TECHLINE®
IMPROVING FLEXIBILITY

LA14
Data Sheet

LINAK®
WE IMPROVE YOUR LIFE

LINAK.COM/TECHLINE

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.

Safety instructions

Please read this safety information carefully.

Be aware of the following three symbols throughout the user manual:

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 user manual.

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.

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 3.5 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)
- Noise level:
  With standard motor: 50-53 dB (A). With fast motor: 58-63 dB (A)
  Measuring method: DS/EN ISO 3743-1 (actuator not loaded)
- Stainless steel inner tube and zinc-coated steel piston rod eyes
- Colour: Dark olive grey

Options in general

- 12 / 24 V DC permanent magnetic motor
- Load up to 750 N
- Max. speed 45 mm/sec. depending on load and spindle pitch
- Stroke length from 19 to 130 mm (Zero Point: 100 to 130 mm)
- Different back fixtures and piston rod eyes
- Back fixture available in 2 different positions: 0° or 90°
- Stainless steel piston rod eye
- Exchangeable cables in different lengths up to 10 m
- Analogue or digital feedback for precise positioning
- Hall effect sensor
- Zero Point or built-in endstop switches
- Potentiometer for feedback positioning - max. stroke length 100 mm (not with IC)
- Compact design, built-in dimensions 245 mm (up to 345 mm)
- Heavy duty aluminium housing for harsh conditions
- Special anodised housing for extreme environments
- CCC Ex, IECEx/ATEX (Ex) certified for Zone 21
- IC options (see specific platform manuals at the TECHLINE webpage) including:
  - IC
  - I/O
  - Modbus
  - LIN bus
  - CAN bus and CANopen communication
- PC configuration tool (Actuator Connect™ and BusLink)

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
  (further details: page 8-9)
- Ambient operating temperature: -40°C to + 85°C (for IECEx/ATEX: -25°C to +65°C), full performance from +5°C to +40°C
- Storage temperature: -55°C to +105°C

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

Ordering example

14 020 040 00 00 0 A 0 6 = 1 1 0 0 245 0 C S 0 0 0

Type	**14**	=	LA14			
Spindle pitch	**020**	=	2 mm			
	040	=	4 mm			
Stroke length	**XXX**	=	mm			
Safety nut	**00**	=	None			
Feedback	**00**	**=**	**None**			
	0P	=	Potentiometer			
	0K	=	Single Hall			
	0A	=	Hall potentiometer			
	0F	=	PWM			
Platform	**0**	**=**	**None**	B	=	I/O Basic
	3	=	IC	C	=	I/O Customised
	6	=	LIN bus	F	=	I/O Full
	7	=	CAN bus (J1939)	X	=	Special
	9	=	CANopen			
Motor type	**A**	**=**	**12 V DC**			
	B	=	24 V DC			
	C	=	12 V DC Fast			
	D	=	24 V DC Fast			
	X	=	Other			
Endstop	**0**	**=**	**Power switch**			
	1	=	Signal switch			
	2	=	Zero Point			
IP degree	**6**	**=**	**IP66**	9	=	Harsh environment + IP66/IP69K
	T	=	ATEX			
Colour	**=**	**=**	**Dark Olive Grey (NCS S7000-N)**			
Back fixture	**1**	**=**	**0°**	A	=	0° with POM
	2	=	90°	B	=	90° with POM
Piston rod eye	**1**	**=**	**Ø10.2 Zinc-coated steel**	A	=	Ø10.2 AISI 304
	2	=	Ø12.3 Zinc-coated steel	C	=	Ø8.1 AISI 304 + bush
	3	=	Ø12.3 AISI 304	D	=	Ø10.2 AISI 304 + bush
	4	=	Ø12.3 AISI 303	E	=	Ø10.2 AISI 303 + bush
	5	=	Ø8.1 Zinc-coated steel + bush	F	=	Female adapter M8
	6	=	Ø10.2 Zinc-coated steel + bush	K	=	Ball eye Ø10H7
				L	=	Ball eye Ø12H7
				M	=	Male adapter M12 AISI 304
				X	=	Special
Position	**0**	**=**	**No endstop reached signal**			
	1	=	Endstop reached signal			

Ordering example

Brake	**0**	=	**None**
BID	**245**	=	**mm** (min. length)
	XXX	=	mm
Fire category	**0**	=	**None**
Plug type	0	=	None
	C	=	**Flying leads**
	I	=	Deutsch (DT4) Moulded
	J	=	Deutsch (DT4)
	K	=	AMP Superseal
	L	=	AMP Superseal Moulded
	X	=	Special
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)
	Y	=	Straight 1.5 m (11-core)
	Z	=	Straight 5 m (11-core)
	X	=	Special
Safety factor	**0**	=	**2.0**

Feedback level

None

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

CAN / CANopen / LIN bus

0	=	None

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 (Not I/O)

Z	=	Parallel

Parallel mode	**0**	=	**Non-Critical Parallel (Not for I/O)**
	2-8	=	Critical Parallel (Count of actuators)

Technical specifications

12 V

Order number	Push/ Pull Load max. (N)	Self-lock max. (N) Push	Self-lock max. (N) Pull	Pitch (mm/ spindle rev.)	*Typical speed (mm/s)		Standard stroke length (mm)	*Typical amp. (A)	
					No load	Full load		No load	Full load
14020xxxxxxxxA...	750	750	375	2	14	8	19-130	0.4	3.0
14020xxxxxxxxC...	750	750	375	2	22	15	19-130	0.4	4.2
14040xxxxxxxxA...	300	150	150	4	27	20	19-130	0.4	1.7
14040xxxxxxxxC...	300	100**	100**	4	43	36	19-130	0.5	2.6

24 V

Order number	Push/ Pull Load max. (N)	Self-lock max. (N) Push	Self-lock max. (N) Pull	Pitch (mm/ spindle rev.)	*Typical speed (mm/s)		Standard stroke length (mm)	*Typical amp. (A)	
					No load	Full load		No load	Full load
14020xxxxxxxxB...	750	750	375	2	14	8	19-130	0.2	1.6
14020xxxxxxxxD...	750	750	375	2	22	16	19-130	0.2	2.5
14040xxxxxxxxB...	300	150	150	4	28	24	19-130	0.2	0.9
14040xxxxxxxxD...	300	100**	100**	4	45	38	19-130	0.3	1.3

* 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.

