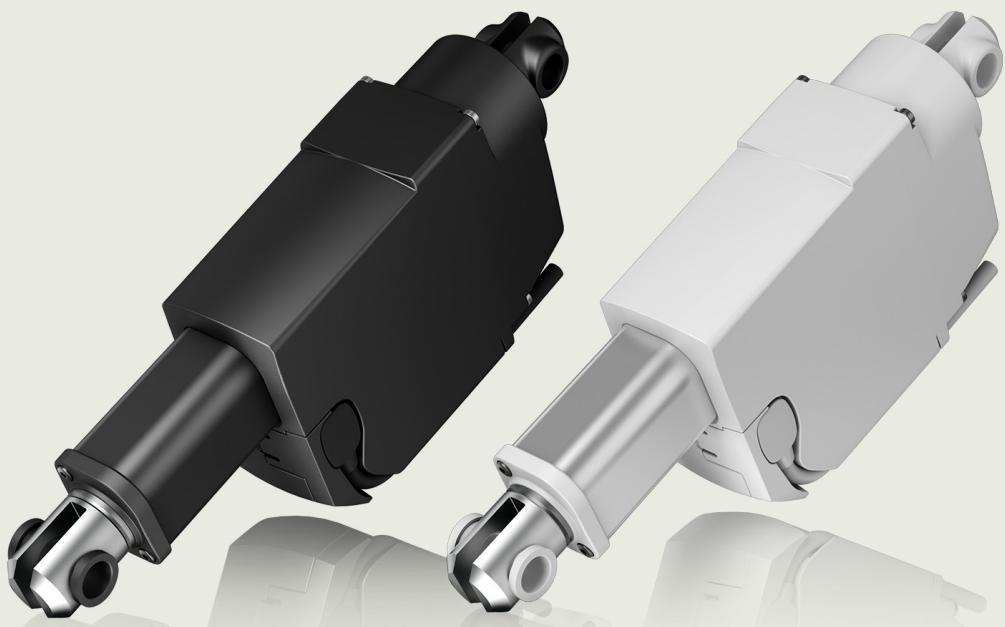


# Linear Actuator LA23

## Data Sheet



## Introduction



The LA23 is a small and strong push/pull actuator (up to 2,500 N). The LA23 can be used in various applications where size is important.

Some of the benefits the LA23 offers you are:

- Compact design
- High lifting force
- Exchangeable cables
- IPX6 Washable DURA™

The standard LA23 is available for the CARELINE®, MEDLINE®, TECHLINE® product ranges.



## Features and options

Load in push:	2,500 N, 1,800 N, 1,500 N, 1,200 N, 900 N or 300 N
Load in pull:	2,500 N, 1,800 N, 1,500 N, 1,200 N, 900 N or 300 N
Dynamic push and pull:	Actuators are designed for push or pull applications. If a combination is required, please contact your local LINAK salesperson.
Housing colour:	Black (RAL 9005), outer tube steel or black Light grey (RAL 7035), outer tube steel
Protection class:	IPX4, IPX6, IPX6 Washable DURA™
Motor:	12 V DC, 24 V DC
Stroke length:	20 - 500 mm (for stroke 300-500 mm max. load is 1,000 N for pitch 3, 5, 6 and 9) Pitch 12 mm (for stroke 300-500 mm max. load is 900 N) Pitch 20 mm (for stroke 300-500 mm max. load is 300 N)
Built-in dimensions:	110 - 146 mm + stroke length
Positioning options:	Potential free end stop signals Hall potentiometer or Hall PWM position Single Hall, Dual Hall
Back fixture material:	Plastic or steel
Nut:	Guided
Safety nut:	In push or pull (2,500 N and 1,800 N version only safety nut in push)
Mechanical spline:	Yes
Built-in electrical end stop:	Yes
Exchangeable cable:	Yes
Static safety factor:	2.5
Noise level:	Max. 58.5 dB(A) (At nominal voltage and with no load, according to EN ISO 3743-1)
Mechanical end stop:	Yes
Integrated control:	Yes

