



Actuator LA35
Data sheet

LA35

The LA35 is a very quiet and powerful actuator, and provides a practical and cost-effective solution with low power consumption. The actuator is designed for a variety of both indoor and outdoor applications.



This **TECHLINE**® actuator comes with IC - Integrated controller.

For more information on our IC options, please see: www.linak.com/techline

Features:

- 12 or 24 V DC Permanent magnetic motor
- Thrust 6000 N in push and 4000 in pull
- Max. speed up to 19.5 mm/sec. depending on load and spindle pitch
- Stroke length from 100 to 600 mm
- Built-in endstop switches
- Stainless steel inner tube
- Protection class: IP66 (dynamic) and IP69K (static)

Options in general:

- Large variety of back fixtures and piston rod eyes
- Anti rotating piston rod eye
- Guided nut (only with 2mm pitch)
- Integrated brake for high self-locking ability
- Exchangeable cables in different lengths
- Long life absolute feedback
- Safety nut in push
- Special anodised housing for extreme environments
- Potential free endstop signals
- IC options including:
 - IC - Integrated Controller
 - Hall sensor
 - Analogue or digital feedback for precise positioning
 - Endstop signals (not potential free)
 - Ready signal for diagnostics

Usage:

- Duty cycle at 6000N and 3mm pitch is max. 10%
- Ambient operating temperature: -25° to +60°C, full performance from +5°C to +40°C

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Chapter 1

Specifications

Motor:	Permanent magnet motor 12 or 24V *
Cable:	Motor: 2 x 14 AWG PVC cable Control: 6 x 20 AWG PVC cable **
Housing:	The housing is made of casted aluminium, coated for outdoor use and in harsh conditions
Spindle part:	Outer tube: Powder coated steel Inner tube: Stainless steel AISI304/SS2333 Acme spindle: Trapezoidal spindle with high efficiency
Temperature range:	- 25° C to +60° C - 13° F to +140° F Full performance +5° C to +40° C
Weather protection:	Rated IP66 for outdoor use. Furthermore, the actuator can be washed down with a high-pressure cleaner (IP69K).
Noise level:	48dB (A) measuring method DS/EN ISO 3743-1 actuator not loaded.
Compatibility:	The LA35 IC is compatible with SMPS-T160 (For combination possibilities, please see the User Manual for SMPS-T160)

* Modbus actuators only 24V - please see the **Modbus installation guide <http://www.linak.com/techline/?id3=2363>**.

** Special control cables for the Modbus actuator - please see the **Modbus installation guide <http://www.linak.com/techline/?id3=2363>**.

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

LA35 with 12V motor

Order number	Push Max. (N)	Pull Max. (N)	Self-lock min. (N) Push	Self-lock min. (N) Pull	Pitch (mm/spindle rev.)	* Typical speed (mm/s)		Standard stroke lengths (mm) in steps of 50mm	* Typical amp. (A)	
						No load	Full load		No load	Full load
3510xx.	6000	4000	6000	4000	3	4.7	3.3	100-300	1.6	7.5
3520xx.	4000	4000	1500	1500	5	7.7	5.3	100-400	1.7	7.7
3521xx. push brake	4000	4000	2500	1500	5	7.2	5.4	100-400	3.2	7.8
3522xx. pull brake	4000	4000	1500	2500	5	6.9	5.9	100-400	4.2	8.4
3530xx.	1500	1500	750	750	9	14.0	12.3	100-500	1.7	5.9
3531xx. push brake	1500	1500	1000	750	9	14.2	12.6	100-500	2.9	5.5
3532xx. pull brake	1500	1500	750	1000	9	14.4	11.2	100-500	3.0	5.4
3540xx.	1000	1000	750	750	12	19.0	17.0	100-600	1.9	5.3
3541xx. push brake	1000	1000	1000	750	12	17.9	16.9	100-600	5.5	5.5
3542xx. pull brake	1000	1000	750	900	12	16.9	15.4	100-600	5.6	5.6

LA35 with 24V motor

Order number	Push Max. (N)	Pull Max. (N)	Self-lock min. (N) Push	Self-lock min. (N) Pull	Pitch (mm/spindle rev.)	* Typical speed (mm/s)		Standard stroke lengths (mm) in steps of 50mm	* Typical amp. (A)	
						No load	Full load		No load	Full load
3510xx.	6000	4000	6000	4000	3	5.1	4.0	100-300	0.9	4.2
3520xx.	4000	4000	1500	1500	5	8.3	6.6	100-400	0.8	4.8
3521xx. push brake	4000	4000	2500	1500	5	8.0	6.7	100-400	1.4	4.3
3522xx. pull brake	4000	4000	1500	2500	5	8.0	7.0	100-400	2.1	4.6
3530xx.	1500	1500	750	750	9	15.0	13.9	100-500	0.6	2.6
3531xx. push brake	1500	1500	1000	750	9	14.5	14.1	100-500	1.2	2.9
3532xx. pull brake	1500	1500	750	1000	9	14.7	13.9	100-500	1.5	3.0
3540xx.	1000	1000	750	750	12	19.5	18.9	100-600	0.9	2.8
3541xx. push brake	1000	1000	1000	750	12	18.9	17.8	100-600	1.3	2.8
3542xx. pull brake	1000	1000	750	900	12	18.7	18	100-600	1.5	2.9

* 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 at 20°C.

