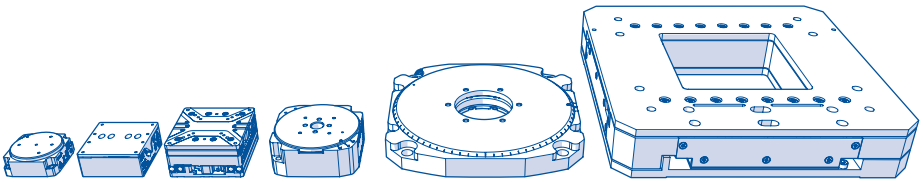
PILine® Positioners

Short Instructions

M-68x / U-52x / U-62x / U-651 / U-7xx



User Information

These short instructions give an overview of the most important safety and handling instructions when installing positioners with PILine® piezo motors. They apply to positioners with the product codes 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 These short instructions are superseded by any new release.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 for the positioners and/or electronics. The manuals will have the following titles: "User Manual", "Technical Note".

Downloading the Manuals from the Website:

1. Open the website **www.pi.ws**.
2. On the website, search for the product number (e.g., U-523).
3. Click the corresponding product for further product details.
4. Click the **Downloads** tab.
   The manuals are shown 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 be sent to the email address entered in the form.

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

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Safety Instructions

Intended Use

The positioner is a laboratory device according to DIN EN 61010-1. It is intended for indoor use, in an environment free from dirt, oil, and lubricants.

In accordance with its design, the positioner is intended to position loads in interval mode. The positioner is not intended for applications where its failure would cause considerable risks to people or to the environment.

The positioner can only be used as intended when it has been installed and connected completely, in conjunction with suitable electronics.

Only authorized and suitably trained personnel may install, operate, maintain, and clean the positioner.

Installation

Mechanical forces can damage or misalign the positioner.

- Avoid knocking and dropping the positioner.
- Do not exceed the maximum permitted forces (see manual).
- For XY stages: If the positioner needs to be moved into a vertical position during installation, prevent the motion platforms from slipping.
- Ensure that the load is aligned correctly (see manual).
  - **Linear stage:** When the motion axis is aligned vertically, the load must be less than the drive's holding force (see manual).
  - **Rotation stage:** When the positioner is mounted vertically, the load must be less than the drive's maximum torque (see manual).
- Pay attention to the recommended installation position of the positioner (see manual).
- Include the masses of the positioners moved in multi-axis systems in the calculations.

Dirt, oil, lubricants, and condensation will render the positioner's drive inoperable.

- Keep the piezo motors free from lubricants.
- Keep the positioner free from dirt and condensation.

Incorrectly fitted screws can cause damage.

- Make sure that the screw heads do not protrude.
- Select the screw length according to the depth of the mounting holes.

Collisions can damage the positioner, the load to be moved, and the surroundings.

- Mount the positioner and load so that the load cannot get jammed, blocked, or collide with objects in the workspace.

Unsuitable mounting could warp the positioner and reduce the accuracy.

- Mount the positioner on a flat surface with similar thermal expansion properties (see manual for recommended flatness).

Unsuitable cables can damage the electronics and can affect the performance of the positioner.

- Only use original PI parts (see manual).

Heat produced during operation can affect your application.

- Install the positioner so that the application is not affected by the heat emitted.

Startup and Operation

If a protective earth conductor is not connected or is not connected properly, touching the positioner in the event of malfunctioning can cause minor injuries from electric shock.

- Only operate the positioner with a properly connected protective earth conductor.
- Do not remove the protective earth conductor from the positioner during operation.
- Pay attention to the applicable standards for connecting the protective earth conductor.

Piezo motors can still be electrically charged after being disconnected from the electronics. Fluctuations in temperature can also induce charges in the piezo motors. Touching charged parts can cause minor injuries from electric shock.

- Do not touch the contacts in the connection plug.

Operating voltages that are too high or connected incorrectly can cause damage to the positioner.

- Only use compatible electronics.
- Pay attention to the operating voltage range of the positioner (see manual).
- Ensure that the pin assignment is correct (see manual).

