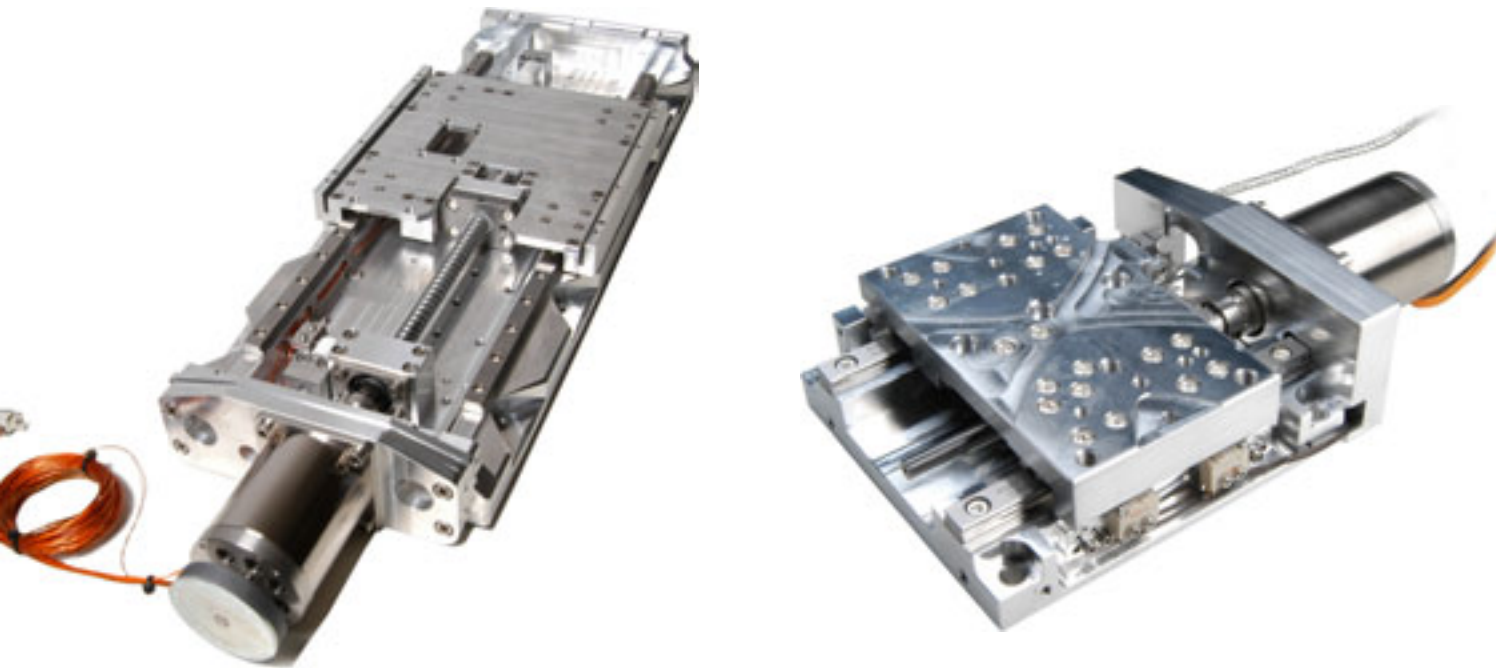


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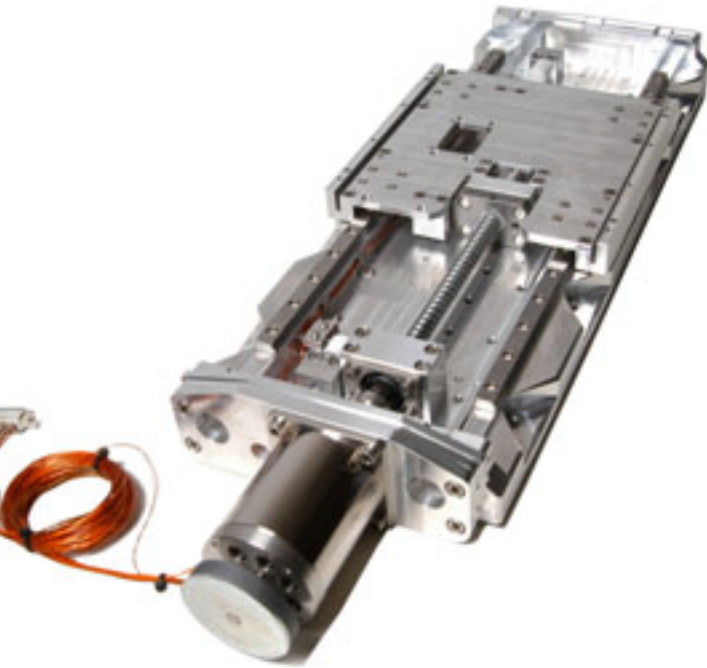
LINEAR STAGES

