Linear Actuator LA76

Data Sheet



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Contents

Preface 3
Terms of use 4
Introduction 5
Safety instructions 5
Features 7
Options in general 7
Usage 8
Ordering example 9
Load vs stroke length 11
Technical specifications 12
Speed and current curves 13
Stroke and built-in tolerances 15
Built-in dimensions 15
Built-in dimensions to and from measure points 16
Keep a clearance when mounting a bracket 17
Durability for piston rod eyes and back fixtures 17
Piston rod eyes 18
All dimensions are in mm. Piston rod eyes are allowed to turn 0-180° 18
Back fixtures 20
All dimensions are in mm 20
Back fixture orientation 23
Electrical installation 24
Current limits 24
Cable mounting 25
Cables 26
Power cable dimensions 28
Signal cable dimensions 28
Y-cable dimensions 28
Actuator Connect cable 29
Plugs 29
Environmental tests – Climatic 31
Environmental tests - Mechanical 33
Environmental tests - Electrical 33
Contacts 34

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 to provide accurate and up-to-date information about its products. However, it is the responsibility of the user to determine the suitability of LINAK products for any specific application.

Due to ongoing product development, LINAK products are subject to continuous modifications and changes. LINAK reserves the right to make such modifications, updates, and changes without prior notice. For this reason, LINAK cannot guarantee the accuracy or current status of printed information about its products.

LINAK makes every effort to fulfil orders. However, due to the factors described above, LINAK cannot guarantee the availability of any particular product at any given time. LINAK also reserves the right to discontinue the sale of any product displayed on its website, in catalogues, or in other written materials issued by LINAK or its affiliated companies.

All sales are subject to the applicable terms and conditions of sale and delivery available on LINAK websites.

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Introduction

Versatile electric linear actuator that delivers both robustness and long-term reliability.
It excels in challenging environments and is a wise choice for a wide array of industrial machinery and applications that require high-level performance.

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.



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 LA76 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)
- Highly efficient acme thread spindle
- Safety factor 2: The actuator has been certified to withstand static loads that are twice the magnitude of its dynamic load capacity without sustaining damage.
- Hand crank for manual operation
- Stroke length from 75 to 1200 mm (in steps of 5 mm)
- Integrated brake with high self-lock ability
- Endplay: max. 3.5 mm
- Non-rotating piston rod eye
- Noise level: 73 dB(A). Measuring method: DS/EN ISO 3746 (actuator not loaded)
- Built-in Zero Point positioning
- Heavy duty aluminium housing for harsh conditions
- Hall effect sensor for precise positioning
- Current monitoring
- Weight: 4.29 kg for 100 mm stroke; Additional 0.24 kg for each additional 50mm stroke.
  (Cable not included; weight varies by selected options)

Options in general

- 24 / 48 V DC Brushless motor
- Load from 500 N - 6,800 N depending on gear ratio and spindle pitch
- Max. speed 142 mm/sec. depending on gear ratio and spindle pitch
- Back fixture turnable in steps of 30 degrees
- Exchangeable cables in different lengths
- When ordering AISI (304 and up) piston rod eye and back fixture, stainless steel screws are automatically included
- Endstop reached signals
- IC options including:

  - I/O
  - Ethernet/IP
  - Modbus TCP/IP
  - Modbus RTU
  - IO-Link
  - CAN SAE J1939
  - CANopen
  - PROFINET
- Specific interface user manuals are available at the TECHLINE webpage containing both Connection Diagrams and I/O Specifications
- PC configuration tool (Actuator Connect™)

Usage

- Duty cycle up to 600 mm stroke: max. 20% (4 minutes drive and 16 minutes rest)
- Duty cycle at 601-999 mm stroke: max. 15% (3 minutes drive and 17 minutes rest)
- Duty cycle at 1,000-1,200 mm stroke: max. 10% (2 minutes drive and 18 minutes rest)
- Ambient operating temperature: Full performance from +5 °C to +40 °C
  -30 °C (reduced load 50%) to + 85 °C (reduced duty cycle 10%)
  -40 °C (no load)
- Storage temperature:
  (Actuator is not activated/connected) -40 °C to +70 °C
  -40 °C to +85 °C for 72 hours
  -55 °C to +105 °C for 24 hours
  Acclimatization before usage.
- Relative humidity:
  (Actuator is not activated/connected) Full performance from 20 % to 80 % - non-condensing
- Cyclic state: 93 % to 98 % - non-condensing +25 °C to +55 °C for 12 hours
- Steady state 93 % to 95 % - non-condensing +40 °C for 56 Days
- Atmospheric pressure: 700 to 1060 hPa
- Meters above sea level: Max. 3000 meters

Ordering example

76 120 200 0 H C3 2 6 = 6 1 6 G 3 0300 N C S 0 0 0

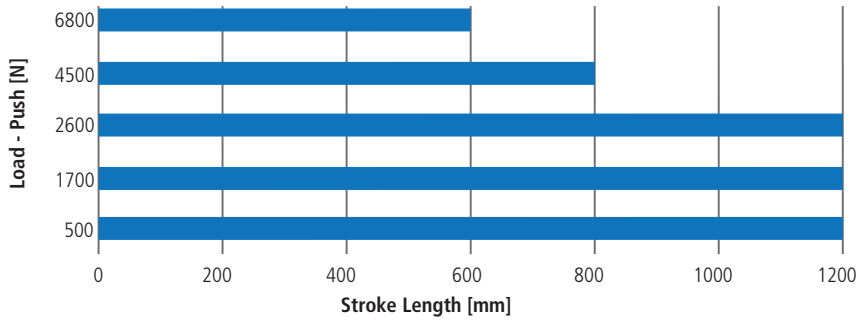
Actuator Type	**76**	=	LA76			
Spindle Type	**120**	=	12 mm	200	=	20 mm
Stroke length	**200**	=	≤ 995 Length in mm (75-995)	Axx	=	10xx Length in mm (1,000-1,095)
	Bxx		11xx Length in mm (1,100-1,195)	C00		1,200 Length in mm
Safety	**0**	=	No safety nut			
Feedback	0	=	No feedback	A	=	Analogue feedback (Hall potentiometer)
	H	=	Dual Hall			
	K	=	Single Hall	X	=	Special
Platform				**9-pin**		
			Zero Point			**Zero Point with split supply**
	B3		I/O (Basic)	A7	=	CAN SAE J1939
	C3	=	I/O (Customised)	A8	=	CANopen
	F3	=	I/O (Full)	0E	=	Modbus TCP/IP
	0B	=	IO-Link	2E	=	Ethernet/IP
	14	=	Modbus RTU	4E	=	PROFINET
				XX		Special
Motor type	**2**	=	24 V BLDC	4	=	48 V BLDC
IP	**6**	=	IP66 - Reinforced house			
Motor type	**=**	=	Brushless Direct Current (BLDC)			
Colour	**6**	=	Dark olivish grey NCS S7000-N	X	=	Special
Back fixture	**1**	=	0 degrees	3	=	Ball eye
	A	=	30 degrees	4	=	Outer thread
	B	=	60 degrees	5	=	Inner thread
	2	=	90 degrees	6	=	Rotated (30° interval)
	C	=	120 degrees	D	=	150 degrees
				X	=	Special
Piston rod eye	1	=	With slot	5	=	Inner thread
	2	=	Solid	**6**	=	Ball eye
	4	=	Outer thread	X	=	Special

Gear	E	=	Ratio 1:70	F	=	Ratio 1:18
	G	=	Ratio 1:31	H	=	Ratio 1:46
Brake	**3**	=	Push/Pull			
Built-in dimension	**0300**	=	mm (min. length)	XXXX	=	mm
Endstop reached output*	A	=	A_HIGH / A_HIGH	B	=	A_LOW / A_HIGH
	C	=	A_HIGH / A_LOW	D	=	A_LOW / A_LOW
	N	=	LOW / LOW	X	=	Special
Plug type	0	=	No plug (when no cable is chosen)	N	=	M12 IO-Link cable
	J	=	Deutsch (DT4)	E**	=	M12 Ethernet Y-cable
	9	=	Deutsch - Moulded	R	=	M12 Modbus RTU cable
	C	=	Flying leads (when no connector is chosen)	X	=	Special
Cable	0	=	No cable selected	**S****	=	Straight
	Y	=	Y-cable	V	=	Y-Cable with 90° angled connectors
	A	=	Mounted with 90° angled connectors	X	=	Special
Parallel mode	**0**	=	Not parallel	2-8	=	Critical parallel (number of actuators in the parallel system)
SW Config.	**0**	=	Standard software	X	=	Special software
Not used	**0**	=	Not used			

* A_High is active high and A_LOW is active low. HIGH is constant high and LOW is constant low.
Active high: The signal goes from low to high, when the endstop is reached.
Active low: The signal goes from high to low, when the endstop is reached.
Low: The signal stays low at all times.

