TOX® Powerpackage

Pneumohydraulic drives
with press forces of 2 - 2000 kN



Power by Powerpackage
Press forces from 2 - 2000 kN

The TOX® Powerpackage combines the benefits of compressed air and oil in one pneumohydraulic working cylinder. The result: press forces up to 2000 kN from cylinders of moderate size!

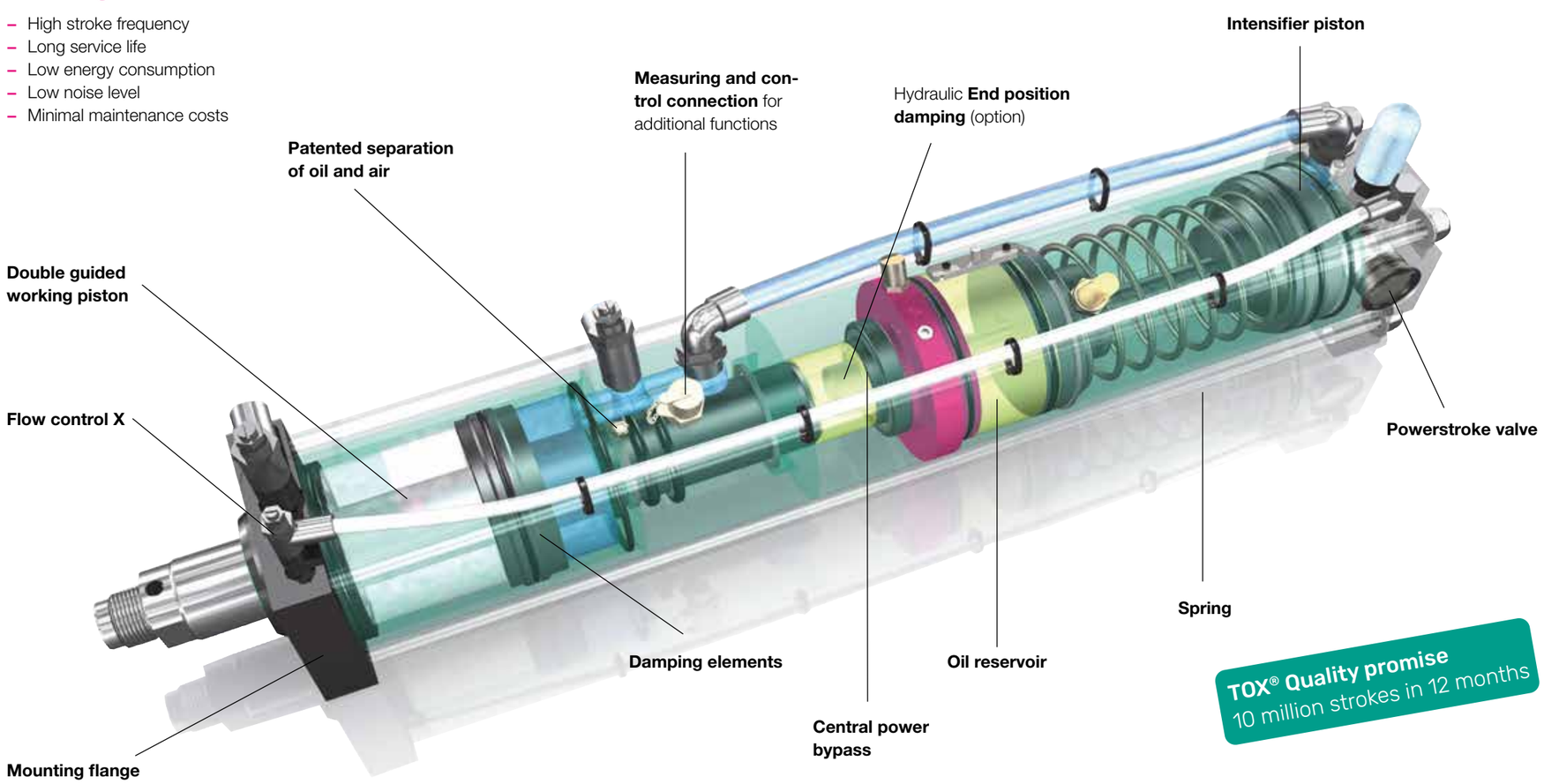
Inside the TOX® Powerpackage is a double guided working piston, working hand in hand with an intensifier piston. While the pneumatic control ensures high speeds, the pneumohydraulic process step is responsible for accurate application of force. The TOX® Powerpackage is controlled like a double acting pneumatic cylinder.

Simple, effective and longlasting
The functional design, with few movable parts, reduces wear and increases the service life. The low impact forces of the fast stroke protect the tool and reduce the noise level.
The low energy consumption is due to the mechanical spring, which provides the return stroke for the piston. This spring also preloads the oil reservoir, allowing the cylinder to be mounted in any orientation. The compact design and optimized valve and connection cross-sections ensure high flow rates with low air consumption.

Unbeatable good
The TOX® Powerpackage impresses with its high power density, flexibility and simplicity. It was developed for combined force-displacement motion sequences, which require forces of up to 2000kN and powerstrokes up to approx. 80 mm. The total stroke is a maximum of 400 mm.

