

## CHARACTERISTICS

The **CTV** series describes Linear Units with a precision ball screw drive and two parallel, integrated, Zero-backlash rail guides. Compact dimensions allow high performance features such as, high speeds, good accuracy and repeatability.

They can easily be combined to multi-axis systems.

Excellent price-/performance ratio and quick delivery time are ensured.

The compact, precision-extruded aluminum Profile from AL 6063, with two parallel, integrated, Zero-backlash rail guide systems, allows high load capacities and optimal cycles for the movement of larger masses at high speed.

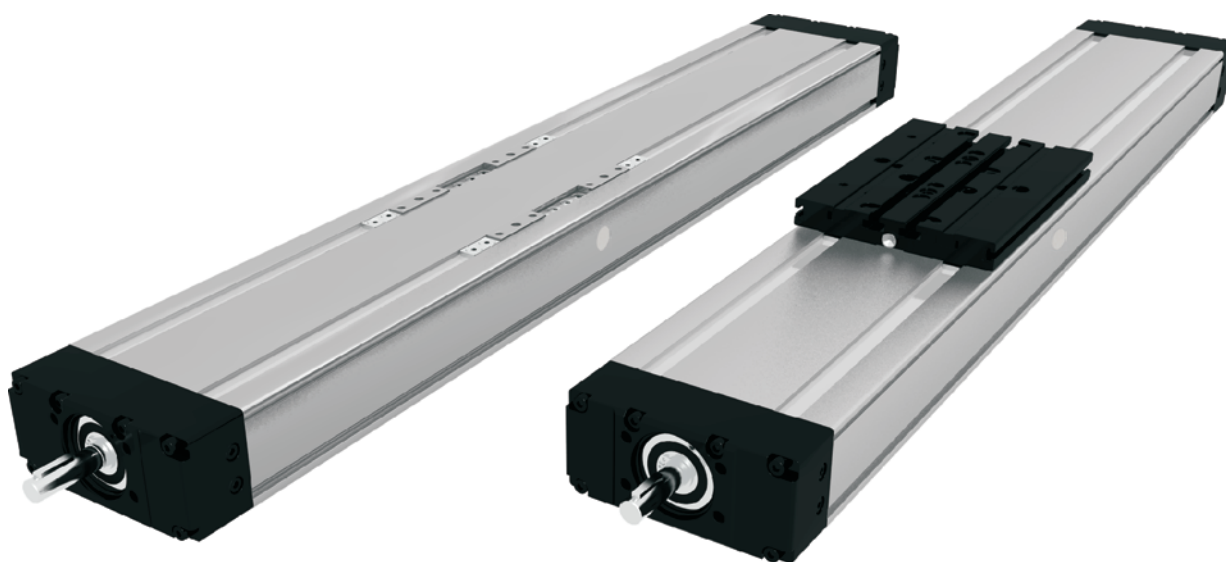
In the Linear Units CTV a precision ball screw, with tolerance class ISO7 ( ISO5 on request), with reduced backlash of the ball nut is used.

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.

Different carriage lengths with lubrication port allows for easy re-lubrication of the ball screw and 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.

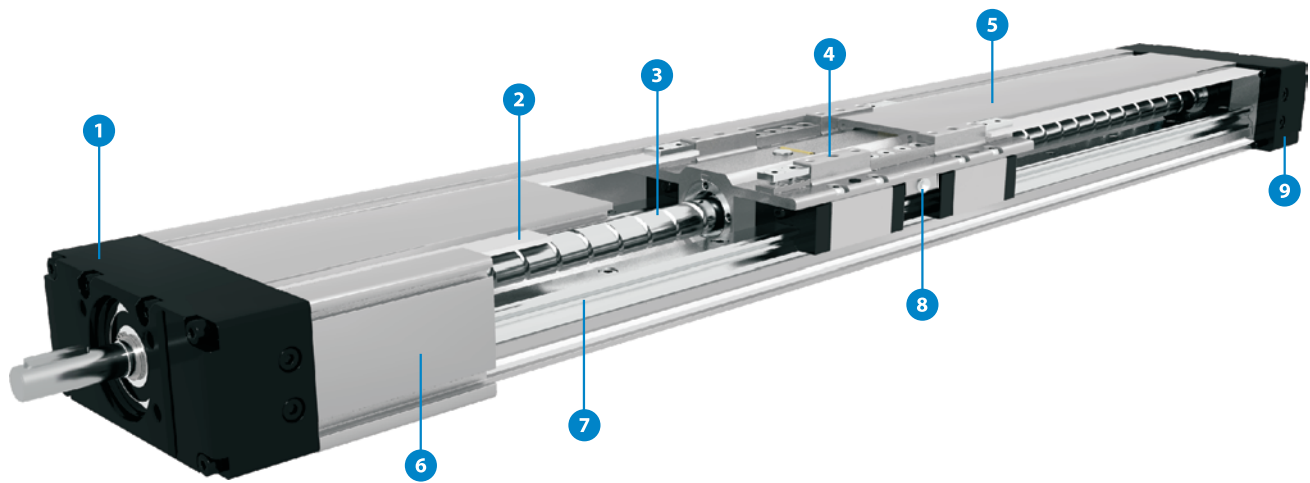
For the linear units CTV various adaptation options, for attaching (or redirecting), for Motors or Gearboxes are available.



**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 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 - Aluminum cover
- 6 - Aluminium profile-Hard anodized
- 7 - Two integrated Linear Ball Guideways
- 8 - Central lubrication port; both sides
- 9 - End block with fixed bearing

**CTV - 110 - 1610 - ISO7 - 1 - 1000 - L - 1 - 1**

**Series:** \_\_\_\_\_  
CTV

**Size:** \_\_\_\_\_  
90  
110  
145  
200

**Ball screw :** \_\_\_\_\_  
CTV 90: Ø12×5, Ø12×10  
CTV 110: Ø16×5, Ø16×10, Ø16×16  
CTV 145: Ø20×5, Ø20×10, Ø20×20, Ø20×50  
CTV 200: Ø32×5, Ø32×10, Ø32×20, Ø32×32

**Ball screw tolerance :** \_\_\_\_\_  
ISO7 (Standard)  
ISO5

**Ball screw journal :** \_\_\_\_\_  
0 : Without keyway  
1 : With keyway  
**!** CTV 90 only available without keyway - 0

**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

**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. length Lmax [ mm ]	* Max. stroke [ mm ]
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Forces		Moments					
						Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]			
CTV 90 S	35	4620	125	17	34	2000	4540	125	17	34	0,3	750	665
CTV 90 L	100	9240	250	300	300	3990	9090	250	297	130	0,5		600

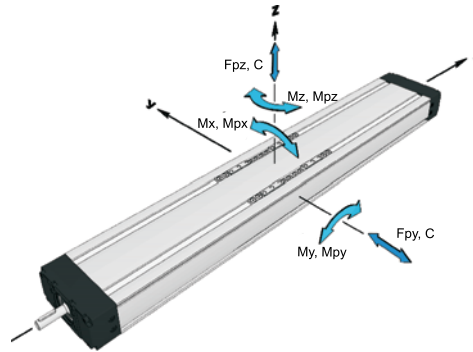
\* For lengths / stroke over the stated value in the table above please contact us.  
Values for max. stroke are not valid for double carriage.  
(equation of defining the linear unit length for particular size of the linear unit needs to be used).

**i 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**

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



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

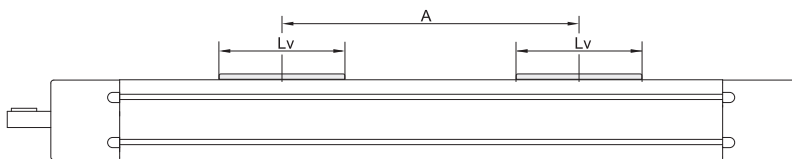
For operating temperature out of the presented range, please contact us.

**General technical data for double carriage**

Linear Unit	Carriage version	Dynamic load capacity C [ N ]	* Dynamic moment			* Forces		Max. permissible loads		
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]
CTV 90	S2	9240	250	4,6 * A [ mm ]	4,6 * A [ mm ]	3990	9090	250	4,5 * A [ mm ]	2,0 * A [ mm ]

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

**i** 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.



**Ball Screw Drive data**

Linear Unit	Ball screw [ d × l ]	Max. rotational speed [ rev / min ]	1 Max. travel speed [ m / s ]	2 No load torque		Lead constant [ mm / rev ]	3 Max. repeatability precision [ mm ]		Dynamic load capacity BS Ca [ N ]	Max. Axial load Fx [ N ]	Max. drive torque Ma [ Nm ]	4 Min. stroke [ mm ]	1 Max. acceleration [ m/s² ]
				Carriage: S [ Nm ]	Carriage: L [ Nm ]		STANDARD ISO7	ISO5					
CTV 90	12 × 5	5800	0,49	0,07	0,09	5	± 0,02	± 0,01	5000	5000	4,4 without Keyway	30	20
	12 × 10		0,97	0,06	0,08	10	± 0,02	± 0,01	3800	2540	4,5 without Keyway		

1 Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.  
For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

2 The stated values are for strokes up to 500mm.  
No Load Torque value increases with stroke elongation

3 For the ball nut with the preload of 2% please contact us

4 For minimum stroke below the stated value in the table above please contact us.

**Mass moment inertia of Linear unit**

Linear unit	Carriage version	Ball screw [ d × l ]	Mass moment of inertia [ 10 <sup>-5</sup> kg · m <sup>2</sup> ]		Planar moment of inertia	
					I <sub>y</sub> [ cm <sup>4</sup> ]	I <sub>z</sub> [ cm <sup>4</sup> ]
CTV 90	S	12 × 5	0,32 + 0,002 * Stroke [ mm ]		13,6	102,6
		12 × 10	0,38 + 0,002 * Stroke [ mm ]			
	L	12 × 5	0,43 + 0,002 * Stroke [ mm ]			
		12 × 10	0,53 + 0,002 * Stroke [ mm ]			

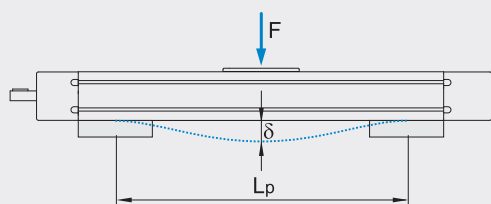
**Mass of Linear unit**

Linear unit	Carriage Length L <sub>v</sub> [ 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 ]

