ROLLCO

TECHNICAL INFORMATION
LINEAR UNITS CT & MT

Index

Product overview

This extensive range of linear units are characterized by compact dimensions allowing high performance features such as high speed, good accuracy and repeatability. They can easily be combined to multi-axis systems. Excellent price-/performance ratio and quick delivery time are ensured.

A compact, precision-extruded aluminum profile from AL 6063, with zero-backlash rail guide systems, allows high load capacities and an optimal sequence for the movement of larger masses at high speed.

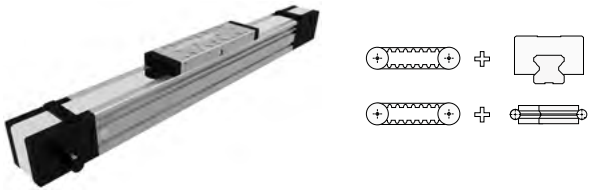
Different carriage lengths with lubrication ports allows for easy re-lubrication and allows the possibility to attach additional accessories.

The aluminum profile includes T-slots for fixing the linear unit and for attaching sensors and switches. Also, a Reed switch can be used. Various adaptation options, for attaching (or redirecting), for motors or gearboxes are also available.

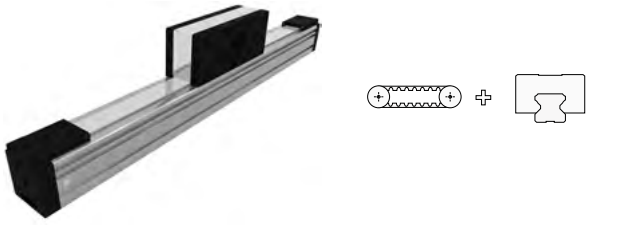
The aluminium profiles are manufactured according to the medium EN 12020-2 standard.

- Straightness = 0.35 mm/m
- Max. torsion = 0.35 mm/m
- Angular torsion = 0.2 mm/40 mm
- Parallelism = 0.2 mm

MTJ & MRJ

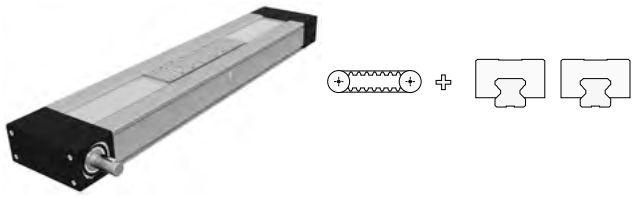


MTJZ



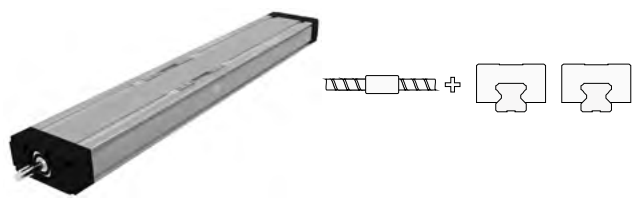
MTV

CTJ



MTJ ECO

CTV



Multi axis systems

We offer all neccessary fittings including brackets, clamping fixtures and adapter plates in order to build multi-axis systems. Beside standard elements we supply also custom fixing and connection elements manufactured in our workshop.

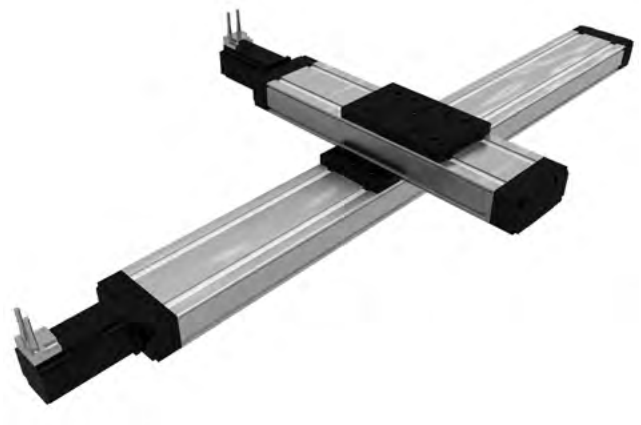
1

2

3

4

5



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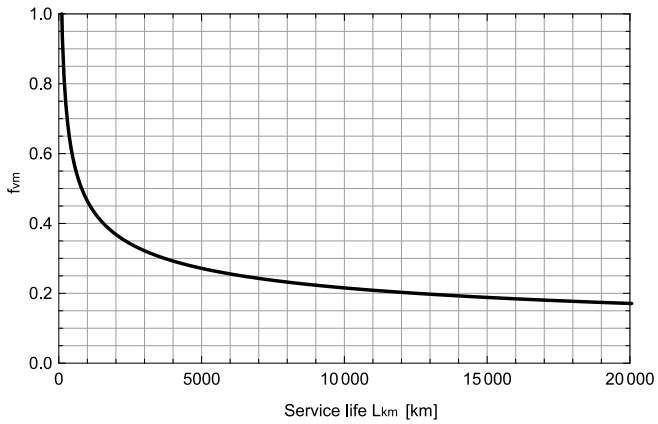
10