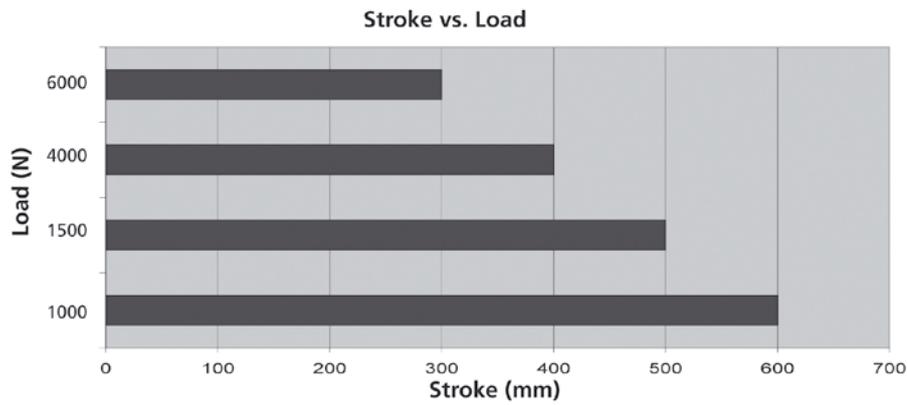


- **Self locking ability**

To ensure maximum self-locking ability, please be sure that the motor is shorted when stopped.
Actuators with integrated controller have this feature incorporated.

- 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.

Load versus Stroke Length

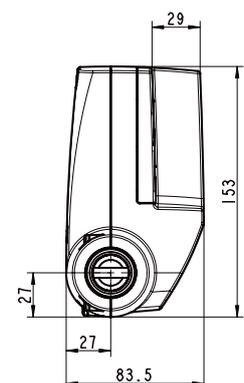
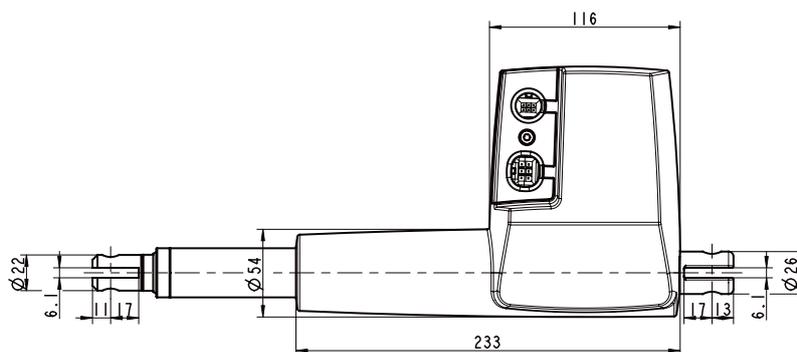
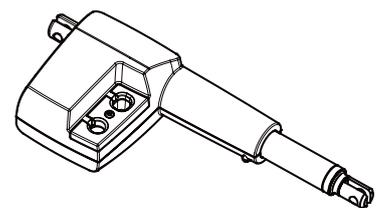
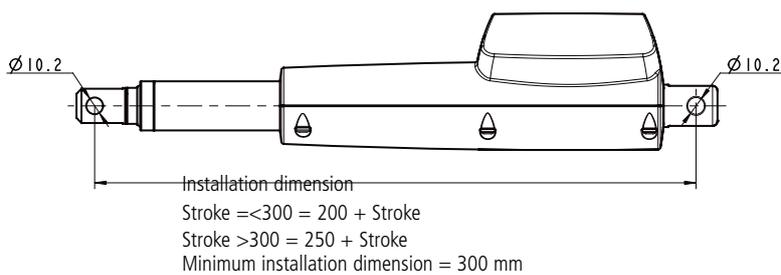


- Safety factor 2.

Stroke and built-in tolerances

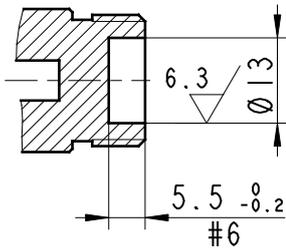
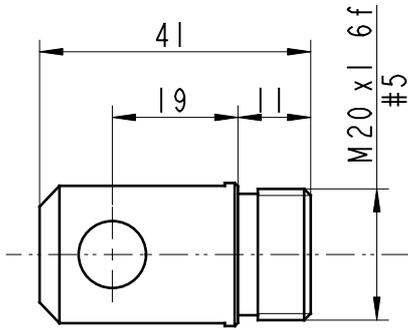
Platform options	Descriptions	Stroke tolerance	Example for 150 mm stroke	BID tolerance	Example for 350 mm BID
35XXXXXXXXXXXXXX	All variants	+2/-2 mm	148 to 152 mm	+2/-2 mm	348 to 352 mm

LA35 Dimensions

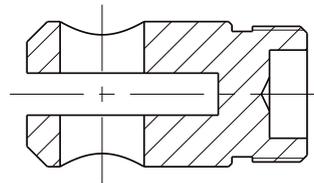
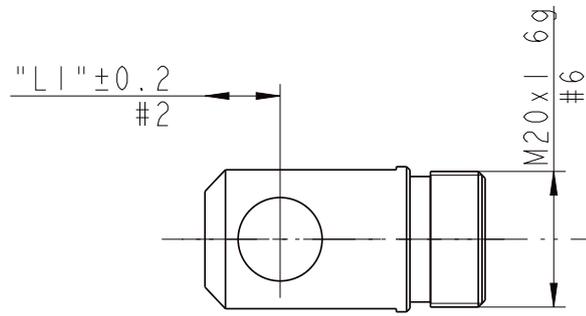