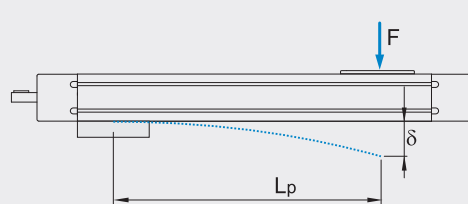
**i** Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

**Deflection of the linear unit**

**Fixed - fixed mounting**



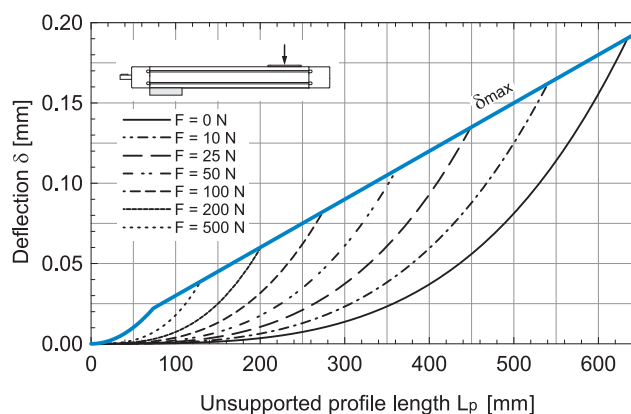
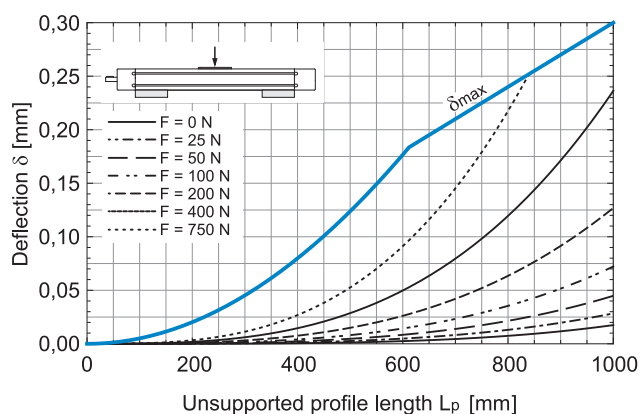
**Fixed - free mounting**



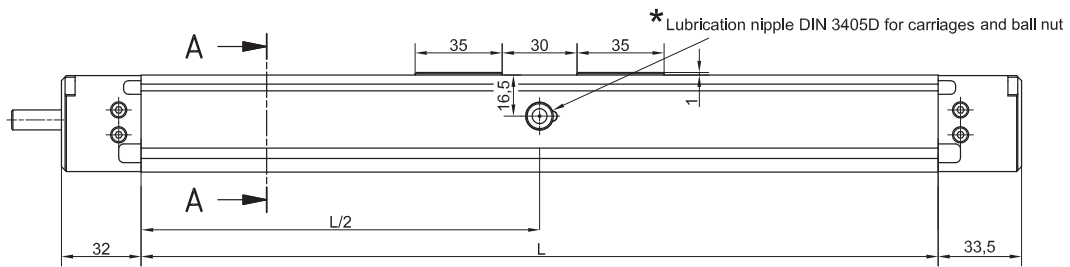
- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

**i** 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.

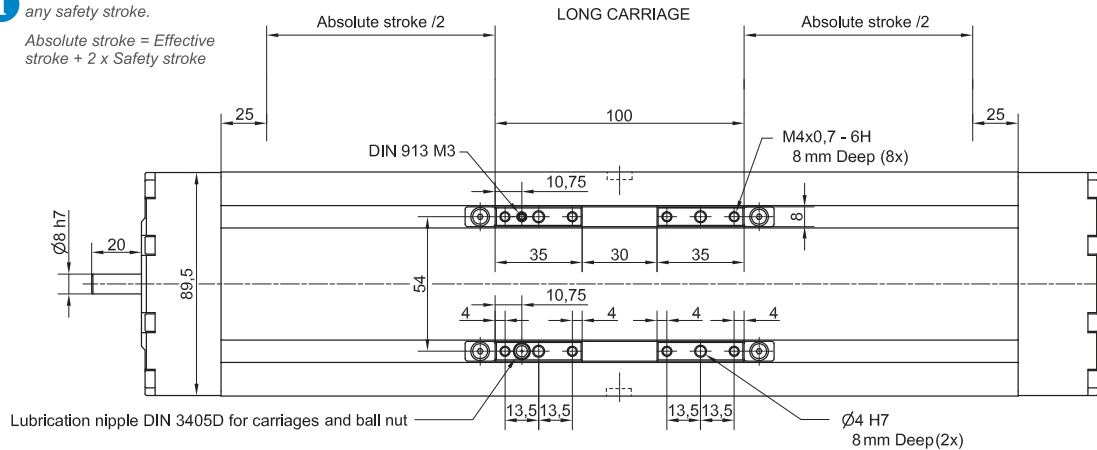
**CTV 90**



**DIMENSIONS**

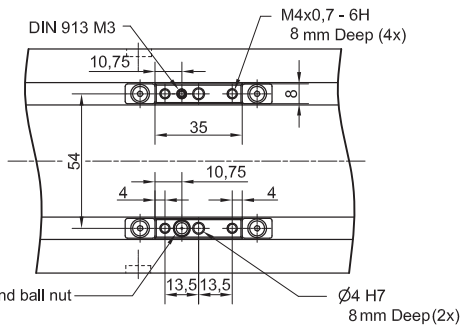


**i** Linear Unit doesn't include any safety stroke.  
Absolute stroke = Effective stroke + 2 x Safety stroke



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

**SHORT CARRIAGE**

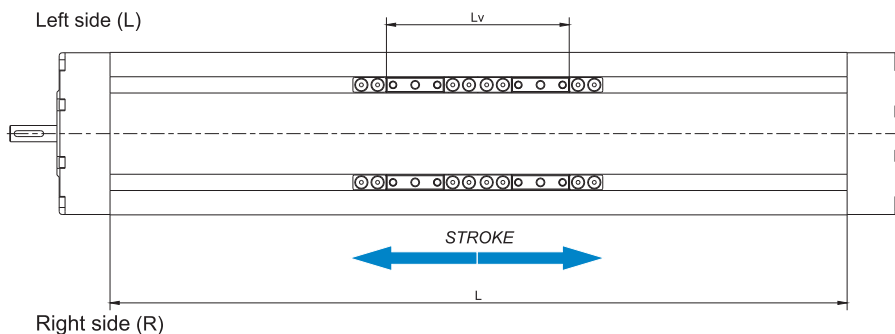


**i** All dimensions in mm.  
Drawings scales are not equal.

**Defining of the linear unit length**

**L = Effective stroke + 2 × Safety stroke + Lv + 50 mm**

**Ltotal = L + 65,5 mm**

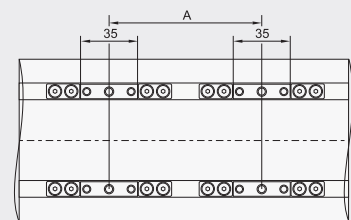


Lv - Long carriage = 100 mm  
Lv - Short carriage = 35 mm

**L = Effective stroke + 2 × Safety stroke + A + 85 mm**  
**Ltotal = L + 65,5mm** } **A ≥ 65 mm** **!**

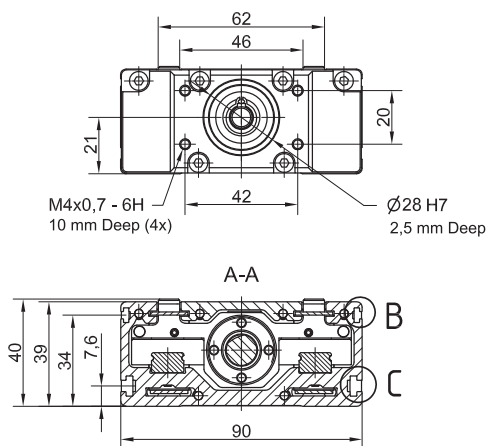
**Double-Carriage**

**i** Only with **short carriage** version.

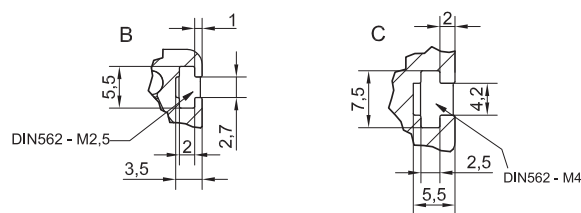


**i** For ordering code please contact us.

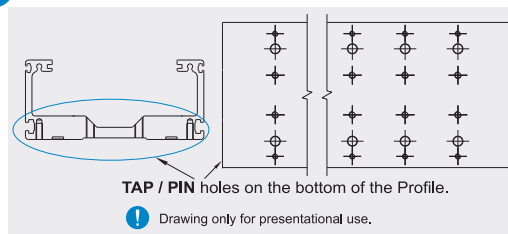
**DIMENSIONS**



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



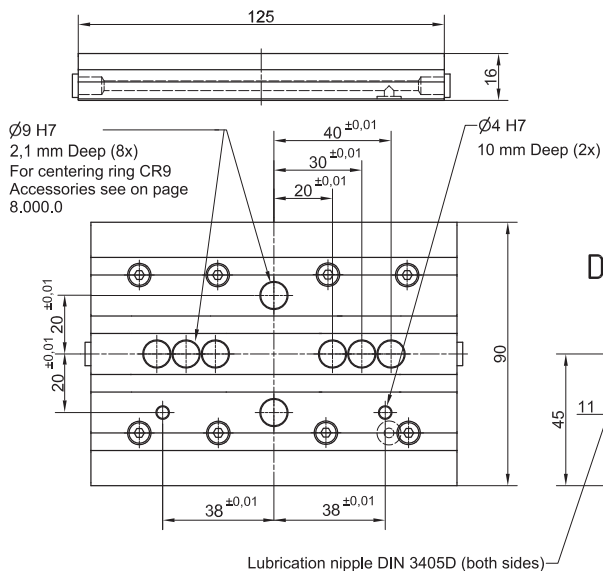
**i** **OPTIONAL: TAP / PIN** holes available on request.



