Coupling Elements
Built-in type and threaded-body type
ND 3, ND 5, ND 8, max. operating pressure up to 500 bar

**Application**
On machine tools with pallet changing systems, the coupling elements transfer hydraulic oil or compressed air from the machine table to the hydraulic clamping fixture.

**Description**
The coupling mechanism and the coupling nipple are provided with axial seals (see coupling situation) and have a very short coupling stroke. The smooth front face of the coupling mechanism is easy to clean in case of swarf formation. The recessed sealing disk can be easily replaced with the assembly tool if it is damaged. The built-in type is fixed with an intermediate plate and is particularly suitable for multi-couplings (see also data sheet F 9.440). The intermediate plates (location plates or covers) must absorb the axial forces generated by the hydraulic pressure (see pages 2 and 3). In case of the threaded-body type, the coupling mechanism is screwed directly into the base plate and the coupling nipple into the clamping fixture. The coupling nipple with VSV (preloaded valve) should be installed in the unclamping or return line of the clamping fixture. The VSV limits a possible pressure build up to approx. 5 bar when uncoupled. Depending on the sealing, the coupling elements can be coupled either against pressure or only without pressure.

**Type with integrated nozzle**
A nozzle on the coupling mechanism generates a strong air stream to clean the smooth front face (see page 4).

**Advantages**
- Many installation variants
- Space-saving installation dimensions
- 3 different nominal diameters for optimum adaptation to the flow rate
- Built-in and threaded-body type of the same nominal size can be combined
- Transmission of hydraulic oil, compressed air and vacuum*
- Stainless steel coupling elements
- Coupling mechanism with smooth front face reduces contamination and is easy to clean
- Axial sealing disk easily renewable
- Additional bushing simplifies the fabrication of the location hole for the coupling mechanism
- Relatively large positioning tolerances
- Threaded-body type ND 5 with integrated nozzle to clean the sealing surface (see also page 4)

**Important notes!**
The sealing surfaces on the front face of the coupling elements have to be cleaned before coupling to ensure the tightness in coupled condition. We recommend to wash the elements and finally clean them with compressed air. Protection covers should be used as far as possible. The mounting bodies of the coupling elements must be guided in parallel 2 – 3 mm before coupling without exceeding the radial positioning tolerance. To transmit compressed air and vacuum, use only the coupling elements for “depressurised coupling”.

* Other media such as coolant and water on request.

**General technical characteristics**

<table>
<thead>
<tr>
<th>Type</th>
<th>Threaded-body</th>
<th>Built-in</th>
<th>Threaded-body with nozzle</th>
<th>Built-in</th>
<th>Threaded-body</th>
<th>Built-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal diameter</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Max. operating pressure [bar]</td>
<td>350</td>
<td>300</td>
<td>500</td>
<td>500</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Max. flow rate [l/min]</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>35</td>
</tr>
<tr>
<td>Coupling stroke [mm]</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>7.4</td>
</tr>
<tr>
<td>Axial coupling force against pressure per coupling point [N]</td>
<td>F = 7.9 x p [bar]</td>
<td>F = 15.4 x p [bar]</td>
<td>F = 28.4 x p [bar]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial coupling force at 0 bar [N]</td>
<td>60</td>
<td>60</td>
<td>90</td>
<td>90</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Axial positioning tolerance [mm]</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
<tr>
<td>Radial positioning tolerance [mm]</td>
<td>±0.1</td>
<td>±0.1</td>
<td>±0.2</td>
<td>±0.2</td>
<td>±0.2</td>
<td>±0.2</td>
</tr>
<tr>
<td>Radial positioning tolerance for 0480776 / -751 [mm]</td>
<td>-</td>
<td>-</td>
<td>±0.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Adm. angular deviation [°]</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Coupling situation**

**Coupling force**

<table>
<thead>
<tr>
<th>Q [l/min]</th>
<th>NW 3</th>
<th>NW 5</th>
<th>NW 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>14</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>22</td>
<td>27</td>
</tr>
</tbody>
</table>

**Characteristic curve**

For kinematic viscosity of 53 x 10^-6 m²/s (HLP 22 at 20 °C)

ND8: \( \Delta p = 1.75 \text{ bar at 35 l/min} \)
Coupling nipple

**Installation examples**

Alternative connecting possibilities

**Location hole**

Colour valve tappet
silver = coupling against pressure
black = only depressurised coupling

**Dimensions**

Colour valve tappet
silver = coupling against pressure
black = only depressurised coupling

