
- Cylinder screws with hexagon socket M8 x 30 mm S931-284, enclosed separately
- O-rings ø 7 × 1.5 mm S933-043, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-575	SE N3 H 380 D190 TO NP DH	Tornado, third-hand function *1	< 0.005 mm	D105, D072
S804-576	SE N3 H 380 D190 TO NP HG	Tornado, high-precision *2	< 0.001 mm	D105, D072

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
Element overview with additional functions – see Element Matrix, page 20

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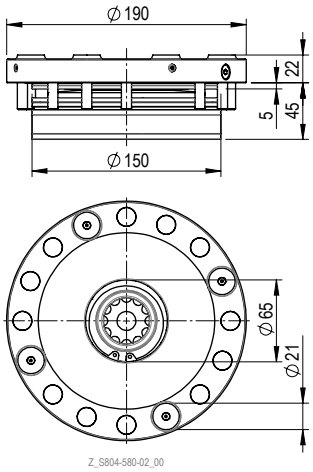
STARK.classic.NG.3, Twister

Fast closing clamp made of high-quality tool steel

- Installation element Ø 190 mm, Twister with nozzle, blow-off via 4 support islands
- Hydraulic single acting
- With release and seat check
- Clamp control optional

Properties

- Retention force: 55,000 N
- Insertion force: 38,000 N
- Release pressure: min. 40 bar, max. 80 bar
- Element weight: 7.6 kg
- Pre-mounted incl. transportation lock + 0.72 kg
- Operating manual: WM-020-332-xx-xx



- Plastic covers M8 S999-365 enclosed separately
- Cylinder screws with hexagon socket M8 × 30 mm S931-284, enclosed separately
- O-rings Ø 7 × 1.5 mm S933-043, enclosed separately

Order number	Article designation	Function	Repeat accuracy	Data sheet
S804-580-02	SE N3 H 380 D190 TW NP DH	Twister, third-hand function *1	< 0.005 mm	D105, D072
S804-580-01	SE N3 H 380 D190 TW NP HG	Twister, high-precision *2	< 0.001 mm	D105, D072

*1 Third hand function – see page 73
*2 HG (high-precision) functional description – see page 31
Element overview with additional functions – see Element Matrix, page 20

Element matrix STARK.classic.NG

STARK.classic.NG clamping elements are clamped with spring force and released hydraulically (H) or pneumatically (P). Both hydraulic-releasing (H) and pneumatic-releasing (P) clamping elements are designed with zero point (NP). A third-hand function (DH) is possible with hydraulic-releasing clamping elements (H). STARK.classic.NG clamping elements are also available with indexing (IN) and/or coolant outlet (KA).

Standard elements		Additional functions		
STARK.classic.**NG.1**		**IN** Indexing	**KA** Coolant outlet	**IN KA** Indexing Coolant outlet
Hydraulic-releasing clamping elements			Order numbers	
STARK.classic.NG.1 ST DH	S804-520	S804-522	S804-634	S804-645
STARK.classic.NG.1 ST HG	S804-521	×	×	×
STARK.classic.NG.1 ST MD1	S804-525	S804-523	S804-635	S804-646
STARK.classic.NG.1 ST MD2	S804-526	S804-524	S804-636	S804-647
STARK.classic.NG.1 ST MD3	S804-527	S804-529	S804-637	S804-648
STARK.classic.NG.1 ST MD4	S804-528	S804-532	S804-638	S804-649
STARK.classic.NG.1 TW DH	S804-535	×	S804-639	×
STARK.classic.NG.1 TW HG	S804-536	×	S804-640	×
STARK.classic.NG.1 TW 2M DH	S804-533	×	S804-641	×
STARK.classic.NG.1 TW HG 2M	S804-534	×	S804-642	×
STARK.classic.NG.1 TO DH	S804-530	×	S804-643	×
STARK.classic.NG.1 TO HG	S804-531	×	S804-644	×
Pneumatic-releasing clamping elements				
STARK.classic.NG.1-P ST	S804-520-P	S804-522-P	S804-634-P	S804-645-P
STARK.classic.NG.1-P TW	S804-535-P	×	×	×
STARK.classic.NG.1-P TW 2M	S804-533-P	×	×	×
STARK.classic.NG.1 P TO	S804-530-P	×	×	×

× Function not available

▶ Article designation code – see page 12
▶ Functional description of indexing and coolant drain – see page 30

Data sheets and 3D data: www.stark-roemheld.com
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Standard elements		Additional functions		
STARK.classic.NG.2		IN Indexing	KA Coolant outlet	IN KA Indexing Coolant outlet
Hydraulic-releasing clamping elements			Order numbers	
STARK.classic.NG.2 ST DH	S804-538	S804-539	S804-538-03	S804-561
STARK.classic.NG.2 ST HG	S804-538-02	×	×	×
STARK.classic.NG.2 ST MD1	S804-545	S804-549	S804-553	S804-562
STARK.classic.NG.2 ST MD2	S804-546	S804-550	S804-554	S804-563
STARK.classic.NG.2 ST MD3	S804-547	S804-551	S804-555	S804-564
STARK.classic.NG.2 ST MD4	S804-548	S804-552	S804-556	S804-565
STARK.classic.NG.2 TW DH	S804-540-02	×	S804-557	×
STARK.classic.NG.2 TW HG	S804-540-01	×	S804-558	×
STARK.classic.NG.2 TW 2M DH	S804-540-12	×	S804-559	×
STARK.classic.NG.2 TW HG 2M	S804-540-11	×	S804-560	×
STARK.classic.NG.2 TO DH	S806-024	×	S806-026	×
STARK.classic.NG.2 TO HG	S806-025	×	S806-027	×
Pneumatic-releasing clamping elements				
STARK.classic.NG.2-P ST	S804-538-P	S804-539-P	S804-538-03-P	S804-561-P
STARK.classic.NG.2-P TW	S804-540-02-P	×	×	×
STARK.classic.NG.2-P TW 2M	S804-540-12-P	×	×	×
STARK.classic.NG.2-P TO	S806-024-P	×	×	×

Standard elements		Additional functions		
STARK.classic.NG.3		IN Indexing	KA Coolant outlet	IN KA Indexing Coolant outlet
Hydraulic-releasing clamping elements			Order numbers	
STARK.classic.NG.3 ST DH	S807-212	S807-213	S807-222	S807-227
STARK.classic.NG.3 ST HG	S807-212-01	×	×	×
STARK.classic.NG.3 ST MD1	S807-214	S807-218	S807-223	S807-228
STARK.classic.NG.3 ST MD2	S807-215	S807-219	S807-224	S807-229
STARK.classic.NG.3 ST MD3	S807-216	S807-220	S807-225	S807-230
STARK.classic.NG.3 ST MD4	S807-217	S807-221	S807-226	S807-231
STARK.classic.NG.3 TW DH	S804-580-02	×	S804-583	×
STARK.classic.NG.3 TW HG	S804-580-01	×	S804-584	×
STARK.classic.NG.3 TO DH	S804-575	×	S804-577	×
STARK.classic.NG.3 TO HG	S804-576	×	S804-578	×
Pneumatic-releasing clamping elements				
STARK.classic.NG.3-P ST	S807-212-P	S807-213-P	S807-222-P	S807-227-P
STARK.classic.NG.3-P TW	S804-580-02-P	×	×	×
STARK.classic.NG.3-P TO	S804-575-P	×	×	×

STARK.classic.NG PNEUMATIC

The pneumatic versions of the STARK.classic.NG product family are a useful addition to the hydraulic-releasing clamping elements.
Particularly suitable for applications with low machining forces such as measuring machines, assembly applications or cleaning systems.

For example, a device that has been clamped for machining with hydraulic-releasing clamping elements can be clamped easily and quickly for intermediate measurements or assembly work with pneumatic-releasing clamping elements.

AREAS OF APPLICATION

- Applications with low machining forces
- Measuring machines
- Assembly applications
- Cleaning systems

SPECIAL FEATURES

Detailed information on the pneumatic versions of the STARK.classic.NG product family can be found in the hydraulic-releasing elements.
For pneumatic-releasing clamping elements with media ducts, the calculation of the coupling force must be taken into special consideration (see chapter Media ducts).

STARK.classic.NG.1 P

Order number	Article designation	Function	Data sheet
S804-520-P	SE N1 P 008 D108 ST NP	Standard	D160, D032
S804-522-P	SE N1 P 008 D108 ST NP IN	Standard with indexing	D160, D032
S804-535-P	SE N1 P 008 D108 TW NP	Twister	D179
S804-530-P	SE N1 P 008 D108 TO NP	Tornado	D179

STARK.classic.NG.2 P

Order number	Article designation	Function	Data sheet
S804-538-P	SE N2 P 025 D139 ST NP	Standard	D134, D032
S804-539-P	SE N2 P 025 D139 ST NP IN	Standard with indexing	D134, D032
S804-540-02-P	SE N2 P 025 D139 TW NP	Twister	D115
S806-024-P	SE N2 P 025 D139 TO NP	Tornado	D115

STARK.classic.NG.3 P

Order number	Article designation	Function	Data sheet
S807-212-P	SE N3 P 032 D190 ST NP	Standard	D106, D032
S807-213-P	SE N3 P 032 D190 ST NP IN	Standard with indexing	D106, D032
S804-580-02-P	SE N3 P 032 D190 TW NP	Twister	D105
S804-575-P	SE N3 P 032 D190 TO NP	Tornado	D105

Data sheets and 3D data: www.stark-roemheld.com
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STARK.classic.NG.1 P

STARK.classic.NG.2 P

STARK.classic.NG.3 P

Technical data STARK.classic.NG Pneumatic

		STARK.classic.NG.1 P	**STARK**.classic.NG.2 P	**STARK**.classic.NG.3 P
Maintenance interval	Cycles		100,000	
Insertion force [1]	[N]	800	2,500	3,200
Insertion force booster at 5 bar [2]	[N]	2,800	6,500	10,000
Retention force [3]	[N]	25,000	38,000	55,000
Min./max. release pressure	[bar]		5/10	
Lifting	[mm]	1.2		1.5
Insertion	[mm]		1.2	
Min. permitted clamping time	[s]		2	
Min. permitted release time	[s]		2	
Radial pre-positioning [4]	[mm]	±3	±2.5	±4.5
Axial pre-positioning [5]	[mm]		-0.3	
Repeat accuracy [6]	[mm]		< 0.005	
System accuracy [7]	[mm]		< 0.01	
Weight	[kg]	1.4	2.05	7.6

[1] *Insertion force:* *The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded.*

[2] *Insertion force with booster* *The insertion force can be increased with an additional 5 bar clamping pressure.*

[3] *Retention force:* *This is the maximum overload up to which the retractable nipple is still held but the zero point has already been left.*

[4] *Radial pre-positioning:* *The loading device must be compliant for automated loading.*

[5] *Axial pre-positioning:* *Retractable nipple is in contact with the piston crown before the clamping process. A gap of max. 0.3 mm is permissible.*

[6] *Repeat accuracy:* *This usually indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).*

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

STARK.CLASSIC.NG-S – SINGLE APPLICATION

STARK.classic.NG-S was specially developed for single clamping and 5-axis machining. This clamping element is ideal for manual and automated loading. A combination with the STARK.classic.NG clamping element is possible at any time. Versions with hydraulic and pneumatic actuation are available.

BENEFITS

- For manual and automated loading
- µ-accurate
- Extremely high stiffness
- Form-fit is free of play due to spring-loaded pins
- Workpiece clamping via self-made adapter plates enables 5-sided accessibility

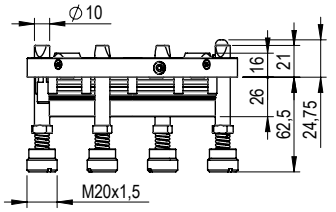
STARK.classic.NG-S.2 D139, Twister

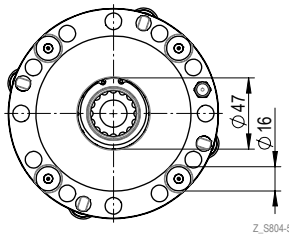
Fast closing clamp made of high-quality tool steel

- Installation element Ø 139 mm, Twister, high-precision (without press fit) with locking function
- With release and seat check
- Clamp control optional

Properties

- Retention force: 38,000 N
- Repeat accuracy: < 0.007 mm
- Installation according to data sheet D123
- Operating manual: WM-020-332-xx-xx





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Plastic covers M6 S999-408 enclosed separately / cylinder screws with hexagon socket M6 × 16 mm S931-138 enclosed separately / O-rings Ø 7 × 1.5 mm S933-043 enclosed separately / locking pin Ø 10 × 58 mm enclosed separately / compression springs S933-080 enclosed separately / spring holders M20 × 1.5 × 15 mm enclosed separately / locating pin Ø 8 mm S952-263 enclosed separately

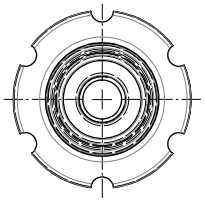
Order number	Article designation	Function	Insertion force	Min. / max. release pressure	Weight
S804-541	SE N2 H 220 D139 TW NP IX HG	Hydraulic-releasing	22,000 N	40 bar / 80 bar	2.70 kg
S804-541-P	SE N2 P 025 D139 TW NP IX HG	Pneumatic-releasing	2,500 N	5 bar / 10 bar	2.30 kg

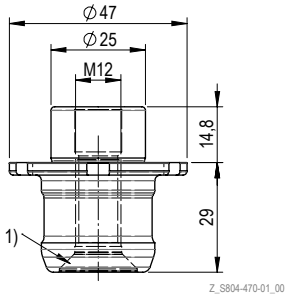
▶ Hardened support disc NG-S – see page 58-59

Retractable nipple STARK.classic.NG-S.2 with zero point

Retractable nipple suitable for STARK.classic.NG-S.2 fast closing clamp

- Retractable nipple with zero point
- Special fit for NG-S
- Material: Tool steel
- Installation according to data sheet D029-2





Z_S804-470-01_00

1) Countersink for M10 screw

Order number	Article designation	Area of application	Weight
S804-474-01	EB C2 NP 250 12 148 HG MK	STARK.classic.NG-S.2	0.19 kg

Application example – Single application with STARK.classic.NG-S

STARK.classic.NG-S can be adapted to almost any machine via various adapters.

Extremely high stiffness due to form-fit that is free of play and high pre-tensioning force of the cup springs (hydraulic-releasing elements) or spiral springs (pneumatic-releasing elements).

The NG-S system is very economical as self-made pallets can also be used: minimum effort and maximum flexibility.

CLAMPING ELEMENTS STARK.classic

The first generation STARK.classic has proven itself worldwide over many years - through precision, stability and sophisticated technology. The STARK.classic.NG series was created on this basis and continues the same principles of reliability and compatibility. Despite the introduction of the new product family, the original version remains available. It offers a tried-and-tested, durable solution and can be combined with many components from the new line.

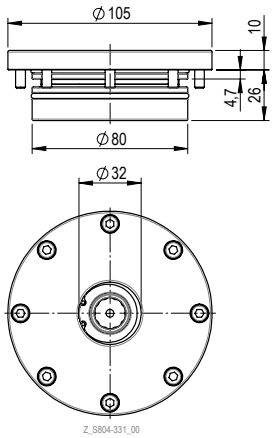
STARK.classic.1, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø105 mm
- Hydraulic single acting

Properties

- Retention force: 25,000 N
- Repeat accuracy: < 0.005 mm
- Operating manual: WM-020-082



Order number	Article designation	Insertion force	Release pressure	Element weight	Data sheet
S804-331	SE C1 H 067 D105 ST NP	6.7 kN	min. 35 bar / max. 40 bar	1.6 kg	D020, D032, D072
S804-348	SE C1 H 100 D105 ST NP SO	10 kN	min. 75 bar / max. 80 bar	1.6 kg	D020, D032, D072

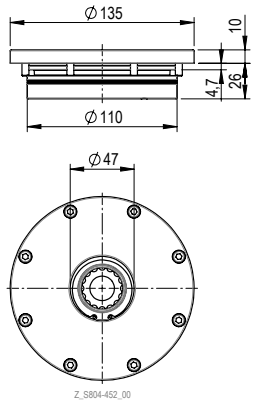
STARK.classic.2, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø135 mm
- Hydraulic single acting

Properties

- Retention force: 38,000 N
- Insertion force: 20,000 N
- Release pressure: min. 35 bar, max. 40 bar
- Repeat accuracy: < 0.005 mm
- Element weight: approx. 2.4 kg
- Operating manual: WM-020-082



Order number	Article designation	Data sheet
S804-452	SE C2 H 200 D135 ST NP	D020, D032, D072

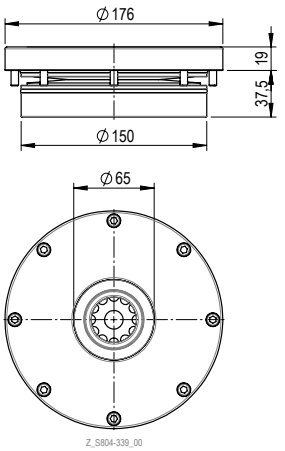
STARK.classic.3, Standard

Fast closing clamp made of high-quality tool steel

- Installation element Ø176 mm
- Hydraulic single acting

Properties

- Retention force: 55,000 N
- Insertion force: 30,000 N
- Release pressure: min. 30 bar, max. 35 bar
- Repeat accuracy: < 0.005 mm
- Element weight: approx. 6.3 kg
- Operating manual: WM-020-082



Order number	Article designation	Data sheet
S804-339	SE C3 H 300 D176 ST NP	D055, D056, D072

Data sheets and 3D data: www.stark-roemheld.com
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Subject to modification | WM-020-450-00-en

Technical data for STARK.classic

		STARK.classic.1		**STARK**.classic.2	**STARK**.classic.3	**STARK**.compact
		S804-331	S804-348	S804-452	S804-339	S801-030
Maintenance interval	Cycles	100,000	20,000	40,000	40,000	15,000
Insertion force [1]	[kN]	6.7	10	20	30	6.5
Retention force [2]	[kN]	10	25	38	55	25
Min./max. release pressure	[bar]	min. 35, max. 40	min. 75, max. 80	min. 35, max. 40	min. 30, max. 35	min. 175, max. 180
Lifting	[mm]	1.2			1.5	1.2
Insertion	[mm]	1.2			1.5	1.2
Min. permitted clamping time	[s]	2				
Min. permitted release time	[s]	2				
Radial pre-positioning [3]	[mm]	±3		±2.5	±4	±3
Axial pre-positioning [4]	[mm]	-0.3				
Repeat accuracy [5]	[mm]	< 0.005				
System accuracy [6]	[mm]	< 0.01				
Weight	[kg]	1.6		2.4	7.6	1.1

STARK.classic.2 vs. STARK.classic.NG.2

		STARK.classic.2	**STARK**.classic.NG.2
Maintenance interval	Cycles	40,000	
Insertion force [1]	[kN]	20	22
Min./max. release pressure	[bar]	min. 35 (max. 40)	min. 40 (max. 80)
Lifting power	[kN]	10 (40 bar)	15 (80 bar)
Diameter	[mm]	Ø135	Ø139
Disc height	[mm]	10	13
Weight	[kg]	2.4	2.5
Screws	[mm]	8× M5 × 14	12× M6 × 16
Released control		×	✓
Seat check		×	✓
Screw cover for easier cleaning		×	✓

[1] *Insertion force:* *The insertion force (pre-tensioning force of the spring assembly) is the load up to which the zero point is guaranteed. The specified insertion force must not be exceeded.*

[2] *Retention force:* *This is the maximum overload up to which the retractable nipple is still held but the zero point has already been left.*

[3] *Radial pre-positioning:* *The loading device must be compliant for automated loading.*

[4] *Axial pre-positioning:* *Retractable nipple is in contact with the piston crown before the clamping process. A gap of max. 0.3 mm is permissible.*

[5] *Repeat accuracy:* *This indicates the accuracy that refers to the change of the same pallet position-oriented on the same interface (clamping elements, etc.).*

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

CLAMPING ELEMENTS STARK.compact

The fast closing clamps in the STARK.compact product family combine maximum retention force with minimal installation space.

