

# LINEAR UNITS CT & MT



**ROLLCO**  
SPECIALIZED  
ON LINEAR MOTION

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**CLIMATE  
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# Product Overview

These 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.

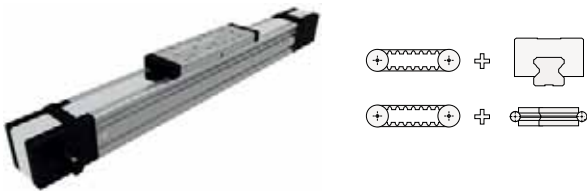
Different carriage lengths with lubrication ports allows for easy re-lubrication and allows the possibility to attach additional accessories.

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.

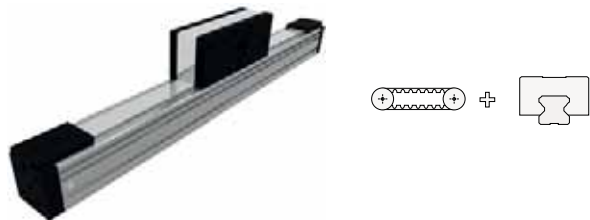
The aluminium profiles are manufactured according to the medium EN 12020-2 standard

- 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



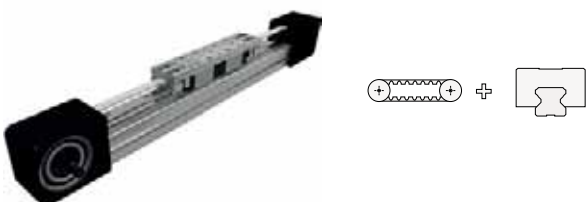
## MTV



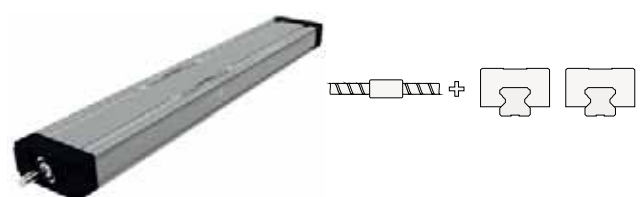
## CTJ



## MTJ ECO



## CTV



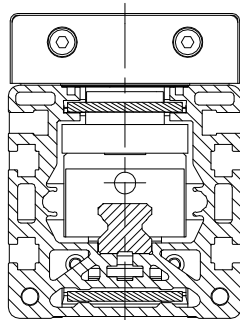
## Linear Units MTJ & MRJ

The MTJ and MRJ linear units have toothed belt drive and compact dimensions to provide high performance features such as high speed and good accuracy. For very high speeds, up to 10m/s, the track rollers (journal bearings) of the type MRJ are particularly suitable.

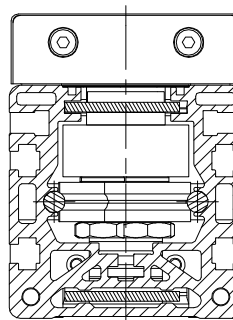
The units MTJ and MRJ have a pre-tensioned steel reinforced AT polyurethane timing toothed belt. In conjunction with a zero-backlash drive pulley high moments with alternating loads with good positioning accuracy, low wear and low noise can be realized.

All parts in the profile are protected from dust and other contaminations. As corrosion-resistant protection strip is available as option.

MTJ

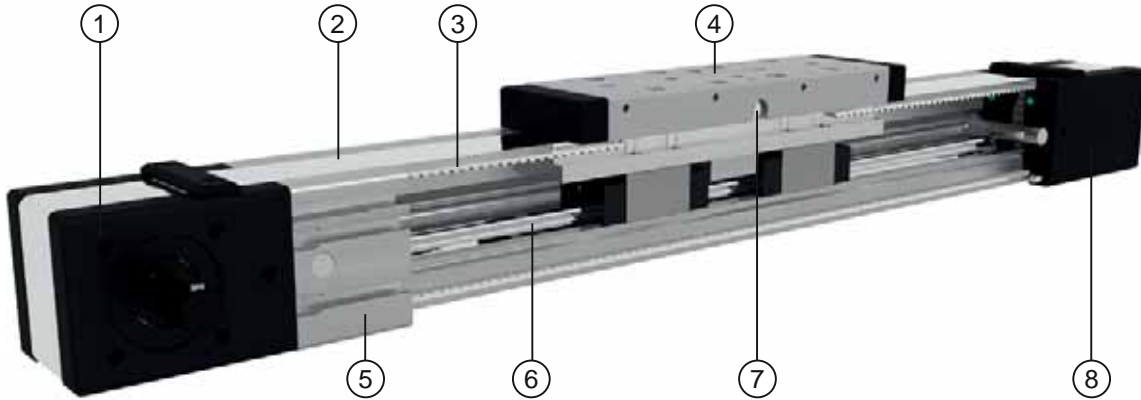


MRJ



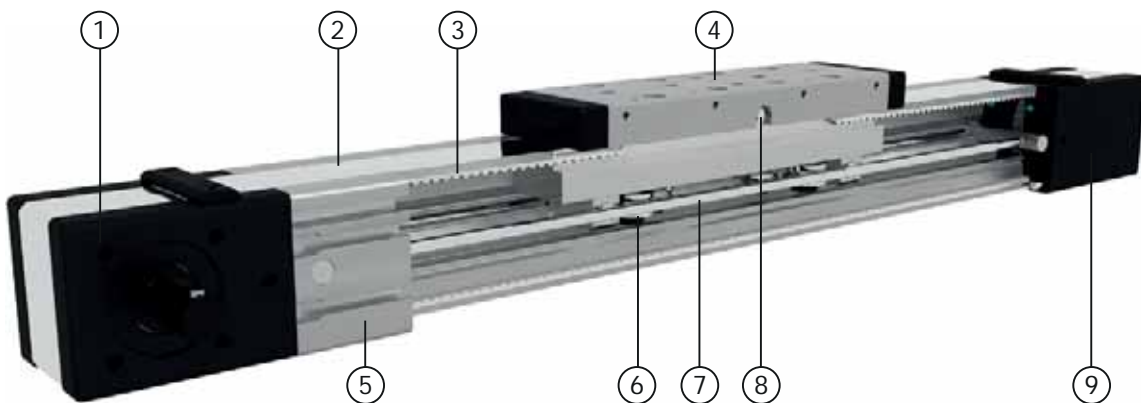
# Structural Design

## MTJ Series



1. Drive block with pulley
2. Corrosion-resistant protection strip (available also without protection strip)
3. AT polyurethane toothed belt with steel tension cords
4. Carriage with built in magnets
5. Aluminium profile-hard anodized
6. Linear ball guideway
7. Central lubrication port, both sides
8. Tension end with integrated belt tensioning system

## MRJ Series



1. Drive block with pulley
2. Corrosion-resistant protection strip (available also without protection strip)
3. AT polyurethane toothed belt with steel tension cords
4. Carriage with build in magnets
5. Aluminium profile-hard anodized
6. Track roller (journal bearing)
7. Two hardened steel round guide (58/60 HRC)
8. Central lubrication port, both sides
9. Tension end with integrated belt tensioning system

# Order Code

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

# Technical Data

## MTJ Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Moved mass (kg)	Max repeatability (mm)	Max length* (Lmax (mm))	Max stroke* (mm)	Min. stroke** (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments							
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)					
MTJ 40	92	4610	6930	28	90	90	3840	3850	14	75	75	0,28	± 0,08	3000	2876	25
MTJ 65 S	140	9900	17500	79	59	59	3270	5100	34	34	34	1,00	± 0,08	6000	5820	40
MTJ 65 L	190	19800	35000	158	1025	1025	6540	10190	60	530	340	1,45	± 0,08		5770	40
MTJ 80 S	170	17100	30000	185	130	130	4470	7530	110	122	100	1,72	± 0,08	6000	5788	55
MTJ 80 L	260	34200	60000	370	2565	2565	8930	15060	150	1130	670	2,72	± 0,08		5698	55
MTJ 110 S	240	24800	42500	315	220	220	5000	10130	135	180	100	3,25	± 0,08	6000	5748	65
MTJ 110 L	330	49600	85000	630	3840	3840	10000	20260	295	1570	775	4,61	± 0,08		5658	65

\* For lengths/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

\*\* For minimum stroke below the stated value in the table above please contact Rollco.

## MRJ Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Moved mass (kg)	Max repeatability (mm)	Max length* (Lmax (mm))	Max stroke* (mm)	Min. stroke** (mm)
		Cy (N)	Cz (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments							
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)					
MRJ 40	92	3400	1700	20	21	25	1015	1090	13	14	7,6	0,26	± 0,08	6000	5876	0
MRJ 65 L	190	8600	4400	74	186	425	1920	1470	25	62	95	1,31	± 0,08	6000	5770	0
MRJ 80 L	260	17100	9000	198	511	1145	3400	1760	39	101	228	2,73	± 0,08	6000	5698	0
MRJ 110 L	330	31000	14000	406	877	2325	6200	3410	99	214	465	4,78	± 0,08	6000	5658	0

\* For lengths/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

\*\* For minimum stroke below the stated value in the table above please contact Rollco.

### Recommended values of loads

All the data of static and dynamic moments and load capacities stated in the upper table 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).

C C

Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperature out of the presented range, please contact Rollco.

### Modulus of elasticity

E = 70000 N / mm<sup>2</sup>

C C

## General technical data for double carriage

Linear Unit	Carriage version	Load capacity				Dynamic moment*			Max. permissible loads*					
		Dynamic C (N)	Static C0 (N)	Cy (N)	Cz (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments			
									Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)	
MTJ	40	2	9220	13860	/	/	57	4,6 * A (mm)	4,6 * A (mm)	7690	7690	28	3,8 * A (mm)	3,8 * A (mm)
	65	S2	19800	35000	/	/	158	9,9 * A (mm)	9,9 * A (mm)	6540	10190	68	5,1 * A (mm)	3,3 * A (mm)
		L2	39600	70000	/	/	316	19,8 * A (mm)	19,8 * A (mm)	13080	20380	120	10,2 * A (mm)	6,5 * A (mm)
	80	S2	34200	60000	/	/	370	17,1 * A (mm)	17,1 * A (mm)	8930	15060	220	7,5 * A (mm)	4,5 * A (mm)
		L2	68400	120000	/	/	740	34,2 * A (mm)	34,2 * A (mm)	17860	30130	300	15,1 * A (mm)	2,9 * A (mm)
	110	S2	49600	85000	/	/	630	24,8 * A (mm)	24,8 * A (mm)	10000	20260	270	10,1 * A (mm)	5,0 * A (mm)
L2		99200	170000	/	/	1260	49,6 * A (mm)	49,6 * A (mm)	20000	40510	590	20,3 * A (mm)	10,0 * A (mm)	
MRJ	40	2	/	/	6800	3400	40	1,7 * A (mm)	3,4 * A (mm)	2030	2180	26	1,1 * A (mm)	1,0 * A (mm)
	65	L2	/	/	17200	8800	148	4,4 * A (mm)	8,6 * A (mm)	3850	2940	50	1,5 * A (mm)	1,9 * A (mm)
		S2	/	/	34200	18000	396	9,0 * A (mm)	17,1 * A (mm)	6800	3530	78	1,8 * A (mm)	3,4 * A (mm)
	110	L2	/	/	62000	28000	812	14,0 * A (mm)	31,0 * A (mm)	12400	6830	198	3,4 * A (mm)	6,2 * A (mm)

\* A - Distance between carriages. More info on following pages.



## Drive and belt data for MRJ and MTJ series

Linear Unit	Max travel speed* (m/s)	Maximum drive torque Ma (Nm)	No load torque**		Puley drive ratio (mm/rev)	Pulley diameter (mm)	Bell type	Beltwidth (mm)	Max. force transmitted by belt (N)	Specific spring constant Cspec (N)	
			With strip (Nm)	Without strip (Nm)							
MRJ 40	10	3,7	0,4	0,2	99	31,51	AT3	20	235	225000	
MTJ 40	6		0,4	0,2							
MRJ 65 L	10	13,1	1	0,7	165	52,52	AT5	32	500	600000	
MTJ 65 S	6		1,1	0,8							
MTJ 65 L			1,2	0,9							
MRJ 80 L	10	29,4	1,4	1,1	210	66,84	AT5	50	880	960000	
MTJ 80 S	6		1,5	1,2							
MTJ 80 L			1,7	1,4							
MRJ 110 L	10	68,5 with keyway	1,8	1,5	300	95,49	AT 10	50	1730	2145000	
MTJ 110 S	6		82,6 without keyway	1,8							1,5
MTJ 110 L				2							1,7

\* Max. travel speed and max. acceleration of linear unit with the corrosion-resistant protection strip is 1,5 m/s and 50 m/s<sup>2</sup>. respectively.  
 \*\* The stated values are for strokes up to 500 mm. No load torque value increases with stroke elongation.

Max. acceleration (m/s<sup>2</sup>): 70\*

For acceleration over the stated value in the table above, please contact Rollco.

## Mass and mass moment of inertia for MTJ series

Linear Unit	Carriage length Lv (mm)	Mass of linear unit (kg)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	Planar moment of inertia	
				Iy (cm <sup>4</sup> )	Iz (cm <sup>4</sup> )
MTJ 40	92	1,3 + 0,0024 * Stroke (mm)	9,7 + 0,0035 * Stroke (mm)	9,8	11,6
MTJ 65 S	140	4 + 0,0055 * Stroke (mm)	98,4 + 0,0154 * Stroke (mm)	59,7	74,4
MTJ 65 L	190	4,6 + 0,0055 * Stroke (mm)	130,1 + 0,0154 * Stroke (mm)		
MTJ 80 S	170	6,8 + 0,0085 * Stroke (mm)	310,6 + 0,0391 * Stroke (mm)	129,1	173,4
MTJ 80 L	260	8,4 + 0,0085 * Stroke (mm)	423,3 + 0,0391 * Stroke (mm)		
MTJ 110 S	240	15 + 0,015 * Stroke (mm)	1065,0 + 0,1370 * Stroke (mm)	513,0	620,0
MTJ 110 L	330	17,7 + 0,015 * Stroke (mm)	1381,0 + 0,1370 * Stroke (mm)		

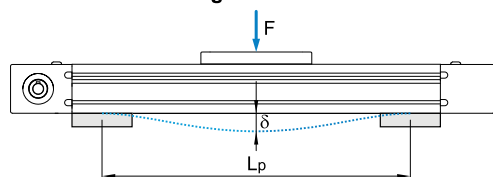
## Mass and mass moment of inertia for MRJ series

Linear Unit	Carriage length Lv (mm)	Mass of linear unit (kg)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	Planar moment of inertia	
				Iy (cm <sup>4</sup> )	Iz (cm <sup>4</sup> )
MRJ40	92	1,25 + 0,0022 * Stroke (mm)	9,3 + 0,0035 * Stroke (mm)	9,8	11,6
MRJ 65 L	190	4,3 + 0,0047 * Stroke (mm)	120,4 + 0,0154 * Stroke (mm)	59,7	74,4
MRJ 80 L	260	8,2 + 0,0075 * Stroke (mm)	424,4 + 0,0391 * Stroke (mm)	129,1	173,4
MRJ 110 L	330	16,3 + 0,0133 * Stroke (mm)	1420,0 + 0,1370 * Stroke (mm)	513,0	620,0

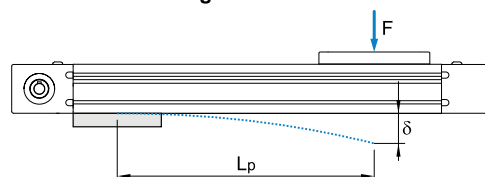
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

## Deflection of the linear unit

Fixed - fixed mounting



Fixed - free mounting

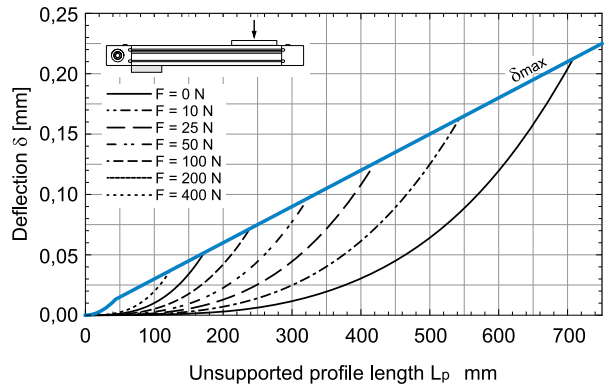
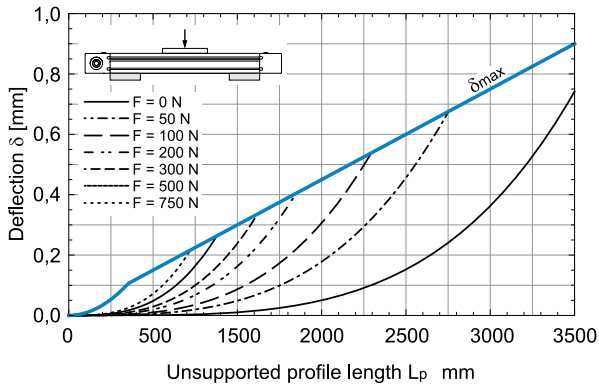


$\delta$  Maximum deflection of the linear unit [mm]  
 $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]  
 F Applied force [N]  
 Lp Unsupported profile length [mm]

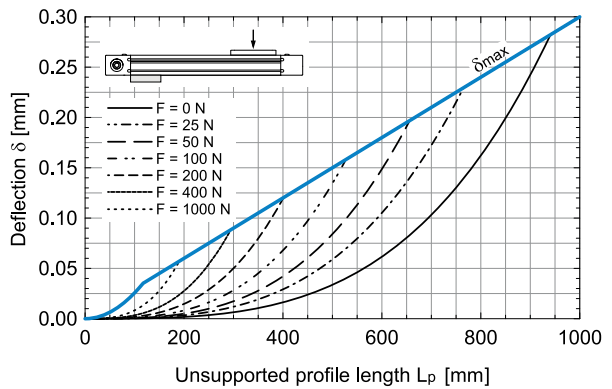
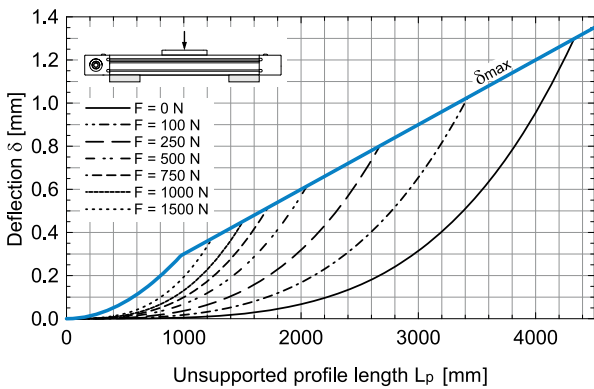
The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.

# Deflection of the linear unit

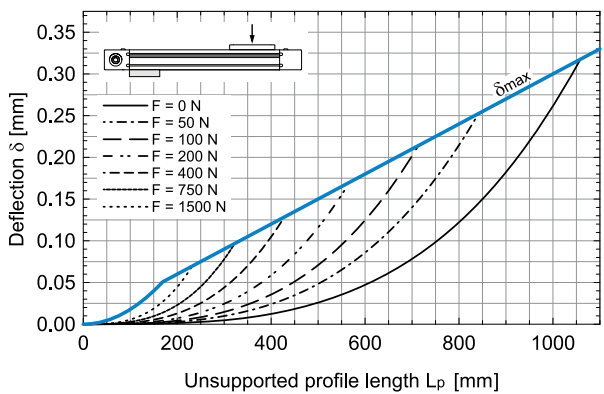
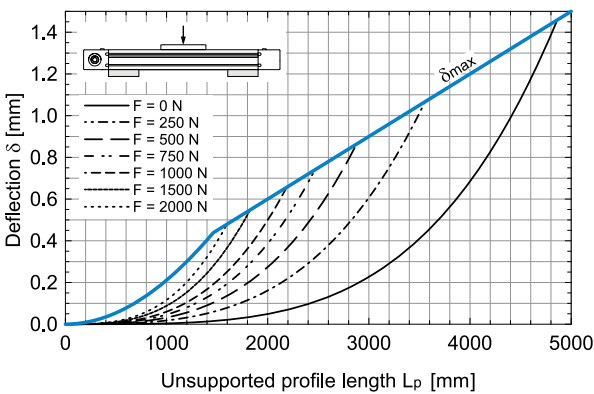
## MTJ 40



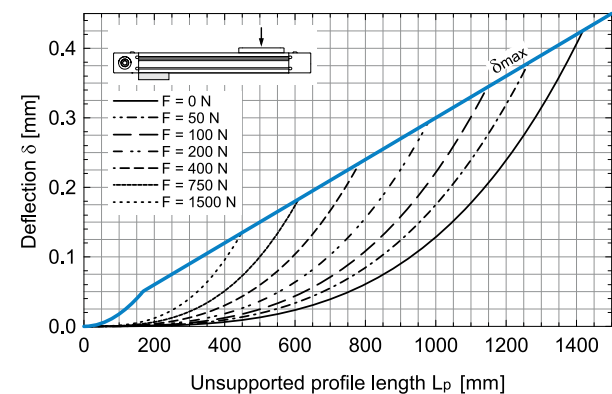
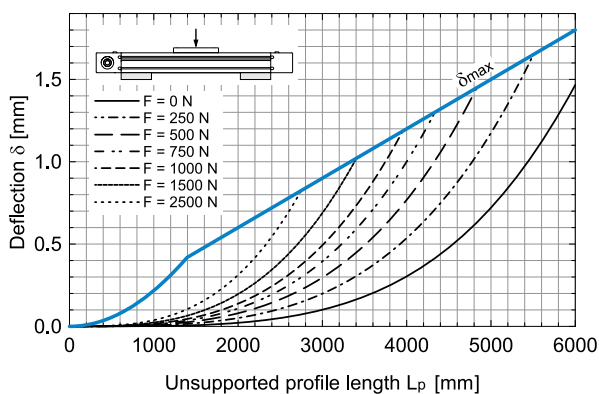
## MTJ 65



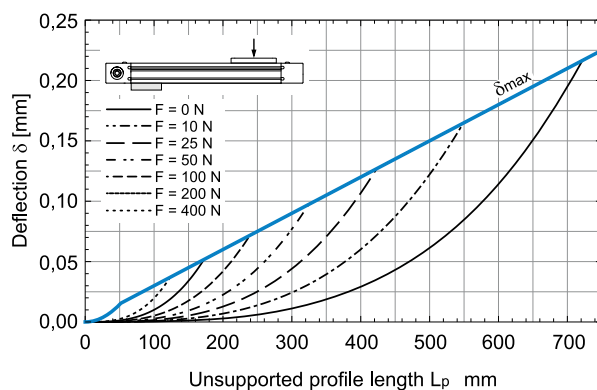
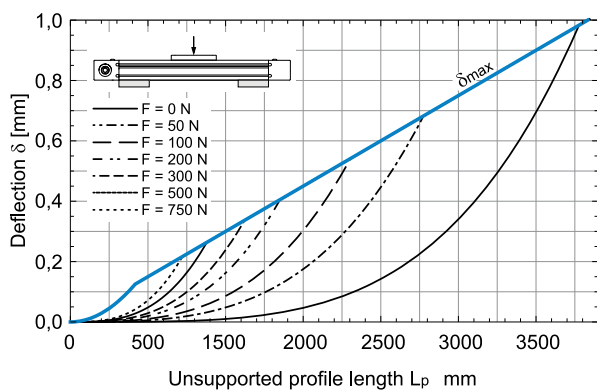
## MTJ 80



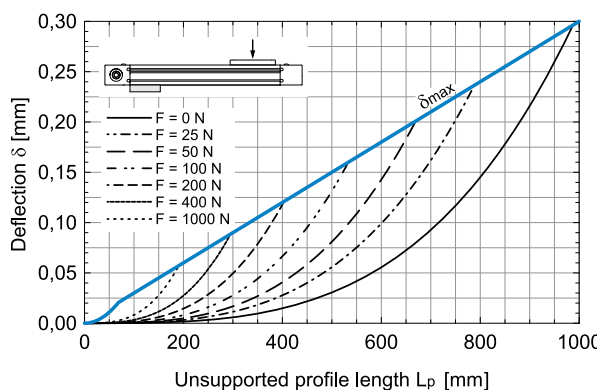
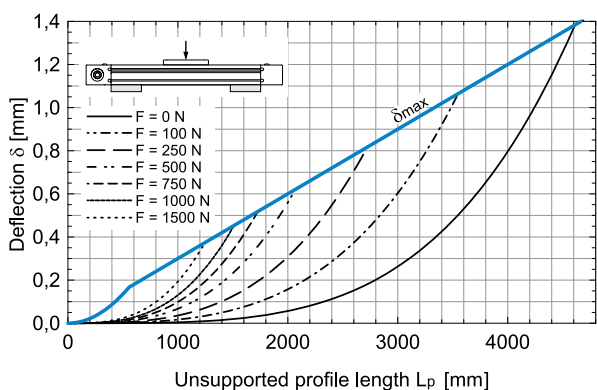
## MTJ 110



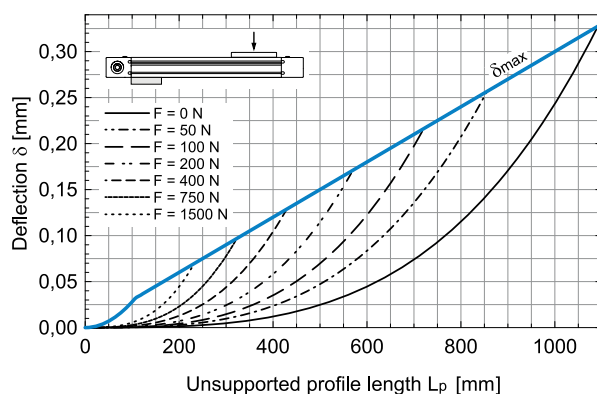
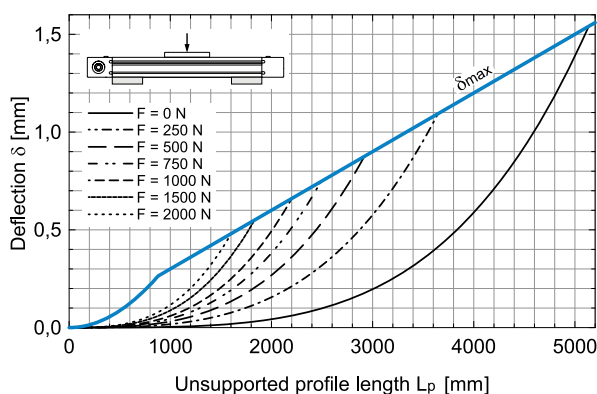
**MRJ 40**



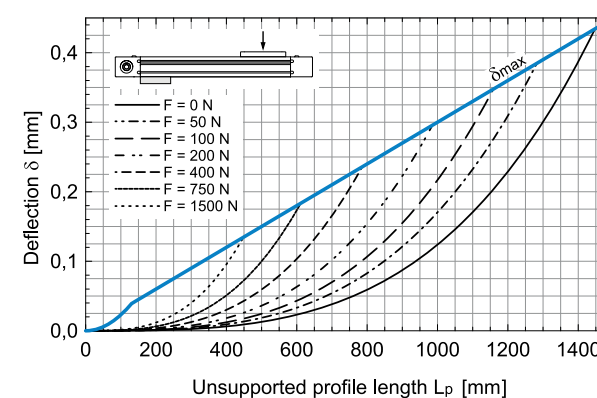
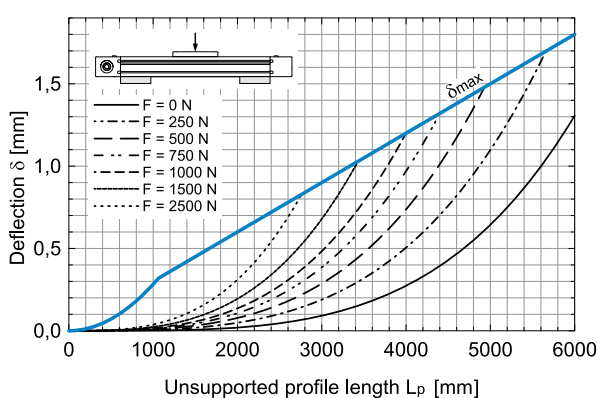
**MRJ 65**



**MRJ 80**



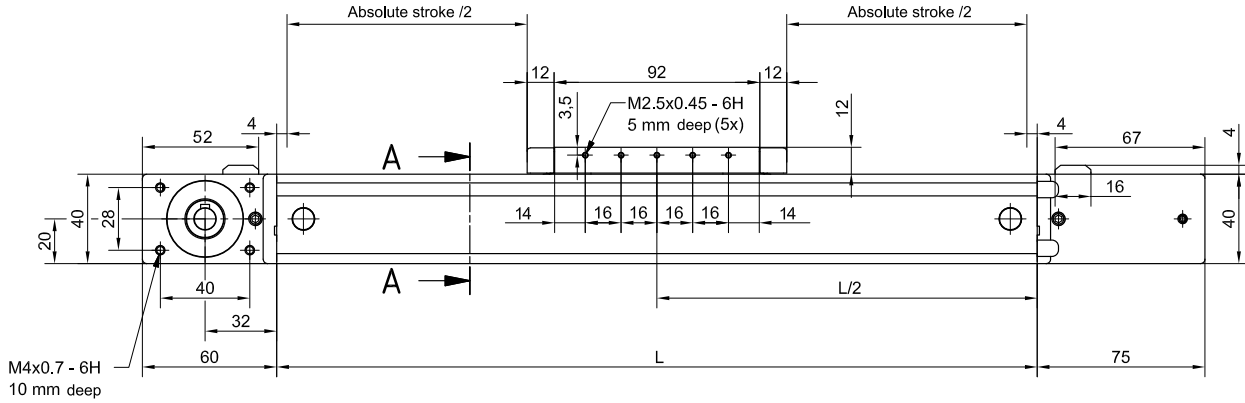
**MRJ 110**



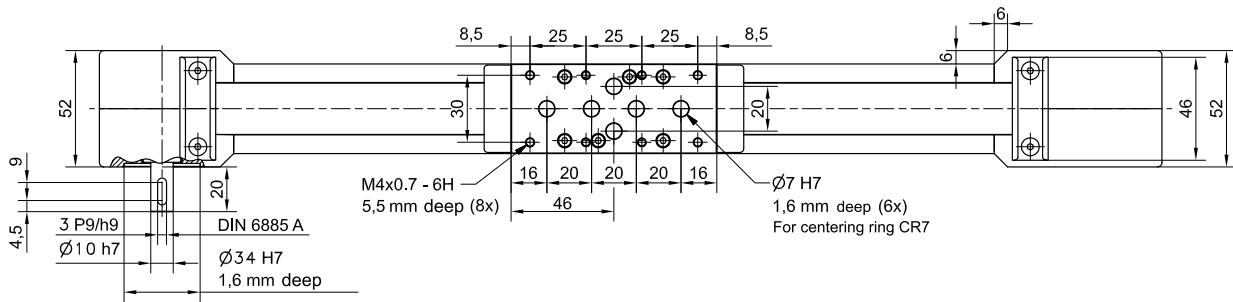
# Dimensions

## MTJ 40 & MRJ 40

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



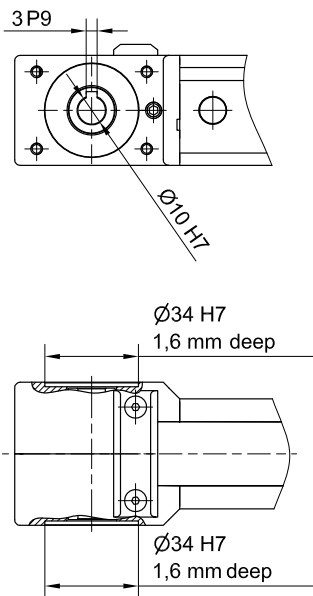
① Lifetime lubricated.



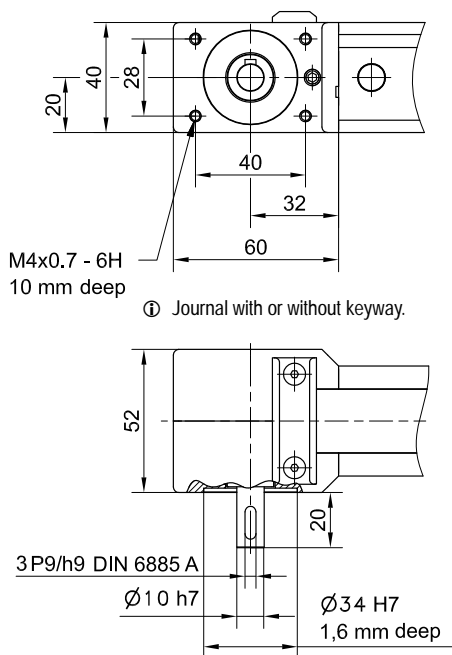
① Journal with or without keyway.

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

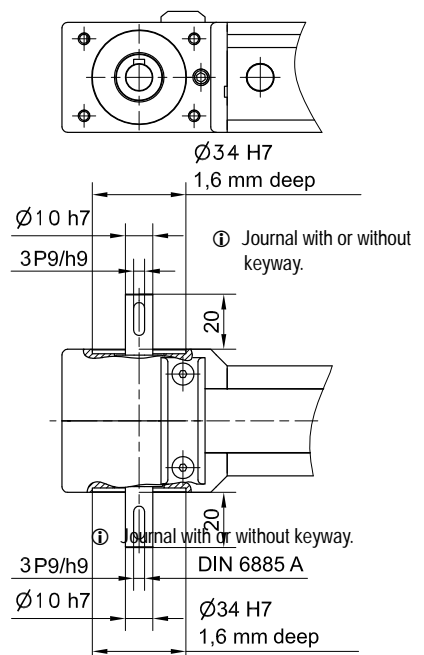
### TYPE 0

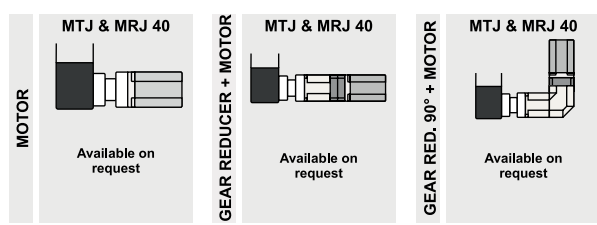
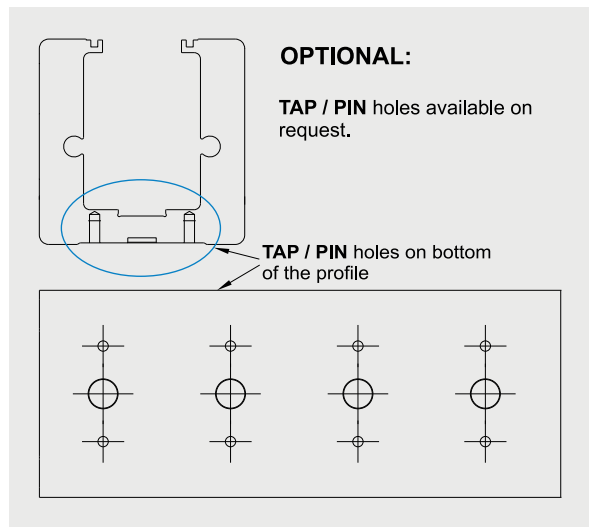
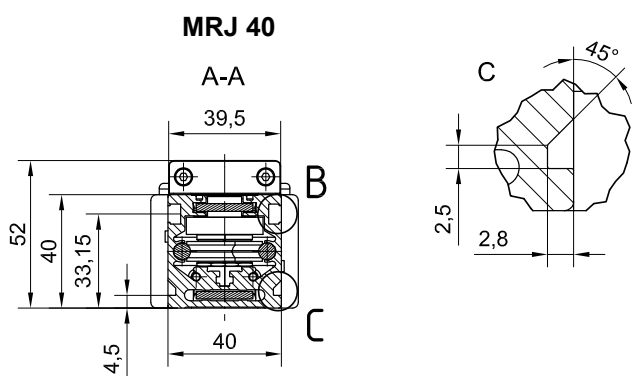
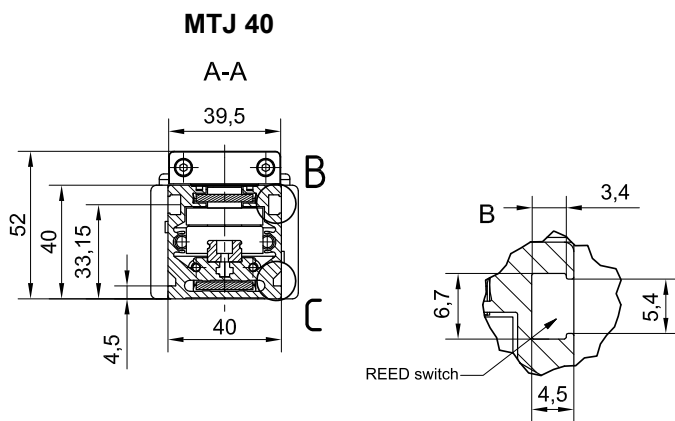


### TYPE 1 L and 1 R



### TYPE 2





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

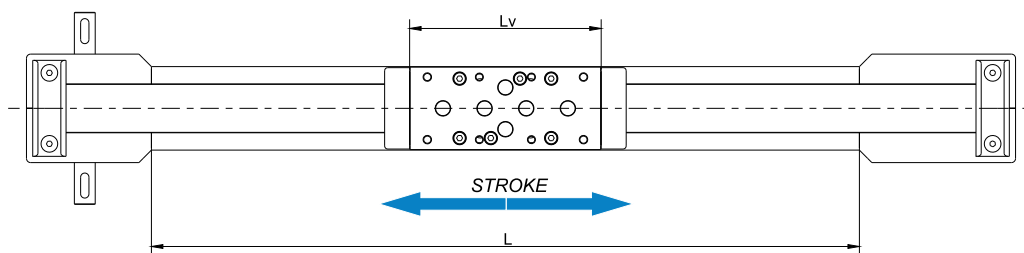
**Defining of the linear unit length**

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 32 \text{ mm}$

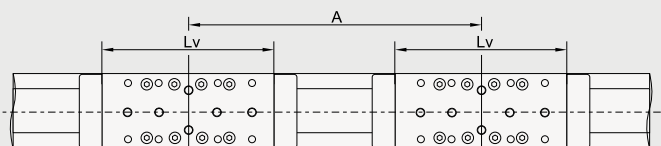
$L_v = 92 \text{ mm}$

$L_{\text{total}} = L + 135 \text{ mm}$

Left side (L)



**Double-Carriage**



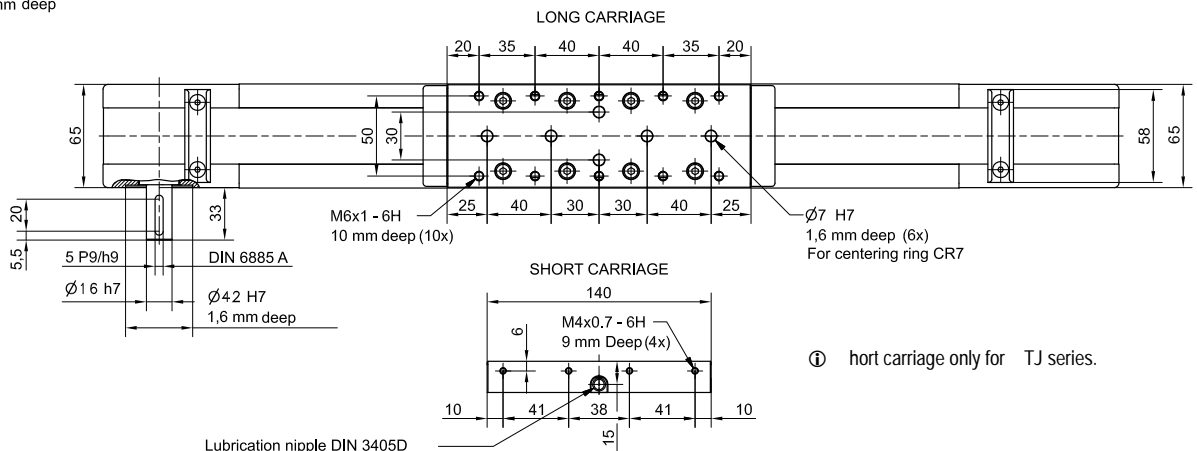
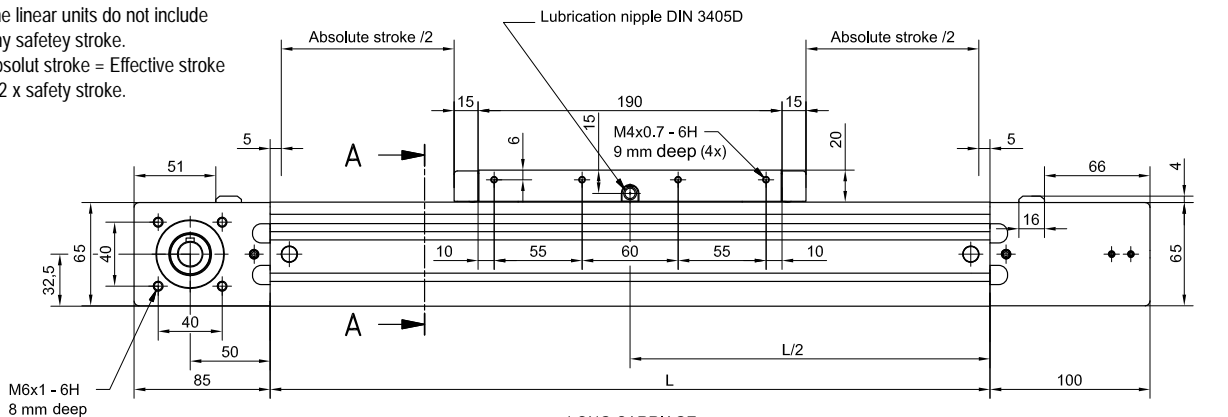
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + A + 32 \text{ mm}$

$L_{\text{total}} = L + 135 \text{ mm}$

$A \geq L_v + 24 \text{ mm}$

# MTJ 65 & MRJ 65

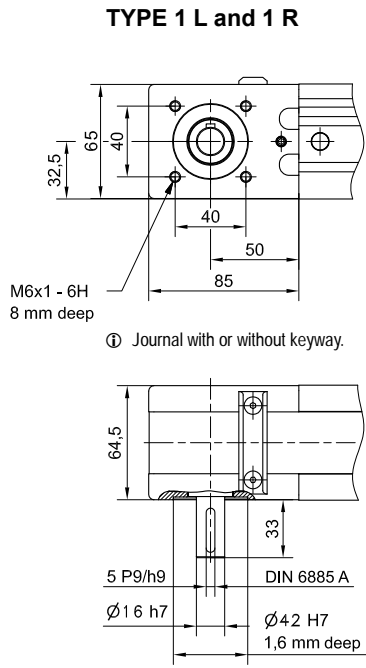
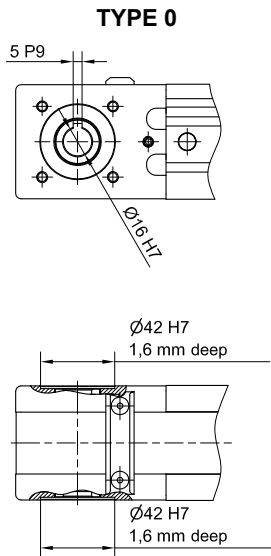
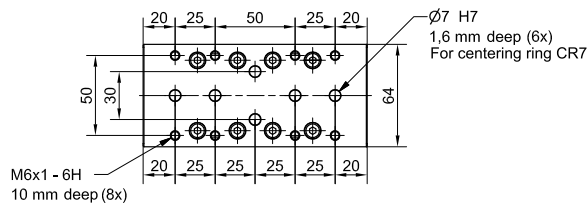
① The linear units do not include any safety stroke.  
 Absolut stroke = Effective stroke + 2 x safety stroke.



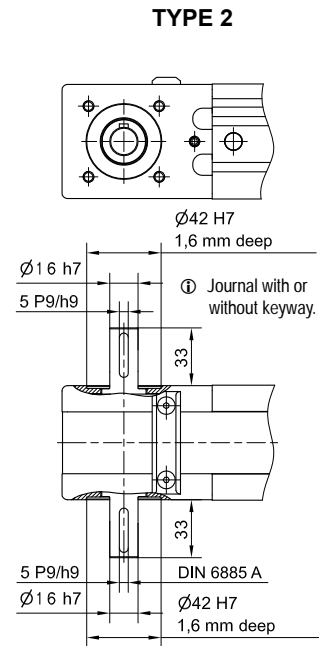
① Short carriage only for TJ series.

① Journal with or without keyway.

