Linear Unit MTV 65

The MTV series describes linear units with precision ball screw drive, integrated guide rail and compact dimensions. The units use a precision ball screw, with tolerance class ISO7 (ISO5 on request), with reduced backlash of the ball nut. A corrosion-resistant protection strip, protects all the parts in the profile from dust and other contaminants.



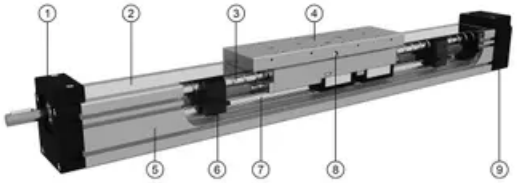
To achieve higher speeds at the same stroke of the linear unit, the ball screw support system can be integrated. With this feature vibrations and deflections of the ball screw are reduced, therefore longer strokes are possible. The linear unit with integrated support system can have a higher axial load capacity. Ball screw supports are made of high quality plastic materials with high wear resistance properties. The system enables ball screw support in horizontal or vertical positioning of the linear unit.

A 2LR version of MTV linear unit is available, where two carriages are moving simultaneously in opposite directions. Both right- and left-handed precision ball screws are used, which are rigidly connected. The ball screw support system can also be integrated.

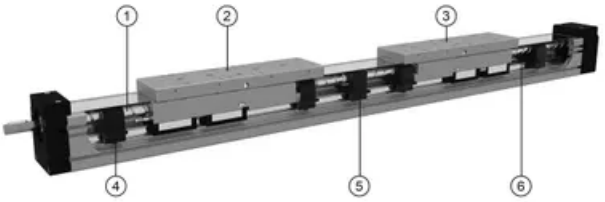
Dimensions in mm.

Modulus of Elasticity: E = 70000 N / mm2
Operating Temperature (°C): 0 ~ +60 For operating temperature out of the presented range, please contact Rollco.
Duty Cycle: 100%
Max. Acceleration (m/s²): 20

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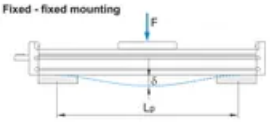
1. Drive block with floating bearing (MTV 110 - fixed bearing)
2. Corrosion-resistant protection strip
3. Ball screw tolerance ISO7 (ISO5 available on request)
4. Carriage with built in magnets
5. Aluminium profile - hard anodized
6. Screw support - SA
7. Integrated linear ball guideway
8. Central lubrication port, both sides
9. End block with fixed bearing (MTV 110 - floating bearing)



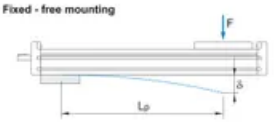
1. Right hand ball screw
2. Carriage with built in right hand ball nut
3. Carriage with built in left hand ball nut
4. Screw support - SA
5. Central screw support - fixed
6. Left hand ball screw

Deflection of the linear unit (standard)

Fixed - fixed mounting



Fixed - free mounting

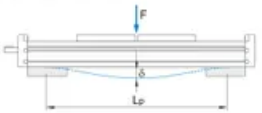


δ Maximum deflection of the linear unit [mm]
δmax Maximum permissible deflection of the linear unit [mm]
F Applied force [N]
Lp Unsupported profile length [mm]

The maximum permissible deflection δmax must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δmax additional profile supports are needed.

Deflection of the 2LR version

Fixed - fixed mounting

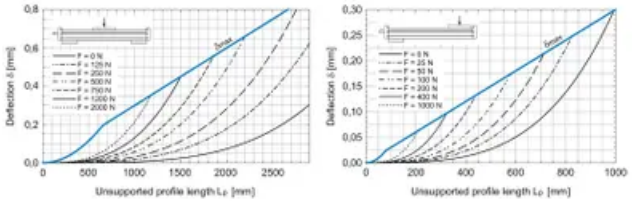


δ Maximum deflection of the linear unit [mm]
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The maximum permissible deflection δmax must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δmax additional profile supports are needed.