Service life - linear guiding

Mean load comparison factor fvm as a function of service life Lkm

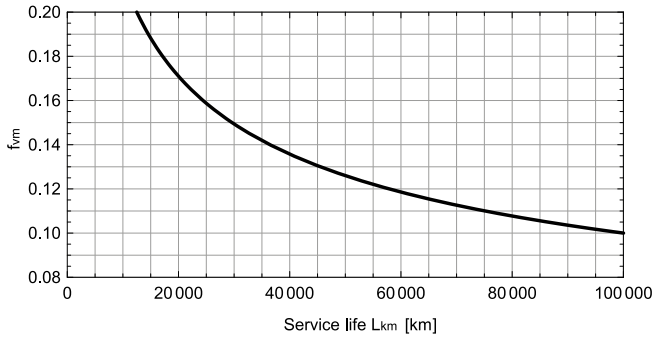


Diagrams and equations are valid for:

- MTJ series
- MTV series
- MTJ ECO series
- MTJZ series
- CTJ series
- CTVseries

Presented diagrams are showing teoretically determined service life of the linear guiding when mean load comparison factor fvm is taken into consideration.

Detailed view



Load comparison factor fv

$$f_v = \frac{|F_y|}{C_{dyn}} + \frac{|F_z|}{C_{dyn}} + \frac{|M_x|}{M_{x\,dyn}} + \frac{|M_y|}{M_{y\,dyn}} + \frac{|M_z|}{M_{z\,dyn}}$$

fv	Load comparison factor	
Cdyn	Dynamic load capacity	N
Mx dyn	Dynamic moment capacity in x-axis	Nm
My dyn	Dynamic moment capacity in y-axis	Nm
Mz dyn	Dynamic moment capacity in z-axis	Nm
Fy	Applied force in y direction	N
Fz	Applied force in z direction	N
Mx	Applied moment in x-axis	Nm
My	Applied moment in y-axis	Nm
Mz	Applied moment in z-axis	Nm

Service life calculation

$$L_{km} = \left(\frac{1}{f_{vm}}\right)^3 \cdot 10^2$$

Lkm Service life (km)

Safety factor fs

$$f_s = \frac{1}{f_{vm}}$$

fs Safety factor

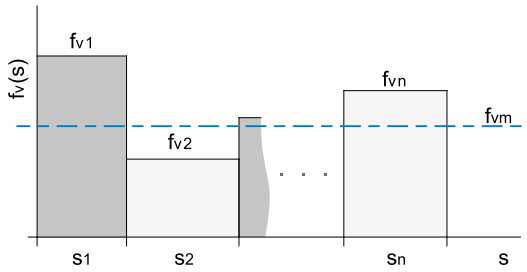
The safety factor depends on the application and its requested safety. We recommend a minimum safety factor fs = 5. 0.

Mean load comparison factor fvm calculation

$$fvm = \sqrt[3]{\frac{fv1^3 \times s1 + fv2^3 \times s2 + \ldots + fvn^3 \times sn}{s1 + s2 + \ldots + sn}}$$

fvm	Mean load comparison factor
fv i	i-th load comparison factor of a given loading regime fv (s), i ∈ {1,2, … ,n}
si	i-th travel path of a given loading regime fv (s), i ∈ {1,2, … ,n}

Loading regime fv (s)



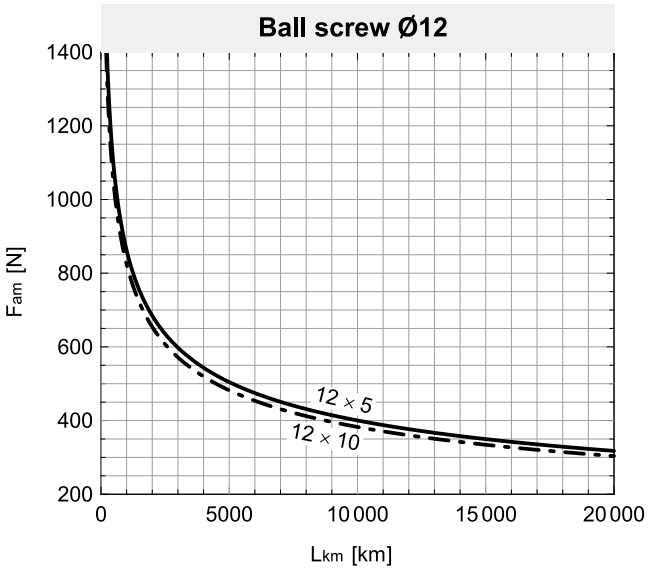
Permissible load factor fp - linear guiding

