Linear Modules MLR

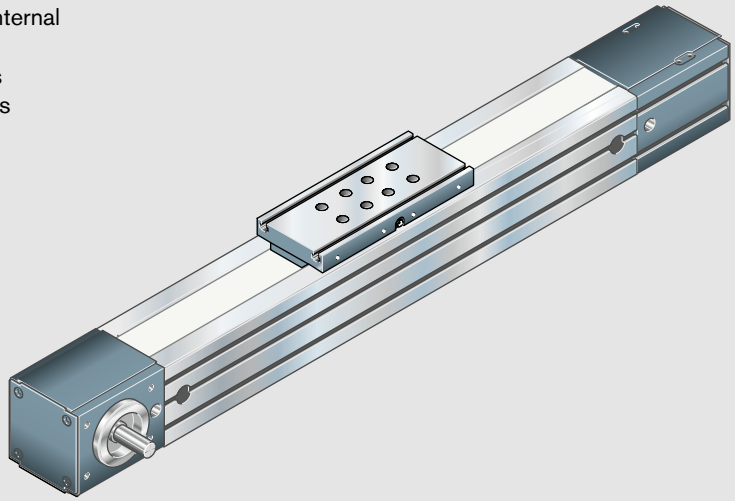
# Product Description

## Characteristic features

MLR...: Linear Modules with Cam Roller Guide and Toothed Belt Drive for high-speed applications (up to 10 m/s)

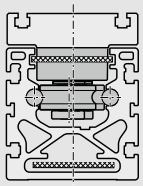
⚠ **Linear Modules with Cam Roller Guide to be lubricated with oil only!**

The MLR... Linear Modules comprise:
- a compact, anodized aluminum profile frame
- the integrated Rexroth Cam Roller Guide system with internal cam rollers
- cam rollers, clearance-free adjusted via eccentric shafts
- a carriage with one-point oil lubrication for all cam rollers
- the pre-tensioned toothed belt
- mountable switches
- an AC servo motor with control units
- gear unit
- a cover provided by the toothed belt



For mounting and maintenance, see the relevant Instructions.

**MLR**



**Linear Module with Cam Roller Guide and Toothed Belt Drive**
The special design of the integrated zero-clearance Rexroth Cam Roller Guide makes it ideal for very high speeds (up to 10 m/s).

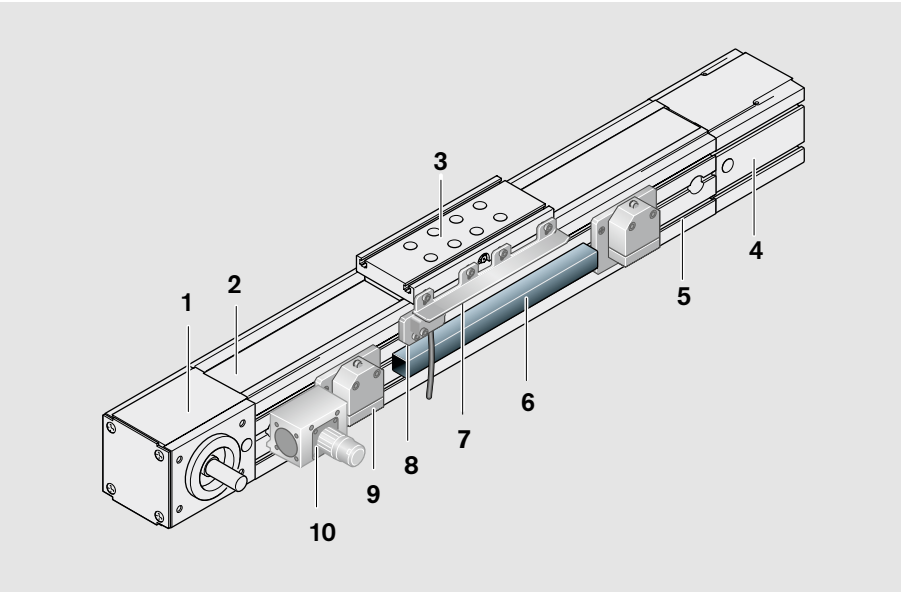
# Structural Design

## Structural design

**1** Drive end enclosure
**2** Toothed belt
**3** Carriage with runner blocks
**4** Idler (non-drive) end enclosure
**5** Frame

**Attachments:**

**6** Cable duct
**7** Switching cam
**8** Proximity switch
**9** Mechanical switch
**10** Socket-plug




## Versions

**MA01 and MA02**

With drive unit (MA) without gear reducer (i = 1), journal for motor attachment right or left.

**MA03**

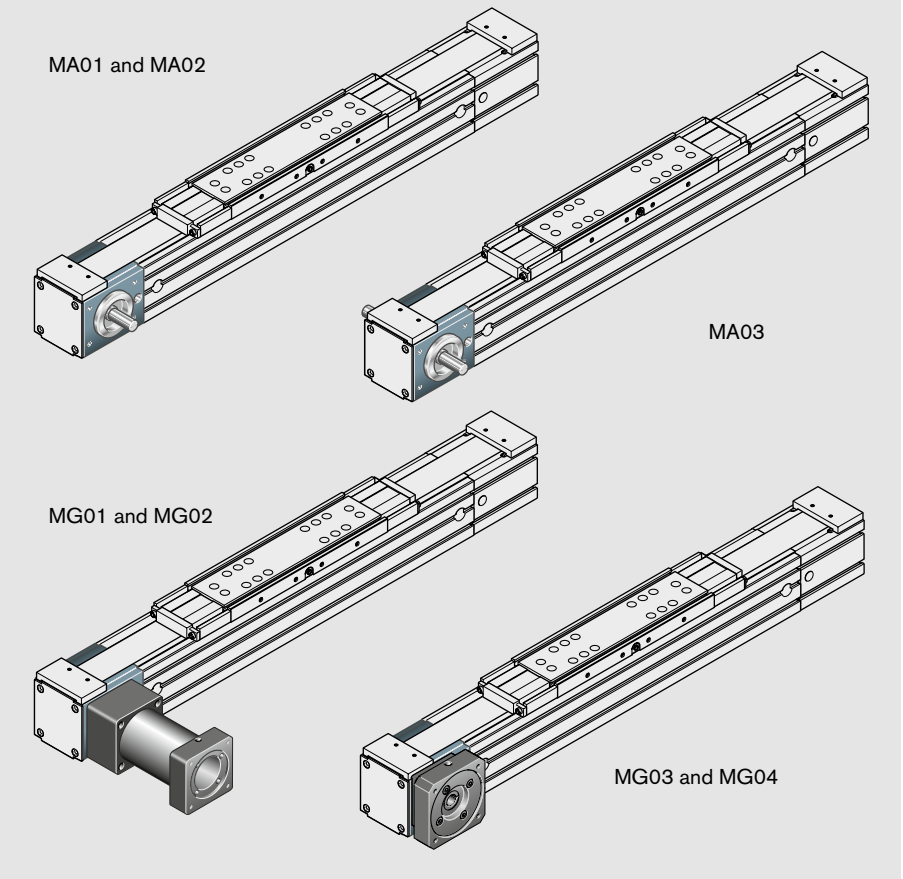
As MA01 and MA02, journal for motor attachment on both sides.

**MG01 and MG02**

With gear reducer, motor attachment via motor mount and socket.