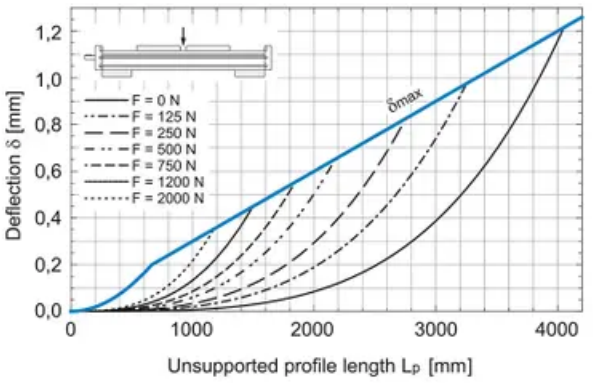
Deflection of the linear unit

MTV 65

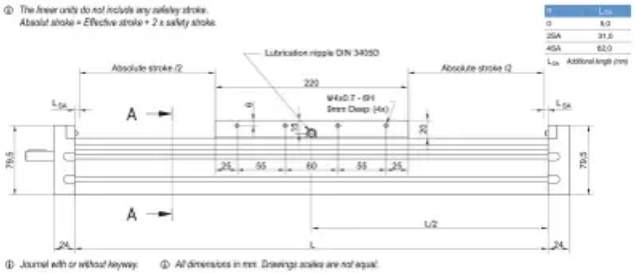


Deflection of the 2LR version

MTV 65



① *The linear units do not include any safetey stroke. Absolut stroke = Effective stroke + 2 x safety stroke.*
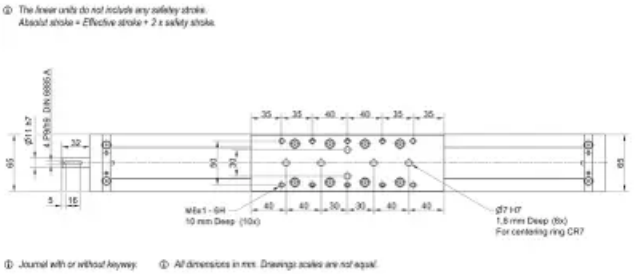


	L$_{SA}$
G	9,0
2SA	31,0
4SA	62,0

L$_{SA}$ Additional length (mm)

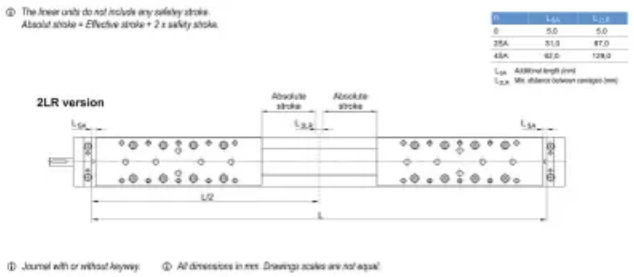
① *Journal with or without keyway.* ② *All dimensions in mm. Drawings scales are not equal.*

① *The linear units do not include any safetey stroke. Absolut stroke = Effective stroke + 2 x safety stroke.*

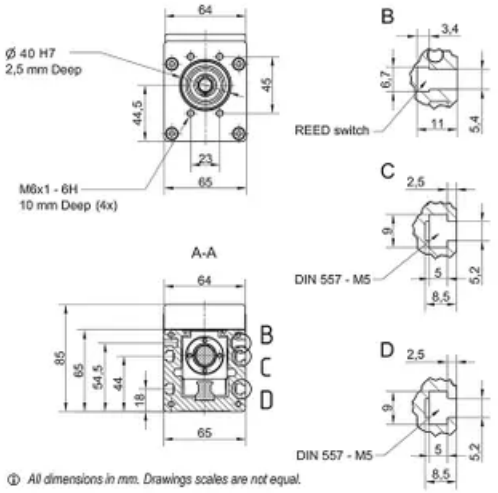


① *Journal with or without keyway.* ② *All dimensions in mm. Drawings scales are not equal.*

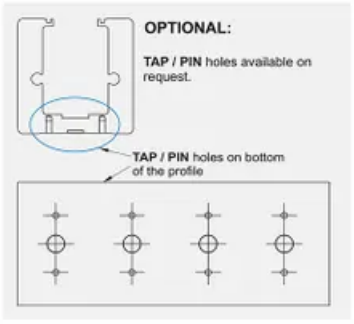
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① Journal with or without keyway. ② All dimensions in mm. Drawings scales are not equal.



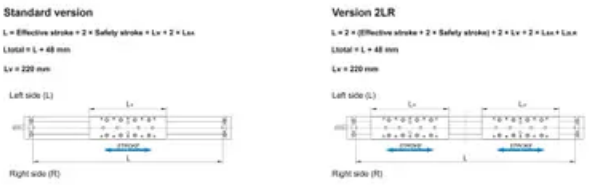
① All dimensions in mm. Drawings scales are not equal.



