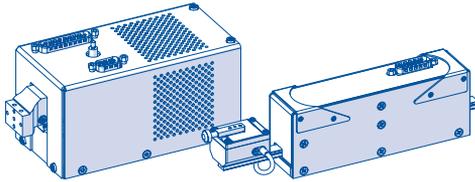


# PIMag<sup>®</sup> Linear Actuators

## Short Instructions

### V-27x



## User Information

These short instructions contain an overview of the most important safety and handling instructions for installing and operating voice coil linear actuators 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 These short instructions are superseded by any new release.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 of the linear actuator and/or the controller. Manuals may be titled as follows: „User Manual“, „Technical Note“.

### Downloading the Manuals from the Website:

1. Note the product number on the product (e.g., V-273.441).
2. Open the website [www.pi.ws](http://www.pi.ws).
3. If the product was shipped with a data storage device: Log into the website:
  - a. Click **Login**.
  - b. Enter the login data. The login data is in the **[...]\_Releasenews\_[...].pdf** on the product's data storage device (in the main directory or the **Manuals** directory). If necessary: Follow the link and register yourself to get the login data.
  - c. Click **Login** or press the **Enter** key.
4. Click **Search**.
5. Enter the product number up to the period (e.g., V-273) into the search field.
6. Click **Start search** or press the **Enter** key.
7. Click the corresponding product in the list of search results.
8. Click the **Downloads** tab.  
The manuals are displayed under **Documentation**.
9. Click the desired manual and save it.

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](mailto:service@pi.de).



## Safety Information

### Intended Use

The linear actuator 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.

In accordance with its design, the linear actuator is intended for single-axis positioning and adjusting of loads at various velocities and with defined forces. The linear actuator is intended for applications in automation or handling technology.

The linear actuator is not intended for applications in areas where failure would be a considerable risk for people or the environment. For further information on the ambient conditions, see „Ambient Conditions and Classifications“ in the manual.

The intended use of the linear actuator is only possible when completely installed and connected, and in conjunction with a suitable controller. The linear actuator may only be installed, operated, maintained, and cleaned by authorized and appropriately qualified personnel.

### Installation

The linear actuator contains permanent magnets. Their magnetic fields can disturb or damage sensitive devices and objects (e.g., heart pacemakers, EC cards, magnetic storage devices). Loose magnetizable objects (e.g., iron, steel) could be attracted and cause material damage. The magnetic fields are also effective when the linear actuator is not connected or switched off.

- ▶ Make sure that people with heart pacemakers and / or electronic implants do not have access to the linear actuator.
- ▶ Remove loose magnetizable objects and sensitive objects from the area where the linear actuator is to be installed.
- ▶ Make sure that the danger zone is marked and the necessary precautions have been taken.

The linear actuators can generate high forces at high velocities. Risk of minor injuries from cutting or crushing between the runner or the contact part of the linear actuator and a fixed part or obstacle.

- ▶ Use safeguards to protect limbs in areas where they could be caught by moving parts.
- ▶ Maintain safety distances according to DIN EN ISO 13857.
- ▶ If possible, use contact parts with a sufficiently dimensioned contact surface. The pressure on the contact surface at maximum force of the linear actuator should not exceed 50 N/cm<sup>2</sup>.

Mechanical forces can damage or misalign the linear actuator.

- ▶ Keep the linear actuator only in its housing.
- ▶ Avoid shocks and drops.
- ▶ Do not exceed the maximum permissible forces and torques (see manual).
- ▶ Avoid lateral forces on the runner.
- ▶ Transport the linear actuator only in the original packaging and with the safeguard attached.

Incorrectly fitted screws and locating pins can cause damage.

- ▶ Pay attention to the maximum tightening torque (see manual).
- ▶ Do not allow screw heads to protrude.
- ▶ Select the screw length according to the depth of the mounting holes.

Unsuitable mounting could warp the linear actuator and reduce the accuracy.

- ▶ Mount the linear actuator on a level surface with similar thermal expansion properties (see manual for recommended flatness).

Dirt, oil, lubricant, and condensation make the drive of the linear actuator inoperable.

