

TECHLINE®  
**Product overview**



# LINAK<sup>®</sup> - We improve your life

Linear actuator movement might be the simplest movement in the world. And yet, perfecting something simple is one of the hardest challenges.

Since LINAK® founder Bent Jensen came up with the idea for the first electric actuator in order to help a friend in a wheelchair, every engineer and specialist employed by LINAK has aimed to solve real-life challenges for real people.

To this day, our motto: 'We Improve Your Life' is reflected in everything we do. Whether we engage in product development, operation or implementation of technology, we always look for ways to make it easier for our customers to enter into in collaborations and partnerships with us and to ultimately improve the lives and working conditions of end users.

Our solutions move people – their work and their lives. We Improve Your Life!








# About our actuators

LINAK® industrial actuators offer a versatile array of movement solutions with high lifting capacity and strong holding force. Their robust design with aluminum housing, high IP rating (up to IP66 dynamic/IP69K static) and operating temperatures between -40°C and +85°C, make them suitable for most settings. Harsh environments, extreme conditions and confined spaces are no challenge.

The IC Integrated Controller™ is a powerful tool that combines actuator power and precision with controller

intelligence and flexibility. This seamless combination provides efficient solutions for a wide range of applications within agriculture, industrial automation, mobile off-highway machinery, ventilation, farming and many others.

We design and test our industrial actuators to withstand salt, water, wind and direct sunlight. Reliable operation for years and no maintenance make them a valuable investment for any project.

Technical Data					
Model		Load (up to)	Stroke length	Voltage	Interfaces
LA37		15,000 N/ 3,367 lbs	100-600 mm	12, 24 or 48 V DC	CAN J1939 CANopen IO-Link lin Modbus RTU Modbus TCP/IP EtherNet/IP I/O PLUS
LA36		6,800 N/ 1,529 lbs	100-1200 mm	12, 24, 36 or 48 V DC	CAN J1939 CANopen IO-Link lin Modbus RTU Modbus TCP/IP EtherNet/IP I/O PLUS
LA35		6,000 N/ 1,349 lbs	100-600 mm	12 or 24 V DC	Modbus RTU
LA33		5,000 N/ 1,124 lbs	100-600 mm	12, 24 or 48 V DC	CAN J1939 CANopen lin I/O PLUS
LA31		6,000 N/ 1,347 lbs	30-630mm	12 or 24 V DC	
LA25		2,500 N/ 561 lbs	20-300 mm	12 or 24 V DC	CAN J1939 CANopen IO-Link lin I/O PLUS
LA23		2,500 N/ 561 lbs	20-300 mm	12 or 24 V DC	
LA20		2,500 N/ 561 lbs	20-300 mm	12 or 24 V DC	
LA14		750 N/ 168 lbs	19-130 mm	12 or 24 V DC	CAN J1939 CANopen lin PLUS
LA12		750 N/ 168 lbs	19-130 mm	12 or 24 V DC	

Explore all  
TECHLINE  
actuators



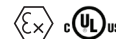



**Krone**  
The Power of Green

Mod.-Nr.: 270909102  
S.N.: 30723185-0030  
Lfd.-Nr.: 282548  
Produktionsdatum: 2021/08/11

*Information*  
210

# Actuators



Actuator	LA37	LA36
<b>Interfaces</b>	CAN J1939    EtherNet/IP I/O	CAN J1939    EtherNet/IP I/O
<b>Load</b>	Up to 15,000 N/3,367 lbs	Up to 6,800 N/1,529 lbs
<b>Speed</b>	Up to 10 mm/s (0.39 in/s)	Up to 168 mm/s (6.3 in/s)
<b>Stroke length</b>	100-600 mm	100-1200 mm
<b>Voltage</b>	12, 24 or 48 V DC	12, 24, 36 or 48 V DC
<b>Duty cycle</b>	10 %	20 %
<b>Ambient temperature</b>	-30°C to +70°C (operation)	-30°C to +65°C (operation)
<b>IP rating</b>	IP66 dynamic and IP69K static	IP66 dynamic and IP69K static
<b>Options (add-ons)</b>	<ul style="list-style-type: none"> <li>Parallel run of up to 8 actuators</li> <li>An Integrated Controller for various industrial interfaces</li> </ul>	<ul style="list-style-type: none"> <li>A special anodized aluminum housing for harsh environments</li> <li>Parallel run of up to 8 actuators</li> <li>An Integrated Controller for various industrial interfaces</li> <li>IECEX/ATEX certification</li> <li>UL1203, Class II, Div I, Groups F &amp; G</li> <li>UL 508</li> <li>Variant tailored for off-highway machinery</li> </ul>
<b>Important facts</b>	<ul style="list-style-type: none"> <li>Heavy-duty reinforced aluminum housing and solid metal construction</li> <li>Designed for outdoor use</li> <li>Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Heavy-duty reinforced aluminum housing and solid metal construction</li> <li>Designed for outdoor use</li> <li>Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>