Their small diameter makes them ideal for confined installation conditions and small spacings. The compact design enables maximum rigidity with minimum space requirements.

AREAS OF APPLICATION

- Machine pallets, plates, angles, cubes and swivel bridges
- Workpiece direct clamping with high rigidity and small support surface
- Machining operations such as milling, turning, grinding, eroding or assembly test benches

SPECIAL FEATURES

- Mechanical clamping, hydraulic release
- Compact design for the smallest spacings
- High rigidity despite minimum space requirement

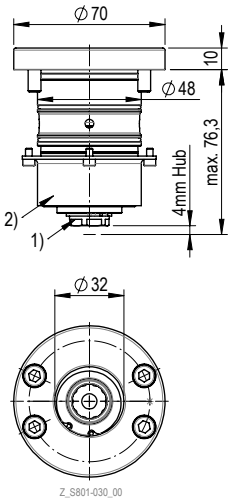
STARK.compact.1, Standard D070

Fast closing clamp made of high-quality tool steel.

- Installation element Ø 70 mm
- Hydraulic single acting

Properties

- Retention force: 25,000 N
- Insertion force: 6,500 N
- Release pressure: 175-180 bar
- Connection thread: G 1/8
- Element weight: 1.1 kg
- Operating manual: WM-020-082



Order number	Article designation	Data sheet
S801-030	SM C1 H 065 D070 ST NP	D038

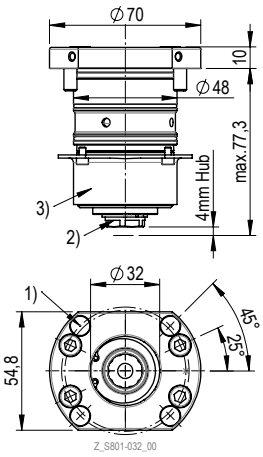
STARK.compact.1, Standard G050, capped

Fast closing clamp made of high-quality tool steel - clamping elements are clamped with spring force and released hydraulically

- Installation element ø 64 mm
- Hydraulic single acting

Properties

- Retention force: 25,000 N
- Insertion force: 6,500 N
- Release pressure: 175-180 bar
- Connection thread: G 1/8
- Element weight: 1.1 kg
- Operating manual: WM-020-082

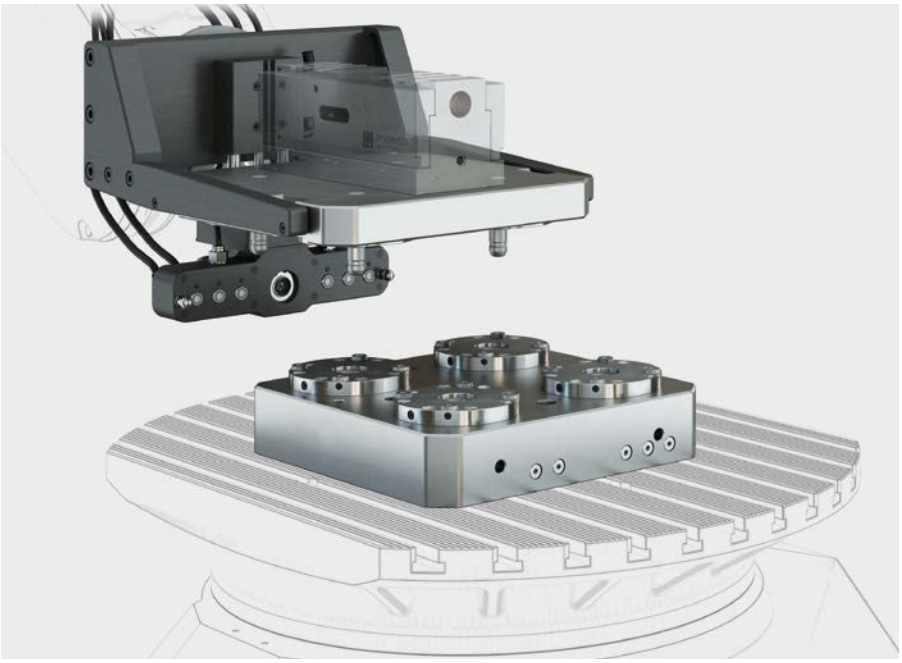


Order number	Article designation	Data sheet
S801-032	SM C1 H 065 G050 ST NP	D038

Practical example STARK.compact

STARK.compact quick-release locking plate

- Raised design for optimum accessibility



STARK.gripper - Automation in the RetroFit area

- Zero point clamping system with 4 STARK.classic.NG
- Coupling unit with media feed and STARK.compact clamping element

INFO Compatibility of retractable nipple STARK

The STARK.classic.1 retractable nipples fit the STARK.compact elements

see page 44

Ways to increase precision

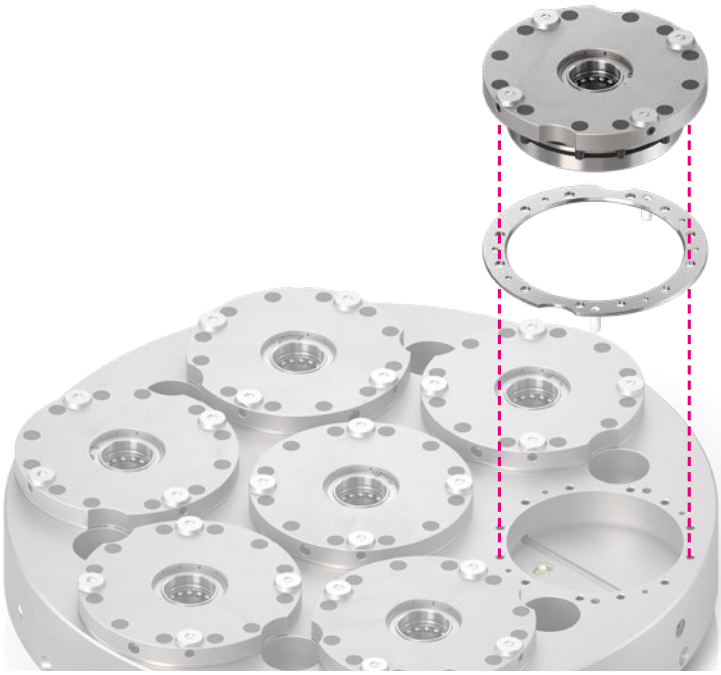
When the requirement must be more precise than precise!

Our understanding of precision is the micrometre range: 1 µ corresponds to a thousandth of a millimetre and 5 µ is standard for us.
With our in-depth and extensive industry know-how, we also offer opportunities to further increase accuracy in high-precision applications:

- SHIMS
  For equalising cumulative tolerances
- 2 µ ACCURATE SUPPORT DISCS
  Maximum accuracy even after changing clamping elements
- HG VERSIONS
  High-precision due to press fit

SHIM – EQUALISER OPTIONS FOR CUMULATIVE TOLERANCES

- Shims allow precise adjustment of the zero point clamping system (ZPC) in the Z plane.
- The shim is located between the fast closing plate (FCP) and the clamping element.
- After successful assembly of the fast closing plate, any height differences are determined. The shims can be ground according to the required tolerances. This procedure is repeated until the required tolerances are reached. This compensates for all cumulative tolerances of the machine, machine table and fast closing plate.
- BENEFIT
  In case of service, a clamping element can simply be exchanged for another one, without time-consuming adjustment work. When changing the clamping element, the shim is not replaced.
- Suitable for all clamping elements of the STARK.classic.NG product family.



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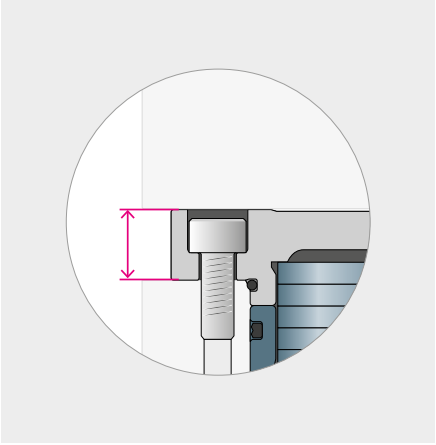
2 µ – PRECISE SUPPORT



The great advantage of the 2 µ version is that in the event of servicing a high-precision system, no height adjustment is necessary when replacing elements and machine availability is optimised.

- For special requirements, the Twister design can be provided with a tolerance of 2 µ: particularly advantageous for high-precision, matched systems (e.g. clamping element changeover).
- Highest accuracy to reduce tolerance errors.
- The standard tolerance for the disc height of STARK clamping elements is 5 µ.

HG – HIGH-PRECISION DUE TO PRESS FIT

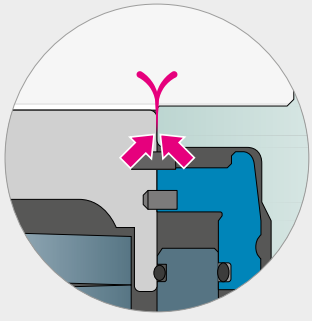
The STARK.classic.NG HG high-precision clamping elements ensure maximum precision when changing devices from the set-up station to the machine or from machine to machine. This maximum precision is achieved by using a press fit between the HG clamping element and the HG retractable nipple. The HG retractable nipple is joined or lifted by means of active insertion and lifting of the STARK.classic system. The materials and heat treatments selected for this highly demanding field of application ensure durable and wear-free operation.

- Used in high precision applications in 5-axis or rotary applications in the centre of the fast closing plate, e.g. turbine engine parts ("aeronautical accuracy").
- HG versions ensure that the axis of rotation is located in the centre with maximum precision.

INFO

High-precision due to press fit

An HG clamping element may only be combined with an HG retractable nipple.



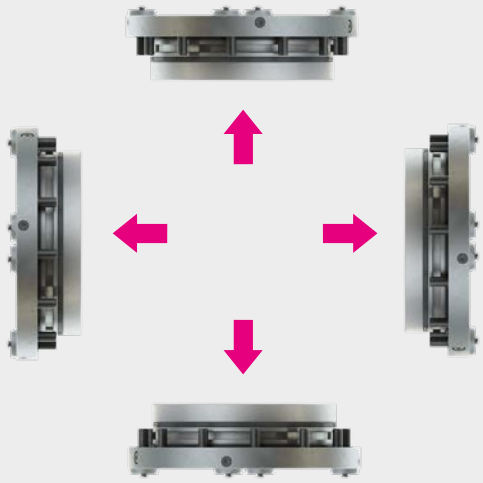
Pre-assembly

The clamping elements of the STARK.classic product family are delivered pre-assembled including transportation lock.

- 100% FUNCTIONALLY SAFE
  Simply plug in and screw tight
- 85% TIME SAVING
  Quick assembly
- 100% SERVICE-FRIENDLY
  Installation possible in any position

INFO Pre-assembly

The pre-assembled STARK.classic.NG clamping elements are delivered with transportation lock and can be installed in any position



Transportation lock

The transportation lock is designed for the transport as well as for the safe installation of the pre-assembled clamping elements. Once the clamping element has been installed, the transportation lock cannot be reused.

- Tempered steel material

Order number	Article designation	Weight
S804-891	Transportation lock C1/N1	0.14 kg
S804-892	Transportation lock C2/N2	0.33 kg
S804-893	Transportation lock C3/N3	0.72 kg

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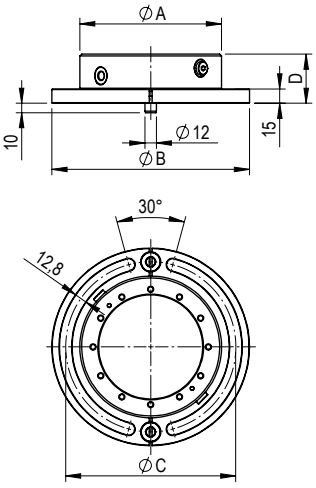
Surface-mounted housing

Surface-mounted housing made of nitrided steel for assembly on machine table. Suitable for the STARK.classic.NG fast closing clamps

- Two-part version
- For installation, see Operating Manual WM-020-332-xx-xx



- Connection discs M6 S938-006 enclosed separately
- Positioning pin Ø 12 m6 x 20 mm S936-033, enclosed separately
- Tensioning clamps enclosed separately

Order number	Article designation	ØA	ØB	ØC	D	Connection Release	Release control connections	Transport thread	Weight
S804-965	Surface-mounted housing NG.1	112 mm	168 mm	140 mm	52 mm	1/8"	1/8"	-	3.74 kg
S804-966	Surface-mounted housing NG.2	150 mm	209 mm	180 mm	52 mm	1/8"	1/8"	-	6.30 kg
S804-967	Surface-mounted housing NG.3	190 mm	246 mm	218 mm	72 mm	1/4"	1/8"	2× M8	10.76 kg

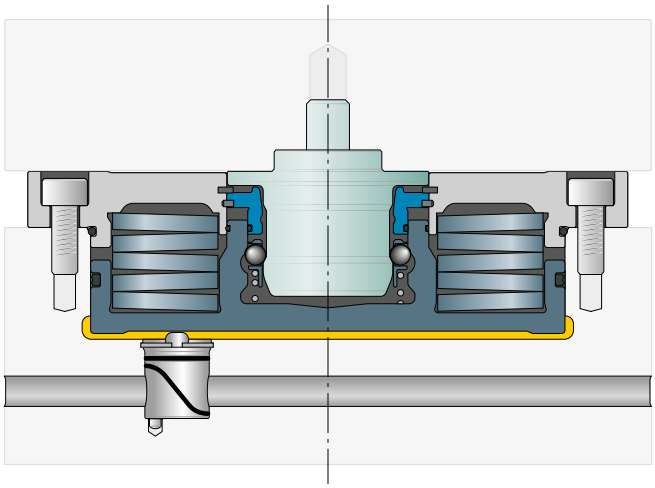
INFO

Surface-mounted housing practical example

STARK.classic.NG surface-mounted housing with clamping ring and hydraulic connection.

Clamp control

For safety reasons, a clamp control is strongly recommended for all high-speed applications. STARK.classic.NG clamping elements can be optionally equipped with a mechanical clamp control valve for this purpose. The evaluation of the clamp control can be integrated directly into the machine control system or can be displayed by means of a visual clamp control. Optionally, pressure boosters or hydraulic units with corresponding sensors can be connected to existing machines.

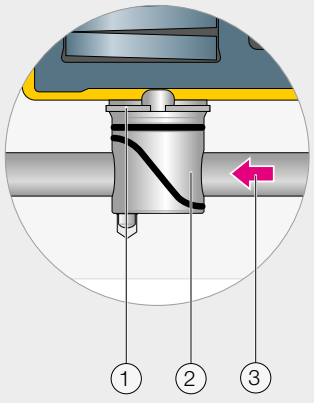


INFO Functional explanation and connection diagram

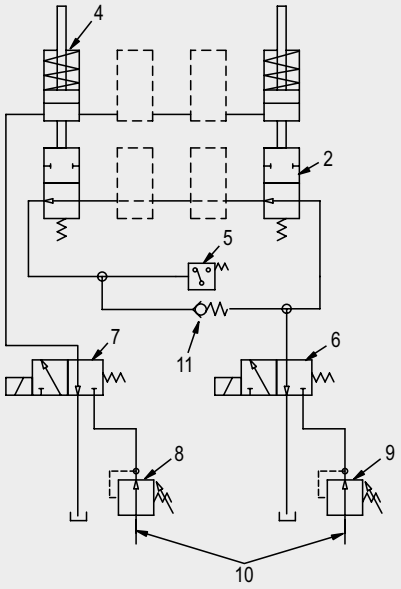
By using the mechanical clamp control valve (2), the correct and secure clamping of the fast closing clamp is checked during each clamping process. If clamping is not correct or without a retractable nipple, the piston moves beyond the normal position and blocks the flow of the hydraulic line (3) with the clamp control valve.

The clamp control valve can be operated hydraulically or pneumatically.

On plates or in towers, all fast closing clamps are queried in series, so the exact clamping of all fast closing clamps can be checked at any time.



1) Lock ring
2) Clamp control valve
3) Direction of flow
4) Clamping element
5) Pressure switch for clamping signal
6) Hydraulic valve for clamp control
7) Hydraulic valve for releasing the element
8) Pressure relief valve, 40 bar (80 bar)
9) Pressure relief valve, 8 bar
10) Oil supply from machine
11) Non-return valve (bypass)



This connection diagram serves only as an example and explains the mode of operation

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Clamp control valve

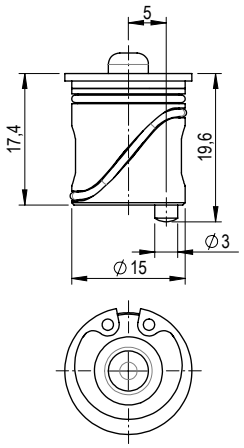
Clamp control valve to ensure the correct clamping state

Clamp control valve must be used on all rotary machines. Especially for vertical change procedures and turning machines.

General recommendation for all zero point clamping systems: a safety benefit for every application.

Properties

- Max. pressure: 10 bar
- Installation according to data sheet D024
- Operating manual: WM-020-255-xx-xx



Z_S704-210_00

Order number	Article designation	Weight
S704-210	Clamp control valve	0.01 kg
S504-070	Clamp control valve installation aid	0.03 kg

▶ Clamp controö valve installation aid – see page 77

INFO Optical clamping control

Is the zero point clamping system securely clamped?

In many applications, e.g. when turning, clamp control is mandatory.
The visual clamp control shows the position of the piston after activation of the clamp control in the fast closing clamp and provides absolutely reliable information via a traffic light signal.

Simple operation and easy retrofitting are key advantages with this safety component.

The visual clamp control can be integrated into the fast closing plate.

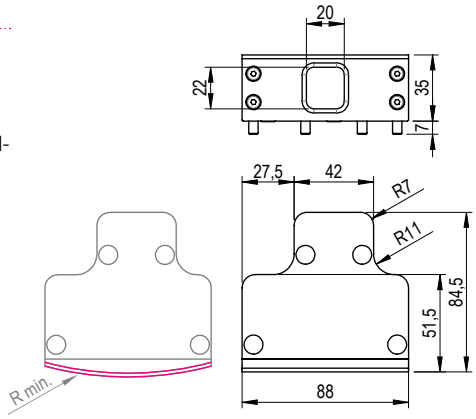
The green display shows that clamping is correct.

The display changes to red when releasing until positive clamp control occurs again.

