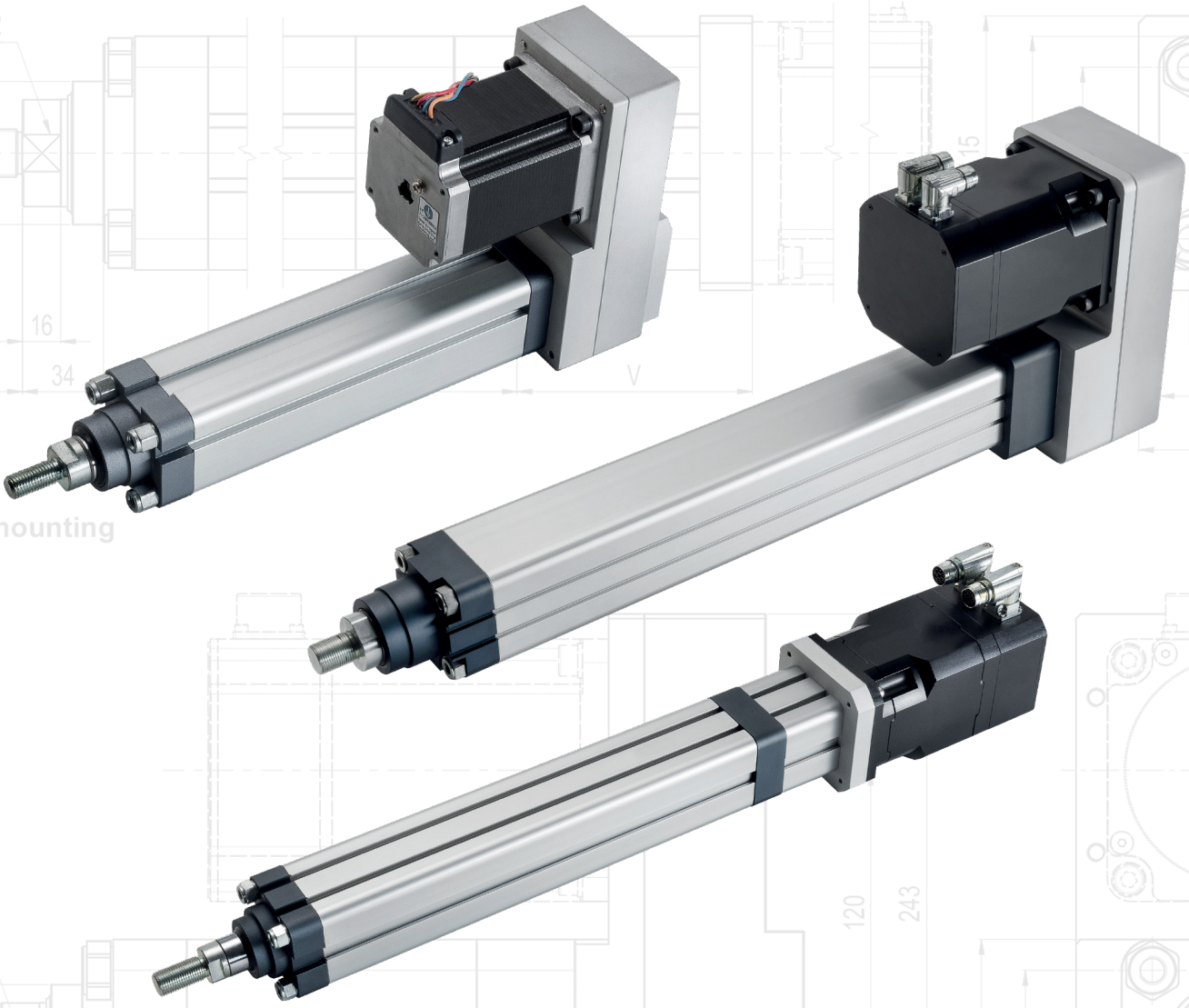
NTN®
AUTOMATION

# Programmable Actuator Catalog



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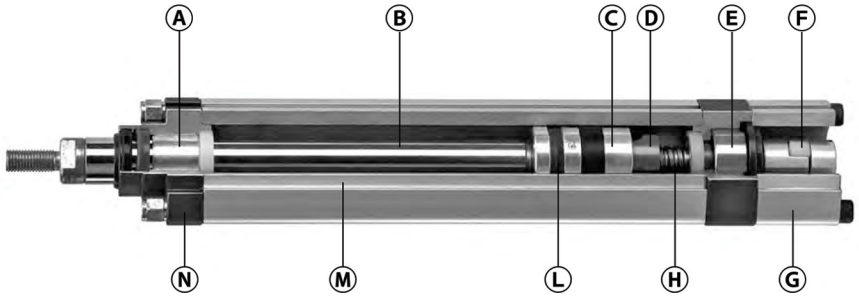
# ECL3

## ELECTRIC CYLINDERS
## NORMAL DUTY
### SERIES 10

**ISO 15552**

## DESCRIPTION




A - Rod guide
B - Rod
C - Piston
D - Nut
E - Bearing
F - Coupling
G - Coupling carter
H - Screw
L - Magnetic ring
M - Barrel
N - Front cap

— Electric cylinder made with mounting interfaces in compliance with ISO 15552.

— The linear motion transmission is obtained by precise and high-efficiency ball-screw system, with hardened shaft and nut.

— All ball screws have high load ratings, thus guaranteeing endurance even in demanding applications. The cylinder design is realized to minimize vibrations: the piston is precisely driven into the barrel with zero backlash sliding rings; the screw-shaft end is supported by strong bushing; the rod is driven into the front-cap by a long linear guide. The cylinder can be equipped with robust integrated anti-rotation device.

— The piston is equipped with magnetic ring and the barrel has external slots to accommodate possible sensors. The rod has increased external diameter and thickness in order to have maximum stiffness and high resistance to radial and buckling loads. The screw is supported with high trust bearings to allow high load transmission in both directions.

— High force timing belt is provided for parallel motor mounting, to guarantee robustness of torque transmission.

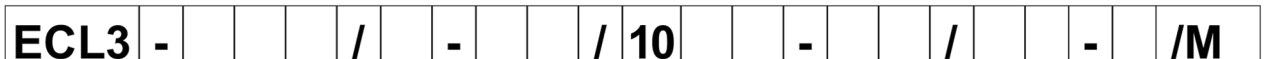
— Many pneumatic accessories can be used for the electric cylinder attachment and mounting, intermediate trunnions included.

## PERFORMANCES

| Size | | **32** | **40** | **50** | **63** | **80** | **100** | **125** |
|---|---|---|---|---|---|---|---|---|
| Maximum axial force | N | 2100 | 3400 | 6400 | 9500 | 12700 | 53500 | 88300 |
| Maximum speed | mm/s | 1111 | 1333 | 1422 | 1333 | 1333 | 702 | 533 |
| Maximum acceleration | m/s² | 6 | 8 | 10 | 13 | 16 | 13 | 13 |
| Standard stroke up to | mm | 800 | 1000 | 1200 | 1400 | 1800 | 2400 | 3000 |
| Maximum average axial force for 2500 km life | N | 832 | 1375 | 2277 | 2453 | 3635 | 12442 | 19744 |
| Ambient temperature range | °C | -20 / +100 | | | | | | |
| Max air humidity allowed for IP65 (without condensation) | % | 90 | | | | | | |
| Protection degree | | IP44 or IP65 | | | | | | |

# ECL3
## SERIES 10

### 1 - IDENTIFICATION CODE




Size:
**32** = ISO 32
**40** = ISO 40
**50** = ISO 50
**63** = ISO 63
**80** = ISO 80
**100** = ISO 100
**125** = ISO 125

Mounting type:
**T** = front threaded holes (**standard**)
**A** = front flange (MF1)
**B** = rear flange (MF2)
**N** = double flange (MF1+MF2)
**C** = rear clevis (MP2)
**D** = rear eye (MP4)
**G** = feet (MS1)
**L** = intermediate trunnions (MT4)

Rod end:
**M** = male thread (**standard**)
**F** = female thread
**C** = clevis cap
**S** = spherical cap
**L** = self-centreing coupler cap
**X** = special

Stroke:
max 800 mm for size 32
max 1000 mm for size 40
max 1200 mm for size 50
max 1400 mm for size 63
max 1800 mm for size 80
max 2400 mm for size 100
max 3000 mm for size 125
For longer strokes contact our technical office.

Screw type:
**B** = ball screw
**L** = lead screw (only available for sizes 32-50-63)
**R** = roller screw (upon request)

Screw lead:
(see overall dimesion tables of each size for availability and matches)

for ball screw
**05** = 5 mm
**10** = 10 mm
**12** = 12 mm
**12,7** = 12.7 mm
**16** = 16 mm
**20** = 20 mm
**25** = 25 mm

for lead screw (see par. 11)
**04** = 4 mm

Series number

Rotation stopper
**N** = none
**P** = present

Protection class:
**N** = IP44
**S** = IP65

Lubrication:
**N** = none
**F0** = centered 12 o'clock
**F3** = centered 3 o'clock
**F6** = centered 6 o'clock
**F9** = centered 9 o'clock

Limit switch:
**N** = none
**A** = front
**P** = rear
**D** = double
**T** = triple
**Q** = quadruple

Motor mounting type (**NOTE**):
(omit if not required)
**L** = in line
**P** = parallel (ratio 1 ÷ 1) (**standard**)
**Q** = parallel (ratio 2 ÷ 1)
**X** = parallel (custom ratio)

Motor position:
**0** = 12 o'clock
**3** = 3 o'clock
**6** = 6 o'clock
**9** = 9 o'clock

Motor flange:
**S** = stepper
**B** = brushless
**A** = AC motor
**D** = DC motor
**V** = stepper with feedback
**G** = gearbox

Project No. assigned by NTN

**NOTE:** The size of the belt transmission box may change for types Q and X; contact the technical department to verify sizing.

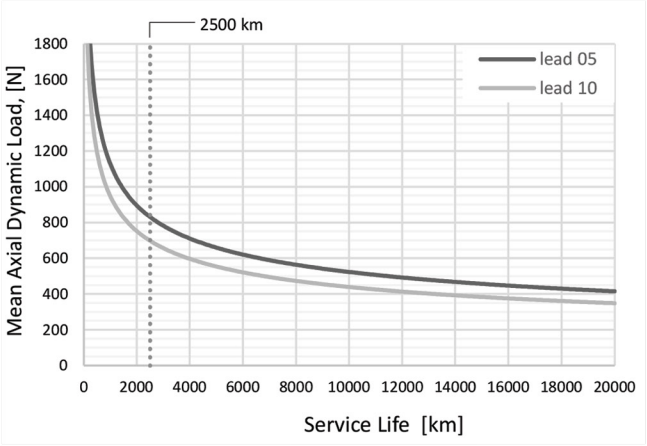
## 4 - ECL3- 32

### 4.1 - Technical Characteristics

| | | | | |
|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 20 | |
| | Rod end | | M10x1.25 | |
| BALL SCREW | Nominal diameter | mm | 12 | 12 |
| | Lead | mm | 5 | 10 |
| | Dynamic load | N | 6600 | 4400 |
| FORCE | Max force - in line | N | 2100 | 2100 |
| | Max torque - in line | Nm | 2.0 | 3.9 |
| | Max force - parallel | N | 2100 | 2100 |
| | Max torque - parallel | Nm | 2.0 | 3.9 |
| | Dynamic axial force at 2500 km lifetime | N | 832 | 698 |
| SPEED | Max speed | rpm | 6667 | 6667 |
| | | mm/s | 556 | 1111 |
| ACCELERATION | Max acceleration | m/s² | 3.2 | 6.4 |
| EFFICIENCY | In line | % | 86 | 88 |
| | Parallel | % | 77 | 79 |

### 4.2 - Service Life

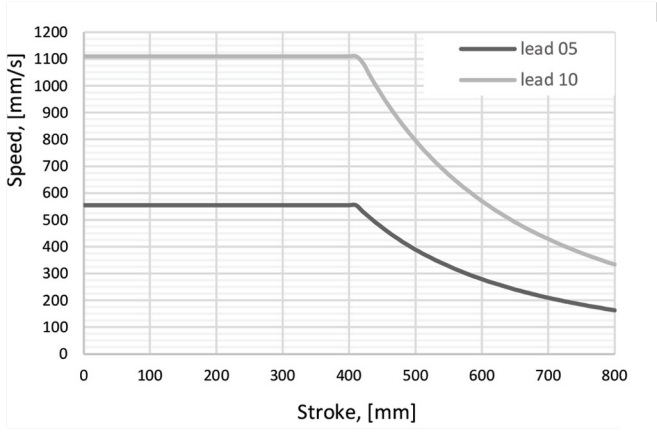
The service life depends on average dynamic axial load.