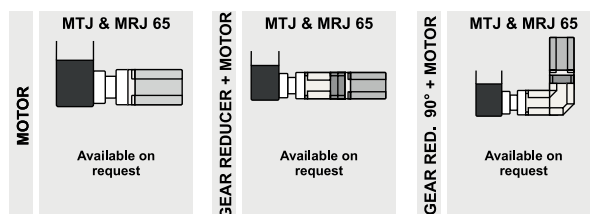
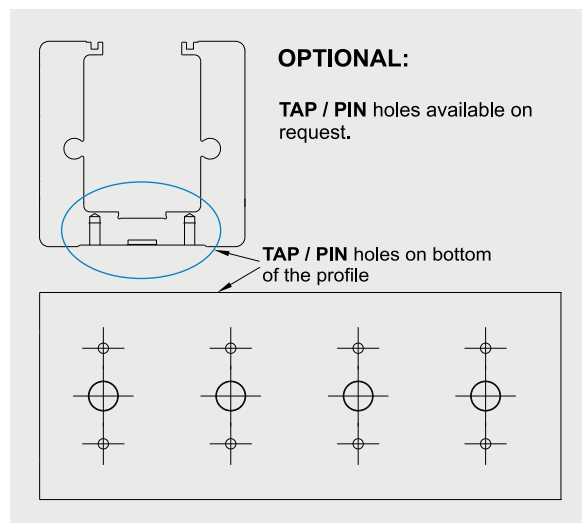
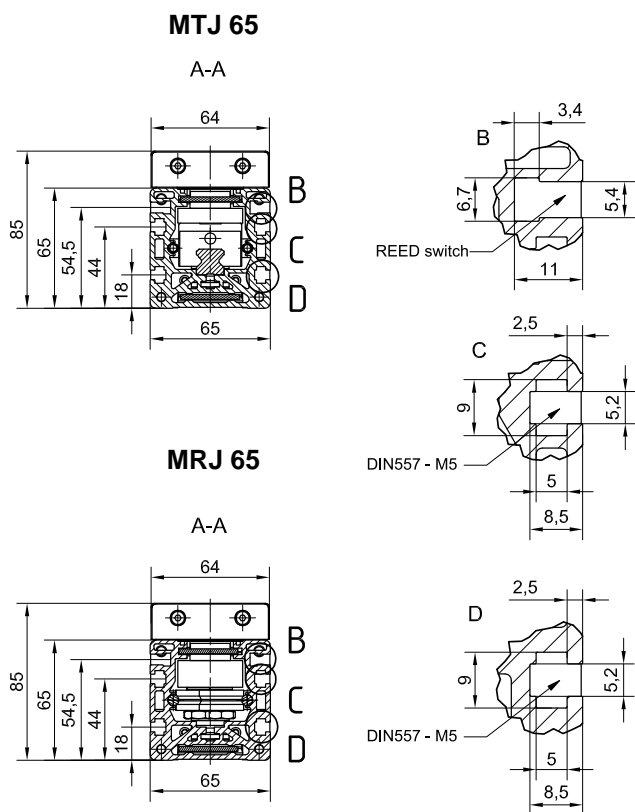
① All dimensions in mm. Drawings scales are not equal.



① Journal with or without keyway.



① Journal with or without keyway.



**Defining of the linear unit length**

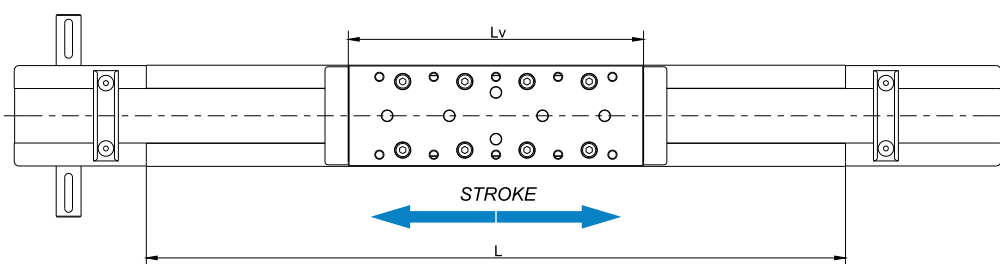
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 40 \text{ mm}$

$L_v - \text{Long carriage} = 190 \text{ mm}$

$L_{\text{total}} = L + 185 \text{ mm}$

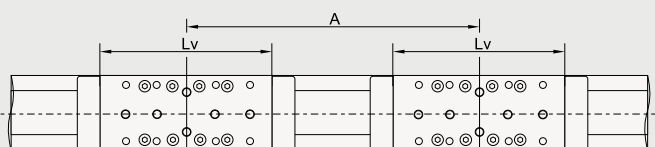
$L_v - \text{Short carriage} = 140 \text{ mm}$

Left side (L)



Right side (R)

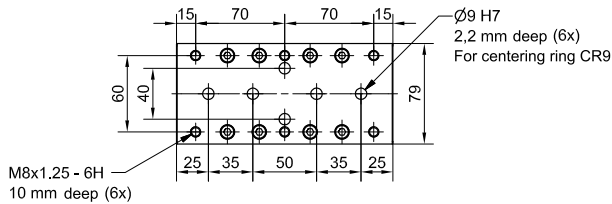
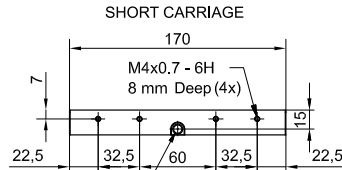
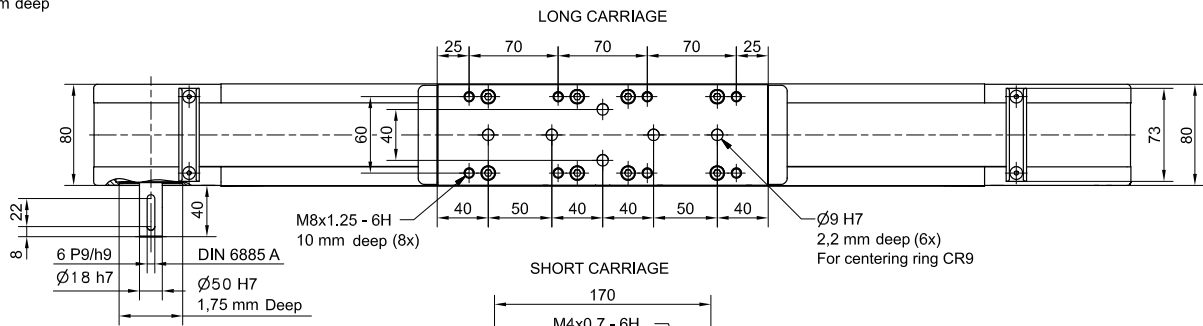
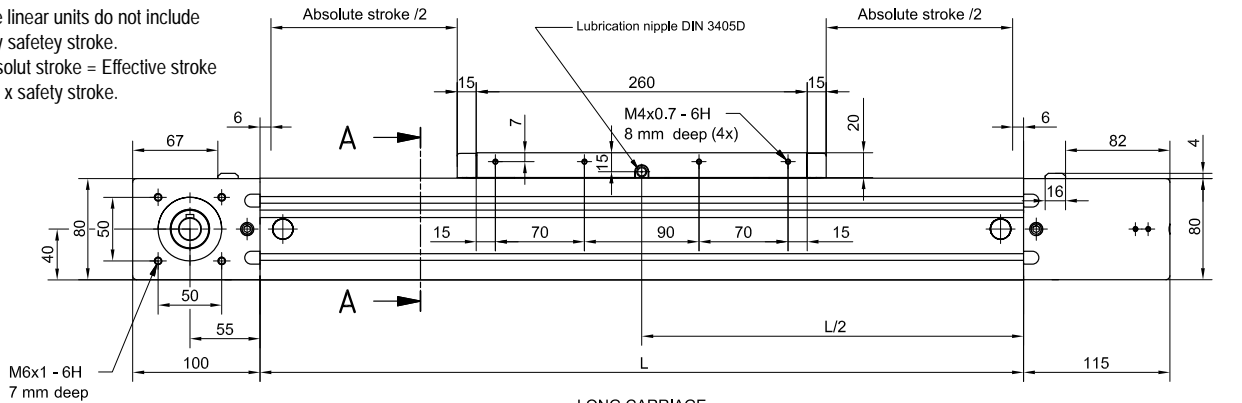
**Double-Carriage**



$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + A + 40 \text{ mm}$   
 $L_{\text{total}} = L + 185 \text{ mm}$   
 $A \geq L_v + 30 \text{ mm}$

# MTJ 80 & MRJ 80

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

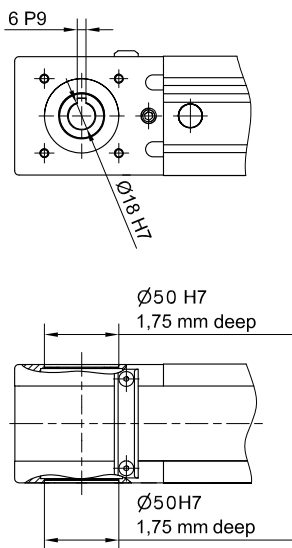


① Journal with or without keyway.

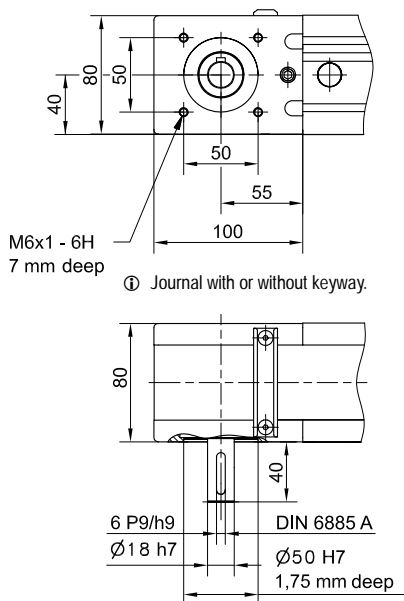
① Short carriage only for TJ series.

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

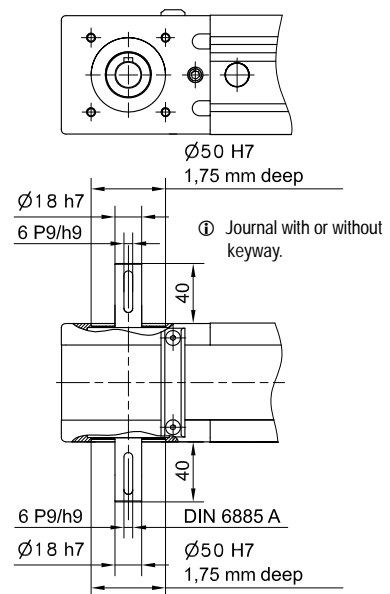
## TYPE 0



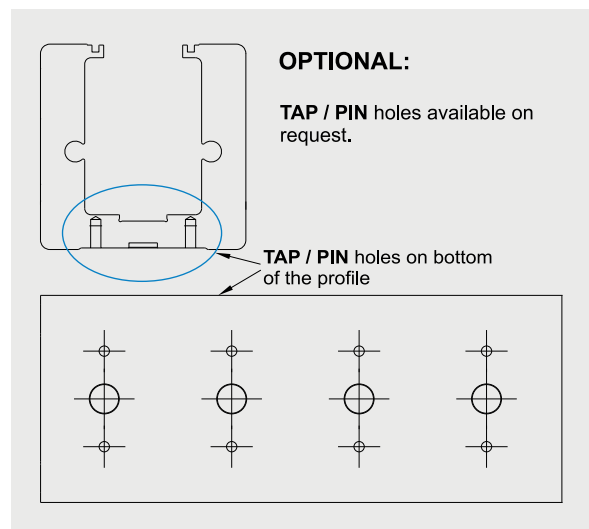
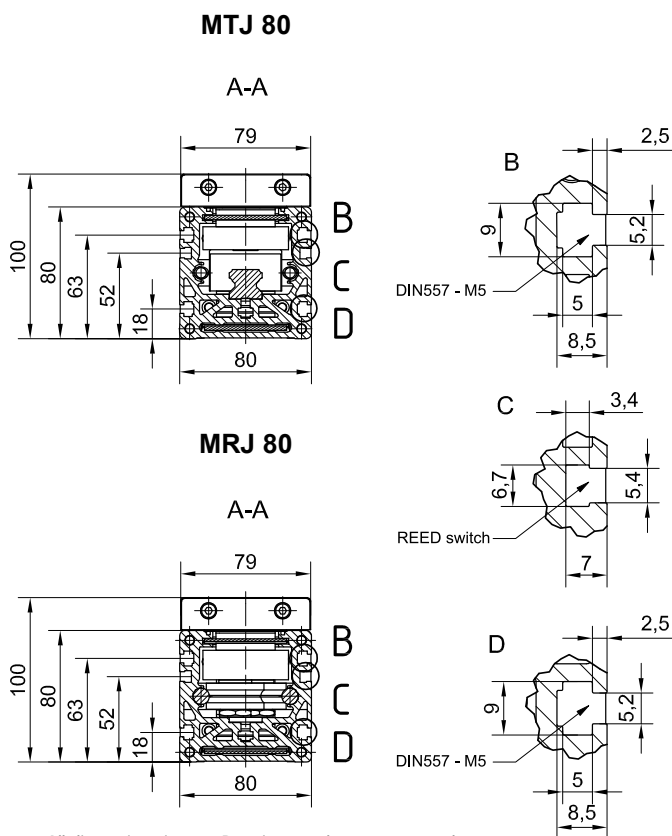
## TYPE 1 L and 1 R



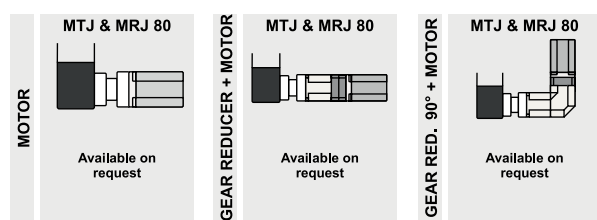
## TYPE 2







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



### Defining of the linear unit length

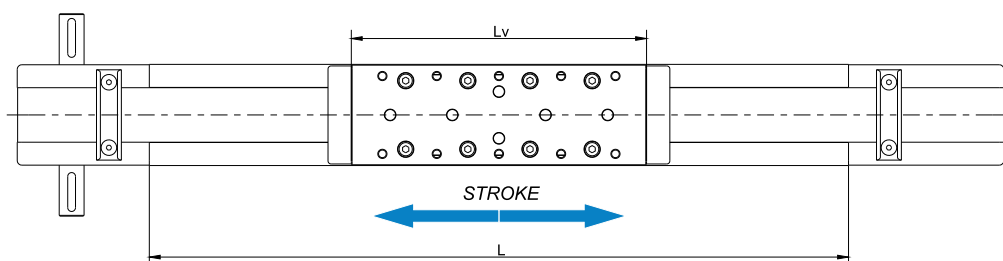
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 42 \text{ mm}$

$L_v - \text{Long carriage} = 260 \text{ mm}$

$L_{\text{total}} = L + 215 \text{ mm}$

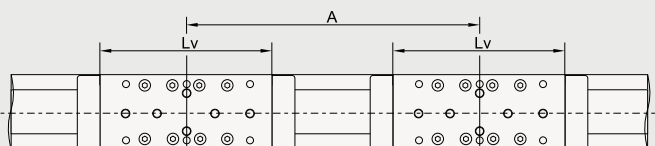
$L_v - \text{Short carriage} = 170 \text{ mm}$

Left side (L)



Right side (R)

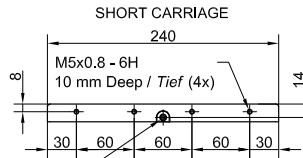
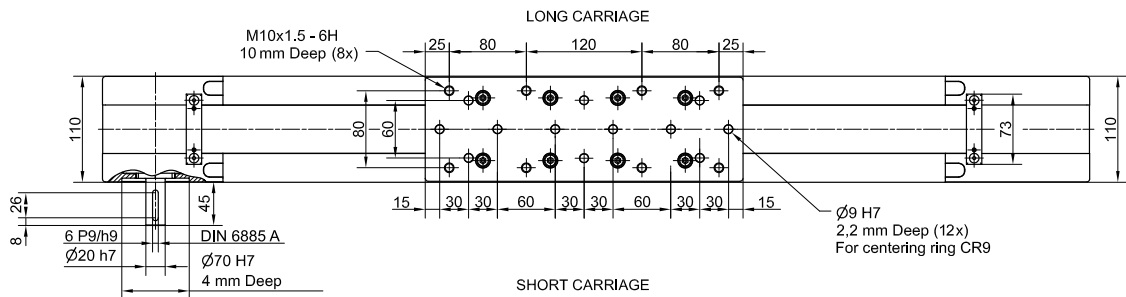
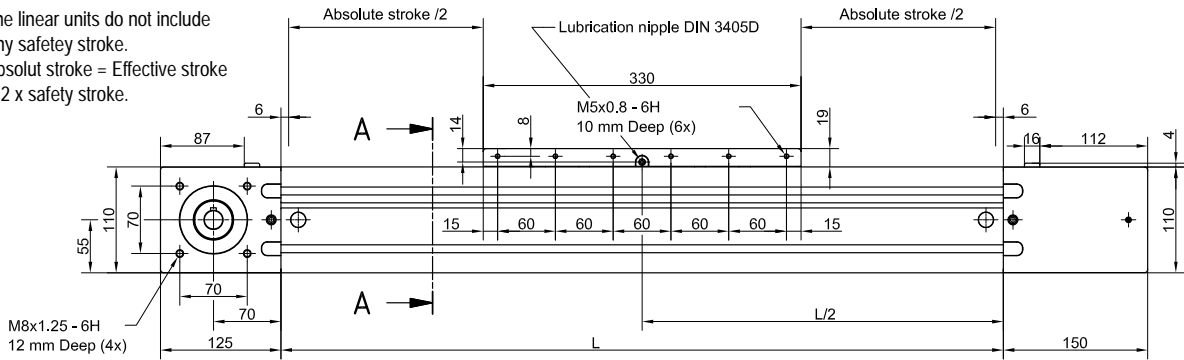
### Double-Carriage



$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + A + 42 \text{ mm}$   
 $L_{\text{total}} = L + 215 \text{ mm}$  }  $A \geq L_v + 30 \text{ mm}$

# MTJ 110 & MRJ 110

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

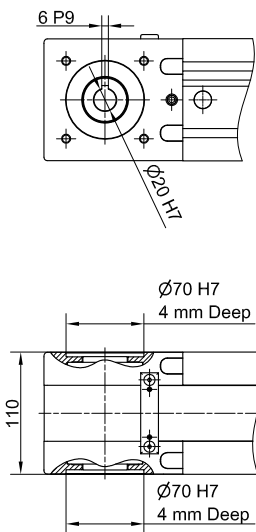


① hort carriage only for TJ series.

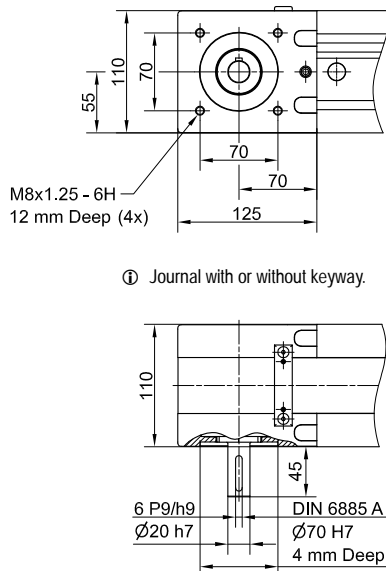
① Journal with or without keyway.

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

## TYPE 0

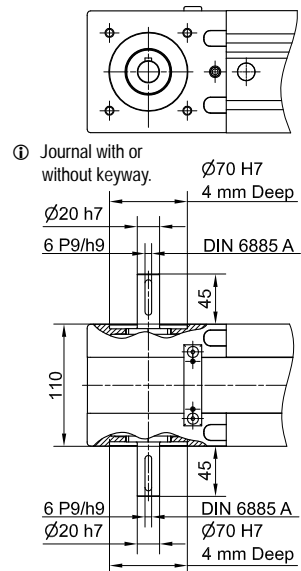


## TYPE 1 L and 1 R

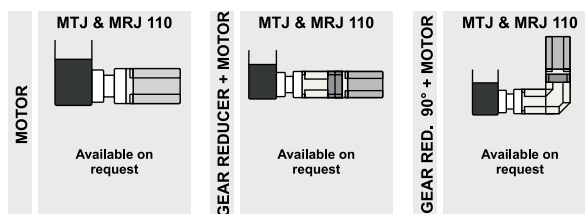
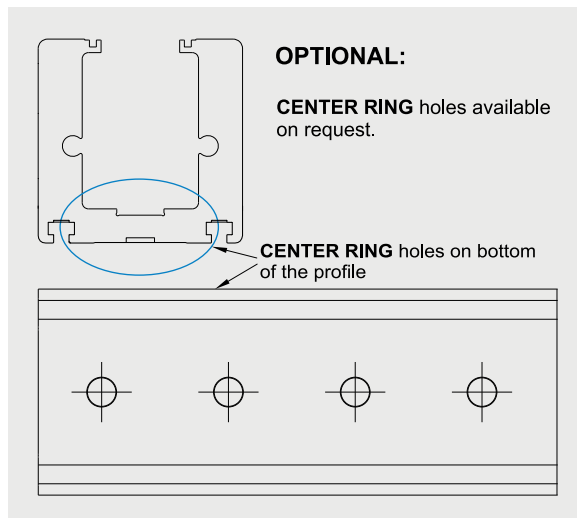
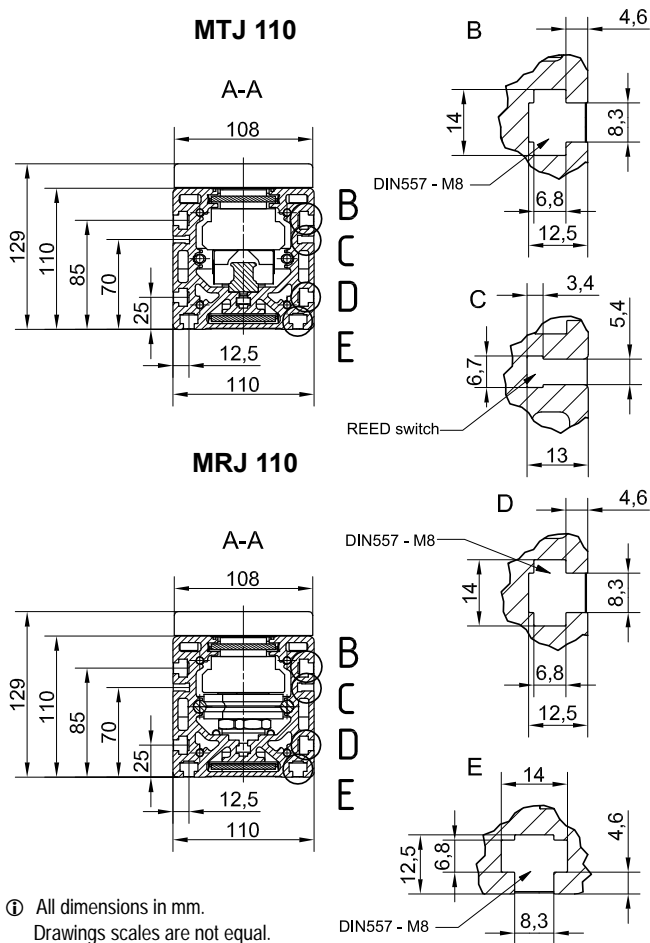


① Journal with or without keyway.

## TYPE 2



① Journal with or without keyway.



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

### Defining of the linear unit length

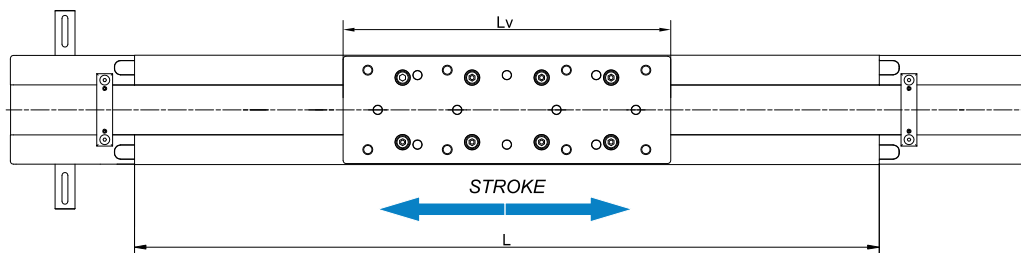
$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 12 \text{ mm}$$

$$L_v - \text{Long carriage} = 330 \text{ mm}$$

$$L_{\text{total}} = L + 275 \text{ mm}$$

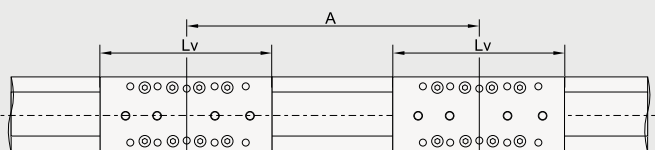
$$L_v - \text{Short carriage} = 240 \text{ mm}$$

Left side (L)



Right side (R)

### Double Carriage



$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + A + 12 \text{ mm} \quad \left. \vphantom{L} \right\} A \geq L_v$$

$$L_{\text{total}} = L + 275 \text{ mm}$$

## Linear Unit MTV

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.

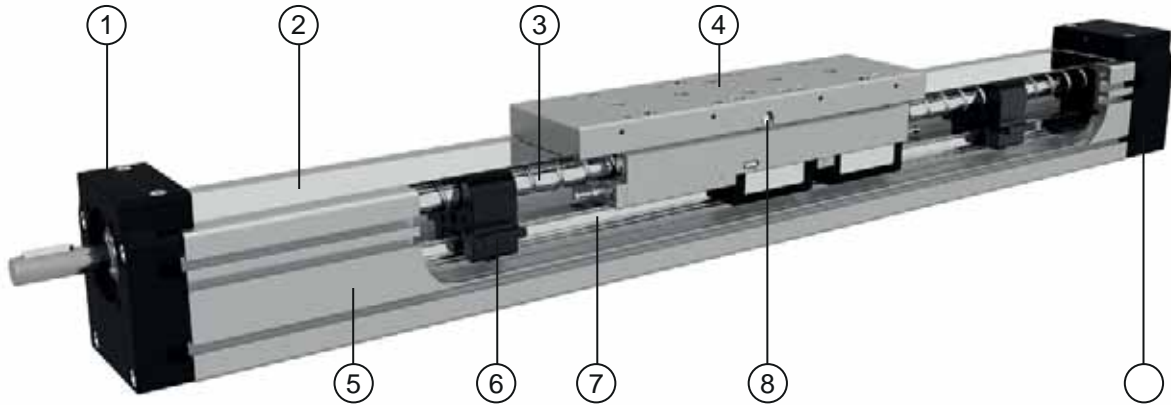
To achieve higher speeds at the same stroke of the linear unit, the ball screw support system can be integrated. With this feature vibrations and deflections of the ball screw are reduced, therefore longer strokes are possible. The linear unit with integrated support system can have a higher axial load 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.



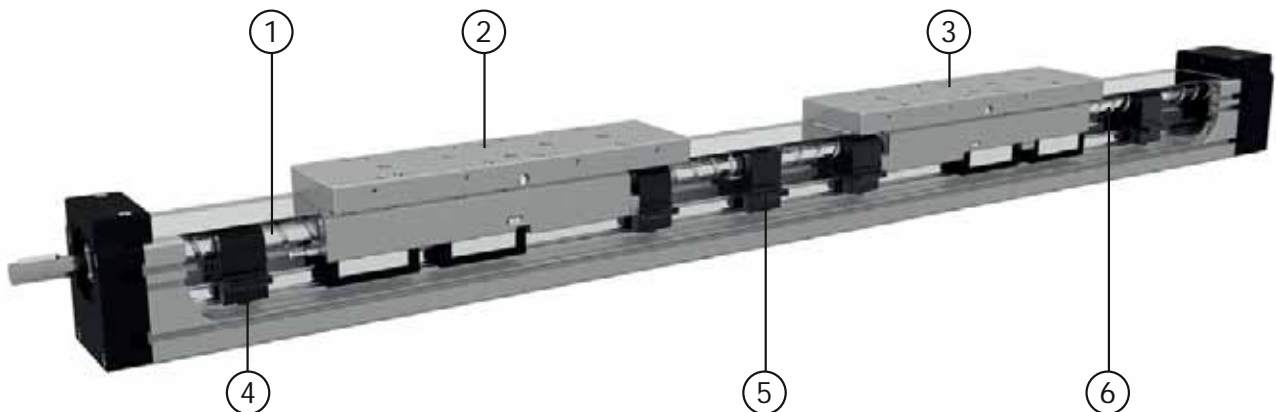
# Structural Design

## Standard version



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}

## 2LR version



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

# Order Code

MTV - 65 - 1610 - ISO7 - 1 - 1000 - 2SA - 2LR

**Series**

MTV

**Size**

65  
80  
110

**Ball screw**

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<sub>SA</sub>**

(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

# Technical Data

## MTV Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Max length* Lmax (mm)	Max stroke* (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments				
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)		
MTV65	220	19800	35000	158	700	700	6540	10190	94	350	233	2920	2690
MTV65 2LR												5789	2667
MTV80	290	34200	60000	370	1470	1470	8930	15070	150	500	384	5480	5163
MTV80 2LR												11055	5224
MTV 110	330	49600	85000	630	2650	2650	10000	20260	295	670	535	5850	5456

\* For lengths/stroke over the stated value in the table above 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 stated in the upper table 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)

### Modulus of elasticity

E = 70000 N / mm<sup>2</sup>

Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperature out of the presented range, please contact us.

## Exceptions for standard version

Linear Unit	Number of SA n <sub>SA</sub>	Max length Lmax (mm)	Max stroke (mm)
MTV65	0	2100	1870
MTV80	0	2500	2183
	2	5010	4648
MTV 110	0	3100	2706

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

Linear Unit	Ball screw (d x l)	Max length Lmax (mm)	Max stroke (mm)
MTV 80	20 X 10	2880	2563

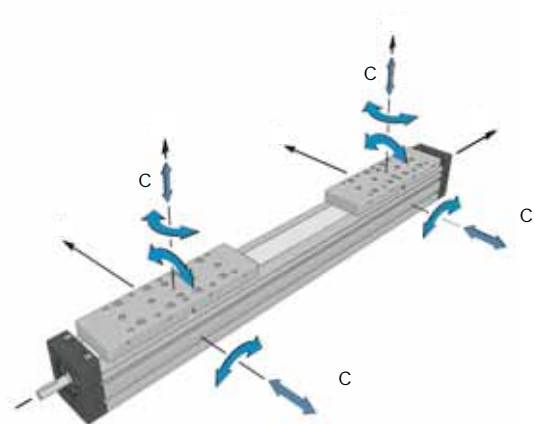
Exceptions for maximum length and stroke!

## Exceptions for 2LR version

Linear Unit	Number of SA n <sub>SA</sub>	Max length Lmax (mm)	Max stroke (mm)
MTV65 2LR	0	4195	1870
MTV80 2LR	0	4973	2183
	2	10200	4750

Linear Unit	Ball screw (d x l)	Max length Lmax (mm)	Max stroke (mm)
MTV652LR	16 X 10	2379	962

Exceptions for maximum length and stroke!



## Ball screw drive data

Linear Unit	Max. rotational speed <sup>1</sup> (without SA) (rev/min)	Max. travel speed <sup>2</sup> (without SA) (m/s)	Lead constant (mm/rev)	Ball screw (d x l)	Max. repeatability precision <sup>3</sup> (mm)		Dynamic load capacity BS  Ca (N)	Max. axial load <sup>4</sup>  Fx (N)	Max. drive torque  Ma (Nm)	Min. stroke <sup>5</sup>  (mm)
					Standard ISO7	ISO5				
MTV65	4200	0,35	5	16 x 5	±0,02	±0,01	13150	8700	7,7	40
		0,70	10	16 x 10	±0,02	±0,01	11550	6730	11,9	40
		1,12	16	16 x 16	±0,02	±0,01	8170	4200	11,9	40
MTV80	3300	0,28	5	20 x 5	±0,02	±0,01	14800	14800	13,0	55
		0,55	10	20 x 10	±0,02	±0,01	15900	13850	24,5	55
		1,10	20	20 x 20	±0,02	±0,01	16250	6930	24,5	55
MTV110	3000	2,50	50	20 x 50	±0,02	±0,01	13000	2770	24,5	55
		0,18	5	32 x 5	±0,02	±0,01	18850	18850	16,7	65
		0,50	10	32 x 10	±0,02	±0,01	33400	29600	52,3	65
MTV110	3000	1,00	20	32 x 20	±0,02	±0,01	29700	14800	52,3	65
		1,60	32	32 x 32	±0,02	±0,01	35150	9240	52,3	70

<sup>1</sup> With SA or 2LR version the max. rotation speed is limited to 3000 rev/min.

<sup>2</sup> 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 in the table above or diagrams please contact Rollco.

<sup>3</sup> For the ball nut with the preload of 2%, please contact Rollco.

<sup>4</sup> In the case of 2RL version the axial load is total axial load of both carriages.

<sup>5</sup> For minimum stroke below the stated value in the table above please contact Rollco.

Max. acceleration (m/s<sup>2</sup>): 20\*

For acceleration over the stated value in the table above, please contact Rollco.

Linear Unit	Planar moment of inertia		Max. permissible drive torque  Ma (Nm)
	Iy (cm <sup>4</sup> )	Iz (cm <sup>4</sup> )	
MTV65	71,3	89,4	5,5
MTV80	144,1	192,3	11,9
MTV 110	562,0	669,0	27,3

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



# Mass, moved mass, mass moment of inertia and no load torque

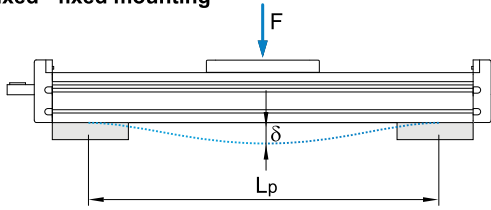
Linear unit	Ball screw (d x l)	Number of SA n <sub>SA</sub>	Mass of linear unit (kg)	Moved mass (kg)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	No load torque <sup>1</sup> (Nm)
MTV 65	16 x 5	0	4,0 + 0,0073 * Stroke (mm)	1,50	1,6 + 0,0052 * Stroke (mm)	0,11
		2	4,5 + 0,0073 * Stroke (mm)	1,58	1,9 + 0,0052 * Stroke (mm)	0,13
		4	5,0 + 0,0073 * Stroke (mm)	1,66	2,2 + 0,0052 * Stroke (mm)	0,15
	16 x 5 2LR version	0	7,2 + 0,0146 * Stroke (mm)	3,00	2,9 + 0,0104 * Stroke (mm)	0,22
		2	8,2 + 0,0146 * Stroke (mm)	3,16	3,5 + 0,0104 * Stroke (mm)	0,26
		4	9,2 + 0,0146 * Stroke (mm)	3,32	4,1 + 0,0104 * Stroke (mm)	0,29
	16 x 10	0	4,0 + 0,0073 * Stroke (mm)	1,50	1,9 + 0,0052 * Stroke (mm)	0,12
		2	4,5 + 0,0073 * Stroke (mm)	1,58	2,2 + 0,0052 * Stroke (mm)	0,16
		4	5,0 + 0,0073 * Stroke (mm)	1,66	2,5 + 0,0052 * Stroke (mm)	0,19
	16 x 10 2LR version	0	7,2 + 0,0146 * Stroke (mm)	3,00	3,5 + 0,0104 * Stroke (mm)	0,24
		2	8,2 + 0,0146 * Stroke (mm)	3,16	4,1 + 0,0104 * Stroke (mm)	0,28
		4	9,2 + 0,0146 * Stroke (mm)	3,32	4,8 + 0,0104 * Stroke (mm)	0,31
	16 x 16	0	4,0 + 0,0073 * Stroke (mm)	1,50	2,5 + 0,0052 * Stroke (mm)	0,13
		2	4,5 + 0,0073 * Stroke (mm)	1,58	2,8 + 0,0052 * Stroke (mm)	0,19
		4	5,0 + 0,0073 * Stroke (mm)	1,66	3,2 + 0,0052 * Stroke (mm)	0,24
MTV 80	20 x 5	0	8,2 + 0,0114 * Stroke (mm)	3,00	5,6 + 0,0127 * Stroke (mm)	0,16
		2	8,9 + 0,0114 * Stroke (mm)	3,07	6,2 + 0,0127 * Stroke (mm)	0,19
		4/6/8/10	9,7 + 0,4 * (n <sub>SA</sub> - 4) + 0,0114 * Stroke (mm)	3,21 + 0,035 * (n <sub>SA</sub> - 4)	7,0 + 0,4 * (n <sub>SA</sub> - 4) + 0,0127 * Stroke (mm)	0,24 + 0,015 * (n <sub>SA</sub> - 4)
	20 x 5 2LR version	0	14,6 + 0,0228 * Stroke (mm)	6,00	9,5 + 0,0254 * Stroke (mm)	0,32
		2	15,9 + 0,0228 * Stroke (mm)	6,14	10,7 + 0,0254 * Stroke (mm)	0,37
		4/6/8/10	17,6 + 0,8 * (n <sub>SA</sub> - 4) + 0,0228 * Stroke (mm)	6,42 + 0,07 * (n <sub>SA</sub> - 4)	12,3 + 0,8 * (n <sub>SA</sub> - 4) + 0,0254 * Stroke (mm)	0,48 + 0,03 * (n <sub>SA</sub> - 4)
	20 x 10	0	8,2 + 0,0114 * Stroke (mm)	3,00	6,2 + 0,0127 * Stroke (mm)	0,17
		2	8,9 + 0,0114 * Stroke (mm)	3,07	6,8 + 0,0127 * Stroke (mm)	0,22
		4/6/8/10	9,7 + 0,4 * (n <sub>SA</sub> - 4) + 0,0114 * Stroke (mm)	3,21 + 0,035 * (n <sub>SA</sub> - 4)	7,6 + 0,4 * (n <sub>SA</sub> - 4) + 0,0127 * Stroke (mm)	0,33 + 0,025 * (n <sub>SA</sub> - 4)
	20 x 20	0	8,2 + 0,0114 * Stroke (mm)	3,00	8,5 + 0,0127 * Stroke (mm)	0,18
		2	8,9 + 0,0114 * Stroke (mm)	3,07	9,1 + 0,0127 * Stroke (mm)	0,29
		4/6/8/10	9,7 + 0,4 * (n <sub>SA</sub> - 4) + 0,0114 * Stroke (mm)	3,21 + 0,035 * (n <sub>SA</sub> - 4)	10,1 + 0,5 * (n <sub>SA</sub> - 4) + 0,0127 * Stroke (mm)	0,50 + 0,055 * (n <sub>SA</sub> - 4)
	20 x 50	0	8,2 + 0,0114 * Stroke (mm)	3,00	24,4 + 0,0127 * Stroke (mm)	0,28
		2	8,9 + 0,0114 * Stroke (mm)	3,07	25,5 + 0,0127 * Stroke (mm)	0,55
		4/6/8/10	9,7 + 0,4 * (n <sub>SA</sub> - 4) + 0,0114 * Stroke (mm)	3,21 + 0,035 * (n <sub>SA</sub> - 4)	27,1 + 0,6 * (n <sub>SA</sub> - 4) + 0,0127 * Stroke (mm)	1,08 + 0,0135 * (n <sub>SA</sub> - 4)
MTV 110	32 x 5	0	17,3 + 0,0216 * Stroke (mm)	4,90	34,6 + 0,0690 * Stroke (mm)	0,45
		2	17,7 + 0,0216 * Stroke (mm)	5,03	35,1 + 0,0690 * Stroke (mm)	0,52
		4/6/8/10	19,3 + 0,8 * (n <sub>SA</sub> - 4) + 0,0216 * Stroke (mm)	5,29 + 0,065 * (n <sub>SA</sub> - 4)	39,4 + 2,2 * (n <sub>SA</sub> - 4) + 0,0690 * Stroke (mm)	0,66 + 0,035 * (n <sub>SA</sub> - 4)
	32 x 10	0	17,3 + 0,0216 * Stroke (mm)	4,90	35,5 + 0,0690 * Stroke (mm)	0,50
		2	17,7 + 0,0216 * Stroke (mm)	5,03	36,1 + 0,0690 * Stroke (mm)	0,64
		4/6/8/10	19,3 + 0,8 * (n <sub>SA</sub> - 4) + 0,0216 * Stroke (mm)	5,29 + 0,065 * (n <sub>SA</sub> - 4)	40,4 + 2,2 * (n <sub>SA</sub> - 4) + 0,0690 * Stroke (mm)	0,92 + 0,070 * (n <sub>SA</sub> - 4)
	32 x 20	0	17,3 + 0,0216 * Stroke (mm)	4,90	39,3 + 0,0690 * Stroke (mm)	0,55
		2	17,7 + 0,0216 * Stroke (mm)	5,03	39,9 + 0,0690 * Stroke (mm)	0,83
		4/6/8/10	19,3 + 0,8 * (n <sub>SA</sub> - 4) + 0,0216 * Stroke (mm)	5,29 + 0,065 * (n <sub>SA</sub> - 4)	44,4 + 2,2 * (n <sub>SA</sub> - 4) + 0,0690 * Stroke (mm)	1,40 + 0,140 * (n <sub>SA</sub> - 4)
	32 x 32	0	17,3 + 0,0216 * Stroke (mm)	4,90	47,0 + 0,0690 * Stroke (mm)	0,60
		2	17,7 + 0,0216 * Stroke (mm)	5,03	47,8 + 0,0690 * Stroke (mm)	1,05
		4/6/8/10	19,3 + 0,8 * (n <sub>SA</sub> - 4) + 0,0216 * Stroke (mm)	5,29 + 0,065 * (n <sub>SA</sub> - 4)	52,8 + 2,3 * (n <sub>SA</sub> - 4) + 0,0690 * Stroke (mm)	1,96 + 0,225 * (n <sub>SA</sub> - 4)

<sup>1</sup> The stated values are for strokes up to 500 mm. No load torque value increases with stroke elongation.

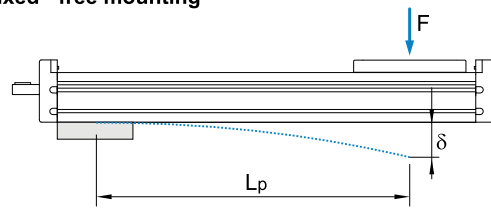
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

## Deflection of the linear unit (standard)

Fixed - fixed mounting



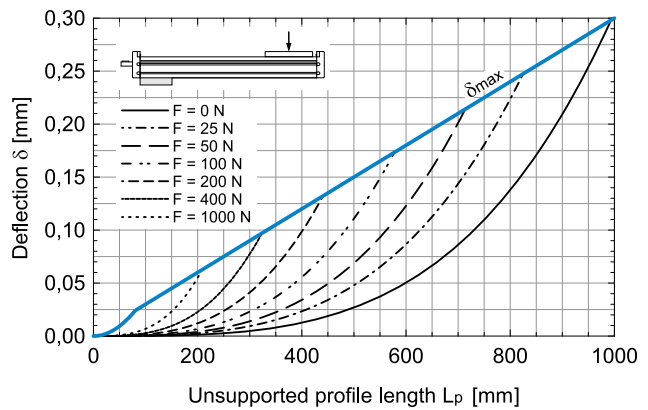
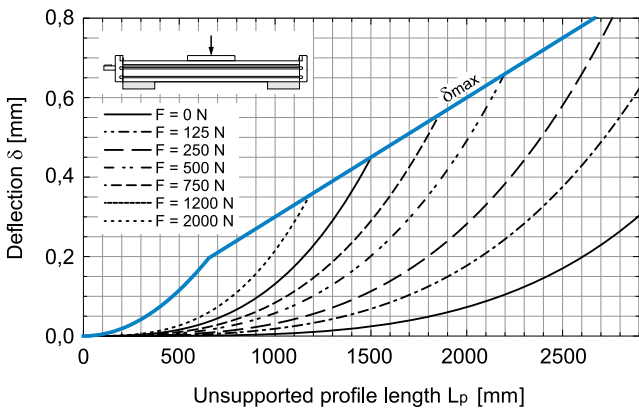
Fixed - free mounting



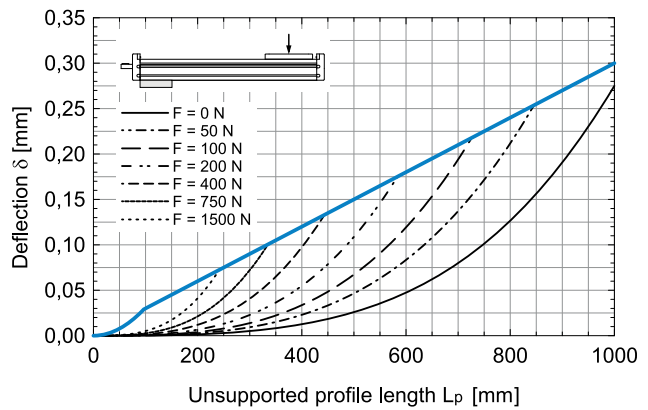
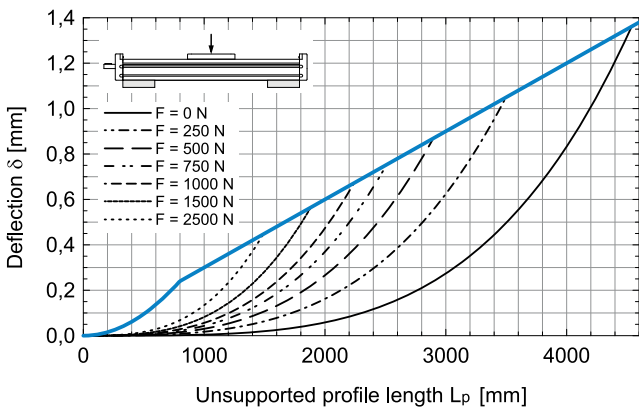
- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- $L_p$  Unsupported profile length [mm]

The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.

