TOX®-Powerpackage Accessories

Data sheet 10.10
2020/07
TOX®-Powerpackage Accessories

- TOX®-Powerpackage with adjustable damping ZED
- TOX®-Powerpackage with cutting impact damping ZSD
- TOX®-Powerpackage with Safety Lock ZSL
- TOX®-Powerpackage with power bypass with hydraulic end position cushion ZHD
- TOX®-Powerpackage with power bypass ZLB
- Mounting accessories ZFV, ZFH
- Mounting accessories ZGH, ZGK
- Oil level monitor ZU
- Positive stop FUD
- Oil pump ZP
- Tool set ZWS ZWS
- Tool holding fixture with anti-rotation lock V
- Coupling ZWK
- Mini ram guide ZMS
- Mounting bracket ZMP, High-pressure measuring hose ZHM
TOX®-Powerpackage with adjustable damping ZED

The TOX®-Powerpackage with adjustable damping ZED is ideal for optimal, even pressing and punching with reduced impact. The approach- and return force are lower than for TOX®-Powerpackages without adjustable damping ZED.

Accessories and options:
The TOX®-Powerpackage options are also available for these units (see TOX® data sheet 10.20).

Scope of delivery:
- Stroke sensing ZHU (without sensors) up to version 30.
- Power bypass ZHD with end position damping for all series X-S, X-K, X-AT and starting from EL 04. For EL 02 and EK cylinders including power bypass ZLB.
- Positive stop with elastomeric damping FUD
- Additional HP connection for damping pressure monitoring
- External power stroke initiation including pneumatic valve (solenoid operated) and power stroke valve mounted on cylinder
- All necessary electrical connectors (without cables)
- Flow control valve provides throttling

Note:
For older Powerpackages of the series EL, EK and AT, the total stroke is reduced by 10 mm due to the signal transducer of the stroke monitoring.

Tolerance of ± 50 N and ± 5 mm/s applies to all force and speed data.
*all speed data valid without any opposing force and any tooling weight.

Order no:
X-S 008.2030.100.12 – ZED

Adjustable damping
TOX®-Powerpackage

<table>
<thead>
<tr>
<th>Type</th>
<th>Total stroke mm</th>
<th>Approach force N</th>
<th>Return force N</th>
<th>Average approach speed* [mm/s]</th>
<th>Average return speed* [mm/s]</th>
<th>Average power stroke speed* [mm/s]</th>
<th>L_a mm</th>
<th>O_a mm</th>
<th>P_in mm</th>
<th>P_out mm</th>
<th>For TOX®-Powerpackage type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZED 02</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>1160</td>
<td>1000</td>
<td>300</td>
<td>390</td>
<td>383</td>
<td>96</td>
<td>330</td>
<td>350</td>
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<td>ZED 04</td>
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<td>300</td>
<td>400</td>
<td>1560</td>
<td>1320</td>
<td>345</td>
<td>299</td>
<td>299</td>
<td>58</td>
<td>335</td>
<td>350</td>
</tr>
<tr>
<td>ZED 08</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>2970</td>
<td>2490</td>
<td>210</td>
<td>252</td>
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<td>31</td>
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<td>450</td>
</tr>
<tr>
<td>ZED 15</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>4650</td>
<td>3280</td>
<td>296</td>
<td>241</td>
<td>241</td>
<td>56</td>
<td>359</td>
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<tr>
<td>ZED 30</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>7620</td>
<td>4640</td>
<td>257</td>
<td>221</td>
<td>221</td>
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<td>459</td>
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<tr>
<td>ZED 50</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>9630</td>
<td>5280</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>382</td>
<td>482</td>
</tr>
</tbody>
</table>
TOX®-Powerpackage with adjustable damping ZED

Function
The TOX®-Powerpackage type ZED can be ordered either with a manually adjustable flow control valve or with a solenoid operated proportional flow control valve.

