

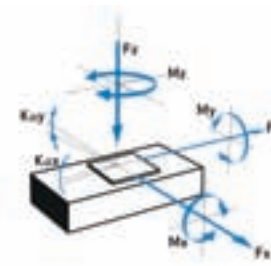


# LINEAR STAGES



## FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y Peak(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k+x(\mu rad/Nm)$	$k+y(\mu rad/Nm)$
LM-015	75	22	88	150	50	100	50	25	20



equipped with a linear scale which is centrally mounted between the guides. The high-quality cross-roller bearings insure a high load capacity and a smooth motion. The UPS-150 stage is driven by an iron-less linear motor and provides high acceleration and speed. A system accuracy below  $1 \mu m / 100 mm$  travel and a bi-directional repeatability of less than  $0.025 \mu m$  is guaranteed. The ultra precision stages are supplied with certificate of performance (flatness, straightness, pitch, yaw & position). The measurement is made with the stage mounted and unloaded on a granite table with a flatness  $< 1 \mu m$ .



The UPS-150 ultra-precision linear stage was specifically designed for sub-surface wafer inspection, fiber alignment, high precision robotics and for all tasks where a maximum positioning accuracy and reliability is absolutely mandatory. All UPS-150 ultra precision stages are

## KEY FEATURES

- Linear motor
- Travel range up to 305 mm (12")
- Uni-directional repeatability down to  $0.015 \mu m$
- Maximum speed 600 mm/sec
- Load capacity up to 15 kg
- Integrated inductive limit switches
- Integrated linear scale (center mounted)
- High long-term stability

## TECHNICAL DATA

	52	102	155	205	305
Travel range (mm)	52	102	155	205	305
Straightness / Flatness ( $\mu m$ )	$\pm 0.5$	$\pm 0.75$	$\pm 1$	$\pm 1.25$	$\pm 1.75$
Pitch ( $\mu rad$ )	$\pm 15$	$\pm 20$	$\pm 25$	$\pm 30$	$\pm 40$
Yaw ( $\mu m$ )	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 20$
Weight (kg)	4.7	5.5	6.3	7.1	8.7

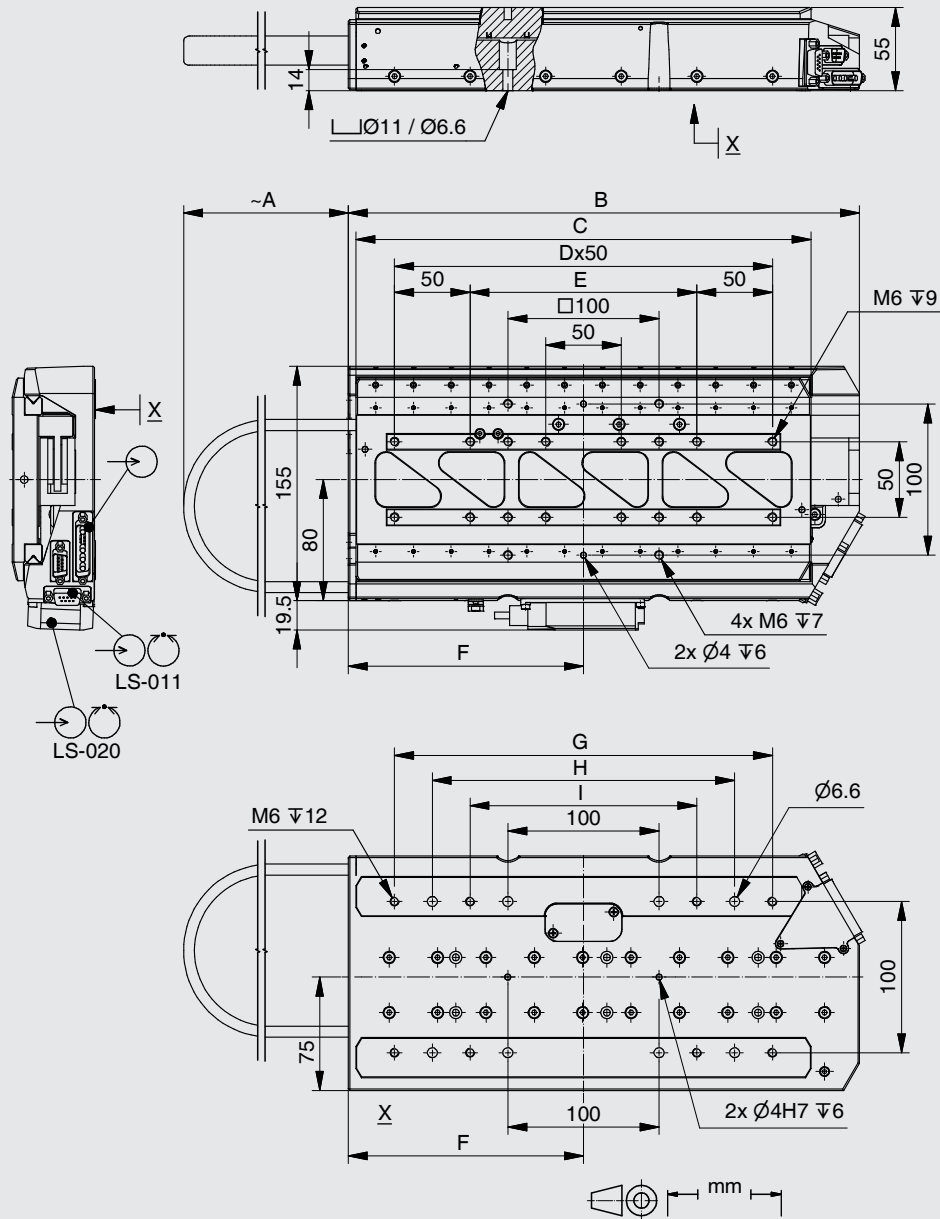
Motor	LM-015		
Linear scale		LS-011	LS-020
Speed max. (mm/sec)	600		
Resolution calculated ( $\mu m$ )		0.015	0.001
Resolution typical ( $\mu m$ )		0.02	0.015
Bi-directional Repeatability ( $\mu m$ )		$\pm 0.035$	$\pm 0.025$
Uni-directional Repeatability ( $\mu m$ )		0.025	0.015
Nominal Current (A)	1.4		

Accuracy	on request
Velocity range (mm/sec)	0.0005 ... 600
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	52	102	155	205	305
A	83	108	133	158	208
B	198	238	288	338	454
C	151	201	251	301	401
D	-	-	-	5	7
E	-	150	150	150	150
F	75.5	105.5	130.5	155.5	205.5
G	-	-	-	250	250
H	-	-	200	200	300
I	125	150	150	150	150



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- LS-180
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- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
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- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E

Order No.	6840-9-			
LM-015		1		
52 mm (2")		1		
102 mm (4")		2		
155 mm (6")		3		
205 mm (8")		4		
305 mm (12")		5		
LS-011, Linear steel scale			1	
LS-020, Linear glass scale			2	

## 4.082 Ultra Precision Linear Stage UPM-160



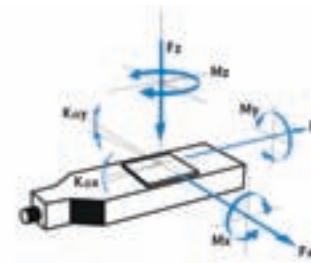
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-039	150	100	350	100	200	100	5	3
2Phase-051	150	100	350	100	200	100	5	3



### KEY FEATURES

- Travel range up to 205 mm (8")
- Uni-directional repeatability down to 0.035  $\mu m$
- Maximum speed 100 mm/sec
- Load capacity up to 35 kg
- Integrated mechanical limit switches
- Integrated linear scale (center mounted)



accuracy and reliability are absolutely mandatory. All UPM-160 stages are equipped with an integrated linear scale that is center mounted between the guides. High-quality cross-roller bearings mounted on a stress-relieved tempered aluminum-alloy body guarantee maximum load capacity and smooth motion. The UPM-160 stage is offered with a 2-phase stepper motor or with a DC-motor and is equipped with two mechanical limit switches. All ultra precision linear stages are supplied with a certificate of performance (flatness, straightness & accuracy).

The UPM-160 ultra-precision linear stage was specifically designed for wafer inspection, fiber alignment or for any other tasks where the highest positioning

### TECHNICAL DATA

Travel range (mm)	55	105	155	205
Straightness / Flatness ( $\mu m$ )	$\pm 0.5$	$\pm 0.75$	$\pm 1$	$\pm 1.25$
Pitch ( $\mu rad$ )	$\pm 15$	$\pm 20$	$\pm 25$	$\pm 30$
Yaw ( $\mu m$ )	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 20$
Weight (kg)	5	6	7	8

Motor (Pitch 2.5   5 mm)	DC-B-039	2Phase-051		
Linear scale			LS-010	LS-020
Speed max. (mm/sec)	50   100	18   30		
Resolution calculated ( $\mu m$ )		5   10 (FS)	0.05	0.001
Resolution typical ( $\mu m$ )			0.04	0.02
Bi-directional Repeatability ( $\mu m$ )			$\pm 0.05$	$\pm 0.035$
Uni-directional Repeatability ( $\mu m$ )			0.05	0.035
Nominal Current (A)	3.8	2.5		
Voltage Range (V)	24			

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 100
Material	Aluminum, black anodized

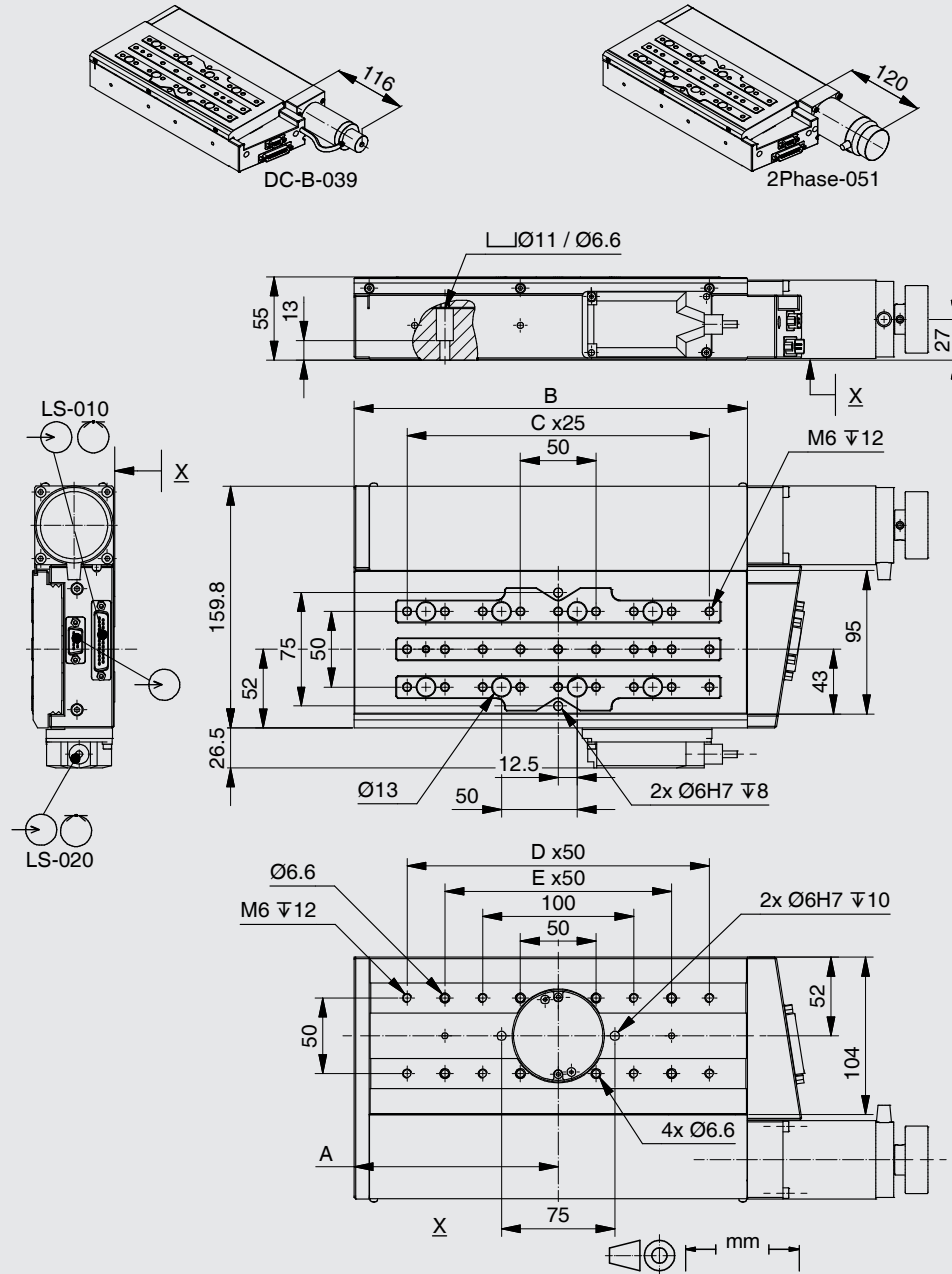
Note: FS = full step, RE = rotary encoder

More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	55	105	155	205
A	110	135	160	185
B	210	260	310	360
C	6	8	10	12
D	-	4	4	6
E	3	3	5	5

Order No.	6270-9-			
DC-B-039		1		
2Phase-051		2		
55 mm (2")		1		
105 mm (4")		2		
155 mm (6")		3		
205 mm (8")		4		
LS-010, Linear steel scale		1		
LS-020, Linear glass scale		2		
Pitch 2.5 mm		1		
Pitch 5.0 mm		2		



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- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
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- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
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- MP-20 B
- MP-15
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## 4.084 High Precision Stage HPS-170



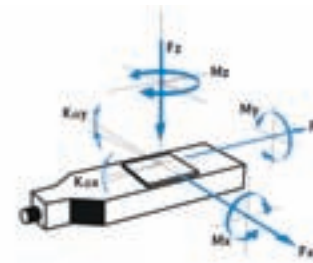
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^+x(\mu rad/Nm)$	$k^+y(\mu rad/Nm)$
DC-B-040	150	100	350	300	400	300	12	8
2Phase-048	150	150	350	300	400	300	12	8



### KEY FEATURES

- Travel range up to 305 mm (12")
- Uni-directional repeatability down to 0.05  $\mu m$
- Maximum speed 90 mm/sec
- Load capacity up to 35 kg
- Integrated mechanical limit switches
- Option: linear scale (center mounted)



precision positioning. Due to its precise and smooth operation this linear stage is perfectly suited for measuring and inspection equipment. High-quality cross-roller bearings mounted on a stress-relieved, tempered aluminum alloy body guarantee maximum load capacity and long-time stability. The HPS-170 precision stage is available with a DC or a 2-phase stepper motor and is equipped with two mechanical limit switches. A linear scale with a resolution of less than 0.05  $\mu m$  is optional. Optical and inductive limit switches as well as a certificate of performance can be supplied on request.

