

# ACTUATOR LA25

## Features:

- 12 or 24 V DC permanent magnetic motor
- Thrust from 900 N - 2500 N in push and pull
- Max. speed up to 13 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
- Hall effect sensor
- Hall potentiometer
- IC options including:
  - IC - Integrated Controller (H-bridge),
  - Integrated Parallel Controller
  - Modbus and LINbus communication
  - Analogue or digital feedback for precise positioning
  - Endstop signals
  - PC configuration tool

## Usage:

- Duty cycle: 20%, 2 minutes continuous use followed by 8 minutes not in use
- Ambient temperature: -40°C to +85°C, full performance from +5°C to +40°C



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.



This TECHLINE® actuator comes with IC - Integrated controller.  
For more information on our IC options, please see: [www.linak.com/techline](http://www.linak.com/techline)



WE IMPROVE YOUR LIFE

## Contents

### Chapter 1

|                                     |     |
|-------------------------------------|-----|
| Specifications.....                 | 3   |
| Technical specifications.....       | 4   |
| Stroke tolerances.....              | 4   |
| Built-in tolerances .....           | 4   |
| LA25 Dimensions.....                | 5   |
| Built-in dimensions.....            | 5   |
| LA25 Back fixture orientation ..... | 6   |
| LA25 Piston Rod Eyes .....          | 6   |
| Cable dimensions .....              | 7   |
| Speed and current curves .....      | 8-9 |

### Chapter 2

#### I/O specifications:

|                                |    |
|--------------------------------|----|
| Actuator without feedback..... | 10 |
|--------------------------------|----|

#### Actuator with:

|  |       |
|--|-------|
| Endstop signal output .....  | 10    |
| Endstop signals and relative positioning -Single Hall.....         | 11    |
| Endstop signals and absolute positioning - Analogue feedback ..... | 12    |
| Endstop signals and absolute positioning - PWM .....               | 13    |
| IC Basic.....  | 14    |
| IC Advanced - with BusLink.....                                    | 15-16 |
| Parallel.....  | 17    |

### Chapter 3

|                                       |       |
|---------------------------------------|-------|
| Environmental tests - Climatic .....  | 18-19 |
| Environmental tests - Mechanical..... | 19    |
| Environmental tests - Electrical..... | 20    |
| Non-complying standards.....          | 20    |

## 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<br>Inner tube: Stainless steel AISI304/SS2333<br>Acme spindle: Trapezoidal spindle with high efficiency |
| Temperature range:   | - 40° C to +85° C<br>- 40° F to +185° F<br>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 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 |           |
|--------------------|--------------------|------------------------------|--------------------|--------------------|-----------------------|-----------|-----------------------------|----------------------|-----------|
|                    |                    | Without short circuit        | With short circuit |                    | No load               | Full load |                             | No load              | Full load |
| 25030xxxxxxxxxA... | 2500               | 2500                         | 2500               | 3                  | 3.1                   | 2.5       | 20 - 300                    | 0.8                  | 3.8       |
| 25060xxxxxxxxxA... | 1500               | 1200                         | 1500               | 6                  | 6.6                   | 5.2       | 20 - 300                    | 0.8                  | 3.8       |
| 25090xxxxxxxxxA... | 1200               | 750                          | 1200               | 9                  | 9.9                   | 7.5       | 20 - 300                    | 0.9                  | 4.0       |
| 25120xxxxxxxxxA... | 900                | 750                          | 900                | 12                 | 13                    | 9.6       | 20 - 300                    | 0.9                  | 3.8       |

### 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 |           |
|--------------------|--------------------|------------------------------|--------------------|--------------------|-----------------------|-----------|-----------------------------|----------------------|-----------|
|                    |                    | Without short circuit        | With short circuit |                    | No load               | Full load |                             | No load              | Full load |
| 25030xxxxxxxxxB... | 2500               | 2500                         | 2500               | 3                  | 3.2                   | 2.6       | 20 - 300                    | 0.4                  | 1.9       |
| 25060xxxxxxxxxB... | 1500               | 1200                         | 1500               | 6                  | 6.4                   | 5.5       | 20 - 300                    | 0.4                  | 1.9       |
| 25090xxxxxxxxxB... | 1200               | 750                          | 1200               | 9                  | 9.5                   | 8.1       | 20 - 300                    | 0.4                  | 2.0       |
| 25120xxxxxxxxxB... | 900                | 750                          | 900                | 12                 | 12.6                  | 10.4      | 20 - 300                    | 0.4                  | 1.9       |

\* 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.