Solenoid operated proportional flow control valve:
- Positional accuracy for damping in approach and power strokes < +/- 0.03 mm. In order to achieve this accuracy, the desired position must be approached slowly (e.g. over a speed ramp).
- Minimum speed adjustment for closed flow control valve during power stroke: < 0.1 mm/s
- Minimum operating air pressure: 3.0 bar

Manual flow control valve:
- Reaction time and reaction distance when switching the damping during approach:
  - Reaction time
    - ZED 02/04/08 < 0.07 sec
    - ZED 15/30 < 0.14 sec
  - Reaction distance dependent on the approach speed
    - ZED 02/04/08 min. 6 mm to max. 34 mm
    - ZED 15/30 min. 6 mm to max. 38 mm
  (high approach speeds result in increased reaction distance)
- Switching repeatability during approach at max. speed:
  - ZED 02/04/08 < 4 mm
  - ZED 15/30 < 7 mm
- Minimum speed adjustment for closed flow control valve during power stroke:
  - ZED 02/04/08 < 0.1 mm/s
  - ZED 15/30 < 0.18 mm/s
- Minimum operating air pressure: 3.0 bar

The return stroke can be activated over a position signal or a force signal at any time due to the integrated check valve independent of the switching position of the solenoid valve 1V5.

Function:
A hydraulic damping cylinder 20 is mounted on the working rod 10 of a standard TOX® pneumatic spring Powerpackage.

During the approach stroke, the oil flows, depending on the cylinder version either through a bi-directional manual flow control valve 1V61 or an electrically operated proportional flow control valve 1V62 from one side of the piston to the opposite side, thereby creating a constant, throttled volume stream 3 and thus a dampened movement.

For a rapid fast approach stroke, the solenoid valve 1V5 can be switched electrically 1 and the oil can flow without being throttled 2.

Caution:
For TOX®-Powerpackages with the damping option ZED, the oil pressure cannot be used to measure the force and to switch the valve.

The pneumatic activation of the approach stroke occurs in the same way as for a TOX®-Powerpackage with air spring. The power stroke activation is done electrically over a position sensor, as well as the switching on and off of the damping function (solenoid valve 1V5). A magnetic piston guarantees for the timely switch point. The sensors are to be ordered separately.

The damping effect can be adjusted manual at the flow control valve 1V61 or electrically using a solenoid operated proportional flow control valve 1V62. As option, this can be monitored over a display 30.
### Valve Data

<table>
<thead>
<tr>
<th>Electric 2-way valve</th>
<th>Manual 2-way flow control valve</th>
<th>Electric proportional 2-way flow control valve</th>
<th>Proportional plug amplifier, mounted directly to 1V62</th>
</tr>
</thead>
<tbody>
<tr>
<td>1V5</td>
<td>1V61</td>
<td>1V62</td>
<td>--</td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>Up to +50°C</td>
<td>Up to +50°C</td>
<td>--</td>
</tr>
<tr>
<td><strong>Hydraulic temperature</strong></td>
<td>Up to +70°C</td>
<td>Up to +70°C</td>
<td>--</td>
</tr>
<tr>
<td><strong>Mounting orientation</strong></td>
<td>Any</td>
<td>Any</td>
<td>--</td>
</tr>
<tr>
<td><strong>Function/operating mode</strong></td>
<td>Solenoid, direct operated, normally closed</td>
<td>Manual, mechanic key actuation via open end wrench and screwdriver</td>
<td>Proportional solenoid push type</td>
</tr>
<tr>
<td></td>
<td>Operating distance = 2.5 mm</td>
<td>Operating range = 900° (2.5 turns)</td>
<td>Proportional amplifier with clocked current regulator. The dither amplitude is variable. Min. and max. solenoid current separately adjustable. Integrated linear ramping. The input free/block allows for the block function. Stabilized output voltage provides an external setpoint device.</td>
</tr>
<tr>
<td></td>
<td>Adjusting accuracy &lt;= 1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electric parameters</strong></td>
<td>Standard nominal voltage UN = 24 VDC</td>
<td>Standard nominal voltage UN = 24 VDC</td>
<td>Supply voltage UN = 24VDC (Tolerance 22 – 36VDC)</td>
</tr>
<tr>
<td></td>
<td>Nominal power = 26 W</td>
<td>Max. current IG = 680 mA</td>
<td>Setpoint input 0 – +10 VDC</td>
</tr>
<tr>
<td></td>
<td>Current tolerance +/-10 % dependent on nominal voltage</td>
<td>Relative switch-on time 100 % ED</td>
<td>Input resistance &gt;= 100 kOhm</td>
</tr>
<tr>
<td></td>
<td>Relative switch-on time 100 % ED</td>
<td>Repeatability &lt;= 2 % *</td>
<td>Stabilized output voltage 10VDC, max. load 2 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hysteresis &lt;= 5 % *</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>* under optimum dither signal</td>
<td>Dither: Adjustable frequency 60 – 250Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Preset at 200 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No-load power 0.3 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min. current Imin adjustable 30 – 400 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Preset at 150 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Max. current Imax adjustable Imin – 1200 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Preset at 700 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ramp up/down are set by the trimming potentiometers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ramp time 0.25 – 6 sec</td>
</tr>
<tr>
<td><strong>Connection type</strong></td>
<td>Cable socket ISO 4400/ DIN 43650</td>
<td>Cable socket EN 17501-803/ ISO 4400</td>
<td>Power plug can be rotated 180°, with 1.5 m long cable</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 65 per EN 60529</td>
<td>IP 65</td>
<td>IP 65, mounted per DIN 40050</td>
</tr>
</tbody>
</table>
## TOX®-Powerpackage with cutting impact damping ZSD