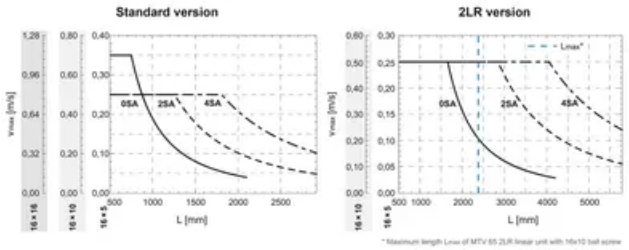
Mounting the drive

- by the **MOTOR SIDE DRIVE - MSD**
- by the **MOTOR ADAPTER WITH COUPLING**

Defining of the linear unit length



Maximum travel speed as a function of the profile length (vmax - L curves)



Exceptions for standard version

Linear Unit	Number of SA nSA	Max length Lmax (mm)	Max stroke (mm)
MTV65	0	2100	1870

Stated values in the table apply only for horizontally orientated unit.

Exceptions for 2LR version

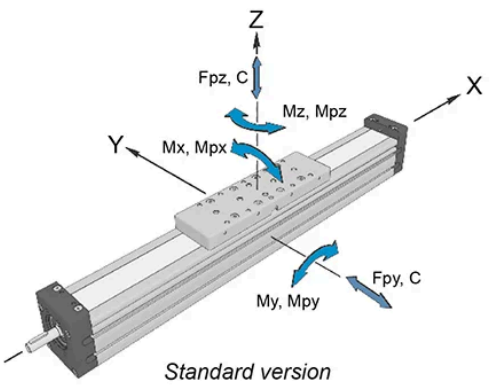
Linear Unit	Number of SA nSA	Max length Lmax (mm)	Max stroke (mm)
MTV65 2LR	0	4195	1870

Linear Unit	Ball screw (d x l)	Max length Lmax (mm)	Max stroke (mm)
MTV65 2LR	16 X 10	2379	962

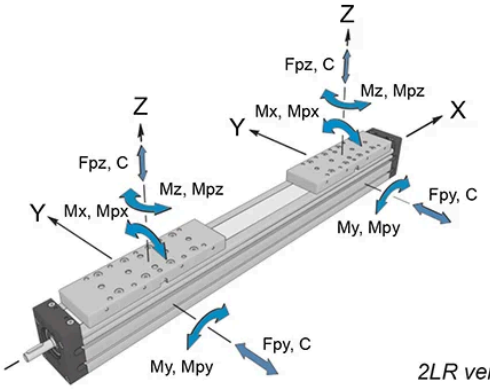
Exceptions for maximum length and stroke!

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General Data



Standard version



2LR version

For lengths/stroke over the stated value please contact us. Values for max. stroke are not valid for screw support SA. For the case of the SA the equation of defining the linear unit length (for particular size of the linear units) needs to be used.

Recommended values of loads

All the data of static and dynamic moments and load capacities are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety. We recommend a minimum safety factor (fs =5.0).

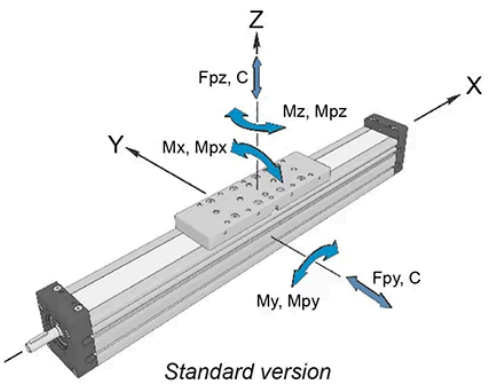
Designation	Carriage Length Lv (mm)	Dynamic Load Capacity C (N)	Static Load Capacity C0 (N)	Dynamic Moment Mx (Nm)	Dynamic Moment My (Nm)
MTV 65 - 16 x 5	220	19800	35000	158	700
MTV 65 2LR - 16 x 5	220	19800	35000	158	700
MTV 65 - 16 x 10	220	19800	35000	158	700
MTV 65 2LR - 16 x 10	220	19800	35000	158	700
MTV 65 - 16 x 16	220	19800	35000	158	700

