

Installation Guide

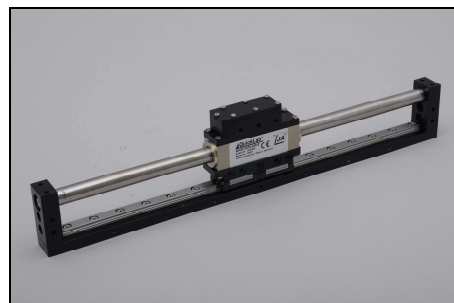
for partly completed machines
according to machinery directive 2006/42/EG app. VI

Maintenance Instructions

Declaration of Conformity

according to machinery directive 2006/42/EG app. II 1. B.

Linear Motor Modules & Guides **QM02-1247, QM02-2070 & QA02-2070**




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1. General Information

1.1 Introduction

	<p>This manual includes instructions for the assembly, use, installation, risks of danger, maintenance, transport, and storage of linear motor modules & guides.</p> <p>The document is intended for electricians, mechanics, service technicians and warehouse staff. Please comply with the safety instructions at all times. Keep this guide accessible and make it available for the assigned staff.</p>
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1.2 Explanation of Signs

	<p>Round command signs indicate what to do.</p>
	<p>Triangular warning signs indicate danger.</p>
	<p>JUNG ANTRIEBSTECHNIK U. AUTOMATION GMBH the company will be referred to as JA² GmbH in the following text.</p>

1.3 Warranty & Liability



As manufacturer of linear motor systems, JA² GmbH does not accept responsibility for the improper use, application or handling of products and declines any liability. Warranty may not be claimed after use or combination with third party products, like cables and power supplies. With purchase every customer confirms to have read and understood the in the installation and maintenance guide listed warnings. This guide is included in every delivery and available online. Please always include this guide in your deliveries, should you resell our linear motor systems as components or install them into machines. We also refer to our general terms and conditions.

1.4 Copyright & Trademark protection



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2. Intended Use

2.1 Use of Linear Motor Modules & Guides



The linear motor modules & guides are high-dynamic actuators. According to European law 2006/42/EG the actuators are partly completed machines, which are further installed into machines. They are used in machines for industrial automation, handling and assembly technologies, packaging, as well as testing technologies.

2.2 Assembly of Partly Completed Machines into Machines



In order to assemble the partly completed machines properly and without compromising the safety and health of people, the following conditions must be met:

- The installation of machines may only be carried out by qualified personnel.
- This document must be read and understood completely before installation.
- All warnings in this document must be observed.

A risk assessment for the complete machine must be carried out!

2.3 Operating Conditions



Conditions

- protection class IP20
- environmental temperature with nat. cooling 0°C to 40°C
- relative humidity ≤ 60 % not condensing
- storage temperature -15°C to +70°C

The storage room must be dry, free of dust and frost and must be protected from shock. The linear module or guide must be protected from extreme weather conditions. The storage room air may not contain any aggressive gases. The maximum installation height is 4.000 m above sea level (MASL). When installing above 1.000 m MASL, with identical motor power, a derating of 1 °C per 100 m is to be expected for air cooling. The operating voltage of the linear motor stators ≤ 72 VDC.

3. Safety Instructions

3.1 Warnings for Unpacking, Handling, Assembly, Processing & Storage



Contusions

The sliders of linear motors contain neodymium magnets and have a very strong magnetic force. Careless handling could cause fingers or skin to become caught between sliders and iron parts. This may lead to contusions, bruises, and bone fractures. Protective gloves should be worn, when handling sliders.



Pacemakers / Defibrillators

When approaching strong magnetic fields, pacemakers or other devices, may switch into test mode and will not function properly. As a wearer of such a device, you should always keep the following minimum distances between the devices and the sliders:

- 100 mm (4") for slider diameters 12 mm
- 100 mm (4") for slider diameters 6,3 mm

Warn other persons, who wear these devices, to avoid getting too close to sliders.



Magnetic Fields

Magnets integrated into the linear motor sliders produce a strong magnetic field. They could damage TV's, laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids, and speakers. Keep magnets away from devices and objects that could be damaged by strong magnetic fields. Please keep a minimum distance of 250 mm (10") from the above mentioned objects.



Flammability

The drilling dust can easily ignite while processing the magnets. Processing the slider and the contained magnets is not permitted.