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# Actuators

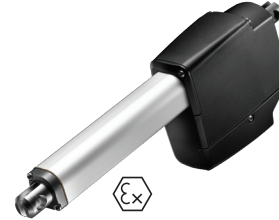


Actuator	LA35	LA33
Interfaces	Modbus RTU	CAN J1939  CANopen  LIN I/O  PLUS M1 <sup>®</sup>
Load	Up to 6,000 N push / Up to 4,000 N pull (1,349 lbs / 899 lbs)	Up to 5,000 N (1,124 lbs)
Speed	Up to 19.5 mm/s (0.77 in/s)	Up to 70 mm/s (2.76 in/s)
Stroke length	100-600 mm	100-600 mm
Voltage	12 or 24 V DC	12, 24 or 48 V DC
Duty cycle	10 %	20 %
Ambient temperature	-25°C to +60°C (operation)	-40°C to +85°C (operation)
IP rating	IP66 dynamic and IP69K static	IP66 dynamic and IP69K static
Options (add-ons)	<ul style="list-style-type: none"> <li>• Large variety of back fixtures and piston rod eyes</li> <li>• A special anodized aluminum housing for the harshest environments</li> <li>• An Integrated Controller which eliminates the need for external power electronics (H-bridge)</li> </ul>	<ul style="list-style-type: none"> <li>• Large variety of back fixtures and piston rod eyes</li> <li>• Parallel run of up to 8 actuators</li> <li>• An Integrated Controller for various industrial interfaces</li> <li>• Gear options: Standard, increased speed or low noise</li> </ul>
Important facts	<ul style="list-style-type: none"> <li>• Heavy-duty aluminum housing and solid metal construction</li> <li>• Designed for outdoor use</li> <li>• Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy-duty aluminum housing and solid metal construction</li> <li>• Designed for outdoor use</li> <li>• Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>

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# Actuators



Actuator	LA31	LA25
Interfaces		CAN J1939    IO-Link I/O  PLUS
Load	Thrust Up to 6,000 N (1,347 lbs)	Up to 2,500 N (561 lbs)
Speed	Speed Up to 26.6 mm/s (1.05 in/s)	Up to 25 mm/s (0.98 in/s)
Stroke length	30-630 mm	20-300 mm
Voltage	Voltage 12 or 24 V DC	12 or 24 V DC
Duty cycle	10%	20 %
Ambient temperature	+5°C to +40°C	-40°C to +85°C (operation)
IP rating	IPX6	IP66 dynamic and IP69K static
Options (add-ons)	<ul style="list-style-type: none"> <li>· Spline</li> <li>· Metal rod and back fixture</li> <li>· Cost effective</li> <li>· Plug and play system (with DESKLINE® or MEDLINE™ parts)</li> </ul>	<ul style="list-style-type: none"> <li>· Large variety of back fixtures and piston rod eyes</li> <li>· A special anodized aluminum housing for the harshest environments</li> <li>· Parallel run of up to 8 actuators</li> <li>· An Integrated Controller for various industrial interfaces</li> <li>· IECEx/ATEX certification</li> </ul>
Important facts	<ul style="list-style-type: none"> <li>· Available with black or gray plastic housing</li> </ul>	<ul style="list-style-type: none"> <li>· Heavy duty aluminum housing and solid metal construction</li> <li>· Designed for outdoor use</li> <li>· Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>

