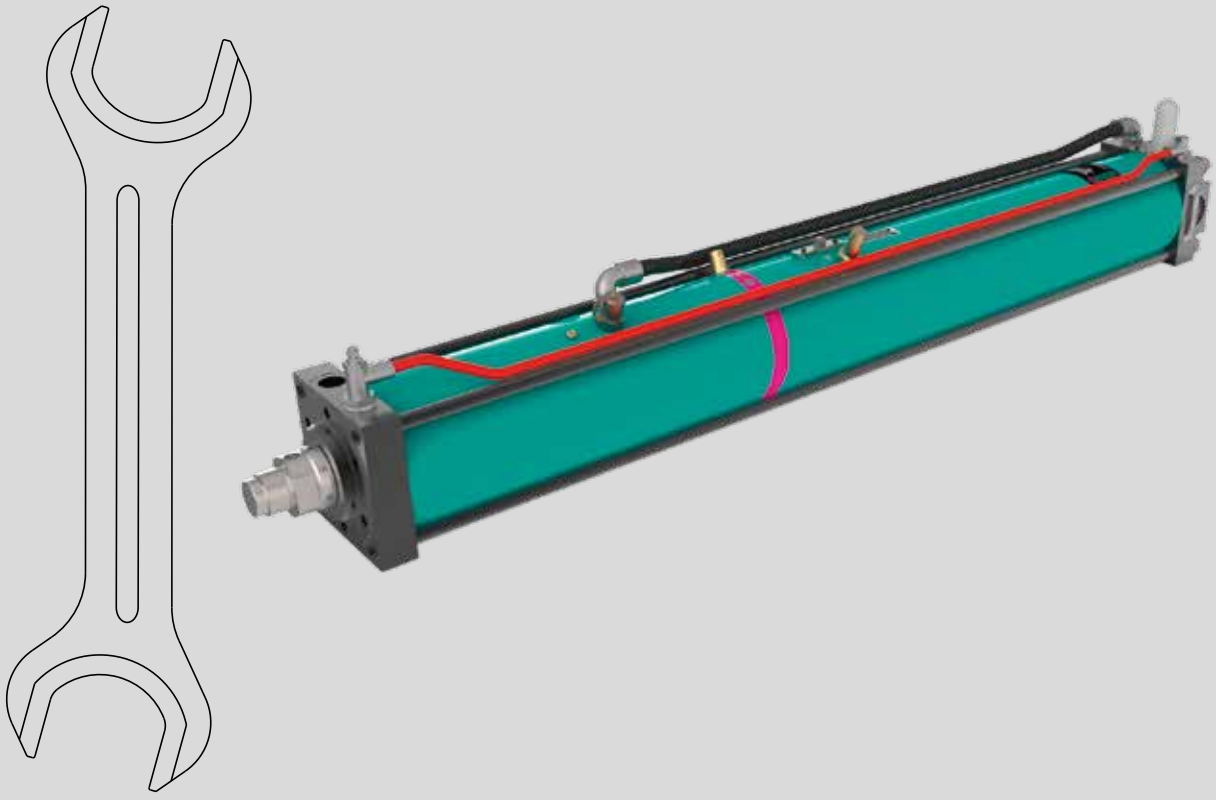
TOX® PRESSOTECHNIK

TOX®-Powerpackage
Installation and assembly guidelines

Data sheet 10.18
2019/07



TOX® PRESSOTECHNIK GmbH & Co. KG, Riedstrasse 4, 88250 Weingarten/Germany
Find your local contact at: www.tox-pressotechnik.com

Installation and assembly guidelines

General information

TOX®-Powerpackages have been produced according to today's state-of-the-art and applicable rules and regulations. In addition to the information provided in this document, please always refer to the operating manual of the TOX®-Powerpackage and the associated press force oil pressure-table. Please ask for these documents as required.

Installation and installation position

The TOX®-Drives can be installed in any position, provided the following points are taken into consideration:

- In general, no transverse forces may act on the piston rod. If necessary, a linear guide can be used for the working piston: either a press plate and guiding columns or a guiding rail with guiding carriage.