** Estimated values.

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.

Special anodised housing

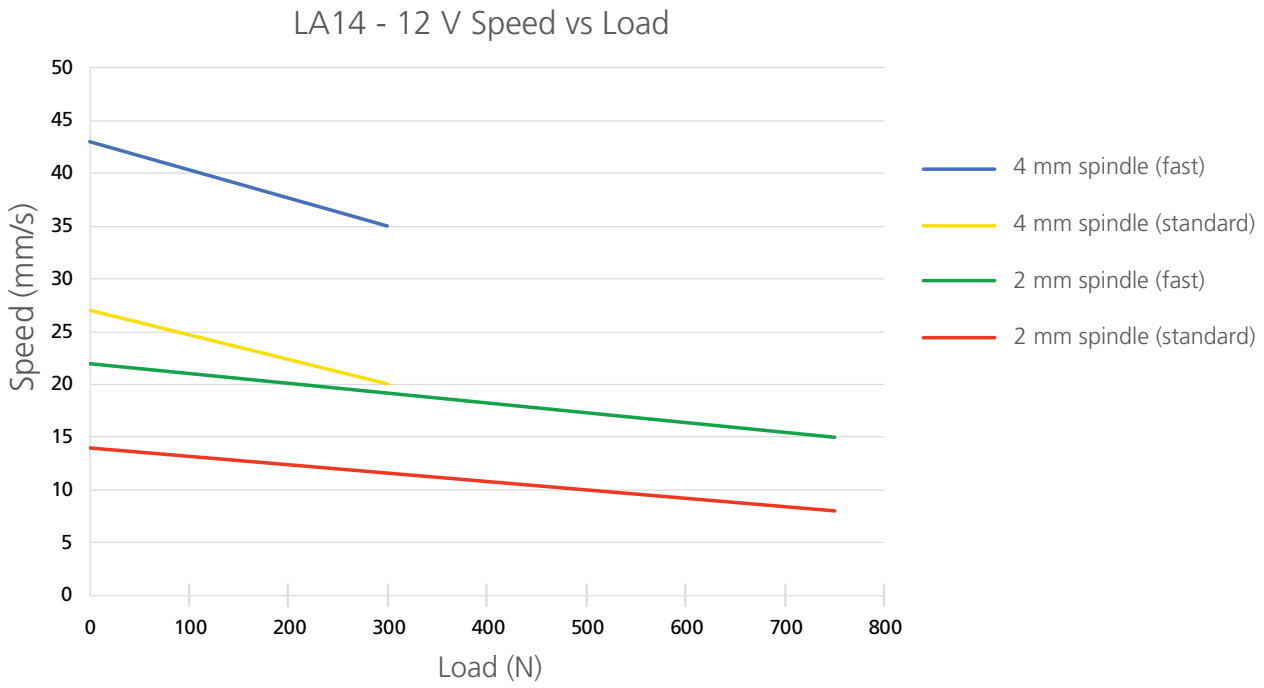
This housing should be recommended for use in particularly harsh environments such as stables, where the actuator is in contact with extremely corrosive liquids and/or vapours - e.g. ammoniac.

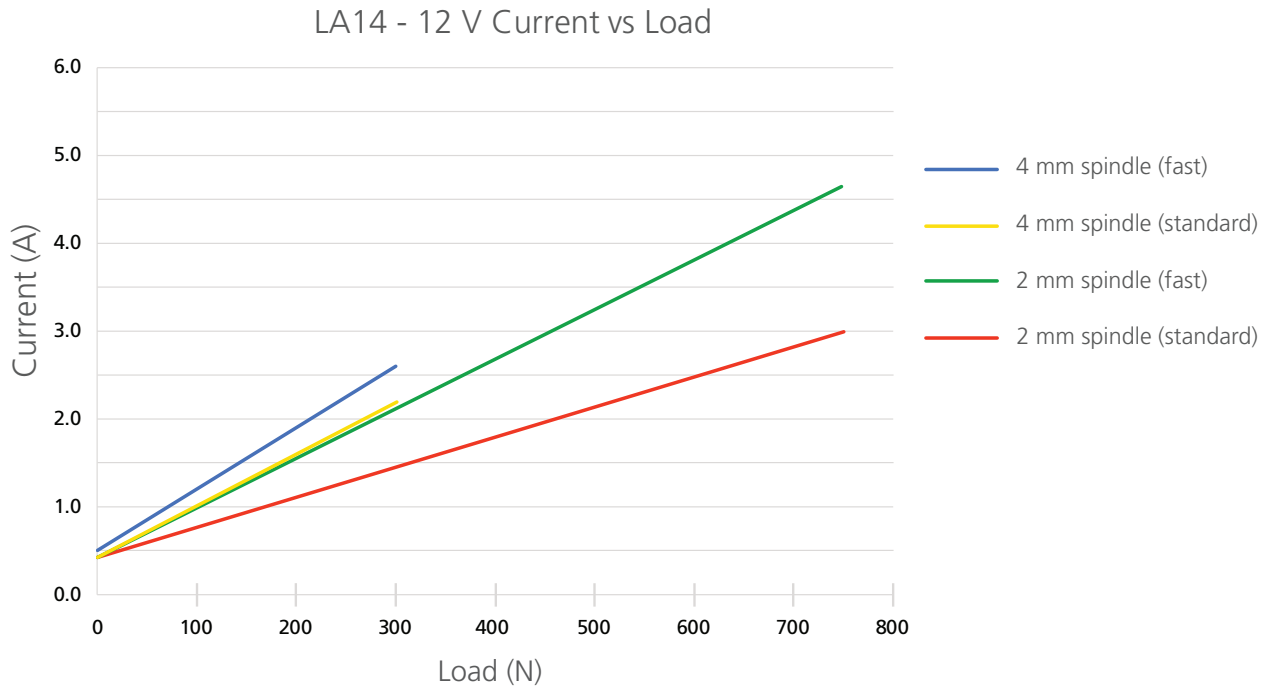
The anodised housing option (i.e. harsh environment housing) embodies a special surface treatment of the aluminium housing in order reduce corrosion of the housing and avoid any vapours or liquids entering the actuator.