The HPS-170 precision stage was developed to meet the demands of high

### TECHNICAL DATA

Travel range (mm)	52	102	155	205	305
Straightness / Flatness ( $\mu m$ )	$\pm 0.75$	$\pm 1$	$\pm 2$	$\pm 3$	$\pm 4$
Pitch ( $\mu rad$ )	$\pm 20$	$\pm 25$	$\pm 30$	$\pm 35$	$\pm 40$
Yaw ( $\mu m$ )	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$
Weight (kg)	5	5.5	6	6.5	7

Motor (Pitch 2 mm)	DC-B-040	2Phase-048	
Linear scale			LS-010
Speed max. (mm/sec)	90	35	
Resolution calculated ( $\mu m$ )	0.1 (RE)	10 (FS)	0.05
Resolution typical ( $\mu m$ )	0.2	0.1	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 1$	$\pm 1$	$\pm 0.05$
Uni-directional Repeatability ( $\mu m$ )	0.2	0.2	0.05
Nominal Current (A)	3.8	1.2	
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 90
Material	Aluminum, black anodized

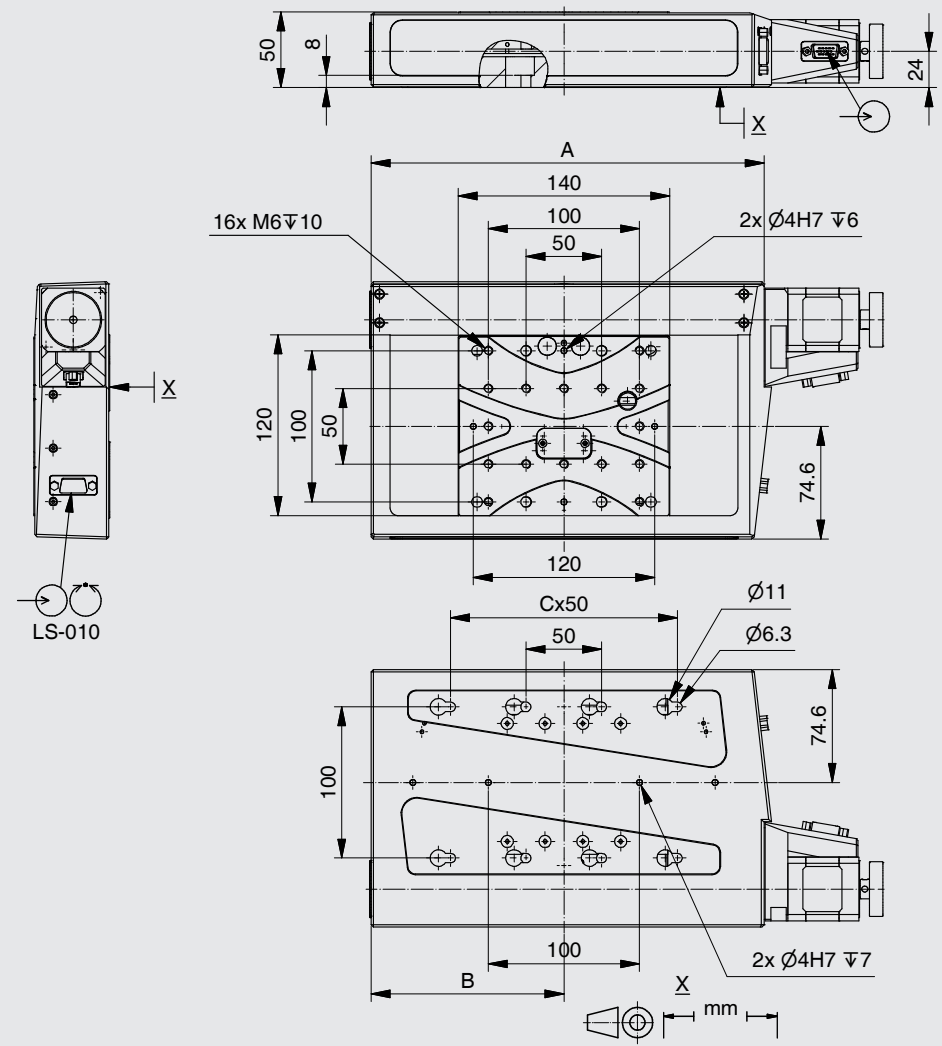
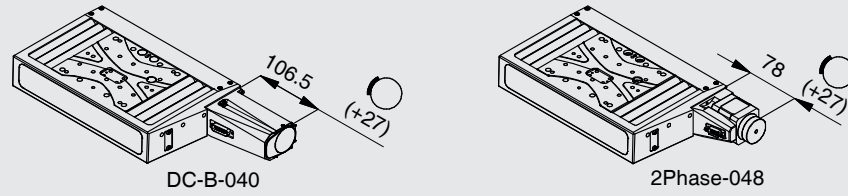
Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	52	102	155	205	305
A	261	311	381	456	556
B	127.5	152.5	187.5	225	275
C	3	3	5	6	7

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- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E



Order No.	6262-9-			
DC-B-040		1		
2Phase-048		2		
2 mm (2")		1		
102 mm (4")		2		
155 mm (6")		3		
205 mm (8")		4		
305 mm (12")		5		
without LS-010		0		
LS-010, Linear steel scale		1		
without brake		0		
with brake		1		

## 4.086 Linear Stage LS-270



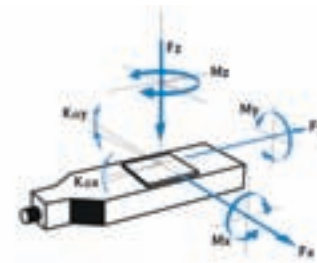
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-086	1200	40	1500	250	280	250	3.2	1.6
2Phase-072	1200	260	1500	250	280	250	3.2	1.6



### KEY FEATURES

- Travel range up to 1016 mm (40")
- Uni-directional repeatability down to 0.05  $\mu m$
- Maximum speed 150 mm/sec
- Load capacity up to 150 kg
- Integrated inductive limit switches
- Option: linear scale (center mounted)



The LS-270 linear stage was developed for positioning high loads. Cross-roller bearings mounted on a rigid tempered aluminum-alloy body guarantee very high guiding stiffness and long operating life. The ball screw with 5 mm pitch allows velocities up to 150 mm/s. For demanding positioning tasks the LS-270 linear stages can be supplied with a linear scale which is centrally installed between the guides. The LS-270 linear stages can be equipped with a DC or a 2-phase stepper motor and have two inductive limit switches.

### TECHNICAL DATA

Travel range (mm)	155	305	508	815	1016
Straightness / Flatness ( $\mu m$ )	$\pm 1.5$	$\pm 3$	$\pm 4$	$\pm 7$	$\pm 10$
Pitch ( $\mu rad$ )	$\pm 20$	$\pm 40$	$\pm 80$	$\pm 100$	$\pm 120$
Yaw ( $\mu m$ )	$\pm 20$	$\pm 20$	$\pm 30$	$\pm 40$	$\pm 50$
Weight (kg)	25	29	35	43	50

Motor (Pitch 5 mm)	DC-B-086	2Phase-072	
Linear scale			LS-010
Speed max. (mm/sec)	150	50	
Resolution calculated ( $\mu m$ )		12.5 (FS)	0.05
Resolution typical ( $\mu m$ )	0.5	0.4	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 2.5$	$\pm 2.5$	$\pm 0.04$
Uni-directional Repeatability ( $\mu m$ )	0.5	0.4	0.05
Nominal Current (A)	5.57	2	
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 150
Material	Aluminum, black anodized

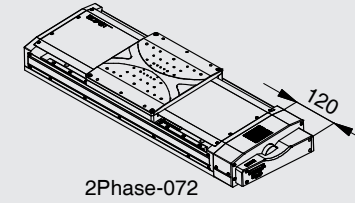
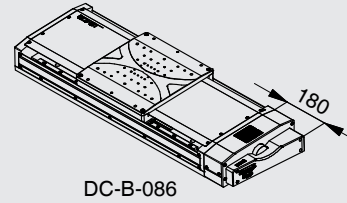
Note: FS = full step, RE = rotary encoder

More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change



Travel (mm)	155	305	508	815	1016
A	275	350	450	600	700
B	550	700	900	1200	1400
C	9	11	15	21	25

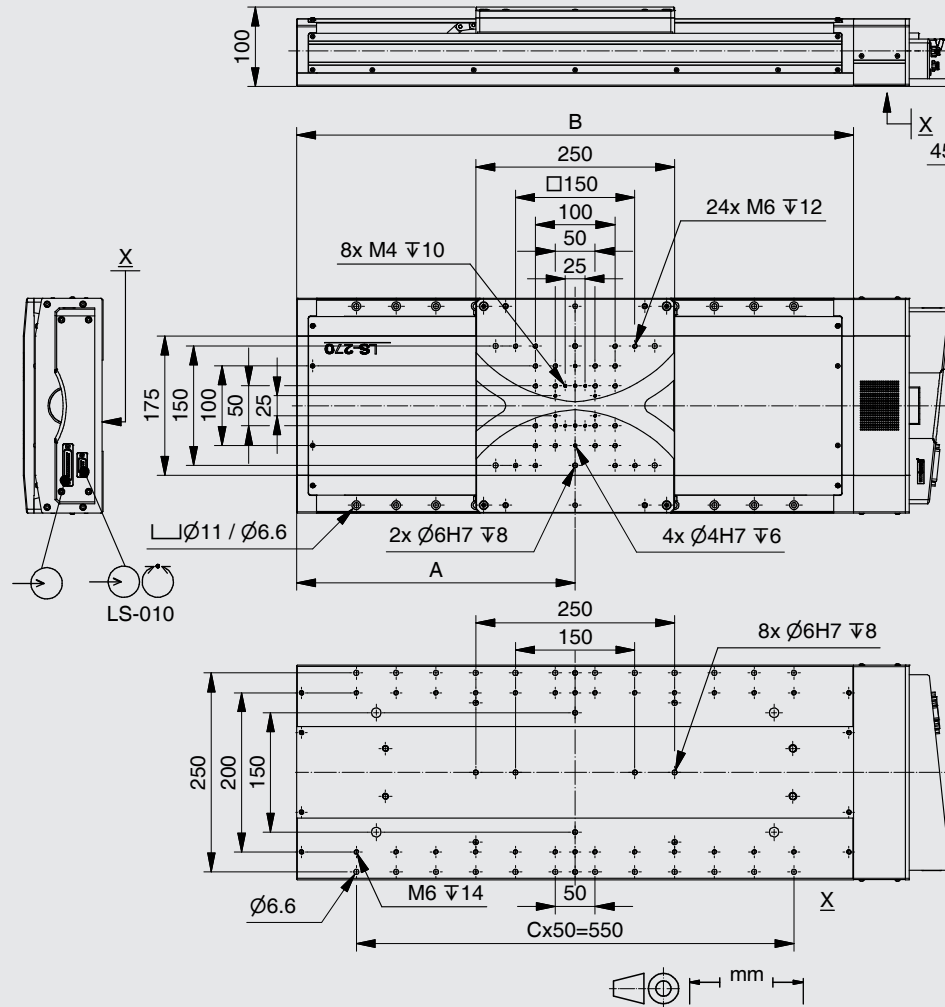


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- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E



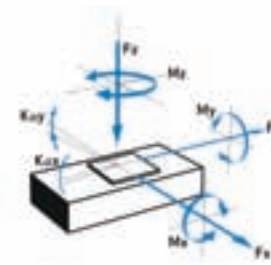
Order No.	6239-9-				
DC-B-086		1			
2Phase-072		2			
155 mm (6")		1			
305 mm (12")		2			
508 mm (20")		3			
815 mm (32")		4			
1016 mm (40")		5			
without LS-010		0			
LS-010, Linear steel scale		1			
ILS-020, Inductive limit switches		4			

## 4.088 Linear Motor Stage LMS-230



### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y Peak(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^+x(\mu rad/Nm)$	$k^+y(\mu rad/Nm)$
LM-050	75	22	88	150	50	100	50	25	20



accidental over-travel. Due to high-quality cross-roller bearings a maximum of load capacity and smooth motion is guaranteed. Special, stress-relieved, tempered aluminum-alloy guarantees a homogeneous non-warping stage structure. The Linear Measuring Stage LMS-230 is driven by a linear motor and provides high acceleration, high travel speed and guaranteed a constant motion. System accuracy below  $1 \mu m / 100 mm$  travel and a bi-directional repeatability of less than  $0.1 \mu m$  is guaranteed. The Linear Measuring Stage LMS-230 is supplied with certificate of performance (flatness, straightness, pitch, yaw & position).

The Linear Motor Stage LMS-230 was specifically designed for dynamic film exposing, high precision robotics and for all tasks where a maximum of positioning accuracy and reliability is absolutely mandatory. The Linear Measuring Stage LMS-230 is equipped with a linear scale which is centrally installed between the guides. Two limit switches protect against

### KEY FEATURES

- Linear Motor
- Travel range 52 mm (2")
- Uni-directional repeatability down to  $0.01 \mu m$
- Maximum speed 400 mm/sec
- Load capacity up to 15 kg
- Integrated inductive limit switches
- Integrated linear scale (center mounted)

### TECHNICAL DATA

Travel range (mm)	52	
Straightness / Flatness ( $\mu m$ )	$\pm 0.5$	
Pitch ( $\mu rad$ )	$\pm 10$	
Yaw ( $\mu m$ )	$\pm 10$	
Weight (kg)	13.5	

Motor	LM-050	
Linear scale		LS-021
Speed max. (mm/sec)	400	
Resolution calculated ( $\mu m$ )		0.001
Resolution typical ( $\mu m$ )	0.005	0.005
Bi-directional Repeatability ( $\mu m$ )		$\pm 0.02$
Uni-directional Repeatability ( $\mu m$ )		0.01
Nominal Current (A)	5.95	

Accuracy	on request	
Velocity range (mm/sec)	0.0005 ... 400	
Material	Aluminum, black anodized	