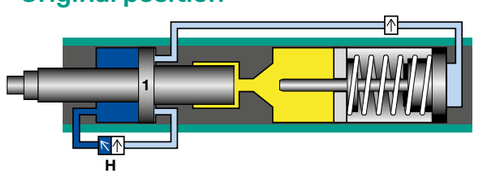
Advantages

- High stroke frequency
- Long service life
- Low energy consumption
- Low noise level
- Minimal maintenance costs



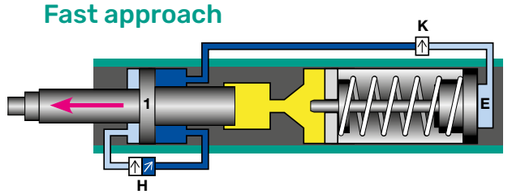
TOX® Quality promise
10 million strokes in 12 months

Original position



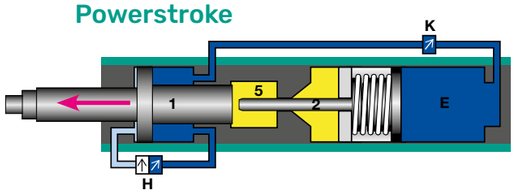
In the **home position** the drive is held by the main control valve **(H)** in the return stroke. The working piston **(1)** is retractedn.

Fast approach



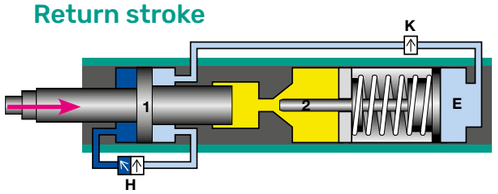
Air-operated **fast approach**: The main control valve **(H)** is actuated. The working piston **(1)** extends in fast approach, until it meets resistance at any point. It stops and the powerstroke valve **(K)** switches. Now air streams into the intensifier chamber **(E)**.

Powerstroke



Pneumohydraulic **powerstroke**: The intensifier piston **(2)** closes the high pressure chamber **(5)** and builds the oil pressure in the working area up to 400 bar. This oil pressure acts on the rear of the working piston **(1)** and generates the powerstroke.

Return stroke



Air-operated **return stroke:** After switching the main control valve **(H)** the powerstroke valve **(K)** vents the chamber **(E)** automatically. The intensifier piston **(2)** is pushed back by the spring. Then the working piston **(1)** returns to the original position.

The pneumohydraulic family

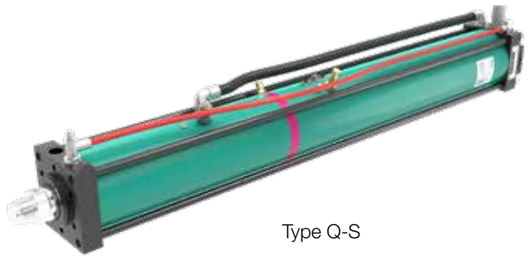
line-Q series

- Press force range: 2 – 283 kN
- Total stroke: up to 200 mm
- Powerstroke: up to 52 mm
- Compressed air: 2 – 6 bar

Advantages

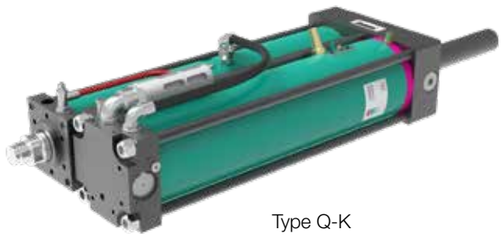
- Available in standard sizes
- Shortest delivery times
- Attractive price
- Mechanical return spring

Design S (Standard)



Type Q-S

Design K (Compact)



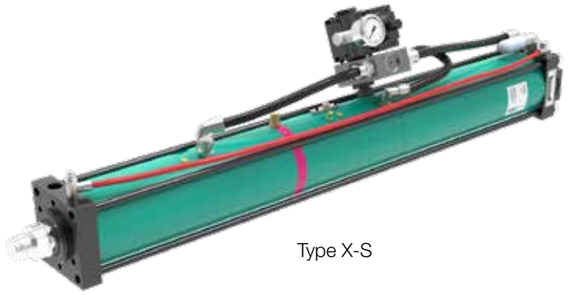
Type Q-K

line-X series

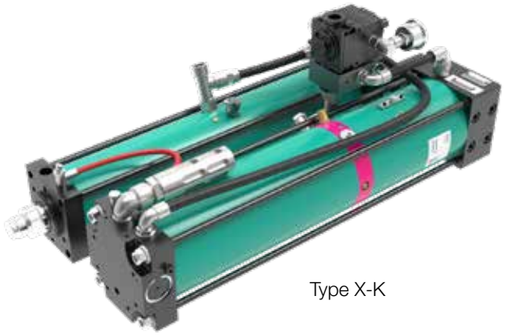
- Press force range: 2 – 1700 kN
- Total stroke: up to 400 mm
- Powerstroke: up to 69 mm
- Compressed air: 2 – 6 bar

Advantages

- Highest versatility
- Configurable according to the applications
- Precisely controllable and adjustable
- High stroke speeds
- Pneumatic spring



