

Linear Actuator LA25

Data Sheet



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Introduction

Compact designed linear actuator ideal for narrow spaces. Comes with a high IP degree and aluminium housing and is suited to operate in almost any conditions.

With its robust design, high IP degree and aluminium housing, the actuator LA25 is ideal for harsh environments where operation under extreme conditions is required. 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 Nm torque.
- Ensure that the duty cycle and the usage temperatures for LA25 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. 58.5 dB (A) at nominal voltage and with no load, according to EN ISO 3743-1
- Weight: 1.42 kg for 100 mm stroke; additional 0.09 kg for each additional 50 mm stroke. (Cable not included; weight varies by selected options)

Options in general

- 12 / 24 V DC Brushed motor
- Load up to 2,500 N
- Max. speed 2.5 to 25 mm/sec. depending on load and spindle pitch
- Stroke length from 20 mm to 600 mm (Zero Point: 75 to 600 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)
- Safety nut in push or pull (2,500 N version: only safety nut in push; 600 N version: no safety nut)
- Exchangeable cables in different lengths up to 10 m
- Analogue or digital feedback for precise positioning
- 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 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 is max. 20% (4 min. drive and 16 min. rest)
The duty cycles and full performance 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: T135 -25°C to +65°C; IECEx/ATEX: T125 -25°C to +55°C)
- Storage temperature: -55°C to +105°C

Ordering example

25 030 XXX 00 0K 0 A 0 A = 3 1 3 J S 1 0 0 0 0 XXX

Actuator type	25	= LA25		
Spindle type	030	= 3 mm		
	060	= 6 mm		
	090	= 9 mm		
	120	= 12 mm		
	200	= 20 mm		
Stroke length	XXX	= mm		
Safety	00	= None		
	0A	= Safety nut		
Feedback	00	= None		
	0K	= Single Hall		
	0A	= Analogue position feedback (Hall potentiometer)		
	0F	= PWM		
Platform	8-pin connector		12-pin connector	
	A	= IO-Link	B	= I/O Basic
	3	= IC (Not for OpenBus™)	C	= I/O Customised
	0	= None	F	= I/O Full
	6	= LIN bus	Q	= Modbus RTU
	7	= CAN bus J1939	S	= IO-Link
	9	= CANopen		
	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		
	B	= 24 V BDC		
Endstop	0	= Power switch		
	1	= Signal switch		
	2	= Zero point		
IP	A	= IP66 + IP69K		
	B	= IP66 + IP69K + stainless steel screws		
	C	= IP66 + Reinforced (vibration proof)		
	D	= IP66 + IP69K Reinforced + stainless steel screws (vibration proof)		
	T	= IECEx + ATEX (not for 12-pin connector)		
	U	= IECEx + ATEX + stainless steel screws (not for 12-pin connector)		
	9	= Harsh environment + IP66/IP69K		
Colour	=	= Dark Olivish Grey NCS S7000-N		
	-	= Black NCS 8800-N (Harsh environment)		

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

Ordering example

25 030 XXX 00 0K 0 A 0 A = 3 1 3 J S 1 0 0 0 0 XXX

Back fixture	Zinc-coated steel - slotted		Stainless steel - slotted		
	1	= ø10.2 (0251011)	A	= ø10.2 (0251015)	
	2	= With bushings ø10.2	B	= With bushings ø10.2	
	3	= ø12.3 (0251010)	C	= ø12.3 (0251014)	
	4	= With bushings ø8.2	D	= With bushings ø8.2	
	5	= ø10.2 + nut (0251032)	F	= ø10.2 + nut (0251034)	
	6	= With bushings ø10.2 + nut	G	= With bushings ø10.2 + nut	
	7	= ø12.3 + nut (0251026)	H	= ø12.3 + nut (0251033)	
	8	= With bushings ø8.2 + nut	I	= With bushings ø8.2 + nut	
	9	= ø12.9 (0251084)			
	M	= Male adaptor M12 (0251021)	X	= Special	
Back fixture orientation	1	= 0°			
	2	= 90°			
Piston rod eye	Zinc-coated steel		Stainless steel		
	1	= ø10.2 (0231033)	A	= ø10.2 (0231096)	
	2	= With bushings ø10.2	B	= With bushings ø10.2	
	3	= ø12.3 (0231016)	C	= ø12.3 (0231095)	
	4	= With bushings ø8.2	D	= With bushings ø8.2	
	9	= ø12.9 (0331014)	K	= Ball eye ø10 H7 (0351053)	
			L	= Ball eye ø12 H7 (0351055)	
			F	= Female adapter M8 (0251039)	
		X	= Special	M	= Male adapter M12 (231094)
				I	= ø12.3 (0301244)
			J	= ø10.2 with bushings (0301244)	
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			
	M	= M12 5P (Only IO-Link length: 0.3 m)			
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 5.0 m (8-core or 2-core when no feedback is needed)			
	U	= Straight 0.3 m (Only IO-Link)			
	V	= Straight 10 m			
	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				

* 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.

Ordering example

25 030 XXX 00 0K 0 A 0 A = 3 1 3 J S 1 0 0 0 0 XXX

Endstop reached output	CAN / LIN / IO-Link (8-pin)	IC Advanced (8-pin) and I/O (12-pin)
	0 = None	0 = None
	Standard (8-pin)	A = A_HIGH / A_HIGH
	0 = None	B = A_LOW / A_HIGH
	1 = Yes	C = A_HIGH / A_LOW
	IC Basic (8-pin)	D = A_LOW / A_LOW
	1 = Yes	E = LOW / A_HIGH
	IC Parallel (8-pin)	F = HIGH / A_HIGH
	1 = A_HIGH / A_HIGH	G = LOW / A_LOW
	IC Parallel with Feedback (8-pin)	H = HIGH / A_LOW
	X = Special	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
Feedback level	CAN / LIN / IO-Link	IC Advanced and I/O
	0 = None	0 = None
	Standard	A = 0 - 10 V
	0 = None	B = 0.5 - 4.5 V
	1 = 0 - 10 V	C = 4 - 20 mA
	2 = 0.5 - 4.5 V	D = 10 - 90% (Only IC Advanced)
	3 = 4 - 20 mA	E = 20 - 80% (Only IC Advanced)
	4 = 10 - 90%	G = 1 - 9 V
	5 = 20 - 80%	X = Special
	9 = Special	
		IC Basic
	8 = None	Z = IC Parallel
		Y = Parallel with feedback
		X = Special
Load type	0 = Push/Pull	
	1 = Push	
	2 = Pull	
Parallel mode	0 = None OR Non-critical Parallel (For IC Parallel only)	
	2-8 = Critical Parallel	
SW config.	0 = Standard configuration	
	X = Special configuration	
Built-in dimensions	xxx = Measured in mm	