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# Actuators



Actuator	LA23	LA20
<b>Interfaces</b>		
<b>Load</b>	Up to 2,500 N (561 lbs)	Up to 2,500 N (561 lbs)
<b>Speed</b>	Up to 21 mm/s (0.83 in/s)	Up to 8.9 mm/s (0.35 in/s)
<b>Stroke length</b>	20-300 mm	20-300 mm
<b>Voltage</b>	12 or 24 V DC	12 or 24 V DC
<b>Duty cycle</b>	10 %	10 %
<b>Ambient temperature</b>	+5°C to +40°C (operation)	+5°C to +45°C (operation)
<b>IP rating</b>	IPX4 and IPX6	IPX4 and IPX6
<b>Options (add-ons)</b>	<ul style="list-style-type: none"> <li>· Various back fixtures (incl. rotation) and piston rod eyes</li> <li>· An Integrated Controller which eliminates the need for external power electronics (H-bridge)</li> </ul>	<ul style="list-style-type: none"> <li>· Large variety of back fixtures and piston rod eyes</li> <li>· Parallel run of up to 8 actuators</li> <li>· An Integrated Controller which eliminates the need for external power electronics (H-bridge)</li> </ul>
<b>Important facts</b>	<ul style="list-style-type: none"> <li>· High lifting force in compact design</li> <li>· Available with black or light gray plastic housing</li> </ul>	<ul style="list-style-type: none"> <li>· High lifting force in a compact design</li> <li>· Replaceable cable</li> <li>· Designed for indoor use</li> </ul>

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# Actuators



Actuator	LA14	LA12
Interfaces	CAN   J1939   CANopen   I/O   PLUS   	
Load	Up to 750 N (168 lbs)	Up to 750 N (168 lbs)
Speed	Up to 45 mm/s (1.77 in/s)	Up to 40 mm/s (1.57 in/s)
Stroke length	19 - 130 mm	19-130 mm
Voltage	12 or 24 V DC	12 or 24 V DC
Duty cycle	20 %	10 %
Ambient temperature	-40°C to +85°C (operation)	-20°C to +60°C (operation)
IP rating	IP66 dynamic and IP69K static	IP66 dynamic
Options (add-ons)	<ul style="list-style-type: none"> <li>• Large variety of back fixtures and piston rod eyes</li> <li>• A special anodized aluminum housing for the harshest environments</li> <li>• Parallel run of up to 8 actuators</li> <li>• An Integrated Controller for IC Basic, IC Advanced, IC Parallel and various industrial interfaces</li> <li>• IECEx/ATEX certification</li> </ul>	<ul style="list-style-type: none"> <li>• Large variety of back fixtures and piston rod eyes</li> <li>• An Integrated Controller which eliminates the need for external power electronics (H-bridge)</li> </ul>
Important facts	<ul style="list-style-type: none"> <li>• Designed for outdoor use</li> <li>• Compact design</li> <li>• Tested inside and out to the extreme in a wide range of tests</li> <li>• Offer a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact and lightweight</li> <li>• Tested inside and out to the extreme in a wide range of tests</li> <li>• Offers a high degree of customization (stroke length, built-in dimensions etc.)</li> </ul>

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# About our lifting columns

LINAK® industrial lifting columns convert rotational movement in low-voltage DC motors into linear push/pull movement. Our vertical electric lifting columns are solid, stable, and capable of handling high bending moments, both dynamic and static. They are quiet, powerful, and fast, and can be mounted upright as well as upside down in a vertical direction, which makes them a versatile option for various industrial applications.

The lifting columns are controlled with our IC Integrated Controller™ or an external control box and are easy to integrate into your application. There are several interfaces with various feedback options, depending on the model.

Our lifting columns are an excellent choice for various industrial applications.

Technical Data				
Model		Load	Speed	Options (add-on)
<b>ELEVATE™</b>		Up to 1,000 N (push and pull) (224 lbs)	Up to 100 mm/s (3.93 in/s)	<ul style="list-style-type: none"> <li>· Digital and analog I/O</li> <li>· Modbus TCP/IP</li> <li>· Ethernet</li> <li>· Simultaneous run</li> </ul>
<b>LC3 2-stage</b> <b>LC3 3-stage</b>		Up to 6,000 N (push) (1,349 lbs) Up to 4,000 N (pull) (899 lbs)	Up to 29 mm/s (1.14 m/s)	<ul style="list-style-type: none"> <li>· Built-in end-stop switch</li> <li>· Dual Hall position feedback</li> </ul>
<b>LC1 DESKLINE</b>		Up to 4,000 N (push) (899 lbs) Up to 2,000 N (pull) (449 lbs)	Up to 30 mm/s (1.18 in/s)	<ul style="list-style-type: none"> <li>· Single drive or parallel drive</li> <li>· Signal switch</li> <li>· Dual Hall position feedback</li> </ul>
<b>DL2</b>		Up to 2,500 N (push) (561 lbs)	Up to 20 mm/s (0.79 in/s)	<ul style="list-style-type: none"> <li>· Built-in limit switch</li> <li>· Single drive or parallel drive</li> </ul>
<b>BL1</b>		Up to 2,000 N (push) (449 lbs)	Up to 46 mm/s (1.81 in/s)	<ul style="list-style-type: none"> <li>· Built-in end-stop switch</li> <li>· Dual Hall position feedback</li> </ul>

