

CHARACTERISTICS

The **CTJ** series includes Linear Units with a toothed belt drive and two parallel, integrated, Zero-backlash rail guides. Compact dimensions allow high performance features such as, high speed 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 two parallel, integrated Zero-backlash rail guide systems, allows high load capacities and an optimal sequence for the movement of larger masses at high speed.

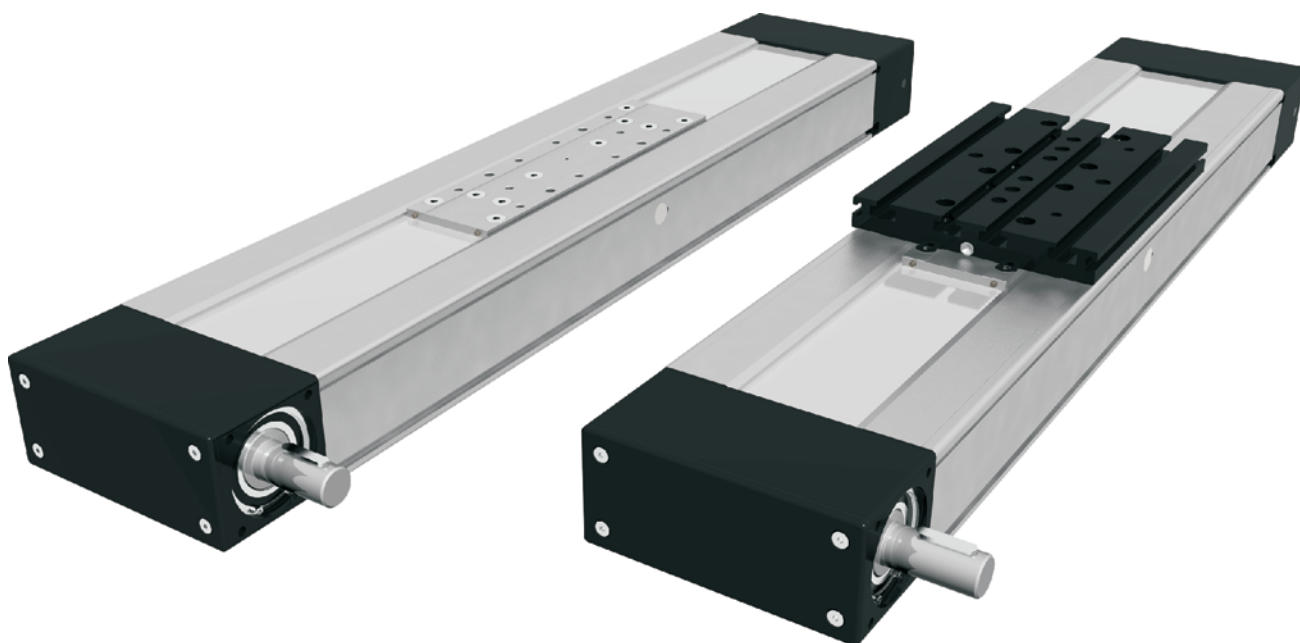
In the linear units CTJ is used a pre-tensioned steel reinforced AT polyurethane timing toothed belt. In conjunction with a Zero-backlash drive pulley high moments with alternating loads with good positioning accuracy, low wear and low noise can be realized.

The in the Profile slot driving Polyurethane timing belt, protects all the parts in the Profile from dust and other contaminations.

Different carriage lengths with lubrication port allows for easy re-lubrication of the Ball rail guide system and allows the possibility to attach additional accessories. The re-lubrication can also be done through maintenance holes on the side of the Profile.

The aluminum profile includes T-slots for fixing the Linear Unit and for attaching sensors and switches. Also, a Reed switch can be used here.

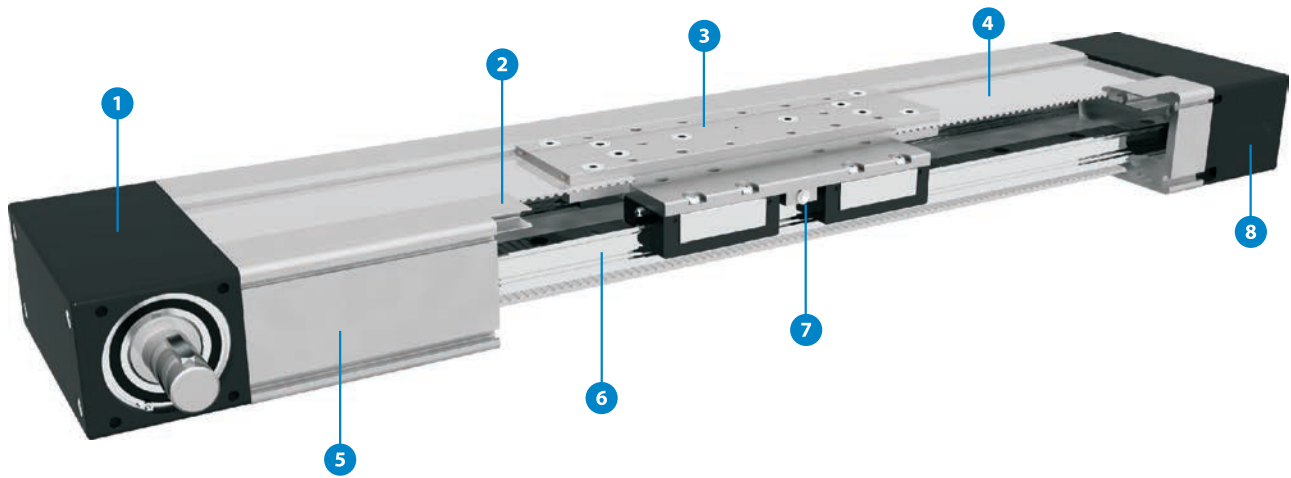
For the linear units CTJ various adaptation options, for attaching (or redirecting), for Motors or Gearboxes are available.



i 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

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

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

10 : Pulley with journal (without Keyway)

2 : Pulley with journal on both sides

20 : Pulley with journal on both sides (without Keyway)

3 : Without drive unit

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

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

TECHNICAL DATA

General technical data

Linear Unit	Carriage length Lv [mm]	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads					Moved mass [kg]	Max. Repeatability [mm]	* Max. length Lmax [mm]	* Max. stroke [mm]	** Min. stroke [mm]	
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments								
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]						
CTJ 90 S	102	4620	125	17	34	2000	4000	110	17	34	0,20	± 0,08	6000	5873	25	
CTJ 90 L	156	9240	250	290	290	3990	8270	200	290	125	0,35	± 0,08		5819	25	

* For lengths / stroke over the stated value in the table above please contact us.
 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 us.

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

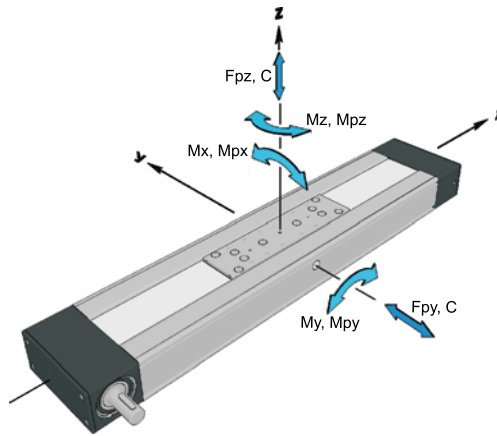
For operating temperature out of the presented range, please contact us.

Recommended values of loads

All the data of 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

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

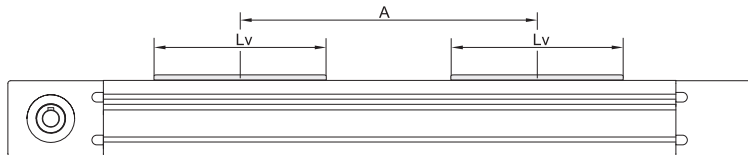


General technical data for double carriage

Linear Unit	Carriage version	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads				
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments		
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]
CTJ 90	S2	9230	250	4,6 * A [mm]	4,6 * A [mm]	4000	8000	220	4,0 * A [mm]	2,0 * A [mm]

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

Presented values are for informational purposes only. Exact values can be calculated using our sizing selection tool on Unimotion web site.
 For greater number of carriages please contact us.