### Function:
The adjusting nut (total stroke limiter) 1 contacts the damping piston 2 during approach or power stroke depending on the adjustment position. The damping piston 2 compresses hydraulic oil through the throttling needle 3. The damping effect can be adjusted with the throttling needle 3. During the return stroke, the damping piston 2 is pushed back to its original position by the pneumatic piston 4 and through the integrated bypass valves. The maximum damping stroke is approximately 7 mm.

Can be mounted in any orientation. The adjustable cutting impact damping works in any position.

The adjustable cutting impact damping is completely installed on the cylinder. No plumbing is required by customer.

### Advantages:
- Hydraulic damping of end of stroke
- Cushioning infinitely adjustable
- Total stroke infinitely adjustable
- Can be mounted in any orientation
- Protects tooling and machine
- Reduces noise levels
- Maintenance-free

### Order no.

K 04.51.200.20 - ZSD

---

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>Y,</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSD 04</td>
<td>101.5</td>
<td>107.5</td>
<td>60</td>
</tr>
<tr>
<td>ZSD 08</td>
<td>101.5</td>
<td>145</td>
<td>67</td>
</tr>
<tr>
<td>ZSD 15</td>
<td>120.5</td>
<td>181.5</td>
<td>83</td>
</tr>
<tr>
<td>ZSD 30</td>
<td>120.5</td>
<td>251</td>
<td>100</td>
</tr>
<tr>
<td>ZSD 50</td>
<td>122.5</td>
<td>295</td>
<td>105</td>
</tr>
<tr>
<td>ZSD 75/100</td>
<td>130</td>
<td>395</td>
<td>130</td>
</tr>
</tbody>
</table>

Further dimensions for total stroke adjustment on request.

Dimensions in mm

Y = Y₁ + 2 x stroke length for total stroke limiter version 51/81

For TOX®-Powerpackage type EK/AT

- for EK/AT 04... for stroke 100 mm
- for EK/AT 08... for stroke 100 mm
- for EK/AT 15... for stroke 100 mm
- for EK/AT 30... for stroke 100 mm
- for EK/AT 50... for stroke 100 mm
- for EK/AT 75.../EK/AT 100 for stroke 100 mm
TOX®-Powerpackage with Safety Lock ZSL

Accessories

to be ordered separately:
- Sensor M12 x 1x45
- Sensor M12 x 1x70
- Cable box incl. cable (5 m)

Order no.
S04.100.06D - ZSL
Safety Rod Catcher
Order no. TOX®-Powerpackage

Electrical control
The electrical control of single acting locking brakes must be realized by the customer observing all applicable local and national safety regulations for power driven presses.

