

LINEAR ACTUATOR TECHNOLOGY

MEDLINE®
IMPROVING EFFICIENCY

CARELINE®
IMPROVING EFFICIENCY



FOCUS ON SAFETY ASPECTS



LINAK® 
WE IMPROVE YOUR LIFE

A P P R O V A L S

In general the LINAK product line complies with the regulations for product approvals.

In the development phase the standards listed below have been taken into consideration by LINAK A/S in order to comply with the regulations required for a customer application certification.

Quality and Safety are key issues for LINAK A/S. Though as a customer you should also be aware of the requirements for test and certification of the final application.

The product and application standards cover the following areas:

THE CONTENTS OF THE STANDARDS:

EN 60335-1:	Safety of household and similar electrical appliances.
EN 60601-1:	Medical electrical equipment. General requirements for safety.
EN 60950:	Safety of information technology equipment.
EN 61558-1	Safety of power transformers, power supply units and similar.
UL 73:	Motor-Operated Appliances.
UL 544:	Medical and Dental Equipment.
UL 962:	Household and commercial furnishing
UL 60601-1:	Medical Electrical Equipment. General Requirements for safety. (Motor-Operated Appliances).
CSA C22.2 No. 68:	Medical Electrical Equipment. General Requirements for safety.
CSA C22.2 No. 601.1:	Particular requirements for the safety of electrically operated hospital beds. The object of the particular standard for beds is to minimise the risks for patients, operators and the environment as much as possible and to describe tests to verify that these requirements have been attained.
EN 60601-2-38:	Particular requirements for the safety of electrically operated hospital beds. The object of the particular standard for beds is to minimise the risks for patients, operators and the environment as much as possible and to describe tests to verify that these requirements have been attained.
EN 60601-2-52:	Particular requirements for basic safety and essential performance of medical beds.
EN1970:	This standard specifies requirements and related test methods for adjustable beds and bed lifts intended for use by disabled persons.
AS/NZS 3200.1.0:	Medical Electrical Equipment - General requirements for safety
AS/NZS 3260:	Approval & Test Specification - Safety of Information Technology Equipment including Electrical Business Equipment
AS/NZS 3108:	Approval & Test Specification - Particular requirements for Transformers & Safety Isolating Transformers

Above information is for reference only. For specific product approvals on LINAK's product range, please contact your local LINAK dealer.

Specifications are subject to change without prior notice. The user is responsible for determining the suitability of LINAK products for a specific application. All sales is according to the standard terms of sale and delivery of LINAK.

Title	International	European	American	Canadian
Household	IEC 60335-1	EN 60335-1	UL 73/UL 962	
Medical & dental	IEC 60601-1 / ISO 80601-2-60	EN 60601-1	UL 544 / UL 60601-1	Can/CSA 22.2 NO. 601.1
Information technology & business (office)	IEC 60950	EN 60950		
Transformers		EN 61558-1		

FOCUS ON SAFETY



Numerous safeguards have been built into both the MEDLINE® and CARELINE® systems. Constantly extending and expanding them is one of the cornerstones of product development.

The safety aspects are divided into standard and extended programmes referring to actuators as well as control boxes.

The standard programme always includes a basic safety part.

The extended programme offers additional safety options depending on the purpose of the application. It also considers the necessity of further safety precautions with regard to the well-being of the operator.

STANDARD

A term used for a functionality, which is always present in the product when ordering.

OPTION

A term used for a functionality, which is optional and must be added to the product via the ordering example.

BASIC SAFETY

A safety function, which can be made by means of minor technical changes or addition of "simple" components.

EXTENDED SAFETY

An advanced function made via techniques where complex electronic circuits or mechanical parts are used. Additional evaluations may take place to ensure whether the function can be implemented or not.