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]	** Max. acceleration [m/s ²]
CTJ 90 S	5	7,5	0,40	90	28,65	AT 3	35	520	402500	70
CTJ 90 L			0,42							

* The stated values are for strokes up to 500mm. No Load Torque value increases with stroke elongation.
 ** For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

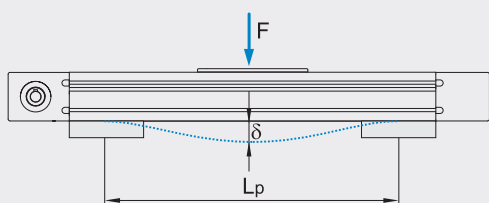
Mass and mass moment of inertia

Linear Unit	Carriage length	Mass of linear unit [kg]	Mass moment of inertia [$10^{-5} \text{ kg} \cdot \text{m}^2$]	Planar moment of inertia	
	L_v [mm]			I_y [cm^4]	I_z [cm^4]
CTJ 90 S	102	$1,7 + 0,0048 \cdot \text{Stroke [mm]}$	$7 + 0,0031 \cdot \text{Stroke [mm]}$	13,4	107,0
CTJ 90 L	156	$2,1 + 0,0048 \cdot \text{Stroke [mm]}$	$11 + 0,0031 \cdot \text{Stroke [mm]}$		

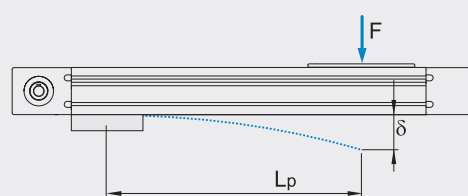
i Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



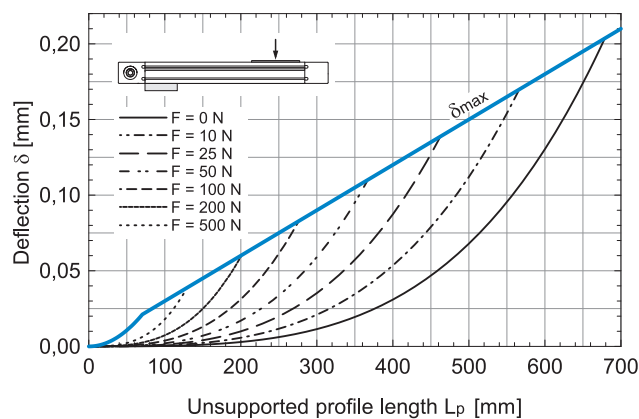
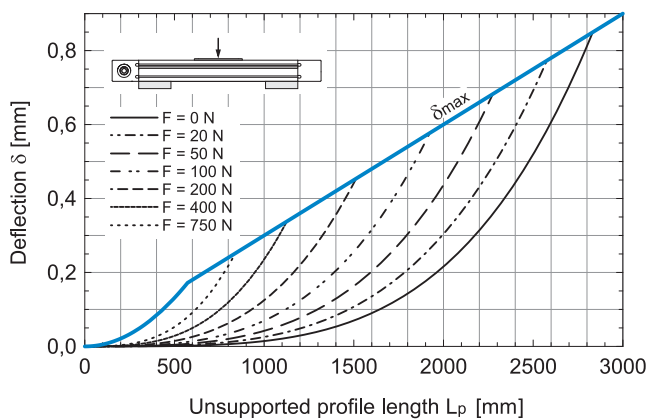
Fixed - free mounting



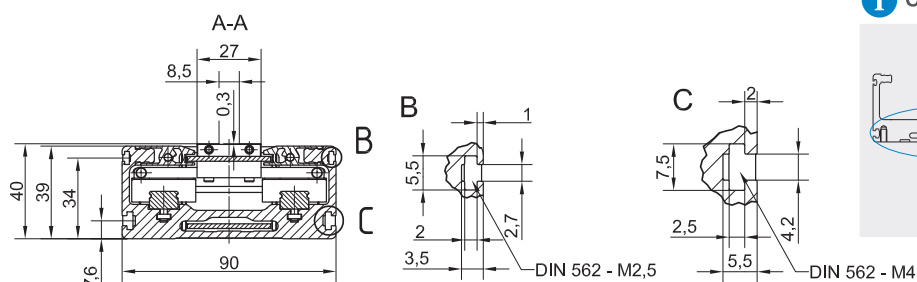
- δ Maximum deflection of the linear unit [mm]
- δ_{max} Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L_p Unsupported profile length [mm]

i The maximum permissible deflection δ_{max} must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ_{max} additional profile supports are needed.

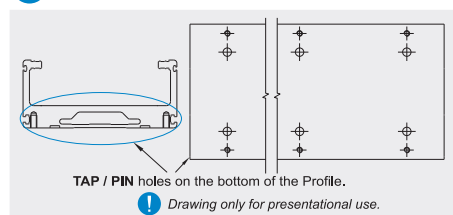
CTJ 90



DIMENSIONS



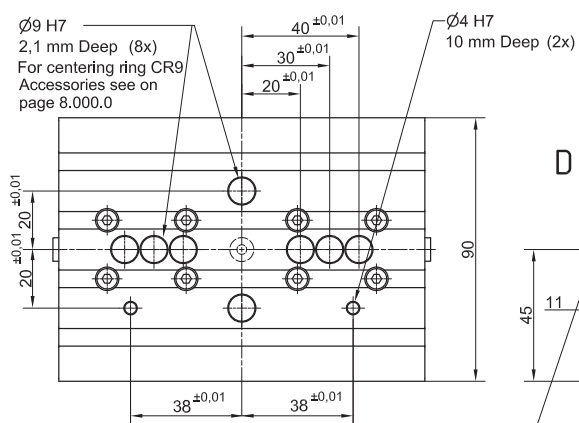
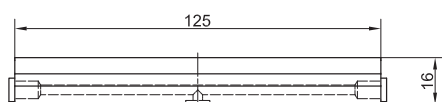
i OPTIONAL: TAP / PIN holes available on request.



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

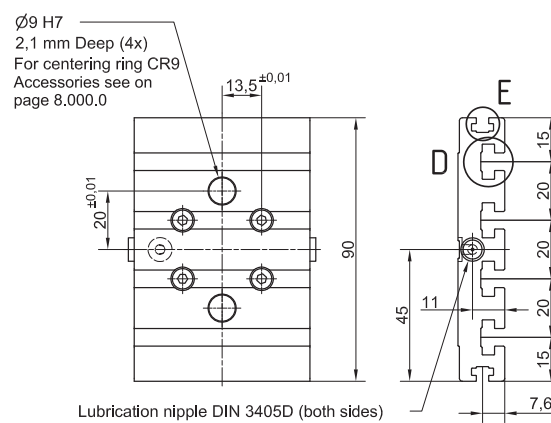
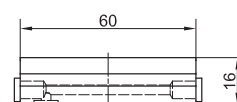
CONNECTION PLATE

CTJ 90 L



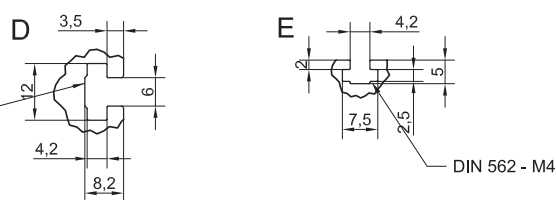
Lubrication nipple DIN 3405D (both sides)

CTJ 90 S



Lubrication nipple DIN 3405D (both sides)

Slot nut
More info at page 8.005.0



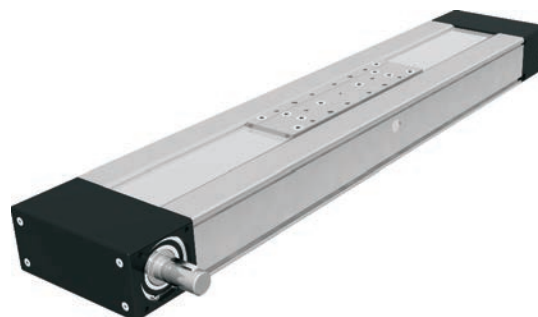
Linear Unit	Plate length [mm]	Weight [kg]	Code
CTJ 90 S	60	0,2	48853
CTJ 90 L	125	0,4	48854

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

Mounting the drive

- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

i Available on request.