## Usage

Duty cycle:	10%, 2 minutes continuous use followed by 18 minutes not in use
Operation temperature:	+5° - +40° normal operating temp. -30° - +50° according to test conditions: ISO 7176-9
Storage temperature:	-45 °C to +70 °C (according to ISO 7176-9)
Compatibility:	Compatible with LINAK control boxes. Please contact LINAK.
Relative humidity:	20% to 80% – non-condensing
Atmospheric pressure:	700 to 1060 hPa
Meters above sea level:	Max. 3000 meters
Flammability rating:	Enclosure UL94-V0
Approvals:	IEC60601-1 ANSI/AAMI ES60601-1 CAN/CSA-22.2 No 60601-1
Cycles:	<p>The LA23 Life cycle test has been performed with a stabilised power supply (10% duty cycle) on a 200mm stroke actuator at max. load for the following number of cycles (at 20 °C ambient temperature):</p> <p>3 mm pitch = 5000 cycles 5, 6, 9, 12 and 20 mm pitch = 10,000 cycles</p>



LA23 is always equipped with mechanical end stop - to ensure first failure safety.

In the norm, EN 60601-1, it is mentioned that an application must be first failure safe. If the electrical end stop in the LA23 should fail, the built-in mechanical end stop ensures that the LA23 cannot run out of the spindle.

The mechanical end stop is only being used as a safety backup for the electrical end stop.

If electrical end stop fails to function, the actuator will continue to retract or extend until mechanical end stop is reached.

The customer application must be able to obtain or withstand an actuator with failing electrical end stop.

**For actuators with stroke length (SL) < 50 mm:**

Typical minimum length of actuator reaching mechanical end stop: BID - 2 mm.

Typical maximum length of actuator reaching mechanical end stop: BID + SL + 52 mm.

**For actuators with stroke length (SL)  $\geq$  50 mm:**

Typical minimum length of actuator reaching mechanical end stop: BID - 2 mm.

Typical maximum length of actuator reaching mechanical end stop: BID + SL + 4 mm.



## Ordering example

23	0	1	0	0	1	0	0	0	2	5	0	B	4	
HOUSING/IP DEGREE:														4=IPX4 6=IPX6 W=IPX6 Washable DURA
MOTOR TYPE:														A = 12 V B = 24 V (driving mainly with battery (CBJ1, CBJ2, CBJH, CBJC, wheelchairs)) G = 24 V (33 V) (For OpenBus (CB20, CB16, CB6s))
STROKE:														XXX = mm      Min. 020 mm      In steps of 5 mm Max. 300 mm
(For minimum BID see table 2)														XX = See table 1
POSITIONING:														0 = No safety option 1 = Safety nut for push 2 = Safety nut for pull 3 = Spline without safety nut 4 = Spline + safety nut push
SAFETY OPTION:														1 = Black (RAL 9005) + grey outer tube 2 = Light grey (RAL7035) + grey outer tube 3 = Black (RAL 9005) + black outer tube
HOUSING COLOUR:														PISTON ROD EYE:
PISTON ROD EYE:														0 = Standard steel with slot (6.1 mm), eye Ø10.1 mm, incl. plastic bushings 1 = Standard steel with slot (6.1 mm), eye Ø10.1 mm 2 = Standard steel with slot (6.1 mm), eye Ø12.3 mm
BACK FIXTURE ROTATION:														0 = 0° clockwise      1 = 90° clockwise A = 7.5° clockwise      M = 97.5° clockwise B = 15° clockwise      N = 105° clockwise C = 22.5° clockwise      P = 112.5° clockwise D = 30° clockwise      Q = 120° clockwise E = 37.5° clockwise      R = 127.5° clockwise F = 45° clockwise      S = 135° clockwise G = 52.5° clockwise      T = 142.5° clockwise H = 60° clockwise      U = 150° clockwise J = 67.5° clockwise      V = 157.5° clockwise K = 75° clockwise      W = 165° clockwise L = 82.5° clockwise      Z = 172.5° clockwise
BACK FIXTURE:														1 = Plastic with slot (6.1 mm), eye Ø10.1, (only for standard push load) 2 = Steel with slot (6.1 mm), eye Ø10.1 mm, incl. plastic bushings 3 = Steel with slot (6.1mm), eye Ø10.1 mm 4 = Steel with slot (6.1mm), eye Ø12.3 mm
SPINDLE TYPE:														0 = 12 mm pitch (900 N) 2 = 20 mm pitch (300 N) 3 = 3 mm pitch (2500 N) 5 = 5 mm pitch (1800 N) 6 = 6 mm pitch (1500 N) 9 = 9 mm pitch (1200 N)
ACTUATOR TYPE:														23 = LA23



