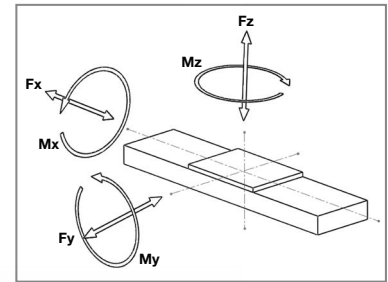


# MLS 3 Linear motor stages

## Technical description

Repeatability of measuring system:  $\pm 0,5 \mu\text{m}$   
Repeatability of linear unit:  $\pm 5 \mu\text{m}$   
Maximum length without joints: up to 6000 mm <sup>4) 5)</sup>  
Operating voltage: 600 Vdc, max. 900 Vdc  
Maximum speed: 9m/s  
Maximum acceleration: 158m/s<sup>2</sup>



## Mechanical specifications

| Size                                                          |    | 3    | 3    | 3    | 5    | 5    | 5    | 5    |
|---------------------------------------------------------------|----|------|------|------|------|------|------|------|
| Carriage model                                                |    | 0240 | 0480 | 0720 | 0450 | 0900 | 1125 | 1350 |
| C - Carriage length <sup>6)</sup>                             | mm |      |      |      | 182  | 260  | 306  | 352  |
| B - Width                                                     | mm |      |      |      | 206  | 206  | 206  | 206  |
| H - Height                                                    | mm |      |      |      | 103  | 103  | 103  | 103  |
| G1 - Distance between profile base grooves                    | mm |      |      |      | 160  | 160  | 160  | 160  |
| G2 - Height of profile lateral grooves                        | mm |      |      |      | 20   | 20   | 20   | 20   |
| M1 - Distance between fixation clamps boreholes <sup>3)</sup> | mm |      |      |      | 220  | 220  | 220  | 220  |
| M2 - Distance between fixation clamp boreholes <sup>3)</sup>  | mm |      |      |      | 40   | 40   | 40   | 40   |
| M3 - Max. distance between fixation clamps <sup>3)</sup>      | mm |      |      |      | 500  | 500  | 500  | 500  |

### Linear motor features

|                                          |     |  |  |  |     |      |      |      |
|------------------------------------------|-----|--|--|--|-----|------|------|------|
| Maximum speed <sup>1)</sup>              | m/s |  |  |  | 3   | 3    | 3    | 3    |
| Continuous force aircooled <sup>2)</sup> | N   |  |  |  | 200 | 400  | 500  | 600  |
| Peak force                               | N   |  |  |  | 450 | 900  | 1125 | 1350 |
| Nominal current                          | A   |  |  |  | 2,3 | 4,5  | 4,7  | 6,8  |
| Peak current                             | A   |  |  |  | 6,5 | 13,1 | 13,5 | 19,6 |

### Guidance features (max.)

|    |    |  |  |  |      |      |      |      |
|----|----|--|--|--|------|------|------|------|
| Fy | N  |  |  |  | 2000 | 2000 | 2000 | 2000 |
| Fz | N  |  |  |  | 1500 | 1500 | 1500 | 1500 |
| Mx | Nm |  |  |  | 340  | 450  | 450  | 450  |
| My | Nm |  |  |  | 450  | 700  | 750  | 1000 |
| Mz | Nm |  |  |  | 450  | 700  | 750  | 1000 |

For the sum of all forces and moments:  $\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1$  (Xxe = calculated value)  
(Xx = max. catalogue value)

### Structure profile features

|                                   |                   |  |  |  |                      |                      |                      |                      |
|-----------------------------------|-------------------|--|--|--|----------------------|----------------------|----------------------|----------------------|
| Geometrical moments of inertia Lx | mm <sup>4</sup>   |  |  |  | 4,5x10 <sup>5</sup>  | 4,5x10 <sup>5</sup>  | 4,5x10 <sup>5</sup>  | 4,5x10 <sup>5</sup>  |
| Geometrical moments of inertia Ly | mm <sup>4</sup>   |  |  |  | 20,5x10 <sup>6</sup> | 20,5x10 <sup>6</sup> | 20,5x10 <sup>6</sup> | 20,5x10 <sup>6</sup> |
| Elastic module                    | N/mm <sup>2</sup> |  |  |  | 70000                | 70000                | 70000                | 70000                |

