Installation and Alignment of Linear Axes

Correct installation and alignment are essential for the performance and lifetime of a linear axis. This page gives the unified procedure for mounting, aligning, coupling, lubricating, and commissioning a NILAB linear axis. For the axis-specific details, follow the links to the family pages.

1. Mounting the axis

- Mount the axis on a **rigid, flat** base (machine frame) — the base flatness and stiffness directly affect the guide lifetime and the achievable precision. - Use the **flange** or **T-slot** mounting (ULCO: unified T-slots compatible with M5, M6, M8 nuts). - Check the mounting surface for flatness and parallelism before fixing the axis.

2. Aligning the guide

- Align the **guide rails parallel** to the motion direction. - Check the **straightness** and **parallelism** of the guide (straightness error and parallel offset of the two rails). - Use the recommended alignment procedure from the axis documentation; for LM axes the guides are WON recirculating ball guides.

3. Coupling the load

- Attach the payload to the **carriage**. - For an **off-axis** load, use a cross-carriage or the GDM module (available in a multi-carriage configuration). - Keep the **moved mass low** and the **rigidity high** — see Machine design (mass reduction, stiffness, natural frequencies ≥ ~200 Hz).

4. Lubrication

- WON recirculating ball guides are equipped with **LF seals** and use a porous resin lubricant — this gives a very long lubrication interval. - **Do not use grease lubrication** in the GDM axis (grease is not optimal for high-speed linear motion). - Follow the Lubrication page for the axis-specific requirements.

5. Cabling

- Use the **cable chain** for the LM axes (CH horizontal, CV vertical, CS side mounting) to protect and guide the cables. - Route the cables without tension; use flying connectors or carriage-mounted connectors. - Integrated motors (NLi, NLi-EtherCAT) reduce the cabling effort and support daisy-chain connection.

6. Protection

- Choose the **bellows** version (GDM) for dust or washdown environments. - Check the **IP rating** for the application environment (washdown, dust, food-grade).

7. First commissioning

- Perform a **homing / reference run**. - Check the encoder, the current, and the force during the first motion. - For integrated drives, use **NILAB Starter** (auto-teach, single and parallel motion, diagnostics).

Related pages

* Linear axes selection * How a linear axis works * GDM Tubular Linear Axis * LM Linear Axis * Lubrication * Mounting examples * Cable chain * Machine design

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