LA35 Piston rod eyes

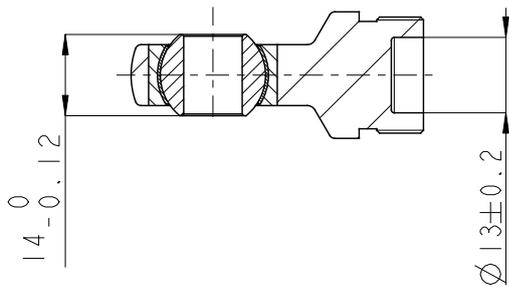
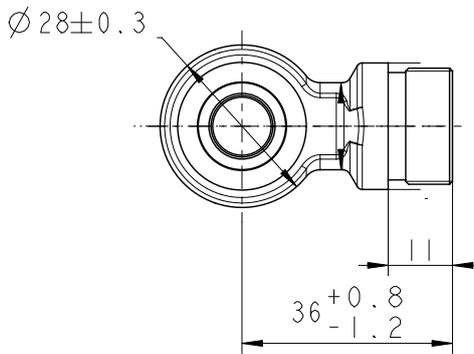
Option "0" and "2"



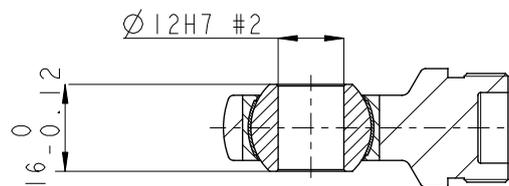
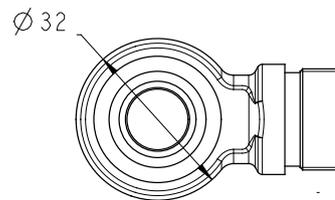
Option "1"
AISI 303



Option "3"
AISI 304



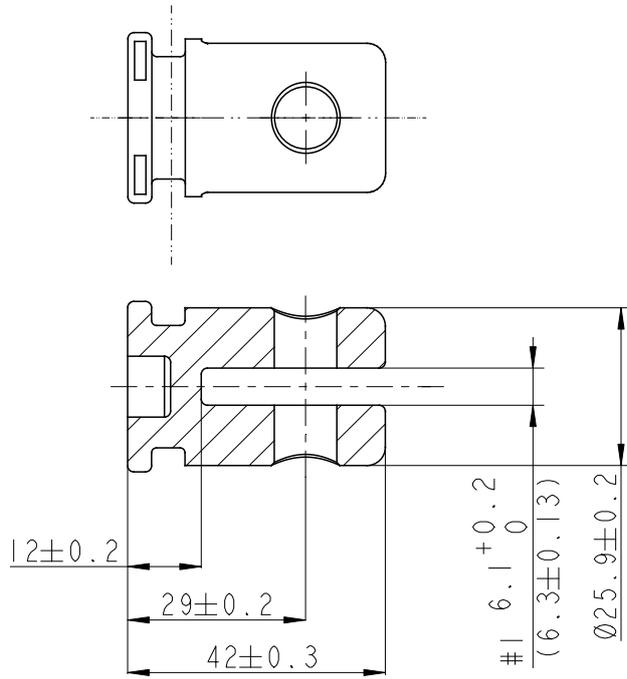
Option "4"
AISI 304



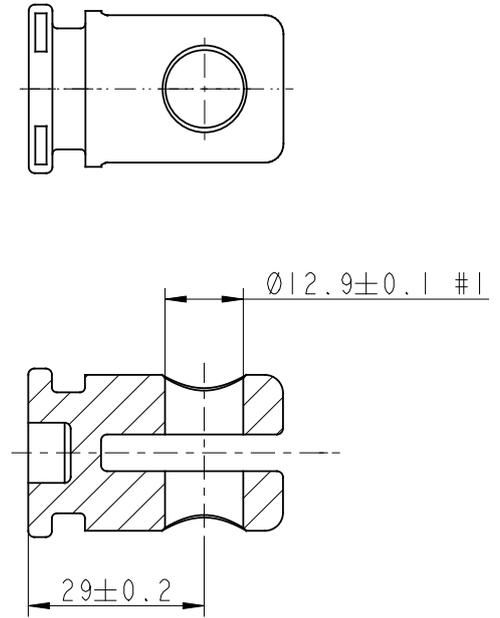
The Piston Rod Eye is only allowed to turn 0 - 90 degrees.