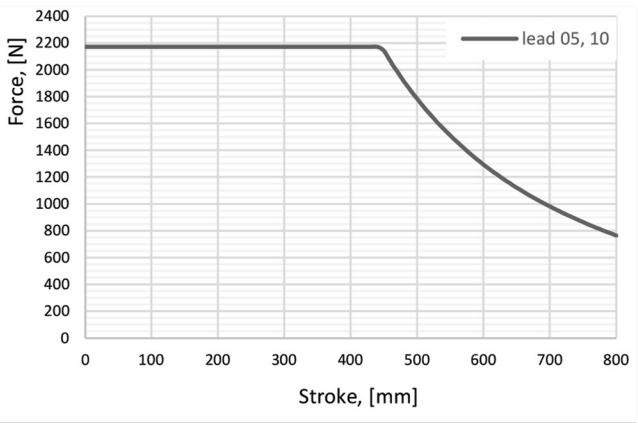

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 4.3 - Permissible Speed




### 4.4 - Permissible Axial Force



# ECL3
## SERIES 10

## 2 - COMMON TECHNICAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| ACCURACY | | mm | ± 0.035 |
| ENVIRONMENT | Ambient temperature range | °C | -20 / +100 (cylinder without motor) |
| | Protection class | | IP44 or IP65 |
| | Humidity | % | 0 ÷ 90 |
| MECHANICAL | Reference standard | | ISO 15552 |
| | Duty cycle | % | 100 |
| | Internal antirotation | | available on all sizes |
| | Rod end | | male or female |
| | Rod material | | chromium-plated (**standard**)<br>stainelss steel upon request |
| | Mounting | | on front cap or with accessories |
| | End stroke sensor | | available on all sizes |

## 3 - FEATURES OF USE

### 3.1 - Field of Application

— In any generic system for automation applications;
— Replacing of pneumatic cylinders where accurate speed profile control is required. The electric cylinder works with constant and controlled acceleration/deceleration ramps, even with variable load.
— When high push/pull force is needed without the use of hydraulics.
— In any motion system where no-pollution or extremely-low noise emission are required.

### 3.2 - Applications

ISO 15552 ECL3 electric cylinders are the right solution for all those applications that require accurate and controlled positioning. They offer the opportunity to use pre-set solutions to solve the design and commissioning of automation systems quickly and simply.

The installation simplicity and the different construction types make the ECL3 cylinder a reference point in this kind of product.

The wide possibility of choice among different types allows the use of the ECL3 even in demanding and critical applications, as they offer force capabilities and dynamic load ratings decisively heavier than standard market proposals.

The possibility to use most of standard pneumatic ISO 15552 accessories for the same size is an additional practical and cost advantage in mounting the cylinders.

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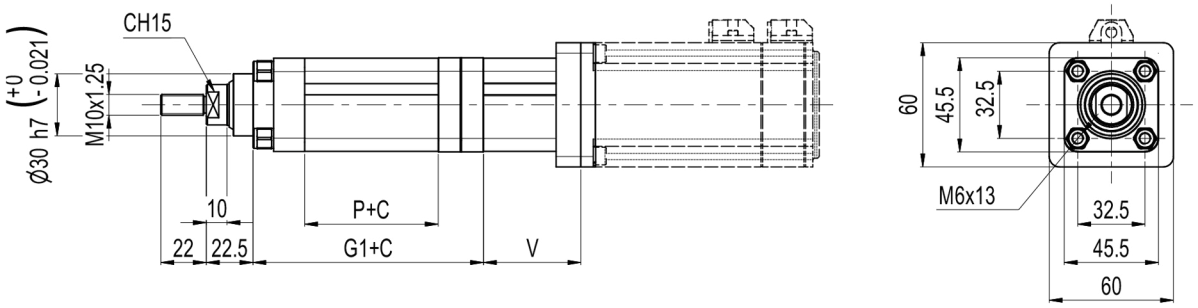
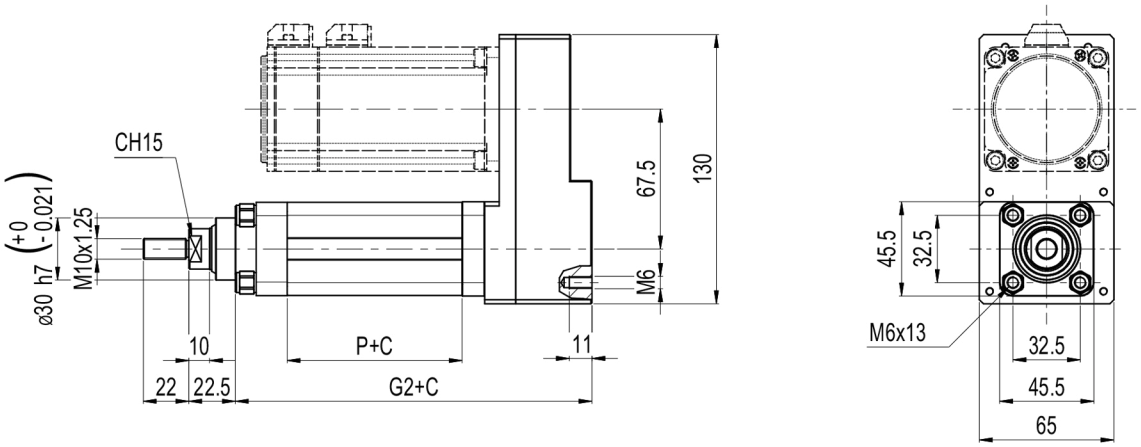
### 4.5 - ECL3-32 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **12X05** | 73.5 | 120.4 | 161.25 |
| **12X10** | 79.5 | 126.4 | 167.25 |

| Lead Screw | P | G1 | G2 |
|---|---|---|---|
| **14X04** | 64.5 | 111.4 | 152.25 |

**C** = Stroke value
**V** = Depending on motor dimensions

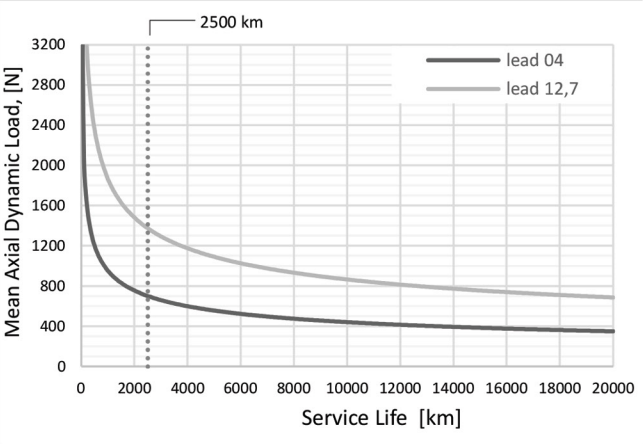
## 5 - ECL3- 40

### 5.1 - Technical Characteristics

| | | | | |
|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 25 | |
| | Rod end | | M12x1.25 | |
| BALL SCREW | Nominal diameter | mm | 14 | 12.7 |
| | Lead | mm | 4 | 12.7 |
| | Dynamic load | N | 6000 | 8000 |
| FORCE | Max force - in line | N | 3000 | 2400 |
| | Max torque - in line | Nm | 2.3 | 5.5 |
| | Max force - parallel | N | 3000 | 3400 |
| | Max torque - parallel | Nm | 2.3 | 7.9 |
| | Dynamic axial force at 2500 km lifetime | N | 702 | 1375 |
| SPEED | Max speed | rpm | 5714 | 6299 |
| | | mm/s | 381 | 1333 |
| ACCELERATION | Max acceleration | m/s² | 2.5 | 8.1 |
| EFFICIENCY | In line | % | 84 | 88 |
| | Parallel | % | 76 | 80 |

### 5.2 - Service Life

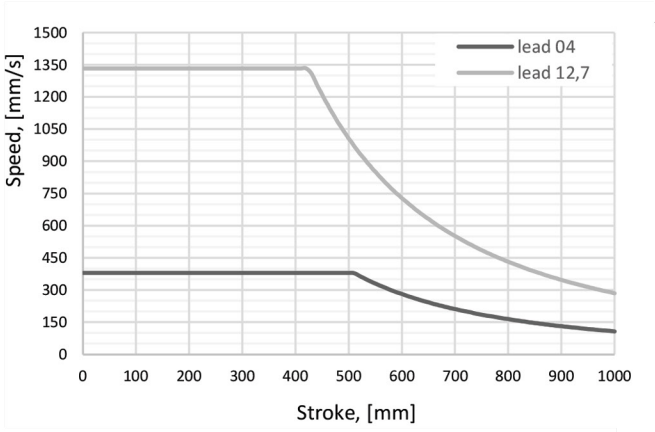
The service life depends on average dynamic axial load.



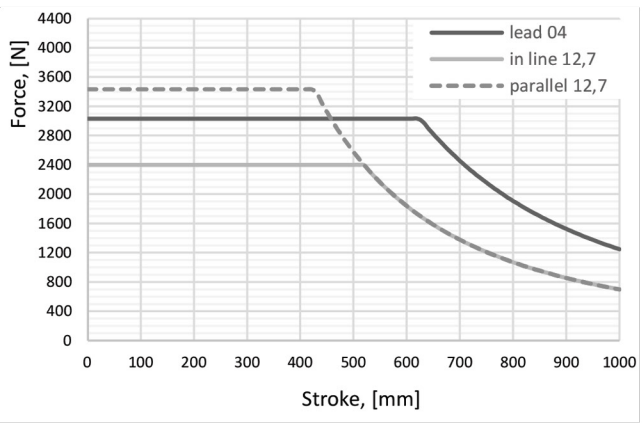

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 5.3 - Permissible Speed



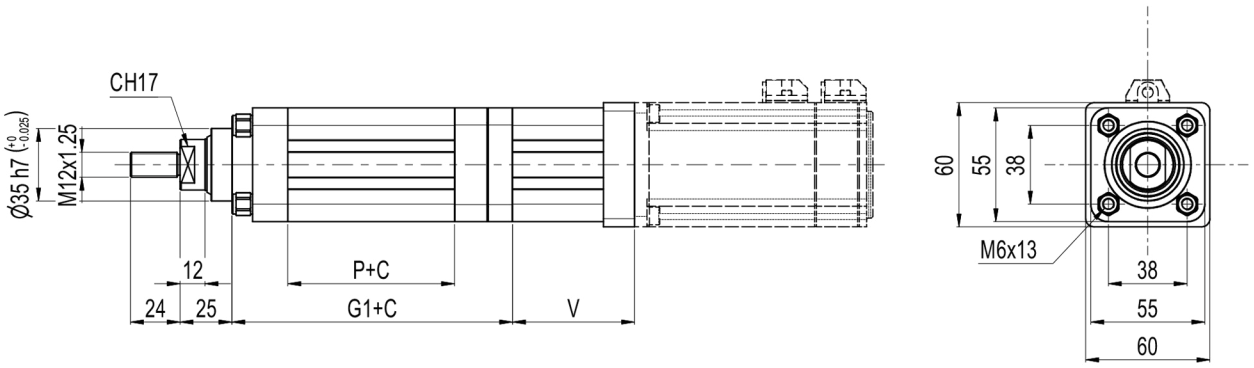

### 5.4 - Permissible Axial Force



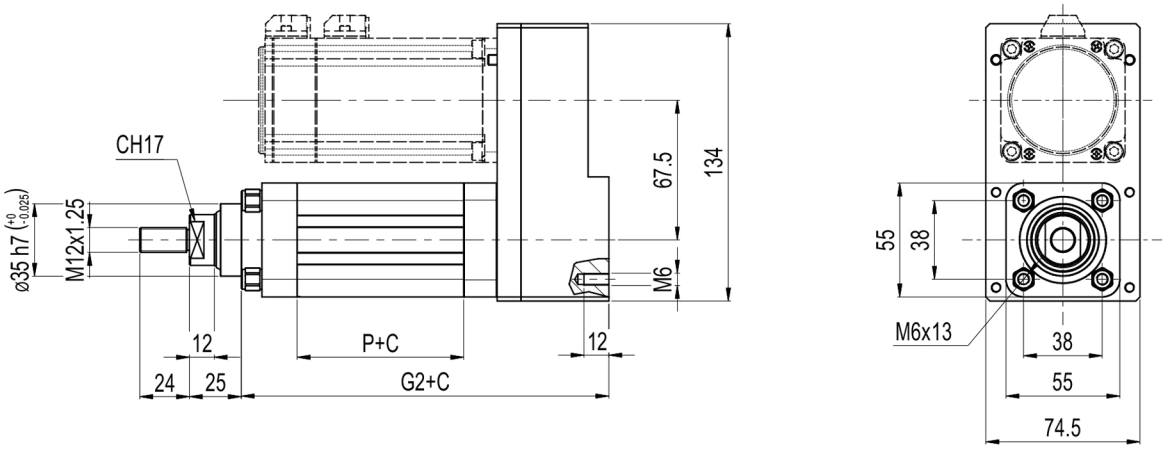
### 5.5 - ECL3- 40 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **12.7X12.7** | 80.5 | 135.64 | 177.6 |
| **14X04** | 64.5 | 119.6 | 161.1 |

