

PRODUCT CATALOGUE

LINEAR MOTOR STAGES



SINADRIVES[®]
DIRECT DRIVE EXPERTS

MLS Serie

Introduction

The **MLS series** is an **advanced range** family of linear motor axes. The long and vast experience of SINADRIVES in dynamic, precise and durable applications made this possible.

The **great modularity** among the standard solutions, as well as the wide choice of models, motors and encoders, allow to optimally cover a wide field of application requirements:

1. The MLS series includes **3 axis sizes**, which differ in their technical features such as profile, guide system and motor sizes.
2. For all axis sizes, **3 encoder Technologies**, inductive, magnetic and optical are available. Each **can be incremental or absolute**, with up to 100nm resolution.
 - Supported protocols: 1 Vpp (sin/cos), TTL, Endat 2.2, DriveCliq, BISS/C, SSI, Hiperface, Hiperface DSL, Panasonic, Fanuc, Mitsubishi & Yaskawa.
3. There are **4 different models available**. So, they can be adapted optimally to the respective application conditions (please see features on the next page).

Reduced lead time of up to 2 weeks.

Linear guides for high load torque. **Low maintenance.**

Compatible with most popular **servo control amplifiers**.

Operating voltage **24-600Vdc**, brake voltage up to 900Vdc.

Integrated energy chains and mounting plates available for complete solutions.



MLS Models

Index

MLS1 - Fully open base model

p.05



- Most economical option
- Very good carriage power to dead weight ratio (good acceleration)
- Cable outlet available

MLS2 - Open top base model

p.11



- High quality guide system (optional revolving ball cage)
- Central lubrication system
- Very suitable for long strokes

MLS3 - Covered model

p.17



- Clean room ISO3 certified
- Best option for applications in dirty environment
- High quality guide system (optional revolving ball cage)
- Central lubrication system
- Covered option for high speeds

MLS4 - Fully enclosed model

p.23



- Best option for applications in harsh environments
- High quality guide system (optional revolving ball cage)
- Central lubrication system
- Suitable for long strokes

MLS Axis combinations

Innovation & Excellence



001



002



003

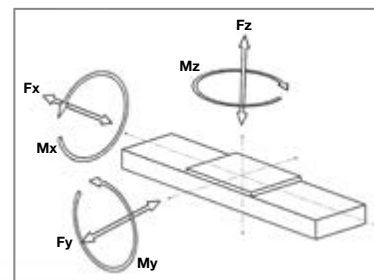


004

MLS 1 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 lenght without joints: up to 6000 mm
Operating voltage: 600 Vdc, max. 900 Vdc
Maximum speed: 9 m/s
Maximum acceleration: 197 m/s^2



Mechanical specifications

Size		3	3	3	5	5	5	5
Carriage model		0240	0480	0720	0450	0900	1125	1350
C - Carriage lenght	mm				170	282	328	380
B - Width	mm				206	206	206	206
H - Height	mm				76	76	76	76
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 ³⁾	mm				220	220	220	220
M2 - Distance between fixation clamp boreholes ³⁾	mm				40	40	40	40
M3 - Max. distance between fixation clamps ³⁾	mm				500	500	500	500

Linear motor features

Maximum speed ¹⁾	m/s				3	3	3	3
Continuous force aircooled ²⁾	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				2025	2700	2700	2700
Fz	N				1350	1800	1800	1800
Mx	Nm				300	400	400	400
My	Nm				400	630	675	900
Mz	Nm				400	630	675	900

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 ⁴				4,1x10 ⁵	4,1x10 ⁵	4,1x10 ⁵	4,1x10 ⁵
Geometrical moments of inertia Ly	mm ⁴				14,4x10 ⁶	14,4x10 ⁶	14,4x10 ⁶	14,4x10 ⁶
Elastic module	N/mm ²				70000	70000	70000	70000

Weight

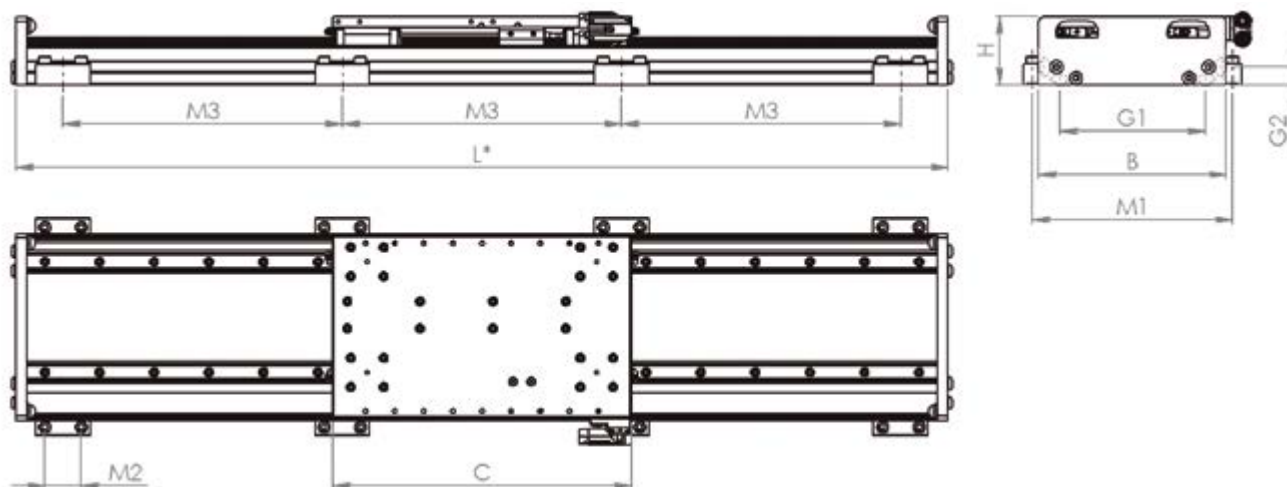
Weight of carriage	kg				3,4	5,4	6,4	7,2
Weight of 100mm	kg				1,65	1,8	1,8	1,8

¹⁾ For a lifetime >30000 km

²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

Technical Description MLS 1



Drawing available under request.

* L: Stroke selection on page 7.