**MG03 and MG04**

With integrated gear reducer, motor attachment via motor mount and socket.

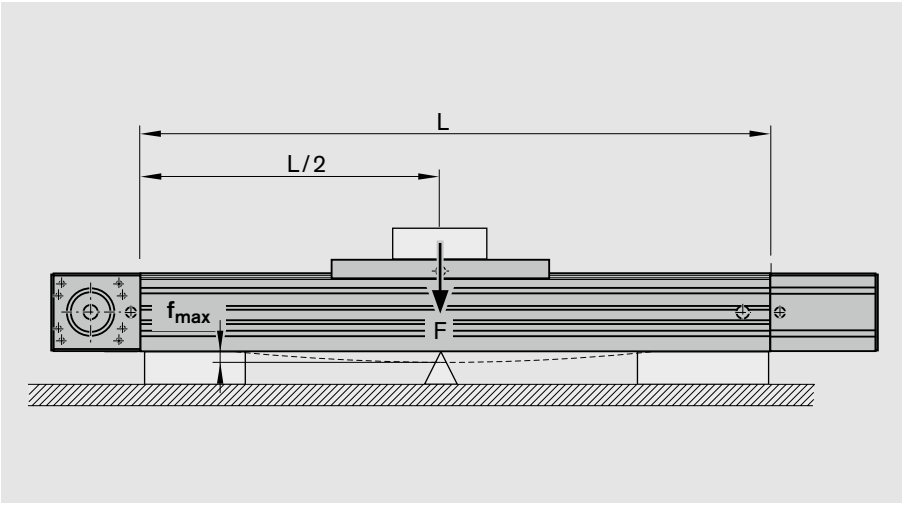


Linear Modules MLR

# Technical Data

## Deflection

A particular feature of Linear Modules is that they can be installed as cantilevered axes.
Deflection must, however, be taken into consideration, because it limits the possible load.
If the maximum permissible deflection is exceeded, additional supports must be provided.




## Maximum permissible deflection $f_{max}$

The maximum permissible deflection $f_{max}$ depends on the length L and the load F.

⚠ **$f_{max}$ must not be exceeded! If high system dynamics are required, supports must be provided every 300 to 600 mm.**

## Example

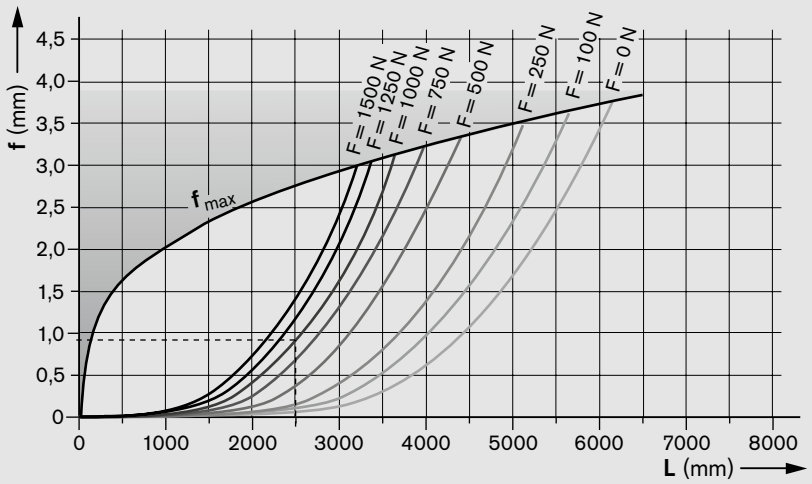
Linear Module MLR 10-80:
L = 3000 mm
F = 500 N
From chart 10-80:
f = 0.9 mm
$f_{max}$ = 3.4 mm

The deflection f lies well below the maximum permissible deflection $f_{max}$, so no additional supports are required.

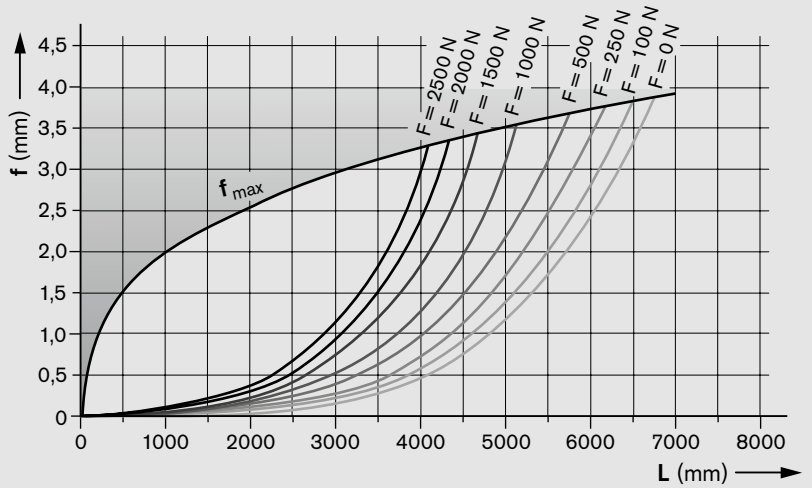
**The graphs apply under the following conditions:**

- Both ends firmly fixed (200 to 250 mm per end)
- 6 to 8 screws per side
- Solid mounting base

**MLR 10-80**




**MLR 10-110**



Linear Modules MLR

# Technical Data

## General technical data

| | Carriage length | Dynamic load capacities*) | | Dynamic load moments*) | | Maximum permissible loads | | | | Moved mass | Minimum length | Maximum length | Planar moment of inertia | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Forces | | Moments | | | | | | |
| | | $C_x$ (N) | $C_y$ (N) | $M_t$ (Nm) | $M_L$ (Nm) | $F_{x\,max}$ (N) | $F_{y\,max}$ (N) | $M_{t\,max}$ (Nm) | $M_{l\,max}$ (Nm) | (kg) | $L_{min}$ (mm) | $L_{max}$ (mm) | $I_x$ ($cm^4$) | $I_y$ ($cm^4$) |
| **MLR 10-80** | 190 | 17 150 | 10 050 | 226 | 316 | 2500 | 1500 | 35 | 158 | 1.7 | 480 | 10000 | 128 | 201 |
| **MLR 10-110** | 305 | 31 000 | 18 200 | 629 | 1121 | 8000 | 4800 | 49 | 302 | 3.3 | 605 | 10000 | 479 | 692 |

*) Dynamic load capacities and load moments for nominal life calculation

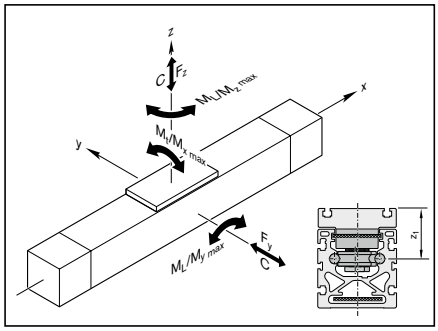
## Note on dynamic load capacities and moments

Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m. Often only 50,000 m are actually stipulated.
For comparison:
Multiply values C, $M_t$ and $M_L$ from the table by 1.26.