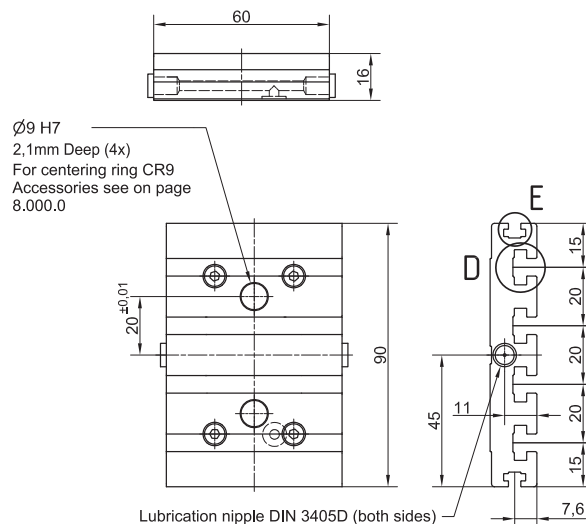
**i** Drawing only for presentational use.

**CONNECTION PLATE**

**CTV 90 L**



**CTV 90 S**



Lubrication nipple DIN 3405D (both sides)

Linear Unit	Plate length [mm]	Weight [kg]	Code
CTV 90 S	60	0,21	46906
CTV 90 L	125	0,44	46907

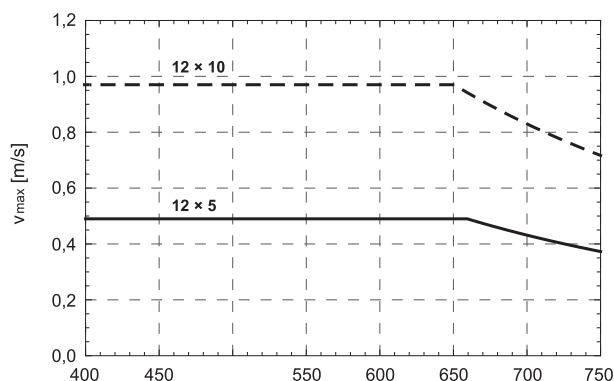
**i** Mounting elements for mounting the connection plate on the Linear unit are included.

**Mounting the drive**

- by the **MOTOR SIDE DRIVE - MSD** (Page 7.095.0)
- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

**i** Available on request.

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



**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. length Lmax [ mm ]	* Max. stroke [ mm ]
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Forces		Moments					
						Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]			
CTV 110 S	39	19800	650	118	235	4670	9390	310	90	90	0,63	1500	1410
CTV 110 L	124	39600	1305	1680	1680	13080	18800	620	800	550	1,36		1325

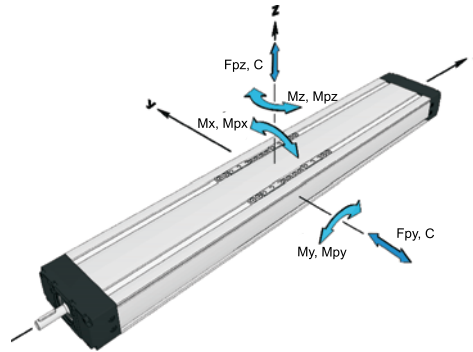
\* For lengths / stroke over the stated value in the table above please contact us.  
Values for max. stroke are not valid for double carriage.  
(equation of defining the linear unit length for particular size of the linear unit needs to be used).

**i 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**

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



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

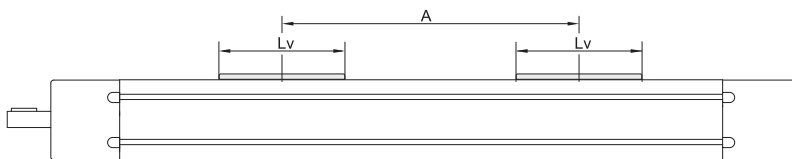
For operating temperature out of the presented range, please contact us.

**General technical data for double carriage**

Linear Unit	Carriage version	Dynamic load capacity C [ N ]	* Dynamic moment			* Forces		Max. permissible loads		
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]
CTV 110	S2	39600	1300	19,8 * A [mm]	19,8 * A [mm]	12940	18790	620	9,4 * A [mm]	6,5 * A [mm]

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

**i** 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.



**Ball Screw Drive data**

Linear Unit	Ball screw [ d × l ]	Max. rotational speed [ rev / min ]	1 Max. travel speed [ m / s ]	2 No load torque		Lead constant [ mm / rev ]	3 Max. repeatability precision [ mm ]		Dynamic load capacity BS Ca [ N ]	Max. Axial load Fx [ N ]	Max. drive torque Ma [ Nm ]	4 Min. stroke [ mm ]	1 Max. acceleration [ m/s <sup>2</sup> ]									
				Carriage: S [ Nm ]	Carriage: L [ Nm ]		STANDARD	ISO7						ISO5								
CTV 110	16 × 5	4200	0,35	0,11	0,13	5	± 0,02	± 0,01	13150	8700	5,5 with Keyway 7,7 without Keyway	40	20									
	16 × 10													0,70	0,12	0,16	10	± 0,02	± 0,01	11550	6730	5,5 with Keyway 11,9 without Keyway
	16 × 16													1,12	0,14	0,18	16	± 0,02	± 0,01	8170	4200	

1 Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.  
For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

2 The stated values are for strokes up to 500mm.  
No Load Torque value increases with stroke elongation

3 For the ball nut with the preload of 2% please contact us

4 For minimum stroke below the stated value in the table above please contact us.



**Mass moment inertia of Linear unit**

Linear unit	Carriage version	Ball screw [ d × l ]	Mass moment of inertia [ 10 <sup>-5</sup> kg · m <sup>2</sup> ]	Planar moment of inertia	
				I <sub>y</sub> [ cm <sup>4</sup> ]	I <sub>z</sub> [ cm <sup>4</sup> ]
CTV 110	S	16 × 5	0,70 + 0,005 · Stroke [ mm ]	29,1	196,0
		16 × 10	0,82 + 0,005 · Stroke [ mm ]		
		16 × 16	1,07 + 0,005 · Stroke [ mm ]		
	L	16 × 5	1,19 + 0,005 · Stroke [ mm ]		
		16 × 10	1,45 + 0,005 · Stroke [ mm ]		
		16 × 16	1,99 + 0,005 · Stroke [ mm ]		

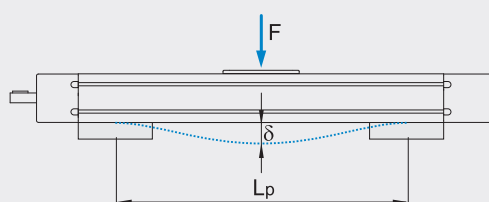
**Mass of Linear unit**

Linear unit	Carriage Length L <sub>v</sub> [ mm ]	Mass of Linear unit [ kg ]
CTV 110 S	39	3,3 + 0,008 · Stroke [ mm ]
CTV 110 L	124	4,6 + 0,008 · Stroke [ mm ]

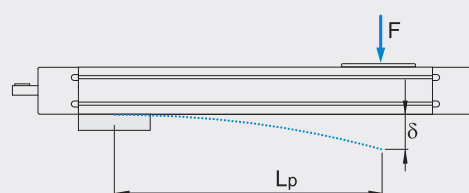
**i** Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

**Deflection of the linear unit**

**Fixed - fixed mounting**



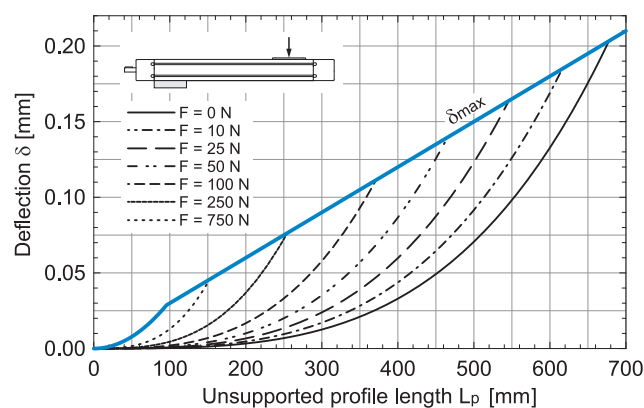
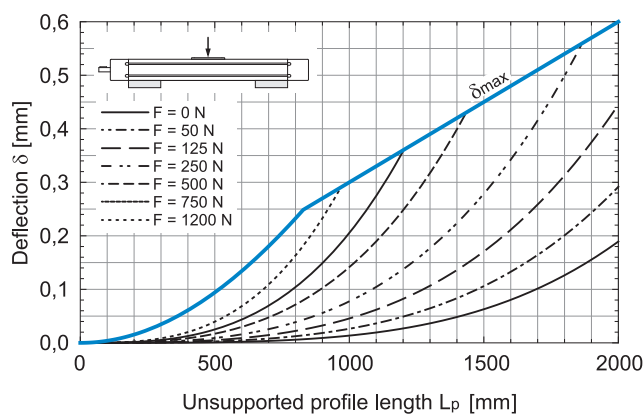
**Fixed - free mounting**



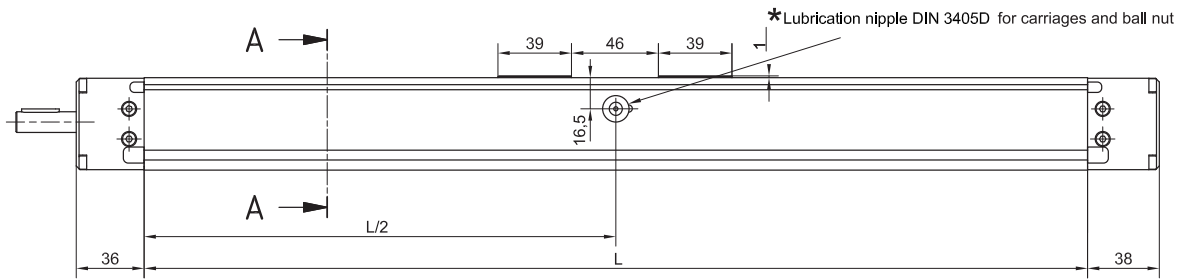
- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