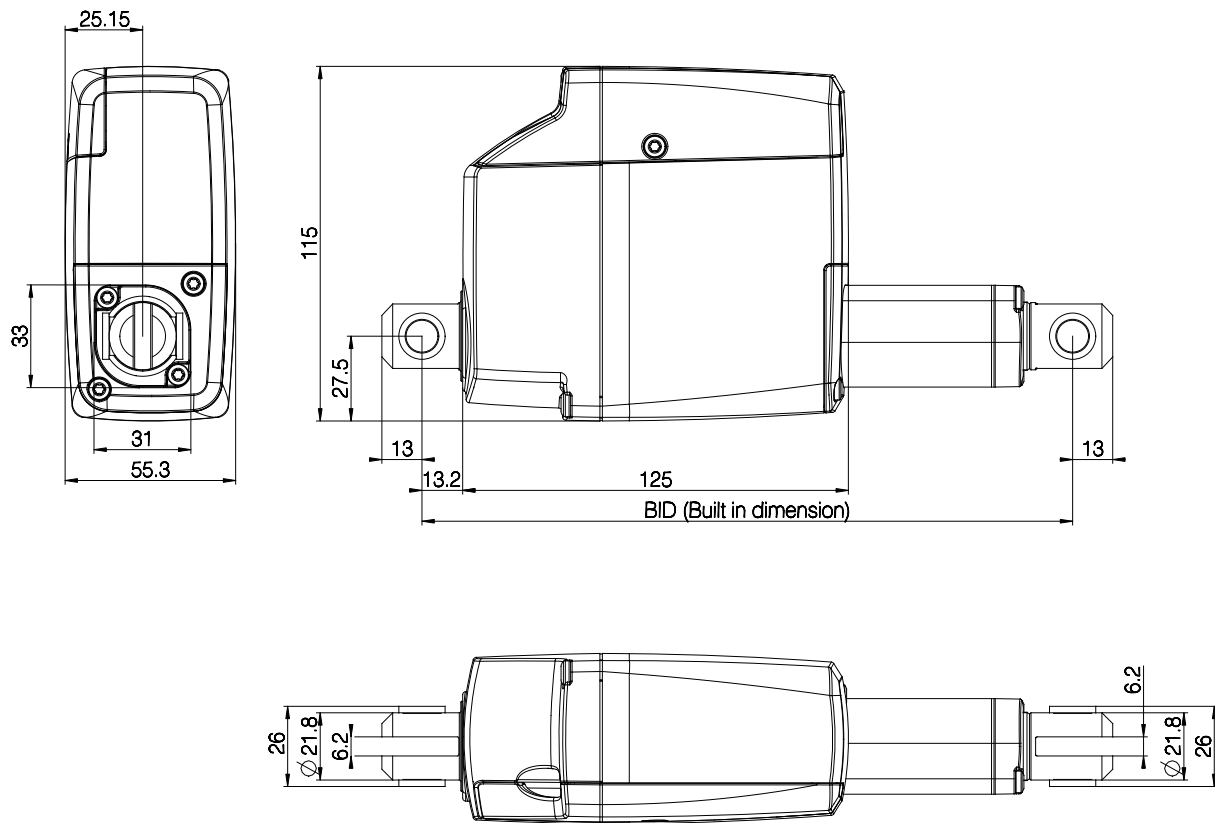
### Stroke tolerances

| Platform options | Descriptions                 | Stroke tolerance | Example for 200 mm stroke |
|------------------|------------------------------|------------------|---------------------------|
| 25XXXXXXXXXX0    | With built-in limit switches | + 2 / - 2 mm     | 198 to 202 mm             |
| 25XXXXXXXXXX3    | 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          |

## LA25 Dimensions

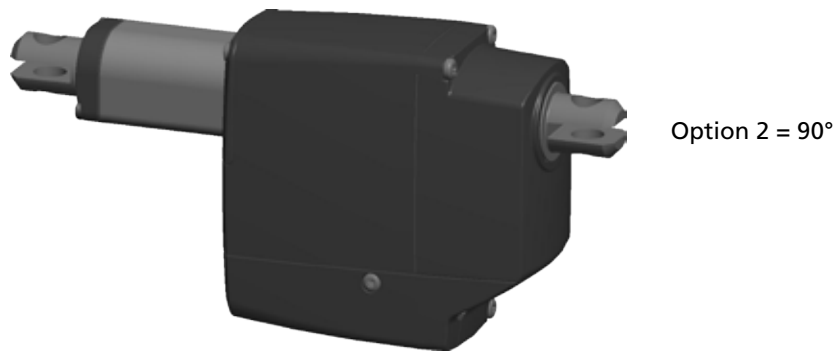
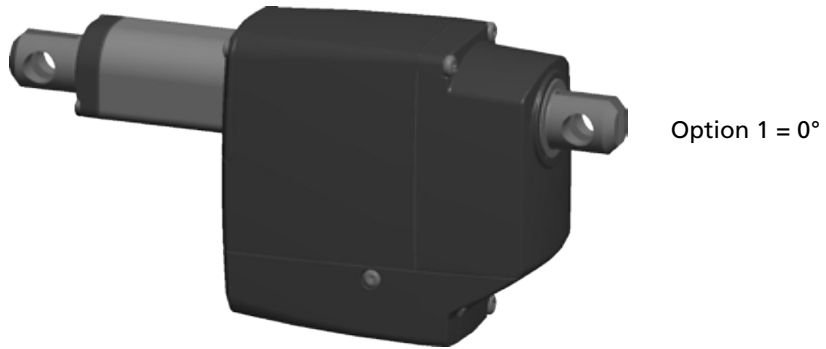


### Built-in dimensions

The built-in dimension depends upon the chosen safety option and stroke length. Please see the table below to decide upon the built-in dimension.