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

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LS-180

LS-120

LS-110

LMS-80

LMS-60

PLS-85

LS-65

MTS-65

MTS-70

VT-75

VT-80

LS-40

VT-21 S

CS-430

MS-8

MS-4

KT-120

MS-bio

NPE-200

UPL-120

ES-100

ES-82

ES-70

ES-50

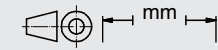
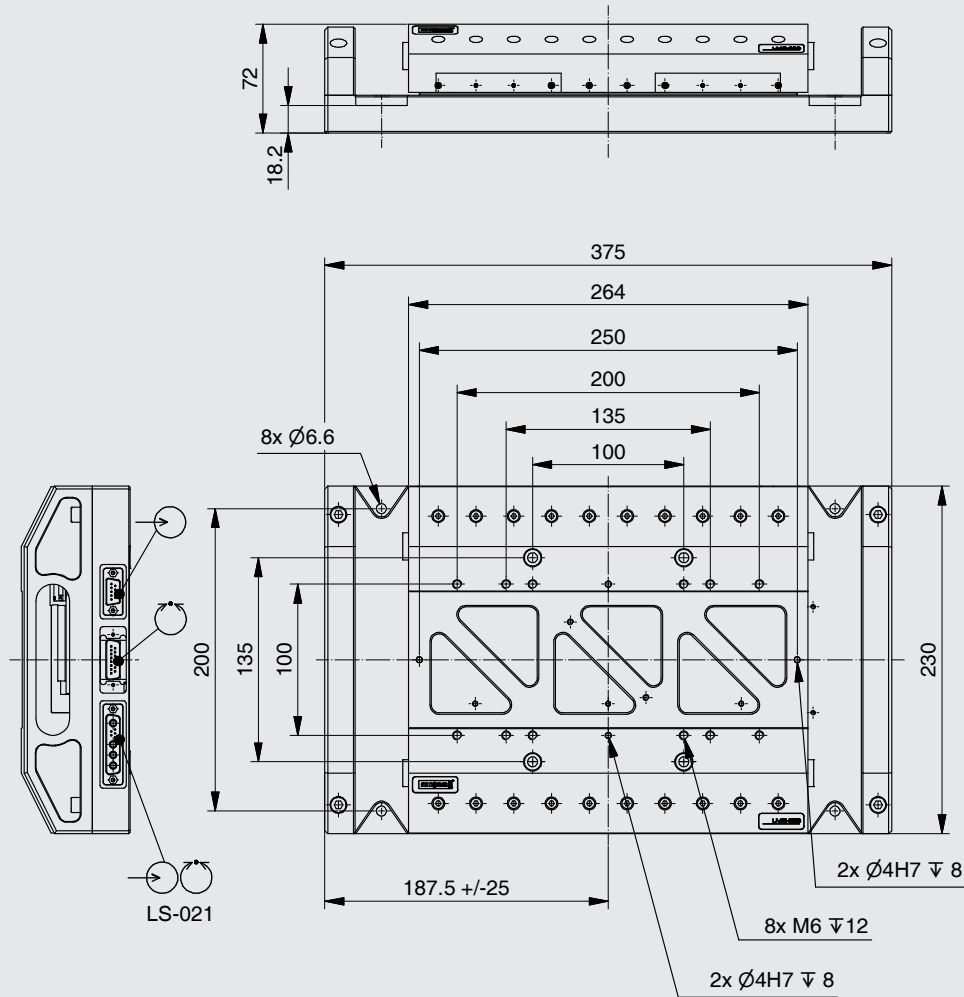
MA-35

MP-20

MP-20 B

MP-15

ASS 5E



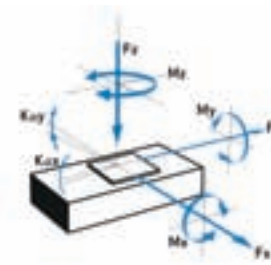
Order No.	6854-9-			
LM-050		1		
52 mm (2")		1		
LS-021, Linear glass scale		1		
ILS-020, Inductive limit switches		1		

## 4.090 Linear Motor Stage LMS-180



### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y \text{ Peak}(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k+x(\mu\text{rad}/Nm)$	$k+y(\mu\text{rad}/Nm)$
LM-010	480	50	176	450	65	120	65	80	60



The LMS-180 linear stage series is developed for advanced electronic production and laser applications. Combined with the PI miCos UPR direct-driven rotation stage series, highly-dynamic and precise positioning systems can be configured resulting in an efficient production line. The LMS-180 linear stage are driven by iron-less linear motors. The very high accuracy linear scale is installed between the guides so that higher system accuracy can be achieved. The LMS-180 series excels with very quiet, dynamic and smooth motion. All LMS-180 linear stages are equipped with inductive limit switches for protection against damage.



### KEY FEATURES

- Linear Motor
- Travel range up to 508 mm (20")
- Uni-directional repeatability down to 0.05  $\mu\text{m}$
- Maximum speed 500 mm/sec
- Integrated inductive limit switches
- Integrated linear scale (center mounted)

### TECHNICAL DATA

Travel range (mm)	155	205	305	408	508
Straightness / Flatness ( $\mu\text{m}$ )	$\pm 2$	$\pm 3$	$\pm 4$	$\pm 5$	$\pm 6$
Pitch ( $\mu\text{rad}$ )	$\pm 40$	$\pm 50$	$\pm 60$	$\pm 70$	$\pm 80$
Yaw ( $\mu\text{m}$ )	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$
Weight (kg)	10.2	10.4	11.5	12.8	14.2

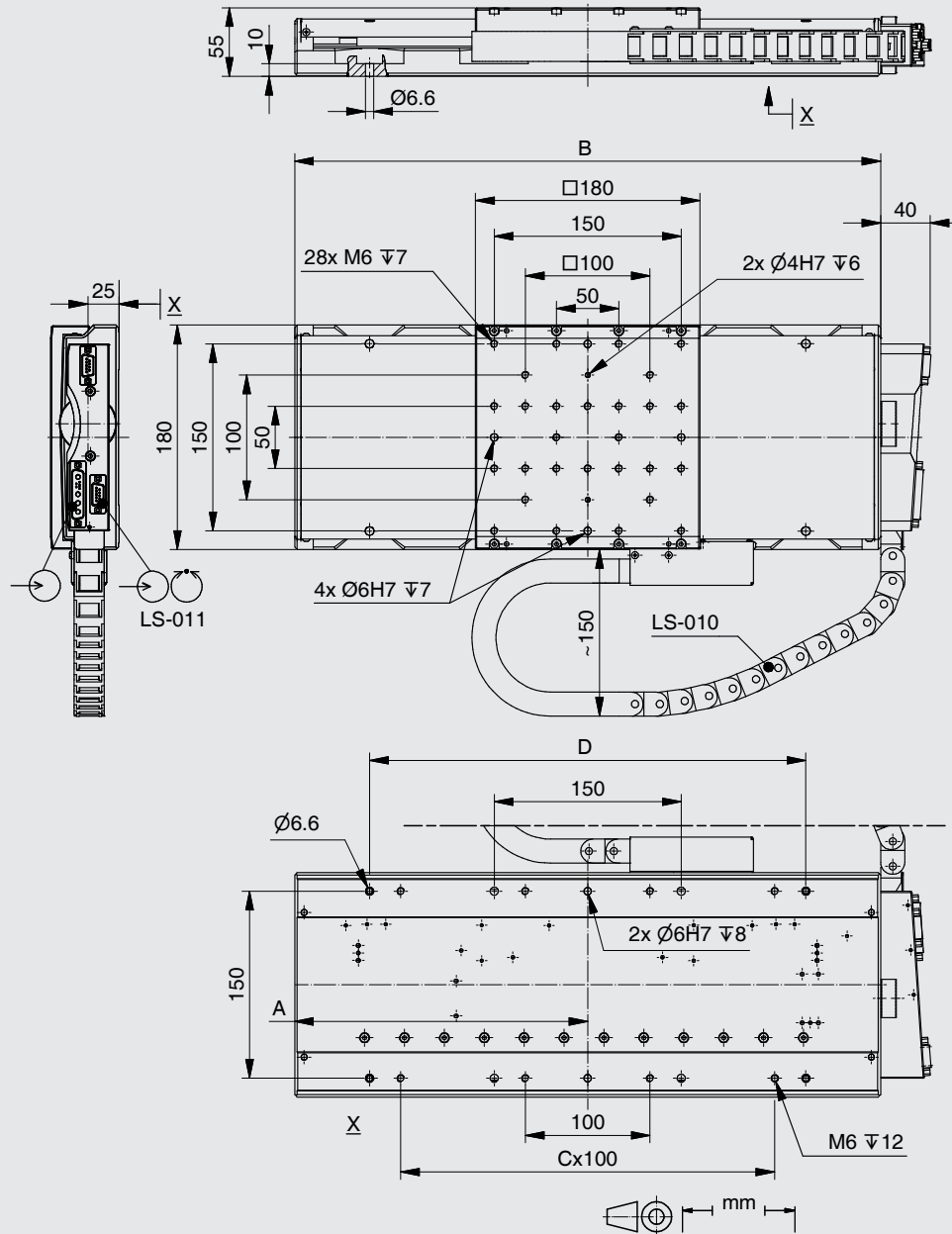
Motor	LM-010	LS-011
Linear scale		
Speed max. (mm/sec)	500	
Resolution calculated ( $\mu\text{m}$ )		0.015
Resolution typical ( $\mu\text{m}$ )		0.04
Bi-directional Repeatability ( $\mu\text{m}$ )		$\pm 0.1$
Uni-directional Repeatability ( $\mu\text{m}$ )		0.05
Nominal Current (A)	1.8	

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 500
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	155	205	305	408	508
A	235	260	310	360	410
B	470	520	620	720	820
C	3	3	5	5	5
D	350	350	450	550	650



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- LMS-80
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- PLS-85
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- VT-21 S
- CS-430
- MS-8
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- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E

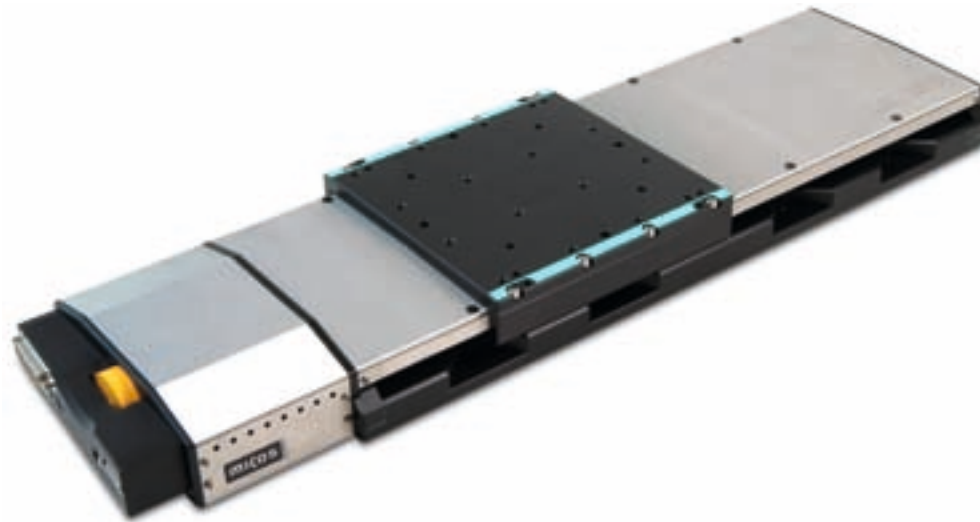
Order No.	6850-9-			
LM-010		1		
155 mm (6")		1		
205 mm (8")		2		
305 mm (12")		3		
408 mm (16")		4		
508 mm (20")		5		
LS-011, Linear steel scale			1	

## 4.092 Linear Stage LS-180



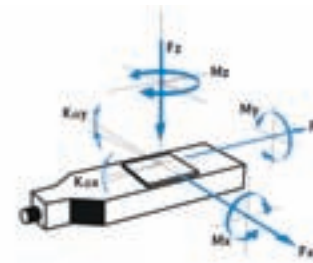
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-040	500	200	1000	132	400	125	60	50
2Phase-052	500	250	1000	132	400	125	60	50



### KEY FEATURES

- Travel range up to 610 mm (24")
- Uni-directional repeatability down to 0.05  $\mu m$
- Maximum speed 200 mm/sec
- Load capacity up to 100 kg
- Integrated inductive limit switches
- Option: linear scale (center mounted)



The LS-180 linear stage was developed for industrial applications. Re-circulating ball guides mounted on a rigid tempered aluminum-alloy body guarantee a very high guiding stiffness and long operating life. The ball screw with 5 mm pitch allows velocities up to 200 mm/s. For demanding positioning tasks the linear stages LS-180 can be supplied with a linear scale which is centrally installed between the guides. The LS-180 linear stages can be equipped with a DC or a 2-phase stepper motor and are supplied with two inductive limit switches.

### TECHNICAL DATA

Travel range (mm)	155	205	305	408	508	610
Straightness / Flatness ( $\mu m$ )	$\pm 2$	$\pm 3$	$\pm 4$	$\pm 5$	$\pm 6$	$\pm 8$
Pitch ( $\mu rad$ )	$\pm 40$	$\pm 50$	$\pm 60$	$\pm 70$	$\pm 80$	$\pm 100$
Yaw ( $\mu m$ )	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$
Weight (kg)	8.4	8.8	9.6	10.2	10.8	12

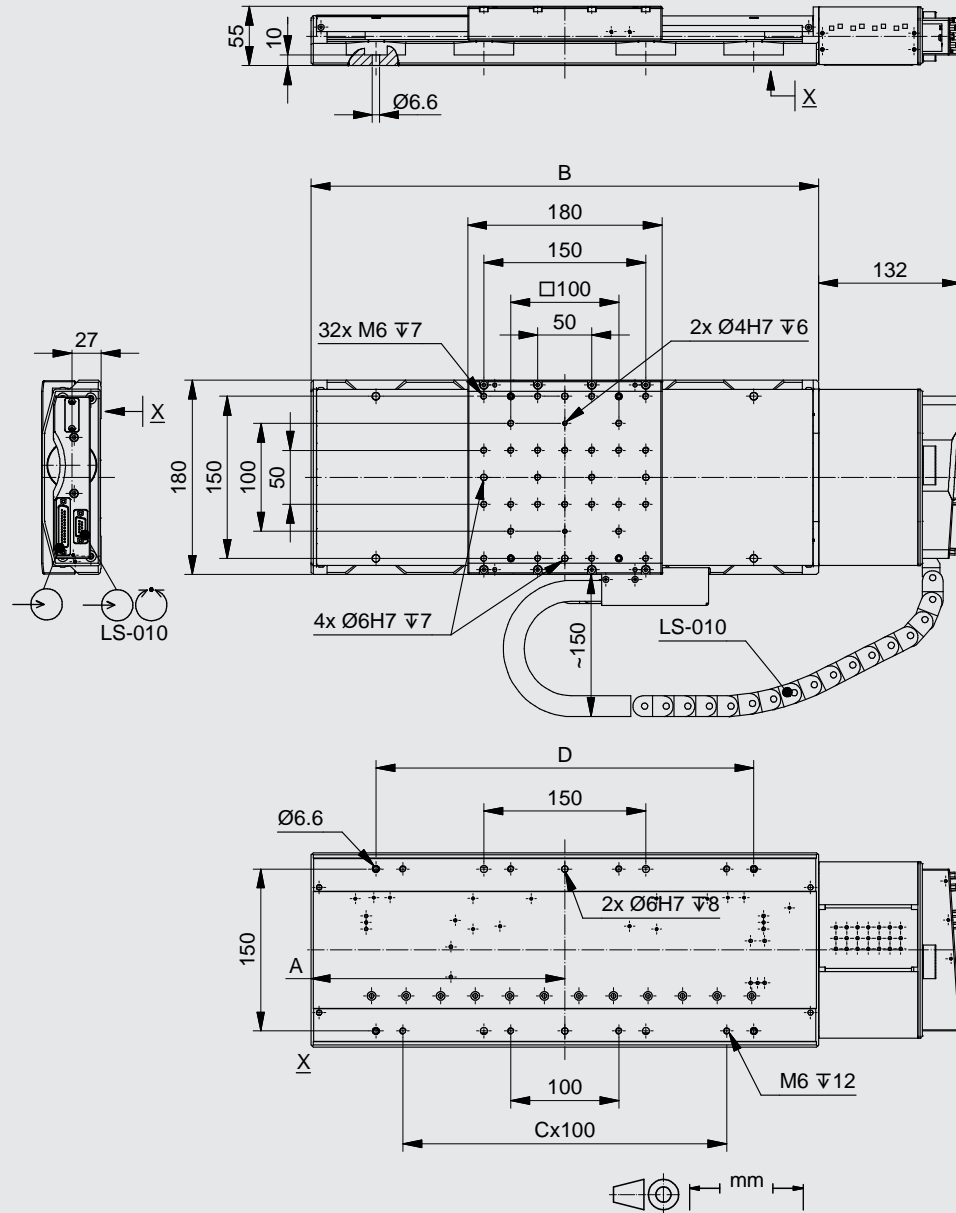
Motor (Pitch 5 mm)	DC-B-040	2Phase-052	
Linear scale			LS-010
Speed max. (mm/sec)	200	75	
Resolution calculated ( $\mu m$ )	0.25 (RE)	25 (FS)	0.05
Resolution typical ( $\mu m$ )	0.5	0.5	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 2.5$	$\pm 2.5$	$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )	0.5	0.5	0.05
Nominal Current (A)	3.8	2	
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 200
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	155	205	305	408	508	610
A	235	260	310	360	410	460
B	470	520	620	720	820	920
C	3	3	5	5	5	7
D	350	350	450	550	650	750