**C** = Stroke value
**V** = Depending on motor dimensions

# ECL3
## SERIES 10

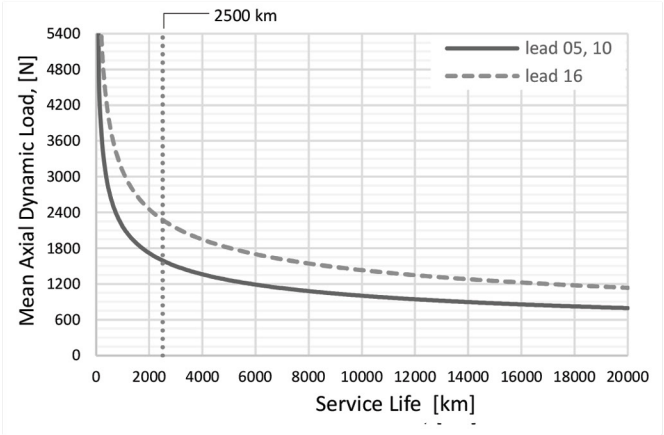
### 6 - ECL3- 50

#### 6.1 - Technical Characteristics

| | | | | | |
|---|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 25 | | |
| | Rod end | | M16x1.5 | | |
| BALL SCREW | Nominal diameter | mm | 15 | 15 | 15 |
| | Lead | mm | 5 | 10 | 16 |
| | Dynamic load | N | 12655 | 9908 | 12263 |
| FORCE | Max force - in line | N | 6300 | 3200 | 2050 |
| | Max torque - in line | Nm | 5.9 | 5.9 | 5.9 |
| | Max force - parallel | N | 6400 | 5400 | 6400 |
| | Max torque - parallel | Nm | 6.0 | 9.9 | 18.5 |
| | Dynamic axial force at 2500 km lifetime | N | 1594 | 1573 | 2276 |
| SPEED | Max speed | rpm | 5333 | 5333 | 5333 |
| | | mm/s | 444 | 889 | 1422 |
| ACCELERATION | Max acceleration | m/s² | 3.2 | 6.4 | 10.2 |
| EFFICIENCY | In line | % | 85 | 88 | 88 |
| | Parallel | % | 77 | 79 | 80 |

#### 6.2 - Service Life

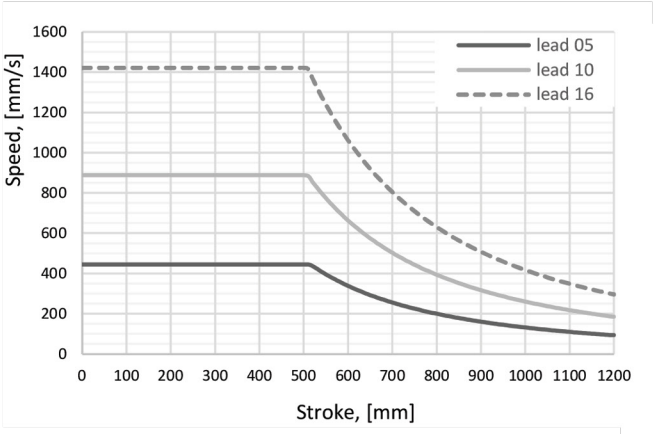
The service life depends on average dynamic axial load.



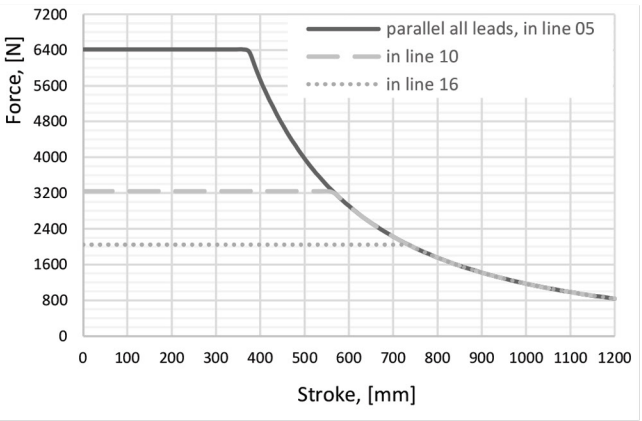

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

#### 6.3 - Permissible Speed



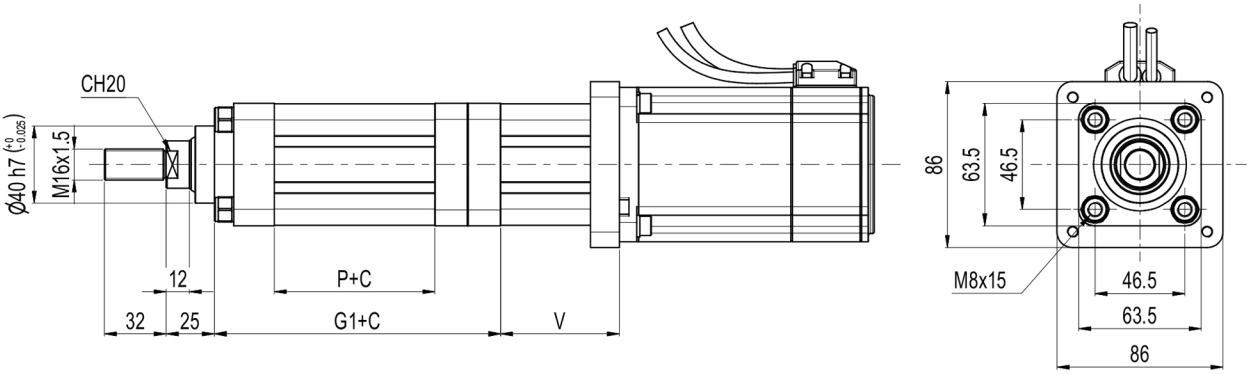

#### 6.4 - Permissible Axial Force



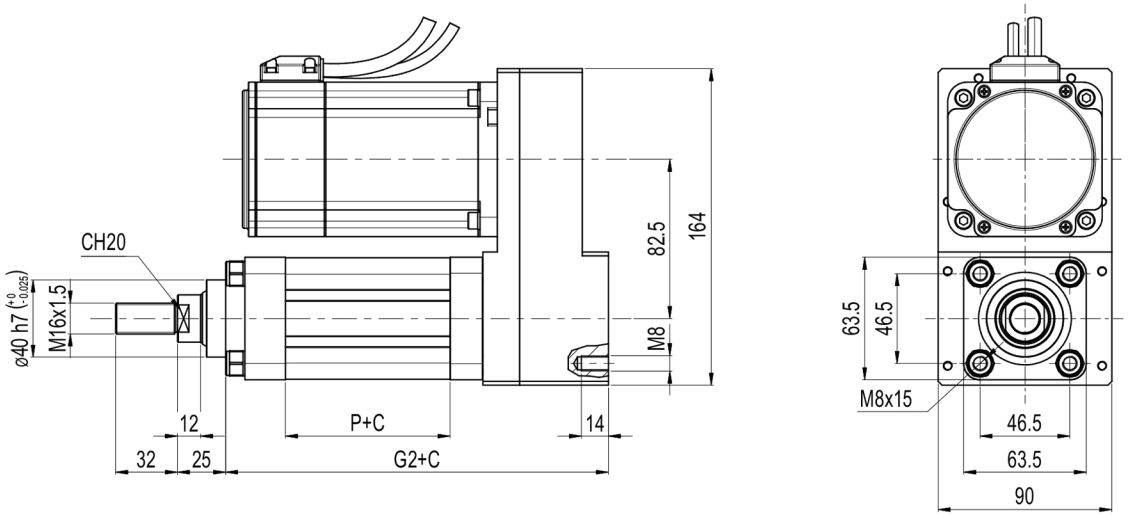
### 6.5 - ECL3-50 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **16X05** | 83.2 | 148.3 | 196.3 |
| **16X10** | 83.2 | 148.3 | 196.3 |
| **16X16** | 85.2 | 150.3 | 198.3 |

| Lead Screw | P | G1 | G2 |
|---|---|---|---|
| **16X04** | 75.5 | 140.6 | 188.6 |

**C** = Stroke value
**V** = Depending on motor dimensions

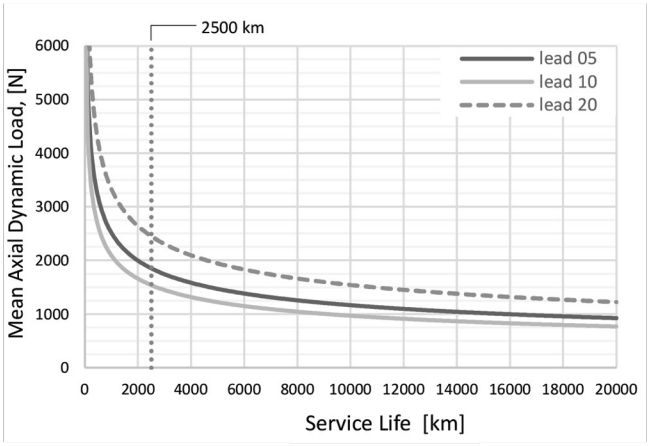
## 7 - ECL3-63

### 7.1 - Technical Characteristics

| | | | | | |
|---|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 30 | | |
| | Rod end | | M16x1.5 | | |
| BALL SCREW | Nominal diameter | mm | 20 | 20 | 20 |
| | Lead | mm | 5 | 10 | 20 |
| | Dynamic load | N | 14715 | 9712 | 12262 |
| FORCE | Max force - in line | N | 9500 | 7300 | 7300 |
| | Max torque - in line | Nm | 9.1 | 13.6 | 26.5 |
| | Max force - parallel | N | 9500 | 7300 | 7300 |
| | Max torque - parallel | Nm | 9.1 | 13.6 | 26.5 |
| | Dynamic axial force at 2500 km lifetime | N | 1854 | 1542 | 2453 |
| SPEED | Max speed | rpm | 4000 | 4000 | 4000 |
| | | mm/s | 333 | 667 | 1333 |
| ACCELERATION | Max acceleration | m/s² | 3.2 | 6.4 | 12.7 |
| EFFICIENCY | In line | % | 84 | 87 | 88 |
| | Parallel | % | 75 | 78 | 80 |

### 7.2 - Service Life

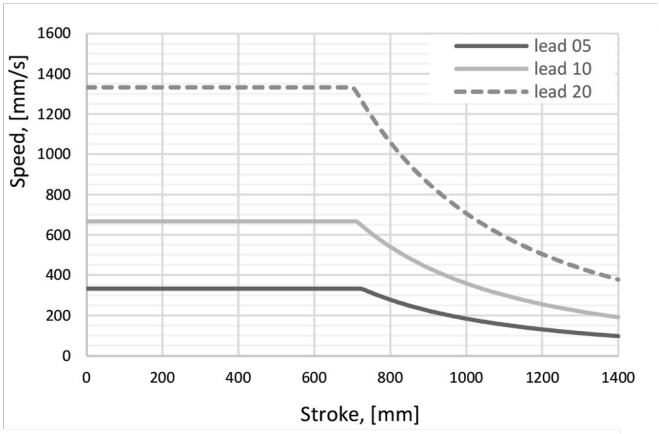
The service life depends on average dynamic axial load.