Technical specifications

12 V

Load max. (N)	Self-lock min. (N)				Pitch (mm/ spindle rev.)	Hall resolution (mm/count)	Typical speed (mm/s)		Standard stroke lengths (mm)	Typical amp. (A)	
	With short circuit		Without short circuit				No load	Full load		No load	Full load
	Self- lock (N)	*Back- drive (mm)	Self- lock (N)	*Back- drive (mm)							
2500	2500	1	2500	1	3	0.125	3.1	2.5	20-500	0.8	3.8
1500	1500	1	1500	2	6	0.250	6.6	5.2	20-600	0.8	3.8
1200	1200	2	1200	4	9	0.375	9.9	7.5	20-600	0.9	4.0
900	900	3	900	7	12	0.500	13	9.6	20-600	0.9	3.8
600	600	5	600	12	20	0.830	25	18	20-600	0.9	4.0

24 V

Load max. (N)	Self-lock min. (N)				Pitch (mm/ spindle rev.)	Hall resolution (mm/count)	Typical speed (mm/s)		Standard stroke lengths (mm)	Typical amp. (A)	
	With short circuit		Without short circuit				No load	Full load		No load	Full load
	Self- lock (N)	*Back- drive (mm)	Self- lock (N)	*Back- drive (mm)							
2500	2500	1	2500	1	3	0.125	3.2	2.6	20-500	0.4	1.9
1500	1500	1	1500	2	6	0.250	6.4	5.5	20-600	0.4	1.9
1200	1200	2	1200	4	9	0.375	9.5	8.1	20-600	0.4	2.0
900	900	3	900	7	12	0.500	12.6	10.4	20-600	0.4	1.9
600	600	5	600	12	20	0.830	25	18	20-600	0.4	2.0



- 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 $\pm 20\%$ on the current values and $\pm 10\%$ 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.

Housing for harsh environments

This housing (ordering example value IP: 9) should be recommended for use in particularly harsh environments such as stables, where the actuator is in touch with extremely corrosive liquids and/or vapours such as ammoniac.

The anodised housing option embodies a special surface treatment of the aluminium housing in order to reduce corrosion of the housing and avoid any vapours or liquids entering the actuator.

The anodised housing is also certified IP66/IP69K. This is only available in the colour black.

Reinforced actuator



This type of actuator (ordering example value IP: C and D) is robust against vibrations and high ambient temperatures up to 85°C.

When ordering this type of actuator, you receive:

- Manually added glue on the screws for the outer tube and motor
- A motor wire manually secured with glue
- A back fixture secured with an M27 nut

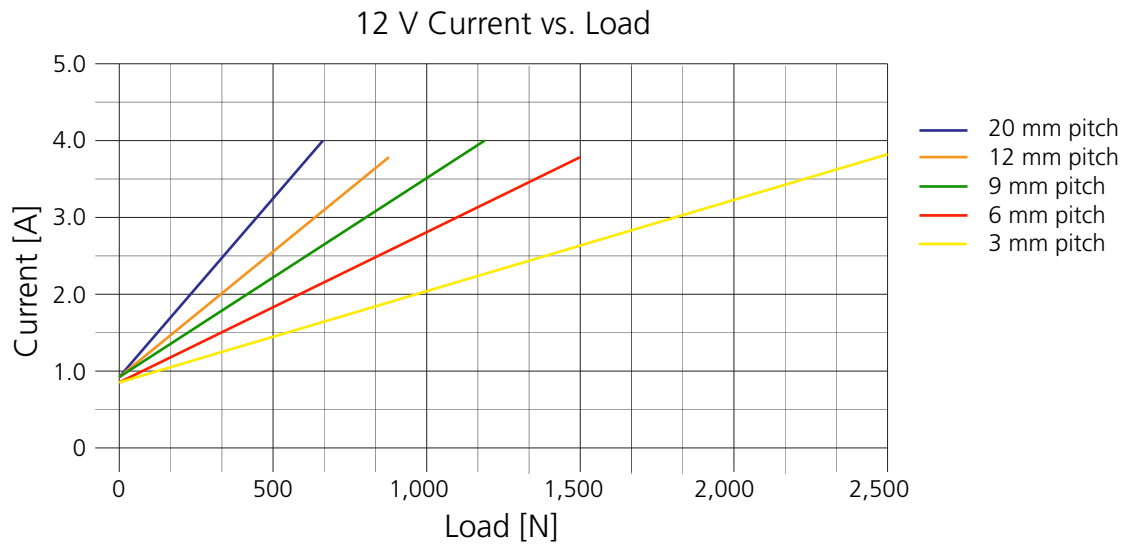
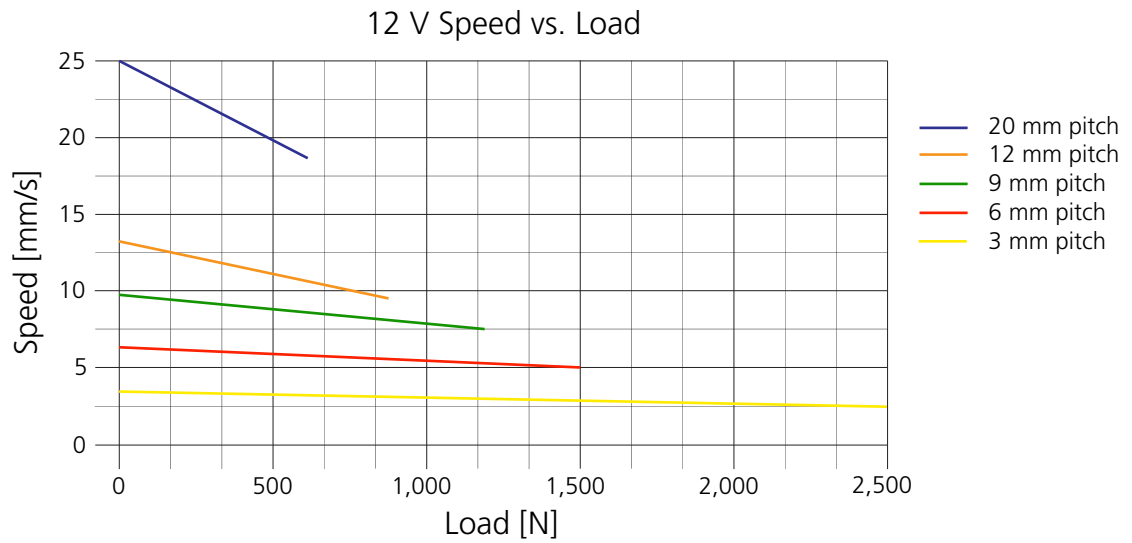
The reinforced design enables the actuator to pass the TECHLINE® vibration test at an ambient temperature of 85°C*.

