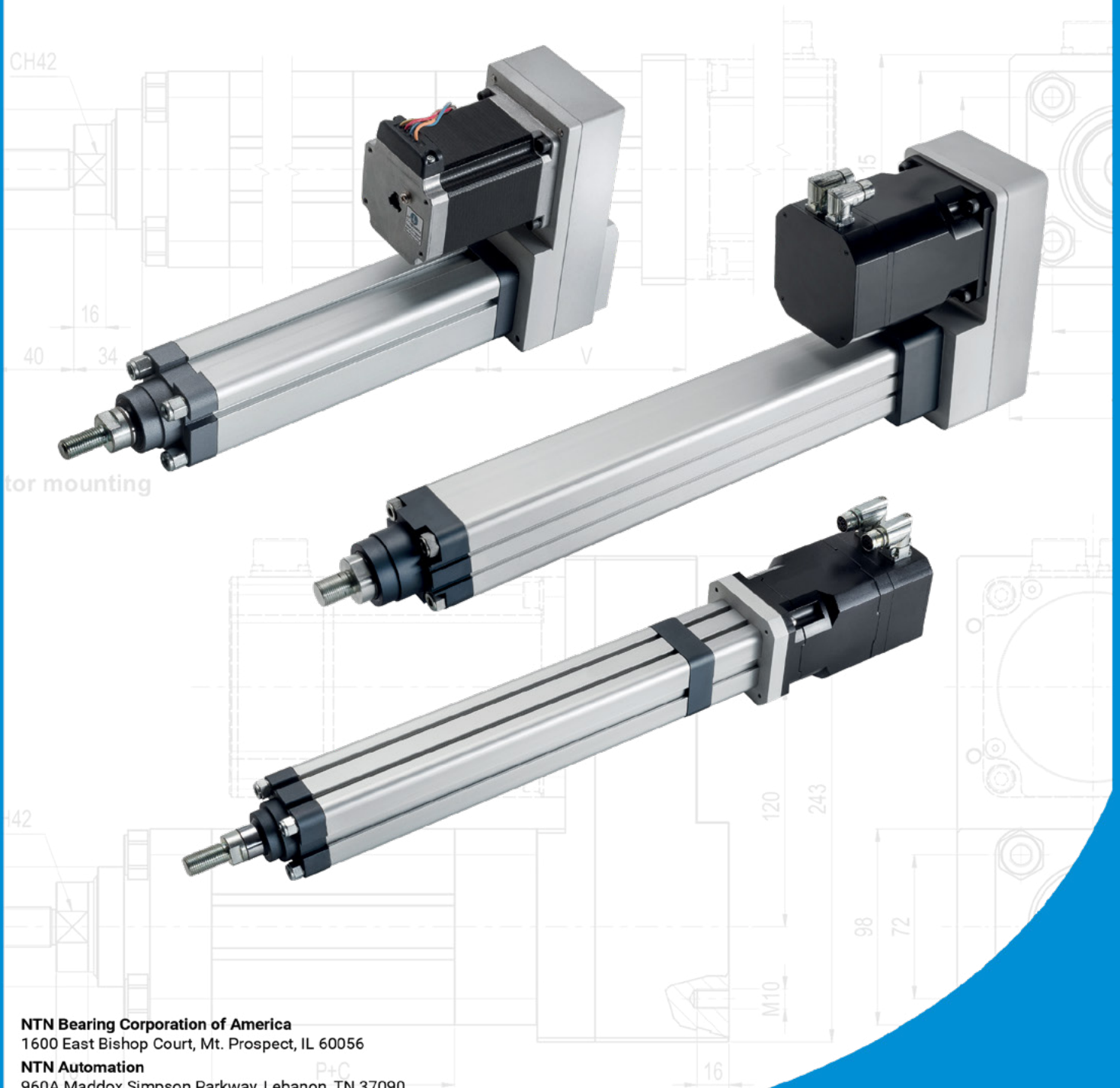


Programmable Actuator Catalog



NTN Bearing Corporation of America
1600 East Bishop Court, Mt. Prospect, IL 60056

NTN Automation
960A Maddox Simpson Parkway, Lebanon, TN 37090
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NTNAmericas.com

G2+C

EC*3 ELECTRIC CYLINDERS

SERIES 11



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

- The electric cylinders ECL3 and ECS3 are made with mounting interfaces in compliance with ISO 15552.
- The linear motion transmission is realized by means of precise and with high efficiency ball screws. Screw and nut are made in high resistance hardened steel and have high load capacity, in order to guarantee long life even in demanding applications. The ECS3 series is characterized by a selection of oversized ball screws. This feature maximizes the life of the cylinders and makes them suitable for the most demanding applications.
- The cylinder design is made to minimize vibrations: the piston is precisely guided in the barrel with double zero-backlash sliding guide; the shaft end of the screw is supported by a bearing; the rod is guided into the front head with a long linear bushing.
- The cylinder can be equipped with a robust integrated anti-rotation device.
- The piston is equipped with a magnetic ring and the barrel is equipped with external slots to accommodate any sensors. The rod has an increased external diameter and thickness to maximize rigidity and resistance to radial and buckling loads. The screw is supported by high capacity bearings to allow the transmission of high loads in both directions.
- A high-strength timing belt is used to connect the motor in parallel, in order to have reliability and strength of the torque transmission chain.
- Many pneumatic accessories can be used to fix and mount the electric cylinder, including intermediate trunnions.

PERFORMANCES

| Size | | 032 | 040 | 050 | 063 | 080 | 100 | 125 |
|--|------------------|--------------|------|------|-------|-------|-------|--------|
| Maximum axial force | N | 2100 | 3400 | 6400 | 11100 | 20900 | 53500 | 123400 |
| Maximum speed | mm/s | 1333 | 1333 | 1422 | 1333 | 1333 | 702 | 533 |
| Maximum acceleration | m/s ² | 8 | 10 | 13 | 16 | 16 | 13 | 13 |
| Standard stroke up to | mm | 800 | 1000 | 1200 | 1400 | 1800 | 2400 | 3000 |
| Maximum average axial force for 2500 km life | N | 1380 | 1700 | 2280 | 3640 | 4520 | 19750 | 49640 |
| Ambient temperature range | °C | -20 / +100 | | | | | | |
| Max air humidity allowed for IP65 (without condensation) | % | 90 | | | | | | |
| Protection degree | | IP44 or IP65 | | | | | | |

1 - IDENTIFICATION CODE

| | | | | | | | | | | | |
|-----------|----------|---|---|---|---|-----------|---|---|---|---|----------|
| EC | 3 | - | / | - | / | 11 | - | / | - | / | M |
|-----------|----------|---|---|---|---|-----------|---|---|---|---|----------|

Electric cylinders

Series: _____
L = standard
S = oversized screw

Dimensional group: _____

Size: _____
032 = ISO 32
040 = ISO 40
050 = ISO 50
063 = ISO 63
080 = ISO 80
100 = ISO 100
125 = ISO 125

Mounting type: _____
T = front threaded holes (standard)
A = front flange (MF1)
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-centring coupler
X = special

Stroke: _____
max 800 mm for size 032
max 1000 mm for size 040
max 1200 mm for size 050
max 1400 mm for size 063
max 1800 mm for size 080
max 2400 mm for size 100
max 3000 mm for size 125
For longer strokes contact our technical dept.

Screw type: _____
B = ball screw
L = lead screw (only for ECL3, sizes 032, 050, 063)
Roller screw available upon request.

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

| | |
|----------------------|-------------------------------|
| for ball screw | for lead screw (see point 11) |
| 040 = 4 mm | 040 = 4 mm |
| 050 = 5 mm | |
| 100 = 10 mm | |
| 120 = 12 mm | |
| 127 = 12.7 mm | |
| 160 = 16 mm | |
| 200 = 20 mm | |
| 250 = 25 mm | |

Project No. assigned by **NTN**

Rod offset:
S000 = no offset (standard)
S010 = offset 10 mm
Custom offset on request

Motor flange:
S = stepper
B = brushless
G = gearbox
Flange for AC or DC motors on request

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

Motor mounting flange: (omit if not required)
P = parallel (ratio 1 + 1) (standard)
L = in line
On request, parallel flange with 2:1 ratio or with customized ratio are also available.

End stroke sensor type (see point 12):
0 = no sensor
1 = PNP normally open (standard)
2 = PNP normally closed
3 = NPN normally open
4 = NPN normally closed

End stroke sensor pcs.:
N = none
A = single
D = double
T = triple
Q = quadruple

Lubrication point:
NN = none (compulsory for EC*3-032)
F0 = centred 12 o'clock
F3 = centred 3 o'clock
F6 = centred 6 o'clock
F9 = centred 9 o'clock

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

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

Series number

NOTE: For all items on request you have to contact our sales support.

2 - COMMON TECHNICAL CHARACTERISTICS

| | | | |
|-------------|---------------------------|----|--|
| ACCURACY | | mm | ± 0.035 |
| ENVIRONMENT | Ambient temperature range | °C | -20 / +100 (NOTE) |
| | Protection class | | IP44 or IP65 |
| | Humidity | % | 0 + 90 |
| MECHANICAL | Reference standard | | ISO 15552 |
| | Duty cycle | % | 100 |
| | Internal rotation stopper | | available on all sizes |
| | Rod-end | | male or female |
| | Rod material | | chromium-plated (standard) stainless steel upon request |
| | Mounting | | on front cap or with accessories |
| | End stroke sensor | | available on all sizes |

NOTE: The indicated temperature range refers to the cylinder only, without motor. If the cylinder is equipped with end stroke sensors, the temperature range has to be limited to -10 / +70 °C.

3 - APPLICATION FIELDS

EC*3 electric cylinders are suitable:

- In normal handling systems with ball screws in the automation field, replacing normal cylinders when speed and controlled and constant acceleration or deceleration ramps are required, even under load.
- On all occasions where handling with considerable traction / thrust forces is required but the use hydraulic cylinders is not advisable.
- In handling systems where absence of environmental pollution and / or extreme silence is required.

3.1 - Applications

ISO 15552 EC*3 electric cylinders are the right solution for all those applications that require accurate and controlled positioning. The wide range of sizes, screw diameters and pitches allow you to design modular application solutions, minimizing the design of customized parts.

Easy installation and the range of construction types make the EC*3 electric cylinders a benchmark for this market segment.

The wide choice among several models makes it possible to use the ECL3 and ECS3 cylinders even in critical applications, offering considerable resistance to static and dynamic loads, significantly heavier than standard market proposals.

The opportunity to share the most of standard ISO 15552 pneumatic accessories with EC*3 cylinders in the same dimensions is an additional practical and cost advantage in mounting the cylinders.

4 - EC*3-032

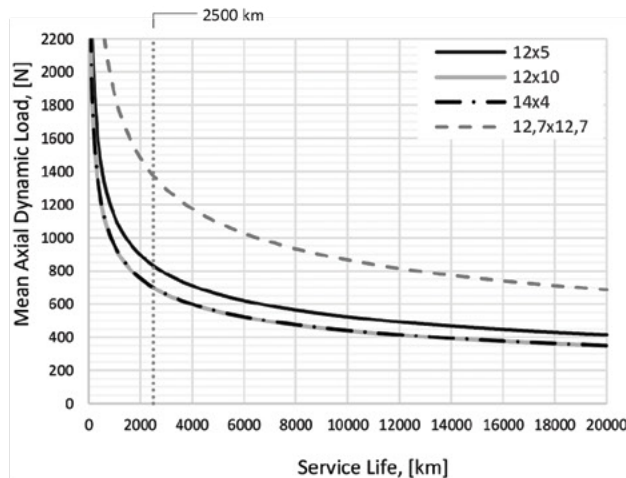
4.1 - Technical characteristics

| | | | ECL3 | | ECS3 | |
|--------------|-------------------------------|------------------|------------|------------|------------|------------|
| Mechanical | Rod diameter | mm | 20 | | 20 | |
| | Rod end | | M10x1.25 | | M10x1.25 | |
| Ball screw | Nominal diameter | mm | 12 | | 14 | 12.7 |
| | Lead | mm | 5 | 10 | 4 | 12.7 |
| | Dynamic load | N | 6600 | 4400 | 6000 | 8000 |
| Force | Max force (torque) - in line | N (Nm) | 2100 (2.0) | 2100 (2.2) | 2100 (1.6) | 2100 (5.0) |
| | Max force (torque) - parallel | N (Nm) | 2100 (2.2) | 2100 (4.4) | 2100 (1.8) | 2100 (5.5) |
| | Force at 2500 km (*) | N | 832 | 698 | 702 | 1375 |
| Speed | Maximum speed | rpm | 6667 | 6667 | 5714 | 6299 |
| | | mm/s | 556 | 1111 | 381 | 1333 |
| Acceleration | Max acceleration | m/s ² | 3.2 | 6.4 | 2.5 | 8.1 |
| Efficiency | In line (parallel) | % | 86 (77) | 88 (79) | 84 (76) | 88 (80) |

(*) Dynamic axial force at 2500 km lifetime

4.2 - Service life

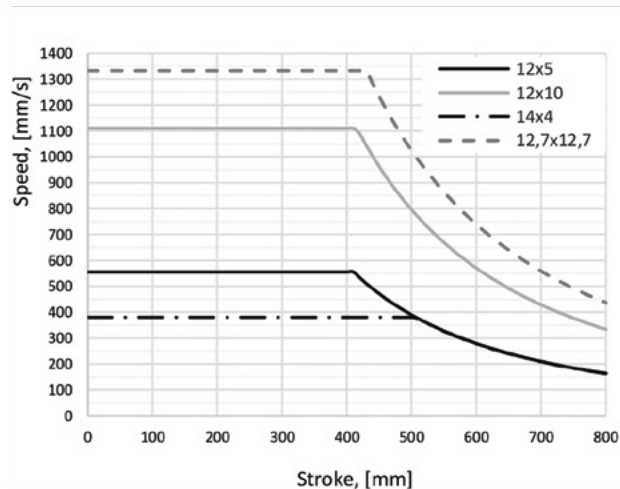
The service life depends on average dynamic axial load.