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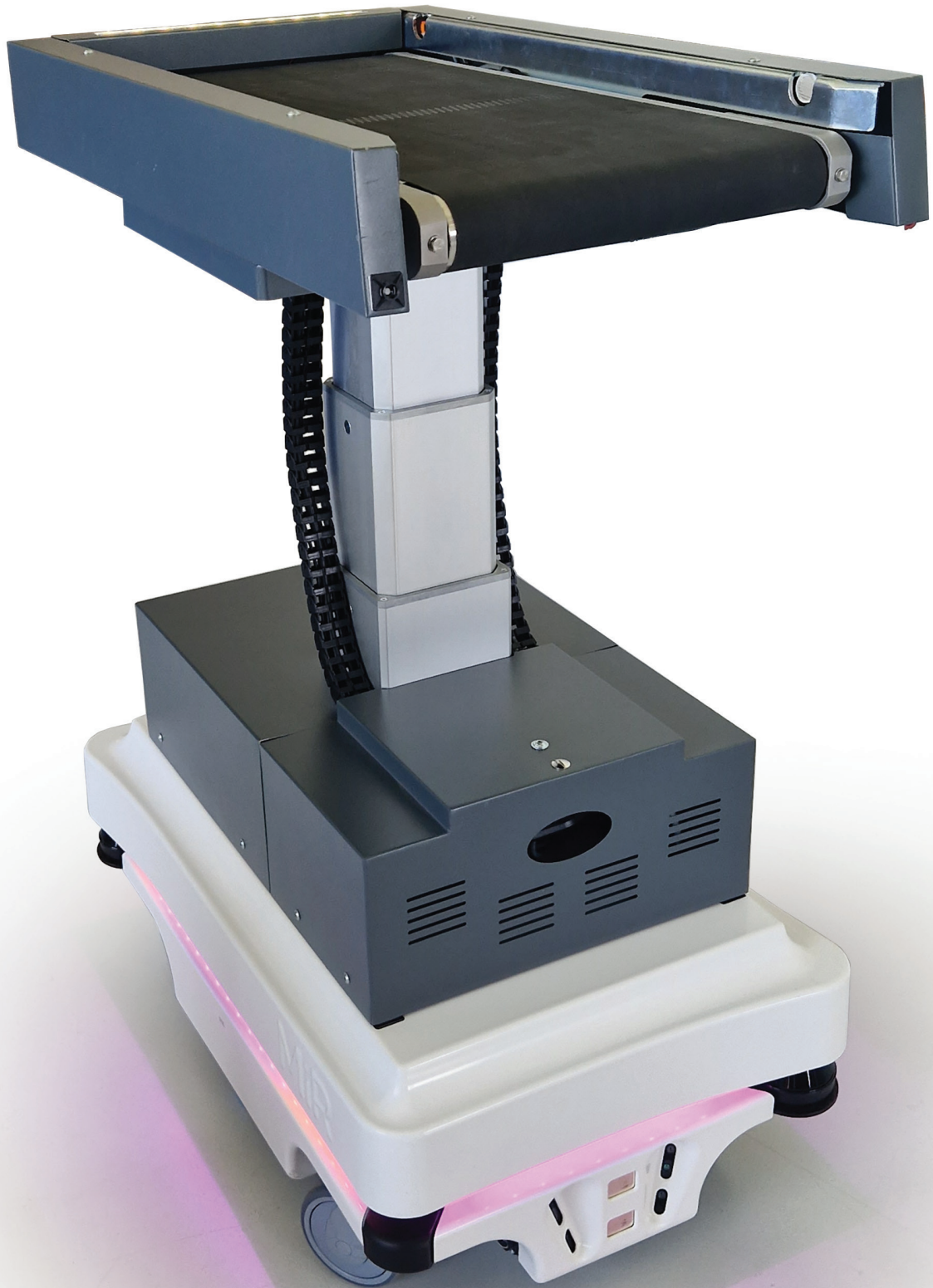
# Lifting columns