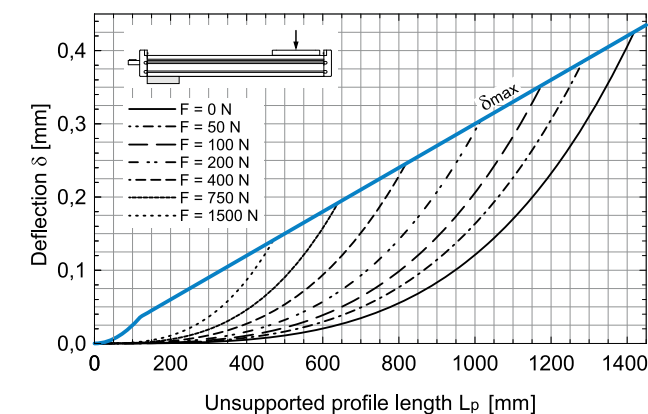
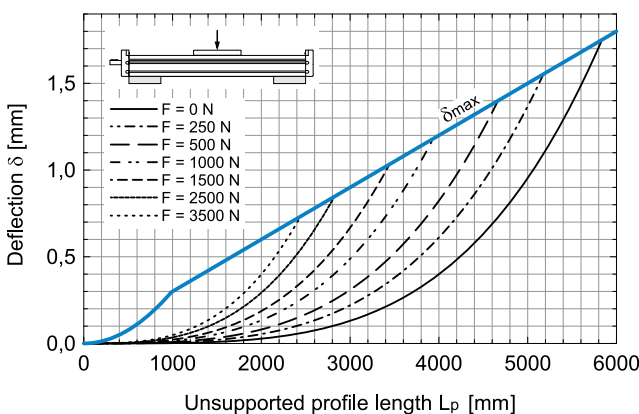
### MTV 65



### MTV 80

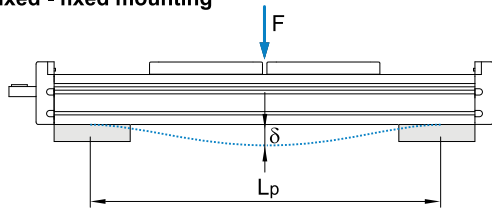


### MTV 110



## Deflection of the 2LR version

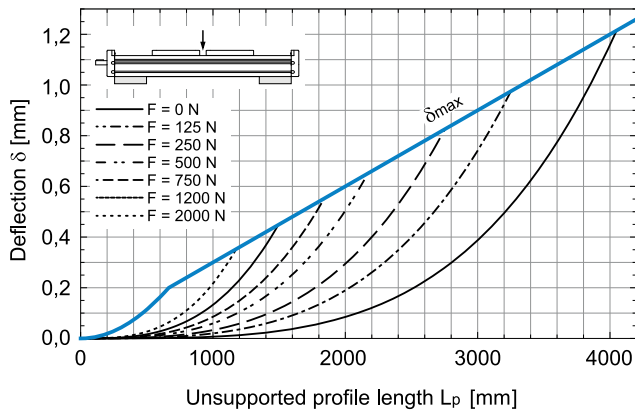
Fixed - fixed mounting



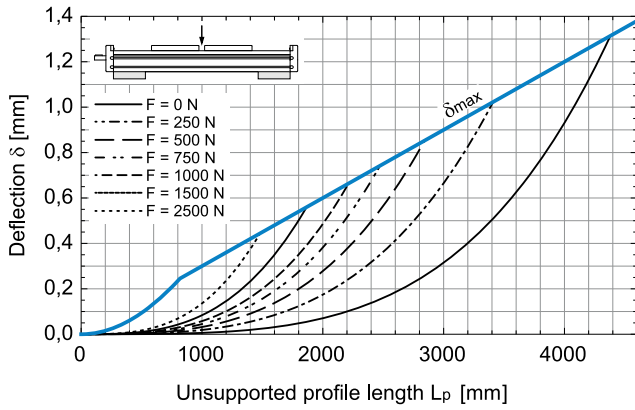
- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- $F$  Applied force [N]
- $L_p$  Unsupported profile length [mm]

*The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.*

### MTV 65



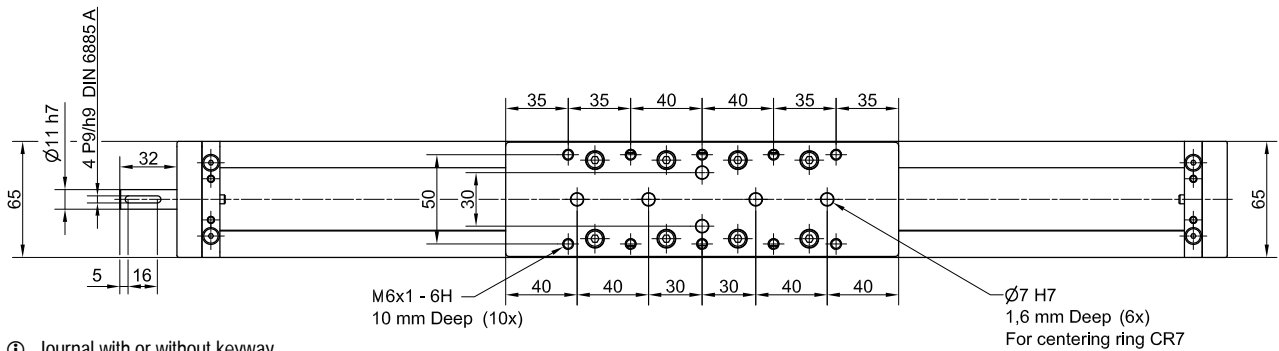
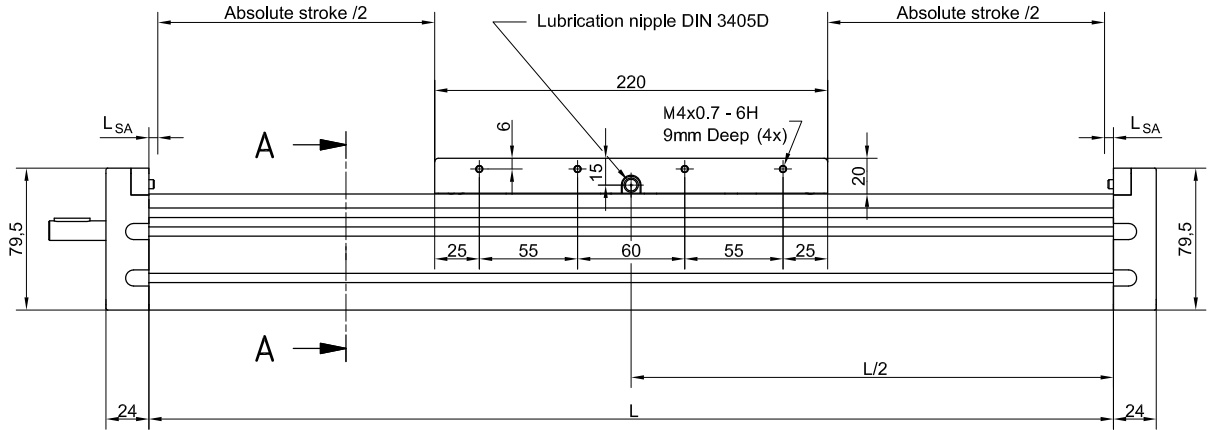
### MTV 80



# Dimensions

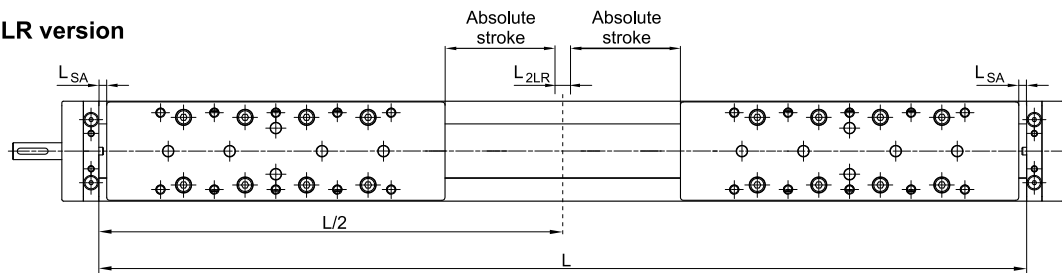
## MTV 65

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



① Journal with or without keyway.

### 2LR version

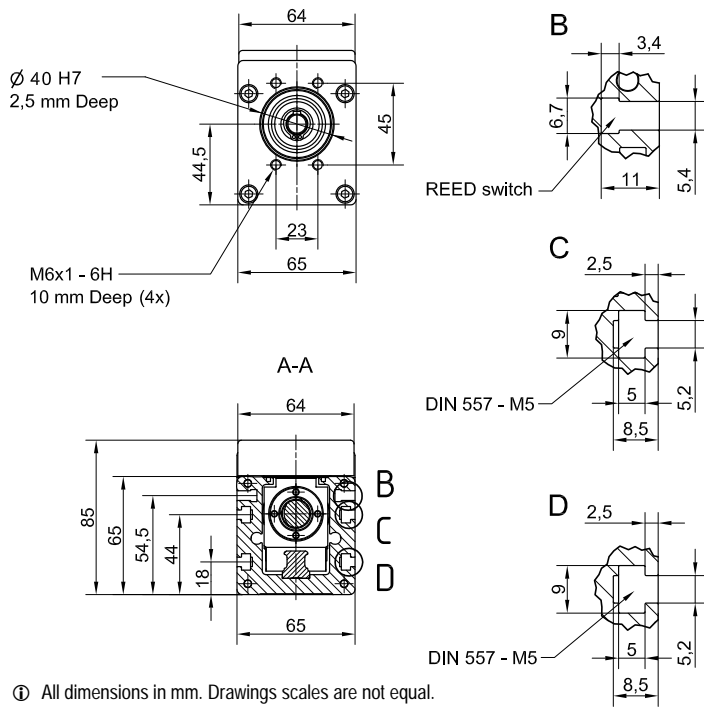


① All dimensions in mm. Drawings scales are not equal.

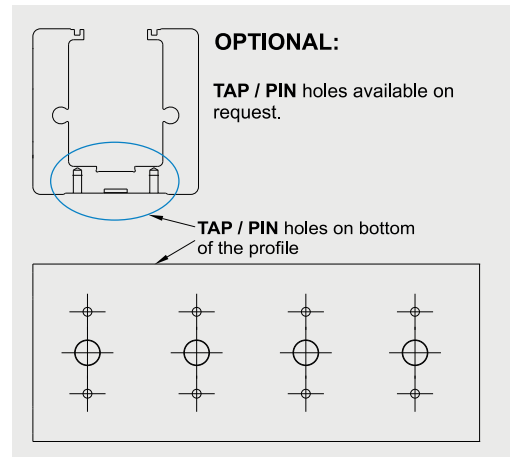
n	L <sub>SA</sub>	L <sub>2LR</sub>
0	5,0	5,0
2SA	31,0	67,0
4SA	62,0	129,0

L<sub>SA</sub> Additional length (mm)

L<sub>2LR</sub> Min. distance between carriages (mm)



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**

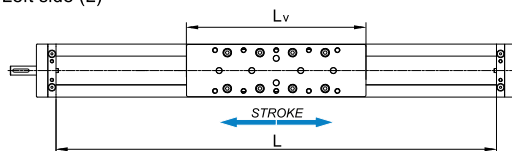
### Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{SA}$$

$$L_{total} = L + 48 \text{ mm}$$

$$L_v = 220 \text{ mm}$$

Left side (L)



Right side (R)

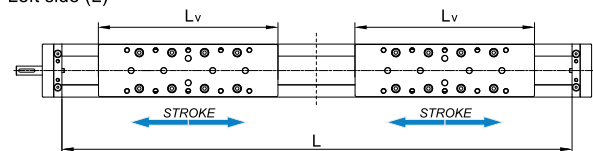
R

$$L = 2 \times (\text{Effective stroke} + 2 \times \text{Safety stroke}) + 2 \times L_v + 2 \times L_{SA} + L_{2LR}$$

$$L_{total} = L + 48 \text{ mm}$$

$$L_v = 220 \text{ mm}$$

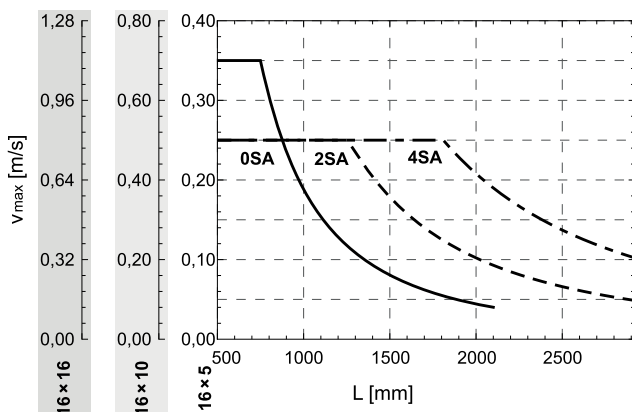
Left side (L)



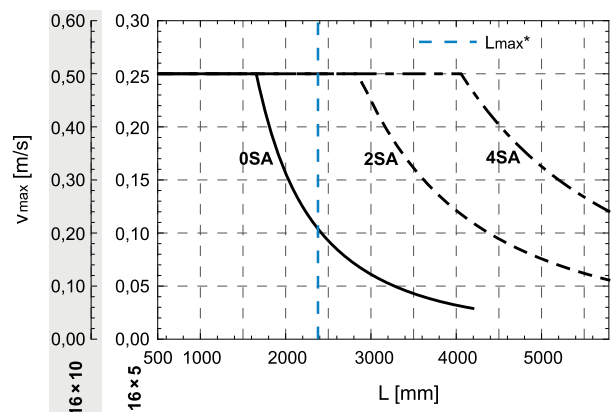
Right side (R)

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

Standard version



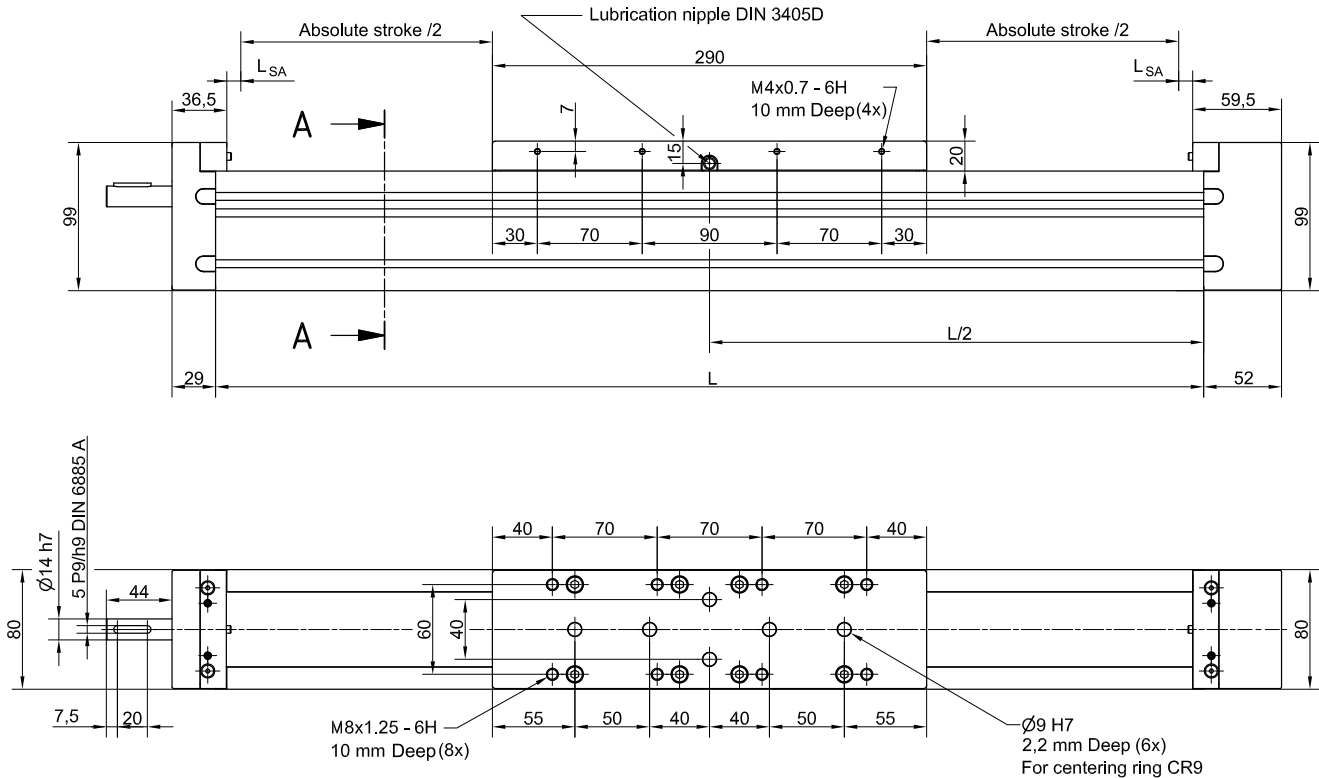
2LR version



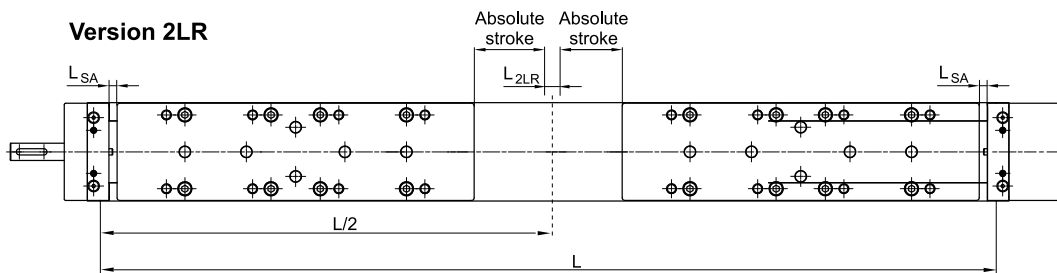
\* Maximum length Lmax of MTV 65 2LR linear unit with 16x10 ball screw

# MTV 80

- ① The linear units do not include any safety stroke.  
Absolute stroke = Effective stroke + 2 x safety stroke.



- ① Journal with or without keyway.

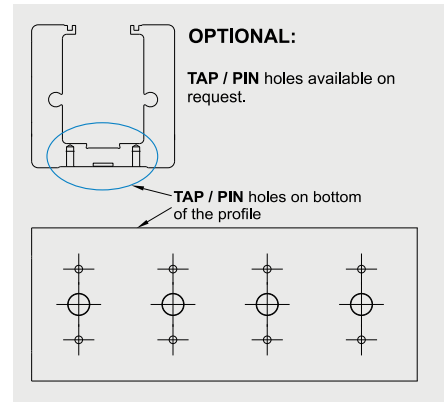
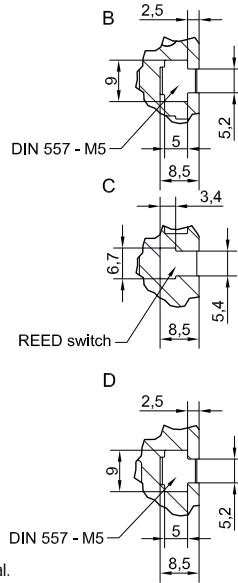
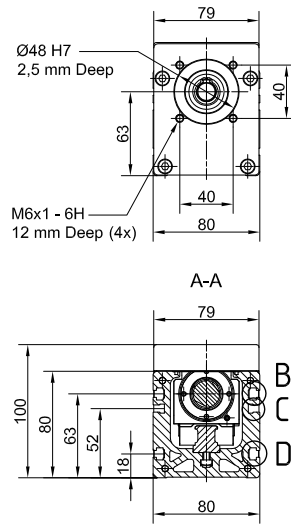


- ① All dimensions in mm. Drawings scales are not equal.

n <sub>SA</sub>	L <sub>SA</sub>	L <sub>2LR</sub>
0	6,0	0,0
2SA	28,5	48,0
4SA	59,5	110,0
6SA	90,5	172,0
8SA	121,5	234,0
10SA	152,5	296,0

L<sub>SA</sub> Additional length (mm)

L<sub>2LR</sub> Min. distance between carriages (mm)



**Mounting the drive**

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

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

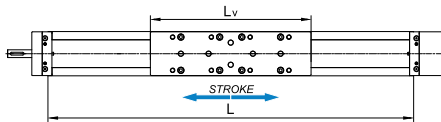
### Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{SA} + 15 \text{ mm}$$

$$L_{\text{total}} = L + 81 \text{ mm}$$

$$L_v = 290 \text{ mm}$$

Left side (L)



Right side (R)

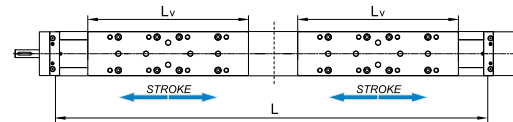
R

$$L = 2 \times (\text{Effective stroke} + 2 \times \text{Safety stroke}) + 2 \times L_v + 2 \times L_{SA} + L_{2LR} + 15 \text{ mm}$$

$$L_{\text{total}} = L + 81 \text{ mm}$$

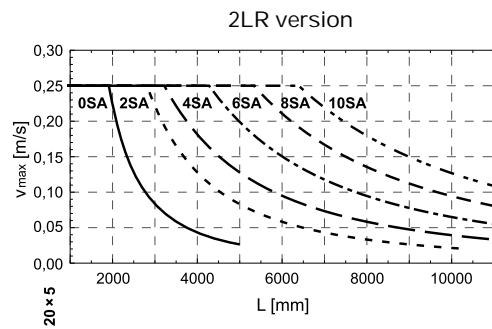
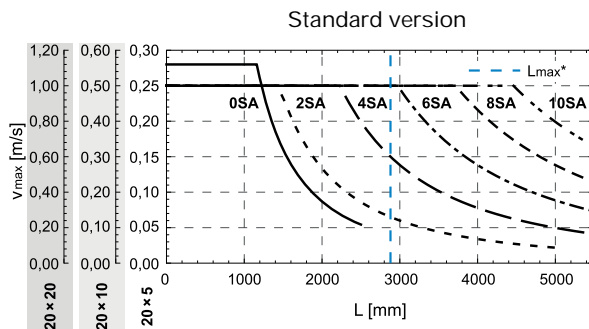
$$L_v = 290 \text{ mm}$$

Left side (L)

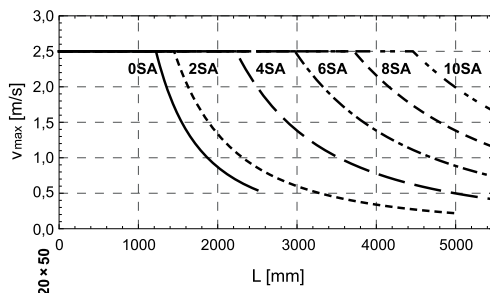


Right side (R)

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

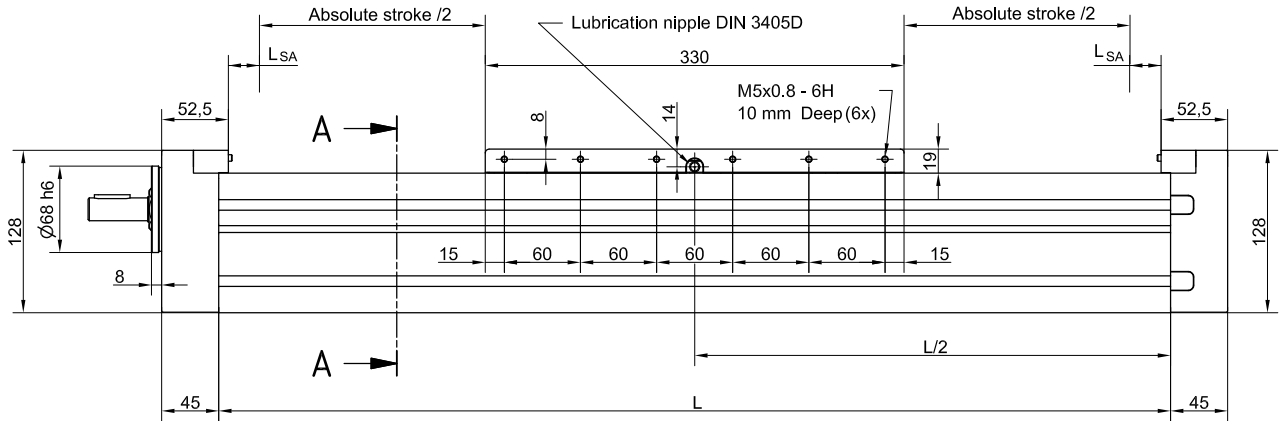


\* Maximum length Lmax of MTV 80 linear unit with 20x10 ball screw

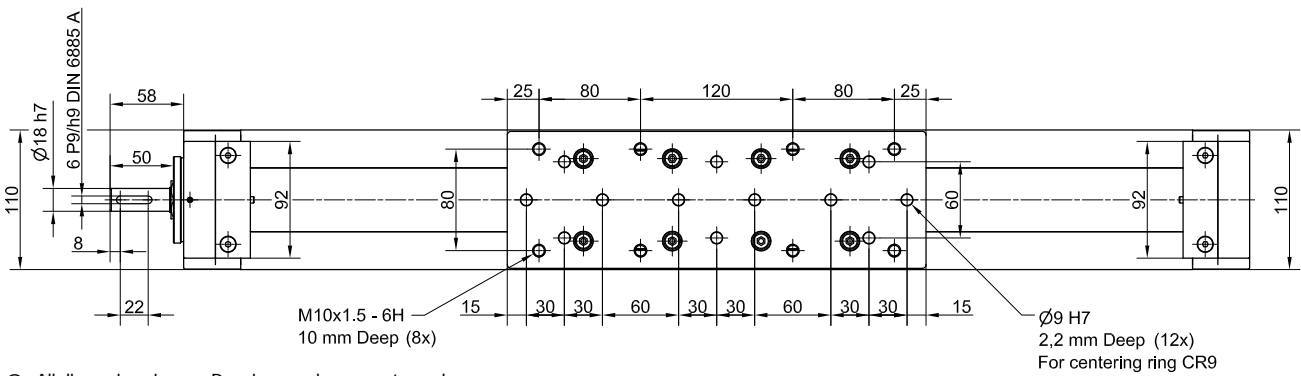


# MTV 110

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



- ① Journal with or without keyway.

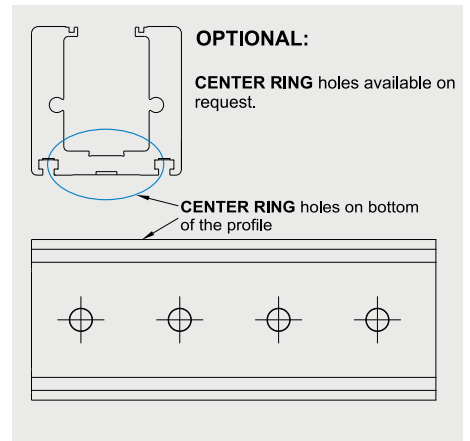
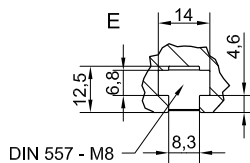
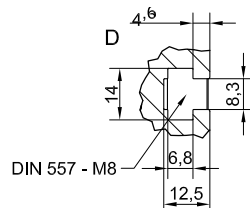
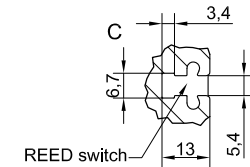
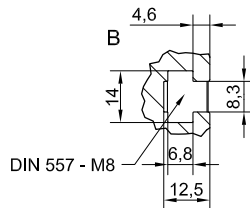
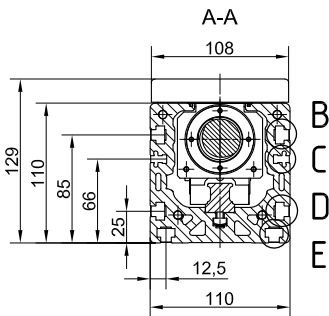
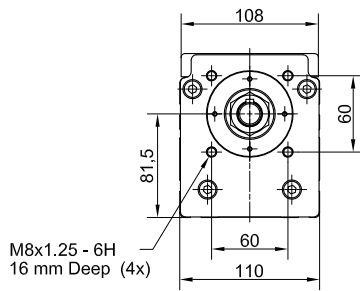


- ① All dimensions in mm. Drawings scales are not equal.

n	$L_{SA}$
0	24,5
2SA	28,0
4SA	59,0
6SA	90,0
8SA	121,0
10SA	152,0

$L_{SA}$  Additional length (mm)





**Mounting the drive**

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

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

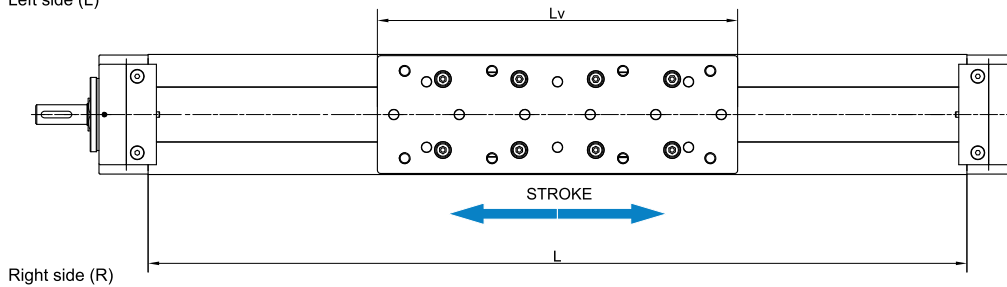
### Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{sa} + 15 \text{ mm}$$

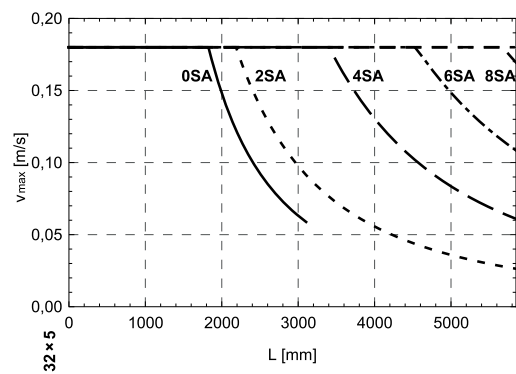
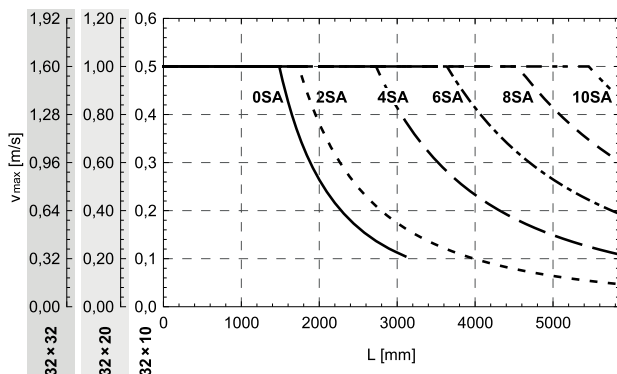
$$L_v = 330 \text{ mm}$$

$$L_{total} = L + 90 \text{ mm}$$

Left side (L)



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

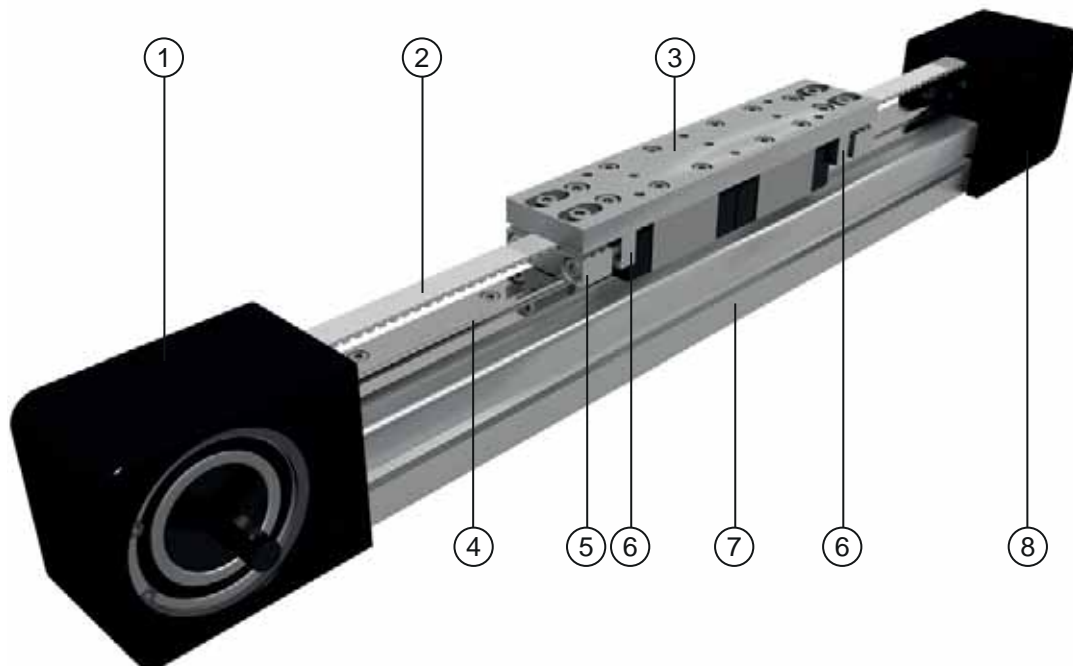


## Linear Unit MTJ ECO

The MTJ ECO series linear unit is a powerful and cost-effective linear unit with toothed belt drive and a zero-backlash ball rail guide system for easy and accurate linear movements.

The linear unit MTJ ECO uses a pre-tensioned steel reinforced AT polyurethane timing toothed belt. In conjunction with a zero-backlash drive pulley high moments with alternating loads with good positioning accuracy, low wear and low noise can be realized.

### Structural Design



1. Drive block with pulley
2. AT polyurethane toothed belt with steel tension cords
3. Carriage
4. Linear ball guideway
5. Belt tensioning system
6. Lubrication port
7. Aluminium profile - hard anodized
8. End block

# Order Code

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

# Technical Data

## MTJ ECO Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Moved mass (kg)	Max repeatability (mm)	Max length* (mm)	Max stroke* (mm)	Min. stroke** (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments							
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)					
MTJ 40 ECO S	132	9900	17500	79	59	59	3270	5100	34	34	34	0,45	± 0,1	5960	5813	40
MTJ 40 ECO L	200	19800	35000	158	660	660	6540	10190	60	341	219	0,72	± 0,1	5960	5745	40

\* For length/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

\*\* For minimum stroke below the stated value in the table above, please contact Rollco.

### Recommended values of loads

All the data of static and dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety.

C

We recommend a minimum safety factor (fs =5.0).

### Modulus of elasticity

E = 70000 N / mm<sup>2</sup>

Operating conditions	
Operating temperature	0°C - +60°C
Duty cycle	100%

C

For operating temperature out of the presented range, please contact Rollco.

## General technical data for double carriage

Linear Unit	Carriage version	Load capacity		Dynamic moment*			Max. permissible loads*				
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments		
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)
MTJ ECO 40	S2	19800	35000	158	9,9 * A (mm)	9,9 * A (mm)	6540	10190	68	5,1 * A (mm)	3,3 * A (mm)
	L2	39600	70000	317	19,8 * A (mm)	19,8 * A (mm)	13080	20380	120	10,1 * A (mm)	6,5 * A (mm)

\*A - Distance between carriages. More info on following pages.

## Drive and belt data

Linear Unit	Max travel speed* (m/s)	Maximum drive torque (Nm)	No load torque* (Nm)	Pulley drive ratio (mm/rev)	Pulley diameter (mm)	Belt type	Belt width (mm)	Max. force transmitted by belt (N)	Specific spring constant Cspec (N)
MTJ 40 ECO S	3	7,5	0,8	180	57,31	AT5	12	262	235000
MTJ 40 ECO L			0,9						

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

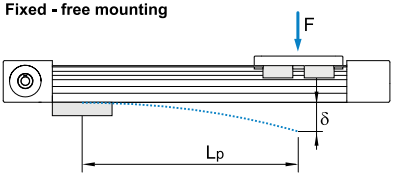
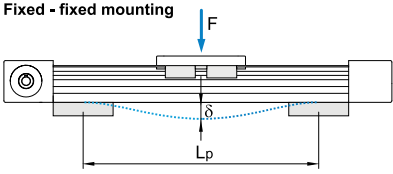
Max. acceleration (m/s<sup>2</sup>): 70

For acceleration over the stated value in the table above, please contact Rollco.

## Mass and mass moment of inertia

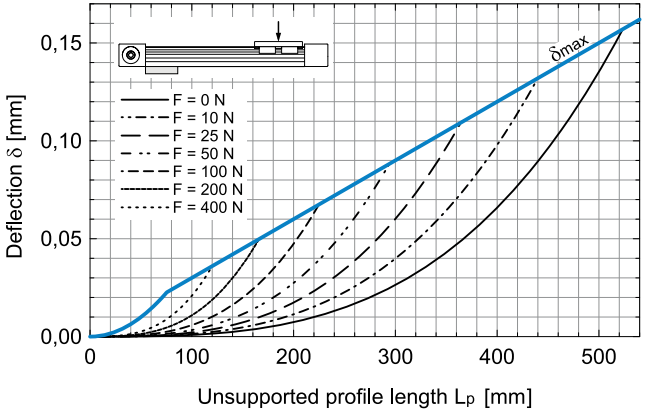
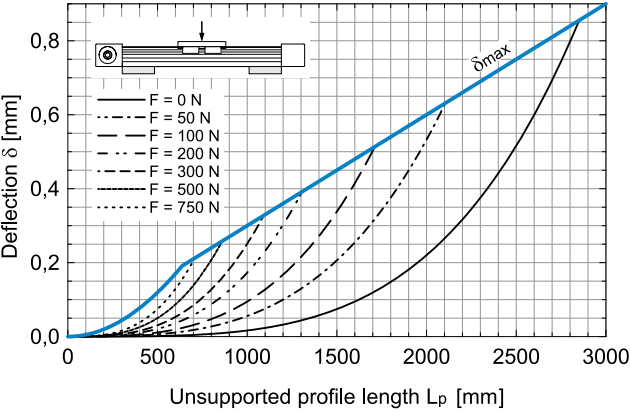
Linear Unit	Carriage length Lv (mm)	Mass of linear unit (kg)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	Planar moment of inertia	
				Iy (cm <sup>4</sup> )	Iz (cm <sup>4</sup> )
MTJ 40 ECOS	132	3,1 + 0,003 * Stroke (mm)	70,1 + 0,007 * Stroke (mm)	9,53	9,21
MTJ 40 ECO L	200	3,55 + 0,003 * Stroke (mm)	92,3 + 0,007 * Stroke (mm)	9,53	9,21

# Deflection of the linear unit



- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- $L_p$  Unsupported profile length [mm]

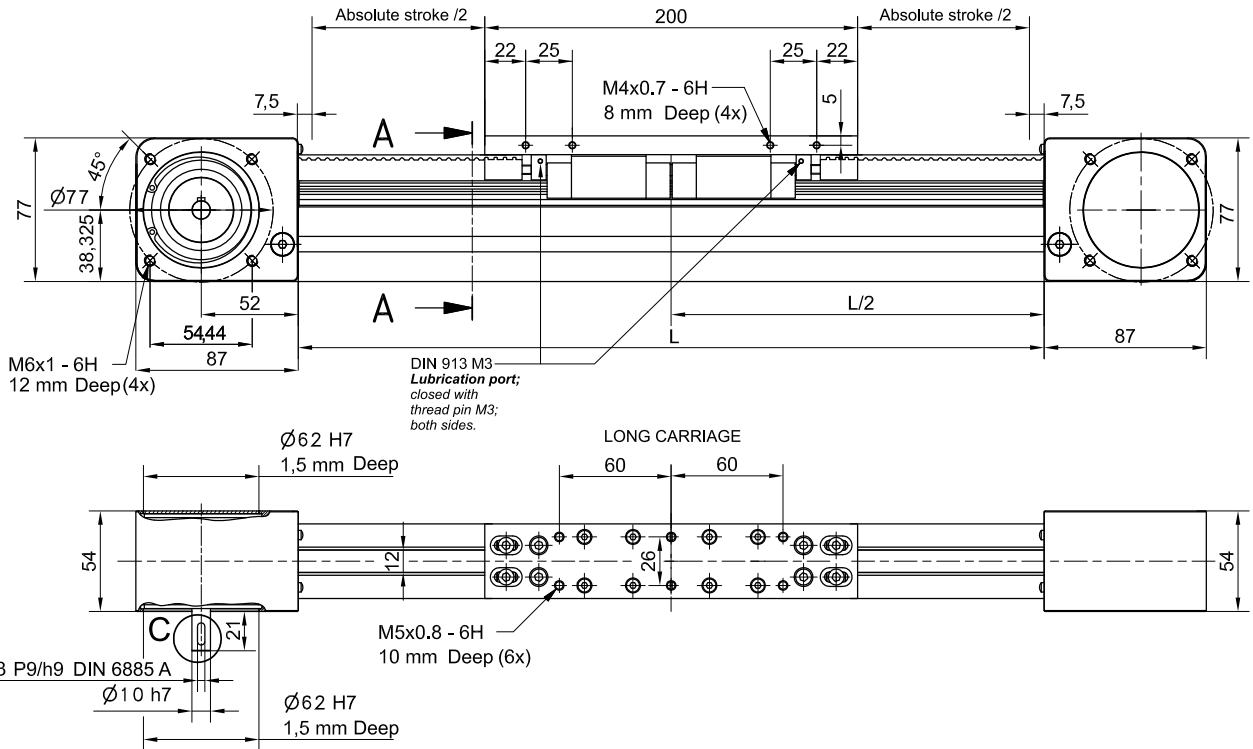
The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.



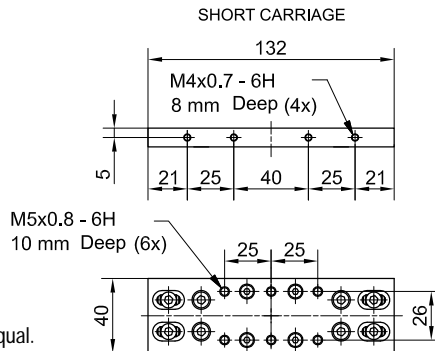
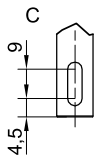
# Dimensions

## MTJ ECO

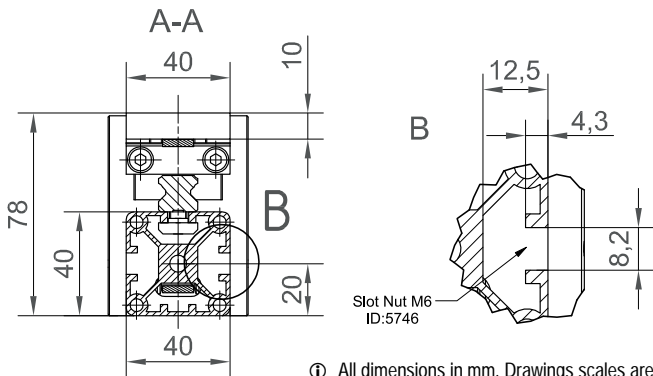
① The linear units do not include any safety stroke.  
 Absolut stroke = Effective stroke + 2 x safety stroke.



① Journal with or without keyway.

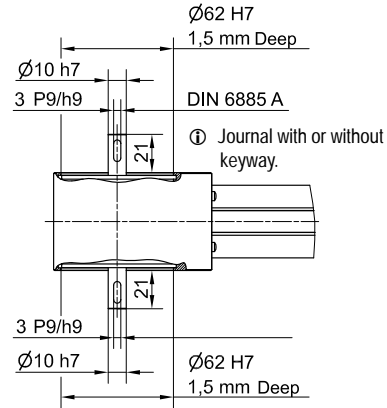
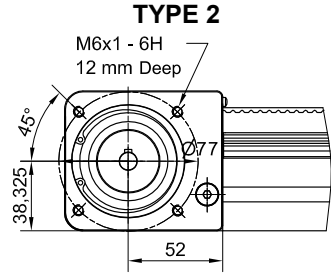
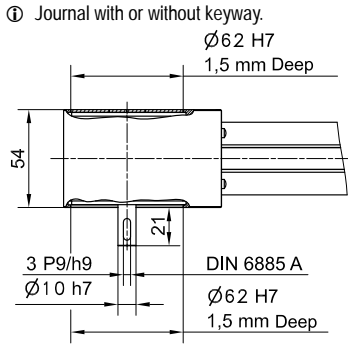
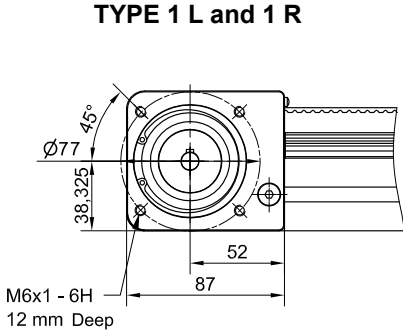
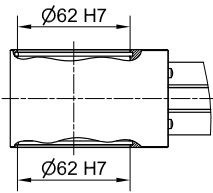
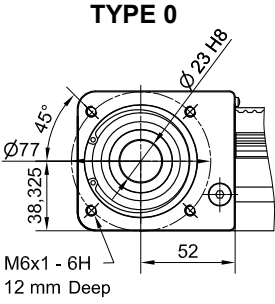


① All dimensions in mm. Drawings scales are not equal.