### Weight

|                    |    |  |  |  |     |     |     |     |
|--------------------|----|--|--|--|-----|-----|-----|-----|
| Weight of carriage | kg |  |  |  | 4,3 | 6,8 | 7,9 | 8,9 |
| Weight of 100mm    | kg |  |  |  | 1,9 | 2,1 | 2,1 | 2,1 |

<sup>1)</sup> For a lifetime >30000 km

<sup>2)</sup> Depending on the application and ambient temperature

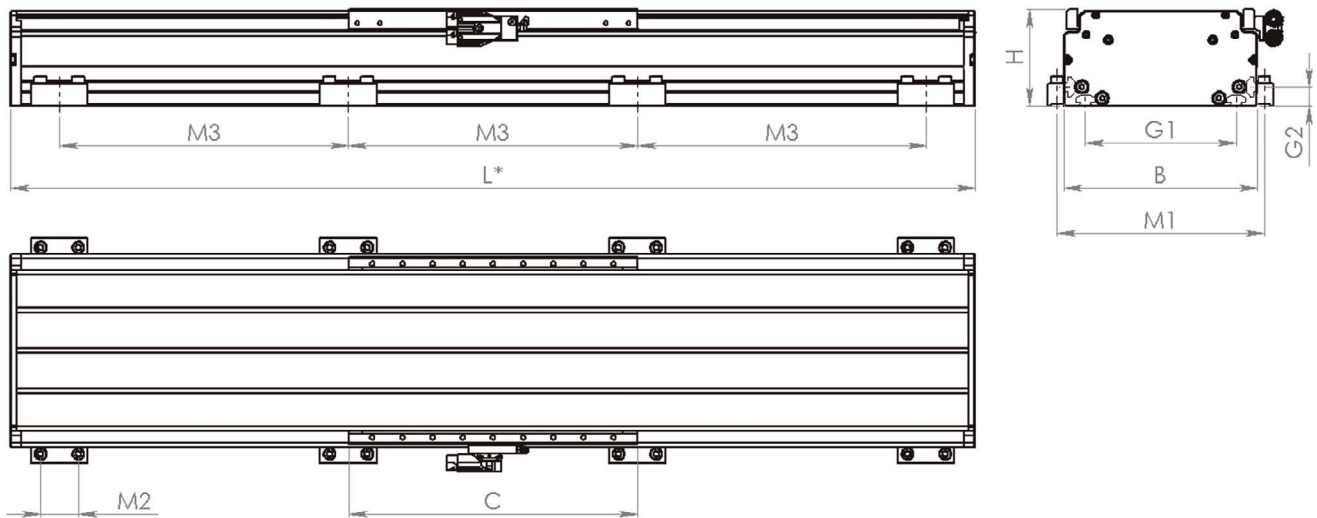
<sup>3)</sup> Sinadrives accessory

<sup>4)</sup> Cover supports are required for lengths over 2500mm

<sup>5)</sup> Lateral profile supports are provided for lengths over 1500 mm

<sup>6)</sup> On ISO3 option, the carriage is 30mm longer (less stroke)

## Technical description MLS 3



Drawing available under request.

\* L: Stroke selection on page 19.