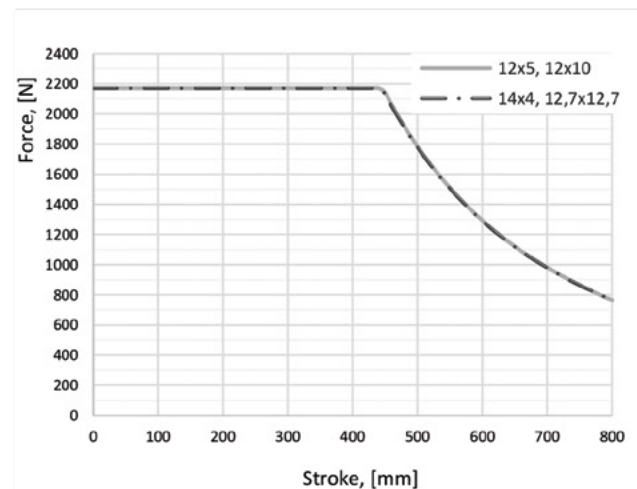
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

4.3 - Permissible speed



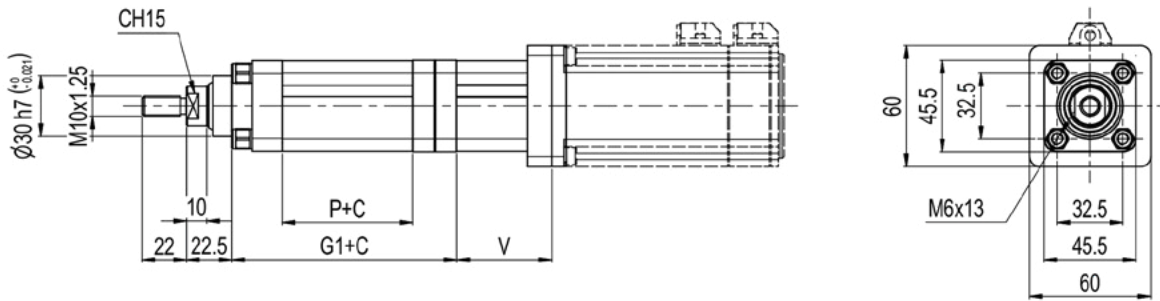
4.4 - Permissible axial force



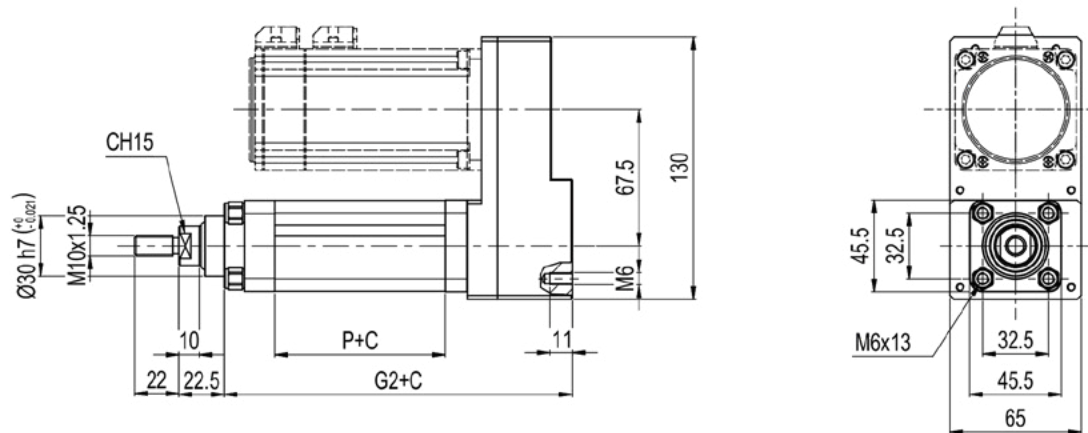
4.5 - EC*3-032 Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|------|-------|--------|
| ECL3 | 12x5 | 73.5 | 120.4 | 161.25 |
| | 12x10 | 73.5 | 120.4 | 161.25 |
| ECS3 | 12.7x12.7 | 84.5 | 131.4 | 172.25 |
| | 14x4 | 64.5 | 111.4 | 152.25 |
| | Lead screw | P | G1 | G2 |
| ECL3 | 14x4 | 64.5 | 111.4 | 152.25 |

C = Stroke value
V = Depending on motor dimensions

5 - EC*3-040

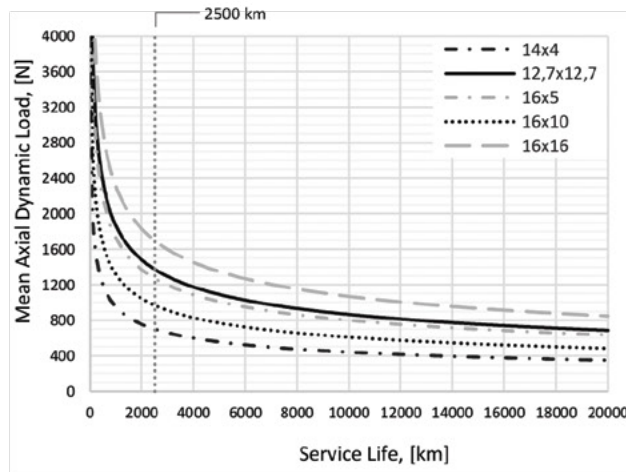
5.1 - Technical characteristics

| | | | ECL3 | | ECS3 | | |
|--------------|-------------------------------|------------------|------------|------------|------------|------------|-------------|
| Mechanical | Rod diameter | mm | 25 | | 25 | | |
| | Rod end | | M12x1.25 | | M12x1.25 | | |
| Ball screw | Nominal diameter | mm | 14 | 12.7 | 16 | | |
| | Lead | mm | 4 | 12.7 | 5 | 10 | 16 |
| | Dynamic load | N | 6000 | 8000 | 10104 | 6112 | 9150 |
| Force | Max force (torque) - in line | N (Nm) | 3000 (2.3) | 2400 (5.5) | 3400 (3.2) | 3400 (6.3) | 3080 (8.9) |
| | Max force (torque) - parallel | N (Nm) | 3000 (2.5) | 3400 (8.7) | 3400 (3.6) | 3400 (7.0) | 3400 (11.0) |
| | Force at 2500 km (*) | N | 702 | 1375 | 1273 | 970 | 1699 |
| Speed | Maximum speed | rpm | 5714 | 6299 | 5000 | 5000 | 5000 |
| | | mm/s | 381 | 1333 | 417 | 833 | 1333 |
| Acceleration | Max acceleration | m/s ² | 2.5 | 8.1 | 3.2 | 6.4 | 10.2 |
| Efficiency | In line (parallel) | % | 84 (76) | 88 (80) | 85 (76) | 87 (79) | 88 (80) |

(*) Dynamic axial force at 2500 km lifetime

5.2 - Service life

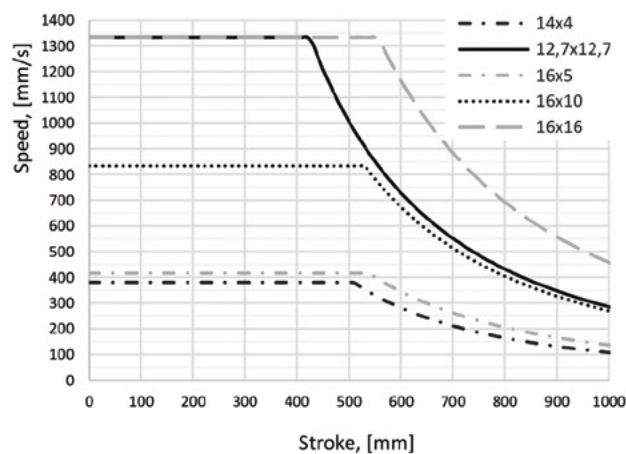
The service life depends on average dynamic axial load.



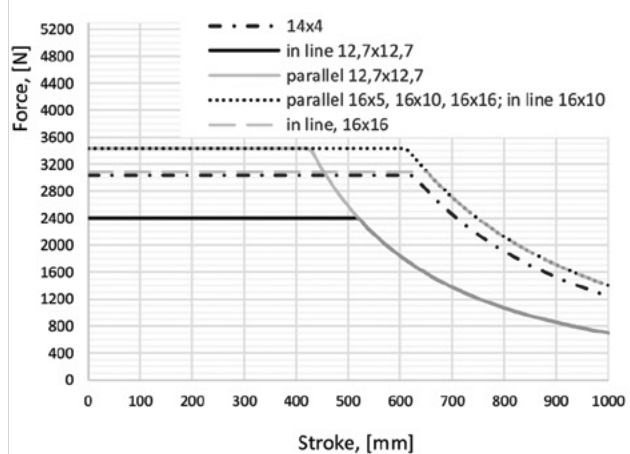
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

5.3 - Permissible speed



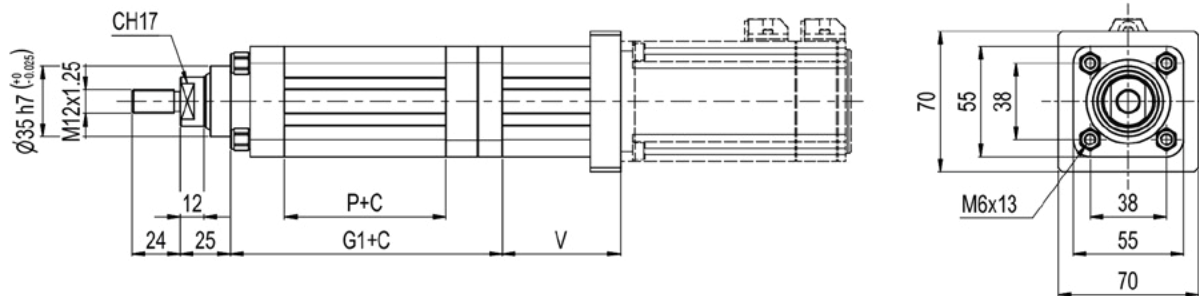
5.4 - Permissible axial force



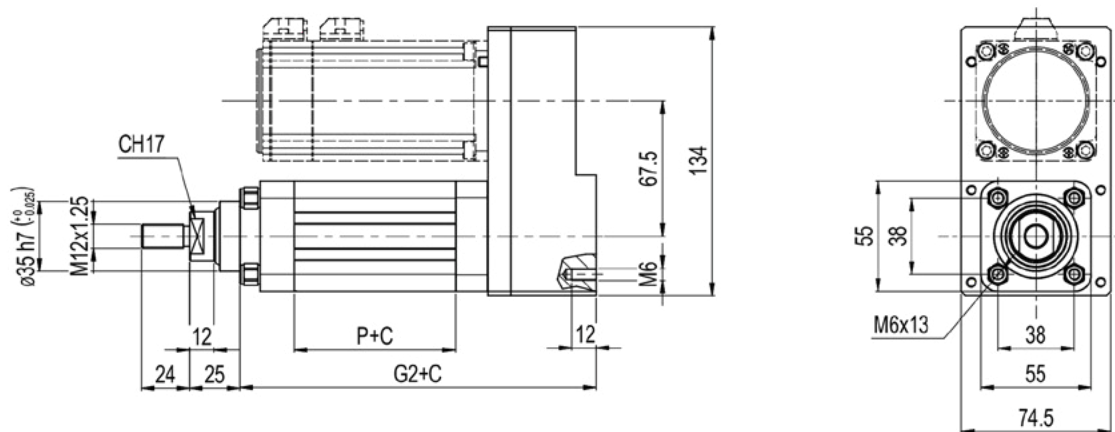
5.5 - EC*3-040 Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|------|-------|-------|
| ECL3 | 12.7x12.7 | 80.5 | 135.6 | 177.6 |
| | 14x4 | 645 | 119.6 | 161.5 |
| ECS3 | 16x5 | 88 | 143.1 | 185.1 |
| | 16x10 | 96 | 151.1 | 193.1 |
| | 16x16 | 79 | 134.1 | 176.1 |

C = Stroke value
V = Depending on motor dimensions

6 - EC*3-050

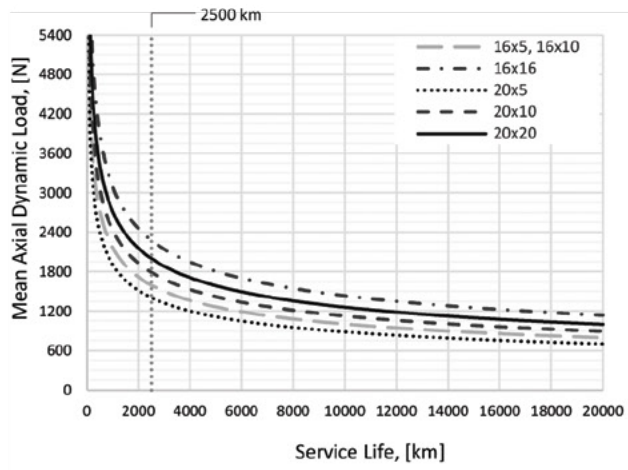
6.1 - Technical characteristics

| | | | ECL3 | | | ECS3 | | |
|--------------|-------------------------------|------------------|------------|------------|-------------|------------|-------------|-------------|
| Mechanical | Rod diameter | mm | 25 | | | 30 | | |
| | Rod end | | M16x1.5 | | | M16x1.5 | | |
| Ball screw | Nominal diameter | mm | 16 | | | 20 | | |
| | Lead | mm | 5 | 10 | 16 | 5 | 10 | 20 |
| | Dynamic load | N | 12655 | 9908 | 12263 | 11154 | 11272 | 10000 |
| Force | Max force (torque) - in line | N(Nm) | 6300 (5.9) | 3200 (5.9) | 2050 (5.9) | 6400 (6.1) | 4850 (8.9) | 2470 (8.9) |
| | Max force (torque) - parallel | N(Nm) | 6400 (6.7) | 5400 (11) | 6400 (20.5) | 6400 (6.8) | 6400 (13.1) | 5830 (23.3) |
| | Force at 2500 km (*) | N | 1594 | 1573 | 2276 | 1405 | 1789 | 2000 |
| Speed | Maximum speed | rpm | 5333 | 5333 | 5333 | 4000 | 4000 | 4000 |
| | | mm/s | 444 | 889 | 1422 | 333 | 667 | 1333 |
| Acceleration | Max acceleration | m/s ² | 3.2 | 6.4 | 10.2 | 3.2 | 6.4 | 12.7 |
| Efficiency | In line (parallel) | % | 85 (77) | 88 (79) | 88 (80) | 84 (75) | 87 (78) | 88 (80) |