LA35 Back fixtures

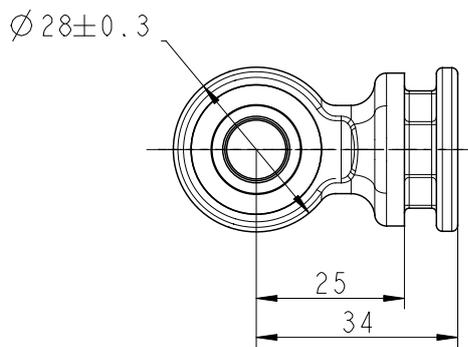
Option "A" and "B"
AISI 304



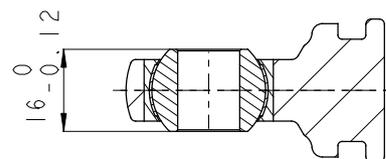
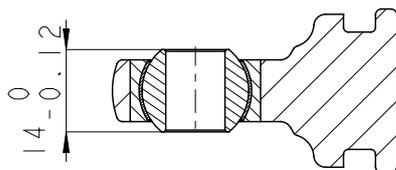
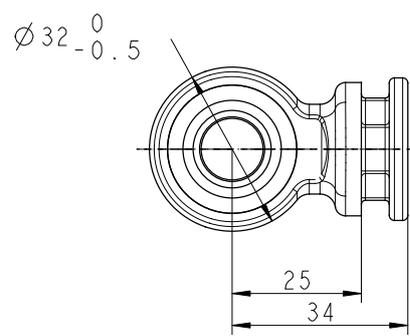
Option "C" and "D"
AISI 304



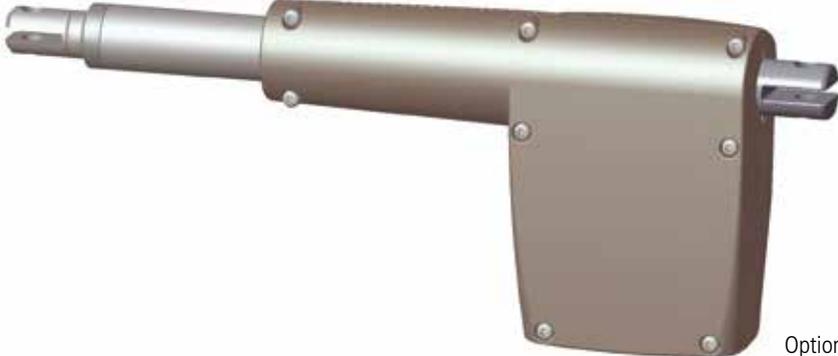
Option "E" and "F"
Stainless steel



Option "G" and "H"
Stainless steel



LA35 Back fixture orientation



Option A = 0°



Option B = 90°

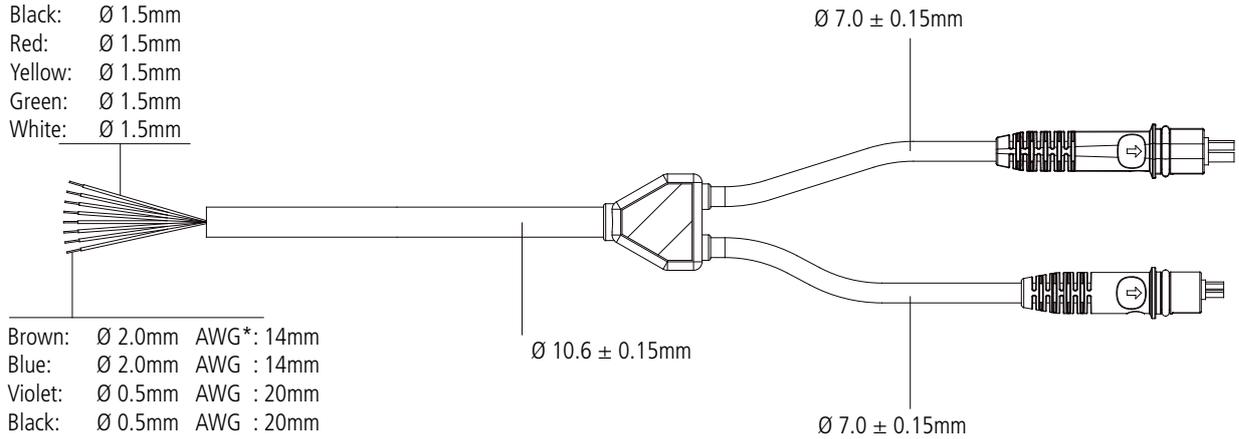
Cable dimensions

Y-cable dimensions:

Brown: Ø 2.8mm
 Blue: Ø 2.8mm
 Violet: Ø 1.5mm
 Black: Ø 1.5mm
 Red: Ø 1.5mm
 Yellow: Ø 1.5mm
 Green: Ø 1.5mm
 White: Ø 1.5mm

Brown: Ø 2.0mm AWG*: 14mm
 Blue: Ø 2.0mm AWG : 14mm
 Violet: Ø 0.5mm AWG : 20mm
 Black: Ø 0.5mm AWG : 20mm
 Red: Ø 0.5mm AWG : 20mm
 Yellow: Ø 0.5mm AWG : 20mm
 Green: Ø 0.5mm AWG : 20mm
 White: Ø 0.5mm AWG : 20mm