Designation	Dynamic Moment Mz (Nm)	Max. Permissible Loads Forces Fpy (N)	Max. Permissible Loads Forces Fpz (N)	Max. Permissible Loads Moments Mpy (Nm)	Max. Permissible Loads Moments Mpz (Nm)	Max. Length Lmax (mm)
MTV 65 - 16 x 5	700	6540	10190	350	233	2920
MTV 65 2LR - 16 x 5	700	6540	10190	350	233	5789
MTV 65 - 16 x 10	700	6540	10190	350	233	2920
MTV 65 2LR - 16 x 10	700	6540	10190	350	233	5789
MTV 65 - 16 x 16	700	6540	10190	350	233	2920

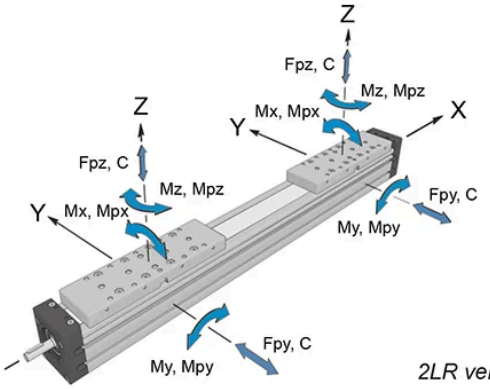
Designation	Max. Stroke (mm)	Min. Stroke (mm)
MTV 65 - 16 x 5	2690	40
MTV 65 2LR - 16 x 5	2667	40
MTV 65 - 16 x 10	2690	40
MTV 65 2LR - 16 x 10	2667	40
MTV 65 - 16 x 16	2690	40

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Drive Data



Standard version



2LR version

- With SA or 2LR version the max. rotation speed is limited to 3000 rev/min.
- Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit. For travel speed over the stated value, please contact Rollco.
- For the ball nut with the preload of 2%, please contact Rollco.
- In the case of 2RL version the axial load is total axial load of both carriages.
- For minimum stroke below the stated value, please contact Rollco.

Max. acceleration (m/s2): 20*

For acceleration over the stated value, please contact Rollco.

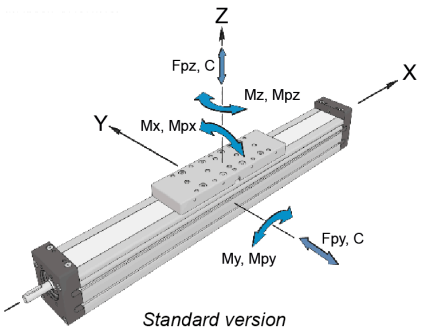
Reduced effective diameter at journal with keyway decreases values of max. drive torque.

Designation	Max. Rotational Speed (without SA) (rev/min)	Max. Travel Speed (without SA) (m/s)	Lead Constant (mm/rev)	Ball Screw (d x l)	Max. Repeatability Precision Standard ISO7
MTV 65 - 16 x 5	4200	0.35	5	16 × 5	±0.02
MTV 65 2LR - 16 x 5	4200	0.35	5	16 × 5	±0.02
MTV 65 - 16 x 10	4200	0.70	10	16 × 10	±0.02
MTV 65 2LR - 16 x 10	4200	0.70	10	16 × 10	±0.02
MTV 65 - 16 x 16	4200	1.12	16	16 × 16	±0.02

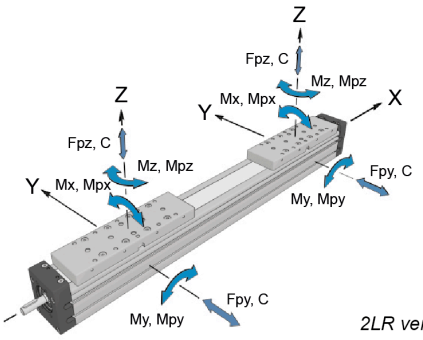
Designation	Max. Repeatability Precision ISO5	Dynamic Load Capacity BS Ca (N)	Max. Axial Load Fx (N)	Max. Drive Torque Ma (Nm)	Planar Moment of Inertia Iy (cm^4)	Planar Moment of Inertia Iz (cm^4)
MTV 65 - 16 x 5	±0.01	13150	8700	5.5 with keyway / 7.7 without keyway	71.3	89.4
MTV 65 2LR - 16 x 5	±0.01	13150	8700	5.5 with keyway / 7.7 without keyway	71.3	89.4
MTV 65 - 16 x 10	±0.01	11550	6730	5.5 with keyway / 11.9 without keyway	71.3	89.4
MTV 65 2LR - 16 x 10	±0.01	11550	6730	5.5 with keyway / 11.9 without keyway	71.3	89.4
MTV 65 - 16 x 16	±0.01	8170	4200	5.5 with keyway / 11.9 without keyway	71.3	89.4

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Mass and Mass Moment



Standard version



2LR version

The stated values are for strokes up to 500 mm. No load torque value increases with stroke elongation.

