TECHLINE®
IMPROVING FLEXIBILITY

Actuator LA25
Data sheet

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LA25

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. Furthermore, the compact dimensions of the LA25 make it applicable for confined spaces.

Features:
- 12 or 24 V DC permanent magnetic motor
- Thrust from 600 N - 2500 N in push and pull
- Max. speed up to 25 mm/sec. depending on load and spindle pitch
- Stroke length from 20 - 300 mm
- Protection class: IP66 (dynamic) and IP69K (static)
- Built-in endstop switches
- Guided nut

Options in general:
- Back fixture and piston rod eye material: Steel or stainless steel
- Safety nut in push or pull (2500N version only safety nut in push)
- Exchangeable cables in different lengths up to 5 m
- Special anodised housing for extreme environments
- IECEx/ATEX certified for Zone 21
- Hall effect sensor
- Hall potentiometer
- IC options including:
  - IC - Integrated Controller
  - Integrated Parallel Controller
  - LIN bus communication and CAN bus communication
  - Analogue or digital feedback for precise positioning
  - Endstop signals
  - PC configuration tool

Usage:
- Duty cycle at is max. 20%
  The duty cycles are valid for operation within an ambient temperature of +5°C to +40°C
- Ambient operating temperature: -40° to +85°C, full performance from +5°C to +40°C
- For IECEx/ATEX:
  Ambient operating temperature: -25°C to +65°C

Contents

Chapter 1

Specifications

Motor:	Permanent magnet motor 12 or 24V DC
Cable:	Motor: 8 x 18 AWG PVC cable
Housing:	The housing is made of casted aluminium, coated for outdoor use and in harsh conditions
Spindle part:	Outer tube: Extruded aluminium anodised Inner tube: Stainless steel AISI304/SS2333 Acme spindle: Trapezoidal spindle with high efficiency
Temperature range:	- 40° C to +85° C For IECEx/ATEX: - 25° C to +65° C - 40° F to +185° F - 13° F to +149° F Full performance +5° C to +40° C
Storage temperature:	-55°C to +105°C
Weather protection:	Rated IP66 for outdoor use. Furthermore, the actuator can be washed down with a high-pressure cleaner (IP69K).
Noise level:	58.5 dB (A) measuring method DS/EN ISO 8746 actuator not loaded.
Safety factor:	Static safety factor: 2.0
Compatibility:	The LA25 IC is compatible with SMPS-T160 (For combination possibilities, please see the User Manual for SMPS-T160)

Be aware of the following two symbols throughout this product data sheet:

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.

Technical specifications

LA25 with 12V motor

Type	Push/Pull Max. (N)	Self-lock min. (N) Push/Pull				Spindle pitch (mm)	*Typical speed (mm/s)		Standard stroke length (mm)	*Typical amp. @ 12 V	
		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)						
25030xxxxxxxA...	2500	2500	1	2500	1	3	3.1	2.5	20 - 300	0.8	3.8
25060xxxxxxxA...	1500	1500	1	1500	2	6	6.6	5.2	20 - 300	0.8	3.8
25090xxxxxxxA...	1200	1200	2	1200	4	9	9.9	7.5	20 - 300	0.9	4.0
25120xxxxxxxA...	900	900	3	900	7	12	13	9.6	20 - 300	0.9	3.8
25200xxxxxxxA...	600	600	5	600	12	20	25	18	20 - 300	0.9	4.0

LA25 with 24V motor

Type	Push/Pull Max. (N)	Self-lock min. (N) Push/Pull				Spindle pitch (mm)	*Typical speed (mm/s)		Standard stroke length (mm)	*Typical amp. @ 24 V	
		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)						
25030xxxxxxxB...	2500	2500	1	2500	1	3	3.2	2.6	20 - 300	0.4	1.9
25060xxxxxxxB...	1500	1500	1	1500	2	6	6.4	5.5	20 - 300	0.4	1.9
25090xxxxxxxB...	1200	1200	2	1200	4	9	9.5	8.1	20 - 300	0.4	2.0
25120xxxxxxxB...	900	900	3	900	7	12	12.6	10.4	20 - 300	0.4	1.9
25200xxxxxxxB...	600	600	5	600	12	20	25	18	20 - 300	0.4	2.0

* 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.

** The backdrive is measured with a stable power supply at an ambient temperature of 20°C after 120 seconds continuous push load.

- **Self locking ability**
  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.

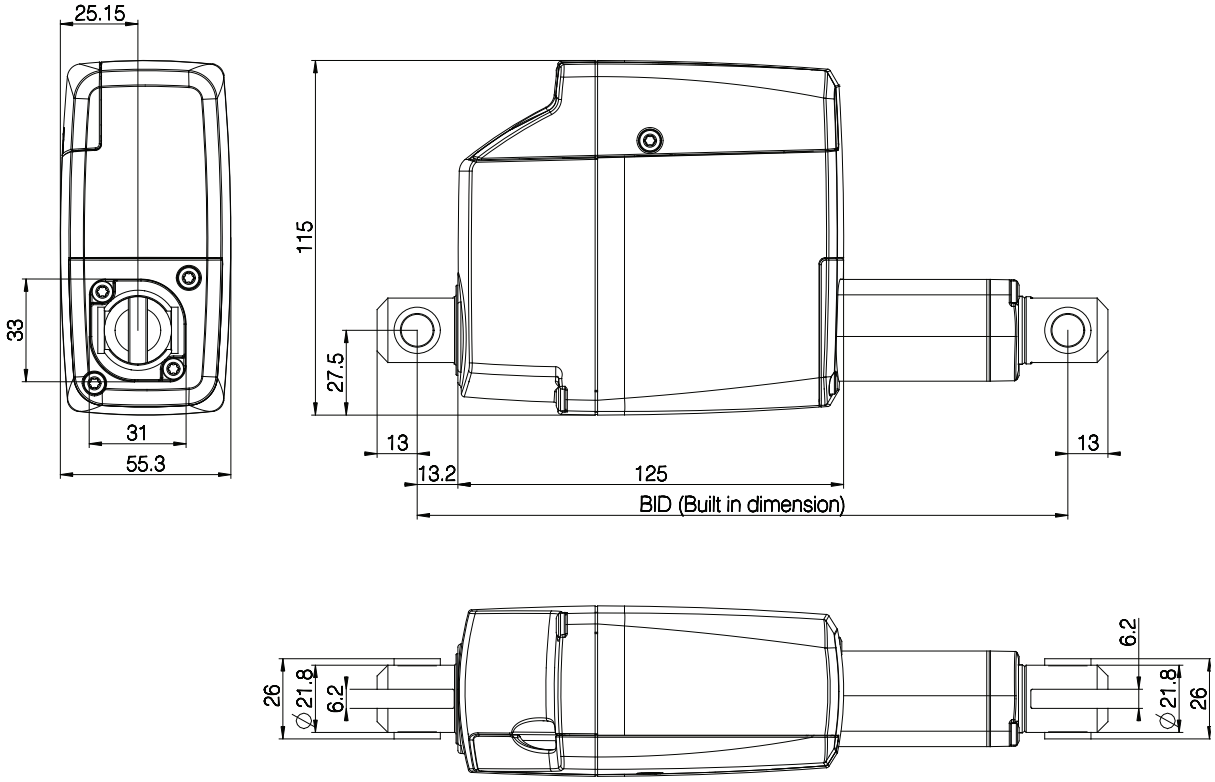
Stroke tolerances

Platform options	Descriptions	Stroke tolerance	Example for 200 mm stroke
25030/060/090/120XXXXXXXXXX0	With built-in limit switches	+ 2 / - 2 mm	198 to 202 mm
25200XXXXXXX0	With built-in limit switches	+ 3 / - 1 mm	199 to 203 mm
25XXXXXXXXX3	Integrated controller	+ 1 / - 3 mm	197 to 201 mm

Built-in tolerances

Platform options	Descriptions	BID tolerance	Example for 200 mm BID
25XXXXXXXXXX	All variants	+ 2 / - 2 mm	198 to 202 mm

Dimensions



The built-in dimension depends upon 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	20 - 49	3	168	165	179	158
	No safety option	20 - 49	6, 9 or 12	160	157	171	150
	No safety option	20 - 48	20	160	157	171	150
	Safety nut for push	20 - 49	3	168	165	179	158
	Safety nut for push	20 - 49	6, 9 or 12	160	157	171	150
	Safety nut for pull	20 - 49	6, 9 or 12	172	169	183	162
	No safety option	50 - 200	3	118 + s	115 + s	129 + s	108 + s
	No safety option	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 push	50 - 200	3	118 + s	115 + s	129 + s	108 + s
	Safety nut for push	50 - 200	6, 9 or 12	110 + s	107 + s	121 + s	100 + s
	Safety nut for pull	50 - 200	6, 9 or 12	122 + s	119 + s	133 + s	112 + s
	No safety option	201 - 300	3	138 + s	135 + s	149 + s	128 + s
	No safety option	201 - 300	6, 9, 12 or 20	130 + s	127 + s	141 + s	120 + s
	Safety nut for push	201 - 300	3	138 + s	135 + s	149 + s	128 + s
	Safety nut for push	201 - 300	6, 9 or 12	130 + s	127 + s	141 + s	120 + s
	Safety nut for pull	201 - 300	6, 9 or 12	142 + s	139 + s	153 + s	132 + s

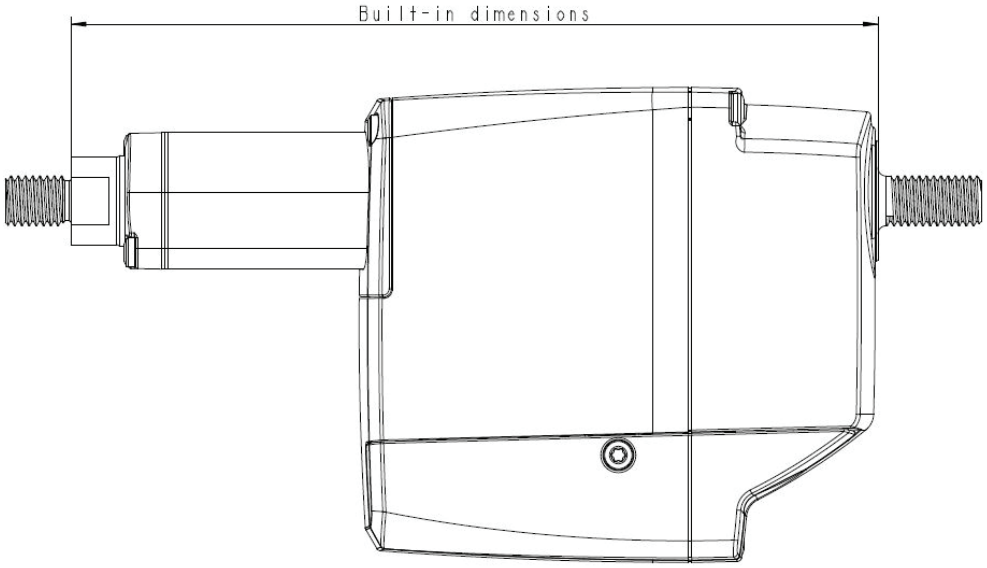
Built-in dimensions

				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
	Safety option	**Stroke length**	**Spindle pitch**	**Min. built-in dimensions**			
Back fixture type M	No safety option	20 - 49	3	155	152	166	145
	No safety option	20 - 49	6, 9 or 12	147	144	158	137
	No safety option	20 - 48	20	147	144	158	137
	Safety nut for push	20 - 49	3	155	152	166	145
	Safety nut for push	20 - 49	6, 9 or 12	147	144	158	137
	Safety nut for pull	20 - 49	6, 9 or 12	159	156	170	149
	No safety option	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	3	105 + s	102 + s	116 + s	95 + 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	201 - 300	3	125 + s	122 + s	136 + s	115 + s
	No safety option	201 - 300	6, 9, 12 or 20	117 + s	114 + s	128 + s	107 + s
	Safety nut for push	201 - 300	3	125 + s	122 + s	136 + s	115 + s
	Safety nut for push	201 - 300	6, 9 or 12	117 + s	114 + s	128 + s	107 + s
	Safety nut for pull	201 - 300	6, 9 or 12	129 + s	126 + s	140 + s	119 + s