Actuators with **Platform option Ethernet/IP are only compatible with **Plug** option E and **Cable** option S

Load vs stroke length



Please note:

500-1,700 N is with 20 mm spindle pitch

500-6,800 N is with 12 mm spindle pitch

- For applications that only operate in pull, the limitations are 1,200 mm stroke and 6,800 N load

Technical specifications

24 V

Push/pull max. [N]	Self-lock min. [N] Push/ pull	Pitch [mm/ spindle rev.]	Gear/Ratio	Hall Resolution [mm/count]	End-play in mm	Regu-lated speed [mm/s]	Typical amp. [A]	
							No load	Full load
500	1,000	20	E 1:7	0.721	4.5	142	2	12
1,700	2,200	20	F 1:18	0.721	3.5	65	1	12
2,600	3,400	12	F 1:18	0.433	2.6	39	1	12
4,500	5,800	12	G 1:31	0.254	2.3	23	1	12
6,800	8,800	12	H 1:46	0.166	2.2	15	1	12

48 V

Push/Pull max. [N]	Self-lock min. [N] Push/ Pull	Pitch [mm Spindle rev.]	Gear/Ratio	Hall Resolution [mm/count]	End-play in mm	Regulated speed [mm/s]	Typical amp. [A]	
							No load	Full load
500	1,000	20	E 1:7	0.721	4.5	142	1	6
1,700	2,200	20	F 1:18	0.721	3.5	65	1	6
2,600	3,400	12	F 1:18	0.433	2.6	39	1	6
4,500	5,800	12	G 1:31	0.254	2.3	23	1	6
6,800	8,800	12	H 1:46	0.166	2.2	15	1	6

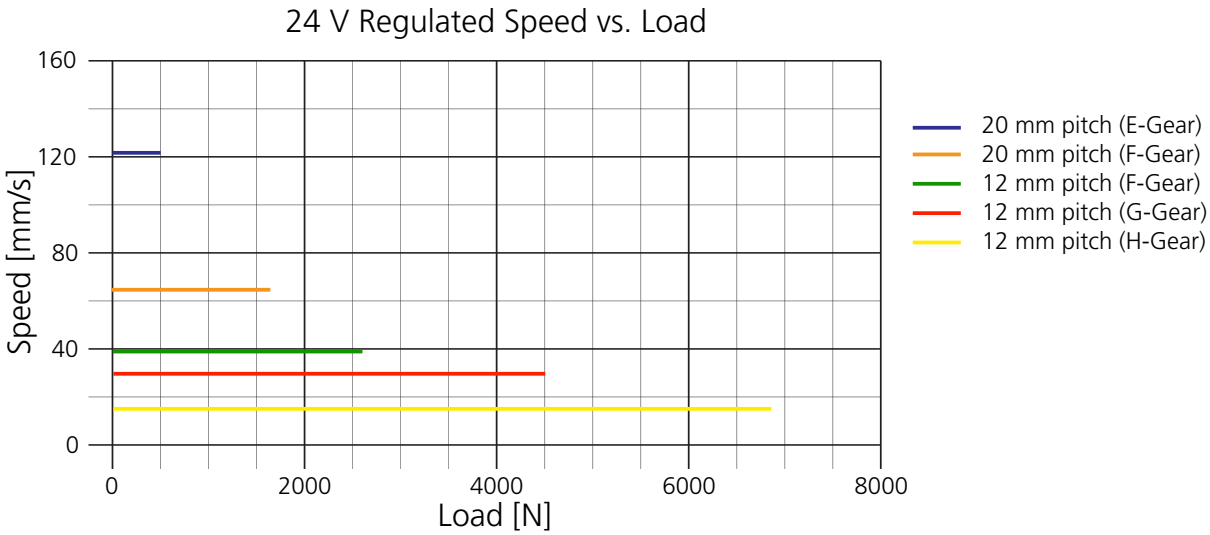
The typical values can have a variation of ± 20% on the current values and ± 10% on the speed values. Measurements are made with an actuator in connection with a stable power supply and an ambient temperature at 20°C.

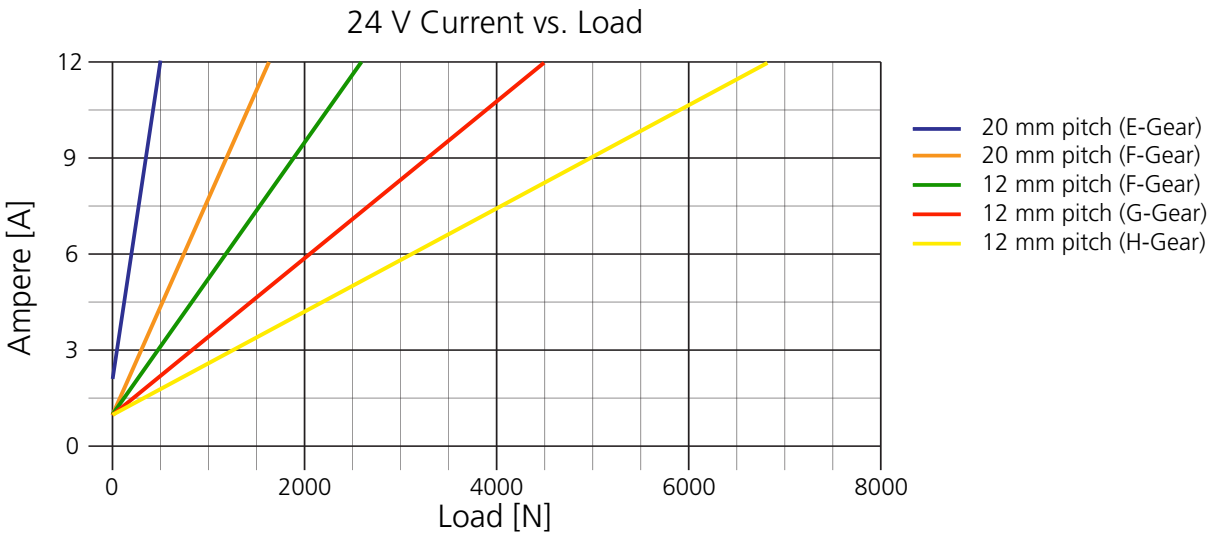
When using soft stop on a DC-motor, a short peak of higher voltage will be sent back towards the power supply. It is important when selecting the power supply that it does not turn off the output, when this backwards load dump occurs.

A Hall pulse consists of two Hall counts. A Hall count occurs every time the signal changes state (high to low or vice versa).