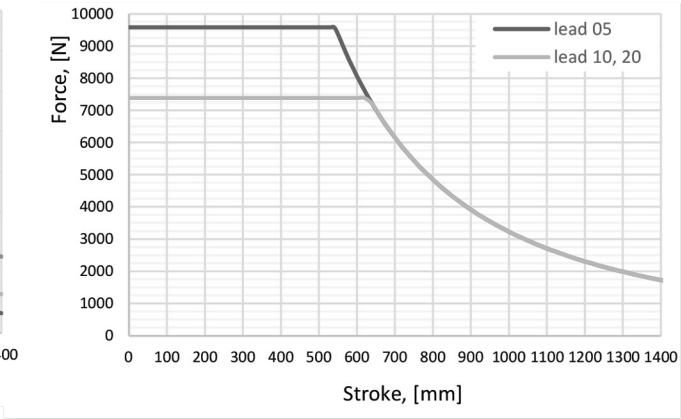

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 7.3 - Permissible Speed



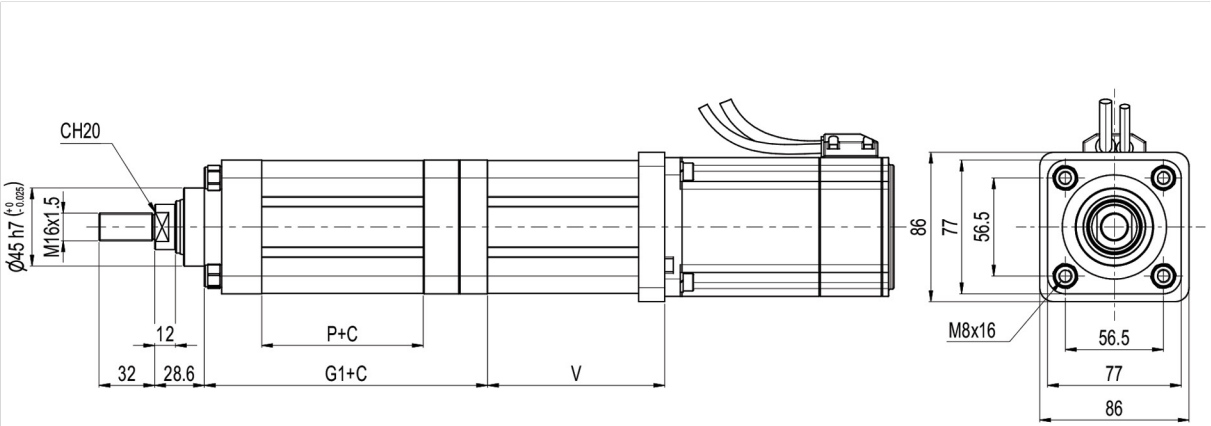

### 7.4 - Permissible Axial Force



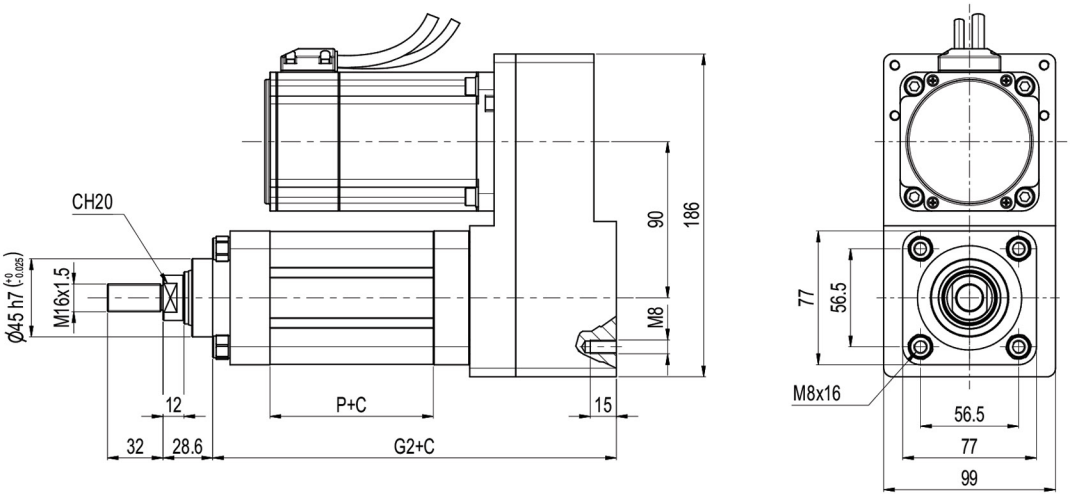
### 7.5 - ECL3-63 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **20X05** | 93.1 | 163.1 | 231.6 |
| **20X10** | 93.1 | 163.1 | 231.6 |
| **20X20** | 95.1 | 165.1 | 233.6 |

| Lead Screw | P | G1 | G2 |
|---|---|---|---|
| **20X04** | 93 | 163 | 231.5 |

**C** = Stroke value
**V** = Depending on motor dimensions

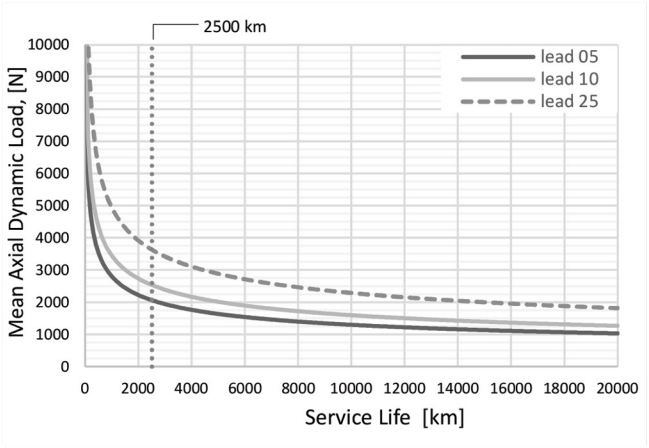
## 8 - ECL3-80

### 8.1 - Technical Characteristics

| | | | | | |
|---|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 45 | | |
| | Rod end | | M20x1.5 | | |
| BALL SCREW | Nominal diameter | mm | 25 | 25 | 25 |
| | Lead | mm | 5 | 10 | 25 |
| | Dynamic load | N | 16383 | 15990 | 16873 |
| FORCE | Max force - in line | N | 12100 | 11500 | 9900 |
| | Max torque - in line | Nm | 11.7 | 21.3 | 45 |
| | Max force - parallel | N | 12100 | 11500 | 12700 |
| | Max torque - parallel | Nm | 11.7 | 21.3 | 57.4 |
| | Dynamic axial force at 2500 km lifetime | N | 2064 | 2538 | 3635 |
| SPEED | Max speed | rpm | 3200 | 3200 | 3200 |
| | | mm/s | 267 | 533 | 1333 |
| ACCELERATION | Max acceleration | m/s² | 3.2 | 6.4 | 15.9 |
| EFFICIENCY | In line | % | 82 | 86 | 88 |
| | Parallel | % | 74 | 77 | 80 |

### 8.2 - Service Life

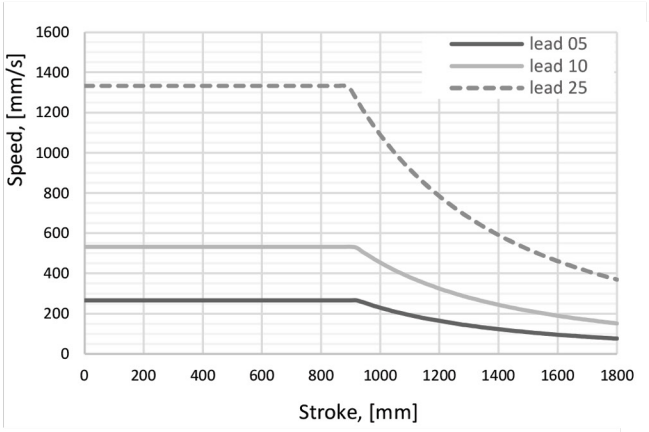
The service life depends on average dynamic axial load.



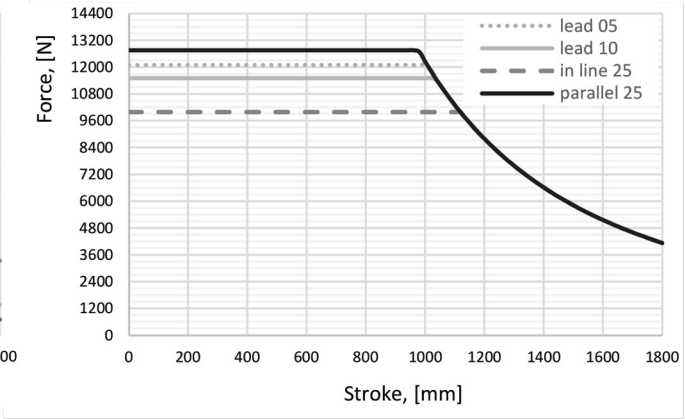

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 8.3 - Permissible Speed




### 8.4 - Permissible Axial Force



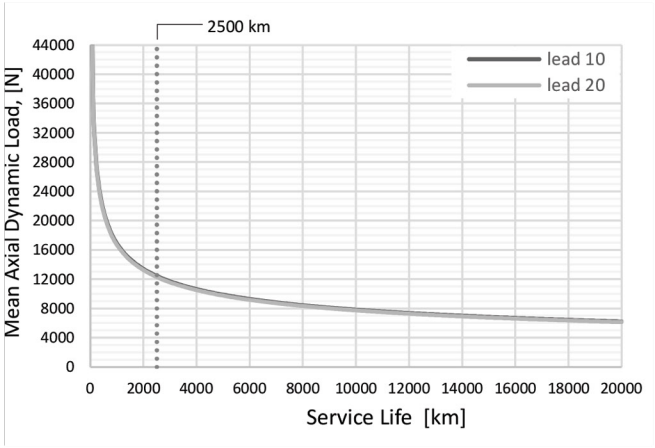
## 9 - ECL3-100

### 9.1 - Technical Characteristics

| | | | | |
|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 70 | |
| | Rod end | | M42x2 | |
| BALL SCREW | Nominal diameter | mm | 38 | 38 |
| | Lead | mm | 10 | 20 |
| | Dynamic load | N | 78382 | 61509 |
| FORCE | Max force - in line | N | 53500 | 53500 |
| | Max torque - in line | Nm | 101.5 | 196.1 |
| | Max force - parallel | N | 53500 | 53500 |
| | Max torque - parallel | Nm | 101.5 | 196.1 |
| | Dynamic axial force at 2500 km lifetime | N | 12442 | 12302 |
| SPEED | Max speed | rpm | 2105 | 2105 |
| | | mm/s | 351 | 702 |
| ACCELERATION | Max acceleration | m/s² | 6.4 | 12.7 |
| EFFICIENCY | In line | % | 84 | 87 |
| | Parallel | % | 79 | 82 |

### 9.2 - Service Life

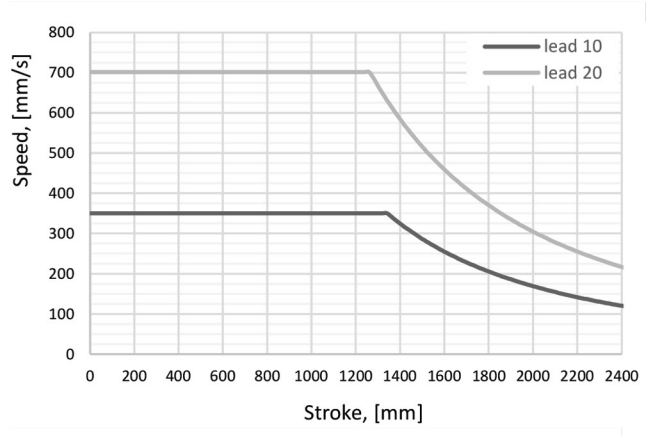
The service life depends on average dynamic axial load.