**Combined equivalent load on bearing of the linear guide**

$$F_{comb} = |F_y| + |F_z| + C \cdot \frac{|M_x|}{M_t} + C \cdot \frac{|M_y|}{M_L} + C \cdot \frac{|M_z|}{M_L}$$

| | Dimension (mm) |
|---|---|
| | $Z_1$ |
| **MLR 10-80** | 50 |
| **MLR 10-110** | 55 |




Nominal life of the guideway in meters:

$$L = \left(\frac{C}{F_{comb}}\right)^3 \cdot 10^5$$

Nominal life of the guideway in hours:

$$L_h = \frac{L}{3600 \cdot v_m}$$

| | | | |
|---|---|---|---|
| C | = | dynamic load capacity | (N) |
| $F_{comb}$ | = | combined equivalent load on bearing | (N) |
| $F_y$ | = | force in y-direction | (N) |
| $F_z$ | = | force in z-direction | (N) |
| L | = | nominal life in meters | (m) |
| $L_h$ | = | nominal life in hours | (h) |
| $M_L$ | = | dynamic longitudinal moment load capacity | (Nm) |
| $M_t$ | = | dynamic torsional moment load capacity | (Nm) |
| $M_x$ | = | torsional moment about the x-axis | (Nm) |
| $M_y$ | = | torsional moment about the y-axis | (Nm) |
| $M_z$ | = | torsional moment about the z-axis | (Nm) |
| $v_m$ | = | average travel speed | (m/s) |
| $Z_1$ | = | application point of the effective force | (mm) |

## Drive data

| | Gear reducer ratio i | Maximum drive torque $M_a$ (Nm) | Lead constant (mm/rev) | Belt data: Belt type | Width (mm) | Tooth pitch (mm) | Max. belt drive transmission force (N) | Belt elasticity limit (N) | Specific spring rate $c_{spec}$ (N) |
|---|---|---|---|---|---|---|---|---|---|
| **MLR 10-80** | 1 | 32.0 | 205.00 | AT 5 | 50 | 5 | 980 | 3500 | $0.875 \cdot 10^6$ |
| | 1 with keyway | 27.0 | 205.00 | | | | | | |
| | 3 | 10.7 | 68.33 | | | | | | |
| | 5 | 6.4 | 41.00 | | | | | | |
| | 10 | 3.2 | 20.50 | | | | | | |
| **MLR 10-110** | 1 | 80.0 | 290.00 | AT 10 | 50 | 10 | 1740 | 7500 | $2.12 \cdot 10^6$ |
| | 1 with keyway | 27.0 | 290.00 | | | | | | |
| | 3 | 26.7 | 96.66 | | | | | | |
| | 5 | 16.0 | 58.00 | | | | | | |
| | 10 | 8.0 | 29.00 | | | | | | |

**Modulus of elasticity E**

$E = 70\,000\ N/mm^2$

**Lengths in excess of $L_{max}$**

Lengths in excess of $L_{max}$ are available on request.

**Weight**

Weight calculation does not include motor or switch attachments.
Weight formula:
Weight factor (kg/mm) · length L (mm) + weight of all parts of fixed length (carriage, end blocks, etc.) (kg)

| | Carriage length (mm) | Drive units | Weight (kg) |
|---|---|---|---|
| **MLR 10-80** | 190 | Without drive unit | 0.0089 · L + 4.4 |
| | | Drive i = 1 | 0.0089 · L + 4.9 |
| | | With LP gear reducer | 0.0089 · L + 8.3 |
| **MLR 10-110** | 305 | Without drive unit | 0.0141 · L + 9.7 |
| | | Drive i = 1 | 0.0141 · L + 10.1 |
| | | With LP gear reducer | 0.0141 · L + 16.9 |

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# Performance Data

# MLR 10-80

### Drive data without motor (i = 1)

| | |
|---|---|
| **Belt pulley drive diameter** | 65.27 mm |
| **Travel speed $v_{mech}$** | Up to 10 m/s |
| **Mass moment of inertia $J_s$ (short carriage)** | (21.1 + L (mm) · 0.00379) · $10^{-4}$ kgm² |
| **Mass moment of inertia $J_s$ (long carriage)** | (29.7 + L (mm) · 0.00379) · $10^{-4}$ kgm² |

## Horizontal operation

**MSK 040C, HCS02.1E-W0028, 3 x 400 V**

| i | | 3 | | | | 5 | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 1 | 2 | 3 | 4 | 4 | 6 | 10 | 14 | 18 | 10 | 20 | 40 | 60 | 80 |
| $t_a$ | (ms) | 77 | 89 | 100 | 110 | 75 | 85 | 105 | 130 | 155 | 110 | 145 | 210 | 280 | 364 |
| $s_a$ | (mm) | 190 | 220 | 250 | 278 | 120 | 145 | 180 | 220 | 263 | 110 | 145 | 210 | 280 | 364 |
| a | ($m/s^2$) | 65 | 56 | 50 | 45 | 47 | 40 | 32 | 26 | 22 | 18 | 13.5 | 9.4 | 7 | 5.5 |
| $v_{dc}$ | (m/s) | 5 | | | | 3.4 | | | | | 2 | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | |

**MSK 050C, HCS02.1E-W0028/W0054, 3 x 400 V**

| i | | 3 | | | | | 5 | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 2 | 5 | 8 | 11 | 14 | 6 | 14 | 22 | 30 | 38 | 20 | 40 | 60 | 80 | 100 |
| $t_a$ | (ms) | 85 | 110 | 135 | 160 | 185 | 145 | 205 | 255 | 315 | 375 | 230 | 300 | 370 | 445 | 510 |
| $s_a$ | (mm) | 210 | 270 | 335 | 400 | 465 | 300 | 420 | 525 | 645 | 760 | 230 | 300 | 370 | 445 | 510 |
| a | ($m/s^2$) | 60 | 46 | 37 | 31 | 27 | 28 | 20 | 16 | 13 | 11 | 8.6 | 6.6 | 5.4 | 4.5 | 3.9 |
| $v_{dc}$ | (m/s) | 5 | | | | | 4.1 | | | | | 2 | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | |

**MSM 041B, HCS01.1E-W0013, 230 V**

| i | | 5 | | | | | 10 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 2 | 4 | 6 | 8 | 10 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| $t_a$ | (ms) | 29 | 36 | 43 | 49 | 55 | 42 | 53 | 61 | 69 | 78 | 86 | 95 |
| $s_a$ | (mm) | 30 | 37 | 43 | 49 | 55 | 21 | 27 | 31 | 35 | 40 | 43 | 48 |
| a | ($m/s^2$) | 68 | 55 | 47 | 40.8 | 36.2 | 23 | 19 | 16 | 14.5 | 12.8 | 11.5 | 10.5 |
| $v_{dc}$ | (m/s) | 2 | | | | | 1 | | | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | |

## Vertical operation (frame stationary, carriage travels)

**MSK 040C, HCS02.1E-W0028, 3 x 400 V**

| i | | 3 | | | | 5 | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 1 | 2 | 3 | 4 | 2 | 6 | 10 | 14 | 18 | 5 | 10 | 15 | 20 | 25 |
| $t_a$ | (ms) | 80 | 95 | 110 | 125 | 65 | 95 | 125 | 160 | 215 | 105 | 135 | 165 | 208 | 285 |
| $s_a$ | (mm) | 200 | 230 | 270 | 313 | 105 | 155 | 215 | 275 | 360 | 105 | 135 | 165 | 208 | 285 |
| a | ($m/s^2$) | 63 | 54 | 46 | 40 | 54 | 37 | 27 | 21 | 16 | 19.5 | 15 | 12 | 9.6 | 7 |
| $v_{dc}$ | (m/s) | 5 | | | | 3.4 | | | | | 2 | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | |

