

TECHNICAL INFORMATION

LINEAR UNITS CT & MT



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Index

GENERAL INFORMATION	4
Product overview	4
ACCESSORIES & OPTIONS	5
Multi axis systems	5
SERVICE LIFE	7
Service life - linear guiding	7
Permissible load factor f_p - linear guiding	8
Service life - ball screw	9
ORDER CODE	11
Linear Unit MRJ & MTJ	11
Linear Unit MTV	12
Linear Unit MTJ	13
Linear Unit MTJZ	14
Linear Unit CTJ	15
Linear Unit CTV	16
Motor Side Drive - MSD	17
Motor adapter with coupling	18
Couplings	18
Synchronisation Shaft	19

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.

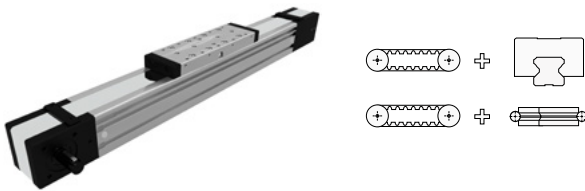
Different carriage lengths with lubrication ports allows for easy re-lubrication and allows the possibility to attach additional accessories.

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.

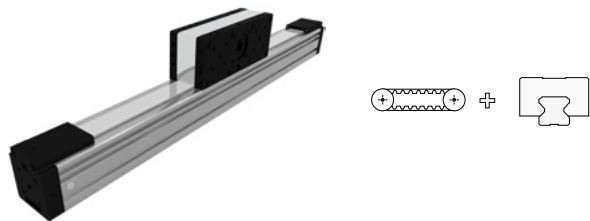
The aluminium profiles are manufactured according to the medium EN 12020-2 standard.