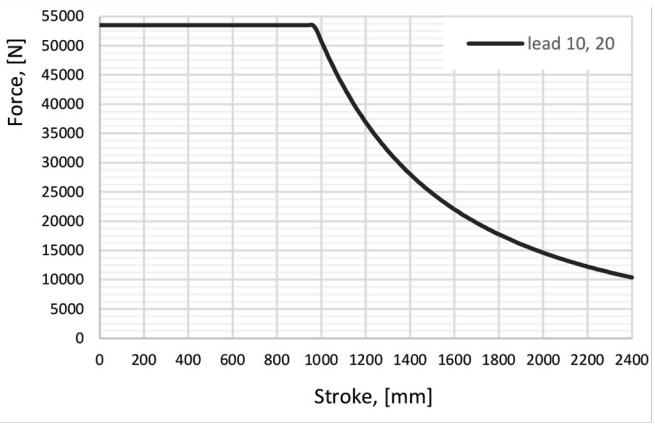

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 9.3 - Permissible Speed



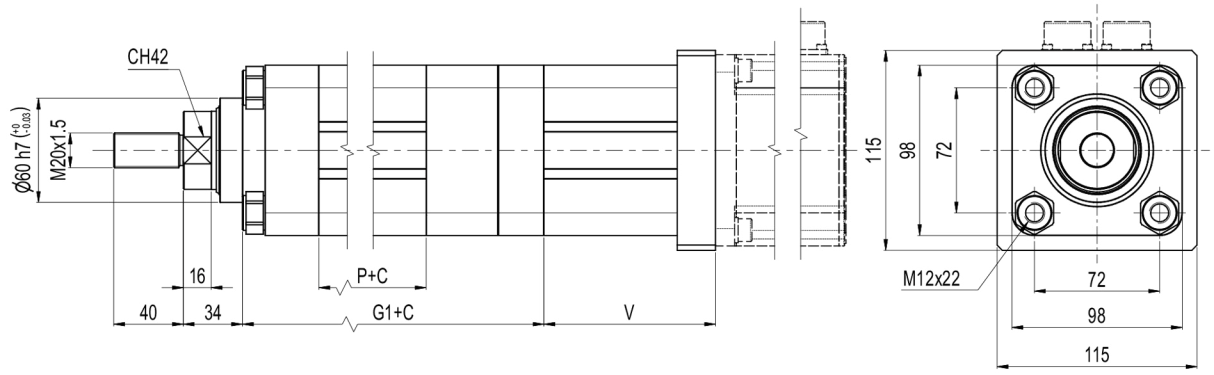

### 9.4 - Permissible Axial Force



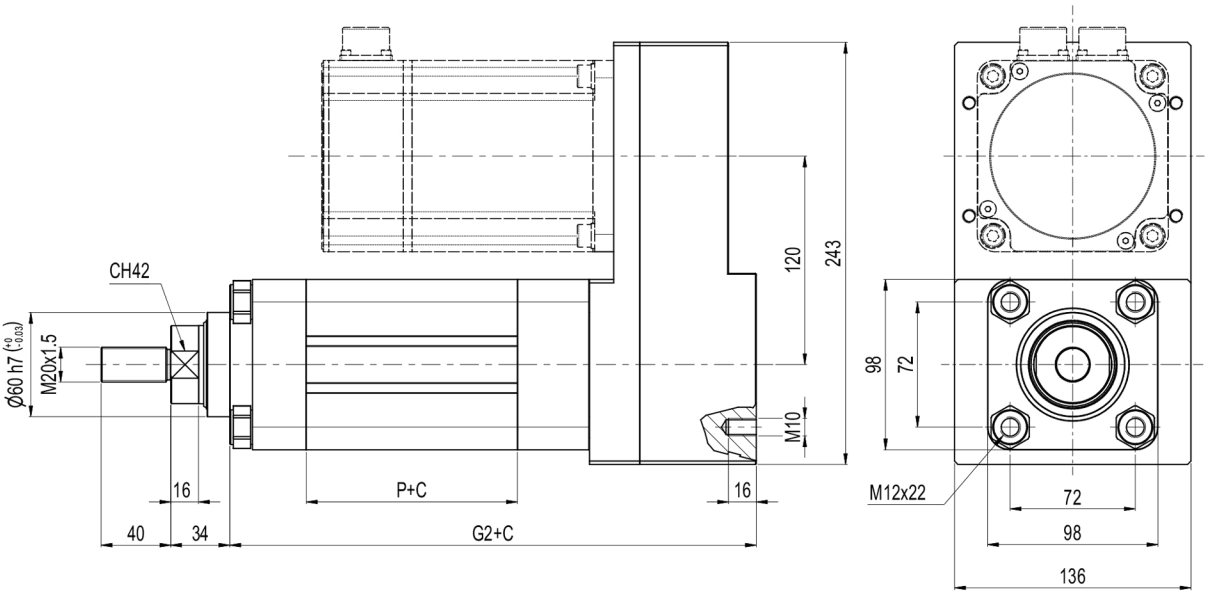
### 8.5 - ECL3-80 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **25X05** | 121.4 | 233.2 | 302.9 |
| **25X10** | 121.1 | 233.2 | 302.9 |
| **25X25** | 121.1 | 233.2 | 302.9 |

**C** = Stroke value
**V** = Depending on motor dimensions

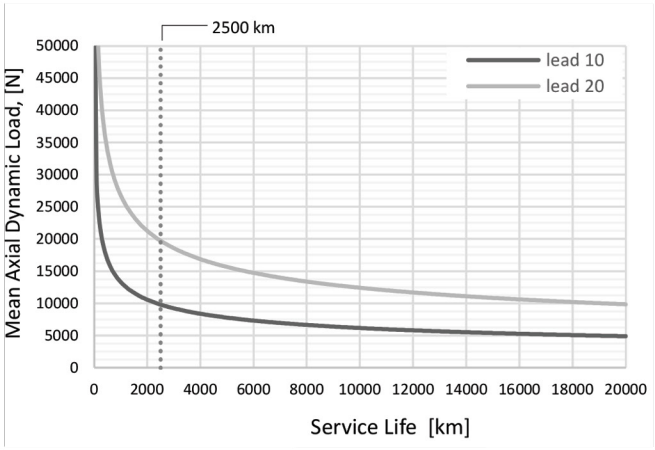
## 10 - ECL3- 125

### 10.1 - Technical Characteristics

| | | | | |
|---|---|---|---|---|
| MECHANICAL | Rod diameter | mm | 85 | |
| | Rod end | | M48x2 | |
| BALL SCREW | Nominal diameter | mm | 50 | 50 |
| | Lead | mm | 10 | 20 |
| | Dynamic load | N | 78382 | 98718 |
| FORCE | Max force - in line | N | 63500 | 88300 |
| | Max torque - in line | Nm | 123 | 327.1 |
| | Max force - parallel | N | 63500 | 88300 |
| | Max torque - parallel | Nm | 123 | 327.1 |
| | Dynamic axial force at 2500 km lifetime | N | 12442 | 19744 |
| SPEED | Max speed | rpm | 1600 | 1600 |
| | | mm/s | 267 | 533 |
| ACCELERATION | Max acceleration | m/s² | 6.4 | 12.7 |
| EFFICIENCY | In line | % | 82 | 86 |
| | Parallel | % | 77 | 81 |

### 10.2 - Service Life

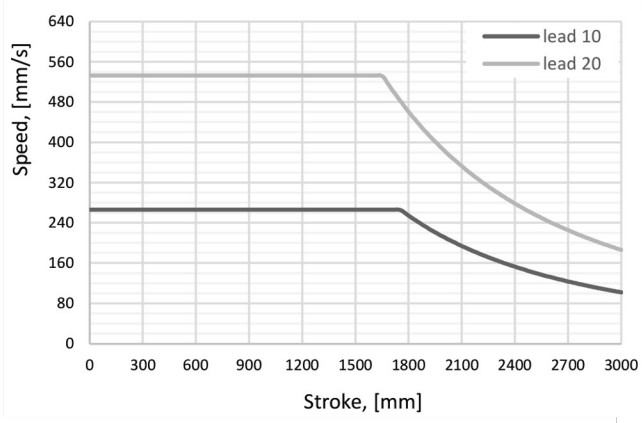
The service life depends on average dynamic axial load.



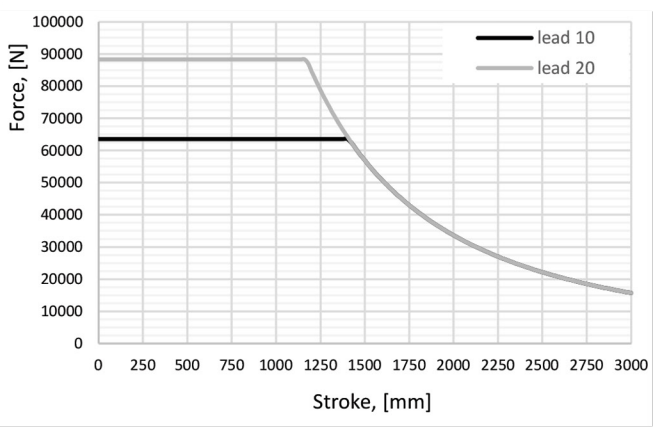

**NOTES**

- Nominal life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

### 10.3 - Permissible Speed



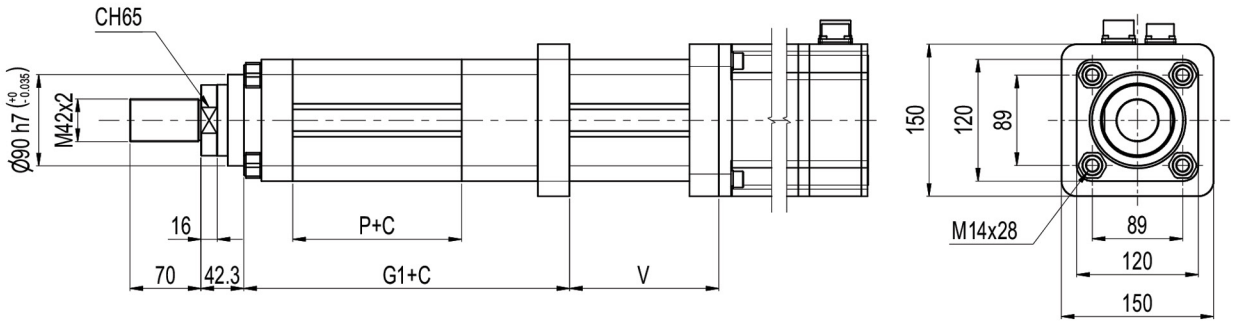

### 10.4 - Permissible Axial Force



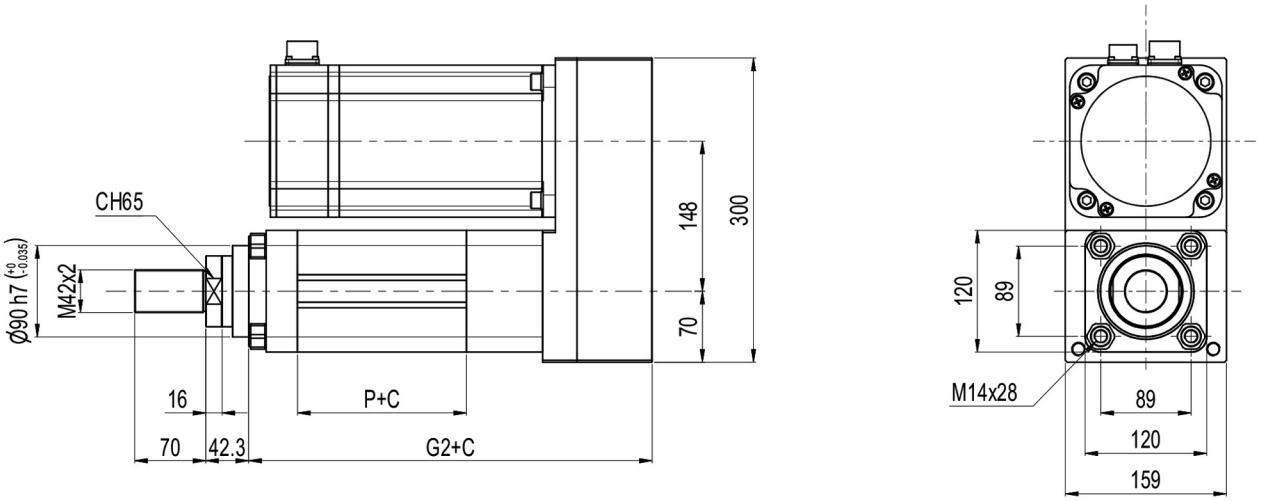
### 9.5 - ECL3-100 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**



