TOX®-Hydraulic Cylinder
Type HZ 40 for up to 500 bar oil pressure

The concept behind the KT-system
The “split” Powerpackage is often used where limited space is available, when several cylinders must operate simultaneously, or where small cylinders are needed. The system consists of the pressure intensifier ES, the hydraulic cylinder HZ and hydraulic hose with quick connect coupling. It is possible to connect several hydraulic cylinders to one pressure intensifier.

The hydraulic cylinder HZ 40 is a single-acting cylinder with spring return. It can also be used in pure hydraulic installations.

HZ & ES: If a short overall length and a cost effective solution is required.

Function
Full press force at any point of the stroke as there is no distinction between approach stroke and power stroke.
Due to the smart design, the cylinder housing serves as piston guidance and provides the thread for mounting the cylinder to the flange thread of the bow or press without additional fasteners – a cost saving solution!

Ordering example:
1. HZ 40.12.035.18.20.431 quantity: 2
2. ES 160.13.067.99 quantity: 1
3. ZS 01.1000 quantity: 2

According to the above example, you receive:
2x HZ 40 incl. hose and quick connect coupling + 1x ES to be switched manually. Completely filled with oil. Ready for installation.
Mounting flange
The illustration below shows the flange recommended for mounting the HZ 40 to a bow or press frame. The same way it is mounted on the TOX®-Machine Tongs CMH 03.45 (see data sheet 90.10 TOX®-Tongs).

The optimum application:

**TOX®-Mini-Handheld Tongs / TOX®-Machine Tongs CMH 03.45**

**Model 11:**
14 mm stroke. With 2-hand safety control. Handles with trigger buttons.
Drive: PHA 160.99 (see data sheet 10.10 TOX®-Tongs).

**Applications**

Multi point die sets

Even for punching!

For more accessories see data sheet 10.10 TOX®-Powerpackage
TOX®-Intensifier
Type ES 160.99

The power intensifier with absolute air/oil separation and integrated bypass for reliable operation. Can be mounted in any orientation.

Closed oil system. Uses simple pneumatic controls like any single-acting pneumatic cylinder with spring reset in the intensifier and in HZ 40.

**Function**
Only power stroke, no fast approach stroke in combination with HZ 40.

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**Order no.**

<table>
<thead>
<tr>
<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>W</th>
<th>X</th>
<th>Pneumatic connection power stroke</th>
<th>High pressure connection</th>
<th>Volumetric displacement power stroke cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 160.13.067.99</td>
<td>170</td>
<td>730</td>
<td>86</td>
<td>90</td>
<td>89</td>
<td>15</td>
<td>22.5</td>
<td>85</td>
<td>437</td>
<td>G3/4</td>
<td>2x G3/8</td>
<td>67</td>
</tr>
</tbody>
</table>

**Air pressure bar**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>5.5 = Max.</th>
</tr>
</thead>
</table>

**Oil pressure**

| 88 | 150 | 247 | 342 | 440 | 488** |

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**Total stroke calculation:**

\[
\left( \frac{V_{Eashi} - F_2 \times \text{hose length}}{\text{per 100mm high pressure hose}} \right) : (V_{HZ} \times \text{number of cylinders}) = \text{possible total stroke per cylinder (mm)}
\]

\[
V_{Eashi} = 67 \text{ cm}^3, F_2 = 0.25, V_{HZ} = 0.96
\]

Examples for total stroke calculation can be found in data sheet 10.05.
TOX®-Intensifier
Type ES 160.99

The suitable high pressure hose

<table>
<thead>
<tr>
<th>Drive</th>
<th>Standard hose lengths [mm]</th>
<th>Hose dimensions [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HZ 40</td>
<td>1000, 3000, 5000, 7000</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>225</td>
</tr>
</tbody>
</table>

Other hose lengths on request. \( R_{\text{min}} \): smallest allowable bending radius

Variants:
01: 2x straight connection
02: 1x 90° elbow on ES; 1x straight connection on HZ
03: 1x straight connection on ES; 1x 90° elbow on HZ
04: 2x 90° elbow connection

Please observe the mounting instructions of the TOX®-KT catalog. A hydro-split coupling for ES 160.13.067.99 is not available. Quick connect couplings are standard. For multi-cylinder solutions please contact us.

Ordering example for hoses:
ZS 01 - 5000
hose length
variant no.

The optimum application:

PHA 160.64.02.00 / PHA 160.99.02.02
The ES intensifiers are available as horizontal carriage or as pedestal with casters and with control system (see data sheet 90.10 TOX®-Tongs).

Several tongs connected to one intensifier

Horizontal carriage with casters
Pedestal stand with casters

Subject to technical modifications.