Clamps 1 for Ø2 mm sensors are included with unit (sensors are not included). Nominal switching distance of 2 mm (flush mountable).

<table>
<thead>
<tr>
<th>Type</th>
<th>L_s</th>
<th>L_t</th>
<th>permissible load* kN</th>
<th>For TOX®-Powerpackage</th>
<th>Required length of sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSL 04</td>
<td>200</td>
<td>G1/4</td>
<td>10</td>
<td>S/K/X-S/X-K/X-AT 04</td>
<td>45</td>
</tr>
<tr>
<td>ZSL 08</td>
<td>200</td>
<td>G1/4</td>
<td>10</td>
<td>S/K/X-S/X-K/X-AT 08</td>
<td>45</td>
</tr>
<tr>
<td>ZSL 15</td>
<td>250</td>
<td>G1/4</td>
<td>15</td>
<td>S/K/X-S/X-K/X-AT 15</td>
<td>45</td>
</tr>
<tr>
<td>ZSL 30</td>
<td>256</td>
<td>G1/4</td>
<td>20</td>
<td>S/K/X-S/X-K/X-AT 30</td>
<td>70</td>
</tr>
<tr>
<td>ZSL 50</td>
<td>275</td>
<td>G3/8</td>
<td>25</td>
<td>S/K/X-S/X-K/X-AT 50</td>
<td>70</td>
</tr>
<tr>
<td>ZSL 100</td>
<td>on request</td>
<td>G3/8</td>
<td>on request</td>
<td>S/K/X-S/X-K/X-AT 75,100</td>
<td></td>
</tr>
</tbody>
</table>

* Attention: max. retraction force of the cylinder must be considered.

Dimensions in mm
TOX®-Powerpackage Accessories

TOX®-Powerpackage with power bypass ZLB with hydraulic end position cushion ZHD in return stroke

A patented further development of the power bypass ZLB, the integrated hydraulic end position dampening (non adjustable) provides optimum cushioning of the working piston at the end of the return stroke. This feature is especially useful in applications with heavy tooling weight and high cycle speeds. This results in longer tool life and reduced noise level of the TOX®-Powerpackage, even on severe working conditions.

Compatible with:
- The TOX®-Powerpackages Q-S, Q-K, X-S, X-K, X-AT, S 4 – S 170, K 75 – K 170 are equipped as standard with bypass and end position dampering.
- TOX®-Powerpackages type K 2 – K 50 are available with ZHD on request. Please note: The overall length of the TOX®-Powerpackage K type will be increased.

Example for ordering
K 4.100.10 - ZHD
Power bypass with hydraulic end position cushion
Order no. of TOX®-Powerpackage

TOX®-Powerpackage with power bypass ZLB

It is also possible to use the bypass system for the realization of long power strokes. This allows fast sequential power strokes with only partial back stroke. e.g. for pressing in bushings. When using the application, please consider the reduced working speed.

Compatible with:
- The ZLB option can be ordered for the types S 1 – S 2 and K 1.
- All other TOX®-Powerpackages are equipped as standard with ZHD or can be ordered with this type of option (see above).

Bestell-Nr. S 1.32.6 - ZLB
Leistungs­bypass
Bestell-Nr. TOX®-Kraftpaket

In the event of control errors, or in case of special applications (particularly punching operations), the strong acceleration of the working piston after punching through the material may cause an underpressure in the high-pressure oil chamber of the TOX®-Powerpackage, and so lead to malfunctions. Such an underpressure can be prevented with the patented, integrated power bypass system ZLB available for the TOX®-Powerpackage.
For TOX®-Powerpackages, different mounting options are available:

**Front mounting plate ZFV**

### Compatible with:
- TOX®-Powerpackages line-Q, line-X and type S/K/AT
- TOX®-Powerpackages with larger intensifier section $A_i > A$: Dimensions on request.