| Safety option       | Stroke length | Spindle pitch | Min. built-in Dimensions |
|---------------------|---------------|---------------|--------------------------|
| No safety option    | 20 - 49       | 6, 9 or 12    | 160                      |
| No safety option    | 20 - 49       | 3             | 168                      |
| Safety nut for push | 20 - 49       | 6, 9 or 12    | 160                      |
| Safety nut for push | 20 - 49       | 3             | 168                      |
| Safety nut for pull | 20 - 49       | 6, 9 or 12    | 172                      |
|                     |               |               |                          |
| No safety option    | 50 - 200      | 6, 9 or 12    | 110 + stroke             |
| No safety option    | 50 - 200      | 3             | 118 + stroke             |
| Safety nut for push | 50 - 200      | 6, 9 or 12    | 110 + stroke             |
| Safety nut for push | 50 - 200      | 3             | 118 + stroke             |
| Safety nut for pull | 50 - 200      | 6, 9 or 12    | 122 + stroke             |
|                     |               |               |                          |
| No safety option    | 201 - 300     | 6, 9 or 12    | 130 + stroke             |
| No safety option    | 201 - 300     | 3             | 138 + stroke             |
| Safety nut for push | 201 - 300     | 6, 9 or 12    | 130 + stroke             |
| Safety nut for push | 201 - 300     | 3             | 138 + stroke             |
| Safety nut for pull | 201 - 300     | 6, 9 or 12    | 142 + stroke             |

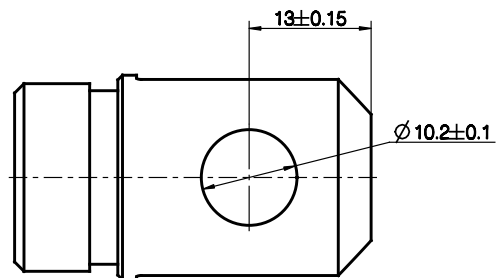
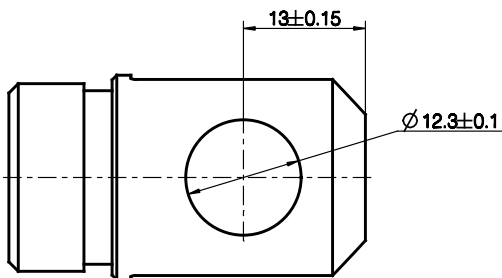
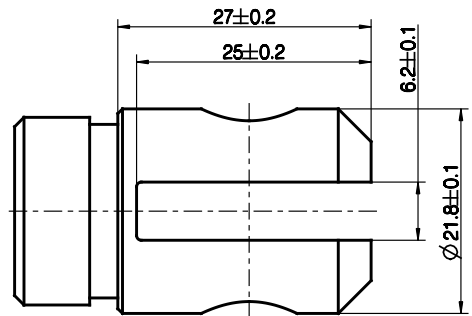
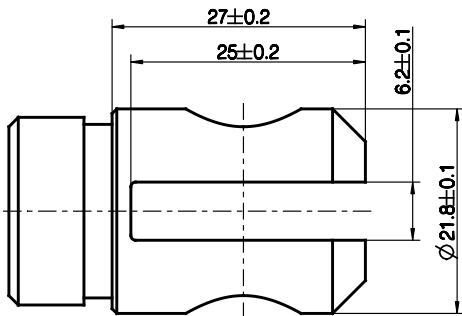
**LA25 Back fixture orientation**



**LA25 Piston Rod Eyes**

Piston: 0231016, Zinc coated  
 Piston: 0231095, Stainless steel AISI 304

Piston: 0231033, Zinc coated  
 Piston: 0231096, Stainless steel AISI 304



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

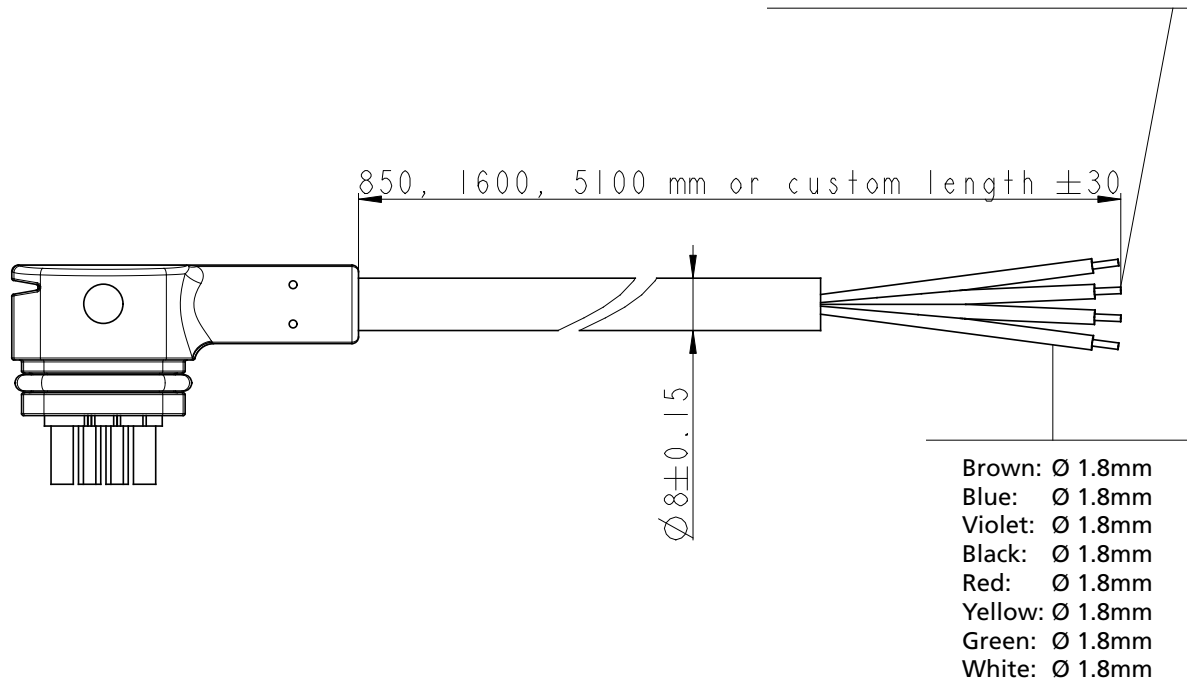


The Piston Rod Eyes can be mounted with extra bushes to reduce the hole to 10.1 or 8.1.