Mechanical Handling

Neodymium magnets are brittle, heat-sensitive and oxidize easily. If two magnets attract and collide, they can crack causing sharp splinters to be catapulted for several meters, which can lead to eye injuries. The magnet could also crack when drilling or sawing with improper tools. The arising heat may cause the magnet to demagnetize, which in turn will cause the magnet to disintegrate due to the damaged coating. Processing the sliders and the therein contained magnets is not permitted.



Linear Motor Sliders

The sliders consist of highly precise, thin-walled stainless steel tubes, which contain the magnets and are to be handled with extreme care. Prevent contact to other sliders or iron parts, since this can cause damage to the surface of the slider. Sliders with a damaged surface (scratches, deformation, etc.) should not be used, due to the fact that they can cause damage to the stator.



Effects on People


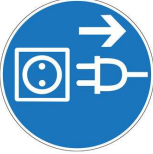




Based on current scientific knowledge, magnetic fields of permanent magnets do not have a measurable positive or negative effects on people. It is unlikely that permanent magnets constitute a health risk, but it cannot be entirely ruled out. For your own safety, avoid constant contact with magnets and store large magnets at least one meter away from your body.



Temperature Resistance

Keep sliders away from unshielded flames or heat.
Temperatures above 120°C will cause demagnetization.





3.2 Warnings for Intended Use

 	<p>Fast moving Machine Parts Our linear motor systems are high-dynamic machine elements. Necessary precautions must be taken to prevent contact with moving parts during operations. This can be done by installing covers, enclosures, light curtains, safety mats, etc.. Operations, without appropriate safety measures are forbidden. Operations may only be carried out by qualified personnel. During assembly the machine is to be turned off!</p>
	<p>Burn Hazards The sliders of linear motors can reach temperatures of 80 °C during operations , which may cause burns upon contact.</p>
	<p>Bruises & Sprains Our linear motor systems can apply very high accelerations, high top speeds and forces over 1.000 N. Depending on the application and the duration of exposure appropriate protective devices must be used!</p>
	<p>Severing of Limbs Our linear motor systems can apply very high accelerations, high top speeds and forces over 1.000 N. Depending on the application and the duration of exposure appropriate protective devices must be used!</p>
	<p>Risk Assessment & Performance Level (PL) of Protective Measures Since the risk depends on the type of machine, the assembly conditions and the implemented protective measures, a general specification to minimize risks during assembly cannot be given by us. We recommend the software assistant SISTEMA for risk assessment and evaluation of the PL according to DIN EN ISO 13849.</p>

4. Maintenance, Dismantling & Assembly

4.1 Maintenance of Linear Motors

The linear motors will be shipped ready for use.

	<p>Maintenance of Linear Motors Maintenance will only be required if or there is a heavy pollution of the motors. Under normal industrial conditions (5 days, 8 h / day) a quarterly inspection is sufficient. The inspection cycle must be reduced if severe motor loads or deviating conditions exist. These conditions are for example:</p> <ul style="list-style-type: none"> - permanent fouling - direct sunshine - low humidity - outdoor operations - increased operating temperatures
	<p>Inspection of Linear Motors With inspections of linear motors the following points need to be checked:</p> <ul style="list-style-type: none"> - Is the slider free of scratches or dents? - Does the slider move easily? <p>A black 'Zebra'-pattern of dust is absolutely normal after short use.</p>
	<p>Cleaning of Linear Motors Use small amounts of methylated spirit or alcohol and a soft tissue to gently clean the stator and slider.</p>
Lubricant for	Description & application
<p>Linear motor stator / slider</p> 	<p>Linear motors LM1247 and LM2070 do not need to be lubricated.</p>

4.2 Maintenance of Linear Guides

The linear modules & guides will be shipped with an initial lubrication and are ready for use.




Maintenance of Linear Guides

Maintenance is recommended after an operational performance of 5.000 km or every 6 months.



Lubrication of Linear Guides

Lubricant can be applied with grease nipples. Alternatively the old lubricant can be washed out with the help of methylated spirits or alcohol and then the new lubricant can be applied.