(*) Dynamic axial force at 2500 km lifetime

6.2 - Service life

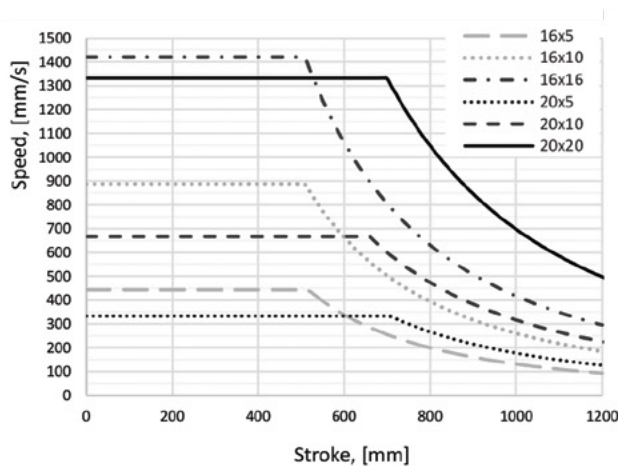
The service life depends on average dynamic axial load.



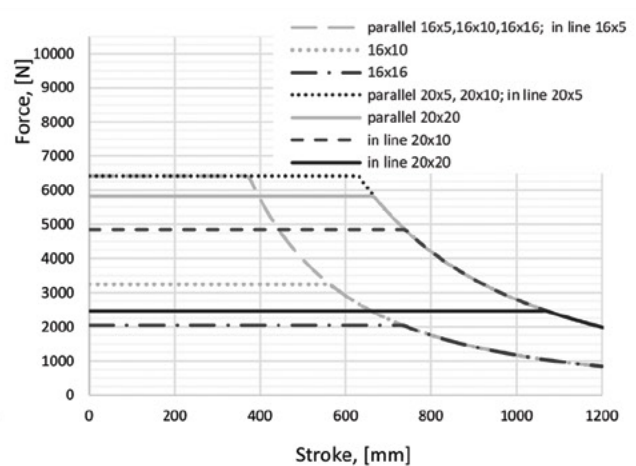
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

6.3 - Permissible speed



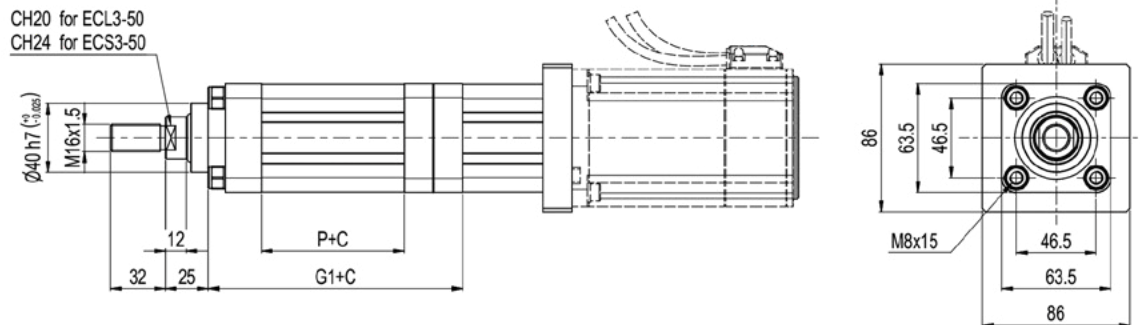
6.4 - Permissible axial force



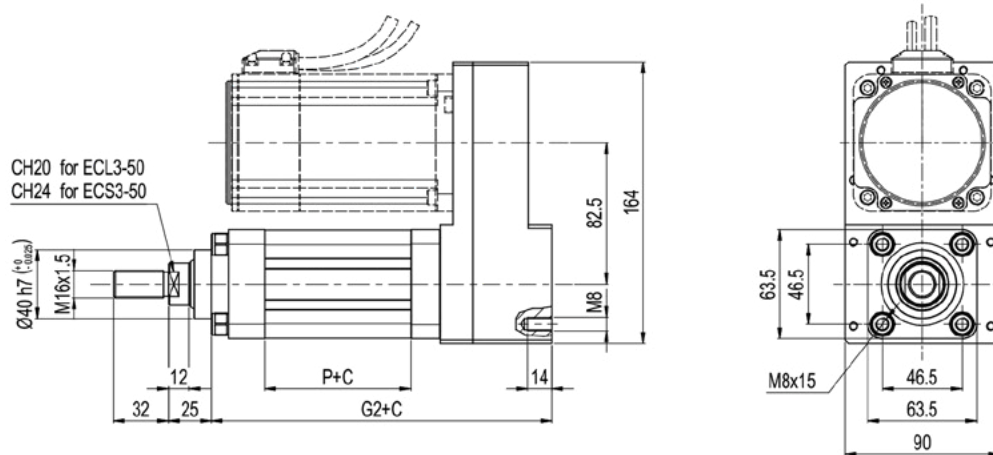
6.5 - EC*3-050 - Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|-------|-------|-------|
| ECL3 | 16x5 | 83.2 | 148.3 | 196.3 |
| | 16x10 | 83.2 | 148.3 | 196.3 |
| | 16x16 | 85.2 | 150.3 | 198.3 |
| ECS3 | 20x5 | 103.2 | 168.3 | 216.3 |
| | 20x10 | 112.2 | 177.3 | 225.3 |
| | 20x20 | 96.2 | 161.3 | 209.3 |
| | Lead screw | P | G1 | G2 |
| ECL3 | 16x4 | 75.5 | 140.6 | 188.6 |

C = Stroke value
V = Depending on motor dimensions

7 - EC*3-063

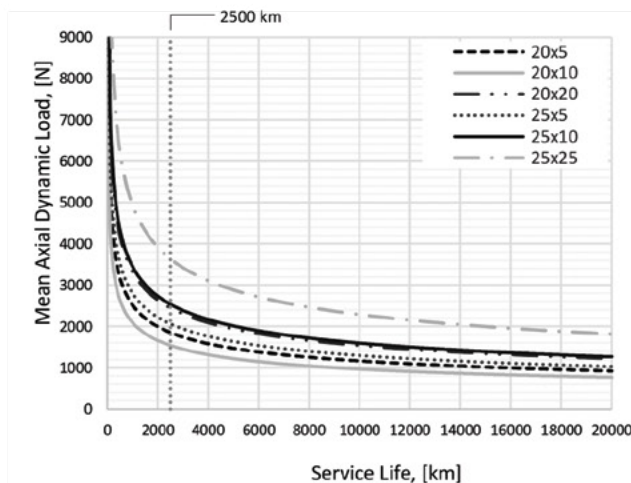
7.1 - Technical characteristics

| | | | ECL3 | | | ECS3 | | |
|--------------|-------------------------------|------------------|-------------|-------------|-------------|--------------|--------------|-------------|
| Mechanical | Rod diameter | mm | 30 | | | 35 | | |
| | Rod end | | M16x1.5 | | | M16x1.5 | | |
| Ball screw | Nominal diameter | mm | 20 | | | 25 | | |
| | Lead | mm | 5 | 10 | 20 | 5 | 10 | 25 |
| | Dynamic load | N | 14715 | 9712 | 12262 | 16383 | 15990 | 16873 |
| Force | Max force (torque) - in line | N (Nm) | 9500 (9.1) | 7300 (13.6) | 7300 (26.5) | 11100 (10.8) | 11100 (20.6) | 5890 (26.5) |
| | Max force (torque) - parallel | N (Nm) | 9500 (10.1) | 7300 (15.1) | 7300 (29.5) | 11100 (11.9) | 11100 (22.9) | 5890 (29.5) |
| | Force at 2500 km (*) | N | 1854 | 1542 | 2453 | 2064 | 2538 | 3635 |
| Speed | Maximum speed | rpm | 4000 | 4000 | 4000 | 3200 | 3200 | 3200 |
| | | mm/s | 333 | 667 | 1333 | 267 | 533 | 1333 |
| Acceleration | Max acceleration | m/s ² | 3.2 | 6.4 | 12.7 | 3.2 | 6.4 | 15.9 |
| Efficiency | In line (parallel) | % | 84 (75) | 87 (78) | 88 (80) | 82 (74) | 86 (77) | 88 (80) |

7.2 - Service life

The service life depends on average dynamic axial load.

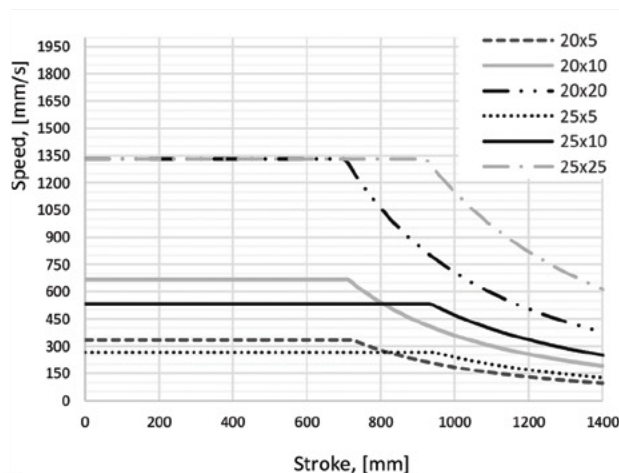
(*) Dynamic axial force at 2500 km lifetime



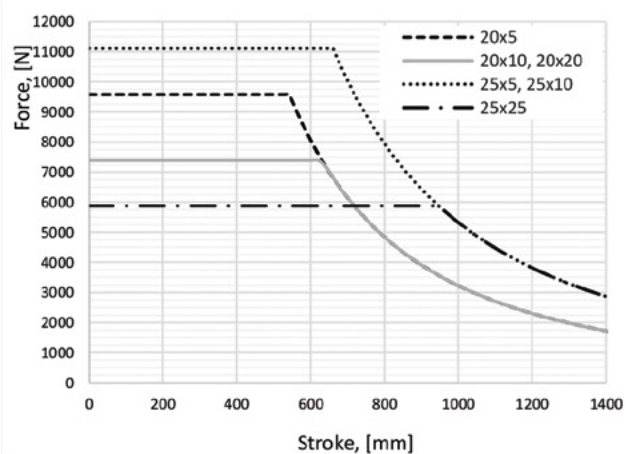
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

7.3 - Permissible speed



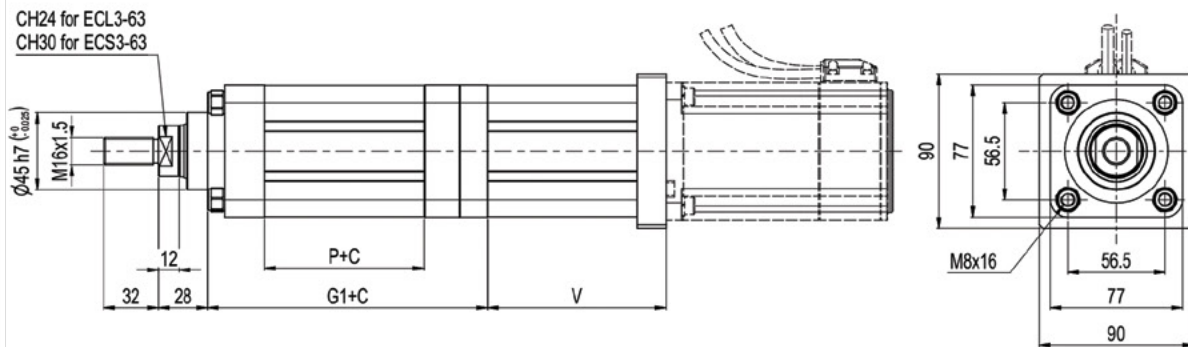
7.4 - Permissible axial force



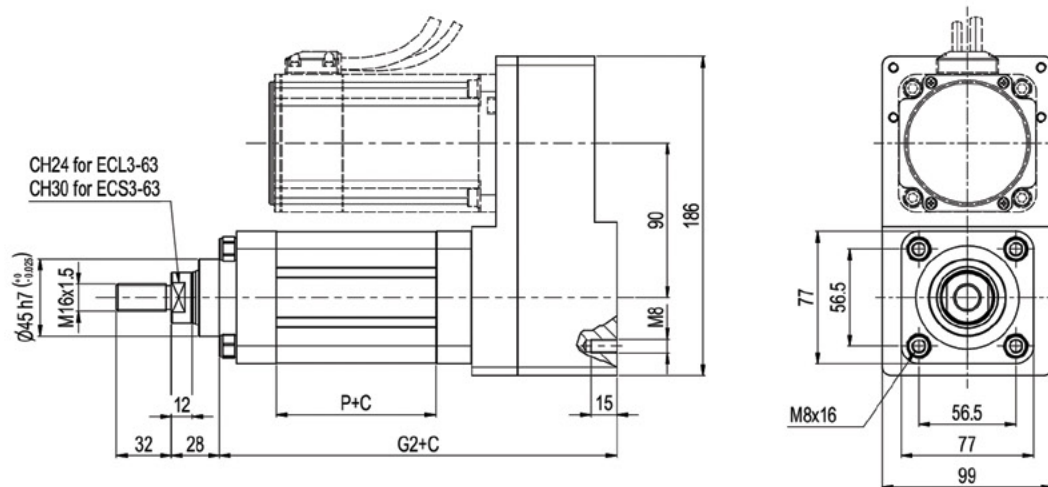
7.5 - EC*3-063 - Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|-------|-------|-------|
| ECL3 | 20x5 | 93.1 | 163.1 | 231.6 |
| | 20x10 | 93.1 | 163.1 | 231.6 |
| | 20x20 | 95.1 | 165.1 | 233.6 |
| ECS3 | 25x5 | 119.1 | 194.1 | 262.6 |
| | 25x10 | 119.1 | 194.1 | 262.6 |
| | 25x25 | 119.1 | 194.1 | 262.6 |
| | Lead screw | P | G1 | G2 |
| ECL3 | 20x4 | 93 | 163 | 231.5 |