Visual clamp control

Visual clamp control for visualisation of the clamping state

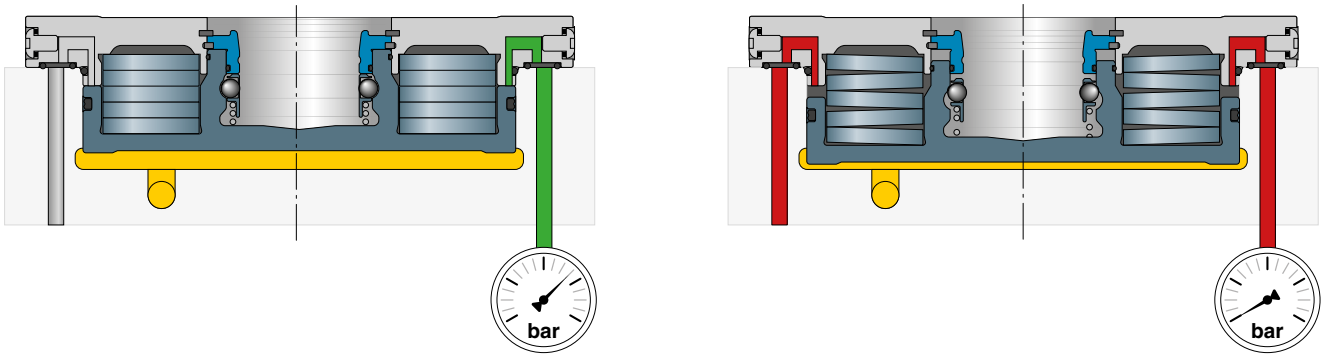
Optionally, the visual clamp control is also available with an individual radius.
R min. = 175 mm (matching with outer radius of the fast closing plate).



Order number	Article designation	Weight
S704-296	Visual clamp control (straight version)	0.58 kg

Released control

Pneumatic release control is possible with standard elements of the STARK.classic.NG product family. The connection lines to the clamping elements are supplied pneumatically via deep-hole bores. Here, the query can be realised via dynamic pressure / flow rate. The release control is recommended for applications with automation and heavy components.



Seat check

Pneumatic seat check is possible for standard elements of the STARK.classic.NG product family. The seat check works with dynamic pressure and is used for precision testing. The seat check is used to detect contamination between the pallet and the zero point clamping system.

Unlike the clamp control valve, the seat check is not a reliable safety feature. For safety-critical applications, clamp control is recommended (see page 31).

INFO Dynamic pressure query

The dynamic pressure is queried via the island blow-off or the query bore.

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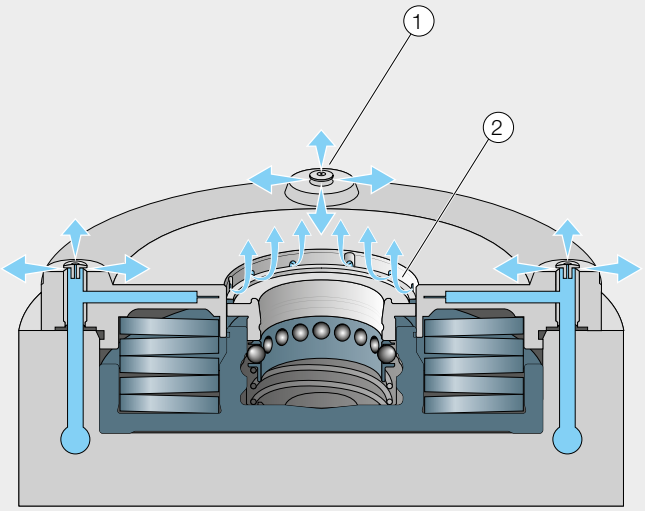
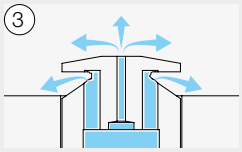
INFO

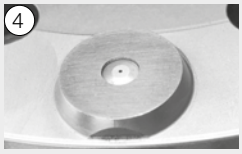
Functional principle blow-off and cleaning

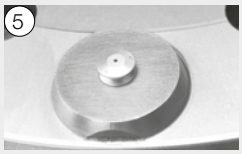
Intelligent blow-out and blow-off technology for cleaning the support islands and the fitting bore. The blow-off takes place directly at the support surfaces and at the fitting diameter. To clean the support islands, air flows upward and mushroom-shaped downward via retractable nozzles.



1) Island blow-off
2) Centre blow-off
3) Island blow-off
   Nozzle functionality
4) Island blow-off
   Nozzle retracted
5) Island blow-off
   Nozzle extended
6) Openings for centre blow-off







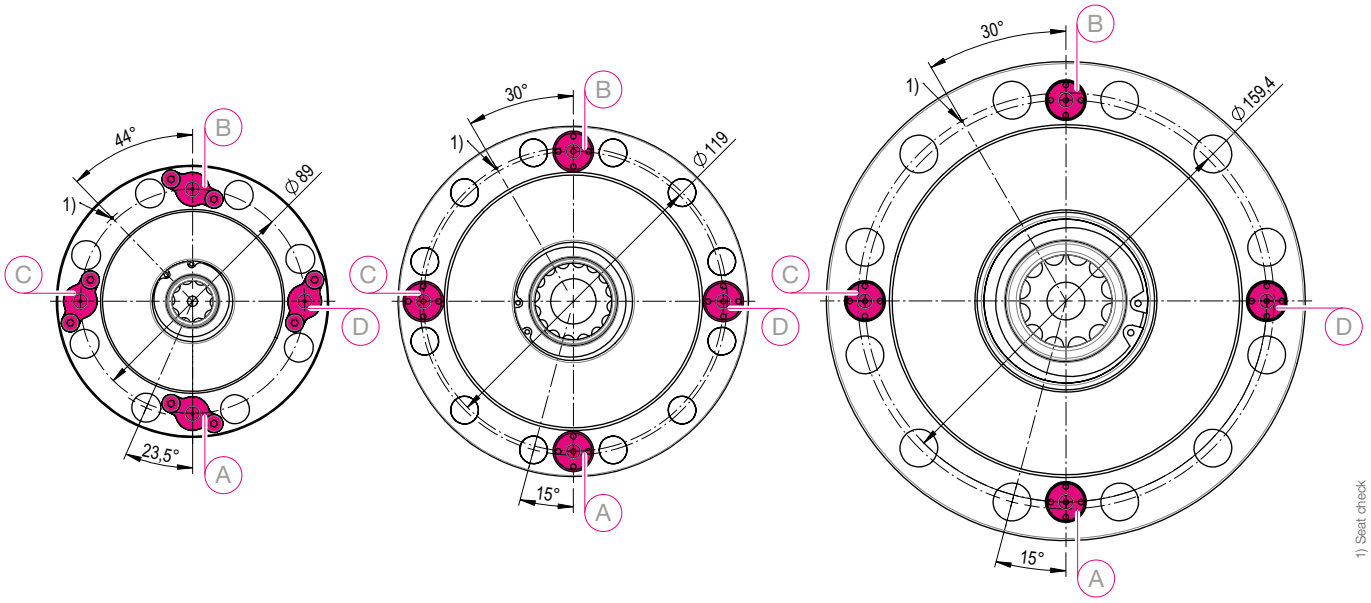
Integrated media duct

For the passage of media such as oil, air, water, etc., STARK.classic.NG can be equipped with integrated media duct on request. These are automatically positioned and coupled during clamping.

This allows, for example, clamping fixture mounted on machine pallets to be supplied with energy (hydraulics, pneumatics, etc.). The coupling force is applied by the clamping element. With extremely simple handling, the pallet is positioned, clamped and coupled fully automatically.

S804-528 - STARK.classic.NG.1 ST MD4

▸ Refer to the hydraulic-releasing clamping elements for detailed information



1) Seat check

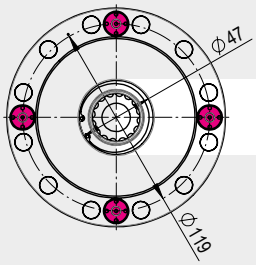
STARK.classic.NG.1 **STARK**.classic.NG.2 **STARK**.classic.NG.3

Element with media duct (MD)	1. MD - Pos. A	2. MD - Pos. B	3. MD - Pos. C	4. MD - Pos. D
STARK.classic.NG with 1× MD	✓	×	×	×
STARK.classic.NG with 2× MD	✓	✓	×	×
STARK.classic.NG with 3× MD	✓	✓	✓	×
STARK.classic.NG with 4× MD	✓	✓	✓	✓

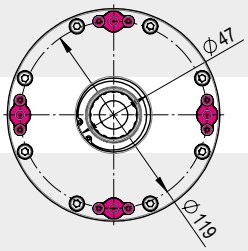
▸ Order numbers and versions with additional functions - see Element Matrix, page 20

INFO Compatibility of retractable nipple and media duct

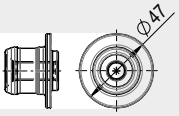
Although the STARK.classic.NG and STARK.classic product families differ in their functionality and dimensions, the same retractable nipples are used and the media duct are compatible. The same pallets can therefore be used.



STARK.classic.NG.2 MD4



STARK.classic.2 MD4



Retractable nipple **STARK**.classic.2

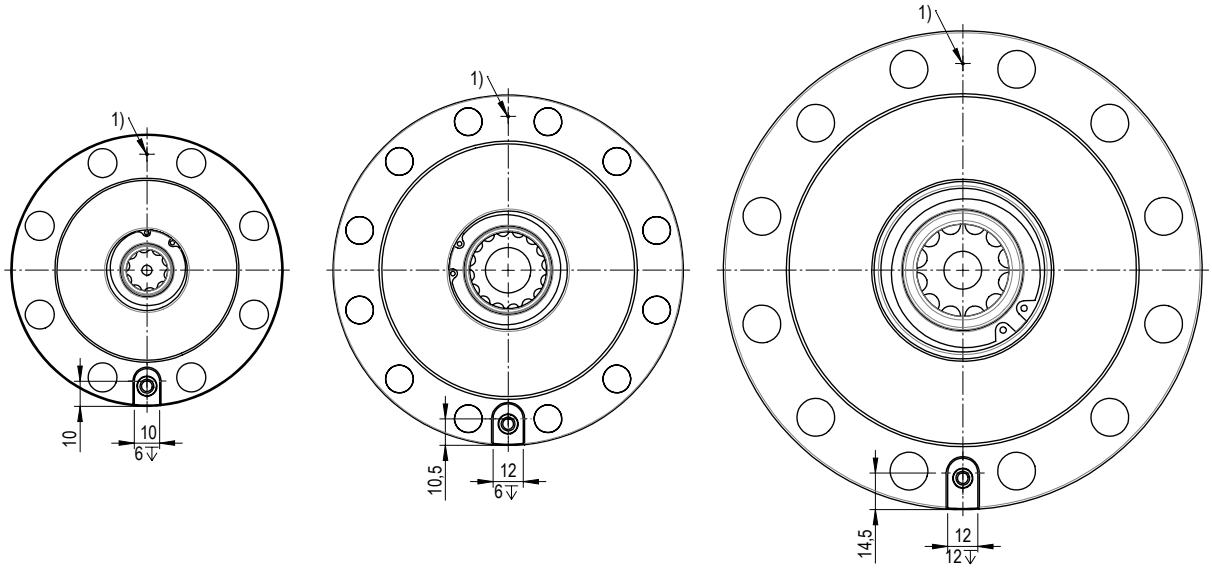
Indexing

Indexing is used for clamping pallets via a single clamping element.

Individual clamping can be realised via indexing, alternatively via STARK.classic.NG-S (see chapter STARK.classic.NG-S).

- Refer to the hydraulic-releasing clamping elements for detailed information

S804-539 - STARK.classic.NG.2 ST IN



1) Seat check

STARK.classic.NG.1 **STARK**.classic.NG.2 **STARK**.classic.NG.3

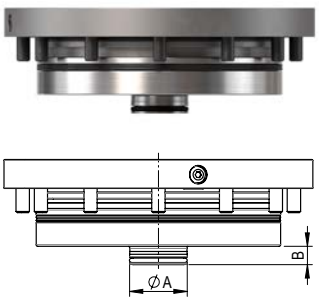
- Order numbers and versions with additional functions - see Element Matrix, page 20

Coolant outlet

The coolant outlet in the clamping element ensures that both fine chips and the coolant can drain through the fast closing plate (SVP).

This function is particularly necessary for EDM machines. Make sure that the fast closing plate is designed in such a way that the liquid between the fast closing plate and the machine table can drain off.

- For STARK.classic.NG Twister & Tornado, no seat check is possible.
- Refer to the hydraulic-releasing clamping elements for detailed information



Size	A	B
STARK.classic.NG.1	14 mm	8.0 mm
STARK.classic.NG.2	26 mm	8.3 mm
STARK.classic.NG.3	30 mm	15.5 mm

- Order numbers and versions with additional functions - see Element Matrix, page 20

FAST CLOSING PLATES (SVP)

Our fast closing plates provide a precise, stable basis for a wide range of clamping tasks.

- Fast closing plate made of steel ground on both sides with mounting bores for different groove spacings
- Zero point clamping system is clamped mechanically with spring force and released hydraulically/pneumatically
- Area of application on 3/4/5-axis machines for all common machining procedures such as milling, grinding, turning

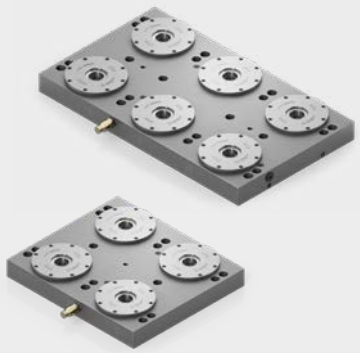
BENEFITS

- Shorter set-up times
- Reproducible and safe workpiece clamping
- Reliable positioning for maximum precision

Individual components: Clamping elements, retractable nipples, pre-centring, media duct

Our individual components form the basis of a precise and modular fast clamping system. All elements can be used immediately, are durable and perfectly matched to each other.

+ Large range of standardised components
+ High repeat accuracy
+ Robust, precise manufacturing



Standard fast closing plates

Preconfigured standard fast closing plates for many applications - ready for immediate use, economical and technically proven.

+ No design work required
+ High precision and secure lock
+ Ideal for fast set-up times

Customised fast closing plates

Customised solutions when standard variants are not enough. We develop fast closing plates exactly according to application, process and machine.

+ Customised adaptations and special designs
+ Solutions from batch size 1
+ Fast, efficient project realisation
+ Decades of development and implementation experience

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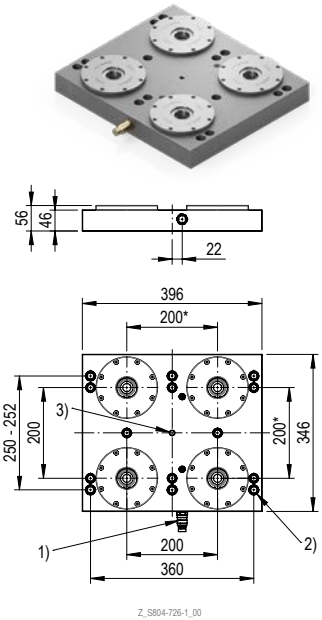
Standard fast closing plates

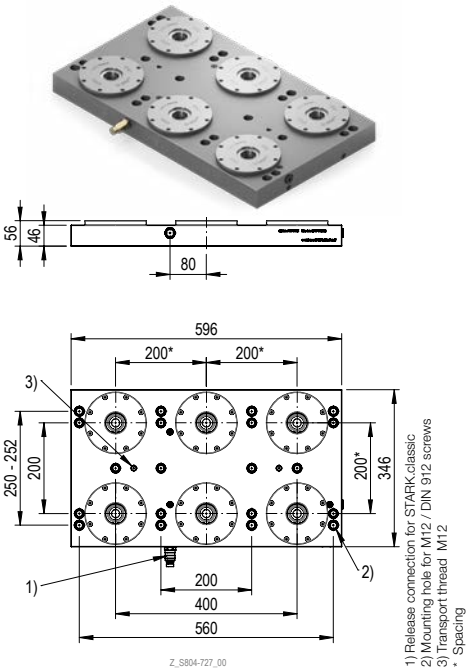
Fast closing plate made of high-quality tool steel

- Fixing holes for different groove spacings groove spacings (63, 100 and 125 mm)
- Hydraulic release system
- Pneumatic single-acting
- Active insertion force

Fast closing plate with 4 **STARK**.classic.2



Fast closing plate with 6 **STARK**.classic.2



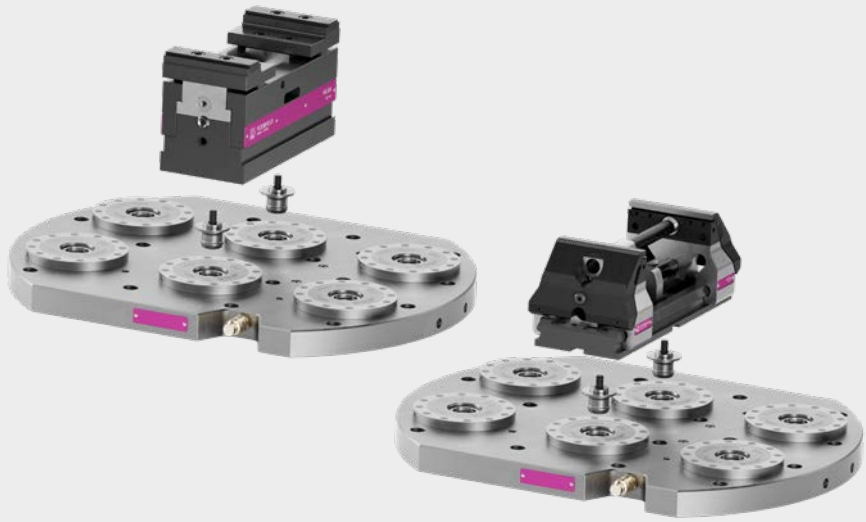
Order number	Fast closing plate	Weight	Insertion force	Size
S804-726	Fast closing plate with 4 STARK.classic.2 (S804-452)	50 kg	up to 80 kN	4-fold 396 × 346 × 56 mm
S804-727	Fast closing plate with 6 STARK.classic.2 (S804-452)	75 kg	up to 120 kN	6-fold 596 × 346 × 56 mm

Application example - special fast closing plate

Zero point clamping system with STARK.classic

- Clamp control valve per clamping element
- Optical clamping control
- Seat check
- Easy handling