	STANDARD	OPTION
BASIC SAFETY	<ul style="list-style-type: none"> • Double power control • Primary fuse • Mechanical blocking at end-stop (BB3, BL4, LA27, and LA34) 	<ul style="list-style-type: none"> • Safety nut • EPR cables • Safety factor 2 • Water protection • Spline • Quick Release (QR)
EXTENDED SAFETY		<ul style="list-style-type: none"> • Safety factor 4 • Power monitor • Microprocessor control • EOP • EAS • ACP

The grouping of the safety functions (standard/option) is intended as guidance.

Variances may occur.

BASIC SAFETY PROGRAMME

DOUBLE POWER CONTROL

The power supply to an actuator is controlled by means of two independent components, a relay, and an electronic component. The electronic part is monitored to detect failures.

PRIMARY FUSE

In case of a short circuit in the electrical parts the control box is protected by means of a fuse.

MECHANICAL BLOCKING AT END-STOP

Safety precaution to the actuator end-stop switch principle. This

additional safety function (buffer principle) prevents the nut from driving off the spindle if the standard end-stop switch in outward direction is defective. It will therefore stop the actuator at max. stroke length.

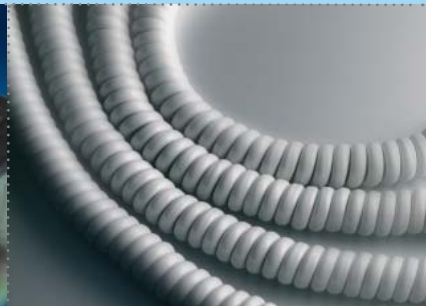
SAFETY NUT

Actuators can be fitted with a safety nut, which is an extra nut moving with the main nut, but taking up the load if the main nut breaks down.

The actuator will therefore still function, but only be able to lower the load; thereby signaling that



DOUBLE POWER CONTROL



EPR CABLES

repair is required. Normally only for push applications.

EPR CABLES

The cables are of an extra high reinforced quality with cable relief to avoid breakage even when subjected to harsh treatment. The EPR cables comply with EN 60601-2-38.

SAFETY FACTOR 2

Indicates the load capability in a static situation. It indicates that the actuator in a safe way is capable of carrying two times the dynamic load as a static load

without being damaged. The dynamic forces are not increased.

WATER PROTECTION

All MEDLINE® systems come as standard in protection class IP X4 to protect the electrical parts against penetration of liquids. Some of these products can also be offered in IP washable for washing tunnels.

SPLINE

An actuator safety feature, which prevents the squeezing of limbs between moving mechanical parts, e.g. in a bed frame when the actuator retracts.

The piston rod / inner tube will disconnect from the nut and will only be connected again with a compressive load.



WATER PROTECTION



EXTENDED SAFETY PROGRAMME



EAS

EAS

EAS (Electric Arc Suppression) is a principle developed and patented by LINAK to reduce the wear of relays.

By reducing the spark of the relay when connecting/disconnecting we have been able to multiply the lifetime of the relay.

This suppression method reduces the probability that errors occur on the relays to a minimum compared to conventional relay/motor operation.

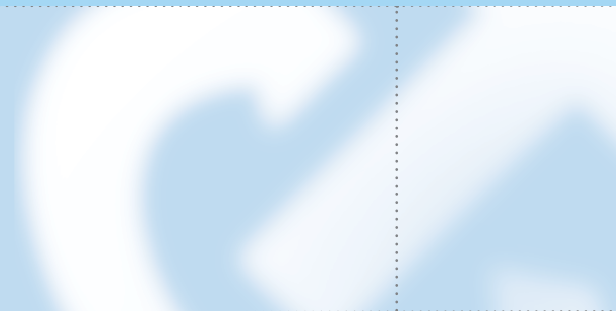
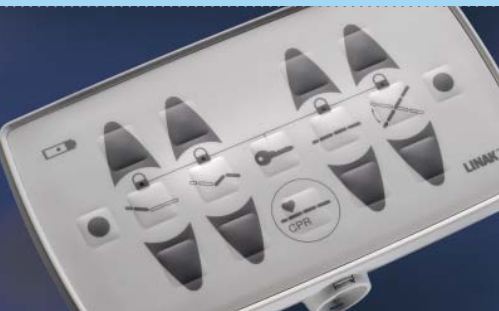
SAFETY FACTOR 4

Possible as a special article. LINAK will evaluate the suitability of the safety factor 4 depending on the application.