### Mechanical specifications

| Size                                                         |    | 5    | 5    | 7    | 7    | 7    | 7    |
|--------------------------------------------------------------|----|------|------|------|------|------|------|
| Carriage model                                               |    | 1800 | 2700 | 1800 | 2250 | 4500 | 6750 |
| C - Carriage length <sup>①</sup>                             | mm | 484  | 720  |      |      |      |      |
| B - Width                                                    | mm | 206  | 206  |      |      |      |      |
| H - Height                                                   | mm | 103  | 103  |      |      |      |      |
| G1 - Distance between profile base grooves                   | mm | 160  | 160  |      |      |      |      |
| G2 - Height of profile lateral grooves                       | mm | 20   | 20   |      |      |      |      |
| M1 - Distance between fixation clamps boreholes <sup>③</sup> | mm | 220  | 220  |      |      |      |      |
| M2 - Distance between fixation clamp boreholes <sup>③</sup>  | mm | 40   | 40   |      |      |      |      |
| M3 - Max. distance between fixation clamps <sup>③</sup>      | mm | 500  | 500  |      |      |      |      |

### Linear motor features

|                                          |     |      |      |  |  |  |  |
|------------------------------------------|-----|------|------|--|--|--|--|
| Maximum speed <sup>1)</sup>              | m/s | 3    | 3    |  |  |  |  |
| Continuous force aircooled <sup>2)</sup> | N   | 800  | 1200 |  |  |  |  |
| Peak force                               | N   | 1800 | 2700 |  |  |  |  |
| Nominal current                          | A   | 9,0  | 13,6 |  |  |  |  |
| Peak current                             | A   | 26,2 | 39,2 |  |  |  |  |

### Guidance features (max.)

|    |    |      |      |  |  |  |  |
|----|----|------|------|--|--|--|--|
| Fy | N  | 3000 | 3000 |  |  |  |  |
| Fz | N  | 1750 | 1750 |  |  |  |  |
| Mx | Nm | 750  | 750  |  |  |  |  |
| My | Nm | 1500 | 2100 |  |  |  |  |
| Mz | Nm | 1500 | 2100 |  |  |  |  |

For the sum of all forces and moments:

$$\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1 \quad \begin{matrix} (X_{xe} = \text{calculated value}) \\ (X_x = \text{max. catalogue value}) \end{matrix}$$

### Structure profile features

|                                   |                   |                      |                      |  |  |  |  |
|-----------------------------------|-------------------|----------------------|----------------------|--|--|--|--|
| Geometrical moments of inertia Lx | mm <sup>4</sup>   | 4,5x10 <sup>5</sup>  | 4,5x10 <sup>5</sup>  |  |  |  |  |
| Geometrical moments of inertia Ly | mm <sup>4</sup>   | 20,5x10 <sup>6</sup> | 20,5x10 <sup>6</sup> |  |  |  |  |
| Elastic module                    | N/mm <sup>2</sup> | 70000                | 70000                |  |  |  |  |

### Weight

|                    |    |      |     |  |  |  |  |
|--------------------|----|------|-----|--|--|--|--|
| Weight of carriage | kg | 12,4 | 17  |  |  |  |  |
| Weight of 100mm    | kg | 2,1  | 2,1 |  |  |  |  |

