

# LA25

## Data Sheet



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## Introduction

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

With its robust design, high IP degree and aluminium housing, the actuator LA25 is ideal for harsh environments where operation under extreme conditions is required.

## Safety instructions

Please read this safety information carefully.

Be aware of the following three symbols throughout the document:



### Warning!

Failing to follow these instructions can cause accidents resulting in serious personal injury.



### Recommendations

Failing to follow these instructions can result in the actuator suffering damage or being ruined.



### Additional information

Usage tips or additional information that is important in connection with the use of the actuator.

Furthermore, ensure that all staff who are to connect, mount, or use the actuator are in possession of the necessary information and that they have access to this document.

Persons who do not have the necessary experience or knowledge of the product/products must not use the product/products. Besides, persons with reduced physical or mental abilities must not use the product/products, unless they are under surveillance or they have been thoroughly instructed in the use of the apparatus by a person who is responsible for the safety of these persons.

Moreover, children must be under surveillance to ensure that they do not play with the product.

### **Before you start mounting/dismounting, ensure that the following points are observed:**

- The actuator is not in operation.
- The actuator is free from loads that could be released during this work.

### **Before you put the actuator into operation, check the following:**

- The actuator is correctly mounted as indicated in the relevant user instructions.
- The equipment can be freely moved over the actuator's whole working area.
- The actuator is connected to a mains electricity supply/transformer with the correct voltage and which is dimensioned and adapted to the actuator in question.
- Ensure that the voltage applied matches to the voltage specified on the actuator label.
- Ensure that the connection bolts can withstand the wear.
- Ensure that the connection bolts are secured safely.

**During operation, please be aware of the following:**

- Listen for unusual sounds and watch out for uneven running. Stop the actuator immediately if anything unusual is observed.
- Do not sideload the actuator.
- Only use the actuator within the specified working limits.
- Do not step on or kick the actuator.

**When the equipment is not in use:**

- Switch off the mains supply in order to prevent unintentional operation.
- Check regularly for extraordinary wear.

**Classification**

The equipment is not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.

**Warnings**

- Do not sideload the actuator.
- When mounting the actuator in the application ensure that the bolts can withstand the wear and that they are secured safely.
- If irregularities are observed, the actuator must be replaced.

**Recommendations**

- Do not place load on the actuator housing.
- Prevent impact or blows, or any other form of stress to the housing.
- Ensure that the cable cover is mounted correctly. Use 3.5 Nm torque.
- Ensure that the duty cycle and the usage temperatures for LA25 actuators are respected.
- Ensure that the cable cannot be squeezed, pulled or subjected to any other stress.
- Furthermore, it will be good practice to ensure that the actuator is fully retracted in the "normal" position. The reason is that there will be a vacuum inside the actuator if it is extended which over time can lead to water entering the actuator.

## Features

- 12 V/24 V DC permanent magnetic motor
- Load from 600 N - 2.500 N in push and pull
- Speed from 2.5 to 25 mm/seconds depending on load and spindle pitch
- Stroke length from 20 - 600 mm (Zero Point: 100 to 600 mm)
- Colour: Dark olive grey
- Protection class: IP66. Furthermore, the actuator can be washed down by a high pressure cleaner (IP69K static)
- Heavy-duty aluminium housing for harsh conditions
- Built-in endstop switches
- Mechanical endstop
- Guided nut
- Static safety factor: 2.0
- Noise level: Max. 58.5 dB(A) at nominal voltage and with no load, according to EN ISO 3743-1

## Options in general

- Safety nut in push or pull (2.500 N version: only safety nut in push; 600 N version: no safety nut)
- Exchangeable cables in different lengths up to 10 m
- Steel or stainless steel back fixture and piston rod eye
- Special anodised housing for extreme environments
- Analogue and digital feedback for precise positioning
- IC Basic and IC Advanced
- I/O Basic, I/O Customised and I/O Full
- Limit switch principle
- Zero point principle
- CAN bus J1939
- CANopen
- LIN bus
- IO-Link
- Actuator Connect™ and BusLink
- IECEx/ATEX certified for Zone 21

## Usage

- Duty cycle is max. 20% (4 min. drive and 16 min. rest)  
The duty cycles are valid for operation within an ambient temperature of +5°C to +40°C
- Ambient operating temperature: -40°C to +85°C (for IECEx/ATEX: T135 -25°C to +65°C; T125 -25°C to +55°C ), full performance from +5°C to +40°C
- Storage temperature: -55°C to +105°C

## Technical specifications

### 12 V

| Type               | Push/<br>Pull<br>Max.<br>(N) | Self-lock min. (N) Push/Pull |                          |                          |                          | Spin-<br>dle<br>pitch<br>(mm) | *Typical<br>speed (mm/s) |              | Standard<br>stroke<br>length<br>(mm) | *Typical amp.<br>at 12 V |              |
|--------------------|------------------------------|------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------|--------------------------|--------------|--------------------------------------|--------------------------|--------------|
|                    |                              | With short<br>circuit        |                          | Without short<br>circuit |                          |                               | No<br>load               | Full<br>load |                                      | No<br>load               | Full<br>load |
|                    |                              | Self-<br>lock<br>(N)         | **Back-<br>drive<br>(mm) | Self-<br>lock<br>(N)     | **Back-<br>drive<br>(mm) |                               |                          |              |                                      |                          |              |
| 25030xxxxxxxxxA... | 2500                         | 2500                         | 1                        | 2500                     | 1                        | 3                             | 3.1                      | 2.5          | 20-500                               | 0.8                      | 3.8          |
| 25060xxxxxxxxxA... | 1500                         | 1500                         | 1                        | 1500                     | 2                        | 6                             | 6.6                      | 5.2          | 20-600                               | 0.8                      | 3.8          |
| 25090xxxxxxxxxA... | 1200                         | 1200                         | 2                        | 1200                     | 4                        | 9                             | 9.9                      | 7.5          | 20-600                               | 0.9                      | 4.0          |
| 25120xxxxxxxxxA... | 900                          | 900                          | 3                        | 900                      | 7                        | 12                            | 13                       | 9.6          | 20-600                               | 0.9                      | 3.8          |
| 25200xxxxxxxxxA... | 600                          | 600                          | 5                        | 600                      | 12                       | 20                            | 25                       | 18           | 20-600                               | 0.9                      | 4.0          |

### 24 V

| Type               | Push/<br>Pull<br>Max.<br>(N) | Self-lock min. (N) Push/Pull |                          |                          |                          | Spin-<br>dle<br>pitch<br>(mm) | *Typical<br>speed (mm/s) |              | Standard<br>stroke<br>length<br>(mm) | *Typical amp.<br>at 24 V |              |
|--------------------|------------------------------|------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------|--------------------------|--------------|--------------------------------------|--------------------------|--------------|
|                    |                              | With short<br>circuit        |                          | Without short<br>circuit |                          |                               | No<br>load               | Full<br>load |                                      | No<br>load               | Full<br>load |
|                    |                              | Self-<br>lock<br>(N)         | **Back-<br>drive<br>(mm) | Self-<br>lock<br>(N)     | **Back-<br>drive<br>(mm) |                               |                          |              |                                      |                          |              |
| 25030xxxxxxxxxB... | 2500                         | 2500                         | 1                        | 2500                     | 1                        | 3                             | 3.2                      | 2.6          | 20-500                               | 0.4                      | 1.9          |
| 25060xxxxxxxxxB... | 1500                         | 1500                         | 1                        | 1500                     | 2                        | 6                             | 6.4                      | 5.5          | 20-600                               | 0.4                      | 1.9          |
| 25090xxxxxxxxxB... | 1200                         | 1200                         | 2                        | 1200                     | 4                        | 9                             | 9.5                      | 8.1          | 20-600                               | 0.4                      | 2.0          |
| 25120xxxxxxxxxB... | 900                          | 900                          | 3                        | 900                      | 7                        | 12                            | 12.6                     | 10.4         | 20-600                               | 0.4                      | 1.9          |
| 25200xxxxxxxxxB... | 600                          | 600                          | 5                        | 600                      | 12                       | 20                            | 25                       | 18           | 20-600                               | 0.4                      | 2.0          |

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

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



Please note that all actuators featuring 'soft stop towards endstop' will run at a regulated speed, which is typically around 80% of the nominal speed.