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

MTJ & MRJ



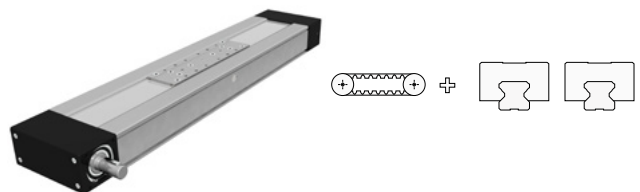
MTJZ



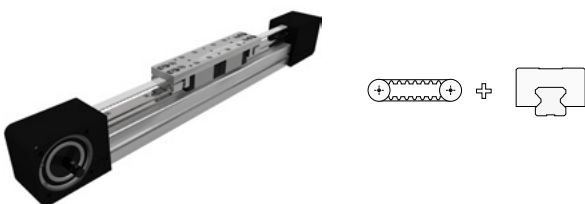
MTV



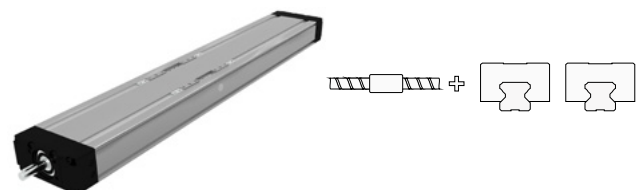
CTJ



MTJ ECO



CTV



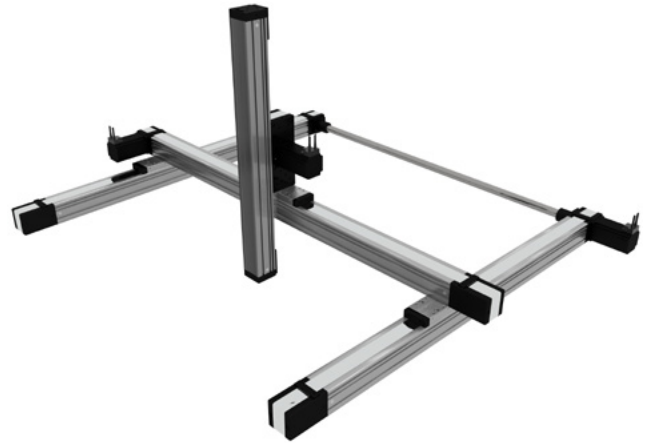
Multi axis systems

We offer all necessary 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



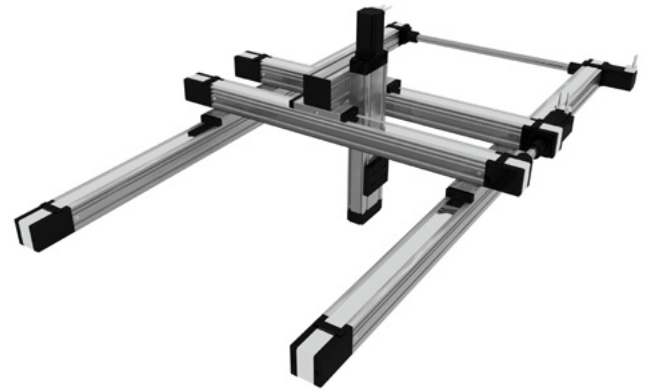
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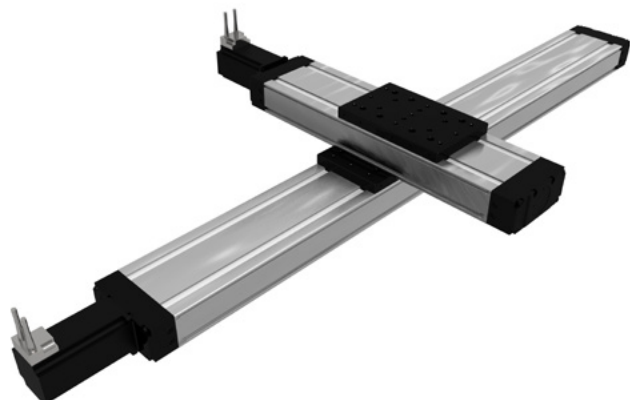
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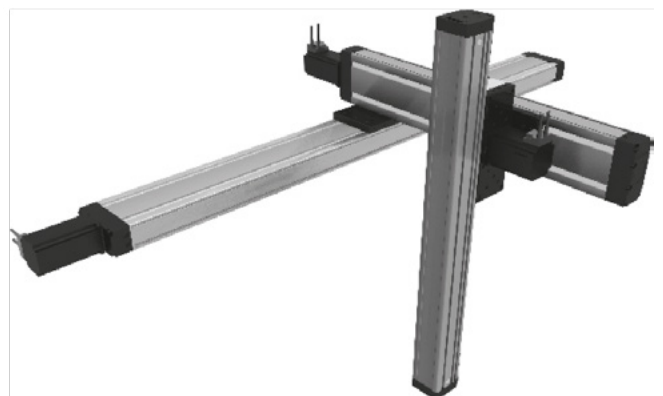
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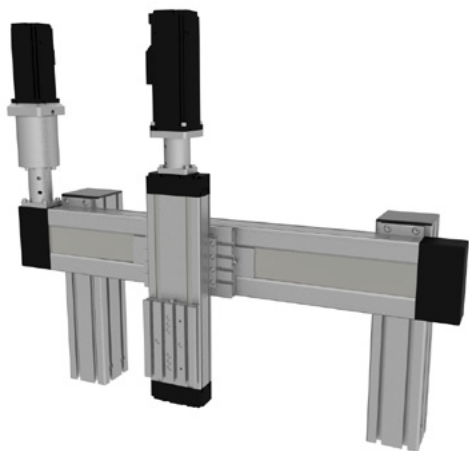
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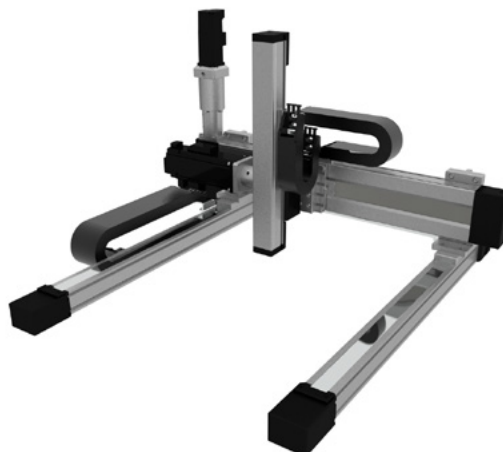
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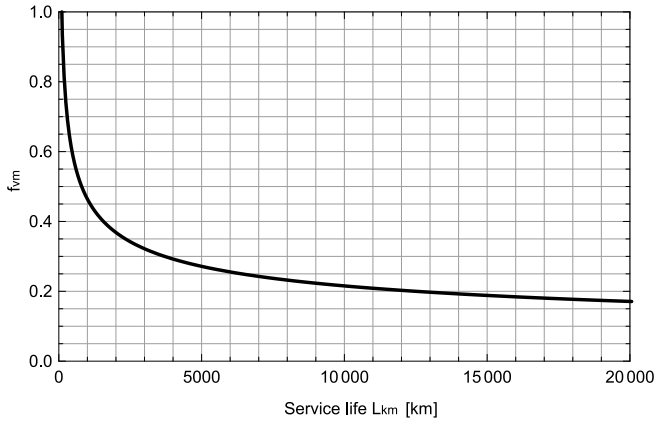