**i** 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.

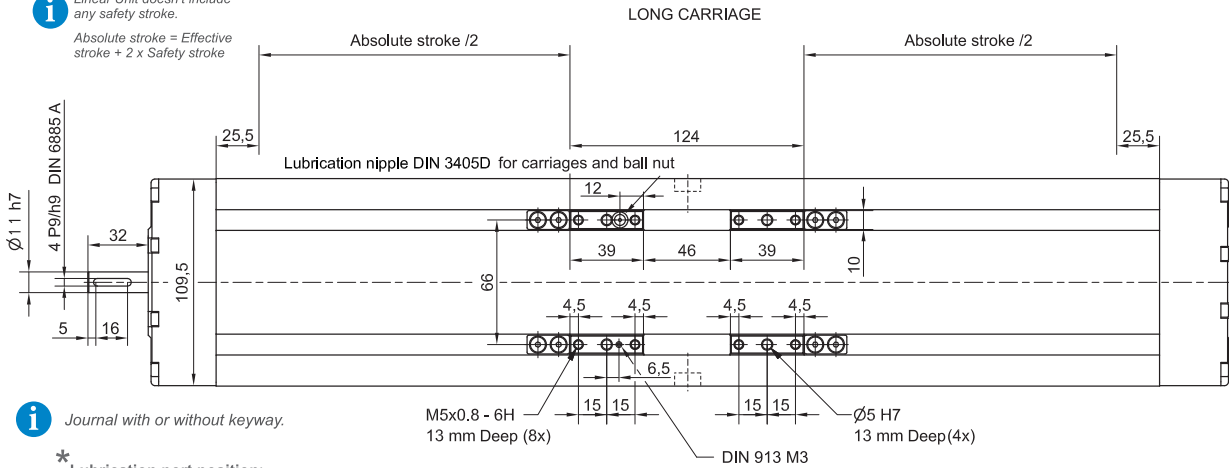
**CTV 110**



**DIMENSIONS**

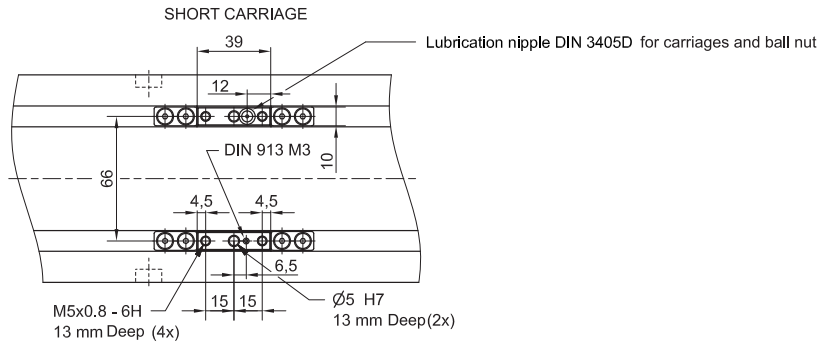


**i** Linear Unit doesn't include any safety stroke.  
Absolute stroke = Effective stroke + 2 x Safety stroke



**i** Journal with or without keyway.  
\* Lubrication port position:  
Long carriage: L/2  
Short carriage: L/2 - 39 mm

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

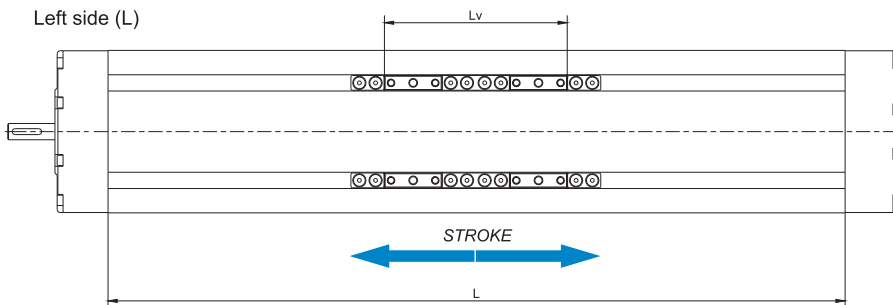


**Defining of the linear unit length**

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

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

Left side (L)



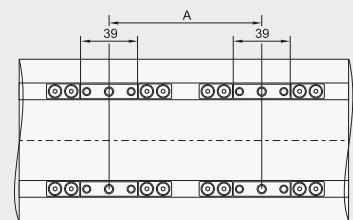
Right side (R)

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

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

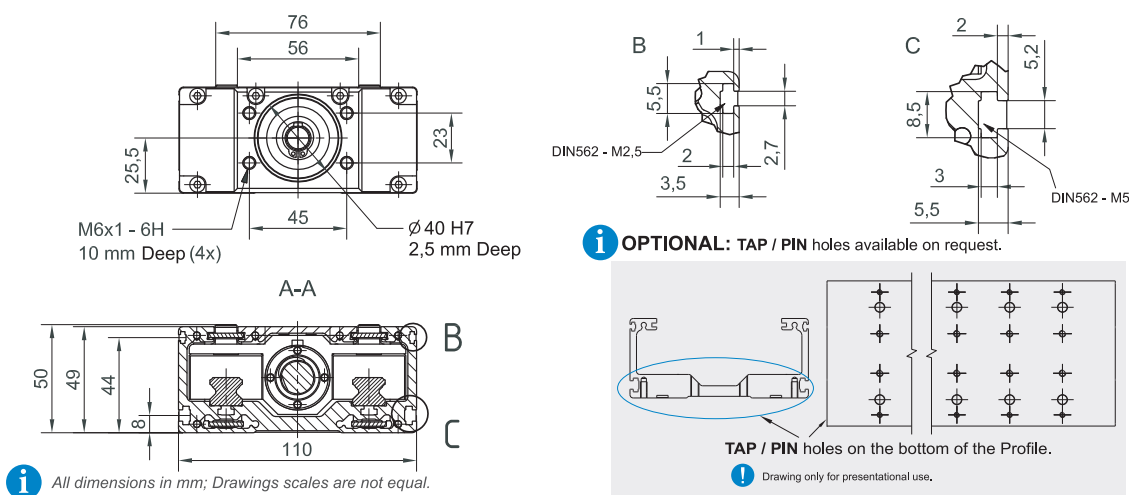
**Double-Carriage**

**i** Only with **short carriage** version.



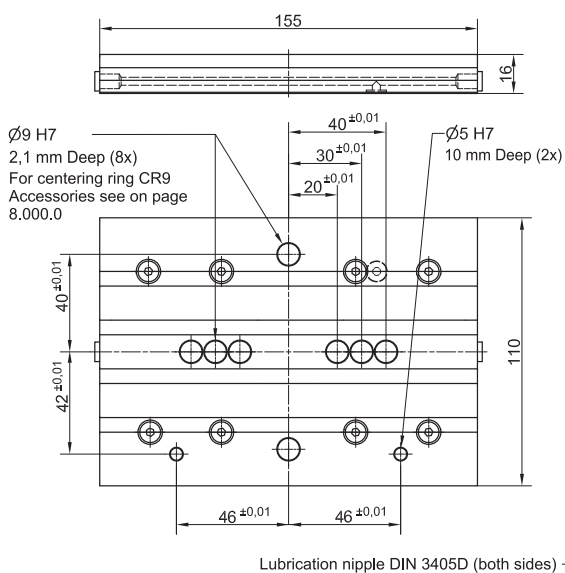
**i** For ordering code please contact us.

**DIMENSIONS**

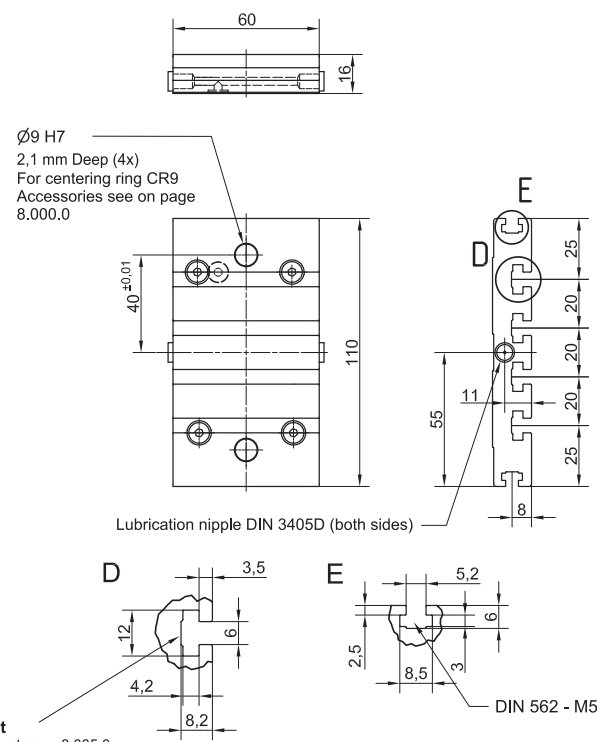


**CONNECTION PLATE**

**CTV 110 L**



**CTV 110 S**



Linear Unit	Plate length [mm]	Weight [kg]	Code
CTV 110 S	60	0,37	48348
CTV 110 L	155	0,74	48349

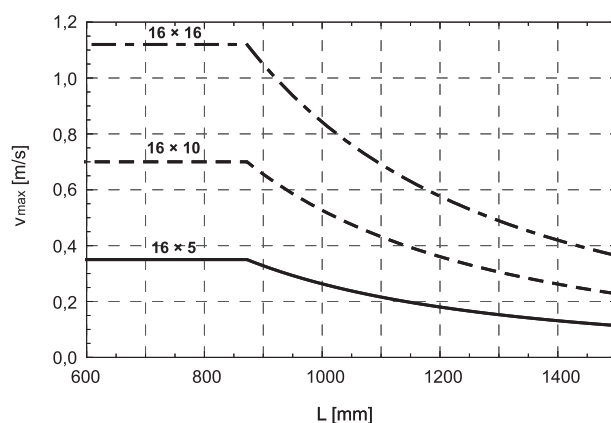
**i** Mounting elements for mounting the connection plate on the Linear unit are included.

**Mounting the drive**

- by the **MOTOR SIDE DRIVE - MSD** (Page 7.095.0)
- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

**i** Available on request.

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



**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. length Lmax [ mm ]	* Max. stroke [ mm ]
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Forces		Moments					
						Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]			
CTV 145 S	49	34200	1500	260	520	8930	15320	674	260	180	1,19	1800	1690
CTV 145 L	149	68400	3005	3420	3420	17870	30680	1350	1700	893	2,61		1590

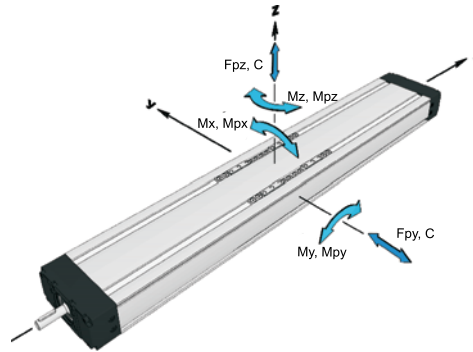
\* For lengths / stroke over the stated value in the table above please contact us.  
Values for max. stroke are not valid for double carriage.  
(equation of defining the linear unit length for particular size of the linear unit needs to be used).

