

Linear Unit CTJ 110

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.

Dimensions in mm.

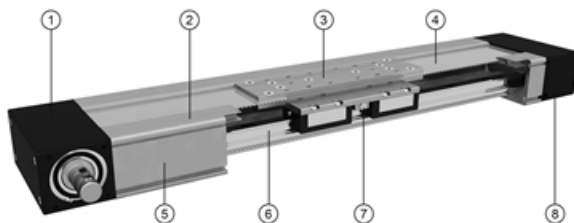
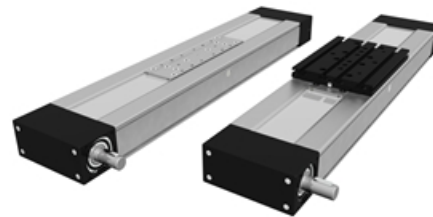
Modulus of Elasticity: $E = 70000 \text{ N/mm}^2$

Operating Temperature (°C): $0 \sim +60$ For operating temperature out of the presented range, please contact Rollco.

Duty Cycle: 100%

Max. Acceleration (m/s²): 70

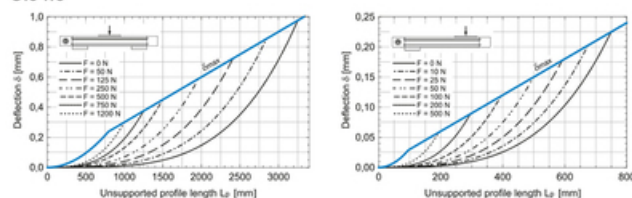
Max. Travel Speed (m/s): 6



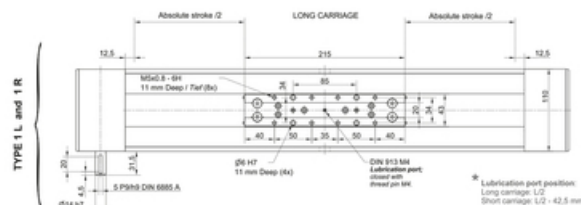
1. Drive block with pulley
2. Aluminum cover
3. Carriage, with built in magnets
4. AT polyurethane toothed belt with steel tension cords
5. Aluminum profile - hard anodized
6. Two integrated linear ball guideways
7. Central lubrication port, both sides
8. Tension end with integrated belt tensioning system

Deflection of the linear unit

CTJ 110



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

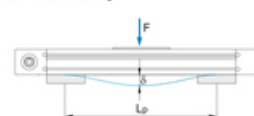


① Journal with or without keyway ② All dimensions in mm. Drawings scales are not equal.

Deflection of the linear unit

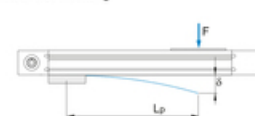
CTJ

Fixed - fixed mounting



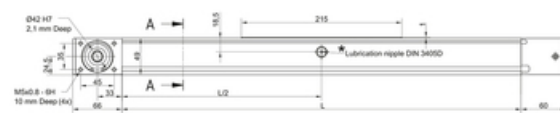
- δ: Maximum deflection of the linear unit [mm]
 δ_{max} : Maximum permissible deflection of the linear unit [mm]
 F : Applied force [N]
 L_p : Unsupported profile length [mm]

Fixed - free mounting



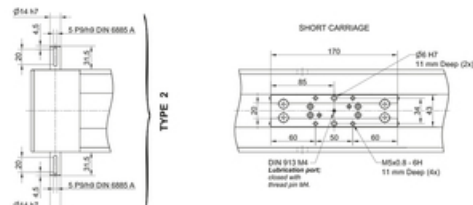
The maximum permissible deflection δ_{max} must not be exceeded. In the case that maximum deflection δ exceeds the maximum permissible deflection δ_{max} additional profile supports are needed.

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



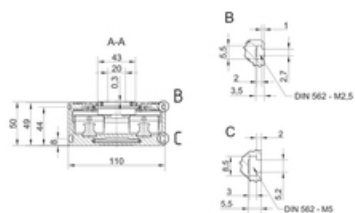
① Journal with or without keyway ② All dimensions in mm. Drawings scales are not equal.

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

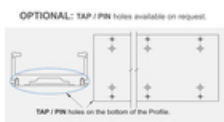


① Journal with or without keyway ② All dimensions in mm. Drawings scales are not equal.