Type X-S



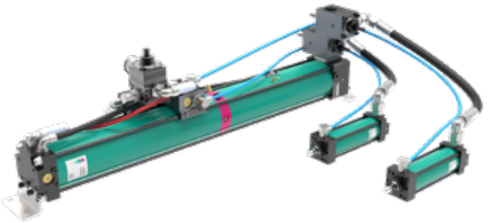
Type X-K

X-KT system

- Press force range: 2 – 2000 kN
- Total stroke: up to 400 mm
- Powerstroke: up to 100 mm
- Compressed air: 2 – 10 bar

Advantages

- Separate pressure-intensifier for 1 - 6 working cylinders
- Long powerstrokes
- Working cylinders can be activated individually
- Compact design
- Flexible mounting



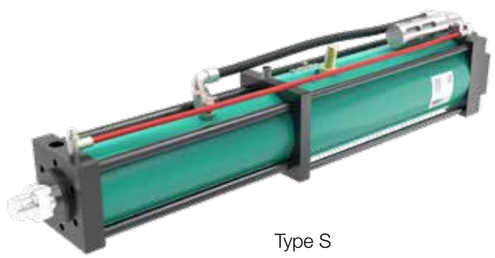
TOX® Powerpackage X-KT-system with working cylinder HZL

Individual TOX® Powerpackages

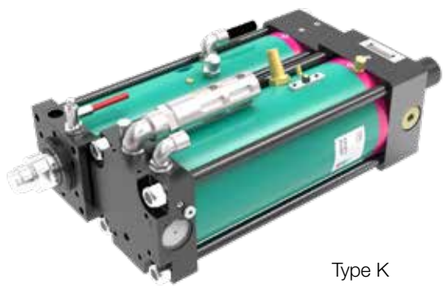
- Press force range: 2 – 1740 kN
- Total stroke: up to 400 mm
- Powerstroke: up to 80 mm
- Compressed air: 2 – 10 bar

Advantages

- Application-specific design
- Wide range of different types
- Entire range of accessories can be used
- Mechanical spring or air spring



Type S



Type K



Type RZK

Versatile applications

The proven TOX® Powerpackage is perfectly suited for powerful use in joining machines, assembly machines, presses, robot tongs and special machines. Everywhere where press forces up to 2000 kN are needed. The system ensures maximum productivity in a wide range of applications.

Joining and Assembling


Clinching

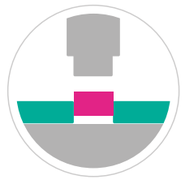

Clipping


Pressing, Compressing


Crimping


Insertion of functional elements

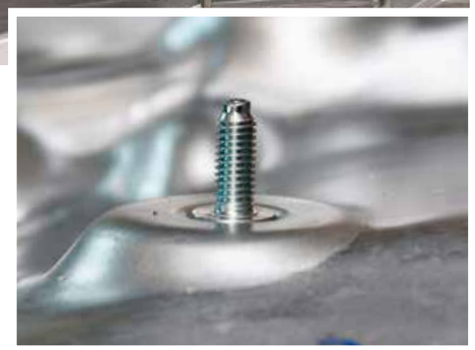

Punching, Piercing


Press Fitting, Installing


Riveting


Tightening, Clamping







Forming


Bending


Molding


Stamping, Marking


Deep drawing

TOX® Laboratory tests for you!

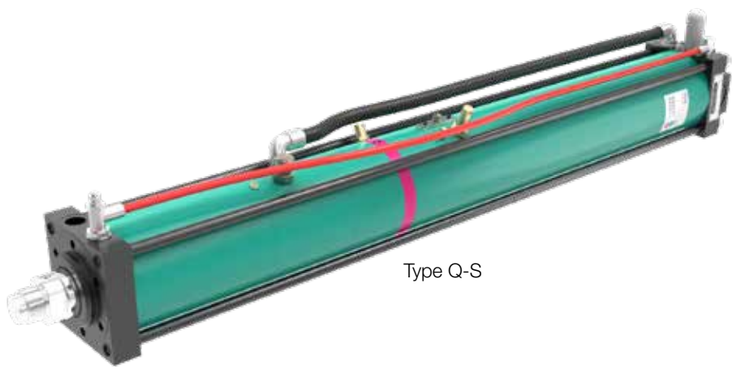
We test your application with your piecepart in our in-house test laboratory. Thus we guarantee an optimal combination of drive and application.

TOX® Powerpackage line-Q
The standardized basic system

The line-Q drives are designed for a large number of standard applications and are available in two designs: a straight, slim type Q-S and a compact type Q-K. This series is available in most standard sizes. This means it can be delivered quickly at an attractive price.

Advantages

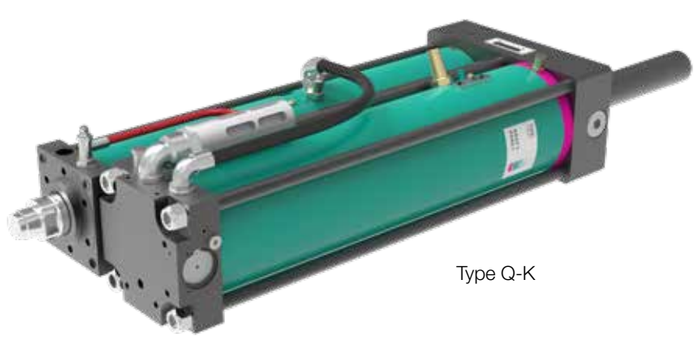
- Short delivery times due to standardized sizes
- Good value for money
- Low air consumption
- Medium maintenance interval



Type Q-S

Technical details:

- Press force range: 2 - 300 kN
- Mechanical return spring
- Hydraulic end position damping ZHD
- Central power bypass ZLB
- Fixed stop with elastomer damping in the forward stroke FUD
- Prepared for stroke request ZHU and external linear position sensor ZHW



Type Q-K

TOX® Powerpackage line-X
The individual high-end system

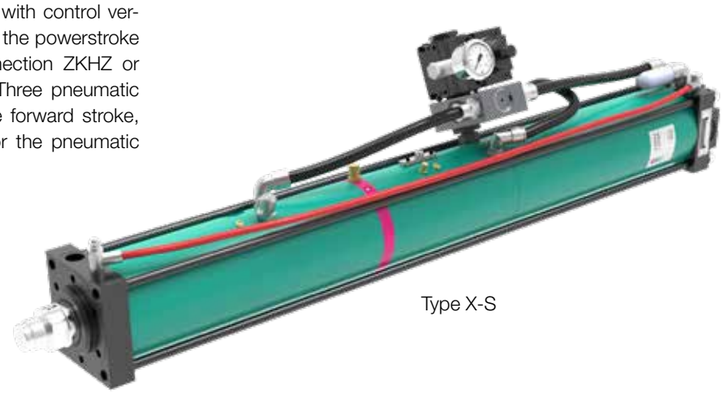
The drives of the line-X series enable high fast approach stroke forces and fast stroke speeds. They have very low maintenance and repair costs. They can be individually adapted to the application. The line-X drives have a central power bypass as standard, as well as a pneumatic spring for the intensifier return.

The line-X series is available as type X-S (slim design) and type X-K (compact design).

Optional this series can be equipped with control versions including a pressure regulator in the powerstroke line ZDK, external powerstroke connection ZKHZ or external powerstroke release ZKHF. Three pneumatic connections are required: one for the forward stroke, one for the return stroke and one for the pneumatic spring.

Advantages

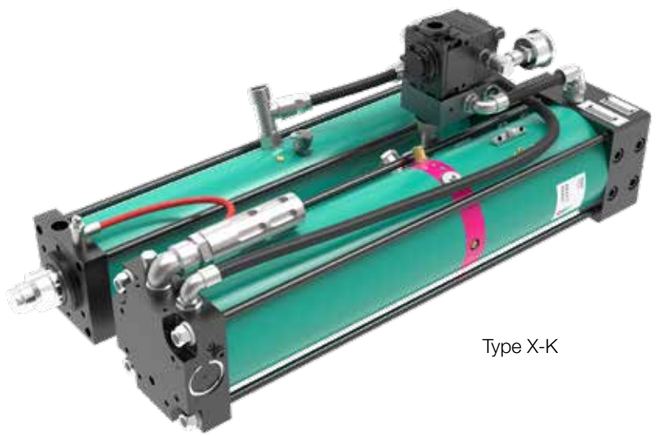
- Maximum capacity and variability
- Individually adaptable
- Maximum speed
- Long maintenance intervals



Type X-S

Technical details:

- Press force range: 2 - 1700 kN
- Pneumatic spring
- Central power bypass ZLB
- Hydraulic end position damping ZHD
- Fixed stop with elastomer damping in the forward stroke FUD
- Type X-K has patented ring buffer version on the intensifier enabling shorter length
- Options: stroke request ZHU and linear position sensor ZHW/ZKW



Type X-K

TOX® Powerpackage X-KT system
The separated pneumohydraulic power unit

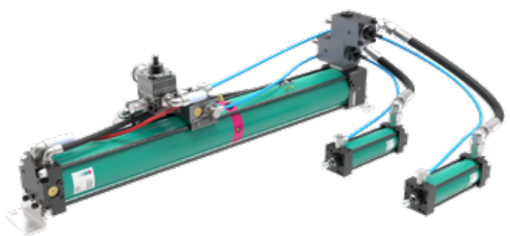
The TOX® X-KT system consists of the pressure intensifier X-ES and one or several working cylinders. Depending on press force, installation dimensions and cycle time, it is tailored to customer requirements.
Either TOX® Hydraulic Cylinders HZL or pneumatic TOX® Working Cylinders X-AT are used as working cylinders.

Advantages

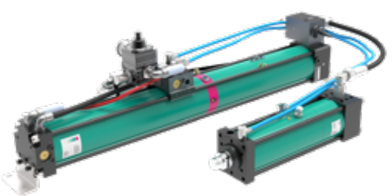
- Compact installation dimensions
- Long powerstrokes
- Simple control
- Maximum capacity and variability
- Modular concept



Technical details:
- Press force range: 2 - 1700 kN
- Use of up to 6 working cylinders per pressure intensifier
- Optimum system separation by TOX® Hydro Split Coupling
- Simple color-coded pneumatic plug system
- Option: selected cylinders can be driven with switchable hydro split coupling



Pressure intensifier X-ES with TOX® Hydraulic Cylinder HZL
- Short design
- Working piston with simple bearing
- Fixed stop in forward stroke (elastomer damping optional)
- Options: Stroke request ZHU and distance transducer ZKW
- Cost-effective drive solution