Lubricant for	Description & application
Carriages / rails	for general applications THK lubricant AFA
	for FDA applications Klübersynth UH1 14-151 from Klüber Lubrication GmbH

4.3 Dismantling & Assembly of Linear Motor Modules & Guides

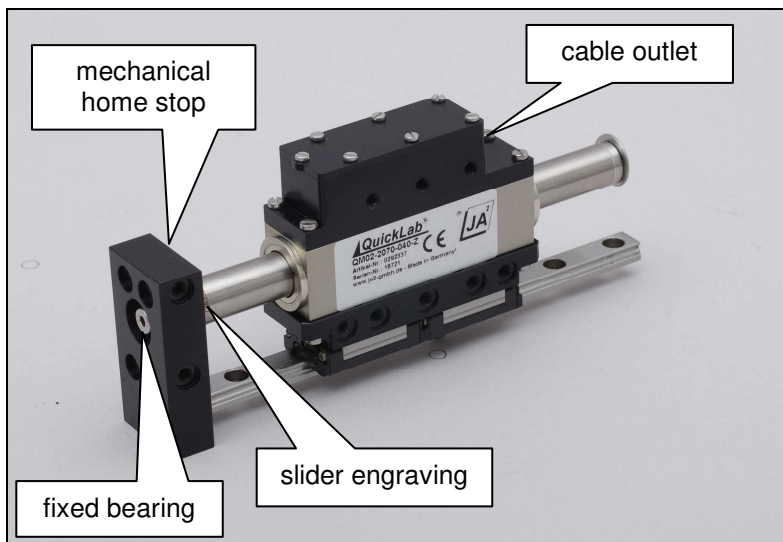


Dismantling & Assembly

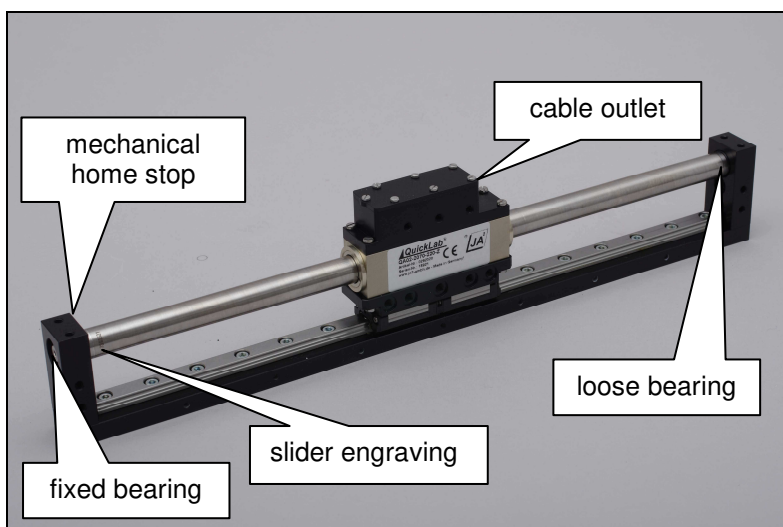
We recommend any dismantling and assembly to be done in our facilities.

If not otherwise ordered, the linearmotor modules & guides are mounted in standard configuration as follows.

Linearmotor Module QM02-2070



Linearmotor Guide QA02-2070



5. Declaration of Conformity & CE-Marking



The following declaration of conformity is generated by computer.
We declare, that this declaration has legal validity.

Declaration of Conformity & CE-Marking

According to **EC Machinery Directives** 2006/42/EG, appendix II 1. B.

We hereby declare, that the below listed partly completed machine is in accordance with safety and health requirements of the EC Machinery Directives 2006/42/EG.

Partly completed machine: QuickLab® Linear Motor Modules QM02 and
QuickLab® Linear Motor Guides QA02

Drawing number: 0464.000.0

The following EU guidelines are applied:

- Electromagnetic Compatibility Directive 2004/108/EG

We also declare, that the special technical documentation for this partly completed machine was created in accordance with the appendix VII B. Also we commit to sending it to market surveillance authorities on demand. Authorized representative for the compilation of the technical documentation is managing director Wilhelm Jung.

The operating of the partly completed machine is forbidden until it is installed into the complete machine and the machine is in accordance with the requirements of the EU guidelines. The declaration of conformity according to appendix II 1. A. must exist.

Wettenberg, March 11th, 2021



Wilhelm Jung

Managing Director

JUNG ANTRIEBSTECHNIK U.
AUTOMATION GMBH