TECHNICAL DATA

General technical data

Linear Unit	Carriage length Lv [mm]	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads					Moved mass [kg]	Max. Repeatability [mm]	* Max. length Lmax [mm]	* Max. stroke [mm]	** Min. stroke [mm]	
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments								
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]						
CTJ 110 S	170	19800	610	118	235	6470	8390	260	90	90	0,64	± 0,08	6000	5805	40	
CTJ 110 L	215	39600	1225	1680	1680	13080	18820	525	880	550	0,98	± 0,08		5760	40	

* For lengths / stroke over the stated value in the table above please contact us.
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 us.

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

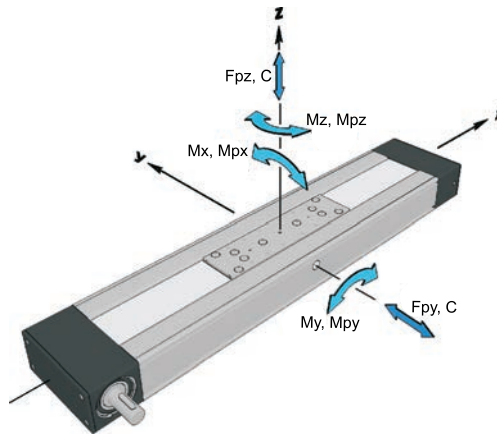
For operating temperature out of the presented range, please contact us.

Recommended values of loads

All the data of 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

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

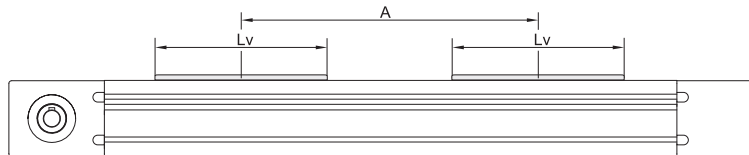


General technical data for double carriage

Linear Unit	Carriage version	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads				
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments		
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]
CTJ 110	S2	39600	1220	19,8 * A [mm]	19,8 * A [mm]	12940	16770	520	8,4 * A [mm]	6,5 * A [mm]

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

Presented values are for informational purposes only. Exact values can be calculated using our sizing selection tool on Unimotion web site.
For greater number of carriages please contact us.



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]	** Max. acceleration [m/s ²]
CTJ 110 S	6	15,7	0,98	120	38,20	AT 5	50	820	960000	70
CTJ 110 L			1,0							

* The stated values are for strokes up to 500mm. No Load Torque value increases with stroke elongation.
** For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

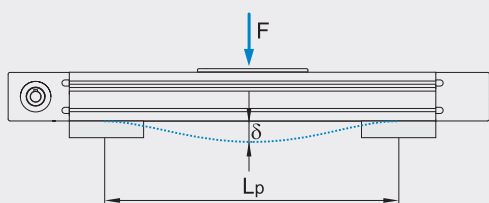
Mass and mass moment of inertia

Linear Unit	Carriage length	Mass of linear unit [kg]	Mass moment of inertia [10 ⁻⁵ kg * m ²]	Planar moment of inertia	
	Lv [mm]			Iy [cm ⁴]	Iz [cm ⁴]
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]		

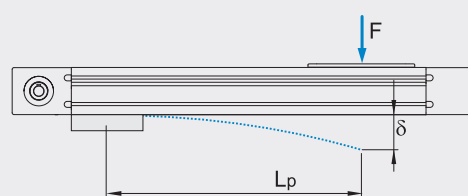
i Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



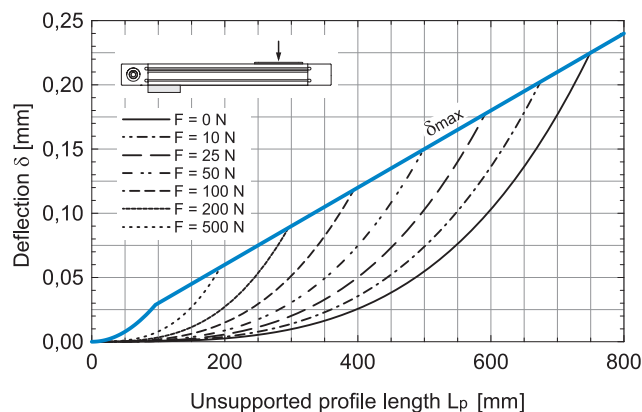
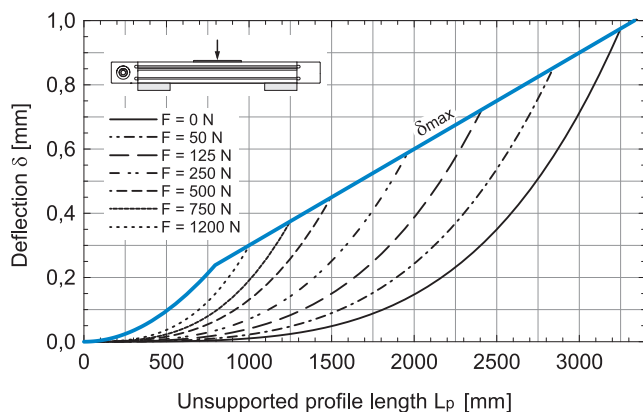
Fixed - free mounting



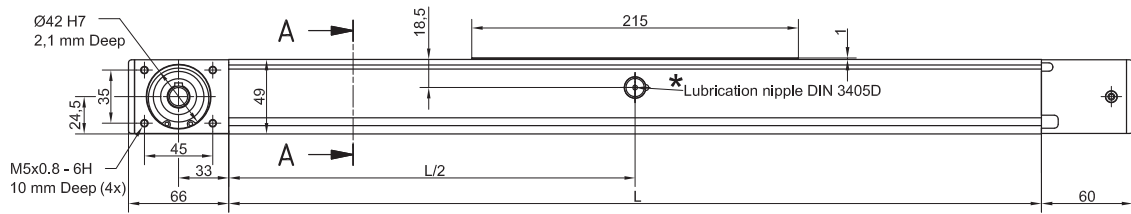
- δ Maximum deflection of the linear unit [mm]
- δ_{max} Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L_p Unsupported profile length [mm]

i The maximum permissible deflection δ_{max} must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ_{max} additional profile supports are needed.

CTJ 110



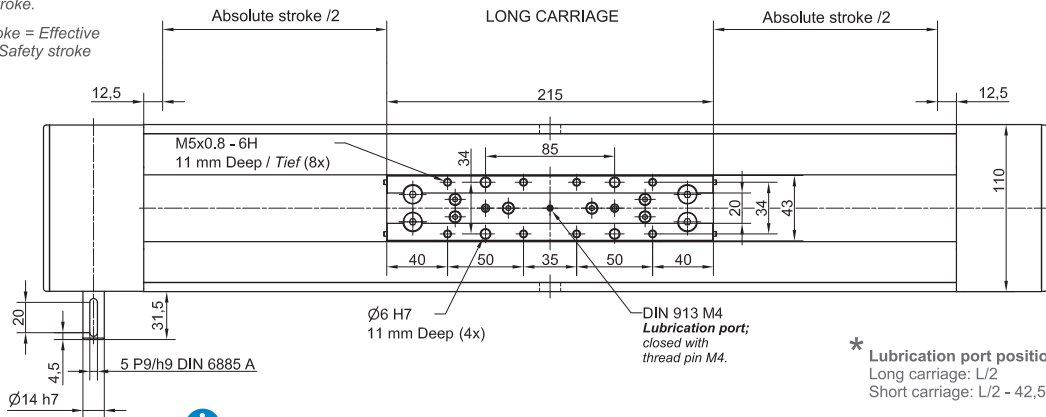
DIMENSIONS



i Linear Unit doesn't include any safety stroke.