Speed and current curves

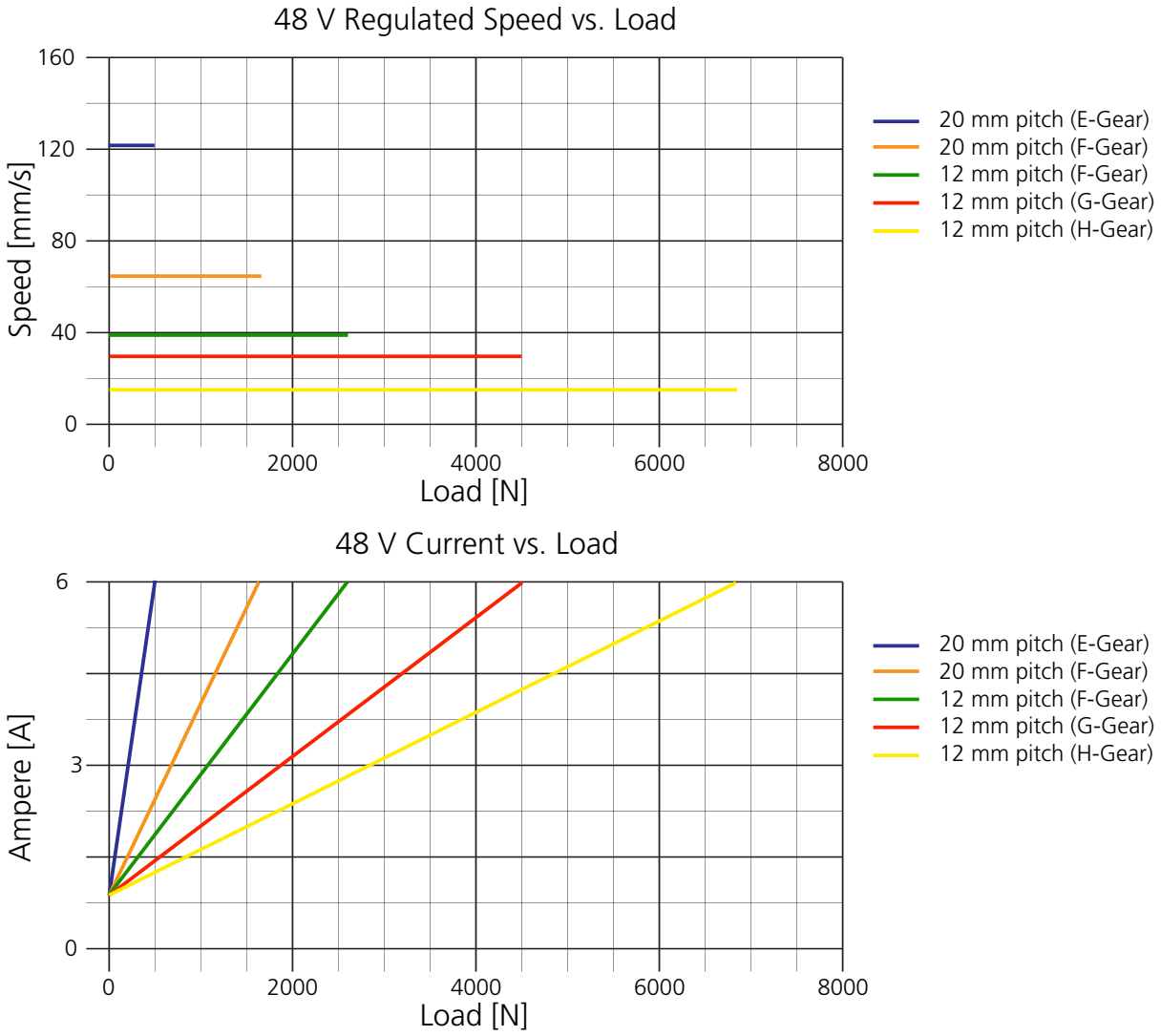
The values below are typical values and made with a stable power supply and an ambient temperature of 20°C.





Speed and current curves

The values below are typical values and made with a stable power supply and an ambient temperature of 20°C.



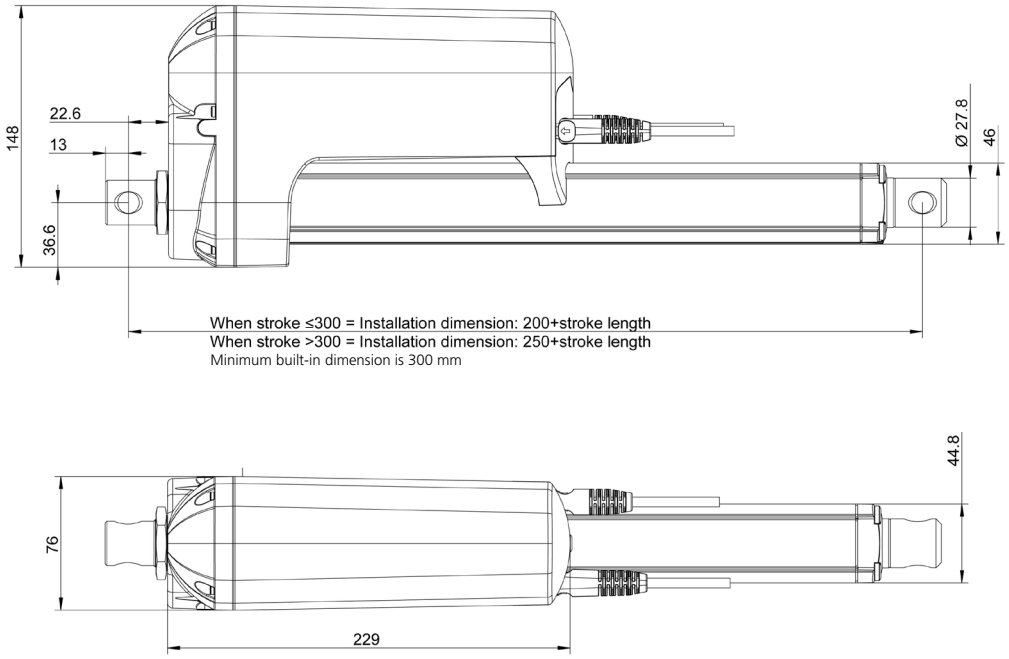
All measurements above describe the spindle pitch (e.g. 20 mm) and the gear type (e.g. H gear) of the actuator.

Stroke and built-in tolerances

Platform	Stroke tolerance	Example for 200 mm stroke	BID tolerance	Example for 400 mm BID
All	+/- 2 mm	198 to 202 mm	+/- 2 mm	398 to 402 mm

