TECHLINE®
IMPROVING FLEXIBILITY

Linear Actuator LA14

Data Sheet

LINAK®
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Contents

Preface

Dear User,

We are delighted that you have chosen a LINAK® product.

LINAK systems are high-tech products based on many years of experience in the manufacture and development of actuators, lifting columns, desk frames, electric control boxes, controls, batteries, accessories and chargers.

This User Manual does not address the end user. It is intended as a source of information for the equipment or system manufacturer only, and it will tell you how to install, use and maintain your LINAK electronics. The manufacturer of the end product has the responsibility to provide a User Manual, where relevant safety information from this manual is passed on to the end user.

We are convinced that your LINAK product/system will give you many years of problem-free operation.

Before our products leave the factory, they undergo both function and quality testing. Should you, nevertheless, experience problems with your product/system, you are always welcome to contact your supplier.

LINAK subsidiaries and some distributors situated all over the world have authorised service centres, which are always ready to help you. Locate your local contact information on the back page.

LINAK provides a warranty on all products. (See warranty section).

This warranty, however, is subject to correct use in accordance with the specifications, maintenance being done correctly, and any repairs being carried out at a service centre, which is authorised to repair LINAK products.

Changes in installation and use of LINAK systems can affect their operation and durability. The products may only be opened by authorised personnel.

This User Manual has been written based on the present technical knowledge. LINAK reserves the right to carry out technical modifications and keeps the associated information updated.

LINAK A/S

Terms of use

LINAK® takes great care in providing accurate and up-to-date information on its products. However, the user is responsible for determining the suitability of LINAK products for a specific application.

Due to continual development, LINAK products are subject to frequent modifications and changes. LINAK reserves the rights to conduct modifications, updates, and changes without any prior notice. For the same reason, LINAK cannot guarantee the correctness and actual status of imprinted information on its products.

LINAK uses its best efforts to fulfil orders. However, for the reasons mentioned above, LINAK cannot guarantee availability of any particular product at any given time. LINAK reserves the right to discontinue the sale of any product displayed on its website or listed in its catalogues or in other written material created and produced by LINAK, LINAK subsidiaries, or LINAK affiliates.

All sales are subject to the 'Standard Terms of Sale and Delivery for LINAK A/S' available on LINAK websites.

Introduction

Extremely durable short-range linear actuator for applications operating in rough environments. Ensures reliable performance in temperatures ranging from -40 to +85° Celsius.

The actuator LA14 is a very tough actuator with a high IP degree and aluminium housing, making it ideal for use in harsh and demanding environments. Also, it is available with an optional ATEX/IECEx/CCC Ex approval.

Safety instructions

Please read this safety information carefully.

Be aware of the following three symbols throughout the document:

Warning!
Failing to follow these instructions can cause accidents resulting in serious personal injury.

Recommendations
Failing to follow these instructions can result in the actuator suffering damage or being ruined.

Additional information
Usage tips or additional information that is important in connection with the use of the actuator.

Furthermore, ensure that all staff who are to connect, mount, or use the actuator are in possession of the necessary information and that they have access to this document.

Persons who do not have the necessary experience or knowledge of the product/products must not use the product/products. Besides, persons with reduced physical or mental abilities must not use the product/products, unless they are under surveillance or they have been thoroughly instructed in the use of the apparatus by a person who is responsible for the safety of these persons.

Moreover, children must be under surveillance to ensure that they do not play with the product.

Before you start mounting/dismounting, ensure that the following points are observed:

- The actuator is not in operation.
- The actuator is free from loads that could be released during this work.

Before you put the actuator into operation, check the following:

- The actuator is correctly mounted as indicated in the relevant user instructions.
- The equipment can be freely moved over the actuator's whole working area.
- The actuator is connected to a mains electricity supply/transformer with the correct voltage and which is dimensioned and adapted to the actuator in question.
- Ensure that the voltage applied matches to the voltage specified on the actuator label.
- Ensure that the connection bolts can withstand the wear.
- Ensure that the connection bolts are secured safely.

During operation, please be aware of the following:

- Listen for unusual sounds and watch out for uneven running. Stop the actuator immediately if anything unusual is observed.
- Do not sideload the actuator.
- Only use the actuator within the specified working limits.
- Do not step on or kick the actuator.

When the equipment is not in use:

- Switch off the mains supply in order to prevent unintentional operation.
- Check regularly for extraordinary wear.

Classification

The equipment is not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.

Warnings

- Do not sideload the actuator.
- When mounting the actuator in the application ensure that the bolts can withstand the wear and that they are secured safely.
- If irregularities are observed, the actuator must be replaced.
- The actuator is not to be opened by unauthorised personnel. In case the actuator is opened, the warranty will be invalid.

Recommendations

- Do not place load on the actuator housing.
- Prevent impact or blows, or any other form of stress to the housing.
- Ensure that the cable cover is mounted correctly. Use 1.5 Nm torque.
- Ensure that the duty cycle and the usage temperatures for LA14 actuators are respected.
- Ensure that the cable cannot be squeezed, pulled or subjected to any other stress.
- Furthermore, it will be good practice to ensure that the actuator is fully retracted in the “normal” position. The reason is that there will be a vacuum inside the actuator if it is extended which over time can lead to water entering the actuator.

Features

- Protection class: IP66 for outdoor use (dynamic). Furthermore, the actuator can be washed down by a high pressure cleaner (IP69K - static)
- Heavy duty aluminium housing for harsh conditions
- Mechanical endstop
- Guided nut
- Static safety factor: 2.0
- Noise level: Max. 50-53 dB (A) with standard motor / 58-63 dB (A) with fast motor at nominal voltage and with no load, according to EN ISO 3743-1.
- Weight: 1.3 kg
  (Cable not included; weight varies by selected options)

Options in general

- 12 / 24 V DC Brushed motor
- Load up to 750 N
- Max. speed 8 to 45 mm/sec. depending on load and spindle pitch
- Stroke length from 19 to 130 mm (Zero Point: 75 to 130 mm)
- Built-in dimensions 245 mm (up to 345 mm)
- Various back fixtures and piston rod eyes in stainless and zinc-coated steel
- Back fixture available in 2 different positions: 0° or 90°
- Colour: Dark olivish grey or black (Harsh environment housing)
- Exchangeable cables in different lengths up to 10 m
- Analogue or digital feedback for precise positioning
- Potentiometer for feedback positioning - max. stroke length 100 mm (not with IC)
- Endstop reached signals
- Built-in Zero Point or endstop switch initialisation principle
- Hall effect sensor for precise positioning
- Special anodised housing for extreme environments
- CCC Ex, IECEx/ATEX (Ex) certified for Zone 21*
- IC options (see specific interface user manuals at the TECHLINE webpage for Connection Diagrams and I/O Specifications) including:
  - I/O
  - IO-Link
  - LIN bus
  - CAN bus J1939
  - CANopen
  - Modbus RTU
  - Modbus TCP/IP
  - Ethernet/IP
  - Profinet
- PC configuration tool (Actuator Connect™ and BusLink)

For more information about interfaces, please see the respective user manual on LINAK.com.

* Only available for actuators with 8-pin connector.

Usage

- Duty cycle at 750 N and 2 mm pitch is max. 20% (4 min. drive and 16 min. rest)
  Duty cycle at 300 N and 4 mm pitch is max. 40% (8 min. drive and 12 min. rest)
  The duty cycles are valid for operation within an ambient temperature of +5°C to +40°C

  Please note: For actuators with short stroke length, low load, and infrequent operation where running time is critical, variations in running time may occur over time.
  To ensure the optimal solution for your application, contact LINAK A/S.