Built-in dimensions

				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	20 - 49	3	174	171	185	164
	No safety option	20 - 49	6, 9 or 12	166	163	177	156
	No safety option	20 - 48	20	168	163	177	156
	Safety nut for push	20 - 49	3	174	171	185	164
	Safety nut for push	20 - 49	6, 9 or 12	166	163	177	156
	Safety nut for pull	20 - 49	6, 9 or 12	178	175	189	168
	No safety option	50 - 200	3	124 + s	121 + s	135 + s	114 + s
	No safety option	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 push	50 - 200	3	124 + s	121 + s	135 + s	114 + s
	Safety nut for push	50 - 200	6, 9 or 12	116 + s	113 + s	127 + s	106 + s
	Safety nut for pull	50 - 200	6, 9 or 12	128 + s	125 + s	139 + s	118 + s
	No safety option	201 - 300	3	144 + s	141 + s	155 + s	134 + s
	No safety option	201 - 300	6, 9, 12 or 20	136 + s	133 + s	147 + s	126 + s
	Safety nut for push	201 - 300	3	144 + s	141 + s	155 + s	134 + s
	Safety nut for push	201 - 300	6, 9 or 12	136 + s	133 + s	147 + s	126 + s
	Safety nut for pull	201 - 300	6, 9 or 12	148 + s	145 + s	159 + s	138 + s

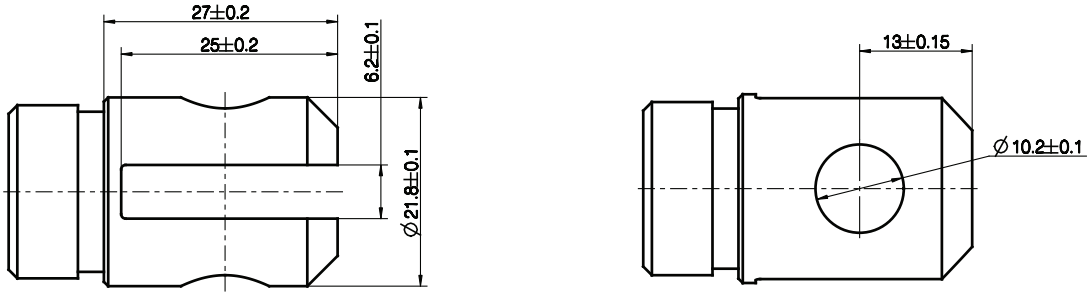
Built-in dimensions



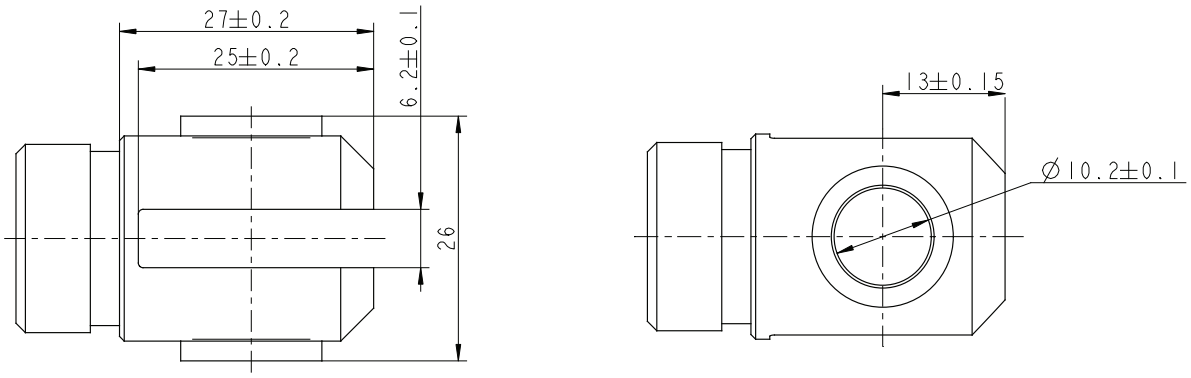
The built-in dimensions for options M and F are measured according to this illustration.

Piston Rod Eyes

Option "1" and "A"
Piston 0231033, Zinc coated steel
Piston 0231096, Stainless steel AISI 304

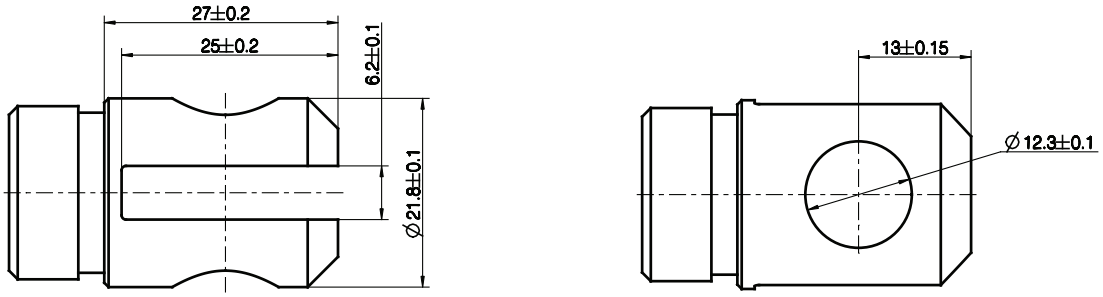


Option "2" and "B"
Piston 0231016 with bushings, Zinc coated steel
Piston 0231095 with bushings, Stainless steel AISI 304

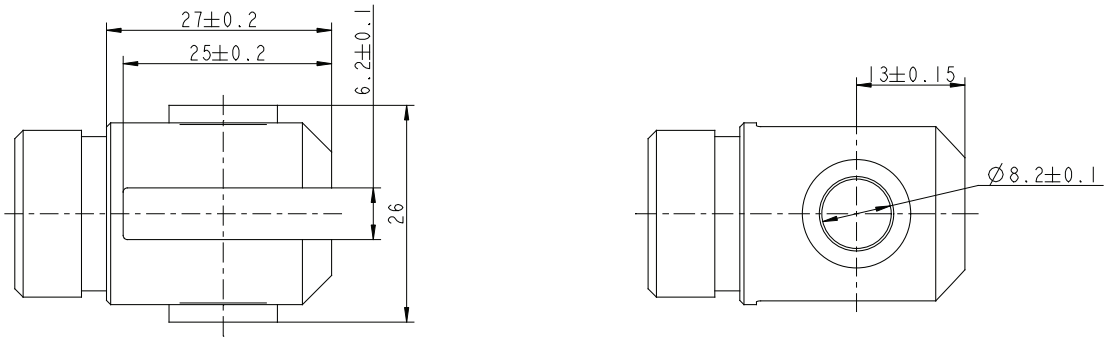


Piston Rod Eyes

Option "3" and "C"
Piston 0231016, Zinc coated steel
Piston 0231095, Stainless steel AISI 304

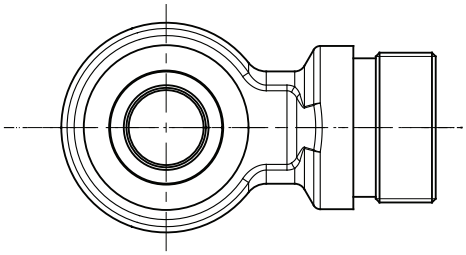


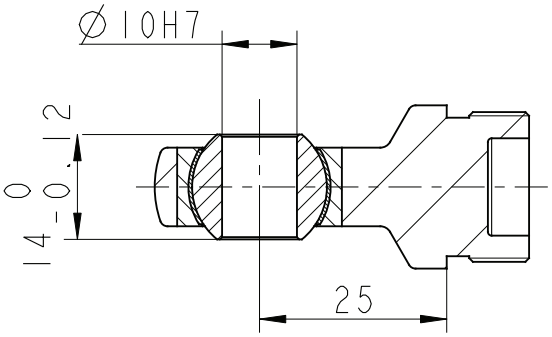
Option "4" and "D"
Piston 0231033 with bushings, Zinc coated steel
Piston 0231096 with bushings, Stainless steel AISI 304



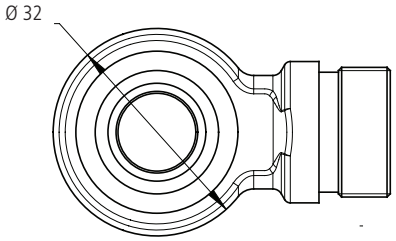
Piston Rod Eyes

Option "K"
Piston 0351043, Stainless steel AISI 304

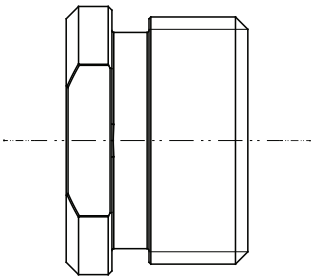


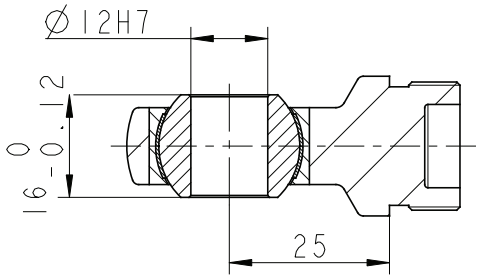


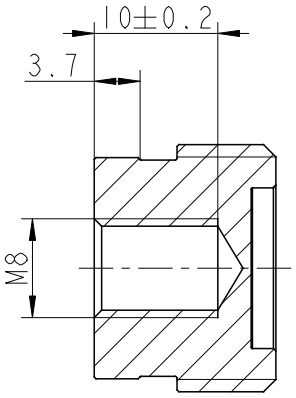
Option "L"
Piston 0351035, Stainless steel AISI 304



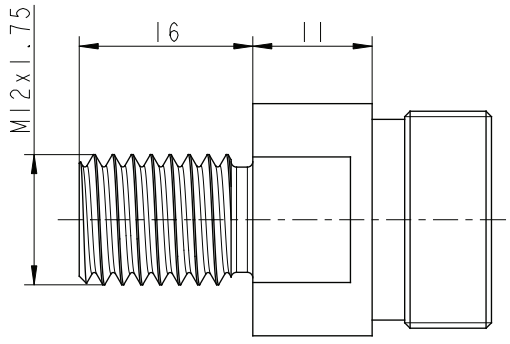
Option "F"
Piston 0251039, Stainless steel AISI 303