4.088 Linear Stage LS-180 Vacuum



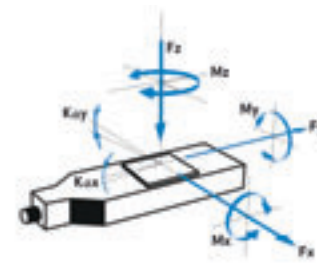
FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k_{ax}(\mu rad/Nm)$	$k_{ay}(\mu rad/Nm)$
FV	500	250	1000	132	400	125	60	50
HV	300	150	100	132	400	125	60	50
UHV	300	150	100	132	400	125	60	50



KEY FEATURES

- Vacuum up 10⁻⁹ hPa
- Travel range up to 610 mm (24")
- Uni-directional repeatability down to 0.05 μm
- Maximum speed 25 mm/sec
- Load capacity up to 100 kg
- Integrated inductive limit switches
- Option: linear scale (center mounted)



The LS-180 Vacuum linear stage was developed for industrial applications. Recirculating 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 25 mm/s. For demanding positioning tasks the linear stages LS-180 Vacuum can be supplied with a linear scale which is centrally installed between the guides. The LS-180 Vacuum linear stages is equipped with a special 2-phase vacuum stepper motor and are supplied with two limit switches.

TECHNICAL DATA

Travel range (mm)	155	205	305	408	508
Straightness / Flatness (μm)	± 2	± 3	± 4	± 5	± 6
Pitch (μrad)	± 40	± 50	± 60	± 70	± 80
Yaw (μrad)	± 50	± 50	± 50	± 50	± 50
Weight (kg)	8.4	8.8	9.6	10.2	10.8

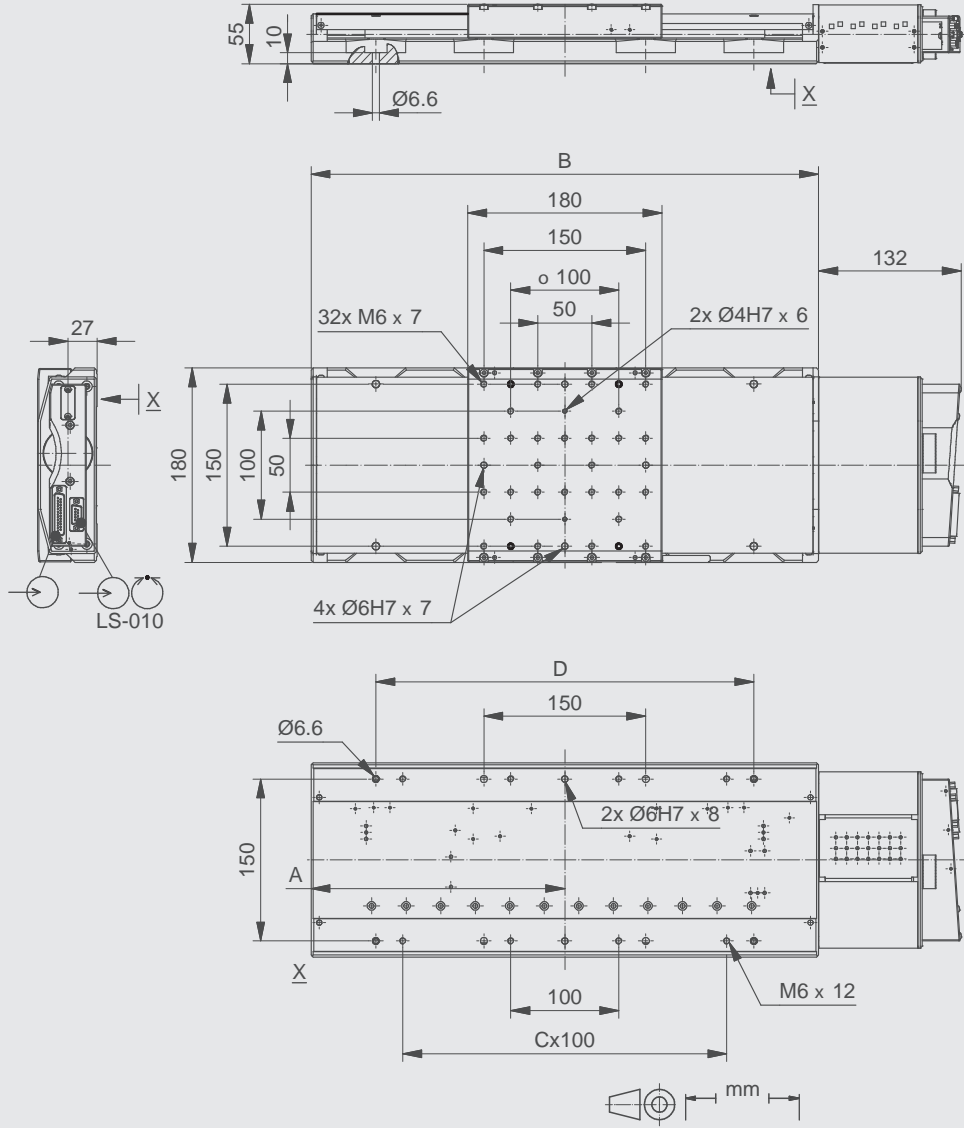
Vacuum type	FV	HV	UHV		
Linear scale				FV	UHV
Speed max. (mm/sec)	25	9	9		
Resolution calculated (μm)	25 (FS)	25 (FS)	25 (FS)	0.05	0.05
Resolution typical (μm)	0.5	0.5	0.5	0.05	0.05
Bi-directional Repeatability (μm)	± 2.5	± 2.5	± 2.5	± 0.1	± 0.1
Uni-directional Repeatability (μm)	0.5	0.5	0.5	0.05	0.05
Nominal Current (A)	2	2.5	2.5		