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- LMS-180

**LS-180**

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- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
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Order No.	6240-9-		
DC-B-040		1	
2Phase-052		2	
155 mm (6")		1	
205 mm (8")		2	
305 mm (12")		3	
408 mm (16")		4	
508 mm (20")		5	
610 mm (24")		6	
without LS-010		0	
LS-010, Linear steel scale		1	

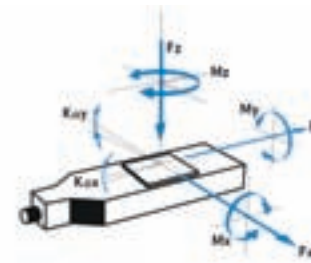
## FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^+x(\mu rad/Nm)$	$k^+y(\mu rad/Nm)$
DC-B-033	50	80	100	30	60	33	40	30
2Phase-048	50	80	100	30	60	33	40	30



## KEY FEATURES

- Travel range up to 40 mm (xy setup by PI miCos)
- Maximum speed 90 mm/sec
- Load capacity up to 10 kg
- Integrated inductive limit switches
- Option: linear scale (center mounted)



The LS-120 linear stage is suited for high precision applications with limited space conditions. High rigidity within a compact package is achieved by using re-circulating linear ball bearings mounted within a highly rigid, tempered aluminum-alloy stage body. The linear stage is driven by a re-circulating ball screw with 2 mm pitch and can be supplied with a linear scale which is centrally installed between the guides. The LS-120 linear stages can be equipped with a DC or 2-phase stepper motor. Inductive limit switches are integrated in the linear stage.

## TECHNICAL DATA

Travel range (mm)	40		
Straightness / Flatness ( $\mu m$ )	$\pm 1.5$		
Pitch ( $\mu rad$ )	$\pm 40$		
Yaw ( $\mu m$ )	$\pm 40$		
Weight (kg)	1.8		
Motor (Pitch 2 mm)	DC-B-033	2Phase-048	
Linear scale			LS-010
Speed max. (mm/sec)	90		
Resolution calculated ( $\mu m$ )	0.1 (RE)		0.05
Resolution typical ( $\mu m$ )	0.2		0.1
Bi-directional Repeatability ( $\mu m$ )	$\pm 1$		$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )	0.2		0.1
Nominal Current (A)	2.3	1.2	
Voltage Range (V)	24		
Accuracy	on request		
Velocity range (mm/sec)	0.001 ... 90		
Material	Aluminum, black anodized		

Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change



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UPM-160

HPS-170

LS-270

LMS-230

LMS-180

LS-180

**LS-120**

LS-110

LMS-80

LMS-60

PLS-85

LS-65

MTS-65

MTS-70

VT-75

VT-80

LS-40

VT-215

CS-430

MS-8

MS-4

KT-120

MS-bio

NPE-200

UPL-120

ES-100

ES-82

ES-70

ES-50

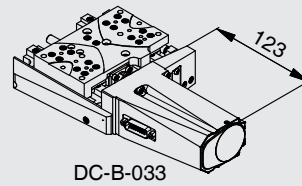
MA-35

MP-20

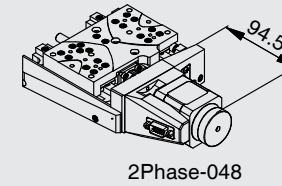
MP-20 B

MP-15

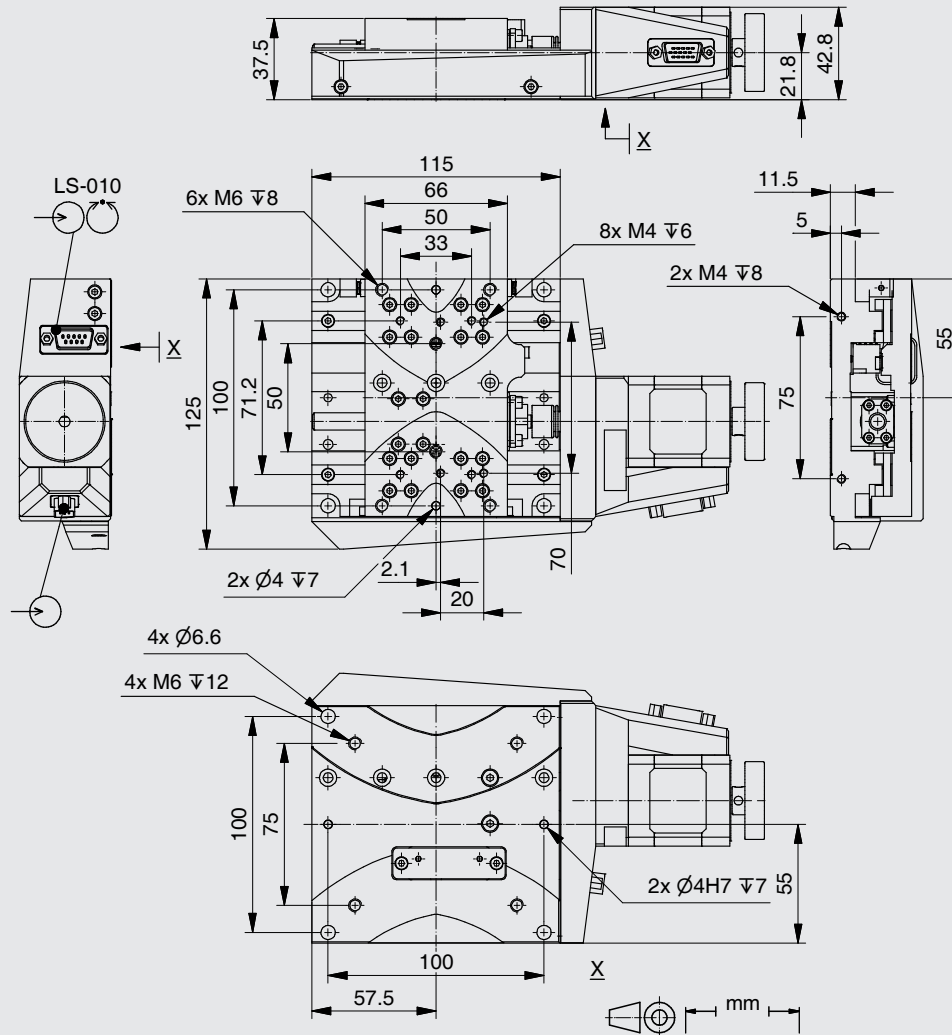
ASS5E



DC-B-033



2Phase-048



Order No.	6237-9-			
DC-B-033		1		
2Phase-048		2		
40 mm (1.5")		1		
40 mm (xy setup by PI miCos)		2		
without LS-010		0		
LS-010, Linear steel scale		1		
ILS-010, Inductive limit switches		4		



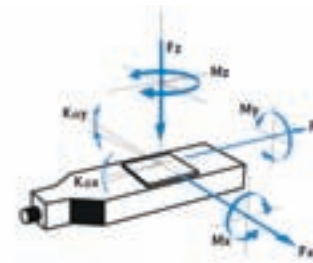
## FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-032	50	80	100	30	60	33	50	40
2Phase-045	50	80	100	30	60	33	50	40
DC-B-033	50	80	100	30	60	33	50	40



## KEY FEATURES

- Travel range up to 305 mm (12")
- Uni-directional repeatability down to 0.05  $\mu m$
- Maximum speed 90 mm/sec
- Load capacity up to 10 kg
- Integrated mechanical limit switches
- Option: linear scale (center mounted)



The LS-110 linear stage series is especially suited for industrial laser treatment. Linear guides with recirculating linear ball bearings guarantee very high guiding stiffness. Driven by a recirculating ball screw with 2 mm pitch, the LS-110 can be mounted in any orientation. For demanding positioning tasks, the LS-110 linear stages can be supplied with a linear scale which is centrally installed between the guides. The LS-110 can be equipped with a DC or a 2-phase stepper motor and is equipped with two mechanical limit switches.

## TECHNICAL DATA

Travel range (mm)	26	52	77	102	155	190	255	305
Straightness / Flatness ( $\mu m$ )	$\pm 1$	$\pm 1.5$	$\pm 2$	$\pm 2.5$	$\pm 3$	$\pm 3.5$	$\pm 4$	$\pm 5$
Pitch ( $\mu rad$ )	$\pm 30$	$\pm 40$	$\pm 50$	$\pm 60$	$\pm 70$	$\pm 80$	$\pm 90$	$\pm 100$
Yaw ( $\mu m$ )	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$
Weight (kg)	2.6	2.7	2.8	2.9	3.1	3.1	3.5	3.7

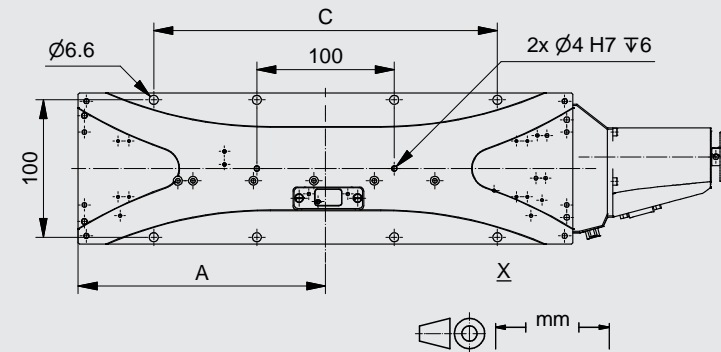
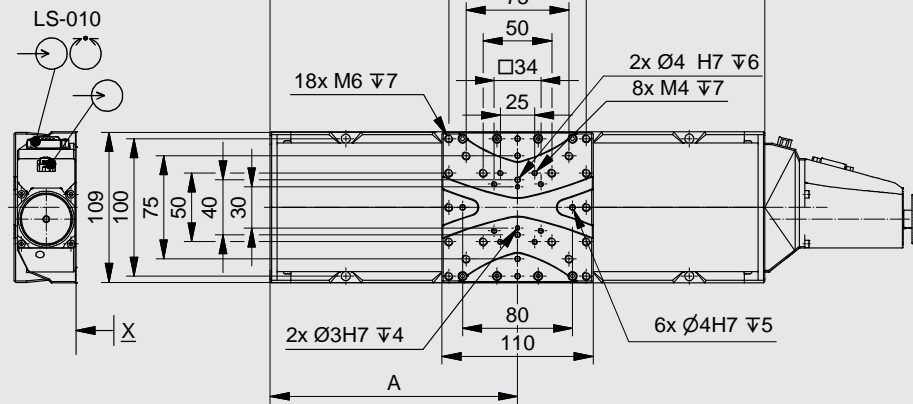
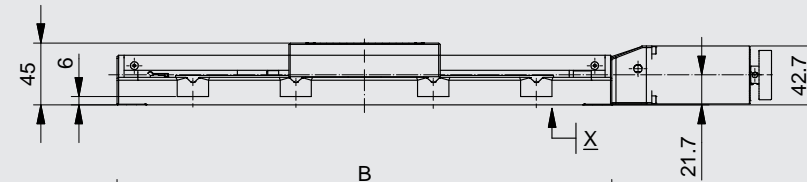
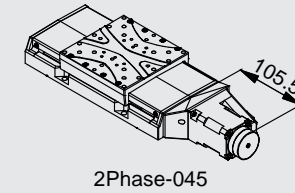
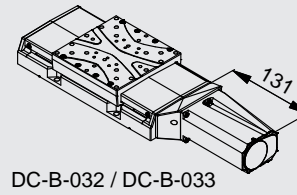
Motor (Pitch 2 mm)	DC-B-032	2Phase-045	DC-B-033	
Linear scale				LS-010
Speed max. (mm/sec)	90	45	90	
Resolution calculated ( $\mu m$ )	1 (RE)	10 (FS)	0.1 (RE)	0.05
Resolution typical ( $\mu m$ )	1	0.2	0.2	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 1$	$\pm 1$	$\pm 1$	$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )	1	0.2	0.2	0.05
Nominal Current (A)	2.3	1.2	2.3	
Voltage Range (V)	24		24	

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 90
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	26	52	77	102	155	190	255	305
A	112.5	125	137.5	150	180	180	215	240
B	225	250	275	300	360	360	430	480
C	-	-	-	-	250	250	300	350



Order No.	6236-9-				
DC-B-032		1			
2Phase-045		3			
DC-B-033		4			
26 mm (1")		1			
52 mm (2")		2			
77 mm (3")		3			
102 mm (4")		4			
155 mm (6")		5			
190 mm		6			
255 mm (10")		7			
305 mm (12")		8			
without LS-010		0			
LS-010, Linear steel scale (max 155 mm)		1			
MLS-020, Mechanical limit switches		0			

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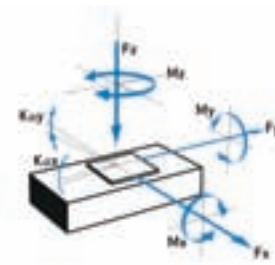
- UPS-150
- UPM-160
- HPS-170
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- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110**
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E

## 4.098 Linear Motor Stage LMS-80



### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y Peak(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
LM-052	40	7	34	50	30	15	20



The LMS-80 linear stage was designed for industrial applications with high speed requirements in a limited space. All LMS-80 linear stages are driven by linear motors and are equipped with a linear scale. The very small height of 16 mm allows extremely compact setups. The LMS-80 linear stage is equipped with limit switches for protection against damage. Other travel ranges on request.