## Cable dimensions

Brown: Ø 1.0mm<sup>2</sup> AWG\*: 18mm  
Blue: Ø 1.0mm<sup>2</sup> AWG : 18mm  
Violet: Ø 1.0mm<sup>2</sup> AWG : 18mm  
Black: Ø 1.0mm<sup>2</sup> AWG : 18mm  
Red: Ø 1.0mm<sup>2</sup> AWG : 18mm  
Yellow: Ø 1.0mm<sup>2</sup> AWG : 18mm  
Green: Ø 1.0mm<sup>2</sup> AWG : 18mm  
White: Ø 1.0mm<sup>2</sup> AWG : 18mm

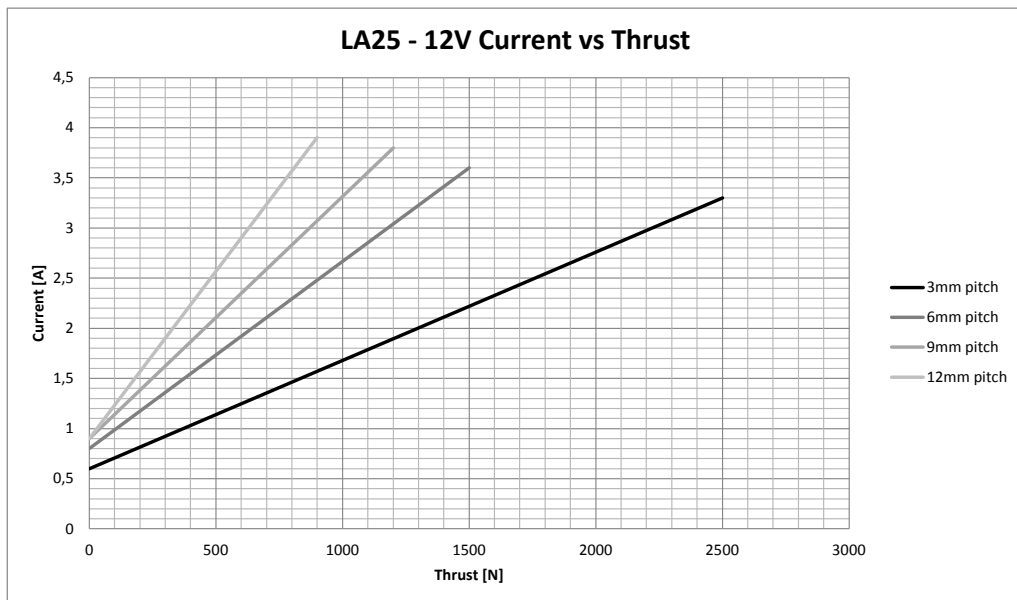
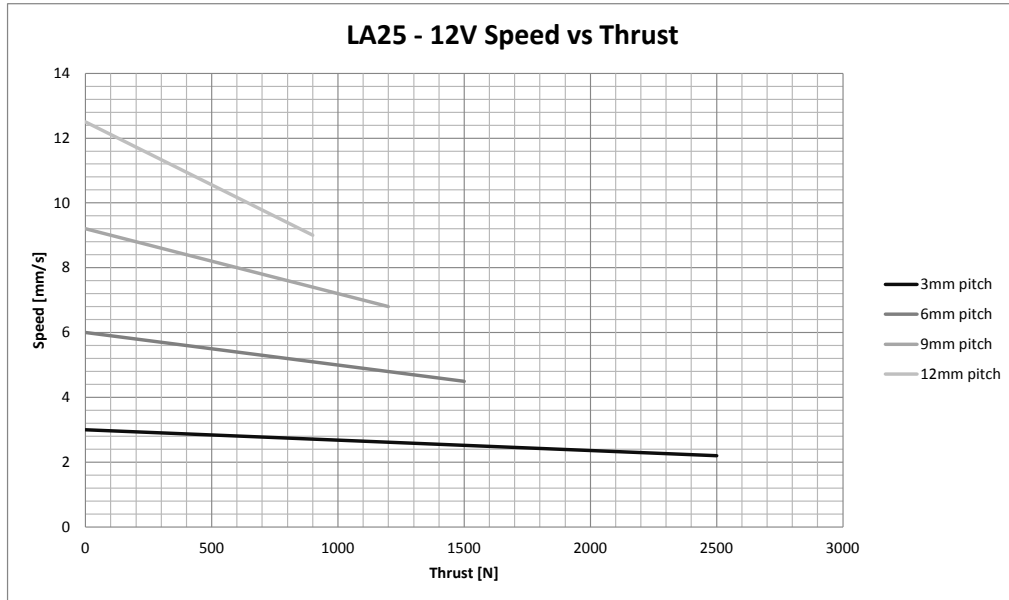
\*AWG: American Wire Gauge



The LA25 standard cable is a UV resistant PVC cable.