<table>
<thead>
<tr>
<th>Order no.</th>
<th>For TOX®-Powerpackage</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZFV 1</td>
<td>S/K/Q-S/Q-K/X-S/X-K/X-AT / AT 1</td>
<td>90</td>
<td>55</td>
<td>30</td>
<td>18</td>
<td>3</td>
<td>6.6</td>
<td>75</td>
<td>40</td>
<td>32.5</td>
<td>18.75</td>
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<tr>
<td>ZFV 2</td>
<td>S/K/Q-S/Q-K/X-S/X-K/X-AT / AT 2</td>
<td>125</td>
<td>75</td>
<td>40</td>
<td>18</td>
<td>3</td>
<td>9</td>
<td>105</td>
<td>54</td>
<td>45.5</td>
<td>26.25</td>
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<tr>
<td>ZFV 4</td>
<td>S/K/Q-S/Q-K/X-S/X-K/X-AT / AT 4</td>
<td>145</td>
<td>85</td>
<td>50</td>
<td>21</td>
<td>3</td>
<td>9</td>
<td>125</td>
<td>64</td>
<td>54.1</td>
<td>31.25</td>
</tr>
<tr>
<td>ZFV 8</td>
<td>S/K/Q-S/Q-K/X-S/X-K/X-AT / AT 8</td>
<td>180</td>
<td>110</td>
<td>70</td>
<td>24</td>
<td>4</td>
<td>11</td>
<td>155</td>
<td>88</td>
<td>67.1</td>
<td>38.75</td>
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<tr>
<td>ZFV 15</td>
<td>S/K/Q-S/Q-K/X-S/X-K/X-AT / AT 15</td>
<td>225</td>
<td>135</td>
<td>75</td>
<td>29</td>
<td>4</td>
<td>18</td>
<td>195</td>
<td>100</td>
<td>84.4</td>
<td>48.75</td>
</tr>
</tbody>
</table>

Dimensions in mm

**Rear mounting plate ZFH**

### Compatible with:
- TOX®-Powerpackages type S/K/AT
- Non retrofittable

<table>
<thead>
<tr>
<th>Order no.</th>
<th>For TOX®-Powerpackage</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZFH 1</td>
<td>S/K/AT 1</td>
<td>90</td>
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<td>30</td>
<td>18</td>
<td>3</td>
<td>6.6</td>
<td>75</td>
<td>40</td>
<td>32.5</td>
<td>18.75</td>
</tr>
<tr>
<td>ZFH 2</td>
<td>S/K/AT 2</td>
<td>125</td>
<td>75</td>
<td>40</td>
<td>18</td>
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<tr>
<td>ZFH 4</td>
<td>S/K/AT 4</td>
<td>145</td>
<td>85</td>
<td>50</td>
<td>21</td>
<td>3</td>
<td>9</td>
<td>125</td>
<td>64</td>
<td>54.1</td>
<td>31.25</td>
</tr>
<tr>
<td>ZFH 8</td>
<td>S/K/AT 8</td>
<td>180</td>
<td>110</td>
<td>70</td>
<td>24</td>
<td>4</td>
<td>11</td>
<td>155</td>
<td>88</td>
<td>67.1</td>
<td>38.75</td>
</tr>
<tr>
<td>ZFH 15</td>
<td>S/K/AT 15</td>
<td>225</td>
<td>135</td>
<td>75</td>
<td>29</td>
<td>4</td>
<td>18</td>
<td>195</td>
<td>100</td>
<td>84.4</td>
<td>48.75</td>
</tr>
</tbody>
</table>

Dimensions in mm
TOX®-Powerpackage Accessories

Rear spherical bearing mount ZGH

Compatible with:
- TOX®-Powerpackages type S/K/AT/X-AT/X-K
- TOX®-Powerpackages with larger intensifier sections $A_J > A$: Dimensions on request.
- Non retrofittable