- Ambient operating temperature: -40°C to + 85°C (for IECEx/ATEX/CCC Ex: -25°C to +65°C), full performance from +5°C to +40°C
- Storage temperature: -55°C to +105°C

Ordering example

14 020 040 00 00 0 A 0 6 = 1 1 0 0 XXX 0 C S 0 0 0

Actuator type	**14**	=	LA14
Spindle type	**020**	=	2 mm
	040	=	4 mm
Stroke length	**XXX**	=	mm
Safety	**00**	=	None
Feedback	**00**	=	None
	0P	=	Potentiometer
	0K	=	Single Hall
	0A	=	Analogue position feedback (Hall potentiometer)
	0F	=	PWM

Platform

8-pin connector

A	=	IO-Link
0	=	None
3	=	IC (Not for OpenBus™)
6	=	LIN bus
7	=	CAN bus J1939
9	=	CANopen

12-pin connector

B	=	I/O Basic
C	=	I/O Customised
F	=	I/O Full
Q	=	Modbus RTU
S	=	IO-Link

12-pin connector (with split supply)

E	=	Ethernet/IP*
G	=	CAN bus J1939
H	=	CANopen
P	=	Profinet
T	=	Modbus TCP/IP
X	=	Special

Motor type	**A**	=	12 V BDC Standard
	B	=	24 V BDC Standard
	C	=	12 V BDC Fast
	D	=	24 V BDC Fast
	X	=	Other
Endstop	**0**	=	Power switch
	1	=	Signal switch
	2	=	Zero Point

IP

	6	=	IP66 + IP69K
	9	=	Harsh environment + IP66/IP69K

Not for 12-pin connector

T	=	ATEX

Colour	**=**	=	Dark Olivish Grey NCS S7000-N
	-	=	Black NCS 8800-N (Harsh environment)
Back fixture	**1**	=	0°
	2	=	90°

A	=	0° with POM
B	=	90° with POM

* Actuators with Ethernet/IP are only compatible with Plug type E and Cable type P (ordering number: 0257079)

Ordering example

14 020 040 00 00 0 A 0 6 = 1 1 0 0 XXX 0 C S 0 0 0

Piston rod eye

Zinc-coated steel

1	=	ø10.2
2	=	ø12.3
5	=	With bushings ø8.1
6	=	With bushings ø10.2
9	=	ø12.9

AISI 303

4	=	ø12.3
E	=	With bushings ø10.2
F	=	Female adapter M8
M	=	Male adapter M12

AISI 304

3	=	ø12.3 (0301244)
A	=	ø10.2
B	=	ø12.3 slotted (0231095)
C	=	With bushings ø8.1
D	=	With bushings ø10.2
K	=	Ball eye ø10H7
L	=	Ball eye ø12H7
X	=	Special

Endstop reached output

0	=	No endstop reached signal
1	=	Endstop reached signal
A	=	A_HIGH / A_HIGH
B	=	A_LOW / A-HIGH
C	=	A_HIGH / A_LOW
D	=	A_LOW / A_LOW
E	=	LOW / A_HIGH
F	=	HIGH / A_HIGH
G	=	LOW / A_LOW
H	=	HIGH / A_LOW
J	=	A_HIGH / LOW
K	=	A_LOW / LOW
L	=	A_HIGH / HIGH
M	=	A_LOW / HIGH
N	=	LOW / LOW
P	=	HIGH / LOW
Q	=	LOW / HIGH
R	=	HIGH / HIGH
X	=	Special

Brake

0	=	None

Built-in dimensions

xxx	=	Measured in mm

Fire category

0	=	None

Plug type

0	=	None (when no cable is chosen)
C	=	Flying leads (when connector is not wanted)**
E	=	Ethernet M12 Y-cable (0257079)*
P	=	IO-Link M12 Y-cable (0257077)
R	=	Modbus RTU M12 Y-cable (0257078)
I	=	Moulded Deutsch (DT4)
J	=	Deutsch (DT4)
K	=	AMP superseal
L	=	Moulded AMP superseal
X	=	Special

Ordering example

14 020 040 00 00 0 A 0 6 = 1 1 0 0 XXX 0 C S 0 0 0

Cable

0	=	None
S	=	Straight 0.75 m (8-core or 2-core when no feedback is needed)
T	=	Straight 1.5 m (8-core or 2-core when no feedback is needed)
R	=	Straight 5 m (8-core or 2-core when no feedback is needed)
V	=	Straight 10 m (8-core or 2-core when no feedback is needed)
K	=	Straight 0.75 m (11-core)**
Y	=	Straight 1.5 m (11-core)**
Z	=	Straight 5 m (11-core)**
L	=	Straight 10 m (11-core)**
P	=	Y-cable 2 m power and 0.15 m signal (Bus only)*
X	=	Special

Safety factor

0	=	2.0

Feedback level

Bus

0	=	None

Standard

0	=	None
A	=	0-10 V
B	=	0.5-4.5 V
C	=	4-20 mA
D	=	PWM 10-90%
E	=	PWM 20-80%
F	=	Special

IC Basic

8	=	None

IC Advanced and I/O

0	=	None
G	=	0-10 V
H	=	0.5-4.5 V
J	=	4-20 mA
K	=	PWM 10-90% (Only IC Advanced)
L	=	PWM 20-80% (Only IC Advanced)
X	=	Special

IC Parallel

Z	=	Parallel

Parallel mode

0	=	None OR Non-critical Parallel
2-8	=	Critical Parallel

* Actuators with Ethernet/IP are only compatible with Plug type E and Cable type P (ordering number: 0257079)

** Cable options K, Y, Z and L are only available with Plug type C.

Technical specifications

12 V

Motor type	Load max. (N)	Self-lock max. (N) Push	Self-lock max. (N) Pull	Pitch (mm/ spindle rev.)	Hall resolution (mm/count)	Typical speed (mm/s)		Standard stroke lengths (mm)	Typical amp (A)	
						No load	Full load		No load	Full load
BDC Standard	750	750	375	2	0.1	14	8	19-130	0.4	3.0
BDC Fast	750	750	375	2	0.1	22	15	19-130	0.4	4.2
BDC Standard	300	150	150	4	0.2	27	20	19-130	0.4	1.7
BDC Fast	300	100*	100*	4	0.2	43	36	19-130	0.5	2.6

24 V

Motor type	Load max. (N)	Self-lock max. (N) Push	Self-lock max. (N) Pull	Pitch (mm/ spindle rev.)	Hall resolution (mm/count)	Typical speed (mm/s)		Standard stroke lengths (mm)	Typical amp (A)	
						No load	Full load		No load	Full load
BDC Standard	750	750	375	2	0.1	14	8	19-130	0.2	1.6
BDC Fast	750	750	375	2	0.1	22	16	19-130	0.2	2.5
BDC Standard	300	150	150	4	0.2	28	24	19-130	0.2	0.9
BDC Fast	300	100*	100*	4	0.2	45	38	19-130	0.3	1.3