### Speed and current curves - 12V motor

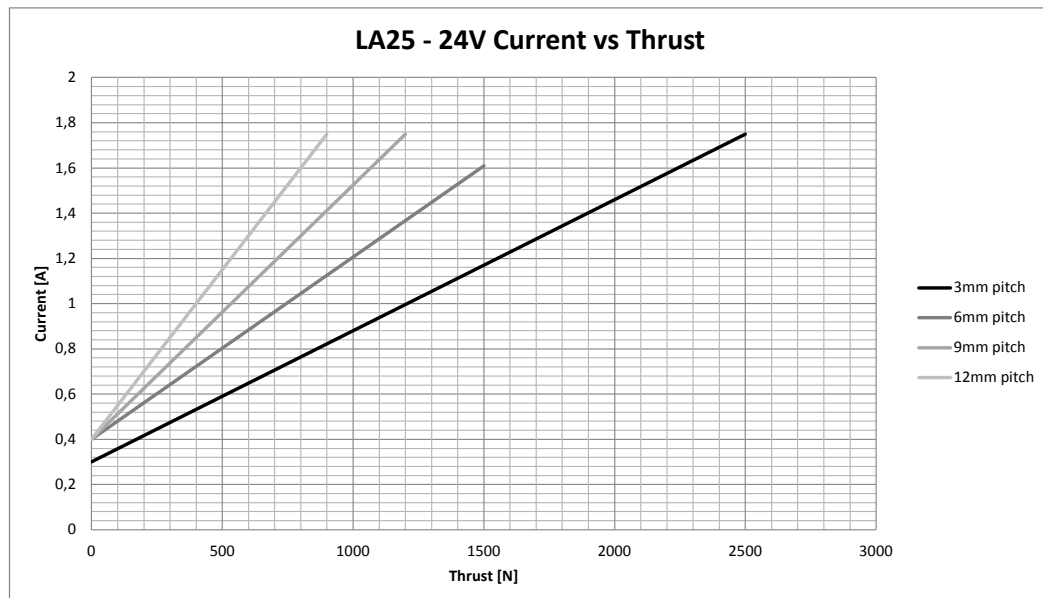
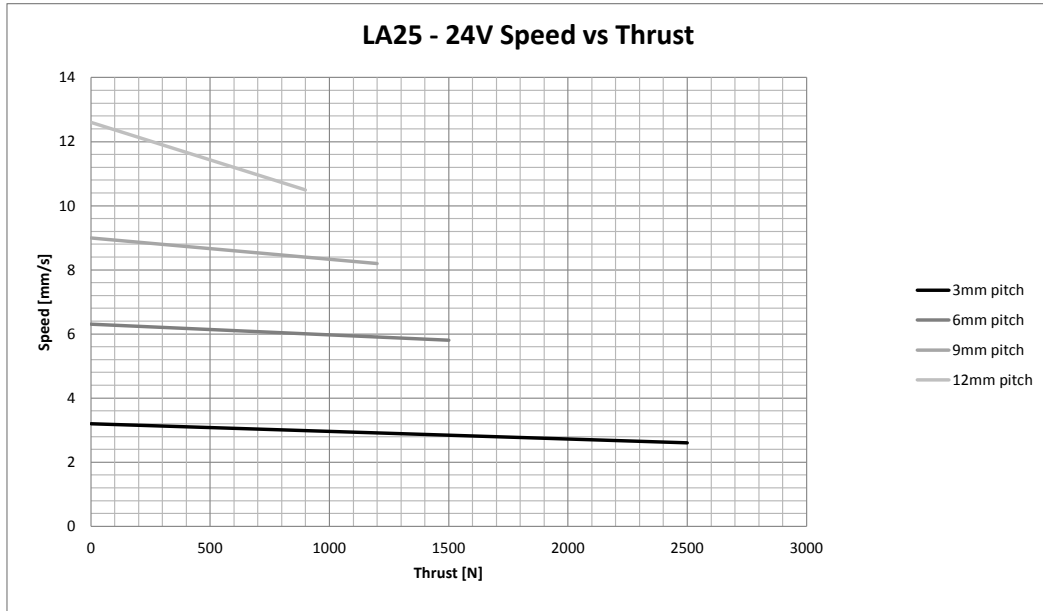
The values below are typical values and made with a stable power supply and an ambient temperature of 20°C.






### 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


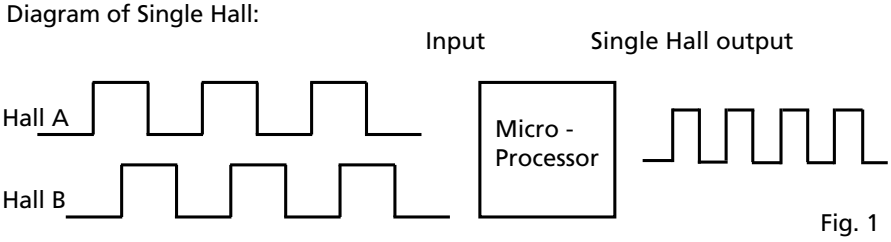
### I/O specifications: Actuator without feedback

| Input/Output | Specification  | Comments  |
|--------------|--|---|
| Description  | Permanent magnetic DC motor.   |                        |
| Brown        | 12-24VDC (+/-)<br>12V ± 20%<br>24V ± 10%   | To extend actuator:<br>Connect Brown to positive<br><br>To retract actuator:<br>Connect Brown to negative |
| Blue         | Under normal conditions:<br>12V, max. 5A depending on load<br>24V, max. 2.5A depending on load | To extend actuator:<br>Connect Blue to negative<br><br>To retract actuator:<br>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