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

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

In continuous operation, the positioner can overheat when under maximum load.

- Select the motor power depending on the duty cycle and ambient temperature (see manual).

Uncontrolled oscillation can damage your application or the positioner.

- If oscillations occur, immediately switch off the servo mode of the electronics or stop the positioner.
- Check the settings for the control parameters (see manual).

In case of high loads, using default parameters for the electronics can damage the positioner.

- Use the default parameters for the first startup only (if possible, without load).
- Adapt the operating parameter settings individually (refer to the user manual for the electronics).

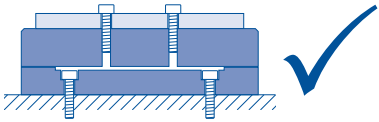
High accelerations can cause damages to or considerable wear of the mechanical system.

- If the electronics malfunction, immediately stop the motion.
- Approach the end of the travel range with low velocity.

Mounting the Positioner and Load

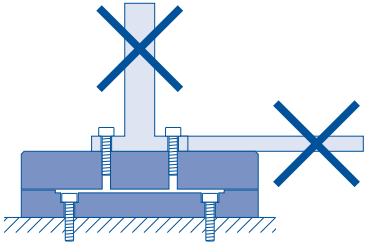
- Fix the positioner using the mounting holes intended for this purpose.
- Fix the load using the mounting holes intended for this purpose.
- Check that the positioner and the load are fixed securely.

Correct Mounting

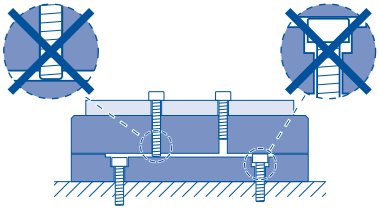


Mounting on an Uneven Surface

Incorrect Alignment of the Load



Incorrect Fitting of the Screws



Connecting the Positioner to the Protective Earth Conductor

CAUTION!

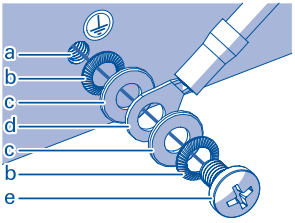
If a protective earth conductor is not connected or is not connected properly, touching the positioner in the event of malfunctioning can cause minor injuries from electric shock.

- Only operate the positioner with a correctly connected protective earth conductor.
- Pay attention to the standards applicable for connecting the protective earth conductor.
- If vibrations occur in your application, secure the screw connection for the protective earth conductor in a suitable manner to prevent it from unscrewing. If this is not possible, check the screw connection at regular intervals and, if necessary, retighten the screw(s).

Connection Using a Separate Protective Earth Connector

If a separate protective earth connector is available, it must be used.

- Firmly attach a suitable cable lug to the protective earth conductor.
- Fix the cable lug of the protective earth conductor to the protective earth connector using the screw set provided.
- Tighten the M4 screw with at least three turns and a torque of 1.2 Nm to 1.5 Nm.

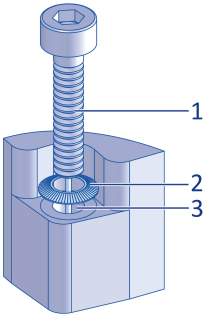


a Protective earth connector in the base body of the positioner
b Lock washer
c Flat washer
d Cable lug of the protective earth conductor
e M4 screw

Connection Using Mounting Holes

If there is no separate protective earth connector, the positioner must be mounted onto an trically conductive surface connected to a protective earth conductor.

- Fix the positioner to the surface by inserting the screws delivered into all of the mounting holes.
- Tighten the mounting screws with the torque specified in the manual.
- After at least 12 hours in operation, retighten the mounting screws using the torque specified in the manual.



1 Screw
2 Lock washer (only when included in the scope of delivery)
3 Mounting hole

Suitable Protective Earth Conductor

- Cross section of the protective earth conductor ≥0.75 mm².

Checking the Connection of the Protective Earth Conductor

- Make sure that the contact resistance of all protective earth connections is <0.1 Ω at 25 A.
- If ground loops occur, contact the PI customer service department.