**MSK 050C, HCS02.1E-W0028/W0054, 3 x 400 V**

| i | | 3 | | | | | 5 | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 2 | 5 | 8 | 11 | 14 | 5 | 10 | 15 | 20 | 25 | 10 | 20 | 30 | 40 | 50 |
| $t_a$ | (ms) | 85 | 115 | 155 | 195 | 230 | 150 | 205 | 265 | 342 | 436 | 235 | 340 | 500 | 400 | 740 |
| $s_a$ | (mm) | 215 | 290 | 380 | 465 | 570 | 310 | 420 | 540 | 700 | 895 | 235 | 340 | 500 | 200 | 370 |
| a | ($m/s^2$) | 58 | 43 | 33 | 26 | 22 | 27 | 20 | 15.5 | 12 | 9.4 | 8.5 | 5.9 | 4 | 2.5 | 1.35 |
| $v_{dc}$ | (m/s) | 5 | | | | | 4.1 | | | | | 2 | | | 1 | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | |

# MLR 10-110

## Drive data without motor (i = 1)

| | |
|---|---|
| **Belt pulley drive diameter** | 92.2 mm |
| **Travel speed $v_{mech}$** | Up to 10 m/s |
| **Mass moment of inertia $J_s$ (short carriage)** | (77.05 + L (mm) · 0.0123) · $10^{-4}$ kgm² |
| **Mass moment of inertia $J_s$ (long carriage)** | (146.35 + L (mm) · 0.0123) · $10^{-4}$ kgm² |

## Horizontal operation

### MSK 060C, HCS02.1E-W0054, 3 x 400 V

| i | | 3 | | | | 5 | | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 3 | 5 | 7 | 9 | 8 | 16 | 24 | 32 | 40 | 50 | 20 | 60 | 100 | 140 | 180 |
| $t_a$ | (ms) | 85 | 95 | 105 | 115 | 120 | 155 | 190 | 215 | 250 | 300 | 175 | 260 | 350 | 435 | 520 |
| $s_a$ | (mm) | 210 | 235 | 260 | 285 | 275 | 350 | 420 | 480 | 555 | 665 | 210 | 310 | 420 | 520 | 626 |
| a | ($m/s^2$) | 59 | 53 | 48 | 44 | 37 | 29 | 24 | 21 | 18 | 15 | 13.5 | 9.2 | 6.9 | 5.5 | 4.6 |
| $v_{dc}$ | (m/s) | 5 | | | | 4.5 | | | | | | 2.4 | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | |

### MSK 076 C, HCS02.1E-W0054, 3 x 400 V

| i | | 3 | | | | | | 5 | | | | | | 10 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 4 | 8 | 12 | 16 | 20 | 24 | 10 | 20 | 40 | 60 | 80 | 100 | 20 | 60 | 100 | 140 | 180 | 200 |
| $t_a$ | (ms) | 150 | 170 | 185 | 210 | 230 | 240 | 275 | 310 | 380 | 340 | 390 | 440 | 476 | 555 | 615 | 690 | 770 | 800 |
| $s_a$ | (mm) | 380 | 430 | 465 | 520 | 570 | 600 | 550 | 615 | 760 | 505 | 585 | 660 | 476 | 555 | 615 | 690 | 770 | 800 |
| a | ($m/s^2$) | 33 | 29 | 27 | 24 | 22 | 21 | 14.5 | 13 | 10.5 | 8.9 | 7.7 | 6.8 | 4.2 | 3.6 | 3.25 | 2.9 | 2.6 | 2.5 |
| $v_{dc}$ | (m/s) | 5 | | | | | | 4 | | | 3 | | | 2 | | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | | | | |

## Vertical operation (frame stationary, carriage travels)

### MSK 060C, HCS02.1E-W0054, 3 x 400 V

| i | | 3 | | | | 5 | | | | | | 10 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 3 | 5 | 7 | 9 | 6 | 10 | 18 | 26 | 34 | 40 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| $t_a$ | (ms) | 85 | 100 | 110 | 125 | 120 | 140 | 190 | 423 | 205 | 250 | 210 | 260 | 320 | 410 | 520 | 370 | 835 |
| $s_a$ | (mm) | 215 | 245 | 275 | 310 | 266 | 315 | 420 | 545 | 310 | 375 | 250 | 310 | 385 | 490 | 625 | 185 | 420 |
| a | ($m/s^2$) | 58 | 51 | 45 | 40 | 38 | 32 | 24 | 18.5 | 14.5 | 12 | 11.5 | 9.3 | 7.5 | 5.9 | 4.6 | 2.7 | 1.2 |
| $v_{dc}$ | (m/s) | 5 | | | | 4.5 | | | | 3 | | 2.4 | | | | | 1 | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | | | |

### MSK 076 C, HCS02.1E-W0054, 3 x 400 V

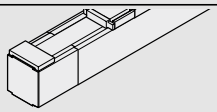
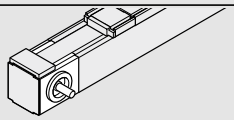
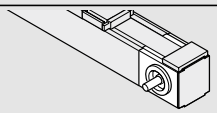
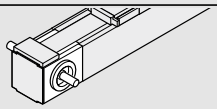
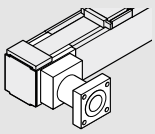
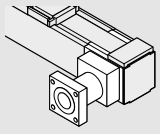
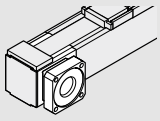
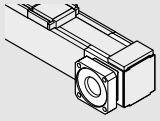
| i | | 3 | | | | | 5 | | | | | | 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_{ex}$ | (kg) | 4 | 8 | 12 | 16 | 20 | 6 | 10 | 18 | 26 | 34 | 40 | 20 | 40 | 60 | 80 | 100 |
| $t_a$ | (ms) | 160 | 180 | 210 | 240 | 265 | 210 | 220 | 265 | 310 | 366 | 417 | 280 | 375 | 540 | 870 | 1800 |
| $s_a$ | (mm) | 390 | 445 | 520 | 595 | 655 | 310 | 330 | 395 | 465 | 550 | 625 | 140 | 190 | 270 | 435 | 910 |
| a | ($m/s^2$) | 32 | 28 | 24 | 21 | 19 | 14.5 | 13.6 | 11.4 | 9.7 | 8.2 | 7.2 | 3.56 | 2.66 | 1.85 | 1.15 | 0.55 |
| $v_{dc}$ | (m/s) | 5 | | | | | 4.5 | | 3 | | | | 1 | | | | |
| * | (mm) | ± 0.1 | | | | | | | | | | | | | | | |

**a** = acceleration ($m/s^2$)
**i** = gear reduction (-)
$m_{ex}$ = mass (kg)
$s_a$ = acceleration travel (mm)
$t_a$ = acceleration time (ms)
$v_{dc}$ = travel speed (m/s)
* = reproducibility (mm)

MSK = servo motor
MSM = servo motor
VRDM = stepping motor
HCS = digital controller