Linear Unit CTJ 110



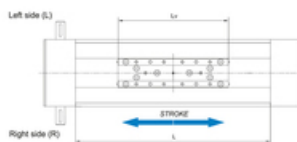
① All dimensions in mm. Drawings scales are not equal.



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

Double-Carriage

① Only with short carriage version.

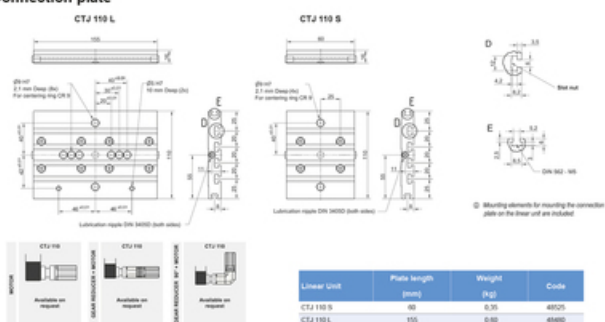


$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + A + 195 \text{ mm}$$

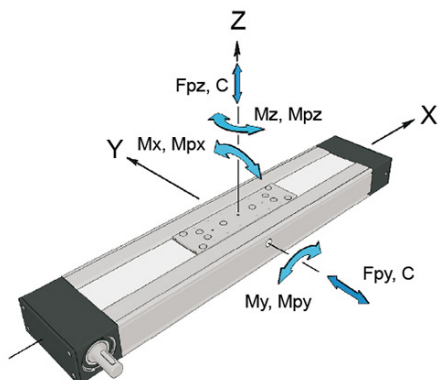
$$L_{\text{total}} = L + 126 \text{ mm}$$

A ≥ 170 mm

Connection plate



General data



For length/stroke over the stated value, 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, please contact Rollco.

Recommended values of loads

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

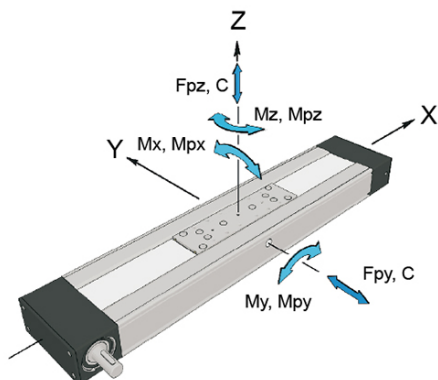
We recommend a minimum safety factor ($f_s = 5.0$).

| Designation | Carriage Length L_v (mm) | Dynamic Moment M_x (Nm) | Dynamic Moment M_y (Nm) | Dynamic Moment M_z (Nm) | Dynamic Load Capacity C (N) |
|------------------|----------------------------|---------------------------|---------------------------|---------------------------|-------------------------------|
| CTJ 110 S | 170 | 610 | 118 | 235 | 19800 |
| CTJ 110 L | 215 | 1225 | 1680 | 1680 | 39600 |

| Designation | Static Load Capacity C_0 (N) | Max. Permissible Loads Forces F_{py} (N) | Max. Permissible Loads Forces F_{pz} (N) | Max. Permissible Loads Moments M_{px} (Nm) | Max. Permissible Loads Moments M_{py} (Nm) | Max. Permissible Loads Moments M_{pz} (Nm) |
|------------------|--------------------------------|--|--|--|--|--|
| CTJ 110 S | 35000 | 6470 | 8390 | 260 | 90 | 90 |
| CTJ 110 L | 70000 | 13070 | 18820 | 525 | 880 | 550 |

| Designation | Moved Mass (kg) | Max. Repeatability (mm) | Max. Length L_{max} (mm) | Max. Stroke (mm) | Min. Stroke (mm) |
|------------------|-----------------|-------------------------|----------------------------|------------------|------------------|
| CTJ 110 S | 0.64 | ± 0.08 | 6000 | 5805 | 40 |
| CTJ 110 L | 0.98 | ± 0.08 | 6000 | 5760 | 40 |

General data double carriage



A - Distance between carriages.

Recommended values of loads

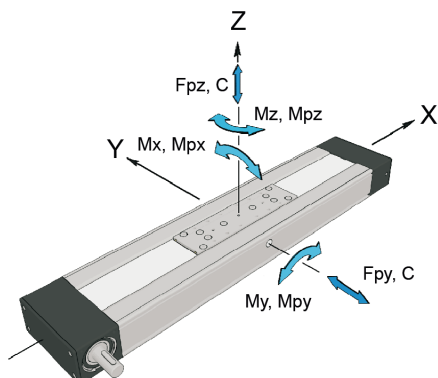
All the data of static and dynamic moments and load capacities stated are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety.