A standard actuator passes the TECHLINE vibration test at an ambient temperature of 25°C.

* See more info under 'Environmental tests - Mechanical'.

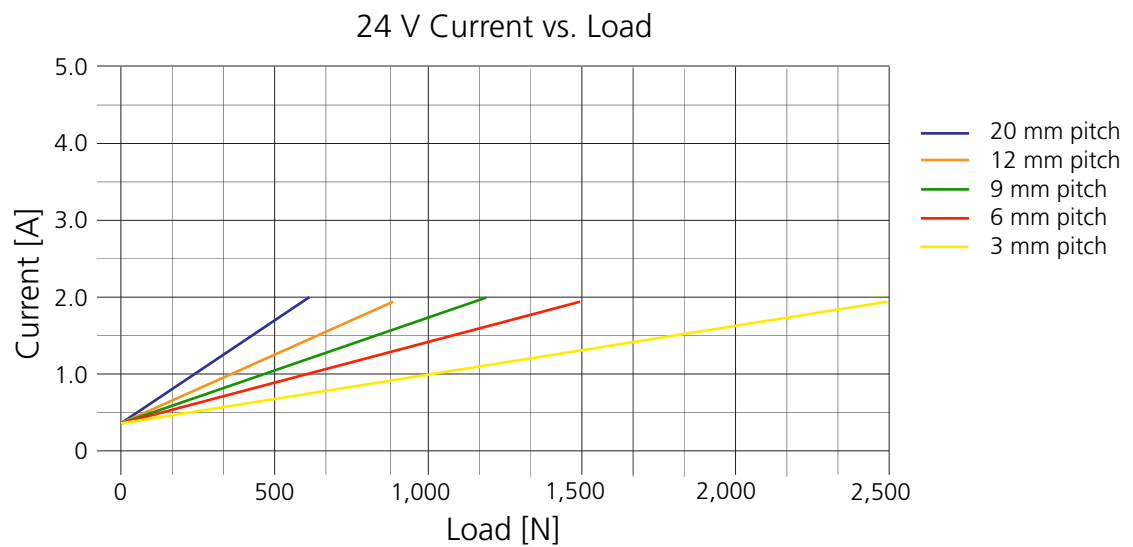
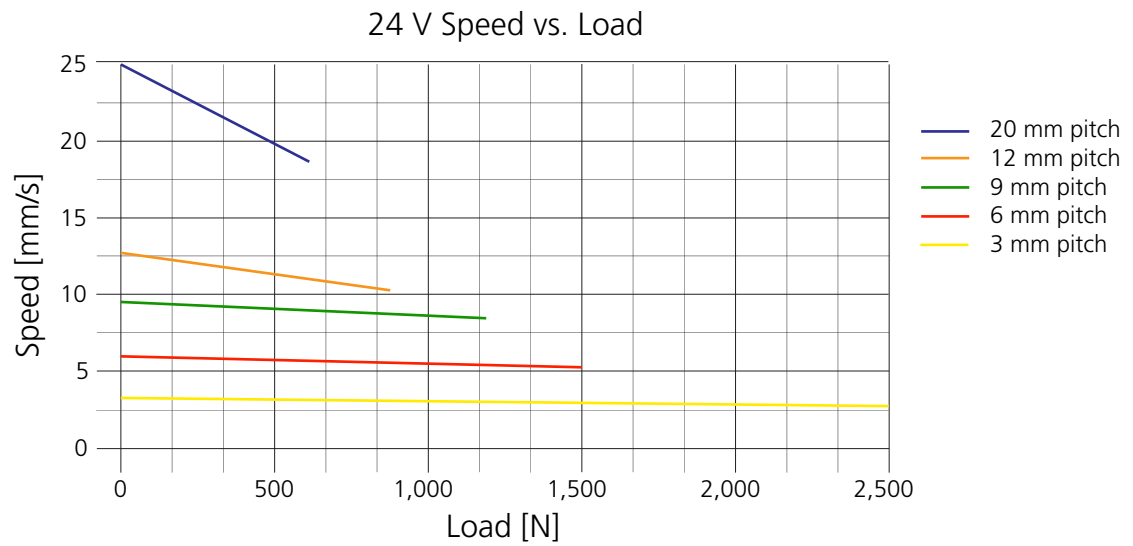
Speed and current curves

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	IO-Link (8-pin) I/O Basic I/O Customised EtherNet/IP I/O Full CAN bus J1939	8 A	5 A	Above
H P Q S T	CANopen PROFINET Modbus RTU IO-Link (12-pin) Modbus TCP/IP	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.

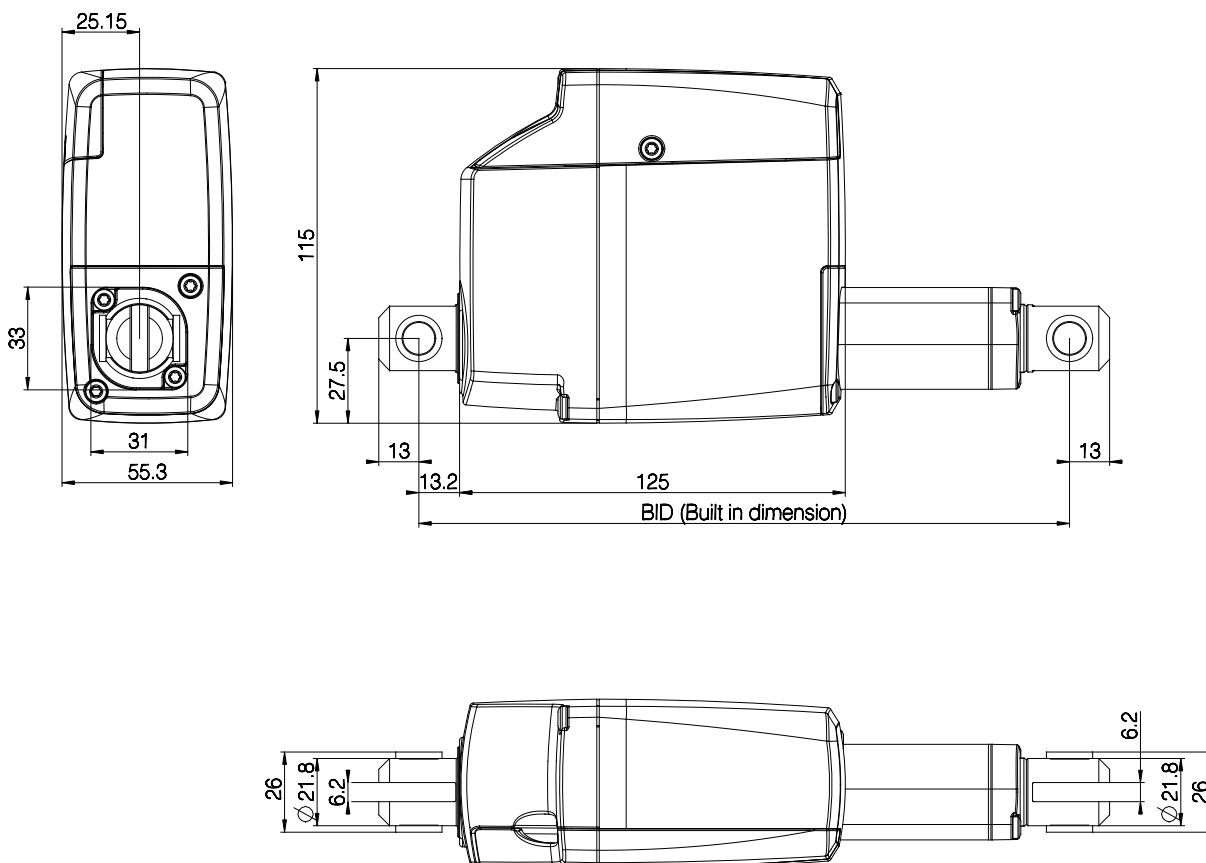
Platform		12 V	24 V	Reference temperature: 0°C
3 6 7 9	IC (Not for OpenBus™) LIN bus CAN bus J1939 CANopen	8 A	5 A	Above
		8 A	8 A	Below