## Positioning options

Table1

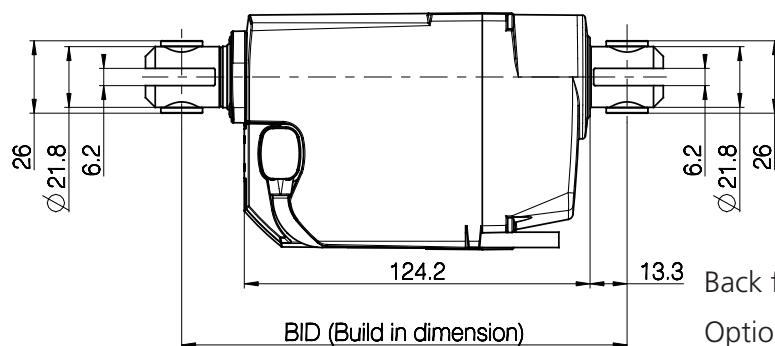
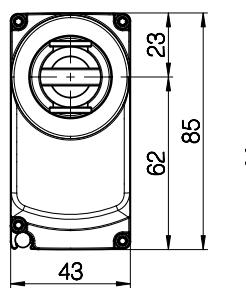
Different positioning options can be chosen for LA23.

Positioning/ Ordering code number <b>X      X</b>		Description of positioning option		No. of pins in LA23
0	0	Standard electrical endstop - no positioning		6
0	1	Standard electrical endstop and potential free endstop - no positioning		6
0	2	Dual Hall digital positioning		6
0	3	Dual Hall PNP positioning		6
0	4	Dual Hall, encoded		6
1	1	Hall Potentiometer feedback	0-10V	10
1	2	Hall Potentiometer feedback	1-9V	10
1	3	Hall Potentiometer feedback	2-8V	10
1	4	Hall Potentiometer feedback	0-5V	10
1	5	Hall Potentiometer feedback	0.5-4.5V	10
1	6	Hall Potentiometer feedback	0-3.3V	10
1	7	Hall Potentiometer feedback	0.3-3V	10
2	1	Hall Potentiometer feedback and potential free endstop	0-10V	10
2	2	Hall Potentiometer feedback and potential free endstop	1-9V	10
2	3	Hall Potentiometer feedback and potential free endstop	2-8V	10
2	4	Hall Potentiometer feedback and potential free endstop	0-5V	10
2	5	Hall Potentiometer feedback and potential free endstop	0.5-4.5V	10
2	6	Hall Potentiometer feedback and potential free endstop	0-3.3V	10
2	7	Hall Potentiometer feedback and potential free endstop	0.3-3V	10
3	1	Hall PWM position feedback	0-100%	10
3	2	Hall PWM position feedback	10-90%	10
3	3	Hall PWM position feedback	20-80%	10
4	1	Hall PWM position feedback and with potential free endstop	0-100%	10
4	2	Hall PWM position feedback and with potential free endstop	10-90%	10
4	3	Hall PWM position feedback and with potential free endstop	20-80%	10