Mechanical specifications

Size		5	5	7	7	7	7
Carriage model		1800	2700	1800	2250	4500	6750
C - Carriage lenght	mm	508	740				
B - Width	mm	206	206				
H - Height	mm	76	76				
G1 - Distance between profile base grooves	mm	160	160				
G2 - Height of profile lateral grooves	mm	20	20				
M1 - Distance between fixation clamps boreholes ³⁾	mm	220	220				
M2 - Distance between fixation clamp boreholes ³⁾	mm	40	40				
M3 - Max. distance between fixation clamps ³⁾	mm	500	500				

Linear motor features

Maximum speed ¹⁾	m/s	3	3				
Continuous force aircooled ²⁾	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	4000	4000				
Fz	N	2700	2700				
Mx	Nm	675	675				
My	Nm	1350	1900				
Mz	Nm	1350	1900				

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 ⁴	4,1x10 ⁵	4,1x10 ⁵				
Geometrical moments of inertia Ly	mm ⁴	14,4x10 ⁶	14,4x10 ⁶				
Elastic module	N/mm ²	70000	70000				

Weight

Weight of carriage	kg	10	13,7				
Weight of 100mm	kg	1,8	1,8				

¹⁾ For a lifetime >30000 km

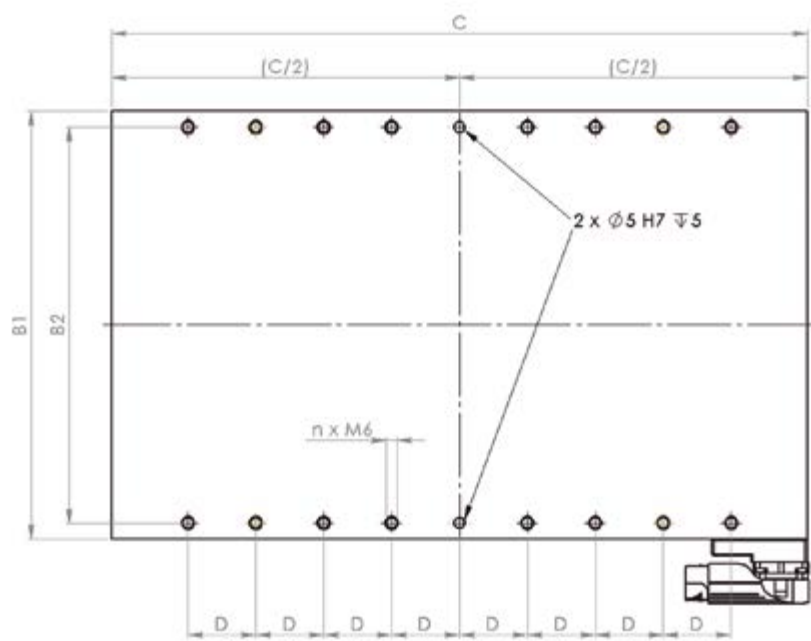
²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

Choice of stroke MLS 1

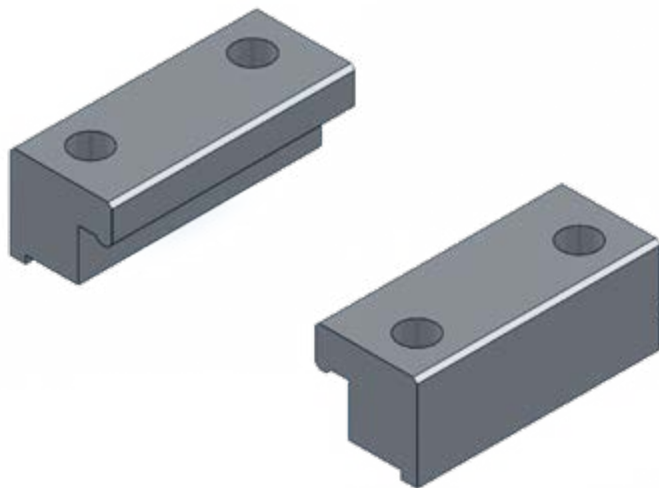
Linear motor stage		MLS15				
Carriage model	450	900	1125	1350	1800	2700
Lenght, L (mm)	Stroke					
270	46	-	-	-	-	-
366	142	30	-	-	-	-
462	238	126	80	28	-	-
558	334	222	176	124	-	-
654	430	318	272	220	92	-
750	526	414	368	316	188	-
846	622	510	464	412	284	52
942	718	606	560	508	380	148
1038	814	702	656	604	476	244
1134	910	798	752	700	572	340
1230	1006	894	848	796	668	436
1326	1102	990	944	892	764	532
1422	1198	1086	1040	988	860	628
1518	1294	1182	1136	1084	956	724
1614	1390	1278	1232	1180	1052	820
1710	1486	1374	1328	1276	1148	916
1806	1582	1470	1424	1372	1244	1012
1902	1678	1566	1520	1468	1340	1108
1998	1774	1662	1616	1564	1436	1204
2094	1870	1758	1712	1660	1532	1300
2190	1966	1854	1808	1756	1628	1396
2286	2062	1950	1904	1852	1724	1492
2382	2158	2046	2000	1948	1820	1588
2478	2254	2142	2096	2044	1916	1684
2574	2350	2238	2192	2140	2012	1780
2670	2446	2334	2288	2236	2108	1876
2766	2542	2430	2384	2332	2204	1972
2862	2638	2526	2480	2428	2300	2068
2958	2734	2622	2576	2524	2396	2164
3054	2830	2718	2672	2620	2492	2260
3150	2926	2814	2768	2716	2588	2356
3246	3022	2910	2864	2812	2684	2452
3342	3118	3006	2960	2908	2780	2548
3438	3214	3102	3056	3004	2876	2644
3534	3310	3198	3152	3100	2972	2740
3630	3406	3294	3248	3196	3068	2836
3726	3502	3390	3344	3292	3164	2932
3822	3598	3486	3440	3388	3260	3028
3918	3694	3582	3536	3484	3356	3124
4014	3790	3678	3632	3580	3452	3220
4110	3886	3774	3728	3676	3548	3316
4206	3982	3870	3824	3772	3644	3412
4302	4078	3966	3920	3868	3740	3508
4398	4174	4062	4016	3964	3836	3604
4494	4270	4158	4112	4060	3932	3700
4590	4366	4254	4208	4156	4028	3796
4686	4462	4350	4304	4252	4124	3892
4782	4558	4446	4400	4348	4220	3988
4878	4654	4542	4496	4444	4316	4084
4974	4750	4638	4592	4540	4412	4180
5070	4846	4734	4688	4636	4508	4276
5166	4942	4830	4784	4732	4604	4372
5262	5038	4926	4880	4828	4700	4468
5358	5134	5022	4976	4924	4796	4564
5454	5230	5118	5072	5020	4892	4660
5550	5326	5214	5168	5116	4988	4756
5646	5422	5310	5264	5212	5084	4852
5742	5518	5406	5360	5308	5180	4948
5838	5614	5502	5456	5404	5276	5044
5934	5710	5598	5552	5500	5372	5140
6030	5806	5694	5648	5596	5468	5236