<sup>1)</sup> For a lifetime >30000 km

<sup>2)</sup> Depending on the application and ambient temperature

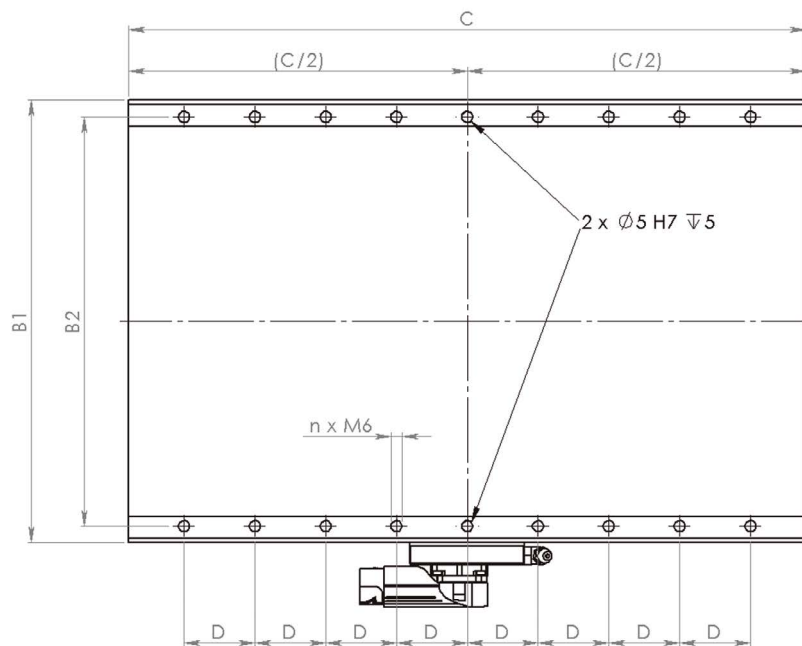
<sup>3)</sup> Sinadrives accessory

<sup>⑥</sup> On ISO3 option, the carriage is 30mm longer (less stroke)