<table>
<thead>
<tr>
<th>Order no.</th>
<th>For TOX®-Powerpackage</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E'</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZGH 1</td>
<td>S/K/AT/X-K 1</td>
<td>42</td>
<td>22</td>
<td>10</td>
<td>34</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>12</td>
<td>10.4</td>
</tr>
<tr>
<td>ZGH 2</td>
<td>S/K/AT/X-K/AT 2</td>
<td>62</td>
<td>30</td>
<td>10</td>
<td>50</td>
<td>12</td>
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<td>12</td>
<td>16</td>
<td>15.4</td>
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<td>S/K/AT/X-K/AT/AT 4</td>
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<td>40</td>
<td>12</td>
<td>64</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>21</td>
<td>19.3</td>
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<td>ZGH 8</td>
<td>S/K/AT/X-K/AT/AT 8</td>
<td>90</td>
<td>45</td>
<td>12</td>
<td>70</td>
<td>22</td>
<td>20</td>
<td>20</td>
<td>28</td>
<td>25.8</td>
</tr>
<tr>
<td>ZGH 15</td>
<td>S/K/AT/X-K/AT/AT 15</td>
<td>100</td>
<td>50</td>
<td>15</td>
<td>84</td>
<td>30</td>
<td>20</td>
<td>25</td>
<td>37</td>
<td>34.8</td>
</tr>
</tbody>
</table>

Dimensions in mm

Front spherical rod end ZGK

Compatible with:
- Retrofittable for all TOX®-Powerpackages

Attention:
The rod end must be screwed securely against the shoulder on the working piston. Length compensation over the thread is not permissible.

<table>
<thead>
<tr>
<th>Order no.</th>
<th>For TOX®-Powerpackage</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H''</th>
<th>J</th>
<th>K</th>
<th>M</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZGK 1</td>
<td>S/K/Q-S/Q-K/S/X-K/S/X-K/AT 1</td>
<td>66</td>
<td>50</td>
<td>32</td>
<td>17.5</td>
<td>22</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>15.4</td>
<td>22</td>
<td>M12x1.5</td>
<td>19</td>
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<tr>
<td>ZGK 2</td>
<td>S/K/Q-S/Q-K/S/X-K/S/X-K/AT 2</td>
<td>85</td>
<td>64</td>
<td>42</td>
<td>22</td>
<td>27</td>
<td>21</td>
<td>15</td>
<td>16</td>
<td>19.3</td>
<td>28</td>
<td>M16x1.5</td>
<td>22</td>
</tr>
<tr>
<td>ZGK 4</td>
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<td>111</td>
<td>84</td>
<td>54</td>
<td>30</td>
<td>37</td>
<td>28</td>
<td>20</td>
<td>22</td>
<td>25.8</td>
<td>37</td>
<td>M22x2</td>
<td>32</td>
</tr>
<tr>
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<td>145</td>
<td>110</td>
<td>70</td>
<td>40</td>
<td>50</td>
<td>37</td>
<td>25</td>
<td>30</td>
<td>34.8</td>
<td>51</td>
<td>M30x2</td>
<td>41</td>
</tr>
<tr>
<td>ZGK 15</td>
<td>S/K/Q-S/Q-K/S/X-K/S/X-K/AT 15</td>
<td>145</td>
<td>110</td>
<td>70</td>
<td>40</td>
<td>50</td>
<td>37</td>
<td>25</td>
<td>30</td>
<td>34.8</td>
<td>51</td>
<td>M30x2</td>
<td>41</td>
</tr>
</tbody>
</table>

Dimensions in mm
Oil level monitor ZU

If the minimum oil level is reached, the indicator pin integrated in the TOX®-Powerpackage actuates a switch (pneumatic or electric). Mounted via steel strip. Manual reset.

Type ZU 01 = potential-free contact set with step function (open/close), contact load rating 0–30V DC, constant current 5 A, cable length 2 m.