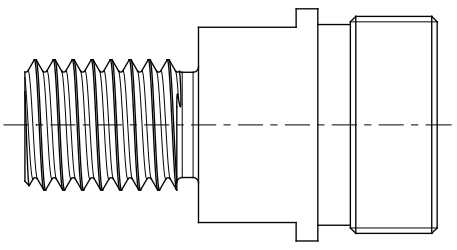






Option "M"
Piston 0231094, Stainless steel AISI 304

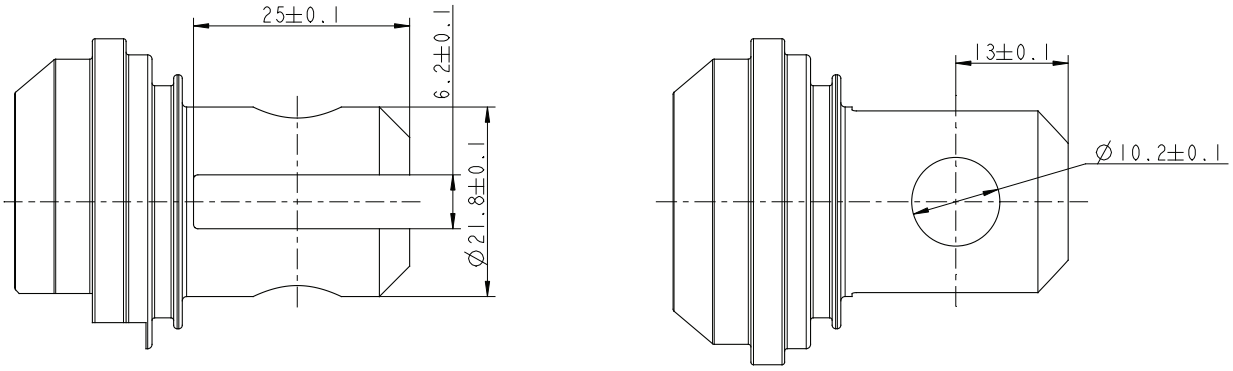




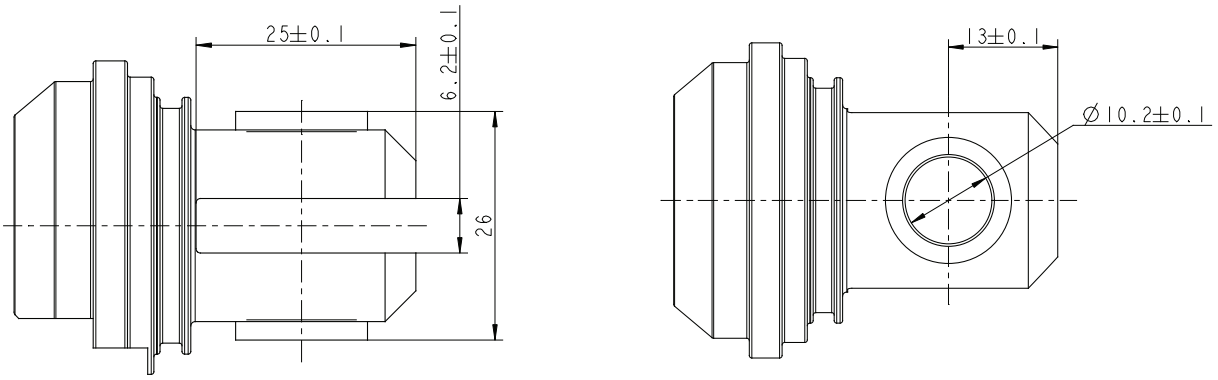
The Piston Rod Eye is only allowed to turn 0 - 90 degrees.

Back fixtures

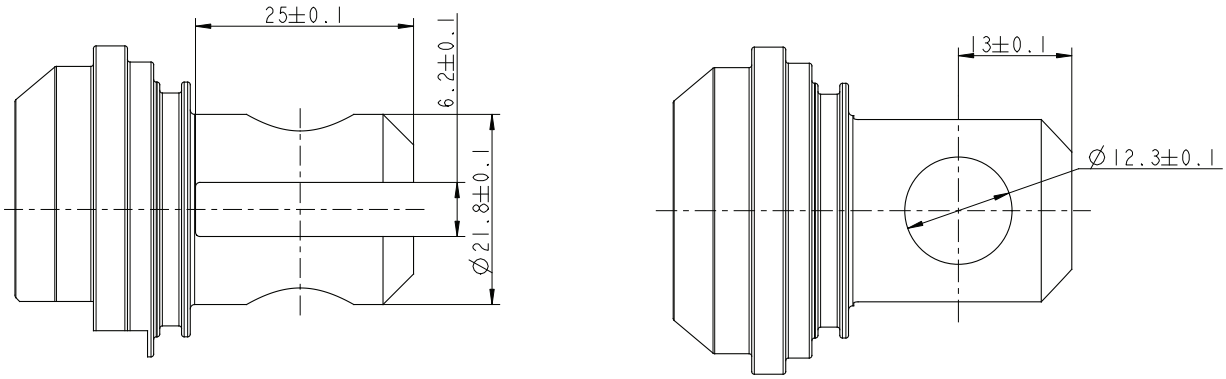
Option "1" and "A"
LINAK P/N: 0251011 without bushings, Zinc coated steel
0251015 without bushings, Stainless steel AISI 304



Option "2" and "B"
LINAK P/N: 0251010 with bushings, Zinc coated steel
0251014 with bushings, Stainless steel AISI 304

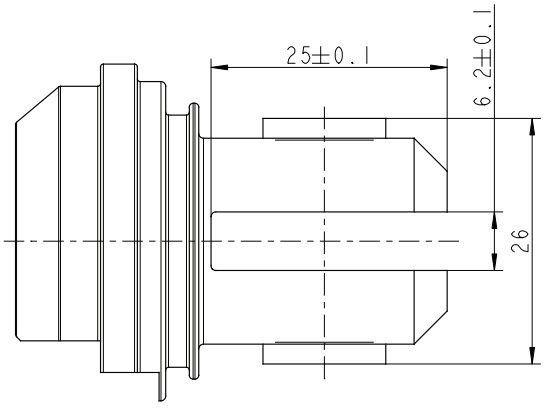


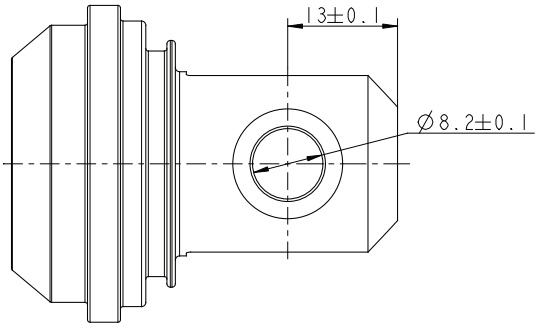
Option "3" and "C"
LINAK P/N: 0251010 without bushings, Zinc coated steel
0251014 without bushings, Stainless steel AISI 304



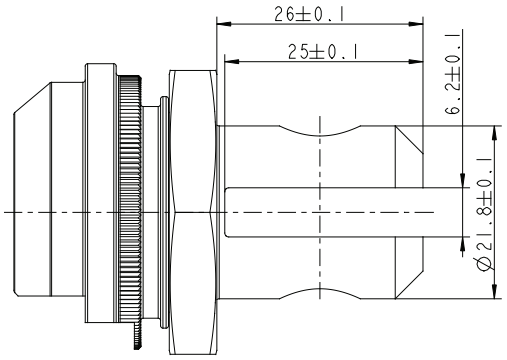
Back fixtures

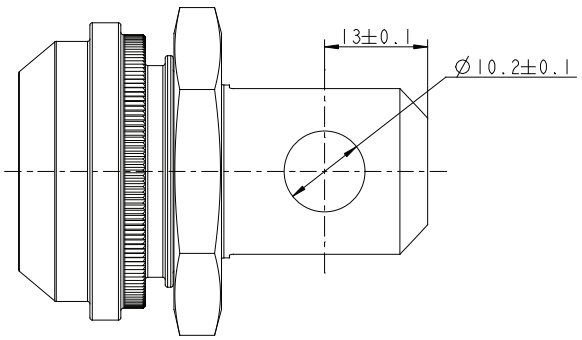
Option "4" and "D"
LINAK P/N: 0251011 with bushings, Zinc coated steel



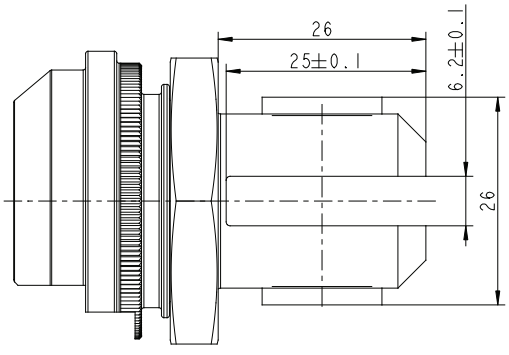


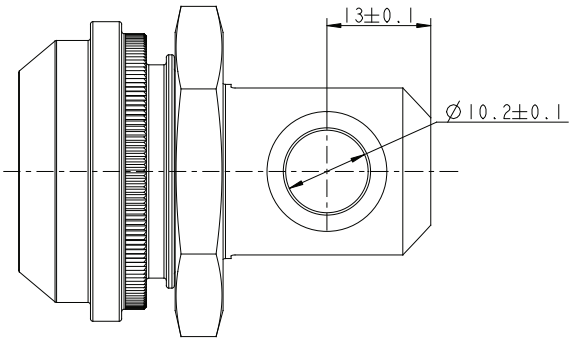
Option "5" and "F"
LINAK P/N: 0251032 without bushings, Zinc coated steel
0251034 without bushings, Stainless steel AISI 304





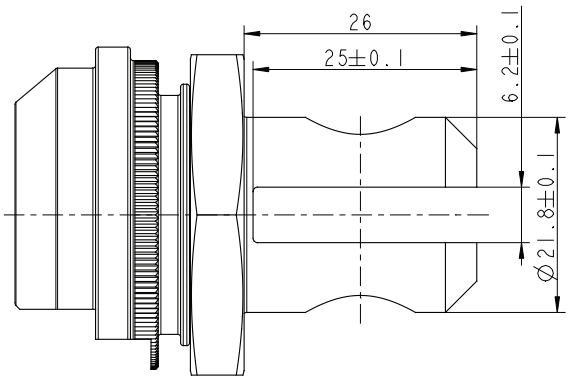
Option "6" and "G"
LINAK P/N: 0251026 with bushings, Zinc coated steel
0251033 with bushings, Stainless steel AISI 304