## Special anodised housing



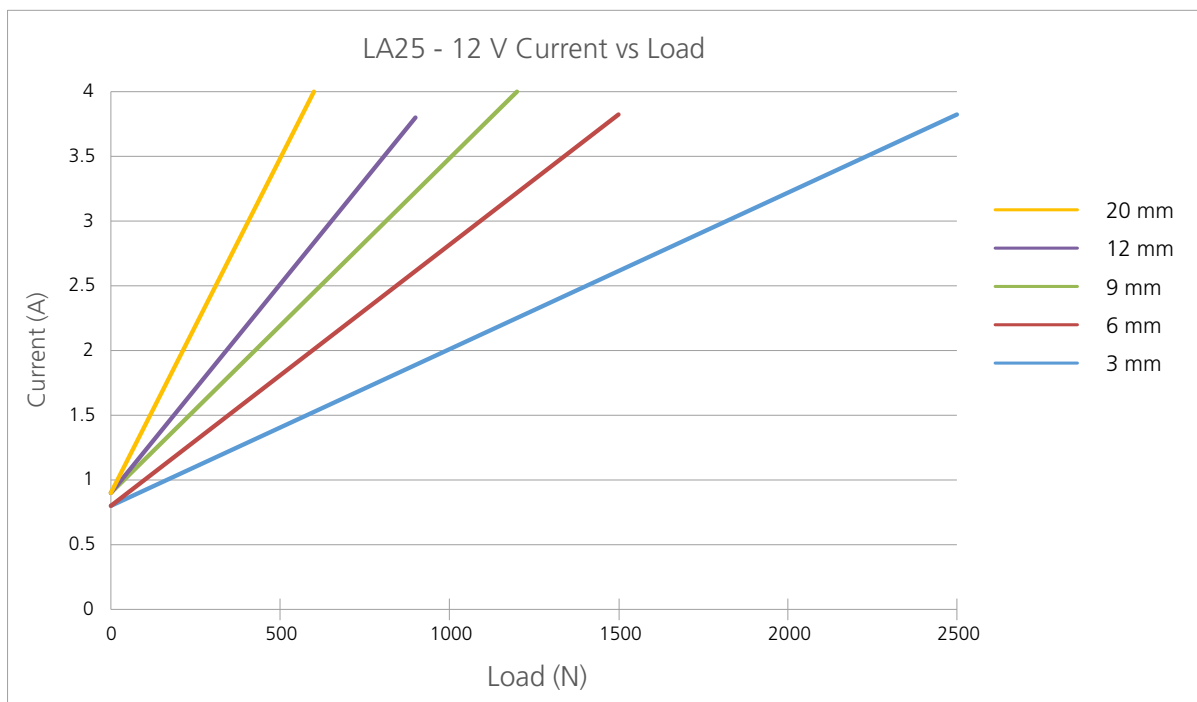
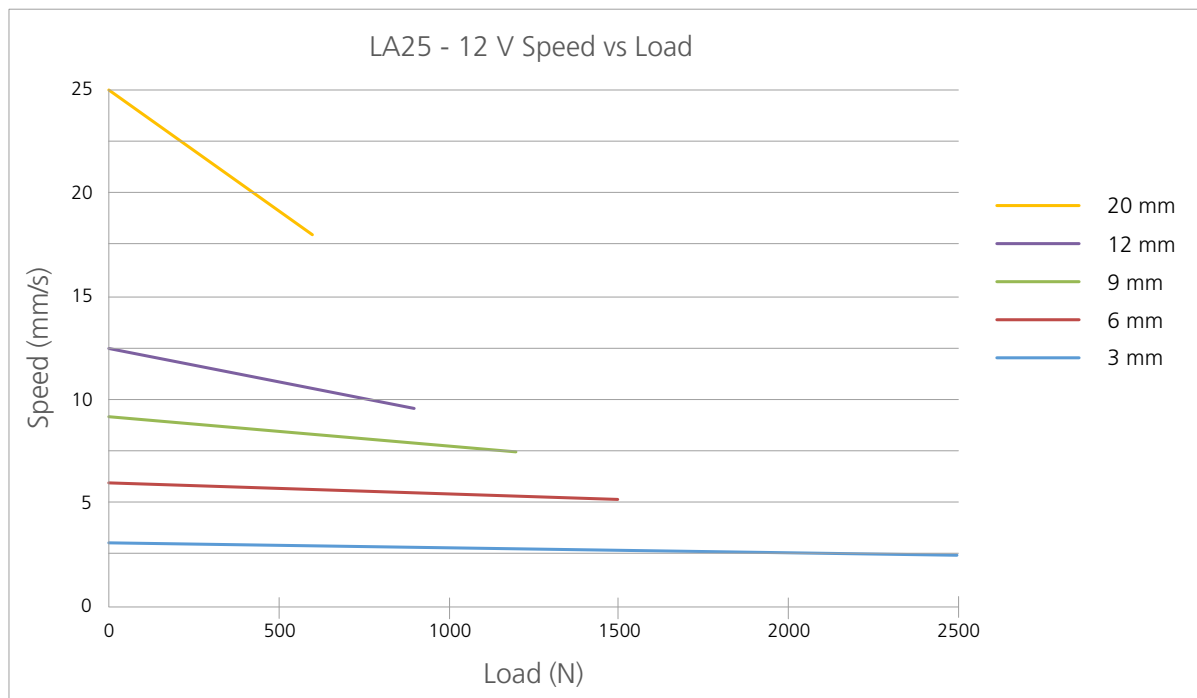
This housing should be recommended for use in particularly harsh environments such as stables, where the actuator is in touch with extremely corrosive liquids and/or vapours such as ammoniac.

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

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

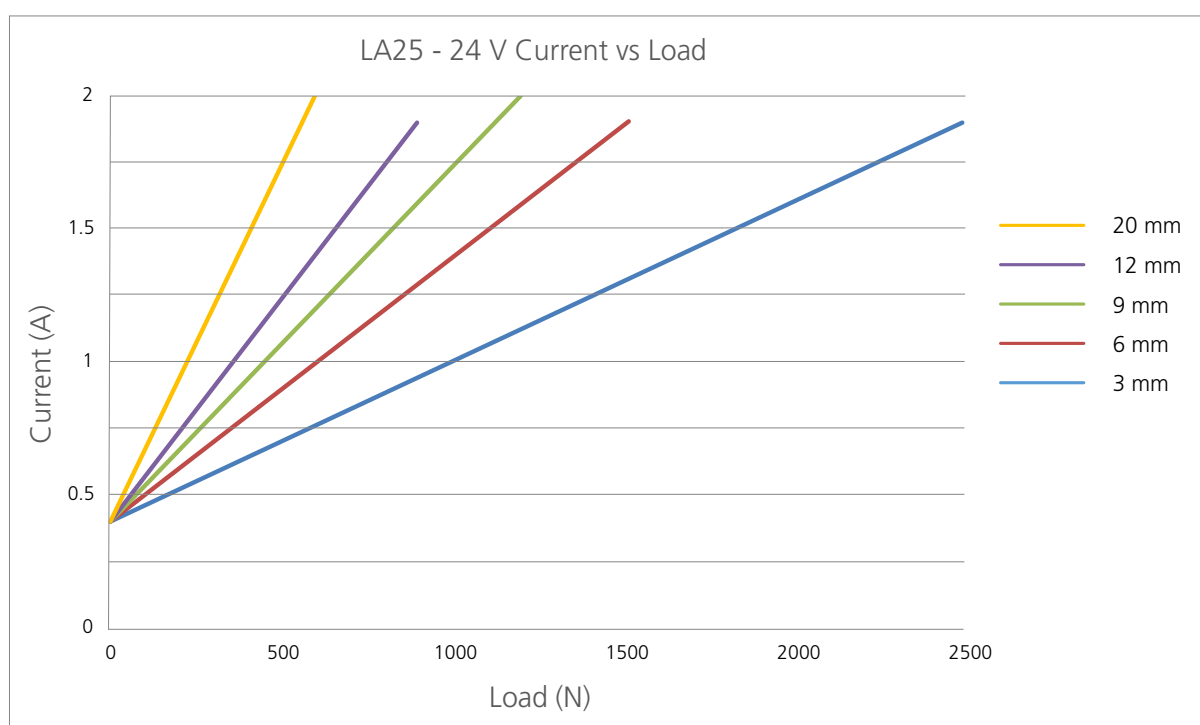
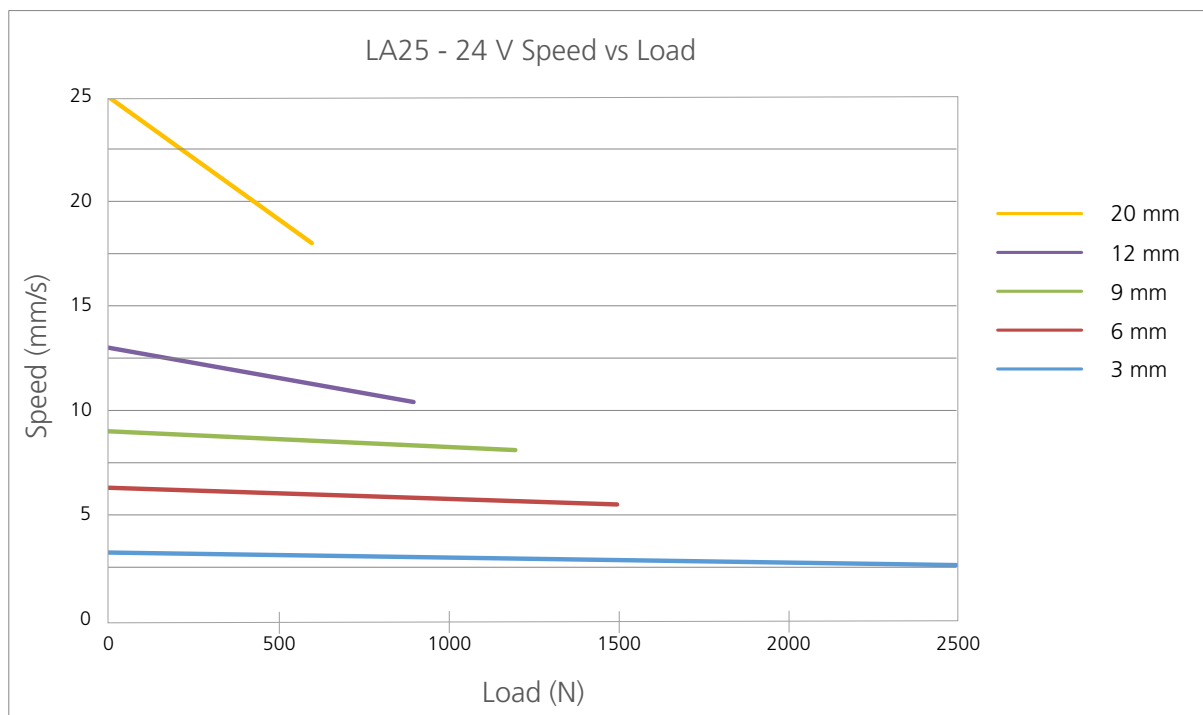
## Speed and current curves