Accuracy	on request
Velocity range (mm/sec)	0.001 ... 25
Material	Aluminum or Stainless steel, suitable for vacuum

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

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

drawings for the corresponding vacuum class must be requested separately.
 The installed motor types are:
 PK258 for FV
 VSS 57 for HV & UHVG



- APPLICATIONS
- CONTROLLERS
- ROBOTICS
- LINEAR STAGES**
- ROTATION STAGES
- PIEZO STAGES
- ACCESSORIES
- APPENDIX

- UPM-160
- HPS-170
- LS-270
- LS-180**
- LS-120
- LS-110
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-80
- LS-40
- MCS
- NPE-200
- UPL-120
- ES-100
- ES-82
- MA-35
- MP-20
- MP-20 B
- MP-15

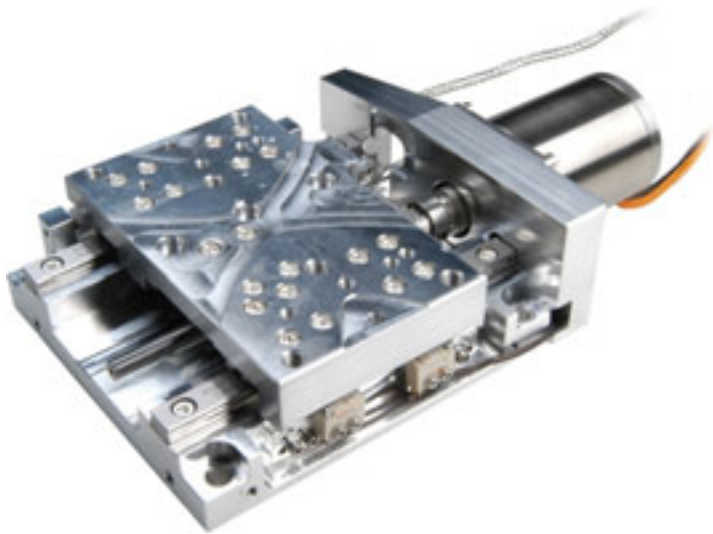
Order No.	6240-V-			0	0
FV		1			
HV		2			
UHVG		3			
155 mm (6")		1			
205 mm (8")		2			
305 mm (12")		3			
408 mm (16")		4			
508 mm (20")		5			
open loop		0			
closed loop		1			