C = Stroke value
V = Depending on motor dimensions

8 - EC*3-080

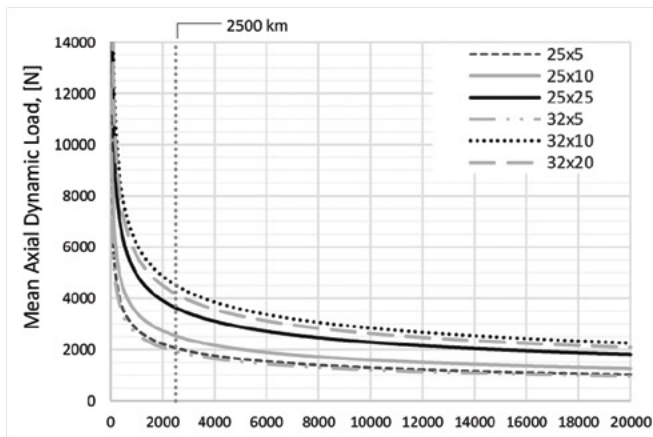
8.1 - Technical characteristics

| | | | ECL3 | | | ECS3 | | |
|--------------|-------------------------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Mechanical | Rod diameter | mm | 45 | | | 45 | | |
| | Rod end | | M20x1.5 | | | M20x1.5 | | |
| Ball screw | Nominal diameter | mm | 25 | | | 32 | | |
| | Lead | mm | 5 | 10 | 25 | 5 | 10 | 20 |
| | Dynamic load | N | 16383 | 15990 | 16873 | 15333 | 28439 | 20895 |
| Force | Max force (torque) - in line | N(Nm) | 12100 (11.7) | 11500 (21.3) | 9900 (45) | 13100 (13) | 20900 (39.3) | 12300 (45) |
| | Max force (torque) - parallel | N(Nm) | 12100 (13) | 11500 (23.7) | 12700 (63.8) | 13100 (14.5) | 20900 (43.6) | 15990 (64.7) |
| | Force at 2500 km (*) | N | 2064 | 2538 | 3635 | 1932 | 4514 | 4179 |
| Speed | Maximum speed | rpm | 3200 | 3200 | 3200 | 2500 | 2500 | 2500 |
| | | mm/s | 267 | 533 | 1333 | 208 | 417 | 833 |
| Acceleration | Max acceleration | m/s ² | 3.2 | 6.4 | 15.9 | 3.2 | 6.4 | 12.7 |
| Efficiency | In line (parallel) | % | 82 (74) | 86 (77) | 88 (80) | 80 (72) | 85 (76) | 85 (76) |

(*) Dynamic axial force at 2500 km lifetime

8.2 - Service life

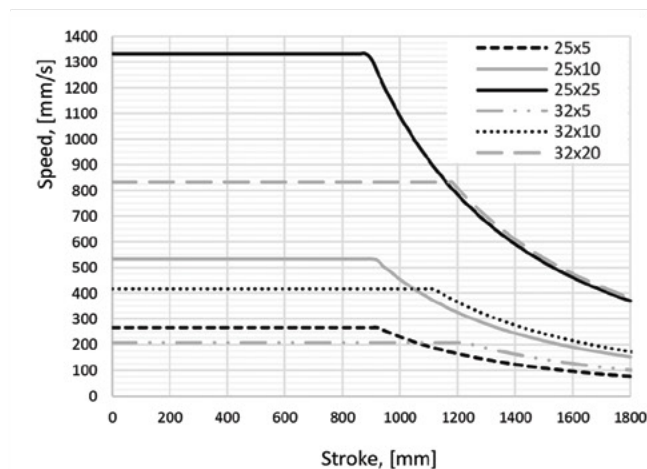
The service life depends on average dynamic axial load.



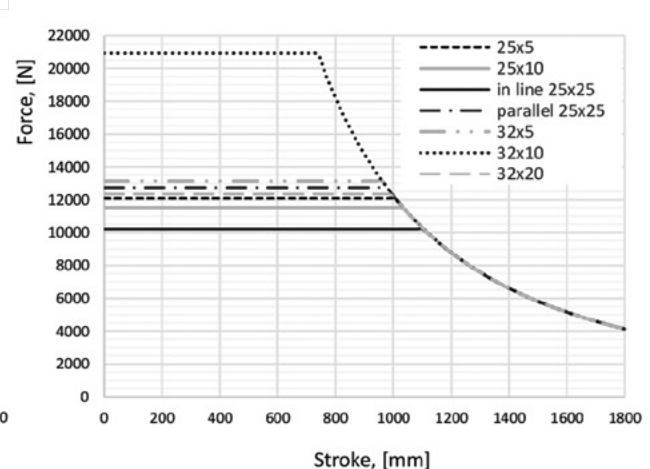
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

8.3 - Permissible speed



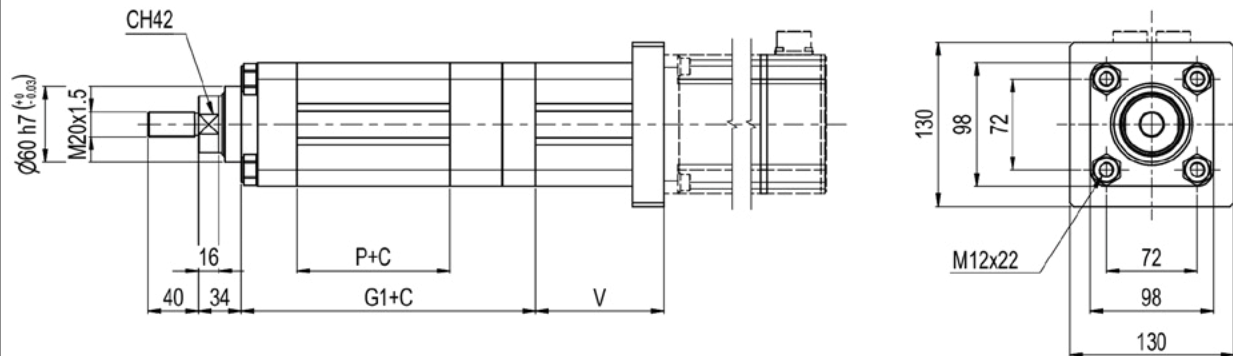
8.4 - Permissible axial force



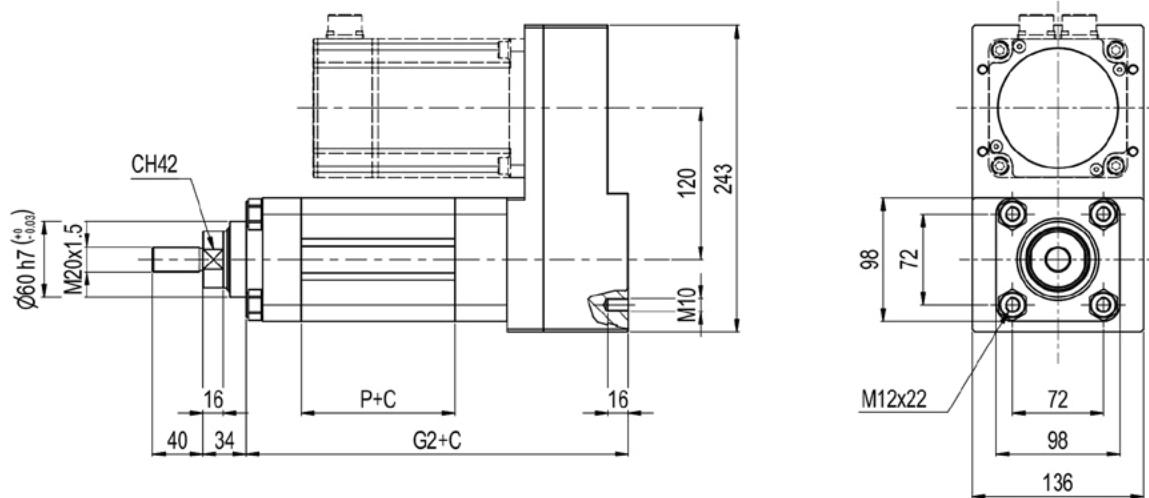
8.5 - EC*3-080 - Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|-------|-------|-------|
| ECL3 | 25x5 | 121.4 | 233.2 | 302.9 |
| | 25x10 | 121.4 | 233.2 | 302.9 |
| | 25x25 | 121.4 | 233.2 | 302.9 |
| ECS3 | 32x5 | 109.8 | 221.6 | 291.3 |
| | 32x10 | 140.8 | 252.6 | 322.3 |
| | 32x20 | 136.8 | 248.6 | 318.3 |

C = Stroke value
V = Depending on motor dimensions

9 - EC*3-100

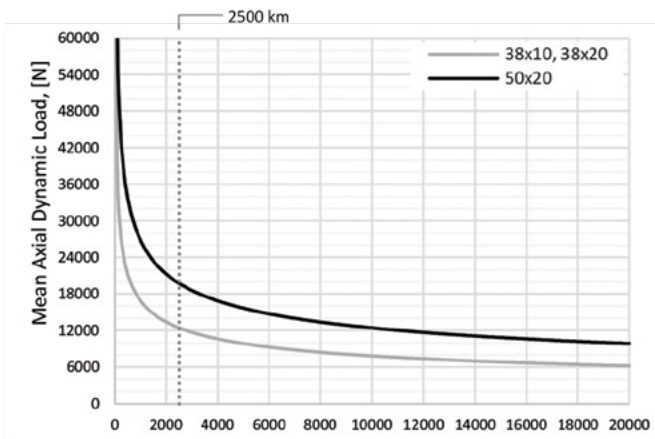
9.1 - Technical characteristics

| | | | ECL3 | | ECS3 |
|--------------|-------------------------------|------------------|---------------|---------------|---------------|
| Mechanical | Rod diameter | mm | 70 | | 70 |
| | Rod end | | M42x2 | | M42x2 |
| Ball screw | Nominal diameter | mm | 38 | 38 | 50 |
| | Lead | mm | 10 | 20 | 20 |
| | Dynamic load | N | 64150 | 61509 | 98718 |
| Force | Max force (torque) - in line | N (Nm) | 53500 (101.5) | 53500 (196.1) | 53500 (198.3) |
| | Max force (torque) - parallel | N (Nm) | 53500 (107.9) | 53500 (208.6) | 53500 (210.9) |
| | Force at 2500 km (*) | N | 12442 | 12302 | 19744 |
| Speed | Maximum speed | rpm | 2105 | 2105 | 1600 |
| | | mm/s | 351 | 702 | 533 |
| Acceleration | Max acceleration | m/s ² | 6.4 | 12.7 | 12.7 |
| Efficiency | In line (parallel) | % | 84 (79) | 87 (82) | 86 (81) |

(*) Dynamic axial force at 2500 km lifetime

9.2 - Service life

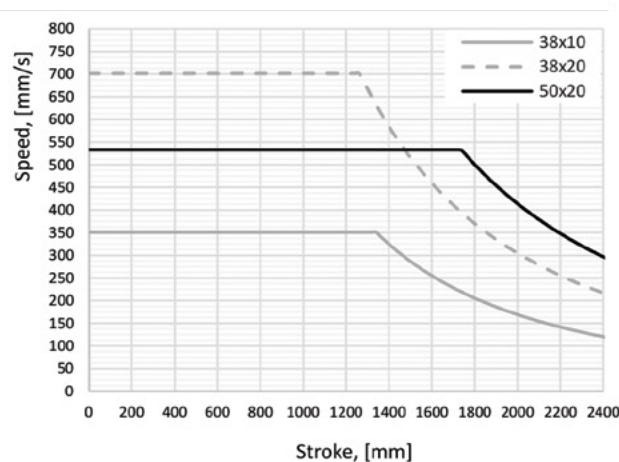
The service life depends on average dynamic axial load.