MLS 1 Mounting interface



Carriage model	B1 (mm)	B2 (mm)	C (mm)	D (mm)	n / row	Borehole
0450	200	185	170	32	4	M6
0900			282		6	
1125			328		8	
1350			380		10	
1800			508		14	
2700			740		20	

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



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

KTM05



KTM06



KTM08



MLS 1 Connector options

■ Side connectors YTEC hybrid, steerable $\pm 90^\circ$ (00)



■ Side connectors M23 backwards (01)



■ Side connectors M23 downwards (02)



■ Side connectors M23 upwards (03)



■ Side connectors M23 backwards (04)



■ Cable output without connectors (05)



■ Cable output with connectors YTEC (06)



MLS 1 Order Code

Axis model

MLS 1 - Linear unit with iron core linear motor, fully open base model.

MLS1 S - - - - A - T C - A1S - 00 - X - 00

Axis model

Size:

3 - MLS13
5 - MLS15
7 - MLS17

Lenght (mm) ⁵⁾

Motor / Carriage model

Motor type:

IT - Iron core motor
XX - Without motor

Peak force, N (aircooled) ¹⁾:

MLS23	[	02 - 240N
		05 - 480N
		07 - 720N
MLS25	[	04 - 450N
		09 - 900N
		11 - 1125N
		13 - 1350N
		18 - 1800N
MLS27	[	27 - 2700N
		18 - 1800N
		22 - 2250N
		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
XXXXX Without encoder

Supplier ²⁾

Reading head output ⁴⁾:

* Incremental:

0 - 1 Vpp
4 - TTL

* Absolut:

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

Measurement system ²⁾:

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 ²⁾:

15 - 15 mm
20 - 20 mm

Number of blocks ²⁾:

4 - 4 Blocks
6 - 6 Blocks

Lubrication

Lubrication type:

01 - Straight
02 - Angled

Grease type:

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

Upgrades

Version:

S - Standard

Screws:

S - Standard
I - Stainless steel

Connectors

Typ:

00 - Side connectors YTEC hybrid, steerable ± 90° ³⁾
01 - Side connectors M23 backwards
02 - Side connectors M23 downwards
03 - Side connectors M23 upwards
04 - Side connectors M23 backwards
05 - Cable output without connectors
06 - Cable output with connectors YTEC ³⁾
XX - Without connector

¹⁾ Depending on the application and ambient temperature

²⁾ Defined by previous selections

³⁾ Not available for peak force ≥ 1800N

⁴⁾ On request

⁵⁾ Length on page 7

MLS 2 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 ⁴⁾
Operating voltage: 600 Vdc, max. 900 Vdc
Maximum speed: 9m/s
Maximum acceleration: 166m/s²



Mechanical specifications

Size		3	3	3	5	5	5	5
Carriage model		0240	0480	0720	0450	0900	1125	1350
C - Carriage length	mm				186	264	310	356
B - Width	mm				206	206	206	206
H - Height	mm				96	96	96	96
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 ³⁾	mm				220	220	220	220
M2 - Distance between fixation clamp boreholes ³⁾	mm				40	40	40	40
M3 - Max. distance between fixation clamps ³⁾	mm				500	500	500	500

Linear motor features

Maximum speed ¹⁾	m/s				3	3	3	3
Continuous force aircooled ²⁾	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: $\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1$ (X_e = calculated value)
(X_x = max. catalogue value)

Structure profile features

Geometrical moments of inertia Lx	mm ⁴				16,3x10 ⁵	16,3x10 ⁵	16,3x10 ⁵	16,3x10 ⁵
Geometrical moments of inertia Ly	mm ⁴				19,1x10 ⁶	19,1x10 ⁶	19,1x10 ⁶	19,1x10 ⁶
Elastic module	N/mm ²				70000	70000	70000	70000

Weight

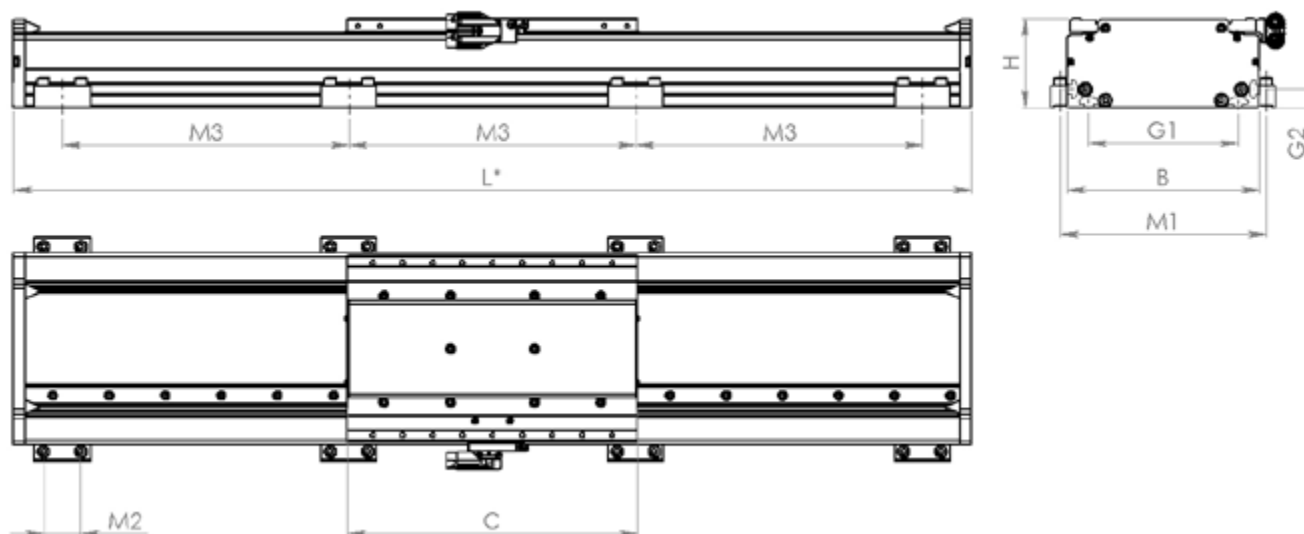
Weight of carriage	kg				4,4	6,9	7,9	9
Weight of 100mm	kg				1,75	1,95	1,95	1,95