Application examples

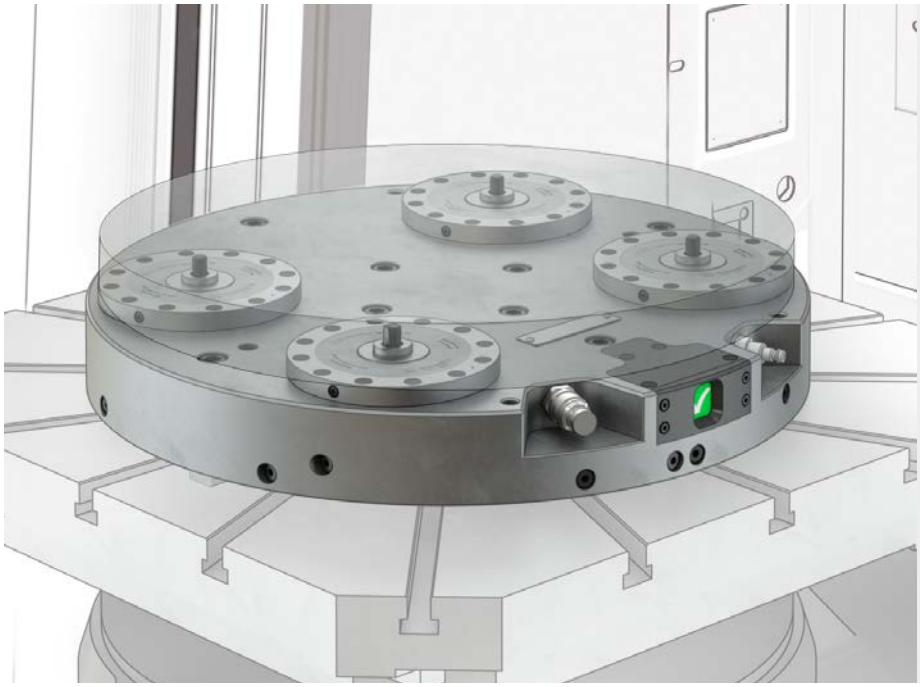


Fast closing plates with manual control

- Common application in retrofitting machines without media
- Adapted to machine table or desired clamping pallets
- Cost-effective to realise and quickly available

Combination option HILMA & STARK

- Machine vices from HILMA are prepared for combination with STARK fast closing plates
- HILMA.UC can be clamped on STARK standard fast closing plates (spacing 200) crosswise, lengthwise or side by side



Fast closing plates with optical clamping control

- Mill-turn machines can also be retrofitted with zero point clamping technology
- The clamp control safety feature can be easily retrofitted thanks to the visual clamp control display

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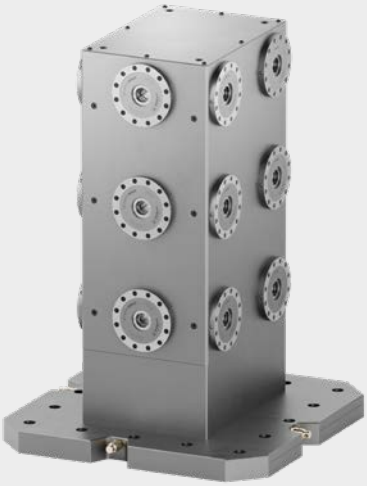
Application examples

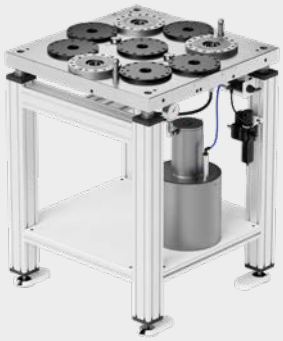


Clamping towers

- Clamping tower with optional quick-change interface to the machine table
- Customised design of each individual side

Large machine tables

- Customised design depending on requirements
- Version with individual clamping strips (picture above)
- Combination with rotary tables in the centre (picture below)



Set-up station

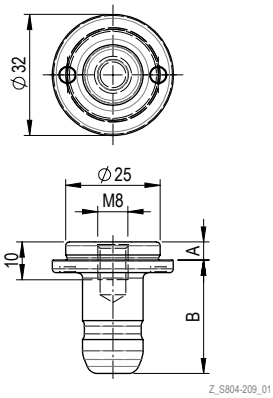
- Design of set-up stations to match the machine table configuration
- From simple storage systems to powered systems with swivel and/or tilt options and height adjustment

RETRACTABLE NIPPLE SIZE 1

Retractable nipple STARK.classic.1 with zero point

Retractable nipple suitable for all fast closing clamps of the STARK.classic.1, STARK.classic.NG.1 and STARK.compact family

- Retractable nipple with zero point
- Material: Tool steel
- Installation according to data sheet D029-1



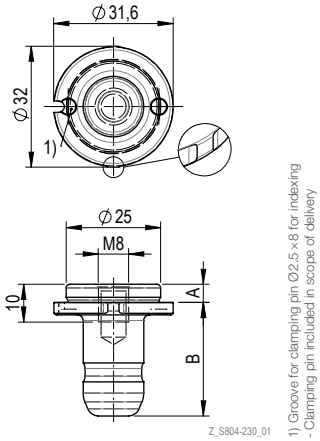
Order number	Article designation	Area of application/special feature	Collar A	Length B	Weight
S804-209	EB C1 NP 250 08 048	Standard	4.8 mm	30.0 mm	0.07 kg
S804-209K	EB C1 NK 250 08 048	Standard without lifting *1	4.8 mm	28.5 mm	0.07 kg
S02637	EB C1 NP 250 08 128	With hardened support disc *2	12.8 mm	30.0 mm	0.10 kg
S02942	EB C1 NP 250 08 048 MK	Standard with air recess *3	4.8 mm	30.0 mm	0.07 kg
S03384	EB C1 NK 250 08 128	With hardened support disc *2 without lifting *1	12.8 mm	28.5 mm	0.10 kg
S02637-11	EB C1 NP 250 08 128 MK	With hardened support disc *2 with air recess *3	12.8 mm	30.0 mm	0.10 kg
S804-209HG	EB C1 NP 250 08 048 HG	Standard high-precision *4	4.8 mm	30.0 mm	0.07 kg
S804-211HG	EB C1 NP 250 08 078 HG	With hardened pallet *2 and high-precision *4	7.8 mm	30.0 mm	0.07 kg
S804-213HG	EB C1 NP 250 08 128 HG	With hardened support disc *2 and high-precision *4	12.5 mm	30.0 mm	0.10 kg

*1 Retractable nipple without lifting – see page 51
*2 Hardened support disc – see page 58-59
*3 Retractable nipple with air recess – see page 51
*4 HG (high-precision) functional description – see page 31

Retractable nipple STARK.classic.1 with equaliser

Retractable nipple suitable for all fast closing clamps of the STARK.classic.1, STARK.classic.NG.1 and STARK.compact family

- Retractable nipple with equaliser
- Material: Tool steel
- Installation according to data sheet D029-1 / D029-5



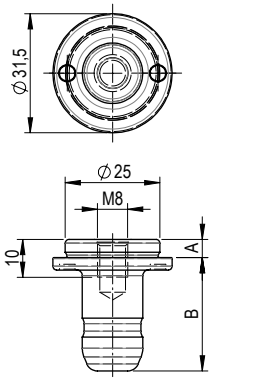
Order number	Article designation	Area of application/special feature	Collar A	Length B	Weight
S804-230	EB C1 AG 250 08 048	Standard	4.8 mm	30.0 mm	0.07 kg
S804-230K	EB C1 AK 250 08 048	Standard without lifting *1	4.8 mm	28.5 mm	0.07 kg
S02637-01	EB C1 AG 250 08 128	With hardened support disc *2	12.8 mm	30.0 mm	0.10 kg
S03385	EB C1 AK 250 08 128	With hardened support disc *2 without lifting *1	12.8 mm	28.5 mm	0.10 kg

*1 Retractable nipple without lifting – see page 51
*2 Hardened support disc – see page 58-59

Retractable nipple STARK.classic.1 without centring

Retractable nipple suitable for all fast closing clamps of the STARK.classic.1, STARK.classic.NG.1 and STARK.compact family

- Retractable nipple without centring
- Material: Tool steel
- Installation according to data sheet D029-1



Order number	Article designation	Area of application/ special feature	Collar A	Length B	Weight
S804-238	EB C1 OZ 250 08 048	Standard	4.8 mm	30.0 mm	0.07 kg
S804-238K	EB C1 OK 250 08 048	Standard without lifting *1	4.8 mm	28.5 mm	0.07 kg
S02637-02	EB C1 OZ 250 08 128	With hardened support disc *2	12.8 mm	30.0 mm	0.10 kg
S03386	EB C1 OK 250 08 128	With hardened support disc *2 without lifting *1	12.8 mm	28.5 mm	0.10 kg

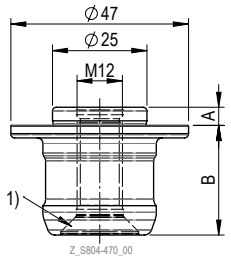
*1 Retractable nipple without lifting – see page 51
*2 Hardened support disc – see page 58-59

RETRACTABLE NIPPLE SIZE 2

Retractable nipple STARK.classic.2 with zero point

Retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and STARK.classic.NG.2 family

- Retractable nipple with zero point
- Material: Tool steel
- Installation according to data sheet D029-2



1) Countersink for M10 screw

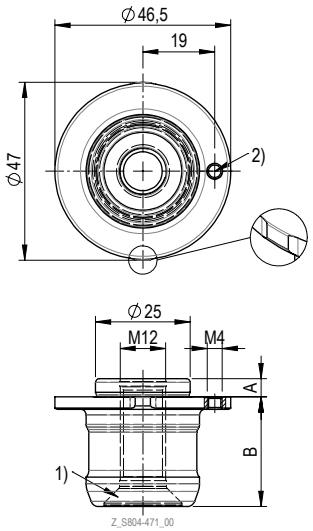
Order number	Article designation	Area of application/ special feature	Collar A	Length B	Weight
S804-470	EB C2 NP 250 12 048	Standard	4.8 mm	29.0 mm	0.17 kg
S804-470K	EB C2 NK 250 12 048	Standard without lifting *1	4.8 mm	27.5 mm	0.17 kg
S804-474	EB C2 NP 250 12 148	With hardened support disc *2	14.8 mm	29.0 mm	0.19 kg
S804-470-02	EB C2 NP 250 12 048 MK	Standard with air recess *3	4.8 mm	29.0 mm	0.17 kg
S804-474K	EB C2 NK 250 12 148	With hardened support disc *2 without lifting *1	14.8 mm	27.5 mm	0.19 kg
S804-474-02	EB C2 NP 250 12 148 MK	With hardened support disc *2 with air recess *3	14.8 mm	29.0 mm	0.19 kg
S804-470HG	EB C2 NP 250 12 048 HG	Standard high-precision *4	4.8 mm	29.0 mm	0.17 kg
S804-469HG	EB C2 NP 250 12 078 HG	With hardened pallet *2 and high-precision *4	7.8 mm	29.0 mm	0.17 kg
S804-474HG	EB C2 NP 250 12 148 HG	With hardened support disc *2 and high-precision *4	14.8 mm	29.0 mm	0.19 kg

▶ *1 Retractable nipple without lifting – see page 51
▶ *2 Hardened support disc – see page 58-59
▶ *3 Retractable nipple with air recess – see page 51
▶ *4 HG (high-precision) functional description – see page 31

Retractable nipple STARK.classic.2 with equaliser

Retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and STARK.classic.NG.2 family

- Retractable nipple with equaliser
- Material: Tool steel
- Installation according to data sheet D029-2 / D029-5



1) Countersink for M10 screw
2) Thread for shaft screw M4×8 for indexing - Shaft screw included in scope of delivery

Order number	Article designation	Area of application/ special feature	Collar A	Length B	Weight
S804-471	EB C2 AG 250 12 048	Standard	4.8 mm	29.0 mm	0.17 kg
S804-471K	EB C2 AK 250 12 048	Standard without lifting *1	4.8 mm	27.5 mm	0.17 kg
S804-476	EB C2 AG 250 12 148	With hardened support disc *2	14.8 mm	29.0 mm	0.19 kg
S804-476K	EB C2 AK 250 12 148	With hardened support disc *2 without lifting *1	14.8 mm	27.5 mm	0.19 kg

▶ *1 Retractable nipple without lifting – see page 51
▶ *2 Hardened support disc – see page 58-59

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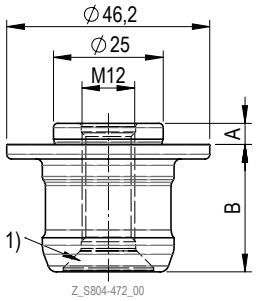
Retractable nipple STARK.classic.2 without centring

Retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and STARK.classic.NG.2 family

- Retractable nipple without centring
- Material: Tool steel
- Installation according to data sheet D029-2



1) Countersink for M10 screw

Order number	Article designation	Area of application/ special feature	Collar A	Length B	Weight
S804-472	EB C2 OZ 250 12 048	Standard	4.8 mm	29.0 mm	0.17 kg
S804-472K	EB C2 OK 250 12 048	Standard without lifting *1	4.8 mm	27.5 mm	0.17 kg
S804-478	EB C2 OZ 250 12 148	With hardened support disc *2	14.8 mm	29.0 mm	0.19 kg
S804-478K	EB C2 OK 250 12 148	With hardened support disc *2 without lifting *1	14.8 mm	27.5 mm	0.19 kg

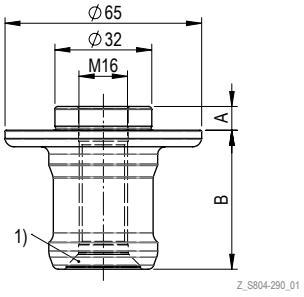
*1 Retractable nipple without lifting – see page 51
*2 Hardened support disc – see page 58-59

RETRACTABLE NIPPLE SIZE 3

Retractable nipple STARK.classic.3 with zero point

Retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and STARK.classic.NG.3 family

- Retractable nipple with zero point
- Material: Tool steel
- Installation according to data sheet D029-2



1) Countersink for M12 screw

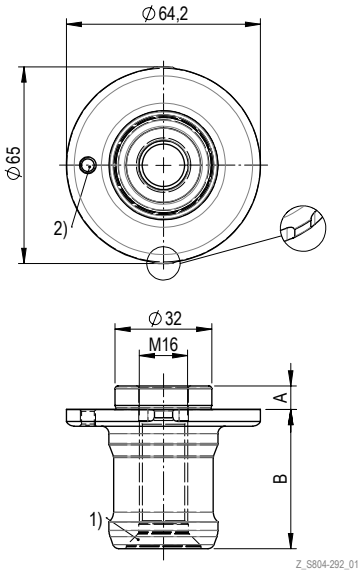
Order number	Article designation	Area of application/special feature	Collar A	Length B	Weight
S804-290	EB C3 NP 320 16 078	Standard	7.8 mm	46.0 mm	0.40 kg
S804-290K	EB C3 NK 320 16 078	Standard without lifting *1	7.8 mm	44.3 mm	0.40 kg
S04156	EB C3 NP 320 16 248	With hardened support disc *2	24.8 mm	46.0 mm	0.48 kg
S804-290-01	EB C3 NP 320 16 078 MK	Standard with air recess *3	7.8 mm	46.0 mm	0.40 kg
S804-312K	EB C3 NK 320 16 248	With hardened support disc *2 without lifting *1	24.8 mm	44.3 mm	0.48 kg
S804-312-01	EB C3 NP 320 16 248 MK	With hardened support disc *2 with air recess *3	24.8 mm	46.0 mm	0.48 kg
S804-290HG	EB C3 NP 320 16 078 HG	With hardened pallet *2 and high-precision *4	7.8 mm	46.0 mm	0.40 kg
S03641	EB C3 NP 320 16 248 HG	With hardened support disc *2 and high-precision *4	24.8 mm	46.0 mm	0.48 kg

- *1 Retractable nipple without lifting – see page 51
- *2 Hardened support disc – see page 58–59
- *3 Retractable nipple with air recess – see page 51
- *4 HG (high-precision) functional description – see page 31

Retractable nipple STARK.classic.3 with equaliser

Retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and STARK.classic.NG.3 family

- Retractable nipple with equaliser
- Material: Tool steel
- Installation according to data sheet D029-2/D029-5



1) Countersink for M12 screw
2) Thread for shaft screw M5×25 for indexing - Shaft screw included in scope of delivery

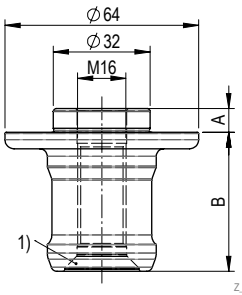
Order number	Article designation	Area of application/special feature	Collar A	Length B	Weight
S804-292	EB C3 AG 320 16 078	Standard	7.8 mm	46.0 mm	0.40 kg
S804-292K	EB C3 AK 320 16 078	Standard without lifting *1	7.8 mm	44.3 mm	0.40 kg
S03642	EB C3 AG 320 16 248	With hardened support disc *2	24.8 mm	46.0 mm	0.48 kg
S804-313K	EB C3 AK 320 16 248	With hardened support disc *2 without lifting *1	24.8 mm	44.3 mm	0.48 kg

- *1 Retractable nipple without lifting – see page 51
- *2 Hardened support disc – see page 58-59

Retractable nipple STARK.classic.3 without centring

Retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and STARK.classic.NG.3 family

- Retractable nipple without centring
- Material: Tool steel
- Installation according to data sheet D029-2



1) Countersink for M12 screw

Order number	Article designation	Area of application/ special feature	Collar A	Length B	Weight
S804-294	EB C3 OZ 320 16 078	Standard	7.8 mm	46.0 mm	0.40 kg
S804-294K	EB C3 OK 320 16 078	Standard without lifting *1	7.8 mm	44.3 mm	0.40 kg
S03660	EB C3 OZ 320 16 248	With hardened support disc *2	24.8 mm	46.0 mm	0.48 kg
S804-314K	EB C3 OK 320 16 248	With hardened support disc *2 without lifting *1	24.8 mm	44.3 mm	0.48 kg

*1 Retractable nipple without lifting – see page 51
*2 Hardened support disc – see page 58-59

Equaliser via retractable nipple

A zero-point clamping system consists of a fast closing clamp into which a retractable nipple is clamped. Three different retractable nipples are combined to equalise manufacturing tolerances and the necessary "mobility for thermal expansion" on a pallet "temperature variation of a workpiece":

Retractable nipple with zero point (NP)

Retractable nipple with equaliser (AG) equalisation of theoretical centre in equaliser direction

Retractable nipple without centring (OZ) equaliser of theoretical centre in all directions

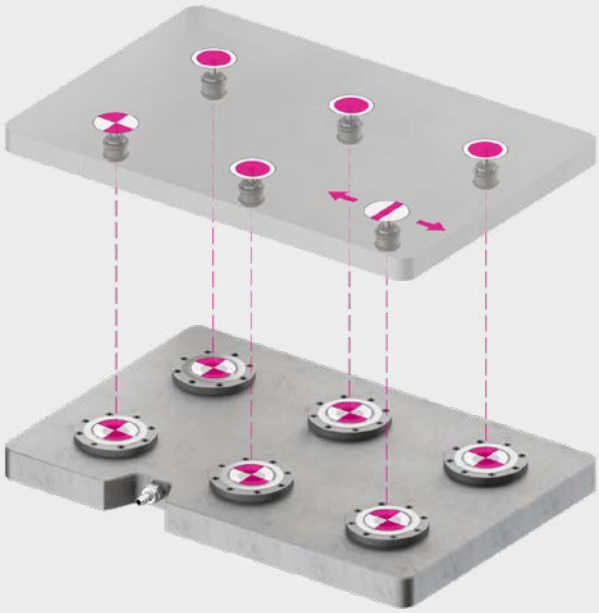
INFO Equalisation principle

Area of application

- Different materials between pallet and plate
- Flexible for different pallet sizes
- Manufacturing tolerances during production

Application example - equalisation principle

- Fast closing plate with 6 clamping elements
- Device pallet with 6 retractable nipples
  - > 1 × retractable nipple with zero point
  - > 1 × retractable nipple with equaliser
  - > 4 × retractable nipple without centring



Symbols – equaliser function

with zero point (NP) with equaliser (AG) without centring (OZ)

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Retractable nipple with air recess

The air recess prevents the pallet from rattling when the blow-out air is active. The compressed air can escape in a controlled manner through the recesses on the zero point nipple. Thus, the blow-out can remain activated even during the clamping process. This ensures optimum cleaning even in automated operation.