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



## Speed and Current Curves

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



## Current limits

| Platform | Movement                  | 12 V | 24 V | Temperature |
|----------|---------------------------|------|------|-------------|
| B, C, F  | Outwards                  | 8 A  | 5 A  | Above       |
|          | Inwards                   | 8 A  | 5 A  |             |
|          | Reference temperature 0°C |      |      |             |
|          | Outwards                  | 8 A  | 8 A  | Below       |
|          | Inwards                   | 8 A  | 8 A  |             |

If the actuator's current consumption rises above the set limit, the actuator regulates and tries to keep it below the set current limit by reducing the PWM and therefore also the speed accordingly. The actuator does this continuously until the actuator stops moving (mechanically blocked) - something that is determined by monitoring the Hall feedback signal. If there are no changes to the Hall feedback signal during the set time frame, the Integrated Controller will cut power to the H-bridge motor circuit.

If the actuator is stopped due to the above-mentioned criteria, it automatically drives slightly in the opposite direction to reduce the torque in a blocking situation.

## Current cut-offs

The principle behind the current cut-off measurement is an 'above limit' and a 'below limit' accumulating counter. When the time-out counter reaches a specific value the current cut-off goes into effect. The time-out value is pre-set at 500 ms.

| Platform | Movement                  | 12 V | 24 V | Temperature |
|----------|---------------------------|------|------|-------------|
| 3, 6     | Outwards                  | 8 A  | 5 A  | Above       |
|          | Inwards                   | 8 A  | 5 A  |             |
|          | Reference temperature 0°C |      |      |             |
|          | Outwards                  | 9 A  | 6 A  | Below       |
|          | Inwards                   | 9 A  | 6 A  |             |

| Platform | Movement                  | 12 V | 24 V | Temperature |
|----------|---------------------------|------|------|-------------|
| 7, 9     | Outwards                  | 15 A | 10 A | Above       |
|          | Inwards                   | 15 A | 10 A |             |
|          | Reference temperature 0°C |      |      |             |
|          | Outwards                  | 20 A | 15 A | Below       |
|          | Inwards                   | 20 A | 15 A |             |

## Ordering example

**2 5 P P P X X X S S F F P M E I = B O R P C E F L P 0 X X X**

|                      |            |                                                    |   |                         |
|----------------------|------------|----------------------------------------------------|---|-------------------------|
| <b>Type</b>          | <b>25</b>  | = LA25                                             |   |                         |
| <b>Spindle pitch</b> | <b>PPP</b> |                                                    |   |                         |
|                      | 030        | = 3 mm                                             |   |                         |
|                      | 060        | = 6 mm                                             |   |                         |
|                      | 090        | = 9 mm                                             |   |                         |
|                      | 120        | = 12 mm                                            |   |                         |
|                      | 200        | = 20 mm                                            |   |                         |
| <b>Stroke length</b> | <b>XXX</b> | = mm                                               |   |                         |
| <b>Safety</b>        | <b>SS</b>  |                                                    |   |                         |
|                      | 00         | = None                                             |   |                         |
|                      | 0A         | = Safety nut                                       |   |                         |
| <b>Feedback</b>      | <b>FF</b>  |                                                    |   |                         |
|                      | 00         | = None                                             |   |                         |
|                      | 0K         | = Single Hall                                      |   |                         |
|                      | 0A         | = Hall potentiometer (Analogue feedback)           |   |                         |
|                      | 0F         | = PWM                                              |   |                         |
| <b>Platform</b>      | <b>P</b>   |                                                    |   | <b>12-pin connector</b> |
|                      | 0          | = None                                             | B | = I/O Basic             |
|                      | 3          | = IC (Not for OpenBus™)                            | C | = I/O Customised        |
|                      | 6          | = LIN bus                                          | F | = I/O Full              |
|                      | 7          | = CAN bus                                          |   |                         |
|                      | 9          | = CANopen                                          |   |                         |
|                      | A          | = IO-Link                                          |   |                         |
|                      | X          | = Special                                          |   |                         |
| <b>Motor Type</b>    | <b>M</b>   |                                                    |   |                         |
|                      | A          | = 12 V BDC                                         |   |                         |
|                      | B          | = 24 V BDC                                         |   |                         |
| <b>Endstop</b>       | <b>E</b>   |                                                    |   |                         |
|                      | 0          | = Power switch                                     |   |                         |
|                      | 1          | = Signal switch                                    |   |                         |
|                      | 2          | = Zero point                                       |   |                         |
| <b>IP</b>            | <b>I</b>   |                                                    |   |                         |
|                      | A          | = IP66 + IP69K                                     |   |                         |
|                      | B          | = IP66 + IP69K + stainless steel screws            |   |                         |
|                      | C          | = IP66 + Reinforced                                |   |                         |
|                      | D          | = IP66 + IP69K Reinforced + stainless steel screws |   |                         |
|                      | T          | = IECEx + ATEX (ATEX not for 12-pin connector)     |   |                         |
|                      | U          | = IECEx + ATEX + stainless steel screws            |   |                         |
|                      | 9          | = Harsh environment + IP66/IP69K                   |   |                         |
| <b>Colour</b>        | <b>=</b>   |                                                    |   |                         |
|                      | =          | = Dark grey                                        |   |                         |
|                      | -          | = Black                                            |   |                         |