4.090 Linear Stage LS-120 Vacuum



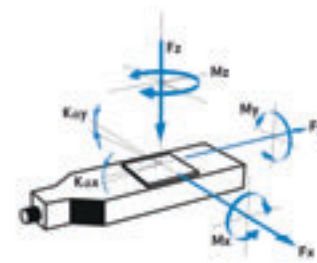
FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k_{ax}(\mu rad/Nm)$	$k_{ay}(\mu rad/Nm)$
FV	50	80	100	30	60	33	40	30
HV	50	80	100	30	60	33	40	30
UHV	50	80	100	30	60	33	40	30



KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range up to 40 mm (xy setup by PI miCos)
- Maximum speed 15 mm/sec
- Load capacity up to 10 kg
- Integrated limit switches
- Option: linear scale (center mounted)



The LS-120 Vacuum 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 and can be supplied with a linear scale which is centrally installed between the guides. The LS-120 Vacuum linear stages is equipped with a special 2-phase vacuum stepper motor.

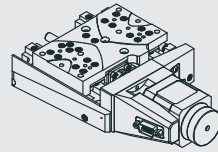
TECHNICAL DATA

Travel range (mm)	40
Straightness / Flatness (μm)	± 1.5
Pitch (μrad)	± 40
Yaw (μrad)	± 40
Weight (kg)	1.8

Vacuum type	FV	HV	UHV	FV	UHV
Linear scale				FV	UHV
Speed max. (mm/sec)	15	5	5		
Resolution calculated (μm)	10 (FS)	10 (FS)	10 (FS)	0.05	0.05
Resolution typical (μm)	0.2	0.2	0.2		
Bi-directional Repeatability (μm)	± 1	± 1	± 1		
Uni-directional Repeatability (μm)	0.2	0.2	0.2		
Nominal Current (A)	1.2	1.2	1.2		

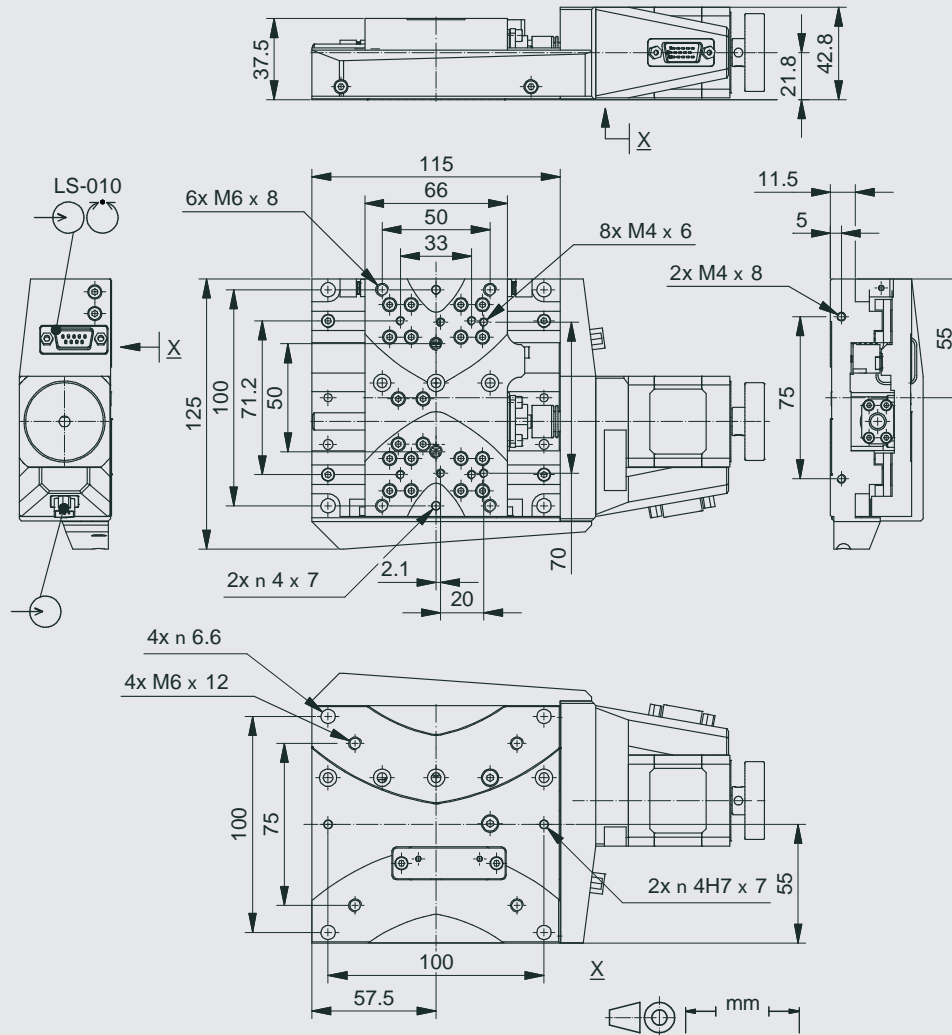
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 15
Material	Aluminum or Stainless steel, suitable for vacuum