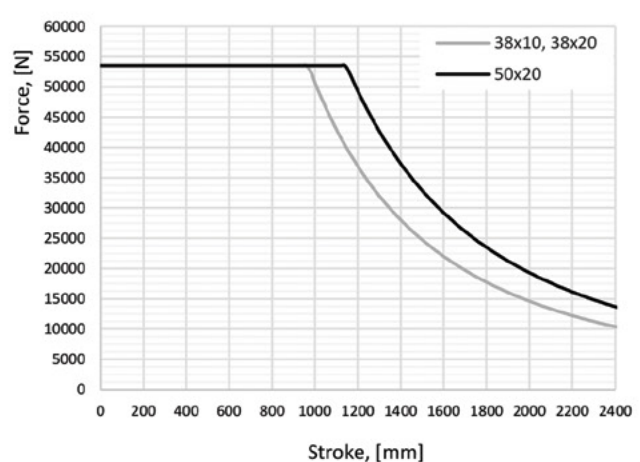
NOTES

- Service 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.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

9.3 - Permissible speed



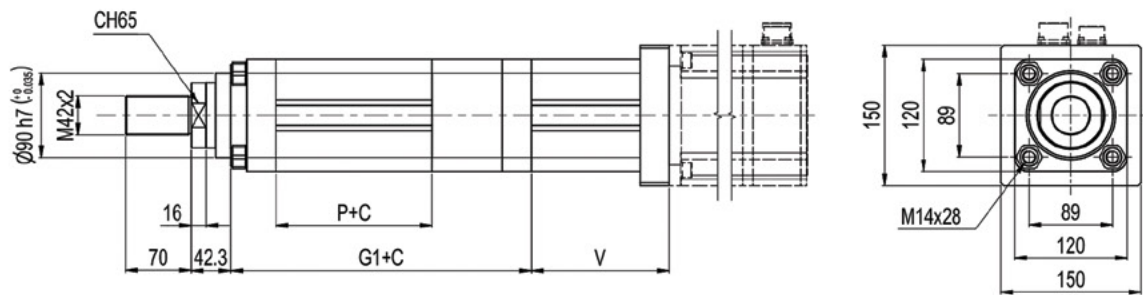
9.4 - Permissible axial force



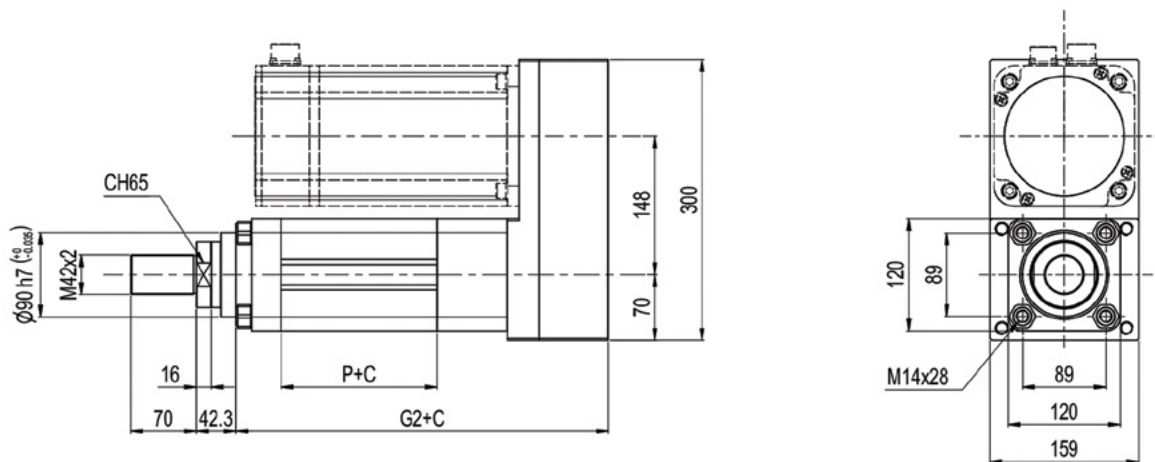
9.5 - EC*3-100 - Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|-------|-------|-------|
| ECL3 | 38x10 | 166.5 | 321.1 | 397.8 |
| | 38x20 | 166.5 | 321.1 | 397.8 |
| ECS3 | 50x20 | 219.5 | 374.1 | 450.8 |

C = Stroke value
V = Depending on motor dimensions

10 - EC*3-125

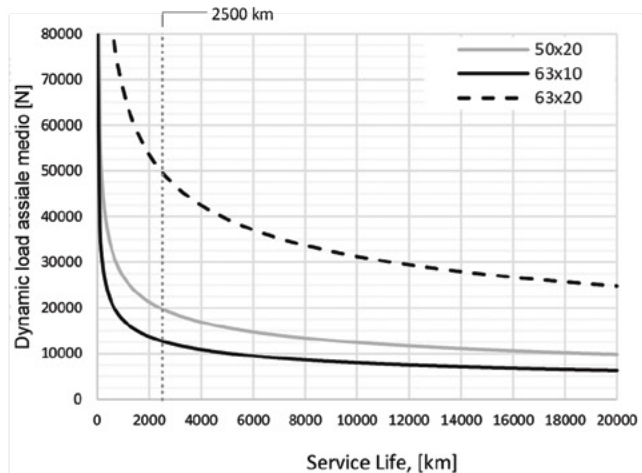
10.1 - Technical characteristics

| | | | ECL3 | ECS3 | |
|--------------|-------------------------------|------------------|---------------|----------------|----------------|
| Mechanical | Rod diameter | mm | 85 | 85 | |
| | Rod end | | M48x2 | M48x2 | |
| Ball screw | Nominal diameter | mm | 50 | 63 | |
| | Lead | mm | 20 | 10 | 20 |
| | Dynamic load | N | 98718 | 80148 | 248193 |
| Force | Max force (torque) - in line | N (Nm) | 88300 (327.1) | 103800 (205.4) | 123400 (462.7) |
| | Max force (torque) - parallel | N (Nm) | 88300 (348.0) | 103800 (218.5) | 123400 (492.2) |
| | Force at 2500 km (*) | N | 19744 | 12723 | 49639 |
| Speed | Maximum speed | rpm | 1600 | 1270 | 1270 |
| | | mm/s | 533 | 212 | 423 |
| Acceleration | Max acceleration | m/s ² | 12.7 | 6.4 | 12.7 |
| Efficiency | In line (parallel) | % | 86 (81) | 80 (76) | 85 (80) |

(*) Dynamic axial force at 2500 km lifetime

10.2 - Service life

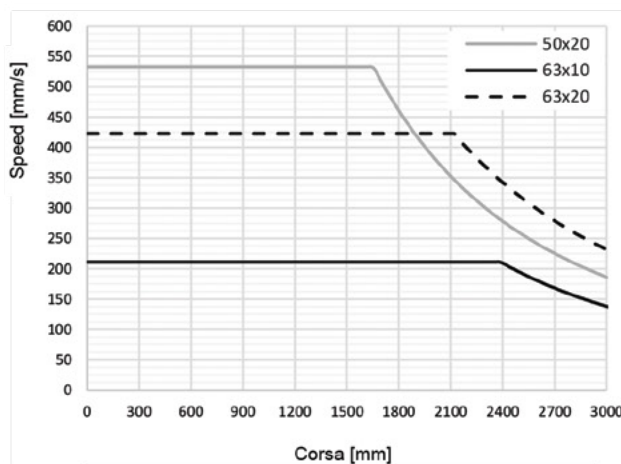
The service life depends on average dynamic axial load.



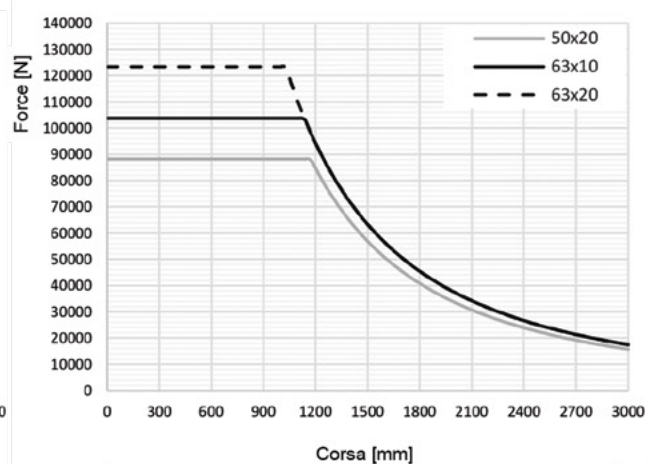
NOTES

- Service life is a statistical value and refers to 90% reliability.
- Correct working conditions: i.e. no lateral-load, no overload, right lubrication, no over-temperature, no short-stroke application.
- The permissible axial force is calculated considering a pushing condition with free rod end and fixed barrel constraint. Contact us for different loading applications and for any questions.

10.3 - Permissible speed



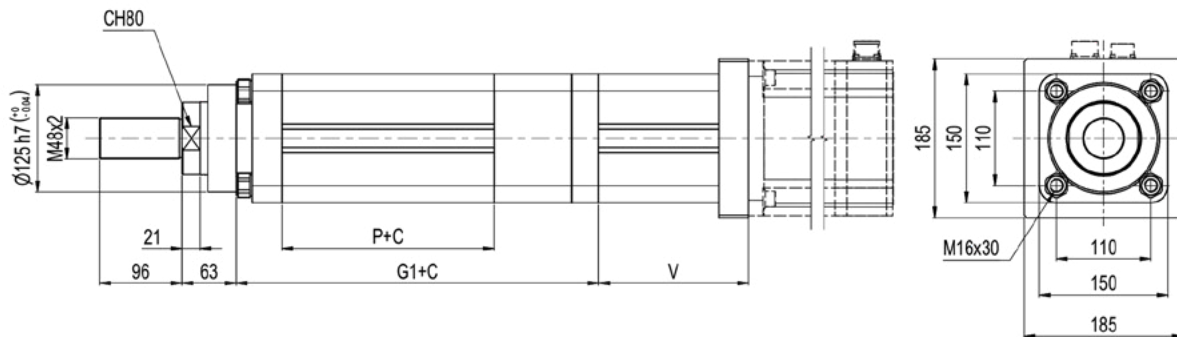
10.4 - Permissible axial force



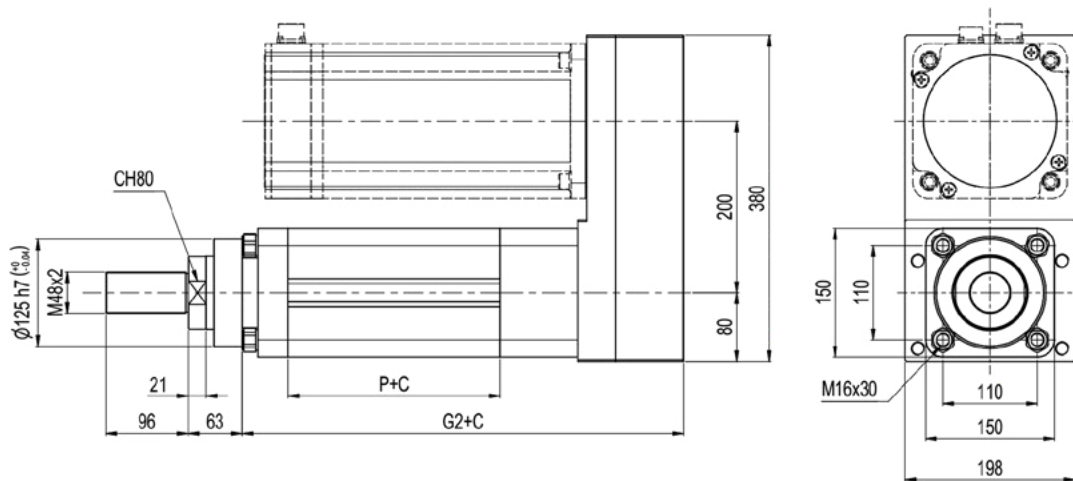
10.5 - EC*3-125 - Dimensions

dimensions in mm

In-line motor mounting



Parallel motor mounting



| | Ball screw | P | G1 | G2 |
|------|------------|-------|-------|-------|
| ECL3 | 50x20 | 247 | 422.5 | 514.2 |
| ECS3 | 63x10 | 177.2 | 352.7 | 444.4 |
| | 63x20 | 291 | 466.5 | 558.2 |

C = Stroke value
V = Depending on motor dimensions

11 - LEAD SCREW

This type of screw is only available for ECL3-032, ECL3-050 and ECL3- 063 electric cylinders.

11.1 - Technical characteristics

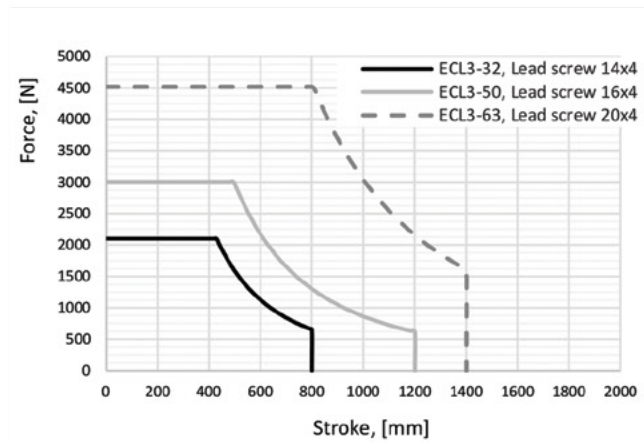
| | | | ECL3 | | |
|----------------|-------------------------------|--------|------------|------------|-------------|
| | | | 032 | 050 | 063 |
| Mechanical | Rod diameter | mm | 20 | 25 | 30 |
| | Rod end | | M10x1.25 | M16x1.5 | M16x1.5 |
| Lead screw | Nominal diameter | mm | 14 | 16 | 20 |
| | Lead | mm | 4 | 4 | 4 |
| Force / torque | Max force (torque) - in line | N (Nm) | 2104 (3.3) | 3008 (5.1) | 4520 (9.1) |
| | Max force (torque) - parallel | N (Nm) | 2104 (3.7) | 3008 (5.7) | 4520 (10.1) |
| Efficiency | In line (parallel) | % | 41 (37) | 37 (34) | 32 (29) |

In order that the electric cylinder with lead screw operates correctly, the following operating conditions must be met:

- no side loading
- no overload
- adequate lubrication
- no overheating
- no short stroke applications

The permissible force is calculated considering thrust condition with free rod-end and fixed barrel.