OPENBUS

A new technology platform that makes phantom run impossible. With LINAK's OPENBUS systems, manufacturers of for instance hospital beds can specify customised software programs with built-in safety functions.





ACO

ACO

ACO (Attendant Control Openbus) is a control and a blocking unit, which provides the possibility of controlling and locking the use of specific functions and channels on the ACO itself and the handset. It is therefore also a safety precaution, which prevents the occurrence of an uncomfortable or dangerous position via improper use of the handset. It has been developed in close corporation with nurses.

EOP

EOP (Electronic Overload Protection) is implemented in the control box and protects the actuator against overload. If the actuator becomes obstructed, the current increases to a level, which may damage the actuator. The EOP circuit monitors this and cuts off the current at a predefined and safe level.

LINAK WORLDWIDE

FACTORIES

CHINA
LINAK (Shenzhen) Actuator Systems, Ltd.
Phone: +86 755 8610 6656 · Fax: +86 755 8610 6990
E-mail: sales@linak.cn · www.linak.cn

DENMARK
LINAK A/S · Group Headquarters Guderup
Phone: +45 73 15 15 15 · Fax: +45 74 45 80 48
Fax (Sales): +45 73 15 16 13
E-mail: info@linak.com · www.linak.com

SLOVAKIA
LINAK Slovakia s.r.o.
Phone: +421 517563 414 · Fax: +421 517563 410
E-mail: jp@linak.sk · www.linak.com

USA
LINAK U.S. Inc.
North and South American Headquarters
Phone: +1 502 253 5595 · Fax: +1 502 253 5596
E-mail: info@linak-us.com · www.linak-us.com

SUBSIDIARIES

AUSTRALIA
LINAK Australia Pty. Ltd
Phone: +61 3 8796 9777 · Fax: +61 3 8796 9778
E-mail: sales@linak.com.au · www.linak.com.au

AUSTRIA
LINAK GmbH
Phone: +43 2746 21036 · Fax: +43 2746 21044
www.linak.at

BELGIUM & LUXEMBOURG
LINAK Actuator-Systems NV/SA
Phone: +32 (0)9 230 01 09 · Fax: +32 (0)9 230 88 80
E-mail: info@linak.be · www.linak.be

BRAZIL
LINAK do Brasil Comércio de Atuadores Ltda.
Phone: +55 (11) 2832-7070 · Fax: +55 (11) 2832-7060
E-mail: info@linak.com.br · www.linak.com.br

CANADA
LINAK Canada Inc.
Phone: +1 905 821 7727 · Fax: +1 905 821 4281
E-mail: info@linak.ca · www.linak.ca

CZECH REPUBLIC
LINAK C&S S.R.O.
Phone: +420581741814 · Fax: +420581702452
E-mail: ponizil@linak.cz · www.linak.cz

DENMARK
LINAK DANMARK A/S
Phone: +45 86 80 36 11 · Fax: +45 86 82 90 51
E-mail: linak@linak-silkeborg.dk · www.linak.dk

FINLAND
LINAK OY
Phone: +358 10 841 8700 · Fax: +358 10 841 8729
E-mail: linak@linak.fi · www.linak.fi

FRANCE
LINAK FRANCE S.A.R.L.
Phone: +33 (0)2 4136 3434 · Fax: +33 (0)2 4136 3500
E-mail: linak@linak.fr · www.linak.fr

GERMANY
LINAK GmbH
Phone: +49 6043 9655 0 · Fax: +49 6043 9655 60
E-mail: info@linak.de · www.linak.de

