

## Linear Unit MTJ ECO 40

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

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

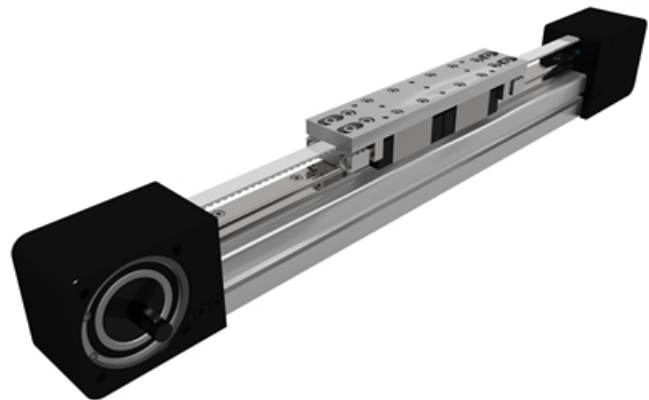
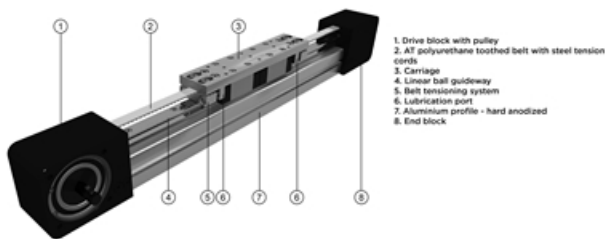
**Modulus of Elasticity:**  $E = 70000 \text{ N / mm}^2$

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

**Duty Cycle: 100%**

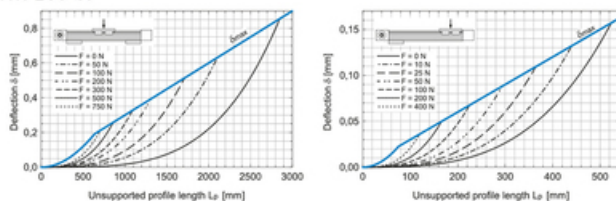
**Max. Acceleration (m/s<sup>2</sup>): 70**

**Max. Travel Speed (m/s): 3**

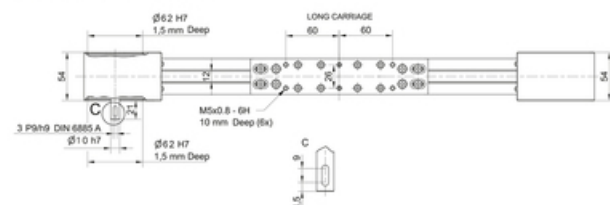


### Deflection of the linear unit

## MTJ ECO 40



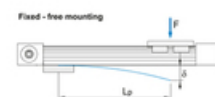
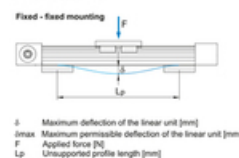
③ The linear units do not include any safety stroke.  
 $\text{Absolute stroke} = \text{Effective stroke} + 2 \times \text{safety stroke}$



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

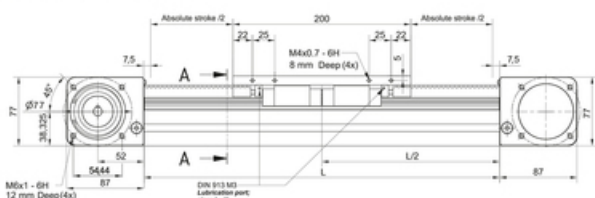
### Deflection of the linear unit

## MTJ ECO 40



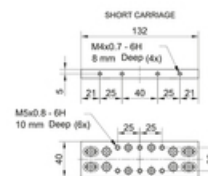
The maximum permissible deflection  $\delta_{\max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{\max}$  additional profile supports are needed.

① The linear units do not include any safety stroke.  
 $\text{Absolute stroke} = \text{Effective stroke} + 2 \times \text{safety stroke}$



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

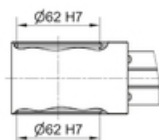
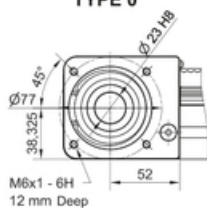
① The linear units do not include any safety stroke.  
 $\text{Absolute stroke} = \text{Effective stroke} + 2 \times \text{safety stroke}$



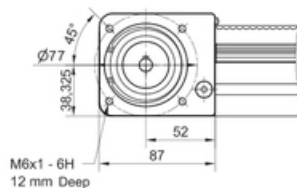
① Journal with or without keyway;      ② All dimensions in mm. Drawings scales are not equal