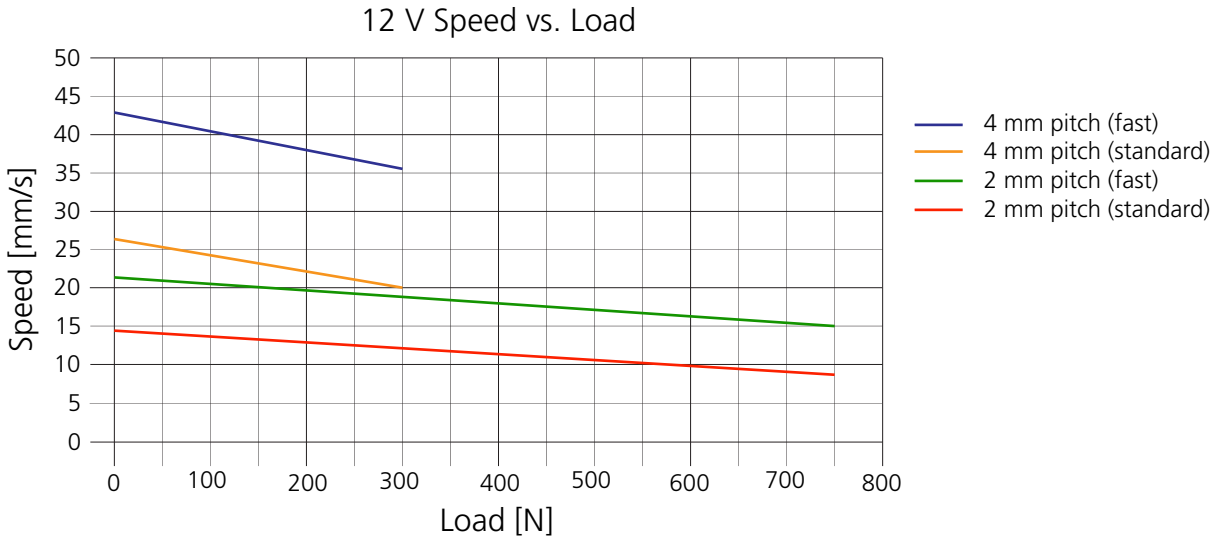
*Estimated values.

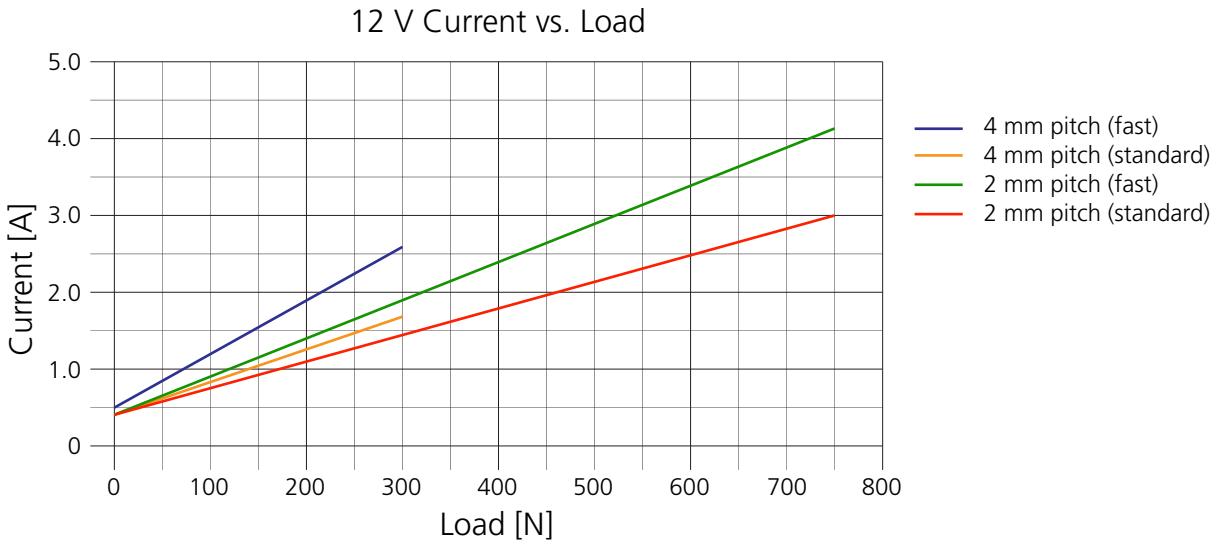
- To ensure maximum self-locking ability, please make sure that the motor is shorted when stopped. Actuators with Integrated Controller provide this feature, as long as the actuator is powered.
- When using soft stop on a DC-motor, a short peak of higher voltage will be sent back towards the power supply. It is important when selecting the power supply that it does not turn off the output when this backwards load dump occurs.

- A Hall count occurs every time the signal changes state (high to low or vice versa). Two Hall counts (positive and negative) create a Hall pulse.
- The typical values can have a variation of ± 20% on the current values and ± 10% on the speed values. Measurements are made with an actuator in connection with a stable power supply and an ambient temperature of 20°C.
- Please note that all actuators featuring 'soft stop towards endstop' will run at a regulated speed, which is typically around 80% of the nominal speed.

Speed and current curves

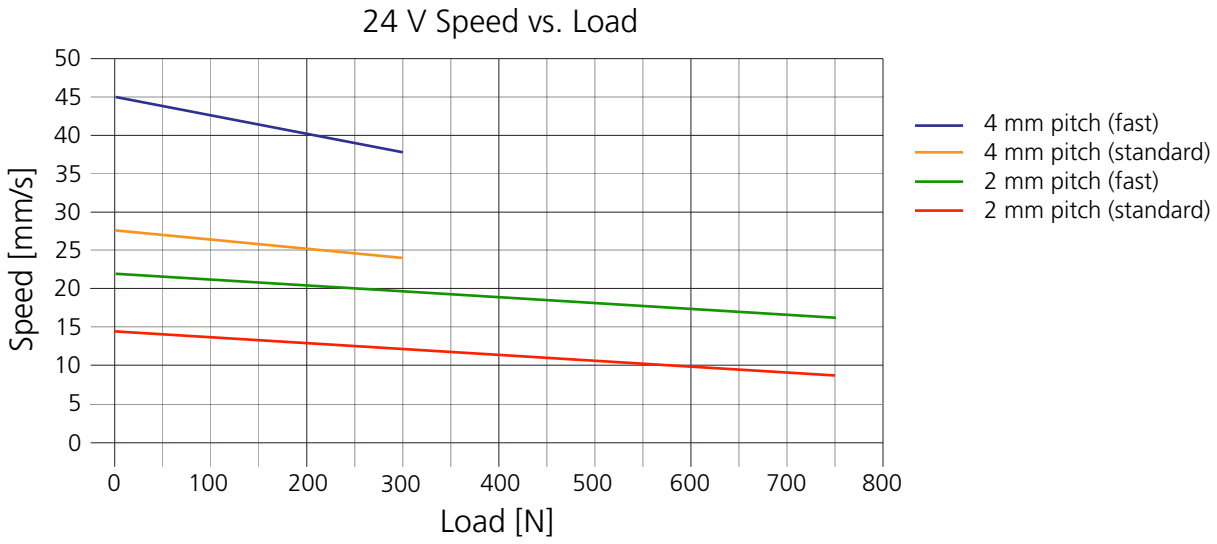
The charts below display typical values made with a nominal power supply and an ambient temperature of 20°C.