Stroke and built-in tolerances

Platform		Pitch (mm)	Stroke tolerance	Example for 200 mm stroke	BID tolerance	Example for 200 mm BID
0	None with built-in limit switches	3/6/9/12	+2 / -2 mm	198 to 202 mm	+2 / -2 mm	198 to 202 mm
		20	+3 / -1 mm	199 to 203 mm	+2 / -2 mm	198 to 202 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 bus J1939 CANopen PROFINET Modbus RTU IO-Link (12-pin) Modbus TCP/IP	3/6/9/12	+1 / -3 mm	197 to 201 mm	+2 / -2 mm	198 to 202 mm
		20	+2 / -2 mm	198 to 202 mm	+2 / -2 mm	198 to 202 mm

Dimensions

All dimensions are in mm



Built-in dimensions

The built-in dimension depends on the chosen safety option and stroke length(s).

				Piston rod types			
				1, 2, 3, 4, A, B, C, D	M / from the surface	K, L / to the centre of the hole	F / from the surface
Back fixture types 1, 2, 3, 4 and A, B, C, D	Safety option	Stroke length	Spindle pitch	Min. built-in dimensions			
	No safety option or Safety nut for push	20 - 49	3	168	165	179	158
			6, 9 or 12	160	157	171	150
	No safety option	20 - 48	20	160	157	171	150
	Safety nut for pull	20 - 49	6, 9 or 12	172	169	183	162
	No safety option or Safety nut for push	50 - 200	3	118 + s*	115 + s	129 + s	108 + s
	No safety option or Safety nut for push	50 - 200	6, 9 or 12	110 + s	107 + s	121 + s	100 + s
	No safety option	49 - 200	20	112 + s	109 + s	123 + s	102 + s
	Safety nut for pull	50 - 200	6, 9 or 12	122 + s	119 + s	133 + s	112 + s
	No safety option or Safety nut for push	201 - 400	3	138 + s	135 + s	149 + s	128 + s
	No safety option	201 - 400	6, 9, 12 or 20	130 + s	127 + s	141 + s	120 + s
	Safety nut for push	201 - 400	6, 9 or 12	130 + s	127 + s	141 + s	120 + s
	Safety nut for pull	201 - 400	6, 9 or 12	142 + s	139 + s	153 + s	132 + s
	No safety option or Safety nut for push	401 - 500	3	158 + s	155 + s	169 + s	148 + s
	No safety option	401 - 600	6, 9, 12 or 20	150 + s	147 + s	161 + s	140 + s
	Safety nut for push	401 - 600	6, 9 or 12	150 + s	147 + s	161 + s	140 + s
	Safety nut for pull	401 - 600	6, 9 or 12	162 + s	159 + s	173 + s	152 + s



These built-in dimensions are measured according to the illustration on page 19.

* $118 + s = 118 + \text{stroke length}$

Built-in dimensions

All dimensions are in mm

The built-in dimension depends on the chosen safety option and stroke length(s).

				Piston rod types			
				1, 2, 3, 4, A, B, C, D	M / from the surface	K, L / to the centre of the hole	F / from the surface
Back fixture type M	Safety option	Stroke length	Spindle pitch	Min. built-in dimensions			
	No safety option or Safety nut for push	20 - 49	3	155	152	166	145
	No safety option or Safety nut for push	20 - 49	6, 9 or 12	147	144	158	137
	No safety option	20 - 48	20	147	144	158	137
	Safety nut for pull	20 - 49	6, 9 or 12	159	156	170	149
	No safety option or Safety nut for push	50 - 200	3	105 + s	102 + s	116 + s	95 + s
	No safety option	50 - 200	6, 9 or 12	97 + s	94 + s	108 + s	87 + s
	No safety option	49 - 200	20	99 + s	96 + s	110 + s	89 + s
	Safety nut for push	50 - 200	6, 9 or 12	98 + s	94 + s	108 + s	87 + s
	Safety nut for pull	50 - 200	6, 9 or 12	110 + s	106 + s	120 + s	99 + s
	No safety option or Safety nut for push	201 - 400	3	125 + s	122 + s	136 + s	115 + s
	No safety option	201 - 400	6, 9, 12 or 20	117 + s	114 + s	128 + s	107 + s
	Safety nut for push	201 - 400	6, 9 or 12	117 + s	114 + s	128 + s	107 + s
	Safety nut for pull	201 - 400	6, 9 or 12	129 + s	126 + s	140 + s	119 + s
	No safety option or Safety nut for push	401 - 500	3	145 + s	142 + s	156 + s	135 + s
	No safety option or Safety nut for push	401 - 600	6, 9, 12 or 20	137 + s	134 + s	148 + s	127 + s
	Safety nut for pull	401 - 600	6, 9, 12 or 20	149 + s	146 + s	160 + s	139 + s



These built-in dimensions are measured according to the illustration on page 19.