10



Service life - linear guiding

Mean load comparison factor f_{vm} as a function of service life L_{km}

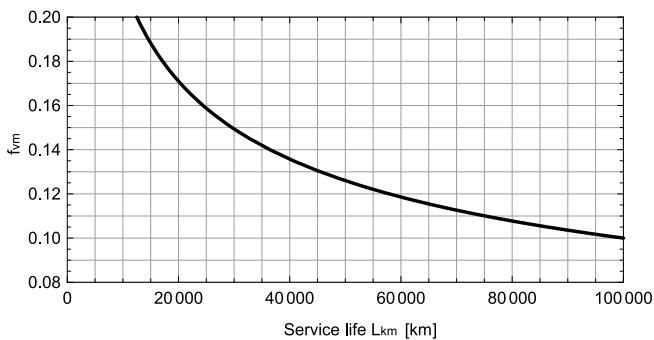


Diagrams and equations are valid for:

- 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 f_{vm} is taken into consideration.

Detailed view



Load comparison factor f_v

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

f_v	Load comparison factor	
C_{dyn}	Dynamic load capacity	N
$M_{x\ dyn}$	Dynamic moment capacity in x-axis	Nm
$M_{y\ dyn}$	Dynamic moment capacity in y-axis	Nm
$M_{z\ dyn}$	Dynamic moment capacity in z-axis	Nm
F_y	Applied force in y direction	N
F_z	Applied force in z direction	N
M_x	Applied moment in x-axis	Nm
M_y	Applied moment in y-axis	Nm
M_z	Applied moment in z-axis	Nm

Service life calculation

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

L_{km} Service life (km)

Safety factor f_s

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

f_s Safety factor

The safety factor depends on the application and its requested safety. We recommend a minimum safety factor $f_s = 5.0$.

Mean load comparison factor f_{vm} calculation

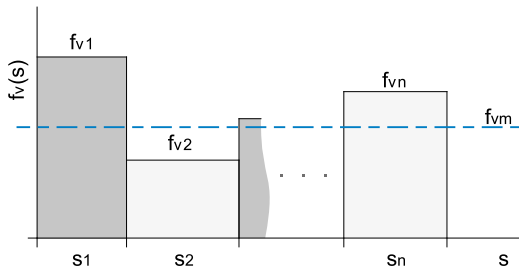
$$f_{vm} = \sqrt[3]{\frac{f_{v1}^3 \times s_1 + f_{v2}^3 \times s_2 + \dots + f_{vn}^3 \times s_n}{s_1 + s_2 + \dots + s_n}}$$

f_{vm} Mean load comparison factor

f_{vi} i-th load comparison factor of a given loading regime $f_v(s)$, $i \in \{1,2, \dots ,n\}$

s_i i-th travel path of a given loading regime $f_v(s)$, $i \in \{1,2, \dots ,n\}$