Type ZU 02 = 3/2-way valve with locking zero setting (normally open contact) connecting thread M5

Type ZU 03 = as for ZU 02, but with quick connector

Compatible with:
- Can be retrofitted to all TOX®-Powerpackages.

Order no.
ZU 01 electric
ZU 02 pneumatic (connecting thread M5)
ZU 03 pneumatic (quick connector)

Positive stop FUD

A positive stop is required in the TOX®-Powerpackage if the working piston in power stroke meets the internal end stop in the front flange. This is necessary, if the end stop in the power stroke cannot be realized by the tool or the bow. Especially for punching processes, where the working piston moves through to the internal end stop at high speed after punching, a positive stop is recommended.

Compatible with:
- TOX®-Powerpackages of the series Q-S, Q-K, X-S, X-K, X-AT, RZS, RZK are equipped with a positive stop with elastomer damping by default. For these devices, the positive stop can be used at any time. The elastomer damping occurs approx. 2 mm before impact and the design of the damping allows compression only in power stroke. As a result, the dampening stroke of the TOX®-Powerpackage is reduced by approx. 2 mm in fast approach stroke.
- For the following series, the positive stop FUD is available as an option: S, K, HZL, AT.

Order no.
S 08.00.100.06 – FUD

Dimensions in mm

Pin assignment switch

1 brown
2 green
4 white

Positive stop

TOX®-Powerpackage
TOX®-Powerpackage Accessories

Oil pump ZP

It guarantees the optimum maintenance concept and extended maintenance intervals. For easy, air-free refilling and reduction of the oil volume of the TOX®-Powerpackage. Clear body and refill hose allow easy monitoring of the oil level in the pump. Little operator effort required.

- Pumping medium: hydraulic oil DIN 51524 HL or HPL with 32 cSt viscosity at 40°C.
- Pump capacity: 9 ml/stroke
- Container filling volume 0.3l
- Max. permissible back pressure 10 bar
- Hose length 800 mm
- Magnetic fixture

Order no.
ZP 20.000

Version for special oil types on request.

Tool set ZWS

Special tools for seal kit of TOX®-Powerpackage facilitate the removal and installation of seals.

Order no.
ZWS 01
Tool holding fixture with anti-rotation lock V

The guide pin and bushing are included in the delivery package. Please indicate the total travel of the TOX®-Powerpackage when ordering. The center of the guide bushing bore must be set at dimension E from the centerline of the cylinder.

Order no. For TOX®-Powerpackage | A  | B  | C  | D  | E  | F  | G  | H  | J  | K  | L  | M  | N  | O  | P
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
V 1 | S/K/AT 1 | 14 | 12 | 60 | 94 | 75 | 20 | 38 | 69.0 | 30 | 45 | 16 | 10 | 16 | 5 | 17
V 2 | Q-S/Q-K/X-S/X-K/AT 1 | 14 | 12 | 62 | 109 | 90 | 20 | 38 | 71.0 | 30 | 45 | 20 | 10 | 16 | 5 | 17
V 4 | Q-S/Q-K/X-S/X-K/AT 4 | 18 | 16 | 77 | 132 | 110 | 20 | 48 | 88.5 | 30 | 60 | 30 | 25 | 25 | 5 | 20
V 8 | Q-S/Q-K/X-S/X-K/AT 8 | 23 | 20 | 105 | 145 | 120 | 40 | 68 | 115.0 | 50 | 80 | 45 | 22 | 30 | 5 | 24
V 15 | Q-S/Q-K/X-S/X-K/AT 15 | 23 | 20 | 106 | 165 | 140 | 40 | 68 | 116.0 | 50 | 80 | 50 | 23 | 30 | 5 | 24
V 30 | Q-S/Q-K/X-S/X-K/AT 30 | 28 | 25 | 125 | 195 | 170 | 40 | 88 | 137.0 | 50 | 90 | 56 | 35 | 35 | 5 | 24
V 50 | X-S/X-K/AT 50 | 28 | 25 | 145 | 205 | 180 | 40 | 98 | 157.0 | 50 | 105 | 63 | 45 | 35 | 5 | 24
V 75 | X-S/X-K 75 | 28 | 25 | 67 | 255 | 235 | 40 | 98 | 190.0 | 50 | 136 | 98 | – | 35 | 5 | 24
V 100 | X-S/X-K/AT 100 | 28 | 25 | 67 | 255 | 235 | 40 | 98 | 190.0 | 50 | 136 | 98 | – | 35 | 5 | 24