¹⁾ For a lifetime >30000 km

²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

Technical Description MLS 2



Drawing available under request.

* L: Stroke selection on page 13.

Mechanical specifications

Size		5	5	7	7	7	7
Carriage model		1800	2700	1800	2250	4500	6750
C - Carriage lenght	mm	488	724				
B - Width	mm	206	206				
H - Height	mm	96	96				
G1 - Distance between profile base grooves	mm	160	160				
G2 - Height of profile lateral grooves	mm	20	20				
M1 - Distance between fixation clamps boreholes ³⁾	mm	220	220				
M2 - Distance between fixation clamp boreholes ³⁾	mm	40	40				
M3 - Max. distance between fixation clamps ³⁾	mm	500	500				

Linear motor features

Maximum speed ¹⁾	m/s	3	3				
Continuous force aircooled ²⁾	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 ⁴	16,3x10 ⁵	16,3x10 ⁵				
Geometrical moments of inertia Ly	mm ⁴	19,1x10 ⁶	19,1x10 ⁶				
Elastic module	N/mm ²	70000	70000				

Weight

Weight of carriage	kg	12,4	16,2				
Weight of 100mm	kg	1,95	1,95				

¹⁾ For a lifetime >30000 km

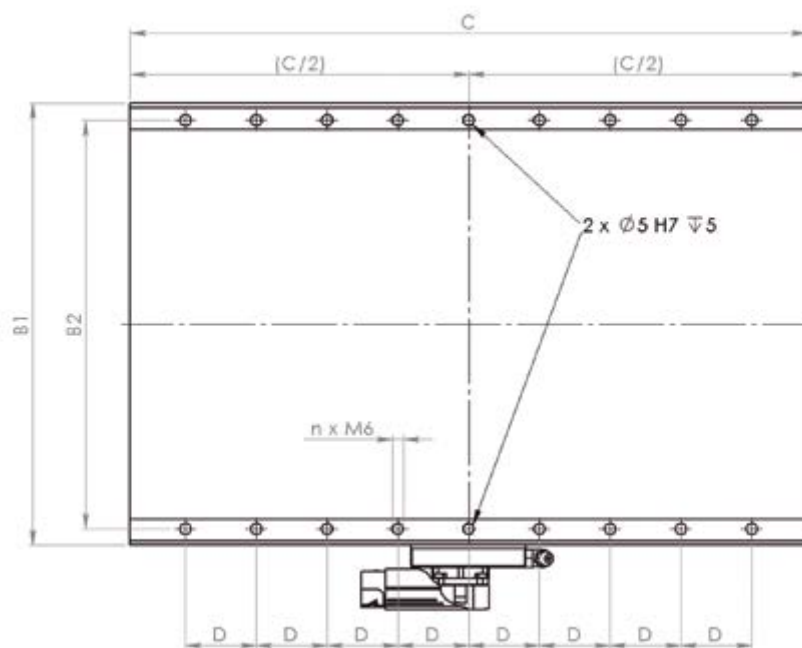
²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

Choice of stroke MLS 2

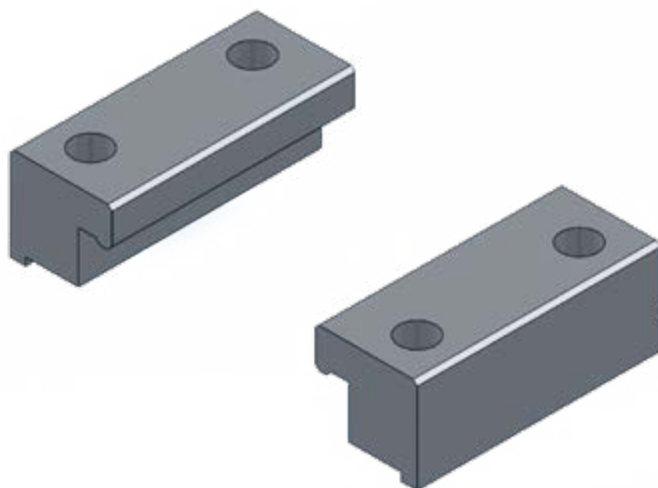
Linear motor stage		MLS25				
Carriage model	450	900	1125	1350	1800	2700
Lenght, L (mm)	Stroke					
270	30	-	-	-	-	-
366	126	48	2	-	-	-
462	222	144	98	52	-	-
558	318	240	194	148	16	-
654	414	336	290	244	112	-
750	510	432	386	340	208	-
846	606	528	482	436	304	68
942	702	624	578	532	400	164
1038	798	720	674	628	496	260
1134	894	816	770	724	592	356
1230	990	912	866	820	688	452
1326	1086	1008	962	916	784	548
1422	1182	1104	1058	1012	880	644
1518	1278	1200	1154	1108	976	740
1614	1374	1296	1250	1204	1072	836
1710	1470	1392	1346	1300	1168	932
1806	1566	1488	1442	1396	1264	1028
1902	1662	1584	1538	1492	1360	1124
1998	1758	1680	1634	1588	1456	1220
2094	1854	1776	1730	1684	1552	1316
2190	1950	1872	1826	1780	1648	1412
2286	2046	1968	1922	1876	1744	1508
2382	2142	2064	2018	1972	1840	1604
2478	2238	2160	2114	2068	1936	1700
2574	2334	2256	2210	2164	2032	1796
2670	2430	2352	2306	2260	2128	1892
2766	2526	2448	2402	2356	2224	1988
2862	2622	2544	2498	2452	2320	2084
2958	2718	2640	2594	2548	2416	2180
3054	2814	2736	2690	2644	2512	2276
3150	2910	2832	2786	2740	2608	2372
3246	3006	2928	2882	2836	2704	2468
3342	3102	3024	2978	2932	2800	2564
3438	3198	3120	3074	3028	2896	2660
3534	3294	3216	3170	3124	2992	2756
3630	3390	3312	3266	3220	3088	2852
3726	3486	3408	3362	3316	3184	2948
3822	3582	3504	3458	3412	3280	3044
3918	3678	3600	3554	3508	3376	3140
4014	3774	3696	3650	3604	3472	3236
4110	3870	3792	3746	3700	3568	3332
4206	3966	3888	3842	3796	3664	3428
4302	4062	3984	3938	3892	3760	3524
4398	4158	4080	4034	3988	3856	3620
4494	4254	4176	4130	4084	3952	3716
4590	4350	4272	4226	4180	4048	3812
4686	4446	4368	4322	4276	4144	3908
4782	4542	4464	4418	4372	4240	4004
4878	4638	4560	4514	4468	4336	4100
4974	4734	4656	4610	4564	4432	4196
5070	4830	4752	4706	4660	4528	4292
5166	4926	4848	4802	4756	4624	4388
5262	5022	4944	4898	4852	4720	4484
5358	5118	5040	4994	4948	4816	4580
5454	5214	5136	5090	5044	4912	4676
5550	5310	5232	5186	5140	5008	4772
5646	5406	5328	5282	5236	5104	4868
5742	5502	5424	5378	5332	5200	4964
5838	5598	5520	5474	5428	5296	5060
5934	5694	5616	5570	5524	5392	5156
6030	5790	5712	5666	5620	5488	5252

