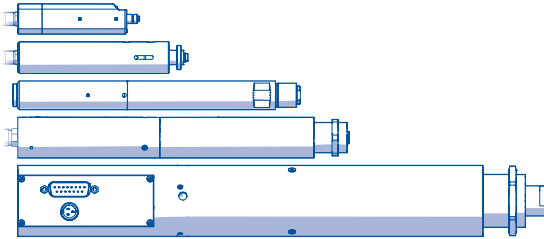


Linear Actuators

Short Instructions

M-22x / M-23x



User Information

These short instructions contain an overview of the most important safety and handling instructions for installing linear actuators (hereinafter referred to as "positioner") with the product numbers specified above (x: any number).

Subject to change. These short instructions are superseded by any new release. The latest respective release is available for download on our website.



Downloading and Reading the Manual

The actions during installation, startup, operation, and maintenance require additional information from the manuals of the positioner and/or the electronics.

Manuals may be titled as follows: "User Manual", "Technical Note".

Downloading the manuals from the website

1. Open the website **www.pi.ws**.
2. Search the website for the product number (e.g., M-235).
3. Click the corresponding product to open the product detail page.
4. Click the **Downloads** tab.
The manuals are displayed under **Documentation**.
5. Click the **ADD TO LIST** button for the desired manual and then click **REQUEST**.
6. Fill out the request form and click **SEND REQUEST**.
The download link will then be sent to the email address entered.

If you cannot find the manual you are looking for or if you have any questions:
Contact our customer service department via service@pi.de.



General Safety Information

Intended Use

The positioner is a laboratory device as defined by DIN EN 61010-1. It is intended for indoor use and use in an environment that is free of dirt, oil, and lubricants.

According to its design, the positioner is intended for positioning loads at various velocities. The positioner is not intended for applications in areas where failure would be a considerable risk for people or the environment.

It is only possible to use the positioner as intended when completely installed and connected, and in conjunction with suitable electronics. The positioner may only be installed, operated, maintained, and cleaned by authorized and appropriately qualified personnel.

Installation

Risk of minor injuries or damage to equipment from crushing between the pusher and a fixed part or obstacle.

- ▶ Install touch protection
- ▶ Maintain safety distances according to DIN EN ISO 13857.
- ▶ Mount the positioner so that the motion of the pusher is not hindered by objects in the workspace.

If the positioner is vacuum-compatible, attention must be paid to cleanliness.

- ▶ Touch the stage only when wearing powder-free gloves.
- ▶ If necessary: Wipe the positioner to clean it.

Incorrect mounting can damage the positioner and hinder the movement of the pusher.

- ▶ Pay attention to the maximum torque for the mounting screws or nuts (see manual).
- ▶ If the positioner is mounted in a clamping fixture, only use the areas on the housing that are approved for clamping (see manual).

A cable break leads to failure of the positioner.

- ▶ Install the positioner so that the cable is cannot be bent too strongly or crushed during operation.

Startup

Excessively high or wrongly connected operating voltages can damage the positioner.

- ▶ Use compatible electronics only.
- ▶ Pay attention to the operating voltage range of the positioner (see manual).
- ▶ Pay attention to the correct pin assignment (see manual).

Improper setting of the servo control parameters can damage the positioner or impair the performance of the positioner.

- ▶ If oscillation occurs, switch the servo mode of the electronics off immediately or stop the positioner.
- ▶ Use the default parameters only for the first startup.
- ▶ Adapt the operating parameter settings individually (refer to the user manual for the electronics).

The positioner may move unintentionally when connecting it to the electronics.

- ▶ Before connecting the positioner, check whether a macro is defined as the startup macro in the electronics and if necessary, cancel the selection.

Lateral forces acting on the pusher impair the motion of the pusher and increase wear on the drive components.

- ▶ Avoid lateral forces on the pusher of the positioner.

High acceleration can cause considerable wear and damage the positioner.

- ▶ Stop motion immediately if an electronics malfunction occurs.
- ▶ Move to the end of the travel range with low velocity.

Operation

Operating the positioner in environments that increase electrical conductivity could damage the positioner.

- ▶ Keep the positioner free of liquids and electrically conductive materials (e.g., metal dust).
- ▶ Do not operate the positioner in air pressure ranges where conductivity of the air is increased.
- ▶ Pay attention to the permissible ambient conditions (see manual).



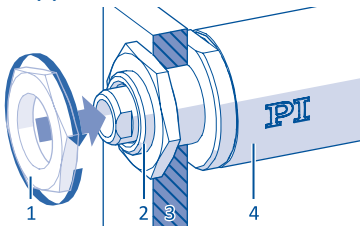
Mounting the Positioner

Mounting with Grub Screws

1. Bore at least one threaded hole into the mounting opposite the groove (see manual for dimensions).
2. Insert the positioner into the mounting.
3. Screw a grub screw into each hole so that it threads firmly into the groove.
4. Check that the positioner is firmly seated.

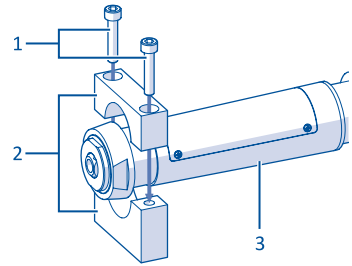
Mounting with Mounting Nut

1. Insert the positioner (4) into the mounting (3).
2. If necessary, put a flat washer or spring washer onto the mounting shaft (2).
3. Clamp the positioner firmly with the clamping nut (1).



Mounting with Clamping Shank

1. Prepare a suitable mounting with clamping fixture (2) (refer to the manual for dimensions).
2. Insert the positioner (3) into the clamping fixture.
3. Tighten the mounting screws (1) evenly.
4. Check that the positioner is firmly seated.



Changing the Tip



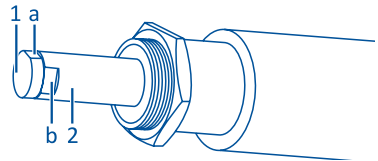
NOTICE!

Torques on the pusher can damage the drive of the positioner.

- ▶ Avoid torques on the pusher.

The supplied tips make it possible to realize different mechanical connections to a load:

1. If necessary (see manual), use an open-end wrench to fix the pusher (2) to the wrench flats (b).
2. Unscrew the tip (1).
3. Screw in the new tip by hand.
4. If necessary, remove the open-end wrench from the pusher.
5. Make sure that the tip is fixed firmly.





Starting and Operating the Positioner

The instructions required for starting and operating are in the manual for the electronics.



Maintenance



NOTICE!

Damage due to improper maintenance.

- Maintain the positioner only according to the instructions in the manual.

The positioner is maintenance-free.

- If the positioner is moved over a short travel range during continuous operation (<20 % of the travel range): Do maintenance runs regularly.
- If the positioner is operated under difficult conditions: Contact our customer service department to determine individual maintenance requirements.



Old Equipment Disposal

In accordance with EU law, electrical and electronic equipment may not be disposed of in EU member states via the municipal residual waste.

Dispose of your old equipment according to international, national, and local rules and regulations.

PI undertakes environmentally correct and free disposal of all old PI equipment made available to the market after 13 August 2005.

If you have an old device from PI, you can send it to PI free of charge.