### KEY FEATURES

- Linear motor
- Travel range 120 mm
- Maximum speed 500 mm/sec
- Load capacity up to 5 kg
- Integrated hall limit switches
- Integrated linear scale

### TECHNICAL DATA

Travel range (mm)	120	
Straightness / Flatness ( $\mu m$ )	$\pm 4$	
Pitch ( $\mu rad$ )	$\pm 150$	
Yaw ( $\mu m$ )	$\pm 150$	
Weight (kg)	2.5	
Motor	LM-052	
Linear scale		LS-070
Speed max. (mm/sec)	500	
Resolution calculated ( $\mu m$ )		0.015
Resolution typical ( $\mu m$ )		0.1
Bi-directional Repeatability ( $\mu m$ )		$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )		0.1
Nominal Current (A)	0.7	
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 500	
Material	Steel	

Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

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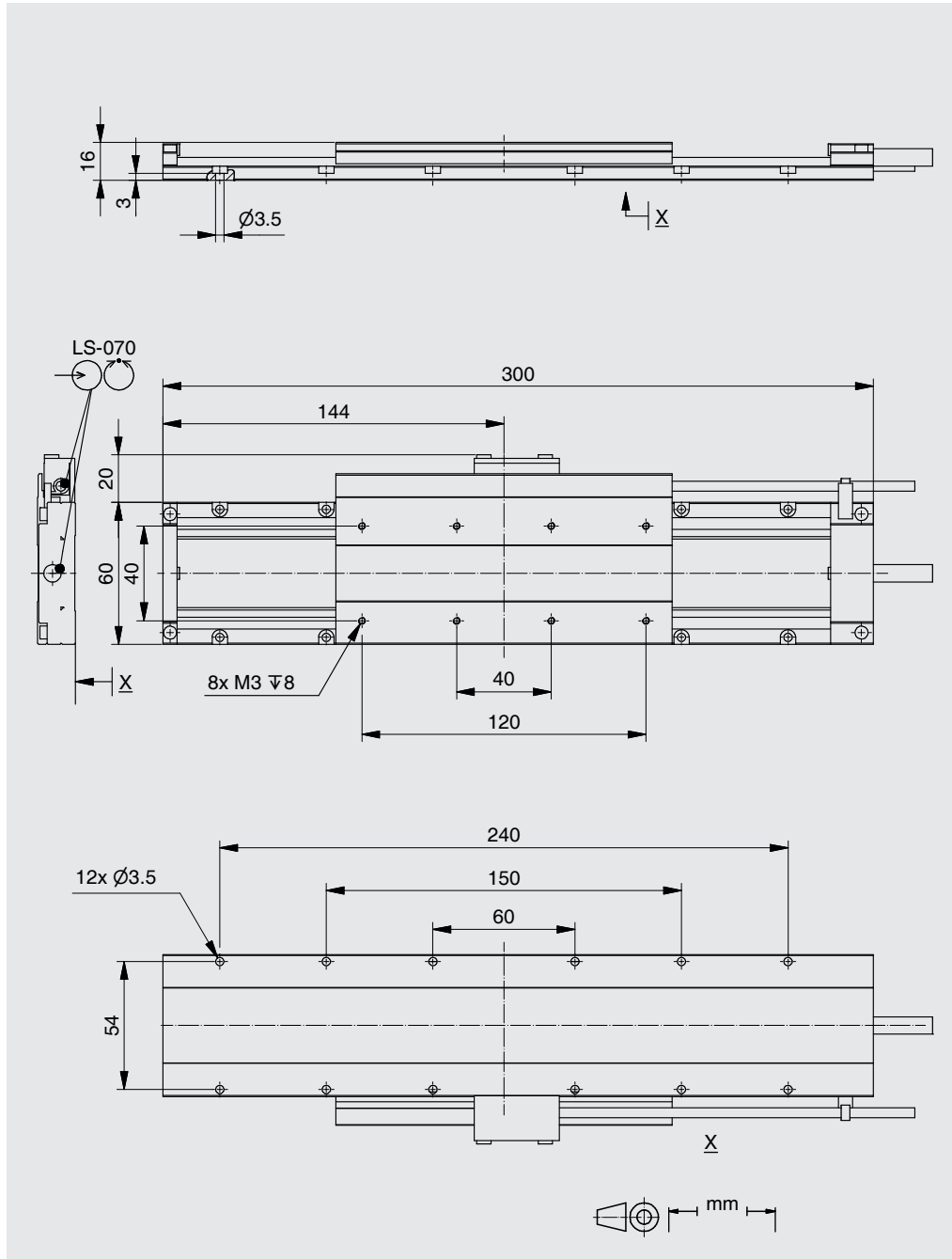
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- LS-65
- MTS-65
- MTS-70
- VT-75
- LS-80
- LS-40
- VT-21 S
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E



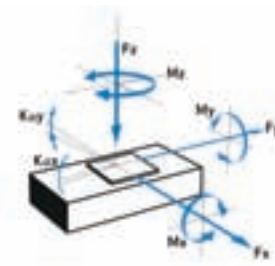
Order No.	6842-9-				
LM-052		1			
120 mm		1			
LS-070, Linear steel scale		1			
HLS-020, Hall limit switches		1			

## 4.100 Linear Motor Stage LMS-60

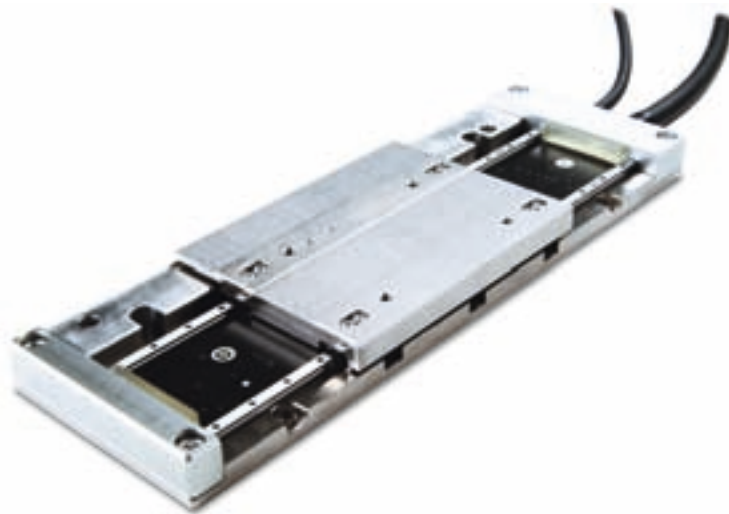


### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y Peak(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
LM-051	25	7	31	30	4	4	10
LM-054	25	7	31	30	4	4	10



The linear stage LMS-60 was designed for industrial applications with high speed requirements within and limited space conditions. Linear stages LMS-60 are driven by linear motors and are equipped with a linear scale. The very small height of 14 mm allows very compact setups. All Linear Stages of the LMS-60 series are equipped with limit switches for protection against damage.



### KEY FEATURES

- Linear motor
- Travel range 65 mm (LM-054)
- Maximum speed 500 mm/sec
- Load capacity up to 3 kg
- Integrated hall limit switches
- Integrated linear scale

### TECHNICAL DATA

Travel range (mm)	25	65
Straightness / Flatness ( $\mu m$ )	$\pm 1$	$\pm 2$
Pitch ( $\mu rad$ )	$\pm 80$	$\pm 100$
Yaw ( $\mu m$ )	$\pm 80$	$\pm 100$
Weight (kg)	1	1.8

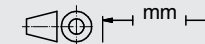
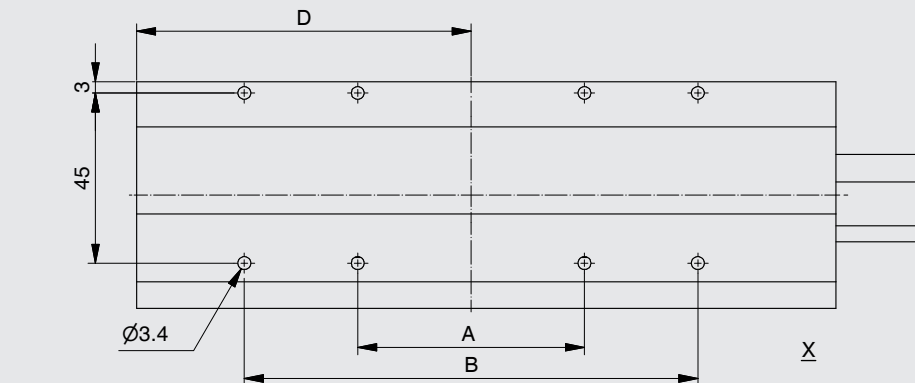
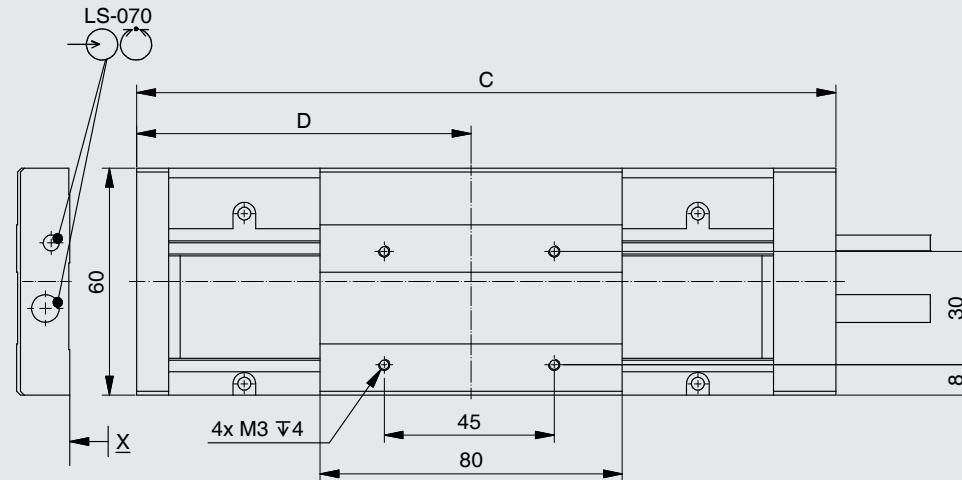
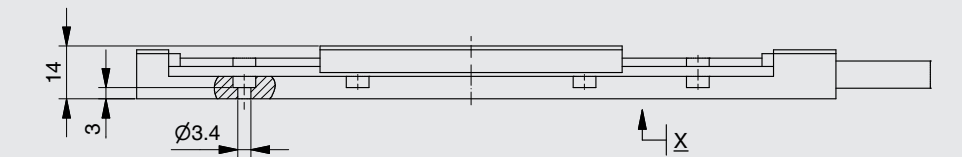
Motor	LM-051	LM-054	
Linear scale			LS-070
Speed max. (mm/sec)	500	500	
Resolution calculated ( $\mu m$ )			0.015
Resolution typical ( $\mu m$ )			0.1
Bi-directional Repeatability ( $\mu m$ )			$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )			0.1
Nominal Current (A)	0.32	0.64	

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 500
Material	Steel

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	25	65
A	75	60
B	-	120
C	145	185
D	68.5	88.5



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- LS-65
- MTS-65
- MTS-70
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- VT-80
- LS-40
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- ES-82
- ES-70
- ES-50
- MA-35
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Order No.	6841-9-	0			
25 mm (LM-051)		1			
65 mm (LM-054)		2			
LS-070, Linear steel scale		1			
HLS-020, Hall limit switches		1			

## 4.102 Precision Linear Stage PLS-85



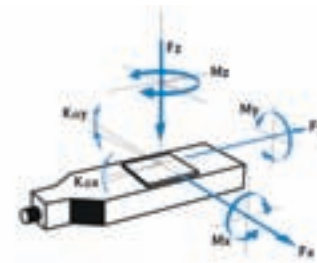
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-032	60	50	100	25	30	20	70	40
2Phase-045	60	50	100	25	30	20	70	40
DC-B-033	60	50	100	25	30	20	70	40



### KEY FEATURES

- Travel range up to 155 mm (6")
- Uni-directional repeatability down to 0.05  $\mu m$
- Maximum speed 100 mm/sec
- Load capacity up to 10 kg
- Integrated mechanical / hall limit switches
- Limit switch adjustable
- Option: linear scale



The PLS-85 linear stages are especially suited for high precision applications with limited space conditions while allowing loads of up to 10 kg. Cross-roller bearings guarantee very high guiding stiffness. Driven by a re-circulating ball screw with 1 or 2 mm pitch options, the PLS-85 can be mounted in any orientation. For demanding positioning tasks, the PLS-85 linear stages can be supplied with a side-mounted linear scale. The PLS-85 can be equipped with a DC or a 2-phase stepper motor and has two mechanical or hall sensors limit switches.