The anodised housing is certified IP66/IP69K, and it is only available in black.

Speed and current curves

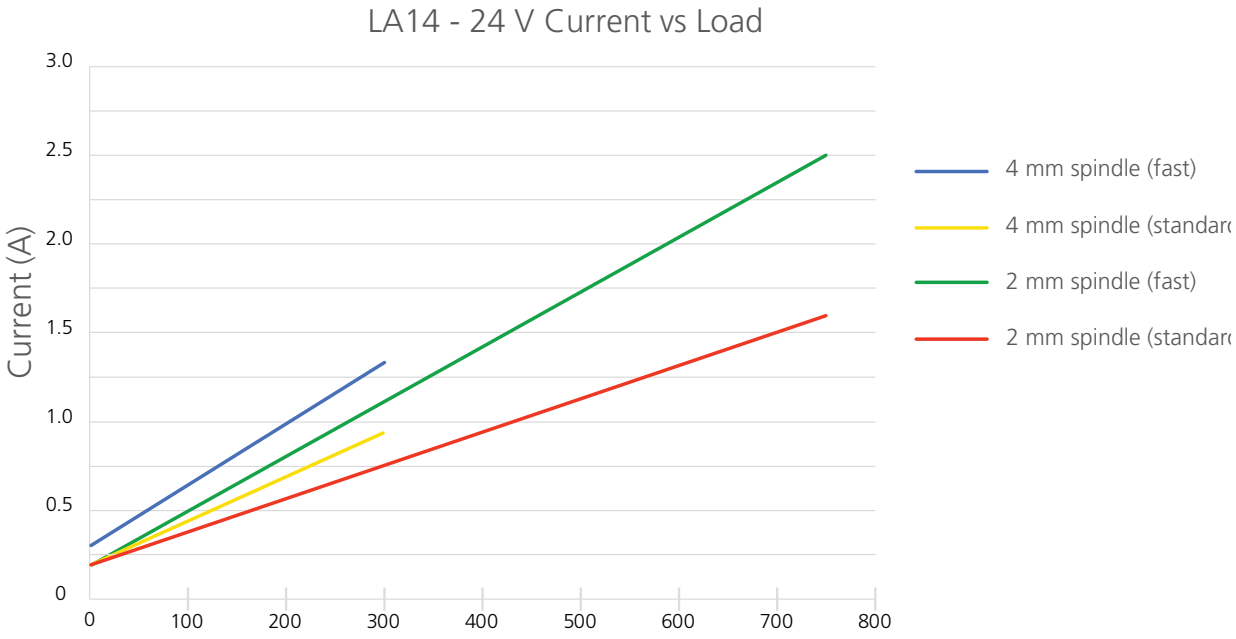
The typical values below are made with a nominal power supply of 12 V DC and an ambient temperature of 20°C.



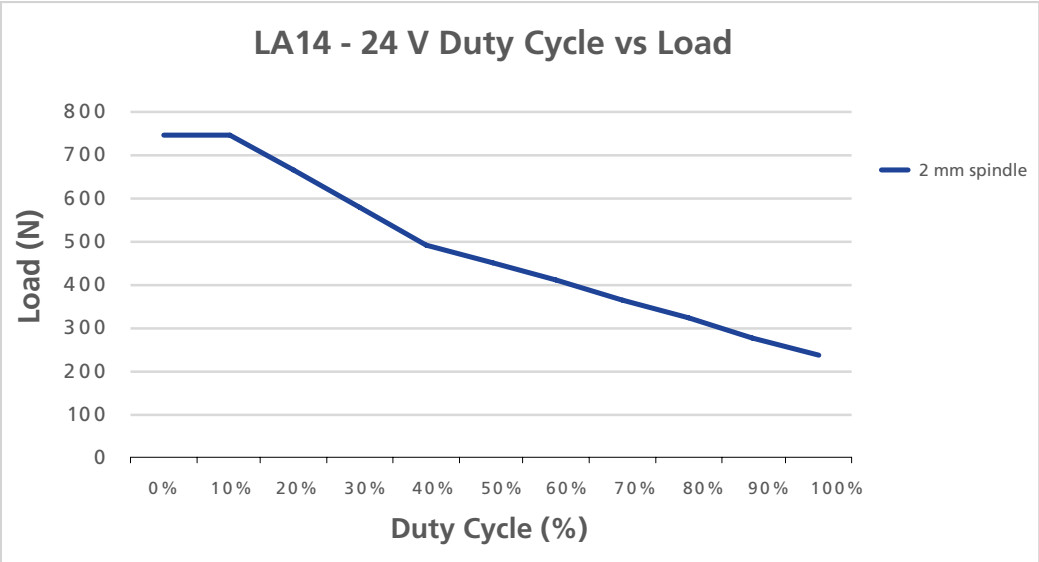


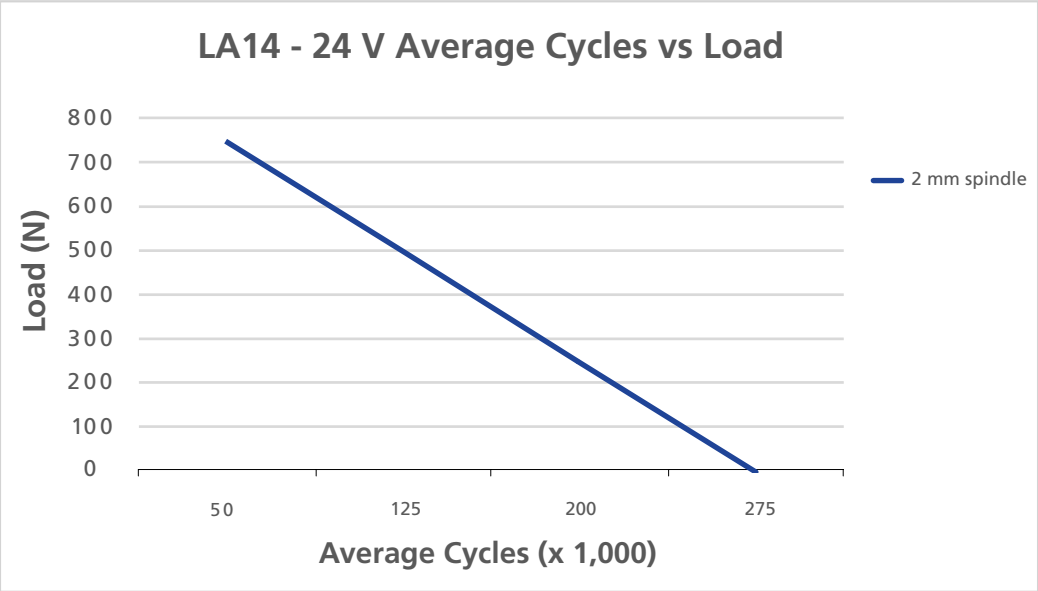
Speed and current curves

The typical values below are made with a nominal power supply of 12 V DC and an ambient temperature of 20°C.