**i 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**

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



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

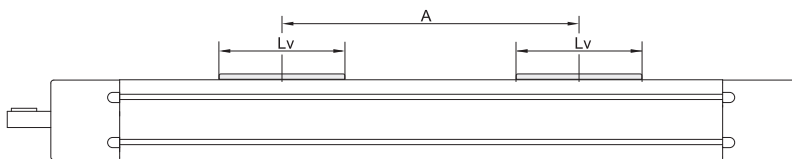
For operating temperature out of the presented range, please contact us.

**General technical data for double carriage**

Linear Unit	Carriage version	Dynamic load capacity C [ N ]	* Dynamic moment			* Forces		Max. permissible loads		
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]
CTV 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.

**i** 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.



**Ball Screw Drive data**

Linear Unit	Ball screw [ d × l ]	Max. rotational speed [ rev / min ]	1 Max. travel speed [ m / s ]	2 No load torque		Lead constant [ mm / rev ]	3 Max. repeatability precision [ mm ]		Dynamic load capacity BS Ca [ N ]	Max. Axial load Fx [ N ]	Max. drive torque Ma [ Nm ]	4 Min. stroke [ mm ]	1 Max. acceleration [ m/s² ]
				Carriage: S [ Nm ]	Carriage: L [ Nm ]		STANDARD ISO7	ISO5					
CTV 145	20 × 5	3300	0,28	0,28	0,3	5	± 0,02	± 0,01	14800	14800	11,9 with Keyway 13,0 without Keyway	55	20
	20 × 10			0,55	0,26	0,28	10	± 0,02	± 0,01	15900	13850		
	20 × 20			1,10	0,24	0,28	20	± 0,02	± 0,01	16250	6930		
	20 × 50	3000	2,50	0,58	0,6	50	± 0,02	± 0,01	13000	2770	11,9 with Keyway 24,5 without Keyway		

1 Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.  
For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

2 The stated values are for strokes up to 500mm.  
No Load Torque value increases with stroke elongation

3 For the ball nut with the preload of 2% please contact us

4 For minimum stroke below the stated value in the table above please contact us.

Mass moment inertia of Linear unit

Linear unit	Carriage version	Ball screw [ d × l ]	Mass moment of inertia [ 10 <sup>-5</sup> kg · m <sup>2</sup> ]	Planar moment of inertia	
				I <sub>y</sub> [ cm <sup>4</sup> ]	I <sub>z</sub> [ cm <sup>4</sup> ]
CTV 145	S	20 × 5	3,04 + 0,013 * Stroke [ mm ]	85,3	682,3
		20 × 10	3,27 + 0,013 * Stroke [ mm ]		
		20 × 20	4,17 + 0,013 * Stroke [ mm ]		
		20 × 50	10,50 + 0,013 * Stroke [ mm ]		
	L	20 × 5	4,43 + 0,013 * Stroke [ mm ]		
		20 × 10	4,92 + 0,013 * Stroke [ mm ]		
		20 × 20	6,91 + 0,013 * Stroke [ mm ]		
		20 × 50	20,79 + 0,013 * Stroke [ mm ]		

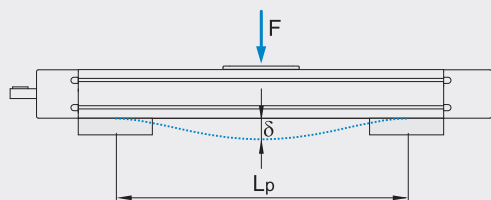
Mass of Linear unit

Linear unit	Carriage Length L <sub>v</sub> [ mm ]	Mass of Linear unit [ kg ]
CTV 145 S	49	5,7 + 0,015 * Stroke [ mm ]
CTV 145 L	149	8,4 + 0,015 * Stroke [ mm ]

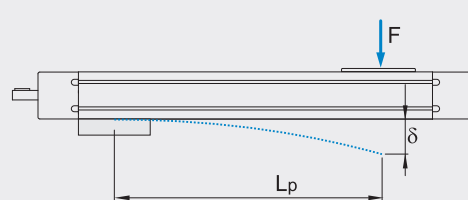
**i** Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



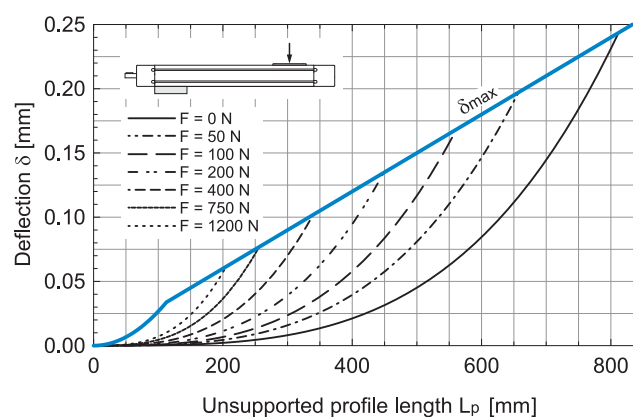
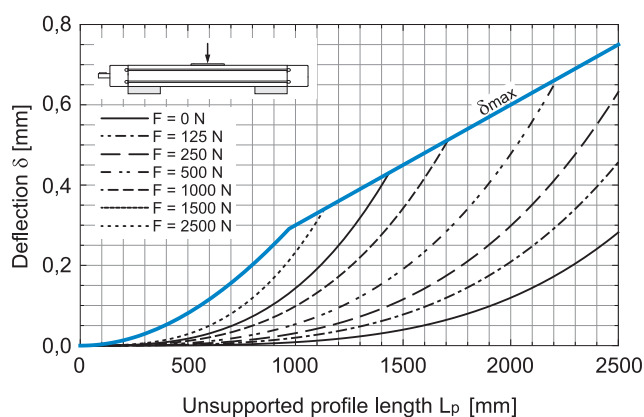
Fixed - free mounting



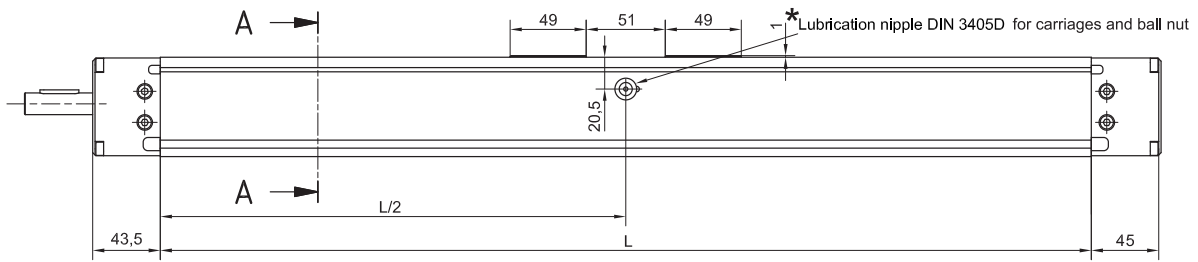
- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

**i** 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.

CTV 145



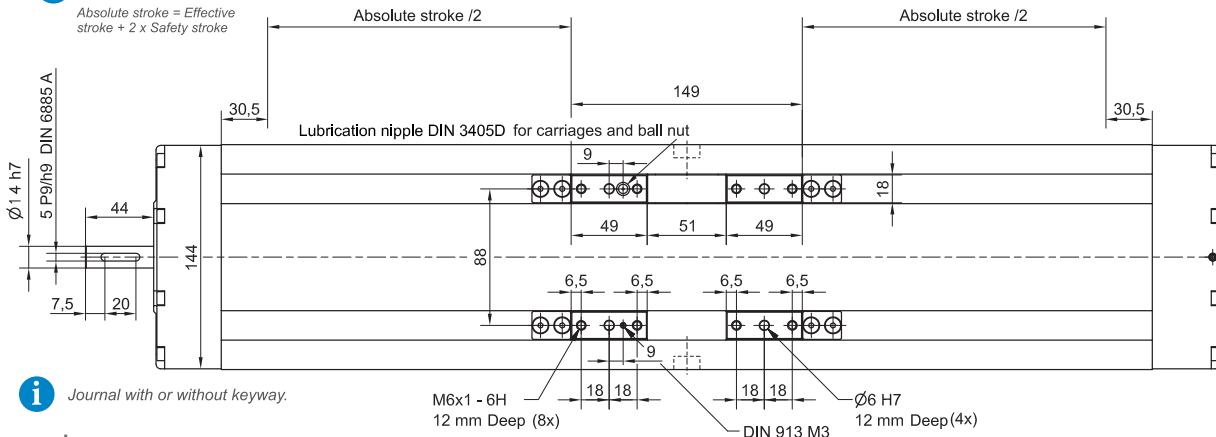
**DIMENSIONS**



**i** Linear Unit doesn't include any safety stroke.

Absolute stroke = Effective stroke + 2 x Safety stroke

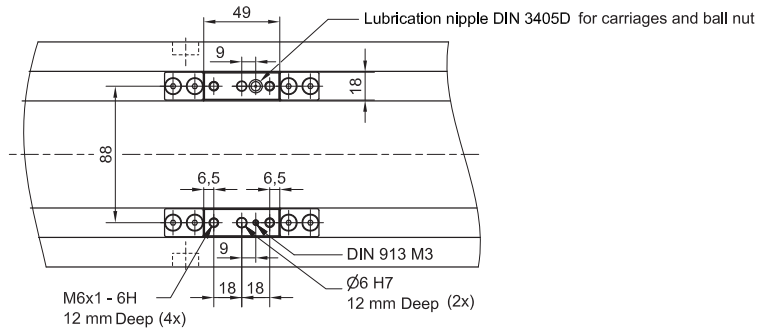
**LONG CARRIAGE**



**i** Journal with or without keyway.

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

**SHORT CARRIAGE**



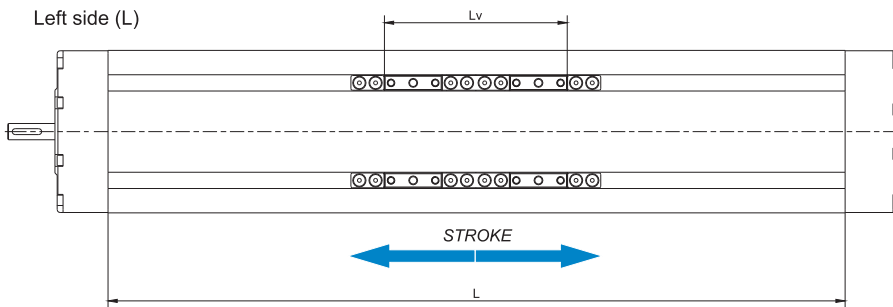
**i** All dimensions in mm.  
Drawings scales are not equal.