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



PK245

drawings for the corresponding vacuum class must be requested separately. The installed motor types are: PK245 for FV VSS 42.200.1.2-E for HV & UHVG



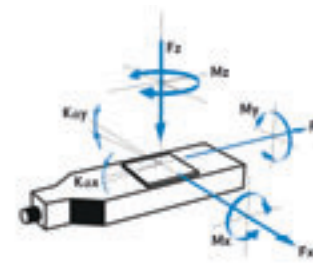
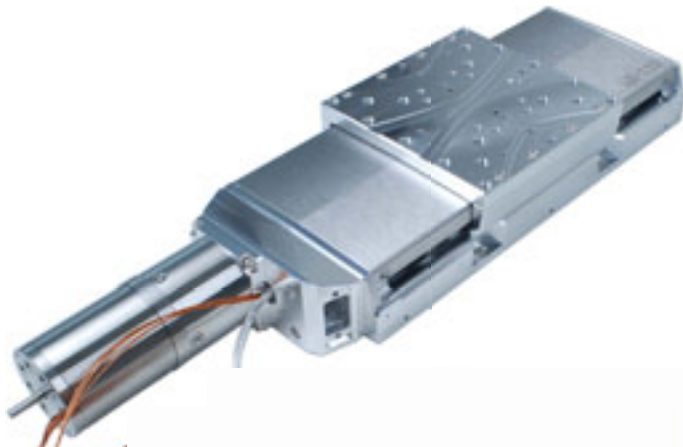
- APPLICATIONS
- CONTROLLERS
- ROBOTICS
- LINEAR STAGES**
- ROTATION STAGES
- PIEZO STAGES
- ACCESSORIES
- APPENDIX

UPM-160
HPS-170
LS-270
LS-180
LS-120
LS-110
PLS-85
LS-65
MTS-65
MTS-70
VT-80
LS-40
MCS
NPE-200
UPL-120
ES-100
ES-82
MA-35
MP-20
MP-20 B
MP-15

Order No.	6237-V-			0	0
FV		1			
HV		2			
UHVG		3			
40 mm (1.5")		1			
open loop		0			
closed loop		1			

FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k_{ax}(\mu rad/Nm)$	$k_{ay}(\mu rad/Nm)$
FV	50	80	100	30	60	33	50	40
HV	50	80	100	30	60	33	50	40
UHVG	50	80	100	30	60	33	50	40



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

KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range up to 508 mm (20")
- Uni-directional repeatability down to 0.05 μm
- Maximum speed 15 mm/sec
- Load capacity up to 10 kg
- Integrated mechanical limit switches
- Option: linear scale (center mounted)

TECHNICAL DATA

Travel range (mm)	26	52	77	102	155	190	255	305	508
Straightness / Flatness (μm)	± 1	± 1.5	± 2	± 2.5	± 3	± 3.5	± 4	± 5	± 6
Pitch (μrad)	± 30	± 40	± 50	± 60	± 70	± 80	± 90	± 100	± 110
Yaw (μrad)	± 40	± 40	± 40	± 40	± 40	± 40	± 40	± 40	± 40
Weight (kg)	2.6	2.7	2.8	2.9	3.1	3.1	3.5	3.7	4

Vacuum type	FV	HV	UHVG		
Linear scale				FV	UHV
Speed max. (mm/sec)	15	5	5		
Resolution calculated (μm)	10 (FS)	10 (FS)	10 (FS)	0.05	0.05
Resolution typical (μm)	0.2	0.2	0.2	0.05	0.05
Bi-directional Repeatability (μm)	± 1	± 1	± 1	± 0.1	± 0.1
Uni-directional Repeatability (μm)	0.2	0.2	0.2		0.05
Nominal Current (A)	1.5	1.2	1.2		