INFO Air recess

Size 1 **Size 2** **Size 3**

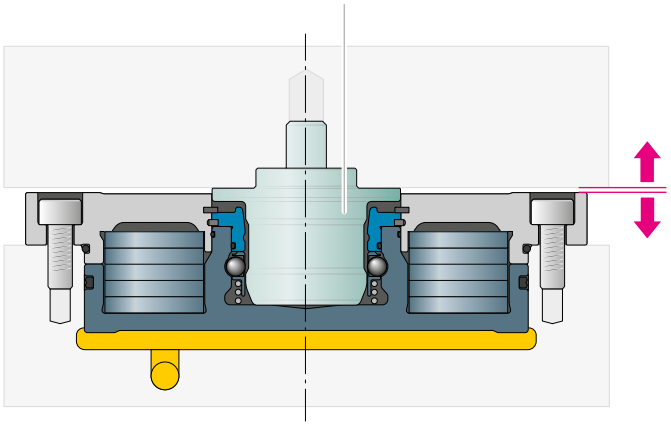
Short retractable nipple without lifting out of the fit

The release cycle of the STARK.classic product family 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 a "short" retractable nipple.

When is the "short" retractable nipple used?

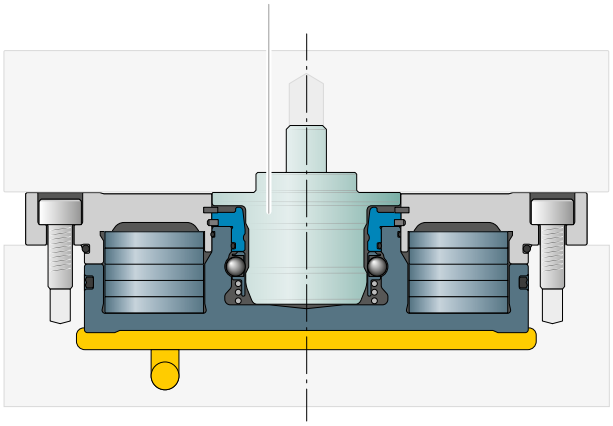
If the STARK.classic is released, the "released" signal only occurs when the piston has reached the end position and the retractable nipple has been lifted. If lifting during release is not possible, e.g. due to the handling situation (the force acting against the lifting force is greater than the lifting 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

"Short" retractable nipple



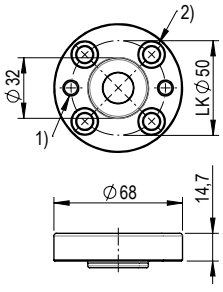
(2) Released without lifting

PENDULUM NIPPLE

Flange STARK.classic.1 – NP

Mounting flange with zero point for pendulum nipple

- Areas of application:
  Machine pallets, machine vice, chucks, devices, workpiece direct clamping
- Installation according to data sheet D030

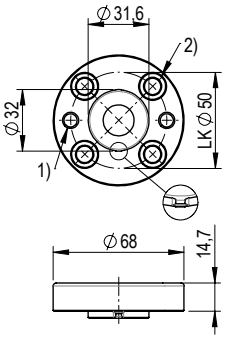


Order number	Article designation	Area of application/ special feature	Weight
S801-010	Mounting flange C1 NP	Standard, Tornado	0.20 kg

Flange STARK.classic.1 – AG

Mounting flange with equaliser for pendulum nipple

- Areas of application:
  Machine pallets, machine vice, chucks, devices, workpiece direct clamping
- Installation according to data sheet D030

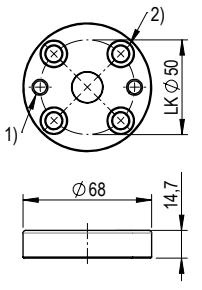


Order number	Article designation	Area of application/ special feature	Weight
S801-011	Mounting flange C1 AG	Standard, Tornado	0.20 kg

Flange STARK.classic.1 – OZ

Mounting flange without centring for pendulum nipple

- Areas of application:
  Machine pallets, machine vice, chucks, devices, workpiece direct clamping
- Installation according to data sheet D030

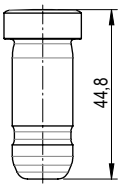


Order number	Article designation	Area of application/ special feature	Weight
S801-012	Mounting flange C1 OZ	Standard, Tornado	0.20 kg

Pendulum nipple STARK.classic.1

Pendulum nipple for mounting flange

- Areas of application:
  Machine pallets, machine vice, chucks, devices, workpiece direct clamping
- Suitable for S801-010/-011/-012

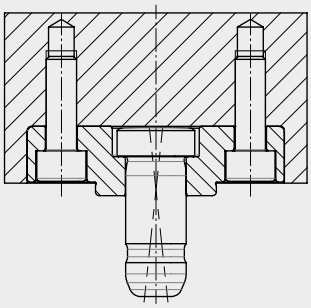


Z_S801-009_00

Order number	Article designation	Weight
S801-009	C1 pendulum nipple	0.20 kg

INFO Pendulum nipple

The pendulum nipple is movable and mounted in a flange to prevent possible tilting when changing pallets (especially with heavy components and large machine pallets). It is only used for machine pallet or workpiece feed, positioning and centring is done via the zero point and compensation flange.



INFO Advantages and benefits
Retractable nipple STARK.classic floating function

- **Low production costs**

  For large spacings, the advantage of a large equalisation can lead to much cheaper manufacture and thus significant cost savings. There are no processing steps and therefore the throughput time for the production of fast closing plates and pallets is reduced.

- **Thermal expansion**

  Temperature changes, e.g. night 17 °C / day 32 °C, require special precautions to prevent redundant dimensioning (e.g. in the case of aluminium, a change in temperature of 15 °C modifies spacing from 1,000 mm to 1,000.36 mm).

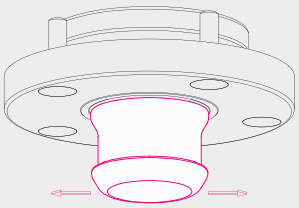
- **Manufacturing tolerances**

  Due to the large equalisation, it is sufficient to prepare the position of the elements and retractable nipples with generous tolerances. The entire system is always zero point accurate.

You determine the zero point.
Zero point and axis alignment are retained and are always known. A total of up to ±2 mm can be compensated.

Retractable nipple AG

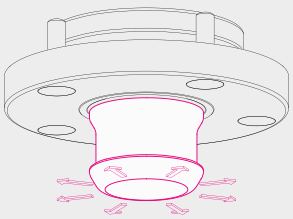
Floating range in the direction of the arrow



Schematic diagram

Retractable nipple NP and OZ

Floating range in the direction of the arrow (radial in all directions)



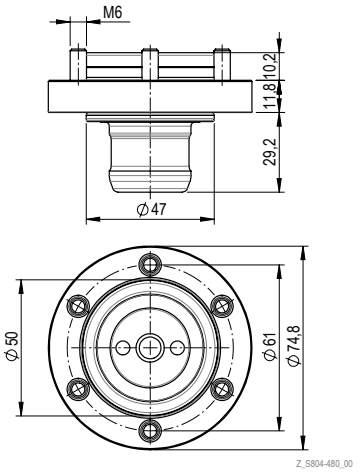
Schematic diagram

FLOATING NIPPLE

Retractable nipple STARK.classic.2 floating function – NP

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and the STARK.classic.NG.2 family

- Flange retractable nipple with zero point, Ø 47mm: without floating range
  Retractable nipple front part: floating range of ± 1.5mm
- Installation according to data sheet D143

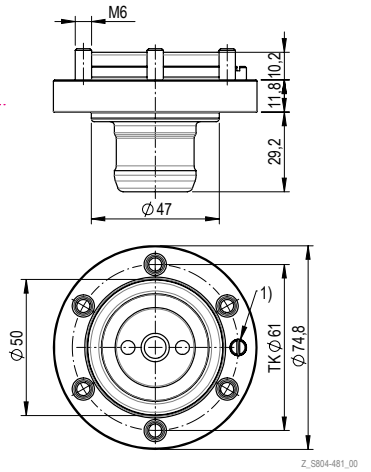


Order number	Article designation	Area of application/ special feature	Weight
S804-480	EF C2 NP 500 00 102	Standard, Tornado	0.70kg

Retractable nipple STARK.classic.2 floating function – AG

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and the STARK.classic.NG.2 family

- Flange retractable nipple with equaliser in one axis, floating range of ±1.5mm
- Installation according to data sheet D143

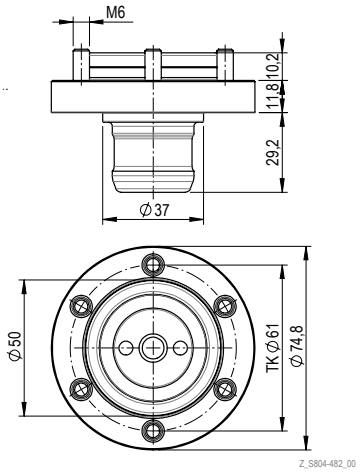


Order number	Article designation	Area of application/ special feature	Weight
S804-481	EF C2 AG 500 00 102	Standard, Tornado	0.70kg

Retractable nipple STARK.classic.2 floating function – OZ

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.2 and the STARK.classic.NG.2 family

- Flange retractable nipple without centring, floating range of ±1.5mm
- Installation according to data sheet D143



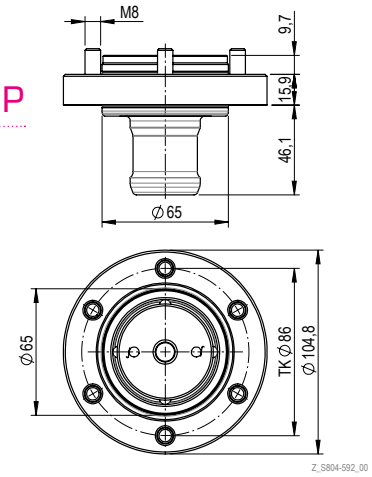
Order number	Article designation	Area of application/ special feature	Weight
S804-482	EF C2 OZ 500 00 102	Standard, Tornado	0.70kg

Data sheets and 3D data: www.stark-roemheld.com
STARK Spannsysteme | +43 5522 37400 | info@stark-roemheld.com
Subject to modification | WM-020-450-00-en

Retractable nipple STARK.classic.3 floating function – NP

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and the STARK.classic.NG.3 family

- Flange retractable nipple with zero point, Ø 65 mm: without floating range
  Retractable nipple front part: floating range of ± 2 mm
- Installation according to data sheet D163

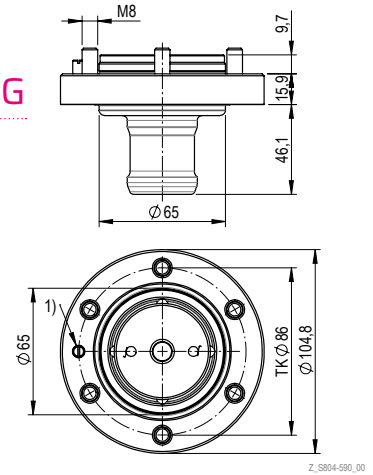


Order number	Article designation	Area of application/ special feature	Weight
S804-592	EF C3 NP 650 00 097	Standard, Tornado	2.40 kg

Retractable nipple STARK.classic.3 floating function – AG

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and the STARK.classic.NG.3 family

- Flange retractable nipple with equaliser in one axis, Retractable nipple front part: floating range of ± 2 mm
- Installation according to data sheet D163



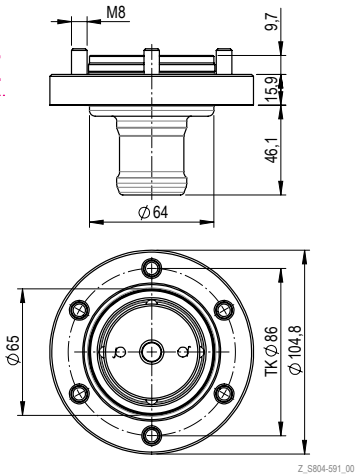
1) Shaft screw M6 DIN 427 for indexing

Order number	Article designation	Area of application/ special feature	Weight
S804-590	EF C3 AG 650 00 097	Standard, Tornado	2.40 kg

Retractable nipple STARK.classic.3 floating function – OZ

Flange retractable nipple suitable for all fast closing clamps of the STARK.classic.3 and the STARK.classic.NG.3 family

- Flange retractable nipple without centring
  Retractable nipple front part: floating range of ± 2 mm
- Installation according to data sheet D163



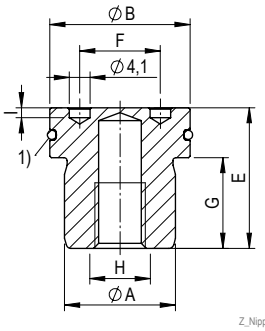
Order number	Article designation	Area of application/ special feature	Weight
S804-591	EF C3 OZ 650 00 097	Standard, Tornado	2.40 kg

NIPPLE FASTENING

Nipple fastening D

For mounting the retractable nipple according to fastening option "D"

- Enables the nipple fastening bore hole to be produced from above in one clamping procedure
- Mounting key or face spanner recommended for counterhold
- Installation according to data sheet D029
- Operating manual: WM-020-332-xx-xx



1) O-ring included in scope of delivery

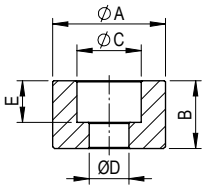
Order number	Article designation	Size	ØA *1	ØB	E	F	G	H	I	Weight
S804-252	NB 30 22 25 12 M08 NI D	1	Ø25.0mm	Ø29.8mm	21.9mm	24.0mm	12.0mm	M8×13	3.0mm	0.09kg
S804-267	NB 30 22 25 12 M10 NI D	2	Ø25.0mm	Ø29.8mm	21.9mm	24.0mm	12.0mm	M10×13	3.0mm	0.09kg
S804-262	NB 38 28 32 18 M12 NI D	3	Ø32.0mm	Ø37.8mm	27.9mm	24.0mm	18.0mm	M12×18	2.0mm	0.18kg

*1 ØA should correspond to the collar Ø of the retractable nipple

Nipple fastening E

For mounting the retractable nipple according to fastening option "E"

- Enables the nipple fastening bore hole to be produced from above in one clamping procedure
- Installation according to data sheet D029-1
- Operating manual: WM-020-332-xx-xx

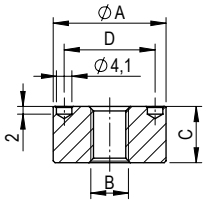


Order number	Article designation	Size	ØA	B	ØC	ØD	E	Weight
S804-250	NB 30 15 00 00 F08 NI E	1	Ø29.8mm	14.9mm	Ø15.0mm	ø8.5mm	9.0mm	0.07kg
S804-251	NB 20 15 00 00 F08 NI E	1	Ø19.8mm	14.9mm	Ø15.0mm	ø8.5mm	9.0mm	0.02kg
S804-266-01	NB 30 18 00 00 F12 NI E	2	Ø29.8mm	17.9mm	Ø18.5mm	ø13.0mm	12.5mm	0.07kg
S804-266-03	NB 38 24 00 00 F16 NI E	3	Ø37.8mm	23.9mm	Ø26.0mm	ø17.0mm	17.0mm	0.13kg
S03651	NB 44 27 00 00 F16 NI E	3	Ø43.8mm	26.6mm	Ø26.0mm	ø17.0mm	16.6mm	0.23kg

Nipple fastening E.1

For mounting the retractable nipple according to fastening option "E.1"

- Enables the nipple fastening bore hole to be produced from above in one clamping procedure
- Mounting key or face wrench recommended for counterholding.
- Installation according to data sheet D029-2
- Operating manual: WM-020-332-xx-xx



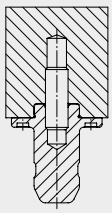
Order number	Article designation	Size	ØA	B	C	D	Weight
S804-266	NB 30 15 00 00 M10 NI E1	2	Ø29.8mm	M10	14.9mm	24.0mm	0.05kg
S804-264	NB 38 18 00 00 M12 NI E1	3	Ø37.8mm	M12	17.9mm	24.0mm	0.15kg

INFO Retractable nipple fastening versions

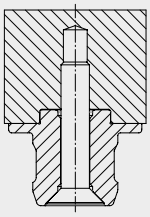
Version A*

Simple nipple fastening from one side. For applications where nipple bores are not possible or permissible on the surface (e.g. top of the pallet) or for direct workpiece clamping.

STARK.classic.1*



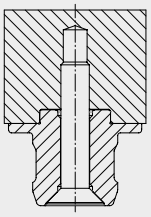
STARK.classic.2
STARK.classic.3



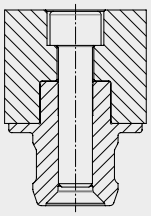
Version B

Simple nipple fastening from above.

STARK.classic.1



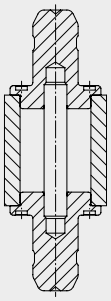
STARK.classic.2
STARK.classic.3



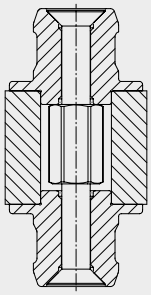
Version C*

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

STARK.classic.1*



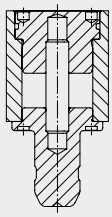
STARK.classic.2
STARK.classic.3



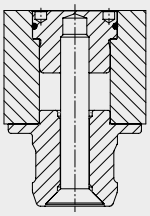
Version D

The fitting bores for the retractable nipple 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. Mounting version D is additionally sealed by an O-ring.

STARK.classic.1

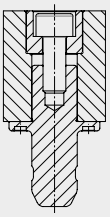


STARK.classic.2
STARK.classic.3



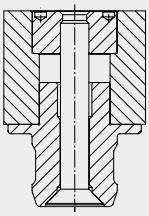
Version E

STARK.classic.1



Version E.1

STARK.classic.2
STARK.classic.3

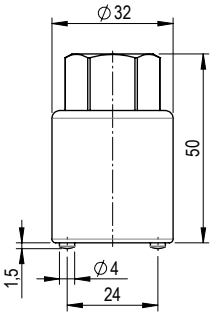


* For the STARK.classic.1 with compensation (AG) retractable nipple, fastening version A is not possible and for version C only possible on one side.