### TECHNICAL DATA

Travel range (mm)	26	52	102	155
Straightness / Flatness ( $\mu m$ )	$\pm 1$	$\pm 2$	$\pm 4$	$\pm 6$
Pitch ( $\mu rad$ )	$\pm 60$	$\pm 90$	$\pm 120$	$\pm 150$
Yaw ( $\mu m$ )	$\pm 60$	$\pm 80$	$\pm 100$	$\pm 130$
Weight (kg)	0.9	1.2	1.5	1.8

Motor (Pitch 1   2 mm)	DC-B-032		2Phase-045		DC-B-033		
Linear scale							LS-012
Speed max. (mm/sec)	50	90	20	45	50	90	
Resolution calculated ( $\mu m$ )	0.5	1 (RE)	5	10 (FS)	0.05	0.1 (RE)	0.05
Resolution typical ( $\mu m$ )	0.5	1	0.05	0.1	0.1	0.2	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 1$		$\pm 1$		$\pm 1$		$\pm 0.1$
Uni-directional Repeatability ( $\mu m$ )	0.5	1	0.1	0.2	0.1	0.2	0.05
Nominal Current (A)	2.3		1.2		2.3		
Voltage Range (V)	24				24		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 100
Material	Aluminum, black anodized

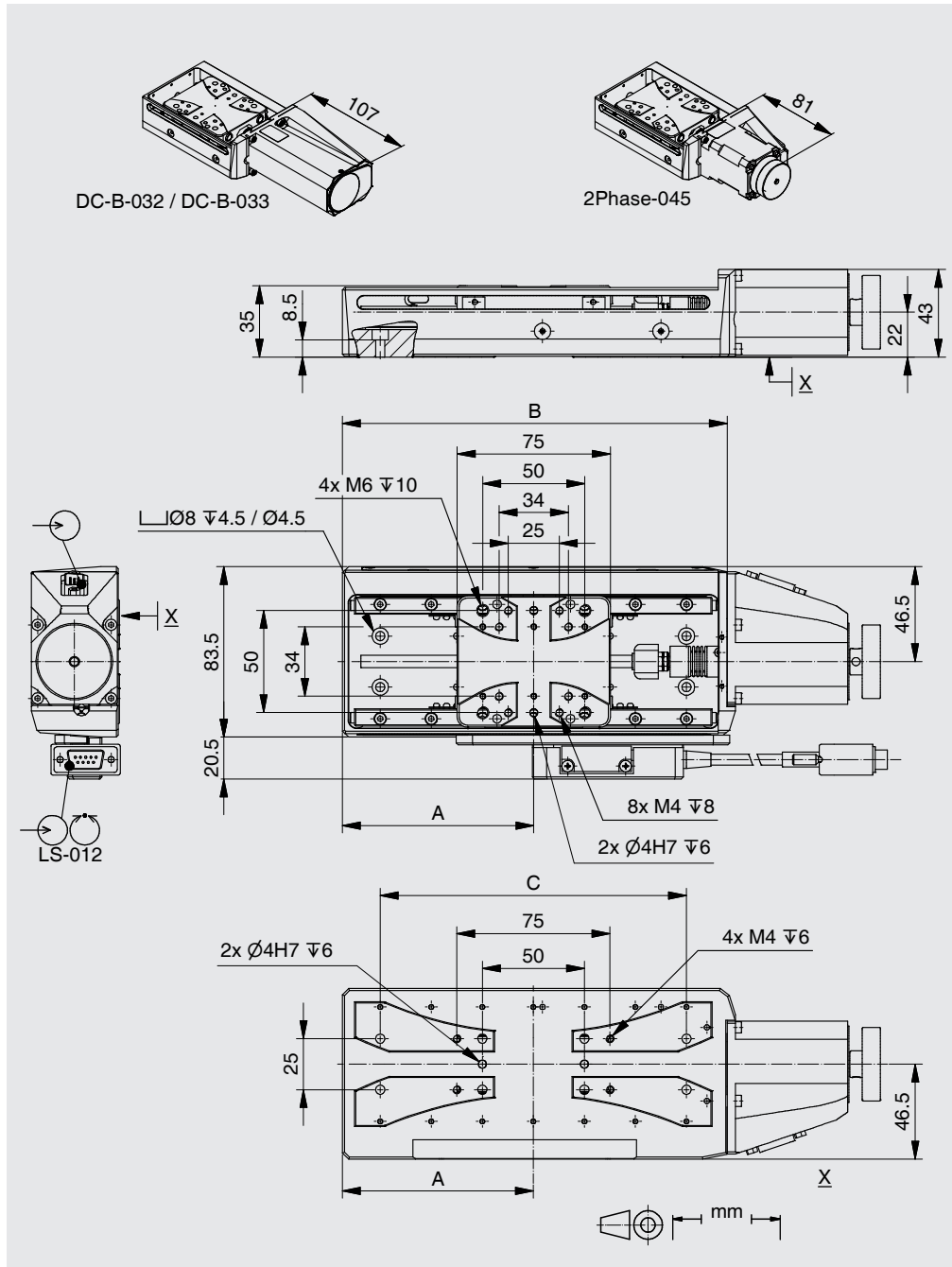
Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change



Travel (mm)	26	52	102	155
A	59	68.5	93.5	128
B	119.5	138.5	188.5	257.5
C	-	100	150	200

Order No.	6234-9-			
DC-B-032		1		
2Phase-045		3		
DC-B-033		4		
26 mm (1")		0		
52 mm (2")		1		
102 mm (4")		2		
155 mm (6")		3		
without LS-012		0		
LS-012, Linear steel scale		1		
Pitch 1 mm / mechanical limit switches		0		
Pitch 2 mm / mechanical limit switches		1		
Pitch 1 mm / hall limit switches		2		
Pitch 2 mm / hall limit switches		3		



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- HPS-170
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- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85**
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E

## 4.104 Linear Stage LS-65



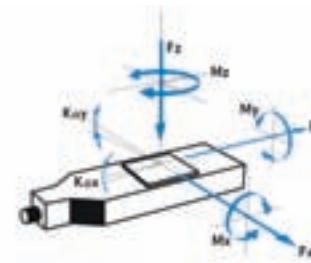
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-026	50	15	60	7.5	7.5	7.5	140	80
2Phase-045	50	25	60	7.5	7.5	7.5	140	80
2Phase-042	50	25	60	7.5	7.5	7.5	140	80



### KEY FEATURES

- Travel range up to 102 mm (4")
- Uni-directional repeatability down to 0.3  $\mu m$
- Maximum speed 10 mm/sec
- Load capacity up to 6 kg
- Integrated mechanical / optical limit switches
- Optionally higher resolution / 0.4 mm pitch
- Optionally higher repeatability with ballscrew



The LS-65 linear stage features a compact, low profile construction for high strength in a lightweight package. Typical applications for this measuring stage are inspection stations and micro-manipulators for laser diodes and other highly sensitive components. A precision ground lead-screw with 1 mm pitch (optionally 0.4 mm pitch or ballscrew) guarantees smooth and quiet motion. The LS-65 linear stages are equipped with a re-circulating ball guiding system and are motorized with a DC or 2-phase stepper motor. Additionally the LS-65 can be ordered with our SMC pollux motor-controller module (2Phase-042).

### TECHNICAL DATA

Travel range (mm)	26	52	77	102
Straightness / Flatness ( $\mu m$ )	$\pm 2$	$\pm 4$	$\pm 6$	$\pm 8$
Pitch ( $\mu rad$ )	$\pm 70$	$\pm 90$	$\pm 110$	$\pm 130$
Yaw ( $\mu m$ )	$\pm 70$	$\pm 80$	$\pm 90$	$\pm 100$
Weight (kg)	0.6	0.7	0.8	0.9

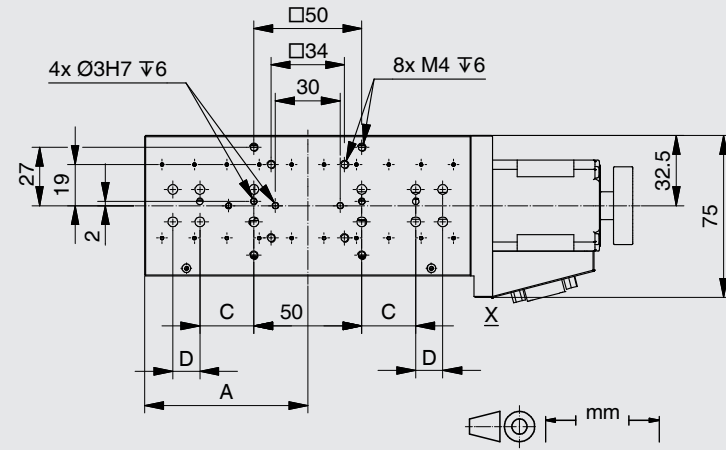
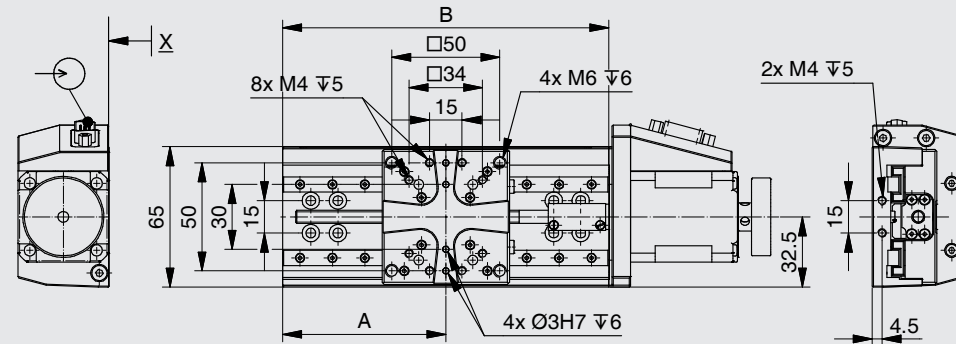
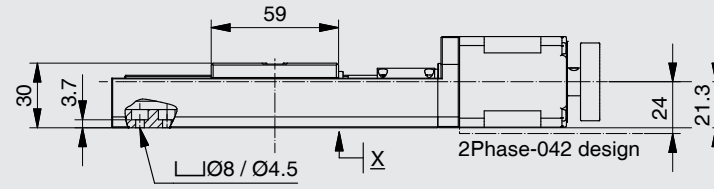
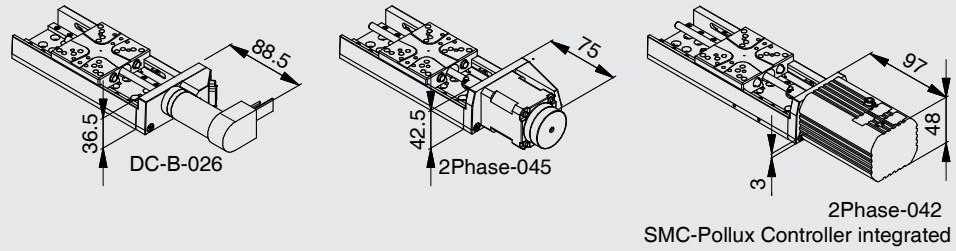
Motor (Pitch 1 mm)	DC-B-026	2Phase-045	2Phase-042
Speed max. (mm/sec)	20	20	13
Resolution calculated ( $\mu m$ )	0.5 (RE)	5 (FS)	5 (FS)
Resolution typical ( $\mu m$ )	0.5	0.2	0.2
Bi-directional Repeatability ( $\mu m$ )	$\pm 5$	$\pm 5$	$\pm 5$
Uni-directional Repeatability ( $\mu m$ )	0.5	0.3	0.3
Nominal Current (A)	0.98	1.2	0.5
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 10
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

Travel (mm)	26	52	77	102
A	46.5	60.5	75.5	85.5
B	93	121	151	171
C	9	25	25	37.5
D	-	-	12.5	12.5



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- LS-270
- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65**
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E

Order No.	6233-9-		0
DC-B-026		1	
2Phase-045		2	
2Phase-042, only with OLS-010		3	
26 mm (1")		1	
52 mm (2")		2	
77 mm (3")		3	
102 mm (4")		4	
MLS-010, Mechanical limit switches		2	
OLS-010, Optical limit switches		3	

## 4.106 Micro Stage MTS-65



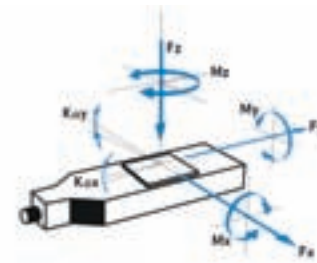
### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
2Phase-020	10	3	10	0.4	0.6	0.4	80	30



### KEY FEATURES

- Travel range up to 52 mm (2")
- Uni-directional repeatability down to 0.1  $\mu m$
- Maximum speed 10 mm/sec
- Load capacity up to 1 kg
- Integrated hall / optical limit switches
- Option: linear scale



space conditions and is typically used for the positioning of laser diodes and optical components. Driven by a 2-phase stepper motor using high resolution microstepping, the gearless stage utilizes recirculating ball bearings and a ground recirculating ball screw. As a result, a high stiffness, accuracy and smoothness of motion is achieved. The micro stage is equipped with two optical or hall limit switches. For higher positioning accuracy and repeatability of 0.1  $\mu m$ , the MTS-65 micro stage is offered with a linear scale. Using a special mounting kit, the MTS-65 stages can be assembled as XY or XYZ-modules.

The MTS-65 micro stage was developed for industrial application with limited

### TECHNICAL DATA

Travel range (mm)	13	26	52
Straightness / Flatness ( $\mu m$ )	$\pm 1$	$\pm 2$	$\pm 3$
Pitch ( $\mu rad$ )	$\pm 40$	$\pm 60$	$\pm 80$
Yaw ( $\mu m$ )	$\pm 40$	$\pm 40$	$\pm 40$
Weight (kg)	0.4	0.6	0.8

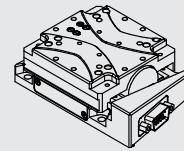
Motor (Pitch 1 mm)	2Phase-020	
Linear scale		LS-050
Speed max. (mm/sec)	8	
Resolution calculated ( $\mu m$ )	5 (FS)	0.05
Resolution typical ( $\mu m$ )	0.1	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 5$	$\pm 0.2$
Uni-directional Repeatability ( $\mu m$ )	0.2	0.1
Nominal Current (A)	1.2	

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 10
Material	Aluminum, black anodized

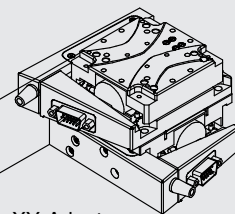
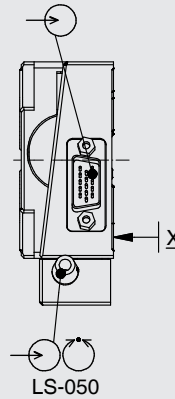
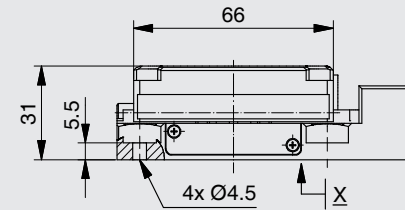
Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

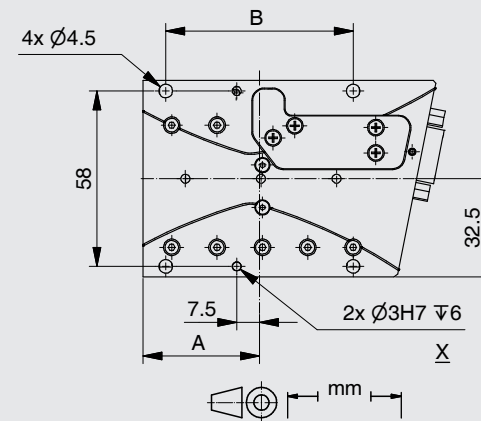
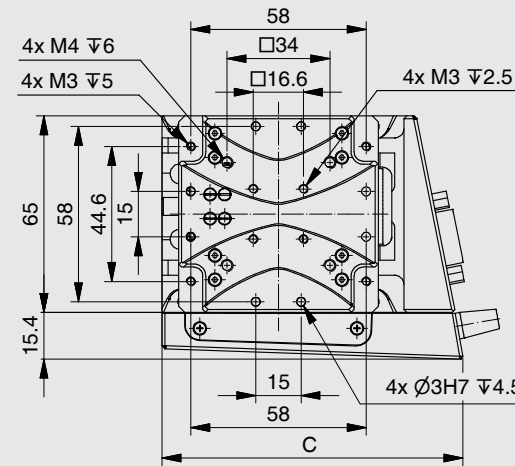
Travel (mm)	13	26	52
A	38.5	45	62
B	62	75	105
C	99.5	112.5	147.5



2Phase-020



XY-Adapter:  
 6217-9-0001 Var. 1"  
 6217-9-0002 Var. 1/2"  
 6217-9-0003 Var. 2"



Order No.	6217-9-			
2Phase-020		2		
13 mm (1/2")		1		
26 mm (1")		2		
52 mm (2")		3		
without LS-050		0		
LS-050, Linear steel scale		1		
HLS-010, Hall limit switches		1		
OLS-010, Optical limit switches		3		

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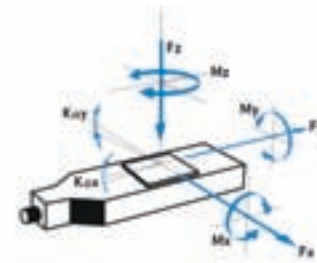
- UPS-150
- UPM-160
- HPS-170
- LS-270
- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65**
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E

## 4.108 Micro Stage MTS-70



### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
2Phase-020	10	3	10	0.4	0.6	0.4	80	30



The MTS-70 micro stage was developed for precision industrial applications with limited space conditions. The stage is driven by a 2-phase gearless stepper motor. The MTS-70 micro stages series is provided with cross-roller bearings and a ground re-circulating ball screw guaranteeing maximum stiffness, accuracy and smoothness of motion. The MTS-70 stages are equipped with two limit switches. For high positioning accuracy and repeatability, the MTS-70 micro stages are offered with a linear scale. The stages are offered as a single axis or as an integrated XY system.