Linear Modules MLR

# Linear Modules MLR 10-80 Components and Ordering Data

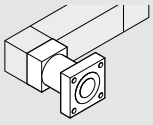
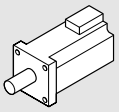
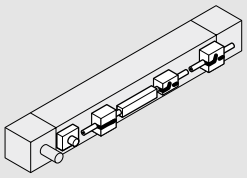
| Part number, length R1148 160 10, .... mm<br>Version | | Guideway | Drive unit<br>Drive journal | Reduction<br>i = 1 1) | i = 1 2) | i = 3 | i = 5 | i = 10 | Carriage<br>$L_{ca}$ = 190 mm<br>with T-slot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Without drive unit | OA01  | 02 | Without | 50 | | | | | 01 | |
| With drive unit (MA), without gear reducer i = 1 | MA01  | 01 | Journal at right | 01 | 03 | – | | | | |
| | MA02  | 01 | Journal at left | 01 | 03 | – | | | | |
| | MA03  | 01 | Journal on both sides | 02 | 04 | – | | | | |
| With gear (MG), external gear reducer | MG01  MG02  | 01 | Gear reducer at right / at left | – | – | 10 | | | | |
| | | | Gear reducer at right / at left | – | – | 11 Gear reducer with second journal | | | | |
| With gear (MG), integrated LPB gear reducer | MG03  MG04  | 01 | Gear reducer at right / at left | – | – | 20 | | | | |

## Ordering example: see “Inquiry/Order”

**Please check whether the selected combination is a permissible one (load capacities, moments, maximum speeds, motor data, etc.)!**

$L_{ca}$ = carriage length

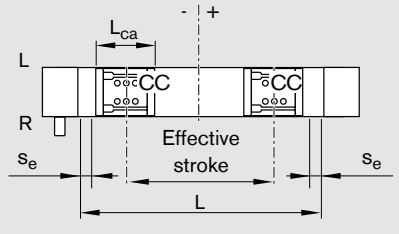
1) Without keyway
2) With keyway
3) Attachment kit also available without motor (when ordering: enter “00” for motor)
4) Stepping motors on request

| Motor attachment | | | | Motor | | Switches / Cable duct / Socket-plug | Documentation | |
|---|---|---|---|---|---|---|---|---|
|  | | | |  | |  |  | |
| Reduction i = | Attachment kit[3] with gear reducer | for motor[4] | | without | with Brake | | Standard report | Measure-ment report |
| – | 00 | – | | 00 | | **Without switch and cable duct** 00 | | |
| – | 00 | – | | 00 | | **Switches:**<br>– PNP NC 11- . ± ... mm<br>– PNP NO 13- . ± ... mm<br>– Mechanical 15- . ± ... mm | | |
| – | 00 | – | | 00 | | **Ordering data:**<br>Switch type<br>Mounting side (R/L)<br>Direction of travel<br>Switching distance | | |
| – | 00 | – | | 00 | | | | 02 Friction moment |
| i = 3 | 01 | **MSK 040C** | 86 | 87 | | **Cable duct (loose)**<br>– Length 20, ... mm | 01 | |
| i = 5 | 10 | | | | | | | |
| i = 10 | 20 | | | | | | | |
| i = 3 | 02 | **MSM 041B** | 110 | 111 | | **External socket/plug (loose)** 17 | | 05 Positioning accuracy |
| i = 5 | 11 | | | | | | | |
| i = 10 | 21 | | | | | | | |
| i = 3 | 04 | **MSK 050C** | 88 | 89 | | **External switching cam** 16 | | |
| i = 5 | 14 | | | | | | | |
| i = 10 | 24 | | | | | | | |
| i = 3 | 50 | **MSK 040C** | 86 | 87 | | | | |
| i = 5 | 55 | | | | | | | |
| i = 10 | 60 | | | | | | | |
| i = 3 | 51 | **MSM 041B** | 110 | 111 | | | | |
| i = 5 | 56 | | | | | | | |
| i = 10 | 61 | | | | | | | |
| i = 3 | 54 | **MSK 050C** | 88 | 89 | | | | |
| i = 5 | 58 | | | | | | | |
| i = 10 | 63 | | | | | | | |

**Length L**

$$L = (\text{effective stroke} + 2 \cdot \text{excess travel } s_e) + 100 \text{ mm} + L_{ca}$$

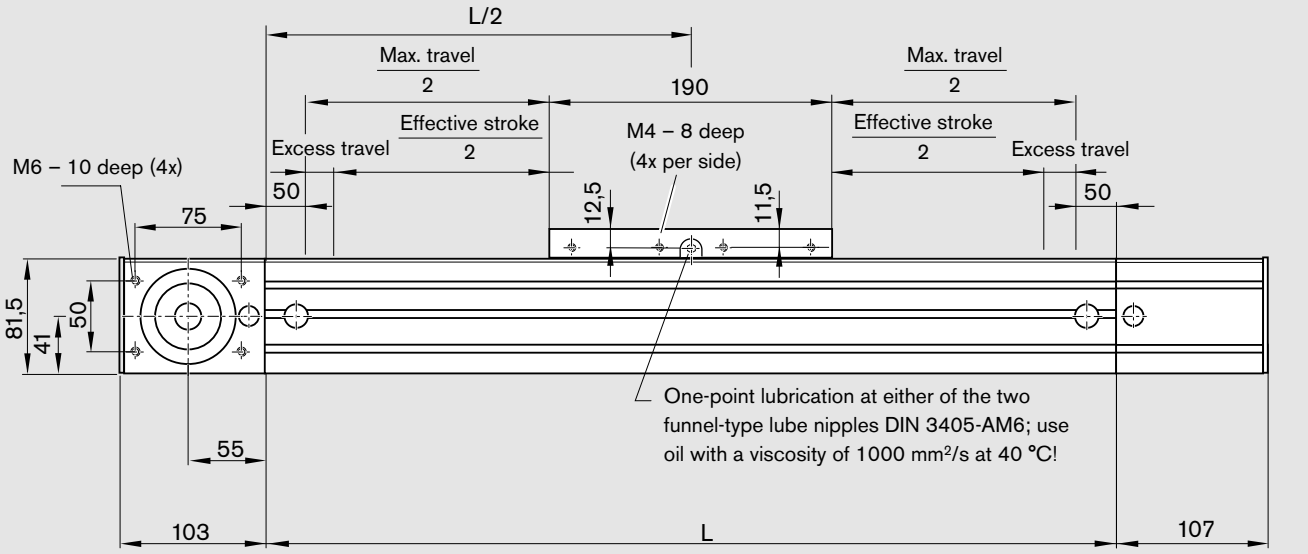
Effective stroke = maximum travel of carriage center (CC) between the outermost switch activation points.
The excess travel $s_e$ must be longer than the braking distance. The acceleration travel can be taken as a guideline value for the braking distance.