<b>Lifting columns</b>	<b>ELEVATE™</b>
<b>Load</b>	Up to 1,000 N (push and pull) (224 lbs)
<b>Speed</b>	Up to 100 mm/s (3.93 in/s)
<b>Stroke length</b>	Up to 1100 mm
<b>Voltage</b>	24 V DC
<b>Bending moment</b>	Static: 3,000 Nm / Dynamic: 1,400 N
<b>Duty cycle</b>	20 %
<b>Ambient temperature</b>	+5°C to +40°C (operation)
<b>IP rating</b>	IP4X
<b>Options (add-ons)</b>	<ul style="list-style-type: none"> <li>· Digital and analog I/O</li> <li>· Ethernet Modbus TCP/IP</li> <li>· Simultaneous run</li> </ul>
<b>Important facts</b>	<ul style="list-style-type: none"> <li>· Designed for cobot palletizing</li> <li>· Available with different mounting plates and cable kits</li> <li>· ELEVATE uses our powerful LC3 IC</li> <li>Compatible with:               <ul style="list-style-type: none"> <li>· Universal Robots cobots with URCap</li> <li>· Cobots from Techman Robot and OMRON™ with ELEVATE™ components for TMFlow</li> <li>· Cobots from Kassow Robots with Cbun</li> <li>· Pally URCap and MyRobot.cloud</li> </ul> </li> </ul>

Learn more about ELEVATE™





# Lifting columns



Lifting columns	LC3 2-stage and 3-stage	LC1 DESKLINE
<b>Load</b>	Up to 6,000 N (push) (1,349 lbs) Up to 4,000 N (pull) (899 lbs)	Up to 4,000 N (push) (899 lbs) Up to 2,000 N (pull) (449 lbs)
<b>Speed</b>	Up to 29 mm/s (1.14 m/s)	Up to 30 mm/s (1.18 in/s)
<b>Stroke length</b>	<b>3-stage:</b> 200-700 mm in steps of 50 mm (1 mm on request) <b>2-stage:</b> 200-700 mm in steps of 50 mm (1 mm on request)	200-665 mm
<b>Voltage</b>	24 V DC	24 V DC
<b>Bending moment</b>	Static: 3,000 Nm/ Dynamic: 1,400 Nm	Static: 900 Nm / Dynamic: 250 Nm
<b>Duty cycle</b>	10 %	10 %
<b>Ambient temperature</b>	+5°C to +40°C (operation)	+5°C to +40°C (operation)
<b>IP rating</b>	IPX4 standard, IPX6 optional	IPX0 (top plate down), IPX6 (top plate up)
<b>Options (add-ons)</b>	<ul style="list-style-type: none"> <li>· Built-in end-stop switch</li> <li>· Dual Hall position feedback</li> </ul>	<ul style="list-style-type: none"> <li>· Single drive or parallel drive</li> <li>· Signal switch</li> <li>· Dual Hall position feedback</li> </ul>
<b>Important facts</b>	<ul style="list-style-type: none"> <li>· Low noise level</li> <li>· Compact and mounting friendly design</li> <li>· Parallel drive</li> </ul>	<ul style="list-style-type: none"> <li>· Low noise level</li> <li>· Strong and stable</li> </ul>

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# Lifting columns



Lifting columns	DL2	BL1
<b>Load</b>	Up to 2,500 N (push) (561 lbs)	Up to 2,000 N (push) (449 lbs)
<b>Speed</b>	Up to 20 mm/s (0.79 in/s)	Up to 46 mm/s (1.81 in/s)
<b>Stroke length</b>	300-500 mm	200-400 mm
<b>Voltage</b>	12 V DC	12 V DC or 24 V DC
<b>Bending moment</b>	Static: 500 Nm / Dynamic: 250 Nm	Dynamic: 250 Nm
<b>Duty cycle</b>	5%	10 %
<b>Ambient temperature</b>	+10°C to +40°C (operation)	+5°C to +40°C (operation)
<b>IP rating</b>		IPX6
<b>Options (add-ons)</b>	<ul style="list-style-type: none"> <li>· Built-in limit switch</li> <li>· Single drive or parallel drive</li> </ul>	<ul style="list-style-type: none"> <li>· Built-in end-stop switch</li> <li>· Dual Hall position feedback</li> </ul>
<b>Important facts</b>	<ul style="list-style-type: none"> <li>· Low noise level</li> <li>· Strong and stable</li> </ul>	<ul style="list-style-type: none"> <li>· Low noise level</li> <li>· High degree of stability</li> <li>· Short installation dimension and long stroke length</li> </ul>