### KEY FEATURES

- Travel range 10 mm
- Uni-directional repeatability down to 0.1  $\mu m$
- Maximum speed 8 mm/sec
- Load capacity up to 1 kg
- Integrated mechanical limit switches
- Option: linear scale

### TECHNICAL DATA

Travel range (mm)	10	
Straightness / Flatness ( $\mu m$ )	$\pm 1$	
Pitch ( $\mu rad$ )	$\pm 50$	
Yaw ( $\mu m$ )	$\pm 50$	
Weight (kg)	0.4	
Motor (Pitch 1 mm)	2Phase-020	
Linear scale		LS-010
Speed max. (mm/sec)	8	
Resolution calculated ( $\mu m$ )	5 (FS)	0.05
Resolution typical ( $\mu m$ )	0.1	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 5$	$\pm 0.2$
Uni-directional Repeatability ( $\mu m$ )	0.2	0.1
Nominal Current (A)	1.2	
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 8	
Material	Aluminum, black anodized	

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

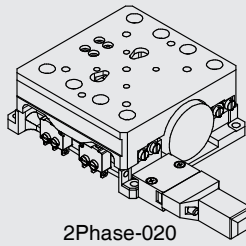
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**LINEAR STAGES**

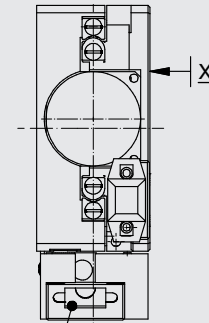
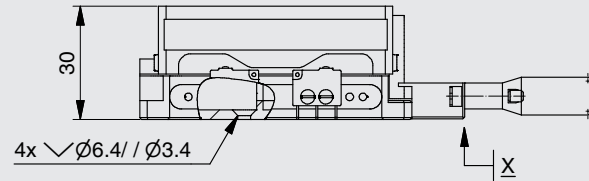
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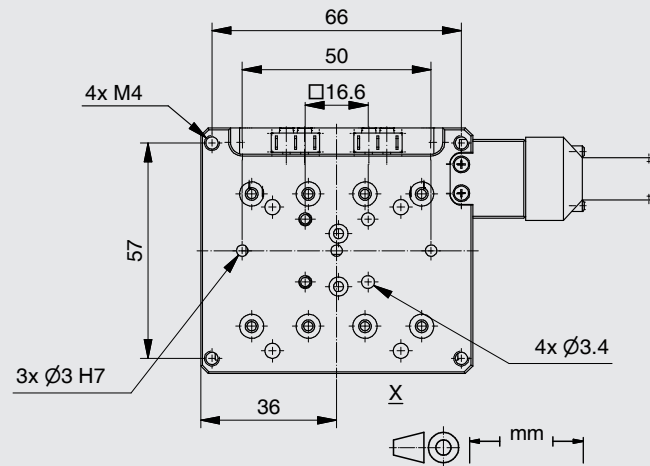
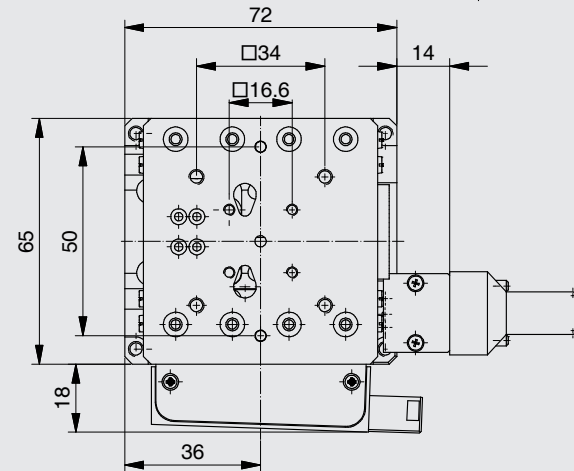
- UPS-150
- UPM-160
- HPS-170
- LS-270
- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70**
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E



2Phase-020



LS-010



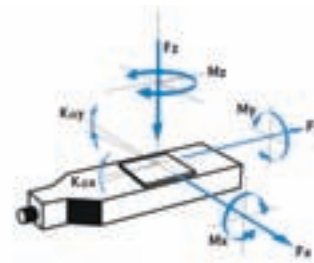
Order No.	6218-9-				
2Phase-020		2			
x axis		1			
xy axes (setup by PI miCos)		2			
10 mm		0			
without LS-010		0			
LS-010, Linear steel scale		3			

## 4.110 Linear Stage VT-75

NEW

### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
DC-B-026	25	18	50	3	3	5
2Phase-045	25	88	50	3	3	5
2Phase-042	25	50	50	3	3	5



The VT-75 linear stage was designed for standard industrial applications that require less than 6  $\mu\text{m}$  repeatability and up to 600 mm travel range. Typical applications for this metrology stage are inspection and assembly systems. The low profile yet rigid steel design allows setups with long travel ranges within limited space conditions. A precision ball screw with a 4 mm pitch guarantees a quiet, smooth motion. The VT-75 linear stages are equipped with a roller guide system and are motorized with a DC or 2-phase stepper motor. Additionally the VT-75 can be ordered with our SMC pollux motor-controller module.

### TECHNICAL DATA

Travel range (mm)	50	100	200	300	400	500	600
Straightness / Flatness ( $\mu\text{m}$ )	$\pm 2$	$\pm 3$	$\pm 4$	$\pm 5$	$\pm 7$	$\pm 9$	$\pm 11$
Pitch ( $\mu\text{rad}$ )	$\pm 50$	$\pm 60$	$\pm 70$	$\pm 80$	$\pm 90$	$\pm 100$	$\pm 110$
Yaw ( $\mu\text{m}$ )	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 60$	$\pm 80$	$\pm 90$	$\pm 90$
Weight (kg)	1.6	2.1	2.7	3.4	4.1	4.7	5.4

Motor (Pitch 4 mm)	DC-B-026	2Phase-045	2Phase-042
Speed max. (mm/sec)	150	80	52
Resolution calculated ( $\mu\text{m}$ )	2 (RE)	20 (FS)	20 (FS)
Resolution typical ( $\mu\text{m}$ )	2	0.4	0.4
Bi-directional Repeatability ( $\mu\text{m}$ )	$\pm 6$	$\pm 6$	$\pm 6$
Uni-directional Repeatability ( $\mu\text{m}$ )	2	0.4	0.4
Nominal Current (A)	0.98	1.2	0.5
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.003...100
Material	Steel

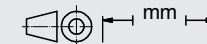
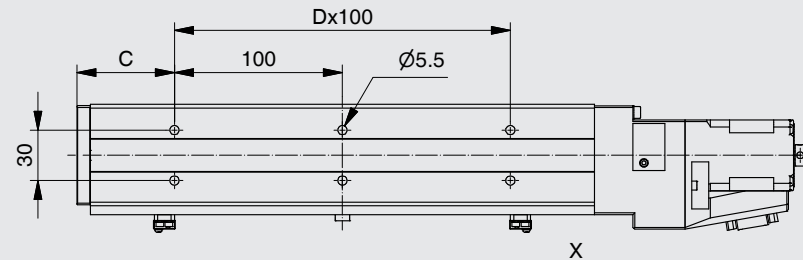
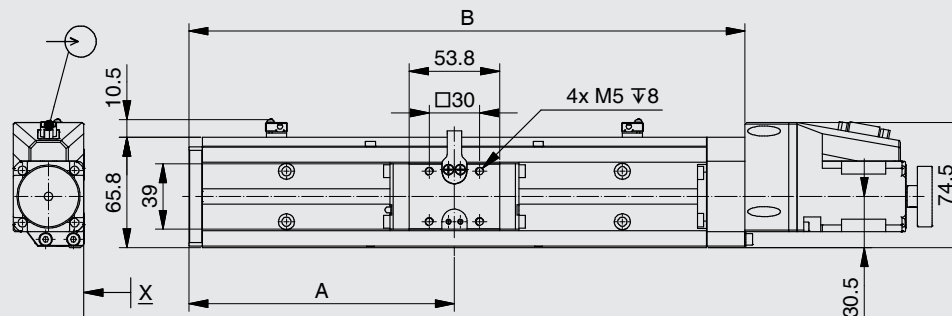
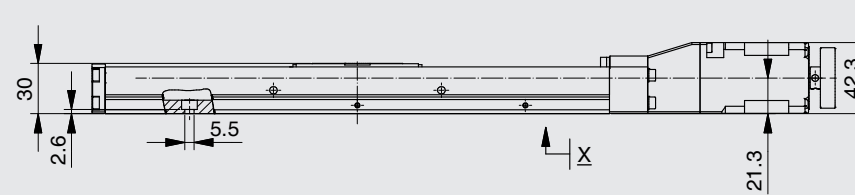
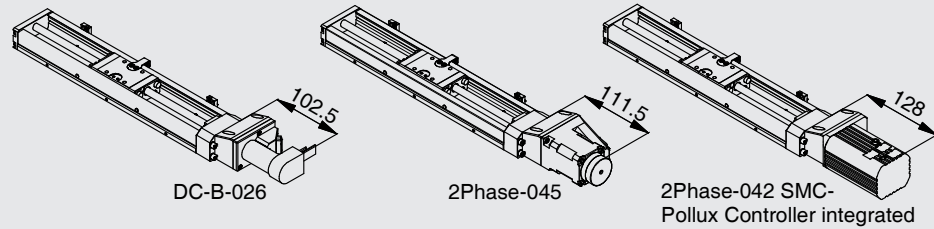
Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

### KEY FEATURES

- Travel range up to 600 mm
- Uni-directional repeatability down to 0.4  $\mu\text{m}$
- Maximum speed 100 mm/sec
- Load capacity up to 5 kg
- Integrated hall limit switches



Travel (mm)	50	100	200	300	400	500	600	650
A	83	108	158	208	258	308	358	383
B	181	231	331	431	531	631	731	781
C	33	58	58	58	58	58	58	33
D	1	1	2	3	4	5	6	7



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- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70

**VT-75**

- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E

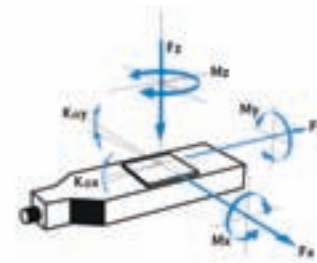
Order No.	6229-9-		0
DC-B-026		1	
2Phase-045		2	
2Phase-042		3	
50 mm		1	
100 mm		2	
200 mm		3	
300 mm		4	
400 mm		5	
500 mm		6	
600 mm		7	
HLS-010, Hall limit switches		1	

## 4.112 Translation Stage VT-80



### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k^{+x}(\mu rad/Nm)$	$k^{+y}(\mu rad/Nm)$
DC-B-026	40	30	50	2.5	5	2.5	220	150
2Phase-041	40	30	50	2.5	5	2.5	220	150
2Phase-042	40	30	50	2.5	5	2.5	220	150



backlash compensated lead screw guarantee a quiet and smooth motion. The VT-80 translation stages are equipped with integrated limit switches and are motorized with a DC or 2-phase stepper motor. Additionally, the VT-80 can be ordered with our SMC Pollux motor-controller module. Due to the compact dimensions, the VT-80 stages are especially suitable for lower duty cycles applications in instrumentation. All VT-80 translation stages can be directly assembled in XY configurations. The XY systems with a travel of 25 mm must be specified when ordering.

The VT-80 translation stage is a popular laboratory stage that offers a wide range of travel lengths. A backlash-free recirculating ball bearing along with a

### TECHNICAL DATA

Travel range (mm)	25	50	75	100	150	200	250	300
Straightness / Flatness ( $\mu m$ )	$\pm 8$	$\pm 10$	$\pm 11$	$\pm 12$	$\pm 14$	$\pm 20$	$\pm 25$	$\pm 35$
Pitch ( $\mu rad$ )	$\pm 100$	$\pm 110$	$\pm 120$	$\pm 130$	$\pm 150$	$\pm 170$	$\pm 190$	$\pm 210$
Yaw ( $\mu m$ )	$\pm 150$	$\pm 150$	$\pm 150$	$\pm 150$	$\pm 150$	$\pm 150$	$\pm 150$	$\pm 150$
Weight (kg)	0.55	0.65	0.7	0.75	0.85	0.95	1.1	1.25

Motor (Pitch 1 mm)	DC-B-026	2Phase-041	2Phase-042
Speed max. (mm/sec)	20	20	13
Resolution calculated ( $\mu m$ )	0.5 (RE)	5 (FS)	5 (FS)
Resolution typical ( $\mu m$ )	0.5	0.2	0.2
Bi-directional Repeatability ( $\mu m$ )	$\pm 10$	$\pm 10$	$\pm 10$
Uni-directional Repeatability ( $\mu m$ )	0.8	0.4	0.4
Nominal Current (A)	0.98	1.7	0.5
Voltage Range (V)	24		