*AWG: American Wire Gauge

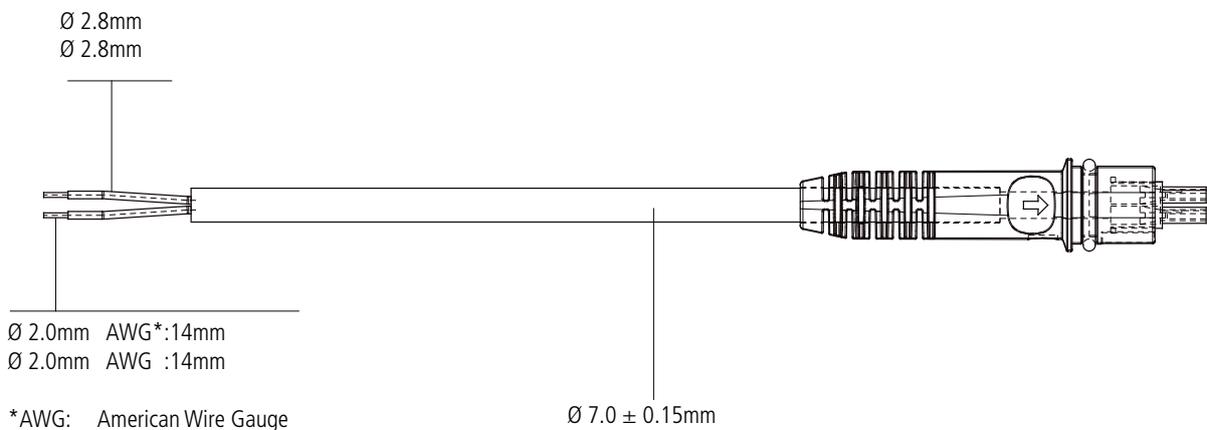


Power cable dimensions:

Ø 2.8mm
 Ø 2.8mm

Ø 2.0mm AWG*:14mm
 Ø 2.0mm AWG :14mm

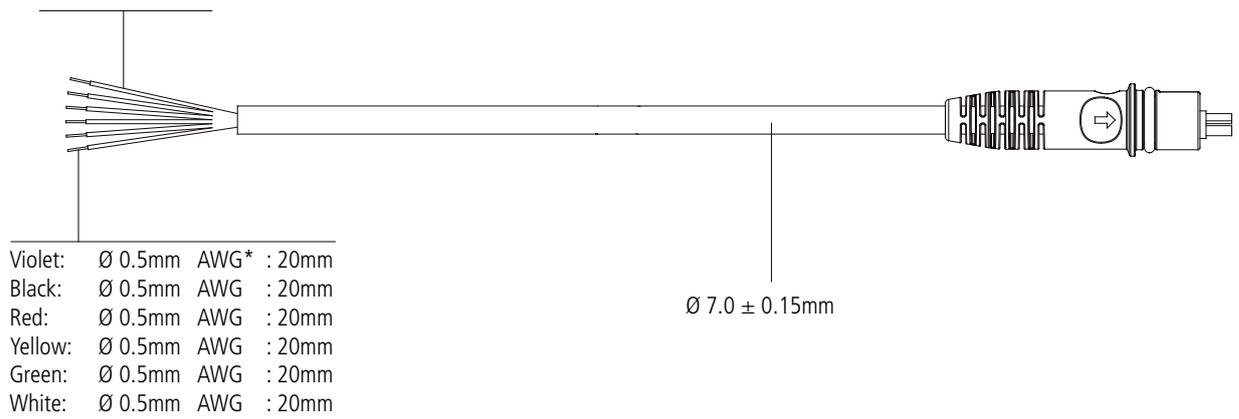
*AWG: American Wire Gauge



Cable dimensions

Signal cable dimensions:

Violet: Ø 1.5mm
Black: Ø 1.5mm
Red: Ø 1.5mm
Yellow: Ø 1.5mm
Green: Ø 1.5mm
White: Ø 1.5mm