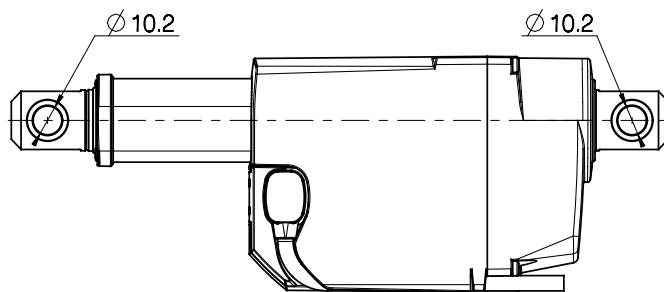
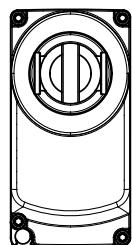


Positioning/ Ordering code number X X		Description of positioning option IC (Integrated Control)		No. of pins in LA23
5	0	Standard electrical endstop - no positioning		10
5	2	Standard single Hall positioning		10
6	1	Hall potentiometer feedback	0 - 10V	10
6	2	Hall potentiometer feedback	1 - 9V	10
6	3	Hall potentiometer feedback	2 - 8V	10
6	4	Hall potentiometer feedback	0 - 5V	10
6	5	Hall potentiometer feedback	0.5 - 4.5V	10
6	6	Hall potentiometer feedback	0 - 3.3V	10
6	7	Hall potentiometer feedback	0.3 - 3V	10
7	1	Hall PWM position feedback	0-100%	10
7	2	Hall PWM position feedback	10-90%	10
7	3	Hall PWM position feedback	20-80%	10