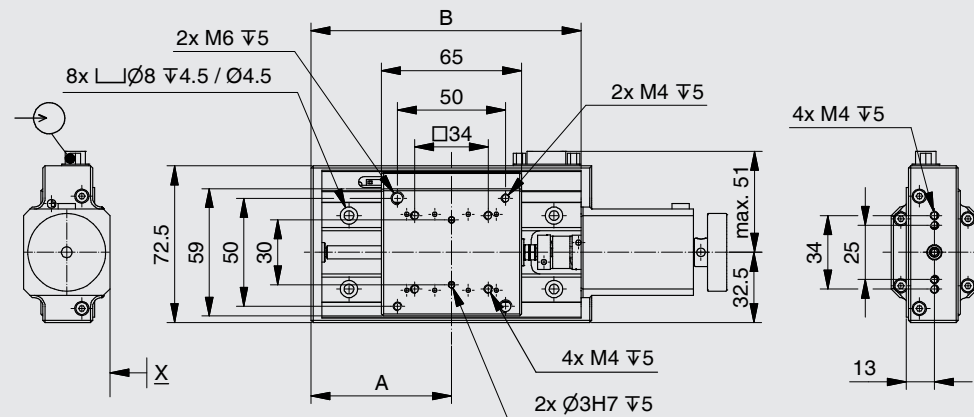
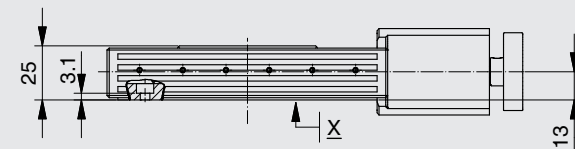
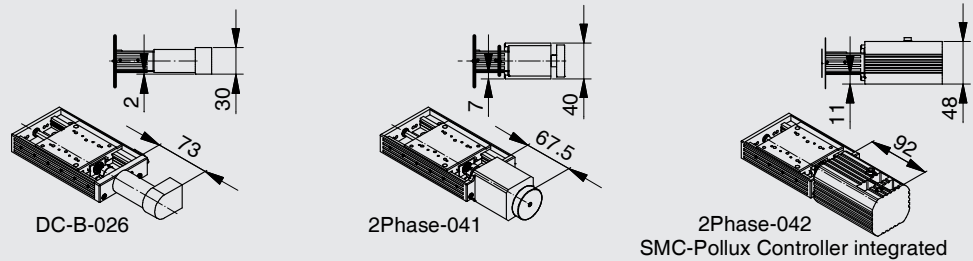
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 20
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

### KEY FEATURES

- Travel range up to 300 mm
- Uni-directional repeatability down to 0.4  $\mu m$
- Maximum speed 20 mm/sec
- Load capacity up to 5 kg
- Integrated mechanical limit switches

Travel (mm)	25	50	75	100	150	200	250	300
A	52.5	65	77.5	90	115	140	165	190
B	100	125	150	175	225	275	325	375
C	70	95	120	145	195	245	295	345



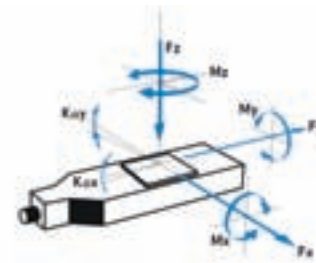
Order No.	6230-9-		
DC-B-026		1	
2Phase-041		2	
2Phase-042		4	
25 mm (xy set up by PI miCos)		1	
50 mm		2	
75 mm		3	
100 mm		4	
150 mm		5	
200 mm		6	
250 mm		7	
300 mm		8	
single stage		0	
25 mm xy setup		1	

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- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80**
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E

## FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
DC-B-010	20	20	30	0.4	0.6	0.4
2Phase-019	20	10	30	0.4	0.6	0.4
2Phase-010	20	20	30	0.6	0.8	0.6



equipped with re-circulating ball guides and a finepitch screw with 0,5 mm pitch (optionally a ball screw with 1 mm pitch can be delivered). It is driven with a 2-phase gearless stepper motor or with a DC- or 2-phase stepper geared motor. The LS-40 series excels with very smooth, high resolution motion. For restricted space conditions, the LS-40 can also be ordered with a side-mounted motor.

Micro stages LS-40 are suited for the precise positioning of small parts such as fibers, optical components, laser diodes and inspection equipment. The space saving modules can be assembled into XYZ-systems. The micro stage LS-40 is

Travel ranges of 13, 26 or 52 mm are available and two standard limit switches prevent damage from accidental over-travel. XY-assembly is possible at the factory and must be indicated when ordering.

## TECHNICAL DATA

Travel range (mm)	13	26	52
Straightness / Flatness ( $\mu m$ )	$\pm 1.5$	$\pm 3$	$\pm 5$
Pitch ( $\mu rad$ )	$\pm 150$	$\pm 170$	$\pm 190$
Yaw ( $\mu m$ )	$\pm 150$	$\pm 150$	$\pm 150$
Weight (kg)	0.18	0.2	0.25

Motor (Pitch 0.5 mm)	DC-B-010	2Phase-019	2Phase-010
Speed max. (mm/sec)	1.5	5	0.4
Resolution calculated ( $\mu m$ )	0.0110804 (RE)	2.5 (FS)	0.2745086 (FS)
Resolution typical ( $\mu m$ )	0.1	0.1	0.1
Bi-directional Repeatability ( $\mu m$ )	$\pm 3$	$\pm 3$	$\pm 3$
Uni-directional Repeatability ( $\mu m$ )	0.1	0.1	0.1
Nominal Current (A)	0.32	0.8	0.25
Voltage Range (V)	12		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 5
Material	Aluminum, black anodized

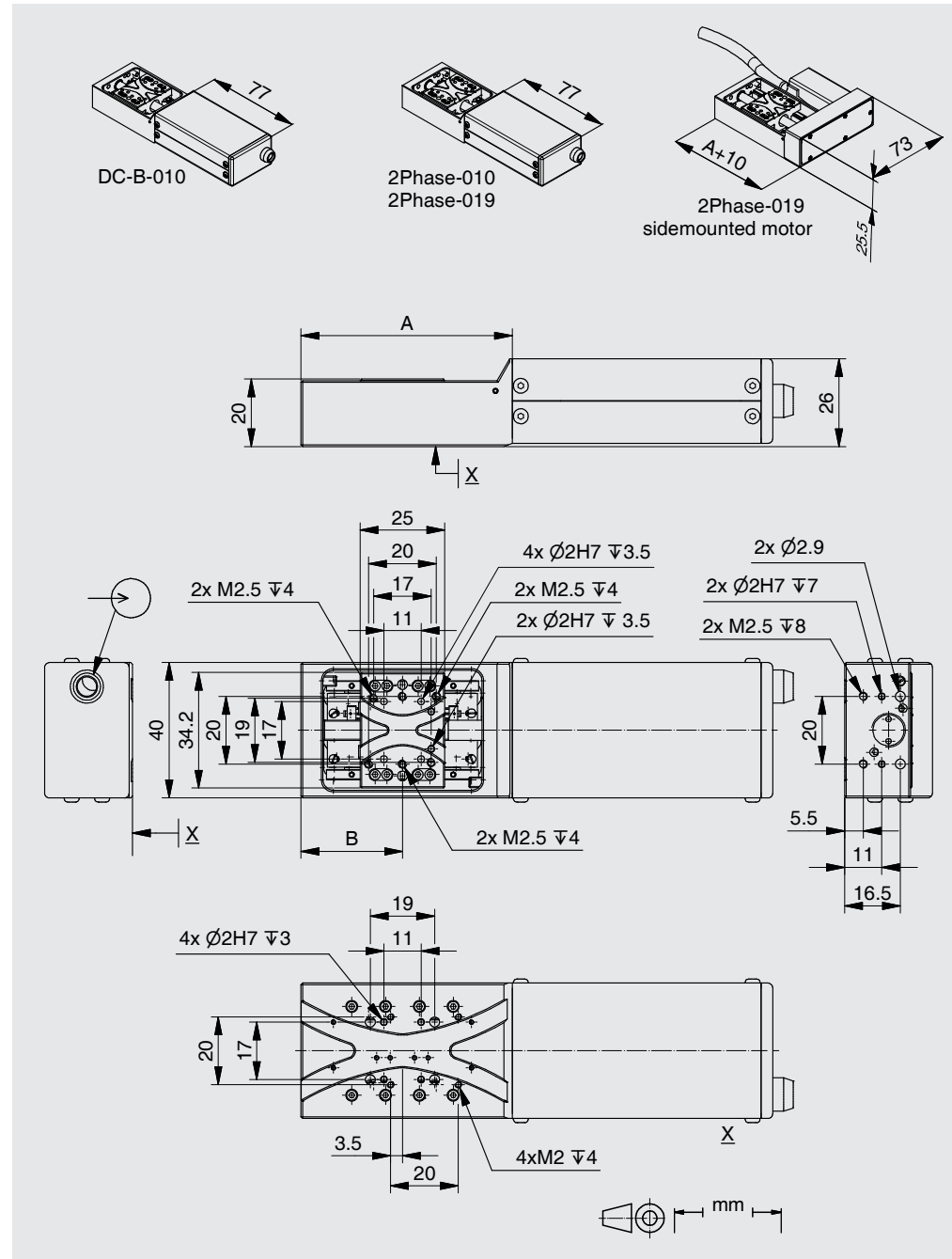
Note: FS = full step, RE = rotary encoder  
 More info: Detailed information concerning motors and encoders, see appendix.

## KEY FEATURES

- Travel range up to 52 mm
- Uni-directional repeatability down to 0.1  $\mu m$
- Maximum speed 5 mm/sec
- Load capacity up to 2 kg
- Integrated hall / mechanical / optical limit switches
- Optionally higher quality with ballscrew

Travel (mm)	13	26	52
A	62.5	75.5	101.5
B	30	36.5	49.5

Order No.	6213-9-		0
DC-B-010		1	
2Phase-019		2	
2Phase-010		3	
2Phase-019 sidemounted		4	
13 mm		1	
26 mm		2	
52 mm		3	
HLS-010, Hall limit switches		1	
MLS-010, Mechanical limit switches		2	
OLS-010, Optical limit switches		3	



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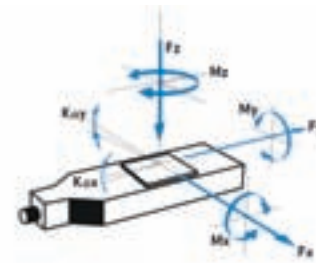
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- UPM-160
- HPS-170
- LS-270
- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40**
- VT-21 5
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E

## 4.116 Translation Stage VT-21 S

NEW

### FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
2Phase-018	10	10	10	0.4	0.6	0.5



The VT-21 S linear stage is designed for applications with very limited space conditions and about 8  $\mu m$  repeatability. Typical applications for this stage are inspection and OEM systems. The VT-21 S linear stages are motorized with a 2 phase stepper motor, and with two limit switches. An optional linear scale is also available. XY and XZ configurations can be assembled with a special bracket.



### KEY FEATURES

- Travel range 10 mm
- Maximum speed 5 mm/sec
- Load capacity up to 1 kg
- Integrated mechanical limit switches
- Option: linear scale

### TECHNICAL DATA

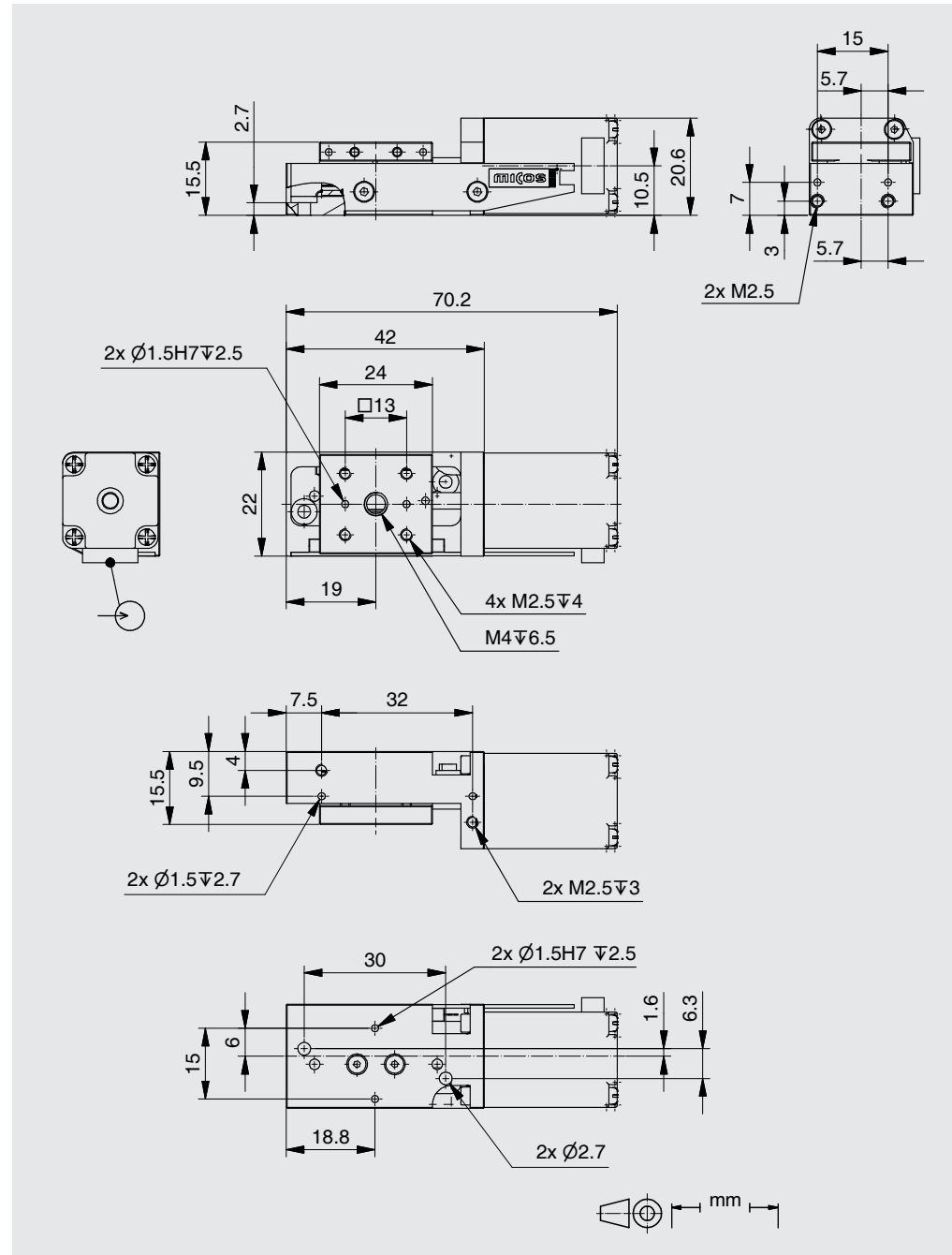
Travel range (mm)	10	
Straightness / Flatness ( $\mu m$ )	$\pm 2.5$	
Pitch ( $\mu rad$ )	$\pm 150$	
Yaw ( $\mu m$ )	$\pm 150$	
Weight (kg)	0.1	
Motor (Pitch 0.5 mm)	2Phase-018	
Linear scale		LS-059
Speed max. (mm/sec)	5	
Resolution calculated ( $\mu m$ )	2.5 (FS)	0.05
Resolution typical ( $\mu m$ )	0.5	0.05
Bi-directional Repeatability ( $\mu m$ )	$\pm 4$	$\pm 0.3$
Uni-directional Repeatability ( $\mu m$ )	0.5	0.2
Nominal Current (A)	0.24	
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 5	
Material	Aluminum, black anodized	

Note: FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

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- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E



Order No.	6214-9-					
2Phase-018		2				
10 mm		2				
without LS-059		0				
LS-059, Linear scale		1				
MLS-060		2				
Pitch 0.5 mm		1				

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