Loading regime $f_v(s)$



Permissible load factor f_p - linear guiding

$$f_p = \frac{|F_y|}{F_{py}} + \frac{|F_z|}{F_{pz}} + \frac{|M_x|}{M_{px}} + \frac{|M_y|}{M_{py}} + \frac{|M_z|}{M_{pz}} \leq 1$$

f_p Permissible load factor

F_{py} Max. permissible force in y-axis N

F_{pz} Max. permissible force in z-axis N

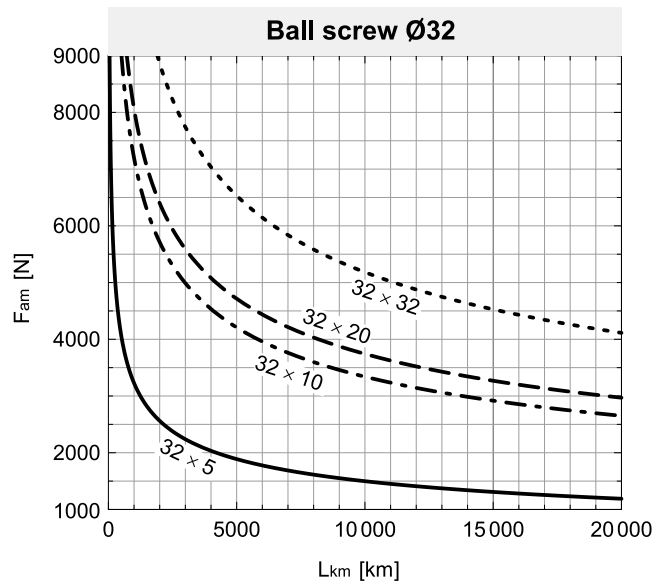
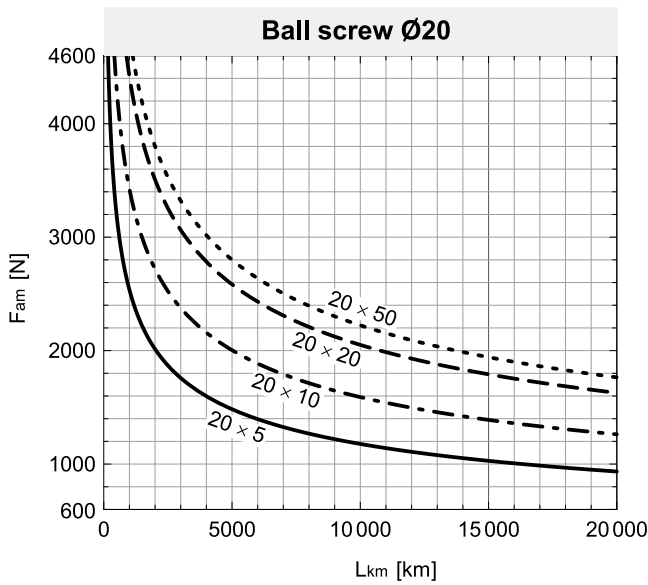
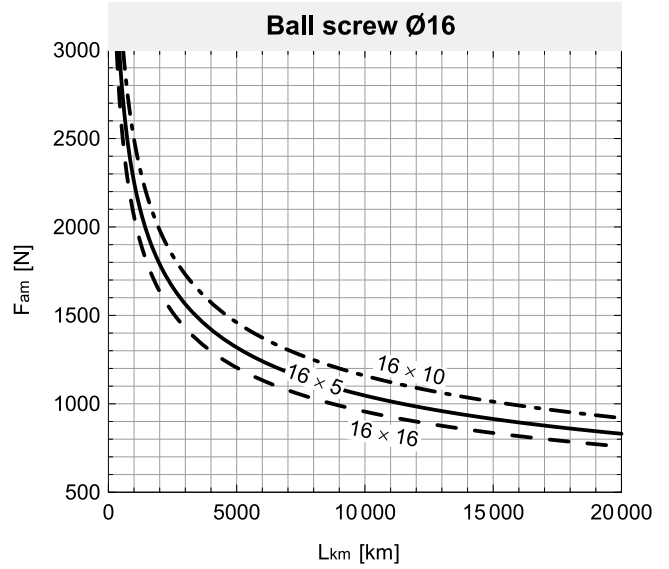
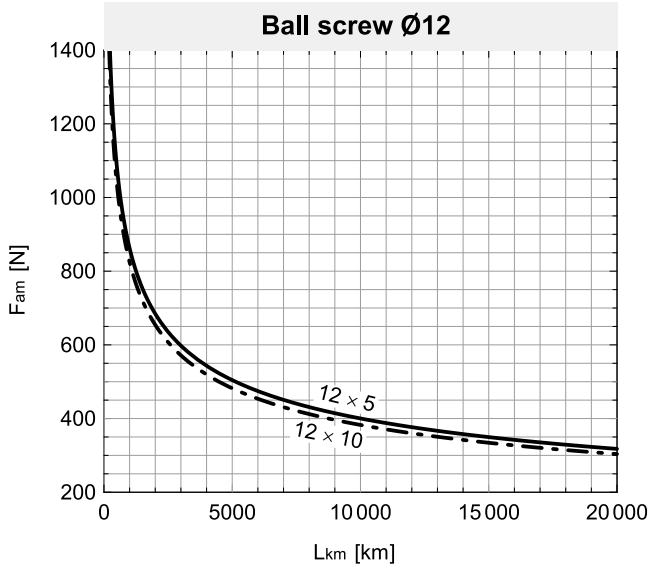
M_{px} Max. permissible moment in x-axis Nm