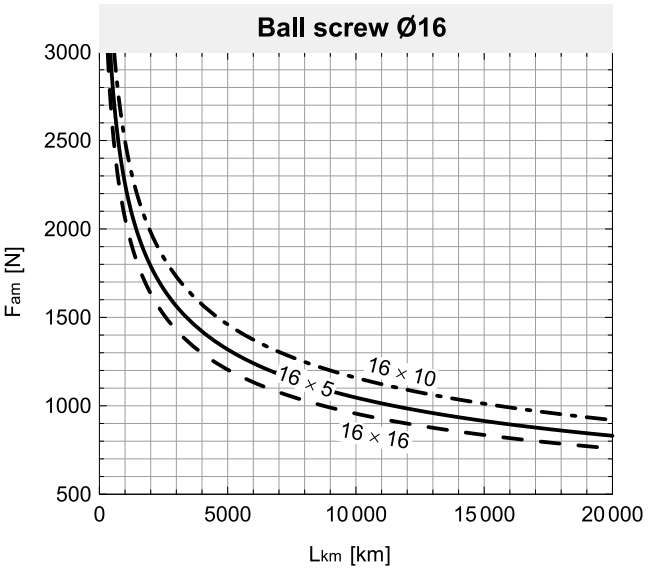
$$fp = \frac{|Fy|}{Fpy} + \frac{|Fz|}{Fpz} + \frac{|Mx|}{Mpx} + \frac{|My|}{Mpy} + \frac{|Mz|}{Mpz} \leq 1$$

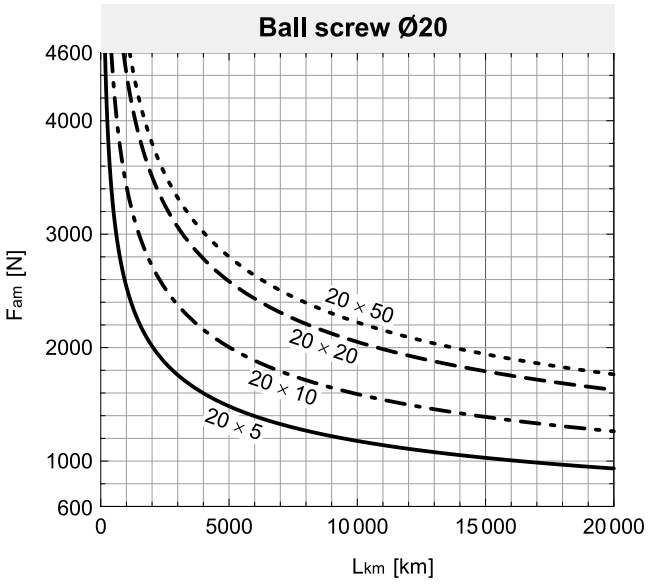
fp	Permissible load factor	
Fpy	Max. permissible force in y-axis	N
Fpz	Max. permissible force in z-axis	N
Mpx	Max. permissible moment in x-axis	Nm
Mpy	Max. permissible moment in y-axis	Nm
Mpz	Max. permissible moment in z-axis	Nm

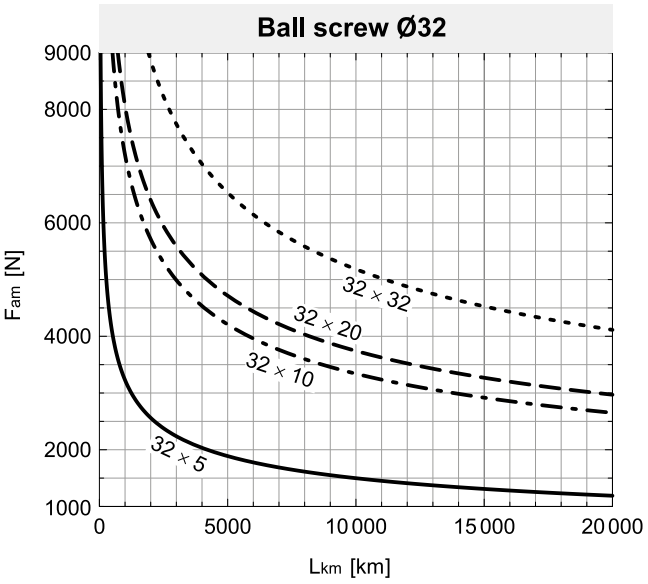
Service life - ball screw

Applied mean axial force Fam as a function of service life Lkm.