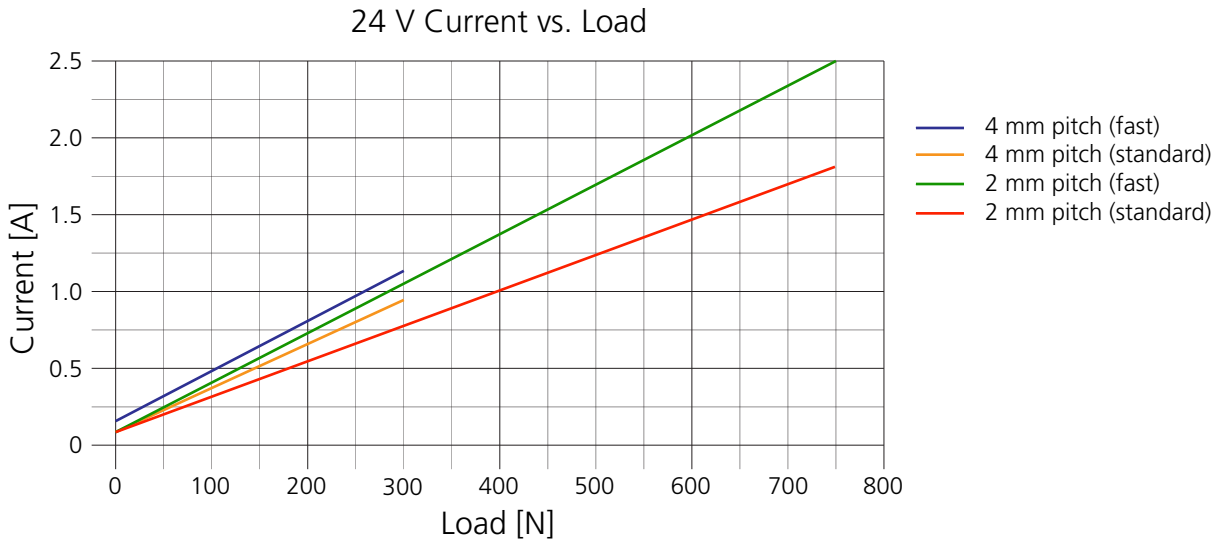




Speed and current curves

The charts below display typical values made with a nominal power supply and an ambient temperature of 20°C.





Current limits

If the actuator's current consumption rises above the set limit, the actuator regulates and tries to keep it below the set current limit by reducing the PWM and therefore also the speed accordingly. The actuator does this continuously, until the actuator stops moving (mechanically blocked). If there are no changes to the Hall feedback signal during the set time frame, the integrated controller will cut power to the H-bridge motor circuit.

If the actuator is stopped due to the above-mentioned criteria, it automatically drives slightly in the opposite direction to reduce the torque in a blocking situation.

For more detailed information, please see the I/O interface manual.

Platform		12 V	24 V	Reference temperature: 0°C
A B C E F G H P Q S T	IO-Link (8-pin) I/O Basic I/O Customised Ethernet/IP I/O Full CAN bus J1939 CANopen Profinet Modbus RTU IO-Link (12-pin) Modbus TCP/IP	8 A	5 A	Above
		9 A	6 A	Below

Current cut-offs

The principle behind the current cut-off measurement is an ‘above limit’ and a ‘below limit’ accumulating counter. When the time-out counter reaches a specific value the current cut-off goes into effect. The time-out value is pre-set at 500 ms.

Platform		12 V	24 V	Reference temperature: 0°C
3 6 7 9	IC (Not for OpenBus™) LIN bus CAN bus J1939 CANopen	8 A	5 A	Above
		8 A	8 A	Below

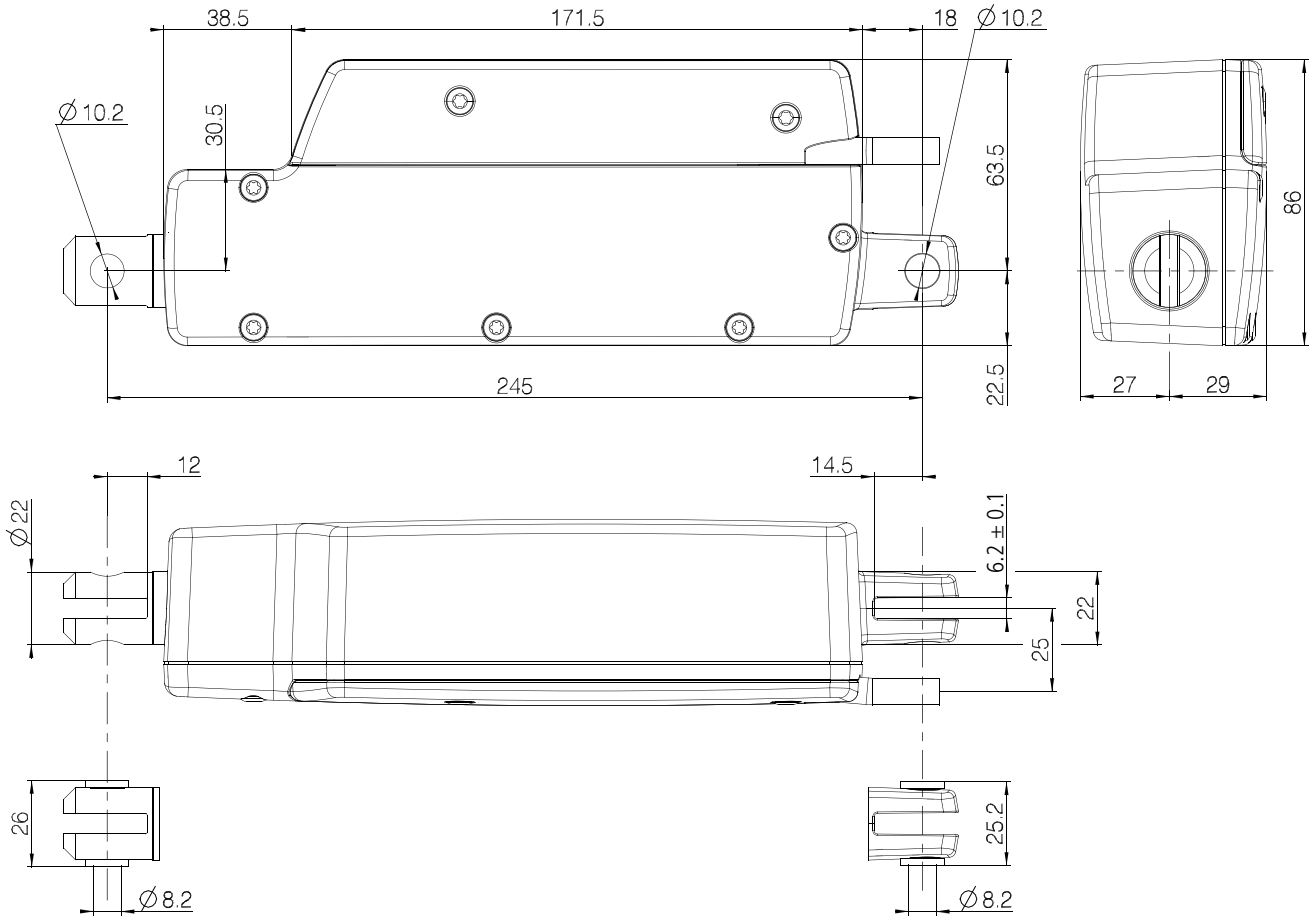
Stroke and built-in tolerances

Platforms		Stroke tolerance	Example for 130 mm stroke	BID tolerance	Example for 245 mm BID
0	None with built-in limit switches or Zero Point	+2/- 2 mm	128 to 132 mm	+2/- 2 mm	243 to 247 mm
A B C E F G H P Q S T	IO-Link (8-pin) I/O Basic I/O Customised Ethernet/IP I/O Full CAN J1939 CANopen Profinet Modbus RTU IO-Link (12-pin) Modbus TCP/IP	+1/-3 mm	127 to 131 mm	+2/- 2 mm	243 to 247 mm
All	All with Piston Rod Eye (PRE): K and L*	-	-	+2/- 2 mm	254 to 258 mm