Duty cycle - 24 V





Current limits

Platform	Movement	12 V	24 V	Temperature
9-pin Zero Point B: I/O Basic C: I/O Customised F: I/O Full	Outwards	8 A	5 A	Above
	Inwards	8 A	5 A	
	Reference temperature 0°C			
	Outwards	16 A	10 A	Below
	Inwards	16 A	10 A	

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) - something that is determined by monitoring the Hall feedback signal. 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.

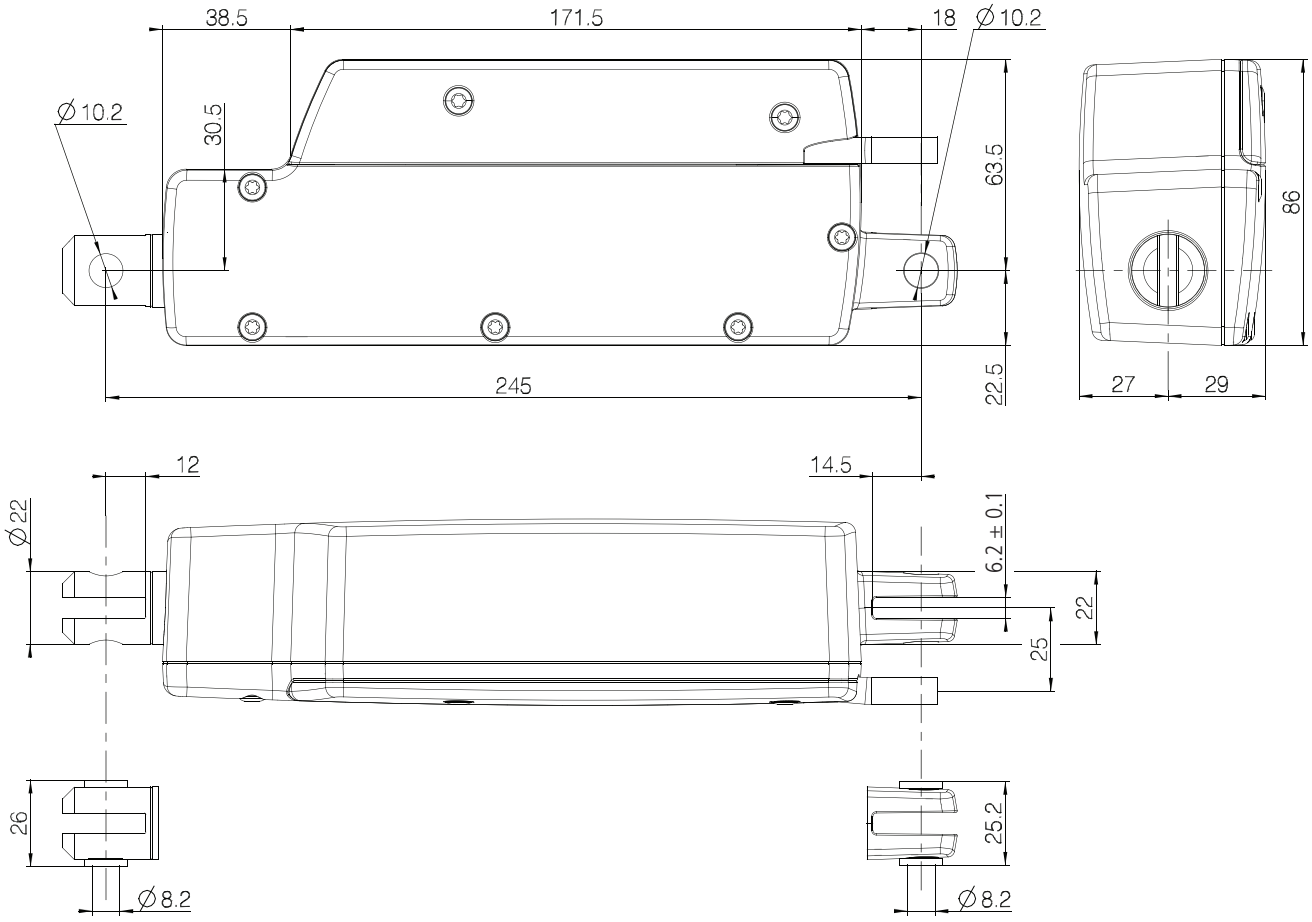
If the actuator is stopped due to the above-mentioned criteria, it automatically drives slightly in the opposite direction to reduce the torque in a blocking situation.

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 200 ms.