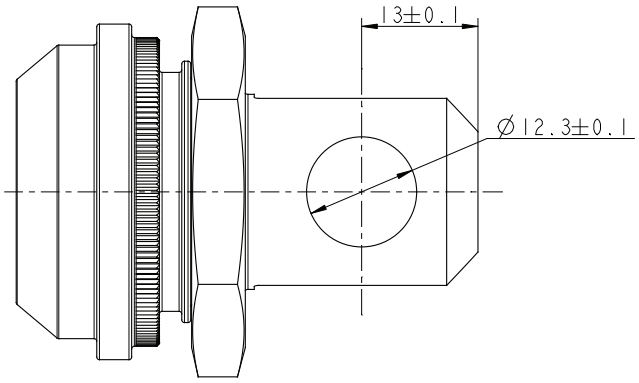




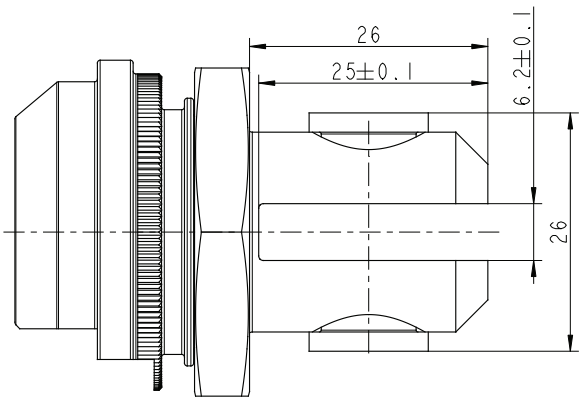
Back fixtures

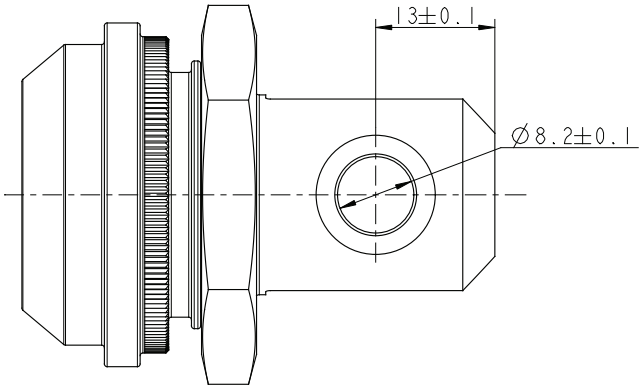
Option "7" and "H"
LINAK P/N 0251026 without bushings, Zinc coated steel
0251033 without bushings, Stainless steel AISI 304



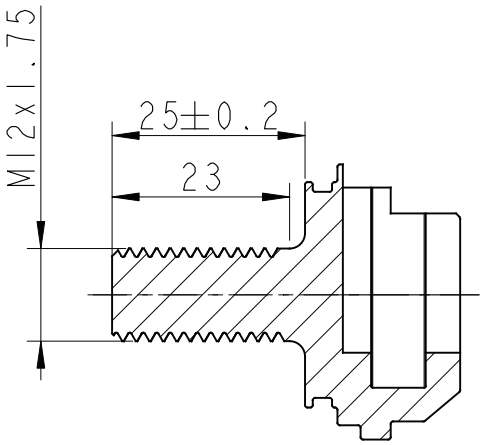


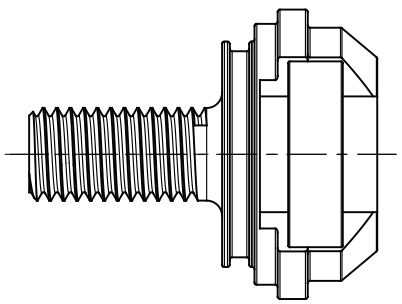
Option "8" and "I"
LINAK P/N 0251032 with bushings, Zinc coated steel
0251034 with bushings, Stainless steel AISI 304



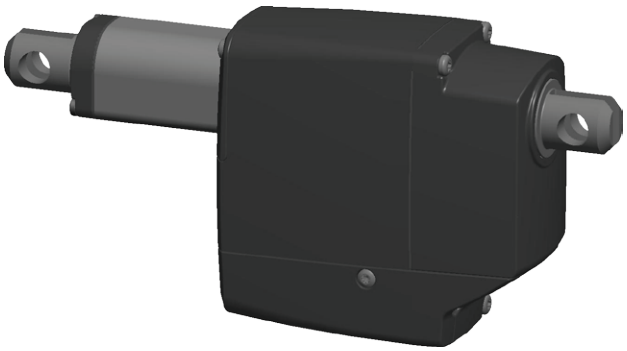


Option "M"
LINAK P/N: 0251021, Stainless steel AISI 303

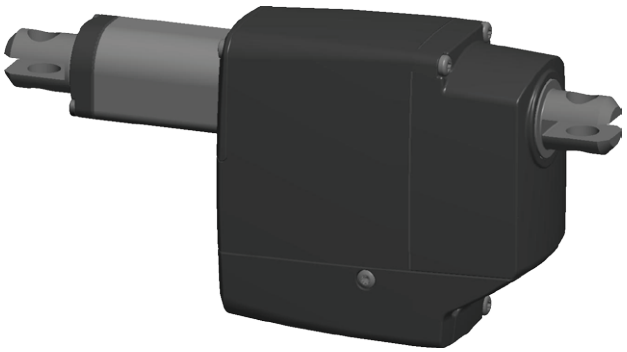




Back fixture orientation



Option 1 = 0°

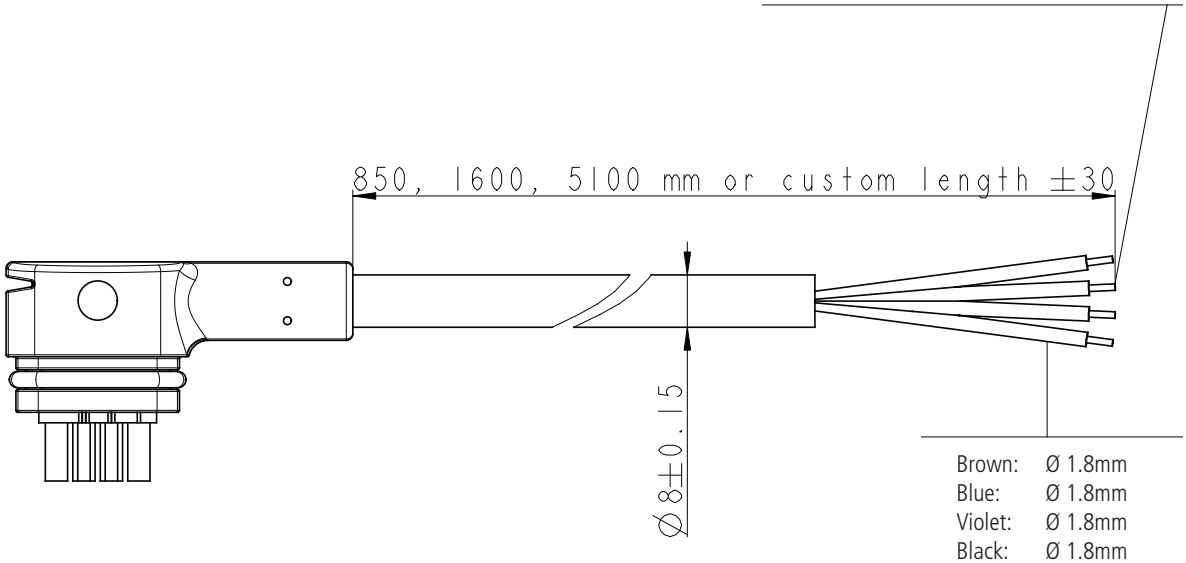


Option 2 = 90°

Cable dimensions

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

*AWG: American Wire Gauge

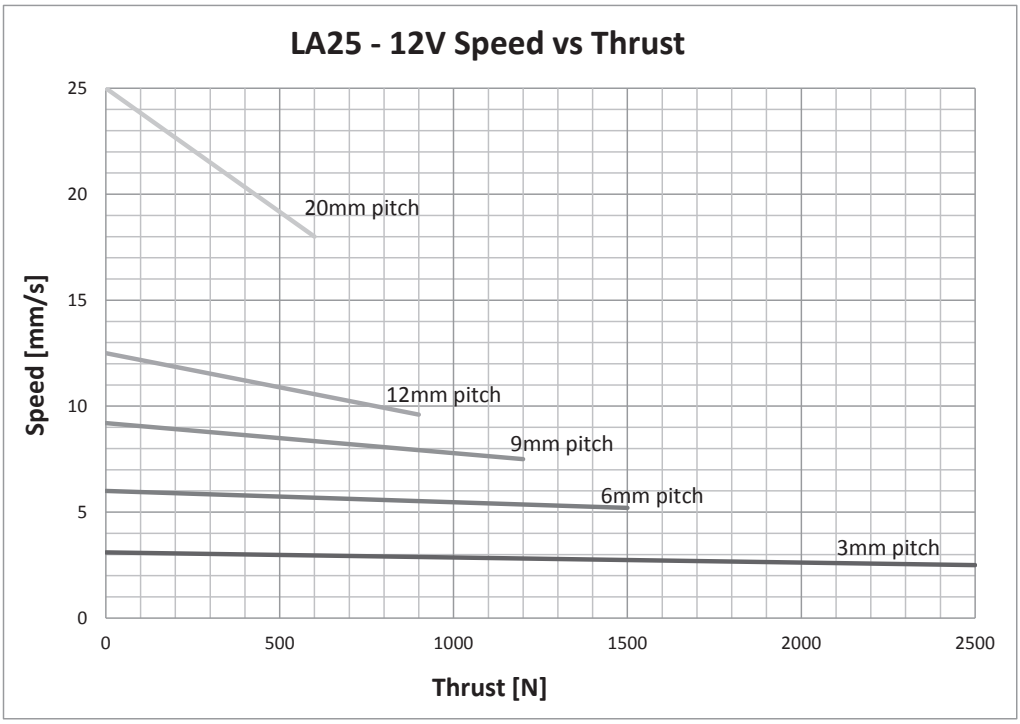


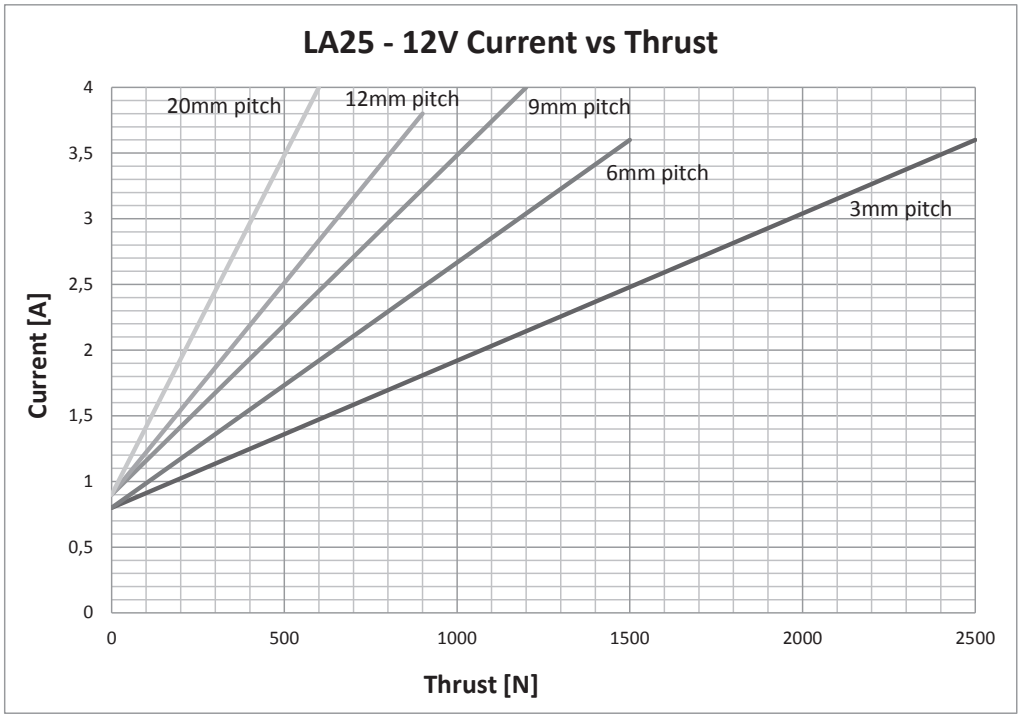
Brown: Ø 1.8mm
Blue: Ø 1.8mm
Violet: Ø 1.8mm
Black: Ø 1.8mm
Red: Ø 1.8mm
Yellow: Ø 1.8mm
Green: Ø 1.8mm
White: Ø 1.8mm

The LA25 standard cable is a UV resistant PVC cable.