## Ordering Example

**2 5 P P P X X X S S F F P M E I = B O R P C E F L P O X X X**

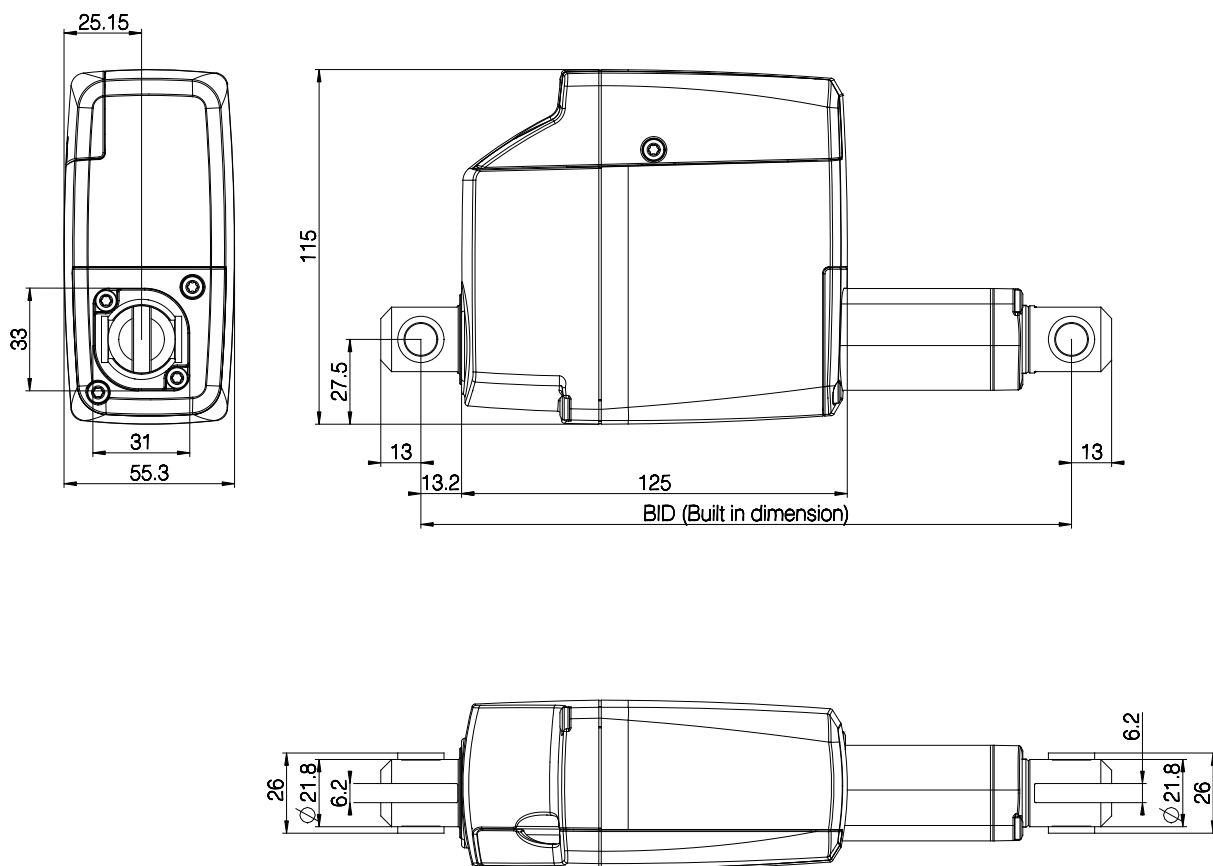
|                                 |          |                                                                 |  |   |                               |
|---------------------------------|----------|-----------------------------------------------------------------|--|---|-------------------------------|
| <b>Back fixture type</b>        | <b>B</b> | <b>Zinc-coated steel</b>                                        |  |   | <b>Stainless steel</b>        |
|                                 | 1        | = ø10.2 (0251011)                                               |  | A | = ø10.2 (0251015)             |
|                                 | 2        | = With bushings ø10.2                                           |  | B | = With bushings ø10.2         |
|                                 | 3        | = ø12.3 (0251010)                                               |  | C | = ø12.3 (0251014)             |
|                                 | 4        | = With bushings ø8.2                                            |  | D | = With bushings ø8.2          |
|                                 | 5        | = ø10.2 + nut (0251032)                                         |  | F | = ø10.2 + nut (0251034)       |
|                                 | 6        | = With bushings ø10.2 + nut                                     |  | G | = With bushings ø10.2 + nut   |
|                                 | 7        | = ø12.3 + nut (0251026)                                         |  | H | = ø12.3 + nut (0251033)       |
|                                 | 8        | = With bushings ø8.2 + nut                                      |  | I | = With bushings ø8.2 + nut    |
|                                 |          |                                                                 |  | M | = Male adapter M12 (0251021)  |
|                                 |          |                                                                 |  | X | = Special                     |
| <b>Back fixture orientation</b> | <b>O</b> |                                                                 |  |   |                               |
|                                 | 1        | = 0 degrees                                                     |  |   |                               |
|                                 | 2        | = 90 degrees                                                    |  |   |                               |
| <b>Piston rod eye</b>           | <b>R</b> | <b>Zinc-coated steel</b>                                        |  |   | <b>Stainless steel</b>        |
|                                 | 1        | = ø10.2 (0231033)                                               |  | A | = ø10.2 (0231096)             |
|                                 | 2        | = With bushings ø10.2                                           |  | B | = With bushings ø10.2         |
|                                 | 3        | = ø12.3 (0231016)                                               |  | C | = ø12.3 (0231095)             |
|                                 | 4        | = With bushings ø8.2                                            |  | D | = With bushings ø8.2          |
|                                 |          |                                                                 |  | K | = Ball eye ø10 H7 (0351053)   |
|                                 |          |                                                                 |  | L | = Ball eye ø12 H7 (0351035)   |
|                                 |          |                                                                 |  | F | = Female adapter M8 (0251039) |
|                                 |          |                                                                 |  | M | = Male adapter M12 (231094)   |
|                                 |          |                                                                 |  | X | = Special                     |
| <b>Plug type</b>                | <b>P</b> |                                                                 |  |   |                               |
|                                 | 0        | = None (Is to be chosen if cable and connectors are not wanted) |  |   |                               |
|                                 | C        | = Flying leads (Is to be chosen if connector is not wanted)     |  |   |                               |
|                                 | I        | = Moulded Deutsch (DT4)                                         |  |   |                               |
|                                 | J        | = Deutsch (DT4)                                                 |  |   |                               |
|                                 | K        | = AMP superseal                                                 |  |   |                               |
|                                 | L        | = Moulded AMP superseal                                         |  |   |                               |
|                                 | M        | = M12 5P (Only IO-Link length: 0.3 m)                           |  |   |                               |
|                                 | S        | = SMPS (Only cable length: 0.3 and 1.5 m)                       |  |   |                               |
|                                 | X        | = Special                                                       |  |   |                               |
| <b>Cable</b>                    | <b>C</b> |                                                                 |  |   |                               |
|                                 | 0        | = None                                                          |  |   |                               |
|                                 | S        | = Straight 0.75 m (8-core or 2-core when no feedback is needed) |  |   |                               |
|                                 | T        | = Straight 1.5 m (8-core or 2-core when no feedback is needed)  |  |   |                               |
|                                 | R        | = Straight 5.0 m (8-core or 2-core when no feedback is needed)  |  |   |                               |
|                                 | U        | = Straight 0.3 m (Only SMPS and IO-Link)                        |  |   |                               |
|                                 | V        | = Straight 10 m                                                 |  |   |                               |
|                                 | Y        | = Straight 1.5 m (11-core)                                      |  |   |                               |
|                                 | Z        | = Straight 5 m (11-core)                                        |  |   |                               |
|                                 | X        | = Special                                                       |  |   |                               |

## Ordering Example

25 PPP XXX SS FF P M E I = B O R P C E F L P 0 XXX

|                                                        |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Endstop signal<br/>(Endstop reached<br/>in/out)</b> | <b>E</b><br><b>CAN / LIN / IO-Link</b><br>0 = None<br><br><b>Standard</b><br>0 = None<br>1 = Yes<br><br><b>IC Basic</b><br>1 = Yes<br><br><b>IC Parallel (Not for I/O)</b><br>1 = A_HIGH / A_HIGH<br><br><br><b>IC Parallel with Feedback</b><br>X = Special | <b>IC Advanced and I/O</b><br>0 = None<br>A = A_HIGH / A_HIGH<br>B = A_LOW / A_HIGH<br>C = A_HIGH / A_LOW<br>D = A_LOW / A_LOW<br>E = LOW / A_HIGH<br>F = HIGH / A_HIGH<br>G = LOW / A_LOW<br>H = HIGH / A_LOW<br>J = A_HIGH / LOW<br>K = A_LOW / LOW<br>L = A_HIGH / HIGH<br>M = A_LOW / HIGH<br>N = LOW / LOW<br>P = HIGH / LOW<br>Q = LOW / HIGH<br>R = HIGH / HIGH<br>X = Special |
| <b>Feedback</b>                                        | <b>F</b><br><b>CAN / LIN / IO-Link</b><br>0 = None<br><br><b>Standard</b><br>0 = None<br>1 = 0 - 10 V<br>2 = 0.5 - 4.5 V<br>3 = 4 - 20 mA<br>4 = 10 - 90%<br>5 = 20 - 80%<br>9 = Special<br><br><b>IC Basic</b><br>8 = None                                  | <b>IC Advanced and I/O</b><br>0 = None<br>A = 0 - 10 V<br>B = 0.5 - 4.5 V<br>C = 4 - 20 mA<br>D = 10 - 90% (Only IC Advanced)<br>E = 20 - 80% (Only IC Advanced)<br>G = 1 - 9 V<br>X = Special<br><br><br><b>IC Parallel (Not for I/O)</b><br>Z = IC Parallel<br>Y = Parallel with feedback<br>X = Special                                                                            |
| <b>Load type</b>                                       | <b>L</b><br>0 = Push/Pull<br>1 = Push<br>2 = Pull                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Parallel mode</b>                                   | <b>P</b><br>0 = Non-critical Parallel                                                                                                                                                                                                                        | 2-8 = Critical Parallel                                                                                                                                                                                                                                                                                                                                                               |
| <b>SW configuration</b>                                | <b>0</b><br>0 = Standard configuration<br>X = Special configuration                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Built-in dimensions</b>                             | <b>XXX</b> = BID (mm)                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                       |

## Dimensions



## Stroke tolerances

| Platform options              | Descriptions                                                      | Stroke tolerance | Example for 200 mm stroke |
|-------------------------------|-------------------------------------------------------------------|------------------|---------------------------|
| 25030/060/090/120<br>XXXXXXX0 | 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             |
| 25XXXXXXXXXXX3                | Integrated Controller with built-in limit switches and zero point | +1 / -3 mm       | 197 to 201 mm             |
| 25200XXXXXXX3                 | Integrated Controller with built-in limit switches and zero point | +2 / -2 mm       | 198 to 202 mm             |

## Built-in tolerances

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

## Built-in dimensions

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

|                                              |                     |               |                | Piston rod types          |                         |                                        |                         |
|----------------------------------------------|---------------------|---------------|----------------|---------------------------|-------------------------|----------------------------------------|-------------------------|
|                                              |                     |               |                | 1, 2, 3, 4,<br>A, B, C, D | M / from the<br>surface | K, L / to the<br>centre of<br>the hole | F / from the<br>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 - 400     | 3              | 138 + s                   | 135 + s                 | 149 + s                                | 128 + s                 |
|                                              | No safety option    | 201 - 400     | 6, 9, 12 or 20 | 130 + s                   | 127 + s                 | 141 + s                                | 120 + s                 |
|                                              | Safety nut for push | 201 - 400     | 3              | 138 + s                   | 135 + s                 | 149 + s                                | 128 + s                 |
|                                              | Safety nut for push | 201 - 400     | 6, 9 or 12     | 130 + s                   | 127 + s                 | 141 + s                                | 120 + s                 |
|                                              | Safety nut for pull | 201 - 400     | 6, 9 or 12     | 142 + s                   | 139 + s                 | 153 + s                                | 132 + s                 |
|                                              | No safety option    | 401 - 500     | 3              | 158 + s                   | 155 + s                 | 169 + s                                | 148 + s                 |
|                                              | No safety option    | 401 - 600     | 6, 9, 12 or 20 | 150 + s                   | 147 + s                 | 161 + s                                | 140 + s                 |
|                                              | Safety nut for push | 401 - 500     | 3              | 158 + s                   | 155 + s                 | 169 + s                                | 148 + s                 |
|                                              | Safety nut for push | 401 - 600     | 6, 9 or 12     | 150 + s                   | 147 + s                 | 161 + s                                | 140 + s                 |
|                                              | Safety nut for pull | 401 - 600     | 6, 9 or 12     | 162 + s                   | 159 + s                 | 173 + s                                | 152 + s                 |