MLS 2 Mounting interface



Carriage model	B1 (mm)	B2 (mm)	C (mm)	D (mm)	n / row	Borehole
0450	200	185	186	32	4	M6
0900			264		6	
1125			310		8	
1350			356		10	
1800			488		12	
2700			724		20	

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



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

■ KTM05



■ KTM06



■ KTM08



MLS 2 Connector options

■ Side connectors YTEC hybrid, 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 2 Order Code

Axis model

MLS 2 - Linear unit with iron core linear motor, open top base model.

MLS2 S - - - - A - T - A1S - 00 - X - 00

Axis model

Size:

3 - MLS23
5 - MLS25
7 - MLS27

Length (mm) ⁵⁾

Motor / Carriage model

Motor type:

IT - Eisenbehaftete Motor
XX - Without motor

Peak force, N (aircooled) ¹⁾:

MLS23	02 - 240N
	05 - 480N
	07 - 720N
MLS25	04 - 450N
	09 - 900N
	11 - 1125N
	13 - 1350N
	18 - 1800N
MLS27	27 - 2700N
	18 - 1800N
	22 - 2250N
	45 - 4500N
	67 - 6750N

Motor winding:

N - Standard motor
H - High-speed motor
I - Low voltage motor
X - Ohne Motor

Encoder

Technology:

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

Supplier ²⁾

Reading head output ⁴⁾:

* Incremental:

0 - 1 Vpp
4 - TTL

* Absolut:

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

Measurement system ²⁾:

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 ²⁾:

15 - 15 mm
20 - 20 mm

Number of blocks ²⁾:

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

Screws:

S - Standard
I - Stainless steel

Connectors

Typ:

00 - Side connectors YTEC hybrid, steerable $\pm 90^\circ$ ³⁾
01 - Side connectors M23 backwards
02 - Side connectors M23 downwards
03 - Side connectors M23 upwards
11 - Side connectors M23 frontwards
XX - Without connector

¹⁾ Depending on the application and ambient temperature

²⁾ Defined by previous selections

³⁾ Not available for peak force $\geq 1800N$

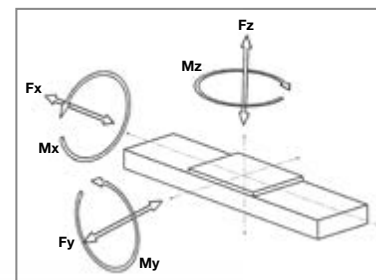
⁴⁾ On request

⁵⁾ Length on page 13

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 lenght without joints: up to 6000 mm ^{4) 5)}
Operating voltage: 600 Vdc, max. 900 Vdc
Maximum speed: 9m/s
Maximum acceleration: 158m/s²



Mechanical specifications

Size		3	3	3	5	5	5	5
Carriage model		0240	0480	0720	0450	0900	1125	1350
C - Carriage lenght ⁶⁾	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 ³⁾	mm				220	220	220	220
M2 - Distance between fixation clamp boreholes ³⁾	mm				40	40	40	40
M3 - Max. distance between fixation clamps ³⁾	mm				500	500	500	500

Linear motor features

Maximum speed ¹⁾	m/s				3	3	3	3
Continuous force aircooled ²⁾	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 ⁴				4,5x10 ⁵	4,5x10 ⁵	4,5x10 ⁵	4,5x10 ⁵
Geometrical moments of inertia Ly	mm ⁴				20,5x10 ⁶	20,5x10 ⁶	20,5x10 ⁶	20,5x10 ⁶
Elastic module	N/mm ²				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