## Choice of stroke MLS 3

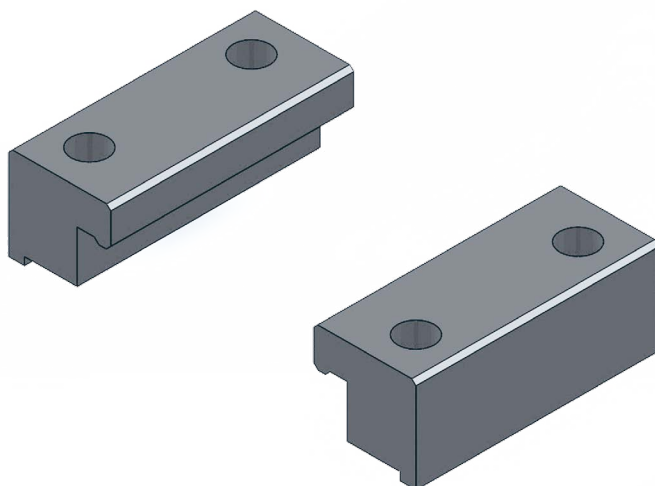
| Linear motor stage |        | MLS35 |      |      |      |      |
|--------------------|--------|-------|------|------|------|------|
| Carriage model     | 450    | 900   | 1125 | 1350 | 1800 | 2700 |
| Length, L (mm)     | Stroke |       |      |      |      |      |
| 270                | 34     | -     | -    | -    | -    | -    |
| 366                | 130    | 52    | 6    | -    | -    | -    |
| 462                | 226    | 148   | 102  | 56   | -    | -    |
| 558                | 322    | 244   | 198  | 152  | 20   | -    |
| 654                | 418    | 340   | 294  | 248  | 116  | -    |
| 750                | 514    | 436   | 390  | 344  | 212  | -    |
| 846                | 610    | 532   | 486  | 440  | 308  | 72   |
| 942                | 706    | 628   | 582  | 536  | 404  | 168  |
| 1038               | 802    | 724   | 678  | 632  | 500  | 264  |
| 1134               | 898    | 820   | 774  | 728  | 596  | 360  |
| 1230               | 994    | 916   | 870  | 824  | 692  | 456  |
| 1326               | 1090   | 1012  | 966  | 920  | 788  | 552  |
| 1422               | 1186   | 1108  | 1062 | 1016 | 884  | 648  |
| 1518               | 1282   | 1204  | 1158 | 1112 | 980  | 744  |
| 1614               | 1378   | 1300  | 1254 | 1208 | 1076 | 840  |
| 1710               | 1474   | 1396  | 1350 | 1304 | 1172 | 936  |
| 1806               | 1570   | 1492  | 1446 | 1400 | 1268 | 1032 |
| 1902               | 1666   | 1588  | 1542 | 1496 | 1364 | 1128 |
| 1998               | 1762   | 1684  | 1638 | 1592 | 1460 | 1224 |
| 2094               | 1858   | 1780  | 1734 | 1688 | 1556 | 1320 |
| 2190               | 1954   | 1876  | 1830 | 1784 | 1652 | 1416 |
| 2286               | 2050   | 1972  | 1926 | 1880 | 1748 | 1512 |
| 2382               | 2146   | 2068  | 2022 | 1976 | 1844 | 1608 |
| 2478               | 2242   | 2164  | 2118 | 2072 | 1940 | 1704 |
| 2574               | 2338   | 2260  | 2214 | 2168 | 2036 | 1800 |
| 2670               | 2434   | 2356  | 2310 | 2264 | 2132 | 1896 |
| 2766               | 2530   | 2452  | 2406 | 2360 | 2228 | 1992 |
| 2862               | 2626   | 2548  | 2502 | 2456 | 2324 | 2088 |
| 2958               | 2722   | 2644  | 2598 | 2552 | 2420 | 2184 |
| 3054               | 2818   | 2740  | 2694 | 2648 | 2516 | 2280 |
| 3150               | 2914   | 2836  | 2790 | 2744 | 2612 | 2376 |
| 3246               | 3010   | 2932  | 2886 | 2840 | 2708 | 2472 |
| 3342               | 3106   | 3028  | 2982 | 2936 | 2804 | 2568 |
| 3438               | 3202   | 3124  | 3078 | 3032 | 2900 | 2664 |
| 3534               | 3298   | 3220  | 3174 | 3128 | 2996 | 2760 |
| 3630               | 3394   | 3316  | 3270 | 3224 | 3092 | 2856 |
| 3726               | 3490   | 3412  | 3366 | 3320 | 3188 | 2952 |
| 3822               | 3586   | 3508  | 3462 | 3416 | 3284 | 3048 |
| 3918               | 3682   | 3604  | 3558 | 3512 | 3380 | 3144 |
| 4014               | 3778   | 3700  | 3654 | 3608 | 3476 | 3240 |
| 4110               | 3874   | 3796  | 3750 | 3704 | 3572 | 3336 |
| 4206               | 3970   | 3892  | 3846 | 3800 | 3668 | 3432 |
| 4302               | 4066   | 3988  | 3942 | 3896 | 3764 | 3528 |
| 4398               | 4162   | 4084  | 4038 | 3992 | 3860 | 3624 |
| 4494               | 4258   | 4180  | 4134 | 4088 | 3956 | 3720 |
| 4590               | 4354   | 4276  | 4230 | 4184 | 4052 | 3816 |
| 4686               | 4450   | 4372  | 4326 | 4280 | 4148 | 3912 |
| 4782               | 4546   | 4468  | 4422 | 4376 | 4244 | 4008 |
| 4878               | 4642   | 4564  | 4518 | 4472 | 4340 | 4104 |
| 4974               | 4738   | 4660  | 4614 | 4568 | 4436 | 4200 |
| 5070               | 4834   | 4756  | 4710 | 4664 | 4532 | 4296 |
| 5166               | 4930   | 4852  | 4806 | 4760 | 4628 | 4392 |
| 5262               | 5026   | 4948  | 4902 | 4856 | 4724 | 4488 |
| 5358               | 5122   | 5044  | 4998 | 4952 | 4820 | 4584 |
| 5454               | 5218   | 5140  | 5094 | 5048 | 4916 | 4680 |
| 5550               | 5314   | 5236  | 5190 | 5144 | 5012 | 4776 |
| 5646               | 5410   | 5332  | 5286 | 5240 | 5108 | 4872 |
| 5742               | 5506   | 5428  | 5382 | 5336 | 5204 | 4968 |
| 5838               | 5602   | 5524  | 5478 | 5432 | 5300 | 5064 |
| 5934               | 5698   | 5620  | 5574 | 5528 | 5396 | 5160 |
| 6030               | 5794   | 5716  | 5670 | 5624 | 5492 | 5256 |

## MLS 3 Mounting interface



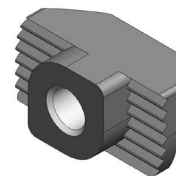
| Carriage model | B1 (mm) | B2 (mm) | C (mm) | D (mm) | n / row | Borehole |
|----------------|---------|---------|--------|--------|---------|----------|
| 0450           | 200     | 185     | 182    | 32     | 4       | M6       |
| 0900           |         |         | 260    |        | 6       |          |
| 1125           |         |         | 306    |        | 8       |          |
| 1350           |         |         | 352    |        | 10      |          |
| 1800           |         |         | 484    |        | 12      |          |
| 2700           |         |         | 720    |        | 20      |          |