Built-in dimensions

All dimensions are in mm

The built-in dimension depends on the chosen safety option and stroke length(s).

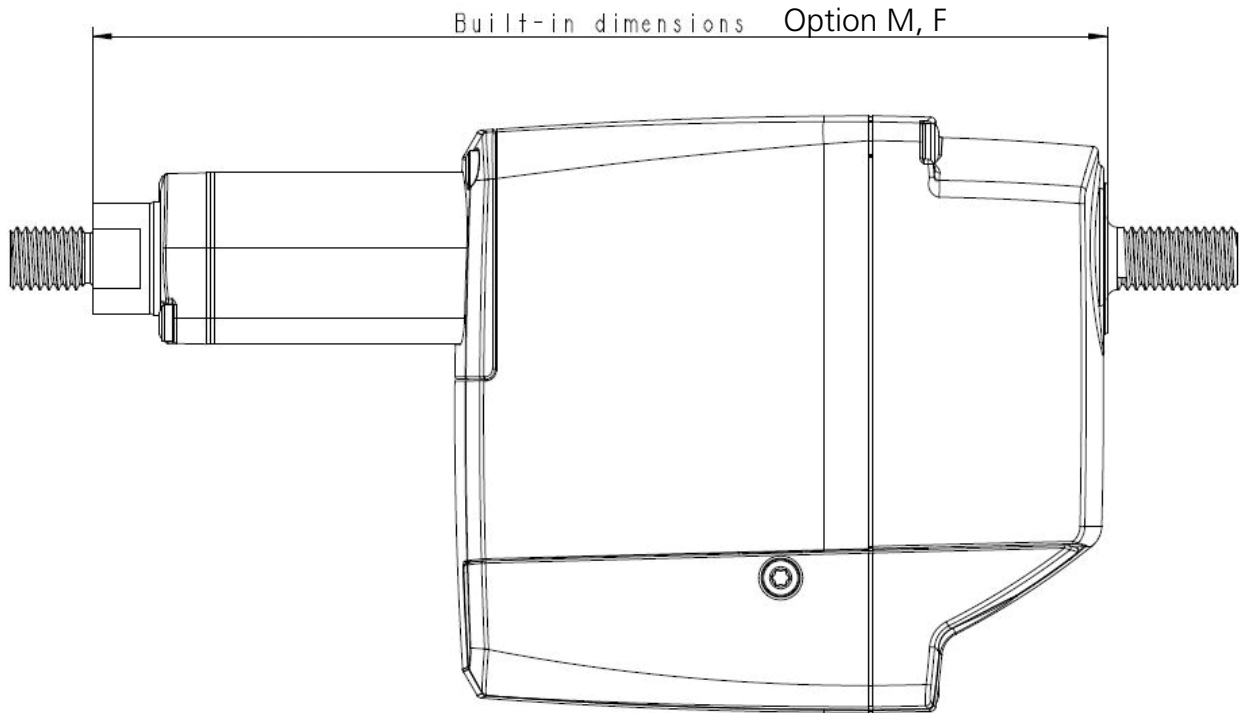
				Piston rod types			
				1, 2, 3, 4, A, B, C, D	M / from the surface	K, L / to the centre of the hole	F / from the surface
Back fixture types 5, 6, 7, 8 and F, G, H, I	Safety option	Stroke length	Spindle pitch	Min. built-in dimensions			
	No safety option or Safety nut for push	20 - 49	3	174	171	185	164
	No safety option or Safety nut for push	20 - 49	6, 9 or 12	166	163	177	156
	No safety option	20 - 48	20	166	163	177	156
	Safety nut for pull	20 - 49	6, 9 or 12	178	175	189	168
	No safety option or Safety nut for push	50 - 200	3	124 + s	121 + s	135 + s	114 + s
	No safety option or Safety nut for push	50 - 200	6, 9 or 12	116 + s	113 + s	127 + s	106 + s
	No safety option	49 - 200	20	118 + s	115 + s	129 + s	108 + s
	Safety nut for pull	50 - 200	6, 9 or 12	128 + s	125 + s	139 + s	118 + s
	No safety option or Safety nut for push	201 - 400	3	144 + s	141 + s	155 + s	134 + s
	No safety option or Safety nut for push	201 - 400	6, 9, 12 or 20	136 + s	133 + s	147 + s	126 + s
	Safety nut for pull	201 - 400	6, 9 or 12	148 + s	145 + s	159 + s	138 + s
	No safety option or Safety nut for push	401 - 500	3	164 + s	161 + s	175 + s	154 + s
	No safety option or Safety nut for push	401 - 600	6, 9, 12 or 20	156 + s	153 + s	167 + s	146 + s
	Safety nut for pull	401 - 600	6, 9, 12 or 20	168 + s	165 + s	179 + s	158 + s



These built-in dimensions are measured according to the illustration on page 19.

Built-in dimensions

All dimensions are in mm

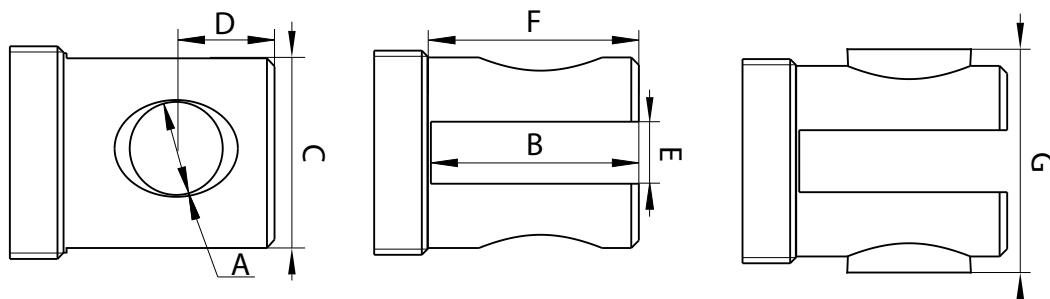


To have an extended BID, the BID must be at least 6 mm longer than the standard BID.