11.2 - Permissible axial force



12 - END STROKE SENSORS

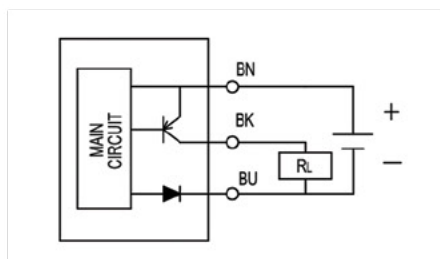
All ECL3 and ECS3 electric cylinders can be equipped with end stroke sensors, PNP or NPN type, with normally open or normally closed function. The sensors can be single or redundant, up to 4 sensors.

The end stroke sensors are housed in the side grooves of the cylinder. The sensor must then be manually arranged in the desired point.

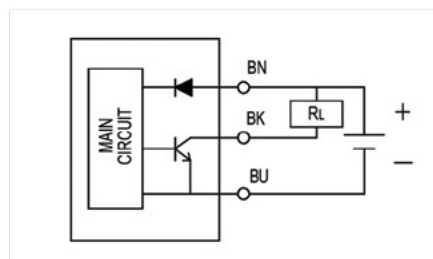
All models are equipped with signalling LEDs.

| TYPE | | 1 | 2 | 3 | 4 |
|-------------------------------|------|--|---------|-----------------|---------|
| Logic | | PNP | | NPN | |
| Sensor type | | NO | NC | NO | NC |
| Operating voltage | V DC | 5 + 30 | 10 + 28 | 5 + 30 | 10 + 28 |
| Switching current | mA | 200 | | | |
| Contact rating | W | 6 | 5.5 | 6 | 5.5 |
| Current consumption at 24V DC | mA | 6 | 10 | 6 | 10 |
| Max voltage drop | V | 0.5 (at 200 mA) | 1.5 | 0.5 (at 200 mA) | 1.5 |
| Leakage current | mA | 0.01 | 0.05 | 0.01 | 0.05 |
| Switching frequency | Hz | max 1000 | | | |
| Temperature | °C | -10 / +70 | | | |
| Cable | | Ø2.8 PUR - 26 AWG (0.15 mm ²) - 3 wire - 3 meters length | | | |

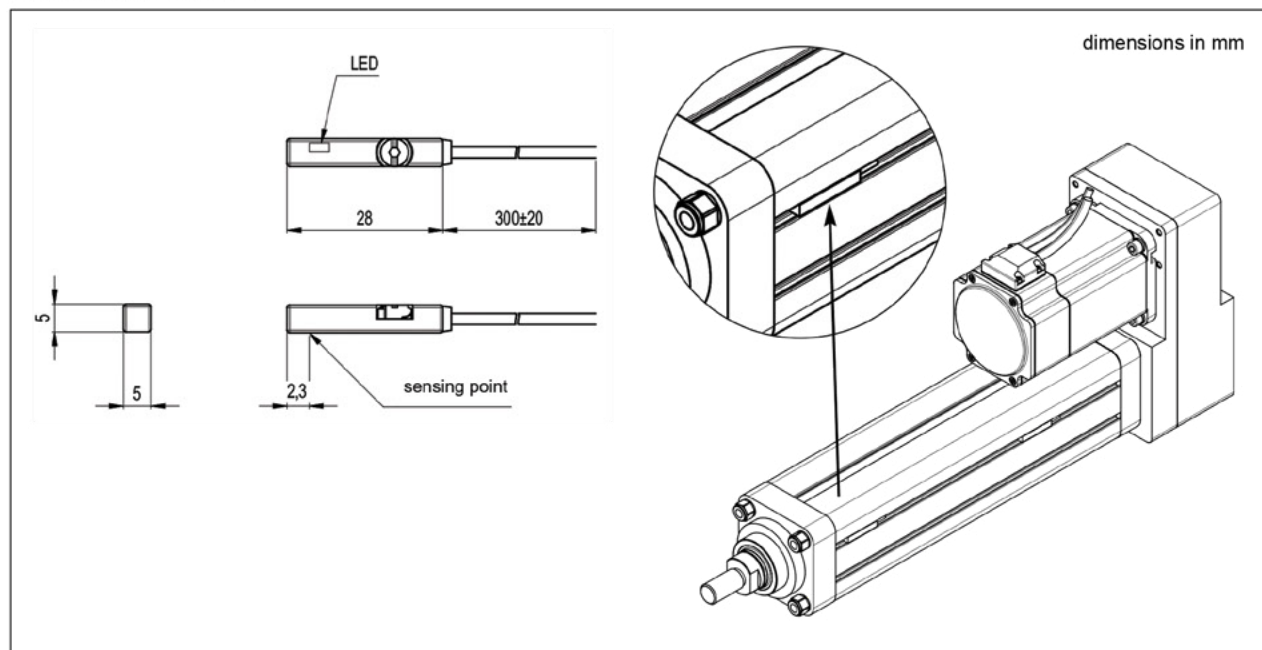
12.1 - Wiring diagram sensor type 1 and 2



sensor type 3 and 4



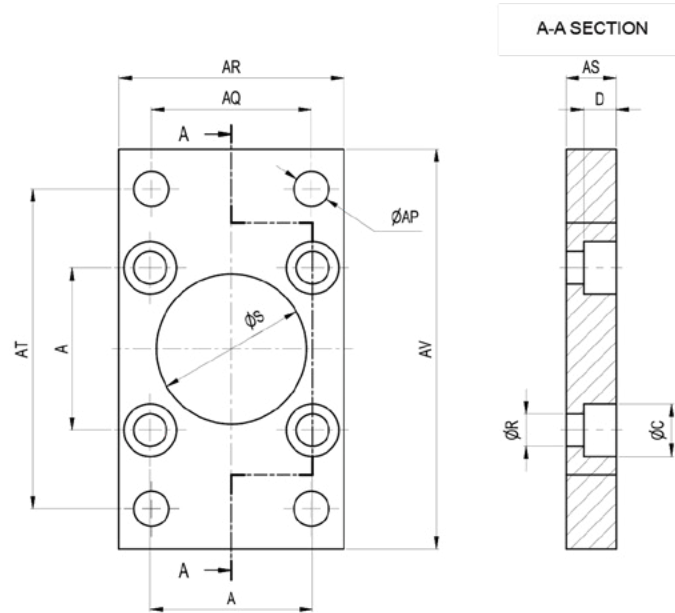
12.2 - Overall dimensions



13 - A MOUNTING TYPE

A FRONT FLANGE (MF1)

dimensions in mm

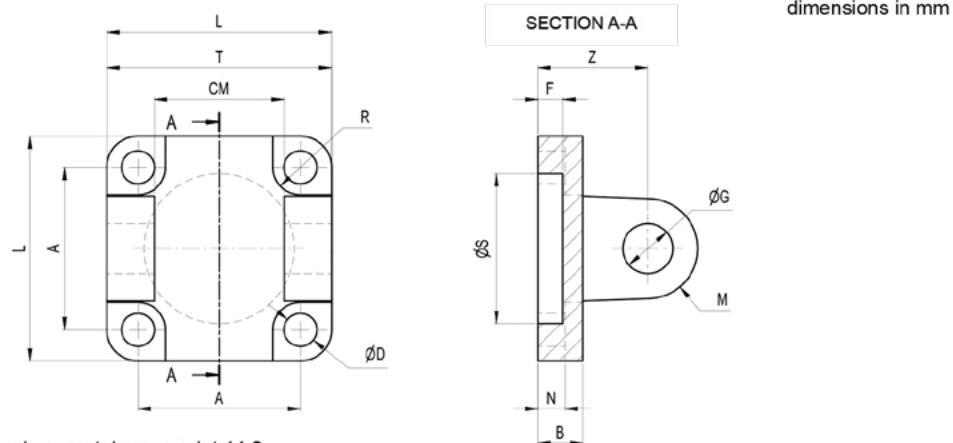


NOTE: Withstands the same loads as for cylinders

| Size | S H11 | A ± 0.2 | AP H13 | R | AS ± 0.2 | AR | AQ JS14 | AT JS14 | AV | C | D |
|---------|----------|----------------|-----------|------|-----------------|-----|------------|------------|-----|------|-----|
| FFP-032 | 30 | 32.5 | 7 | 6.5 | 10 | 45 | 32 | 64 | 80 | 10.5 | 6.5 |
| FFP-040 | 35 | 38 | 9 | 6.5 | 10 | 52 | 36 | 72 | 90 | 10.5 | 6.5 |
| FFP-050 | 40 | 46.5 | 9 | 8.5 | 12 | 65 | 45 | 90 | 110 | 13.5 | 8.5 |
| FFP-063 | 45 | 56.5 | 9 | 8.5 | 12 | 75 | 50 | 100 | 120 | 13.5 | 8.5 |
| FFP-080 | 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 |

14 - C MOUNTING TYPE

C REAR CLEVIS (MP2)

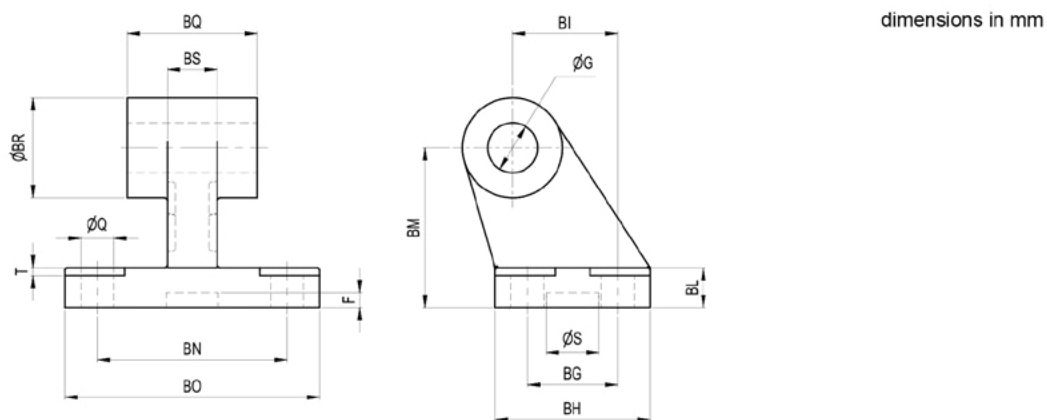


NOTE 1: The pin is to be ordered separately, see point 14.2

NOTE 2: The clevis withstands loads up to the value indicated in the table. For heavier loads please contact us.

| Size | G H9 | A ±0.2 | L | D H13 | R H13 | N ±0.5 | B | S H11 | F | Z ±0.2 | M | CM H14 | T h14 | Max load (N) |
|---------|---------|-----------|-----|----------|----------|-----------|----|----------|---|-----------|----|-----------|----------|-----------------|
| RPC-032 | 10 | 32.5 | 45 | 6.6 | 11 | 5.5 | 9 | 30 | 5 | 22 | 10 | 26 | 45 | 1760 |
| RPC-040 | 12 | 38 | 52 | 6.6 | 11 | 5.5 | 9 | 35 | 5 | 25 | 12 | 28 | 52 | 3230 |
| RPC-050 | 12 | 46.5 | 65 | 9 | 15 | 6.5 | 11 | 40 | 5 | 27 | 12 | 32 | 60 | 5150 |
| RPC-063 | 16 | 56.5 | 75 | 9 | 15 | 6.5 | 11 | 45 | 5 | 32 | 16 | 40 | 70 | 7010 |
| RPC-080 | 16 | 72 | 95 | 11 | 18 | 10 | 14 | 45 | 5 | 36 | 16 | 50 | 90 | 12060 |
| RPC-100 | 25 | 110 | 140 | 14 | 20 | 10 | 20 | 60 | 7 | 50 | 25 | 70 | 130 | 20220 |
| RPC-125 | 30 | 140 | 180 | 18 | 26 | 10 | 20 | 65 | 7 | 55 | 25 | 90 | 170 | 32730 |

14.1 - Rear Square Brackets

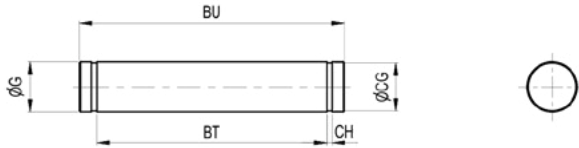


Please contact us for heavier loads.

| 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 | Max load (N) |
|---------|------|---------|----------|----------|------------|-----------|------------|----|------------|------------|-----------|-----------|-----------|----------|----------------|----------------|--------------------|-----------------|
| SBP-032 | 032 | 10 | 6.6 | 11 | 18 | 31 | 21 | 8 | 32 | 38 | 51 | 10 | 20 | 1.6 | 10.5 | 3 | 26 | 1440 |
| SBP-040 | 040 | 12 | 6.6 | 11 | 22 | 35 | 24 | 10 | 36 | 41 | 54 | 10 | 22 | 8.5 | 20 | 3 | 28 | 1960 |
| SBP-050 | 050 | 12 | 9 | 15 | 30 | 45 | 33 | 12 | 45 | 50 | 65 | 16 | 26 | 1.6 | 10.5 | 3 | 32 | 5520 |
| SBP-063 | 063 | 16 | 16 | 15 | 35 | 50 | 37 | 12 | 50 | 52 | 67 | 14 | 30 | 10.5 | 20 | 3 | 40 | 5110 |
| SBP-080 | 080 | 16 | 11 | 18 | 40 | 60 | 47 | 14 | 63 | 66 | 86 | 20 | 30 | 2.5 | 10.5 | 3 | 50 | 11310 |
| SBP-100 | 100 | 25 | 14 | 20 | 60 | 90 | 70 | 20 | 90 | 94 | 124 | 30 | 45 | 3.2 | 10.5 | 3 | 70 (*) | 18180 |
| SBP-125 | 125 | 30 | 14 | 20 | 88 | 126 | 97 | 25 | 115 | 118 | 156 | 36 | 63 | 4 | - | - | 90 (*) | 30920 |