**Mounting set (2 u. / set); Ref. AC03-0501**

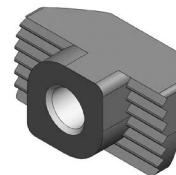


**T-slot nuts set (10 u. / set)**

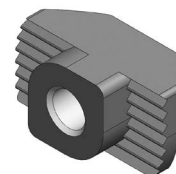
■ KTM05



■ KTM06

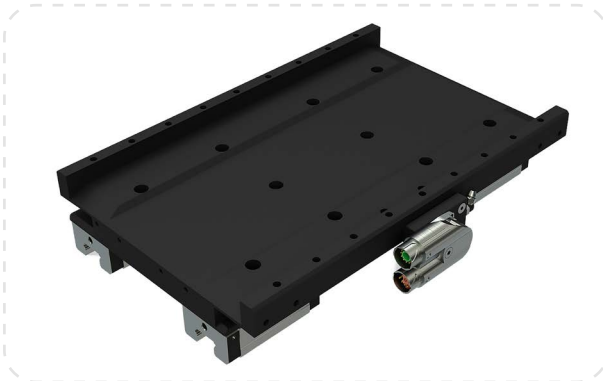


■ KTM08

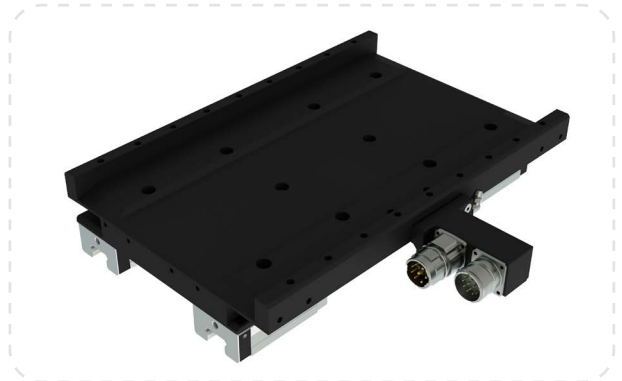


## MLS 3 Connector options

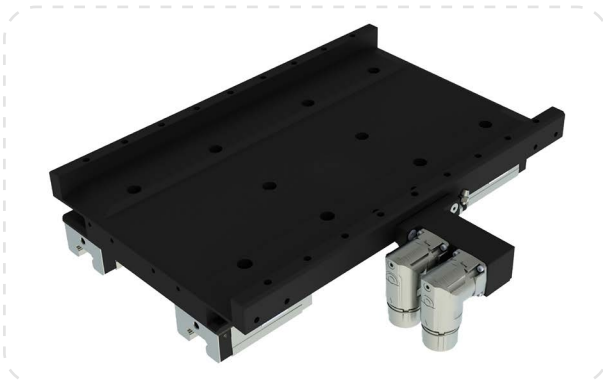
■ Side connectors Hybrid YTEC Steerable  $\pm 90^\circ$  (00)



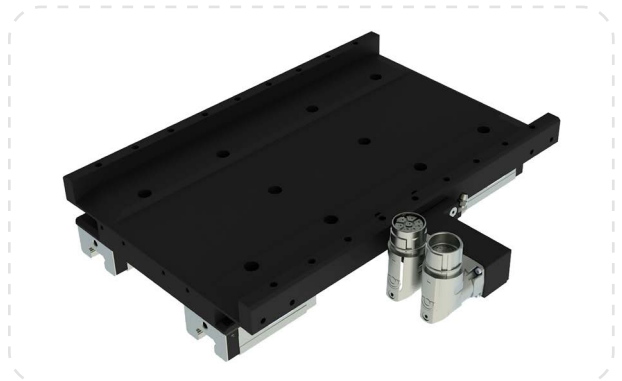
■ Side connectors M23 backwards (01)