**Type**

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>ND</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>A mm</td>
<td>Ø20 H7 M20x1.5 M20x1.5</td>
<td>Ø20 H7 M24x1.5 M24x1.5</td>
<td>Ø24 H8 M32x1.5</td>
</tr>
<tr>
<td>Ø B mm</td>
<td>15.8 17 H7 17 H7</td>
<td>15.8 15.8 21.9 H8 21.9 H8</td>
<td>21 24</td>
</tr>
<tr>
<td>C mm</td>
<td>10 22 27.5</td>
<td>10 16.5 26.5 27.5</td>
<td>9 24</td>
</tr>
<tr>
<td>D mm</td>
<td>11.5 – –</td>
<td>11.5 17.1 – –</td>
<td>15 –</td>
</tr>
<tr>
<td>E mm</td>
<td>– 9.5 9.5</td>
<td>– 9.5 9.5</td>
<td>– 12.5</td>
</tr>
<tr>
<td>F mm</td>
<td>– 11 11</td>
<td>– 13 13</td>
<td>– 15</td>
</tr>
<tr>
<td>Ø H mm</td>
<td>16 – –</td>
<td>16 16 – –</td>
<td>21 H8 –</td>
</tr>
<tr>
<td>Ø M mm</td>
<td>9.8 9.8 9.8</td>
<td>13.5 13.5 12.8 13.5</td>
<td>18.4 18.4</td>
</tr>
<tr>
<td>Ø N mm</td>
<td>10 13.5 19</td>
<td>10 16.5 18 19</td>
<td>9 12</td>
</tr>
<tr>
<td>Ø P mm</td>
<td>4.5 4.5 4.5</td>
<td>4.5 4.5 4.5</td>
<td>7.4 7.4</td>
</tr>
<tr>
<td>Ø R mm</td>
<td>5 5 5</td>
<td>5 5 5</td>
<td>8 8</td>
</tr>
<tr>
<td>Ø S mm</td>
<td>5 6 6</td>
<td>5 5 6</td>
<td>8 8</td>
</tr>
<tr>
<td>T mm</td>
<td>– 15 15</td>
<td>– – 18.25 18.25</td>
<td>24.6</td>
</tr>
<tr>
<td>Ø U mm</td>
<td>– 2.8 2.8</td>
<td>– – 2.8 2.8</td>
<td>4.3</td>
</tr>
<tr>
<td>V °</td>
<td>– 1.5x20° 1.5x20°</td>
<td>– – 0.7x15° 0.7x15°</td>
<td>2x20°</td>
</tr>
<tr>
<td>Axial force A [N]</td>
<td>31.4xP [bar] – –</td>
<td>– – 31.4xP [bar] – –</td>
<td>– – 31.4xP [bar] – –</td>
</tr>
<tr>
<td>Tightening torque [Nm]</td>
<td>– 37 – 37</td>
<td>– – 40 40</td>
<td>– – 45</td>
</tr>
<tr>
<td>Part no.</td>
<td>– – – –</td>
<td>– – – –</td>
<td>– – – –</td>
</tr>
</tbody>
</table>

- **coupling against pressure**: 0460692 0460836
- **only depressurised coupling**: 0460743 0460838
- **with preloaded valve (VSV)**: 0460682 0460729 0460751 0460841

*approx. 5 bar, only depressurised coupling

Subject to modifications
### Application example

**Rotary indexing table - clamping fixture, hydraulically operated, with trunnion bearing and hydraulic positioning**

**Coupling nipple ND5 threaded-body type part-no. 0460 703**

- **for coupling mechanism with integrated nozzle**

**Installation example**

**Location hole**

**Coupling against pressure**

**Screw-in tool**

- **Part no. 2010901**
- **Tightening torque: 45 Nm**

**Alternative connecting possibilities**

- **max. Ø5**
- **max. Ø7**

**Coupling mechanism ND5 threaded-body type part-no. 0460 732**

- **with integrated nozzle to clean the sealing surface**

**Connecting hole for blast air**

**Coupling against pressure**

- **max. Ø5**
- **20.5 min.**
- **24 min.**

**Application example**

**Rotary coupling 9208 176**

- **(single passage)**

**Rotary coupling 9281 146**

- **(two passages)**

**Spindle head DIN 55021 - Size 5**

**Intermediate flange**

**Threaded-body cylinder 1460 000**

- **(single acting)**

**Interchangeable cassette**

**Interchangeable fixture plate**

**Wiper**

**Nozzle**

**SW32**

**Coupling against pressure**

- **max. R 0.3**

**Rmax. = 10 µm**

**Max. 0,3 x 45°**

**Max. Ø 7**

**Tightening torque: 40 Nm**

**Part no. 0460 831**

**Coupling mechanism 0460 830**

**Screw-in tool Part no. 2010901**

**Tightening torque: 45 Nm**

**Threaded-body type with integrated nozzle**

**Application example**

- **max. R 0.3**
- **max. Ø5**
- **20.5 min.**
- **24 min.**