Key for nipple fastening

For assembly and disassembly of the STARK.classic.1 retractable nipple and of retractable nipple according to fastening versions "D & E.1"

- Width across flats SW22
- For tightening torque, see retractable nipple installation data sheets



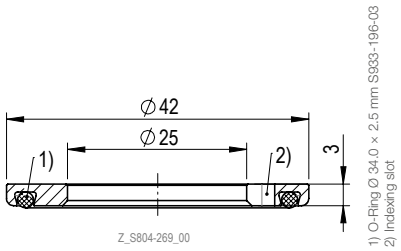
Z_S804-254_00

Order number	Article designation	Dimensions	Weight
S804-254	Key for nipple fastening M10	Ø32 mm / 50 mm	0.16 kg

Spacer with O-ring - NG.1

For height compensation and sealing the centre bore for STARK.classic.NG.1 Twister

- Very precise seat check (up to 0.01 mm) possible, as air can only escape at the 4 support islands due to the sealing of the centre bore
- Installation according to data sheet D033

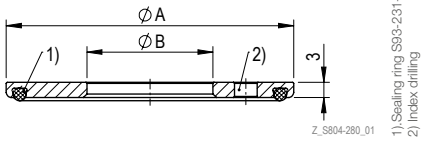


Order number	Article designation	Area of application/special feature	Weight
S804-269	DS 042 25 030 B	NG.1 Twister	0.02 kg

Spacer with O-ring - NG.2/NG.3

For height compensation and sealing the centre bore for STARK.classic.NG.2 Twister and STARK.classic.NG.3 Twister

- Very precise seat check (up to 0.01 mm) possible, as air can only escape at the 4 support islands due to the sealing of the centre bore
- Installation according to data sheet D033

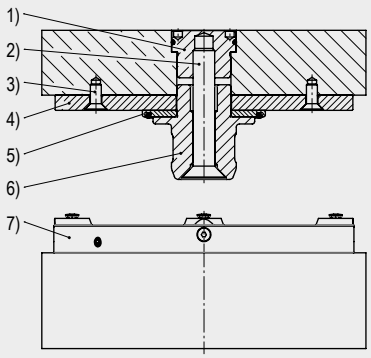


Order number	Article designation	Area of application/special feature	A	B	Weight
S804-280	DS 057 25 030 B	NG.2 Twister	57 mm	25 mm	0.05 kg
S804-060	DS 078 32 030 B	NG.3 Twister	77 mm	32 mm	0.09 kg

INFO Support & spacer

Application example; STARK.classic.NG.2 Twister with spacer and support disc

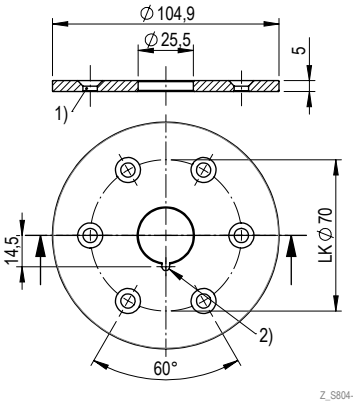
1 Nipple fastening
2 Fixing screw for retractable nipple
3 Fixing screw for hardened support disc
4 Hardened support disc
5 Spacer with O-ring (not applicable for Tornado)
6 Retractable nipple
7 STARK.classic.NG.2 Twister



Support disc made of hardened steel - NG.1

For use with non-hardened machine pallet surfaces for STARK.classic.NG.1 Twister and Tornado

- High wear resistance for non-hardened machine pallet surfaces
- Thickness tolerance 5 µ
- Installation according to data sheet D033 (sheet 5)

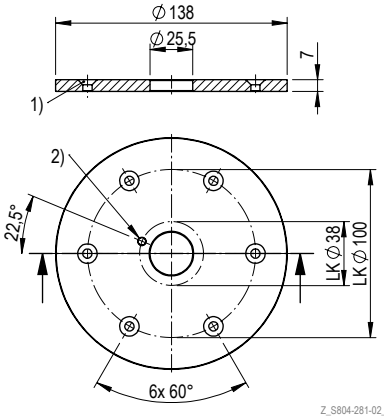


Order number	Article designation	Area of application/special feature	Collar	Weight
S804-510-1	AS D105 25 50 A	NG.1 Twister & Tornado	Ø25mm	0.31kg

Support disc made of hardened steel - NG.2

For use with non-hardened machine pallet surfaces for STARK.classic.NG.2 Twister and Tornado

- High wear resistance for non-hardened machine pallet surfaces
- Thickness tolerance 5 µ
- Installation according to data sheet D033 (sheet 33)

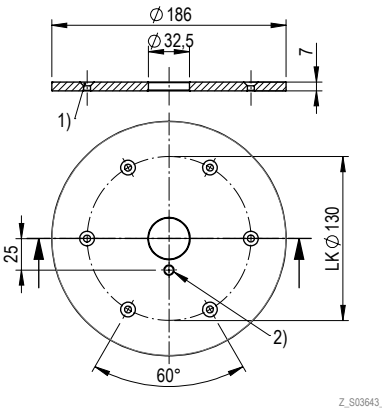


Order number	Article designation	Area of application/special feature	Collar	Weight
S804-281-02	AS D138 25 70 A	NG.2 Twister & Tornado	Ø25mm	0.78kg
S804-282	AS D138 25 70 A Ix	NG-S with 4 grooves	Ø25mm	0.78kg

Support disc made of hardened steel - NG.3

For use with non-hardened machine pallet surfaces for STARK.classic.NG.3 Twister and Tornado

- High wear resistance for non-hardened machine pallet surfaces
- Thickness tolerance 5 µ
- Installation according to data sheet D033 (sheet 10)



Order number	Article designation	Area of application/special feature	Collar	Weight
S03643	AS D186 32 70 A	NG.3 Twister & Tornado	Ø32mm	1.42kg

MEDIA DUCT

Media ducts are used to feed media such as oil, air, water, etc. through the STARK.classic.NG zero point clamping system. This allows, for example, clamping fixtures mounted on machine pallets to be supplied with energy (hydraulic oil, compressed air). Media ducts each consist of two components: one for installation in the clamping element and one for installation in the pallet, which are automatically coupled when the retractable nipples are clamped.

BENEFITS

- Media ducts can be integrated directly into the STARK.classic.NG zero point clamping system.
- Up to 4 media ducts are possible per clamping element.
- The coupling travel is matched with the retraction path of the clamping elements.

TECHNICAL DATA

Min. coupling force	Operating pressure	Flow rate
250 N / coupling	Max. 200 bar	28 l/min with dynamic pressure 90 bar for HLP 46

CALCULATION FORMULA

Coupling force F [N] = (250 + 7.1 × p [bar]) × n

(n = number of lines under the same pressure in the coupled state)

- Non-pressurised lines are under 250 N spring force.
- The sum of the axial forces of the media ducts counteract the insertion force of the clamping elements.
- The machining force and the coupling force to be absorbed must not exceed the insertion force of the zero point clamping system!

Calculation example:

STARK.classic.NG.2 insertion force: 22,000 N

Number of elements: 4 pcs.

Media duct pressure: 140 bar

Number of media ducts: 4 pcs.

Coupling force F [N] = (250 + 7.1 × 140 [bar]) × 4 = 4,976 N

Element insertion force: 4 × 22,000 N > 88,000 N

88,000 N > 4,976 N

The calculation example shows that there is sufficient insertion force for machining. Media ducts must be taken into account in the tilting moment calculation, page 11.

Data sheets and 3D data: www.stark-roemheld.com
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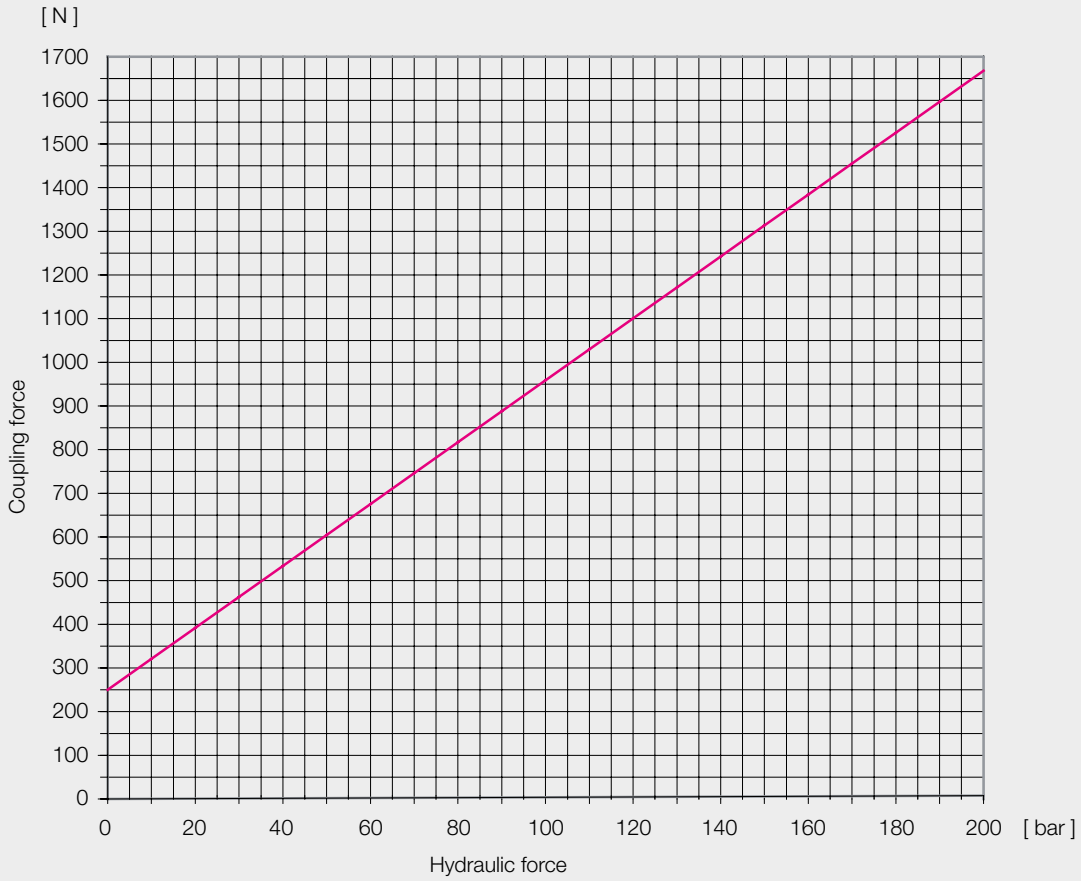
Subject to modification | WM-020-450-00-en

Determination of the coupling force

INFO

Diagram for determining the coupling force per media duct



Important note for the correct use of the media ducts

- The media ducts may only be coupled without pressure.
- Machine pallets with regularly installed media ducts must not be pressurised when uncoupled. Fast closing plates with irregularly installed media ducts must also not be pressurised when uncoupled.
- Concentric pre-positioning of Ø 0.20 mm is necessary.
- Both components of the media duct are closed when uncoupled.

Media duct NW4 coupling mechanism ABV

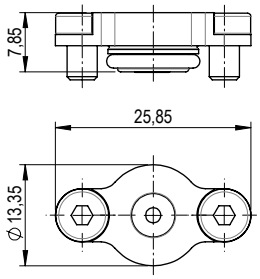
Media duct for hydraulic oil, water and air, other media on request

The media duct is coupled by the retraction stroke of the clamping elements and is tight when uncoupled. Can be coupled without pressure.

Together with the clamping element, the necessary positioning is ensured.

For direct installation in clamping elements as well as single or multiple couplings with or without blow-out.

- Screw-on version (ABV)
- Installation on the pallet side (regular)
- Weight 0.03 kg
- Installation according to data sheet D023



Z_S704-200_00

Order number	Article designation	Max. coupling force
S704-200	Media duct NW4 coupling mechanism ABV	See Determination of the coupling force (beginning of chapter)

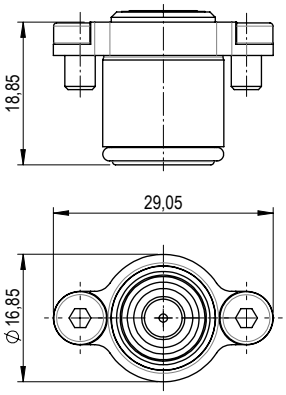
Media duct NW4 coupling nipple ABV

Media duct for hydraulic oil, water and air, other media on request

The media duct is coupled by the retraction stroke of the clamping elements and is tight when uncoupled. Can be coupled without pressure.

For direct installation in machine pallets as well as single or multiple couplings with or without blow-out.

- Screw-on version
- Installation on the pallet side (regular)
- Weight 0.03 kg
- Installation according to data sheet D025

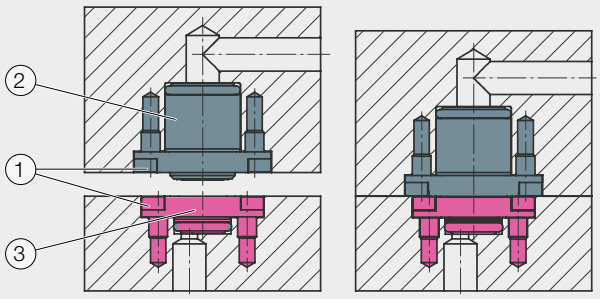


Z_S704-201_00

Order number	Article designation	Max. coupling force
S704-201	Media duct NW4 coupling nipple ABV	See Determination of the coupling force (beginning of chapter)

INFO Application example for screw-on version (ABV)

1 Fixing screws
2 Media duct, pallet side
3 Media duct, element side



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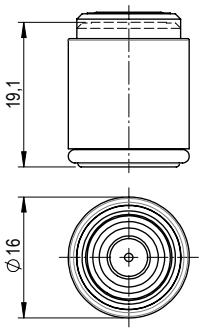
Media duct NW4 coupling nipple EKV

Media duct for hydraulic oil, water and air, other media on request

The media duct is coupled by the retraction stroke of the clamping elements and is tight when uncoupled. Can be coupled without pressure.

For two-part installation in machine pallets as well as single or multiple couplings with or without blow-out, e.g. combined with hardened support disc.

- Plug-in version (EKV)
- Installation on the pallet side (regular)
- Weight 0.02 kg
- Installation according to data sheet D121



Order number	Article designation	Max. coupling force
S704-203	Media duct NW4 coupling nipple EKV	See Determination of the coupling force (beginning of chapter)

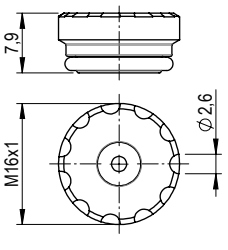
Media duct NW4 coupling mechanism EBV

Media duct for hydraulic oil, water and air, other media on request

The media duct is coupled by the retraction stroke of the clamping elements and is tight when uncoupled. Can be coupled without pressure.

For two-part installation in machine pallets as well as single or multiple couplings with or without blow-out.

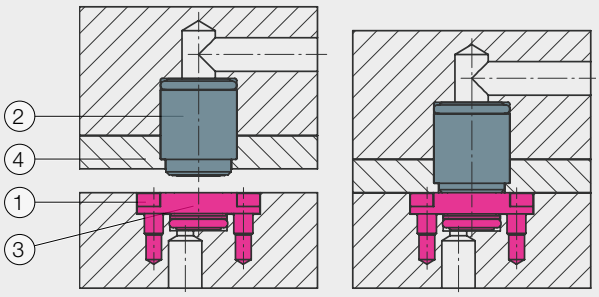
- Screw-in version (EBV)
- Installation on the pallet side (regular)
- Weight 0.007 kg
- Installation according to data sheet D188



Order number	Article designation	Max. coupling force
S704-205	Media duct NW4 coupling nipple EBV	See Determination of the coupling force (beginning of chapter)

INFO Application example for plug-in version (EKV)

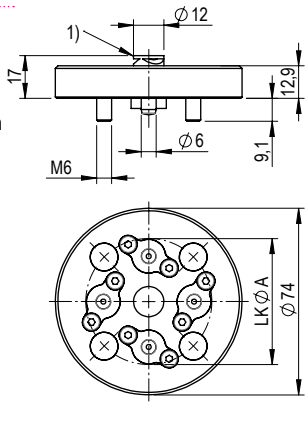
1 Fixing screws
2 Media duct, pallet side
3 Media duct, element side
4 Support disc



Multiple coupling NW4 coupling mechanism

Media duct with 1-5 connections and integrated blow-out

- For controlling devices or hydraulic vices on machine pallets
- Particularly suitable for automated loading due to integrated blow-out
- Retrofitting existing zero point clamping systems with media ducts
- Installation on the pallet side (regular)
- Installation according to data sheet D042



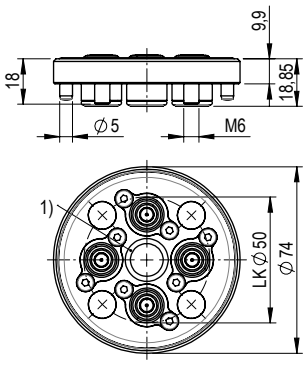
1) Blow-off nozzle
- Cylinder screws with hexagon socket M6 x 14 mm S931-137, enclosed separately
- Screw covers M6 S999-408, enclosed separately
- O-ring ø 6 x 1.5 mm S933-283, enclosed separately
- Cylinder pins Ø 6 x 16 DIN 7979 D S936-111, enclosed separately

Order number	Article designation	Number of media ducts	LK ⌀A	Weight
S703-009	Multiple coupling NW4 coupling mechanism with 1× MD	1× media duct	50 mm	0.50 kg
S703-010	Multiple coupling NW4 coupling mechanism with 2× MD	2× media duct	50 mm	0.50 kg
S703-012	Multiple coupling NW4 coupling mechanism with 3× MD	3× media duct	50 mm	0.50 kg
S703-011	Multiple coupling NW4 coupling mechanism with 4× MD	4× media duct	50 mm	0.50 kg
S703-022	Multiple coupling NW4 coupling mechanism with 5× MD	5× media duct	54 mm	0.50 kg

Multiple coupling NW4 coupling nipple

Media duct with 1-5 connections

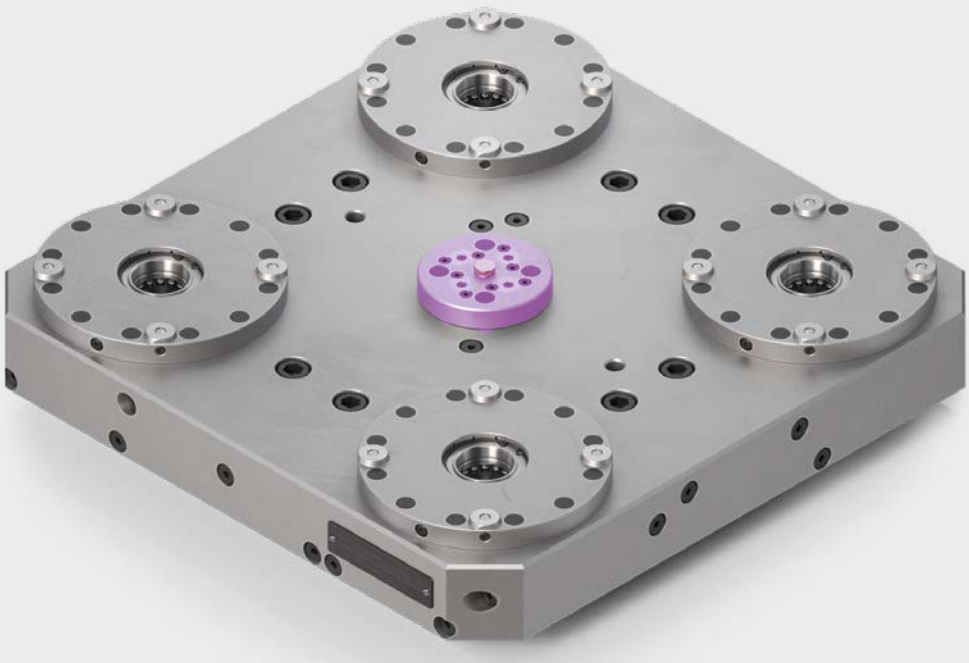
- For controlling devices or hydraulic vices on machine pallets
- Retrofitting existing zero point clamping systems with media ducts
- Installation on the pallet side (regular)
- Installation according to data sheet D040