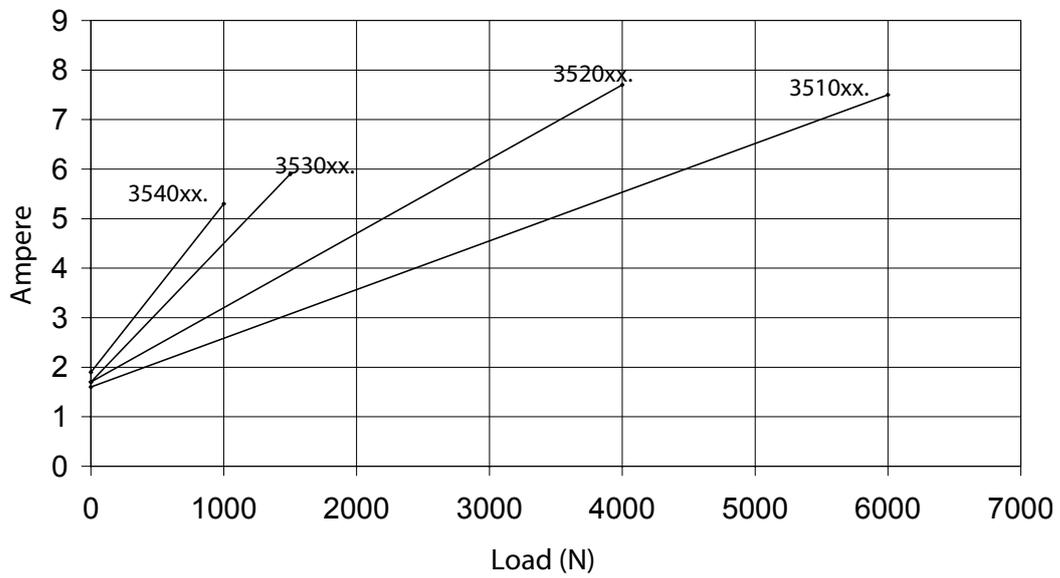


*AWG: American Wire Gauge

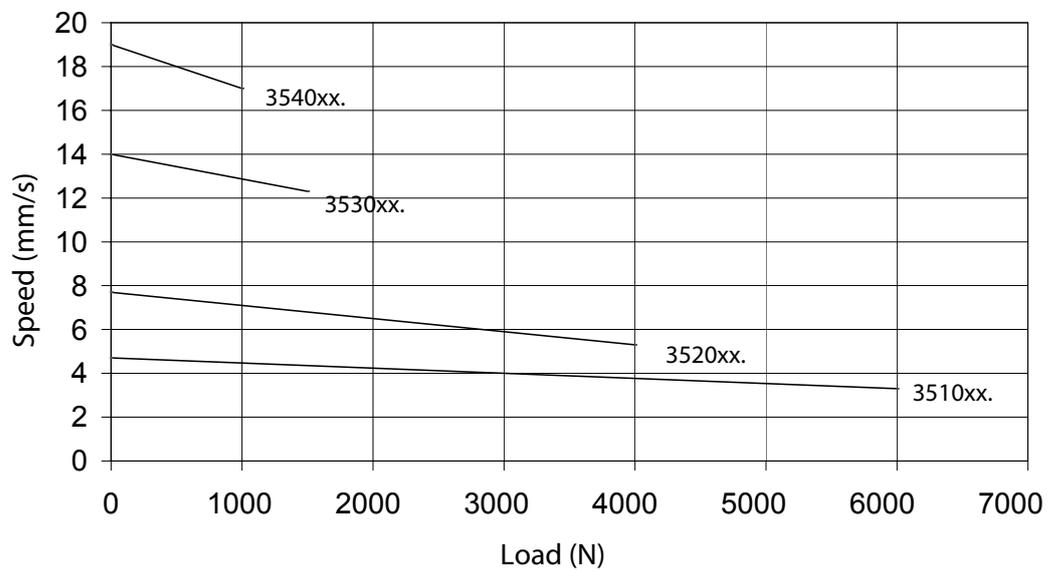
Speed and current curves - 12V motor

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

LA35 - 12V current vs load



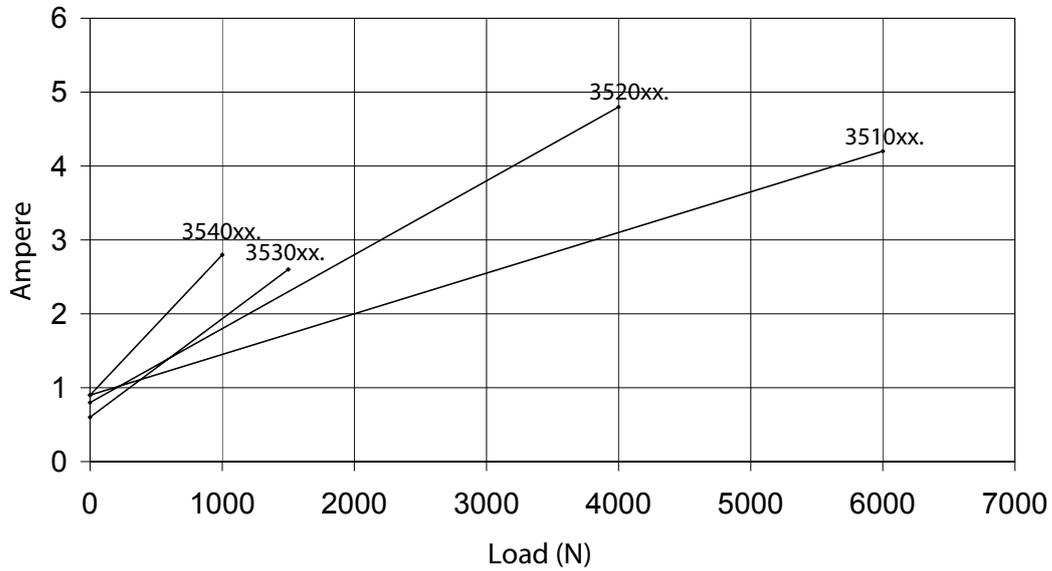
LA35 - 12V speed vs load



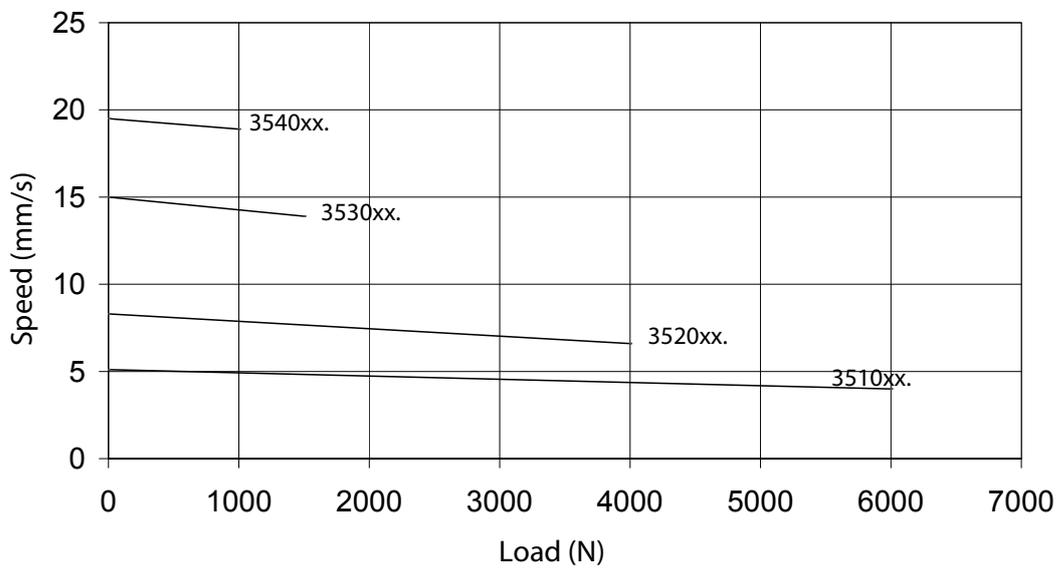
Speed and current curves - 24V motor

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

LA35 - 24V current vs load



LA35 - 24V speed vs load



Chapter 2

I/O specifications: Actuator without feedback

Input/Output	Specification	Comments
Description	Permanent magnetic DC motor.	
Brown	12 or 24VDC (+/-) 12V \pm 20% 24V \pm 10%	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	Under normal conditions: 12V, max. 10A depending on load 24V, max. 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	

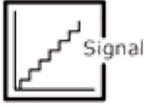
I/O specifications: Actuator with potential free endstop signal output

Input/Output	Specification	Comments
Description	The actuator is equipped with potential free endstop signals out. The micro switches are normally open.	
Brown	12 or 24VDC (+/-) 12V ± 20% 24V ± 10% Under normal conditions:	To extend actuator: Connect Brown to positive To retract actuator: Connect Brown to negative
Blue	12V, max. 10A depending on load 24V, max. 5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
Red	Potential free signal power supply (+) 10-28VDC	Switching capacity: Minimum 10mA Maximum 1A
Black	Not to be connected	
Green	Endstop signal out	Output voltage is the same as the input voltage
Yellow	Endstop signal in	
Violet	Not to be connected	
White	Not to be connected	

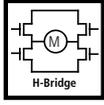
I/O specifications: Actuator with potential free endstop signals and relative positioning - Single Hall

Input/Output	Specification	Comments
Description	The actuator is equipped with potential free endstop signals and Single Hall that gives a relative positioning feedback signal when the actuator moves.	 Hall