¹⁾ For a lifetime >30000 km

²⁾ Depending on the application and ambient temperature

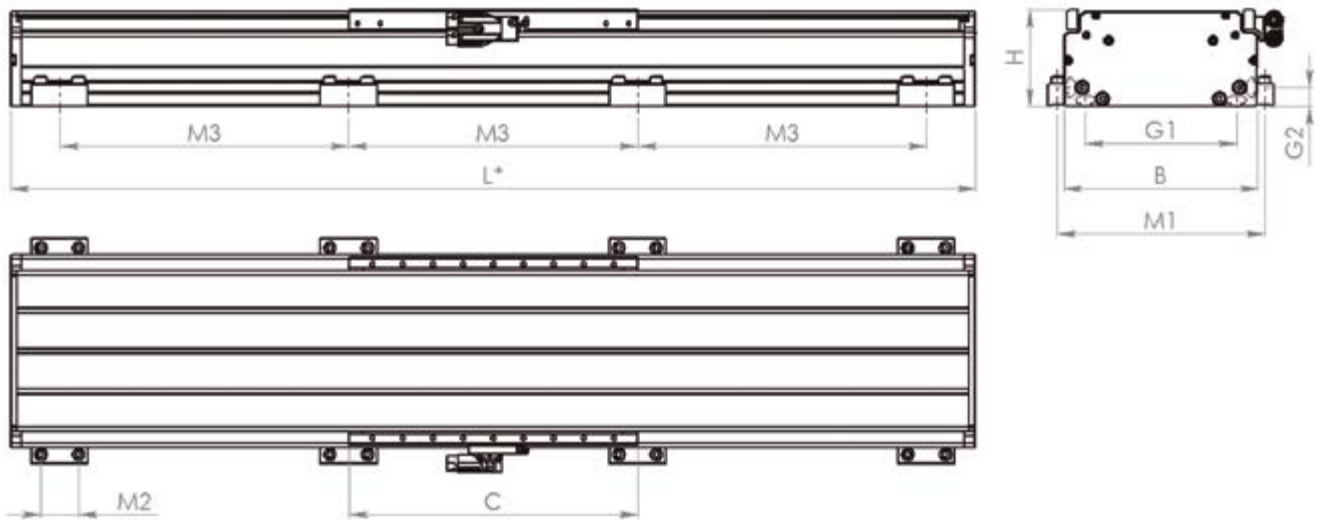
³⁾ Sinadrives accessory

⁴⁾ Cover supports are required for lengths over 2500mm

⁵⁾ Lateral profile supports are provided for lengths over 1500 mm

⁶⁾ 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 ^①	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 ^③	mm	220	220				
M2 - Distance between fixation clamp boreholes ^③	mm	40	40				
M3 - Max. distance between fixation clamps ^③	mm	500	500				

Linear motor features

Maximum speed ^①	m/s	3	3				
Continuous force aircooled ^②	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:

$$\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1$$

(Xxe = calculated value)
(Xx = max. catalogue value)

Structure profile features

Geometrical moments of inertia Lx	mm ⁴	4,5x10 ⁵	4,5x10 ⁵				
Geometrical moments of inertia Ly	mm ⁴	20,5x10 ⁶	20,5x10 ⁶				
Elastic module	N/mm ²	70000	70000				

Weight

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

^① For a lifetime >30000 km

^② Depending on the application and ambient temperature

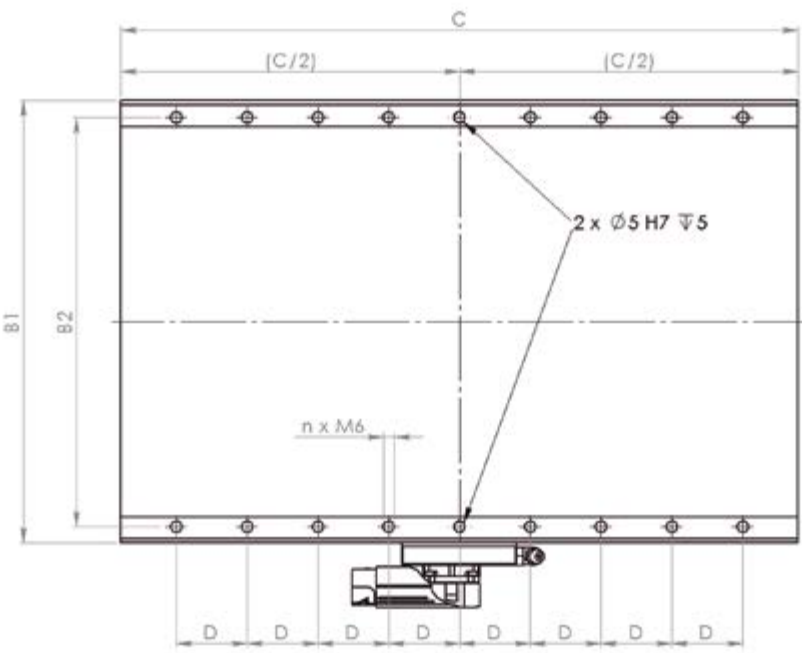
^③ Sinadrives accessory

^⑥ 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
Lenght, 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)

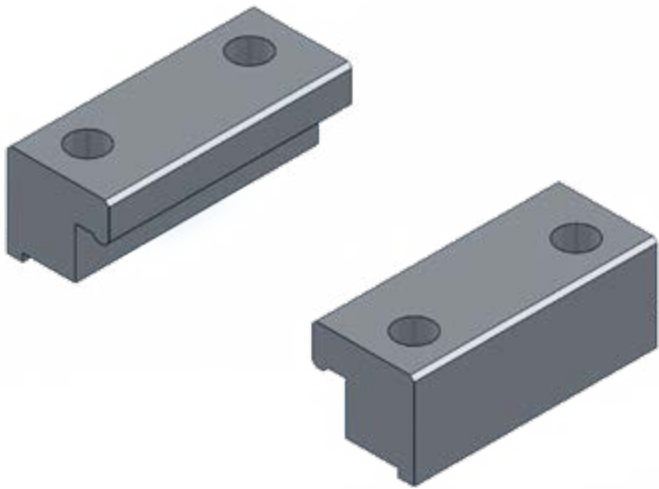
■ KTM05



■ 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

Lenght (mm) ⁵⁾

Motor / Carriage model

Motor type:

IT - iron core motor
XX - without motor

Peak force, N (aircooled) ¹⁾:

MLS23	02 - 240N
	05 - 480N
	07 - 720N
MLS25	04 - 450N
	09 - 900N
	11 - 1125N
	13 - 1350N
	18 - 1800N
MLS27	27 - 2700N
	18 - 1800N
	22 - 2250N
	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 ²⁾

Reading head output ⁴⁾:

* Incremental:

0 - 1 Vpp
4 - TTL
* Absolut:

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

Measurement system ²⁾:

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 ²⁾:

15 - 15 mm
20 - 20 mm

Number of blocks ²⁾:

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 $\pm 90^\circ$ ³⁾
01 - Side connectors M23 backwards
02 - Side connectors M23 downwards
03 - Side connectors M23 upwards
11 - Side connectors M23 frontwards
XX - Without connector

¹⁾ Depending on the application and ambient temperature

²⁾ Defined by previous selections

³⁾ Not available for peak force $\geq 1800N$

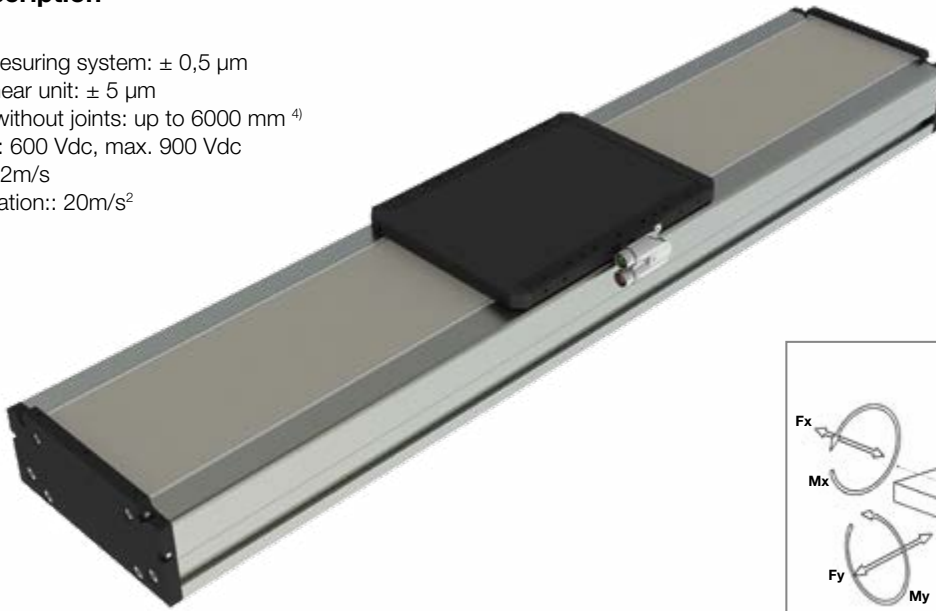
⁴⁾ On request

⁵⁾ Length on page 19

MLS 4 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 lenght without joints: up to 6000 mm ⁴⁾
 Operating voltage: 600 Vdc, max. 900 Vdc
 Maximum speed: 2m/s
 Maximum acceleration: 20m/s²



Mechanical specifications

Size		3	3	3	5	5	5	5
Carriage model		0240	0480	0720	0450	0900	1125	1350
C - Carriage lenght	mm				182	260	306	352
B - Width	mm				206	206	206	206
H - Height	mm				96	96	96	96
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 ³⁾	mm				220	220	220	220
M2 - Distance between fixation clamp boreholes ³⁾	mm				40	40	40	40
M3 - Max. distance between fixation clamps ³⁾	mm				500	500	500	500

Linear motor features

Maximum speed ¹⁾	m/s				2	2	2	2
Continuous force aircooled ²⁾	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:

$$\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1$$

(X_e = calculated value)
(X_x = max. catalogue value)

Structure profile features

Geometrical moments of inertia Lx	mm ⁴				16,3x10 ⁵	16,3x10 ⁵	16,3x10 ⁵	16,3x10 ⁵
Geometrical moments of inertia Ly	mm ⁴				19,1x10 ⁶	19,1x10 ⁶	19,1x10 ⁶	19,1x10 ⁶
Elastic module	N/mm ²				70000	70000	70000	70000

Weight

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

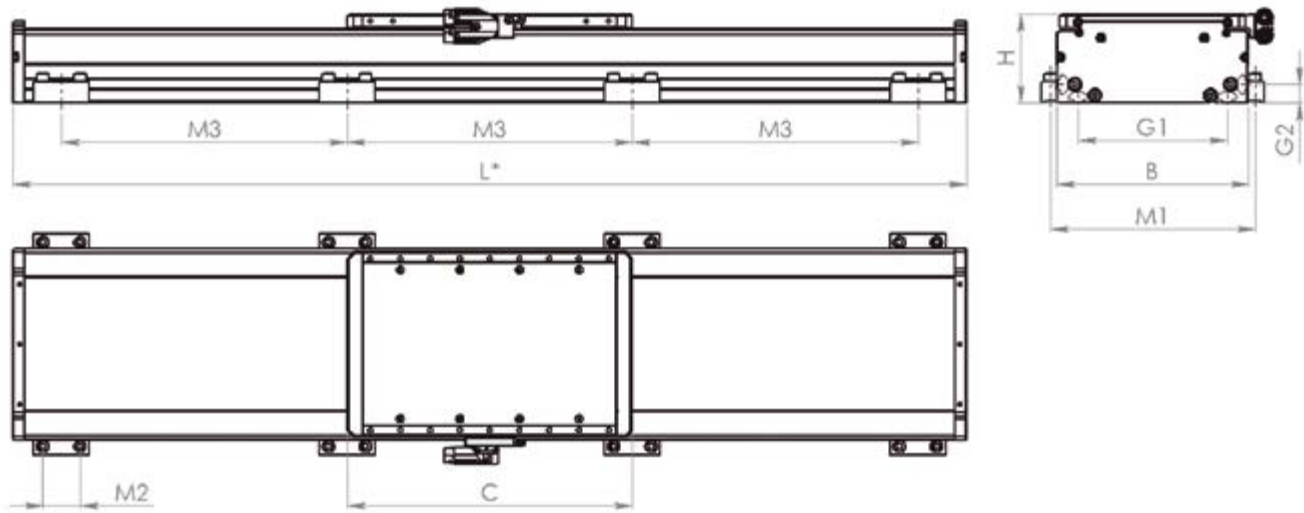
¹⁾ For a lifetime >30000 km

²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

⁴⁾ Lateral profile supports are provided for lengths over 1500 mm

Technical Description MLS 4



Drawing available under request.

* L: Stroke selection on page 25.