**Defining of the linear unit length**

**L = Effective stroke + 2 × Safety stroke + Lv + 61 mm**

**Ltotal = L + 88,5 mm**

Left side (L)



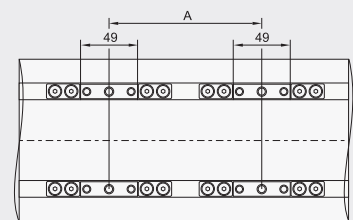
Right side (R)

Lv - Long carriage = 149 mm  
Lv - Short carriage = 49 mm

**L = Effective stroke + 2 × Safety stroke + A + 110 mm**  
**Ltotal = L + 88,5 mm** } **A ≥ 100 mm** **!**

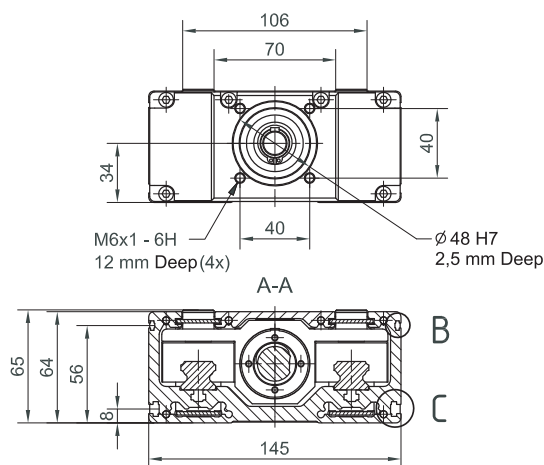
**Double-Carriage**

**i** Only with *short carriage* version.

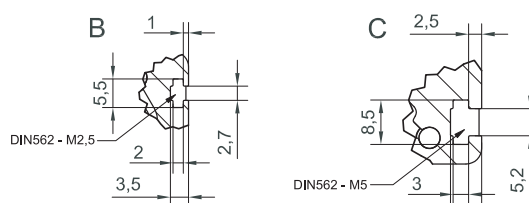


**i** For ordering code please contact us.

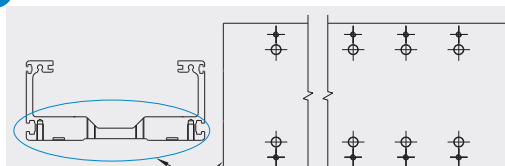
**DIMENSIONS**



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



**i** **OPTIONAL: TAP / PIN holes** available on request.

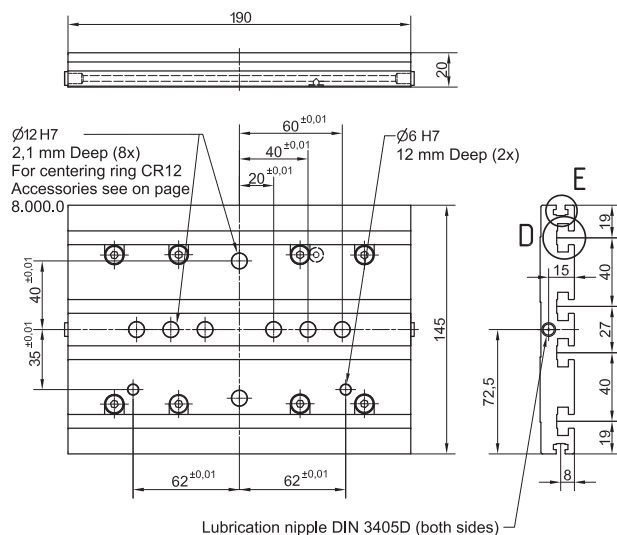


**TAP / PIN holes** on the bottom of the Profile.

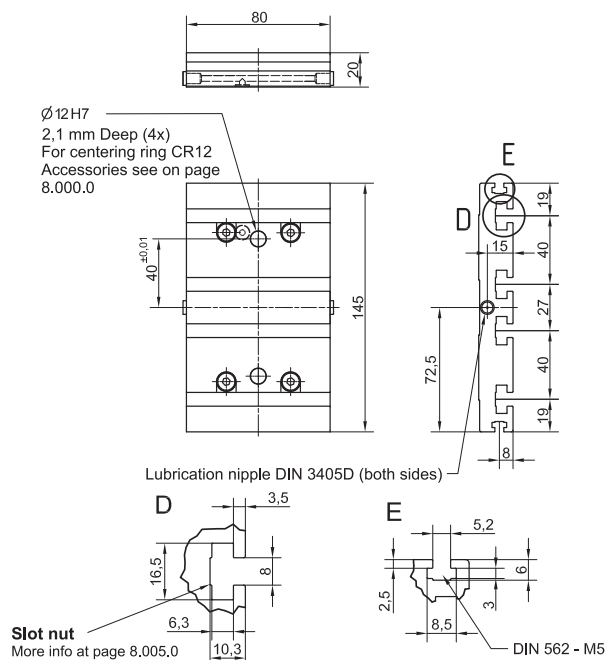
**i** Drawing only for presentational use.

**CONNECTION PLATE**

**CTV 145 L**



**CTV 145 S**



Linear Unit	Plate length [mm]	Weight [kg]	Code
CTV 145 S	80	0,78	48351
CTV 145 L	190	1,54	48350

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

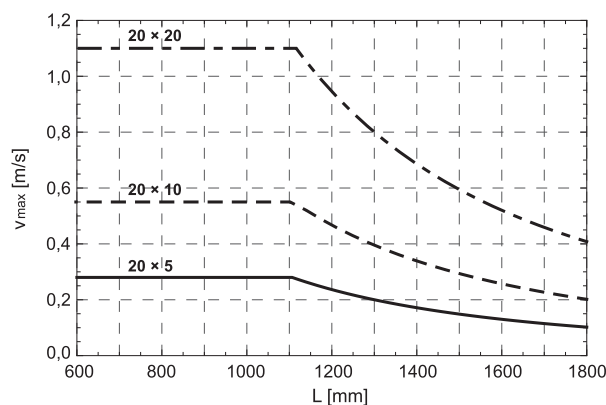
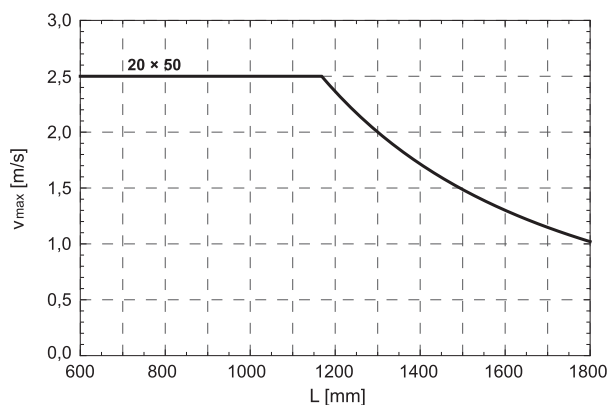
**Montage des Antriebs**

- Mittels **UMLENKRIEMENTRIEB** (Page 7.095.0)

- Mittels **MOTORGLOCKE UND KUPPLUNG** (Page 8.020.0)

**i** Available on request.

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



**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. length Lmax [ mm ]	* Max. stroke [ mm ]
			Mx [ Nm ]	My [ Nm ]	Mz [ Nm ]	Forces		Moments					
						Fpy [ N ]	Fpz [ N ]	Mpx [ Nm ]	Mpy [ Nm ]	Mpz [ Nm ]			
CTV 200 S	80	49600	3220	450	900	10000	24610	1600	450	308	3,11	2200	2000
CTV 200 L	255	99200	6445	8680	8680	20000	51540	3350	4550	1750	6,21		1825

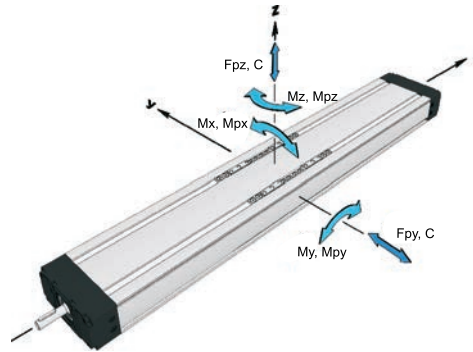
\* For lengths / stroke over the stated value in the table above please contact us.  
Values for max. stroke are not valid for double carriage.  
(equation of defining the linear unit length for particular size of the linear unit needs to be used).

**i 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**

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



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

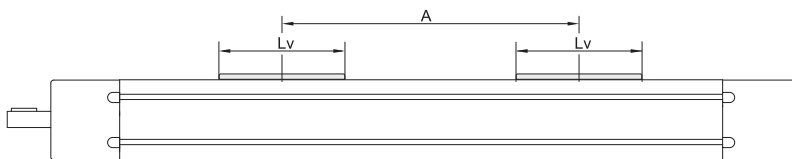
For operating temperature out of the presented range, please contact us.

**General technical data for double carriage**

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

**i** 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.



**Ball Screw Drive data**

Linear Unit	Ball screw [ d × l ]	Max. rotational speed [ rev / min ]	1 Max. travel speed [ m / s ]	2 No load torque		Lead constant [ mm / rev ]	3 Max. repeatability precision [ mm ]		Dynamic load capacity BS Ca [ N ]	Max. Axial load Fx [ N ]	Max. drive torque Ma [ Nm ]	4 Min. stroke [ mm ]	1 Max. acceleration [ m/s² ]
				Carriage: S [ Nm ]	Carriage: L [ Nm ]		STANDARD	ISO5					
CTV 200	32 × 5	2150	0,18	0,45	0,55	5	± 0,02	± 0,01	18850	18850	16,7 with Keyway 16,7 without Keyway	65	20
	32 × 10			0,50	0,60	10	± 0,02	± 0,01					
	32 × 20	3000	1,00	0,65	20	± 0,02	± 0,01	29700	14800	27,3 with Keyway 52,3 without Keyway			
	32 × 32		1,60	0,70	32	± 0,02	± 0,01				35150		

1 Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.  
For travel speed and acceleration over the stated value in the table above or diagrams please contact us.