Built-in dimensions

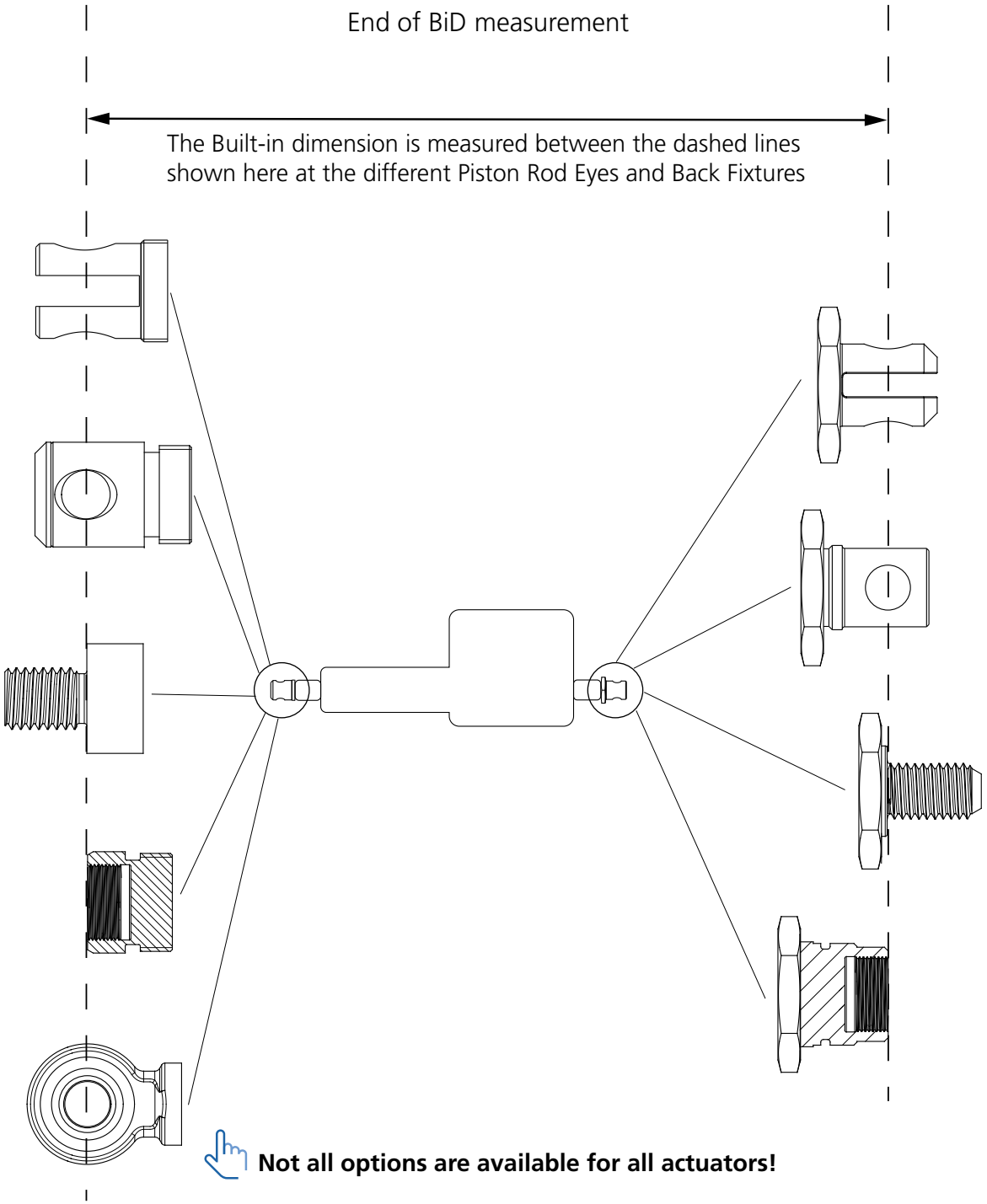
All dimensions are in mm



The above dimensions apply for solid and slotted piston rod eyes and back fixtures.

	Back fixture	Slotted/Solid		Male adapter		Female adapter	
Stroke length		<=300	>300	<=300	>300	<=300	>300
Piston rod eye		From center of hole		From the surface		From the surface	
Slotted/Solid	From center of hole	200	250	185	235	194	244
Male Adapter	From the surface	187	237	173	223	181	321
Female adapter	From the surface	195	245	180	230	189	239
Ball Eye	From center of hole	215	265	200	250	209	259
All dimensions are in mm. The stroke length added to the above numbers, results in the built-in dimension.							

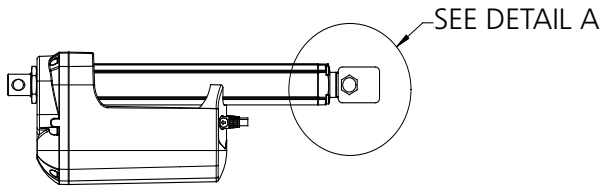
Built-in dimensions to and from measure points

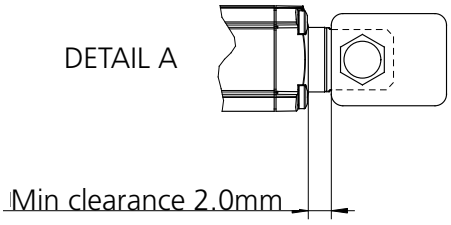


Not all options are available for all actuators!

Keep a clearance when mounting a bracket

When mounting a custom bracket on the moving part of the actuator, please observe the minimum clearance between bracket and cylinder top, when fully retracted, to avoid jamming and destruction of actuator drive train.





The Zero Point Initialisation Zone is located between 35-75 mm going from the most inward position.

The movement passing the zone has to be stable for the initialisation to succeed. No virtual limits can be set in the initialisation zone.

Durability for piston rod eyes and back fixtures



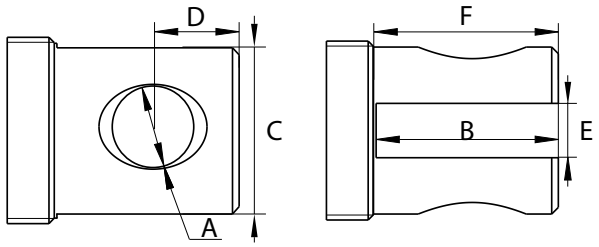
Blue = Full Lifetime
Grey = Reduced lifetime
(If e.g. a Male thread M12 is used with an actuator with a larger load than 4,500 N and a Slotted fixture is used with an actuator with a larger load than 4,500 N their lifetime will be shorter than if the other fixtures are chosen).

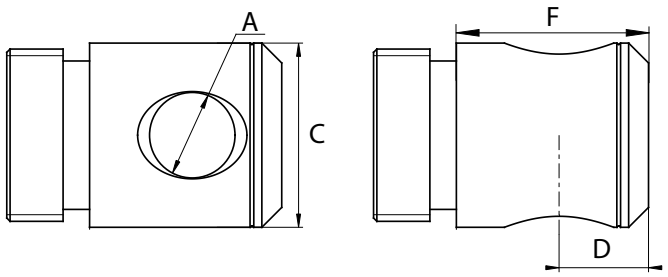
In some applications the bolt through the fixtures can, durıng movement, rotate inside the fixture.
The friction between bolt and fixture creates excessive wear that shortenes the lifetime of the fixtures.
In applications where this is happening, we recommend solid fixtures with bushings which prevent this specific type of wear.

Piston rod eyes

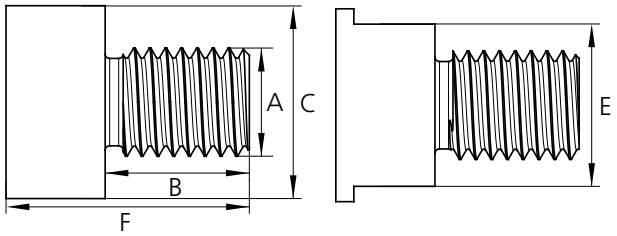
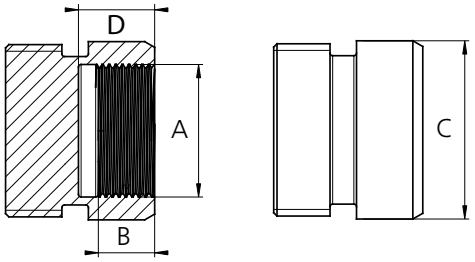
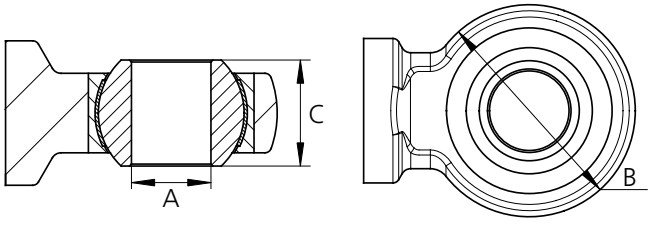
All dimensions are in mm. Piston rod eyes are allowed to turn 0-180°