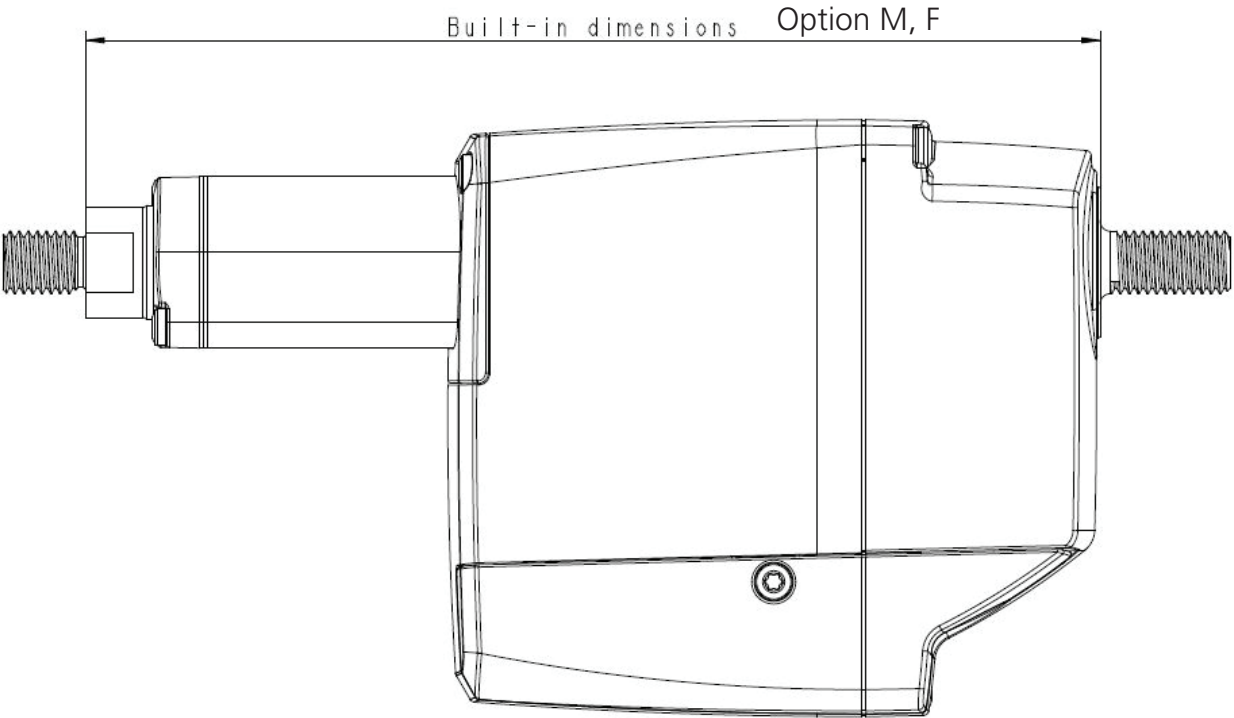
## Built-in dimensions

|                     |                     |                  |                | Piston rod types          |                         |                                        |                         |
|---------------------|---------------------|------------------|----------------|---------------------------|-------------------------|----------------------------------------|-------------------------|
|                     |                     |                  |                | 1, 2, 3, 4,<br>A, B, C, D | M / from<br>the surface | K, L / to the<br>centre of<br>the hole | F / from the<br>surface |
| Back fixture type M | Safety option       | Stroke<br>length | Spindle pitch  | Min. built-in dimensions  |                         |                                        |                         |
|                     | 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 - 400        | 3              | 125 + s                   | 122 + s                 | 136 + s                                | 115 + s                 |
|                     | No safety option    | 201 - 400        | 6, 9, 12 or 20 | 117 + s                   | 114 + s                 | 128 + s                                | 107 + s                 |
|                     | Safety nut for push | 201 - 400        | 3              | 125 + s                   | 122 + s                 | 136 + s                                | 115 + s                 |
|                     | Safety nut for push | 201 - 400        | 6, 9 or 12     | 117 + s                   | 114 + s                 | 128 + s                                | 107 + s                 |
|                     | Safety nut for pull | 201 - 400        | 6, 9 or 12     | 129 + s                   | 126 + s                 | 140 + s                                | 119 + s                 |
|                     |                     |                  |                |                           |                         |                                        |                         |
|                     | No safety option    | 401 - 500        | 3              | 145 + s                   | 142 + s                 | 156 + s                                | 135 + s                 |
|                     | No safety option    | 401 - 600        | 6, 9, 12 or 20 | 137 + s                   | 134 + s                 | 148 + s                                | 127 + s                 |
|                     | Safety nut for push | 401 - 500        | 3              | 145 + s                   | 142 + s                 | 156 + s                                | 135 + s                 |
|                     | Safety nut for push | 401 - 600        | 6, 9, 12 or 20 | 137 + s                   | 134 + s                 | 148 + s                                | 127 + s                 |
|                     | Safety nut for pull | 401 - 600        | 6, 9, 12 or 20 | 149 + s                   | 146 + s                 | 160 + s                                | 139 + s                 |

## Built-in dimensions

|                                              |                     |                  |                | Piston rod types          |                         |                                        |                         |
|----------------------------------------------|---------------------|------------------|----------------|---------------------------|-------------------------|----------------------------------------|-------------------------|
|                                              |                     |                  |                | 1, 2, 3, 4,<br>A, B, C, D | M / from<br>the surface | K, L / to the<br>centre of<br>the hole | F / from the<br>surface |
| Back fixture types 5, 6, 7, 8 and F, G, H, I | Safety option       | Stroke<br>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             | 166                       | 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 - 400        | 3              | 144 + s                   | 141 + s                 | 155 + s                                | 134 + s                 |
|                                              | No safety option    | 201 - 400        | 6, 9, 12 or 20 | 136 + s                   | 133 + s                 | 147 + s                                | 126 + s                 |
|                                              | Safety nut for push | 201 - 400        | 3              | 144 + s                   | 141 + s                 | 155 + s                                | 134 + s                 |
|                                              | Safety nut for push | 201 - 400        | 6, 9 or 12     | 136 + s                   | 133 + s                 | 147 + s                                | 126 + s                 |
|                                              | Safety nut for pull | 201 - 400        | 6, 9 or 12     | 148 + s                   | 145 + s                 | 159 + s                                | 138 + s                 |
|                                              |                     |                  |                |                           |                         |                                        |                         |
|                                              | No safety option    | 401 - 500        | 3              | 164 + s                   | 161 + s                 | 175 + s                                | 154 + s                 |
|                                              | No safety option    | 401 - 600        | 6, 9, 12 or 20 | 156 + s                   | 153 + s                 | 167 + s                                | 146 + s                 |
|                                              | Safety nut for push | 401 - 500        | 3              | 164 + s                   | 161 + s                 | 175 + s                                | 154 + s                 |
|                                              | Safety nut for push | 401 - 600        | 6, 9, 12 or 20 | 156 + s                   | 153 + s                 | 167 + s                                | 146 + s                 |
|                                              | Safety nut for pull | 401 - 600        | 6, 9, 12 or 20 | 168 + s                   | 165 + s                 | 179 + s                                | 158 + s                 |

Built-in dimensions

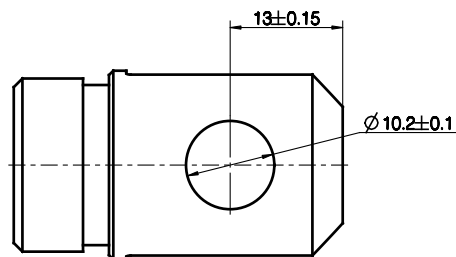
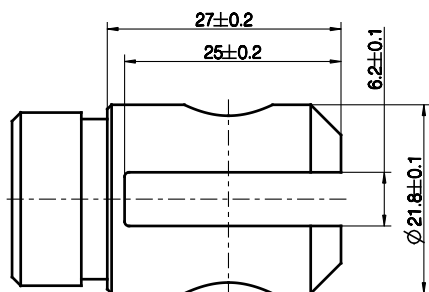


## Piston rod eyes

Option "1" and "A"

Piston 0231033, zinc-coated steel

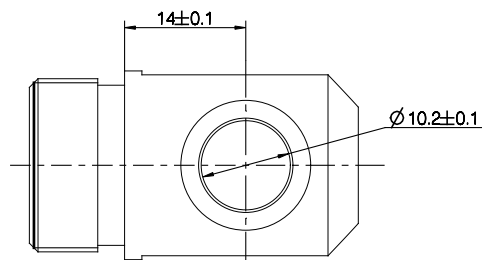
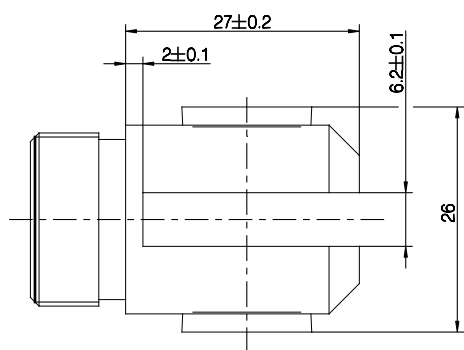
Piston 0231096, stainless steel AISI 304