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

	<b>MTJ 40 ECO</b>	<b>MTJ 40 ECO</b>	<b>MTJ 40 ECO</b>
<b>MOTOR</b>			
	Available on request	Available on request	Available on request
<b>GEAR REDUCER + MOTOR</b>			
	Available on request	Available on request	Available on request
<b>GEAR REDUC. 90° + MOTOR</b>			
	Available on request		Available on request



**Defining of the linear unit length**

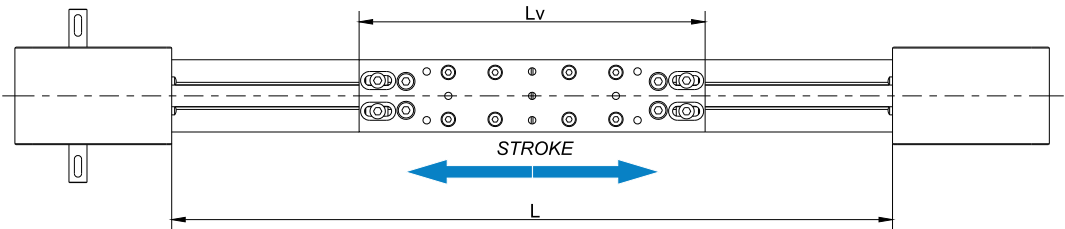
**L = Effective stroke + 2 × Safety stroke + Lv + 15 mm**

**Lv - Long carriage = 200 mm**

**Ltotal = L + 174 mm**

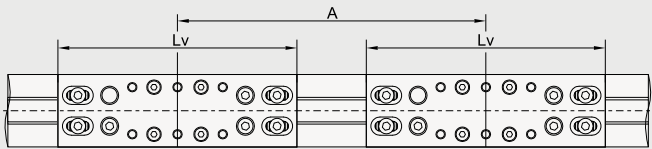
**Lv - Short carriage = 132 mm**

Left side (L)



Right side (R)

**Double Carriage**



**L = Effective stroke + 2 × Safety stroke + Lv + A + 15 mm**  
**Ltotal = L + 174 mm** } **A ≥ Lv**

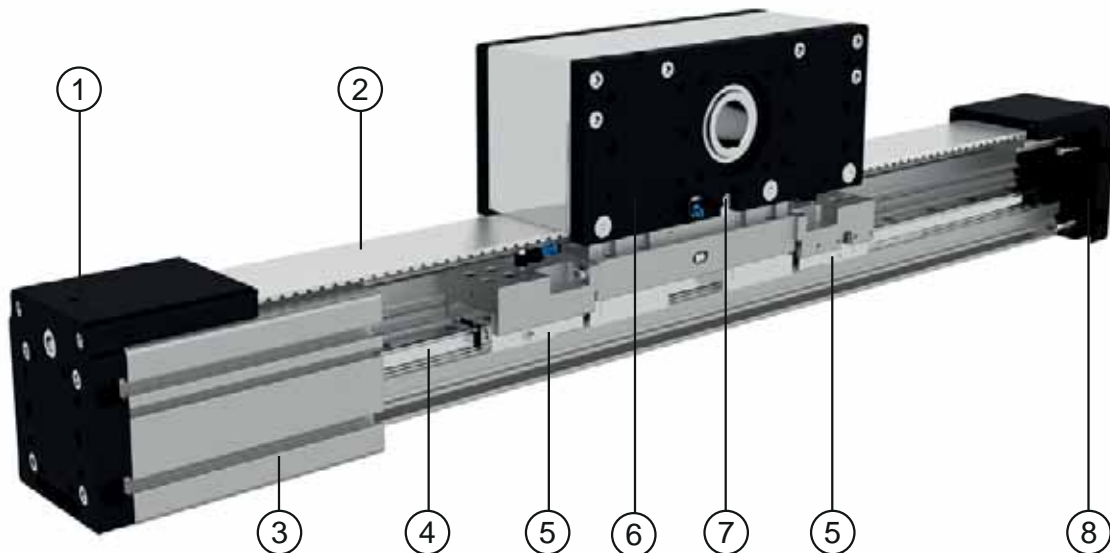
## Linear Units MTJZ

The MTJZ series contains Z-axis linear units with toothed belt drive, integrated ball rail system and compact dimensions. This linear units provide high performance features such as, high speed, good accuracy and repeatability by vertical applications.

In the linear units MTJZ is used a pre-tensioned steel reinforced AT polyurethane timing toothed belt. In conjunction with a zero-backlash drive pulley high moments with alternating loads with good positioning accuracy, low wear and low noise can be realized.

The in the profile slot driving timing belt protects all the parts in the profile from dust and other contaminations. The drive block provides the possibility to attach a motor or gearbox housing and additional accessories on it.

## Structural Design



1. Tension End with integrated belt tensioning system
2. AT polyurethane toothed belt with steel tension cords
3. Aluminium profile - hard anodized
4. Linear ball guideway
5. Clamping and braking element for linear guideway
6. Drive block with pulley. Motor flange with built in magnets
7. Central lubrication port, both sides
8. Tension end with integrated belt tensioning system



# Order Code

MTJZ - 65 - 1000 - 1 - 0 - 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.

# Technical Data

## MTJZ

Linear Unit	Drive block length Lv (mm)	Load capacity		Dynamic moment			Mass of drive block (kg)	Max repeatability (mm)	Max length***		Max stroke***		Min. stroke* (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)			(Version 1**)	(Version 2**)	(Version 1**)	(Version 2**)	
									Lmax (mm)	Lmax (mm)	(mm)	(mm)	
MTJZ 40	120	4610	6930	28	120	120	0,95	± 0,08	1000	3000	792	2792	25
MTJZ 65	200	19800	35000	158	1025	1025	3,2	± 0,08	1200	6000	880	5680	40
MTJZ 80	250	34200	60000	370	2565	2565	4,9	± 0,08	1500	6000	1118	5618	55
MTJZ 110	300	49600	85000	630	3470	3470	11,3	± 0,08	1800	6000	1304	5504	65

\* For minimum stroke below the stated value in the table above please contact Rollco.

\*\* Mounting versions, see below.

\*\*\* For length/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for multi drive box (equation of defining the linear unit length for particular size of the linear unit needs to be used).

### Recommended values of loads

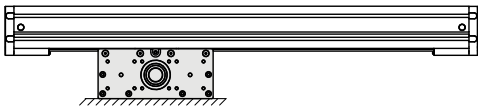
All the data of static and dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety.

We recommend a minimum safety factor (fs =5.0)

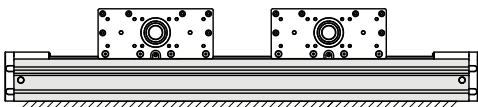
### Modulus of elasticity

$E = 70000 \text{ N / mm}^2$

Version 1: Mounting by the drive block, profile travels



Version 2: Mounting by the profile, drive block travels



On request, multi drive blocks, which travel independently of each other, can be applied.

Linear Unit	Max. permissible loads				
	Forces		Moments		
	Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)
MTJZ 40	2320	1510	14	40	62
MTJZ 65	6540	5870	60	305	340
MTJZ 80	8930	7130	150	535	670
MTJZ 110	10000	14290	260	1000	700

Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperature out of the presented range, please contact Rollco.

## Drive and belt data

Linear Unit	Max travel speed* (m/s)	Maximum drive torque (Nm)	Pulley drive ratio (mm/rev)	Pulley diameter (mm)	Belt type	Beltwidth (mm)	Max. force transmitted by belt (N)	Specific spring constant Cspec (N)
MTJZ 40	5	3,6	99	31,51	AT3	20	230	225000
MTJZ 65	5	13,1	165	52,52	AT5	32	500	600000
MTJZ 80	5	29,4	210	66,84	AT5	50	880	960000
MTJZ 110	5	110,0	300	95,49	AT10	70	2300	2450000

Max. acceleration (m/s²): 70\*

For acceleration over the stated value in the table above, please contact Rollco.

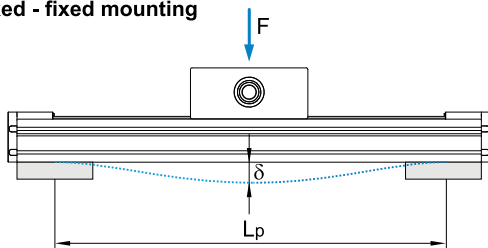
## Mass and mass moment of inertia

Linear Unit	Mass of linear unit	Mass moment of inertia of drive block	Planar moment of inertia	
	(kg)	(10 <sup>-4</sup> kg * m <sup>2</sup> )	I <sub>y</sub> (cm <sup>4</sup> )	I <sub>z</sub> (cm <sup>4</sup> )
MTJZ 40	1,7 + 0,0023 * Stroke (mm)	2,3 + 0,0058 * Stroke (mm)	9,8	11,6
MTJZ 65	5,7 + 0,0054 * Stroke (mm)	18,9 + 0,0374 * Stroke (mm)	59,7	74,4
MTJZ 80	9,7 + 0,0083 * Stroke (mm)	60,5 + 0,0922 * Stroke (mm)	129,1	173,4
MTJZ 110	21,7 + 0,0147 * Stroke (mm)	273,0 + 0,3358 * Stroke (mm)	513,0	620,0

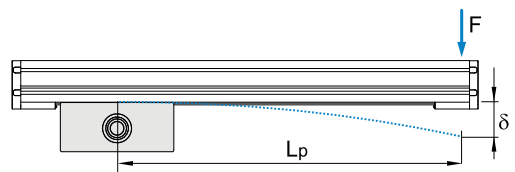
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

## Deflection of the linear unit

Fixed - fixed mounting



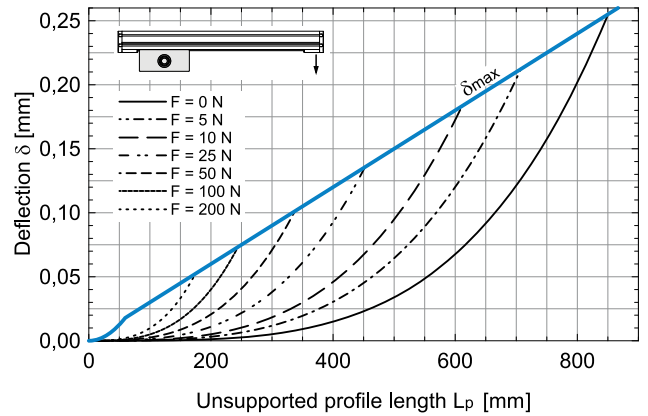
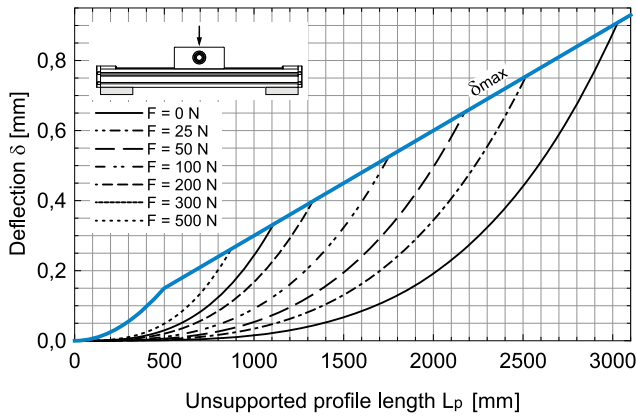
Fixed - free mounting



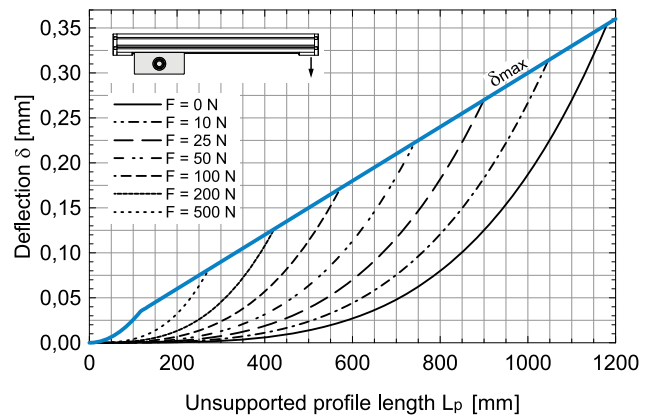
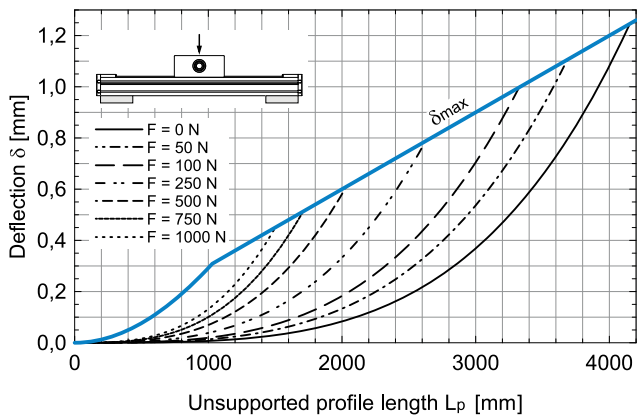
- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

The maximum permissible deflection δ<sub>max</sub> must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ<sub>max</sub> additional profile supports are needed.

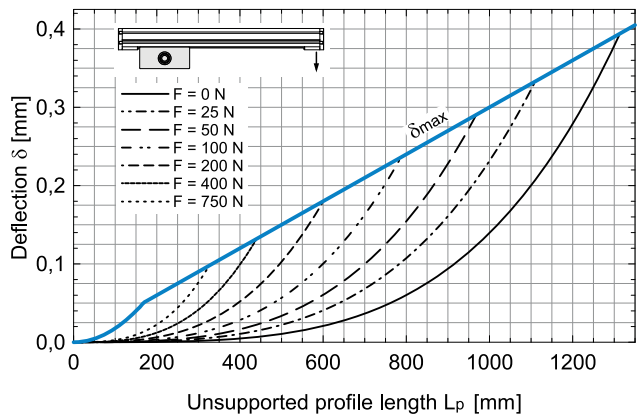
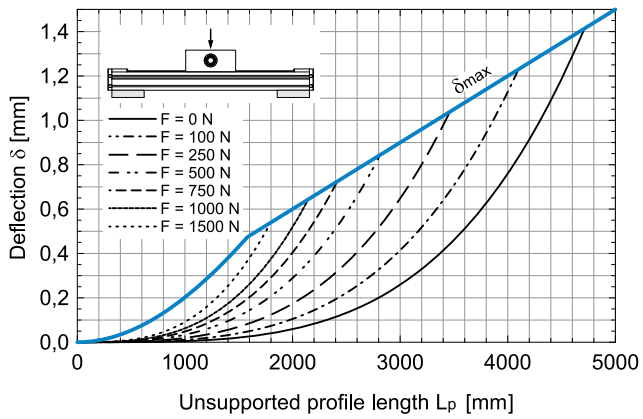
### MTJZ 40



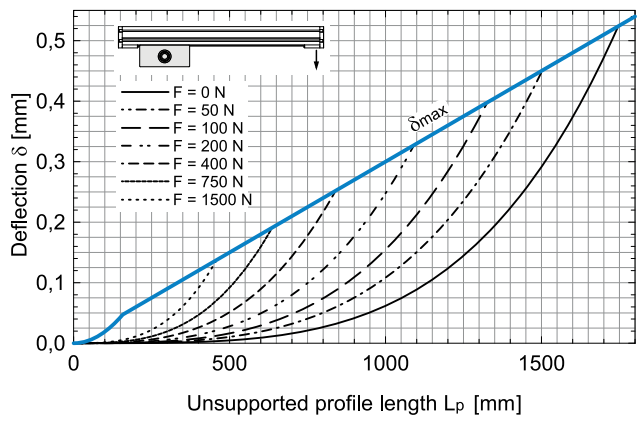
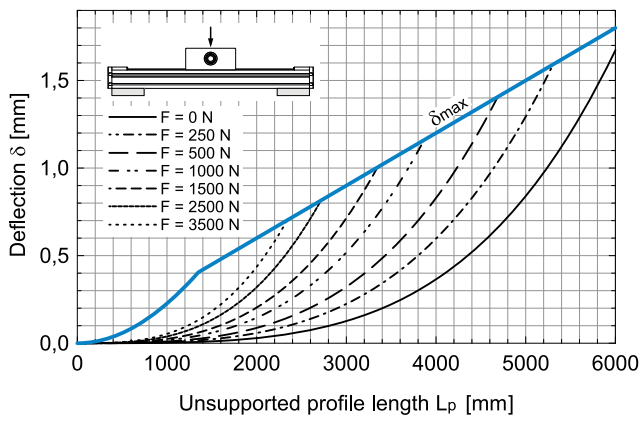
### MTJZ 65



**MTJZ 80**



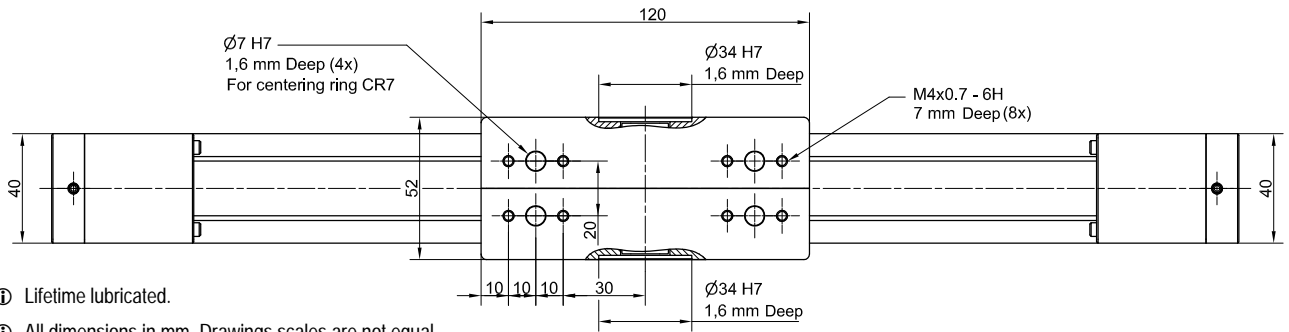
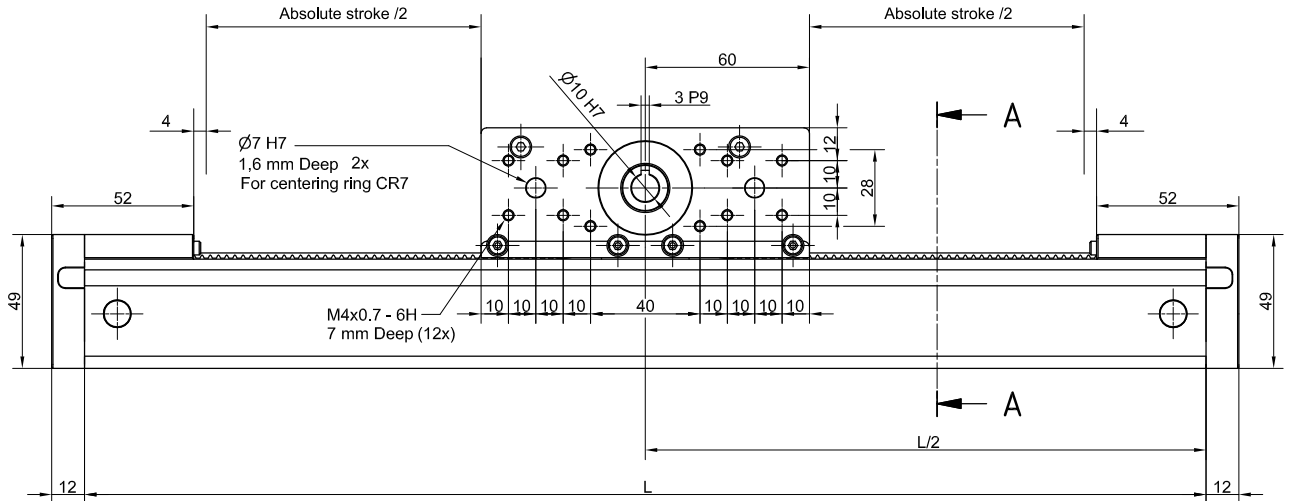
**MTJZ 110**



# Dimensions

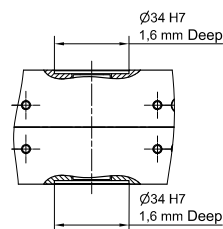
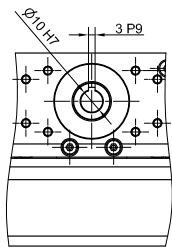
## MTJZ 40

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



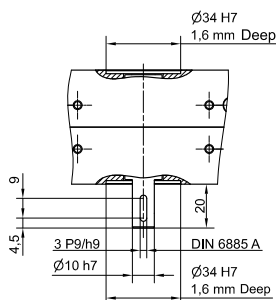
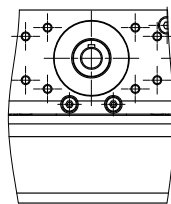
- ① Lifetime lubricated.
- ① All dimensions in mm. Drawings scales are not equal.

### TYPE 0



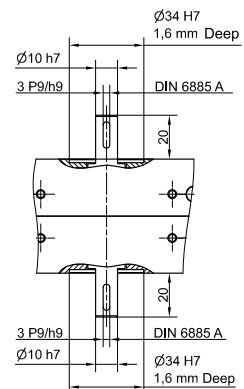
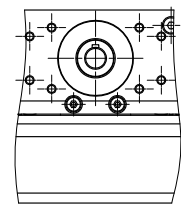
### TYPE 1

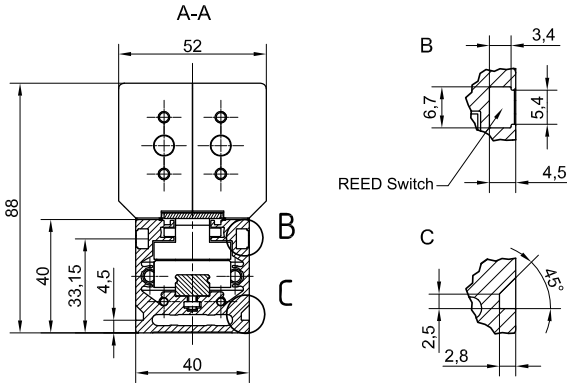
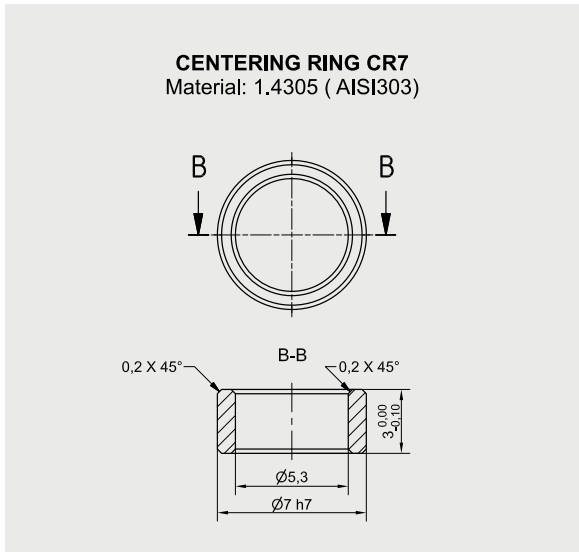
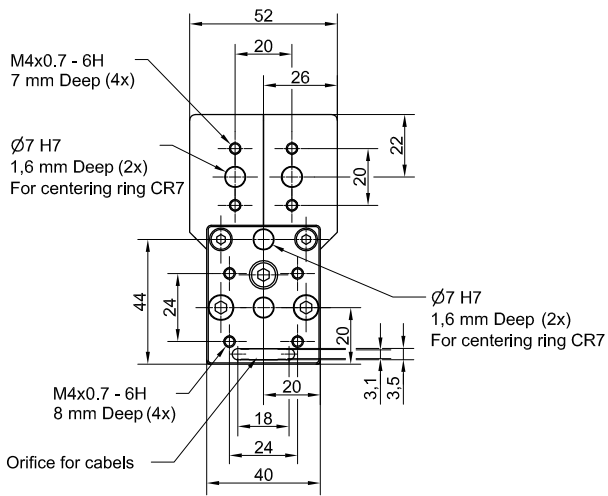
- ① Journal with or without keyway.



### TYPE 2

- ① Journal with or without keyway.



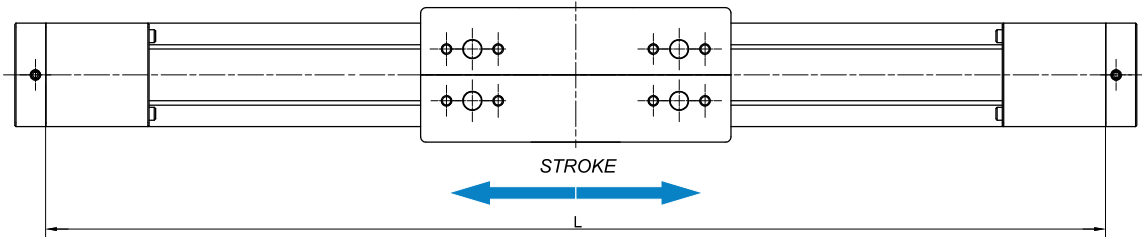


① All dimensions in mm. Drawings scales are not equal.

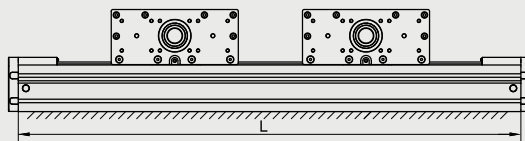
**Defining of the linear unit length**

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 208 \text{ mm}$

$L_{\text{total}} = L + 24 \text{ mm}$



**Multi drive block**



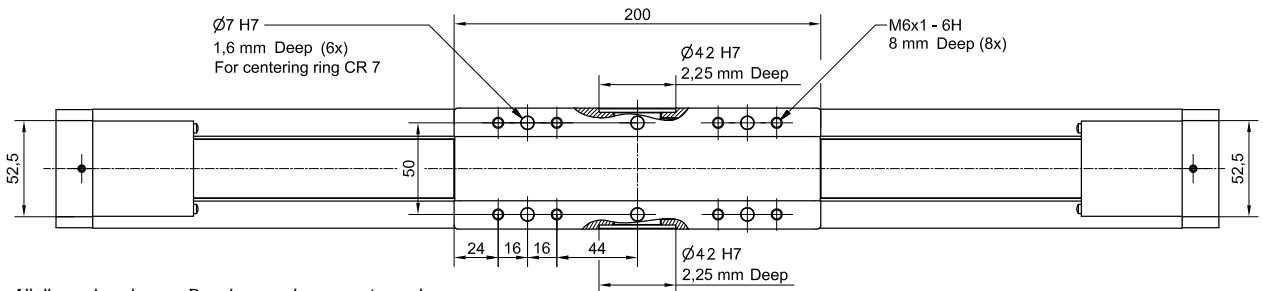
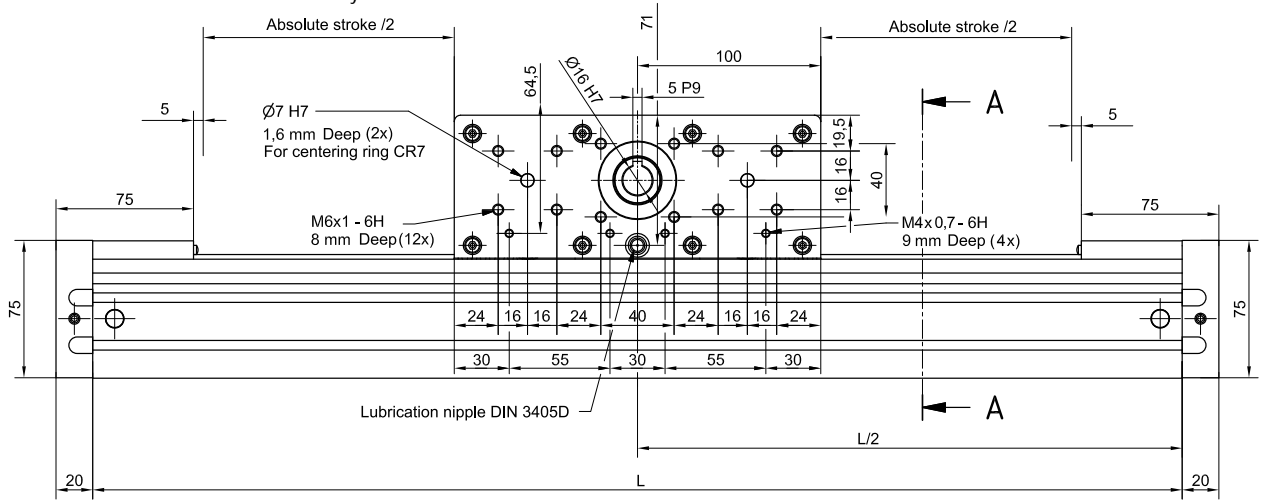
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 120 \times n_b + 88 \text{ mm}$

$n_b$  - number of drive blocks

$L_{\text{total}} = L + 24 \text{ mm}$

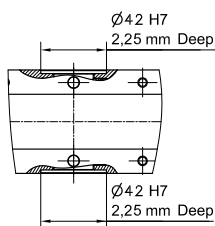
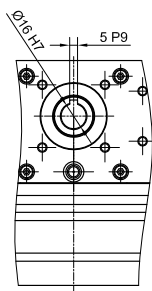
# MTJZ 65

- ① The linear units do not include any safety stroke.  
 Absolute stroke = Effective stroke + 2 x safety stroke.



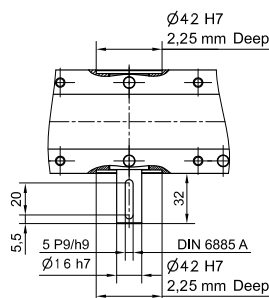
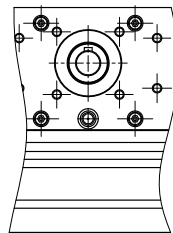
- ① All dimensions in mm. Drawings scales are not equal.

## TYPE 0



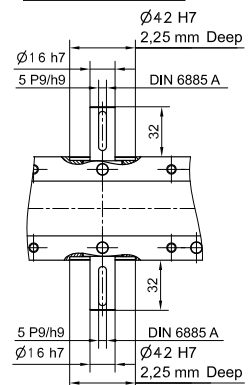
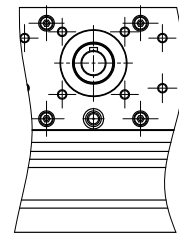
## TYPE 1

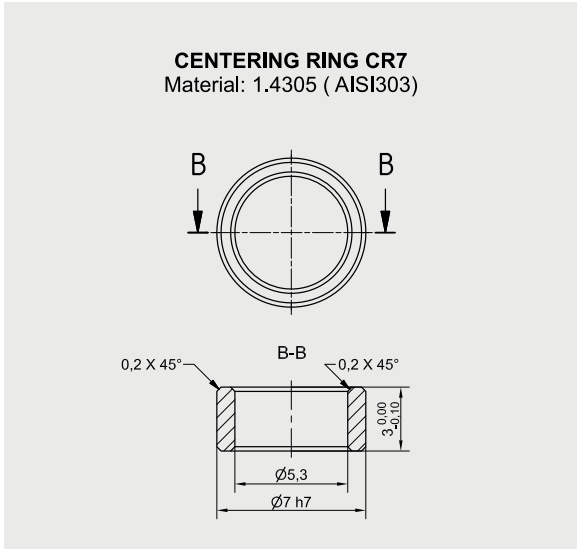
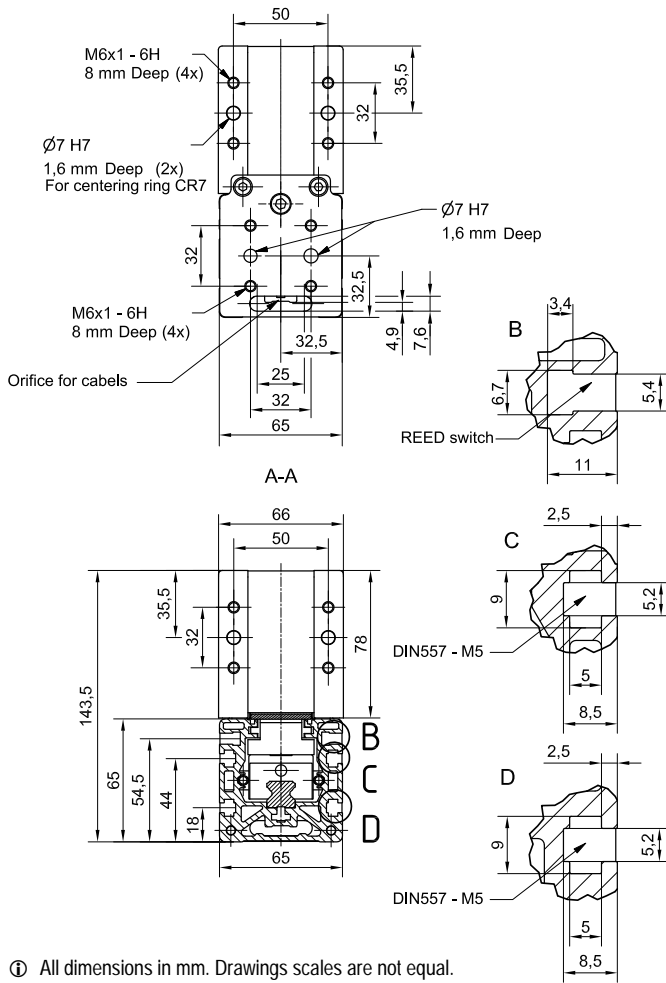
- ① Journal with or without keyway.



## TYPE 2

- ① Journal with or without keyway.



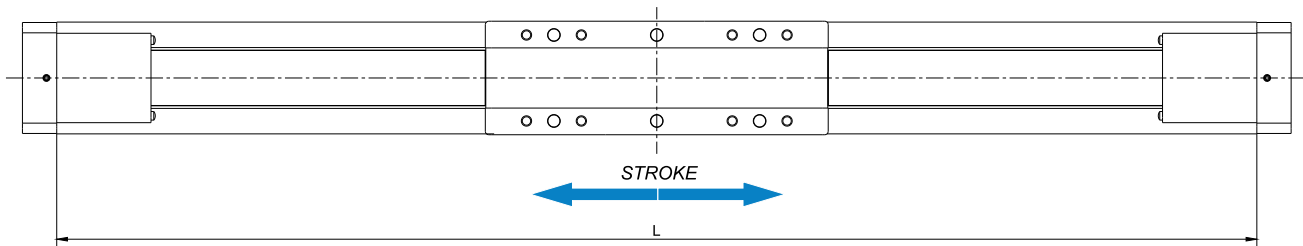


① All dimensions in mm. Drawings scales are not equal.

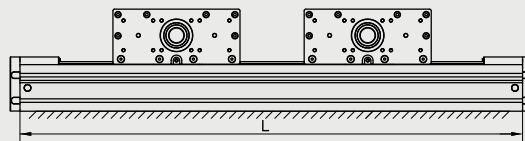
**Defining of the linear unit length**

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 320 \text{ mm}$

$L_{\text{total}} = L + 40 \text{ mm}$



**Multi drive block**



$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 200 \times n_b + 120 \text{ mm}$

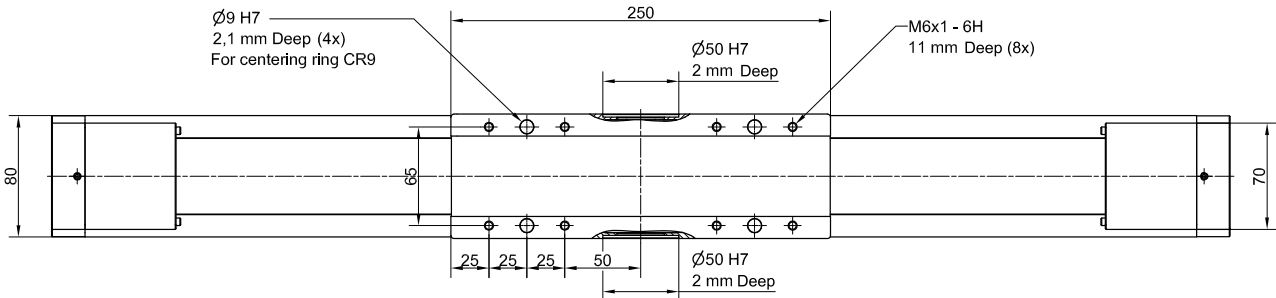
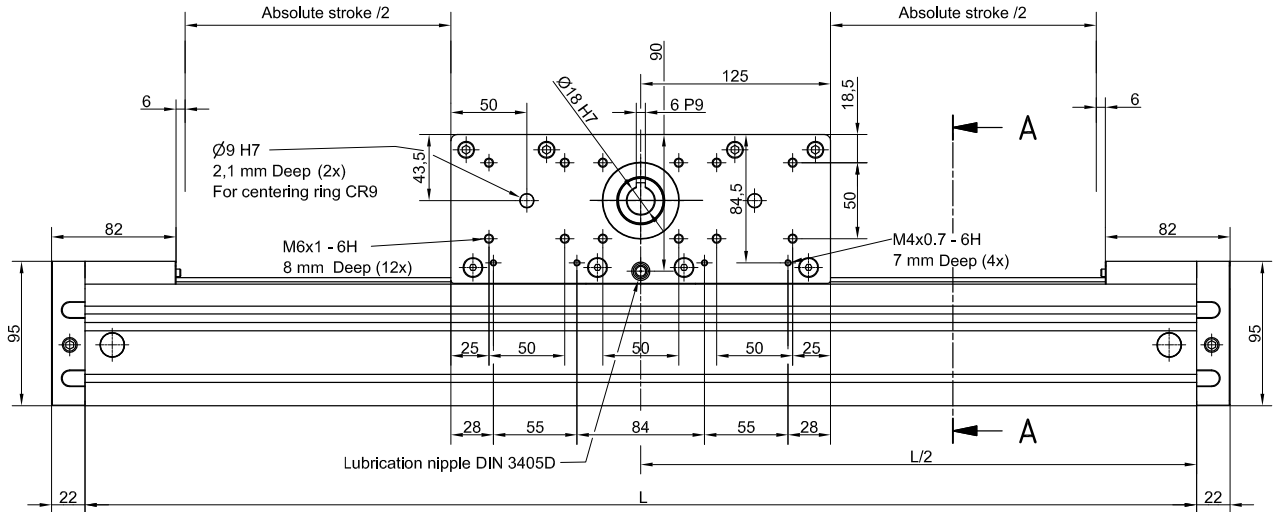
$n_b$  - number of drive blocks

$L_{\text{total}} = L + 40 \text{ mm}$

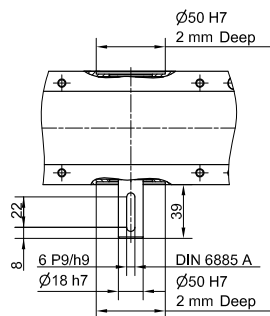
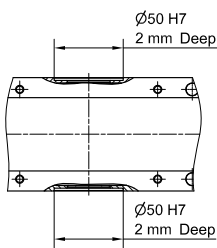
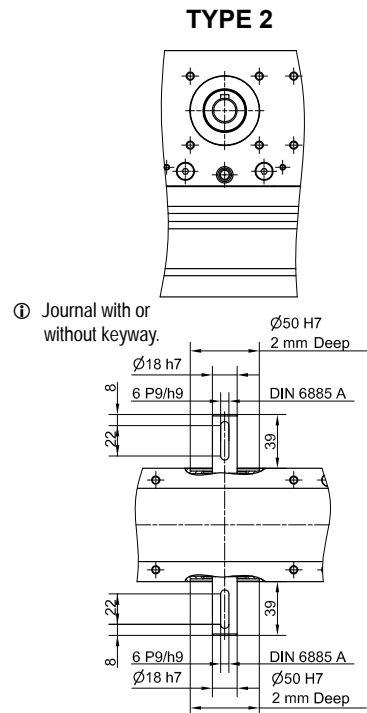
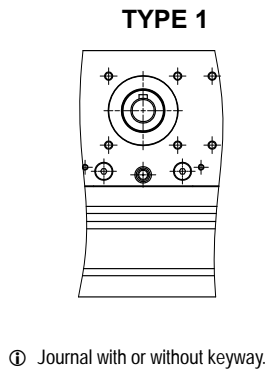
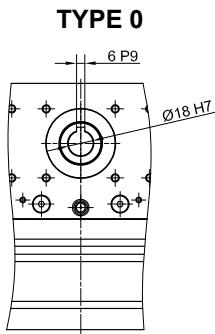


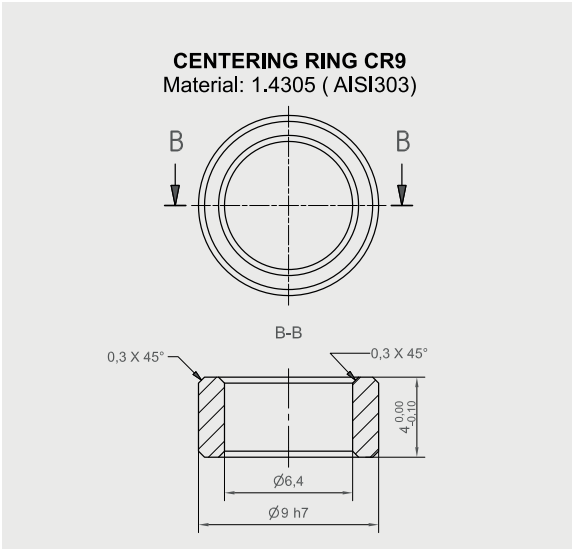
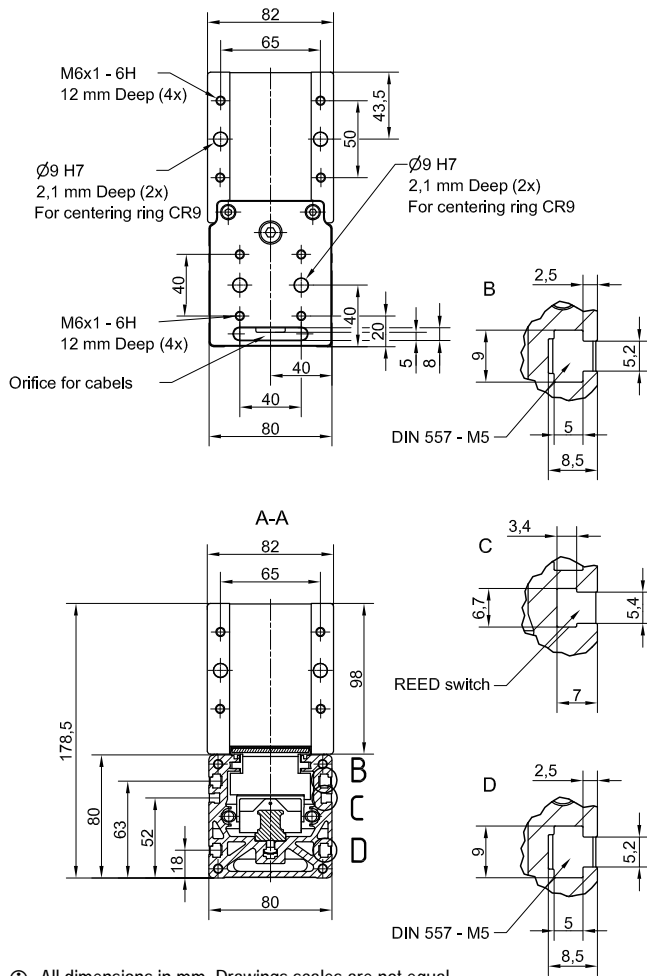
# MTJZ 80

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



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



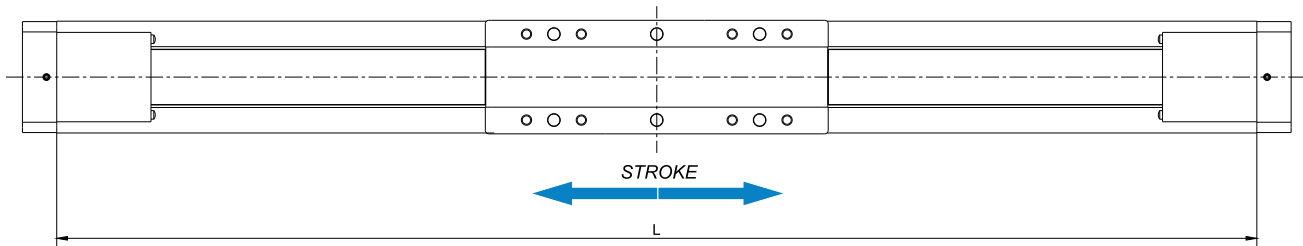


ⓘ All dimensions in mm. Drawings scales are not equal.

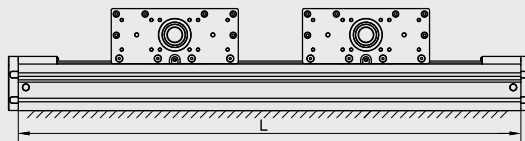
**Defining of the linear unit length**

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 382 \text{ mm}$

$L_{\text{total}} = L + 44 \text{ mm}$



**Multi drive block**



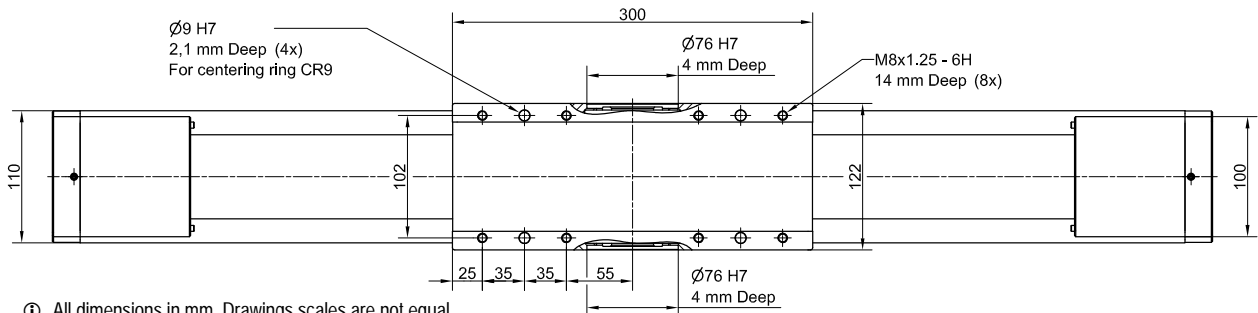
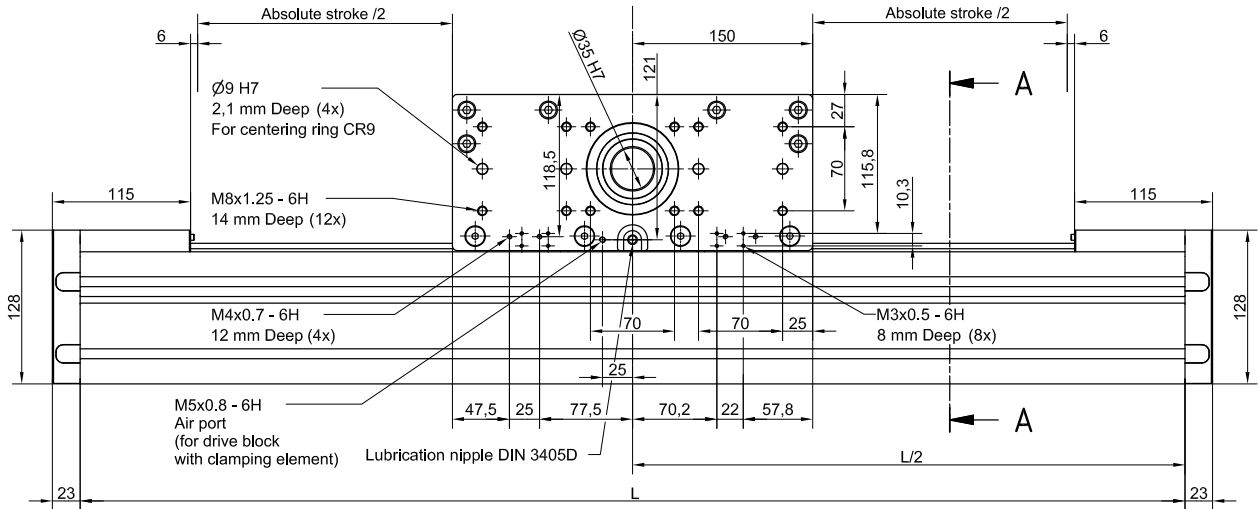
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + 250 \times n_b + 132 \text{ mm}$

$n_b$  - number of drive blocks

$L_{\text{total}} = L + 44 \text{ mm}$

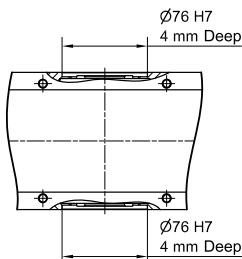
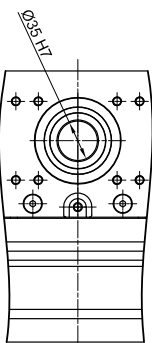
# MTJZ 110

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



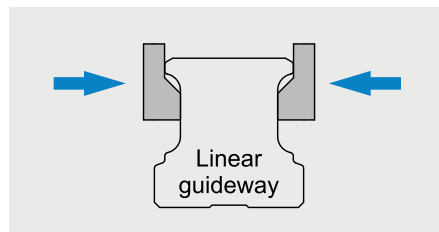
① All dimensions in mm. Drawings scales are not equal.