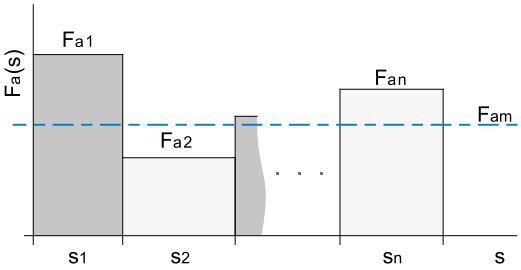


Mean axial force Fam calculation

$$Fam = \sqrt[3]{\frac{|Fa1|^3 \times s1 + |Fa2|^3 \times s2 + ... + |Fan|^\beta \times sn}{s1 + s2 + ... + sn}}$$

Fam Mean axial force
Fa i i-th axial force of a given loading regime Fa (s), i ∈ {1,2, ... ,n}
si i-th travel path of a given loading regime Fa (s), i ∈ {1,2, ... ,n}

Loading regime Fa (s)



Diagrams presented above are showing teoretically determined service life of the ball screw when mean axial force Fam is taken info consideration.

Diagrams and equations are valid for:
- MTV series
- CTV series

Linear Unit MRJ & MTJ

MTJ - 65 - 700 - L - 2 - 250 - 10 - R - 1

Series
MRJ
MTJ

Size
40
65
80
110

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)

Carriage version
S: Short (only for MTJ series)
L: Long
Leave blank for MRJ 40, MTJ 40

Number of carriages
The stated number specifies the number of carriages on one Linear unit (up to 5 carriages)
Leave blank for the case of one carriage

Distance between two carriages (mm)
Leave blank for the case of one carriage

Type of drive pulley
0: Pulley with through hole
1: Pulley with journal (with keyway)
10: Pulley with journal (without keyway)
2: Pulley with journal on both sides (with keyway)
20: Pulley with journal on both sides (without keyway)
3: Without drive unit

Drive journal position
L: Journal on left side
R: Journal on right side
Leave blank for type of drive pulley 0, 2, 20 and 3

Protection cover
0: In profile groove guided Polyurethane toothed belt
1: Corrosion-resistant protection strip

Linear Unit MTV

MTV - 65 - 1610 - ISO7 - 0 - 650 - 2 - 250 - 2SA - 2LR

Series
MTV

Size
40
65
80
110

Ball screw
MTV 40: Ø12x5, Ø12x10
MTV 65: Ø16x5, Ø16x10, Ø16x16
MTV 80: Ø20x5, Ø20x10, Ø20x20, Ø20x50
MTV 110: Ø32x5, Ø32x10, Ø32x20, Ø32x32

Ball screw tolerance
ISO7 (Standard)
ISO5

Ball screw journal*
0: Without keyway
1: With keyway

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)
2LR version: Absolute stroke of one carriage.

Number of carriages**
The stated number specifies the number of carriages on one Linear unit (up to 5 carriages)
Leave blank for the case of one carriage

Distance between two carriages (mm)
Leave blank for the case of one carriage

Number of screw supports n_{SA}
(Only even integer number - 2, 4, 6, 8, 10SA) - for MTV 65 max. 4SA is available.)
Leave blank: Without SA

2LR version***
Both right and left ball screws are used.
Leave blank: Standard version

* MTV 40 only available without keyway

** Connection between the carriages must be provided by the customer

*** Available for: MTV 65: 16x5, 16x10
MTV 80: 20x5

Linear Unit MTJ ECO

MTJ - 40 - ECO - 700 - L - 2 - 300 - 10 - R

Series
MTJ

Size
40

Type
ECO

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)

Carriage version
S: Short
L: Long

Number of carriages
The stated number specifies the number of carriages on one Linear unit (up to 5 carriages)
Leave blank for the case of one carriage

Distance between two carriages (mm)
Leave blank for the case of one carriage

Type of drive pulley
0: Pulley with through hole
1: Pulley with journal (with keyway)
10: Pulley with journal (without keyway)
2: Pulley with journal on both sides (with keyway)
20: Pulley with journal on both sides (without keyway)
3: Without drive unit

Drive journal position
L: Journal on left side
R: Journal on right side
Leave blank for type of drive pulley 0, 2, 20 and 3