Option "2" and "B"

Piston 0231016 with bushings, zinc-coated steel

Piston 0231095 with bushings, stainless steel AISI 304

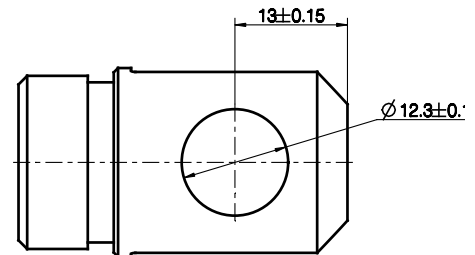
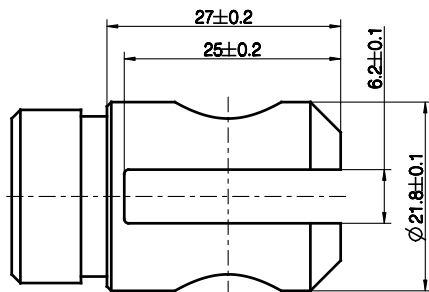


## Piston rod eyes

Option "3" and "C"

Piston 0231016, zinc-coated steel

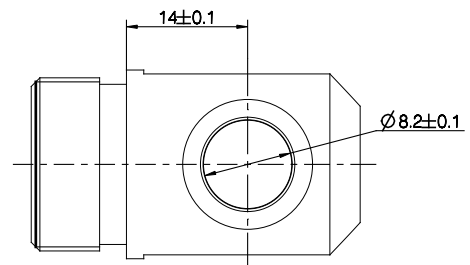
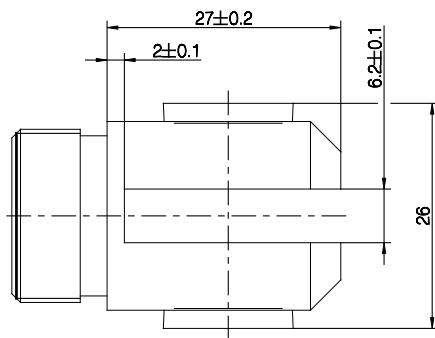
Piston 0231095, stainless steel AISI 304



Option "4" and "D"

Piston 0231033 with bushings, zinc-coated steel

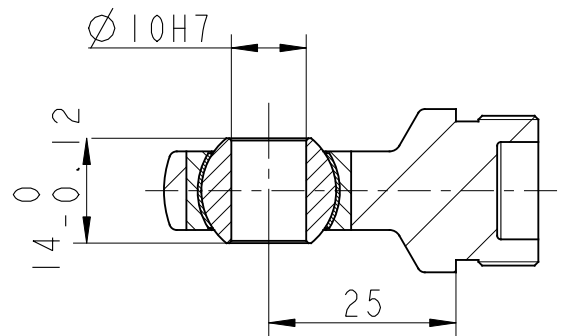
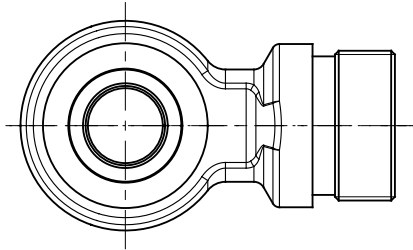
Piston 0231096 with bushings, stainless steel AISI 304



## Piston rod eyes

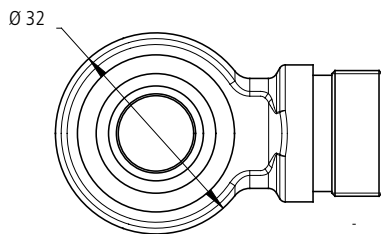
Option "K"

Piston 0351053, stainless steel AISI 304



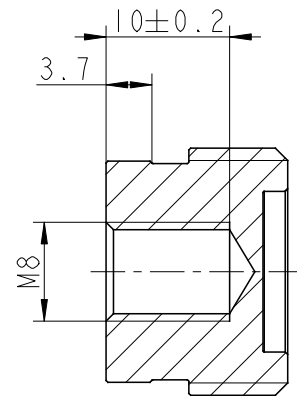
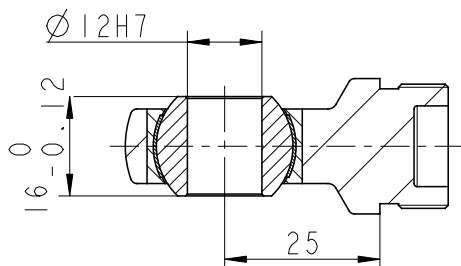
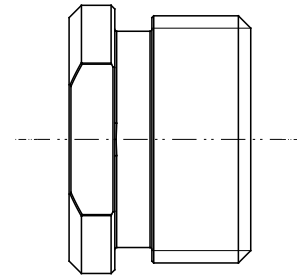
Option "L"

Piston 0351035, stainless steel AISI 304



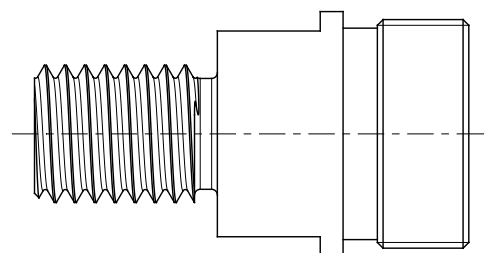
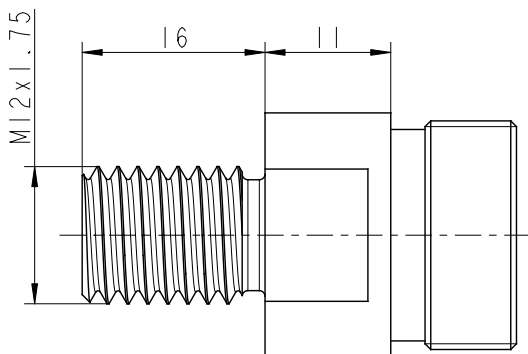
Option "F"

Piston 0251039, stainless steel AISI 303



Option "M"

Piston 0231094, stainless steel AISI 304



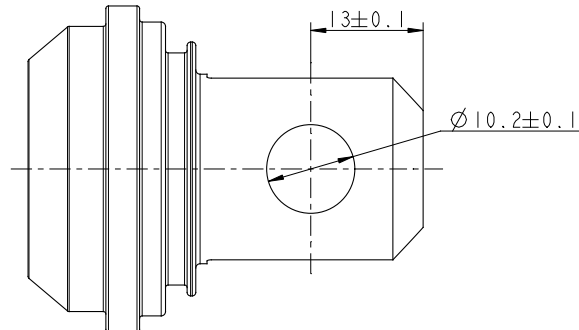
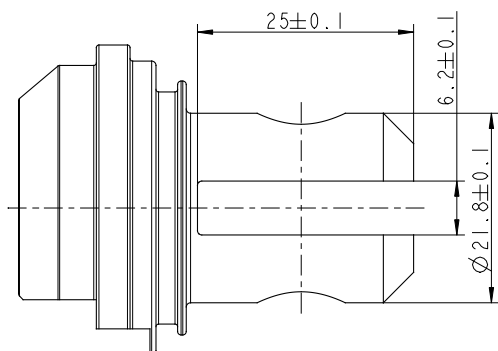
The piston rod eye is only allowed to turn 0-180 degrees anti-clockwise.

## Back fixtures

Option "1" and "A"

LINAK P/N: 0251011 without bushings, zinc-coated steel

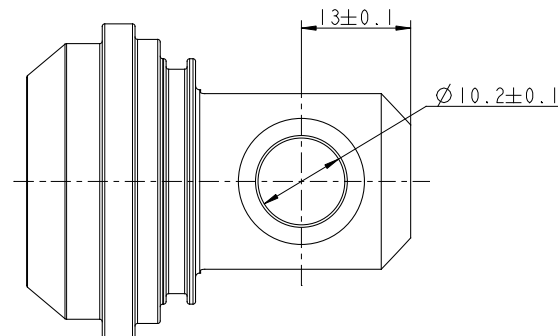
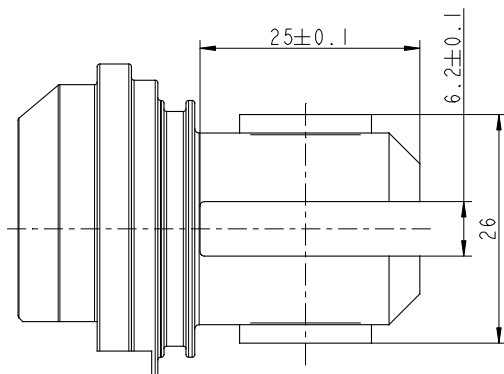
0251015 without bushings, stainless steel AISI 304



Option "2" and "B"

