



Precision Elevation Stages

4.128 Nano Precision Elevation Stage NPE-200



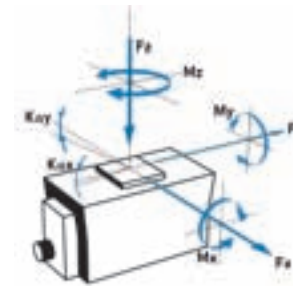
FACTS

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-034	100	80	300	100	50	100	3	1



KEY FEATURES

- Travel range 13 mm (1/2")
- Uni-directional repeatability down to 0.04 μm
- Maximum speed 0.2 mm/sec
- Load capacity up to 30 kg
- Integrated mechanical limit switches
- Integrated linear scale (center mounted)



The NPE-200 nano-precision elevation stage offers the highest precision in our elevation stage series. Maximum positioning accuracy and high stiffness makes this stage especially suitable for lithography, fiber alignment and wafer

inspection. High-quality, double cross-roller bearings mounted on a stress-relieved, tempered aluminum-alloy body guarantee a non-warping stage structure, high stiffness and smooth motion. Position stability of less than 5 nm over a period of 1 minute can be achieved. The NPE-200 is equipped with a 2-phase stepper motor using a backlash-free gear-head (ratio=50:1), two mechanical limit switches and a linear scale which is center mounted for highest accuracy. All nano-precision elevation stages are supplied with a certificate of performance (flatness, pitch, yaw, straightness & accuracy).

TECHNICAL DATA

Travel range (mm)	13	
Straightness / Flatness (μm)	± 0.7	
Pitch (μrad)	± 20	
Yaw (μm)	± 20	
Weight (kg)	9.2	
Motor (Pitch 2 mm)	2Phase-034	
Linear scale		LS-040
Speed max. (mm/sec)	0.2	
Resolution calculated (μm)	0.2 (FS)	0.001
Resolution typical (μm)		0.005
Bi-directional Repeatability (μm)		± 0.04
Uni-directional Repeatability (μm)		0.04
Nominal Current (A)	1.2	
Accuracy	on request	
Velocity range (mm/sec)	0.00001 ... 0.2	
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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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