Dimensions in mm
TOX®-Powerpackage Accessories

**Coupling ZWK**

This coupling provides a flexible connection between the TOX®-Powerpackage and die set, thereby preventing any side loads. Includes anti-rotation device. Is threaded directly on the working rod of the TOX®-Powerpackage.

**Example for ordering**

ZWK 001.060.000

<table>
<thead>
<tr>
<th>Order no.</th>
<th>For TOX®-Powerpackage</th>
<th>A</th>
<th>ØB</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>ØF</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>V*</th>
<th>SW</th>
<th>Max. press force kN</th>
<th>Max. retract force kN</th>
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<tbody>
<tr>
<td>ZWK 001.060.000</td>
<td>S/K/AT 1</td>
<td>60</td>
<td></td>
<td>16</td>
<td>74</td>
<td>44</td>
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<td>4xM6x9</td>
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<td></td>
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<td>30</td>
<td>28.0</td>
<td>52.5</td>
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<td>4xM8x12</td>
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<td>74</td>
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<td>72.0</td>
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<td>89.0</td>
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<td>4xM12x19</td>
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<td>50</td>
<td>325</td>
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<td>130</td>
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<td>63</td>
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<td>92.5</td>
<td>56</td>
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<td>55</td>
<td>500</td>
<td>20.0</td>
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<td>130</td>
<td>84</td>
<td>70</td>
<td>51.8</td>
<td>100.5</td>
<td>64</td>
<td>6xM16x25</td>
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<td>85</td>
<td>1000</td>
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<td>130</td>
<td>84</td>
<td>78</td>
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<td>74</td>
<td>6xM16x25</td>
<td>25</td>
<td>140</td>
<td>2000</td>
<td>50.0</td>
</tr>
</tbody>
</table>

*anti-rotation device (can be removed if necessary)
The center of the guide bushing bore must be set at dimension E1 from the centerline of the cylinder. The bushings, posts and the coupling ZWK are included in the delivery package. The centering hole allows accurate alignment of the ram plate for finishing work.
**TOX®-Powerpackage Accessories**

**Mounting bracket ZMP 001.002**

External attachment to the TOX®-Powerpackage with mounting plate, including protective caps for the display and the programming keys as well as the HP measuring terminal.

Accessories

to be ordered separately:
- Two-piece fastening strap with two screws M5, hole distance 44 mm
- ZMP 001.002
  Mounting plate for attachment to the service side of TOX®-Powerpackage
- HP measuring hose ZHM 630: for connection in case the pressure switch is mounted in other position.
  Connection 1 x 90°, compl. assembled, filled and bled, secured against leaking of oil (optional 400, 1000, 1500, 2000 mm)

**High-pressure measuring hose ZHM 630**

Pressure range up to 400 bar. Available lengths: 400, 630, 1000, 1500, 2000, 2500, 3000, 3500 mm. On request also available with 90° end connectors on both sides or straight end connectors on both sides, up to L = 2000 mm.

Attention:

Due to the compressibility of the oil, the following loss of power stroke occurs when the device is fitted to the TOX®-Powerpackage (given a hose length of 400 mm):
- Q-S/X-S 1/Q-K/X-K 1 = 0.8 mm,
- Q-S/X-S 2/Q-K/X-K 2 = 0.5 mm,
- Q-S/X-S 4/Q-K/X-K 4 = 0.25 mm,
- Q-S/X-S 8/Q-K/X-K 8 = 0.13 mm,
- Negligible for larger TOX®-Powerpackages

Order no.

ZHM 630-90
[Connection 90°]
Length 630 mm