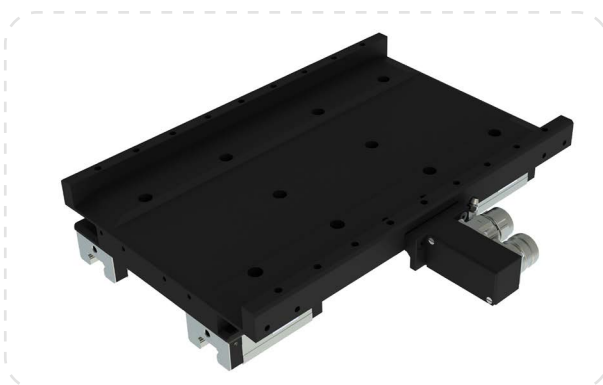
■ Side connectors M23 downwards (02)



■ Side connectors M23 upwards (03)



■ Side connectors M23 frontwards (11)



## MLS 3 Order Code

### Axis model

MLS 3 - Linear unit with iron core linear motor, covered model.

MLS3  S -     -     -     -   A - T     - A1S - 00  -   A - 00

### Axis model

#### Size:

3 - MLS33  
5 - MLS35  
7 - MLS37

### Length (mm) <sup>5)</sup>

### Motor / Carriage model

#### Motor type:

IT - iron core motor  
XX - without motor

#### Peak force, N (aircooled) <sup>1)</sup>:

|       |            |
|-------|------------|
| MLS33 | 02 - 240N  |
|       | 05 - 480N  |
|       | 07 - 720N  |
| MLS35 | 04 - 450N  |
|       | 09 - 900N  |
|       | 11 - 1125N |
|       | 13 - 1350N |
| MLS37 | 18 - 1800N |
|       | 27 - 2700N |
|       | 18 - 1800N |
|       | 22 - 2250N |
| MLS37 | 45 - 4500N |
|       | 67 - 6750N |

#### Motor winding:

N - Standard motor  
H - High-speed motor  
I - Low voltage motor  
X - Without winding

### Encoder

#### Technology:

0 - Inductive incremental  
1 - Optic incremental  
2 - Magnetic incremental  
3 - Inductive absolute  
4 - Optic absolute  
5 - Magnetic absolute  
XXXX Without encoder

#### Supplier <sup>2)</sup>

#### Reading head output <sup>4)</sup>:

\* Incremental:

0 - 1 Vpp  
4 - TTL  
\* Absolut:

E - Endat 2.2  
B - Biss/C  
D - Driveliq  
F - Fanuc  
H - Hiperface  
L - DSL  
M - Mitsubishi  
P - Panasonic  
S - SSI

#### Measurement system <sup>2)</sup>:

4C - 40 µm  
1U - 1 µm  
2M - 2 mm  
2H - 0,25 µm  
1H - 0,1 µm  
1S - 0,1 µm + Safety function  
1Y - 1 µm + Safety function

### Guiding

#### Size <sup>2)</sup>:

15 - 15 mm  
20 - 20 mm

#### Number of blocks <sup>2)</sup>:

4 - 4 Blocks  
6 - 6 Blocks

#### Block type:

A - With caged balls  
B - Without caged balls

### Lubrication

#### Grease type:

S - Standard  
C - Clean room  
F - Food grade  
L - Low temperature

### Upgrades

#### Version:

S - Standard  
C - Clean room

#### Screws:

S - Standard  
I - Stainless steel

### Connectors

#### Typ:

00 - Side connectors Hybrid YTEC Steerable ± 90° <sup>3)</sup>  
01 - Side connectors M23 backwards  
02 - Side connectors M23 downwards  
03 - Side connectors M23 upwards  
11 - Side connectors M23 frontwards  
XX - Without connector

<sup>1)</sup> Depending on the application and ambient temperature

<sup>2)</sup> Defined by previous selections

<sup>3)</sup> Not available for peak force ≥ 1800N

<sup>4)</sup> On request

<sup>5)</sup> Length on page 19