Linear Unit MTJZ

MTJZ - 65 - 700 - 10 - 0 - 2 - 350

Series
MTJZ

Size
40
65
80
110

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)

Type of drive pulley*
0: Pulley with through hole
1: Pulley with journal (with keyway)
10: Pulley with journal (without keyway)
2: Pulley with journal on both sides (with keyway)
20: Pulley with journal on both sides (without keyway)

Clamping element**
0: Without
1: With (available only for MTJZ 110)

Number of drive blocks
The stated number specifies the number of drive blocks on one Linear unit (up to 5 drive blocks)
Leave blank for the case of one drive block

Distance between two drive blocks (mm)
Leave blank for the case of one drive block

* MTJZ 110 only available with drive pulley with through hole

** Only as emergency break

Linear Unit CTJ

CTJ - 145 - 1000 - L - 2 - 300 - 10 - R - 1

Series
CTJ

Size
90
110
145
200

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)

Carriage version
S: Short
L: Long

Number of carriages
The stated number specifies the number of carriages on one Linear unit (up to 5 carriages)
Leave blank for the case of one carriage

Distance between two carriages (mm)
Leave blank for the case of one carriage

Type of drive pulley
1: Pulley with journal (with keyway)
10: Pulley with journal (without keyway)
2: Pulley with journal on both sides (with keyway)
20: Pulley with journal on both sides (without keyway)
3: Without drive unit

Drive journal position*
L: Journal on left side
R: Journal on right side
Leave blank for type of drive pulley 2, 20 and 3

Connection plate
0: Without
1: With

* By CTJ 200 with drive pulley 2 or 20, the drive journal position left - L or right - R side must also be specified - motor/gearbox attachment side.

Linear Unit CTV

CTV - 110 - 1610 - ISO7 - 0 - 700 - S - 2 - 200 - 1 - 1

Series
CTV

Size
90
110
145
200

Ball screw
CTV 90: Ø12x5, Ø12x10
CTV 110: Ø16x5, Ø16x10, Ø16x16
CTV 145: Ø20x5, Ø20x10, Ø20x20, Ø20x50
CTV 200: Ø32x5, Ø32x10, Ø32x20, Ø32x32

Ball screw tolerance
ISO7 (Standard)
ISO5

Ball screw journal*
0: Without keyway
1: With keyway

Absolute stroke (mm)
(Absolute stroke = Effective stroke + 2 x Safety stroke)

Carriage version
S: Short
L: Long

Number of carriages**
The stated number specifies the number of carriages on one Linear unit (up to 5 carriages)
Leave blank for the case of one carriage

Distance between two carriages (mm)
Leave blank for the case of one carriage

Connection plate
0: Without
1: With

Protection cover
0: Without antistatic PU Gap-type seal strip
1: With antistatic PU Gap-type seal strip (standard)
2: With corrosion-resistant protection strip

* CTV 90 only available without keyway - 0

** Connection between the carriages is not rigid

Motor Side Drive - MSD

MSD - CTV 110 - T2 - 1,5 - MSM040B

Motor side drive

Lineae unit series
MTV / CTV

Type

Gear ratio

Motor type
According to customer´s drawing

Motor adapter

VK - CTV 110 - SMB60 - GESM14

Motor adapter

Linear unit series

Motor type

Suitable coupling size (ordered separately)

Coupling

COUPLING - GESM14 - F8C - F14C

Coupling

Coupling type/size
7, 9, 14, 19/24, 24/28, 28/38, 38/45

Hole diameter

Option
C: with keyway
Leave blank without keyway

Synchronisation Shaft

OSR - 19 - MTJ65 - LM - 890 - F16C - F16C

Type
OSL
OSR

Size
OSL: 14, 19/24, 24/28, 28/38, 38/45
OSR: 19, 24, 28, 38

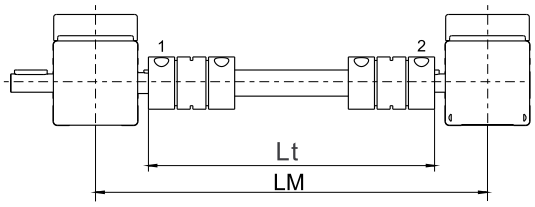
Linear unit series
MTJ/MRJ/MTJ ECO: 40, 65, 80, 110
CTJ:90, 110, 145, 200
If not for linear unit, leave blank

Length type
LM (Middle distance of the linear units)
Lt (Production length of the sync. shaft)

Length (mm)

Hole diameter
One side end hub1
One side end hub2

Option
C: with keyway
Leave blank without keyway



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