*BID is 11 mm longer with PRE: K and L

Dimensions

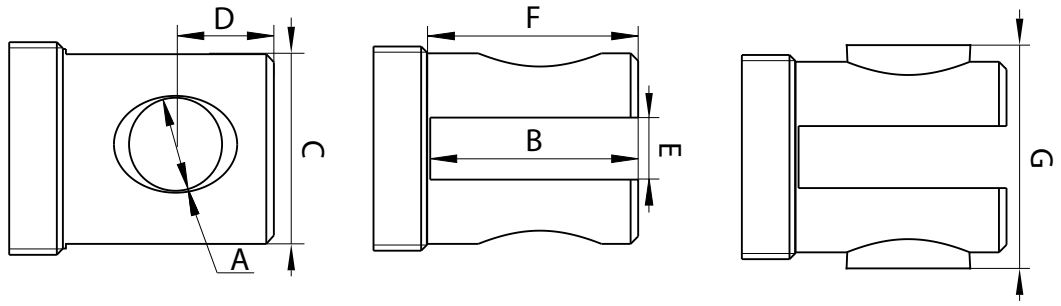
All dimensions are in mm



Piston rod eyes

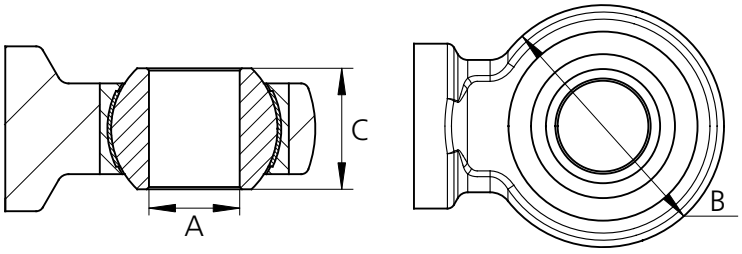
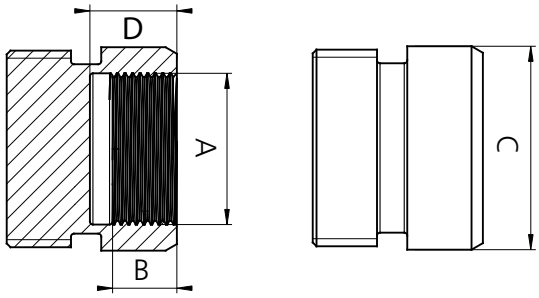
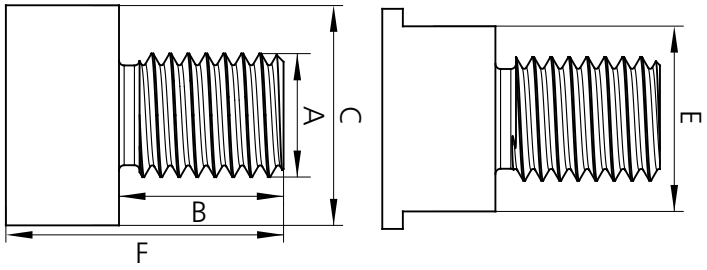
All dimensions are in mm. The piston rod eye is only allowed to turn 0 - 180°.

Option	Piston rod eye	Material	A	B	C	D	E	F (~)	G	Bushing	Change in BiD	P/N
1	Slotted	Automatic steel	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231033
A	Slotted	AISI 304	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231096
2	Slotted	Automatic steel	12.3 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231016
B	Slotted	AISI 304	12.3 ± 0.1	25 ± 0.3	21.8 ± 0.1	13± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231095
3	Slotted	AISI 304	12.3 ± 0.07	28.2 ± 0.4	21.7 ± 0.1	11 ± 0.3	6.3 ± 0.2	30 ± 0.2	-	No	+5	0301244
C	Slotted	AISI 304	8.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	26	Yes	0	0231096
4	Slotted	AISI 303	12.3 +0.05/ -0.07	28.1 ± 0.1	21.7 ± 0.1	11 ± 0.3	6.2 ± 0.1	30 ± 0.2	-	No	+5	031923
D	Slotted	AISI 304	10.2 ± 0.1	28.2 ± 0.4	21.7 ± 0.1	11 ± 0.3	6.3 ± 0.2	30 ± 0.2	26	Yes	+5	0301244
5	Slotted	Automatic steel	8.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	26	Yes	0	0231033
E	Slotted	AISI 303	10.2 ± 0.1	28.1 ± 0.1	21.7 ± 0.1	11 ± 0.3	6.2 ± 0.1	30 ± 0.2	26	Yes	+5	031923
6	Slotted	Automatic steel	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	26	Yes	0	0231016
9	Slotted	Automatic steel	12.9 ± 0.1	25 ± 0.1	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0331014



Piston rod eyes

All dimensions are in mm. The piston rod eye is only allowed to turn 0-180°.

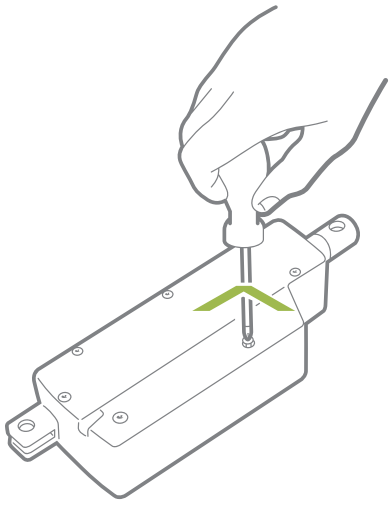
Option	Piston rod eye	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
K	Ball eye	AISI 304	10H7	Ø28	14 +0 / -0.12	-	-	-	+ 11	0351053
L	Ball eye	AISI 304	12H7	Ø32	16 +0 / -0.12	-	-	-	+ 11	0351055
										