Piston rod eyes

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

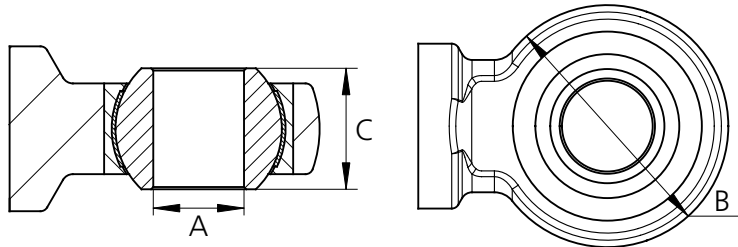
Option	Piston rod eye	Material	A	B	C	D	E	F (~)	G	Bushing	Change in BiD	P/N
1	Slotted	Automatic steel	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231033
A	Slotted	AISI 304	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231096
3	Slotted	Automatic steel	12.3 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	-	No	0	0231016
C	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
I	Slotted	AISI 304	12.3 ± 0.07	28.2 ± 0.4	21.7 ± 0.1	11 ± 0.3	6.3 ± 0.1	30 ± 0.2	-	No	+5	0301244
D	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
J	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
4	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
2	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
B	Slotted	AISI 304	10.2 ± 0.1	25 ± 0.3	21.8 ± 0.1	13 ± 0.3	6.2 ± 0.1	27 ± 0.2	26	Yes	0	0231095
9	Slotted	Automatic steel	12.9 ± 0.1	25 ± 0.1	21.8 ± 0.1	13 ± 0.15	6.2 ± 0.1	27 ± 0.2	-	No	+14	0331014



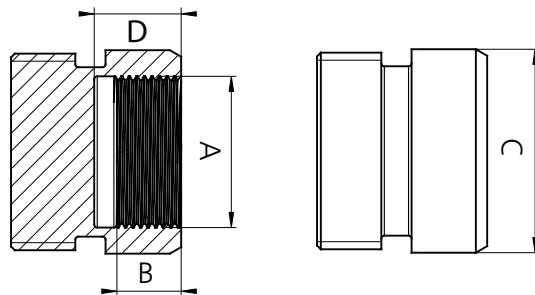
Piston rod eyes

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

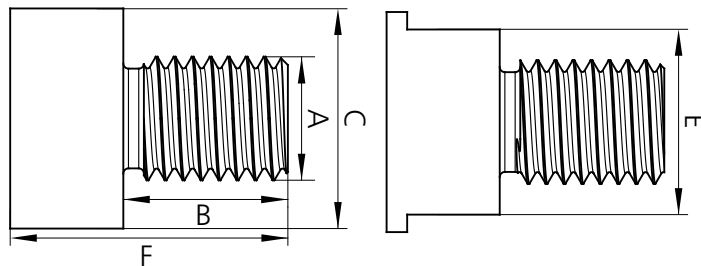
Option	Piston rod eye	Material	A	B	C	D	E	F (-)	Change in BiD	P/N
K	Ball eye	AISI 304	10H7	Ø28	14 +0 -0.12	-	-	-	+ 11	0351053
L	Ball eye	AISI 304	12H7	Ø32	16 +0 -0.12	-	-	-	+ 11	0351055



F	Female adaptor	AISI 303	M8	8 ± 0.5	21.7 ± 0.2	10 ± 0.2	-	-	-10	0251039
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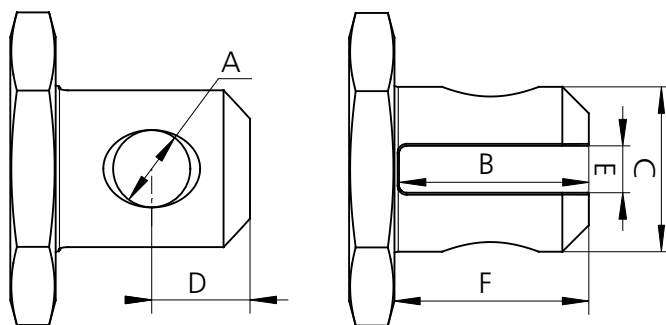
M	Male adaptor	AISI 304	M12 x 1.75	16 ± 0.1	21.3 ± 0.1	-	-	-	-10	0231094
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Back fixtures

All dimensions are in mm.

Option	Back fixture	Material	A	B	C	D	E	F	G	Change in BiD	Bushing	P/N
A	Slotted	AISI 304	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	-	0	No	0251015
1	Slotted	Automatic steel	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	-	0	No	0251011
B	Slotted	AISI 304	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	26	0	Yes	0251014
2	Slotted	Automatic steel	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	26	0	Yes	0251010
C	Slotted	AISI 304	12.3 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	-	0	No	0251014
3	Slotted	Automatic steel	12.3 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	-	0	No	0251010
D	Slotted	AISI 304	8.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	26	0	Yes	0251015
4	Slotted	Automatic steel	8.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	26	0	Yes	0251011
9	Slotted	Automatic steel	12.9 ±0.1	25.6 ±0.1	21.8 ±0.1	13 ±0.1	6.2 ±0.1	25.6 ±0.1	-	0	No	0251084

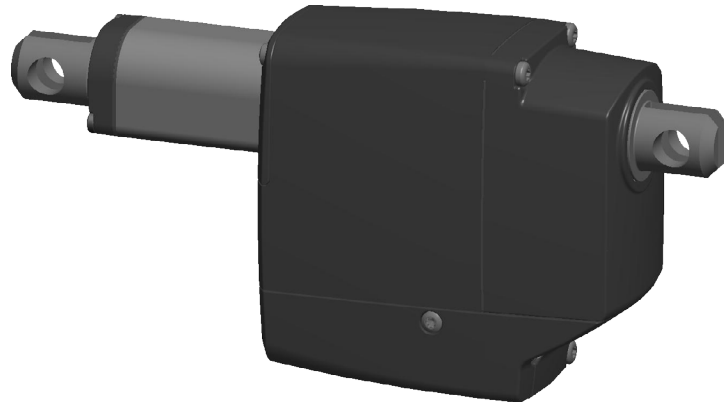


Back fixtures

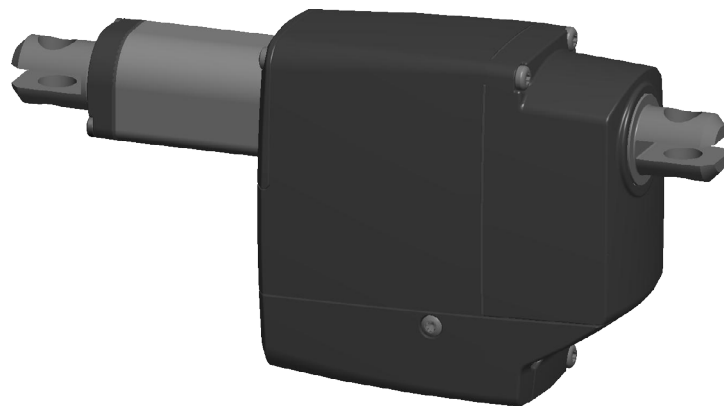
All dimensions are in mm.