## Dimensions



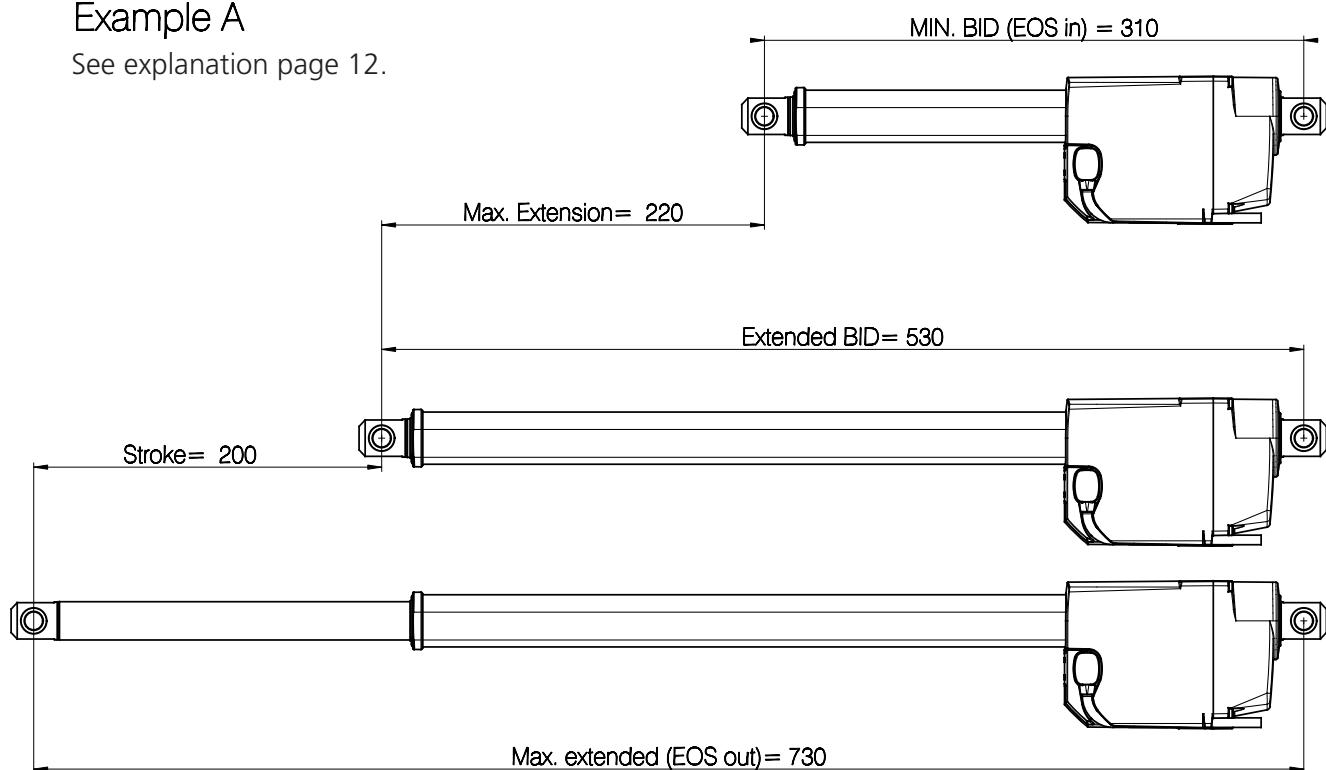
Back fixture orientation  
Option 1



Back fixture orientation  
Option 0

## Example A

See explanation page 12.



Drawing no.: 0234024

## Tolerances

For built-in dimensions and stroke  $\pm 2$  mm.

## Built-in dimensions

Table 2

The built-in dimension depends upon the chosen safety option and stroke length.

Please see the table below to decide upon the built-in dimension.

<b>Safety option</b>	<b>Stroke length</b>	<b>Spindle pitch</b>	<b>Min. built-in Dimensions</b>
0 = No safety option	20 - 49	6, 9, 12 or 20	160
0 = No safety option	20 - 49	3, 5	168
1 = Safety nut for push	20 - 49	6, 9 or 12	160
1 = Safety nut for push	20 - 49	3, 5	168
2 = safety nut for pull	20 - 49	6, 9 or 12	172
3 = Mechanical Spline for push	20 - 49	6, 9 or 12	180
3 = Mechanical Spline for push	20 - 49	3, 5	196
4 = Mechanical Spline & safety nut for push	20 - 49	6, 9 or 12	180
4 = Mechanical Spline & safety nut for push	20 - 49	3, 5	196
<hr/>			
0 = No safety option	50 - 200	6, 9, 12 or 20	110 + stroke
0 = No safety option	50 - 200	3, 5	118 + stroke
1 = Safety nut for push	50 - 200	6, 9 or 12	110 + stroke
1 = Safety nut for push	50 - 200	3, 5	118 + stroke
2 = Safety nut for pull	50 - 200	6, 9 or 12	122 + stroke
3 = Mechanical Spline for push	50 - 200	6, 9 or 12	130 + stroke
3 = Mechanical Spline for push	50 - 200	3, 5	146 + stroke
4 = Mechanical Spline & safety nut for push	50 - 200	6, 9 or 12	130 + stroke
4 = Mechanical Spline & safety nut for push	50 - 200	3, 5	146 + stroke
<hr/>			
0 = No safety option	201 - 500	6, 9, 12 or 20	130 + stroke
0 = No safety option	201 - 500	3, 5	138 + stroke
1 = Safety nut for push	201 - 500	6, 9 or 12	130 + stroke
1 = Safety nut for push	201 - 500	3, 5	138 + stroke
2 = Safety nut for pull	201 - 500	6, 9 or 12	142 + stroke
3 = Mechanical Spline for push	201 - 500	6, 9 or 12	150 + stroke
3 = Mechanical Spline for push	201 - 500	3, 5	166 + stroke
4 = Mechanical Spline & safety nut for push	201 - 500	6, 9 or 12	150 + stroke
4 = Mechanical Spline & safety nut for push	201 - 500	3, 5	166 + stroke

**It is possible to order LA23 with extended built-in dimensions if the following requirements are fulfilled (see example "A" earlier page):**

	Spindle pitch = 6, 9, 12, 20	Spindle pitch = 3, 5	Spindle pitch = 6, 9, 12	Spindle pitch = 6, 9, 12	Spindle pitch = 3, 5	
	Safety option 0: No safety option			Safety option 2: Safety nut pull	Safety option 3: Spline without safety nut	
	Safety option 1: safety nut push				Safety option 4: Spline + safety nut push	
Max.built-in dimensions	≤730 - stroke	≤738 - stroke	≤742 - stroke		≤750 - stroke	≤766 - stroke