Platform	Movement	12 V	24 V	Temperature
6-pin Endstop switch 3: IC 6: LIN bus 7: CAN bus (J1939) 9: CANopen	Outwards	8 A	5 A	Above reference
	Inwards	8 A	5 A	
	Reference temperature 0°C			
	Outwards	9 A	9 A	Below reference
	Inwards	9 A	9 A	

Built-in dimensions



Stroke tolerances

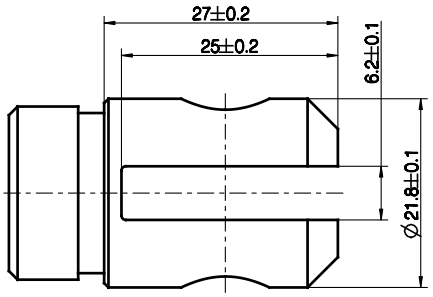
Platform options	Description	Stroke tolerance	Example for 130 mm stroke
14XXXXXXXXXX0	With built-in limit switches or Zero Point	+2/- 2 mm	128 to 132 mm
14XXXXXXXXXX3	Integrated controller	+1/-3 mm	127 to 131 mm

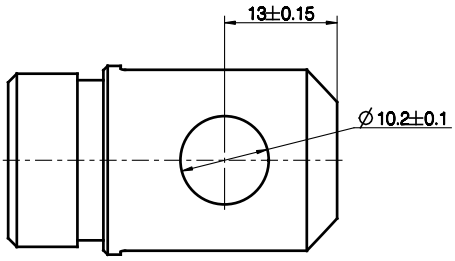
Built-in dimension tolerances

Platform Options	Description	BID tolerance	Example for 245 mm BID
14XXXXXXXXXXX	All variants	+2/- 2 mm	243 to 247 mm
Piston Rod Eye (PRE): K and L	BID is 11 mm longer with PRE: K and L	+2/- 2 mm	254 to 258 mm

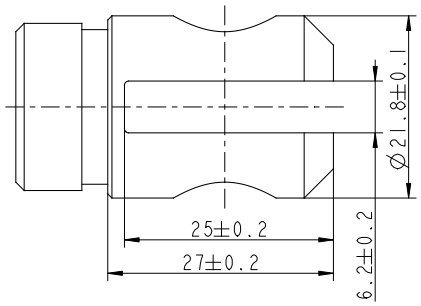
Piston rod eyes

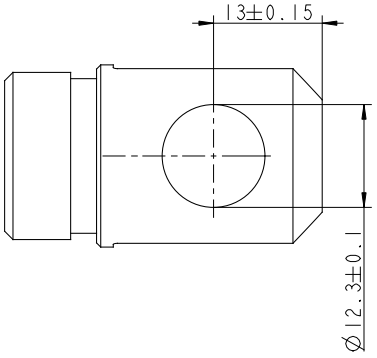
Option “1” and “A”
Piston 0231033, zinc-coated steel
Piston 0231096, stainless steel AISI 304



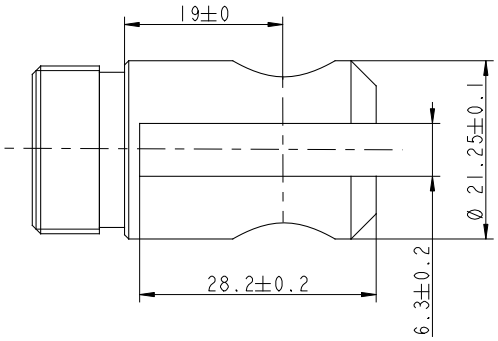


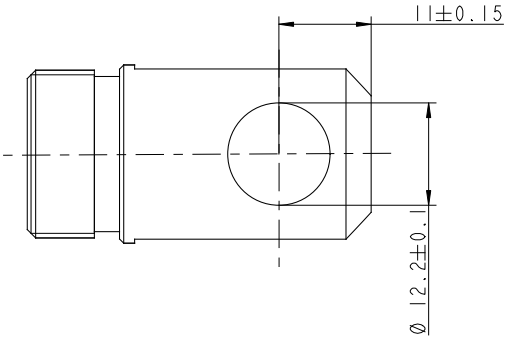
Option “2”
Piston 0231016, zinc-coated steel





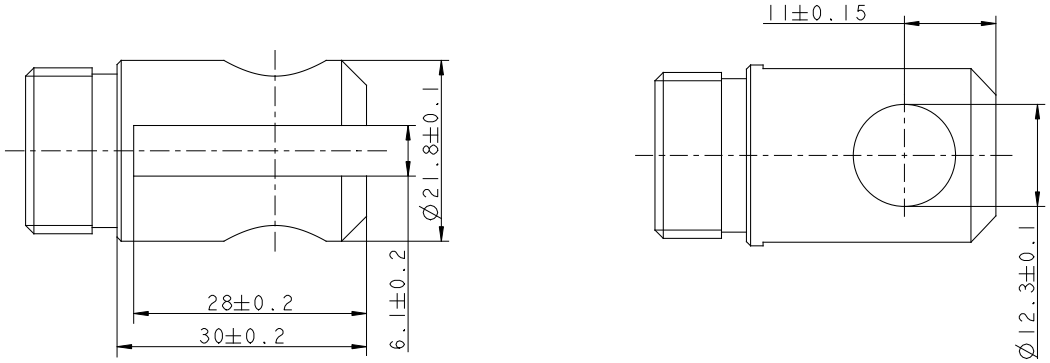
Option “3”
Piston 0301244, stainless steel AISI 304