Option	Piston rod eye	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
1	Slotted	Free cutting steel	Ø 12.2	27.5	27.8	13.5	7	29	0	0361137
1	Slotted	Free cutting steel	Ø 12.2	27.5	27.8	13.5	8.2	29	0	0361138
1	Slotted	AISI 304	Ø 12.2	27.5	27.8	13.5	8.2	29	0	0361260
1	Slotted	AISI 316	Ø 12.2	27.5	27.8	13.5	8.25	29	0	0361304
1	Slotted	Free cutting steel	Ø 12.9	27.5	27.8	13.5	8.2	29	0	0361636
1	Slotted	AISI 304	Ø 12.9	27.5	27.8	13.5	8.2	29	0	0361275
2	Solid	Free cutting steel	Ø 12.2	-	27.8	13.5	-	29	0	0361109
2	Solid	AISI 304	Ø 12.2	-	27.8	13.5	-	29	0	0361382
2	Solid	Free cutting steel	Ø 12.9	-	27.8	13.5	-	29	0	0361018
2	Solid	AISI 304	Ø 12.9 H10	-	27.8	13.5	-	29	0	0361340
2	Solid	AISI 304 Bushing: PTFE composit	Ø 12 H9	-	27.8	13.5	-	32.5	0	0368081
2	Solid	AISI 304 Bushing: PTFE composit	Ø 12.9 H7	-	27.8	13.5	-	32.5	0	0368092





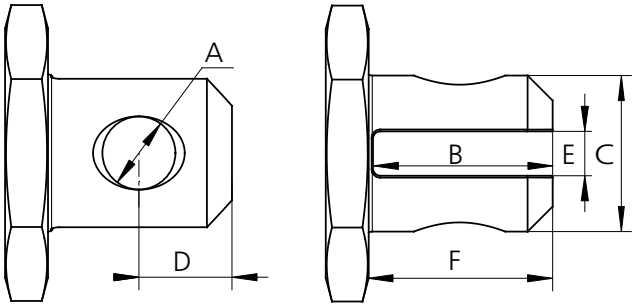
* Shoulderbolt (ISO7379) with hardness 150 - 600 HB and a surface roughness of max. R_a 0,8 must be used. Shoulderbolt shall be rotationally locked with customer application. Grease may NOT be used in the bushings. Keep a clearence of 0.5 - 1.0 mm between the bracket and the application. Max. misallignment ± 0.1°

Option	Piston rod eye	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
4	Male adaptor	AISI 303	M12 X 1.75	25	27.8	-	27.8	27	-13	0361224
4	Male adaptor	AISI 303	M16 X 1.5	24	27.8	-	27.8	26	-13	0361135
4	Male adaptor	AISI 303	M16 X 1.5	35	25	-	27.8	27	-13	0361151
4	Male adaptor	AISI 316	M16 X 1.5	25	25	-	27.8	27	-13	0361354
										
5	Female adaptor	AISI 303	M20 X 1	8.5	26.9	11.5	-	-	-5	0361016
										
6	Ball eye	AISI 304 (Ball 440C only)	Ø 12 H7	32	16	-	-	-	+14	0361350
6	Ball eye	AISI 304 (Ball 440C only)	Ø 12.7 H7	38	16	-	-	-	+22	0361273
6	Ball eye	AISI 304 (Ball 440C only)	Ø 16 H7	42	21	-	-	-	+14	0361351
										

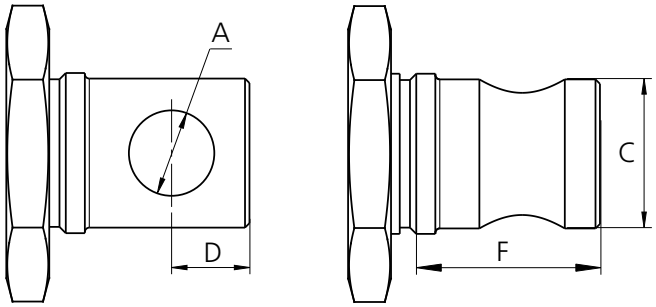
Back fixtures

All dimensions are in mm

Option	Back fixture	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
1,2,6, A,B,C,D	Slotted	AISI 304	Ø 12,2	25.2	25.2	13	8.2	27.5	0	0361742
1,2,6, A,B,C,D	Slotted	AISI 316	Ø 12.2	25.2	25.2	13	8.25	27.5	0	0361749
1,2,6, A,B,C,D	Sotted	Free cutting steel	Ø 12.3	25.2	25.2	13	8.2	27.5	0	0361713
1,2,6, A,B,C,D	Slotted	Free cutting steel	Ø 12.9	25.2	25.2	13	8.2	27.5	0	0361741
1,2,6, A,B,C,D	Slotted	AISI 304	Ø 12.9	25.2	25.2	13	8.2	27.5	0	0361743

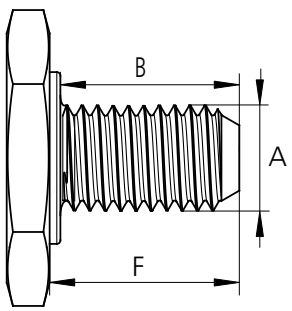


Option	Back fixture	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
1,2,6, A,B,C,D	Solid	Free cutting steel	Ø 12.2	-	25.2	13	-	27.9	0	0361714
1,2,6, A,B,C,D	Solid	AISI 304	Ø 12.2	-	25.2	13	-	27.9	0	0361745
1,2,6, A,B,C,D	Solid	Free cutting steel	Ø 12.9	-	25.2	13	-	27.9	0	0361715
1,2,6, A,B,C,D	Solid	AISI 304	12.9 H10	-	25.2	13	-	27.9	0	0361744
1,2,6, A,B,C,D	Solid	Free cutting steel	16	-	25.2	13	-	37.9	+10	0361712
1,2,6, A,B,C,D	Solid w/ bushing*	AISI 304 Bushing: PTFE composit	Ø 12 H9	-	25.2	13	-	27.9	0	0368082
1,2,6, A,B,C,D	Solid w/ bushing*	AISI 304 Bushing: PTFE composit	Ø 12.9	-	25.2	13	-	27.9	0	0368091

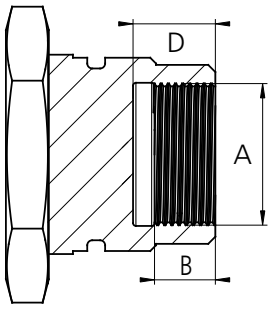


* Shoulderbolt (ISO7379) with hardness 150 - 600 HB and a surface roughness of max. R_a 0,8 must be used. Shoulderbolt shall be rotationally locked with customer application. Grease may NOT be used in the bushings. Keep a clearence of 0.5 - 1.0 mm between the bracket and the application. Max. misallignment ± 0.1°

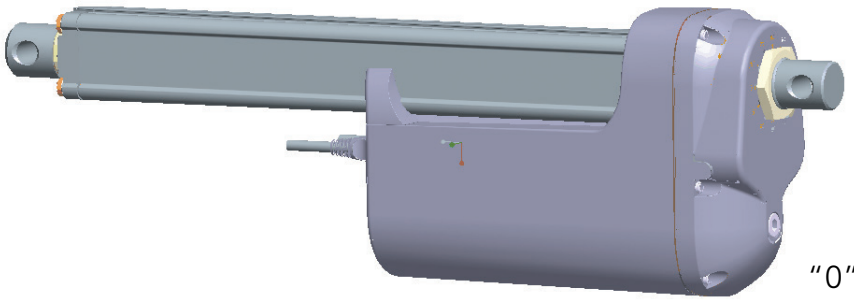
4	Male adapter	AISI 303	M12 X 1.75	25	-	-	-	25	-15	0361753
4	Male adapter	AISI 303	M16 X 1.5	35	-	-	-	35	-15	0361711
4	Male adapter	AISI 303	M16 X 1.5	25	-	-	-	25	-15	0361754