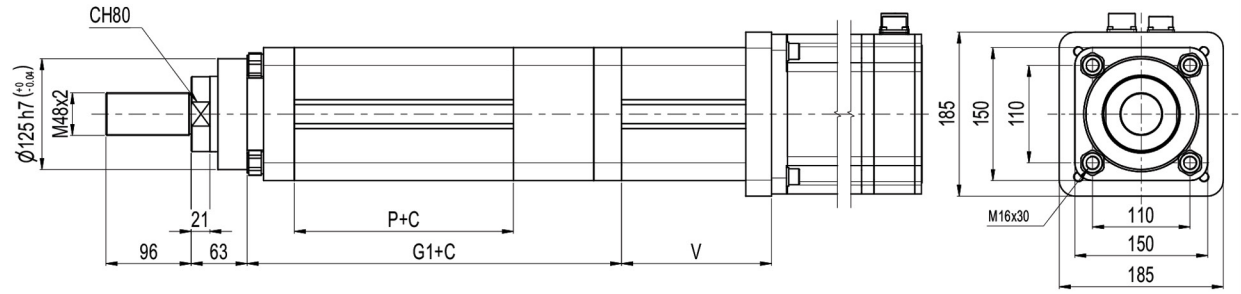

| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **38X10** | 166.5 | 321.1 | 397.8 |
| **38X20** | 166.5 | 321.1 | 397.8 |

**C** = Stroke value
**V** = Depending on motor dimensions

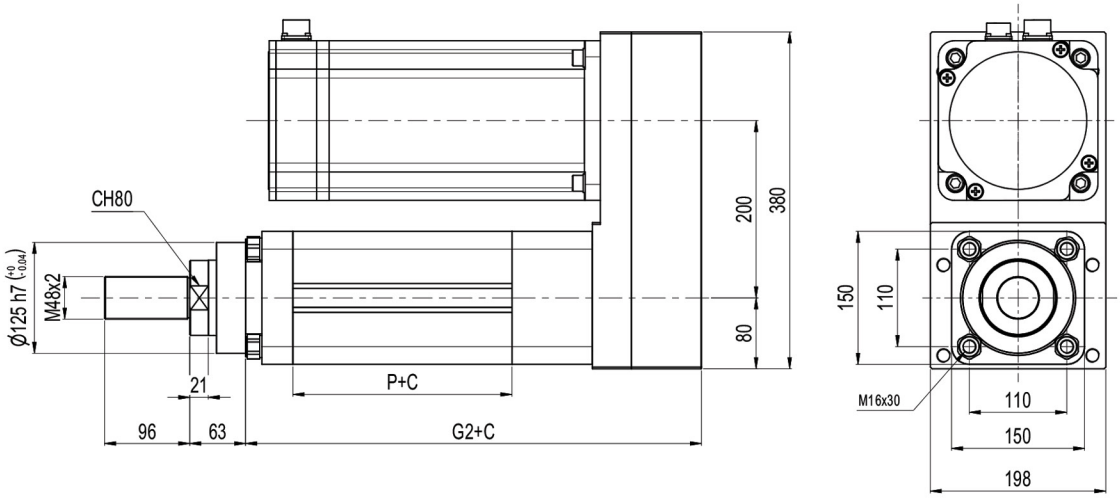
### 10.5 - ECL3-125 Overall Mounting Dimensions

dimensions in mm

**In-line motor mounting**




**Parallel motor mounting**




| Ball Screw | P | G1 | G2 |
|---|---|---|---|
| **50X10** | 222 | 397.5 | 489.2 |
| **50X20** | 247 | 422.5 | 514.2 |

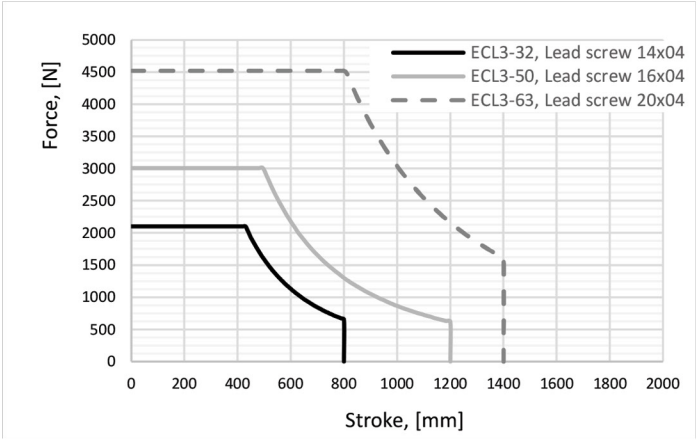
**C** = Stroke value
**V** = Depending on motor dimensions

## 11 - LEAD SCREW TYPES

This screw type is available is available only for actuators in size 32, 50 and 63.

| CYLINDER SIZE | | | **32** | **50** | **63** |
|---|---|---|---|---|---|
| MECHANICAL | Rod diameter | | 20 | 25 | 30 |
| | Rod end | | M10x1.25 | M16x1.5 | M16x1.5 |
| LEAD SCREWS | Nominal diameter | mm | 14 | 16 | 20 |
| | Lead | mm | 4 | 4 | 4 |
| FORCE/TORQUE | Max force | N | 2104 | 3008 | 4520 |
| | Max torque | Nm | 1.6 | 2.3 | 3.5 |
| EFFICIENCY | In line | % | 41 | 37 | 32 |
| | Parallel | % | 37 | 34 | 29 |

### 11.2 - Permissible Axial Force




**NOTES:** Correct working conditions: i.e. no lateral-load, no over-load, right lubrication, no over-temperature, no short-stroke application.

The permissible force is calculated considering pushing condition with free rod-end and fixed barrel. Contact us for different load applications.

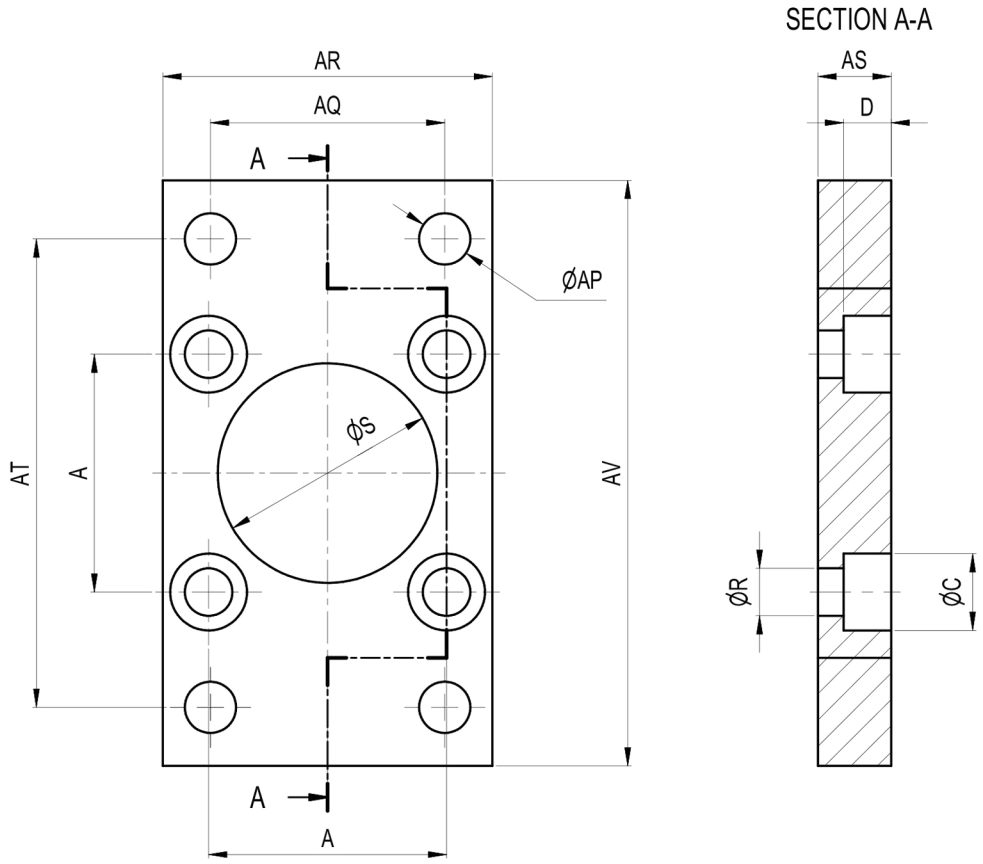
Contact us for any doubt.

## 12 - MOUNTING TYPE A AND B

**A** FRONT FLANGE (MF1)

**B** REAR FLANGE (MF2)

dimensions in mm

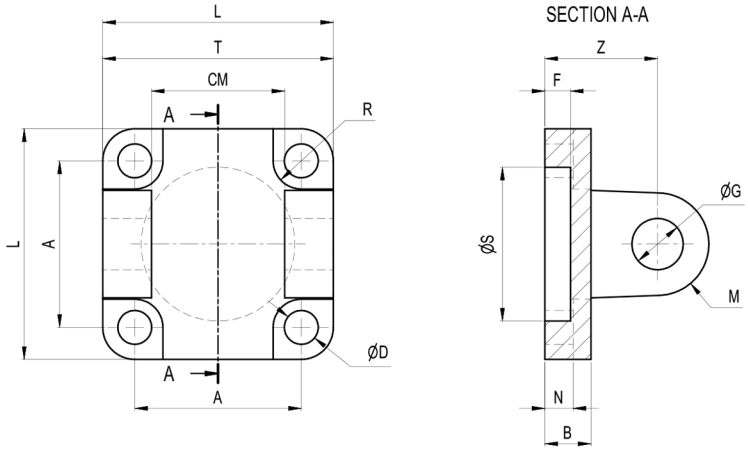



| Size | S H11 | A ± 0.2 | AP H13 | R | AS ± 0.2 | AR | AQ JS14 | AT JS14 | AV | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FFP-32** | 30 | 32.5 | 7 | 6.5 | 10 | 45 | 32 | 64 | 80 | 10.5 | 6.5 |
| **FFP-40** | 35 | 38 | 9 | 6.5 | 10 | 52 | 36 | 72 | 90 | 10.5 | 6.5 |
| **FFP-50** | 40 | 46.5 | 9 | 8.5 | 12 | 65 | 45 | 90 | 110 | 13.5 | 8.5 |
| **FFP-63** | 45 | 56.5 | 9 | 8.5 | 12 | 75 | 50 | 100 | 120 | 13.5 | 8.5 |
| **FFP-80** | 60 | 72 | 12 | 12.5 | 18 | 95 | 63 | 126 | 150 | 19 | 13 |
| **FFP-100** | 90 | 89 | 14.5 | 14.5 | 20 | 115 | 75 | 150 | 170 | 22 | 15 |
| **FFP-125** | 125 | 110 | 16.5 | 16.5 | 25 | 140 | 90 | 180 | 205 | 25 | 18 |