Brown	12 or 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. 10A depending on load 24V, max. 5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
White	Signal power supply (+) 10-28VDC	Current consumption: Max. 40mA, also when the actuator is not running
Black	Signal power supply GND (-)	
Green	Endstop signal out	Output voltage is the same as the input voltage
Yellow	Endstop signal in	
Violet	Single Hall output (PNP) Movement per Single Hall pulse: 3mm pitch = 0.38mm per pulse 5mm pitch = 0.63mm per pulse 9mm pitch = 1.13mm per pulse 12mm pitch = 1.5mm per pulse Frequency: Frequency is 30-125 Hz on Single Hall output depending on load and spindle. Overvoltage on the motor can result in shorter pulses.	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.
Red	Potential free signal power supply (+) 10-28VDC	Switching capacity: Minimum 10mA Maximum 1A

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

Input/Output	Specification	Comments
Description	The actuator is equipped with potential free endstop signals and an electronic circuit that gives an analogue feedback signal when the actuator moves.	
Brown	12 or 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. 10A depending on load 24V, max. 5A depending on load	To extend actuator: Connect Blue to negative To retract actuator: Connect Blue to positive
White	Signal power supply (+) 10-28VDC	Current consumption: Max. 40mA, also when the actuator is not running
Black	Signal power supply GND (-)	
Green	Endstop signal out	Output voltage is the same as the input voltage
Yellow	Endstop signal in	
Violet	Analogue feedback 0-10V (Option A) 0.5-4.5V (Option B)	Tolerances +/- 0.5V Max. current output: 1mA Ripple max. 200mV Transaction delay 100ms Linear feedback 0.5% It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning
Red	Potential free signal power supply (+) 10-28VDC	Switching capacity: Minimum 10mA Maximum 1A