Speed and current curves - 12V motor

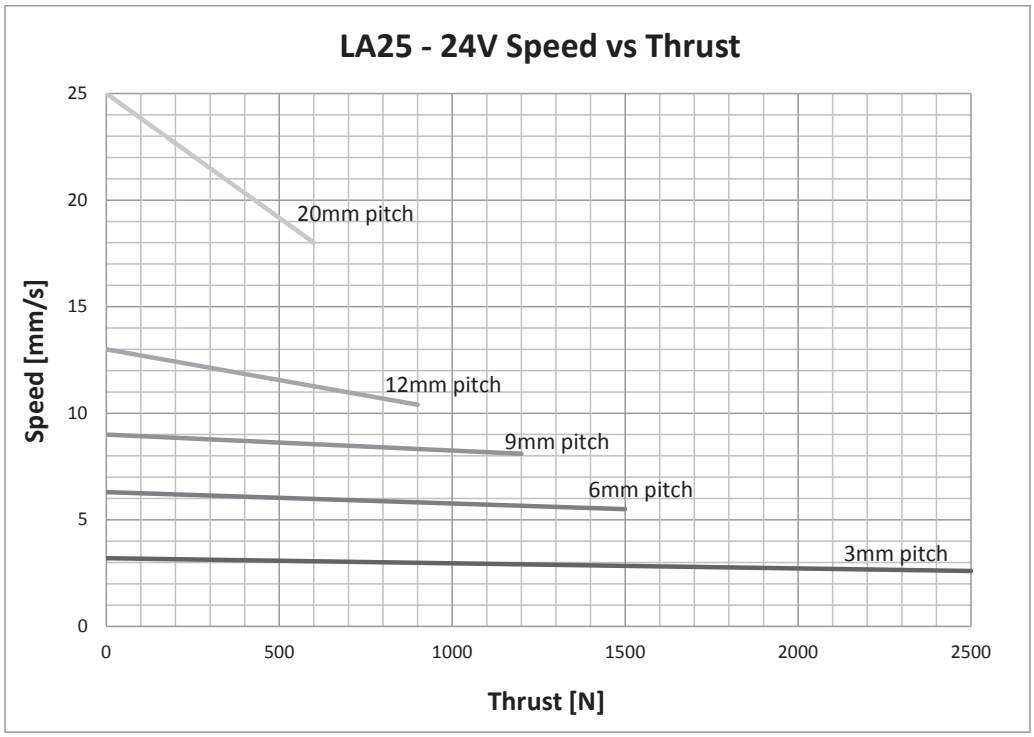
The values below are typical values and made with a stable power supply and an ambient temperature of 20˚C.

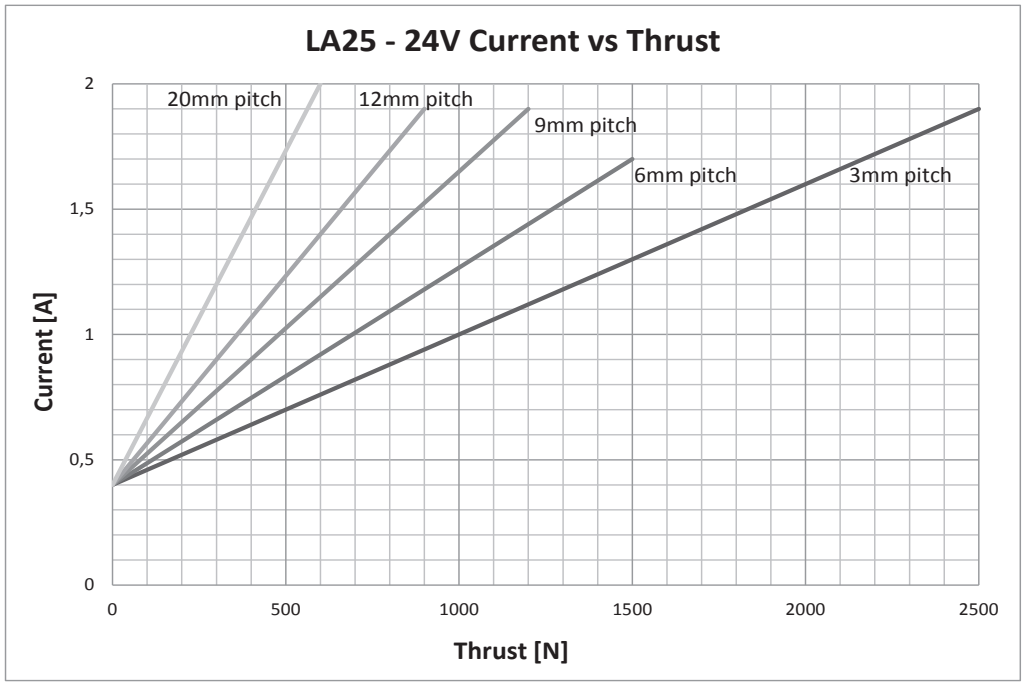




Speed and current curves - 24V motor

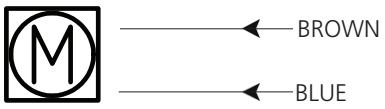
The values below are typical values and made with a stable power supply and an ambient temperature of 20˚C.





Chapter 2

I/O specifications: Actuator without feedback



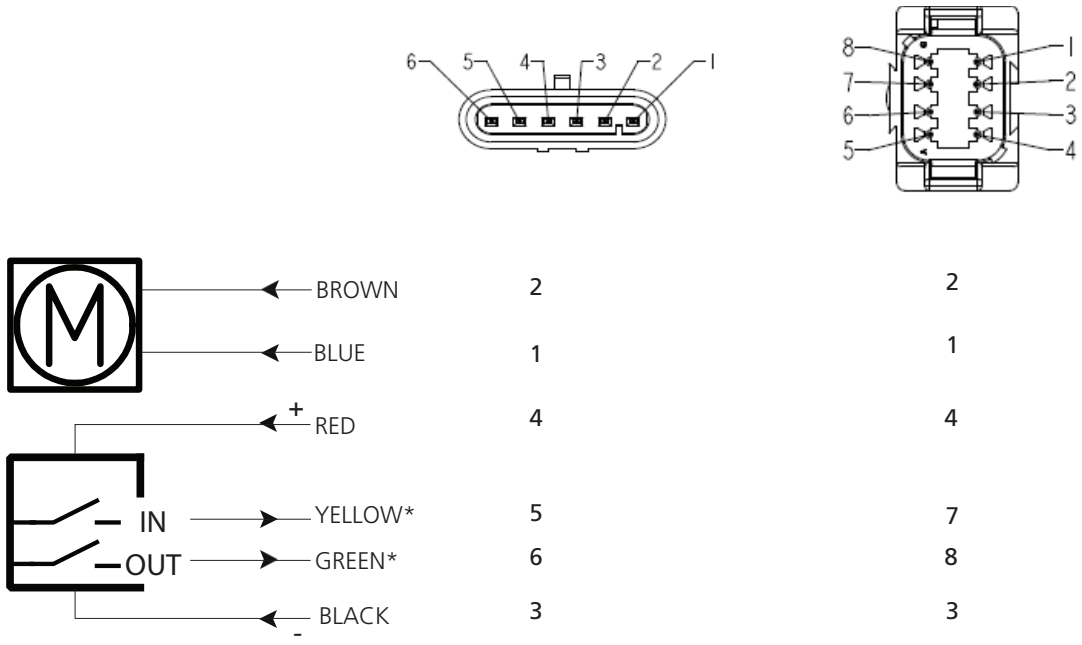
Standard connector front view

AMP 2P	**DEUTSCH** 2P
	
2	2
1	1

Input/Output	**Specification**	**Comments**
Description	Permanent magnetic DC motor.	
Brown	12-24VDC (+/-) 12V ± 20% 24V ± 10%	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	Under normal conditions: 12V, max. 5A depending on load 24V, max. 2.5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Not to be connected	
Black	Not to be connected	
Green	Not to be connected	
Yellow	Not to be connected	
Violet	Not to be connected	
White	Not to be connected	

I/O specifications: Actuator with endstop signal output

Standard connector front view

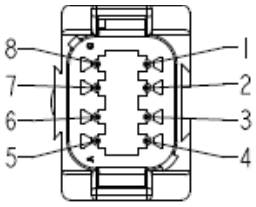


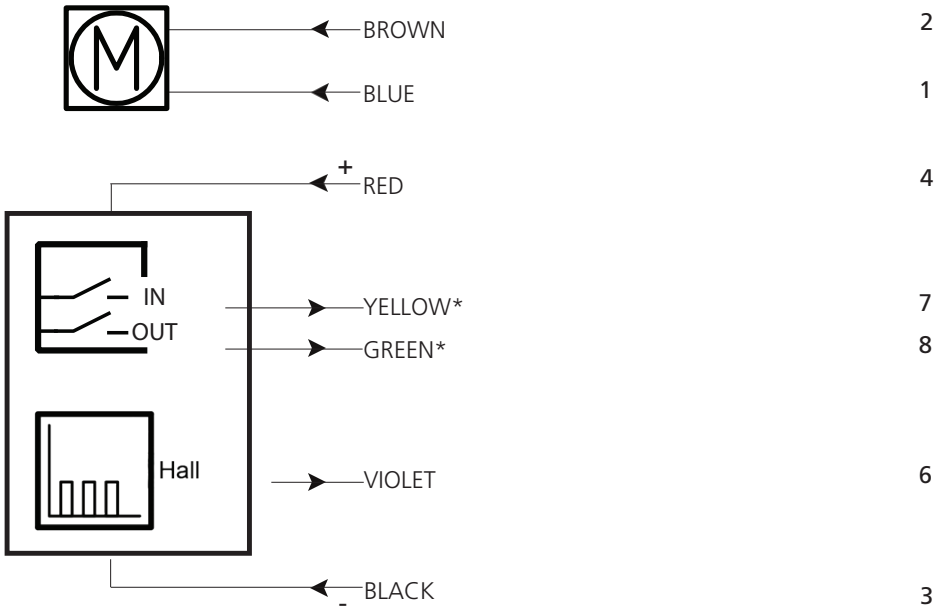
Input/Output	Specification	Comments
Description	The actuator can be equipped with electronically controlled endstop signals out.	
Brown	12-24VDC (+/-) 12V ± 20% 24V ± 10%	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	Under normal conditions: 12V, max. 5A depending on load 24V, max. 2.5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24VDC	Current consumption: Max. 40 mA, also when the actuator is not running
Black	Signal power supply GND (-)	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100 mA NOT potential free
Yellow	Endstop signal in	
Violet	Not to be connected	
White	Not to be connected	