# Linear Unit MTJ ECO 40

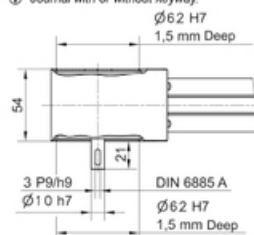
TYPE 0



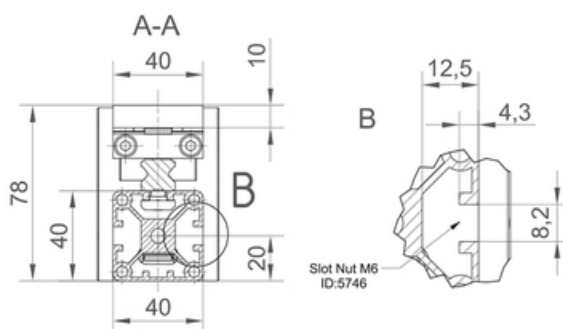
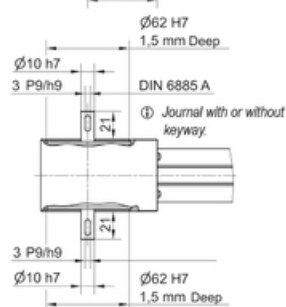
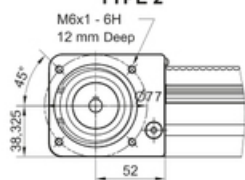
TYPE 1 L and 1 R



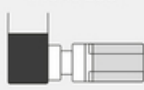
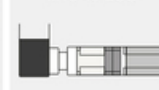

① Journal with or without keyway.



TYPE 2



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

| MOTOR | MTJ 40 ECO  | MTJ 40 ECO  | MTJ 40 ECO  |
|-------|---|---|---|
|       | <br>Available on request | <br>Available on request | <br>Available on request |
|       | GEAR REDUCER + MOTOR  |   | GEAR REDUC. 90° + MOTOR   |

## Defining of the linear unit length

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

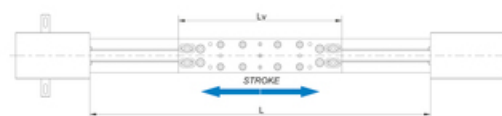
$L_{\text{total}} = L + 174 \text{ mm}$

Left side (L)

$L_v - \text{Long carriage} = 200 \text{ mm}$

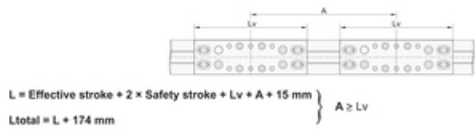
$L_v - \text{Short carriage} = 132 \text{ mm}$

Right side (R)

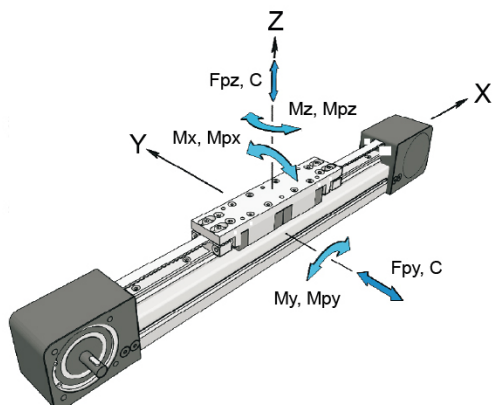


# Linear Unit MTJ ECO 40

## Double Carriage



## 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

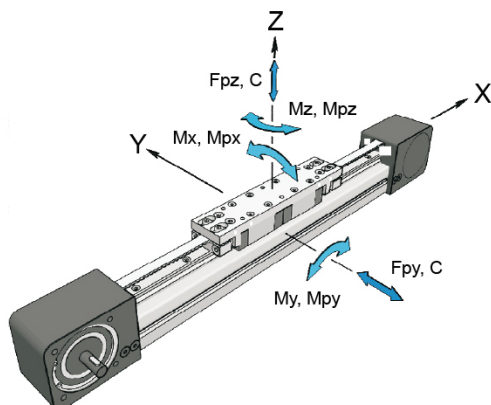
All the data of static and dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor.  
 The safety factor depends on the application and its requested safety.  
 We recommend a minimum safety factor ( $f_s = 5.0$ ).

| 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) |
|--------------|----------------------------|---------------------------|---------------------------|---------------------------|-------------------------------|
| MTJ 40 ECO S | 132                        | 79                        | 59                        | 59                        | 9900                          |
| MTJ 40 ECO L | 200                        | 158                       | 660                       | 660                       | 19800                         |

| 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) |
|--------------|--------------------------------|--|--|--|--|--|
| MTJ 40 ECO S | 17500                          | 3270                                       | 5100                                       | 34   | 34   | 34   |
| MTJ 40 ECO L | 35000                          | 6540                                       | 10190                                      | 60   | 341  | 219  |

| Designation  | Moved Mass (kg) | Max. Repeatability (mm) | Max. Length $L_{max}$ (mm) | Max. Stroke (mm) | Min. Stroke (mm) |
|--------------|-----------------|-------------------------|----------------------------|------------------|------------------|
| MTJ 40 ECO S | 0.45            | $\pm 0.1$               | 5960                       | 5813             | 40               |
| MTJ 40 ECO L | 0.72            | $\pm 0.1$               | 5960                       | 5745             | 40               |