I/O specifications: Actuator with IC

Input/Output	Specification	Comments
Description	<p>Easy to use interface with integrated power electronics (H-bridge).</p> <p>The actuator can also be equipped with electronic circuit that gives an absolute or relative feedback signal.</p> <p>The version with "IC option" cannot be operated with PWM (power supply).</p>	
Brown	<p>12-24VDC + (VCC) Connect Brown to positive</p> <p>12V ± 20% 24V ± 10%</p> <p>12V, current limit 18A 24V, current limit 9A</p>	<p>Note: Do not change the power supply polarity on the brown and blue wires!</p> <p>Power supply GND (-) is electrically connected to the housing</p> <p>If the temperature drops below 0°C, all current limits will automatically increase to maximum (no limits)</p>
Blue	<p>12-24VDC - (GND) Connect Blue to negative</p> <p>12V ± 20% 24V ± 10%</p> <p>12V, current limit 18A 24V, current limit 9A</p>	
Red	Extends the actuator	<p>On/off voltages: > 67% of V_{IN} = ON < 33% of V_{IN} = OFF</p> <p>Input current: 10mA</p>
Black	Retracts the actuator	
Green	Endstop signal out	<p>Output voltage min. $V_{IN} - 2V$ Source current max. 100mA</p> <p>Endstop signals are NOT potential free</p>
Yellow	Endstop signal in	
Violet	<p>Analogue feedback: Configure any high/low combination between 0-10V or 0.5-4.5V</p> <p>0-10V (Option A) 0.5-4.5V (Option B)</p>	<p>Tolerances +/- 0.5V Max. current output: 1mA Ripple max. 200mV Transaction delay 100ms Linear feedback 0.5%</p> <p>It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning</p>
	<p>Single Hall output (PNP)</p> <p>Movement per Single Hall pulse: 3mm pitch = 0.38mm per pulse 5mm pitch = 0.63mm per pulse 9mm pitch = 1.13mm per pulse 12mm pitch = 1.5mm per pulse</p> <p>Frequency: Frequency is 30-125 Hz on Single Hall output depending on load and spindle. Overvoltage on the motor can result in shorter pulses.</p>	
White	Ready	<p>The signal is constantly high when the actuator is in ready mode.</p> <p>Failure modes: The signal goes low when:</p> <ul style="list-style-type: none"> - The current cuts off - The temperature is out of range (high duty cycle protection)

Chapter 3

Environmental tests - Climatic

Test	Specification	Comment
Cold test	EN60068-2-1 (Ab)	<u>Storage at low temperature:</u> Temperature: -40°C Duration: 72h Not connected Tested at room temperature.
	EN60068-2-1 (Ad)	<u>Storage at low temperature:</u> Temperature: -25°C Duration: 12h Tested at low temperature.
Dry Heat	EN60068-2-2 (Bb)	<u>Storage at high temperature:</u> Temperature: +90°C Duration: 72h Actuator is not powered during test Tested at room temperature. <u>Storage at high temperature:</u> Temperature: +70°C Duration: 1,000h Actuator is not powered during test Tested at high temperature.
	EN60068-2-2 (Bd)	<u>Operating at high temperature:</u> Temperature: +60°C Int. max. 17% Duration: 700h Actuator is activated Tested at high temperature.
Change of temperature	EN60068-2-14 (Na)	<u>Rapid change of temperature:</u> High temperature: +100°C in 60 minutes Low temperature: -30°C in 60 minutes Transition time: <10 seconds Duration: 100 cycles Actuator is not powered during test Tested at room temperature.
	EN60068-2-14 (Nb)	<u>Controlled change of temperature:</u> 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 powered during test. Tested at 250, 500 and 1,000 cycles at low and high temperatures.
Damp heat	EN60068-2-30 (Db)	<u>Damp heat, Cyclic:</u> 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 powered during test Tested within 1 hour after condensation That means after the upper temperature has been reached.
	EN60068-2-3 (Ca)	<u>Damp heat, Steady state:</u> Relative humidity: 93-95% Temperature: +40 ±2°C Duration: 56 days Actuator is not powered during test Tested within one hour after exposure.
Salt mist.	EN60068-2-52 (Kb)	<u>Salt spray test:</u> Salt solution: 5% sodium chloride (NaCl) 4 spraying periods, each of 2 hours Humidity storage 7 days after each Actuator not powered during test Exposure time: 500 hours

Environmental tests - Mechanical

Test	Specification	Comment
Free fall		Free fall from all sides: Height of fall: 0.8 meter onto linoleum covered concrete Actuator not powered during test.
Vibration	EN60068-2-64 EN 60068-2-6 (Fc)	<u>Random vibration:</u> Short time test: 6.29g RMS Actuator is not connected Long time test: 7.21g RMS Actuator is not powered during test Duration: 2 hours in each direction <u>Sinus vibration:</u> Frequency 5-200Hz Displacement: 3.3mm pp, B 25Hz Acceleration 4g Number of directions: 3 (X-Z-Y) Duration: 2 hours in each direction Actuator is not powered during test.
Bump	EN60068-2-29 (Eb)	<u>Bump test:</u> Level: 25g Duration: 6 milliseconds x 1000 times in each direction pr. axis Actuator is not powered during test.
Shock	EN60068-2-27 (Ea)	<u>Shock test:</u> Level: Half sinus 100g Duration: 6 milliseconds Number of bumps: 3 shocks in each of 6 directions Actuator is not powered during test.

Environmental tests - Electrical

Test	Specification	Comment
Power supply		Operating voltages +7V - +27V Over voltage +29(V) / 5min. Reverse polarity +7 and +27(V) / 5min.
Electromagnetic fields	EN61000-4-3	30 V/m, 80%AM, 1 kHz 20 - 2.700 Mhz 10 V/m, 80% AM, 1kHz 80 - 1000 Mh 3 V/m, 80% AM, 1 kHz 1.4 - 2.0 GHz 1 V/m, 80% AM 2.0 - 2.7 GHz
Fast transients	EN61000-4-4	± 2 kV
Surge transients	EN61000-4-5	± 2 kV (42Ω output)
Radio frequency	EN61000-4-6	10 Vrms, 80% AM 0.15 - 80 MHz



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

Terms of use

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

However, due to continuous development in order to improve its products, LINAK products are subject to frequent modifications and changes without prior notice. Therefore, LINAK cannot guarantee the correct and actual status of said information on its products.

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