CompactLINE

A powerful synchronizer for small transmissions
The technical principle

In the CompactLINE, the synchronizer rings are arranged and guided in an axially movable sub-assembly. The blocking surfaces are located between the synchronizer ring and the sliding unit. Coupling of the synchronizer rings to the sliding unit must be assured over the entire shifting travel. For this purpose, the two synchronizer rings that are arranged on either side are connected to each other. This connection ensures that, while the sliding unit can be moved axially relative to the rings (meshing with the clutch toothing), complete decoupling is prevented.

The shift process is similar to that of the standard synchronizer:

- The detents center the synchronizer rings axially and radially in the sliding unit.
- When the sliding unit is shifted axially, one synchronizer ring makes contact with the cone of the clutch body.
- The resulting friction torque moves the synchronizer ring into a blocking position relative to the sliding unit.
- In addition, the blocking chamfers become seated against each other, and the shifting force is applied.
- When the synchronous speed has been reached, the friction torque drops significantly and the synchronizer ring is rotated together with the clutch body (gear wheel) relative to the sliding unit (which is seated non-rotatably on the shaft).
- The sliding unit is now pushed axially past the synchronizer ring and engages in the clutch toothing.

Compact
Up with shifting comfort – down with space requirements

Efficient
Reduced drag torque for lower fuel consumption

Competitive
Excellent cost structure thanks to metal forming technology
The Synchronizer LINES

**ClassicLINE**
Single and Multicone Systems for all applications

**CompactLINE**
Single Cone Systems for low torques

**SKSLINE**
Single (and Multicone) Systems for medium & high torques
CompactLINE features

- Larger cone diameter in same installation space
- Improved shift comfort with low shift forces
- Higher load capacity due to better oil supply and optimal heat dissipation
- Increased efficiency

<table>
<thead>
<tr>
<th>Synchronization impulse [Ns]</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,0</td>
</tr>
<tr>
<td>ClassicLINE</td>
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</tbody>
</table>

All data indicative and subject to possible changes

Active lifting of blocker rings

30% weight reduction
## Modular Concept

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>M</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>load torque  [Nm]</strong></td>
<td>250</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td><strong>max. shift force [N]</strong></td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td><strong>max. shift force (overload) [N]</strong></td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td><strong>detent force (standard) [N]</strong></td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td><strong>capacity [Nm/N]</strong></td>
<td>0,028</td>
<td>0,031</td>
<td>0,034</td>
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</tbody>
</table>

### dimensions

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>M</th>
<th>L</th>
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</thead>
<tbody>
<tr>
<td>outer axial width a [mm]</td>
<td>&gt;= 34</td>
<td>37,5 (&gt;= 34)</td>
<td>36 (&gt;= 34)</td>
</tr>
<tr>
<td>inner axial width b [mm]</td>
<td>27</td>
<td>28,00 (27,0)</td>
<td>28,00 (27,0)</td>
</tr>
<tr>
<td>outer diameter c [mm]</td>
<td>83,5</td>
<td>91</td>
<td>98,5</td>
</tr>
<tr>
<td>inner diameter (df) d [mm]</td>
<td>31,5</td>
<td>39</td>
<td>46,5</td>
</tr>
<tr>
<td>shift travel e [mm]</td>
<td>&gt;= 7,5</td>
<td>8,0 (&gt;= 7,5)</td>
<td>8,0 (&gt;= 7,5)</td>
</tr>
<tr>
<td>cone diameter f [mm]</td>
<td>67,5</td>
<td>75</td>
<td>82,5</td>
</tr>
<tr>
<td>cone angle g [°]</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>module inner spline h [-]</td>
<td>1,25 (&gt;= 1,2)</td>
<td>1,4 (&gt;= 1,2)</td>
<td>1,4 (&gt;= 1,2)</td>
</tr>
<tr>
<td>chamfer angle h [°]</td>
<td>&gt;= 90°</td>
<td>&gt;= 90°</td>
<td>&gt;= 90°</td>
</tr>
</tbody>
</table>

All data indicative and subject to possible changes

- Size M tested and validated with off tool parts
- Size S and L planned as future standards
- Interfaces subject to technical review
HOERBIGER combines innovation and technology in maximum quality solutions

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