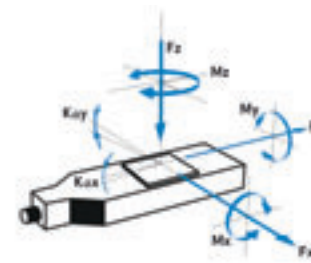
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 15
Material	Aluminum or Stainless steel, suitable for vacuum

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

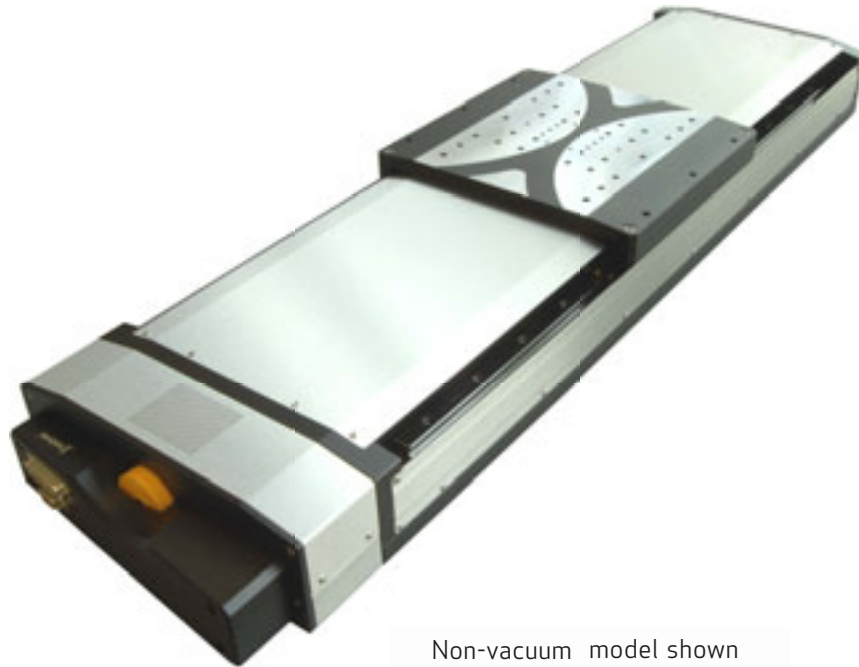


FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$	$k_{ax}(\mu rad/Nm)$	$k_{ay}(\mu rad/Nm)$
FV	1200	260	1500	250	280	250	3.2	1.6
HV	1200	260	1500	250	280	250	3.2	1.6
UHVG	1200	260	2500	250	280	250	3.2	1.6



The LS-270 Vacuum 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 15 mm/s. For demanding positioning tasks the LS-270 Vacuum linear stages can be supplied with a linear scale which is centrally installed between the guides. The LS-270 Vacuum linear stages is equipped with a special 2-phase vacuum stepper motor and have two limit switches.



Non-vacuum model shown

KEY FEATURES

- Vacuum up to 10-9 hPa
- Travel range up to 1016 mm (40")
- Uni-directional repeatability down to 0.05 μm
- Maximum speed 15 mm/sec
- Load capacity up to 150 kg
- Integrated limit switches
- Option: linear scale (center mounted)