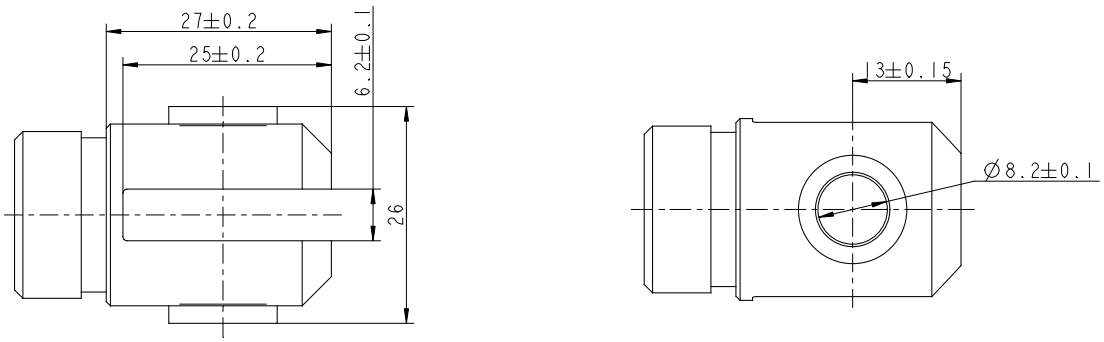


Piston rod eyes

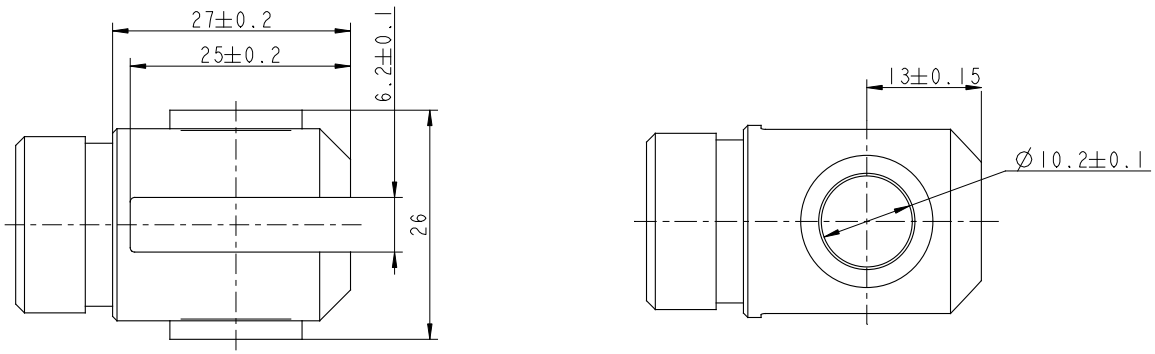
Option "4"
Piston 031923, stainless steel AISI 303



Option "5" and "C"
Piston 0231033 with bushings, zinc-coated steel
Piston 0231096 with bushings, stainless steel AISI 304

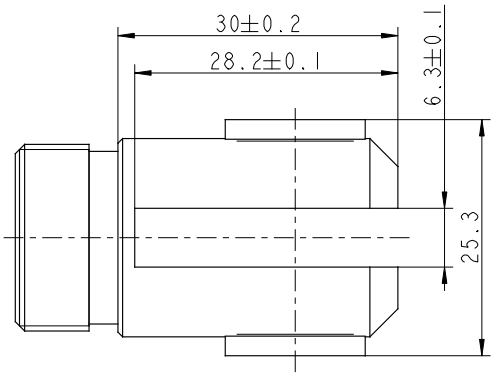


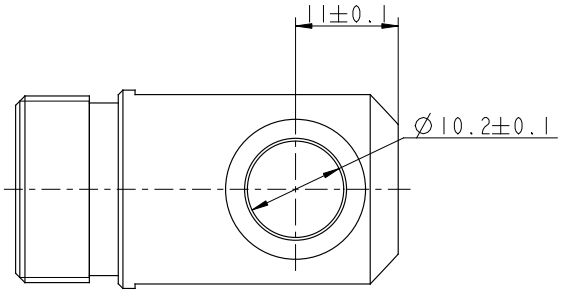
Option "6"
Piston 0231016 with bushings, zinc-coated steel



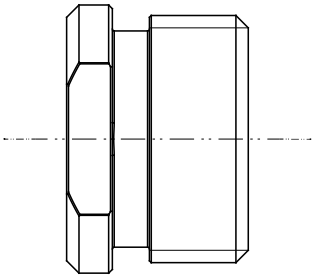
Piston rod eyes

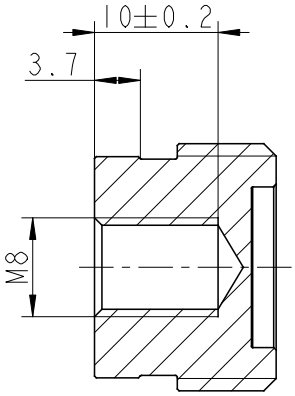
Option “D” and “E”
Piston 0301244 with bushings, stainless steel AISI 304
Piston 031923 with bushings, stainless steel AISI 303



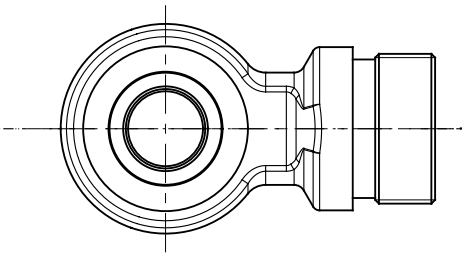


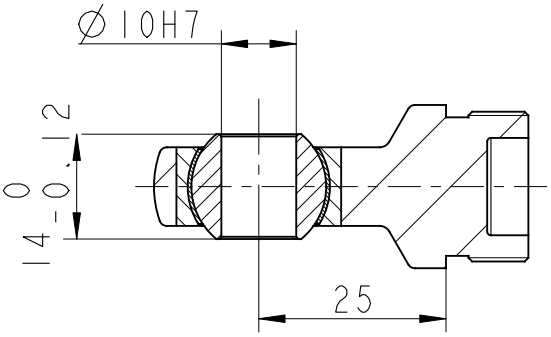
Option “F”
Piston 0251039, stainless steel AISI 303