T



## Drive block with clamping element

Clamping by spring-loaded energy

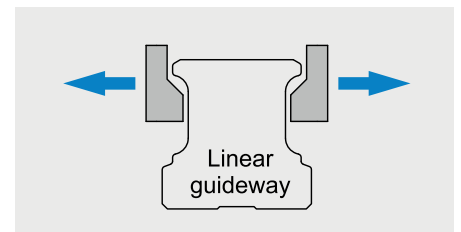


Air pressure = 0 bar

Holding force = 1400 N

Holding force is tested on clamping element using a slightly lubricated rail (ISO VG 68).

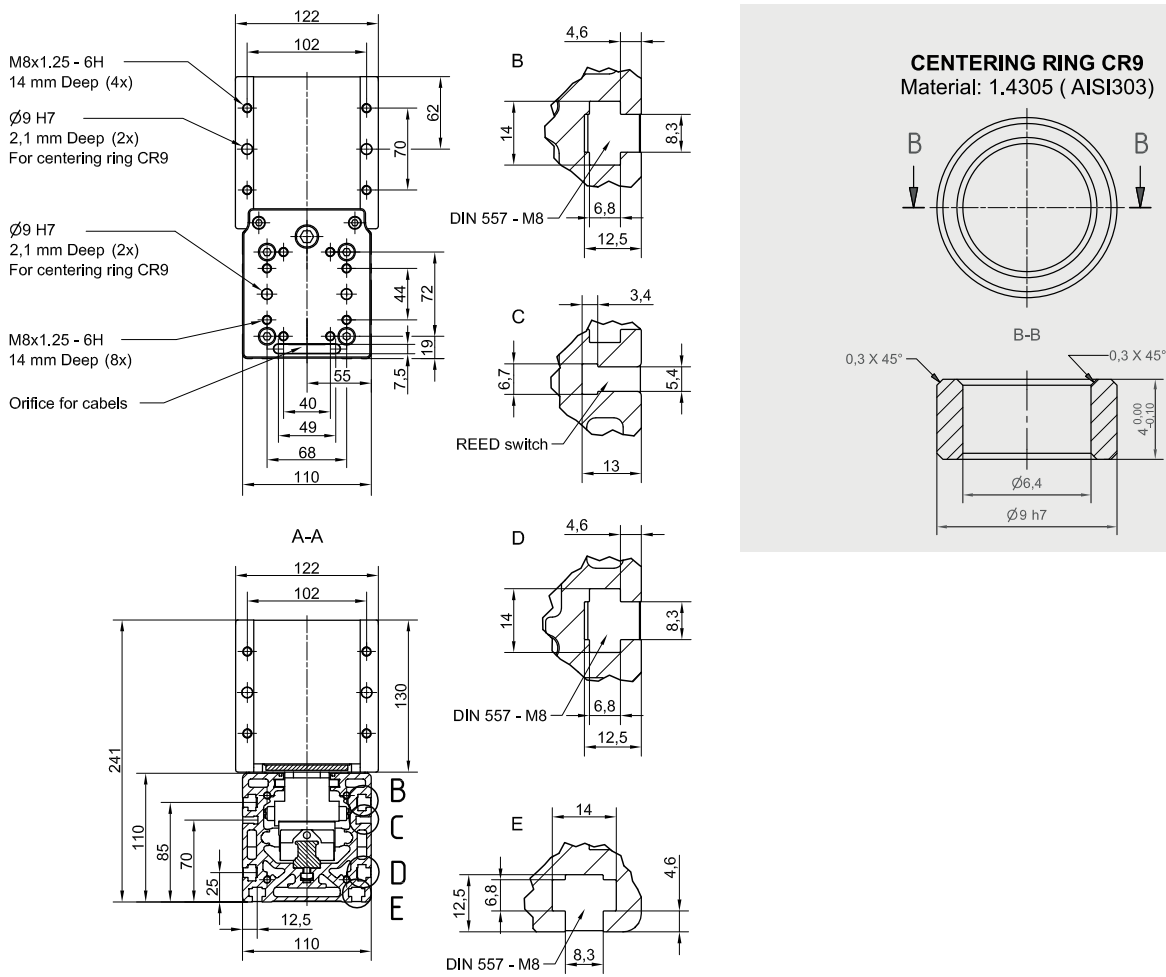
Opened by air pressure



Opening air pressure = 5,5 - 8 bar

The air pressure opens clamping pistons. Free movement is allowed. Purified and oiled air shall be used (according to ISO 8573-1 Class 4). Recommended filter size is 25 $\mu$ m.

Linear Unit	Mass of drive block (kg)	Mass of linear unit (kg)
MTJZ 110	12,9	23,3 + 0,0147 * Stroke (mm)

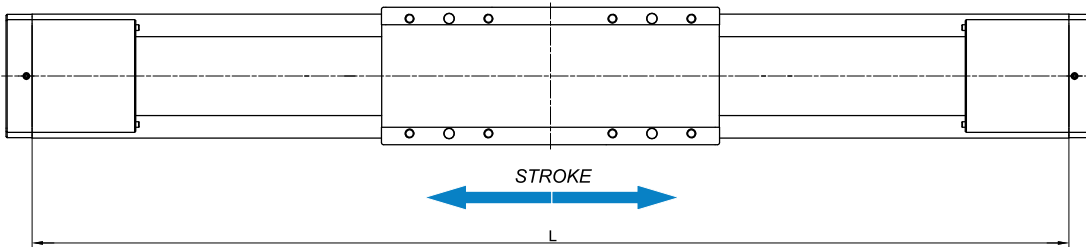


ⓘ All dimensions in mm. Drawings scales are not equal.

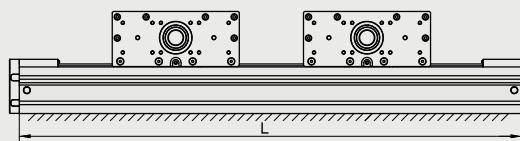
**Defining of the linear unit length**

**L = Effective stroke + 2 × Safety stroke + 496 mm**

**Ltotal = L + 46 mm**



**Multi drive block**



**L = Effective stroke + 2 × Safety stroke + 300 × n<sub>b</sub> + 196 mm**

n<sub>b</sub> - number of drive blocks

**Ltotal = L + 46 mm**

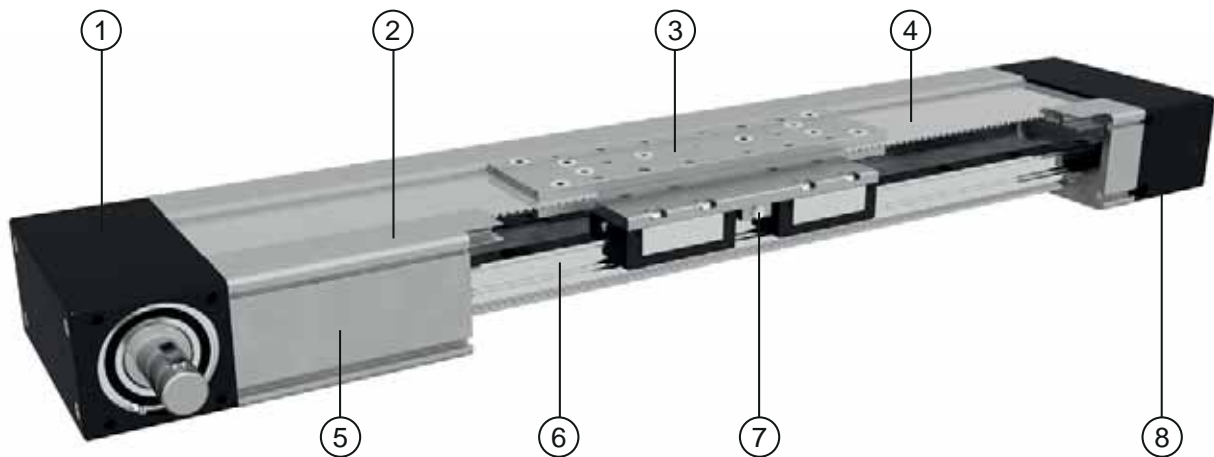
## Linear Unit CTJ

The CTJ series includes linear units with a toothed belt drive and two parallel, integrated, zero-backlash rail guides. In the linear units CTJ is used a pre-tensioned steel reinforced AT polyurethane timing toothed belt. In conjunction with a zero-backlash drive pulley high moments with alternating loads with good positioning accuracy, low wear and low noise can be realized.

The in the profile slot driving timing belt, protects all the parts in the profile from dust and other contaminations. Re-lubrication can be done through maintenance holes on the side of the profile.



## Structural Design



1. Drive block with pulley
2. Aluminum cover
3. Carriage, with built in magnets
4. AT polyurethane toothed belt with steel tension cords
5. Aluminium profile - hard anodized
6. Two integrated linear ball guideways
7. Central lubrication port, both sides
8. Tension end with integrated belt tensioning system

# Order Code

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.

# Technical Data

## CTJ Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Moved mass (kg)	Max repeatability (mm)	Max length* Lmax (mm)	Max stroke* (mm)	Min. stroke** (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments							
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)					
CTJ 90 S	102	4620	6930	125	17	34	2000	4000	110	17	34	0,20	± 0,08	6000	5873	25
CTJ 90 L	156	9240	13860	250	290	290	3990	8270	200	290	125	0,35				
CTJ 110 S	170	19800	35000	610	118	235	6470	8390	260	90	90	0,64	± 0,08	6000	5805	40
CTJ 110 L	215	39600	70000	1225	1680	1680	13070	18820	525	880	550	0,98				
CTJ 145 S	180	34200	60000	1500	260	520	8930	15320	674	260	180	1,35	± 0,08	6000	5795	55
CTJ 145 L	240	68400	120000	3005	3420	3420	17870	30640	1200	1700	893	2,25				
CTJ 200 S	265	49600	85000	3235	450	900	10000	24520	1600	450	308	3,05	± 0,08	6000	5710	65
CTJ 200 L	405	99200	170000	6470	8680	8680	20000	50900	3250	4550	1750	5,70				

\* For length/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

\*\* For minimum stroke below the stated value in the table above, please contact Rollco.

### Recommended values of loads

All the data of static and dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety.

We recommend a minimum safety factor ( $f_s = 5.0$ ).

### Modulus of elasticity

$E = 70000 \text{ N} / \text{mm}^2$

Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperature out of the presented range, please contact Rollco.

## General technical data for double carriage

Linear Unit	Carriage version	Load capacity		Dynamic moment*			Max. permissible loads*				
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments		
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)
CTJ 90	S2	9232	13860	250	4,6 * A (mm)	4,6 * A (mm)	4000	8000	220	4,0 * A (mm)	2,0 * A (mm)
CTJ 110	S2	39600	70000	1220	19,8 * A (mm)	19,8 * A (mm)	12940	16770	520	8,4 * A (mm)	6,5 * A (mm)
CTJ 145	S2	68400	120000	3000	34,2 * A (mm)	34,2 * A (mm)	17860	30630	1350	15,3 * A (mm)	8,9 * A (mm)
CTJ 200	S2	99200	170000	6470	49,6 * A (mm)	49,6 * A (mm)	20000	49040	3200	24,5 * A (mm)	10,0 * A (mm)

\*A - Distance between carriages. More info on following pages.

## Drive and belt data

Linear Unit	Max. travel speed* (m/s)	Max. drive torque (Nm)	No load torque* (Nm)	Pulley drive ratio (mm/rev)	Pulley diameter (mm)	Belt type	Belt width (mm)	Max. force transmitted by belt (N)	Specific spring constant Cspec (N)
CTJ 90 S	5	7,5	0,40	90	28,65	AT 3	35	520	402500
CTJ 90 L			0,42						
CTJ 110 S	6	15,7	0,98	120	38,20	AT 5	50	820	960000
CTJ 110 L			1,0						
CTJ 145 S	6	33,6	1,48	165	52,52	AT 5	70	1280	1360000
CTJ 145 L			1,5						
CTJ 200 S	6	102 with keyway 129 without keyway	2,3	250	79,58	AT 10	100	3250	4350000
CTJ 200 L			2,8						

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

Max. acceleration (m/s<sup>2</sup>): 70

For acceleration over the stated value in the table above, please contact Rolco.

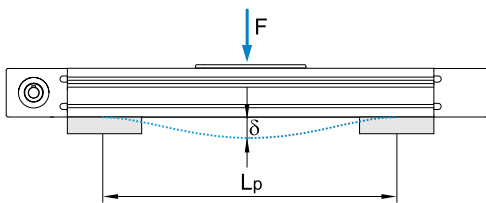
## Mass and mass moment of inertia

Linear Unit	Carriage length Lv (mm)	Mass of linear unit (kg)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	Planar moment of inertia	
				ly (cm <sup>4</sup> )	lz (cm <sup>4</sup> )
CTJ 90 S	102	1,7 + 0,0048 * Stroke (mm)	7 + 0,0031 * Stroke (mm)	13,4	107,0
CTJ 90 L	156	2,1 + 0,0048 * Stroke (mm)	11 + 0,0031 * Stroke (mm)		
CTJ 110 S	170	3,6 + 0,0072 * Stroke (mm)	36 + 0,0125 * Stroke (mm)	31,1	217,2
CTJ 110 L	215	4,2 + 0,0072 * Stroke (mm)	49 + 0,0125 * Stroke (mm)		
CTJ 145 S	180	7,2 + 0,0127 * Stroke (mm)	145 + 0,0330 * Stroke (mm)	78,9	707,6
CTJ 145 L	240	8,8 + 0,0127 * Stroke (mm)	208 + 0,0330 * Stroke (mm)		
CTJ 200 S	265	20,2 + 0,0245 * Stroke (mm)	778 + 0,1868 * Stroke (mm)	376,4	2744,6
CTJ 200 L	405	26,2 + 0,0245 * Stroke (mm)	1210 + 0,1868 * Stroke (mm)		

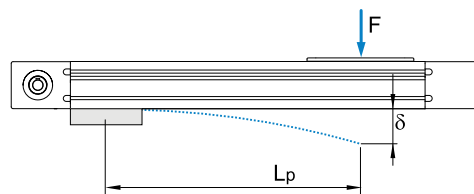
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

## Deflection of the linear unit

Fixed - fixed mounting



Fixed - free mounting

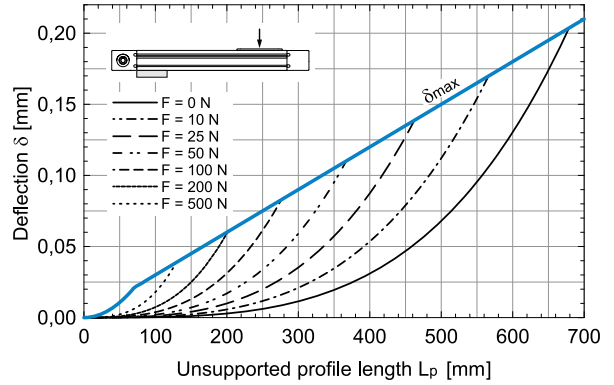
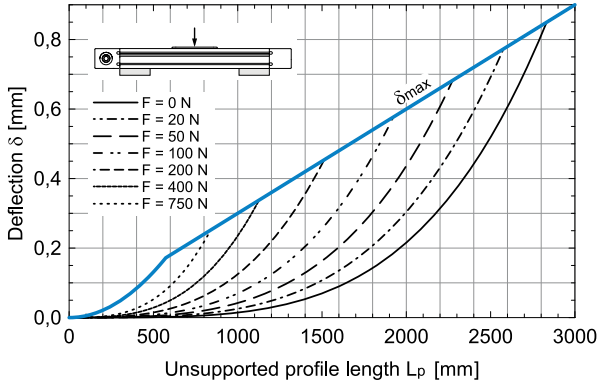


- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

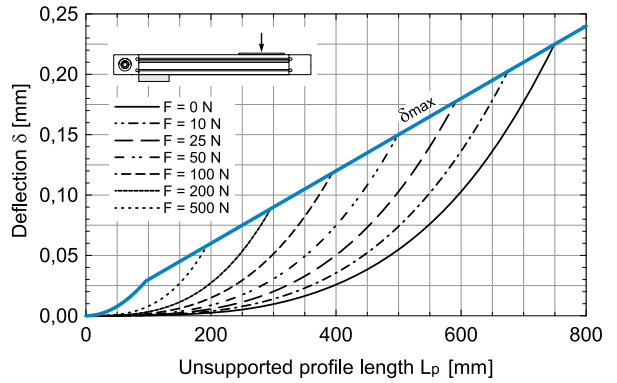
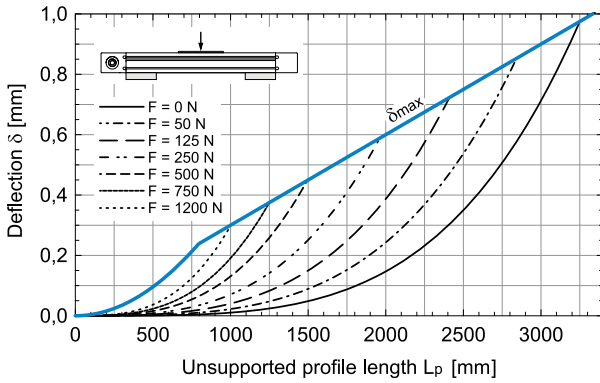
The maximum permissible deflection δ<sub>max</sub> must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ<sub>max</sub> additional profile supports are needed.



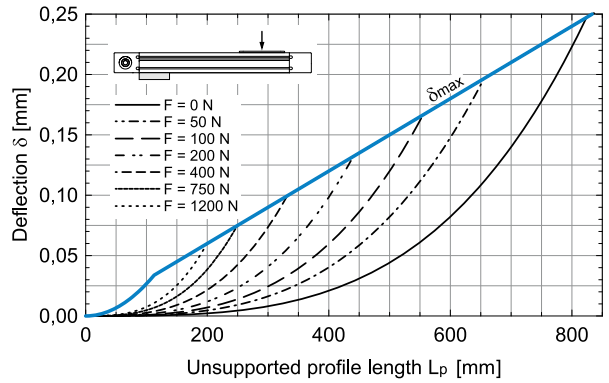
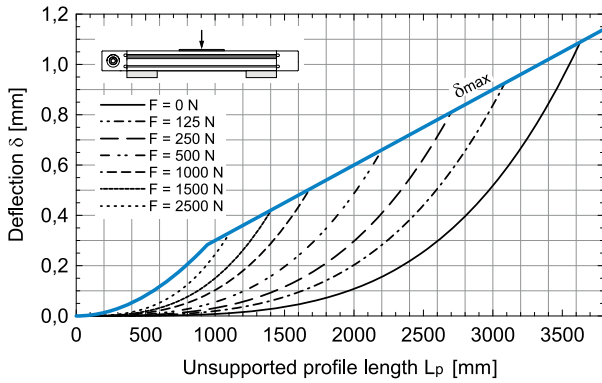
**CTJ 90**



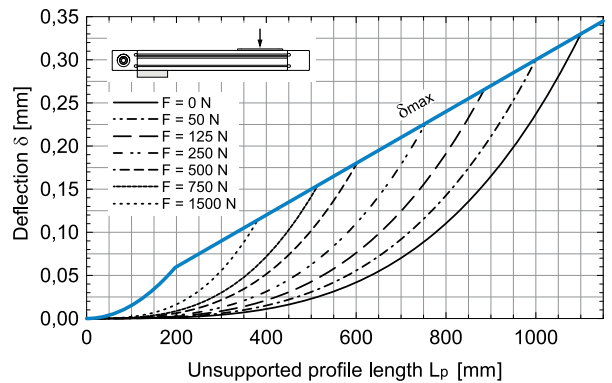
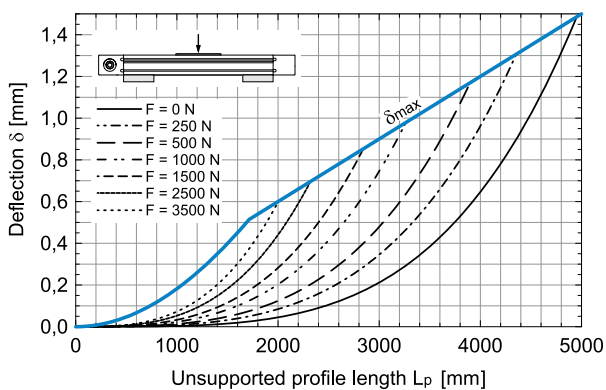
**CTJ 110**



**CTJ 145**



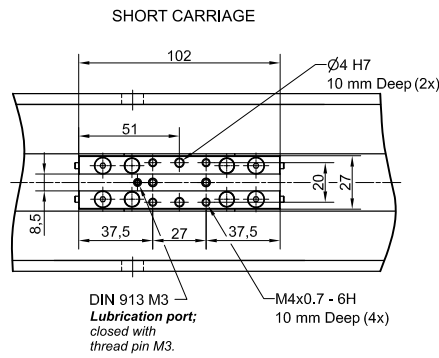
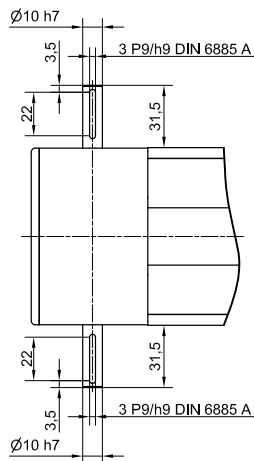
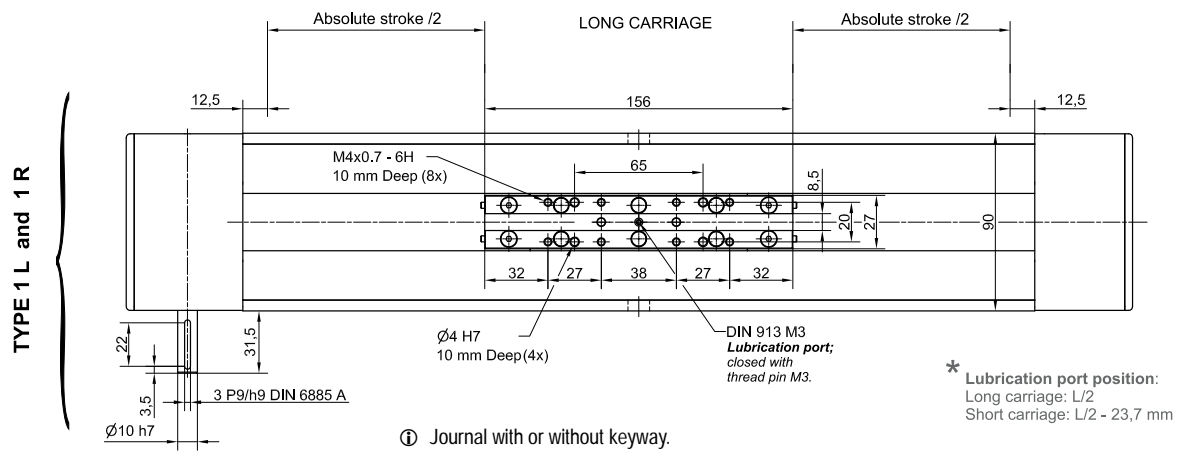
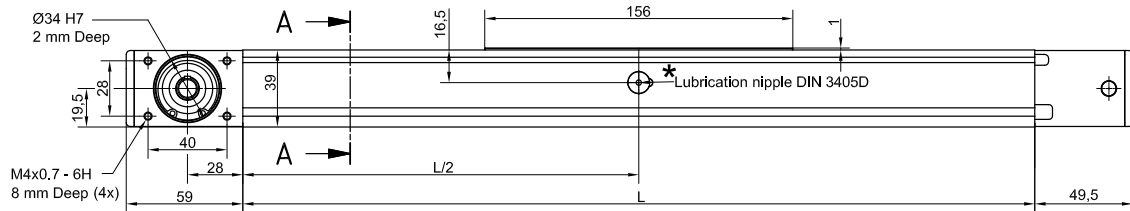
**CTJ 200**



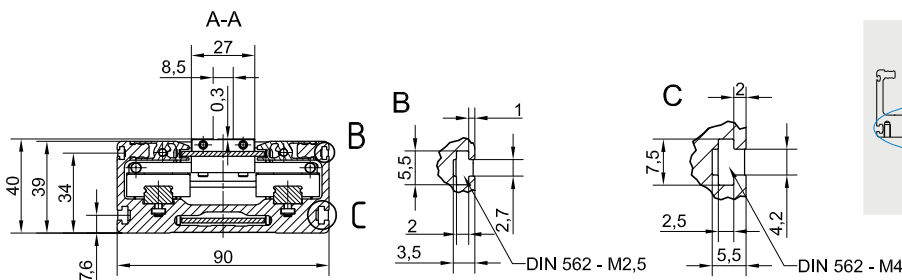
# Dimensions

## CTJ 90

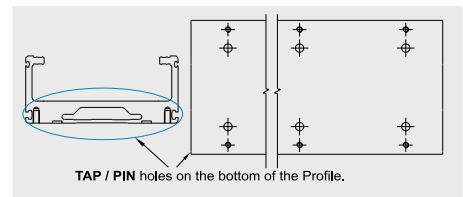
① The linear units do not include any safety stroke.  
 Absolut stroke = Effective stroke + 2 x safety stroke.



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



OPTIONAL: TAP / PIN holes available on request.

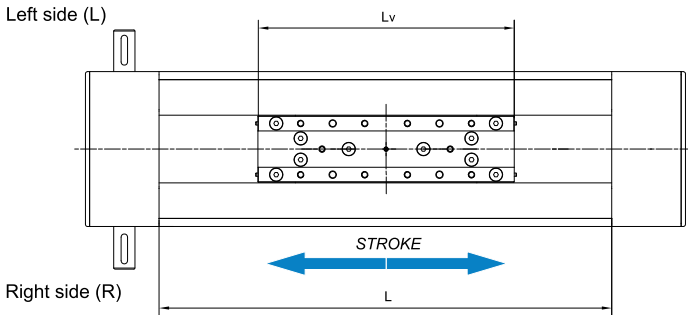


① All dimensions in mm. Drawings scales are not equal.

### Defining of the linear unit length

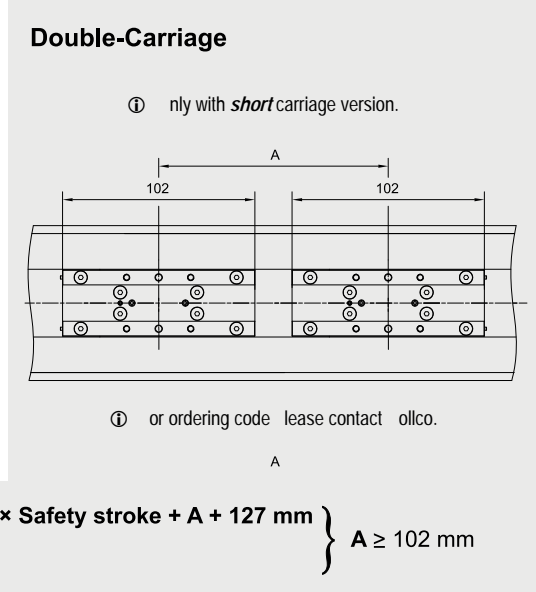
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 25 \text{ mm}$

$L_{\text{total}} = L + 108,5 \text{ mm}$



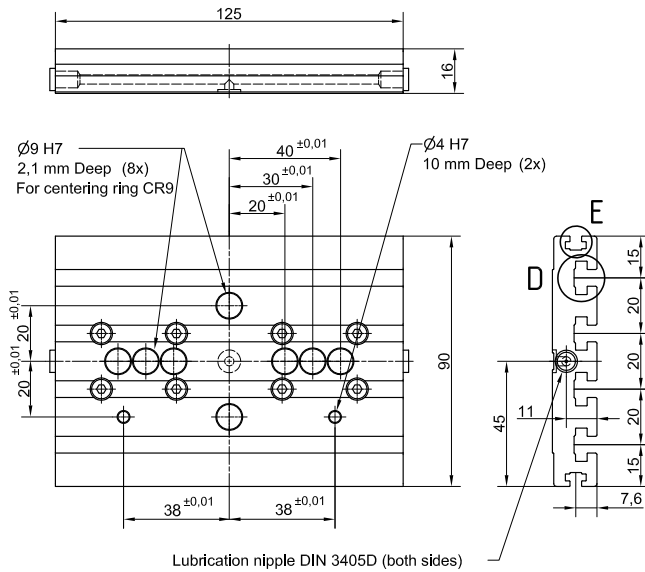
$L_v$  - Long carriage = 156 mm  
 $L_v$  - Short carriage = 102 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 127 \text{ mm}$   
 $L_{\text{total}} = L + 108,5 \text{ mm}$  }  $A \geq 102 \text{ mm}$

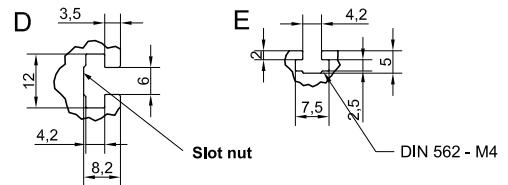
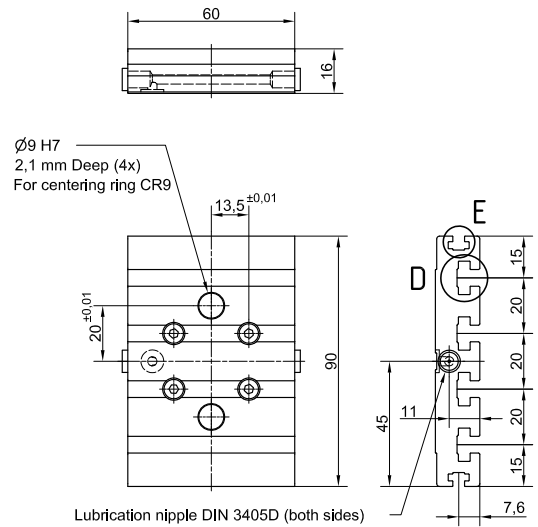


### Connection plate

CTJ 90 L



CTJ 90 S



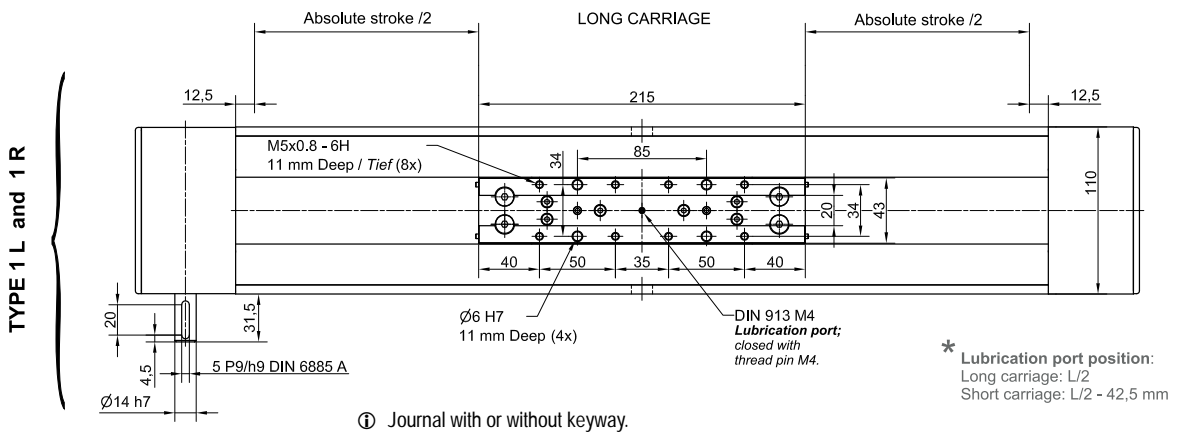
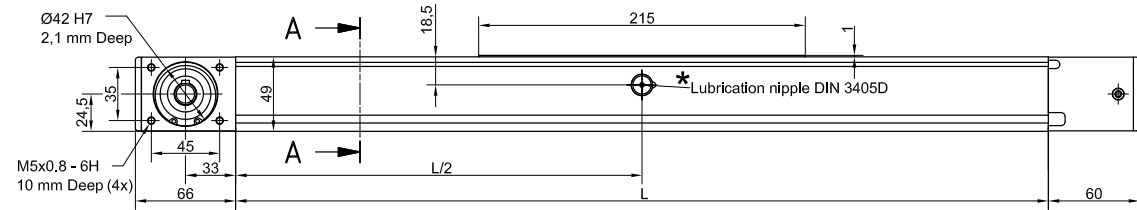
MOTOR	CTJ 90	CTJ 90	CTJ 90
	Available on request	Available on request	Available on request
GEAR REDUCER + MOTOR	CTJ 90	CTJ 90	CTJ 90
	Available on request	Available on request	Available on request
GEAR REDUCER 90° + MOTOR	CTJ 90	CTJ 90	CTJ 90
	Available on request	Available on request	Available on request

① Mounting elements for mounting the connection plate on the linear unit are included.

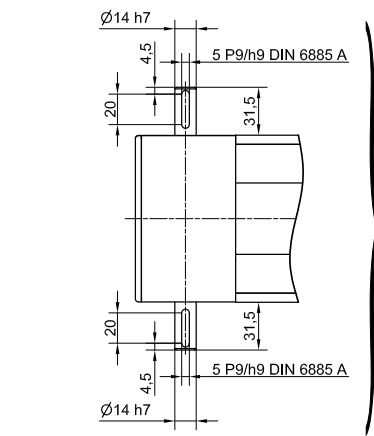
Linear Unit	Plate length (mm)	Weight (kg)	Code
CTJ 90 S	60	0,2	48853
CTJ 90 L	125	0,4	48854

# CTJ 110

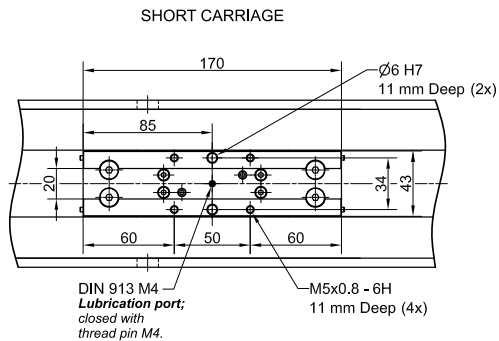
① The linear units do not include any safety stroke.  
 Absolute stroke = Effective stroke + 2 x safety stroke.



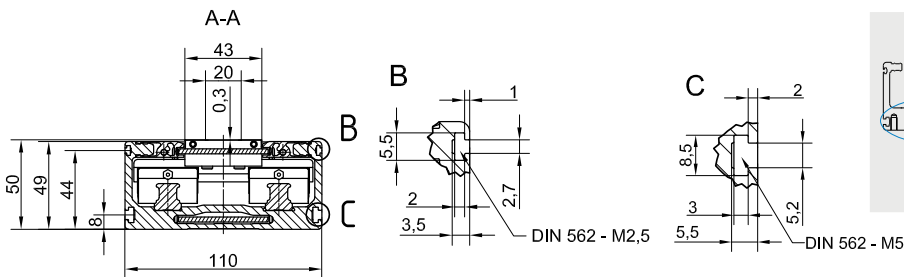
① Journal with or without keyway.



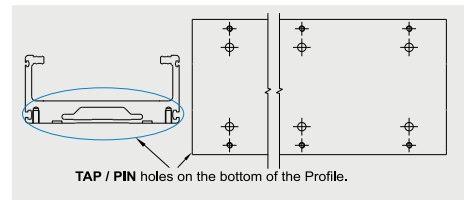
TYPE 2



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



OPTIONAL: TAP / PIN holes available on request.

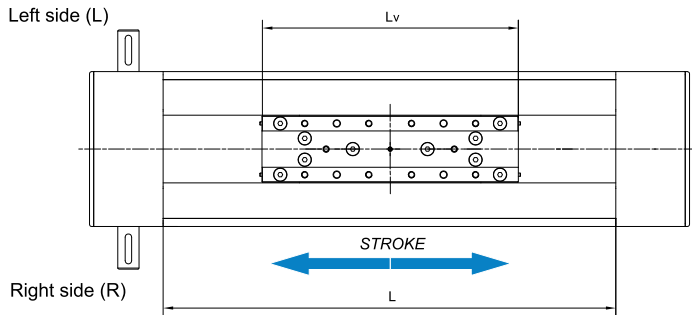


① All dimensions in mm. Drawings scales are not equal.

### Defining of the linear unit length

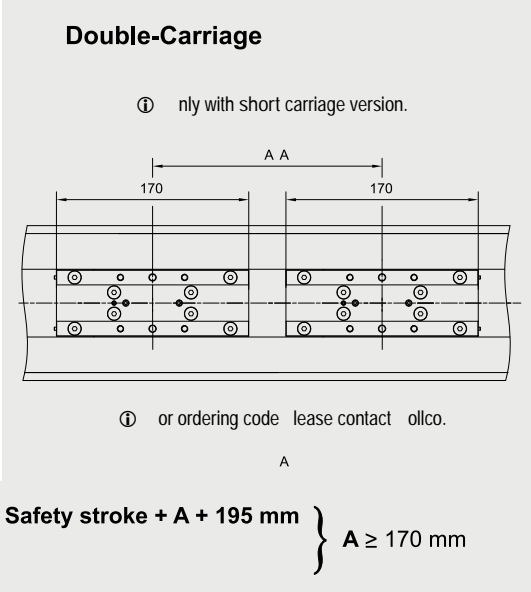
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 25 \text{ mm}$

$L_{\text{total}} = L + 126 \text{ mm}$



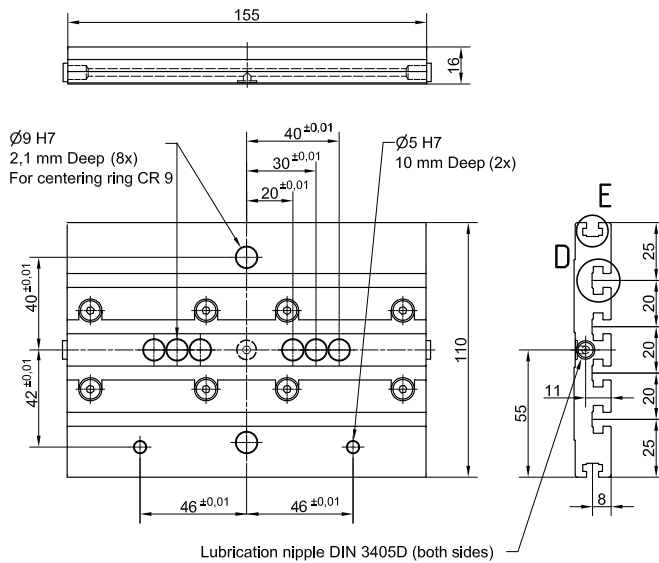
$L_v$  - Long carriage = 215 mm  
 $L_v$  - Short carriage = 170 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 195 \text{ mm}$   
 $L_{\text{total}} = L + 126 \text{ mm}$  }  $A \geq 170 \text{ mm}$

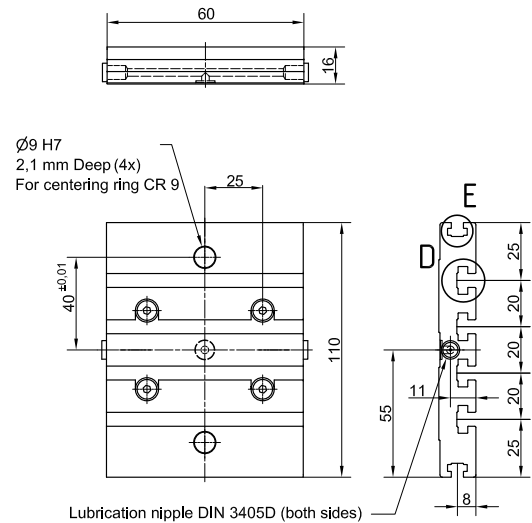


### Connection plate

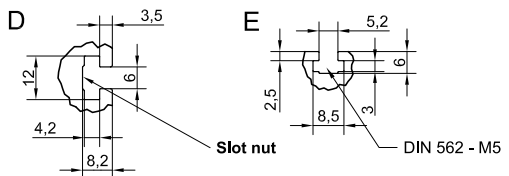
CTJ 110 L



CTJ 110 S



MOTOR	CTJ 110	CTJ 110	CTJ 110
	Available on request	Available on request	Available on request
GEAR REDUCER + MOTOR	CTJ 110	CTJ 110	CTJ 110
	Available on request	Available on request	Available on request
GEAR REDUCER 90° + MOTOR	CTJ 110	CTJ 110	CTJ 110
	Available on request	Available on request	Available on request

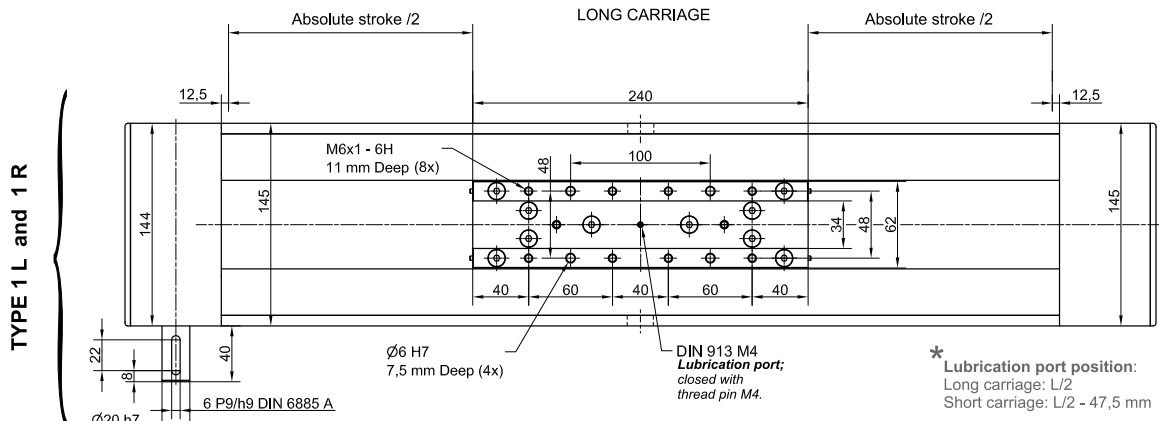
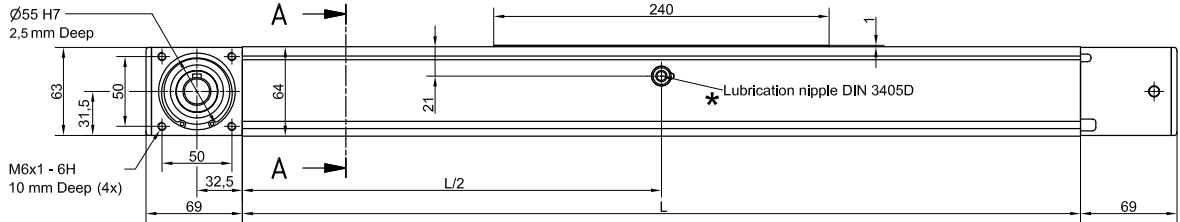


Counting elements for mounting the connection plate on the linear unit are included.

Linear Unit	Plate length (mm)	Weight (kg)	Code
CTJ 110 S	60	0,35	48525
CTJ 110 L	155	0,60	48480

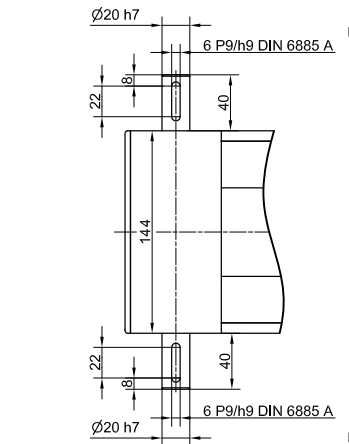
# CTJ 145

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

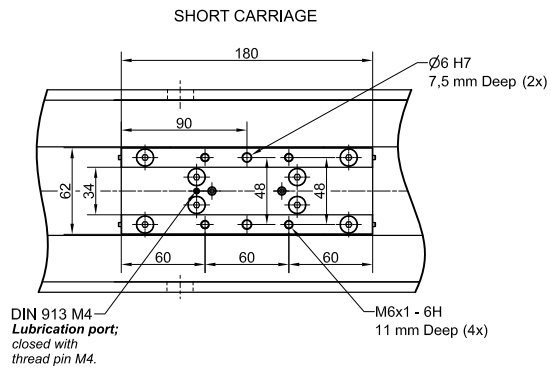


\* Lubrication port position:  
 Long carriage: L/2  
 Short carriage: L/2 - 47,5 mm

① Journal with or without keyway.