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# IC™ - move smarter

Our IC actuators with integrated controller cut down actuator installation time and boost productivity on any application.

The integrated controller reduces the number of external components and the need for third party power electronics. IC also gives you access to productivity-

enhancing data and industrial interfaces to ease your design and integration processes – even into complex systems.

IC actuators ease every stage of your application process, from development, installation and integration to tailored movement and improved productivity.

- **Speed up your R&D processes**
- **Enjoy easy integration**
- **Boost productivity**

INTEGRATED CONTROLLER

Learn more about IC



Learn more about interfaces



# Interfaces and protocols



The flexible LINAK® I/O™ interface enables a range of movements and choice of input control and data outputs. It offers endless modifications for full control of the exact functionalities you need and lets you move swiftly from innovation to action.



CANopen® is a communications protocol that relies on the CiA 301 standard and is one of the main network architectures used in industries such as Railway, Agriculture, Heavy Truck & Bus, Marine, Off-Highway and Factory Automation.



IO-Link® is a point-to-point industrial network standard used to connect digital sensors and actuators to an industrial Fieldbus or Ethernet. IO-Link increases efficiency and reduces downtime in e.g. industrial automation and packaging machinery.



CAN SAE J1939® is a set of standards defining how ECUs (Electronic Control Unit) communicate via CAN – offering a common language for all manufacturers. The protocol is widely used in mobile off-highway machinery as it supports smart automation.



PLUS+1® is a development tool where engineers can add, move, drag and drop components when designing modern heavy-duty machinery. A software extension makes it possible to add LINAK® actuators to the platform as easy as drag and drop.



EtherNet/IP™ is a network protocol that allows industrial devices, including actuators, to communicate over Ethernet. It supports real-time control and data exchange, making it ideal for applications like automated manufacturing, robotic systems, and process control.



LIN bus is a cost-effective supplement to CAN bus. The overall performance and reliability of the network is lower compared to CAN bus, but the protocol is very suitable for non-critical components.



Modbus®RTU is a serial communications protocol used for industrial electronic devices, which is often connected to a PLC. Using Modbus®RTU makes it easy to integrate and maintain many devices on the same network. Actuators with Modbus®RTU can e.g. be used for industrial automation and solar tracking.



Modbus® TCP/IP is a protocol that enables industrial devices, such as actuators, to connect over Ethernet. It simplifies integration and maintenance of devices on the same network, suitable for applications like HVAC systems, energy management, and factory automation.

## Basic, Advanced and Parallel

This interface is the first generation of ICT™ and part of our IC Integrated Controller™ actuator range. It offers three levels of options with different features.

Choose between Basic and Advanced control or opt for Parallel to move up to eight actuators in parallel.

## Configuration tools



LINAK Actuator Connect configurator helps you configure actuators with IC Integrated Controller, when working with the I/O interface. Adjust parameters such as start/stop settings, virtual limits, and current limits, and read-out real-time and historical usage data.

Download a free version of Actuator Connect.



The BusLink software can be used to configure actuators with IC Integrated Controller, when working with other interfaces than I/O. You can easily adjust parameters such as soft start/stop, virtual limits and current limits. You can also access historical usage data, to analyze the performance of both the actuators and the application in which they are installed.

[Download a free version of BusLink.](#)





# Third party products

It is important for us to meet your demands – no matter what they are. That is why we offer a wide range of products from our trusted third party suppliers. Below you will find a selection of the products in the portfolio.