2 The stated values are for strokes up to 500mm.  
No Load Torque value increases with stroke elongation

3 For the ball nut with the preload of 2% please contact us

4 For minimum stroke below the stated value in the table above please contact us.



Mass moment inertia of Linear unit

Linear unit	Carriage version	Ball screw [ d × l ]	Mass moment of inertia [ 10 <sup>-5</sup> kg · m <sup>2</sup> ]	Planar moment of inertia	
				I <sub>y</sub> [ cm <sup>4</sup> ]	I <sub>z</sub> [ cm <sup>4</sup> ]
CTV 200	S	32 × 5	21,17 + 0,069 · Stroke [ mm ]	417,4	3007,3
		32 × 10	21,76 + 0,069 · Stroke [ mm ]		
		32 × 20	24,12 + 0,069 · Stroke [ mm ]		
		32 × 32	29,04 + 0,069 · Stroke [ mm ]		
	L	32 × 5	33,41 + 0,069 · Stroke [ mm ]		
		32 × 10	34,59 + 0,069 · Stroke [ mm ]		
		32 × 20	39,31 + 0,069 · Stroke [ mm ]		
		32 × 32	49,12 + 0,069 · Stroke [ mm ]		

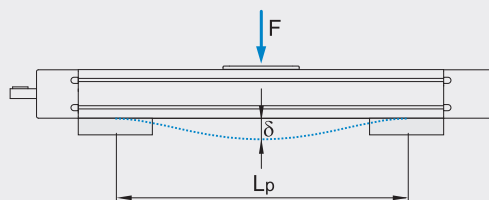
Mass of Linear unit

Linear unit	Carriage Length L <sub>v</sub> [ mm ]	Mass of Linear unit [ kg ]
CTV 200 S	80	15,4 + 0,031 · Stroke [ mm ]
CTV 200 L	255	23,8 + 0,031 · Stroke [ mm ]

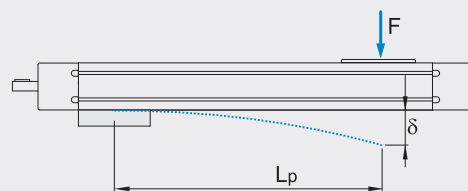
**i** Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

Deflection of the linear unit

Fixed - fixed mounting



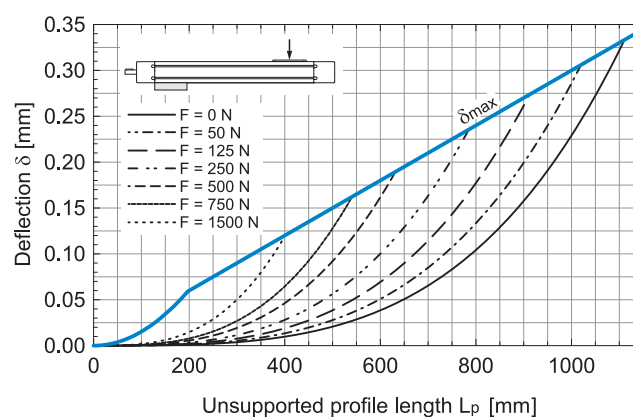
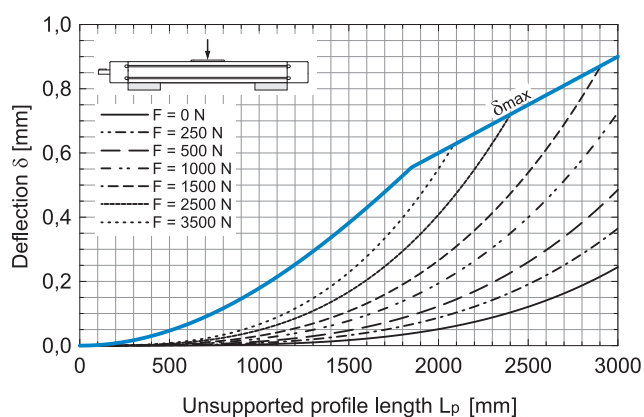
Fixed - free mounting



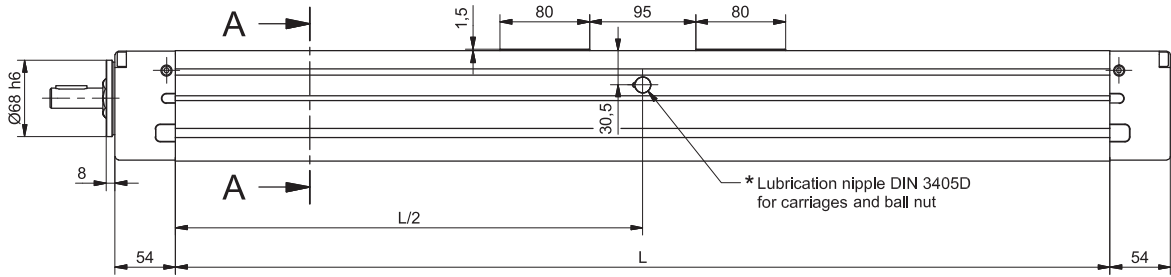
- δ Maximum deflection of the linear unit [mm]
- δ<sub>max</sub> Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- L<sub>p</sub> Unsupported profile length [mm]

**i** 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.

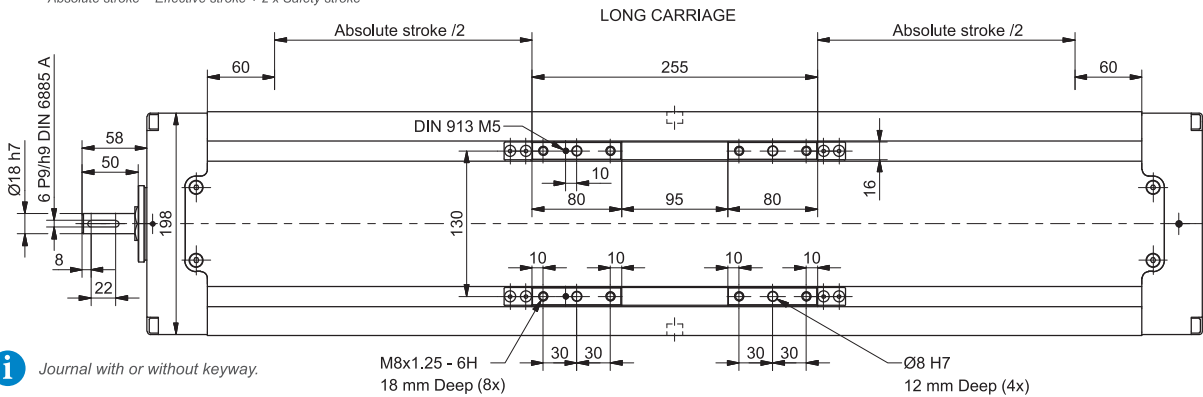
CTV 200



**DIMENSIONS**



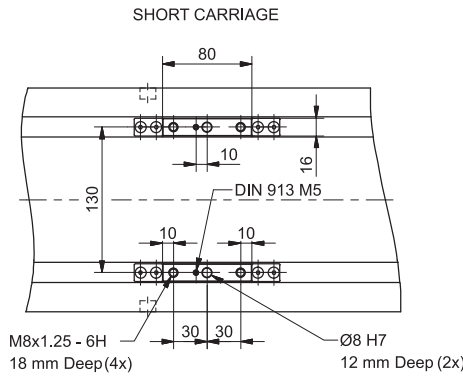
**i** Linear Unit doesn't include any safety stroke.  
Absolute stroke = Effective stroke + 2 x Safety stroke



**i** Journal with or without keyway.

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

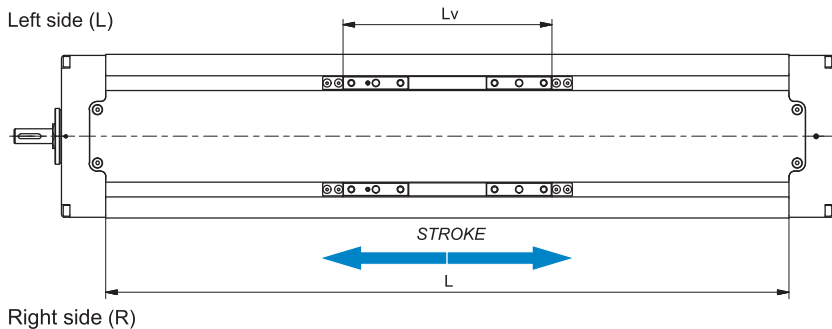
**i** All dimensions in mm.  
Drawings scales are not equal.