(*) Tolerance value $\begin{matrix} -0.5 \\ -1.2 \end{matrix}$

14.2 - Pin for Rear Clevis



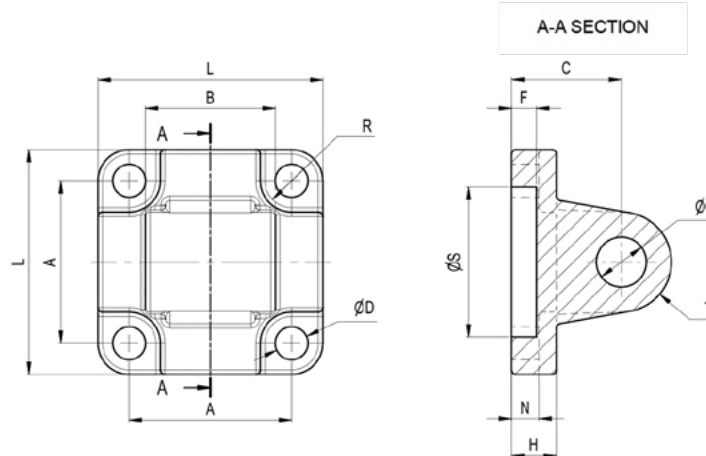
NOTE: It withstands the same loads as the related accessories.

| Type | Size | G _{e8} | BT _{+0.3 0} | CG | CH _{H13} | BU |
|---------|------|-----------------|--------------------------|------|-------------------|-----|
| PNP-032 | 032 | 10 | 46 | 9.6 | 1.1 | 53 |
| PNP-040 | 040 | 12 | 53 | 11.5 | 1.1 | 60 |
| PNP-050 | 050 | 12 | 61 | 11.5 | 1.1 | 68 |
| PNP-063 | 063 | 16 | 71 | 15.2 | 1.1 | 78 |
| PNP-080 | 080 | 16 | 91 | 15.2 | 1.1 | 98 |
| PNP-100 | 100 | 25 | 132 | 23.9 | 1.3 | 139 |
| PNP-125 | 125 | 30 | 171.5 | 28.6 | 1.6 | 178 |

15 - D MOUNTING TYPE

D REAR EYE (MP4)

dimensions in mm



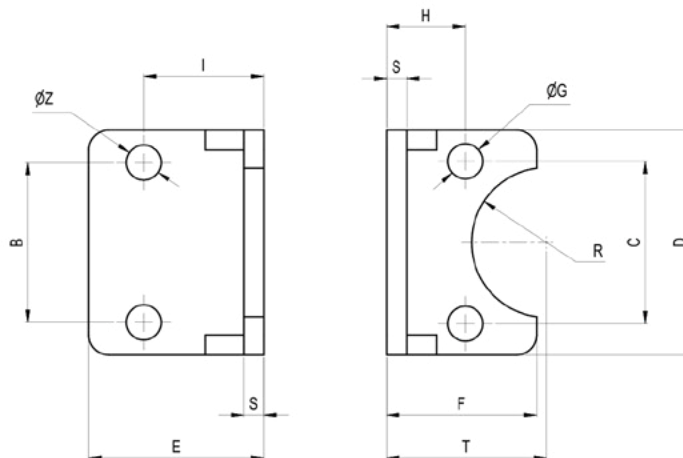
NOTE: Please contact us for heavier loads.

| 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} | Max load (N) |
|---------|-----------------|-------------------|-----|------------------|------------------|-------------------|----|------------------|---|-------------------|------------------|----------------------------|--------------|
| REP-032 | 10 | 32.5 | 45 | 6.6 | 11 | 5.5 | 9 | 30 | 5 | 22 | 10 | 26 | 2410 |
| REP-040 | 12 | 38 | 52 | 6.6 | 11 | 5.5 | 9 | 35 | 5 | 25 | 12 | 28 | 3770 |
| REP-050 | 12 | 46.5 | 65 | 9 | 15 | 6.5 | 11 | 40 | 5 | 27 | 12 | 32 | 5890 |
| REP-063 | 16 | 56.5 | 75 | 9 | 15 | 6.5 | 11 | 45 | 5 | 32 | 16 | 40 | 9550 |
| REP-080 | 16 | 72 | 95 | 11 | 18 | 10 | 14 | 45 | 5 | 36 | 16 | 50 | 15080 |
| REP-100 | 25 | 110 | 140 | 14 | 20 | 10 | 20 | 60 | 7 | 50 | 25 | 70 | 23560 |
| REP-125 | 30 | 140 | 180 | 18 | 26 | 10 | 26 | 65 | 7 | 55 | 25 | 90 | 36820 |

16 - G MOUNTING TYPE

G FEET (MS1)

dimensions in mm



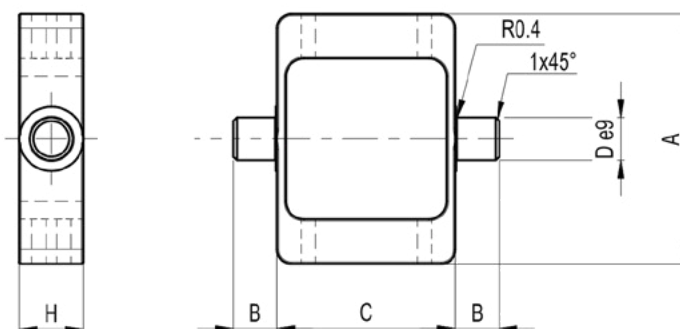
NOTE: Do not use to withstand load. Please contact us for a technical analysis if the application force should apply to this accessory.

| 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-032 | 032 | 32.5 | 32 | 45 | 35 | 30 | 7 | 15.75 | 24 | 4 | 32 | 15 | 11 | 7 |
| FTP-040 | 040 | 38 | 36 | 52 | 36 | 30 | 7 | 17 | 28 | 4 | 36 | 17.5 | 15 | 9 |
| FTP-050 | 050 | 46.5 | 45 | 65 | 47 | 36 | 9 | 21.75 | 32 | 5 | 45 | 20 | 16 | 9 |
| FTP-063 | 063 | 56.5 | 50 | 75 | 45 | 35 | 9 | 21.75 | 32 | 5 | 50 | 22.5 | 18 | 9 |
| FTP-080 | 080 | 72 | 063 | 95 | 55 | 47 | 12.5 | 27 | 41 | 6 | 63 | 30 | 17 | 12.5 |
| FTP-100 | 100 | 89 | 75 | 115 | 57 | 53 | 14.5 | 26.5 | 41 | 6 | 71 | 45 | 24 | 14.5 |
| FTP-125 | 125 | 110 | 90 | 140 | 70 | 70 | 16.5 | 35 | 45 | 8 | 90 | 62.5 | - | 16.5 |

17 - L MOUNTING TYPE

L INTERMEDIATE TRUNNIONS (MT4)

dimensions in mm

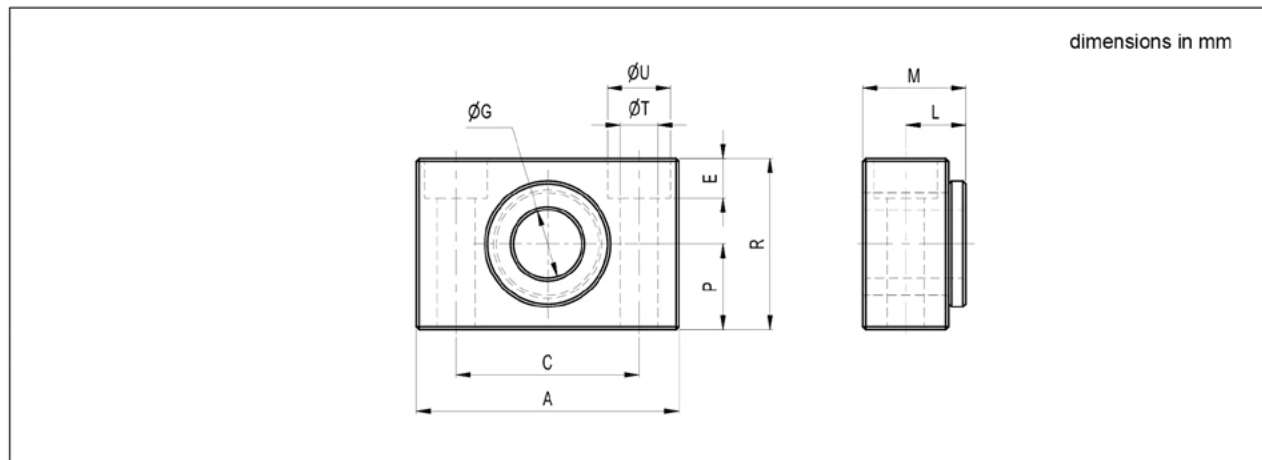


NOTE 1: Side fixing brackets are to be ordered separately, see point 17.1

| Type | Size | A | B | C | D | H |
|---------|------|-----|----|-----|----|----|
| TRP-032 | 032 | 70 | 12 | 50 | 12 | 18 |
| TRP-040 | 040 | 78 | 16 | 62 | 16 | 20 |
| TRP-050 | 050 | 91 | 16 | 74 | 16 | 20 |
| TRP-063 | 063 | 94 | 20 | 88 | 20 | 25 |
| TRP-080 | 080 | 130 | 20 | 109 | 20 | 25 |
| TRP-100 | 100 | 145 | 25 | 130 | 25 | 30 |
| TRP-125 | 125 | 154 | 25 | 155 | 25 | 32 |

NOTE 2: Do not use to withstand load. Please contact us for a technical analysis if the application force should apply to this accessory.

17.1 - Side Fixing Brackets

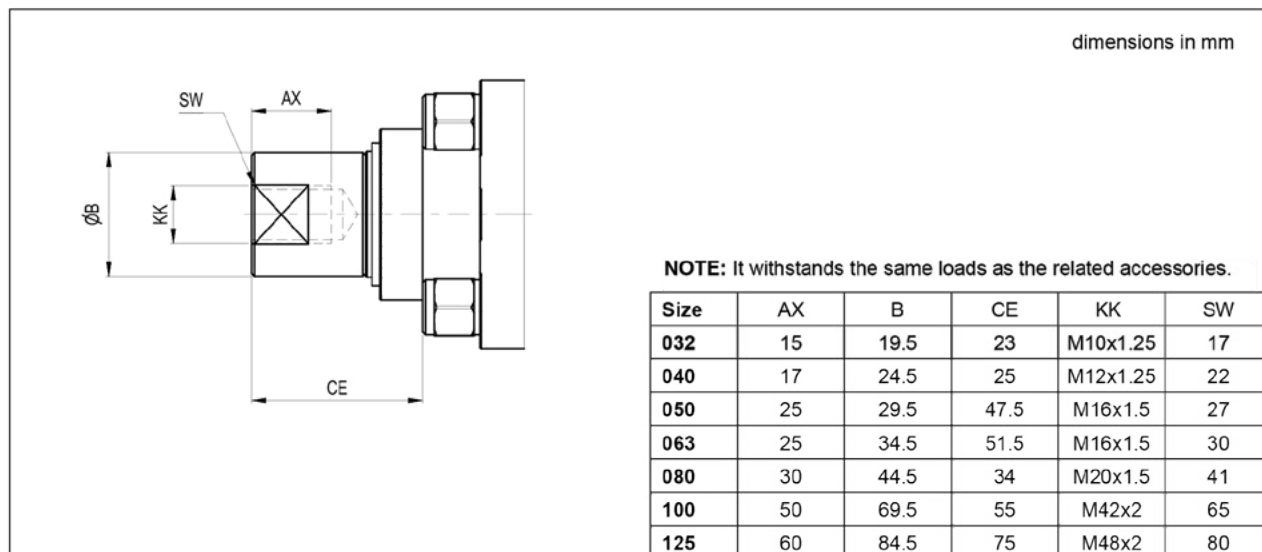


NOTE: Do not use to withstand load.
Please contact us for a technical analysis if the application force should apply to this accessory.