**Example:**

A) 6 mm pitch no safety option, stroke 200, BID can be max.  $(730 - 200) = 530$   
(see earlier page for further explanation)

B) 3 mm pitch no safety option, stroke 20, BID can be max.  $(738 - 20) = 718$

## Self-locking specifications

Spindle Pitch	Without short circuit	With short circuit
20 mm pitch	100	300
12 mm pitch	750	900
9 mm pitch	750	1,200
6 mm pitch	1,200	1,500
5 mm pitch	1,600	1,800
3 mm pitch	2,500	2,500



## Technical specifications

Power supply	Spindle pitch (mm)	Load max.** Push/Pull (N)	Motor type	*Typical speed at 0/full load (mm/sec.)	*Typical current at 0/ full load (Amp.)	Inrush current (Amp.)
12VDC	3	2,500/2,500	A: 12V	3.1 / 2.5	0.8 / 3.6	13.4
CBJ1/2, CBJH and CBJC	3	2,500/2,500	B: 24V	3.2 / 2.6	0.4 / 1.9	8.7
OpenBus™	3	2,500/2,500	G: 24V	3.3 / 2.7	0.3 / 1.4	6.2
12VDC	5	1,800/1,800	A:12V	5.4 / 4.2	0.8 / 3.9	13.4
CBJ1/2, CBJH and CBJC	5	1,800/1,800	B:24V	5.4 / 4.5	0.4 / 1.9	8.7
OpenBus™	5	1,800/1,800	G:24V	5.6 / 4.6	0.3 / 1.4	6.2
12VDC	6	1,500/1,500	A: 12V	6.6 / 5.2	0.8 / 3.6	13.4
CBJ1/2, CBJH and CBJC	6	1,500/1,500	B: 24V	6.4 / 5.5	0.4 / 1.7	8.7
OpenBus™	6	1,500/1,500	G: 24V	6.7 / 5.5	0.3 / 1.3	6.2
12VDC	9	1,200/1,200	A: 12V	9.9 / 7.5	0.9 / 4.0	13.4
CBJ1/2, CBJH and CBJC	9	1,200/1,200	B: 24V	9.5 / 8.1	0.4 / 1.9	8.7
OpenBus™	9	1,200/ 1,200	G: 24V	9.9 / 8.1	0.3 / 1.3	6.2
12VDC	12	900/900	A:12V	13 / 9.6	0.9 / 3.8	13.4
CBJ1/2, CBJH and CBJC	12	900/900	B:24V	12.6 / 10.4	0.4 / 1.9	8.7
OpenBus™	12	900/900	G:24V	13.3 / 10.7	0.3 / 1.4	6.2
12VDC	20	300/300	A:12V	21.5 / 18.6	0.8 / 4.3	–
CBJ1/2, CBJH and CBJC	20	300/300	B:24V	21.6 / 20.2	0.4 / 2.3	–
OpenBus™	20	300/300	G:24V	21.8 / 20.6	0.3 / 1.6	–

\* Typical values, measurements are made with an actuator in connection with a stable power supply. The typical values can have a variation of  $\pm$  20% on the current values and  $\pm$  10% on the speed values.

\*\* If the stroke is between 300-500 mm, the max. load is 1,000 N for pitch 3, 5, 6 and 9.

## Safety nut and back fixture overview

Pitch (mm)	Load (N)	Safety nut	Steel back fixture	Plastic back fixture
20	300	Not an option	Required in pull	Only in push
12	900	Optional in push or pull	Required in pull	Only in push
9	1,200	Optional in push or pull	Required in pull	Only in push
6	1,500	Optional in push or pull	Required in pull	Only in push
5	1,800	Optional in push (Safety nut 1,800 N not available in pull)	Always required	Not available
3	2,500	Optional in push (Safety nut 2,500 N not available in pull)	Always required	Not available