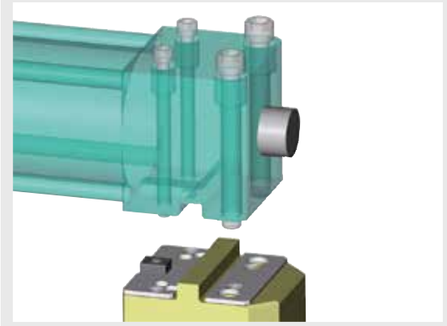
Pressure intensifier X-ES with TOX® Working Part X-AT
- High fast and return stroke forces
- Short cycle times
- Fixed stop with elastomer damping in the forward stroke
- Prepared for stroke request type ZHU
- Prepared for external linear position sensor ZHW
- All sizes with bypass ZLB incl. hydraulic end position damping ZHD

TOX® Powerpackage RZK, RZS, RZH
The specialist for robot tongs

The TOX® Powerpackages RZ are ideal for applications on robot tongs and handheld tongs. These drives can be precisely adjusted with a special flange. This enables highest precision and production quality, even without additional guide for the tool. The robot tong drives are ready for operation in all installation positions.

Advantages

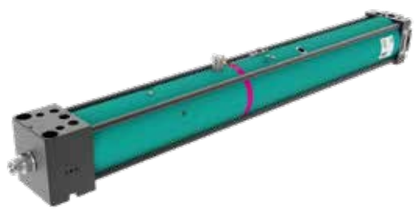
- Simple and accurate adjustment on the tongs thanks to the special flange
- Short cycle times
- Maximum maintenance intervals



Precise flange connection
The drive can be precisely aligned in both directions perpendicular to the stroke direction by means of custom-fit grooves on the mounting surface of the TOX® Powerpackage type RZ. The height and position of the drive can be adjusted with shims and the key on the mounting surface.



Powerpackage type RZK
- Compact and lightweight design
- For robot tongs and hand tongs
- With pneumatic spring
- High stroke rates, short cycle times
- Stroke lengths standardized for TOX® Tongs
- Integrated total stroke adjustment



Powerpackage type RZS
- Long design
- Ideal as a press drive without a guide carriage on the die
- With pneumatic spring
- High stroke rates, short cycle times
- Cost-effective

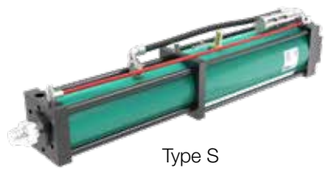
Powerpackage type RZHL / RZHO
- Compact and light
- Working cylinder RZHL for combination with pressure intensifier X-ES
- Working cylinder RZHO for combination with hydraulic pump
- With special flange for robot guided TOX® Tongs
- High stroke rates, short cycle times
- Integrated total stroke adjustment



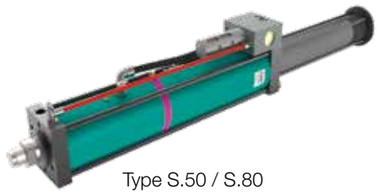
Individual types S, K, T and RP

Whether extremely fast or powerful, with marking tool mounting or defined stroke: In case of unique applications, the special versions of the TOX® Powerpackage S, K, T or RP come into play. All designs are available with flanges and air connections rotated to fit your mounting area.

TOX® Powerpackage S
- Slim design
- High fast approach and retraction forces
- Versions S.50 / S.80 offer adjustment of the length of the powerstroke independent of the length of the total stroke - ideal for marking different piece parts.

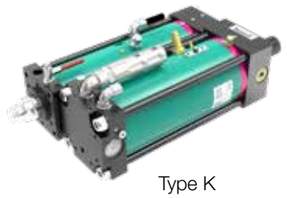


Type S

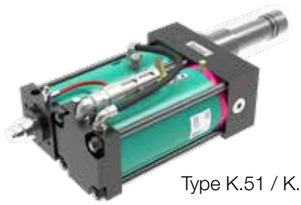


Type S.50 / S.80

TOX® Powerpackage K
- Compact design
- High stroke forces
- Versions K.51 / K.81 the total stroke can be continously adjusted - ideal if tools without end stop are used.



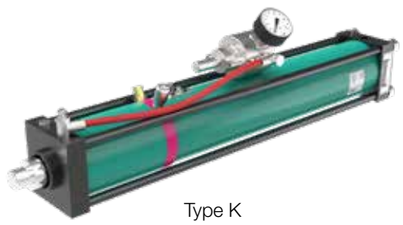
Type K



Type K.51 / K.81

TOX® Powerpackage T
The high-speed TOX® Powerpackage T operates with up to 550 strokes per minute. Due to the high speed, the turbo cylinder is particularly suited to punching and nibbling machines.

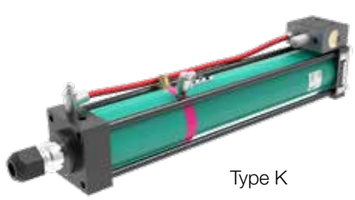
- Only powerstrokes
- Up to 550 strokes / min
- With pneumatic spring and integrated power bypass
- Constant press force
- Compressed air: up to 10 bar



Type K

TOX® Powerpackage RP
Designed with a working piston with anti-rotation device, the marking cylinder TOX® Powerpackage RP is ideally suited to stamping and labelling of components.