LINAK P/N: 0251010 with bushings, zinc-coated steel

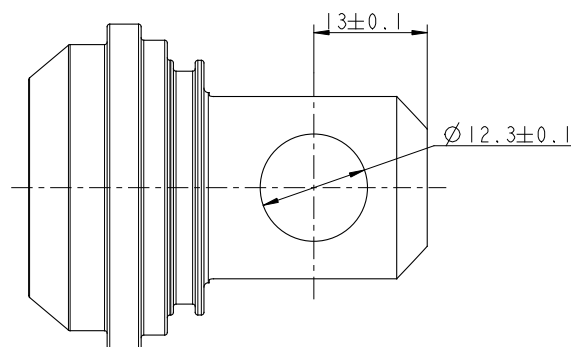
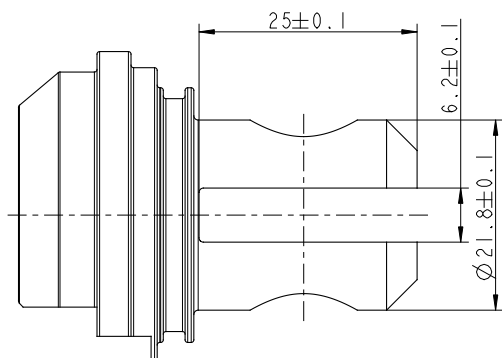
0251014 with bushings, stainless steel AISI 304



Option "3" and "C"

LINAK P/N: 0251010 without bushings, zinc-coated steel

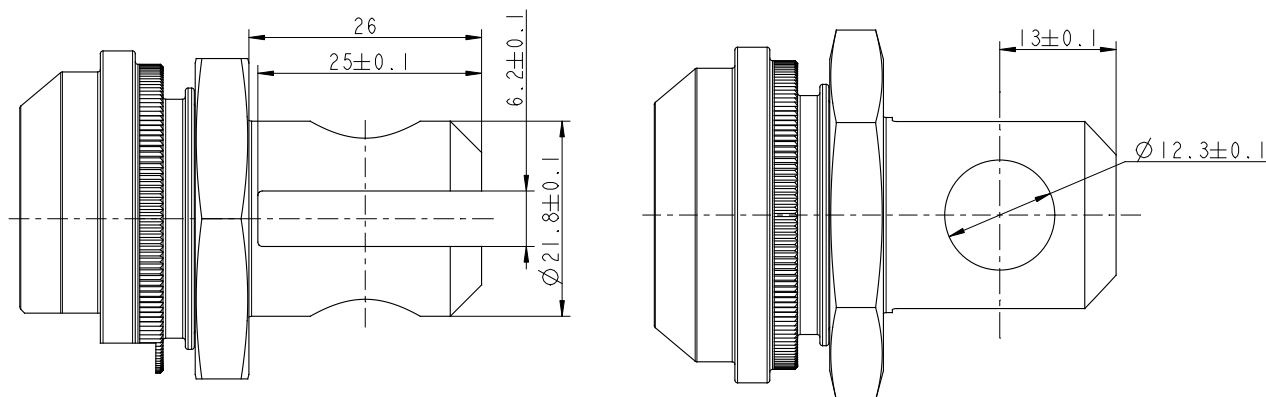
0251014 without bushings, stainless steel AISI 304



## Back fixtures

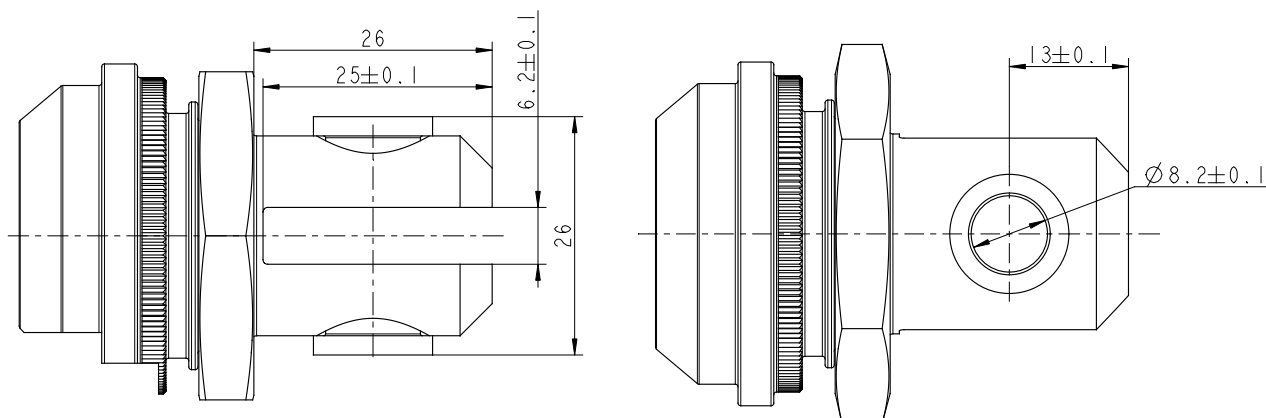
Option "7" and "H"

LINAK P/N 0251026 without bushings, zinc-coated steel  
0251033 without bushings, stainless steel AISI 304



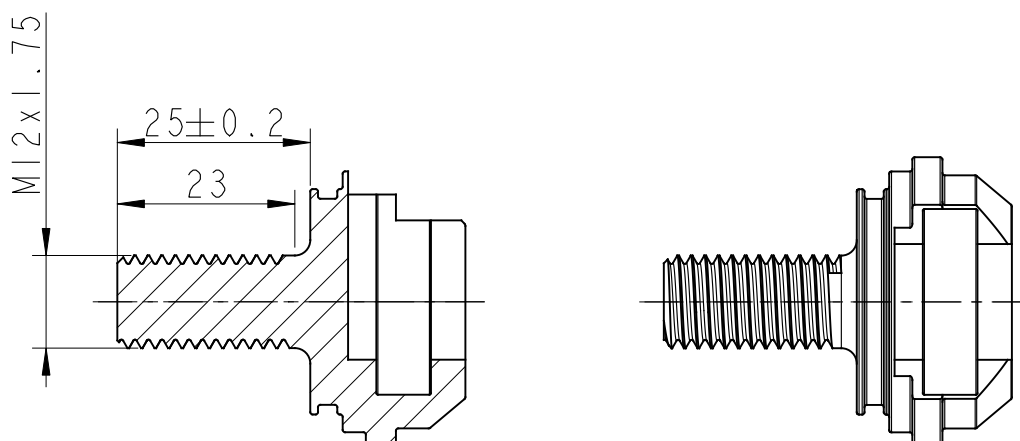
Option "8" and "I"

LINAK P/N 0251032 with bushings, zinc-coated steel  
0251034 with bushings, stainless steel AISI 304

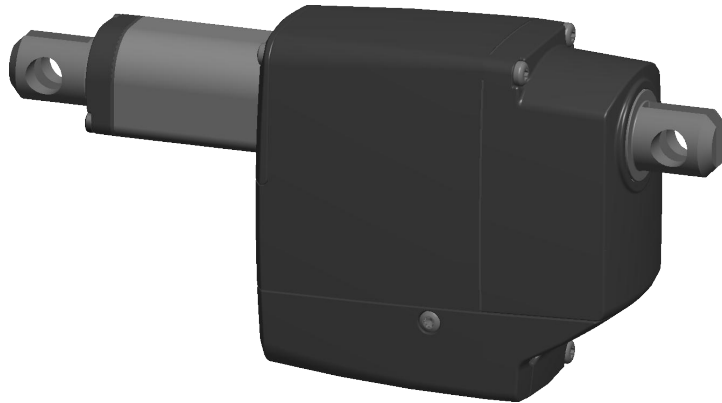


Option "M"

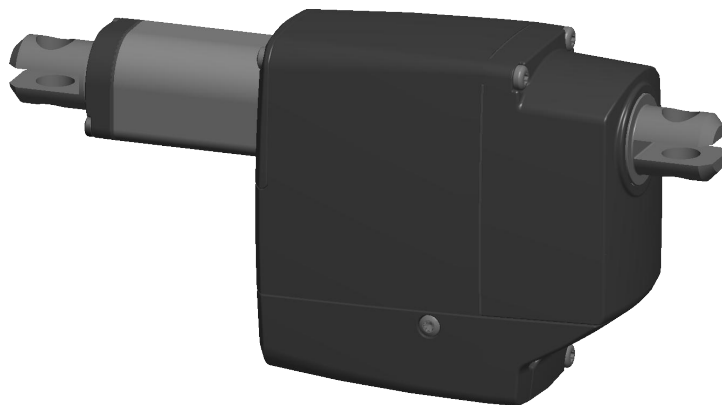
LINAK P/N: 0251021, stainless steel AISI 303