1) Thread M14 x 1
- Cylinder screws with hexagon socket M6 x 10 mm S931-252, enclosed separately
- Screw covers M6 S999-408, enclosed separately
- Cylinder pins Ø 5 x 12 DIN 7979 D S936-131, enclosed separately

Order number	Article designation	Number of media ducts	Weight
S703-014	Multiple coupling NW4 coupling nipple with 1× MD	1× media duct	0.50 kg
S703-015	Multiple coupling NW4 coupling nipple with 2× MD	2× media duct	0.50 kg
S703-017	Multiple coupling NW4 coupling nipple with 3× MD	3× media duct	0.50 kg
S703-016	Multiple coupling NW4 coupling nipple with 4× MD	4× media duct	0.50 kg
S703-023	Multiple coupling NW4 coupling nipple with 5× MD	5× media duct	0.50 kg

Application example – multiple coupling



Typical application for milling machines

- Zero point clamping system with 4 STARK.classic.NG.2 Twister elements
- Multiple coupling with 4 connections
- Integrated blow-out

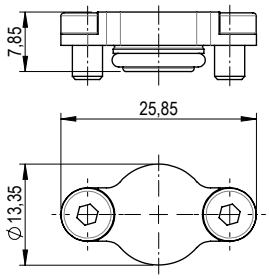
System options and features

- Customer-specific design
- 2 Pneumatic circuits for queries on the device
- 2 Hydraulic circuits for actuating thehydraulic device

Blanking plug coupling mechanism ABV

Blanking plug for media duct. To close the media duct that are not required

- Suitable for S704-200



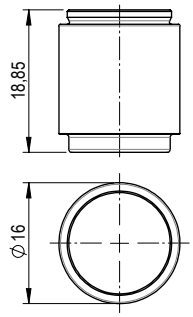
Z_S704-208_00

Order number	Article designation	Weight
S704-208	Blanking plug coupling mechanism ABV	0.01 kg

Blanking plug coupling nipple EKV

Blanking plug for media duct. To close the media duct that are not required

- Suitable for S704-203



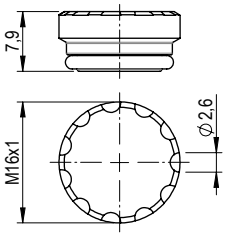
Z_S704-260_00

Order number	Article designation	Weight
S704-260	Blanking plug coupling nipple EKV	0.03 kg

Blanking plug coupling nipple EBV

Blanking plug for media duct. To close the media duct that are not required

- Suitable for S704-205



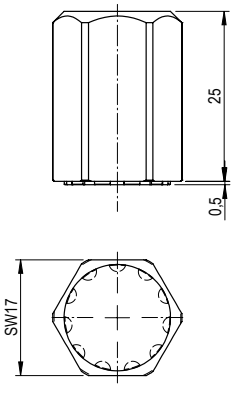
Z_S704-206_01

Order number	Article designation	Weight
S704-206	Blanking plug coupling nipple EBV	0.01 kg

Face wrench

Face wrench for mounting/dismounting media duct (EBV)

- Suitable for S704-205, S704-206



Z_S704-218_02

Order number	Article designation	Weight
S704-218	Face wrench NW4 EBV	0.02 kg

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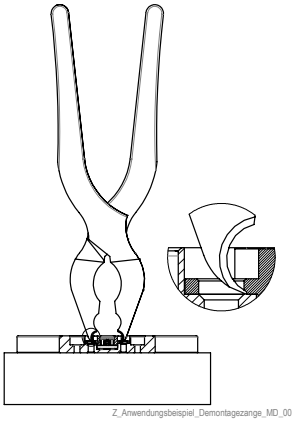
Disassembly pliers

Pliers for dismantling media ducts (AVB)

Due to the adapted contour of the disassembly pliers, the media duct is not damaged during disassembly



Order number	Article designation	Weight
S504-015	Disassembly pliers for AVB media duct	0.18 kg

Application example – Clamping tower with media duct

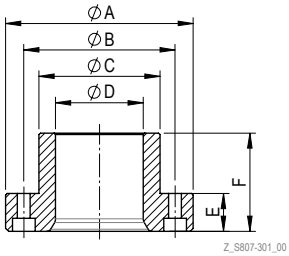
STARK.classic.2 fast closing clamps with media ducts installed on each side of the clamping tower. The HILMA machine vices are actuated via the top-mounted control valves.

PRE-CENTRING

Pre-centring bushes

Pre-centring is used for easier and gentler loading of pallets and devices. Recommended for large or heavy components.

- Material: Hardened tool steel
- Installation according to data sheet D128

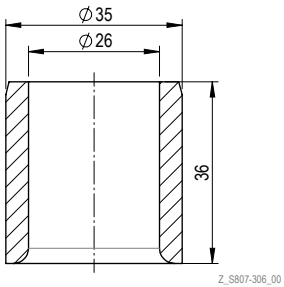


Order number	Article designation	ØA	ØB	ØC	ØD	E	F	Fastening	Weight
S807-301	Pre-centring bush Ø58×65mm	124mm	100mm	80mm	58mm	25mm	65mm	4× M8	2.50kg
S807-304	Pre-centring bush Ø78×68mm	144mm	120mm	100mm	78mm	28mm	68mm	4× M8	3.35kg
S807-308	Pre-centring bush Ø36×40mm	71.9mm	58mm	45mm	36mm	18mm	40mm	4× M6	0.50kg
S807-310	Pre-centring bush Ø58×43mm	114mm	90mm	74mm	58mm	17mm	43mm	4× M8	1.30kg

Pre-centring bush

Pre-centring is used for easier and gentler loading of pallets and devices. Recommended for large or heavy components.

- Material: Hardened steel
- Installation according to data sheet D128

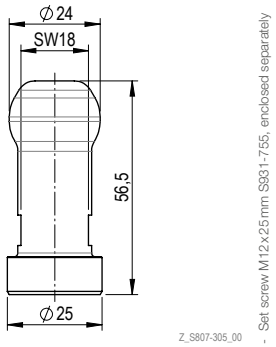


Order number	Article designation	Weight
S807-306	Pre-centring bush Ø26×36mm	0.13kg

Pre-centring mandrel

Pre-centring is used for easier and gentler loading of pallets and devices. Recommended for large or heavy components.

- Material: Hardened tool steel
- Installation according to data sheet D128

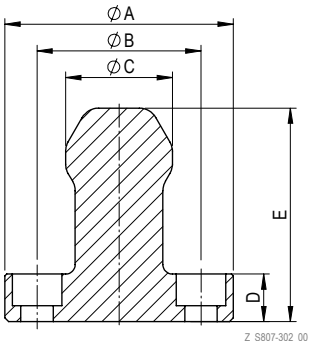


Order number	Article designation	Weight
S807-305	Pre-centring mandrel Ø24×56.5mm	0.16kg

Pre-centring mandrel

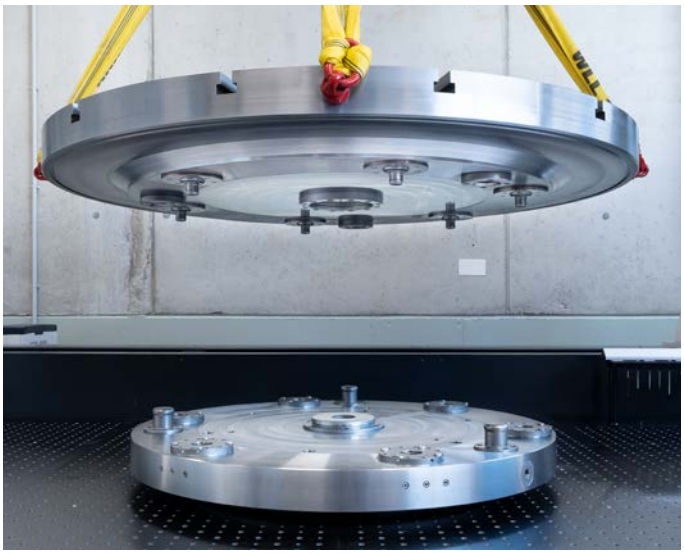
Pre-centring is used for easier and gentler loading of pallets and devices. Recommended for large or heavy components.

- Material: Hardened tool steel
- Installation according to data sheet D128



Order number	Article designation	ØA	ØB	ØC	D	E	Fastening	suitable for	Weight
S807-300	Pre-centring mandrel Ø 56 × 105 mm	119.8 mm	86 mm	56 mm	25 mm	105 mm	4× M16	S807-301	3.00 kg
S807-302	Pre-centring mandrel Ø 56 × 112 mm	119.8 mm	86 mm	56 mm	25 mm	112 mm	4× M16	S807-301	3.10 kg
S807-303	Pre-centring mandrel Ø 76 × 112 mm	139.8 mm	105 mm	76 mm	25 mm	112 mm	4× M16	S807-304	5.15 kg
S807-307	Pre-centring mandrel Ø 34 × 59.5 mm	69.8 mm	51 mm	34 mm	25 mm	59.5 mm	4× M8	S807-308	0.65 kg
S807-309	Pre-centring mandrel Ø 56 × 65.5 mm	99.8 mm	76 mm	56 mm	15 mm	65.5 mm	6× M8	S807-310	1.70 kg

Application example – Pre-centring



Grinding machine application
Aviation

- Zero point clamping system with 6 STARK.classic.NG.2 elements
- 3× pre-centring
- Centring elements with integrated media coupling
- Retractable nipple with spacer and support disc

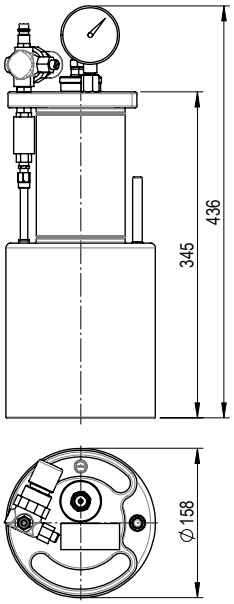
PRESSURE BOOSTER

RECORD pressure booster

Pressure booster is used to release single-acting clamping systems. The RECORD converts air pressure into the required hydraulic system pressure for releasing the STARK.classic clamping elements.

- Air pressure 6 bar
- Oil volume 0,3 l
- Max. oil pressure 40 bar
- Operating manual: WM-020-062-xx-xx

▸ Pressure booster can be extended to DH with article S804-427



Z_S804-412_00

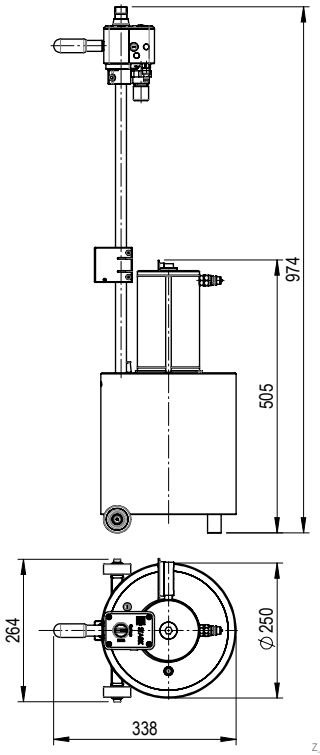
Order number	Article designation	Size 1	Size 2	Size 3	Weight
S804-411	"Record" pressure booster 40 bar	14 elements	7 elements	2 elements	8.80 kg

COMFORT pressure booster

Pressure booster is used to release single-acting clamping systems. The booster converts compressed air into hydraulic pressure and is suitable for application areas of 40 bar.

- Air pressure 6 bar
- Oil volume 1 l
- Max. oil pressure 40 bar
- Operating manual: WM-020-334-xx-xx

▸ Pressure booster can be extended to DH with article S804-427



Z_S804-433_00

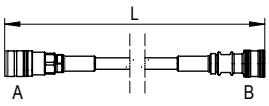
Order number	Article designation	Size 1	Size 2	Size 3	Weight
S804-432	"COMFORT" booster 40 bar	45 elements	24 elements	7 elements	27.3 kg

Hydraulic hose with couplings

Hydraulic hose with hydraulic plug-in coupling on both sides

Used to connect between pressure booster and fast closing clamp plate or surface-mounted element

- Max. pressure 300 bar



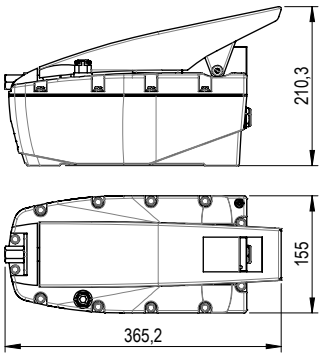
Z_S704-153_00

Order number	Article designation	Couplings A/B	Length L	Weight
S704-150	Hydraulic hose set	A/B: Standard (S952-044)	1.5 m	0.63 kg
S704-151	Hydraulic hose set	A: Leakage oil-free (S952-177) / B: Standard (S952-044)	1.5 m	0.63 kg
S704-152	Hydraulic hose set	A/B: Standard (S952-044)	3.0 m	0.85 kg
S704-153	Hydraulic hose set	A: Leakage oil-free (S952-177) / B: Standard (S952-044)	3.0 m	0.85 kg

Air-hydraulic clamping pump

Air-hydraulic pump Actuation via integrated foot pedal
Oscillating air/oil pressure intensifier

- Pneumatic coupling plug
- Pressure gauge
- Oil volume 2,4 l
- Hydraulic hose set 2.5 m leakage oil-free
- Operating manual WM-020-410-xx



Z_S952-314_00

Order number	Article designation
S803-413	Air-hydraulic pump 40 bar with pressure gauge and throttle valve
S803-412	Air-hydraulic pump 80 bar with pressure gauge and throttle valve

Hydraulic pump unit

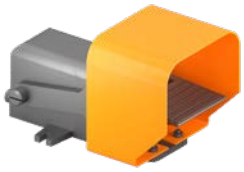
Hydraulic pump unit optionally with DH (third-hand function) and query of the clamp control

- Ready for connection
- Energy-saving switch-off mode
- Volume flow 0.82/2.1/3.5 l/min
- Max. operating pressure 500/250/160 bar

Suitable units are selected project-related from the extensive ROEMHELD unit product range.

Reference
ROEMHELD power unit product range D 8.0115 (www.roemheld-gruppe.de)

Pedal controller



Pedal controller for controlling the pressure booster

- Control of the pressure booster via foot controller
- The pressure booster does not have to be located in the immediate vicinity
- Both hands are free for loading or for removing the workpieces to be processed

Order number	Article designation	Weight
S804-419	Pedal controller for pressure booster (incl. pneumatic hose and screw-in connections)	1.50 kg

DH pedal controller (third hand function)

The special pressure control (actuation) of the fast closing clamps allows the workpiece, pallet or device to be easily engaged. Feed, engage and clamp.

- For a vertical clamping position or for feeding by robots or handling systems
- Operating manual: WM-020-257-xx-xx

Order number	Article designation	Weight
S804-427	Pedal controller for pressure booster (incl. pneumatic hose and screw-in connections)	4.00 kg

INFO

Practical example pedal controller

Control of the pressure booster via foot controller

The pressure booster does not have to be located in the immediate vicinity

Both hands are free for loading or for removing the workpieces to be processed

Data sheets and 3D data: www.stark-roemheld.com
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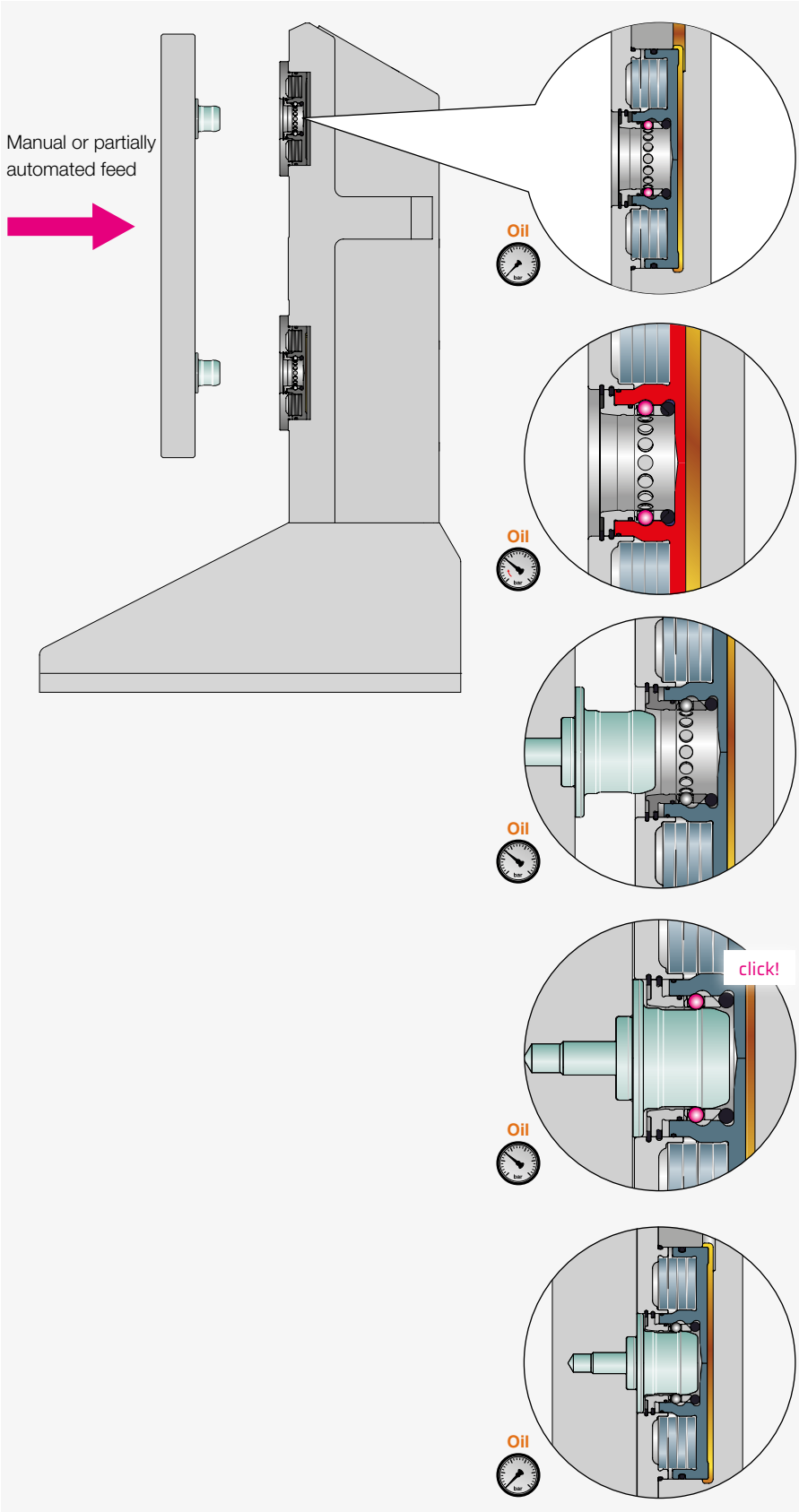
Subject to modification | WM-020-450-00-en

Third-hand function (DH) – the option for your process reliability



THIRD-HAND FUNCTION

Schematic diagram for all STARK elements with third-hand function (DH).