Mass calculation does not include mass of motor, reduction gear, switches and clamps.

Abs. stroke	Absolute stroke [mm]
A	Distance between carriages [mm]
nc	Number of carriages

Designation	Ball Screw (d x l)	Number of SA ^{n}SA	Mass of Linear Unit (kg)	Moved Mass (kg)	Mass Moment of Inertia (10^{-5} kg m²)
MTV 65 - 16 x 5	16 × 5	0 ; 2 ; 4	4.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 4.5 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 5.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1)	1.50 + 1.50 × (nc - 1) ; 1.58 + 1.50 × (nc - 1) ; 1.66 + 1.50 × (nc - 1)	1.6 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.09 × (nc - 1) ; 1.9 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.09 × (nc - 1) ; 2.2 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.09 × (nc - 1)
MTV 65 2LR - 16 x 5	16 × 5	0 ; 2 ; 4	7.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1) ; 8.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1) ; 9.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1)	3.00 + 3.00 × (nc - 1) ; 3.16 + 3.00 × (nc - 1) ; 3.32 + 3.00 × (nc - 1)	2.9 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.19 × (nc - 1) ; 3.5 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.19 × (nc - 1) ; 4.1 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.19 × (nc - 1)
MTV 65 - 16 x 10	16 × 10	0 ; 2 ; 4	4.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 4.5 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 5.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1)	1.50 + 1.50 × (nc - 1) ; 1.58 + 1.50 × (nc - 1) ; 1.66 + 1.50 × (nc - 1)	1.9 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.38 × (nc - 1) ; 2.2 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.38 × (nc - 1) ; 2.5 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.38 × (nc - 1)
MTV 65 2LR - 16 x 10	16 × 10	0 ; 2 ; 4	7.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1) ; 8.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1) ; 9.2 + 0.0146 × (Abs. Stroke + (nc - 1) × A) + 3.0 × (nc - 1)	3.00 + 3.00 × (nc - 1) ; 3.16 + 3.00 × (nc - 1) ; 3.32 + 3.00 × (nc - 1)	3.5 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.76 × (nc - 1) ; 4.1 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.76 × (nc - 1) ; 4.8 + 0.0104 × (Abs. Stroke + (nc - 1) × A) + 0.76 × (nc - 1)
MTV 65 - 16 x 16	16 × 16	0 ; 2 ; 4	4.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 4.5 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1) ; 5.0 + 0.0073 × (Abs. Stroke + (nc - 1) × A) + 1.5 × (nc - 1)	1.50 + 1.50 × (nc - 1) ; 1.58 + 1.50 × (nc - 1) ; 1.66 + 1.50 × (nc - 1)	2.5 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.97 × (nc - 1) ; 2.8 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.97 × (nc - 1) ; 3.2 + 0.0052 × (Abs. Stroke + (nc - 1) × A) + 0.97 × (nc - 1)

Designation	No Load Torque (Nm)	Planar Moment of Inertia Iy (cm⁴)	Planar Moment of Inertia Iz (cm⁴)
MTV 65 - 16 x 5	0.14 + 0.14 × (nc - 1) ; 0.16 + 0.14 × (nc - 1) ; 0.18 + 0.14 × (nc - 1)	71.3	89.4
MTV 65 2LR - 16 x 5	0.28 + 0.28 × (nc - 1) ; 0.32 + 0.28 × (nc - 1) ; 0.35 + 0.28 × (nc - 1)	71.3	89.4

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Designation	No Load Torque (Nm)	Planar Moment of Inertia Iy (cm⁴)	Planar Moment of Inertia Iz (cm⁴)
MTV 65 - 16 x 10	0.15 + 0.15 × (nc - 1) ; 0.19 + 0.15 × (nc - 1) ; 0.22 + 0.15 × (nc - 1)	71.3	89.4
MTV 65 2LR - 16 x 10	0.30 + 0.30 × (nc - 1) ; 0.34 + 0.30 × (nc - 1) ; 0.37 + 0.30 × (nc - 1)	71.3	89.4
MTV 65 - 16 x 16	0.20 + 0.20 × (nc - 1) ; 0.26 + 0.20 × (nc - 1) ; 0.31 + 0.20 × (nc - 1)	71.3	89.4

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