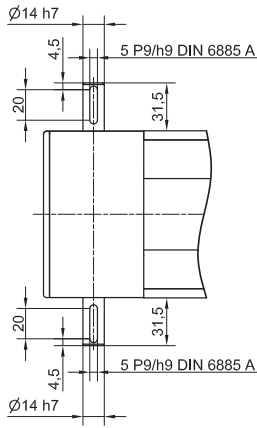
Absolute stroke = Effective stroke + 2 x Safety stroke

TYPE 1 L and 1 R

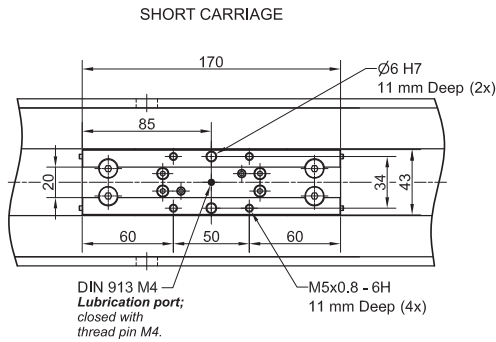


* Lubrication port position:
Long carriage: L/2
Short carriage: L/2 - 42,5 mm

i Journal with or without Keyway.



TYPE 2

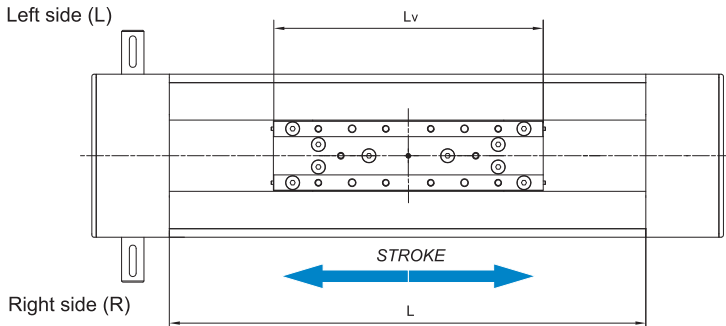


i All dimensions in mm; Drawings scales are not equal.

Defining of the linear unit length

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

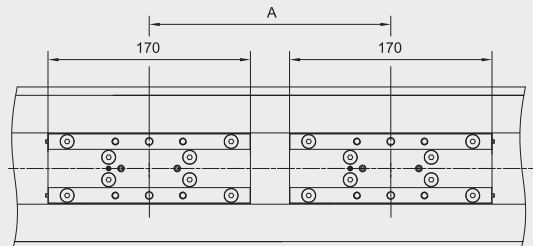
$L_{\text{total}} = L + 126 \text{ mm}$



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

Double-Carriage

i Only with *short carriage* version.



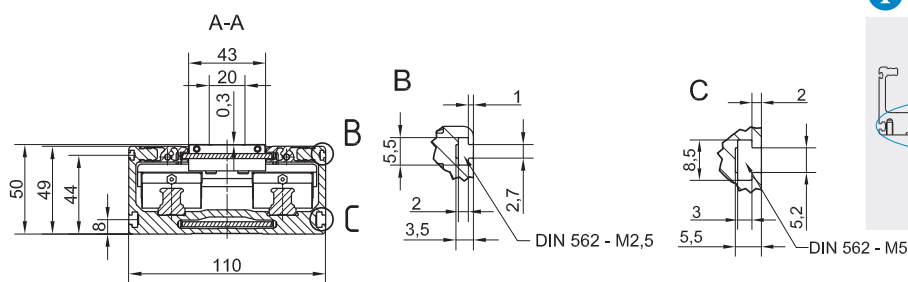
i For ordering code please contact us.

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 195 \text{ mm}$

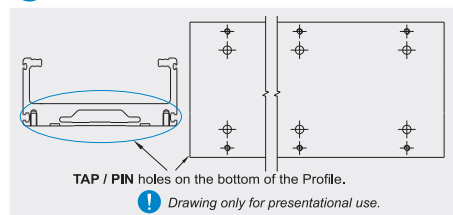
$L_{\text{total}} = L + 126 \text{ mm}$

$A \geq 170 \text{ mm}$ **!**

DIMENSIONS



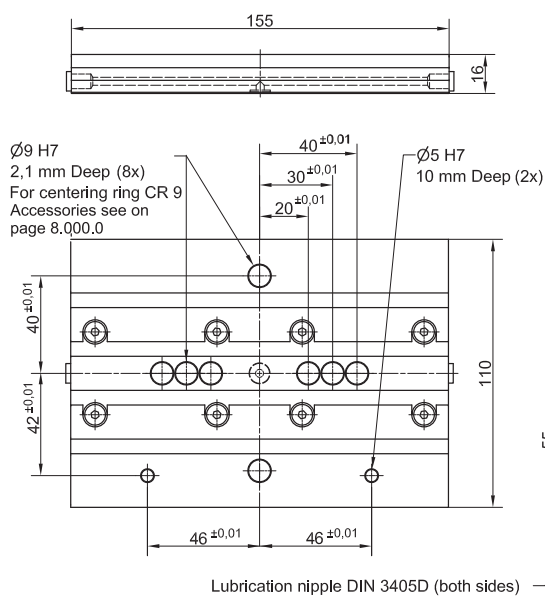
i OPTIONAL: TAP / PIN holes available on request.



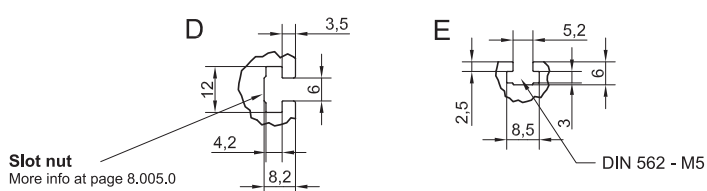
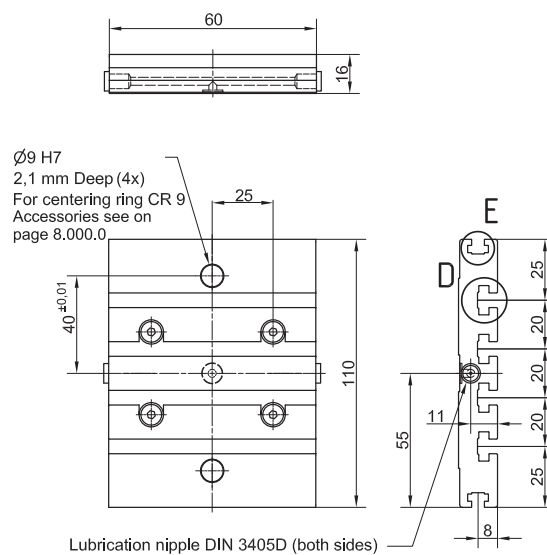
i All dimensions in mm; Drawings scales are not equal.

CONNECTION PLATE

CTJ 110 L



CTJ 110 S



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

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

Mounting the drive

- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

i Available on request.



TECHNICAL DATA

General technical data

Linear Unit	Carriage length Lv [mm]	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads					Moved mass [kg]	Max. Repeatability [mm]	* Max. length Lmax [mm]	* Max. stroke [mm]	** Min. stroke [mm]	
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments								
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]						
CTJ 145 S	180	34200	1500	260	520	8930	15320	674	260	180	1,35	± 0,08	6000	5795	55	
CTJ 145 L	240	68400	3005	3420	3420	17870	30640	1200	1700	893	2,25	± 0,08		5735	55	

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 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 us.