<p><b>TR-EM-288</b> <b>Single Motor Driver</b></p>	<p><b>TR-EM-337A-PLI</b> <b>Parallel Synchro Controller</b></p>	<p><b>TR-EM-322</b> <b>BASIC - ventilation control unit</b></p>
<p>Designed for operation of a single actuator. Protects the actuator and application, and disconnects the actuator's motor if it exceeds a predefined power limit.</p>	<p>The synchronization controller will keep all motors at the same speed and position. If a synchronization error exceeds the specified deviation threshold, all motors will stop.</p>	<p>Designed for powering the actuator and its controller. The housing is IP66 rated and therefore suitable for outdoor applications.</p>



<p><b>WCU</b> <b>Water Valve Control Unit</b></p>	<p><b>RF</b> <b>Remote Control</b></p>	<p><b>TP1</b> <b>Waterproof control</b></p>
<p>Designed to perform the opening and closing movement of valves. Easy installation.</p>	<p>The small and compact RF receiver enables easy control of one actuator. The small form factor makes this device easy to implement in your application.</p>	<p>A waterproof desk switch made for rough working conditions. It is appropriate for use in locations with a wet and damp environment.</p>

See the third party products 







# Explore the technology behind actuators

At the Actuator Academy™, you will find a library of videos and information about actuator components, actuator testing, and intelligent actuator control.

Find out what to expect of a good industrial actuator, what affects its performance and efficiency, and how to best utilize your electric linear actuator.

We hope to inspire you and ultimately make you curious about the moving electric revolution that we are all a part of.

**Happy exploring!**



Check out the Actuator Academy 





**LINK**<sup>®</sup>

Designed in Denmark

Site: SAKT Nordborg

Type: 363A75-00150160

Rev. No.: 361924-00



Prod. Date: 2018.05.27

Max. Load: Push 2600 N / Pull 2600 N IP66

Power Rating: 12 V<sup>DC</sup> Max. 26 A

Duty Cycle: 25 %, Max. 4 min./10min.

NOT TO BE OPENED BY UNAUTHORIZED PERSONNEL  
NE PAS OUVRIR PAR DU PERSONNEL NON AUTORISÉ

CE  

10718 361-00001-0007 MADE IN DENMARK

Learn  
how we  
test




# Testing program

In any industrial application, the actuator is just one of many components, but that does not diminish the importance of smooth and reliable operation. For this reason, we ensure that every actuator leaving our factory undergoes a comprehensive 100% function test.

Depending on the actuator type, various tests are carried through. To get a detailed overview of the tests performed, please consult your local LINAK® office or refer to the relevant actuator data sheet.

Our commitment to testing is your guarantee that your electric actuators will work reliably for many years.

		
<p><b>Climatic tests:</b> In the climatic test the actuators are tested to operate in extreme temperatures as well as to endure rapid changes in temperature. In a dunk test, the actuators have to withstand repeating temperature fluctuations between +85°C to -40°C while maintaining its full functionality and ingress protection.</p> <p><b>EN60529-IP6X:</b> dust <b>EN60529-IPX6:</b> water <b>ISO16750- IP69K:</b> high-pressure cleaning <b>IEC60068-2-3:</b> moisture storage <b>IEC60068-2-30:</b> operation in moisture <b>ISO16750-4:2010:</b> dunk test <b>EN60068-2-52:</b> salt spray <b>BS7691 Section 6.11.2.4:</b> chemicals</p>	<p><b>Mechanical tests:</b> Vibration: The actuator must withstand continuous vibration in three directions. Shock: The shock test puts the actuator through 3 shocks of up to 50 G in each of six directions. Bump: The actuator receives bumps of up to 30 G in each of six directions several hundred times.</p> <p><b>EN60068-2-64 (Fh):</b> random vibration <b>EN60068-2-27 (Ea):</b> shock <b>EN60068-2-29 (Eb):</b> bump</p>	<p><b>Electrical tests:</b> All electrical parts are tested i.e. power supply, power and signal cables, control signals etc. Electrical immunity is tested according to industrial standards i.e. for radio noise, electrical discharge and burst.*</p> <p><b>EN/IEC 61000-6-4:</b> generic standard emission industry <b>EN/IEC 60204:</b> electrical equipment of machinery <b>EN 50121-3-2:</b> railway applications - Rolling stock apparatus <b>94/25/EC:</b> recreational crafts directive <b>EN/ISO 13766:</b> earth moving machinery <b>EN/IEC 61000-6-2:</b> generic standard immunity industry <b>2004/104/EC:</b> automotive Directive <b>EN/ISO 14982:</b> agricultural and forestry machines <b>EN/ISO 13309:</b> construction machinery</p>



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