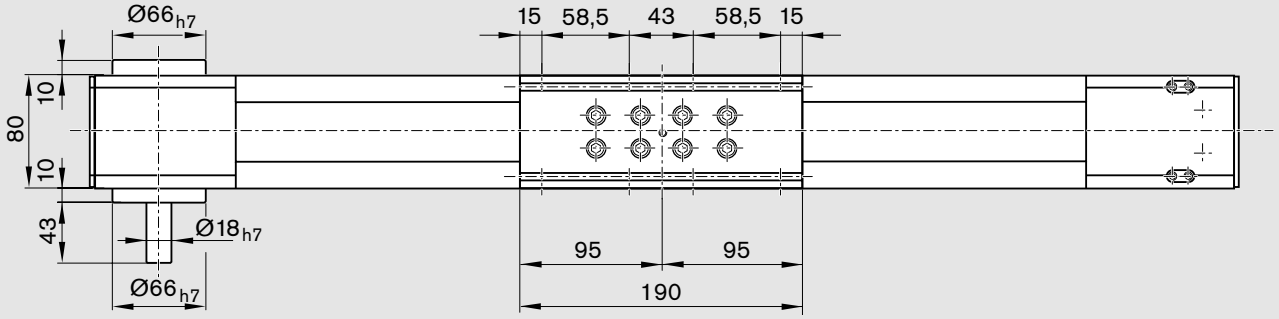


Linear Modules MLR

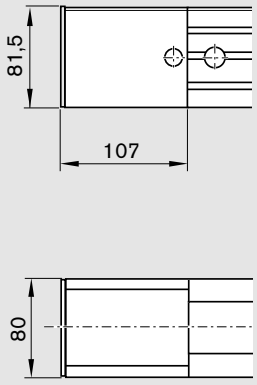
# Linear Modules MLR 10-80 Dimensions

All dimensions in mm
Drawings not to scale

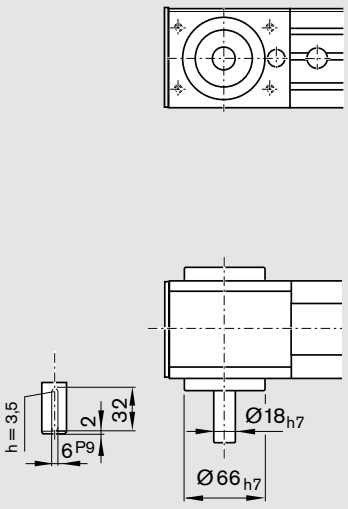


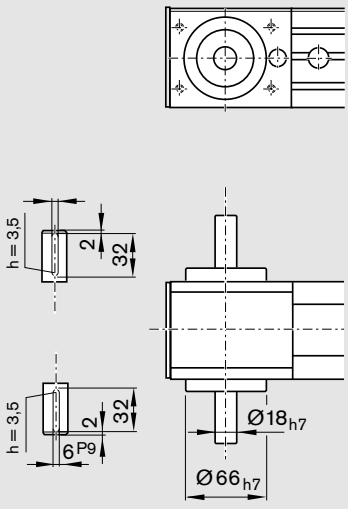

**OA01**

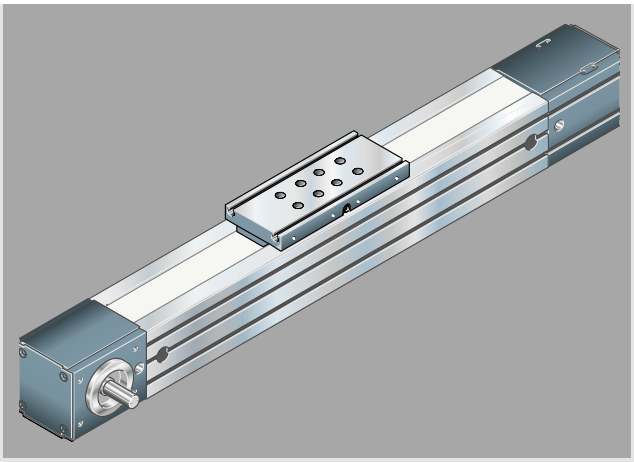


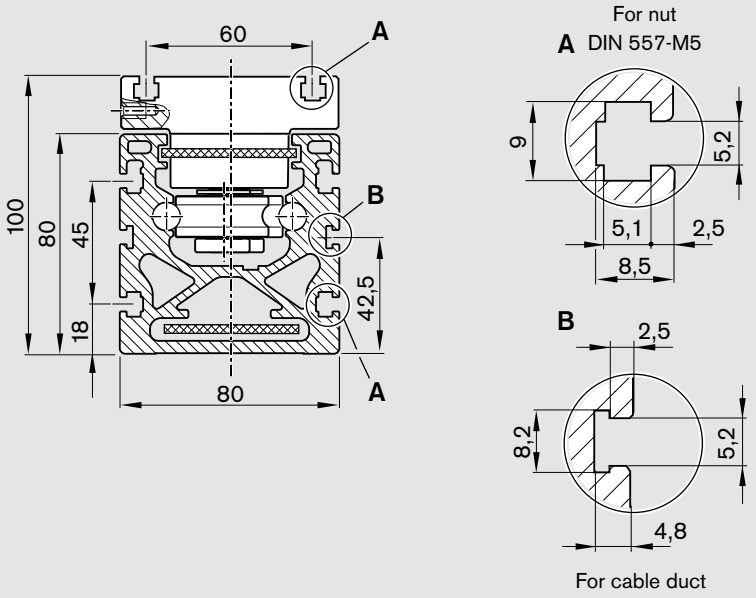

**MA01, MA02**



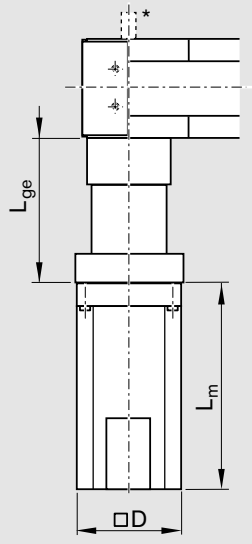

**MA03**



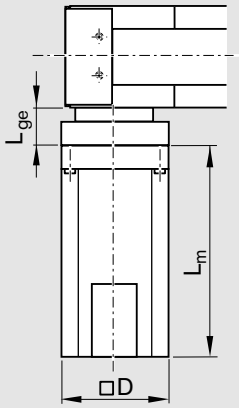





**MG01*, MG02***




**MG03, MG04**



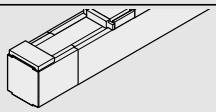
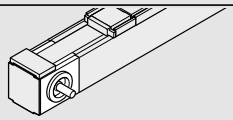
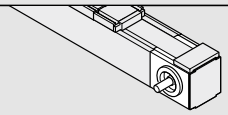
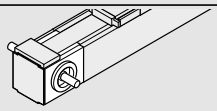
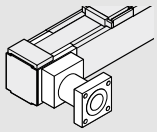
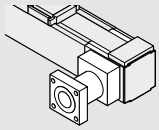
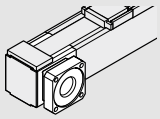
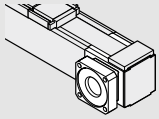

| Motor | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | Gear unit | | Motor | | |
| | | $L_{ge}$ | D | | $L_m$ |
| | MG01 MG02 | MG03 MG04 | | without brake | with brake |
| **MSK 040C** | 135 | 41 | 82 | 185.5 | 215.5 |
| **MSK 050C** | 145 | 51 | 98 | 203.0 | 233.0 |
| **MSM 041B** | 140 | 46 | 80 | 112.0 | 149.0 |