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

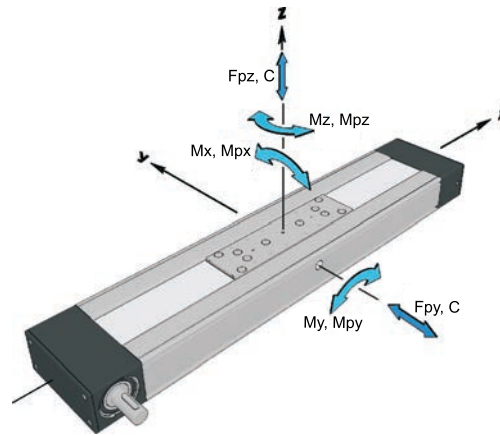
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Recommended values of loads

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Modulus of elasticity

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

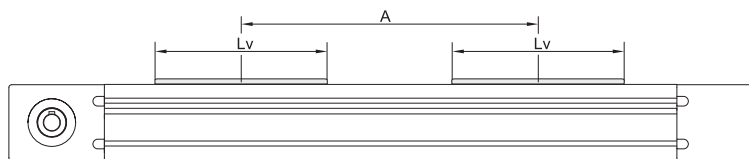


General technical data for double carriage

Linear Unit	Carriage version	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads				
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments		
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]
CTJ 145	S2	68400	3000	34,2 * A [mm]	34,2 * A [mm]	17870	30640	1350	15,3 * A [mm]	8,9 * A [mm]

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

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 For greater number of carriages please contact us.



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]	** Max. acceleration [m/s ²]
CTJ 145 S	6	33,6	1,48	165	52,52	AT 5	70	1280	1360000	70
CTJ 145 L			1,5							

* The stated values are for strokes up to 500mm. No Load Torque value increases with stroke elongation.
 ** For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

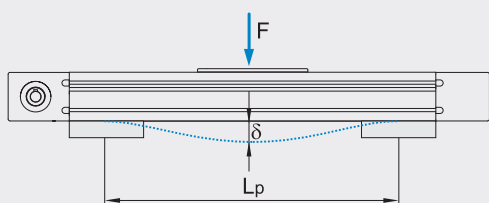
Mass and mass moment of inertia

Linear Unit	Carriage length Lv [mm]	Mass of linear unit [kg]	Mass moment of inertia [10 ⁻⁵ kg * m ²]	Planar moment of inertia	
				Iy [cm ⁴]	Iz [cm ⁴]
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]		

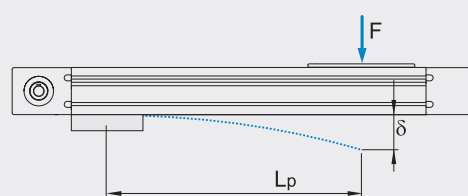
i Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



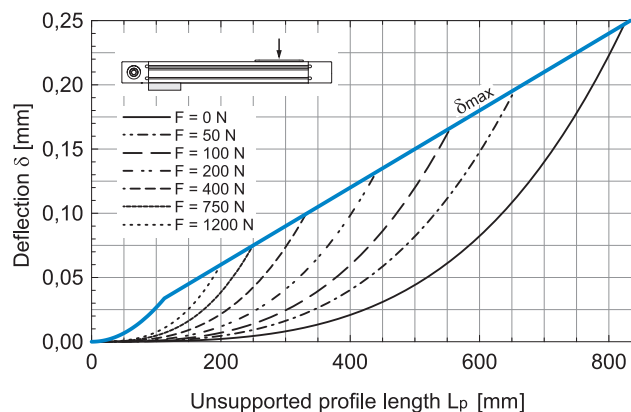
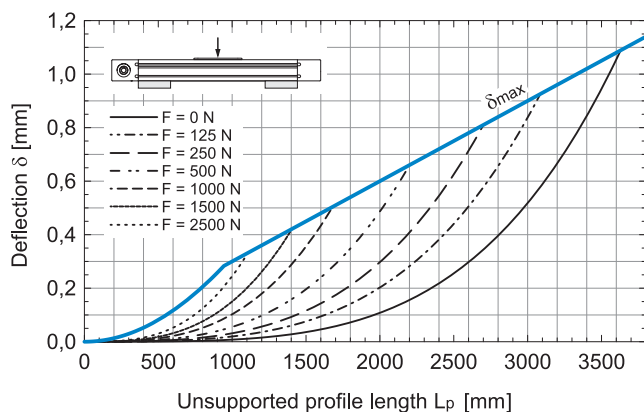
Fixed - free mounting



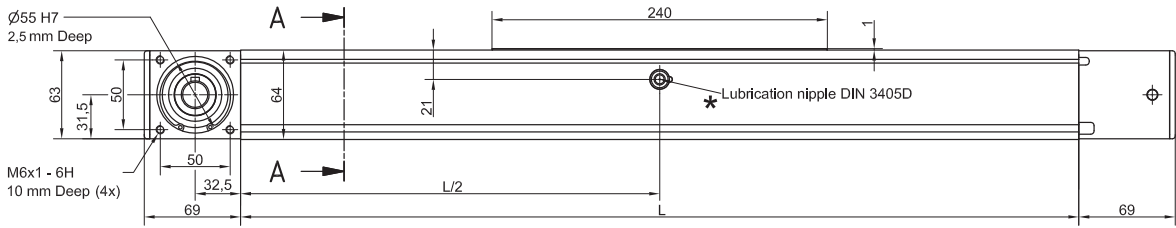
- δ Maximum deflection of the linear unit [mm]
- δ_{max} Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L_p Unsupported profile length [mm]

i The maximum permissible deflection δ_{max} must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ_{max} additional profile supports are needed.

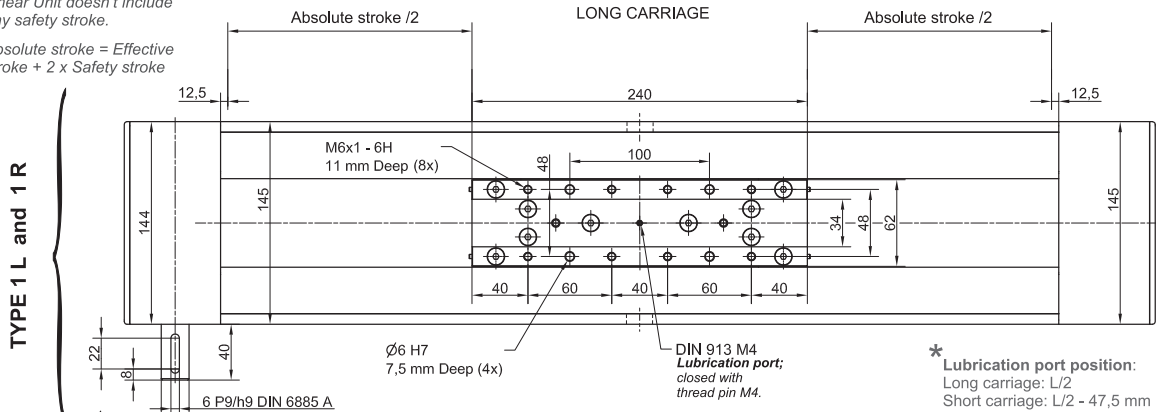
CTJ 145



DIMENSIONS

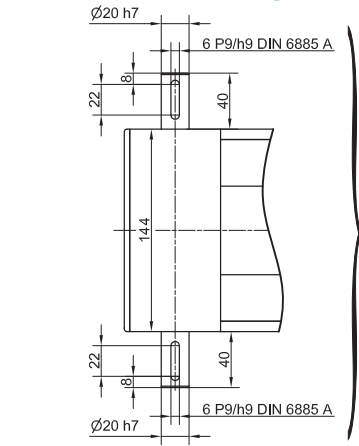


i Linear Unit doesn't include any safety stroke.
Absolute stroke = Effective stroke + 2 x Safety stroke

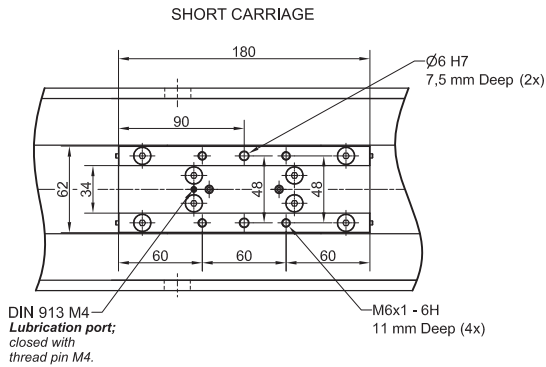


* Lubrication port position:
Long carriage: L/2
Short carriage: L/2 - 47,5 mm

i Journal with or without Keyway.