HOLDING FUNCTION

The fast closing clamp is applied with the holding pressure and is ready for the secure engagement of the pallet.

FEEDING

The pallet is fed by hand or by crane.

ENGAGING

The retractable nipples are retracted, engaged and then mechanically secured.

You can release the pallet.

POSITIONING AND CLAMPING

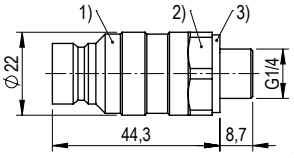
The fast closing clamp is depressurised. The pallet is now positioned, inserted and securely clamped via the cup springs.

HYDRAULIC COUPLINGS

Hydraulic coupling nipple (leak-free)

Oil leakage-free plug-in coupling for fast closing clamp plates or connection block for piping of the STARK.classic fast closing clamps.

- Use wherever leakage oil must not get into the drilling emulsion.
- Suitable for S952-177



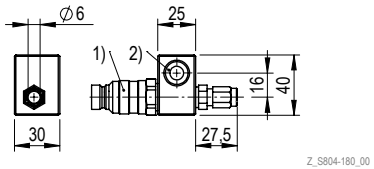
1) Coupling
2) SW22
3) Sealing disc

Order number	Article designation	max. pressure	Weight
S952-126-UBG	Oil-leakage-free hydraulic plug-in coupling	300 bar	0.1 kg

Connection block with hydraulic plug-in coupling

Connection block for hydraulic piping for STARK.classic fast closing clamps.

- Suitable for S952-177



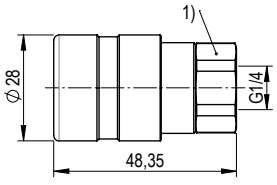
1) Hydraulic plug-in coupling S952-126
2) Countersink for M8 DIN 912/ISO 4762

Order number	Article designation	max. pressure	Weight
S804-180	Connection block for piping with oil leakage-free coupling	100 bar	0.2 kg

Hydraulic coupling

Oil-leakage-free hydraulic plug-in coupling (hose side) for hydraulic piping for STARK. classic clamping elements.

- Suitable for S952-126-UBG, S804-180



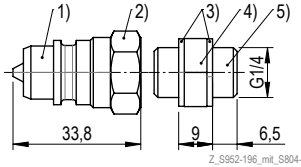
1) SW22

Order number	Article designation	max. pressure	Weight
S952-177	Oil leakage-free hydraulic plug-in coupling, internal thread G1/4"	300 bar	0.1 kg

Hydraulic coupling nipple

Plug-in coupling for fast closing clamp plates or connection block for piping of the STARK.classic fast closing clamps.

- Low coupling force
- Suitable for S952-044



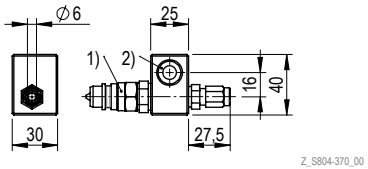
1) Hydraulic plug-in coupling S952-196
2) SW 19 / 3) sealing disc
4) SW 18 / 5) steel double nipple

Order number	Article designation	Thread	max. pressure	Weight
S804-371	Hydraulic plug-in coupling with sealing disc	G1/4 internal thread	700 bar	0.1 kg
S952-196	Hydraulic plug-in coupling without sealing disc	G1/4 internal thread	700 bar	0.04 kg
S952-196-UBG	Plug-in coupling with steel double nipple, 2 sealing discs, protective cap and key ring	G1/4 external thread	700 bar	0.1 kg
S804-372	Steel double nipple with 2 sealing discs	G1/4 external thread	500 bar	0.04 kg
S804-395	Aluminium protective cap			0.1 kg

Connection block with hydraulic plug-in coupling

Connection block for hydraulic piping for STARK.classic fast closing clamps.

- Suitable for S952-044



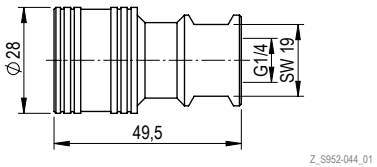
1) Hydraulic plug-in coupling S952-196
2) Countersink for M8 DIN 912 / ISO 4762

Order number	Article designation	max. pressure	Weight
S804-370	Connection block for piping	100 bar	0.2 kg

Hydraulic coupling

Hydraulic plug-in coupling (hose side) for hydraulic piping for STARK.classic clamping elements.

- Suitable for S804-371, S804-370, S952-196



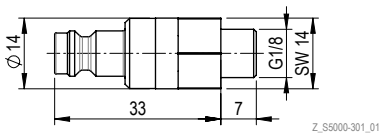
Order number	Article designation	max. pressure	Weight
S952-044	Hydraulic plug-in coupling, female thread G1/4	300 bar	0.1 kg

PNEUMATIC COUPLINGS

Coupling nipple

Coupling nipple for STARK fast closing clamp plate

- For connection of pneumatic line
- Suitable for S5000-300, S954-208

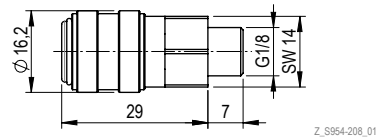


Order number	Article designation	Connection	Weight
S5000-301	Coupling nipple	G1/8	0.05 kg

Plug coupling

Pneumatic coupling (hose side) for connecting the STARK fast closing clamp plate

- Suitable for S5000-301

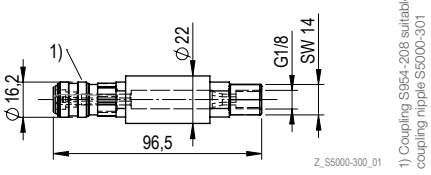


Order number	Article designation	Connection	Weight
S954-208	Plug coupling	G1/8	0.05 kg

Sliding coupling

Pneumatic coupling unit (hose side) with slide valve for connecting and operating the fast closing clamp

- Suitable for S5000-301



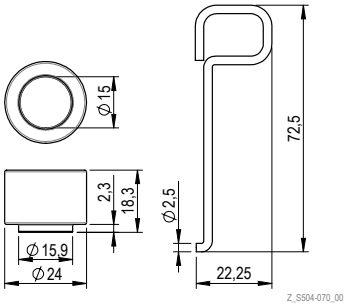
Order number	Article designation	Connection	Weight
S5000-300	Sliding coupling	G1/8	0.2 kg

ACCESSORIES

Clamp control valve installation aid

Installation aid for assembly and installation of the clamp control valve S704-210

- Operating manual clamp control valve WM-020-255-xx

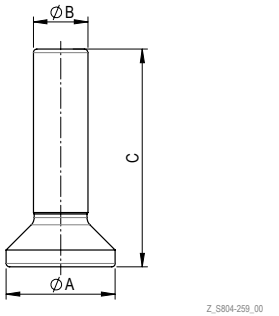


Order number	Article designation	Weight
S504-070	Clamp control valve installation aid	0.03 kg

Positioning nipple

Positioning nipple for mounting in a collet chuck

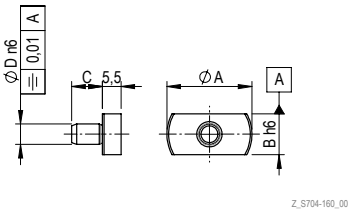
- For fast and precise positioning of surface-mounted clamping elements



Order number	Article designation	ØA	ØB	ØC
S804-259	Positioning nipple for size 1	32 mm	16 mm	64 mm
S804-258	Positioning nipple for size 2	47 mm	25 mm	82 mm
S804-260	Positioning nipple for size 3	65 mm	32 mm	100 mm

Sliding block with pin

Sliding blocks are used for positioning in the T-slots



Order number	A	B	C	D
S704-160	25 mm	12 mm	9 mm	6 mm
S704-162	25 mm	14 mm	14 mm	12 mm
S704-163	30 mm	18 mm	20 mm	16 mm
S704-166	25 mm	20 mm	14 mm	12 mm

Ball retainer

Symbol graphic

The ball retainer is a maintainable component of the clamping element that can be replaced if necessary. Depending on the version, a ball retainer with spring or with O-ring is used.

Order number	Article designation	Version
S704-233	STARK.classic.NG.1 ball retainer	Ball retainer with spring
S704-226	STARK.classic.NG.2 ball retainer	Ball retainer with spring and spring guide ring
S704-220	STARK.classic.1 ball retainer	Ball retainer with O-ring
S704-221	STARK.classic.2 ball retainer	Ball retainer with O-ring
S704-224	STARK.classic.3 ball retainer and STARK.classic.NG.3 ball retainer	Ball retainer with spring

Retaining ring ball retainer

Symbol graphic

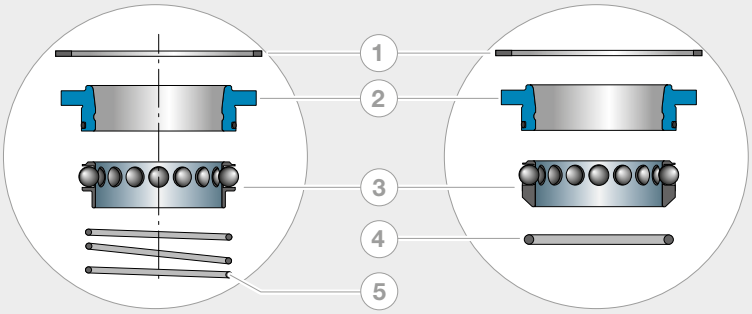
The retaining ring fixes the ball retainer in the clamping element and, thanks to its conical shape, helps the retractable nipple to retract securely and without tilting.

Order number	Article designation
S704-215	STARK.classic.1 and STARK.classic.NG.1 retaining ring
S704-216	STARK.classic.2 and STARK.classic.NG.2 retaining ring
S704-217	STARK.classic.3 and STARK.classic.NG.3 retaining ring

INFO

Ball retainer design

Due to historical differences, the version installed may vary depending on the model. If you are unsure about the right design, we will be happy to help you make the right choice.



1) Lock ring
2) Retaining ring
3) Ball retainer
4) O-Ring
5) Spring

Data sheets and 3D data: www.stark-roemheld.com
STARK Spannsysteme | +43 5522 37400 | info@stark-roemheld.com
Subject to modification | WM-020-450-00-en

Ball retainer assembly aid

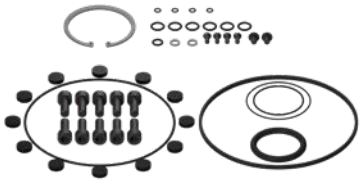
S704-221-M

The ball retainer assembly aid is used for easy assembly/disassembly of the ball retainers.

Order number	Article designation
S704-221-M	Assembly aid ball retainer STARK.classic.NG.2

O-rings service set

S804-199



Service set consisting of all O-rings, screws, lock rings including special grease. For maintenance of the STARK.classic clamping elements.

Order number	Article designation
S804-964	STARK.classic.NG.1 O-rings service set
S804-199	STARK.classic.NG.2 O-rings service set
S804-198	STARK.classic.NG.3 O-rings service set
S804-191	STARK.classic.1 O-rings service set
S804-193	STARK.classic.2 O-rings service set
S804-192	STARK.classic.3 O-rings service set
S804-190	STARK.compact O-rings service set

Cup spring service set

S804-957

Service set consisting of cup springs for the maintenance of STARK.classic clamping elements.

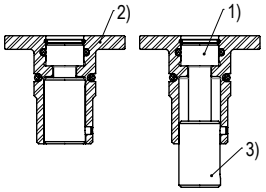
STARK recommends a regular check of the insertion force with the mechanical insertion force tester S504-000.

Order number	Article designation	Number of cup springs
S804-963	Cup spring set for STARK.classic.NG.1	5 pcs.
S804-957	Cup spring set for STARK.classic.NG.2	5 pcs.
S804-956	Cup spring set for STARK.classic.NG.3	5 pcs.
S804-950	Cup spring set for STARK.classic.1 / 6.7 kN	6 pcs.
S804-951	Cup spring set for STARK.classic.1 / 10 kN	4 pcs.
S804-953	Cup spring set for STARK.classic.2	4 pcs.
S804-954	Cup spring set for STARK.classic.3	6 pcs.

Sealing plugs

Sealing plug with O-ring that prevents the penetration of dirt (e.g. chips).

Protection for unused fast closing clamps. Sealing plug (2) is pressed out of the clamping element by turning the screw (1) clockwise. Turn the spacer (3) back again before the next insertion.

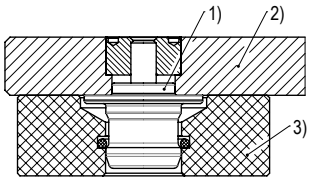


Order number	Article designation
S704-098	Sealing plug for size 1
S704-099	Screw plug for size 2
S704-093	Screw plug for size 3

Retractable nipple transport protection

S704-133

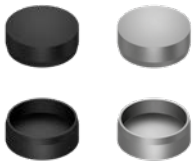
Transport protection to prevent damage to the retractable nipples and pallet surfaces during transport or stacked storage.



Order number	Article designation
S704-130	Transport protection for STARK.classic.1 retractable nipple
S704-133	Transport protection for STARK.classic.2 retractable nipple
S704-131	Transport protection for STARK.classic.3 retractable nipple

Screw cover

S704-231
S999-408



Screw cover suitable for the retractable nipples or fast closing clamps of the STARK.classic.NG family

Order number	Article designation	Size	Version
S704-231	Stainless steel screw cover for M6	NG.1	M6 ø11.5×3.0mm
S999-408	Plastic cover for M6	NG.2	M6 ø11.0×3.3mm
S999-365	Plastic cover for M8	NG.3	M8 ø15.0×4.2mm

Hydraulic assembly aid

504-011

Hydraulic assembly aid consisting of knurled nut, assembly aid with connection for hand pump, expanding mandrel and centring shells.

- Disassembly/assembly of retaining ring and ball retainer, for use in any installation position, for quick and easy assembly
- Operating manual: WM-020-084-xx-xx

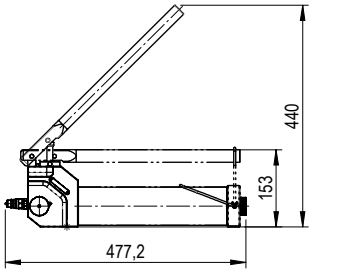
Order number	Article designation	Typical operating pressure	Weight
S504-011	Hydraulic assembly aid for STARK.classic.NG.1	90 bar	3.30 kg
S504-012	Hydraulic assembly aid for STARK.classic.NG.2	100 bar	3.75 kg
S504-013	Hydraulic assembly aid for STARK.classic.NG.3	150 bar	6.85 kg

Hand pump

Hydraulic pump can supply two independent hydraulic circuits.

By means of a rotary slide and the handwheel, two circuits can be controlled individually or together.

In hydraulic double-acting systems, one side can be pressurised while the other side is relieved into the tank.



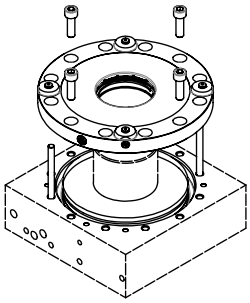
Z_S801-040_00

Order number	Article designation	System pressure	Oil volume	Weight
S801-040	Hand pump	0-250 bar	1 l	6.30 kg

Assembly aid

Assembly aid consisting of centring bolt and two centring pins. For disassembly/assembly of cup springs and cover.

- Operating manual: WM-020-332-xx-xx



Order number	Article designation
S504-008-01	Centring aid for STARK.classic.NG.1
S504-009	Centring aid for STARK.classic.2 and STARK.classic.NG.2
S504-010-01	Centring aid for STARK.classic.NG.3
S504-008	Centring aid for STARK.classic.1
S504-010	Centring aid for STARK.classic.3

Specification dimension tester

S504-022

The specification dimension tester is used to check the specification dimension according to the operating manual of the respective element types.

The DH specification dimension tester is used to check the function of the DH position (third-hand function) and its setting

- Supplied in a plastic case
- Incl. calibration piece
- Operating manual: WM-020-349-xx-xx

Order number	Article designation
S504-021	Specification dimension tester for size 1
S504-031	Specification dimension tester DH for size 1
S504-038	Specification dimension tester for STARK.classic.NG.1 TW
S504-022	Specification dimension tester for size 2
S504-032	Specification dimension tester DH for size 2
S504-037	Specification dimension tester for STARK.classic.NG.2 TW
S504-023	Specification dimension tester for size 3
S504-033	Specification dimension tester DH for size 3

Mechanical insertion force tester

S504-000

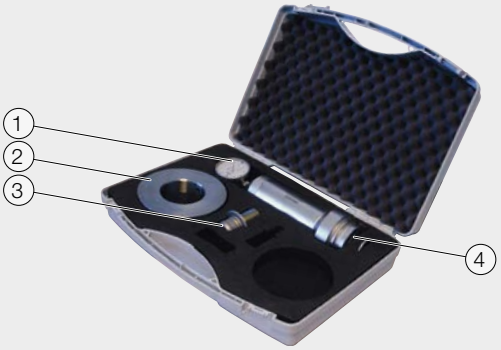
The insertion force tester is used to reliably check the insertion force of the STARK fast closing clamps.

The insertion force may change depending on actuation cycles and wear. As a result, the specified insertion force is no longer achieved and the machining forces are no longer fully absorbed by the zero point clamping system. As a preventive measure, STARK recommends regular inspection of the clamping elements (see operating manual).

Order number	Article designation	Weight
S504-001	Mechanical insertion force tester for size 1	6.20 kg
S504-002	Mechanical insertion force tester for size 2	7.10 kg
S504-004	Mechanical insertion force tester for size 3	8.60 kg
S504-000	Rental case: Mechanical insertion force tester STARK.classic.1/2/3	

INFO Mechanical insertion force tester

Supplied in a practical plastic case
(L390 × W280 × H110)



Insertion force tester (1) with calibration certificate and operating manual in the plastic box, with support ring (2), adapter retractable nipple (3) and spacer (4)

Practical examples

Large parts production with STARK.classic

Increase in machine running time through external set-up

1. Machine pallet with clamping fixture for workpieces.
2. Fast closing clamps installed in clamping strips and piped. Workpieces of up to 12 m can be clamped and processed using the two devices.
3. Loading with the handling system from STARK. The centre of gravity of the clamping fixture can be adjusted using the various bores.

Simple quick change of a device with STARK.classic.2

Coupling, releasing and lifting. Due to the retractable nipple contour, asymmetrical devices can also be removed at an angle.

Large parts production with STARK.classic
Release the STARK.classic fast closing clamps with 40 bar hydraulic pressure.
Clamping angle for workpieces up to 2.5 m high with 12 STARK.classic, 360 kN insertion force. Clamping / releasing with "third hand"

Function:
Latching / releasing / tensioning

Zero-point clamping system with STARK.classic.2
Fast closing clamps installed in round plate on set-up station

Tensioning tower with 18 STARK.classic.NG.2
for optimum utilisation of the machine workspace

Order number directory STARK.classic

Data sheets and 3D data: www.stark-roemheld.com
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Subject to modification | WM-020-450-00-en

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STARK Spannsysteme

The ROEMHELD Group consists of 5 companies at locations in Germany and Austria, each 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 of companies, 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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WM-020-450-00-en_STARK-classic_01-02