## General data double carriage

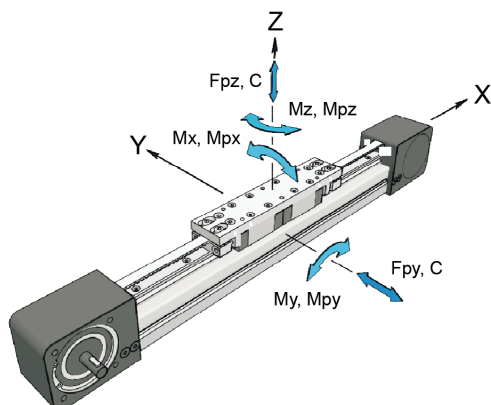


A - Distance between carriages.

| Designation         | Carriage version | Dynamic Load Capacity C (N) | Static Load Capacity C0 (N) | Dynamic Moment Mx (Nm) | Dynamic Moment My (Nm) |
|---------------------|------------------|-----------------------------|-----------------------------|------------------------|------------------------|
| <b>MTJ 40 ECO S</b> | S2               | 19800                       | 35000                       | 158                    | $9.9 \times A$ (mm)    |
| <b>MTJ 40 ECO L</b> | L2               | 39600                       | 70000                       | 317                    | $19.8 \times A$ (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) |
|---------------------|------------------------|---------------------------------------|---------------------------------------|---|---|---|
| <b>MTJ 40 ECO S</b> | $9.9 \times A$ (mm)    | 6540                                  | 10190                                 | 68                                      | $5.1 \times A$ (mm)                     | $3.3 \times A$ (mm)                     |
| <b>MTJ 40 ECO L</b> | $19.8 \times A$ (mm)   | 13080                                 | 20380                                 | 120                                     | $10.1 \times A$ (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/s<sup>2</sup>): 70

For acceleration over the stated value, please contact Rollco.

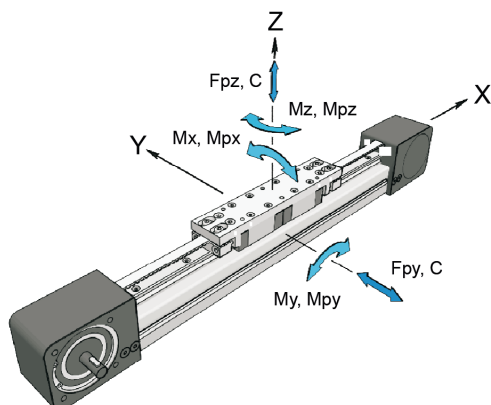
Mass calculation does not include mass of motor, reduction gear, switches and clamps.

|             |                                 |
|-------------|---------------------------------|
| 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 |
|--------------|-------------------------|---------------------|-----------------------------|-----------------|-----------|
| MTJ 40 ECO S | 3                       | 1.0 × nc            | 180                         | 57.31           | AT5       |
| MTJ 40 ECO L | 3                       | 1.1 × nc            | 180                         | 57.31           | AT5       |

| Designation  | Belt Width | Max. Force Transmitted by Belt (N) | Specific Spring Constant Cspec (N) | Max. Drive Torque (Nm) | Planar Moment of Inertia Iy (cm <sup>4</sup> ) | Planar Moment of Inertia Iz (cm <sup>4</sup> ) |
|--------------|------------|------------------------------------|------------------------------------|------------------------|--|--|
| MTJ 40 ECO S | 12         | 262                                | 235000                             | 7.5                    | 9.53   | 9.21   |
| MTJ 40 ECO L | 12         | 262                                | 235000                             | 7.5                    | 9.53   | 9.21   |

## 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/s<sup>2</sup>): 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 <sup>-5</sup> kg m <sup>2</sup> )                          | Planar Moment of Inertia Iy (cm <sup>4</sup> ) | Planar Moment of Inertia Iz (cm <sup>4</sup> ) | Moved Mass (kg) |
|---------------------|---|---|--|--|-----------------|
| <b>MTJ 40 ECO S</b> | $3.1 + 0.003 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 0.45 \times (nc - 1)$  | $70.1 + 0.007 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 36.9 \times (nc - 1)$ | 9.53   | 9.21   | 0.45            |
| <b>MTJ 40 ECO L</b> | $3.55 + 0.003 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 0.72 \times (nc - 1)$ | $92.3 + 0.007 \times (\text{Abs. Stroke} + (nc - 1) \times A) + 59.1 \times (nc - 1)$ | 9.53   | 9.21   | 0.72            |

| Designation         | No Load Torque (Nm) |
|---------------------|---------------------|
| <b>MTJ 40 ECO S</b> | $1.0 \times nc$     |
| <b>MTJ 40 ECO L</b> | $1.1 \times nc$     |