F	Female adaptor	AISI 303	M8	8 ± 0.5	21.7	10 ± 0.2	-	-	-10	0251039
										
M	Male adaptor	AISI 304	M12 x 1.75	16 ± 0.1	21.3 ± 0.1	-	-	-	-3	0231094
										

Back fixture orientation

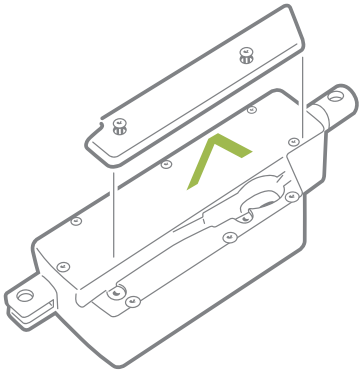
"0" Degrees

"90" Degrees

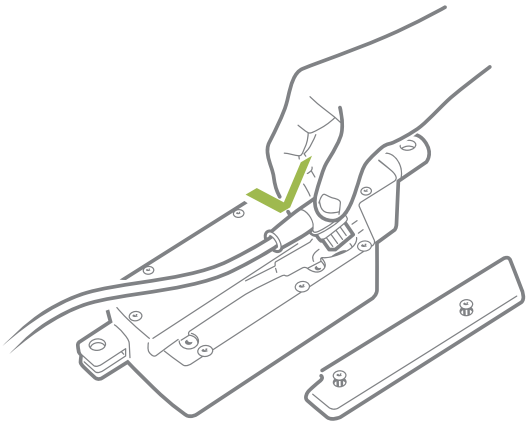
Cable mounting



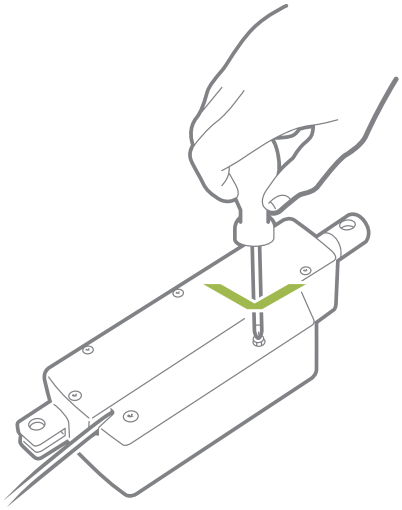
1. Unscrew the cover



2. Remove the cover



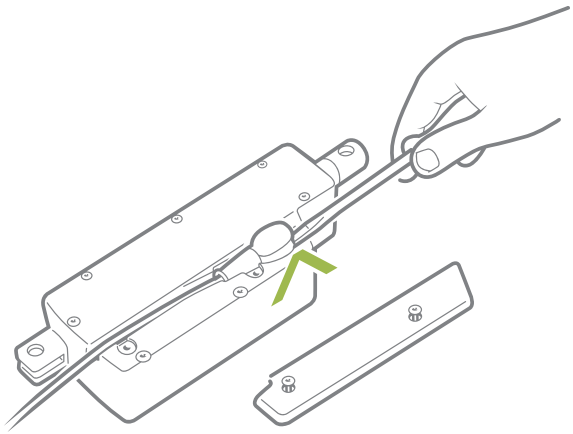
3. Plug in the cable gently without using any tools



4. Screw the cover back onto the actuator

The torque of the cover screw is approx. 1.5 Nm

Removing cables



5. Use a screwdriver to pull up the cable

When changing the cables on a LINAK® actuator, it is important that this is done carefully, in order to protect the plugs and pins. Before the new cable is mounted, we recommend that the socket is greased with Vaseline®, to keep the high IP protection and ensure an easy mounting. Please be sure that the plug is in the right location and fully pressed in before the cable lid is mounted.

Please note that if the cables are mounted and dismounted more than 3 times the plugs can be damaged. Therefore, we recommend that such cables are discarded and replaced.

Also note that the cables should not be used for carrying the actuator.

We recommend to take some precaution and design the wire connection in a way, where the cable end is kept inside a closed, protected area to guarantee the high IP protection.

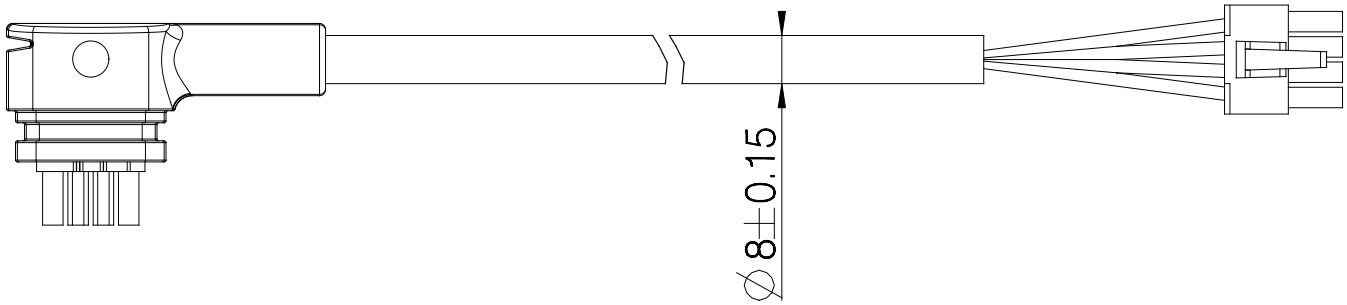
NOT valid for ATEX cables, please refer to the ATEX section for correct cable mounting on ATEX actuators.

Cables

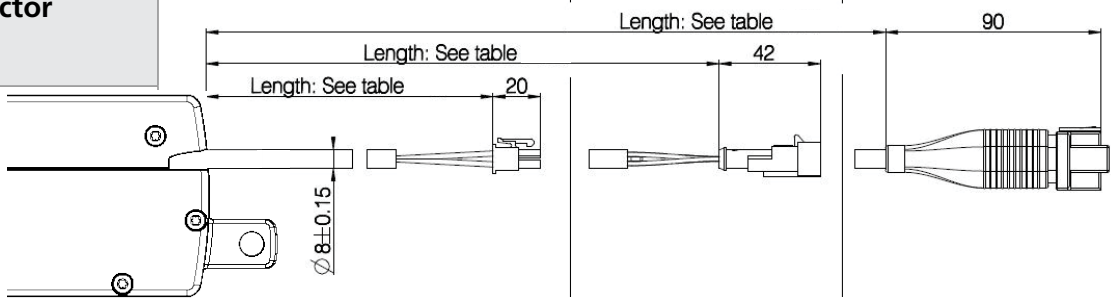
Power + signal cable dimensions

LINAK P/N: 0147032 (Only for Standard actuators)

Colour	Outer dimensions	Core mm²	AWG
Brown	Ø1.8 mm	1.0	18
Blue	Ø1.8 mm	1.0	18
Violet	Ø1.8 mm	1.0	18
Black	Ø1.8 mm	1.0	18
Red	Ø1.8 mm	1.0	18
Yellow	Ø1.8 mm	1.0	18
Green	Ø1.8 mm	1.0	18
White	Ø1.8 mm	1.0	18



8-pin connector cable item numbers

Connector	C	J/K	I/L
			

Ordering no.	LINAK P/N	Length (mm)		Length (mm)		Length (mm)	
S	0147001 - 850	CS	750 ±30	JS/KS	725 ±30	IS/LS	680 ±30
T	0147001 - 1600	CT	1500 ±30	JT/KT	1475 ±30	IT/LT	1430 ±30
R	0147001 - 5100	CR	4900 ±50	JR/KR	4875 ±50	IR/LR	4830 ±50
V	0147001 - 10100	CV	10000 ±100	JV/KV	9975 ±100	IV/LV	9930 ±100

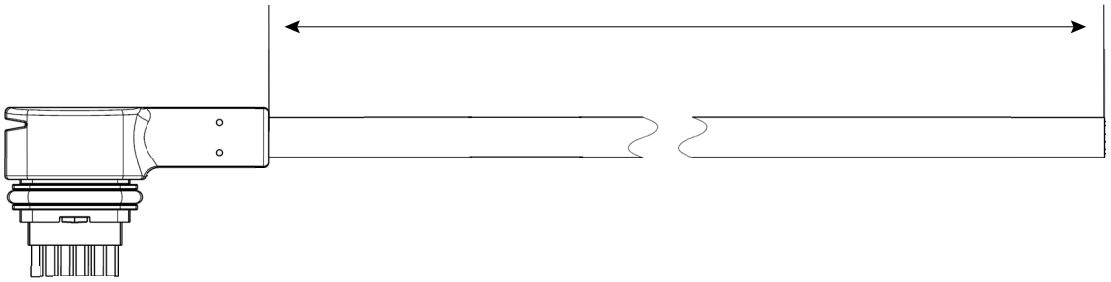
*AWG: American Wire Gauge

Cables

Power + signal cable dimensions

LINAK P/N: 0257057 (Only for actuators with I/O, CAN bus J1939, CANopen, IO-Link Parallel and Modbus RTU Parallel)