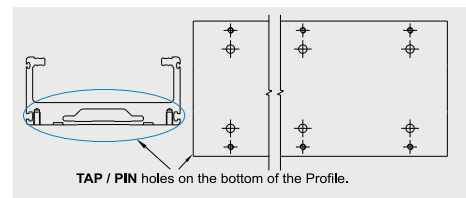
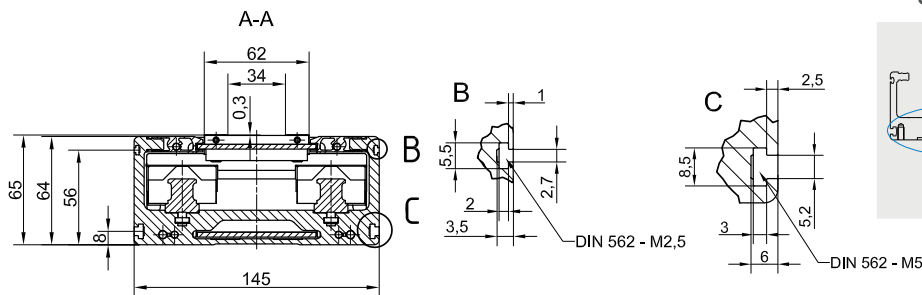


TYPE 2



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

OPTIONAL: TAP / PIN holes available on request.



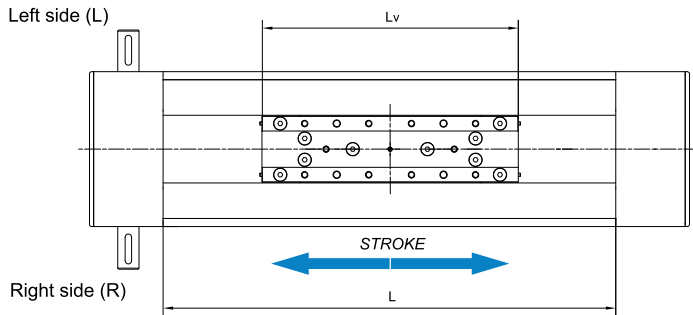
TAP / PIN holes on the bottom of the Profile.

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

### Defining of the linear unit length

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 25 \text{ mm}$

$L_{\text{total}} = L + 138 \text{ mm}$

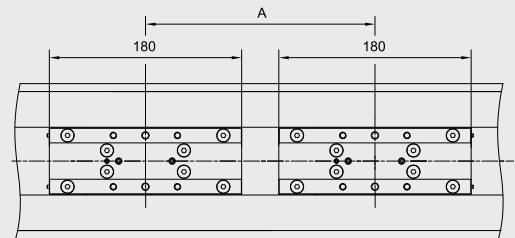


$L_v$  - Long carriage = 240 mm  
 $L_v$  - Short carriage = 180 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 205 \text{ mm}$   
 $L_{\text{total}} = L + 138 \text{ mm}$  }  $A \geq 180 \text{ mm}$

### Double-Carriage

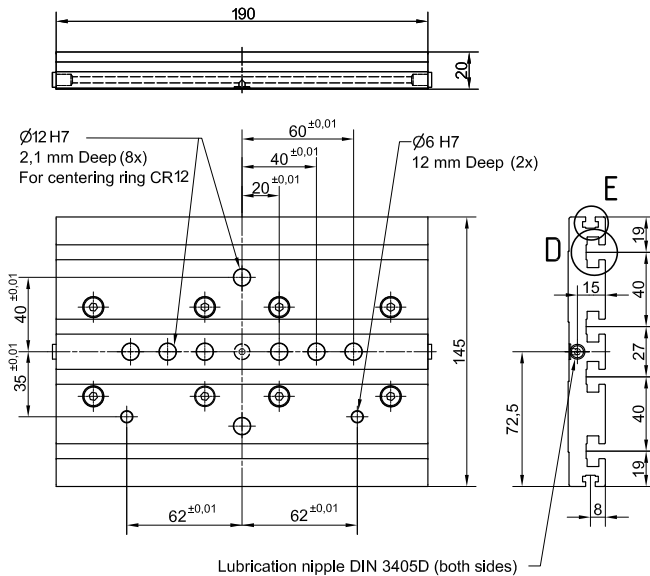
① Only with short carriage version.



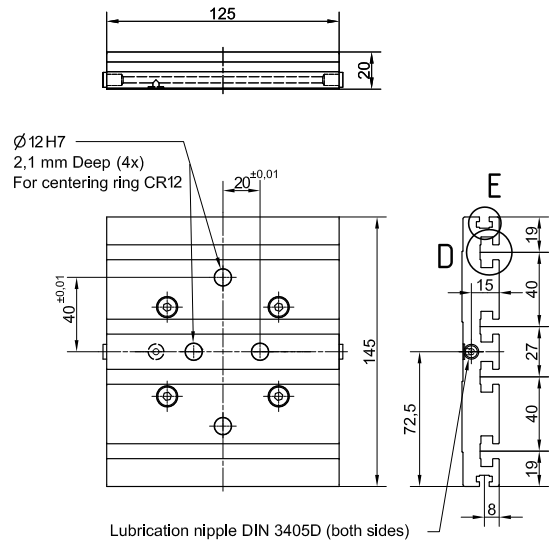
① For ordering code please contact Colco.

### Connection plate

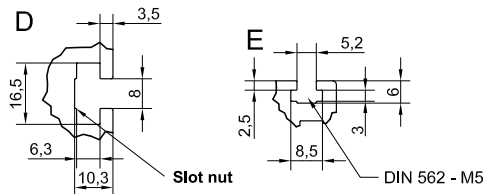
#### CTJ 145 L



#### CTJ 145 S



MOTOR	CTJ 145	CTJ 145	CTJ 145
	Available on request	Available on request	Available on request
GEAR REDUCER + MOTOR	CTJ 145	CTJ 145	CTJ 145
	Available on request	Available on request	Available on request
GEAR REDUCER 90° + MOTOR	CTJ 145	CTJ 145	CTJ 145
	Available on request	Available on request	Available on request

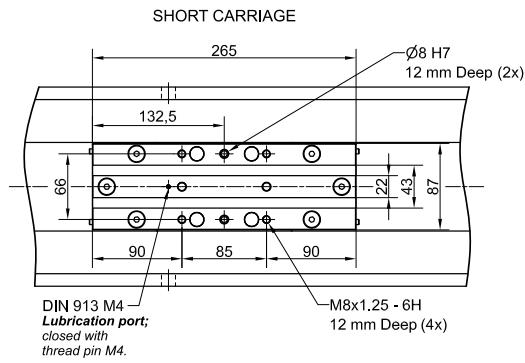
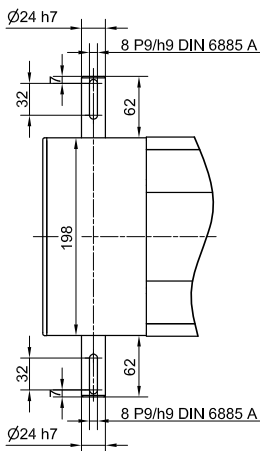
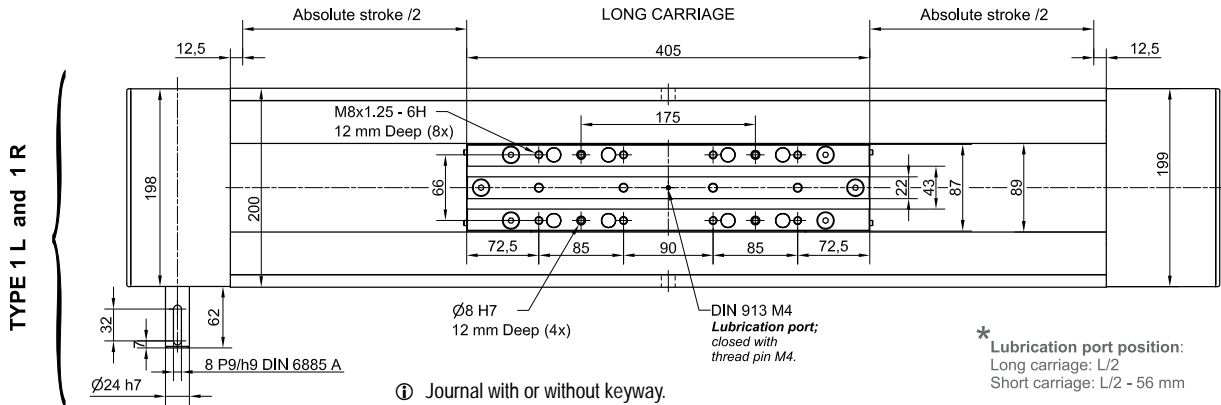
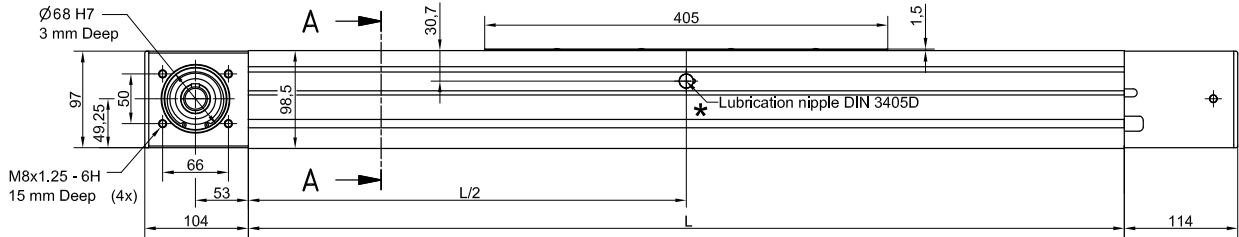


① Mounting elements for mounting the connection plate on the linear unit are included.

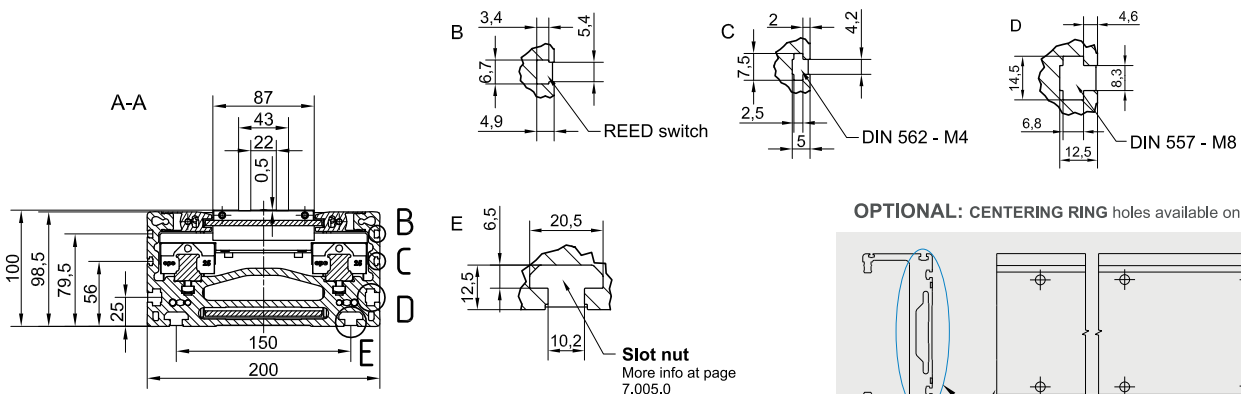
Linear Unit	Plate length (mm)	Weight (kg)	Code
CTJ 145 S	125	0,8	46776
CTJ 145 L	190	1,3	46775

# CTJ 200

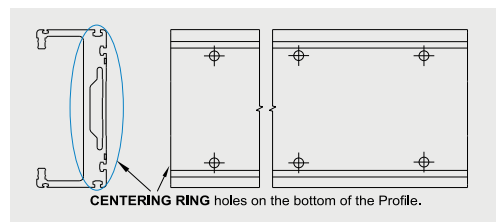
① The linear units do not include any safety stroke.  
 Absolut stroke = Effective stroke + 2 x safety stroke.



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



OPTIONAL: CENTERING RING holes available on request.



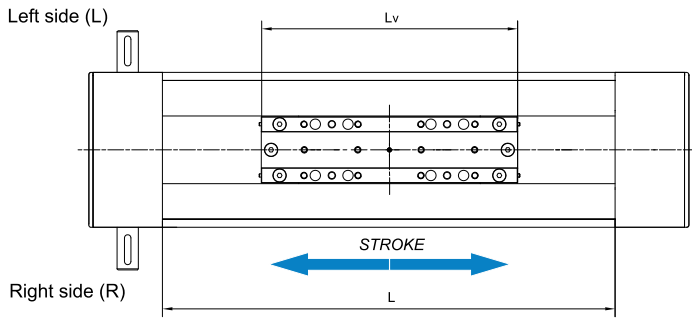
① All dimensions in mm. Drawings scales are not equal.



### Defining of the linear unit length

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 25 \text{ mm}$

$L_{\text{total}} = L + 218 \text{ mm}$

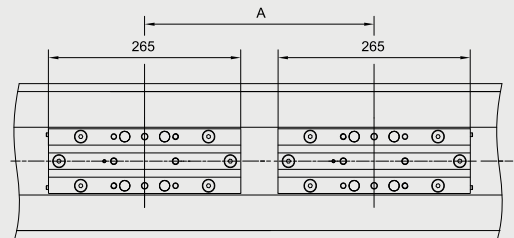


Lv - Long carriage = 405 mm  
 Lv - Short carriage = 265 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 290 \text{ mm}$   
 $L_{\text{total}} = L + 218 \text{ mm}$  }  $A \geq 265 \text{ mm}$

### Double-Carriage

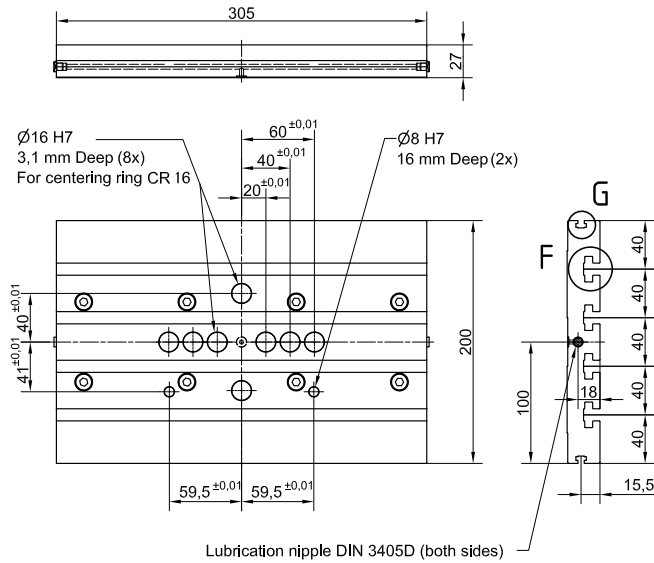
① nly with short carriage version.



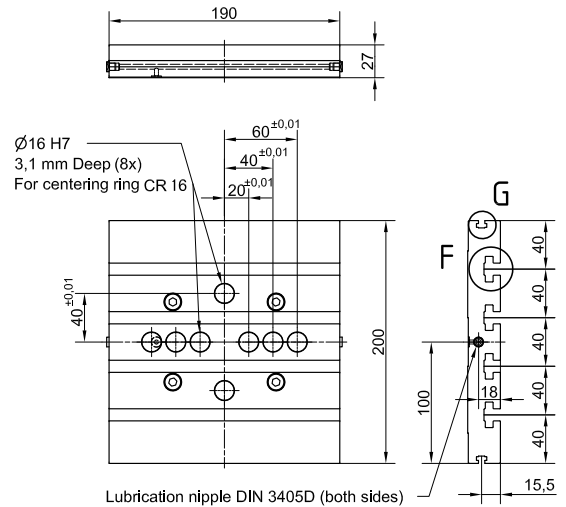
① or ordering code please contact colco.

### Connection plate

#### CTJ 200 L

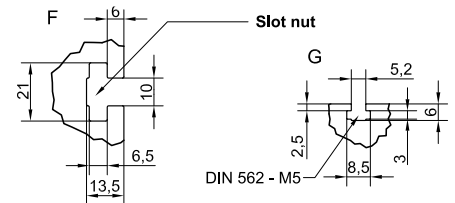


#### CTJ 200 S



Lubrication nipple DIN 3405D (both sides)

MOTOR	CTJ 200	CTJ 200	CTJ 200
	Available on request	Available on request	Available on request



① Mounting elements for mounting the connection plate on the linear unit are included.

Linear Unit	Plate length (mm)	Weight (kg)	Code
CTJ 200 S	190	2,3	52483
CTJ 200 L	305	3,7	52482

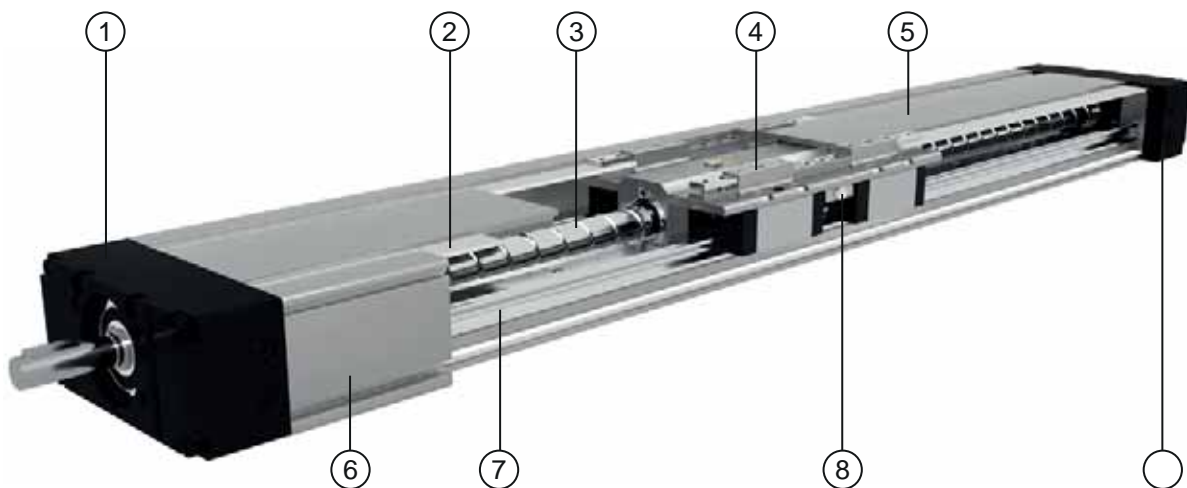
## Linear Unit CTV

The CTV series describes linear units with a precision ball screw drive and two parallel, integrated, zero-backlash rail guides. In the linear units CTV a precision ball screw, with tolerance class ISO7 (ISO5 on request), with reduced backlash of the ball nut is used.

Two parallel circulating antistatic polyurethane sealing strips and an aluminum cover are ensuring to protect all the parts in the profile from dust and other contaminations. Re-lubrication can be done through maintenance holes on the side of the profile.



## Structural Design



1. Drive block with floating bearing
2. Gap-type seal of antistatic PU strip (recirculating)
3. Ball screw tolerance ISO7 (ISO5 available on request)
4. Carriage; with built in magnets
5. Aluminium cover
6. Aluminium profile - hard anodized
7. Two integrated linear ball guideways
8. Central lubrication port, both sides
9. End block with fixed bearing

# Order Code

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.

# Technical Data

## CTV Series

Linear Unit	Carriage length Lv (mm)	Load capacity		Dynamic moment			Max. permissible loads					Moved mass (kg)	Max length* Lmax (mm)	Max stroke* (mm)
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments					
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)			
CTV 90 S	35	4620	6930	125	17	34	2000	4540	125	17	34	0,3	750	665
CTV 90 L	100	9240	13860	250	300	300	3990	9080	250	297	130	0,5		
CTV 110 S	39	19800	35000	650	118	235	4670	9390	310	90	90	0,63	1500	1410
CTV 110 L	124	39600	70000	1305	1680	1680	13080	18800	620	800	550	1,36		
CTV 145 S	49	34200	60000	1500	260	520	8930	15320	674	260	180	1,19	1800	1690
CTV 145 L	149	68400	120000	3005	3420	3420	17860	30680	1350	1700	893	2,61		
CTV 200 S	80	49600	85000	3220	450	900	10000	24610	1600	450	308	3,11	2200	2000
CTV 200 L	255	99200	170000	6445	8680	8680	20000	51540	3350	4550	1750	6,21		

\* For lengths/stroke over the stated value in the table above please contact Rollco. Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

### Recommended values of loads

All the data of static and dynamic moments and load capacities stated in the upper table 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)

C

### Modulus of elasticity

$$E = 70000 \text{ N / mm}^2$$

C

Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperature out of the presented range, please contact Rollco.

## Ball screw drive data

Linear Unit	Max. rotational speed (rev/min)	Max. travel speed <sup>1</sup> (m/s)	No load torque <sup>2</sup>		Lead constant (mm/rev)	Ball screw (d x l)	Max. repeatability precision <sup>3</sup> (mm)		Dynamic load capacity BS Ca (N)	Max. axial load Fx (N)	Max. drive torque Without keyway Ma (Nm)	Min. stroke <sup>4</sup> (mm)
			Carriage S (Nm)	Carriage L (Nm)			Standard ISO7	ISO5				
CTV 90	5800	0,49	0,07	0,09	5	12 x 5	± 0,02	± 0,01	5000	5000	4,4	30
			0,06	0,08	10	12 x 10	± 0,02	± 0,01	3800	2540	4,5	30
CTV110	4200	0,35	0,11	0,13	5	16 x 5	± 0,02	± 0,01	13150	8700	7,7	40
			0,12	0,16	10	16 x 10	± 0,02	± 0,01	11550	6730	11,9	40
			0,14	0,18	16	16 x 16	± 0,02	± 0,01	8170	4200	11,9	40
CTV 145	3300	0,28	0,28	0,3	5	20 x 5	± 0,02	± 0,01	14800	14800	13,0	55
			0,26	0,28	10	20 x 10	± 0,02	± 0,01	15900	13850	24,5	55
			0,24	0,28	20	20 x 20	± 0,02	± 0,01	16250	6930	24,5	55
CTV 200	3000	2,50	0,34	0,38	50	20 x 50	± 0,02	± 0,01	13000	2770	24,5	55
			0,45	0,55	5	32 x 5	± 0,02	± 0,01	18850	18850	16,7	65
			0,50	0,60	10	32 x 10	± 0,02	± 0,01	33400	29600	52,3	65
CTV 200	3000	1,00	0,55	0,65	20	32 x 20	± 0,02	± 0,01	29700	14800	52,3	65
			0,60	0,70	32	32 x 32	± 0,02	± 0,01	35150	9240	52,3	70

<sup>1</sup> 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 in the table above or diagrams please contact us.

<sup>2</sup> The stated values are for strokes up to 500mm. No load torque value increases with stroke elongation.

<sup>3</sup> For the ball nut with the preload of 2%, please contact Rollco.

<sup>4</sup> For minimum stroke below the stated value in the table above please contact Rollco.

Max. acceleration (m/s<sup>2</sup>): 20

For acceleraffon over the stated value in the table above, please contact Rollco.

Linear unit	Permissible drive torque (with keyway) Ma (Nm)
CTV 90	-
CTV 110	5,5
CTV 145	11,9
CTV 200	27,3

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

## Mass of linear unit

Linear Unit	Carriage length Lv (mm)	Mass of linear unit (kg)
CTV 90 S	35	1,6 + 0,006 * Stroke (mm)
CTV 90 L	100	2,2 + 0,006 * Stroke (mm)
CTV 110 S	39	3,3 + 0,008 * Stroke (mm)
CTV 110 L	124	4,6 + 0,008 * Stroke (mm)
CTV 145 S	49	5,7 + 0,015 * Stroke (mm)
CTV 145 L	149	8,4 + 0,015 * Stroke (mm)
CTV 200 S	80	15,4 + 0,031 * Stroke (mm)
CTV 200 L	255	23,8 + 0,031 * Stroke (mm)

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

## Mass moment inertia of linear unit

Linear Unit	Carriage version	Ball screw (d x l)	Mass moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )	Planar moment of inertia	
				Iy (cm <sup>4</sup> )	Iz (cm <sup>4</sup> )
CTV 90	S	12 x 5	0,32 + 0,002 * Stroke (mm)	13,6	102,6
		12 x 10	0,38 + 0,002 * Stroke (mm)		
	L	12 x 5	0,43 + 0,002 * Stroke (mm)		
		12 x 10	0,53 + 0,002 * Stroke (mm)		
CTV 110	S	16 x 5	0,70 + 0,005 * Stroke (mm)	29,1	196,0
		16 x 10	0,82 + 0,005 * Stroke (mm)		
		16 x 16	1,07 + 0,005 * Stroke (mm)		
	L	16 x 5	1,19 + 0,005 * Stroke (mm)		
		16 x 10	1,45 + 0,005 * Stroke (mm)		
		16 x 16	1,99 + 0,005 * Stroke (mm)		
CTV 145	S	20 x 5	3,04 + 0,013 * Stroke (mm)	85,3	682,3
		20 x 10	3,27 + 0,013 * Stroke (mm)		
		20 x 20	4,17 + 0,013 * Stroke (mm)		
		20 x 50	10,50 + 0,013 * Stroke (mm)		
	L	20 x 5	4,43 + 0,013 * Stroke (mm)		
		20 x 10	4,92 + 0,013 * Stroke (mm)		
		20 x 20	6,91 + 0,013 * Stroke (mm)		
		20 x 50	20,79 + 0,013 * Stroke (mm)		
CTV 200	S	32 x 5	21,17 + 0,069 * Stroke (mm)	417,4	3007,3
		32 x 10	21,76 + 0,069 * Stroke (mm)		
		32 x 20	24,12 + 0,069 * Stroke (mm)		
		32 x 32	29,04 + 0,069 * Stroke (mm)		
		32 x 5	33,41 + 0,069 * Stroke (mm)		
	L	32 x 10	34,59 + 0,069 * Stroke (mm)		
		32 x 20	39,31 + 0,069 * Stroke (mm)		
		32 x 32	49,12 + 0,069 * Stroke (mm)		

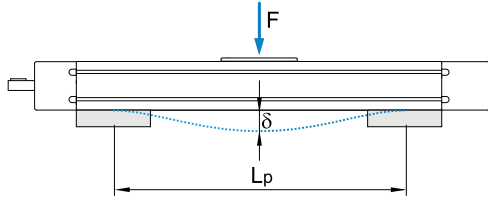
## General technical data for double carriage

Linear Unit	Carriage version	Load capacity		Dynamic moment*			Max. permissible loads*				
		Dynamic C (N)	Static C0 (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Forces		Moments		
							Fpy (N)	Fpz (N)	Mpx (Nm)	Mpy (Nm)	Mpz (Nm)
CTV 90	S2	9240	13860	250	4,6 * A (mm)	4,6 * A (mm)	3990	9090	250	4,5 * A (mm)	2,0 * A (mm)
CTV 110	S2	39600	70000	1300	19,8 * A (mm)	19,8 * A (mm)	12940	18790	620	9,4 * A (mm)	6,5 * A (mm)
CTV 145	S2	68400	120000	3000	34,2 * A (mm)	34,2 * A (mm)	17870	30640	1350	15,3 * A (mm)	8,9 * A (mm)
CTV 200	S2	99200	170000	6440	49,6 * A (mm)	49,6 * A (mm)	20000	49230	3200	24,6 * A (mm)	10,0 * A (mm)

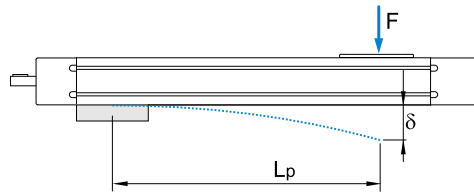
\*A - Distance between carriages. More info on following pages.

# Deflection of the linear unit

Fixed - fixed mounting



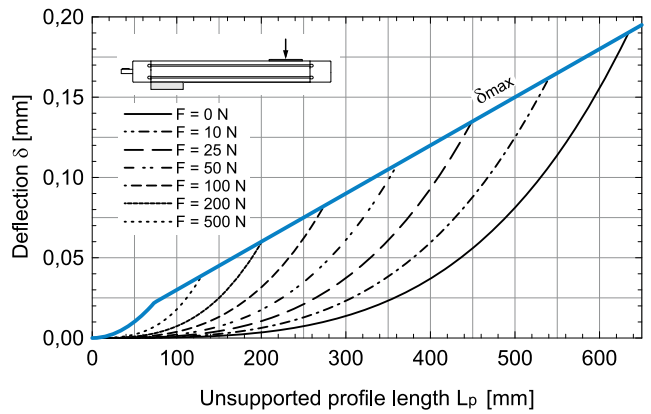
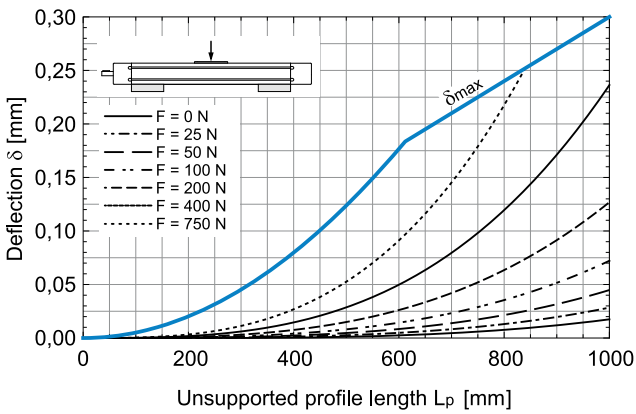
Fixed - free mounting



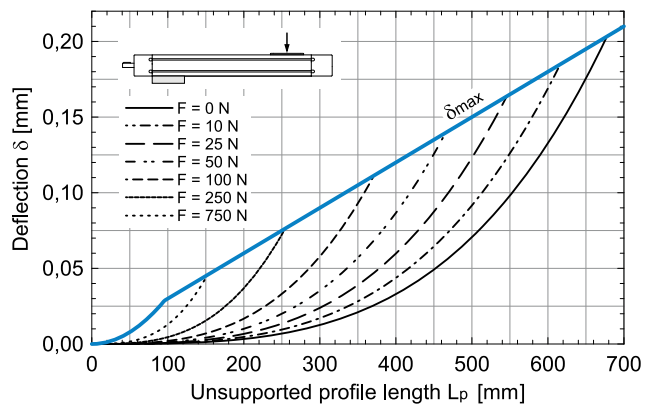
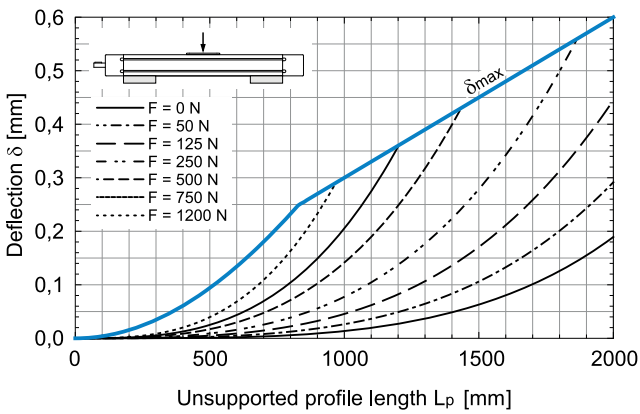
- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- $L_p$  Unsupported profile length [mm]

The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.

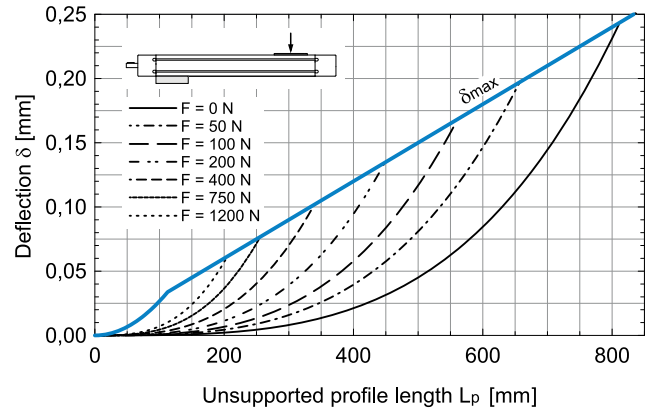
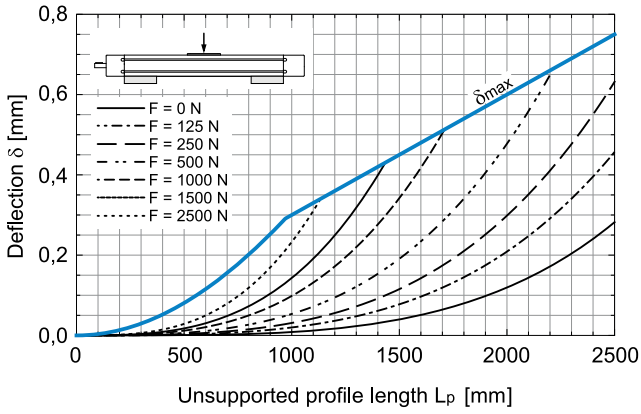
## CTV 90



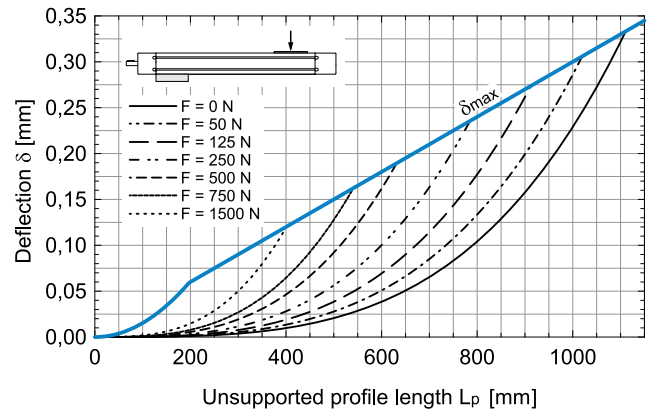
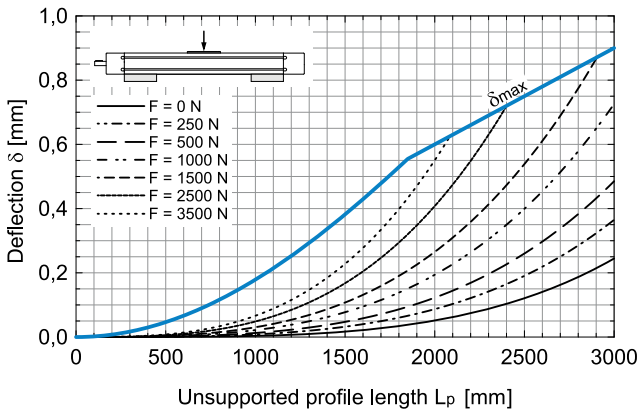
## CTV 110



**CTV 145**



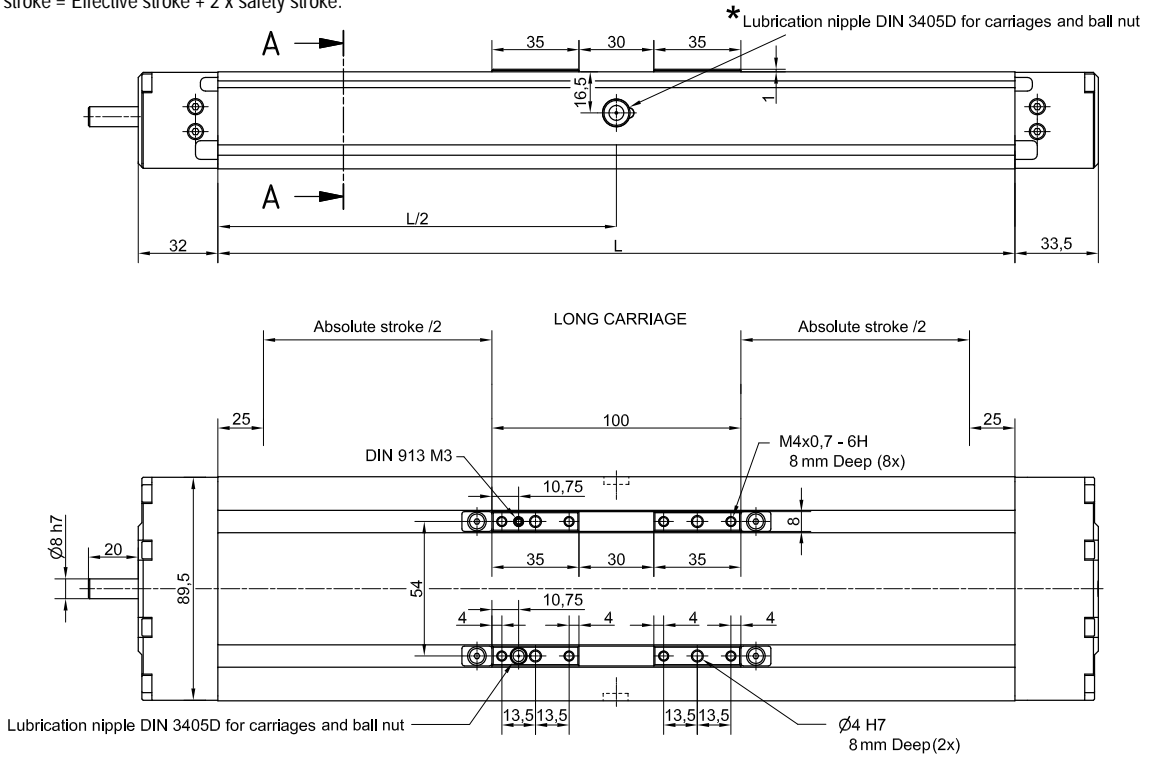
**CTV 200**



# Dimensions

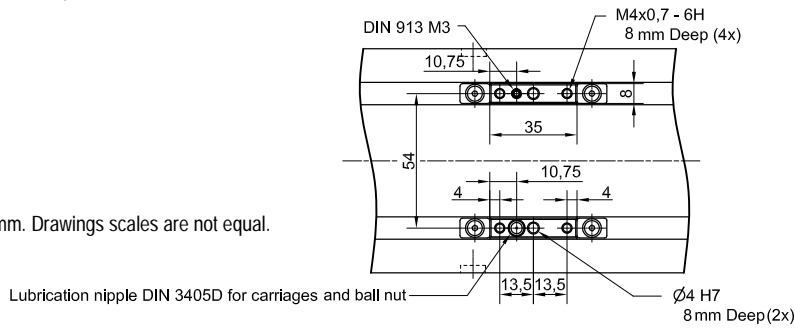
## CTV 90

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



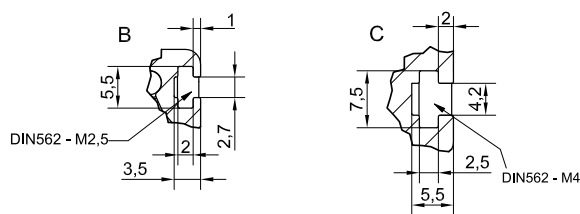
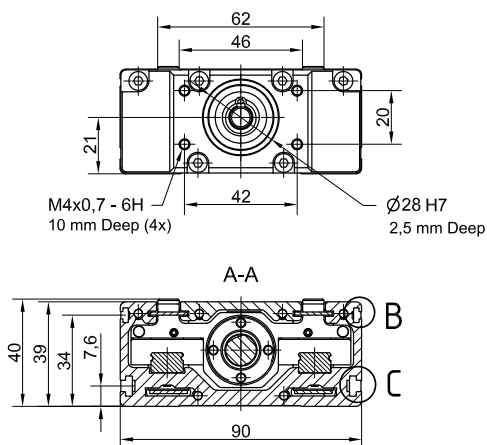
\* Lubrication port position:  
 Long carriage: L/2  
 Short carriage: L/2 - 24,2 mm

### SHORT CARRIAGE

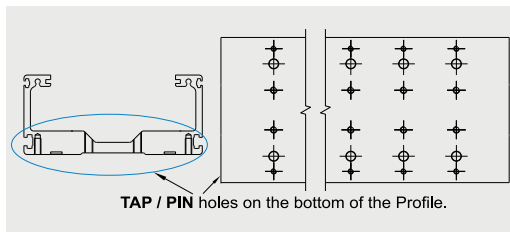


① All dimensions in mm. Drawings scales are not equal.





OPTIONAL: TAP / PIN holes available on request.

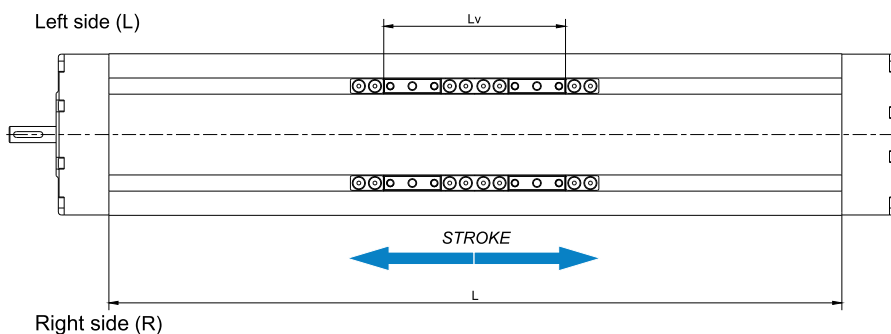


① All dimensions in mm. Drawings scales are not equal.

### Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 50 \text{ mm}$$

$$L_{\text{total}} = L + 65,5 \text{ mm}$$

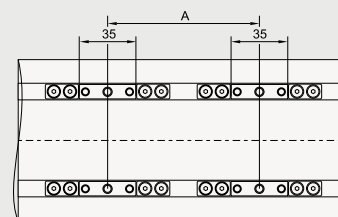


L<sub>v</sub> - Long carriage = 100 mm  
L<sub>v</sub> - Short carriage = 35 mm

$$\left. \begin{aligned} L &= \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 85 \text{ mm} \\ L_{\text{total}} &= L + 65,5 \text{ mm} \end{aligned} \right\} A \geq 65 \text{ mm}$$

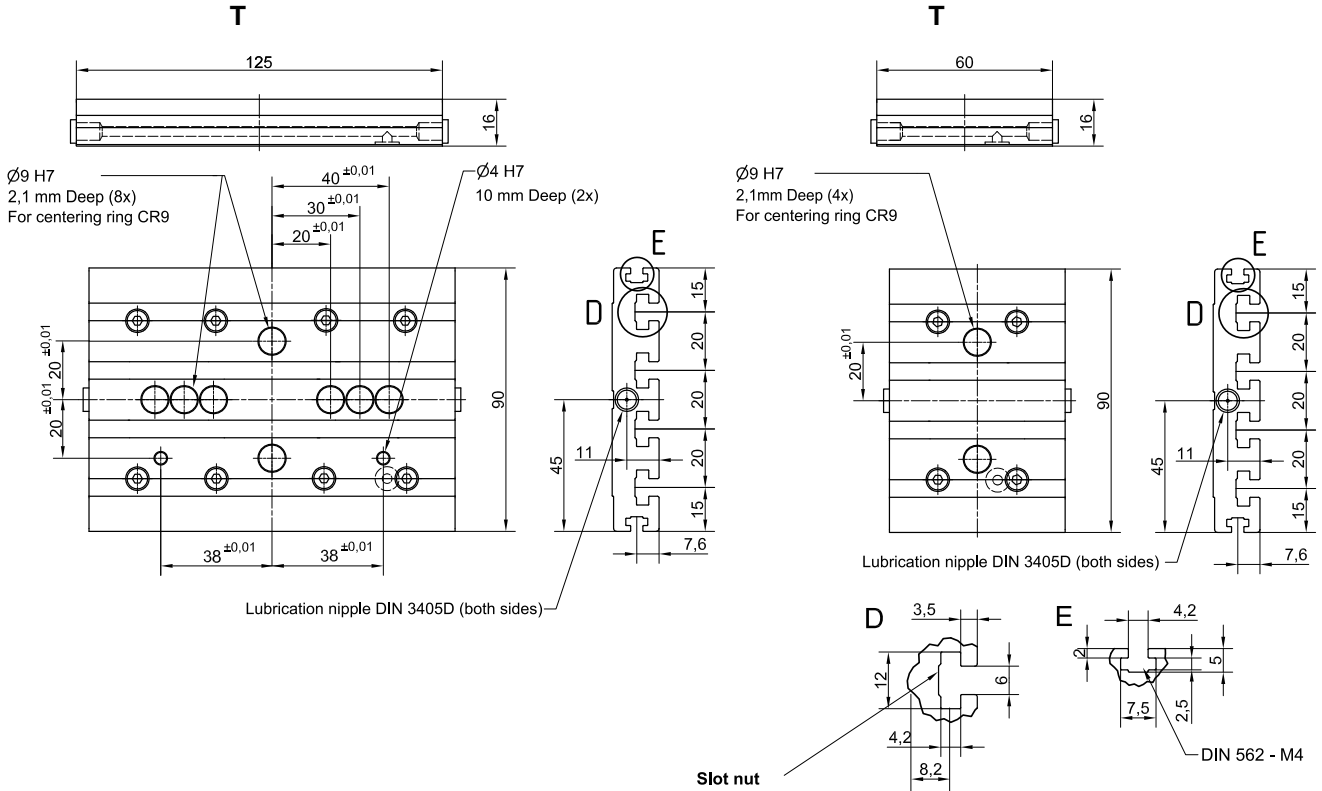
### Double-Carriage

① Only with short carriage version.