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

| 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 (+/-)<br>12V ± 20%<br>24V ± 10%  | To extend actuator:<br>Connect Brown to positive<br><br>To retract actuator:<br>Connect Brown to negative  |
| Blue   | Under normal conditions:<br>12V, max. 5A depending on load<br>24V, max. 2.5A depending on load  | To extend actuator:<br>Connect Blue to negative<br><br>To retract actuator:<br>Connect Blue to positive  |
| Red  | Signal power supply (+)<br>12-24VDC   | Current consumption:<br>Max. 40 mA, also when the actuator is not running  |
| Black  | Signal power supply GND (-)   |  |
| Green  | Endstop signal out  | Output voltage min. $V_{IN} - 2V$<br>Source current max. 100mA<br>NOT potential free   |
| Yellow   | Endstop signal in   |  |
| Violet   | Single Hall output (PNP)<br><br>Movement per single Hall pulse:<br>LA25030 Actuator = 0.25mm per pulse<br>LA25060 Actuator = 0.5mm per pulse<br>LA25090 Actuator = 0.75mm per pulse<br>LA25120 Actuator = 1.0mm per pulse<br><br>Frequency:<br>Frequency is 10 - 20 Hz on Single Hall output depending on load.<br>Pulse ON time is minimum 8ms. OFF time between two ON pulses is minimum 8ms.<br>Overvoltage on the motor can result in shorter pulses. | Output voltage min. $V_{IN} - 2V$<br>Max. current output: 12mA<br>Max. 680nF<br><br>N.B. For more precise measurements, please contact LINAK A/S.<br><br>Low frequency with a high load.<br>Higher frequency with no load. |
| <p>Diagram of Single Hall:</p>  <p style="text-align: right;">Fig. 1</p> |   |  |
| White  | Not to be connected   |  |

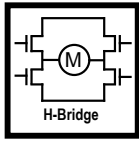
**I/O specifications: Actuator with endstop signals and absolute positioning - Analogue feedback**

| 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 (+/-)<br>12V ± 20%<br>24V ± 10%  | To extend actuator:<br>Connect Brown to positive<br><br>To retract actuator:<br>Connect Brown to negative   |
| Blue         | Under normal conditions:<br>12V, max. 5A depending on load<br>24V, max. 2.5A depending on load  | To extend actuator:<br>Connect Blue to negative<br><br>To retract actuator:<br>Connect Blue to positive   |
| Red          | Signal power supply (+)<br>12-24VDC   | Current consumption:<br>Max. 60 mA, also when the actuator is not running   |
| Black        | Signal power supply GND (-)   |   |
| Green        | Endstop signal out  | Output voltage min. $V_{IN} - 2V$<br>Source current max. 100mA<br>NOT potential free  |
| Yellow       | Endstop signal in   |   |
| Violet       | Analogue feedback<br>0-10V (Feedback level 1)<br>0.5-4.5V (Feedback level 2)  | Tolerances +/- 0.2 V<br>Max. current output: 1mA<br>Ripple max. 200mV<br>Transaction delay max. 20ms<br>Linear feedback 0.5%<br>Source current max. 1mA |
|              | 4-20mA (Feedback level 3)<br>Special (Feedback level 9)   | Tolerances +/- 0.2mA<br>Transaction delay 20ms<br>Linear feedback 0.5%<br>Output: Source<br>Serial resistance:<br>12V max 300 ohm<br>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   |   |

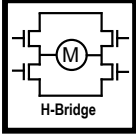
**I/O specifications: Actuator with endstop signals and absolute positioning - PWM**

| 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 (+/-)<br>12V ± 20%<br>24V ± 10%   | To extend actuator:<br>Connect Brown to positive<br><br>To retract actuator:<br>Connect Brown to negative   |
| Blue         | Under normal conditions:<br>12V, max. 5A depending on load<br>24V, max. 2.5A depending on load                       | To extend actuator:<br>Connect Blue to negative<br><br>To retract actuator:<br>Connect Blue to positive   |
| Red          | Signal power supply (+)<br>12-24VDC  | Current consumption:<br>Max. 40mA, also when the actuator is not running  |
| Black        | Signal power supply GND (-)  |   |
| Green        | Endstop signal out   | Output voltage min. $V_{IN} - 2V$<br>Source current max. 100 mA<br>NOT potential free   |
| Yellow       | Endstop signal in  |   |
| Violet       | Digital output feedback<br>10-90% (Feedback level 4)<br>20-80% (Feedback level 5)<br>Special (Feedback level 9)      | Output voltage min. $V_{IN} - 2V$<br>Tolerances +/- 2%<br>Max. current output: 12mA<br><br>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

| Input/Output | Specification  | Comments   |
|--------------|--|--|
| Description  | <p>Easy to use interface with integrated power electronics (H-bridge).<br/>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> |  <p>H-Bridge</p>  |
| Brown        | <p>12-24VDC + (VCC)<br/>Connect Brown to positive</p> <p>12V ± 20%<br/>24V ± 10%</p> <p>12V, current limit 8A<br/>24V, current limit 5A</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>   |
| Blue         | <p>12-24VDC - (GND)<br/>Connect Blue to negative</p> <p>12V ± 20%<br/>24V ± 10%</p> <p>12V, current limit 8A<br/>24V, current limit 5A</p>   | <p>If the temperature drops below -10°C, all current limits will automatically increase to 9A for 12V, and 6A for 24V</p>  |
| Red          | Extends the actuator   | <p>On/off voltages:</p> <p>&gt; 67% of <math>V_{IN}</math> = ON<br/>&lt; 33% of <math>V_{IN}</math> = OFF</p> <p>Input current: 10mA</p>   |
| Black        | Retracts the actuator  |  |
| Green        | Not to be connected  |  |
| Yellow       | Not to be connected  |  |
| Violet       | <p>Analogue feedback<br/>0-10V (Feedback level 1)</p>  | <p>Standby power consumption:<br/>12V, 60mA<br/>24V, 45mA</p> <p>Ripple max. 200mV<br/>Transaction delay 20ms<br/>Linear feedback 0.5%<br/>Max. current output: 1mA</p> <p>It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning.</p> |
|              | Single Hall output (PNP)   | <p>Output voltage min. <math>V_{IN} - 2V</math><br/>Max. current output: 12mA<br/>For more information see fig. 1, page 11</p>   |
| White        | Signal GND   |  |