## Back fixture orientation

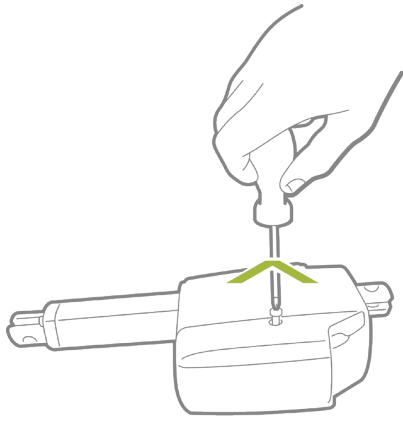


Option 1 = 0°

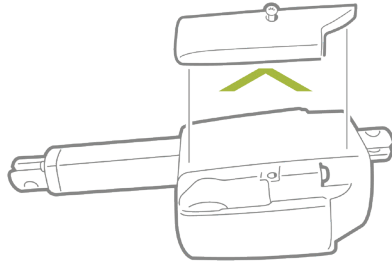


Option 2 = 90°

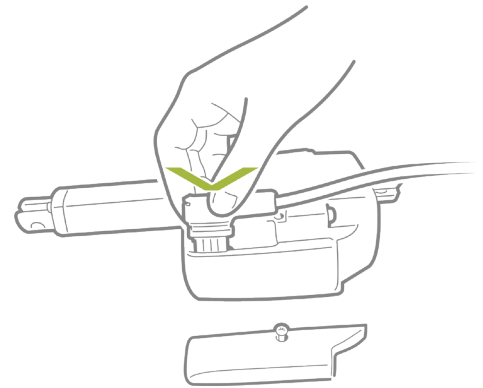
## Mounting of cables



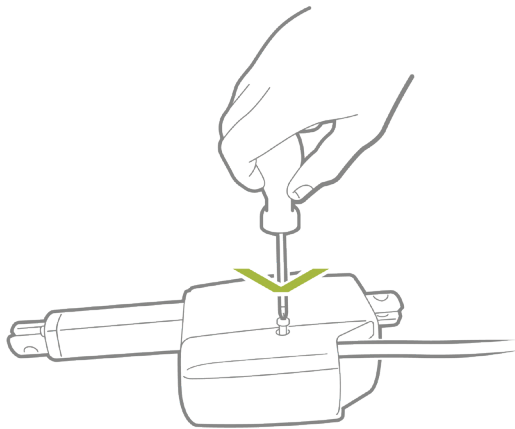
1. Unscrew the cover



2. Remove the cover



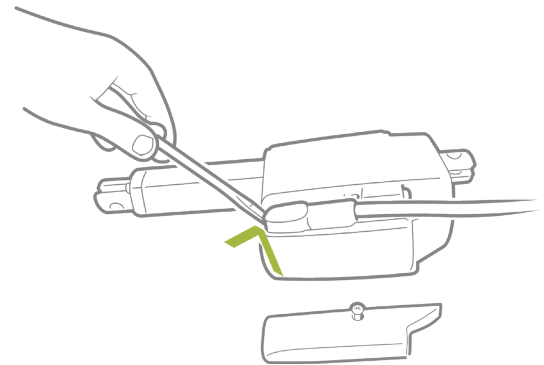
3. Plug in the cable gently without using any tools



4. Screw the cover back onto the actuator

The torque of the cover screw is approx. 1.5 Nm

## Removing cables



5. Use a screwdriver to pull up the cable



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

Please note that if the cables are mounted and dismantled more than 3 times the plugs can be damaged. Therefore, we recommend that such cables are discarded and replaced.

Also note that the cables should not be used for carrying the actuator.

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

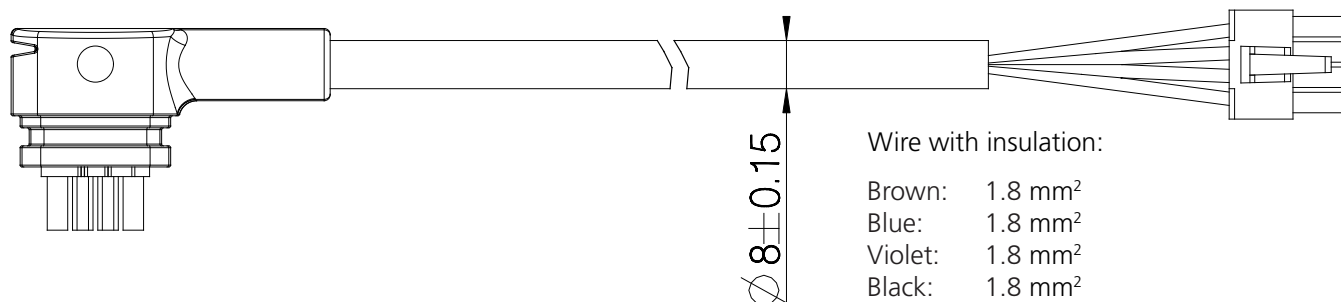


**NOT** valid for ATEX cables, please refer to the ATEX section for correct cable mounting on ATEX actuators.

## Cable dimensions

Wire without insulation:

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



Wire with insulation:

|         |                     |
|---------|---------------------|
| Brown:  | 1.8 mm <sup>2</sup> |
| Blue:   | 1.8 mm <sup>2</sup> |
| Violet: | 1.8 mm <sup>2</sup> |
| Black:  | 1.8 mm <sup>2</sup> |
| Red:    | 1.8 mm <sup>2</sup> |
| Yellow: | 1.8 mm <sup>2</sup> |
| Green:  | 1.8 mm <sup>2</sup> |
| White:  | 1.8 mm <sup>2</sup> |

## Standard cable item numbers (included in new actuator)

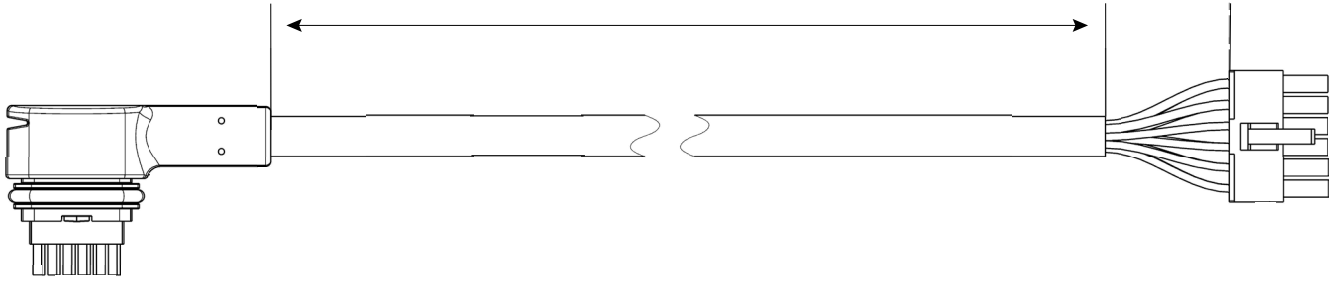
| Connector    |                     | C           |       | J/K         |       | I/L         |      |
|--------------|---------------------|-------------|-------|-------------|-------|-------------|------|
|              |                     |             |       |             |       |             |      |
| Ordering no. | LA25 cable item no. | Length (mm) |       | Length (mm) |       | Length (mm) |      |
| S            | 0147001 - 850       | CS          | 810   | JS/KS       | 785   | IS/LS       | 740  |
| T            | 0147001 - 1600      | CT          | 1560  | JT/KT       | 1535  | IT/LT       | 1490 |
| R            | 0147001 - 5100      | CR          | 4960  | JR/KR       | 4935  | IR/LR       | 4890 |
| V            | 0147001 - 10100     | CV          | 10060 | JV/KV       | 10035 | IV/LV       | 9990 |



The LA25 standard cable is a UV-resistant PVC cable.

\*AWG: American Wire Gauge

## Cable dimensions



### Standard cable item numbers (included in new actuator)

| LA25 cable item no. | Length      |
|---------------------|-------------|
| 0257057 - 0850      | 850 ± 30    |
| 0257057 - 1600      | 1600 ± 30   |
| 0257057 - 2000      | 2000 ± 40   |
| 0257057 - 5100      | 5100 ± 50   |
| 0257057 - 10100     | 10100 ± 100 |
| 0257057 - 15100     | 15100 ± 100 |

## Electrical installation

### For Standard actuators:



- To ensure maximum self-locking ability, please be sure that the motor is shorted when stopped. 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. The power supply must be monitored externally and cut off in case of current overload.

### For IC actuators:



- As long as the actuator is powered, actuators with Integrated Controller ensure that the motor is shorted when stopped.

## 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 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 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 (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 and submerged into a 0°C cold salt-water-detergent solution for 2 h<br>Followed by 18 h dry time<br>Duration: 5 cycles                           | TRD5679    |

|                       |                  |                                                                                                                                                                                                                                                                                            |         |
|-----------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 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 for 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 seconds each at 4 different angles: 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 sideloaded with 5 N<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 surfaces                                               | 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 axes    | TRD5684    |
|                                         |               | Peak Pulse Amplitude: 30 G<br>Pulse Duration: 18 ms<br>Number of pulses: 18 total - 3 in each direction for all three axes    | TRD5684    |
|                                         |               | Peak Pulse Amplitude: 25 G<br>Pulse Duration: 6 ms<br>Number of pulses: 6000 total- 1000 in each direction for all three axes | TRD5684    |
| Vibration random                        |               | Random vibration:<br>From 18 Hz - 0,025 G to 1000 Hz - 0,015 G<br><br>Duration: 2 h/axis<br>UM-32-30-003                      | 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 |                                                                                                                                                                  |                                                                                                       |
| IECEX / ATEX (Ex)                         | EN60079-0:2012<br>EN60079-31:2014<br>This Ex certification allows the actuator to be mounted in Ex dust areas: II 2D Ex tb IIIC T135°C<br>Db Tamb -25°C to +65°C |                                                                                                       |



All electrical and radiated emission tests (EMC) have been conducted.

## Non-complying standards

| Standard    | Explanation                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEC 60601-1 | Please note that this product cannot be approved according to the medical electrical equipment standard. Due to the combination of the aluminium cast housing and the embedded PCB, we do not fulfil the regulations according to leakage current. |

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