- ▶ Keep the linear actuator free of dirt, lubricants, and condensation.

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

- ▶ Make sure that the runner cannot collide with the load or the surroundings within the motion range of the linear actuator.
- ▶ Do not place any objects in areas where they can be caught by moving parts.

The linear actuator can overheat during continuous operation outside of the specified parameters. Overheating can damage the linear actuator. Heat produced during operation can affect your application.

- ▶ Ensure sufficient ventilation and heat dissipation from contact surfaces.
- ▶ Install the linear actuator so that the application is not affected by dissipating heat.
- ▶ Pay attention to the permissible values for nominal and peak current (see manual).

### Startup

The drive of the linear actuator is not self-locking. If servo control is switched off, the linear actuator could move unexpectedly and the runner or the contact part could collide with the hard stop or objects in the workspace.

- ▶ If the linear actuator or the axis is aligned vertically or is tilted (only V-275, V-277): Perform an autozero procedure on the controller for the axis (see manual for the controller).
- ▶ Take suitable precautionary measures to prevent unintentional motion before switching off or rebooting the controller.
- ▶ Move to the travel range limits only with low velocity and force.

The nominal current as specified in the manual applies when operating at room temperature.

- ▶ Adjust the nominal current needed for operating the actuator when the ambient temperature rises (see user manual).
- ▶ Adapt your application (acceleration, speed, load) so that the calculated nominal current is not exceeded. If you have any questions, contact our customer service department.

Defective software or incorrect operation of the software can result in unintentional motion.

- ▶ Do not place any objects in areas where they can be caught by moving parts.

Travel to the hard stop with maximum force or at high velocity can cause damage, excessive heat or considerable wear to the mechanics.

- ▶ Stop the motion immediately if a controller malfunction occurs.
- ▶ Ensure that the end of the travel range is approached at low velocity and with low force.
- ▶ Set the control signal so that the runner does not stop abruptly or try to continue motion at the end of the travel range.
- ▶ Determine the maximum velocity for your application.

Uncontrolled oscillation can damage your application or the linear actuator.

- ▶ If oscillation occurs, switch the servo mode off or stop the linear actuator immediately.
- ▶ Check the servo control parameter settings (see manual).

Moisture, liquids, and electrically conductive materials (e.g., metal dust) that penetrate the linear actuator can damage it.

- ▶ Operate the linear actuator only within the permissible ambient conditions (see manual).

Excessively high or wrongly connected operating voltages can cause damage to the linear actuator.

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



## Mounting the Linear Actuator

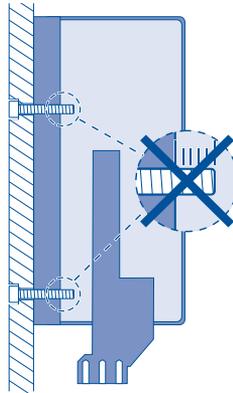


### NOTICE!

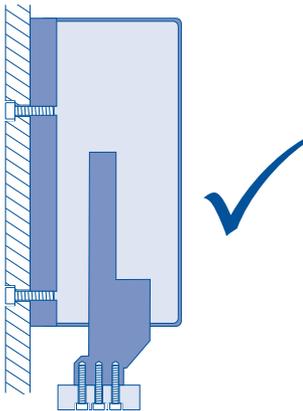
Damage due to improper mounting!

- ▶ Pay attention to the safety instructions in the "Installation" section.
- ▶ Fix the linear actuator by tightening the screws in the mounting holes provided.
- ▶ Fix the load by tightening the screws in the holes provided.
- ▶ Check that the linear actuator and the load are firmly seated.

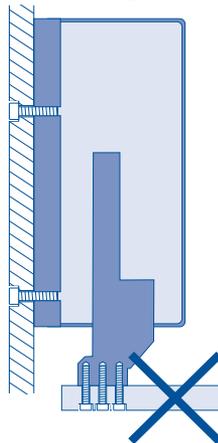
### Incorrect Fitting of the Screws



### Correct Mounting



### Incorrect Alignment of the Load



### Mounting on an Uneven Surface