## 13 - MOUNTING TYPE C

**C** REAR CLEVIS (MP2)

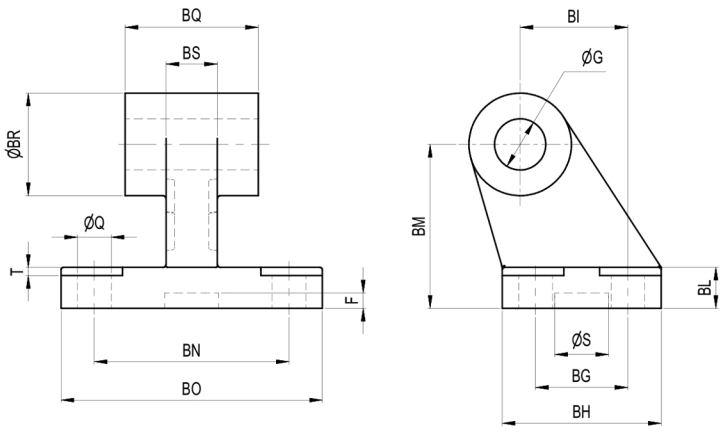
dimensions in mm




| Size | G H9 | A ± 0.2 | L | D H13 | R H13 | N ± 0.5 | B | S H11 | F | Z ± 0.2 | G H9 | M | CM H14 | T h14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RPC-32** | 10 | 32.5 | 45 | 6.6 | 11 | 5.5 | 9 | 30 | 5 | 22 | 10 | 10 | 26 | 45 |
| **RPC-40** | 12 | 38 | 55 | 6.6 | 11 | 5.5 | 10 | 35 | 5 | 25 | 12 | 12 | 28 | 52 |
| **RPC-50** | 12 | 46.5 | 65 | 9 | 15 | 6.5 | 11 | 40 | 5 | 27 | 12 | 12 | 32 | 60 |
| **RPC-63** | 16 | 56.5 | 75 | 9 | 15 | 6.5 | 12 | 45 | 5 | 32 | 16 | 16 | 40 | 70 |
| **RPC-80** | 16 | 72 | 95 | 11 | 18 | 10 | 14 | 45 | 5 | 36 | 16 | 16 | 50 | 90 |
| **RPC-100** | 25 | 110 | 140 | 14 | 20 | 10 | 20 | 60 | 7 | 50 | 25 | 25 | 70 | 130 |
| **RPC-125** | 30 | 140 | 180 | 18 | 26 | 10 | 20 | 65 | 7 | 55 | 30 | 25 | 90 | 170 |

### 13.1 - Rear Square Bracket

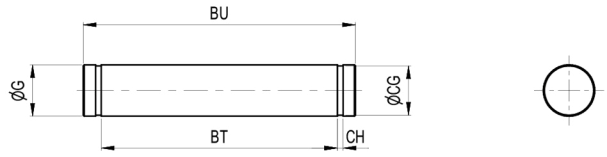
dimensions in mm




| Type | Size | G H9 | Q H13 | M H13 | BG JS14 | BH max | BI JS14 | BL | BM JS15 | BN JS14 | BO max | BS max | BR max | T max | S +0.5 0 | F +0.5 0 | BQ -0.2 -0.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SBP-32** | 32 | 10 | 6.6 | 11 | 18 | 31 | 21 | 8 | 32 | 38 | 51 | 10 | 20 | 1.6 | 10.5 | 3 | 26 |
| **SBP-40** | 40 | 12 | 6.6 | 11 | 22 | 35 | 24 | 10 | 36 | 41 | 54 | 10 | 22 | 8.5 | 20 | 3 | 28 |
| **SBP-50** | 50 | 12 | 9 | 15 | 30 | 45 | 33 | 12 | 45 | 50 | 65 | 16 | 26 | 1.6 | 10.5 | 3 | 32 |
| **SBP-63** | 63 | 16 | 16 | 15 | 35 | 50 | 37 | 12 | 50 | 52 | 67 | 14 | 30 | 10.5 | 20 | 3 | 40 |
| **SBP-80** | 80 | 16 | 11 | 18 | 40 | 60 | 47 | 14 | 63 | 66 | 86 | 20 | 30 | 2.5 | 10.5 | 3 | 50 |
| **SBP-100** | 100 | 25 | 14 | 20 | 60 | 90 | 70 | 20 | 90 | 94 | 124 | 30 | 45 | 3.2 | 10.5 | 3 | 70 (*) |
| **SBP-125** | 125 | 30 | 14 | 20 | 88 | 12.6 | 97 | 25 | 115 | 118 | 156 | 36 | 63 | 4 | - | - | 90 (*) |

**(*)** Tolerance values $^{-0.5}_{-1.2}$

### 13.2 - Pin for Rear Clevis

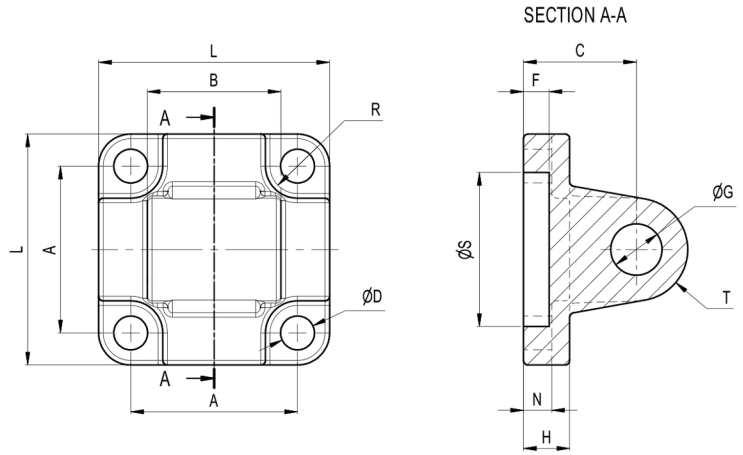



| Type | Size | G e8 | BT +0.3 0 | CG | CH H13 | BU |
|---|---|---|---|---|---|---|
| **PNP-32** | 32 | 10 | 46 | 9.6 | 1.1 | 53 |
| **PNP-40** | 40 | 12 | 53 | 11.5 | 1.1 | 60 |
| **PNP-50** | 50 | 12 | 61 | 11.5 | 1.1 | 68 |
| **PNP-63** | 63 | 16 | 71 | 15.2 | 1.1 | 78 |
| **PNP-80** | 80 | 16 | 91 | 15.2 | 1.1 | 98 |
| **PNP-100** | 100 | 25 | 132 | 23.9 | 1.1 | 98 |
| **PNP-125** | 125 | 30 | 171.5 | 28.6 | 1.6 | 178 |

## 14 - MOUNTING TYPE D

**D** REAR EYE (MP4)

dimensions in mm



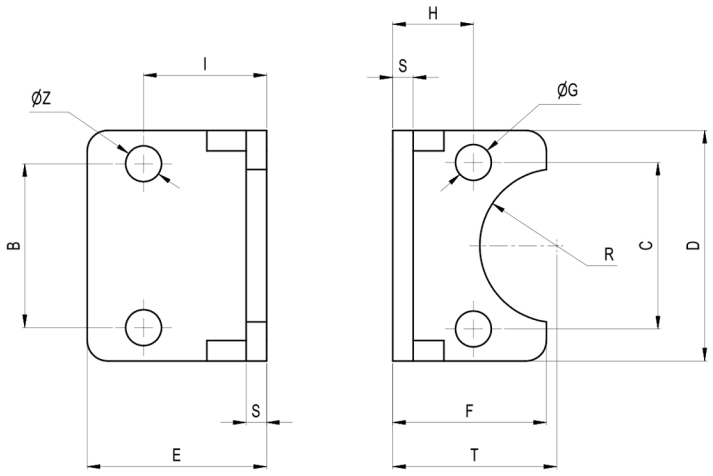

| Type | G H9 | A ± 0.2 | L | D H13 | R H13 | N ± 0.5 | H | S H11 | F | C ± 0.2 | T max | B -0.2 -0.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **REP-32** | 10 | 32.5 | 45 | 6.6 | 11 | 5.5 | 9 | 30 | 5 | 22 | 10 | 26 |
| **REP-40** | 12 | 38 | 52 | 6.6 | 11 | 5.5 | 9 | 35 | 5 | 25 | 12 | 28 |
| **REP-50** | 12 | 46.5 | 65 | 9 | 15 | 6.5 | 11 | 40 | 5 | 27 | 12 | 32 |
| **REP-63** | 16 | 56.5 | 75 | 9 | 15 | 6.5 | 11 | 45 | 5 | 32 | 16 | 40 |
| **REP-80** | 16 | 72 | 95 | 11 | 18 | 10 | 14 | 45 | 5 | 36 | 16 | 50 |
| **REP-100** | 25 | 110 | 140 | 14 | 20 | 10 | 20 | 60 | 7 | 50 | 25 | 70 |
| **REP-125** | 30 | 140 | 180 | 18 | 26 | 10 | 26 | 65 | 7 | 55 | 25 | 90 |

# ECL3
## SERIES 10

### 15 - MOUNTING TYPE G

**G** FEET (MS1)

dimensions in mm

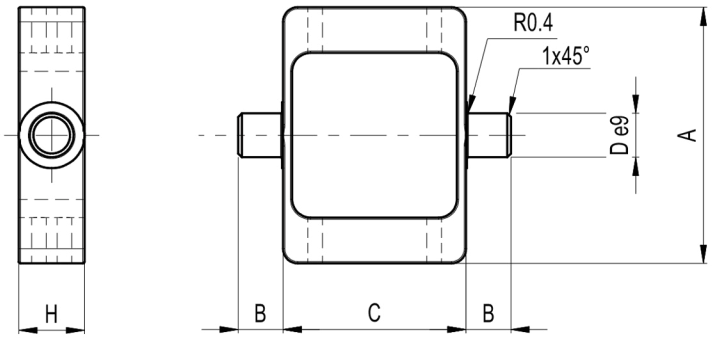



| Type | Size | C ±0.2 | B JS14 | D 0 -0.2 | E | F +2 0 | G H14 | H ±0.2 | I ±0.2 | S ±0.5 | T JS15 | R H15 | U | Z H14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FTP-32** | 32 | 32.5 | 32 | 45 | 35 | 30 | 7 | 15.75 | 24 | 4 | 32 | 15 | 11 | 7 |
| **FTP-40** | 40 | 38 | 36 | 52 | 36 | 30 | 7 | 17 | 28 | 4 | 36 | 17.5 | 15 | 9 |
| **FTP-50** | 50 | 46.5 | 45 | 65 | 47 | 36 | 9 | 21.75 | 32 | 5 | 45 | 20 | 16 | 9 |
| **FTP-63** | 63 | 56.5 | 50 | 75 | 45 | 35 | 9 | 21.75 | 32 | 5 | 50 | 22.5 | 18 | 9 |
| **FTP-80** | 80 | 72 | 63 | 95 | 55 | 47 | 11 | 27 | 41 | 6 | 63 | 30 | 17 | 12 |
| **FTP-100** | 100 | 89 | 75 | 115 | 57 | 53 | 11 | 26.3 | 41 | 6 | 71 | 45 | 24 | 14.5 |
| **FTP-125** | 125 | 110 | 90 | 140 | 70 | 70 | 14 | 35 | 45 | 8 | 90 | 62.5 | - | 16.5 |

### 16 - MOUNTING TYPE L

**L** INTERMEDIATE TRUNNIONS (MT4)

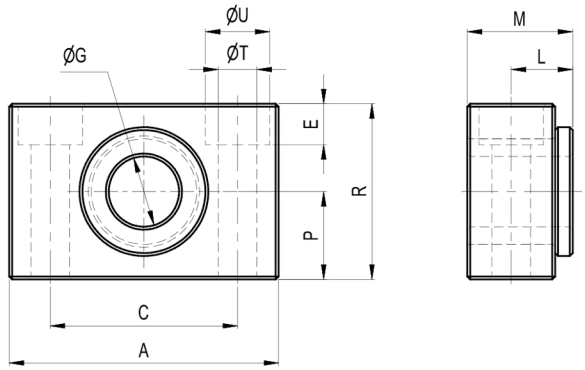
dimensions in mm




| Size | A | B | C | D | H |
|---|---|---|---|---|---|
| **32** | 70 | 12 | 50 | 12 | 18 |
| **40** | 78 | 16 | 62 | 16 | 20 |
| **50** | 91 | 16 | 74 | 16 | 20 |
| **63** | 94 | 20 | 88 | 20 | 25 |
| **80** | 130 | 20 | 109 | 20 | 25 |
| **100** | 145 | 25 | 130 | 25 | 30 |
| **125** | 154 | 25 | 155 | 25 | 32 |