* For drive unit Option 11: second journal Ø18 x 43

**CAD configurator available on the Internet at www.boschrexroth.com/dcl**

Linear Modules MLR

# Linear Modules MLR 10-110 Components and Ordering Data

| Part number, length R1148 260 10, .... mm<br>Version | | Guideway | Drive unit<br>Drive journal | Reduction<br>i = 1 [1] | i = 1 [2] | i = 3 | i = 5 | i = 10 | Carriage<br>$L_{ca}$ = 305 mm<br>with T-slot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Without drive unit | OA01  | 02 | Without | 50 | | | | | 05 | |
| With drive unit (MA), without gear reducer i = 1 | MA01  | 01 | Journal at right | 01 | 03 | – | | | | |
| | MA02  | 01 | Journal at left | 01 | 03 | – | | | | |
| | MA03  | 01 | Journal on both sides | 02 | 04 | – | | | | |
| With gear (MG), external gear reducer | MG01  MG02  | 01 | Gear reducer at right / at left | – | – | 10 | | | | |
| | | | Gear reducer at right / at left | – | – | 11<br>Gear reducer with second journal | | | | |
| With gear (MG), integrated LPB gear reducer | MG03  MG04  | 01 | Gear reducer at right / at left | – | – | 20 | | | | |

## Ordering example: see “Inquiry/Order”

**Please check whether the selected combination is a permissible one (load capacities, moments, maximum speeds, motor data, etc.)!**

$L_{ca}$ = carriage length

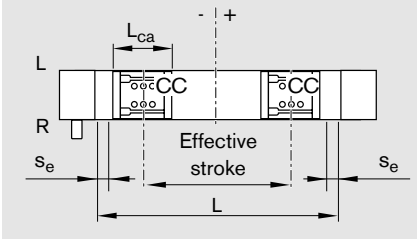
1) Without keyway
2) With keyway
3) Attachment kit also available without motor (when ordering: enter “00” for motor)
4) Stepping motors on request

| Motor attachment | | | | Motor | | Switches / Cable duct / Socket-plug | Documentation | |
|---|---|---|---|---|---|---|---|---|
| Reduction i = | Attachment kit[3] with gear reducer | for motor[4] | | without | with Brake | | Standard report | Measure-ment report |
| – | 00 | – | | 00 | | **Without switch and cable duct** 00 | 01 | 02 Friction moment<br>05 Positioning accuracy |
| – | 00 | – | | 00 | | **Switches:**<br>– PNP NC 11- . ± ... mm<br>– PNP NO 13- . ± ... mm<br>– Mechanical 15- . ± ... mm<br>**Ordering data:**<br>Switch type<br>Mounting side (R/L)<br>Direction of travel<br>Switching distance | | |
| – | 00 | – | | 00 | | | | |
| – | 00 | – | | 00 | | | | |
| i = 3 | 06 | MSK 060C | | 90 | 91 | **Cable duct (loose)**<br>– Length 20, ... mm | | |
| i = 5 | 16 | | | | | | | |
| i = 10 | 26 | | | | | | | |
| i = 3 | 02 | MSK 076C | | 92 | 93 | **External socket/plug (loose)** 17 | | |
| i = 5 | 11 | | | | | | | |
| i = 10 | 21 | | | | | | | |
| i = 3 | 05 | MSK 060C | | 90 | 91 | **Switching cam at one end** 16 | | |
| i = 5 | 15 | | | | | | | |
| i = 10 | 25 | | | | | | | |
| i = 3 | 04 | MSK 076C | | 92 | 93 | **Switching cam at both ends** 26 | | |
| i = 5 | 14 | | | | | | | |
| i = 10 | 24 | | | | | | | |

**Length L**

$$L = (\text{effective stroke} + 2 \cdot \text{excess travel } s_e) + 70 \text{ mm} + L_{ca}$$

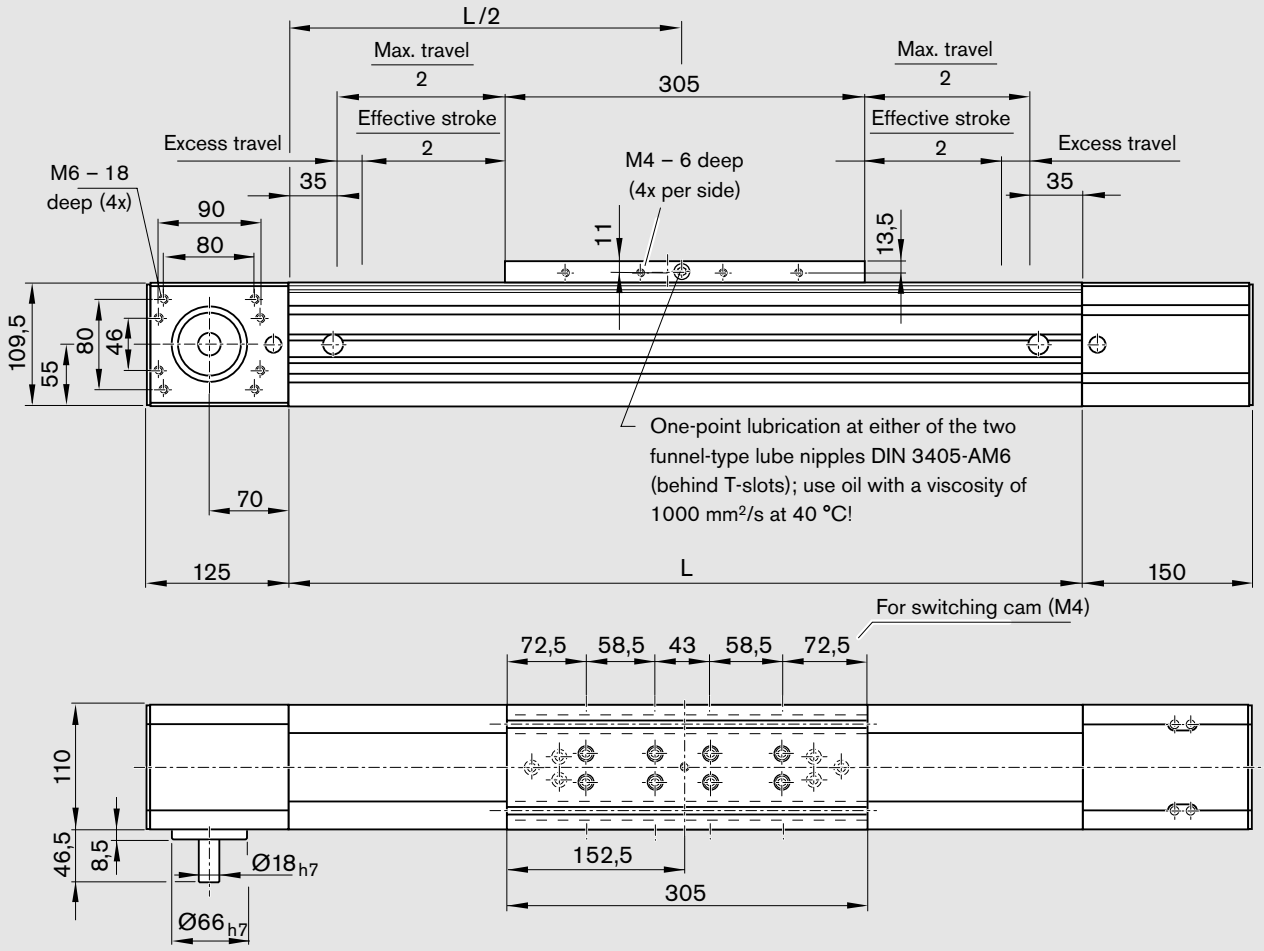
Effective stroke = maximum travel of carriage center (CC) between the outermost switch activation points.
The excess travel $s_e$ must be longer than the braking distance. The acceleration travel can be taken as a guideline value for the braking distance.