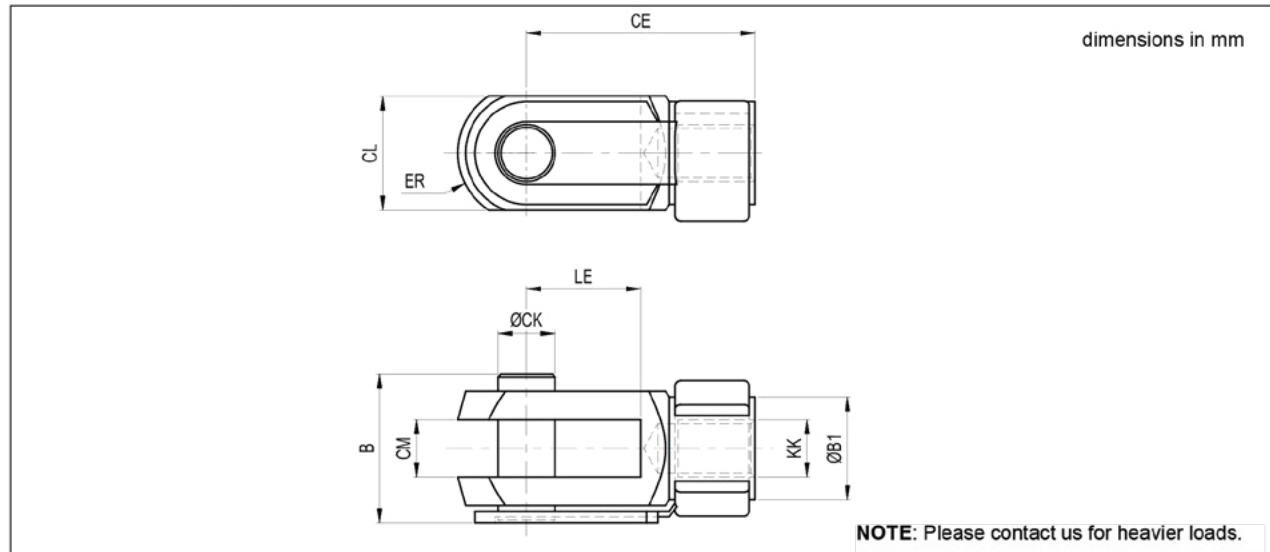
| Type | Size | G F7 | A | M | R | P ±0.1 | C ±0.2 | L | U H13 | T H13 | E ±0.5 |
|--------|------|---------|----|------|----|-----------|-----------|------|----------|----------|-----------|
| BRP-12 | 032 | 12 | 46 | 18 | 30 | 15 | 32 | 10.5 | 11 | 6.6 | 7 |
| BRP-16 | 040 | 16 | 55 | 21 | 36 | 18 | 36 | 12 | 15 | 9 | 9 |
| | 050 | 16 | 55 | 21 | 36 | 18 | 36 | 12 | 15 | 9 | 9 |
| BRP-20 | 063 | 20 | 65 | 23 | 40 | 20 | 42 | 13 | 18 | 11 | 11 |
| | 080 | 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 |

18 - OVERALL MOUNTING DIMENSIONS FOR ROD-END

18.1 - Female Thread

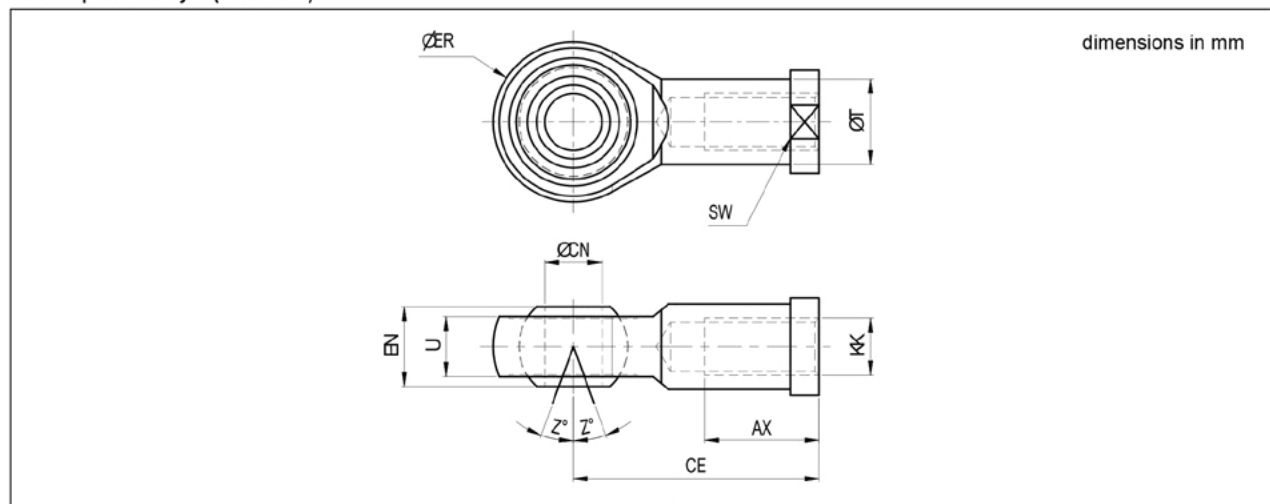


18.2 - Clevis (ISO 8140)



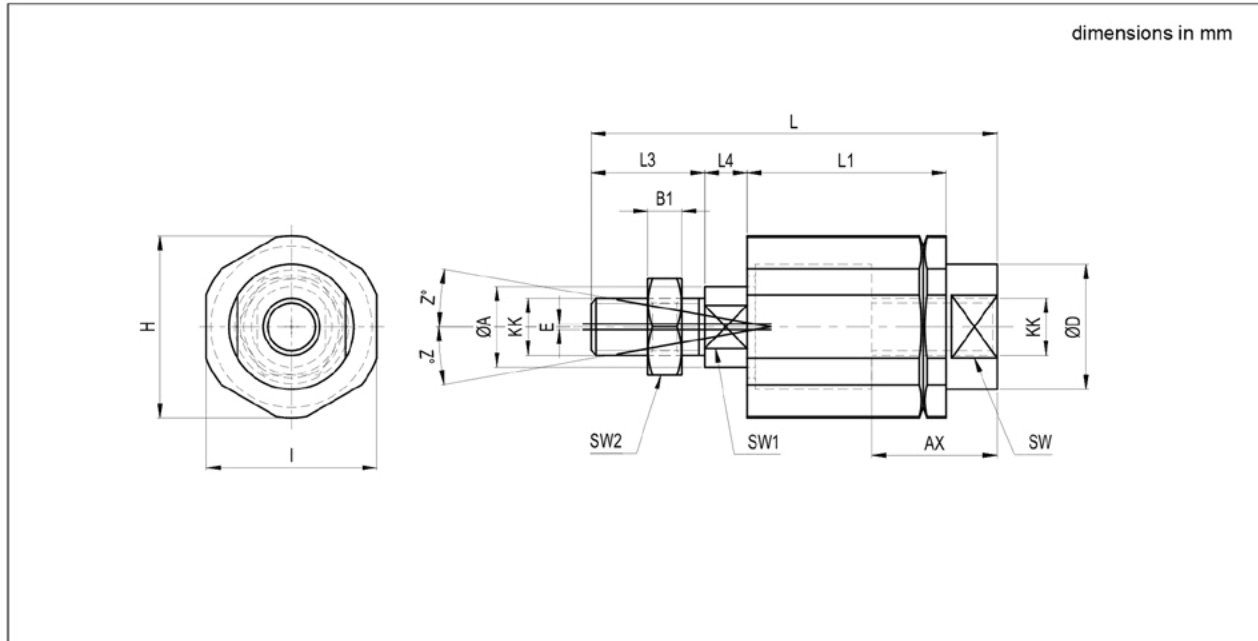
| Type | Size | KK | CK | LE | CM | CL | ER | CE | B | B1 | Max load (N) |
|---------|------|----------|----|----|----|----|----|-----|-------|----|--------------|
| CLP-M10 | 032 | M10x1.25 | 10 | 20 | 10 | 20 | 12 | 40 | 26 | 18 | 5000 |
| CLP-M12 | 040 | M12x1.25 | 12 | 24 | 12 | 24 | 14 | 48 | 32 | 20 | 7200 |
| CLP-M16 | 050 | M16x1.5 | 16 | 32 | 16 | 32 | 19 | 64 | 40 | 26 | 12800 |
| CLP-M16 | 063 | M16x1.5 | 16 | 32 | 16 | 32 | 19 | 64 | 40 | 26 | 12800 |
| CLP-M20 | 080 | M20x1.5 | 20 | 40 | 20 | 40 | 25 | 80 | 48 | 34 | 20000 |
| CLP-M42 | 100 | M42x2 | 40 | 84 | 40 | 85 | 64 | 168 | 104.3 | 70 | 88750 |
| CLP-M48 | 125 | M48x2 | 50 | 96 | 50 | 96 | 73 | 192 | 117.3 | 82 | 102500 |

18.3 - Spherical Eye (ISO 8139)



| Type | Size | KK | CN | U | EN | ER | AX | CE | T | Z | SW | Max load (N) |
|---------|------|----------|----|------|----|-----|----|-----|------|-----|----|--------------|
| SPP-M10 | 032 | M10x1.25 | 10 | 10.5 | 14 | 28 | 20 | 43 | 15 | 6.5 | 17 | 3500 |
| SPP-M12 | 040 | M12x1.25 | 12 | 12 | 16 | 32 | 22 | 50 | 17.5 | 6.5 | 19 | 4750 |
| SPP-M16 | 050 | M16x1.5 | 16 | 15 | 21 | 42 | 28 | 64 | 22 | 7.5 | 22 | 12000 |
| SPP-M16 | 063 | M16x1.5 | 16 | 15 | 21 | 42 | 28 | 64 | 22 | 7.5 | 22 | 12000 |
| SPP-M20 | 080 | M20x1.5 | 20 | 18 | 25 | 50 | 33 | 77 | 27.5 | 7 | 30 | 13000 |
| SPP-M42 | 100 | M42x2 | 40 | 33 | 49 | 91 | 60 | 142 | 53 | 8 | 55 | 65000 |
| SPP-M48 | 125 | M48x2 | 50 | 45 | 60 | 117 | 65 | 162 | 65 | 7 | 65 | 77000 |

18.4 - Self-centering Coupler



dimensions in mm

NOTE: Self-centering couplers are not available for sizes 100 and 125. Please contact us for heavier loads.

| Type | Size | KK | L | L1 | L3 | L4 | A | D | H | I | SW | SW1 | SW2 | B1 | AX | Z | E | Max load (N) |
|---------|------|----------|------|----|----|-----|----|----|----|----|----|-----|-----|----|----|---|---|--------------|
| COP-M10 | 032 | M10x1.25 | 71.5 | 35 | 20 | 7.5 | 14 | 22 | 32 | 30 | 19 | 12 | 17 | 5 | 22 | 4 | 2 | 1250 |
| COP-M12 | 040 | M12x1.25 | 75.5 | 35 | 24 | 7.5 | 14 | 22 | 32 | 30 | 19 | 12 | 19 | 6 | 22 | 4 | 2 | 1250 |
| COP-M16 | 050 | M16x1.5 | 104 | 53 | 32 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 24 | 8 | 30 | 3 | 2 | 2500 |
| | 063 | M16x1.5 | 104 | 53 | 32 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 24 | 8 | 30 | 3 | 2 | 2500 |
| COP-M20 | 080 | M20x1.5 | 119 | 53 | 40 | 10 | 22 | 32 | 45 | 41 | 27 | 20 | 30 | 10 | 37 | 3 | 2 | 2500 |



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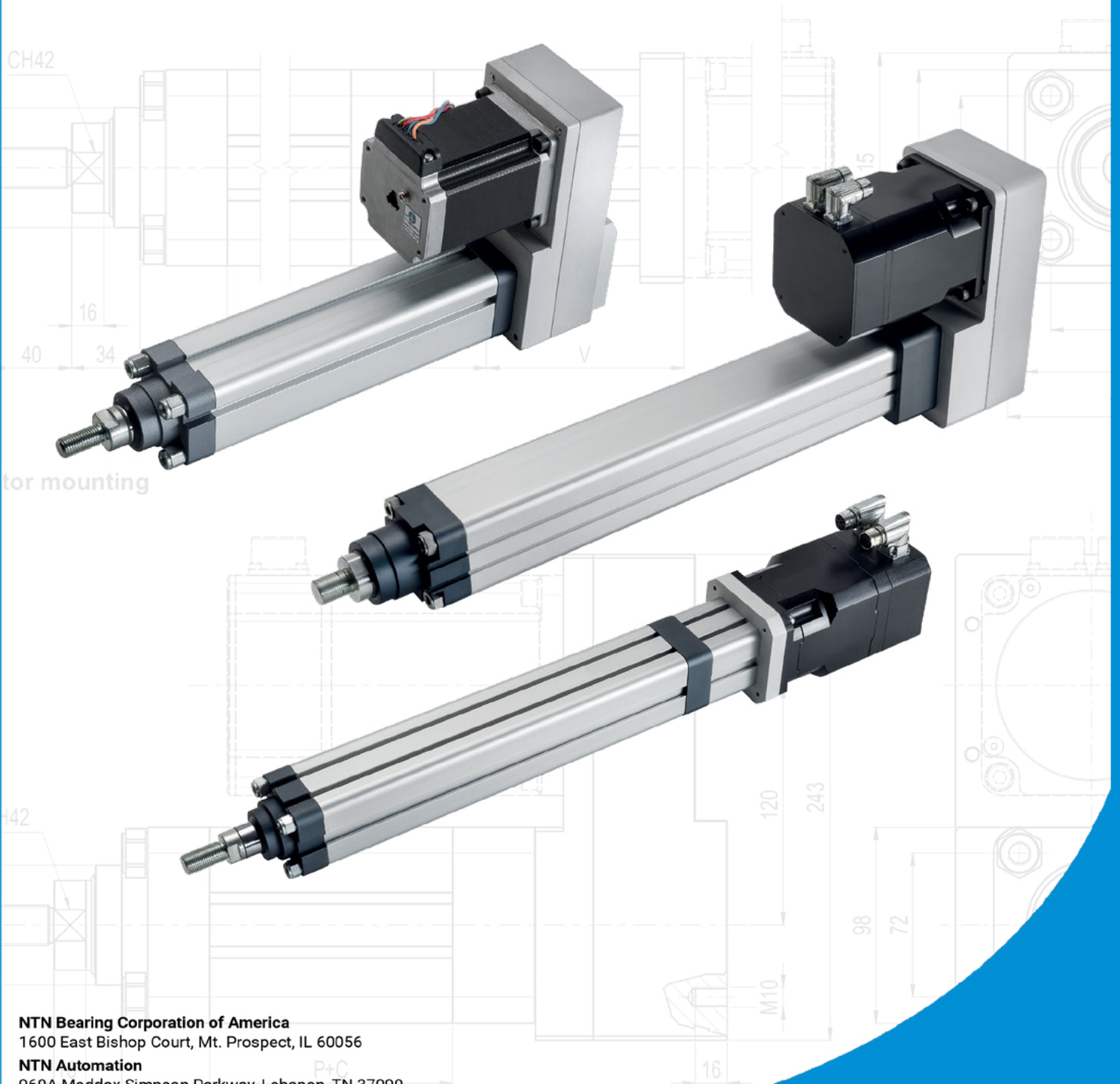
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