Option “K”*
Piston 0351043, stainless steel AISI 304

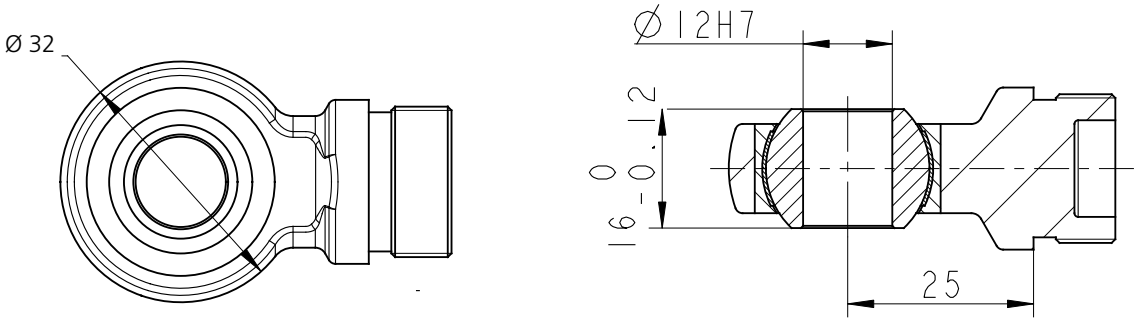




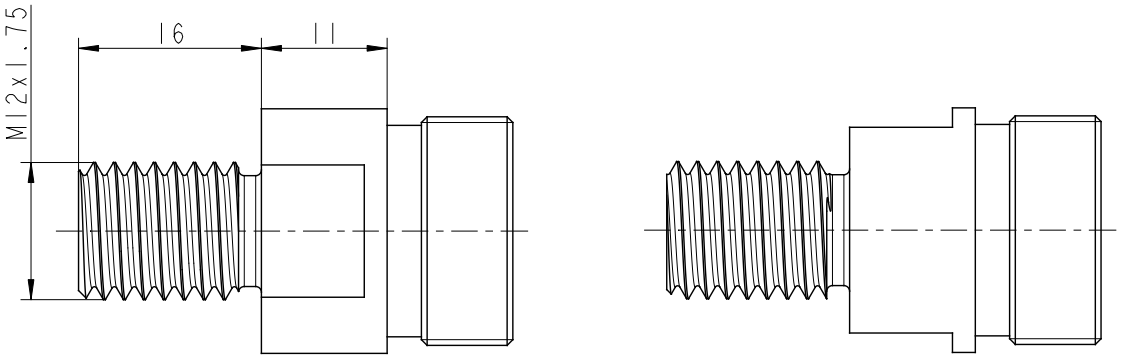
* With piston rod eye version 'K', the BID is standard plus 11 mm

Piston rod eyes

Option "L"*
Piston 0351035, stainless steel AISI 304



Option "M"
Piston 0231094, stainless steel AISI 304



* With piston rod eye version 'L', the BID is standard plus 11 mm.

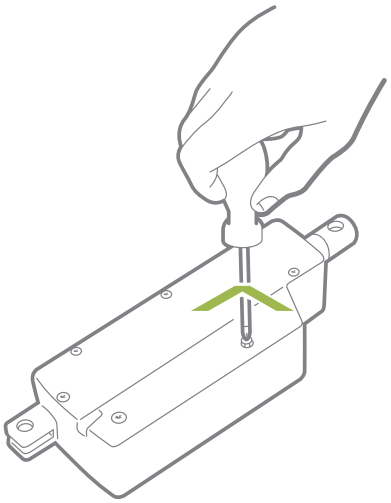
The piston rod eye is only allowed to turn 0 - 90 degrees.

Back fixture orientation

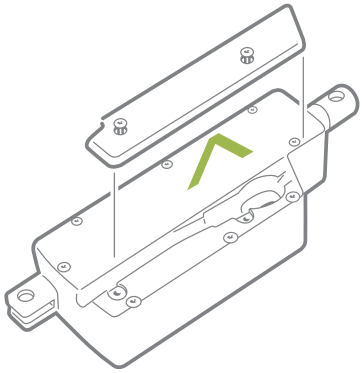
Option 1 = 0°

Option 2 = 90°

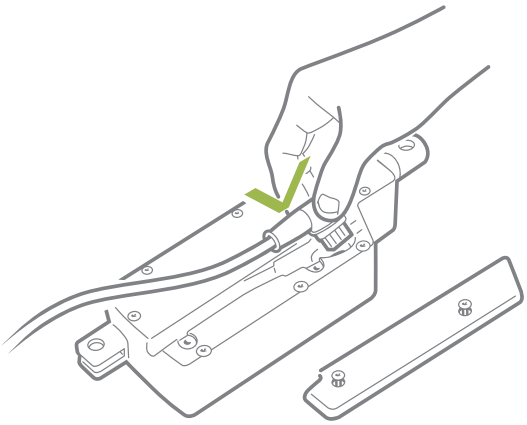
Mounting of cables



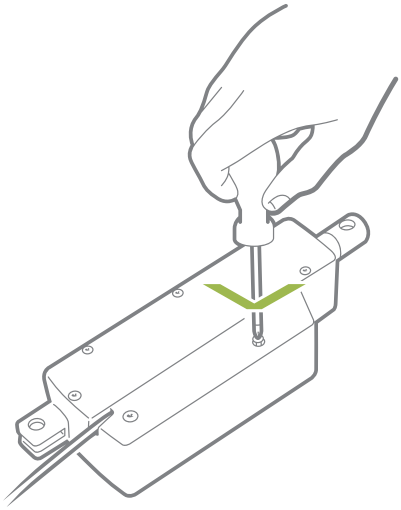
1. Unscrew the cover



2. Remove the cover



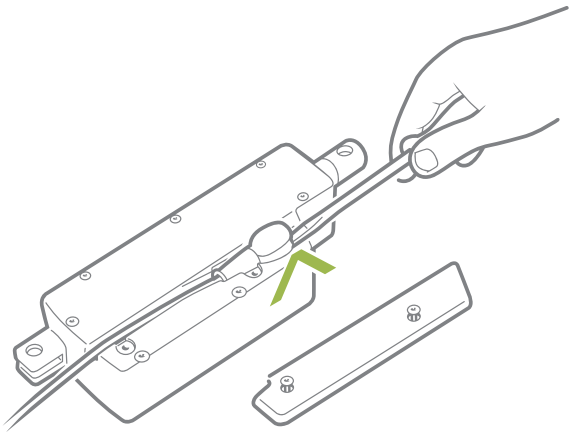
3. Plug in the cable gently without using any tools



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.

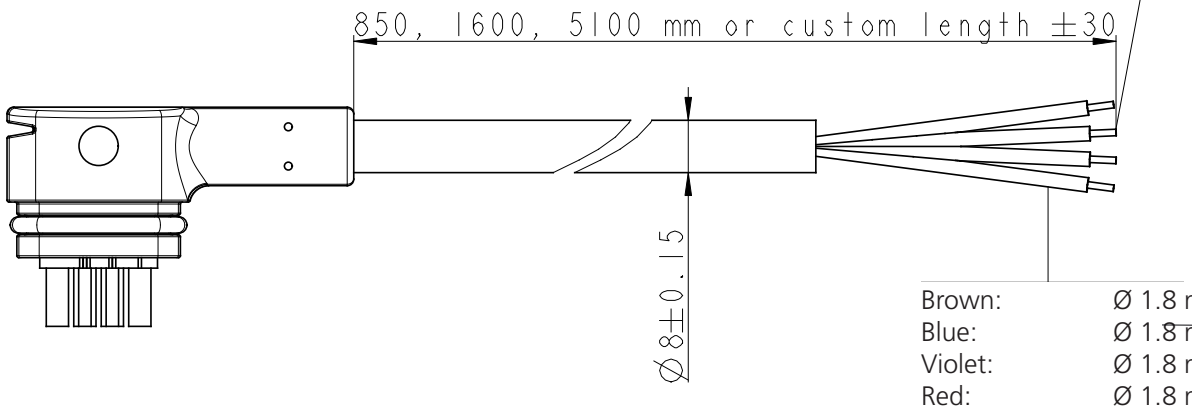
NOT valid for ATEX cables, please refer to the ATEX section for correct cable mounting on ATEX actuators.

