The ROLLON linear unit simply and reliably solves the problems of a moving axis. Fully interlocked multi-axes robots can be quickly established by fixing one or more linear units to a basic structure and then adding motors and drive controls.

The problem
Up to now, linear units could be divided into two categories:

- a) units using recirculating ball bearings
- b) units using roller bearings

Although the recirculating ball units offer high-load capacity and stiffness, they are generally oversized compared to their structural profile. They are very noisy and unable to work at high speed because of the constraints inherent in the ball recirculating system.

Until now, units using roller bearings, although less noisy and capable of high speed, have been limited by low-load capacity, moderate stiffness and undersize compared to their structural profile. Major versions have profiled ball bearings running on steel rods which are only partially sunk into the outside of the structural profile and therefore remain visible. In general, rollers are no more than plastic covered ball bearings running directly onto aluminium!

ROLLON's solution
The original construction of the ROLLON Linear Unit A100C has been achieved after extensive development and use of FEM techniques. The result is an optimum integration of linear slide and structural profile.

Unit A100C therefore combines the high-load capacity, stiffness and compactness of a recirculating ball bearing unit with the high-speed and low-noise of a roller bearing unit.

- Completely enclosed system with longitudinal seals and brushes in the heads
- Heads are aluminium castings
- Electric motor connection
- Polyurethan belt with internal steel cables
- Belt tensioning system incorporated in the head
- Linear bearing with rollers (ROLLON COMPACT RAIL System) high stiffness and load capacity
- Extruded self-supporting light alloy structural profile
The linear slide inside the unit is from the **ROLLON COMPACT RAIL** System which is based on the concept of a slider, with rollers running inside a carbon steel channel-shaped rail. The raceways are induction hardened and positioned internally for protection. The section has been optimized using FEM techniques in accordance with the rail profile and slider rollers.

The rollers comprise a precision double row angular contact ball bearing, with an internal eccentric pivot. The extra thick outer ring is profiled for optimum running inside the rail. The result is a slide-roller system having high axial/radial load capacity and high stiffness.

The internal eccentric pivots allow adjustment of the rollers in order to achieve a required preload suited to the application.

The extruded structural profile has been carefully proportioned to obtain a balance between stiffness of the slide and stiffness of the profile. The external sides of the structural profile have tee-slots to allow the unit to be easily fixed to support structures or other profiles.

Transmission is achieved by using a polyurethane toothed belt of the AT series, which has been reinforced with internal steel cables to give low extension, very high stiffness, resistance to wear and reliability with a no-maintenance guarantee.

The motor head is an aluminium casting fitted either with a hollow shaft or projecting solid shaft for motor connection. The tension head is an aluminium casting which incorporates the belt tension system.

The mechanical movement is completely protected by longitudinal seals and brushes in the heads.

**Dimensions**

![Diagram](image)

**Motor connections**

- **Hollow shaft**
- **Projecting shaft**

**Technical characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial load capacity $P_a$ (N)</td>
<td>7200</td>
</tr>
<tr>
<td>Radial load capacity $P_r$ (N)</td>
<td>12500</td>
</tr>
<tr>
<td>Allowable moment $M_x$ (Nm)</td>
<td>250</td>
</tr>
<tr>
<td>Allowable moment $M_y$ (Nm)</td>
<td>250</td>
</tr>
<tr>
<td>Allowable moment $M_z$ (Nm)</td>
<td>600</td>
</tr>
<tr>
<td>Moment of inertia $I_x$ (cm²)</td>
<td>400</td>
</tr>
<tr>
<td>Moment of inertia $I_y$ (cm²)</td>
<td>500</td>
</tr>
<tr>
<td>Max. belt tractive force (N)</td>
<td>5000</td>
</tr>
<tr>
<td>Positioning precision (mm)</td>
<td>0.1</td>
</tr>
<tr>
<td>Max. speed (m/s)</td>
<td>9</td>
</tr>
<tr>
<td>Stroke per shaft's revolution (mm)</td>
<td>190</td>
</tr>
</tbody>
</table>
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