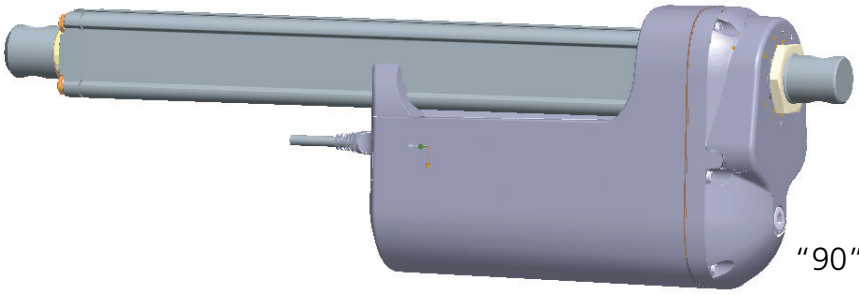
Option	Back fixture	Material	A	B	C	D	E	F (~)	Change in BiD	P/N
5	Female adapter	AISI 303	M20 X 1	8.5	-	11.5	-	-	-6	0361761



Back fixture orientation



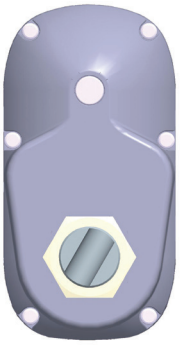
"0" Degrees



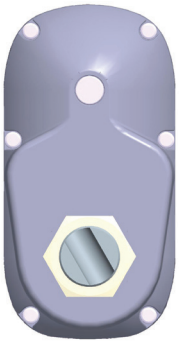
"90" Degrees



"30" Degrees



"60" Degrees



"120" Degrees



"150" Degrees

NB. All with tolerance of ±4°

Electrical installation

- When using soft stop on a DC-motor, the actuator can send a short high-voltage pulse to the power supply. It is important to make sure that it does not turn off the output when this backwards load dump occurs

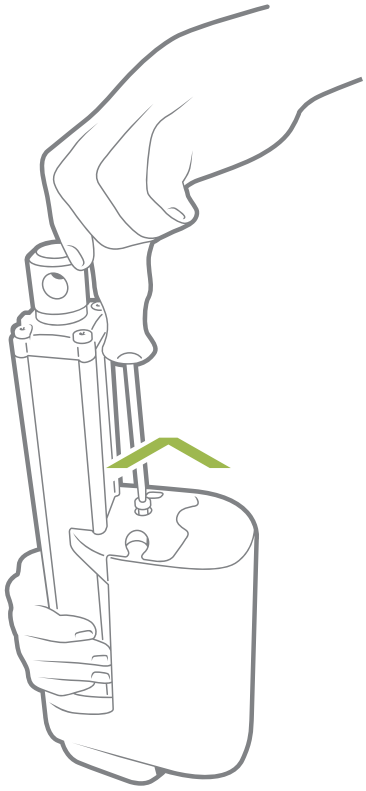
IC actuators have an integrated overcurrent protection.

Current limits

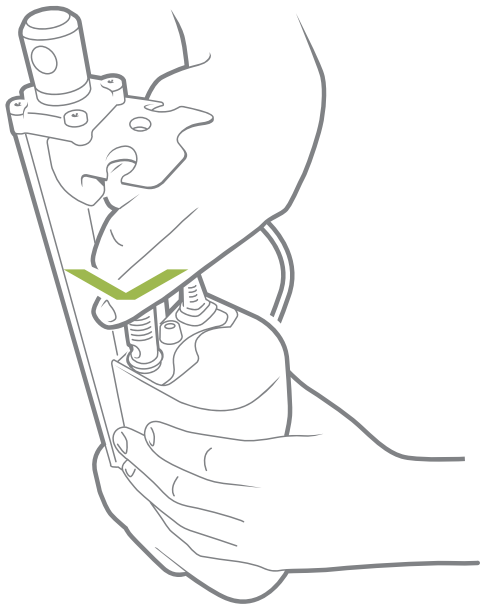
As described in the algorithm on previous page

Platform	24 V	48 V	Reference temperature: 0°C
All	13 A	8 A	Above
	26 A	13 A	Below

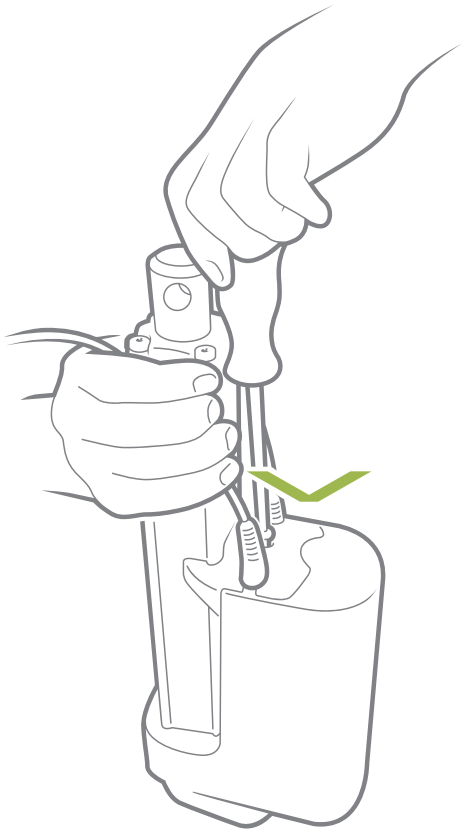
Cable mounting



1. Unscrew the screw and separate the cover from the housing. Remove the blind plug(s).



2. Plug in the power cable and/or the signal cable.



3. Slide the cover onto the actuator.

   The torque of the cover screw is approx. 3.5 ± 0.3 Nm TORX 25IP

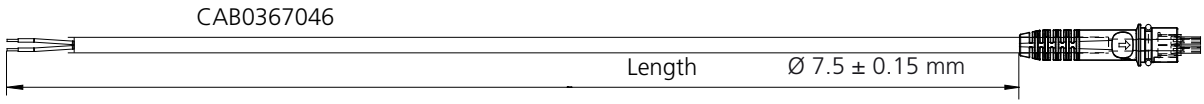
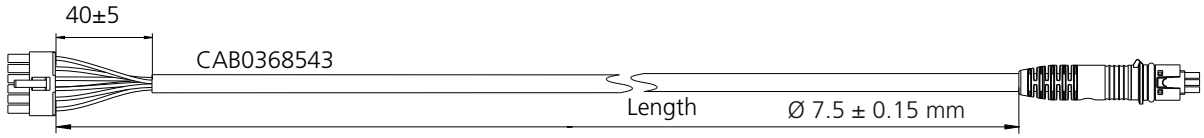
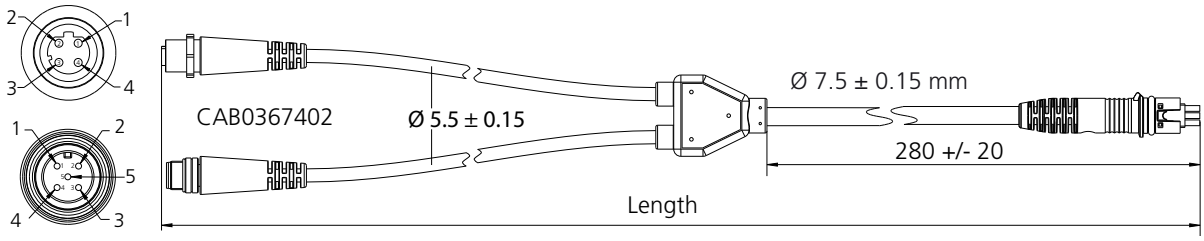
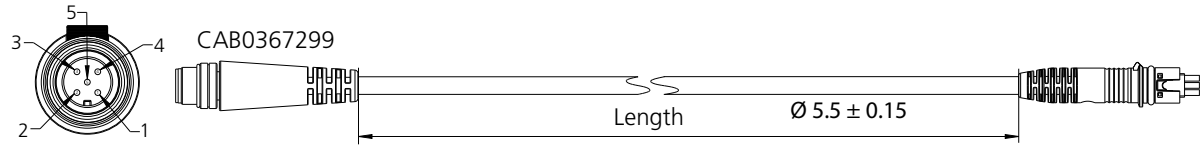
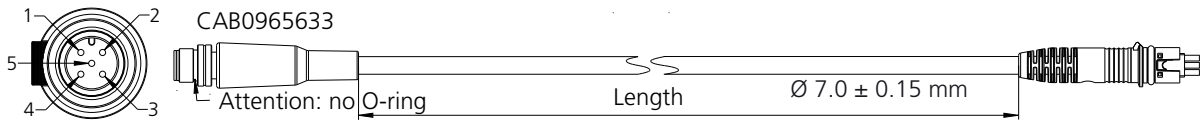
When changing the cables on a LINAK® actuator, it is important that this is done carefully, in order to protect the plugs and pins. Before the new cable is mounted, we recommend that the socket is greased with Vaseline®, to keep the high IP protection and ensure an easy mounting. Please be sure that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