### 16.1 - Lateral Bracket

dimensions in mm

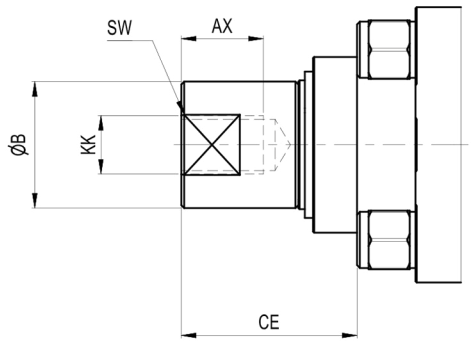



| Type | Size | G F7 | A | M | R | P ± 0.1 | C ± 0.2 | L | U H13 | T H13 | E ± 0.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRP-12** | 32 | 12 | 46 | 18 | 30 | 15 | 32 | 10.5 | 11 | 6.6 | 7 |
| **BRP-16** | 40 | 16 | 55 | 21 | 36 | 18 | 36 | 12 | 15 | 9 | 9 |
| | 50 | 16 | 55 | 21 | 36 | 18 | 36 | 12 | 15 | 9 | 9 |
| **BRP-20** | 63 | 20 | 65 | 23 | 40 | 20 | 42 | 13 | 18 | 11 | 11 |
| | 80 | 20 | 65 | 23 | 40 | 20 | 42 | 13 | 18 | 11 | 11 |
| **BRP-25** | 100 | 25 | 75 | 28.5 | 50 | 25 | 50 | 16 | 20 | 14 | 13 |
| | 125 | 25 | 75 | 28.5 | 50 | 25 | 50 | 16 | 20 | 14 | 13 |

## 17 - OVERALL MOUNTING DIMENSIONS FOR ROD END

### 17.1 - Female Thread

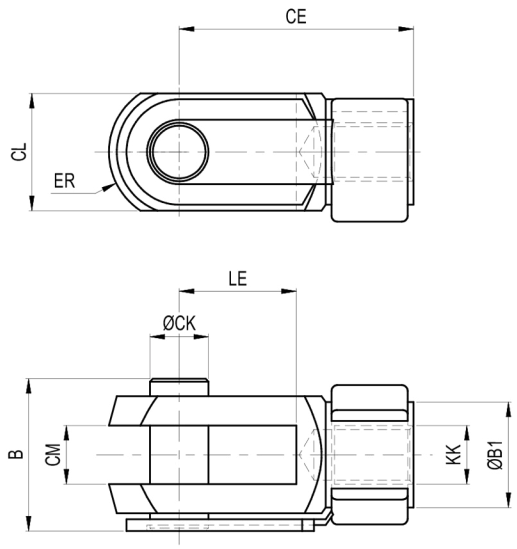
dimensions in mm




| Size | AX | B | CE | KK | SW |
|---|---|---|---|---|---|
| **32** | 15 | 19.5 | 23 | M10x1.25 | 17 |
| **40** | 17 | 24.5 | 25 | M12x1.25 | 22 |
| **50** | 25 | 29.5 | 47.5 | M16x1.5 | 27 |
| **63** | 25 | 34.5 | 51.5 | M16x1.5 | 30 |
| **80** | 30 | 44.5 | 34 | M20x1.5 | 41 |
| **100** | 50 | 69.5 | 55 | M42x2 | 65 |
| **125** | 60 | 84.5 | 75 | M48x2 | 80 |

### 17.2 - Clevis Cap (ISO 8140)

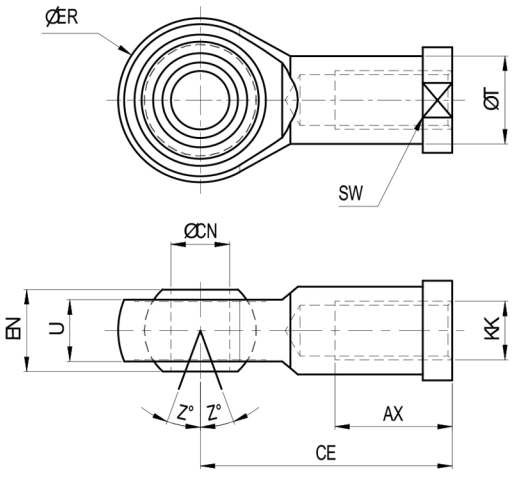
dimensions in mm




| Type | Size | KK | CK | LE | CM | CL | ER | CE | B | B1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CLP-M10** | 32 | M10x1.25 | 10 | 20 | 10 | 20 | 12 | 40 | 26 | 18 |
| **CLP-M12** | 40 | M12x1.25 | 12 | 24 | 12 | 24 | 14 | 48 | 32 | 20 |
| **CLP-M16** | 50 | M16x1.5 | 16 | 32 | 16 | 32 | 19 | 64 | 40 | 26 |
| **CLP-M16** | 63 | M16x1.5 | 16 | 32 | 16 | 32 | 19 | 64 | 40 | 26 |
| **CLP-M20** | 80 | M20x1.5 | 20 | 40 | 20 | 40 | 25 | 80 | 48 | 34 |
| **CLP-M42** | 100 | M42x2 | 40 | 84 | 40 | 85 | 64 | 168 | 104.3 | 70 |
| **CLP-M48** | 125 | M48x2 | 50 | 96 | 50 | 96 | 73 | 192 | 117.3 | 82 |

### 17.3 - Spherical Cap (ISO 8139)

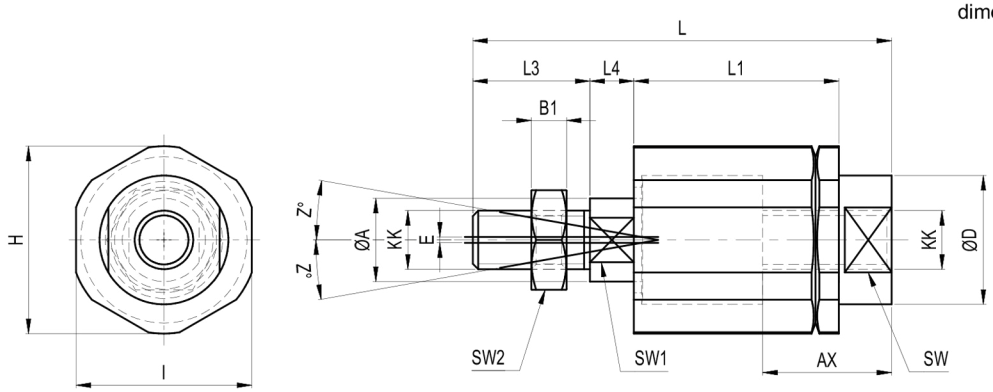
dimensions in mm




| Type | Size | KK | CN | U | EN | ER | AX | CE | T | Z | SW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SPP-M10** | 32 | M10x1.25 | 10 | 10.5 | 14 | 28 | 20 | 43 | 15 | 6.5 | 17 |
| **SPP-M12** | 40 | M12x1.25 | 12 | 12 | 16 | 32 | 22 | 50 | 17.5 | 6.5 | 19 |
| **SPP-M16** | 50 | M16x1.5 | 16 | 15 | 21 | 42 | 28 | 64 | 22 | 7.5 | 22 |
| **SPP-M16** | 63 | M16x1.5 | 16 | 15 | 21 | 42 | 28 | 64 | 22 | 7.5 | 22 |
| **SPP-M20** | 80 | M20x1.5 | 20 | 18 | 25 | 50 | 33 | 77 | 27.5 | 7 | 30 |
| **SPP-M42** | 100 | M42x2 | 40 | 33 | 49 | 91 | 60 | 142 | 53 | 8 | 55 |
| **SPP-M48** | 125 | M48x2 | 50 | 45 | 60 | 117 | 65 | 162 | 65 | 7 | 65 |

**17.4 - Self-Centering Coupler Cap**

dimensions in mm




**NOTE**: Self-centering coupler caps are not available for sizes 100 and 125.

| Type | Size | KK | L | L1 | L3 | L4 | A | D | H | I | SW | SW1 | SW2 | B1 | AX | Z | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COP-M10** | 32 | M10x1.25 | 71.5 | 35 | 20 | 7.5 | 14 | 22 | 32 | 30 | 19 | 12 | 17 | 5 | 22 | 4 | 2 |
| **COP-M12** | 40 | M12x1.25 | 75.5 | 35 | 24 | 7.5 | 14 | 22 | 32 | 30 | 19 | 12 | 19 | 6 | 22 | 4 | 2 |
| **COP-M16** | 50 | M16x1.5 | 104 | 53 | 32 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 24 | 8 | 30 | 3 | 2 |
| | 63 | M16x1.5 | 104 | 53 | 32 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 24 | 8 | 30 | 3 | 2 |
| **COP-M20** | 80 | M20x1.5 | 119 | 53 | 40 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 30 | 10 | 37 | 3 | 2 |

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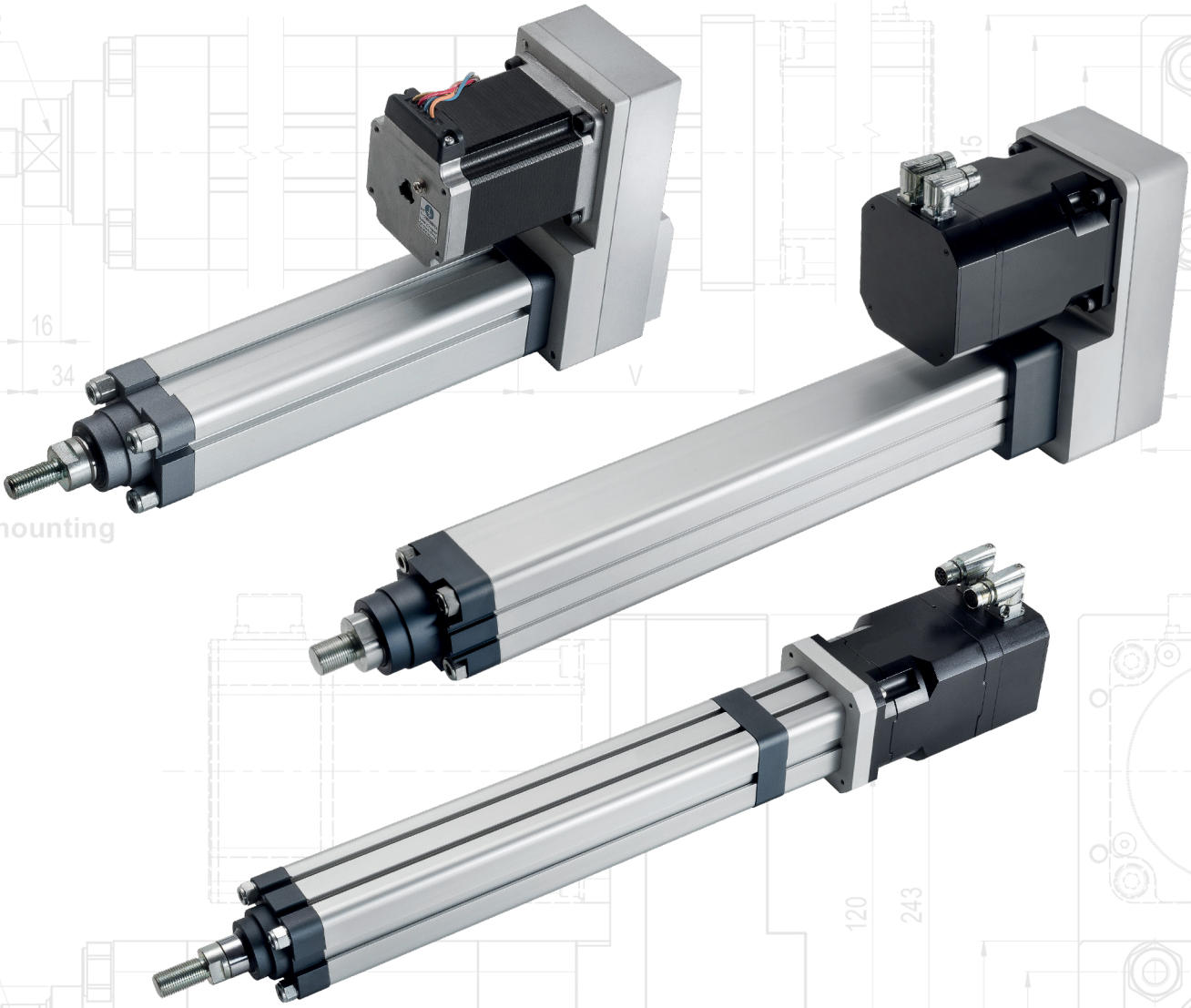

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