I/O specifications: Actuator with endstop signals and relative positioning - Single Hall

Standard connector front view

DEUTSCH
8P





Input/Output	Specification	Comments
Description	The actuator can be equipped with Single Hall that gives a relative positioning feedback signal when the actuator moves.	
Brown	12-24VDC (+/-) 12V ± 20% 24V ± 10%	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	Under normal conditions: 12V, max. 5A depending on load 24V, max. 2.5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24VDC	Current consumption: Max. 40 mA, also when the actuator is not running
Black	Signal power supply GND (-)	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100mA NOT potential free
Yellow	Endstop signal in	

I/O specifications: Actuator with endstop signals and relative positioning - Single Hall

<table>
<tr><th>Input/Output</th><th>Specification</th><th>Comments</th></tr>
<tr><td rowspan="2">Violet</td><td>Single Hall output (PNP)

Movement per single Hall pulse:
LA25030 Actuator = 0.25mm per pulse
LA25060 Actuator = 0.5mm per pulse
LA25090 Actuator = 0.75mm per pulse
LA25120 Actuator = 1.0mm per pulse
LA25200 Actuator = 1.7mm per pulse

Frequency:
Frequency is 10 - 20 Hz on Single Hall output depending on load.
Pulse ON time is minimum 8ms. OFF time between two ON pulses is minimum 8ms.
Overvoltage on the motor can result in shorter pulses.</td><td>Output voltage min. V_{IN} - 2V
Max. current output: 12mA
Max. 680nF

N.B. For more precise measurements, please contact LINAK A/S.

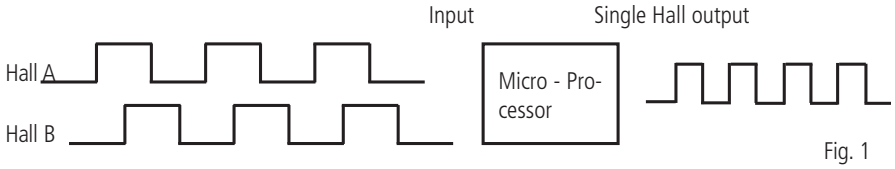
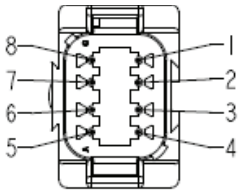
Low frequency with a high load. Higher frequency with no load.</td></tr>
<tr><td colspan="2">Diagram of Single Hall:
 

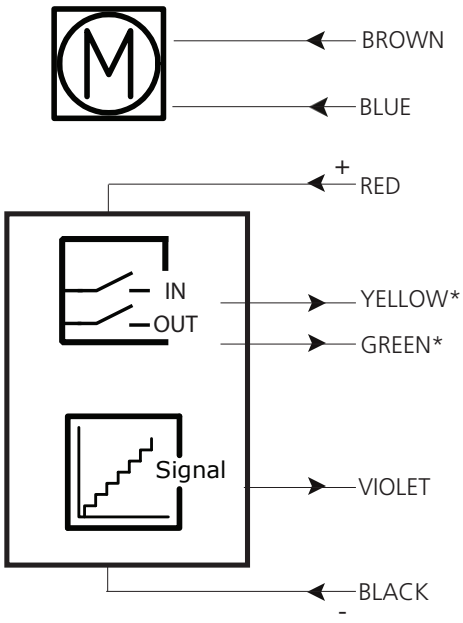
Fig. 1</td></tr>
<tr><td>White</td><td colspan="2">Not to be connected</td></tr>
</table>

I/O specifications: Actuator with endstop signals and absolute positioning - Analogue feedback

Standard connector front view

DEUTSCH
8P





2
1
4
7
8
6
3

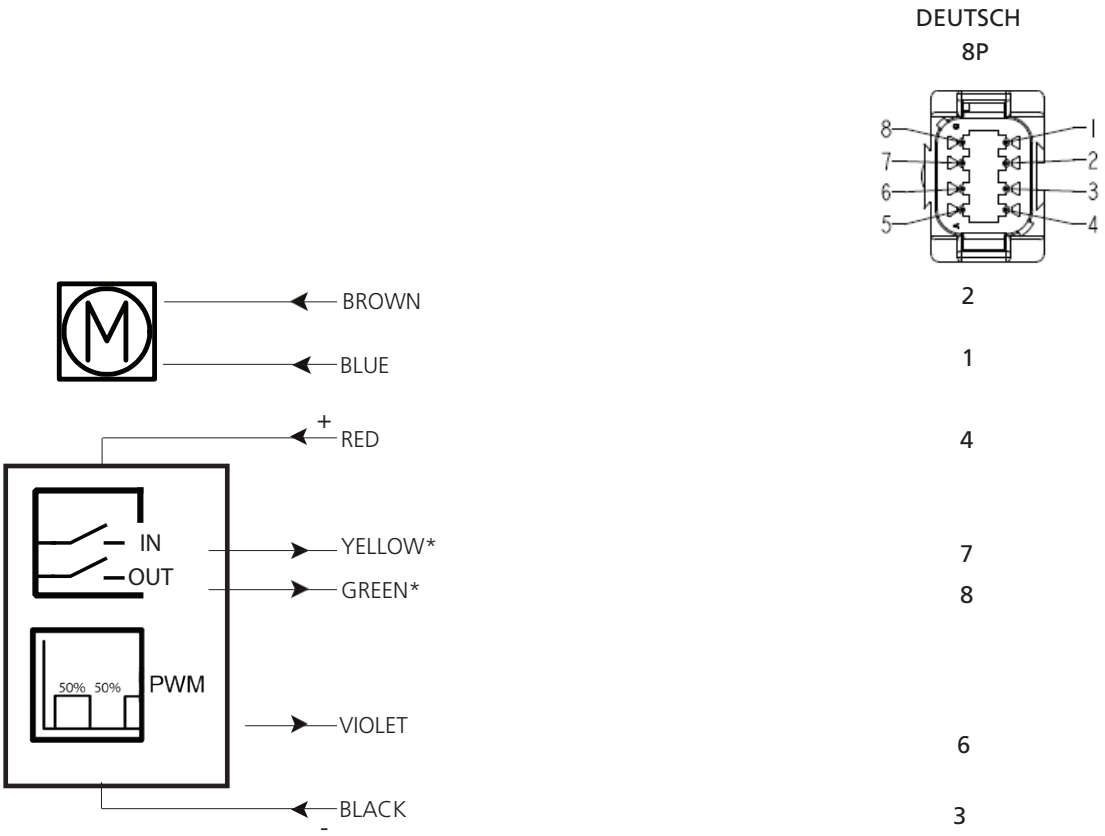
Input/Output	Specification	Comments
Description	The actuator can be equipped with electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12-24VDC (+/-) 12V ± 20% 24V ± 10%	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	Under normal conditions: 12V, max. 5A depending on load 24V, max. 2.5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24VDC	Current consumption: Max. 60 mA, also when the actuator is not running
Black	Signal power supply GND (-)	

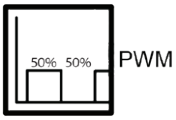
I/O specifications: Actuator with endstop signals and absolute positioning - Analogue feedback

Input/Output	Specification	Comments
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100mA NOT potential free
Yellow	Endstop signal in	
Violet	Analogue feedback 0-10V (Feedback level 1) 0.5-4.5V (Feedback level 2)	Tolerances +/- 0.2 V Max. current output: 1mA Ripple max. 200mV Transaction delay max. 20ms Linear feedback 0.5% Source current max. 1mA
	4-20mA (Feedback level 3) Special (Feedback level 9)	Tolerances +/- 0.2mA Transaction delay 20ms Linear feedback 0.5% Output: Source Serial resistance: 12V max 300 ohm 24V max. 900 ohm
	For all analogue feedbacks it is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning	
White	Not to be connected	

I/O specifications: Actuator with endstop signals and absolute positioning - PWM

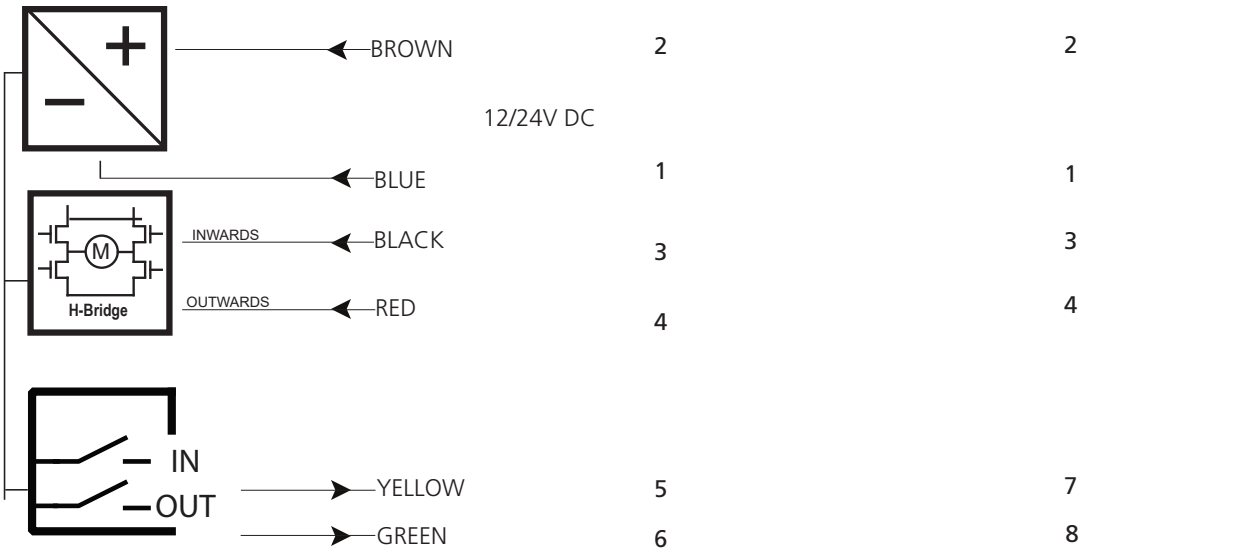
Standard connector front view

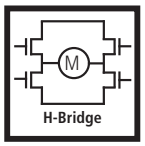


Input/Output	Specification	Comments
Description	The actuator can be equipped with electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12-24VDC (+/-) 12V ± 20% 24V ± 10% Under normal conditions: 12V, max. 5A depending on load 24V, max. 2.5A depending on load	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue		To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Signal power supply (+) 12-24VDC	Current consumption: Max. 40mA, also when the actuator is not running
Black	Signal power supply GND (-)	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100 mA NOT potential free
Yellow	Endstop signal in	
Violet	Digital output feedback 10-90% (Feedback level 4) 20-80% (Feedback level 5) Special (Feedback level 9)	Output voltage min. V_{IN} - 2V Tolerances +/- 2% Max. current output: 12mA It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning
White	Not to be connected	