INDIA
LINAK A/S India Liaison Office
Phone: +91 80 2299 6533 · Fax: +91 80 2224 3863
E-mail: info@linak.in · www.linak.in

IRELAND
LINAK UK Limited
Phone: +44(0)121 544 2211 · Fax: +44(0)121 544 2552
E-mail: stephen@linak.co.uk · www.linak.co.uk

ITALY
LINAK ITALIA S.r.l.
Phone: +39 02 48 46 33 66 · Fax: +39 02 48 46 82 52
E-mail: info@linak.it · www.linak.it

JAPAN
LINAK K.K.
Phone: +81 45 533 0802 · Fax: +81 45 533 0803
E-mail: linak@linak.jp · www.linak.jp

MALAYSIA
LINAK A/S Asian Representative Office
Phone: +60 4 210 6500 · Fax: +60 4 226 8901
E-mail: info@linak-asia.com · www.linak-asia.com

NETHERLANDS
LINAK Actuator-Systems B.V.
Phone: +31 76 5 42 44 40 · Fax: +31 76 5 42 61 10
E-mail: info@linak.nl · www.linak.nl

NEW ZEALAND
LINAK New Zealand Ltd.
Phone: +64 9580 2071 · Fax: +64 9580 2072
E-mail: nzsales@linak.com.au · www.linak.co.nz

NORWAY
LINAK Norge AS
Phone: +47 32 82 90 90 · Fax: +47 32 82 90 98
E-mail: info@linak.no · www.linak.no

POLAND
LINAK Polska
Phone: +48 (22) 500 28 74 · Fax: +48 (22) 500 28 75
E-mail: dkreh@linak.com · www.linak.pl

SPAIN
LINAK Actuadores S.L.
Phone: +34 93 588 27 77 · Fax: +34 93 588 27 85
E-mail: linakact@linak.es · www.linak.es

SWEDEN
LINAK Scandinavia AB
Phone: +46 8 732 20 00 · Fax: +46 8 732 20 50
E-mail: info@linak.se · www.linak.se

SWITZERLAND
LINAK AG
Phone: +41 43 388 31 88 · Fax: +41 43 388 31 87
E-mail: info@linak.ch · www.linak.ch

TAIWAN
LINAK A/S Taiwan Representative Office
Phone: +886 2 25080296 · Fax: +886 2 25083604
E-mail: info@linak.com.tw · www.linak-asia.com

TURKEY
LINAK A/S Turkey Representative Office
Phone: +90 312 4726338-59 · Fax: +90 312 4726635
E-mail: vozen@linak.com.tr · www.linak.com.tr

UNITED KINGDOM
LINAK UK Limited
Phone: +44(0)121 544 2211 · Fax: +44(0)121 544 2552
E-mail: sales@linak.co.uk · www.linak.co.uk

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- INDONESIA
- IRAN
- MEXICO
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For contact details on other countries please visit
www.linak.com or contact:

LINAK INTERNATIONAL
Fax: +45 74 45 90 10
E-mail: info@linak.com · www.linak.com

A HISTORY OF TRADITION AND INNOVATION

LINAK has gone through a remarkable transformation since being established back in 1907. When Bent Jensen, our Director and owner took over the company in 1976 he brought a brand new idea with him. An idea which led to the development of the very first linear actuator in 1980.

It soon became obvious that this new invention had an even larger potential than anyone could have imagined. The linear actuator was going to facilitate ergonomic improvements in workplaces as diverse as offices, hospitals, comfort furniture, farms, and industry.

Throughout this process of improvement and transformation, LINAK's commitment to quality remains the same. The quality of our products affect the quality of people's lives, and we are very much aware of our responsibility. All products are thoroughly tested according to the most demanding standards, and all assemble processes utilize modern technologies.

As we have grown, so has our network of international offices around the world. Today we are present in 35 countries across the globe.



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