Mechanical specifications

Size		5	5	7	7	7	7
Carriage model		1800	2700	1800	2250	4500	6750
C - Carriage lenght	mm	484	720				
B - Width	mm	206	206				
H - Height	mm	96	96				
G1 - Distance between profile base grooves	mm	160	160				
G2 - Height of profile lateral grooves	mm	20	20				
M1 - Distance between fixation clamps boreholes ³⁾	mm	220	220				
M2 - Distance between fixation clamp boreholes ³⁾	mm	40	40				
M3 - Max. distance between fixation clamps ³⁾	mm	500	500				

Linear motor features

Maximum speed ¹⁾	m/s	2	2				
Continuous force aircooled ²⁾	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:

$$\frac{F_{ye}}{F_y} + \frac{F_{ze}}{F_z} + \frac{M_{xe}}{M_x} + \frac{M_{ye}}{M_y} + \frac{M_{ze}}{M_z} < 1$$

(Xxe = calculated value)
(Xx = max. catalogue value)

Structure profile features

Geometrical moments of inertia Lx	mm ⁴	16,3x10 ⁵	16,3x10 ⁵				
Geometrical moments of inertia Ly	mm ⁴	19,1x10 ⁶	19,1x10 ⁶				
Elastic module	N/mm ²	70000	70000				

Weight

Weight of carriage	kg	12,6	17,4				
Weight of 100mm	kg	1,9	1,9				

¹⁾ For a lifetime >30000 km

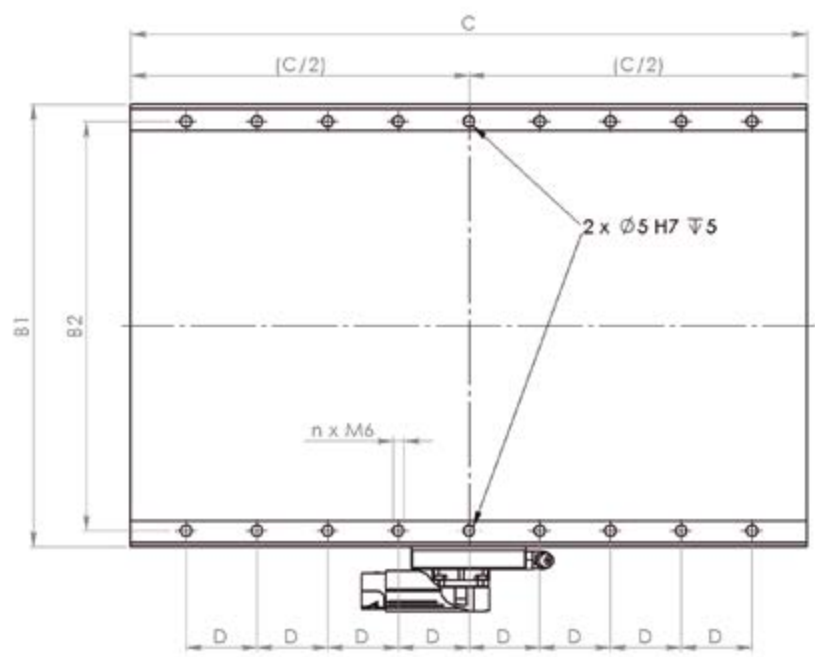
²⁾ Depending on the application and ambient temperature

³⁾ Sinadrives accessory

Choice of stroke MLS 4

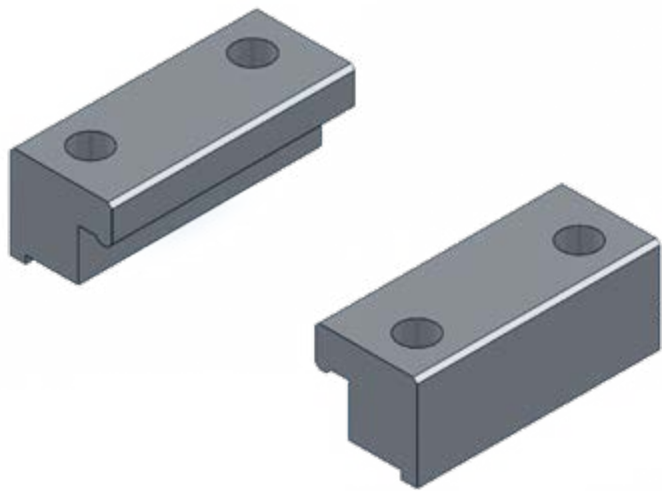
Linear motor stage		MLS45				
Carriage model	450	900	1125	1350	1800	2700
Lenght, L (mm)	Stroke					
270	34	-	-	-	-	-
366	130	52	6	-	-	-
462	226	148	102	56	-	-
558	322	244	198	152	20	-
654	418	340	294	248	116	-
750	514	436	390	344	212	-
846	610	532	486	440	308	72
942	706	628	582	536	404	168
1038	802	724	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 4 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 4 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 4 Order Code

Axis model

MLS 4 - Linear unit with iron core linear motor, fully enclosed model.

MLS4 S - - - - A - T - A1S - 00 - X - 00

Axis model

Size:

3 - MLS43
5 - MLS45
7 - MLS47

Lenght (mm) ⁵⁾

Motor / Carriage model

Motor type:

IT - Iron core motor
XX - Without motor

Peak force, N (aircooled) ¹⁾:

MLS23	[	02 - 240N
		05 - 480N
		07 - 720N
MLS25	[	04 - 450N
		09 - 900N
		11 - 1125N
		13 - 1350N
		18 - 1800N
MLS27	[	27 - 2700N
		18 - 1800N
		22 - 2250N
		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
XXXXX Without encoder

Supplier ²⁾

Reading head output ⁴⁾:

* Incremental:

0 - 1 Vpp
4 - TTL

* Absolut:

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

Measurement system ²⁾:

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 ²⁾:

15 - 15 mm
20 - 20 mm

Number of blocks ²⁾:

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

Screws:

S - Standard
I - Stainless steel

Connectors

Typ:

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

¹⁾ Depending on the application and ambient temperature

²⁾ Defined by previous selections

³⁾ Not available for peak force ≥ 1800N

⁴⁾ On request

⁵⁾ Length on page 25

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Innovation & Excellence

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Linear motor stages