Colour	Outer dimensions	Core mm²	AWG
Grey	Ø1.5 mm	0.5	20
Light Blue	Ø1.5 mm	0.5	20
Yellow	Ø1.5 mm	0.5	20
Red	Ø1.5 mm	0.5	20
White	Ø1.5 mm	0.5	20
Violet	Ø1.5 mm	0.5	20
Orange	Ø1.5 mm	0.5	20
Green	Ø1.5 mm	0.5	20
Black	Ø1.5 mm	0.5	20
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18



12-pin connector cable item numbers

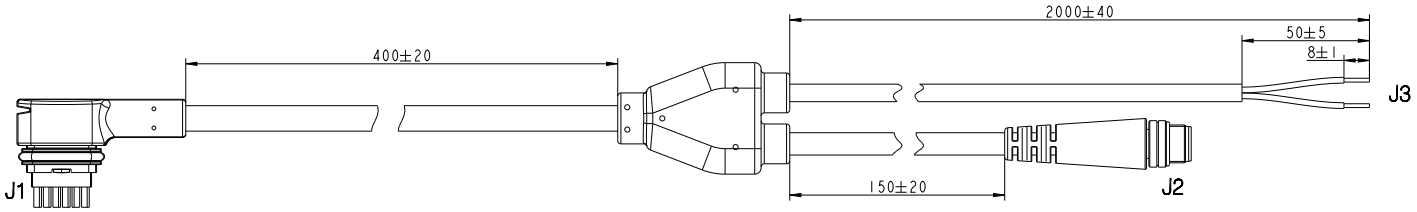
Cable P/N Table				
Ordering no.	**LINAK P/N**	**Cable type**	**# Wires**	**Length in mm**
K	0257057 - 850	Power + signal	11	850 ± 30
Y	0257057 - 1600	Power + signal	11	1600 ± 30
Z	0257057 - 5100	Power + signal	11	5100 ± 50
L	0257057 - 10100	Power + signal	11	10100 ± 100

Cables

Power + signal cable dimensions

LINAK P/N: 0257077 (Only for actuators with IO-Link)

Colour	Outer dimensions	Core mm²	AWG
J1			
Grey	Ø1.5 mm	0.5	20
Light Blue	Ø1.5 mm	0.5	20
Yellow	Ø1.5 mm	0.5	20
Red	Ø1.5 mm	0.5	20
White	Ø1.5 mm	0.5	20
Violet	Ø1.5 mm	0.5	20
Orange	Ø1.5 mm	0.5	20
Green	Ø1.5 mm	0.5	20
Black	Ø1.5 mm	0.5	20
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18
J2			
Grey	Ø1.8 mm	1	18
Light Blue	Ø1.8 mm	1	18
Orange	Ø1.8 mm	1	18
J3			
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18

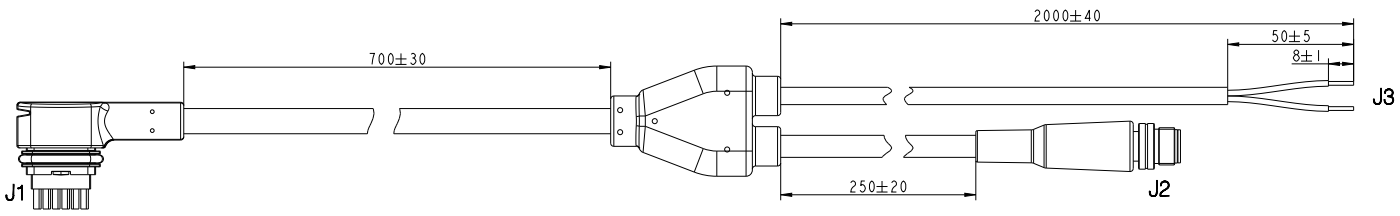


Cables

Power + signal cable dimensions

LINAK P/N: 0257078 (Only for actuators with Modbus RTU)

Colour	Outer dimensions	Core mm²	AWG
J1			
Grey	Ø1.5 mm	0.5	20
Light Blue	Ø1.5 mm	0.5	20
Yellow	Ø1.5 mm	0.5	20
Red	Ø1.5 mm	0.5	20
White	Ø1.5 mm	0.5	20
Violet	Ø1.5 mm	0.5	20
Orange	Ø1.5 mm	0.5	20
Green	Ø1.5 mm	0.5	20
Black	Ø1.5 mm	0.5	20
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18
J2			
Light Blue	Ø1.8 mm	0.34	22
Yellow	Ø1.8 mm	0.34	22
Red	Ø1.8 mm	0.34	22
Green	Ø1.8 mm	0.34	22
Black	Ø1.8 mm	0.34	22
J3			
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18

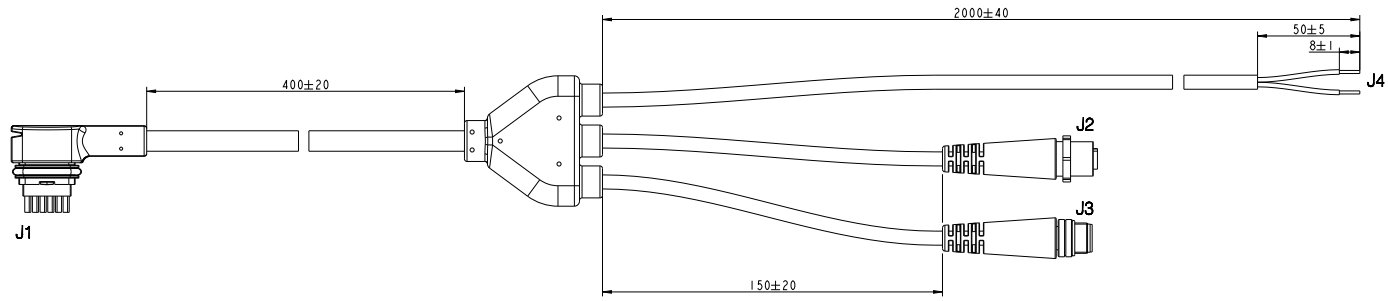


Cables

Power + signal cable dimensions

LINAK P/N: 0257079 (Only for actuators with Ethernet/IP)

Colour	Outer dimensions	Core mm²	AWG
J1			
Grey	Ø1.5 mm	0.5	20
Light Blue	Ø1.5 mm	0.5	20
Yellow	Ø1.5 mm	0.5	20
Red	Ø1.5 mm	0.5	20
White	Ø1.5 mm	0.5	20
Violet	Ø1.5 mm	0.5	20
Orange	Ø1.5 mm	0.5	20
Green	Ø1.5 mm	0.5	20
Black	Ø1.5 mm	0.5	20
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18
J2			
Grey	Ø1.8 mm	0.4	26
Light Blue	Ø1.8 mm	0.4	26
Yellow	Ø1.8 mm	0.4	26
Green	Ø1.8 mm	0.4	26
J3			
Red	Ø1.8 mm	0.4	26
White	Ø1.8 mm	0.4	26
Violet	Ø1.8 mm	0.4	26
Orange	Ø1.8 mm	0.4	26
Black	Ø1.8 mm	0.4	26
J4			
Blue	Ø1.8 mm	1	18
Brown	Ø1.8 mm	1	18



Electrical installation

- To ensure maximum self-locking ability, please be sure that the motor is shorted when stopped. Actuators with integrated controller provide this feature, as long as the actuator is powered.
- When using soft stop on a DC-motor, a short peak of higher voltage will be sent back towards the power supply. It is important when selecting the power supply that it does not turn off the output, when this backwards load dump occurs.
- When using actuators without integrated controller, it is strongly recommended to use a fuse between power supply and actuator.

The power supply for actuators without integrated controller must be monitored externally and cut off in case of current overload.