Option	Back fixture	Material	A	B	C	D	E	F	G	Change in BiD	Bushing	P/N
M	Male adapter	AISI 303	M12 x 1.75	25 ±0.2	23	-	-	-	-	-13	-	0251021
I	Fixed	AISI 304	8.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.00 ±0.1	26 ±0.3	26	+6	Yes	0251034
6	Fixed	Automatic steel	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	26	+6	Yes	0251026
7	Fixed	Automatic steel	12.3 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	-	+6	No	0251026
G	Fixed	AISI 304	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	26	+6	Yes	0251033
F	Fixed	AISI 304	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.00 ±0.1	26 ±0.3	-	+6	No	0251034
5	Fixed	Automatic steel	10.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	-	+6	No	0251032
H	Fixed	AISI 304	12.3 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	-	+6	No	0251033
8	Fixed	Automatic steel	8.2 ±0.1	25 ±0.1	21.8 ±0.1	13 ±0.1	6.20 ±0.1	26 ±0.3	26	+6	Yes	0251032

Back fixture orientation



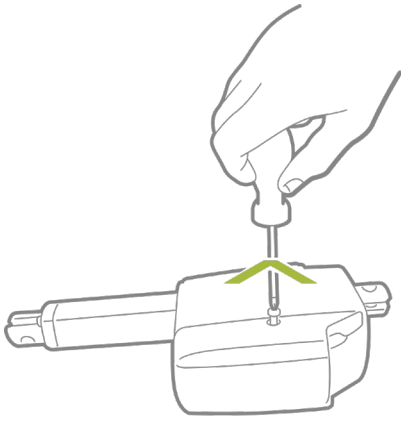
"0" Degrees



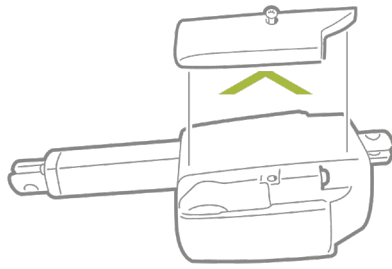
"90" Degrees

NB. All with tolerance of $\pm 4^\circ$

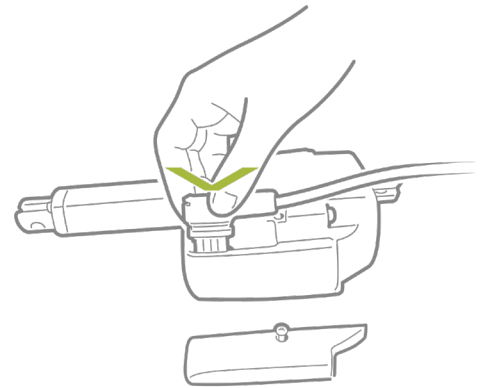
Cable mounting



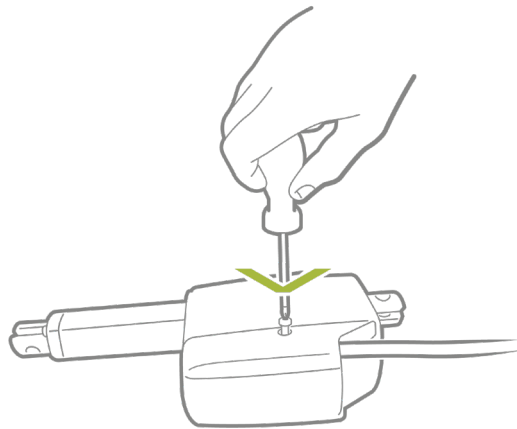
1. Unscrew the cover



2. Remove the cover and blind plug



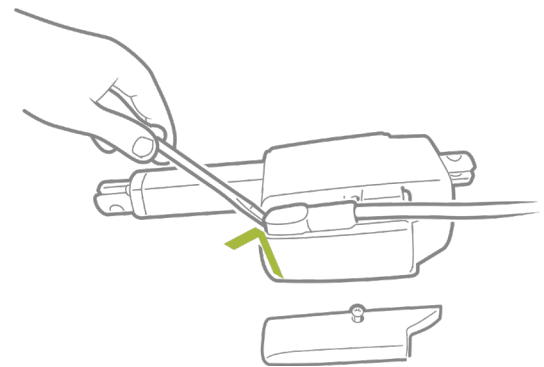
3. Plug in the cable gently without using any tools



4. Screw the cover back onto the actuator

The torque of the cover screw is approx. 1 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 dismantled 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.



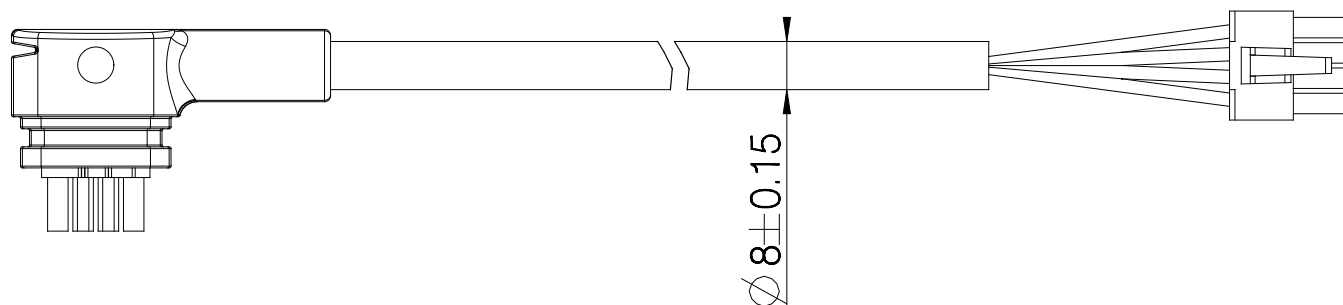
NOT valid for ATEX cables, please refer to the ATEX section for correct cable mounting on ATEX actuators.