- The flexible ZWK tool coupling available as accessory connects the working piston of the TOX®-Powerpackage with a tool plunger. This means that the TOX®-Powerpackage cannot be affected by lateral forces and twisting of the working piston is avoided.

- In order to be able to carry out servicing works, in the case of horizontal installation the connection side must face upward.

- The parts of the TOX®-Powerpackage requiring servicing (oil filling nipple, vent hole, high pressure measuring connection, control throttle ‚X' and oil level indicator) should be easily accessible at all times. It must be ensured that ventilation of the hydraulic system is always possible also when installed. Ventilation openings (ventilation plate or bleeder valves) should be at the highest point. If TOX®-Powerpackages in K or Z design are to be installed in horizontal installation position with the intensifier positioned laterally next to the working part, the weight of the intensifier must be supported particularly in case of large differences in diameter between working part and intensifier part. An installation position where the intensifier part is positioned above or below the working part is preferable to the horizontal lateral installation. Additional installation information for the TOX®-Powerpackage in horizontal installation position can be found in the operating manual.

- In the case of TOX®-Powerpackages type Q-S, X-S, S with the working piston installed in a vertically upward position, the vent screw on the working piston must be freely accessible.

- The space requirement for supply lines must be taken into consideration.

Fastening:
The TOX®-Powerpackage must only be mounted with screws of the property class 12.9. The tightening torques can be found in the associated TOX®-Powerpackage operating manual. DIN EN 14399-8 must be applied for the planning of high-strength screw connections that can be clamped as scheduled.

Usage:
The effective press force is the ratio of the available press force at the specified air pressure to the press force required for the pressing process.

If the use of a TOX®-Powerpackage type Q-S, X-S, EL or S with hydraulic end position damping ZHD and very short fast approach stroke is planned, please contact TOX® PRESSOTECHNIK.

Temperature ranges:
T_{min} = 10° C
T_{min} = 60° C

Compressed air supply:
The TOX®-Drive must only be operated with filtered and dried compressed air. The maximum admissible particle size is 40 µm (in accordance with DIN ISO 8573-1).

Control:
Various pneumatic control units are available for the TOX®-Powerpackage. More information about this can be found in data sheet 10.16. TOX®-Powerpackages must be supplied according to the respective cross sections specified in the technical data sheet. This applies to the maintenance unit, valves, lines etc.

Measuring and control connection:
The TOX®-Powerpackage has a measuring and control connection. The oil pressure proportional to the press force is present on this screw connection. It can be displayed for example by connecting a manometer, or used via transmission to a pressure switch for generating a switching pulse.

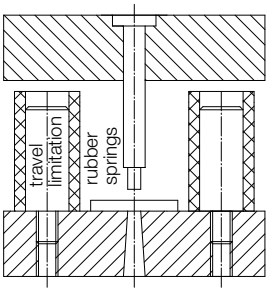
Applications

Applications with fixed end stop:
For all applications where a fixed end stop is required in the powerpackage, the total stroke of the powerpackage can be limited on request. For this purpose, the TOX®-Powerpackage is installed so that the fast stroke together with the required power stroke is identical to the total stroke.
Example: Required power stroke 4 mm + fast stroke 28 mm = total stroke 32 mm. Powerpackage to be ordered e. g. S 08.00.32.06.
Alternatively, a TOX®-Powerpackage with total stroke adjustment type K.51 can be used. Type K.51 with total stroke adjustment enables the precise mechanical setting of the total stroke independent of the length of the stroke, as it is required for clinching for example.

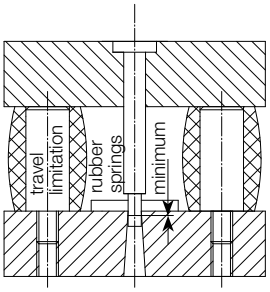
Punching application:
During punching, the working piston of the powerpackage can continue to move after the punching process. To avoid damage, this must be prevented by a limitation in the tool or a limitation of the total stroke in the powerpackage.
Particularly recommended for punching applications is the use of a powerpackage with total stroke adjustment and integrated cutting impact damping ZSD for punching operations that go easy on the machine and have a significantly reduced noise level. Furthermore, for punching operations only TOX®-Powerpackages with pneumatic spring and integrated bypass ZLB, ZHD should be used.