TECHNICAL DATA

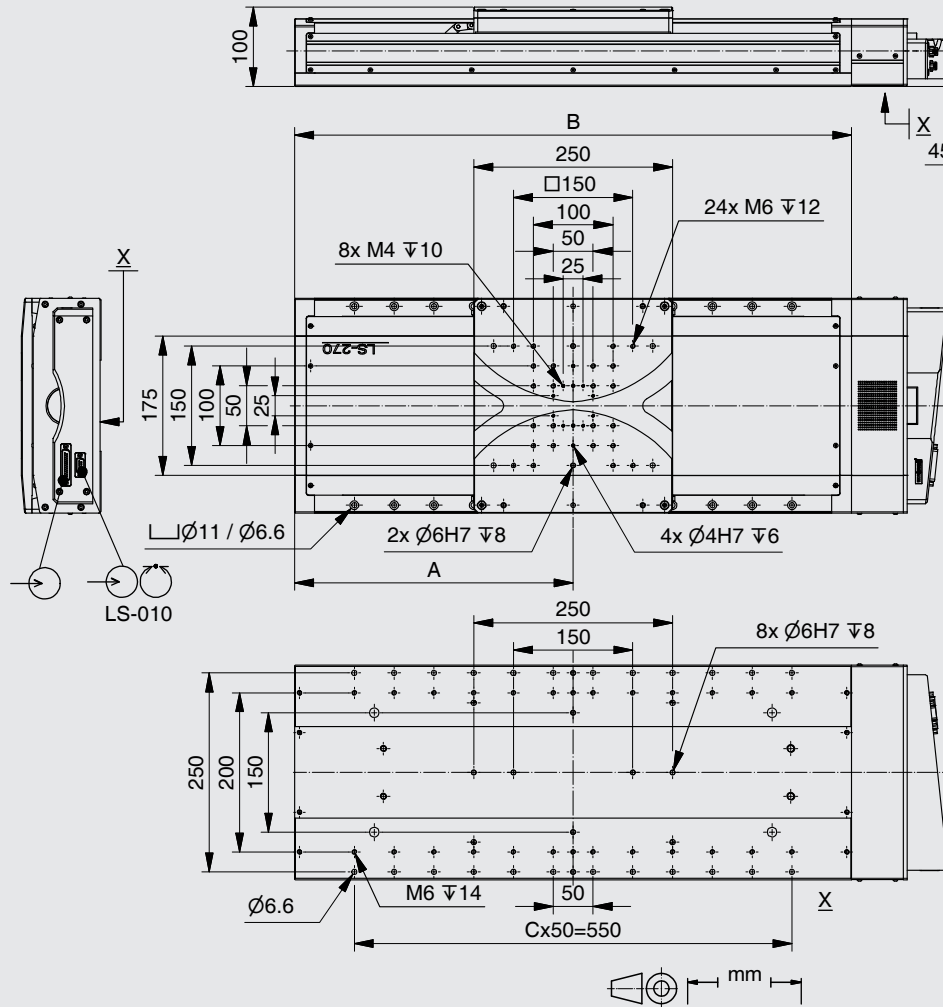
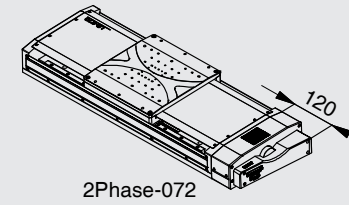
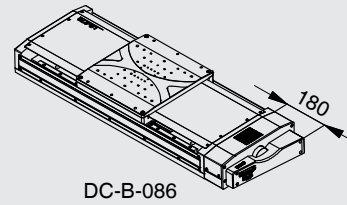
Travel range (mm)	155	305	508	815	1015
Straightness / Flatness (μm)	± 1.5	± 3	± 4	± 7	± 10
Pitch (μrad)	± 20	± 40	± 80	± 100	± 120
Yaw (μrad)	± 20	± 20	± 30	± 40	± 50
Weight (kg)	25	29	35	43	50

Vacuum type	FV	HV	UHVG		
Linear scale				FV	UHV
Speed max. (mm/sec)	15	6	6		
Resolution calculated (μm)	12.5 (FS)	25 (FS)	25 (FS)	0.05	0.05
Resolution typical (μm)	0.4	0.4	0.4	0.05	0.05
Bi-directional Repeatability (μm)	± 2.5	± 2.5	± 2.5	± 0.04	± 0.04
Uni-directional Repeatability (μm)	0.4	0.4	0.4	0.05	0.05
Nominal Current (A)	2	5	5		

Accuracy	on request
Velocity range (mm/sec)	0.01 ... 15
Material	Aluminum or Stainless steel, suitable for vacuum

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

Travel (mm)	155	305	508	815	1015
A	275	350	450	600	700
B	550	700	900	1200	1400
C	9	11	15	21	25

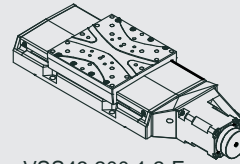


Order No.	6239-V-				0	0
FV		1				
HV		2				
UHV		3				
155 mm (6")		1				
305 mm (12")		2				
508 mm (20")		3				
815 mm (32")		4				
1016 mm (40")		5				
open loop		0				
closed loop		1				