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

| Input/Output | Specification   | Comments  |
|--------------|---|---|
| Description  | <p>Easy to use interface with integrated power electronics (H-bridge).<br/>                     The actuator can also be equipped with electronic circuit that gives an absolute or relative feedback signal.<br/>                     IC Advanced also provides a wide range of possibilities for customisation.</p> <p>The version with "IC option" cannot be operated with PWM (power supply).</p> |    |
| Brown        | <p>12-24VDC + (VCC)<br/>                     Connect Brown to positive</p> <p>12V ± 20%<br/>                     24V ± 10%</p> <p>12V, current limit 8A<br/>                     24V, current limit 5A</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>  |
| Blue         | <p>12-24VDC - (GND)<br/>                     Connect Blue to negative</p> <p>12V ± 20%<br/>                     24V ± 10%</p> <p>12V, current limit 8A<br/>                     24V, current limit 5A</p>   | <p>Current limit levels can be adjusted through BusLink</p> <p>If the temperature drops below -10°C, all current limits will automatically increase to 9A for 12V, and 6A for 24V</p>   |
| Red          | Extends the actuator  | <p>On/off voltages:<br/>                     &gt; 67% of <math>V_{IN}</math> = ON<br/>                     &lt; 33% of <math>V_{IN}</math> = OFF</p> <p>Input current: 10 mA</p>  |
| Black        | Retracts the actuator   |   |
| Green        | Endstop signal out  | <p>Output voltage min. <math>V_{IN} - 2V</math><br/>                     Source current max. 100mA</p> <p>Endstop signals are NOT potential free. Endstop signals can be configured with BusLink software according to any position needed.</p> |
| Yellow       | Endstop signal in   | <p>Before configuring virtual endstop, an absolute feedback type must be chosen. Only use one virtual endstop - keep one end open for initialisation. (See I/O specifications for endstop on page 10)</p>                                       |

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

| Input/Output | Specification   | Comment   |
|--------------|---|---|
| Violet       | Analogue feedback (0-10V):<br>Configure any high/low combination between 0-10V      | Ripple max. 200 mV<br>Transaction delay 20 ms<br>Linear feedback 0.5%<br>Max. current output. 1 mA  |
|              | Single Hall output (PNP)  | Output voltage min. $V_{IN} - 2V$<br>Max. current output: 12mA<br>Please be aware that when choosing single hall, feedback position readout and virtual endstops are not available in BusLink.<br>For more information, see fig. 1, page 11 |
|              | Digital output feedback PWM:<br>Configure any high/low combination between 0 - 100% | Output voltage min. $V_{IN} - 2V$<br>Frequency: 75Hz $\pm$ 10Hz as standard, but this can be customised.<br>Duty cycle: Any low/high combination between 0 and 100 percent.<br>Open Drain source current max. 12mA                          |
|              | Analogue feedback (4-20mA):<br>Configure any high/low combination between 4-20mA    | Tolerances +/- 0.2mA<br>Transaction delay 20ms<br>Linear feedback 0.5%<br>Output: Source<br>Serial resistance:<br>12 V max. 300 ohm<br>24 V max. 900 ohm  |
|              | All absolute value feedbacks (0-10V, PWM and 4-20mA)                                | Standby power consumption:<br>12V, 60mA<br>24V, 45mA<br><br>It is recommendable to have the actuator to activate its limit switches on a regular basis, to ensure more precise positioning  |
| White        | Signal GND  |   |



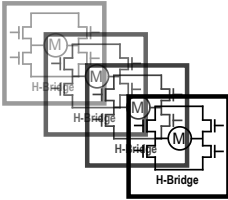
**BusLink is available for IC Advanced and can be used for:**  
Diagnostics, manual run and configuration.