M_{py} Max. permissible moment in y-axis Nm

M_{pz} Max. permissible moment in z-axis Nm

Service life - ball screw

Applied mean axial force F_{am} as a function of service life L_{km} .



Mean axial force Fam calculation

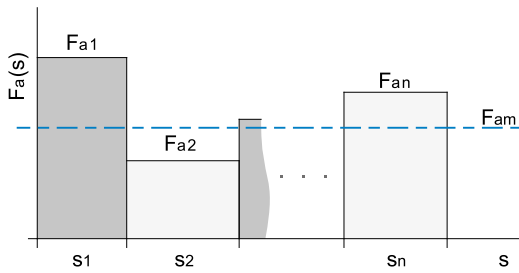
$$F_{am} = \sqrt[3]{\frac{|F_{a1}|^3 \times s_1 + |F_{a2}|^3 \times s_2 + \dots + |F_{an}|^3 \times s_n}{s_1 + s_2 + \dots + s_n}}$$

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 into consideration.

Diagrams and equations are valid for:

- MTV series
- CTV series

Linear Unit MRJ & MTJ

MTJ - 65 - 1000 - L - 1 - 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

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 an both sides (with keyway)
20: Pulley with journal an 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 - 1 - 1000 - 2SA - 2LR

Series
MTV

Size
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 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

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

Linear Unit MTJ ECO

MTJ - 40 - ECO - 1000 - L - 1 - R

Series

MTJ

Size

40

Type

ECO

Absolute stroke (mm)

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

Carriage version

S: Short

L: Long

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 - 1000 - 1 - O - 1

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.

* MTJZ 110 only available with drive pulley with through hole.

Linear Unit CTJ

CTJ - 145 - 1000 - L - 1 - 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

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 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 - 1 - 1000 - L - 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

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.

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 with coupling

VK - CTV 110 - SMB60 - GESM14

Motor adapter				
Linear unit series				
Motor type				
Coupling type				

Couplings

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)

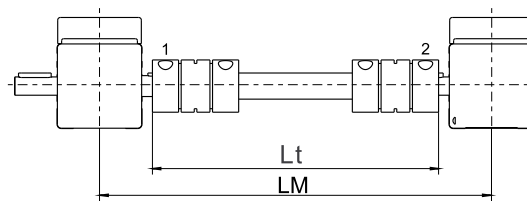
Length (mm)

Hole diameter

One side end hub1
One side end hub2

Option

C: with keyway
Leave blank without keyway



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SOLUTION AT THE RIGHT TIME.**

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With reliability, competence and commitment Rollco rapidly delivers the right solutions and components to create safe and cost-effective automation and linear movement.

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