Environmental tests - Climatic

Test	Specification	Comment
Cold test	EN60068-2-1 (Ab)	Storage at low temperature: Temperature: - 40 °C Duration: 72 h Actuator is not connected/operated Tested at room temperature
	EN60068-2-1 (Ad)	Storage at low temperature: Temperature: -55 °C Duration: 24 h Actuator is not connected Tested at room temperature
	EN60068-2-1 (Ad)	Operating at low temperature: Temperature: -40 °C Duration: 4 h Tested at room temperature within 5 minutes overload
Dry heat	EN60068-2-2 (Bb)	Storage at high temperature: Temperature: +85 °C Duration: 72 h Actuator is not connected/operated Tested at room temperature
	EN60068-2-2 (Bd)	Operating at high temperature: Temperature: +85 °C Duration: 96 h Actuator operated at high temperature
Damp heat	EN60068-2-30 (Db)	Damp heat, cyclic: Relative humidity: 93-98% High temperature: +55 °C in 12 hours Low temperature: +25 °C in 12 hours Duration: 21 cycles in 24 hours Actuator is operated during test
Salt mist	EN ISO 9227	Dynamic salt spray test: Salt solution: 5% sodium chloride (NaCl) Temperature: 35 ± 2 °C Duration: 500 h Actuator is operated
Thermal shock		Dunk test: Actuator is heated to +85 °C for 4 h and submerged into a 0 °C cold salt-water-detergent solution for 2 h Followed by 18 h dry time Duration: 5 cycles

Environmental tests - Climatic

Test	Specification	Comment
Chemicals	BS7691 / 96 hours	Diesel 100% Hydraulic oil 100% Ethylene Glucol 50% Urea Nitrogen saturated solution Liquid lime 10% (Super - Cal) NPK Fertiliser (NPK 16-4-12) saturated Diesel exhaust fluid (DEF) 100% Tested for corrosion
Degrees of protection	EN60529 - IP66	IP6X - Dust: Dust-tight: no ingress of dust Actuator is not activated
	EN60529 - IP66	IPX6 - Water: Ingress of water in quantities causing harmful effects is not allowed Duration: 100 litres pr. minute in 3 minutes Actuator is not activated
	DIN40050 - IP69K	IPX9K: High pressure cleaner. Temperature: +80 °C Water pressure: 80-100 bar Water flow: 14-16 l/min Duration: 30 sec. each at 4 different angles: 0°, 30°, 60° and 90° Actuator is not activated Ingress of water in quantities causing harmful effects is not allowed
Rain		Dynamic rain test: Actuators exposed to continuous rain. Actuators operated and side loaded with 10 N Duration: 10,000 cycles and 240 h

Environmental tests - Mechanical

Test	Specification	Comment
Free fall		3 drops on 6 faces onto a steel plate Drop height: 300 mm onto the piston rod eye, 500 mm on all other faces
Shock	EN60068-2-27:2009	Peak Pulse Amplitude: 50 G Pulse Duration: 11 ms Number of pulses: 18 total - 3 in each direction for all three axes
Shock	EN60068-2-27:2009	Peak Pulse Amplitude: 30 G. Pulse Duration: 18 ms Number of pulses: 18 total - 3 in each direction for all three axes
Shock	EN60068-2-27:2009	Peak Pulse Amplitude: 25 G Pulse Duration: 6 ms Number of pulses: 6000 total - 1000 in each direction for all three axes
Random vibration	EN60068-2-64:2008	Frequency: 18 Hz to 1000 Hz ASD amplitudes: 18 Hz 0.025 g^2/Hz 150 Hz 0.015 g^2/Hz 1000 Hz 0.0015 g^2/Hz Duration: 2 h/axis

Environmental tests - Electrical

Standard	Specification	FOCUS ON
2004/104/EC	Automotive EMC Directive 2004/104/EC on electrical and electronic car components	VEHICLES AND MOBILITY
EN/IEC 60204-1: 2006 +A1: 2009	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	INDUSTRIAL AUTOMATION
EN/IEC 60204-32: 2008	Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines	INDUSTRIAL AUTOMATION PLATFORMS AND LIFTS
EN/IEC 61000-6-1: 2007	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments	INDUSTRIAL AUTOMATION
EN/IEC 61000-6-2: 2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments	INDUSTRIAL AUTOMATION
EN/IEC 61000-6-3: 2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments	INDUSTRIAL AUTOMATION
EN/IEC 61000-6-4: 2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6: Generic standards - Section 4: Emission standard for industrial environments	INDUSTRIAL AUTOMATION
EN 13309: 2010	Construction machinery	CONSTRUCTION
EN/ISO 13766: 2006	Earth-moving machinery - Electromagnetic compatibility	CONSTRUCTION
EN/ISO 14982: 2009	Agricultural and forestry machines - Electromagnetic compatibility	MOBILE AGRICULTURE OUTDOOR POWER EQUIPMENT
EU recreational crafts directive 94/25/EC		
IECEx / ATEX (Ex) EN60079-0:2012 EN60079-31:2014	This Ex certification allows the actuator to be mounted in Ex dust areas: II 2D Ex tb IIIC T135°C Db Tamb -25°C to +65°C	
CCC Ex	CNCA-C23-01:2019 GB12476.1-2013 GB12476.5-2013	

All electrical and radiated emission (EMC) tests are conducted.

The above standards can all be found in the TRD5694, TRD5836, TRD5837 and TRD5842 documents.

Non-complying standards

Standard	Explanation
IEC 60601-1	Please note that this product cannot be approved according to the medical electrical equipment standard. Due to the combination of the aluminium cast housing and the embedded PCB, we do not fulfill the regulations according to leakage current.

Maintenance

- The actuator must be cleaned at regular intervals to remove dust and dirt, and it must be inspected for mechanical damages or wear.
- Inspect attachment points, wires, piston rod, cabinet, and plug. Also check whether the actuator functions correctly.
- To ensure that the pre-greased inner tube remains lubricated, the actuator must only be washed down when the piston rod is fully retracted.
- The actuator is a closed unit and therefore requires no internal maintenance.
- In order to maintain a proper performance of the spherical eyes and to increase the resistance against environmental wear, we strongly recommend that the spherical eyes (ball bearings) mounted on actuators from LINAK® are greased with anticorrosive grease or similar.

Repair

See warranty disclaimer.

Main groups of disposal

LINAK's products may be disposed of, possibly by dividing them into different waste groups for recycling or combustion.

We recommend that our product is disassembled as much as possible at the disposal and that you try to recycle it.

Product	Metal scrap	Cable scrap	Electronic scrap	Plastic recycling or combustion
LA14	X	X	X	X

Warranty

There is an 18 months' warranty on TECHLINE® products against manufacturing faults starting from the production date of the individual products (see label). LINAK's warranty is only valid in so far as the equipment has been used and maintained correctly and has not been tampered with. Furthermore, the actuator must not be exposed to violent treatment. In the event of this, the warranty will be ineffective/ invalid. For further details, please see standard terms of sale and delivery for LINAK A/S.

Note

Only an authorised LINAK service centre should repair LINAK actuator systems. Systems to be repaired under warranty must be sent to an authorised LINAK service centre.

In order to avoid the risk of malfunction, all actuator repairs must only be carried out by an authorised LINAK Service shop or repairer, as special tools and parts must be used.

If a system is opened by unauthorised personnel there is a risk that it may malfunction at a later date.

The actuator is not to be opened by unauthorised personnel. In case the actuator is opened, the warranty will be invalid.

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