Cable dimensions

Standard LA14 cable (8-pin)

Brown:	Ø 1.0 mm²	18 AWG*
Blue:	Ø 1.0 mm²	18 AWG
Violet:	Ø 1.0 mm²	18 AWG
Red:	Ø 1.0 mm²	18 AWG
Black:	Ø 1.0 mm²	18 AWG
Green:	Ø 1.0 mm²	18 AWG
Yellow:	Ø 1.0 mm²	18 AWG
White:	Ø 1.0 mm²	18 AWG

*AWG: American Wire Gauge

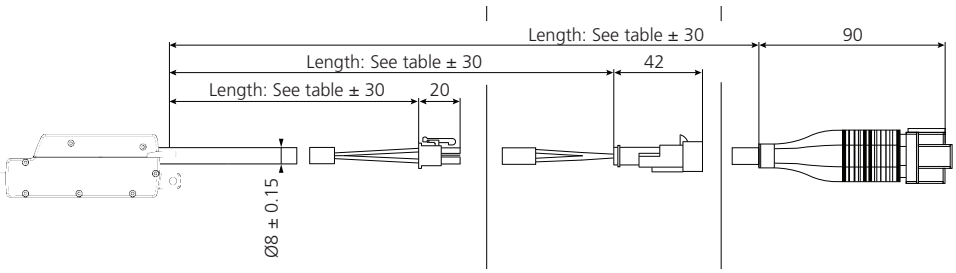


Brown:	Ø 1.8 mm
Blue:	Ø 1.8 mm
Violet:	Ø 1.8 mm
Red:	Ø 1.8 mm
Black:	Ø 1.8 mm
Green:	Ø 1.8 mm
Yellow:	Ø 1.8 mm
White:	Ø 1.8 mm

The LA14 standard cable is a UV-resistant PVC cable.

Standard cable item numbers

Connector	C	J/K	I/L



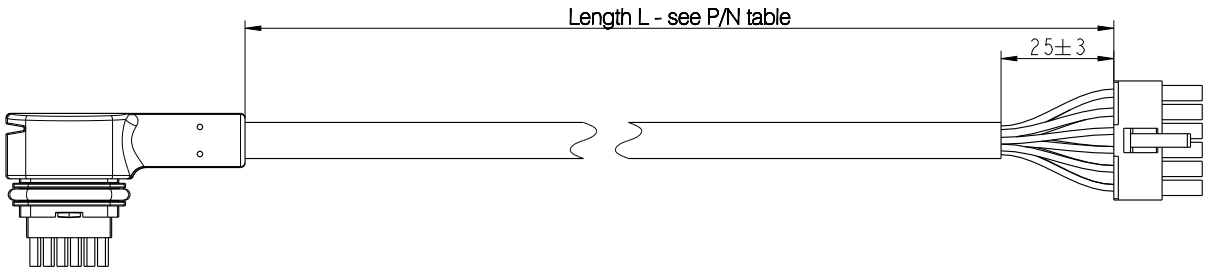
Ordering no.	LA25 cable item no.	Length (mm)		Length (mm)		Length (mm)	
S	0147001 - 850	CS	750	JS/KS	725	IS/LS	680
T	0147001 - 1600	CT	1500	JT/KT	1475	IT/LT	1430
R	0147001 - 5100	CR	4900	JR/KR	4875	IR/LR	4830
V	0147001 - 10100	CV	10000	JV/KV	975	IV/LV	9930

Cable dimensions

LA14 for I/O and CAN options (11-pin)

Gray:	Ø 0.75 mm²	20 AWG*
Light Blue:	Ø 0.75 mm²	20 AWG
Yellow:	Ø 0.75 mm²	20 AWG
Red:	Ø 0.75 mm²	20 AWG
White:	Ø 0.75 mm²	20 AWG
Violet:	Ø 0.75 mm²	20 AWG
Orange:	Ø 0.75 mm²	20 AWG
Green:	Ø 0.75 mm²	20 AWG
Black:	Ø 0.75 mm²	20 AWG
Blue:	Ø 1.0 mm²	18 AWG
Brown:	Ø 1.0 mm²	18 AWG

*AWG: American Wire Gauge



Standard cable item numbers

LA14 cable item no.	Length (mm) outside the actuator
0257057-0850	850±30
0257057-1600	1600±30
0257057-2000	2000±40
0257057-5100	5100±50
0257057-10100	10100±100
0257057-15100	15100±100

Electrical installation

- To ensure maximum self-locking ability, please make sure that the motor is shorted when stopped. Actuators with an 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.

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	TRD number
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	TRD4755
	EN60068-2-1 (Ad)	Storage at low temperature: Temperature: -55 °C Duration: 24 h Actuator is not connected Tested at room temperature	TRD4755
	EN60068-2-1 (Ad)	Operating at low temperature: Temperature: -40 °C Duration: 4 h Tested at room temperature within 5 minutes overload	TRD4756
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	TRD4755
	EN60068-2-2 (Bd)	Operating at high temperature: Temperature: +85 °C Duration: 96 h Actuator operated at high temperature	TRD4824
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	TRD4747
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	TRD4757
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	TRD4750

Environmental tests - Climatic

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	TRD4758
Degrees of protection	EN60529 - IP66	IP6X - Dust: Dust-tight: no ingress of dust Actuator is not activated	TRD4759
	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	TRD4761
	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	TRD4759
Rain		Dynamic rain test: Actuators exposed to continuous rain. Actuators operated and side loaded with 10 N Duration: 10.000 cycles and 240 h	TRD4760

Environmental tests - Mechanical

Test	Specification	Comment	TRD number
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	TRD4799
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	TRD5942
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	TRD5942
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	TRD5942
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	TRD5942

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	

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.

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