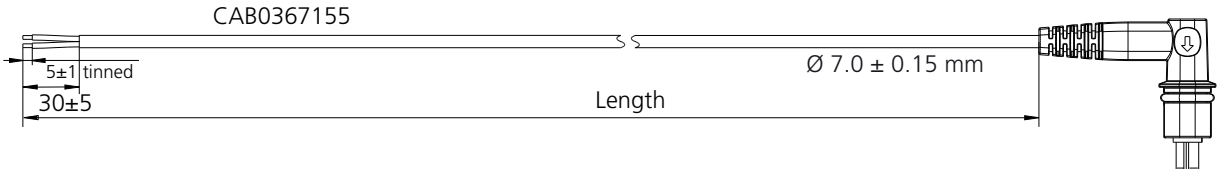
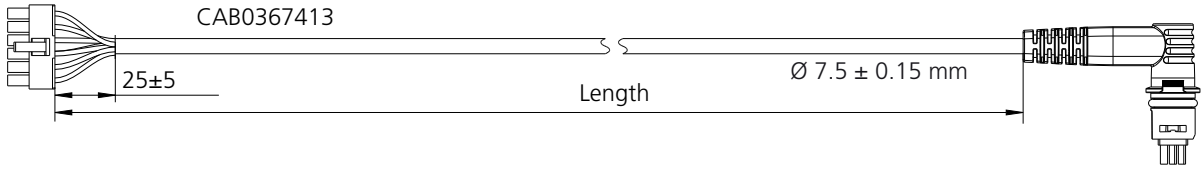
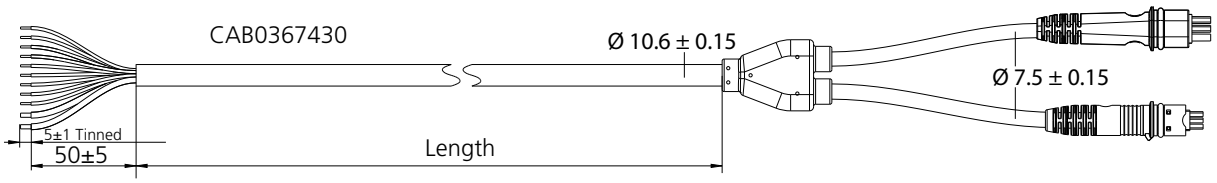
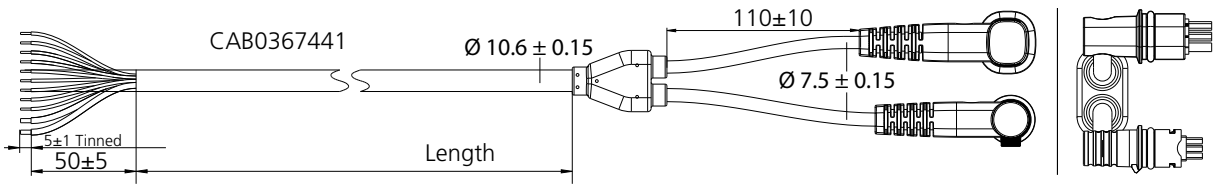
Cut off the tinned end if you connect the cable with screws. The tinned end is only to be used when a soldered connection is made.

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.
Do not lift the actuator by the cables.

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

Cables

Cable P/N Table					
Option	**Cable type**	**# Wires**	**mm²**	**Length in mm**	**LINAK P/N**
S	Power cable	2	2.0	1,500	CAB0367046-1500
S	Power cable	2	2.0	5,000	CAB0367046-5000
S	Power cable	2	2.0	10,000	CAB0367046-10000
					
S	Straight signal cable	9	0.5	1,500	CAB0368543-1500
S	Straight signal cable	9	0.5	5,000	CAB0368543-5000
S	Straight signal cable	9	0.5	10,000	CAB0368543-10000
					
S	Ethernet connection cable	9	0.5	600	CAB0367402
					
S	IO-Link connection cable	5	0.5	600	CAB0367299
					
S	Modbus RTU connection	5	0.5	1000	CAB0965633-1000
					

Cable P/N Table					
Option	**Cable type**	**# Wires**	**mm²**	**Length in mm**	**LINAK P/N**
A	Angled power cable	2	2.0	1,500	CAB0367155-1500
					
A	Angled signal cable	9	0.5	1,500	CAB0367413-1500
					
Y	Straight Y-cable Power and Signal	2 9	2.0 0.5	1,500	CAB0367430-1500
Y	Straight Y-cable Power and Signal	2 9	2.0 0.5	5,000	CAB0367430-5000
Y	Straight Y-cable Power and Signal	2 9	2.0 0.5	10,000	CAB0367430-10000
					
V	Angled Y-cable Power and Signal	2 9	20 0.5	1,500	CAB0367440-1500
					

Power cable dimensions

LINAK® P/N 0367046

Colour	Outer dimensions	Core mm²	AWG*	Pin
Blue	Ø2.8 mm	2.0	14	1
Brown	Ø2.8 mm	2.0	14	2

*AWG: American Wire Gauge

Signal cable dimensions

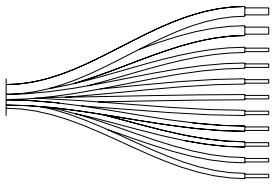
LINAK P/N 0368543

Colour	Outer dimensions	Core mm²	AWG*	Pin
Black	Ø1.5 mm	0.5	20	1
Red	Ø1.5 mm	0.5	20	2
Yellow	Ø1.5 mm	0.5	20	3
Green	Ø1.5 mm	0.5	20	4
Orange	Ø1.5 mm	0.5	20	5
Light Blue	Ø1.5 mm	0.5	20	6
Violet	Ø1.5 mm	0.5	20	7
White	Ø1.5 mm	0.5	20	8
Grey	Ø1.5 mm	0.5	20	-

*AWG: American Wire Gauge

Y-cable dimensions

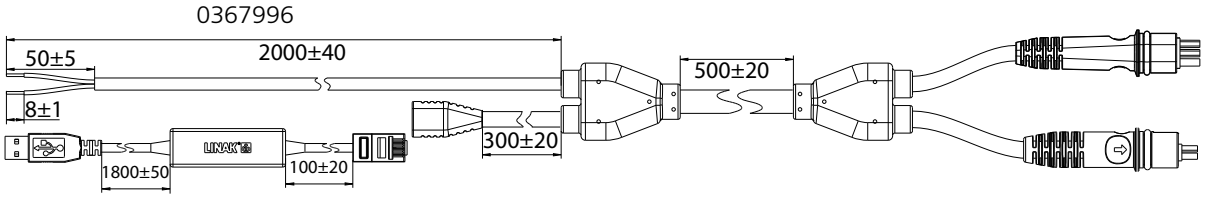
LINAK® P/N 0367430

Colour	Outer dimensions	Core mm²	AWG*	Pin**	
Blue	Ø2.8 mm	2.0	14	1	
Brown	Ø2.8 mm	2.0	14	2	
Orange	Ø1.5 mm	0.5	20	3	
Yellow	Ø1.5 mm	0.5	20	4	
Green	Ø1.5 mm	0.5	20	5	
Black	Ø1.5 mm	0.5	20	6	
Red	Ø1.5 mm	0.5	20	7	
Light Blue	Ø1.5 mm	0.5	20	8	
Violet	Ø1.5 mm	0.5	20	9	
White	Ø1.5 mm	0.5	20	10	
Grey	Ø1.5 mm	0.5	20	-	