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

| Designation | Carriage version | Dynamic Load Capacity C (N) | Static Load Capacity C0 (N) | Dynamic Moment Mx (Nm) | Dynamic Moment My (Nm) |
|-------------|------------------|-----------------------------|-----------------------------|------------------------|------------------------|
| CTJ 110 S | S2 | 39600 | 70000 | 1220 | $19.8 \times A$ (mm) |
| CTJ 110 L | S2 | 39600 | 70000 | 1220 | $19.8 \times A$ (mm) |

| Designation | Dynamic Moment Mz (Nm) | Max. Permissible Loads Forces Fpy (N) | Max. Permissible Loads Forces Fpz (N) | Max. Permissible Loads Moments Mpx (Nm) | Max. Permissible Loads Moments Mpy (Nm) | Max. Permissible Loads Moments Mpz (Nm) |
|-------------|------------------------|---------------------------------------|---------------------------------------|---|---|---|
| CTJ 110 S | $19.8 \times A$ (mm) | 12940 | 16770 | 520 | $8.4 \times A$ (mm) | $6.5 \times A$ (mm) |
| CTJ 110 L | $19.8 \times A$ (mm) | 12940 | 16770 | 520 | $8.4 \times A$ (mm) | $6.5 \times A$ (mm) |

Drive data



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

Max. acceleration (m/s²): 70

For acceleration over the stated value, please contact Rollco.

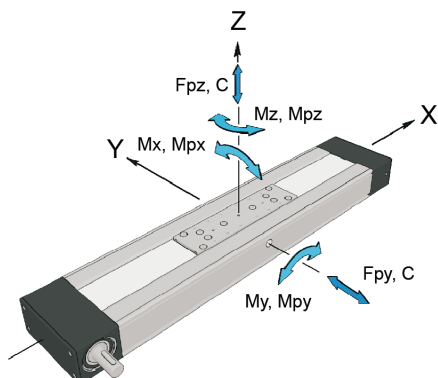
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

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

| Designation | Max. Travel Speed (m/s) | No Load Torque (Nm) | Pulley Drive Ratio (mm/rev) | Pulley Diameter | Belt Type |
|-------------|-------------------------|---------------------|-----------------------------|-----------------|-----------|
| CTJ 110 S | 6 | 0.98 × nc | 120 | 38.2 | AT 5 |
| CTJ 110 L | 6 | 1.00 × nc | 120 | 38.2 | AT 5 |

| Designation | Belt Width | Max. Force Transmitted by Belt (N) | Specific Spring Constant Cspec (N) | Max. Drive Torque (Nm) | Planar Moment of Inertia Iy (cm ⁴) | Planar Moment of Inertia Iz (cm ⁴) |
|-------------|------------|------------------------------------|------------------------------------|------------------------|--|--|
| CTJ 110 S | 50 | 820 | 960000 | 15.7 | 31.1 | 217.2 |
| CTJ 110 L | 50 | 820 | 960000 | 15.7 | 31.1 | 217.2 |

Mass and Mass moment



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

Max. acceleration (m/s²): 70

For acceleration over the stated value, please contact Rollco.

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

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

| Designation | Mass of Linear Unit (kg) | Mass Moment of Inertia (10 ⁻⁵ kg m ²) | Planar Moment of Inertia I _y (cm ⁴) | Planar Moment of Inertia I _z (cm ⁴) | Moved Mass (kg) |
|------------------|---|--|--|--|-----------------|
| CTJ 110 S | $3.6 + 0.0072 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 0.64 \times (nc - 1)$ | $36 + 0.0125 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 23.3 \times (nc - 1)$ | 31.1 | 217.2 | 0.64 |
| CTJ 110 L | $4.2 + 0.0072 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 0.98 \times (nc - 1)$ | $49 + 0.0125 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 35.8 \times (nc - 1)$ | 31.1 | 217.2 | 0.98 |

| Designation | No Load Torque (Nm) |
|------------------|---------------------|
| CTJ 110 S | $0.98 \times nc$ |
| CTJ 110 L | $1.00 \times nc$ |