- With anti-rotation device
- With clamping chuck for tool holding fixture
- Setting of stamping depth
- With pneumatic spring
- Compressed air: up to 10 bar



Type K

Special versions

TOX® Powerpackage for the battery production (Cu/Zn/Ni - optimized))
Drives that will be used in battery production must meet special requirements. All components that can cause abrasion are designed to prevent conductive or interfering particles from getting into the production process. Therefore some or even all attachment parts and components were designed without copper, nickel and zinc.

This special version is available in the types S and K.



Version for usage in the food sector (ZLM)
All TOX® Powerpackages can be filled with food grade oil and grease (both USDA-H11 approved). These units are suited to usage in the food, pharmaceutical and cosmetics industry.

Rust-protected versions (ZRO)
On request, the TOX® Powerpackages is available as rust-protected version. All individual parts are then galvanized, painted or made of stainless steel. These units are particularly suited to usage in the food and packaging industry.



Fast approach | Powerstroke | Return stroke
Individual stroke controls

The strokes of the TOX® Powerpackages can be adapted to individual requirements. The following control units can be used for this:

The **pressure control of the powerstroke line ZDK** enables individual adaptation of the press force by means of a manual pressure valve. The valve even can be installed further away (e.g. in the switch cabinet). An electric proportional pressure control valve can be used as well.



The **external powerstroke activation** activates the connection of the powerstroke valve by an electrically actuated 3/2-way valve. This is recommended for travel-dependent powerstroke connection or for application-related interrupted approach stroke. The ZKHZ is also ideal when using the TOX® Powerpackage with the piston rod pointing upwards and large tool weight.



With the **powerstroke deactivation ZKHD** the powerstroke can be deactivated through an electrical signal (e.g. during setup mode).

The **external powerstroke release ZKHF** secures the activation of the powerstroke valve by means of dynamic pressure control by requesting the release via an additional electrical signal.



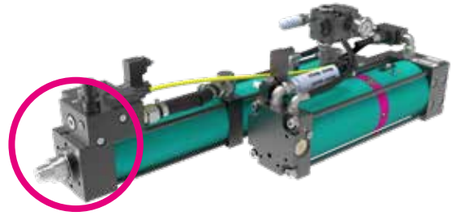
The **Powerstroke servo control ZKPr** controls the powerstroke via a servo valve. For all TOX® Powerpackages with integrated pneumatic spring it enables the adjustment of speed, travel and progression in the powerstroke. It can control press forces of up to 150kN and is suited to all applications with a counterforce.

The **stroke frequency optimization ZHO** is an additional unit for improving the cycle time (time gained approx. 20 percent). It replaces the existing powerstroke valve with a valve of the next larger size.

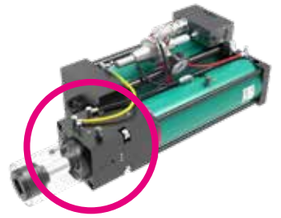




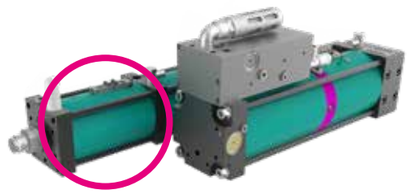
With the adjustable **damping ZED** the speed of the working piston can be controlled across the entire stroke. This is useful for pressing applications to overcome the stick-slip-effect. In punching applications, the punching impact is eliminated. The damping ensures a gentle approach to the piece part, good pressing results, noise reduction, and avoids high mechanical stresses.



The **cutting impact damping ZSD** dampens the working piston when the counterforce ceases, for example during punching applications. As purely mechanical damping it can also be used as stroke damping with limitations.

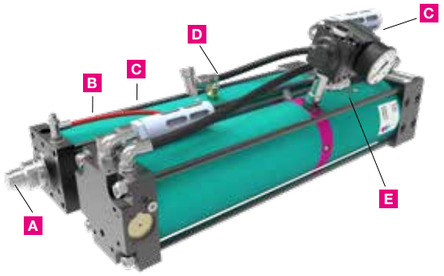


The **holding brake ZSL** takes effect in case of pressure loss and prevents the working piston from extending. It works with mechanical clamping jaws and can only be released again through application of pressure. The holding brake is certified by the professional association.



Accessories for optimization
Higher efficiency and more precision

With a large number of useful accessories, you can also expand your TOX® Powerpackage abilities and optimize it for your application.



Mounting positions for accessories:

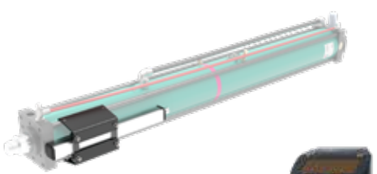
- **A** Press force sensor ZPS
- **B** Stroke request for forward / return stroke ZHU
- **C** Analog position sensor ZHW and ZKW
- **D** Electronic pressure switch ZDO
- **E** Oil level monitoring ZU



The **press force sensor ZPS** is screwed onto the working piston and measures press forces in pull and push directions. It is protected against dirt, sturdy, compact and has a high measuring accuracy.



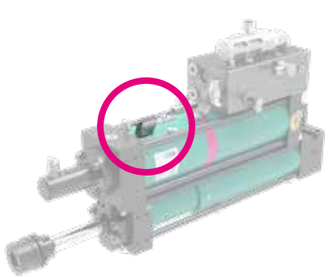
The TOX® Powerpackages of the types line-Q and line-X up to size 030 are equipped with a special barrel and a magnetic disk on the working piston. The **stroke request for forward an return stroke ZHU** determines their position via a sensor and allows determination of lower and upper limit.