① or ordering code please contact olco.

Connection plate



Linear unit	Plate length (mm)	Weight (kg)	Code
CTV 90 S	60	0,21	46906
CTV 90 L	125	0,44	46907

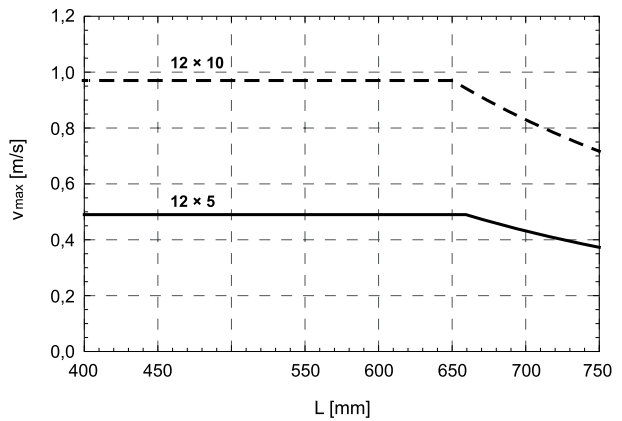
Mounting elements for mounting the connection plate on the linear unit are included.

Mounting the drive

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

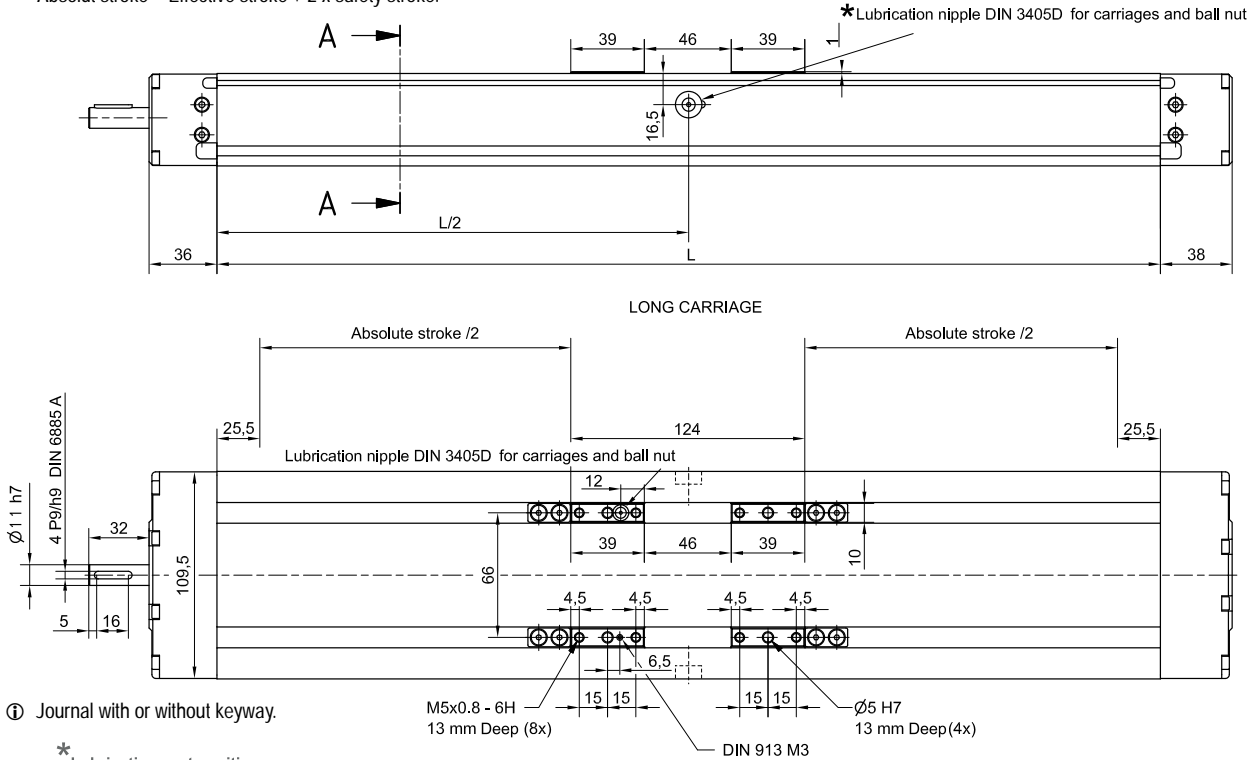
Available on request.

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



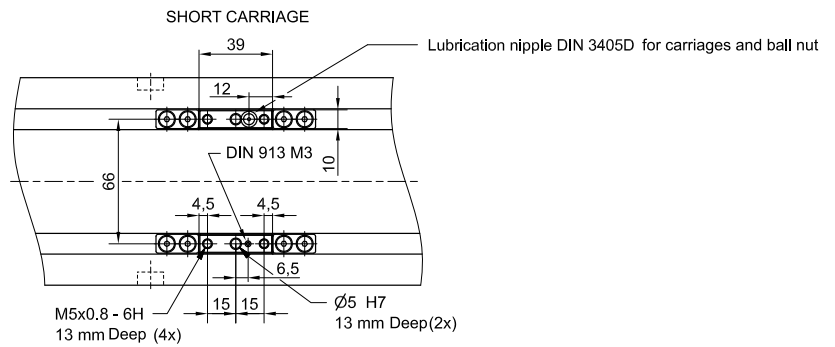
# CTV 110

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

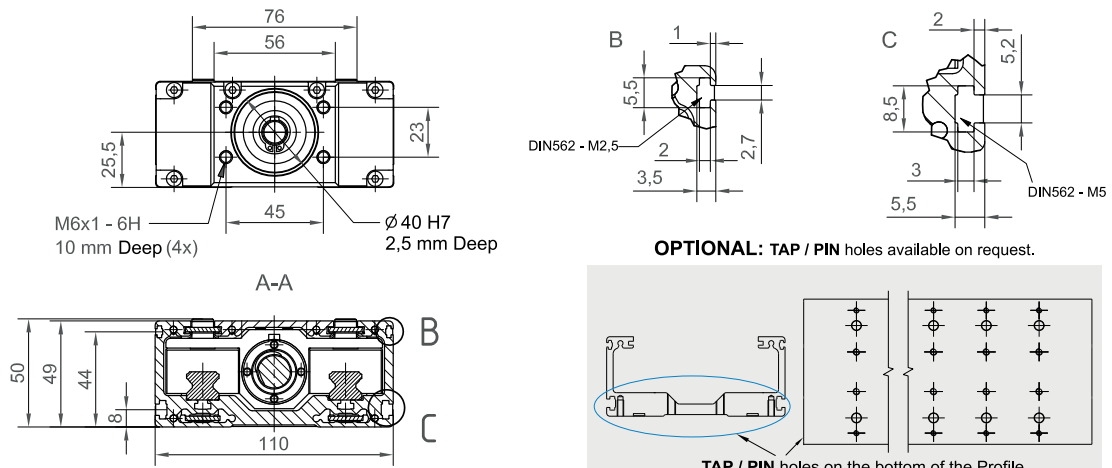


- ① Journal with or without keyway.

\* Lubrication port position:  
Long carriage: L/2  
Short carriage: L/2 - 39 mm



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

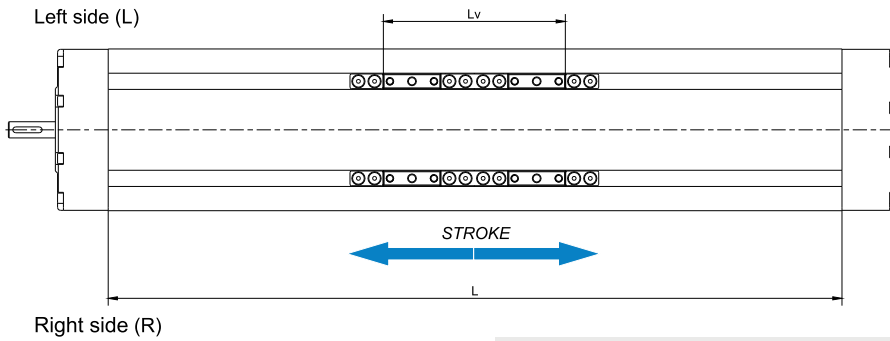


- ① All dimensions in mm. Drawings scales are not equal.

### Defining of the linear unit length

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 51 \text{ mm}$

$L_{\text{total}} = L + 74 \text{ mm}$

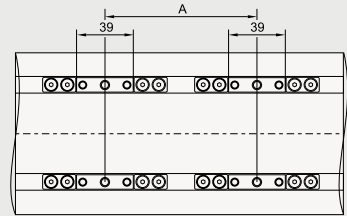


$L_v$  - Long carriage = 124 mm  
 $L_v$  - Short carriage = 39 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 90 \text{ mm}$   
 $L_{\text{total}} = L + 74 \text{ mm}$  }  $A \geq 85 \text{ mm}$

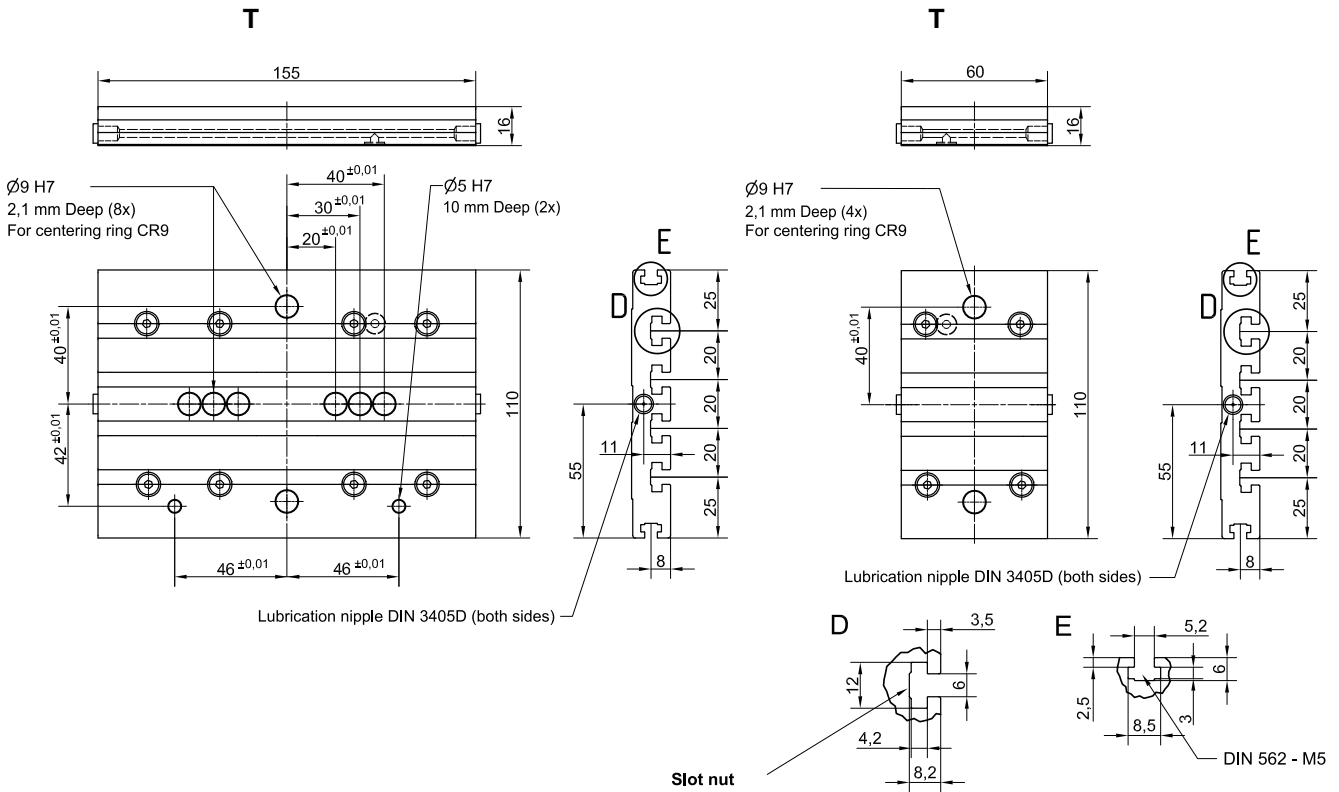
### Double-Carriage

① Only with short carriage version.



① For ordering code please contact Colco.

### Connection plate



Linear unit	Plate length (mm)	Weight (kg)	Code
CTV 110 S	60	0,37	48348
CTV 110 L	155	0,74	48349

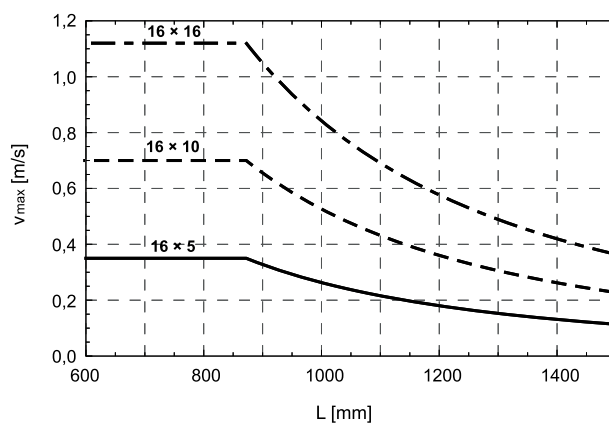
Mounting elements for mounting the connection plate on the linear unit are included.

### Mounting the drive

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

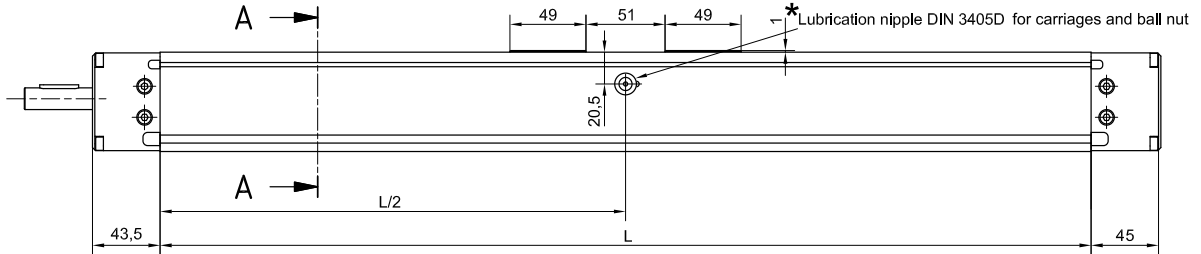
*Available on request.*

### Maximum travel speed as a function of the profile length (v<sub>max</sub> - L curves)

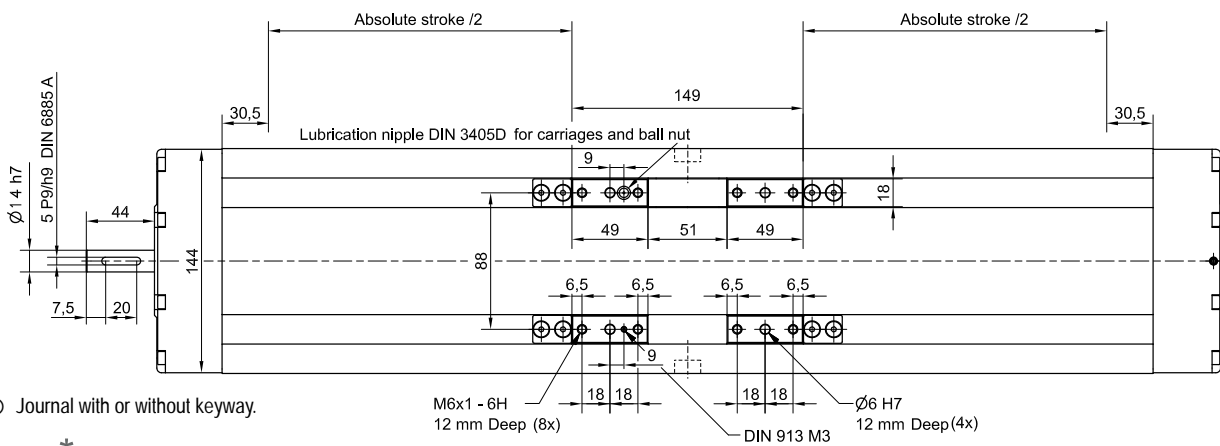


# CTV 145

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



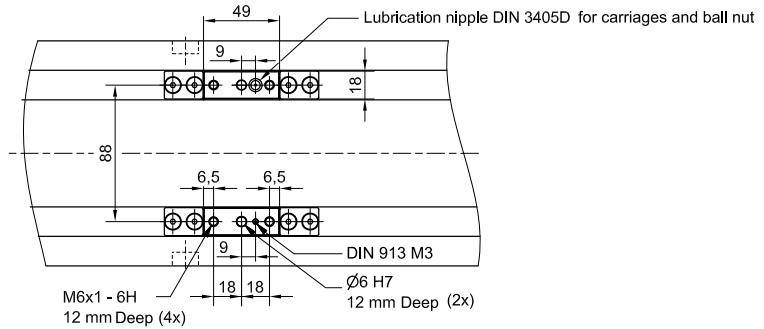
LONG CARRIAGE



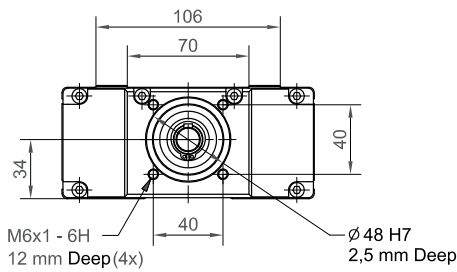
- ① Journal with or without keyway.

\* Lubrication port position:  
 Long carriage: L/2  
 Short carriage: L/2 - 46 mm

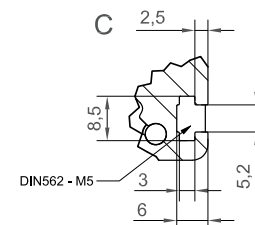
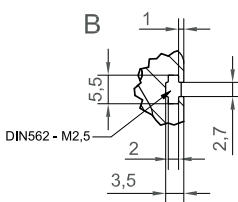
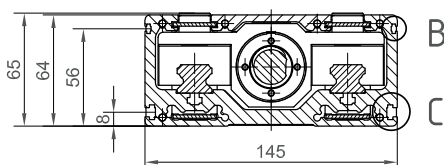
SHORT CARRIAGE



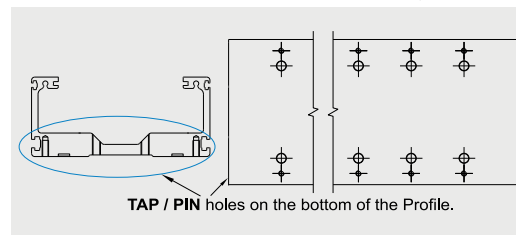
- ① All dimensions in mm. Drawings scales are not equal.



A-A



OPTIONAL: TAP / PIN holes available on request.

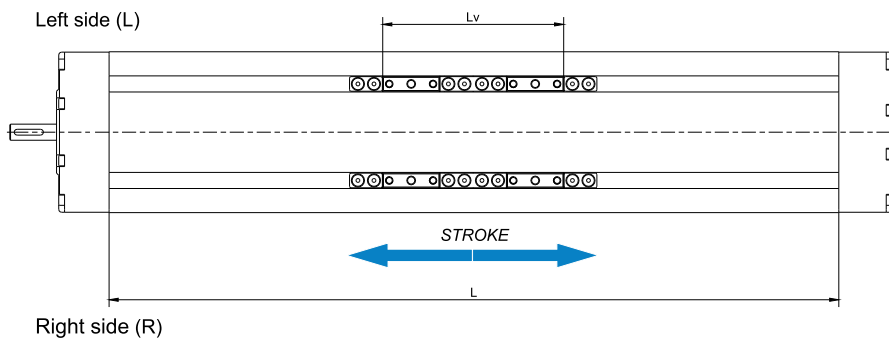


- ① All dimensions in mm. Drawings scales are not equal.

## Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 61 \text{ mm}$$

$$L_{\text{total}} = L + 88,5 \text{ mm}$$

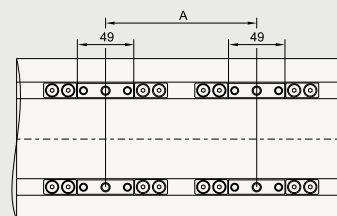


$L_v$  - Long carriage = 149 mm  
 $L_v$  - Short carriage = 49 mm

$$\left. \begin{aligned} L &= \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 110 \text{ mm} \\ L_{\text{total}} &= L + 88,5 \text{ mm} \end{aligned} \right\} A \geq 100 \text{ mm}$$

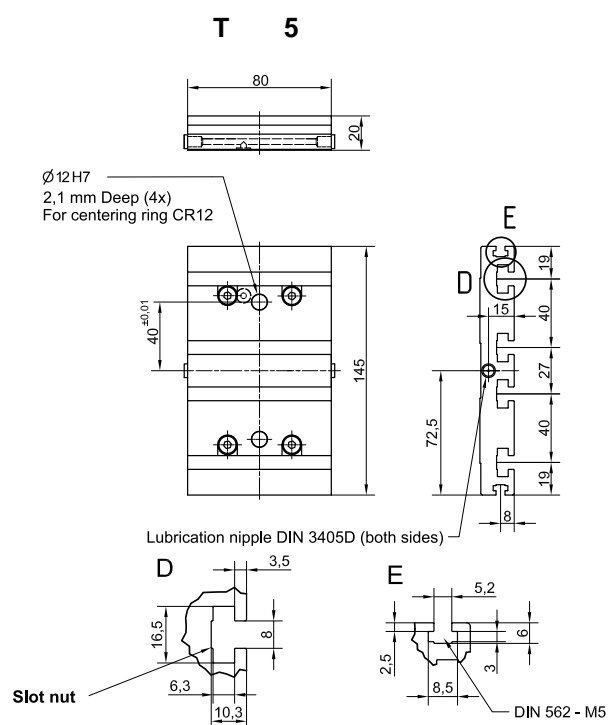
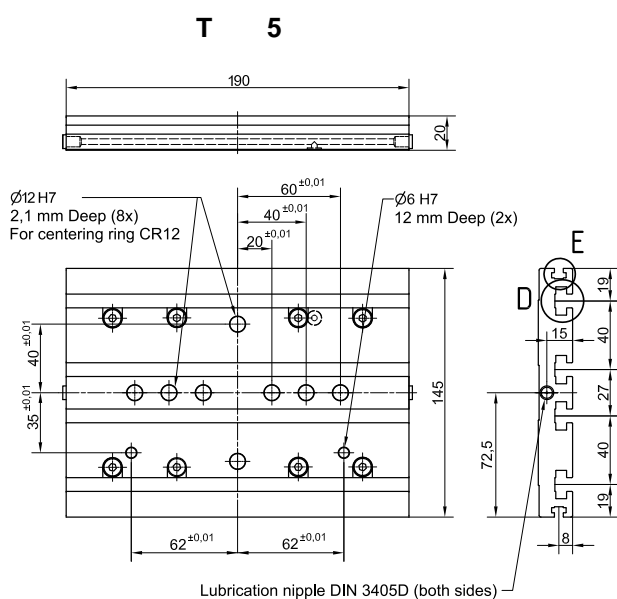
### Double-Carriage

① nly with short carriage version.



① or ordering code please contact ollco.

## Connection plate



Linear unit	Plate length (mm)	Weight (kg)	Code
CTV 145 S	80	0,78	48351
CTV 145 L	190	1,54	48350

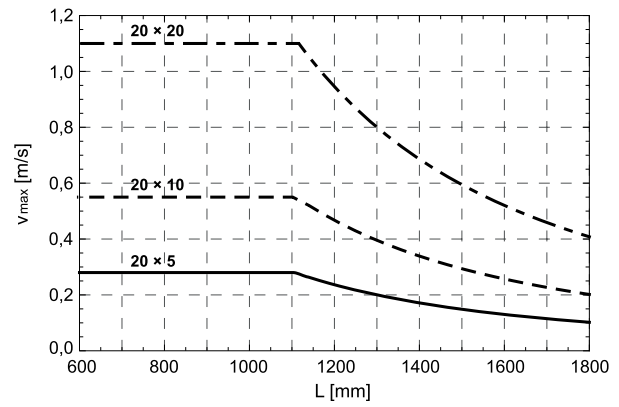
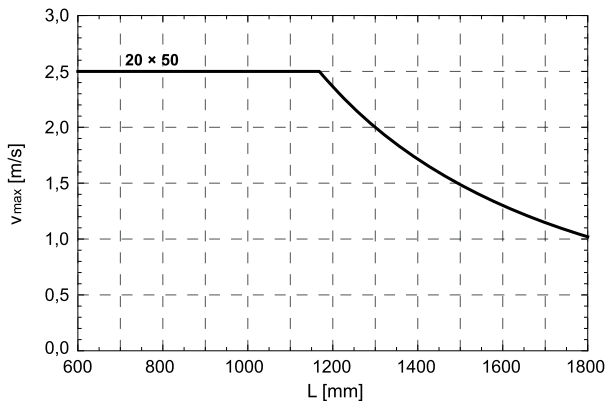
Mounting elements for mounting the connection plate on the linear unit are included.

### Mounting the drive

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

*Available on request.*

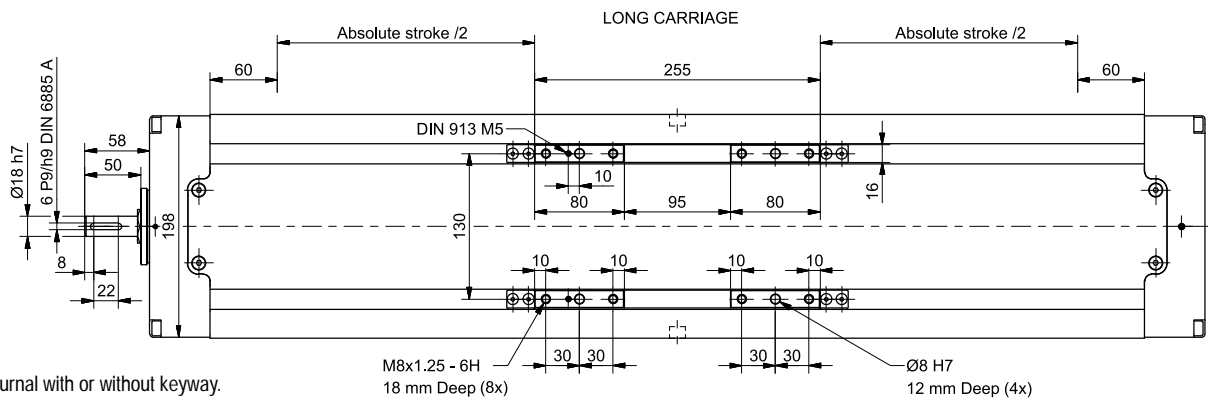
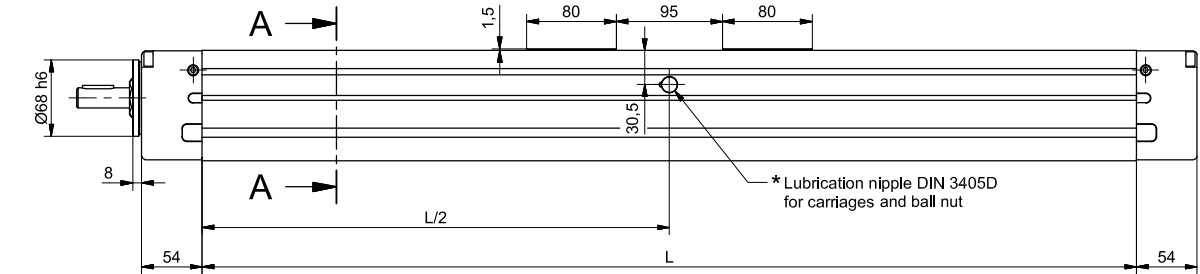
### Maximum travel speed as a function of the profile length (v<sub>max</sub> - L curves)





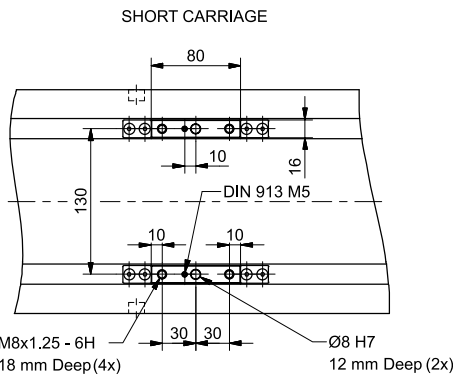
# CTV 200

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

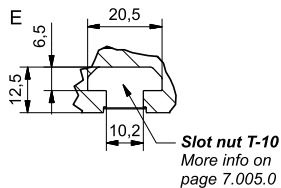
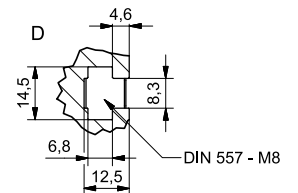
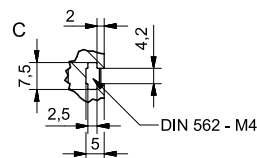
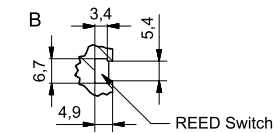
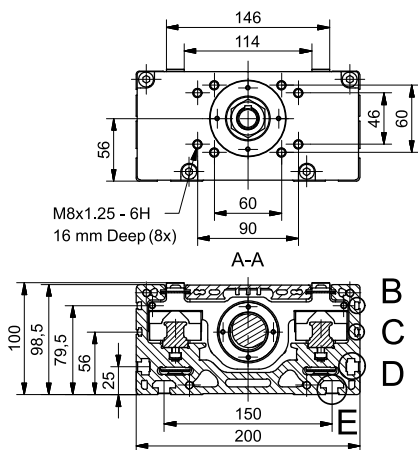


- ① Journal with or without keyway.

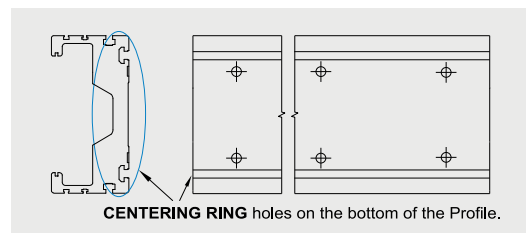
\* Lubrication port position:  
Long carriage: L/2  
Short carriage: L/2 - 53 mm



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



OPTIONAL: CENTERING RING holes available on request.

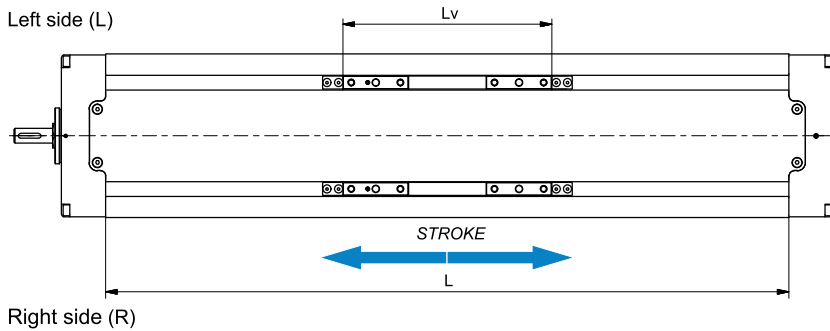


- ① All dimensions in mm. Drawings scales are not equal.

### Defining of the linear unit length

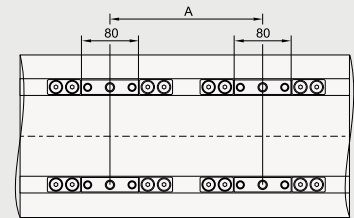
$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 120 \text{ mm}$

$L_{\text{total}} = L + 108 \text{ mm}$



### Double-Carriage

① nly with short carriage version.



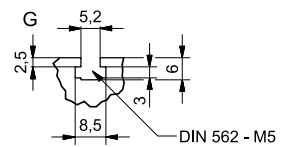
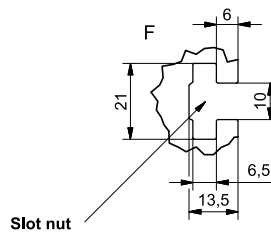
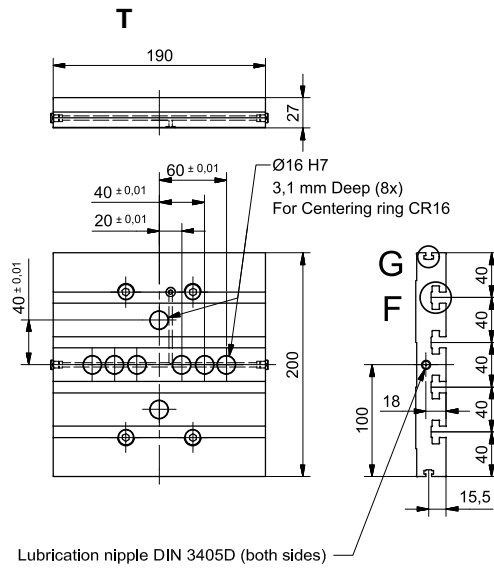
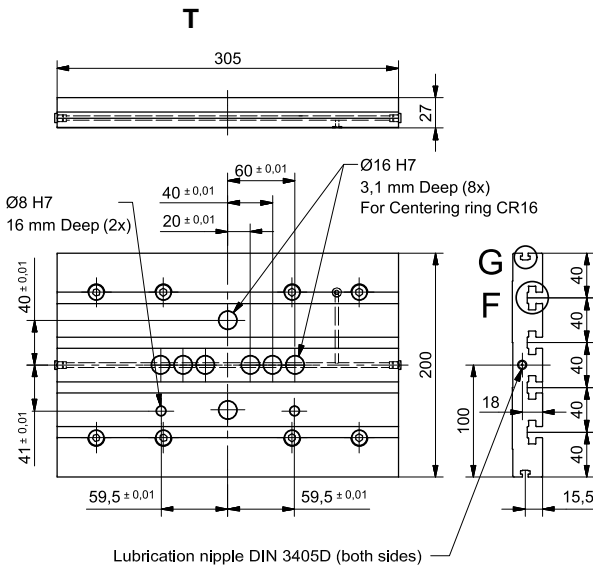
① or ordering code please contact ollco.

$L_v$  - Long carriage = 255 mm  
 $L_v$  - Short carriage = 80 mm

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 200 \text{ mm}$   
 $L_{\text{total}} = L + 108 \text{ mm}$

$A \geq 130 \text{ mm}$   
 $*A \geq 195 \text{ mm}$   
*\* In case of using the connection plates.*

### Connection plate



Linear unit	Plate length (mm)	Weight (kg)	Code
CTV 200 S	190	2,32	66669
CTV 200 L	305	3,75	66657

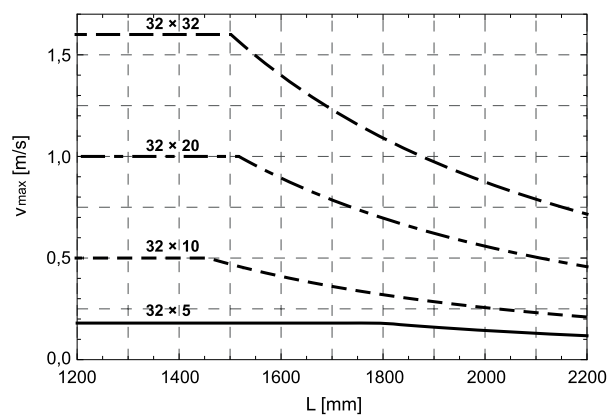
Mounting elements for mounting the connection plate on the linear unit are included.

### Mounting the drive

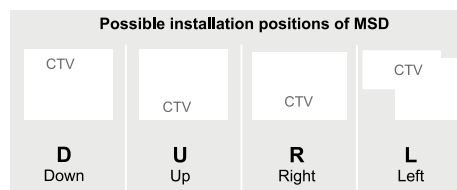
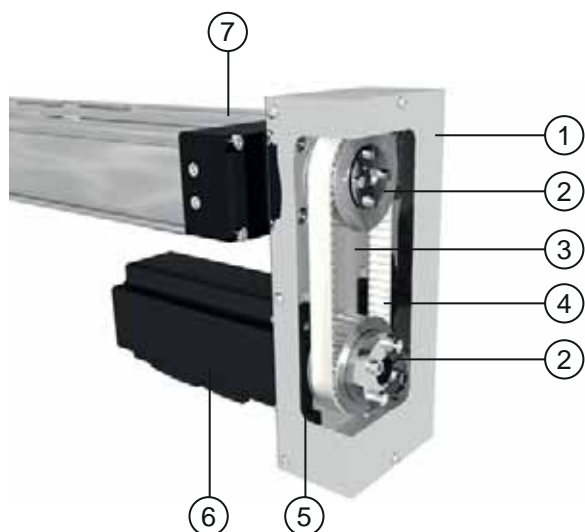
- by the **MOTOR SIDE DRIVE - MSD**
- by the **MOTOR ADAPTER WITH COUPLING**

*Available on request.*

### Maximum travel speed as a function of the profile length (v<sub>max</sub> - L curves)



# Structural Design



1. Cover
2. Attachment of pulley with clamping set
3. Anodized aluminium housing
4. Toothed belt
5. Belt tensioning system (elongation and frequency of belt span provided with delivery of unit)
6. Motor
7. Linear unit - CTV/MTV

The linear unit must be executed with drive journal without keyway so that the MSD belt drive can be mounted on it.

# Technical Data

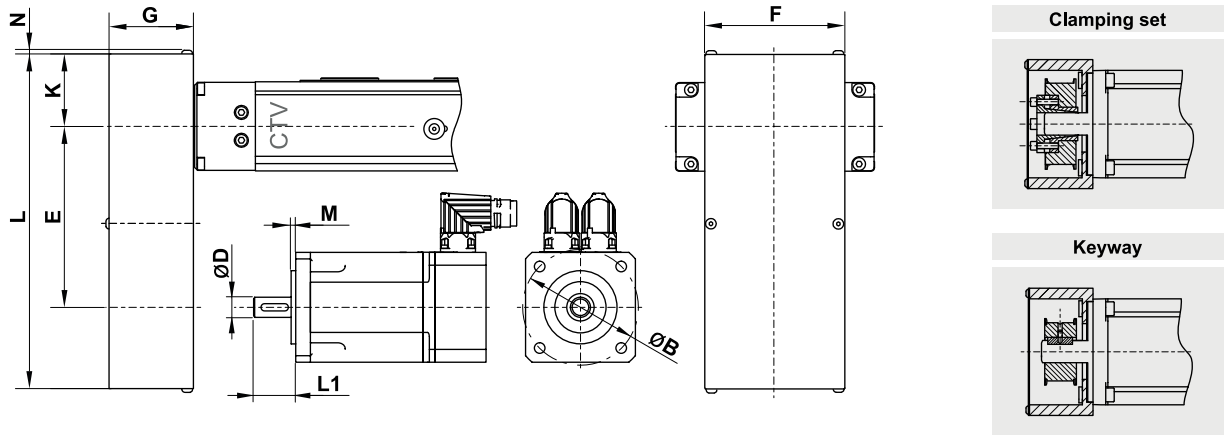
Linear Unit	Type	Gear ratio	Max. drive torque (linear unit) (Nm)	Max. radial load on shaft ** (N)	Mass moment of inertia (10 <sup>-6</sup> kg * m <sup>2</sup> )	Mass (kg)	Motor size limits (mm)						
							ØB max	M* max	L1		ØD Max		
								Min. clamping set	Min. Keyway	Max	Clamping set	Keyway	
CTV 90	T1	i=1	2,7	90	79	0,88	70	4	22	25	39	14	22
		i=1,5	2,7	90	48	0,74			/			14	
CTV 110	T1	i=1	5	175	72	0,90	70	4	22	25	39	14	22
MTV 65		i=1,5	5	175	41	0,80			/			14	
CTV 110	T2	i=1	9	245	206	1,51	100	4	24	30	49	18	30
MTV 65		i=1,5	11	235	335	1,53			25			14	
CTV 145	T1	i=1	13	350	207	1,52	100	4	24	30	49	18	30
MTV 80		i=1,5	19	410	335	1,64			25			14	
CTV 145	T2	i=1	19	410	551	3,30	120	4	30	35	59	22	40
MTV 80		i=2	24	375	860	2,93						14	
CTV 200	ON REQUEST												
MTV 110	ON REQUEST												

(Max. drive speed: 3000 1/min; No load torque: approx. 0,5 Nm)

\* For a bigger value an additional adapter plate is used.

\*\* This is the load which is linearly dependent on the max. drive torque and is generated by the correct pretension of the belt. This load needs to be reduced in accordance with the capabilities of the motor.

# Dimensions



Linear Unit	E	F	G	K	L	N
CTV 90	100 102	70	41	31	179	2
CTV 110	100	70	41	31	179	2
MTV 65	112				190	
CTV 110	145				250	
MTV 65	139	90	51	43	250	2
CTV 145	145				250	
MTV 80	180	90	51	43	282	2
CTV 145	160				297	
MTV 80	158	120	61	56	297	2,5
CTV 200	ON REQUEST					
MTV 110	ON REQUEST					

Dimensions in mm.

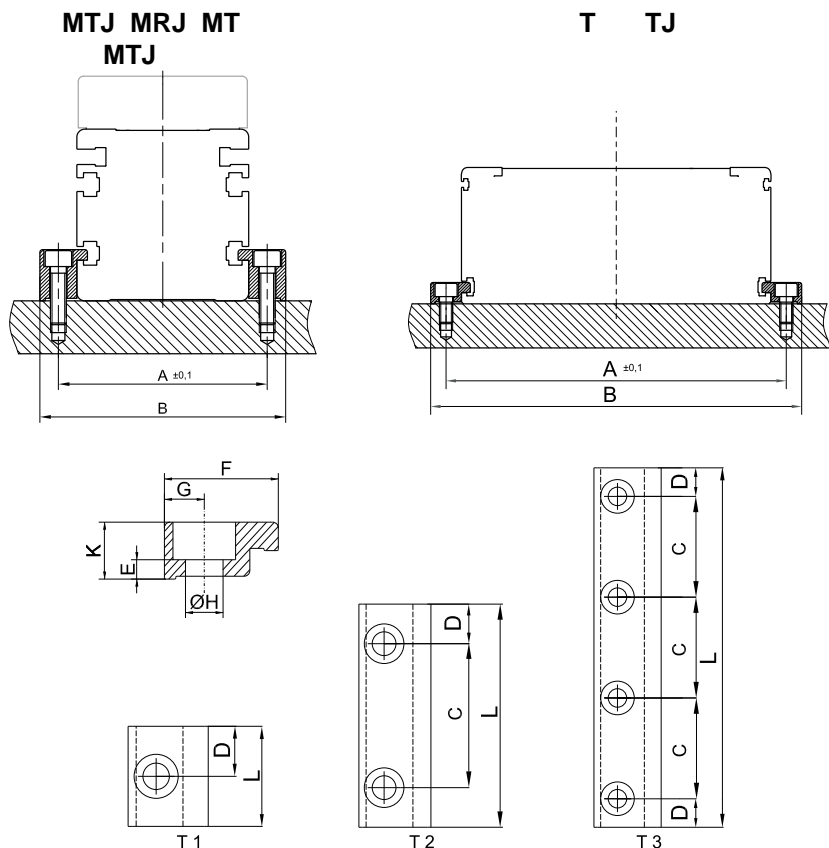
# Order code

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

<b>Motor side drive</b>	
<b>Lineae unit series</b> MTV / CTV	
<b>Type</b>	
<b>Gear ratio</b>	
<b>Motor type</b> According to customer's drawing	

# Fixing System

The linear units are mounted by using fixtures which are placed in the slot on the side of the profile.

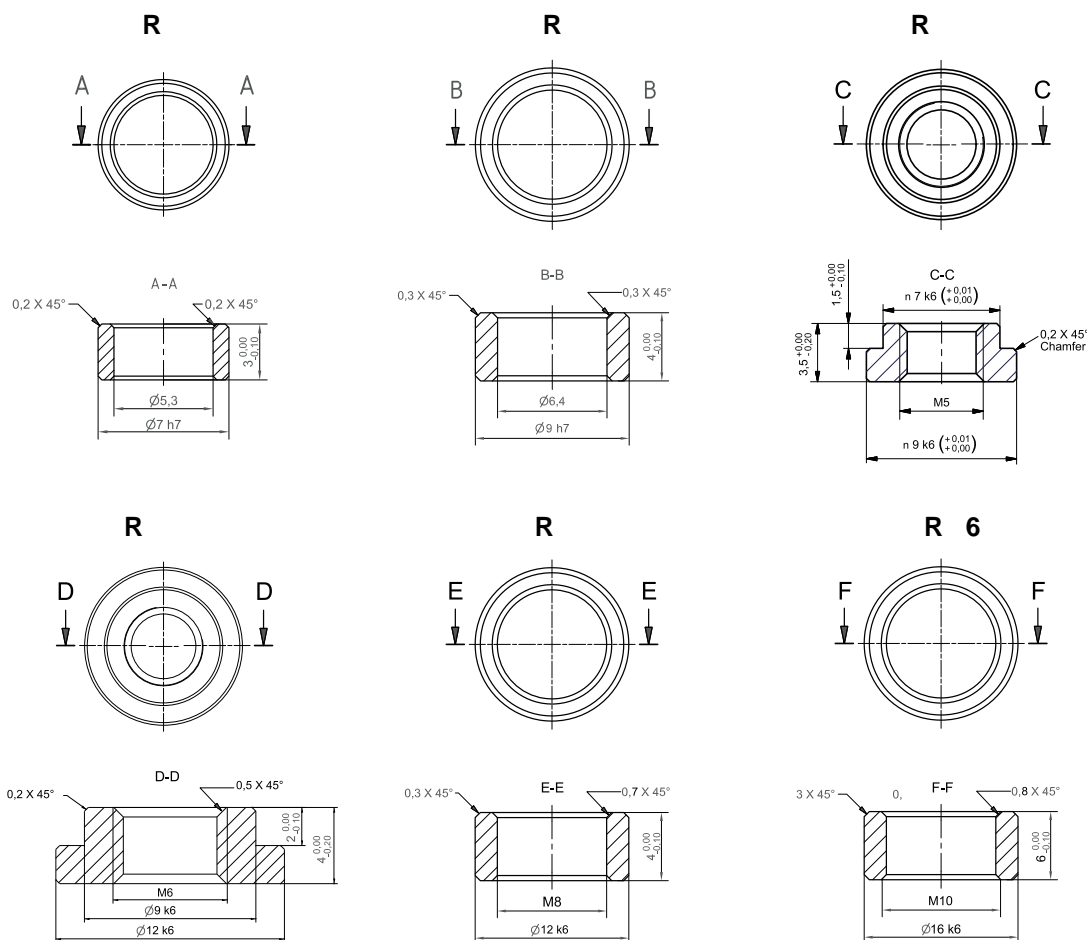


Linear unit must be mounted by the aluminium profile.