I/O specifications: Actuator with IC Basic

Standard connector front view

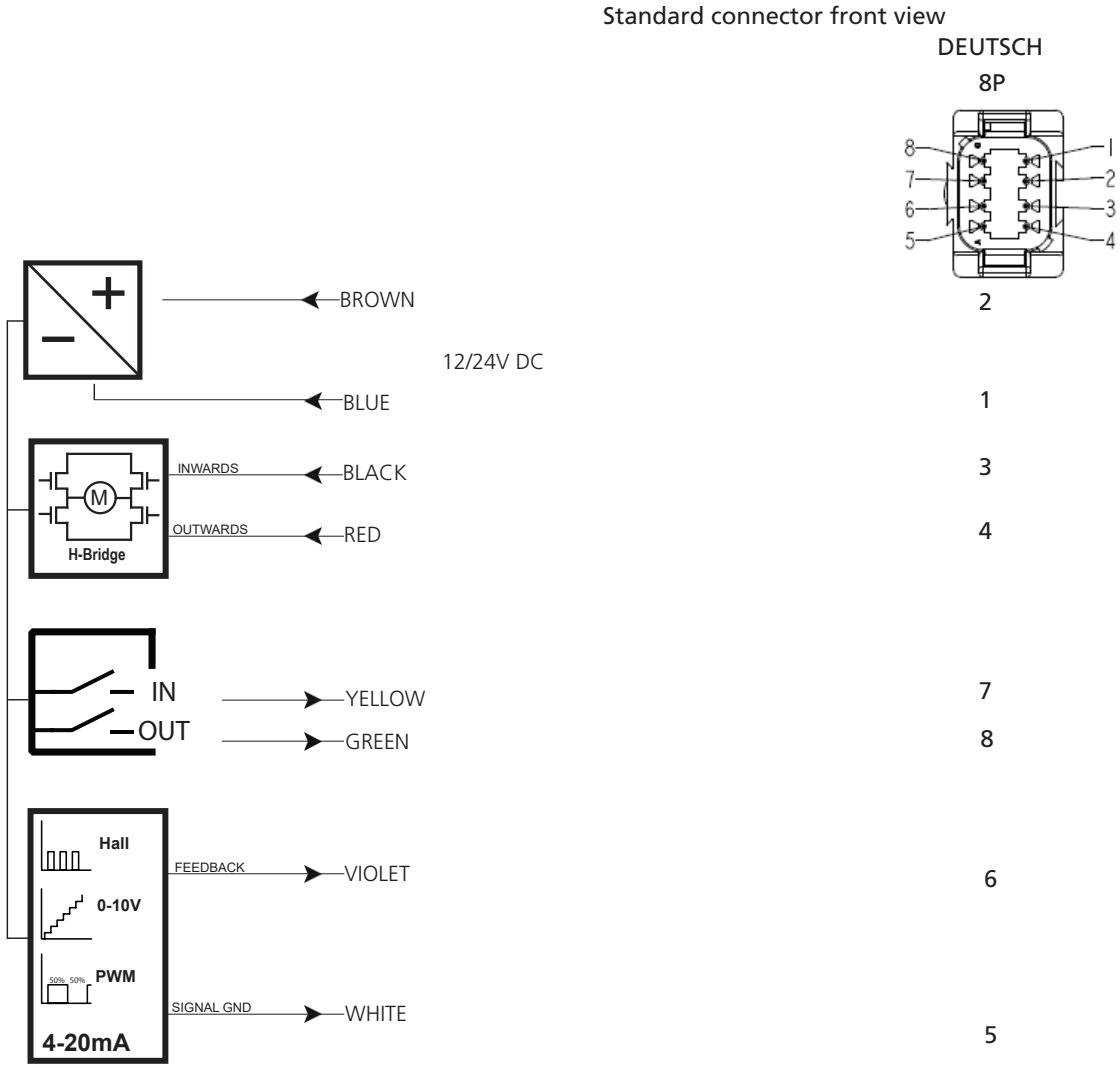


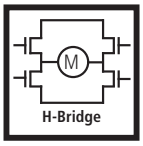
Input/Output	Specification	Comments
Description	Easy to use interface with integrated power electronics (H-bridge). The actuator can also be equipped with electronic circuit that gives an absolute or relative feedback signal. IC Advanced also provides a wide range of possibilities for customisation. The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12-24VDC + (VCC) Connect Brown to positive 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing If the temperature drops below -10°C, all current limits will automatically increase to 9A for 12V, and 6A for 24V
Blue	12-24VDC - (GND) Connect Blue to negative 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	

I/O specifications: Actuator with IC Basic

Input/Output	Specification	Comments
Red	Extends the actuator	On/off voltages: > 67% of V_{IN} = ON < 33% of V_{IN} = OFF Input current: 10mA
Black	Retracts the actuator	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100mA Endstop signals are NOT potential free. Endstop signals can be configured with BusLink software according to any position needed When configuring virtual endstop, it is not necessary to choose the position feedback EOS and virtual endstop will work even when feedback is not chosen
Yellow	Endstop signal in	
Violet	Not to be connected	
White	Not to be connected	

I/O specifications: Actuator with IC Advanced - with BusLink



Input/Output	Specification	Comments
Description	Easy to use interface with integrated power electronics (H-bridge). The actuator can also be equipped with electronic circuit that gives an absolute or relative feedback signal. IC Advanced also provides a wide range of possibilities for customisation. The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12-24VDC + (VCC) Connect Brown to positive 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through BusLink If the temperature drops below -10°C, all current limits will automatically increase to 9A for 12V, and 6A for 24V
Blue	12-24VDC - (GND) Connect Blue to negative 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	

I/O Specifications: Actuator with IC Advanced - with BusLink

Input/Output	Specification	Comment
Red	Extends the actuator	On/off voltages: > 67% of V_{IN} = ON < 33% of V_{IN} = OFF Input current: 10 mA
Black	Retracts the actuator	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100mA Endstop signals are NOT potential free. Endstop signals can be configured with BusLink software according to any position needed. When configuring virtual endstop, it is not necessary to choose the position feedback EOS and virtual endstop will work even when feedback is not chosen
Yellow	Endstop signal in	
Violet	Analogue feedback (0-10V): Configure any high/low combination between 0-10V	Ripple max. 200 mV Transaction delay 20 ms Linear feedback 0.5% Max. current output. 1 mA
	Single Hall output (PNP) Movement per single Hall pulse: LA25030 Actuator = 0.25mm per pulse LA25060 Actuator = 0.5mm per pulse LA25090 Actuator = 0.75mm per pulse LA25120 Actuator = 1.0mm per pulse LA25200 Actuator = 1.7mm per pulse Frequency: Frequency is 10 - 20 Hz on Single Hall output depending on load. Pulse ON time is minimum 8ms. OFF time between two ON pulses is minimum 8ms. Overvoltage on the motor can result in shorter pulses.	Output voltage min. V_{IN} - 2V Max. current output: 12mA Max. 680nF
	Digital output feedback PWM: Configure any high/low combination between 0 - 100%	Output voltage min. V_{IN} -2V Frequency: 75Hz ± 10Hz as standard, but this can be customised. Duty cycle: Any low/high combination between 0 and 100 percent. Open collector source current max. 12mA
	Analogue feedback (4-20mA): Configure any high/low combination between 4-20mA	Tolerances +/- 0.2mA Transaction delay 20ms Linear feedback 0.5% Output: Source Serial resistance: 12 V max. 300 ohm 24 V max. 900 ohm
	All absolute value feedbacks (0-10V, PWM and 4-20mA)	Standby power consumption: 12V, 60mA 24V, 45mA It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning
White	Signal GND	

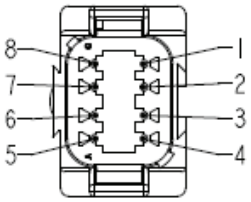
The BusLink software tool is available for IC Advanced and can be used for:
Diagnostics, manual run and configuration. Please note that the BusLink cables must be purchased separately from the actuator!
Item number for BusLink cable kit: 0147999 (adaptor + USB2Lin)

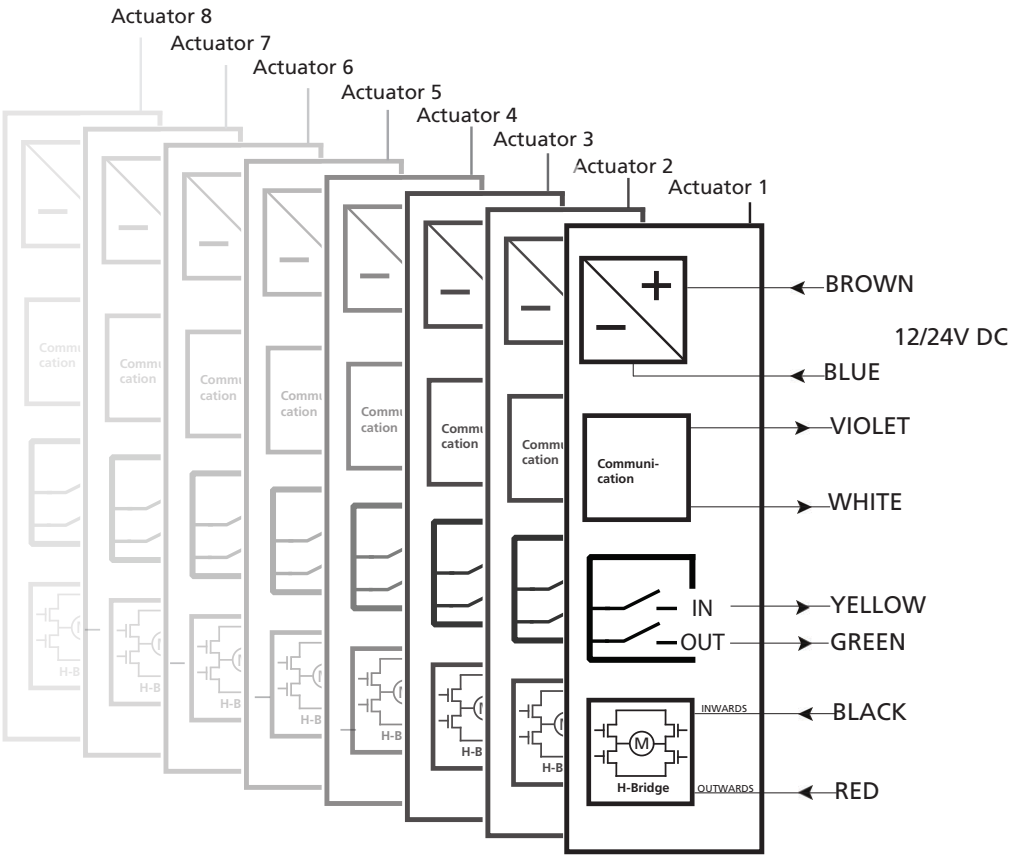
I/O specifications: Actuator with Parallel