The distance transducer indicates the absolute actual position of the piston. The **travel measuring system ZHW / ZKW** can be installed externally (ZKW) as well as internally (ZHW). It operates contact free and is thus wear-free and resistant to contamination and interference fields.



The **electronic pressure switch ZDO** detects the oil pressure in the high-pressure section and shows it on a LED display. According to the set functions two output signals are created.



The **oil level monitor ZU** measures the oil level inside the TOX® Powerpackage. When the minimum oil level is reached, a switch sends an electrical signal.

The **tool coupling ZWK** connects the TOX® Powerpackage and tool flexibly so that the TOX® Powerpackage is not affected by lateral forces. It is screwed directly onto the piston rod.



When installing a TOX® Powerpackage in a press or machine the **mounting plate ZFV or ZFH** can be used. ZFV is for the front and retrofitted. ZFH is for the rear and cannot be retrofitted.



For TOX® Powerpackages with larger translator parts the **mounting with rear spherical bearing ZGH** can be used. It cannot be retrofitted.



The **Mini ram ZMS** ensures optimal tool guidance and is mounted on the working piston of the TOX® Powerpackage. The ZWK tool coupling is included in the scope of delivery.

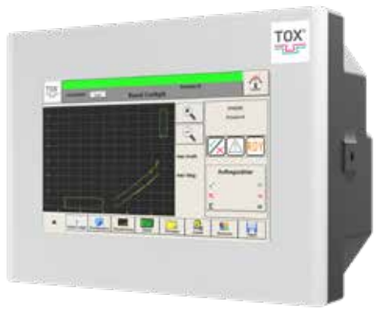


The **tool holder with anti-rotation device** is mounted on the working piston of the TOX® Powerpackage. The guide bushings in the press frame prevent the tool from rotating unintentionally.



TOX® Process monitoring efficient and compact

TOX® Process Monitors offer precise process monitoring, in which exact functional relationships between force and displacement are verified. This technology is not only indispensable in fully automated production lines, but is also used at simple manual workstations, especially for quality control in incoming goods. Put your trust in our solution for reliable and efficient process monitoring.







TOX® EPW 500

The EPW 500 offers a cost-effective solution. With its 128 measuring programs, 10 windows per test program and the ring memory for 1000 values with time stamp you can optimise your work processes and increase efficiency without compromising on quality.

- 128 measuring programs
- 10 windows per test program
- Ring memory for 1000 values with time stamp
- Display of the last 10 measuring curves
- 7“color touchscreen

TOX® EPW 600

The TOX® Process Monitoring Systems provide precise process monitoring, in which the exact functional relationships between force and displacement are verified. These compact devices are particularly suitable for use at simple manual workstation. The system ensures continuous control in real time and thus contributes significantly to quality assurance in your production.

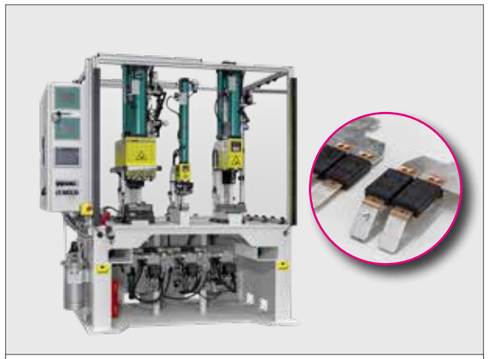
- Monitoring of press-fitting and joining processes via force-distance curves
- Window technology for threading, hysteresis, pitch, block size/block force
- Input via touch screen
- Field bus interfaces: Digital I/O, EtherCAT, Ethernet/IP, Profinet
- Sampling rate: 1 kHz
- Export of quality data via SFTP, field bus or USB
- Live-Feedback Mode / Set-Point Assistant
- Easy to operate diagnostic tools
- Creation of statistics in the device
- Panel and wall-mounted versions available
- Comprehensive range of sensors, all standard sensors can be connected

TOX® CEP 600

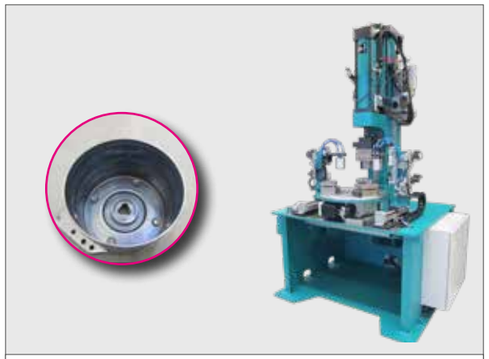
This system ensures continuous control in real time and thus contributes significantly to quality assurance in your production.

- Monitoring the force progression of clinching and caulking processes via multi-channel system (2/4/6/8/10/12 force channels)
- Bar charts for min./max. and warning limit monitoring
- Input via touch screen
- Field bus interfaces: Digital I/O, EtherCAT, Ethernet/IP, Profinet
- Sampling rate: 1 kHz
- Export of quality data via SFTP, field bus or USB
- Live-Feedback Mode / Set-Point Assistant
- Easy to operate diagnostic tools
- Creation of statistics in the device
- Built-in and wall-mounted versions available
- Comprehensive range of sensors, all standard sensors can be connected

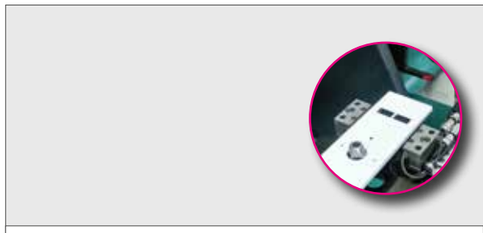
Applications in action
Individual and flexible.