Cables

Power + signal cable dimensions

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

Colour	Outer dimensions	Core mm ²	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	
		Length: See table		Length: See table		90	
Ordering no.	LINAK P/N	Length (mm)		Length (mm)		Length (mm)	
S	0147001 - 850	CS	810 ±30	JS/KS	785 ±30	IS/LS	740 ±30
T	0147001 - 1600	CT	1560 ±30	JT/KT	1535 ±30	IT/LT	1490 ±30
R	0147001 - 5100	CR	5060 ±50	JR/KR	5035 ±50	IR/LR	4980 ±50
V	0147001 - 10100	CV	10060 ±100	JV/KV	10035 ±100	IV/LV	9990 ±100

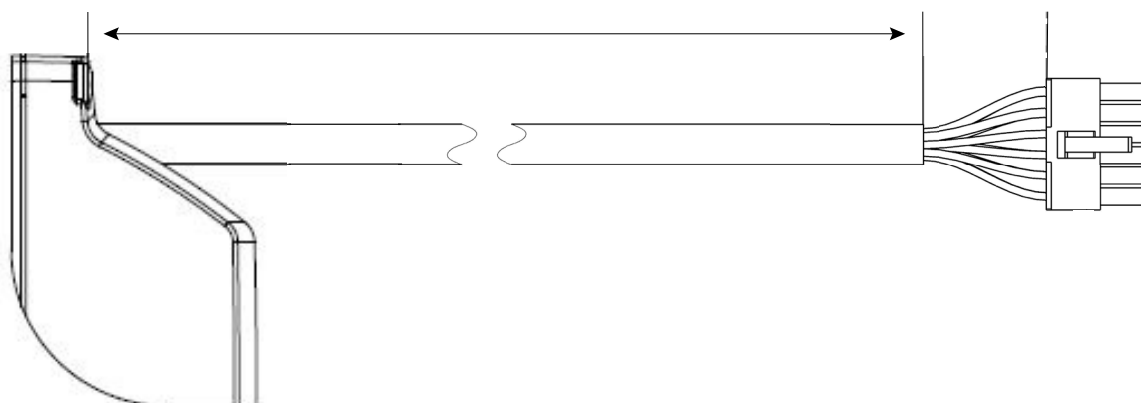
*AWG: American Wire Gauge

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 mm ²	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

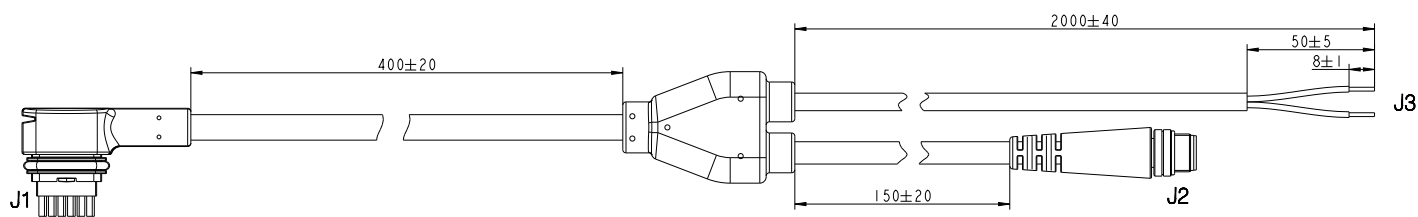
Cable P/N Table				
Ordering no.	LINAK P/N	Cable type	# Wires	Length in mm
K	0257057 - 850	Power + signal	11	850 ± 30
Y	0257057 - 1600	Power + signal	11	1,560 ± 30
Z	0257057 - 5100	Power + signal	11	5,060 ± 50
L	0257057 - 10100	Power + signal	11	10100 ± 100

Cables

Power + signal cable dimensions

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

Colour	Outer dimensions	Core mm ²	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

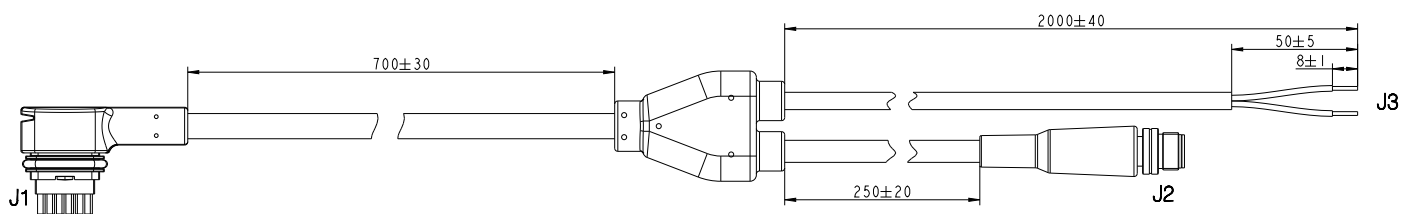


Cables

Power + signal cable dimensions

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

Colour	Outer dimensions	Core mm ²	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

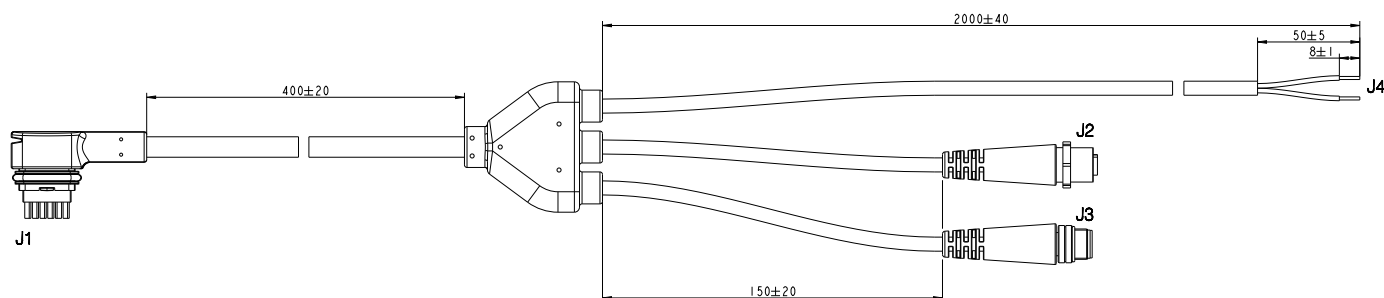


Cables

Power + signal cable dimensions

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

Colour	Outer dimensions	Core mm ²	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
		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 (Bb)	Storage at low temperature: Temperature: +105°C Duration: 24 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 * 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
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 for 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 seconds 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 sideloaded with 5 N Duration: 10.000 cycles and 240 h

Environmental tests – Mechanical

Test	Specification	Comment
Mechanical shock (handling) - drop test		3 drops on 6 faces onto a concrete floor Drop height: 500 mm on all surfaces
Mechanical shock operational		Peak Pulse Amplitude: 50 G Pulse Duration: 11 ms Number of pulses: 18 total - 3 in each direction for all three axes
		Peak Pulse Amplitude: 30 G Pulse Duration: 18 ms Number of pulses: 18 total - 3 in each direction for all three axes
		Peak Pulse Amplitude: 25 G Pulse Duration: 6 ms Number of pulses: 6000 total- 1000 in each direction for all three axes
Vibration random		Random vibration: From 18 Hz - 0,025 G to 1000 Hz - 0,015 G Duration: 2 h/axis UM-32-30-003

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 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-C23-01:2024 GB/T 3836.1-2021 GB/T 3836.31-2021	

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 fulfil the regulations according to leakage current.

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