Linear Unit	Type	Dimensions (mm)										Screw	Countersink for	Weight (kg)	Code
		A	B	C	D	L	E	F	G	ØH	K				
MTJ, MRJ 40	T2	50	64,4	40	7,5	55	2,5	15	7,2	5,5	8	M5	DIN 912	0,014	37139
MTJ, MRJ, MTV 65	T2	78	93	40	10	60	11,5	20	7,5	6,5	20	M6	DIN 912	0,054	37129
MTJ, MRJ, MTV 80	T2	93	108	40	10	60	11,5	20	7,5	6,5	20	M6	DIN 912	0,054	37129
MTJ, MRJ, MTV 110	T2	130	150	40	10	60	18	30	10	8,5	27	M8	DIN 912	0,082	44375
MTJ ECO 40	T2	52	66	40	7,5	55	14,5	20	7	5,5	20	M5	DIN 912	0,035	40728
CTV, CTJ 90	T1	102	112	/	12,5	25	4,5	15	5	4,5	9	M4	DIN 912	0,01	46994
CTV, CTJ 90	T2	102	112	40	11	62	4,5	15	5	4,5	9	M4	DIN 912	0,02	48636
CTV, CTJ 90	T3	102	112	20	8,5	77	4,5	15	5	4,5	9	M4	DIN 912	0,025	47163
CTV, CTJ 90	T3	102	112	25	6	87	4,5	15	5	4,5	9	M4	DIN 912	0,028	55261
CTV, CTJ 90	T3	102	112	30	8,5	107	4,5	15	5	4,5	9	M4	DIN 912	0,031	55638
CTV, CTJ 110	T1	126	140	/	12,5	25	3,4	20	7	6,6	10	M6	DIN 912	0,01	48642
CTV, CTJ 110	T2	126	140	40	11	62	3,4	20	7	6,6	10	M6	DIN 912	0,03	48643
CTV, CTJ 110	T3	126	140	20	8,5	77	4,5	20	7	5,5	10	M5	DIN 912	0,03	48640
CTV, CTJ 110	T3	126	140	30	8,5	107	4,5	20	7	5,5	10	M5	DIN 912	0,045	46995
CTV, CTJ 110	T3	126	140	40	11	142	3,4	20	7	6,6	10	M6	DIN 912	0,056	55260
CTV, CTJ 145	T1	161	175	/	12,5	25	3,4	20	7	6,6	10	M6	DIN 912	0,01	48642
CTV, CTJ 145	T2	161	175	40	11	62	3,4	20	7	6,6	10	M6	DIN 912	0,03	48643
CTV, CTJ 145	T3	161	175	20	8,5	77	4,5	20	7	5,5	10	M5	DIN 912	0,03	48640
CTV, CTJ 145	T3	161	175	30	8,5	107	4,5	20	7	5,5	10	M5	DIN 912	0,045	46995
CTV, CTJ 145	T3	161	140	40	11	142	3,4	20	7	6,6	10	M6	DIN 912	0,056	55260
CTV, CTJ 200	T2	222	240	40	19	78	14,8	29	9	8,5	27,5	M8	DIN 912	0,110	53049
CTV, CTJ 200	T2	222	240	50	19	88	14,8	29	9	8,5	27,5	M8	DIN 912	0,120	53050
CTV, CTJ 200	T2	222	240	70	19	108	16,3	29	9	8,5	27,5	M8	DIN 912	0,160	53051

Recommended number of clamping fixtures: For T1 is recommended 6 pcs. per meter on each side, for T2 is recommended 3 pcs. per meter on each side and for T3 is recommended 3 pcs. per meter on each side.

# Centering Rings



Type	Compatible with	Code
CR 7	MTJ / MRJ / MTJZ / MTV: 40, 65	23332
CR 9	MTJ / MRJ / MTV / MTJZ: 80, 110 CTV / CTJ: 90, 110	23331
CR 7 / 9	MTJ / MRJ / MTV / MTJZ, CTV / CTJ: 90, 110	75114
CR 9 / 12	MTJ / MRJ / MTV / MTJZ: 80, 110 CTV / CTJ: 90, 110, 145	48885
CR 12	CTV / CTJ: 145	49049
CR 16	CTV / CTJ: 200	53023

# Slot Nuts



DIN562



DIN557



Slot Nut

## Linear units - Profile

Code	Nut type	MTJ / MRJ 40	MTJ / MRJ / MTV / MTJZ 65	MTJ / MRJ / MTV / MTJZ 80	MTJ / MRJ / MTV / MTJZ 110	MTJ ECO 40	CTV / CTJ 90	CTV / CTJ 110	CTV / CTJ 145	CTV / CTJ 200
41609	DIN562 - M2,5						X	X	X	
40682	DIN562 - M4	X - *57017	X	X			X			X
40768	DIN562 - M5							X	X	
40769	DIN557 - M5		X	X						
44451	DIN557 - M8				X					X
5746	Slot Nut M6					X				
5551	Slot Nut T-10 - M8									X
5552	Slot Nut T-10 - M6									X
5553	Slot Nut T-10 - M5									X
5570	Slot N. T-10 - MB L=90									X

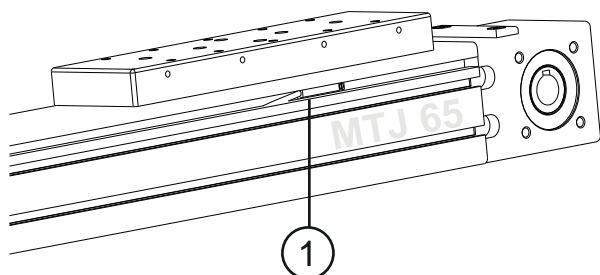
## Linear units - Connection Plates

Code	Nut type	CTV / CTJ 90	CTV / CTJ 110	CTV / CTJ 145	CTV / CTJ 200
48887	Slot Nut 6LM4	X	X		
48888	Slot Nut 6LM5	X	X		
5704	Slot Nut 8LM4			X	
5703	Slot Nut 8LM5			X	
5702	Slot Nut 8LM6			X	
5701	Slot Nut 8LM8			X	
5551	Slot Nut T-10 - M8				X
5552	Slot Nut T-10 - M6				X
5553	Slot Nut T-10 - M5				X
5570	Slot Nut T-10 - M8 L =90				X

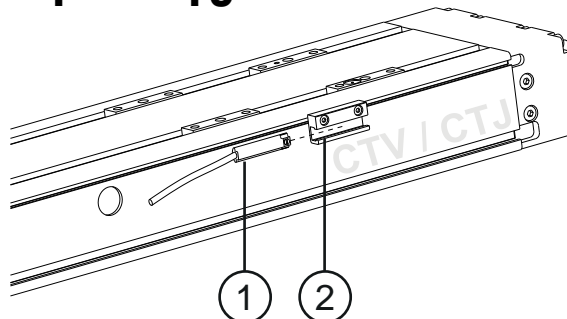


# Magnetic Field Sensors

## MTJ MRJ MT



## T TJ



1. Magnetic field sensor
2. Sensor holder

Mounting of magnetic field sensor on CTV and CTJ series requires a HOM sensor holder. For CTV/CTJ 200 a HOM sensor holder is not needed.

SMT-65TP-K NO / NC	Code	Type	Compatibility	
	43851	HOM Sensor holder	CTV 90, 110, 145 CTJ: 90, 110, 145	
	74073	SMT-65TP-K NC	MTJ / MRJ / MTV / MTJZ: 40, 65, 80, 110 CTV / CTJ: 200	
	77075	SMT-65TP-K NC +HOM	CTV 90, 110, 145 CTJ: 90, 110, 145	
	74074	SMT-65TP-K NO	MTJ / MRJ / MTV / MTJZ: 40, 65, 80, 110 CTV / CTJ: 200	
	77076	SMT-65TP-K NO +HOM	CTV 90, 110, 145 CTJ: 90, 110, 145	
	8146	Extension Cable length 2m - Straight connector		
	8147	Extension Cable length 5m - Straight connector		
	9017	Extension Cable length 2m - Angeled connector		
	9019	Extension Cable length 5m - Angeled connector		

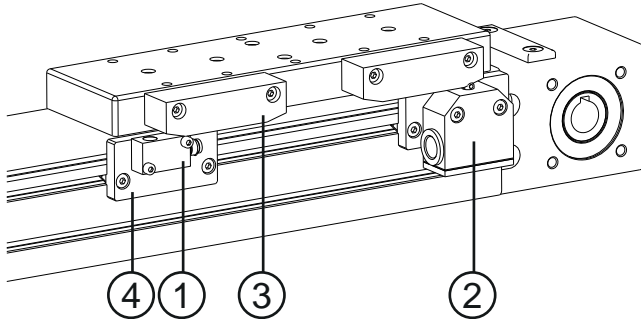
  

**Extension cable with connector**

Technical data	SMT-65TP-K NC	SMT-65TP-K NO
Sensor type	GMR sensor	GMR sensor
Switching function	NC	NO
Output	PNP	PNP
Operating voltage	10 ~ 28 V DC	10 ~ 28 V DC
Switching current	200 mA max.	200 mA max.
Power rating	5,5 W max.	5,5 W max.
Voltage drop	1,5 V / 200 mA max.	1,5 V / 200 mA max.
Current consumption	10 mA / 24 V max.	10 mA / 24 V max.
Switching frequency	1000 Hz	1000 Hz
Ambient temperature	-10 ~ +70°C	-10 ~ +70°C
Shock/vibration	50 G / 9 G	50 G / 9 G
Protection class	IP67	IP67
LED indicator	Yellow	Yellow
Electrical connection	M8, 3-pin	M8, 3-pin
Cable material length	PU - 0,3 m	PU - 0,3 m
Extension cable	Energy chain compliant	Energy chain compliant

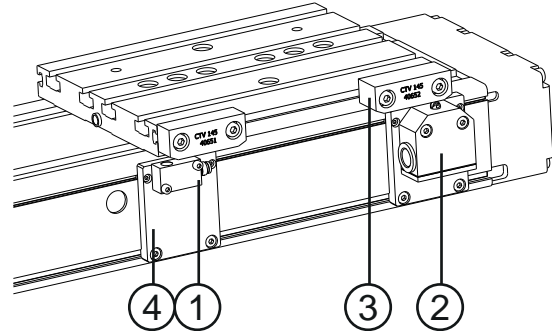
# MS - Mechanical Switch

MTJ MRJ MT



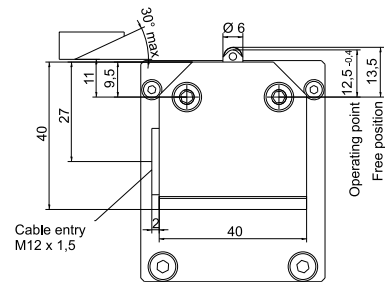
1. Induction switch
2. Mechanical switch
3. Activation block
4. Switch holder

T TJ



Mounting and using the induction and mechanical switch, can be done only if the CTV and CTJ series linear units are delivered with connection plates.

Protection class IEC 60529	IP67
Ambient temperature	-5°C ... +80°C
Operating point accuracy	± 0.05 mm
Approach speed max.	45 m/min
Approach speed min.	0,01 m/min
Switching contact	1 changeover
Switching principle	Snap-action
Rated voltage	250 V AC
Switching current, min. at	10 mA
Switching voltage	24 V DC
Cable entry	M12 x 1,5

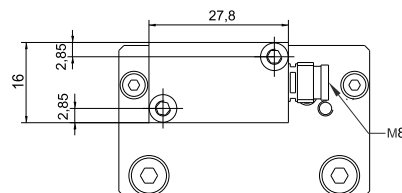


## Ordering codes

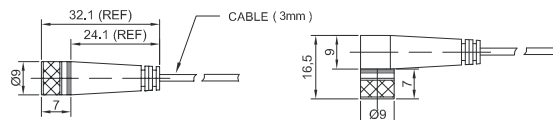
	MTJ/MRJ 40	MTJZ 40	MTJ/MRJ/MTV 65 MTJZ 65/80	MTJ/MRJ/MTV 80	MTJ/MRJ/MTV 110	MTJZ 110	MTJ ECO 40	CTV/CTJ 90	CTV/CTJ 110	CTV/CTJ 145	CTV/CTJ 200
+ 2x	43243	52022	43247	43256	47827	63702	49030	49032	49031	40652	40652
					47921						
2x  +  + 2x  +	40683		40687	40689	47826	63703	49035	49034	49033	47939	53055

# IS - Inductive Switch

Sensor type	PNP
Switching function	NC/NO
Rated voltage	10 - 30V DC
Switching current	150 mA max.
Ambient temperature	-25°C ... + 70°C
Switching frequency	800 Hz max.
Voltage drop	3,5V
Protection class	IP67
Electrical connection	M8, 3-pin
Extension cable	Energy chain compliant - bending radius 75 mm
Cable material-length	PU
Cable length	2m / 5m
Cable entry	M8, 3-pin straight or angeled connector



Extension cable with connector



## Ordering codes

	MTJ/MRJ 40	MTJZ 40	MTJ/MRJ/ MTV 65 MTJZ 65/80	MTJ/ MRJ/MTV 80	MTJ/ MRJ/MTV 110	MTJZ 110	MTJ ECO 40	CTV/CTJ 90	CTV/CTJ 110	CTV/CTJ 145	CTV/CTJ 200
+ 2x	43243	52022	43247	43256	47827	63702	49030	49032	49031	40652	40652
<b>PNP NO</b> Inductive switch only							40671				
2x  +  + 2x	40680		48026	43233	48047	63705	45105	49039	49038	48058	53054
<b>PNP NC</b> Inductive switch only							43570				
2x  +  + 2x	48851		40685	47848	47989	63704	45103	49037	49036	47850	53052
						8146					
						8147					
						9017					
						9019					

## Motor Adapter with Coupling



- 1. Motor
- 2. Motor adapter
- 3. Coupling
- 4. Linear Unit

### Order code

**VK - CTV 110 - SMB60 - GESM14**

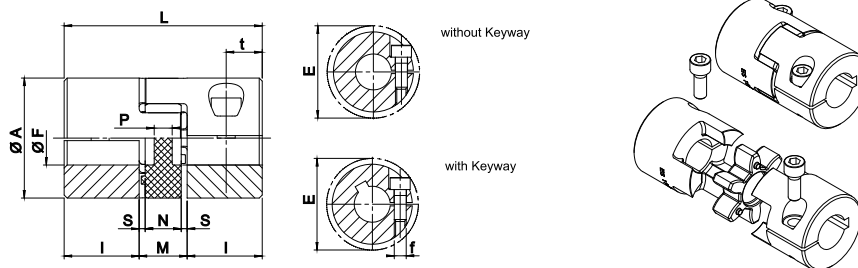
**Motor adapter**

**Linear unit series**

**Motor type**

**Coupling type**

# Couplings



The maximum transmittable torque of the clamping hub depends on the bore diameter.

Size	TKN* Nominal (Nm)	TKmax* (Nm)	Ms (Nm)	Hub		nmax (min <sup>-1</sup> )	A	F (min)	F (max)	f	L	I	M	N	S	P	t	E
				W (kg)	J (Kgm <sup>2</sup> )													
7	2	4	0,35	0,003	0,085 x 10 <sup>-6</sup>	40.000	14	3	7	M2	22	7	8	6	1,0	6	4	15,0
9	5	10	0,75	0,007	0,42 x 10 <sup>-6</sup>	28.000	20	4	10	M2,5	30	10	10	8	1,0	2	5	23,4
14	12,5	25	1,4	0,018	2,6 x 10 <sup>-6</sup>	19.000	30	6	16	M3	35	11	13	10	1,5	2	5,5	32,2
19/24	17	34	11	0,071	18,1 x 10 <sup>-6</sup>	14.000	40	10	20	M6	66	25	16	12	2,0	3,5	12	45,7
24/28	60	120	11	0,156	74,9 x 10 <sup>-6</sup>	10.600	55	10	32	M6	78	30	18	14	2,0	4	12	56,4
28/38	160	320	25	0,240	163,9 x 10 <sup>-6</sup>	8.500	65	14	35	M8	90	35	20	15	2,5	5,2	13,5	72,6
38/45	325	650	25	0,440	465,5 x 10 <sup>-6</sup>	7.100	80	19	45	M8	114	45	24	18	3,0	5,6	16	83,3

\* The values of nominal TKN and max. TKmax transmissible torque in the upper table are valid for coupling with keyway.

Size	Recommended coupling bore diam. and transmissible torque (Nm) - valid for shaft tolerances k6 without keyway																									
	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	
7	0,7	0,8	1	1,1																						
9	1,1	1,4	1,7	1,9	2,2	2,5	2,8																			
14			2,5	2,9	3,3	3,7	4,1	4,6	5	5,8	6,2	6,6														
19/24										23	25	27	32	34	36	43	45									
24/28										23	25	27	32	34	36	43	45	50	54	57	63					
28/38													58	62	66	79	83	91	100	104	116	124	133	145		
38/45														79	83	91	100	104	116	124	133	145	158	166	174	187

- Ms Screw tightening torque Nm
- W Weight Kg
- J Coupling moment of inertia kgm<sup>2</sup>
- nmax Maximum rpm min<sup>-1</sup>
- TKN Coupling nominal torque Nm
- Tkmax Coupling maximum torque Nm

The operating temperature range for the coupling is between -30 and +90°C

## Order code

**COUPLING - GESM14 - F8C - F14C**

### Coupling

### Coupling type/size

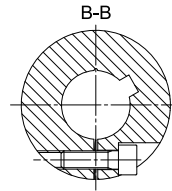
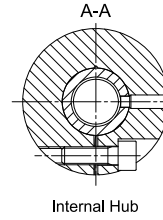
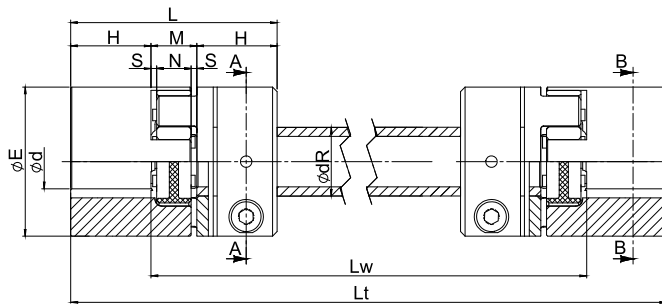
7, 9, 14, 19/24, 24/28, 28/38, 38/45

### Hole diameter

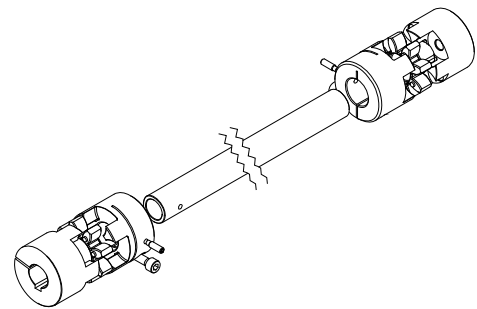
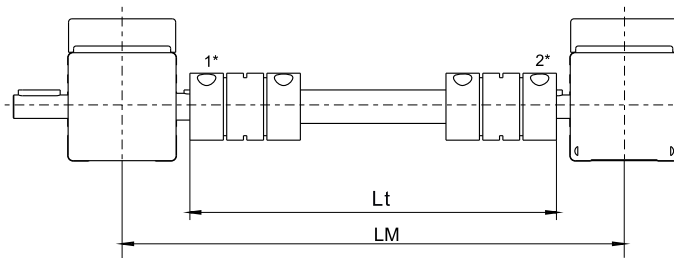
### Option

C: with keyway  
Leave blank without keyway

# Synchronisation Shaft OSL



The maximum transmittable torque of the clamping hub depends on the bore diameter.



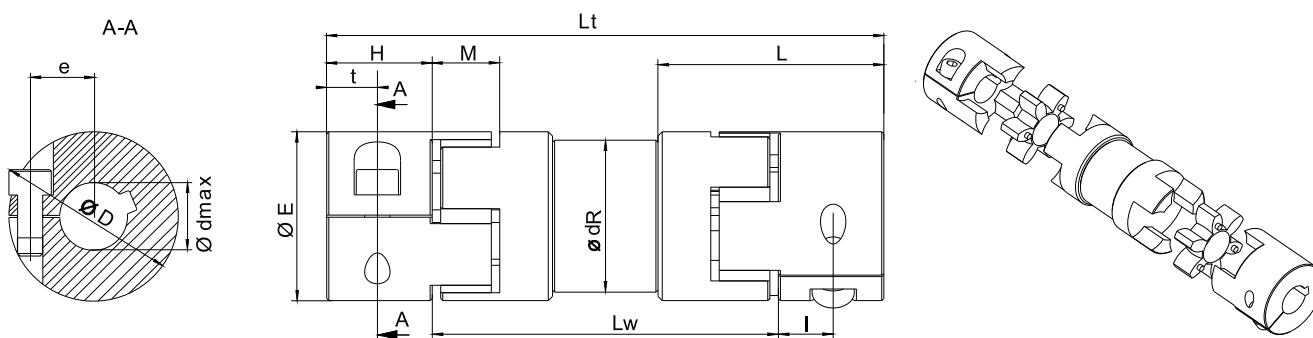
Size	Internal hub		$C_T$ (Nm/rad)	E	H	$\phi d$ min.	$\phi d$ max.	M	N	S	L	Lw min.	L <sub>t</sub>	dR x thickness	Weight (kg)	Moment of inertia (10 <sup>-6</sup> kg * m <sup>2</sup> )
	Ms (Nm)	Mr (Nm)														
14	1,34	6	59	30	11	4	16	13	10	1,5	35	48		14 x 2,0	0,072 + 0,00021 * Lw	10,4 + 0,0076 * Lw
19/24	10	34	314	40	25	6	24	16	12	2	66	82		20 x 3,0	0,284 + 0,00044 * Lw	72,4 + 0,0324 * Lw
24/28	10	45	596	55	30	8	28	18	14	2	78	96		25 x 2,5	0,624 + 0,00048 * Lw	300 + 0,0614 * Lw
28/38	25	105	2868	65	35	10	38	20	15	2,5	90	110		35 x 5,0	0,960 + 0,00128 * Lw	656 + 0,2954 * Lw
38/45	25	123	4521	80	45	12	45	24	18	3	114	138		40 x 5,0	1,760 + 0,00149 * Lw	1862 + 0,4656 * Lw

On request

For longer distances bearing supports are needed, please contact Rollo.

Ms Screw tightening torque Nm  
 Mr Maximum transmissible torque Nm  
 C<sub>T</sub> Torsional rigidity per meter Nm/rad

# Synchronisation Shaft OSR



The maximum transmittable torque of the clamping hub depends on the bore diameter.

Size	d min. (mm)	d max. (mm)	Ms (Nm)	Mr (Nm)	C <sub>T</sub> (Nm/rad)	E	H	I	L	M	Lw min. (mm)	Lt	D	t	e	dR	Weight (kg)	Moment of inertia (10 <sup>-5</sup> kg * m <sup>2</sup> )
19	10	20	10	39	1630	40	25	13	53,5	16	82	On request	47	12	15	36	0,30 + 0,00058 * Lw	66,0 + 0,1679 * Lw
24	10	28	10	53	3980	55	30	16	63	18	96		57	14	20,8	45	0,62 + 0,00091 * Lw	242 + 0,4099 * Lw
28	14	35	25	137	7494	65	35	20	67	20	110		73	15	25	55	0,98 + 0,00112 * Lw	572 + 0,7717 * Lw
38	15	45	25	180	14540	80	45	25	83,5	24	138		84	20	30	68	1,75 + 0,00140 * Lw	1522 + 1,4975 * Lw

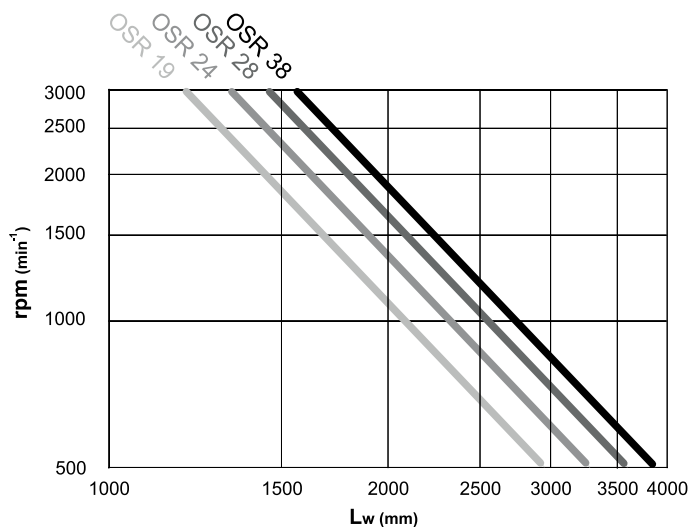
For longer distances bearing supports needed, please contact Rollco.

- Ms Screw tightening torque Nm
- Mr Maximum transmissible torque Nm
- C<sub>T</sub> Torsional rigidity per meter Nm/rad

## Selection Diagram

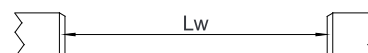
Ideal execution for long distance shaft connections. Torque transmission is zero backlash. Designed for lengths up to 4m without bearing support (depending on rotation speed).

Standard lengths available up to 3m. For longer lengths, please contact us.



## Installation

The overall length Lt is best determined as the distance between shaft ends - length Lw plus 2x dimension H.



**Order code**

**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)

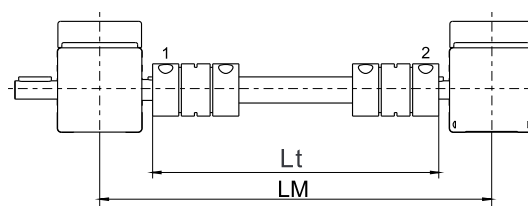
**Length (mm)**

**Hole diameter**

One side end hub<sup>1</sup>  
One side end hub<sup>2</sup>

**Option**

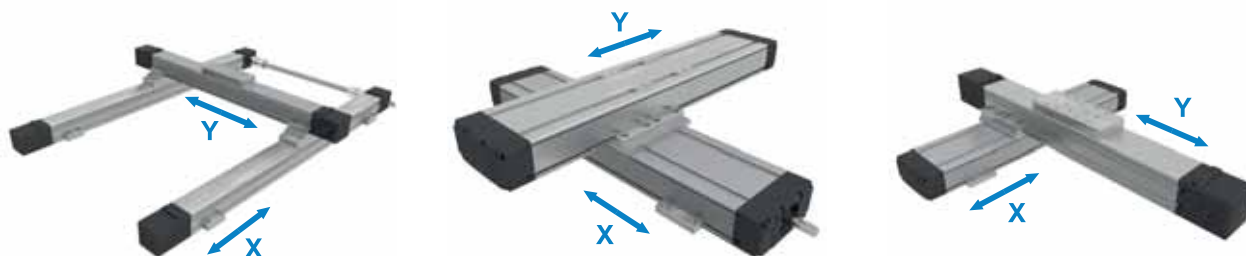
C: with keyway  
Leave blank without keyway





## X-Y Connection Elements, X-Axis = 0° Y Axis = 0°

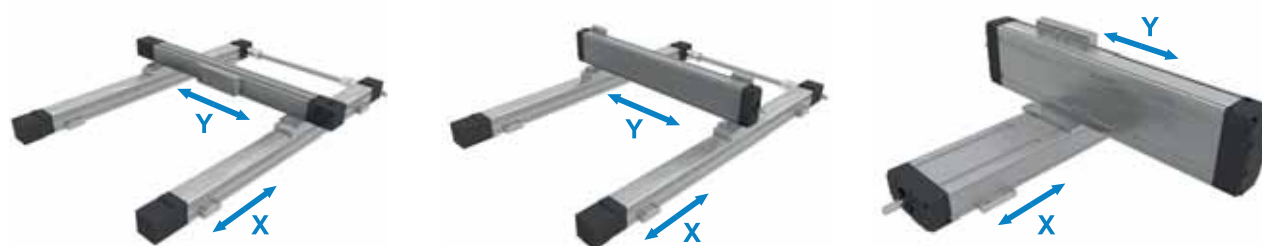
X-Axis MTJ, MRJ, MTV, MTJ ECO, CTV = 0° → Y-Axis = 0°



X-Axis	MTJ/MRJ 40	MTJ/MRJ/MTV 65	MTJ/MRJ/MTV 80	MTJ/MRJ/MTV 110	X-Axis MTJ 40 ECO	CTV/CTJ 90	CTV/CTJ 110	CTV/CTJ 145	CTV/CTJ 200
MTJ/MRJ 40	CP M40 0 M40 0	CP M40 0 M65 0			CP M40 0 E40 0	CP M40 0 C90 0			
MTJ/MRJ/MTV 65	CP M65 0 M40 0	CP M65 0 M65 0	CP M65 0 M80 0		CP M65 0 E40 0	CP M65 0 C90 0	CP M65 0 C110 0		
MTJ/MRJ/MTV 80		CP M80 0 M65 0	CP M80 0 M80 0	CP M80 0 M110 0		CP M80 0 C90 0	CP M80 0 C110 0	CP M80 0 C145 0	
MTJ/MRJ 110		CP M110 0 M65 0	CP M110 0 M80 0	CP M110 0 M110 0			CP M110 0 C110 0	CP M110 0 C145 0	CP M110 0 C200 0
MTJ 40 ECO	CP E40 0 M40 0	CP E40 0 M65 0	CP E40 0 M80 0		CP E40 0 E40 0	CP E40 0 C90 0	CP E40 0 C110 0		
CTV/CTJ 90	CP C90 0 M40 0	CP C90 0 M65 0				CP C90 0 C90 0	CP C90 0 C110 0		
CTV/CTJ 110	CP C110 0 M40 0	CP C110 0 M65 0	CP C110 0 M80 0			CP C110 0 C90 0	CP C110 0 C110 0	CP C110 0 C145 0	
CTV/CTJ 145		CP C145 0 M65 0	CP C145 0 M80 0	CP C145 0 M110 0		CP C145 0 C90 0	CP C145 0 C110 0	CP C145 0 C145 0	
CTV/CTJ 200			CP C200 0 M80 0	CP C200 0 M110 0			CP C200 0 C110 0	CP C200 0 C145 0	CP C200 0 C200 0

## X-Y Connection Elements, X-Axis = 0° Y Axis = 90°

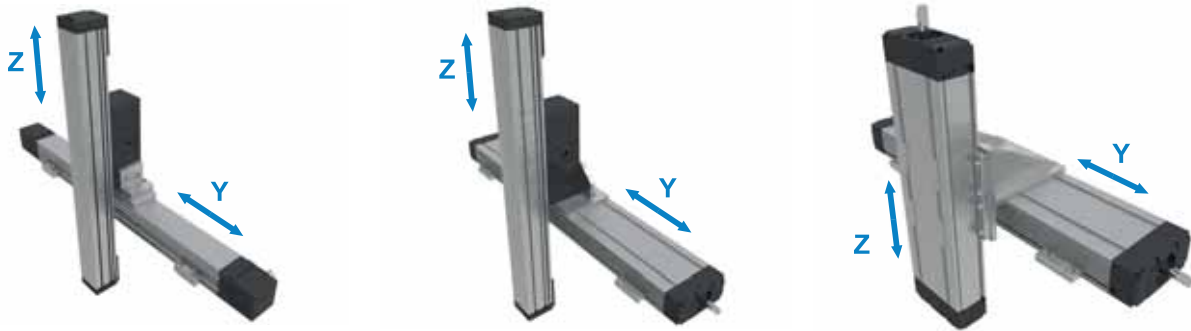
X-Axis MTJ, MRJ, MTV, MTJ ECO, CTV = 0° → Y-Axis = 90°



X-Axis	MTJ/MRJ 40	MTJ/MRJ/MTV 65	MTJ/MRJ/MTV 80	MTJ/MRJ/MTV 110	X-Axis MTJ 40 ECO	CTV/CTJ 90	CTV/CTJ 110	CTV/CTJ 145	CTV/CTJ 200
MTJ/MRJ 40	CP M40 0 M40 90	CP M40 0 M65 90			CP M40 0 E40 90	CP M40 0 C90 90			
MTJ/MRJ/MTV 65	CP M65 0 M40 90	CP M65 0 M65 90	CP M65 0 M80 90			CP M65 0 C90 90	CP M65 0 C110 90		
MTJ/MRJ/MTV 80		CP M80 0 M65 90	CP M80 0 M80 90	CP M80 0 M110 90		CP M80 0 C90 90	CP M80 0 C110 90	CP M80 0 C145 90	
MTJ/MRJ 110		CP M110 0 M65 90	CP M110 0 M80 90	CP M110 0 M110 90			CP M110 0 C110 90	CP M110 0 C145 90	CP M110 0 C200 90
MTJ 40 ECO	CP E40 0 M40 90	CP E40 0 M65 90	CP E40 0 M80 90		CP E40 0 E40 90	CP E40 0 C90 90	CP E40 0 C110 90		
CTV/CTJ 90	CP C90 0 M40 90	CP C90 0 M65 90				CP C90 0 C90 90			
CTV/CTJ 110	CP C110 0 M40 90	CP C110 0 M65 90	CP C110 0 M80 90			CP C110 0 C90 90	CP C110 0 C110 90		
CTV/CTJ 145		CP C145 0 M65 90	CP C145 0 M80 90	CP C145 0 M110 90		CP C145 0 C90 90	CP C145 0 C110 90	CP C145 0 C145 90	
CTV/CTJ 200			CP C200 0 M80 90	CP C200 0 M110 90			CP C200 0 C110 90	CP C200 0 C145 90	CP C200 0 C200 90

# Y-Z Connection Elements, Y-Axis = 0° Z Axis = 90°

Y-Axis MTJ, MRJ, MTV, MTJ ECO, CTV, CTJ = 0° → Z-Axis = 90°



Y-Axis	Z-Axis									
	MTJZ 40	MTJZ 65	MTJZ 80	MTJZ 110	MTV 65	MTV 80	MTV 110	CTV 90	CTV 110	CTV 145
MTJ/MRJ 40	CP M40 0 Z40									
MTJ/MRJ/ MTV 65	CP M65 0 Z40	CP M65 0 Z65			CP M65 0 ZM65					
MTJ/MRJ/ MTV 80	CP M80 0 Z40	CP M80 0 Z65	CP M80 0 Z80		CP M80 0 ZM65	CP M80 0 ZM80				
MTJ/MRJ 110		CP M110 0 Z65	CP M110 0 Z80	CP M110 0 Z110	CP M110 0 ZM65	CP M110 0 ZM80	CP M110 0 ZM110			
MTJ 40 ECO	CP E40 0 Z40									
CTV/CTJ 90	CP C90 0 Z40	CP C90 0 Z65						CP C90 0 ZC90		
CTV/CTJ 110	CP C110 0 Z40	CP C110 0 Z65	CP C110 0 Z80		CP C110 0 ZM65	CP C110 0 ZM80		CP C110 0 ZC90	CP C110 0 ZC110	
CTV/CTJ 145	CP C145 0 Z40	CP C145 0 Z65	CP C145 0 Z80	CP C145 0 Z110	CP C145 0 ZM65	CP C145 0 ZM80	CP C145 0 ZM110	CP C145 0 ZC90	CP C145 0 ZC110	CP C145 0 ZC145
CTV/CTJ 200			CP C200 0 Z80	CP C200 0 Z110		CP C200 0 ZM80	CP C200 0 ZM110		CP C200 0 ZC110	CP C200 0 ZC145

## 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



2



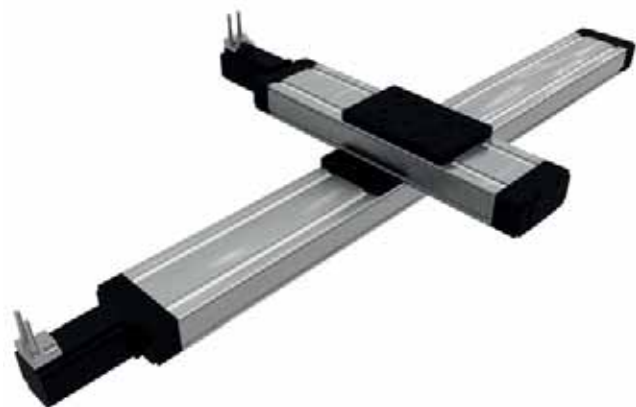
3



4



5



6



## ACCESSORIES

7



8



9

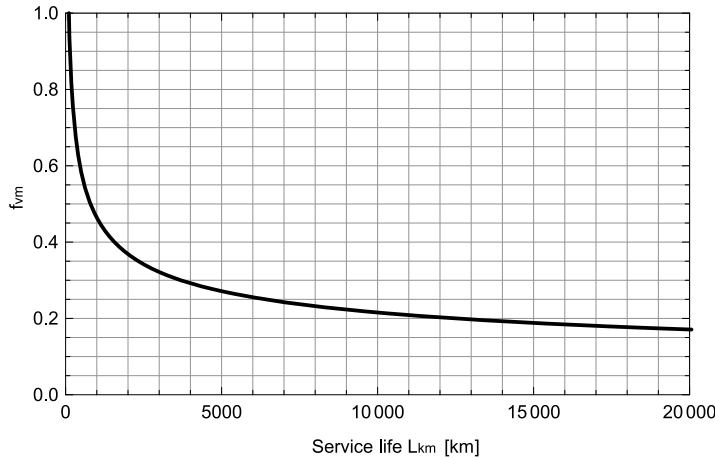


10



# Service Life - Linear Guiding

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

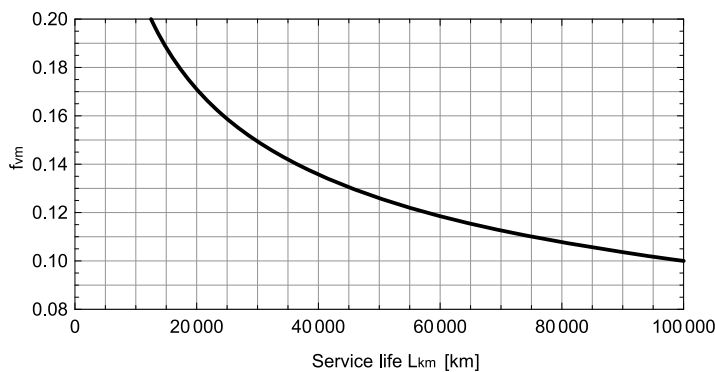


Diagrams and equations are valid for:

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

Presented diagrams are showing theoretically 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

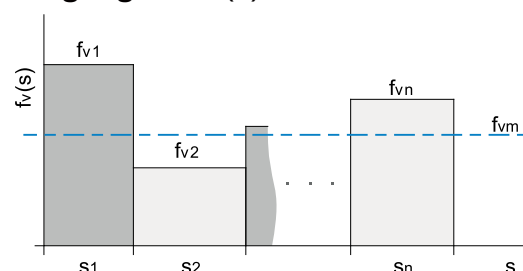
The safety factor depends on the application and its requested safety. We recommend a minimum safety factor  $f_s = 5.0$ .

### 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
$f_{v\ i}$	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 $f_v(s)$



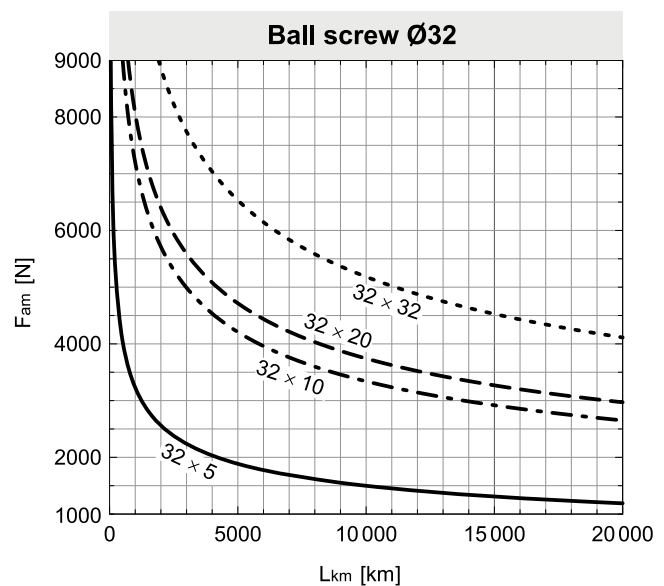
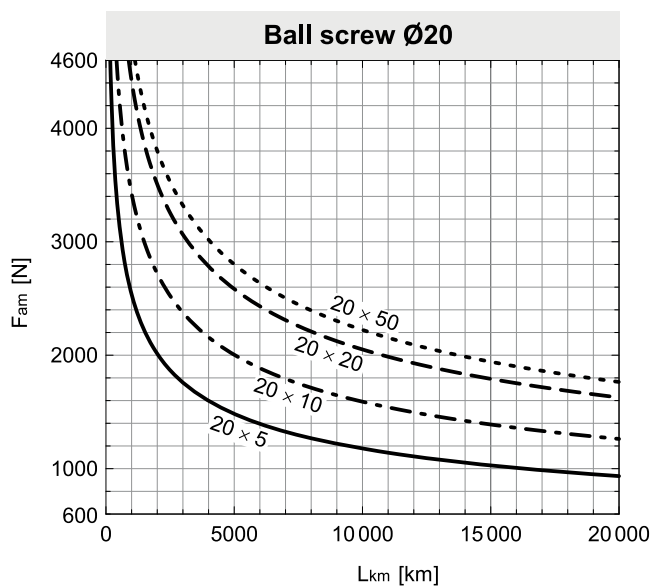
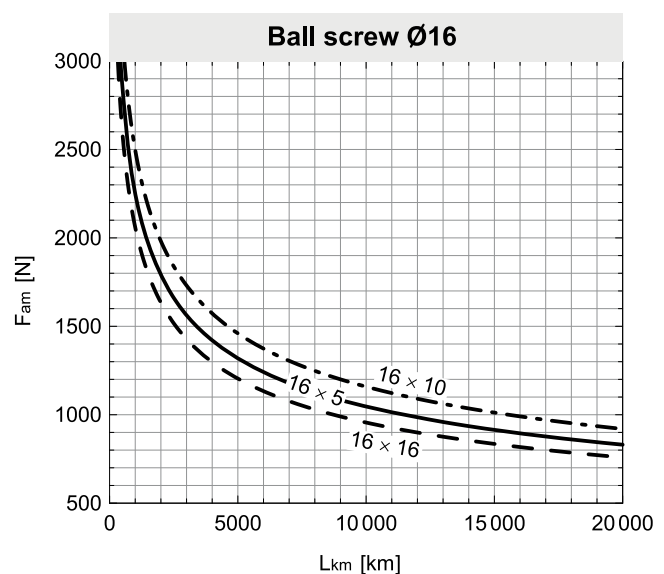
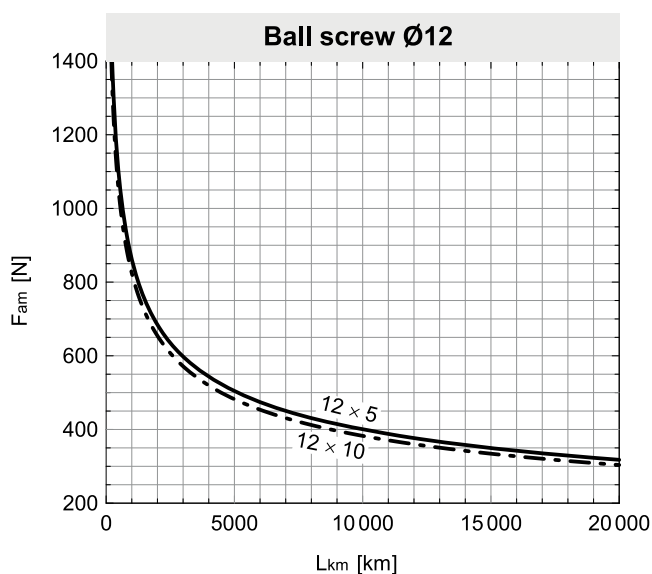
## Permissible Load Factor $f_p$ - Linear Guiding

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

$f_p$	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 $F_{am}$ calculation

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

$F_{am}$  Mean axial force

$F_{ai}$  i-th axial force of a given loading regime  $F_a(s)$ ,  $i \in \{1, 2, \dots, n\}$

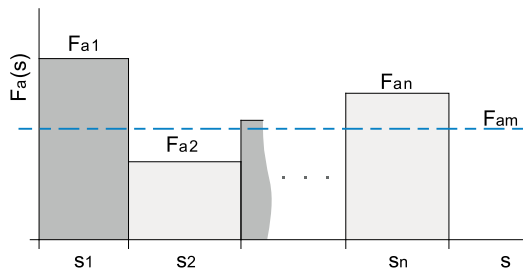
$s_i$  i-th travel path of a given loading regime  $F_a(s)$ ,  $i \in \{1, 2, \dots, n\}$

Diagrams presented above are showing teoretically determined service life of the ball screw when mean axial force  $F_{am}$  is taken into consideration.

Diagrams and equations are valid for:

- MTV series
- CTV series

### Loading regime $F_a(s)$



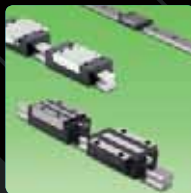
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