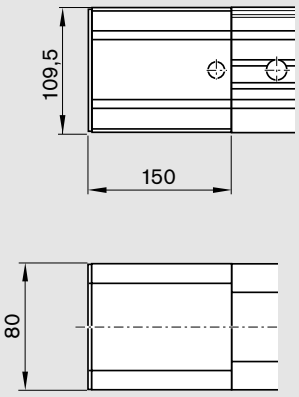
Linear Modules MLR

# Linear Modules MLR 10-110 Dimensions

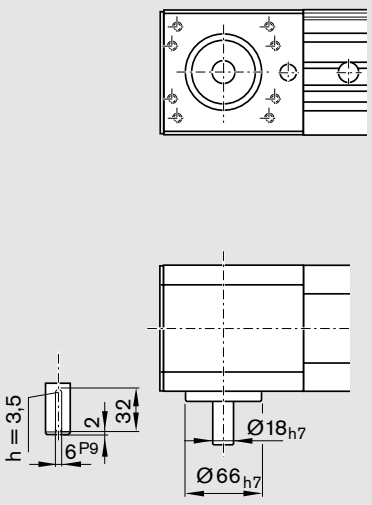
All dimensions in mm
Drawings not to scale



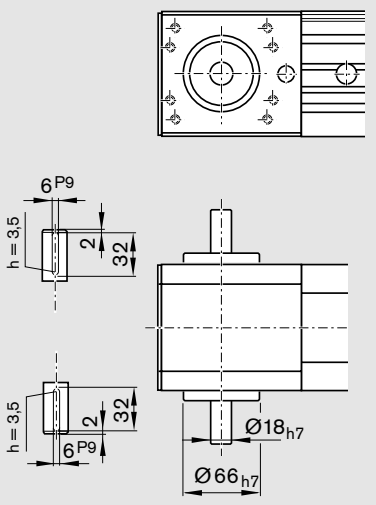

**OA01**

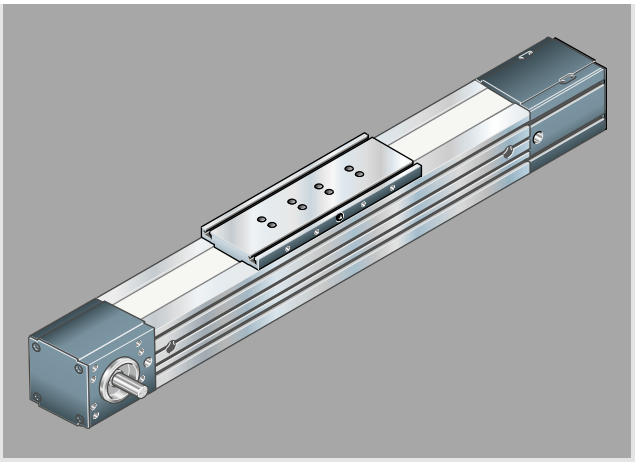


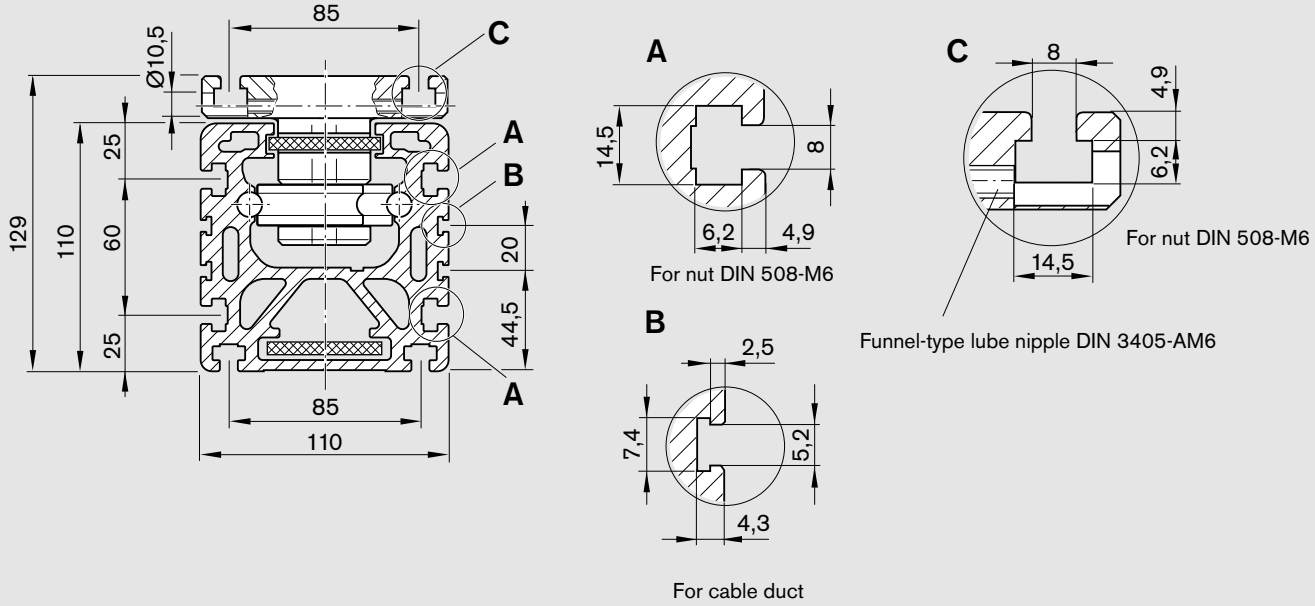

**MA01, MA02**



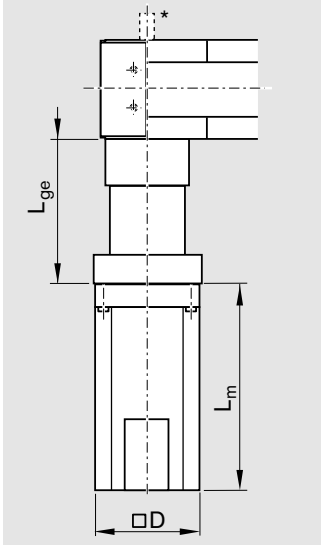

**MA03**



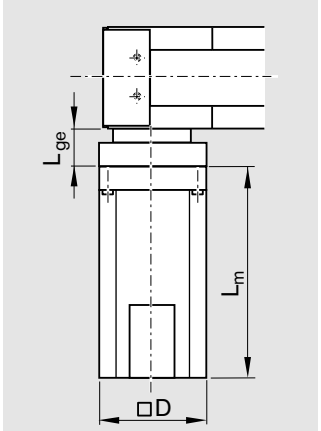





**MG01*, MG02***




**MG03, MG04**




| Motor | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | Gear unit | | Motor | | |
| | | $L_{ge}$ | D | | $L_m$ |
| | MG01 MG02 | MG03 MG04 | | without brake | with brake |
| MSK 060C | 162 | 50 | 116 | 226.0 | 259.0 |
| MSK 076C | 172 | 60 | 140 | 292.5 | 292.5 |

* For drive unit Option 11: second journal Ø18 x 43

**CAD configurator available on the Internet at www.boschrexroth.com/dcl**