TYPE 2

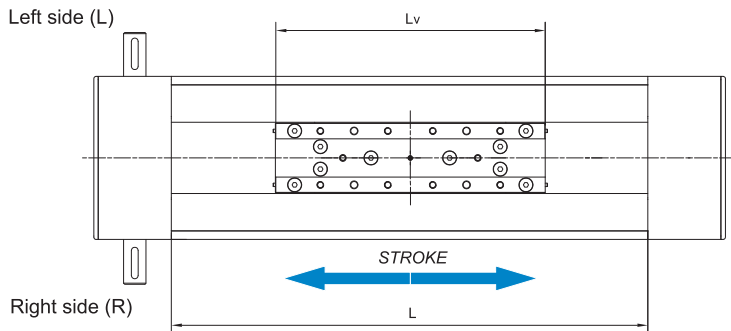


i All dimensions in mm; Drawings scales are not equal.

Defining of the linear unit length

L = Effective stroke + 2 × Safety stroke + Lv + 25 mm

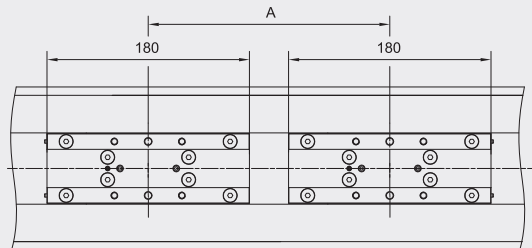
Ltotal = L + 138 mm



Lv - Long carriage = 240 mm
Lv - Short carriage = 180 mm

Double-Carriage

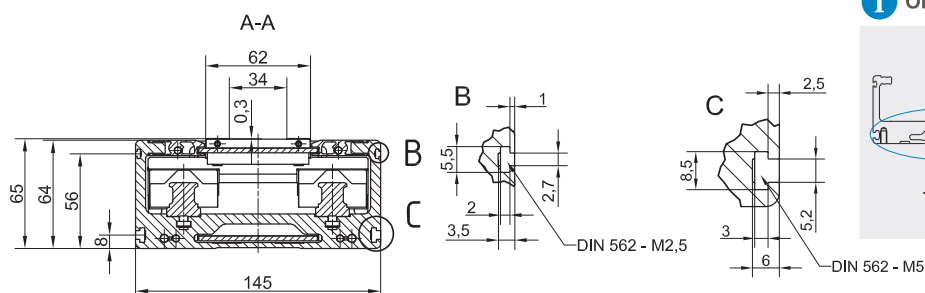
i Only with short carriage version.



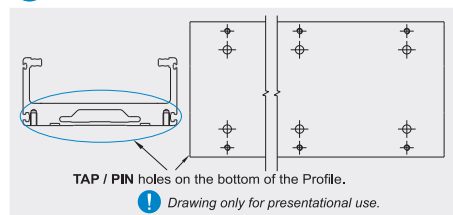
i For ordering code please contact us.

L = Effective stroke + 2 × Safety stroke + A + 205 mm
Ltotal = L + 138 mm } **A ≥ 180 mm** **!**

DIMENSIONS



i OPTIONAL: TAP / PIN holes available on request.

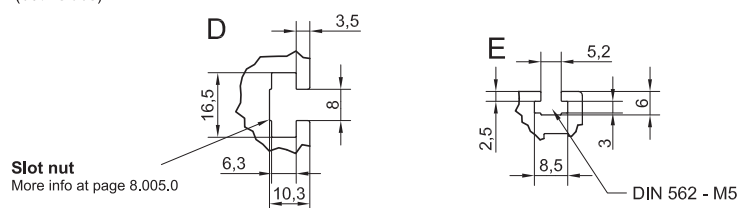
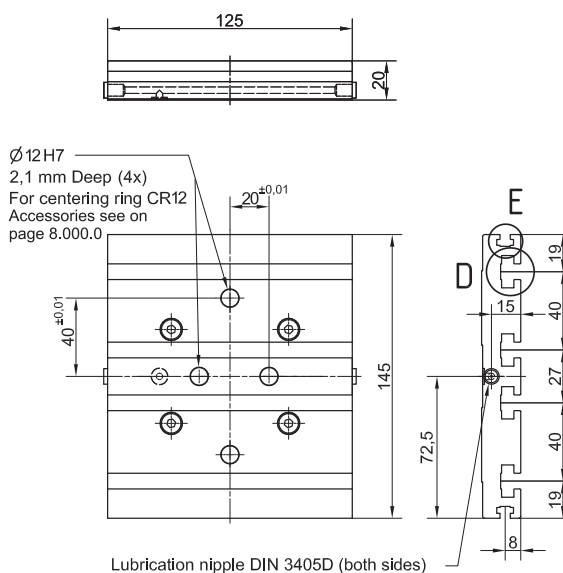
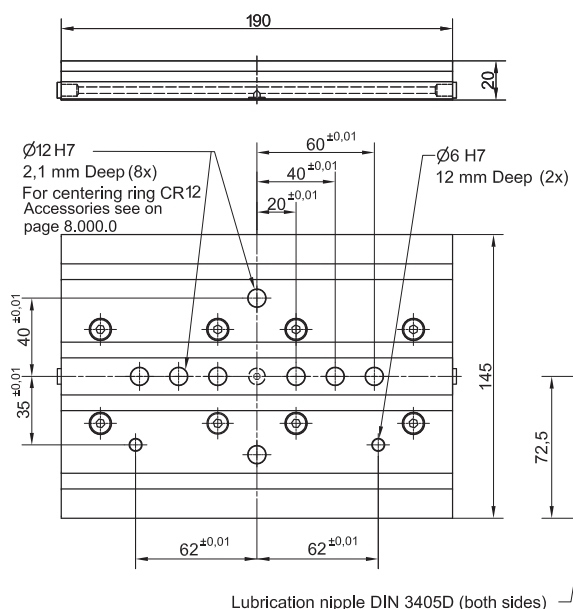


i All dimensions in mm; Drawings scales are not equal.

CONNECTION PLATE

CTJ 145 L

CTJ 145 S



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

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

Mounting the drive

- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

i Available on request.



TECHNICAL DATA

General technical data

Linear Unit	Carriage length Lv [mm]	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads					Moved mass [kg]	Max. Repeatability [mm]	* Max. length Lmax [mm]	* Max. stroke [mm]	** Min. stroke [mm]	
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments								
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]						
CTJ 200 S	265	49600	3235	450	900	10000	24520	1600	450	308	3,05	± 0,08	6000	5710	65	
CTJ 200 L	405	99200	6470	8680	8680	20000	50900	3250	4550	1750	5,70	± 0,08		5570	65	

* For lengths / stroke over the stated value in the table above please contact us.
 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 us.