Generally it must be ensured that the power stroke of the TOX®-Powerpackage used for punching operations is only used to a maximum of 80 %.

Tool in starting position UDC
(UDC = upper dead centre)



Tool after punching LDC
(LDC = lower dead centre)
The tension of the rubber spring must be adapted to the punching process.



Pressing applications:
For all applications with severely variable counterforce, e. g. in case of markedly different static friction and dynamic friction coefficient values of the components, as they are generated for example by the pressing in of connectors, bearings, etc., TOX®-Powerpackages with integrated damping ZED for jerk-free and damped press fitting and punching are available.

Air consumption

For the air consumption, the fast and return stroke are calculated with the available air pressure. The air requirement in the power stroke is calculated depending on the required press force. For example, this depends on when the required oil pressure is reached. If the intensifier chamber is filled with complete air pressure, the air consumption can indeed be higher than the actually needed and calculated requirement.

On request, the air requirement for the desired powerpackage can be determined depending on the individual application.

In general, the specification for the air requirement includes all filling processes required for a stroke. The information only refers to the specific drive. For hoses and valves - in particular for long hoses with large cross sections - which are filled and ventilated together with the drive, their consumption must also be considered when selecting a compressor. The following applies here: You save energy for short lines from the valve to the TOX®-Powerpackage.

When using pressure regulators (e. g. for the pneumatic spring), low internal air consumption cannot be avoided. This is usually in the range of a few litres per hour. Similarly, there might be air losses in the hose and valve connections. In order to avoid air losses, e. g. at night, the drive can be depressurised during this time.

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Cycle times

The cycle time is always calculated depending on the requested press force. On request, the cycle time that can be realized can be determined depending on the individual application. The smaller the effective press force, the shorter the cycle time. An effective press force over 90 % should be avoided. In addition to the specified cycle times, one must also take into consideration the switching times of the valves and controls before the drive. In order to achieve the times calculated, the following requirements must be considered:

- **Air pressure:**
  The required air pressure is the result of the desired effective press force. To achieve a short cycle time, an air pressure as high as possible is recommended for fast approach and return stroke. If the maximum press force of the cylinder is to be reduced, this can be easily realized with a pressure control ZDK (manual or electric) in the power stroke line.

- **Hose cross sections**
  To achieve the calculated cycle time, the line cross sections must correspond to at least the connection specifications in the technical data sheet. This applies also to the regulation valves and maintenance units installed before the drive. Reduced line cross sections can considerably reduce the cycle time.

- **Hose lengths**
  The length of the hoses should be kept to a minimum, as the air consumption as well as the cycle time are increased with the length.

- **Compressor performance**
  The compressor performance should always be sized with sufficient safety.

Stroke frequency optimization ZHO:
The specified cycle time specifications correspond in general to the specific TOX®-Powerpackage under realistic conditions. If necessary, the cycle time can be further reduced using our optional accessory module ZHO.
Speed setting:
The speed can be regulated as required by installing throttle check valves in the fast approach stroke and return stroke lines. Furthermore, the speed of the power stroke can be adjusted by mounting a throttle in the power stroke line of the unit. The drive can thus also be used for special applications like for example for pressing in bushes, projecting etc.

Caution:
Observe the piston speeds. More information can be found in the TOX®-Powerpackage operating manual.

Hydraulic components

All hydraulic lines as well as hydraulic screwing and connection elements supplied by TOX® PRESSOTECHNIK in connection with a TOX®-Powerpackage and X-KT system correspond to the applicable statutory provisions and are dimensioned in such a way that there is no danger if the maximum permissible operating pressure specified in the operating manual is complied with.

If you perform your own conversions, e. g. particularly in the area of the hydraulic lines on X-KT systems, you must make sure that the hydraulic components used are suitable for the application and the intended pressure range. The specifications in the X-KT operating manual must be observed here. If you have questions about hydraulic components, please contact TOX® PRESSOTECHNIK. Please also observe the statutory replacement intervals for hydraulic hoses (rules of the employers' liability insurance association, BGR 237).