- APPLICATIONS
- CONTROLLERS
- ROBOTICS
- LINEAR STAGES**
- ROTATION STAGES
- PIEZO STAGES
- ACCESSORIES
- APPENDIX

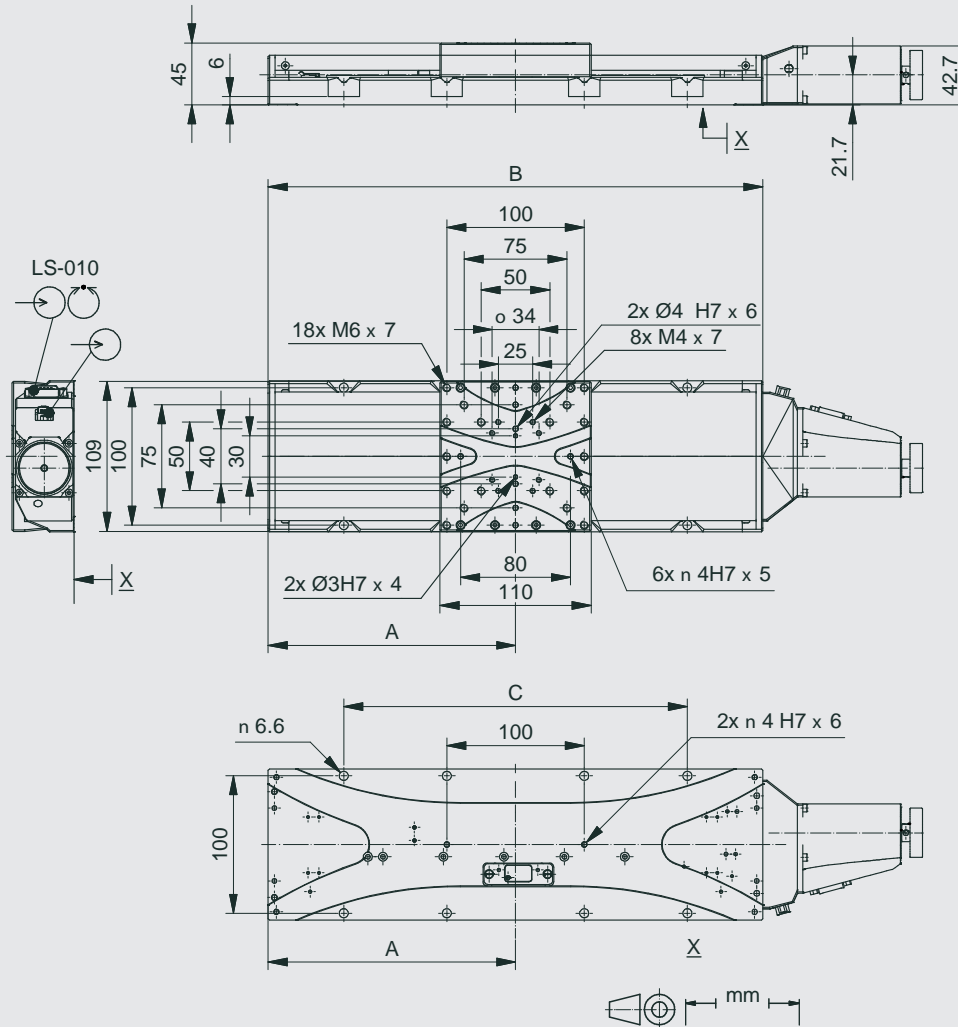
- UPM-160
- HPS-170
- LS-270**
- LS-180
- LS-120
- LS-110
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-80
- LS-40
- MCS
- NPE-200
- UPL-120
- ES-100
- ES-82
- MA-35
- MP-20
- MP-20 B
- MP-15

Travel (mm)	26	52	77	102	155	190	255	305	508
A	112,5	125	137,5	150	180	180	215	240	340
B	225	250	275	300	360	360	430	480	680
C	-	-	-	-	250	250	300	350	500



VSS43.200.1.2-E

drawings for the corresponding vacuum class must be requested separately.
The installed motor types are:
PK245 für FV
VSS 42.200.1.2-E für HV & UHVG



Order No.	6236-V-			0	0
FV		1			
HV		2			
UHVG		3			
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			
508 mm (20")		9			
open loop		0			
closed loop (max 155 mm)		1			

- APPLICATIONS
- CONTROLLERS
- ROBOTICS
- LINEAR STAGES**
- ROTATION STAGES
- PIEZO STAGES
- ACCESSORIES
- APPENDIX

- UPM-160
- HPS-170
- LS-270
- LS-180
- LS-120
- LS-110**
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-80
- LS-40
- MCS
- NPE-200
- UPL-120
- ES-100
- ES-82
- MA-35
- MP-20
- MP-20 B
- MP-15

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