**Defining of the linear unit length**

**L = Effective stroke + 2 × Safety stroke + Lv + 120 mm**

**Ltotal = L + 108 mm**

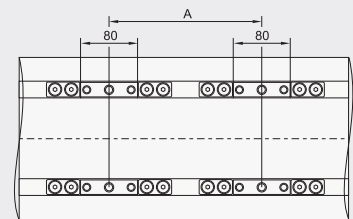


Lv - Long carriage = 255 mm  
Lv - Short carriage = 80 mm

**L = Effective stroke + 2 × Safety stroke + A + 200 mm**  
**Ltotal = L + 108 mm**

**Double-Carriage**

**i** Only with **short carriage** version.

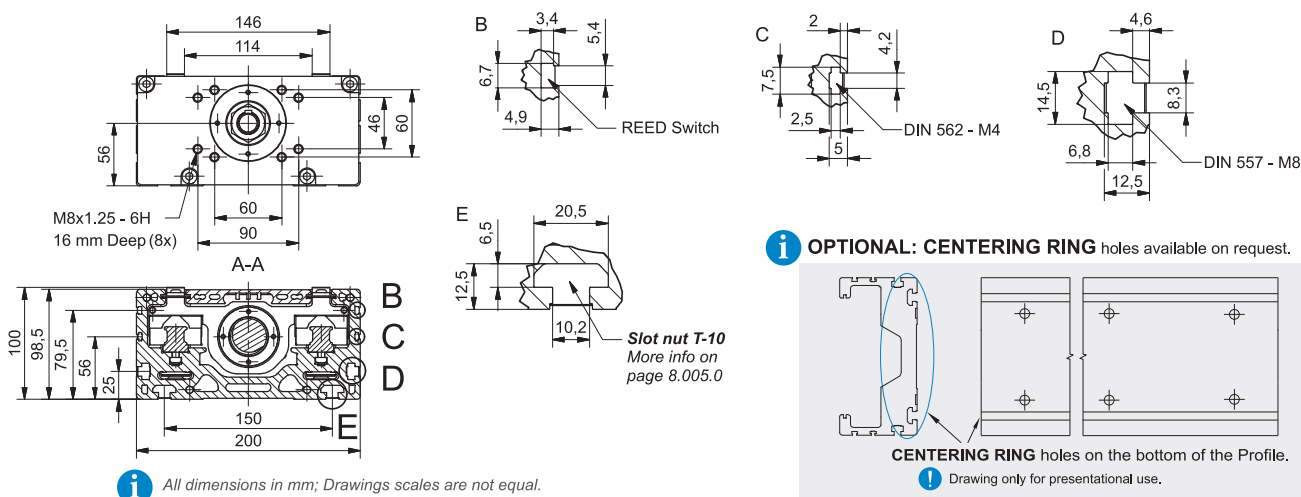


**i** For ordering code please contact us.

**A** ≥ 130 mm  
**\*A** ≥ 195 mm **!**

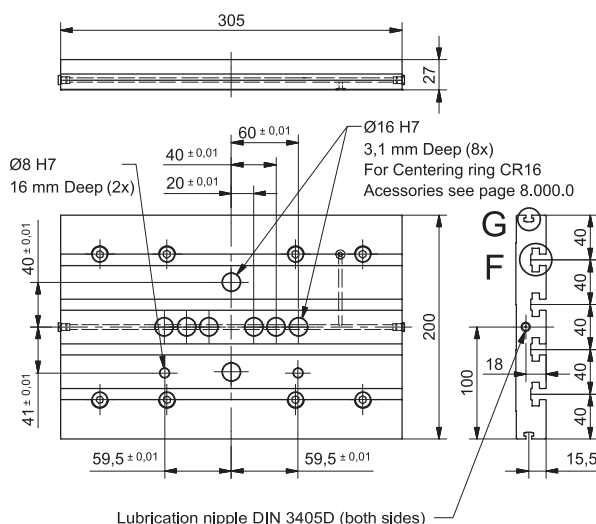
\* In case of using the connection plates.

**DIMENSIONS**

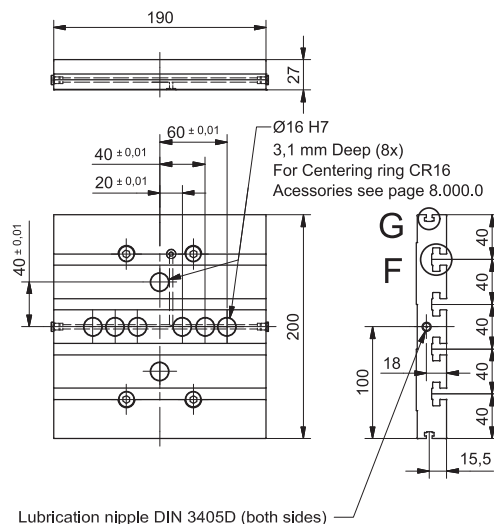


**CONNECTION PLATE**

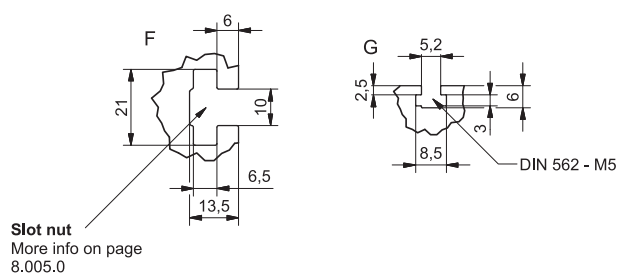
**CTV 200 L**



**CTV 200 S**



Linear Unit	Plate length [mm]	Weight [kg]	Code
CTV 200 S	190	2,32	66669
CTV 200 L	305	3,75	66657



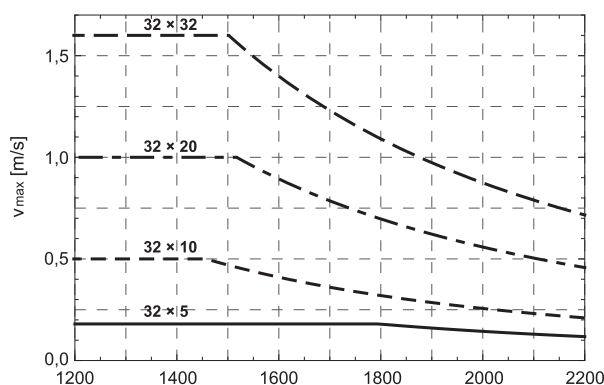
**i** Mounting elements for mounting the connection plate on the Linear unit are included.  
Please consider our advice in our Maintenance- and assembly instructions

**Mounting the drive**

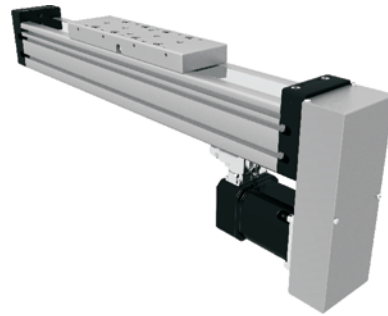
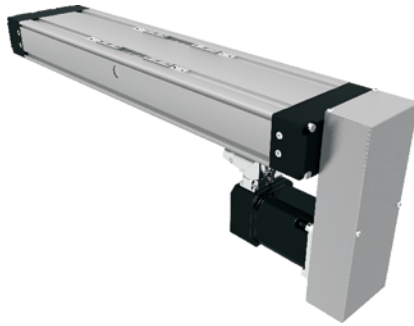
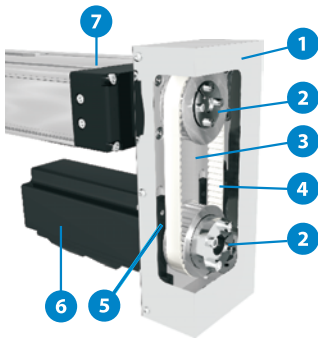
- by the **MOTOR SIDE DRIVE - MSD** (Page 7.095.0)
- by the **MOTOR ADAPTER WITH COUPLING** (Page 8.020.0)

**i** Available on request.

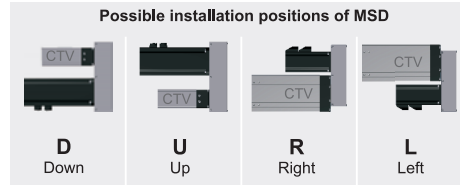
**Maximum travel speed as a function of the profile length (V<sub>max</sub> - L curves)**



## STRUCTURAL DESIGN

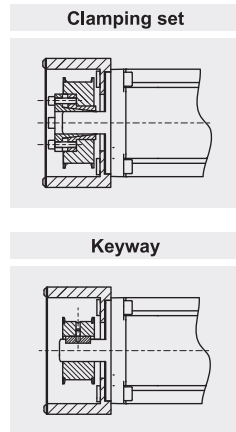
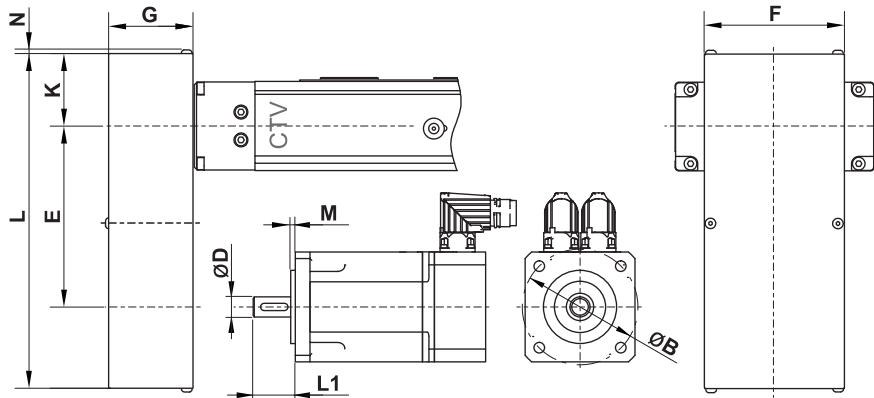


- 1 - Cover
- 2 - Attachment of pulley with clamping set
- 3 - Anodized aluminium housing
- 4 - Toothed belt
- 5 - Belt tensioning system (elongation and frequency of belt span provided with delivery of unit)
- 6 - Motor
- 7 - Linear unit - CTV / MTV



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

## DIMENSIONS AND 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 ]						Dimensions [ mm ]						
							ØB max	M max	L1		ØD max		E	F	G	K	L	N	
									Clamping set min	Keyway	max	Clamping set max	Keyway						
CTV 90	T1	i=1	2,7	90	79	0,88	70	4	22	25	39	14	22	100	70	41	31	179	2
		i=1,5	2,7	90	48	0,74			/			14	102						
CTV 110 MTV 65	T1	i=1	5	175	72	0,90	70	4	22	25	39	14	22	100	70	41	31	179	2
		i=1,5	5	175	41	0,80			/			14	112						
CTV 110 MTV 65	T2	i=1	9	245	206	1,51	100	4	24	30	49	18	30	145	90	51	43	250	2
		i=1,5	11	235	335	1,53			14			139							
CTV 145 MTV 80	T1	i=1	13	350	207	1,52	100	4	24	30	49	18	30	145	90	51	43	250	2
		i=1,5	19	410	335	1,64			14			180							
CTV 145 MTV 80	T2	i=1	19	410	551	3,30	120	4	30	35	59	22	40	160	120	61	56	297	2,5
		i=2	24	375	860	2,93						14	32						
CTV 200 MTV 110	ON REQUEST																		

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

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

\*\* 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.

## HOW TO ORDER

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

Motor Side Drive: \_\_\_\_\_

Linear Unit series : \_\_\_\_\_

CTV / MTV

Type : \_\_\_\_\_

Motor type :

According to customer's drawing

Gear ratio :