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

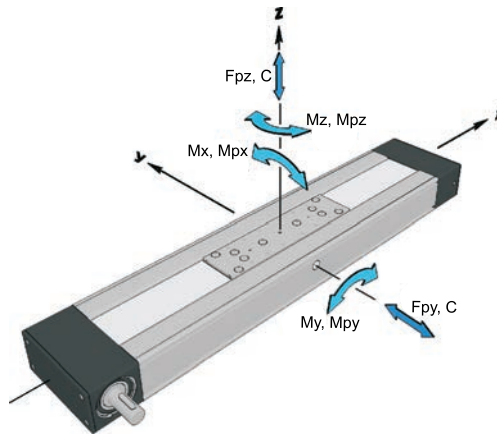
For operating temperature out of the presented range, please contact us.

Recommended values of loads

All the data of 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

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

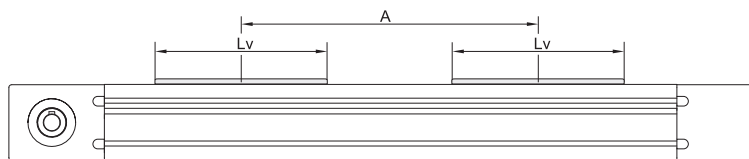


General technical data for double carriage

Linear Unit	Carriage version	Dynamic load capacity C [N]	Dynamic moment			Max. permissible loads				
			Mx [Nm]	My [Nm]	Mz [Nm]	Forces		Moments		
						Fpy [N]	Fpz [N]	Mpx [Nm]	Mpy [Nm]	Mpz [Nm]
CTJ 200	S2	99200	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.

Presented values are for informational purposes only. Exact values can be calculated using our sizing selection tool on Unimotion web site.
 For greater number of carriages please contact us.



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]	** Max. acceleration [m/s ²]
CTJ 200 S	6	102 with keyway	3,5	250	79,58	AT 10	100	3250	4350000	70
CTJ 200 L		129 without keyway	4,5							

* The stated values are for strokes up to 500mm. No Load Torque value increases with stroke elongation.
 ** For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

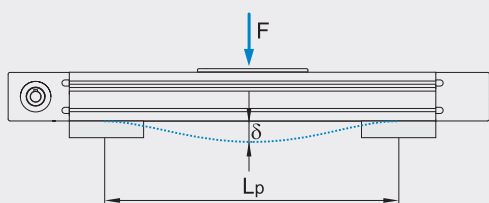
Mass and mass moment of inertia

Linear Unit	Carriage length Lv [mm]	Mass of linear unit [kg]	Mass moment of inertia [10 ⁻⁵ kg * m ²]	Planar moment of inertia	
				Iy [cm ⁴]	Iz [cm ⁴]
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]		

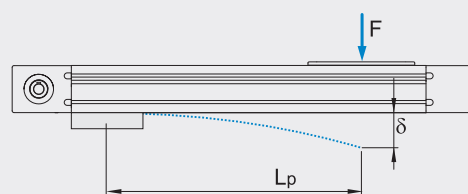
i Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



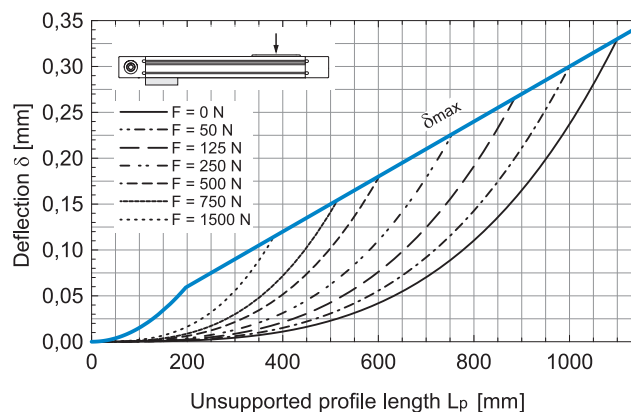
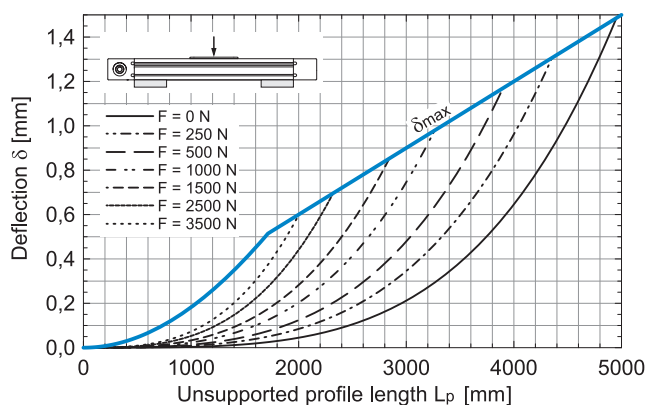
Fixed - free mounting



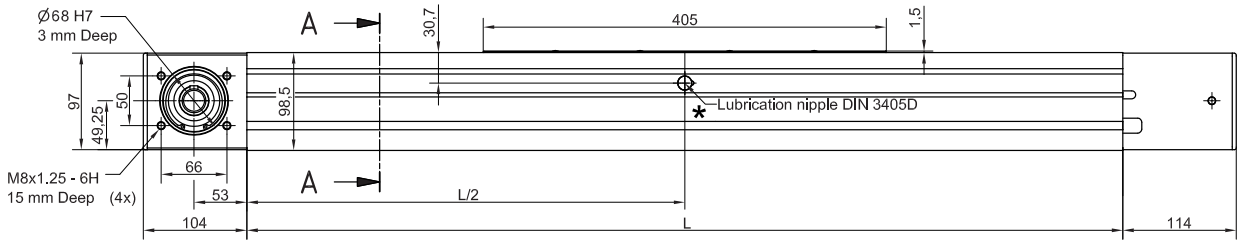
- δ Maximum deflection of the linear unit [mm]
- δmax Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- Lp Unsupported profile length [mm]

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

CTJ 200

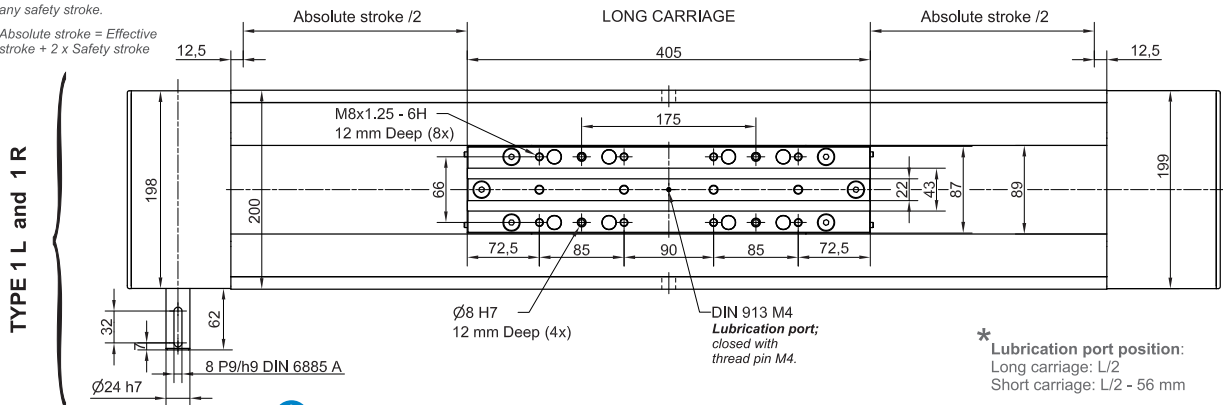


DIMENSIONS

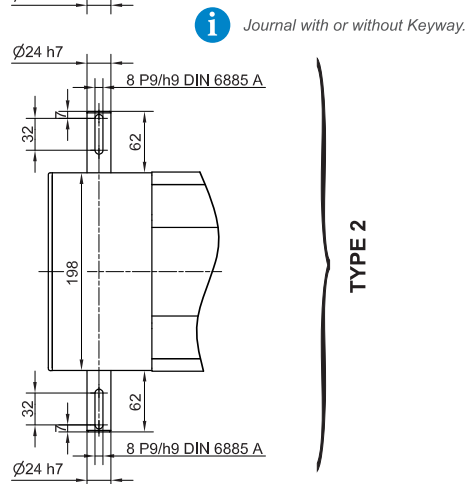


i Linear Unit doesn't include any safety stroke.