TOX® Powerpackage in TOX® Press
eClinching of fuse components.

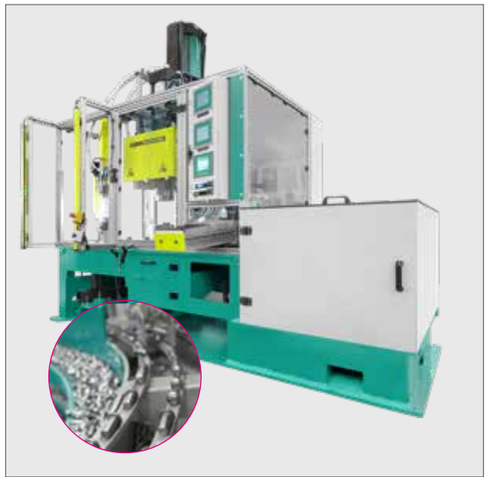


TOX® Powerpackage in TOX® Press
joins housings for electric motors.



TOX® Powerpackage in TOX® Press
joins lighting parts.





TOX® Powerpackage in TOX® Press
which sets 16 rivets in a clutch housing in one stroke.



4 x TOX® Powerpackage in TOX® Press
Punching sunroof holes in a sheet metal.



TOX® Powerpackage in TOX® Press
Joining of fuse parts in sheet metals.



TOX® Powerpackage in TOX® Press
4-column-press for pressing in elements.





4 x TOX® Powerpackage in TOX® Press
Joining of fuse parts in sheet metals.

Your Partner for future-proof solutions. Globally networked. Regionally based.

Joining is tradition

For over 45 years, TOX® has been a leader in providing innovative solutions for sheet metal joining and drive technology. As an international family-owned business with its headquarters in Weingarten (Baden-Württemberg) we develop intelligent systems for joining, press-fitting, and clinching — from individual components to complex production systems.

TOX® stands for the highest quality, durability and depth of integration.







Technologies are our DNA

TOX® determines the ideal technology for the respective application in advance in its in-house test laboratory. Preliminary tests are carried out and analyzed using samples and test parts.

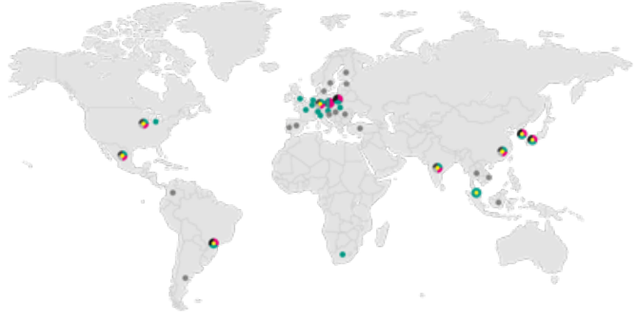
The results provide important parameters, such as the required pressing force or tool geometry, which are incorporated into the system configuration and processing technology. Final test reports verifiably ensure the quality of the joint.







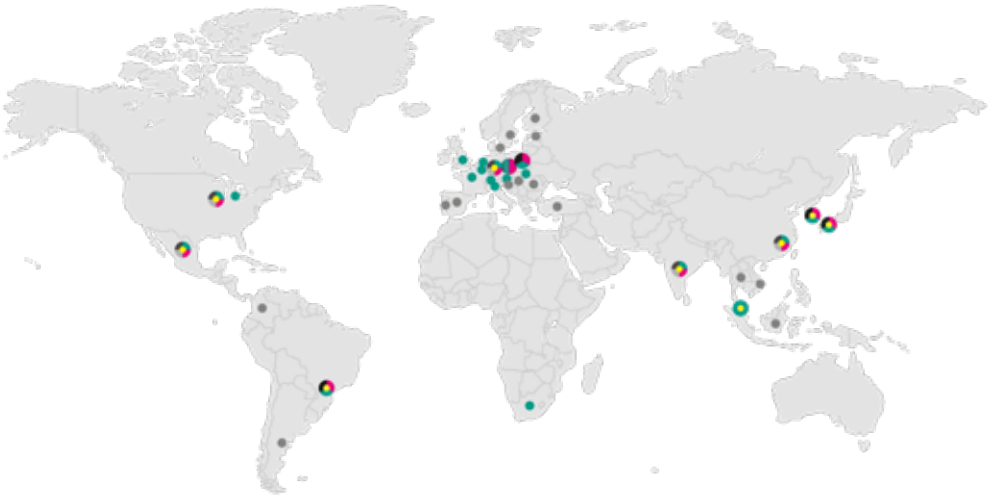




German Engineering meets global Innovation

Our headquarters and technology center are located in Weingarten (Baden-Württemberg). With 17 branches worldwide and a broad network of sales partners, we offer global proximity and comprehensive service.

Five production sites – in Germany, the USA, China, India and Mexico – ensure highest quality wherever our customers are.



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88250 Weingarten / Germany

Find your local contact at:
www.tox.com

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