Standard connector front view

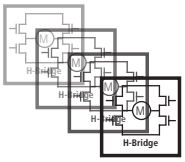
DEUTSCH

8P





I/O specifications: Actuator with Parallel

Input/Output	Specification	Comments
Description	Parallel drive of up to 8 actuators. A master actuator with an integrated H-bridge controller controls up to 7 slaves. The version with "IC option" cannot be operated with PWM (power supply).	
Brown	12-24VDC + (VCC) Connect Brown to positive 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	Note: Do not change the power supply polarity on the brown and blue wires! The parallel actuators can run on one OR separate power supplies Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through Bus-Link (only one actuator at a time for parallel) If the temperature drops below -10°C, all current limits will automatically increase to 9A for 12V, and 6A for 24V
Blue	12-24VDC - (GND) Connect Blue to negative 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	
Red	Extends the actuator	On/off voltages: > 67% of V_{IN} = ON < 33% of V_{IN} = OFF Input current: 10 mA It does not matter where the in/out signals are applied. You can either choose to connect the signal cable to one actuator OR you can choose to connect the signal cable to each actuator on the line. Either way this will ensure parallel drive
Black	Retracts the actuator	
Green	Endstop signal out	Output voltage min. V_{IN} - 2V Source current max. 100mA Endstop signals are NOT potential free. Endstop signals can be configured with BusLink software according to any position needed
Yellow	Endstop signal in	
Violet	Parallel communication: Violet cords must be connected together	Standby power consumption: 12V, 60mA 24V, 45mA No feedback available during parallel drive
White	Signal GND: White cords must be connected together	

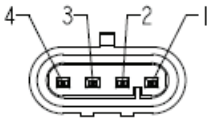
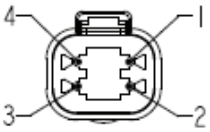
The BusLink software tool is available for Parallel and can be used for:
Diagnostics, manual run and configuration.

Please note that the BusLink cables must be purchased separately from the actuator!

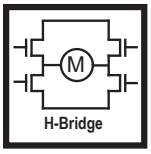
Item number for BusLink cable kit: 0147999 (adaptor + USB2Lin)

I/O specification: Actuators with CAN bus:

Standard connector front view

		AMP 4P	**DEUTSCH** 4P
			
+	BROWN	2	2
	12/24V DC		
−	BLUE	1	1
M H-Bridge	INWARDS — BLACK		
	OUTWARDS — RED		
CAN	CAN_H — YELLOW	3	3
	CAN_L — GREEN	4	4
Service interface	DATA — VIOLET		
	DATA GND — WHITE		

I/O specification: Actuators with CAN bus:

Input/Output	Specification	Comments
Description	Compatible with the SAE J1939 standard. Uses CAN messages to command movement, setting parameters and to deliver feedback from the actuator. See the LINAK CAN bus user manual. Actuator identification is provided, using standard J1939 address claim or fixed addresses. See connection diagram, fig. 12, page 56	
Brown	12-24VDC + (VCC) Connect Brown to positive 12V ± 20% 24V ± 10% 12V, current limit 8A 24V, current limit 5A	Note: Do not swap the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through BusLink If the temperature drops below 0°C, all current limits will automatically increase to 9A for 12V and 6A for 24V.
Blue	12-24VDC - (GND) Connect Blue to negative	
Red	Extends the actuator	On/off voltages: > 67% of V_{IN} = ON < 33% of V_{IN} = OFF
Black	Retracts the actuator	
Green	CAN_L	LA25 with CAN bus does not contain the 120Ω terminal resistor. The physical layer is in accordance with J1939-15.* Speed: Baudrate: 250 kbps Max bus length: 40 meters Max stub length: 3 meters Max node count: 10 (can be extended to 30 under certain circumstances) Wiring: Unshielded twisted pair Cable impedance: 120 Ω (±10%)
Yellow	CAN_H	
Violet	Service Interface	Only BusLink can be used as service interface. Use green adapter cable
White	Service Interface GND	

* J1939-15 refers to Twisted Pair and Shielded cables. The standard/default cables delivered with LA25 CAN do not comply with this.

Please note that the BusLink cables must be purchased separately from the actuator!

For more information about the usage of CAN bus, please see the LINAK TECHLINE CAN bus user manual.

IC options overview

	Basic	Advanced	Parallel	LIN bus	CAN bus
Control					
12V, 24V supply	√	√	√	√	√
H-bridge	√	√	√	√	√
Manual drive in/out	√	√	√	√	√
EOS in/out	-	√	√	√	-
Soft start/stop	√	√	√	√	√
Feedback					
Voltage	√	√ *	-	-	-
Current	-	√ **	-	-	-
Single Hall	√	√	-	-	-
PWM	-	√	-	-	-
Position (mm)	-	-	-	√	√
Custom feedback type	-	√	-	-	√
Monitoring					
Temperature monitoring	√	√	√	√	√
Current cut-off	√	√	√	√	√
Ready signal	-	-	-	-	-
BusLink					
Service counter	-	√	√	√	√
Custom soft start/stop	-	√ ***	√ ***	√ ***	√ ***
Custom current limit	-	√	√	√	√
Speed setting	-	√	√	√	√
Virtual end stop	-	√	√	√	√

* Configure any high/low combination between 0 - 10V

** Configure any high/low combination between 4 - 20mA

*** Configure any value between 0 - 30s

Feedback configurations available for IC Basic, IC Advanced and Parallel

	Pre-configured	Customised range	Pros	Cons
None			N/A	N/A
PWM Feedback	10 – 90 % 75 Hz	0 – 100 % 75 – 150 Hz	Suitable for long distance transmission. Effectual immunity to electrical noise.	More complex processing required, compared to AFV and AFC.
Single Hall*	N/A	N/A	Suitable for long distance transmission.	No position indication.
Analogue Feedback Voltage (AFV)*	0 - 10V	Any combination, going negative or positive. E.g. 8.5 – 2.2V over a full stroke.	High resolution. Traditional type of feedback suitable for most PLCs. Easy faultfinding. Independent on stroke length, compared to a traditional mechanical potentiometer.	Not recommended for applications with long distance cables or environments exposed to electrical noise.
Analogue Feedback Current (AFC)	4 - 20mA	Any combination, going negative or positive. E.g. 5.5 – 18mA over a full stroke.	High resolution. Better immunity to long cables and differences in potentials than AFV. Provides inherent error condition detection. Independent on stroke length, compared to a traditional mechanical potentiometer.	Not suitable for signal isolation.
Endstop signal in/out**	At physical end stops. Default for IC Advanced.	Any position. (Not IC Basic)	Can be set at any position over the full stroke length. (Not IC Basic)	Only one endstop can be customised. (Not IC Basic)

All feedback configurations are available for IC Advanced.
* IC Basic feedback configurations available: Single Hall and 0-10V
** Parallel feedback configurations available: EOS

Actuator configurations available for IC Basic, IC Advanced and Parallel

	Pre-configured	**Customised range** (Not IC Basic)	**Description**
Current limit inwards	20A for both current limit directions. (When the current outputs are at zero, it means that they are at maximum value 20A). Be aware: When the actuator comes with current cut-off limits that are factory pre-configured for certain values, the pre-configured values will be the new maximum level of current cut-off. This means that if the current cut-off limits are pre-configured to 14A, it will not be possible to change the current limits through BusLink to go higher than 14A.	Recommended range: 4A to 20A If the temperature drops below 0°C, all current limits will automatically increase to approximately 30A, indenpendent of the pre-configured value.	The actuator's unloaded current consumption is very close to 4A, and if the current cut-off is customised below 4A there is a risk that the actuator will not start. The inwards and outwards current limits can be configured separately and do not have to have the same value.
Current limit outwards			
Max. speed inwards/ outwards	100% equal to full performance. Please note: for parallel actuators the full performance equals 80% of the max. speed.	Lowest recommended speed at full load: 60% It is possible to reduce the speed below 60%, but this is dependable on load, power supply and the environment.	The speed is based on a PWM principle, meaning that 100% equals the voltage output of the power supply in use, and not the actual speed.
Virtual endstop inwards	0mm for both virtual enstop directions. (When the virtual end-stops are at zero, it means that they are not in use).	It is only possible to run the actuator with one virtual endstop, either inwards or outwards.	The virtual endstop positions are based on hall sensor technology, meaning that the positioning needs to be initialised from time to time. One of the physical endstops must be available for initialisation.
Virtual endstop outwards			
Soft stop inwards	0.3 sec. for both soft stop directions.	0.3 sec. to 30 sec. 0 sec. can be chosen for hard stop.	It is not possible to configure values between 0.01 sec. to 0.29 sec. This is due to the back-EMF from the motor (increasing the voltage). Be aware that the soft stop value equals the deacceleration time after stop command.
Soft stop outwards			
Soft start inwards	0.3 sec. for both soft start directions.	0 sec. to 30 sec.	Be aware that the soft start value equals the acceleration time after start command. To avoid stress on the actuator, it is not recommended to use 0 sec. for soft start, due to higher inrush current.
Soft start outwards			

Chapter 3

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

Degrees of protection	EN60529 - IP66	IP6X - Dust: Dust-tight, No ingress of dust Actuator is not activated
	EN60529 - IP66	IPX6 - Water: Ingress of water in quantities causing harmful effects is not allowed Duration: 100 litres pr. minute in 3 minutes Actuator is not activated
	DIN40050 - IP69K	IPX9K: High pressure cleaner Temperature: +80°C Water pressure: 80 - 100 bar Water flow: 14 - 16 l/min Duration: 30 sec. each at 4 different angles 0°, 30°, 60° and 90° Actuator is not activated Ingress of water in quantities causing harmful effects is not allowed
Rain		Dynamic rain test: Actuators exposed to continous rain Actuators operated and side loaded with 5N 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 faces
Mechanical Shock Operational		Peak Pulse Amplitude: 50 G Pulse Duration: 11 ms Number of pulses: 18 total - 3 in each direction for all three axis
		Peak Pulse Amplitude: 30 G Pulse Duration: 18 ms Number of pulses: 18 total - 3 in each direction for all three axis
		Peak Pulse Amplitude: 25 G Pulse Duration: 6 ms Number of pulses: 6000 total - 1000 in each direction for all three axis
Vibration Random		Random vibration: From 18 Hz 0.0259 to 1000 Hz Duration: 2 h/axis

Environmental tests - Electrical

Standard	Specification	FOCUS ON
2004/104/EC	Automotive EMC Directive 2004/104/EC on electrical and electronic car components	• VEHICLES AND MOBILITY
EN/IEC 60204 - 1: 2006 + A1: 2009	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	• INDUSTRIAL AUTOMATION
EN/IEC 60204 - 32: 2008	Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines	• INDUSTRIAL AUTOMATION • PLATFORMS AND LIFTS
EN/IEC 61000 - 6 - 1: 2007	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for 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 tests are conducted and radiated emission (EMC) tests.

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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