Absolute stroke = Effective stroke + 2 x Safety stroke

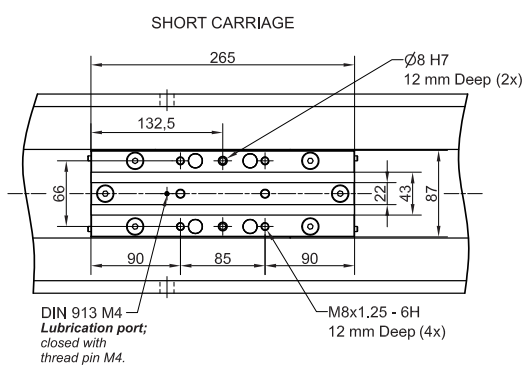


TYPE 1 L and 1 R



i Journal with or without Keyway.

TYPE 2

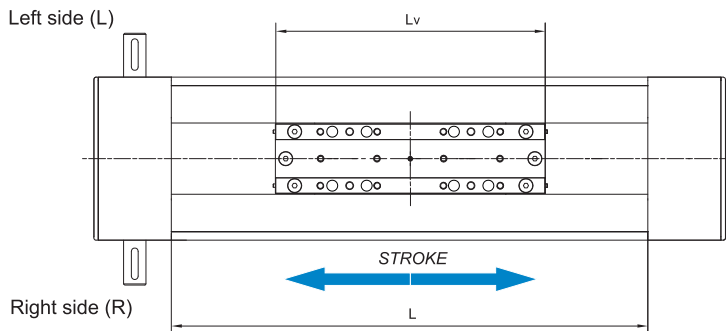


i All dimensions in mm; Drawings scales are not equal.

Defining of the linear unit length

L = Effective stroke + 2 × Safety stroke + Lv + 25 mm

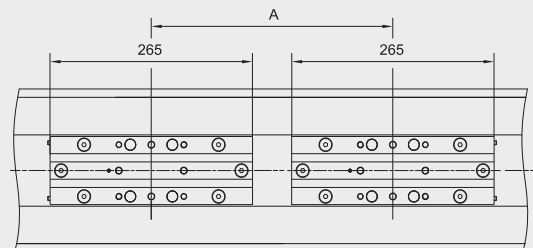
Ltotal = L + 218 mm



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

Double-Carriage

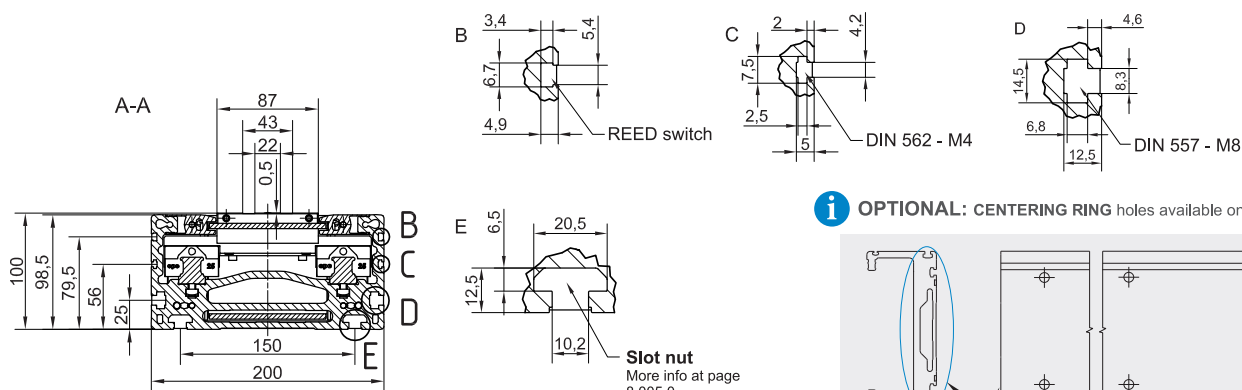
i Only with short carriage version.



i For ordering code please contact us.

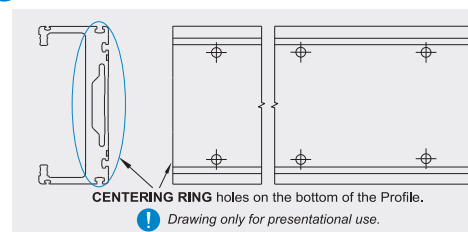
L = Effective stroke + 2 × Safety stroke + A + 290 mm
Ltotal = L + 218 mm } **A ≥ 265 mm** **!**

DIMENSIONS



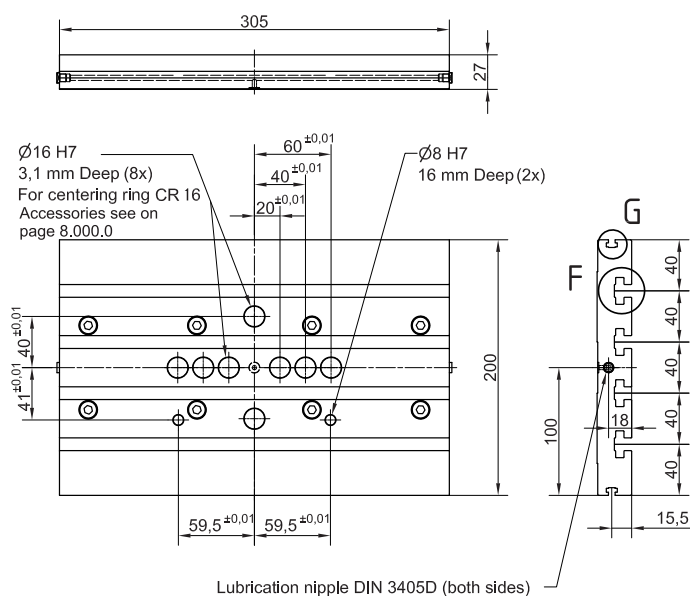
i All dimensions in mm; Drawings scales are not equal.

i **OPTIONAL: CENTERING RING** holes available on request.

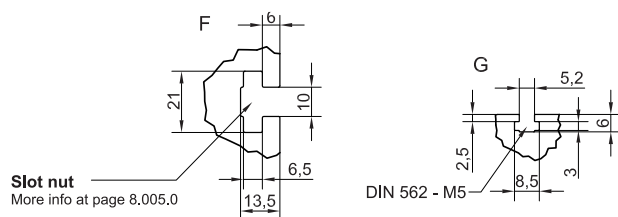
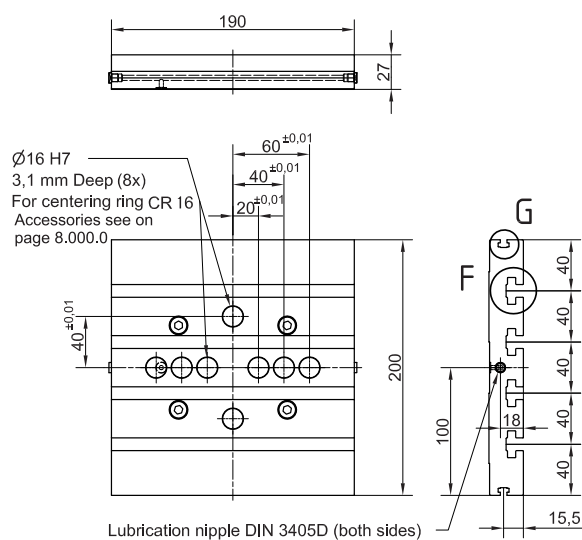


CONNECTION PLATE

CTJ 200 L



CTJ 200 S



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

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

Mounting the drive

- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

i Available on request.