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

Item number for BusLink cables: 0147999



**I/O specifications: Actuator with Parallel**

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



**BusLink is available for Parallel and can be used for:**

- Configuration and diagnostics
- Service counter is available with Parallel

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

Item number for BusLink cables: 0147999

## Chapter 3

### Environmental tests - Climatic

| Test          | Specification     | Comment   | TRD number |
|---------------|-------------------|---|------------|
| Cold test     | EN60068-2-1 (Ab)  | Storage at low temperature:<br>Temperature: - 40°C<br>Duration: 72 h<br>Actuator is not connected/operated<br>Tested at room temperature  | TRD5675    |
|               |                   | Storage at low temperature:<br>Temperature: -55°C<br>Duration: 24 h<br>Actuator is not connected<br>Tested at room temperature  | TRD5675    |
|               | EN60068-2-1 (Ad)  | Operating at low temperature:<br>Temperature: -40°C<br>Duration: 4 h<br>Tested at room temperature<br>within 5 minutes overload   |            |
| Dry heat      | EN60068-2-2 (Bb)  | Storage at high temperature:<br>Temperature: +85°C<br>Duration: 72 h<br>Actuator is not connected/operated<br>Tested at room temperature  | TRD5675    |
|               | EN60068-2-2 (Bb)  | Storage at low temperature:<br>Temperature: +105°C<br>Duration: 24 h<br>Actuator operated at high<br>temperature  | TRD5675    |
| Damp heat     | EN60068-2-30 (Db) | Damp heat, Cyclic:<br>Relative humidity: 93 - 98 %<br>High temperature: +55°C in 12 hours<br>Low temperature: +25°C in 12 hours<br>Duration: 21 cycles * 24 hours<br>Actuator is operated during test | TRD5677    |
| Salt mist.    | EN ISO 9227       | Dynamic salt spray test:<br>Salt solution: 5% sodium chloride<br>(NaCl)<br>Temperature: 35 ± 2°C<br>Duration: 500 h<br>Actuator is operated   | TRD5678    |
| Thermal shock |                   | Dunk test:<br>Actuator is heated to +85°C for 4 h<br>and submerged into a 0°C cold salt-<br>water-detergent solution for 2 h<br>Followed by 18 h dry time<br>Duration: 5 cycles                       | TRD5679    |

### Environmental tests - Climatic

|                       |                  |   |         |
|-----------------------|------------------|---|---------|
| Degrees of protection | EN60529 - IP66   | IP6X - Dust:<br>Dust-tight, No ingress of dust<br>Actuator is not activated   | TRD5680 |
|                       | EN60529 - IP66   | IPX6 - Water:<br>Ingress of water in quantities causing harmful effects is not allowed<br>Duration: 100 litres pr. minute in 3 minutes<br>Actuator is not activated   | TRD5682 |
|                       | DIN40050 - IP69K | IPX9K: High pressure cleaner<br>Temperature: +80°C<br>Water pressure: 80 - 100 bar<br>Water flow: 14 - 16 l/min<br>Duration: 30 sec. each at 4 different angles<br>0°, 30°, 60° and 90°<br>Actuator is not activated<br>Ingress of water in quantities causing harmful effects is not allowed | TRD5680 |
| Rain                  |                  | Dynamic rain test:<br>Actuators exposed to continuous rain<br>Actuators operated and side loaded with 5N<br>Duration: 10.000 cycles and 240 h   | TRD5681 |

### Environmental tests - Mechanical

| Test                                    | Specification | Comment  | TRD number |
|---|---------------|--|------------|
| Mechanical Shock (Handling) - Drop test |               | 3 drops on 6 faces onto a concrete floor.<br>Drop height: 500 mm on all faces  | TRD5683    |
| Mechanical Shock Operational            |               | Peak Pulse Amplitude: 50 G<br>Pulse Duration: 11 ms<br>Number of pulses: 18 total - 3 in each direction for all three axis     | TRD5684    |
|   |               | Peak Pulse Amplitude: 30 G<br>Pulse Duration: 18 ms<br>Number of pulses: 18 total - 3 in each direction for all three axis     | TRD5684    |
|   |               | Peak Pulse Amplitude: 25 G<br>Pulse Duration: 6 ms<br>Number of pulses: 6000 total - 1000 in each direction for all three axis | TRD5684    |
| Vibration Random                        |               | Random vibration:<br>From 18 Hz 0.0259 to 1000 Hz<br><br>Duration: 2 h/axis  | TRD5684    |

## Environmental tests - Electrical

| Standard                                  | Specification   | FOCUS ON  |
|---|---|---|
| 2004/104/EC                               | Automotive EMC Directive 2004/104/EC on electrical and electronic car components  | <ul style="list-style-type: none"> <li>VEHICLES AND MOBILITY</li> </ul>                               |
| EN/IEC 60204 - 1: 2006 + A1: 2009         | Safety of machinery - Electrical equipment of machines - Part 1: General requirements   | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> </ul>                               |
| EN/IEC 60204 - 32: 2008                   | Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines  | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> <li>PLATFORMS AND LIFTS</li> </ul>  |
| EN/IEC 61000 - 6 - 1: 2007                | Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for industrial environments  | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> </ul>                               |
| EN/IEC 61000 - 6 - 2: 2005                | Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments  | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> </ul>                               |
| 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 | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> </ul>                               |
| EN/IEC 61000 - 6 - 4: 2007 + A1:2011      | Electromagnetic compatibility (EMC) - Part 6: Generic standards - Section 4: Emission standard for industrial environments                          | <ul style="list-style-type: none"> <li>INDUSTRIAL AUTOMATION</li> </ul>                               |
| EN 13309: 2010                            | Construction machinery  | <ul style="list-style-type: none"> <li>CONSTRUCTION</li> </ul>  |
| EN/ISO 13766: 2006                        | Earth-moving machinery - Electromagnetic compatibility  | <ul style="list-style-type: none"> <li>CONSTRUCTION</li> </ul>  |
| EN/ISO 14982: 2009                        | Agricultural and forestry machines - Electromagnetic compatibility  | <ul style="list-style-type: none"> <li>MOBILE AGRICULTURE</li> <li>OUTDOOR POWER EQUIPMENT</li> </ul> |
| EU recreational crafts directive 94/25/EC |   |   |

## 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. |

### 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. While LINAK uses its best efforts to fulfill orders, LINAK cannot, for the same reasons as mentioned above, guarantee the availability of any particular product. Therefore, LINAK reserves the right to discontinue the sale of any product displayed on its website or listed in its catalogues or other written material drawn up by LINAK. All sales are subject to the Standard Terms of Sale and Delivery for LINAK. For a copy hereof, please contact LINAK.