** Pin connections are the same for both AMP and Deutsch connectors

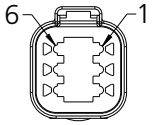
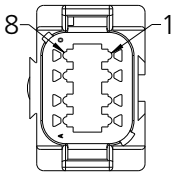
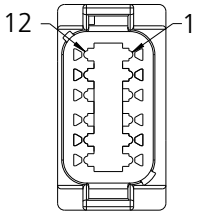
Actuator Connect cable

Actuator Connect™ cable kits					
Platform		**Connection**	**Includes**	**Colour**	**Article no.**
B3 C3 F3 B7 B8 0B A7 A8 2E 0E 14 4E	I/O Basic I/O Customised I/O Full CAN SAE J1939 CANopen IO-Link CAN SAE J1939 CANopen EtherNet/IP Modbus TCP/IP Modbus RTU PROFINET	Signal-power + RJ45	(Adapter + USB2Lin)	Grey	CAB0367996



The latest version of Actuator Connect® can be downloaded at the LINAK/TECHLINE page.

Plugs

Plug type	Deutsch
2-pin	 DTP04-xP
6-pin	 DT04-xP-CO15
8-pin	 DT04-xP-CO15
12-pin	 DT04-xP-CE02

Manual hand crank

The manual hand crank can be used in the case of a power failure -it is only intended for emergency use.



The cover over the Allen key socket must be unscrewed before the Allen key can be inserted and the hand crank operated.

Hand crank torque: 6-8 Nm

Hand crank RPM: Max. 65

Piston rod movement per turn:		
Spindle type:	**12 mm**	**20 mm**
Gear E	-	27 mm
Gear F	11 mm	18 mm
Gear G	6 mm	10 mm
Gear H	4 mm	7 mm

* 5 mm Allen key -if stainless steel piston rod eye and back fixture are chosen

- The power supply has to be disconnected during manual operation.
- If the actuator is operated as a hand crank, it must only be operated by hand - otherwise there is a potential risk of overloading and thereby damaging the actuator. Use your hand to turn the crank. Do not use power tools!
- After using the hand crank, the ingress protection IP66 cannot be maintained.
- Move the actuator to its starting position after using the crank. Failing to do so can damage the actuator or the application it is used for.
- Actuators with absolute positioning must be initialised after use of the manual hand crank, because their positioning will be displaced when the power is disconnected.

Environmental tests – Climatic

Test	Specification	Comment
Cold Test	EN 60068-2-1 (Ab)	Storage at low temperature: Temperature: -40 °C Duration: 72 h Not connected Tested at room temperature.
	EN 60068-2-1 (Ad)	Storage at low temperature: Temperature: -30 °C Duration: 2 h Actuator is not activated/connected. Tested at low temperature.
Dry Heat	EN 60068-2-2 (Bb)	Storage at high temperature: Temperature: +90 °C Duration: 72 h Actuator is not activated/connected. Tested at room temperature
		Storage at high temperature: Temperature: +70 °C Duration: 1,000 h Actuator is not activated/connected Tested at high temperature.
	EN 60068-2-2 (Bd)	Operating at high temperature: Temperature: +60 °C Int. max. 17 % Duration:700 h Actuator is activated Tested at high temperature.
Change of Temperature	EN 60068-2-14 (Na)	Rapid change of temperature: High temperature: +100 °C in 60 minutes. Low temperature: -30 °C in 60 minutes. Transition time: <10 seconds Duration: 100 cycles Actuator is not activated/connected. Tested at room temperature.
	EN 60068-2-14 (Nb)	Controlled change of temperature: Temperature change 5 °C pr. minute High temperature: +70 °C in 60 minutes. Low temperature: -30 °C in 30 minutes. 130 minutes pr. Cycle. Duration: 1,000 cycles (90 days) Actuator is not activated/connected. Tested at 250, 500 and 1,000 cycles at low and high temperatures.

Test	Specification	Comment
Damp Heat	EN 60068-2-30 (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 * 24 hours Actuator is not activated/connected. Tested within 1 hour after condensation, after upper temperature has been reached.
	EN 60068-2-3 (Ca)	Damp heat, Steady state: Relative humidity: 93-95 % Temperature: +40 ± 2 °C Duration: 56 days Actuator is not activated/connected. Tested within one hour after exposure.
Salt Mist	EN 60068-2-52 (Kb)	Salt spray test: Salt solution: 5 % sodium chloride (NaCl) 4 spraying periods, each of 2 hours. Humidity storage 7 days after each. Actuator not activated/connected. Exposure time: 500 hours
Degrees of Protection	EN 60529 – IP66	IP6X - Dust: Dust-tight, No ingress of dust. Actuator is not activated. 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. IPX6 –Connected actuator: Actuator is driving out and in for 3 min. 100 (l/min) jet of water is placed at the wiper ring for 3 (min). IPX6 –Connected actuator and push 6,800 [N] Actuator is driving out and in for 3 min. and Push 6,800 [N] at the end-pos. 100 (l/min.) jet of water is placed at the wiper ring for 3 min.
	DIN 40050 – IP69K	High pressure cleaner: Water temperature: +80 °C Water pressure: 80 bar Spray angle: 45 ° Spray distance: 100 mm Duration: From any direction 10 seconds of spraying followed by 10 seconds rest. Actuator is not activated. Ingress of water in quantities causing harmful effects is not allowed.
	DUNK test	The actuator has been warmed up to 115 °C for 20 hours. After this it is cooled down in 20 °C salt water. Cooling time: 5 minutes Opened for checking salt deposit and water.
Chemicals	BS7691 / 96 hours	Diesel 100 % Hydraulic oil 100 % Ethylene Glucol 50 % Urea Nitrogen saturated solution Liquid lime 10 % (Super- Cal) NPK Fertilizer (NPK 16-4-12) saturated Tested for corrosion.

Environmental tests - Mechanical

Test	Specification	Comment
Free Fall		Free fall from all sides: Height of fall: 0.4 meter onto steel. Actuator not activated/connected.
Vibration	EN 60068-2-36 (Fdb) EN 60068-2-6 (Fc)	Random vibration: Short time test: 6.29 g RMS Actuator is not connected. Long time test: 7.21 g RMS Actuator is not connected. Duration: 2 hours in each direction Sinus vibration: Frequency 5-25 Hz: Amplitude = 3.3 mm pp Frequency 25-200 Hz: Acceleration 4 g Number of directions: 3 (X-Z-Y) Duration: 2 hours in each direction. Actuator is not activated.
Bump	EN 60068-2-29 (Eb)	Bump test: Level: 40 g Duration: 6 milliseconds Number of bumps: 500 shocks in each of 6 directions. Actuator is not connected.
Shock	EN 60068-2-27 (Ea)	Shock test: Level: 100 g Duration: 6 milliseconds Number of bumps: 3 shocks in each of 6 directions. Actuator is not connected.

Environmental tests - Electrical

Test	Specification	Comment
Emission	EN 61000-6-4	Level is within limits for the motor.
Automotive Transients	ISO 7637	Load dump test only accepted on motor power connection.

Contacts

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