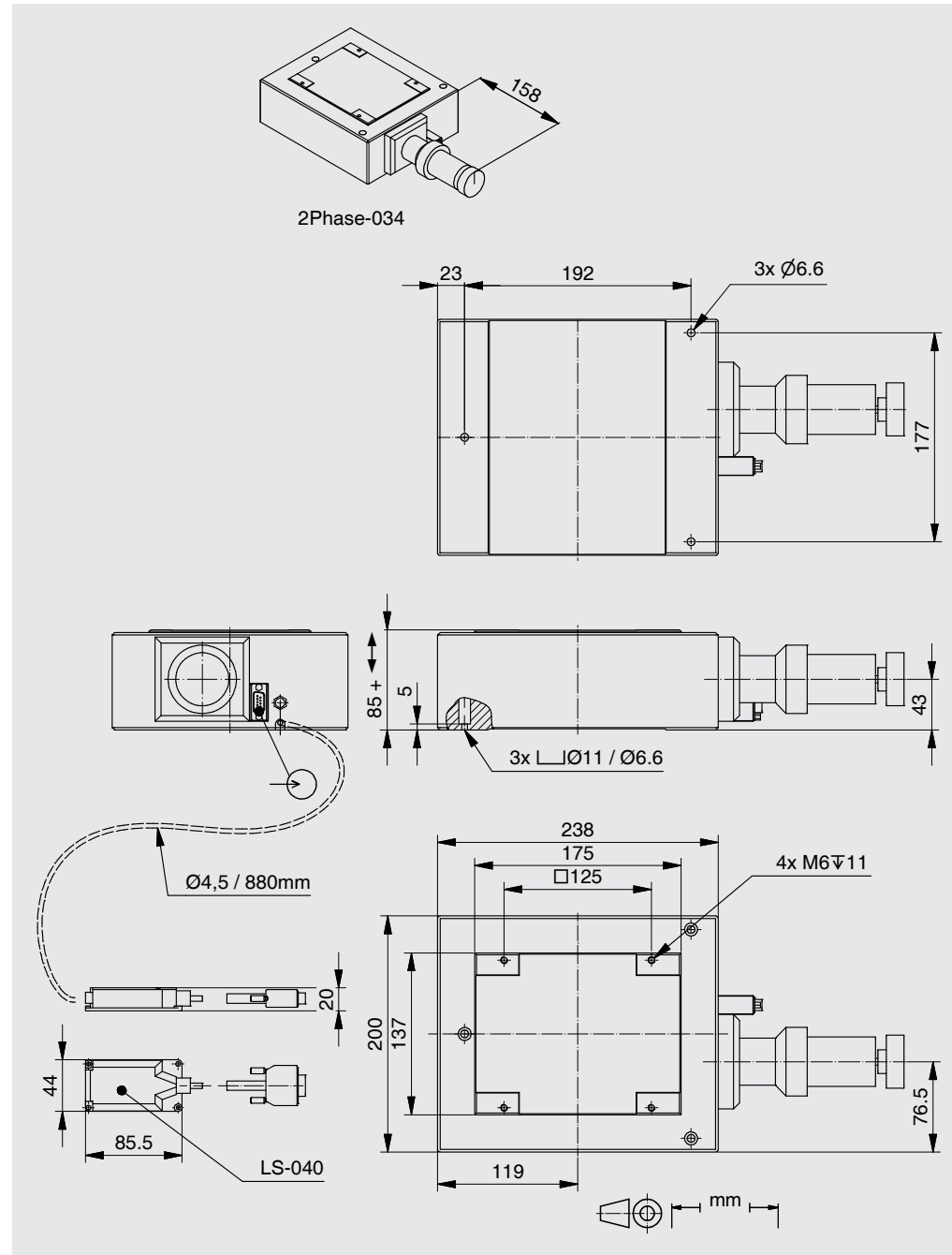
MA-35

MP-20

MP-20 B

MP-15

ASS5E



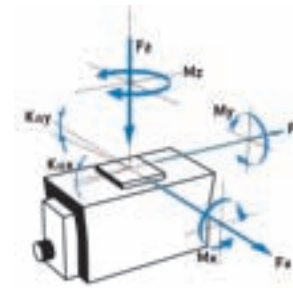
Order No.	6283-9-		
2Phase-034		2	
13 mm (1/2")		0	
LS-040, Linear Zerodur scale		0	

4.130 Ultra Precision Elevation Stage UPL-120



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-028	200	150	200	130	38	150	35	65
2Phase-025	200	150	150	130	38	130	35	65



was specifically designed for wafer inspection, fiber alignment and any other task where maximum positioning accuracy and reliability are absolutely mandatory. The UPL-120 stage can be equipped with an integrated linear scale.

High-quality cross roller bearings mounted on a stress-relieved tempered aluminum alloy body guarantee a maximum load capacity and smooth motion.

The UPL-120 stage is offered with a 2-phase SM motor or with a DC-motor and is equipped with two optical limit switches.

The UPL-120 ultra-precision elevation stage replaces our older UPL-160 stage. It

TECHNICAL DATA

Travel range (mm)	13
Straightness / Flatness (μm)	± 2
Pitch (μrad)	± 35
Yaw (μm)	± 35
Weight (kg)	2.1

Motor (Pitch 0.268 mm)	DC-B-028	2Phase-025	
Linear scale			LS-025
Speed max. (mm/sec)	6	6	
Resolution calculated (μm)	0.0134	1.34	
Resolution typical (μm)	0.5	0.5	0.1
Bi-directional Repeatability (μm)	± 1.5	± 1.5	± 0.05
Uni-directional Repeatability (μm)	0.5	0.5	0.05
Nominal Current (A)	0.98		
Voltage Range (V)	24		

Accuracy	on request
Velocity range (mm/sec)	0.0001 ... 6
Material	Aluminum, black anodized

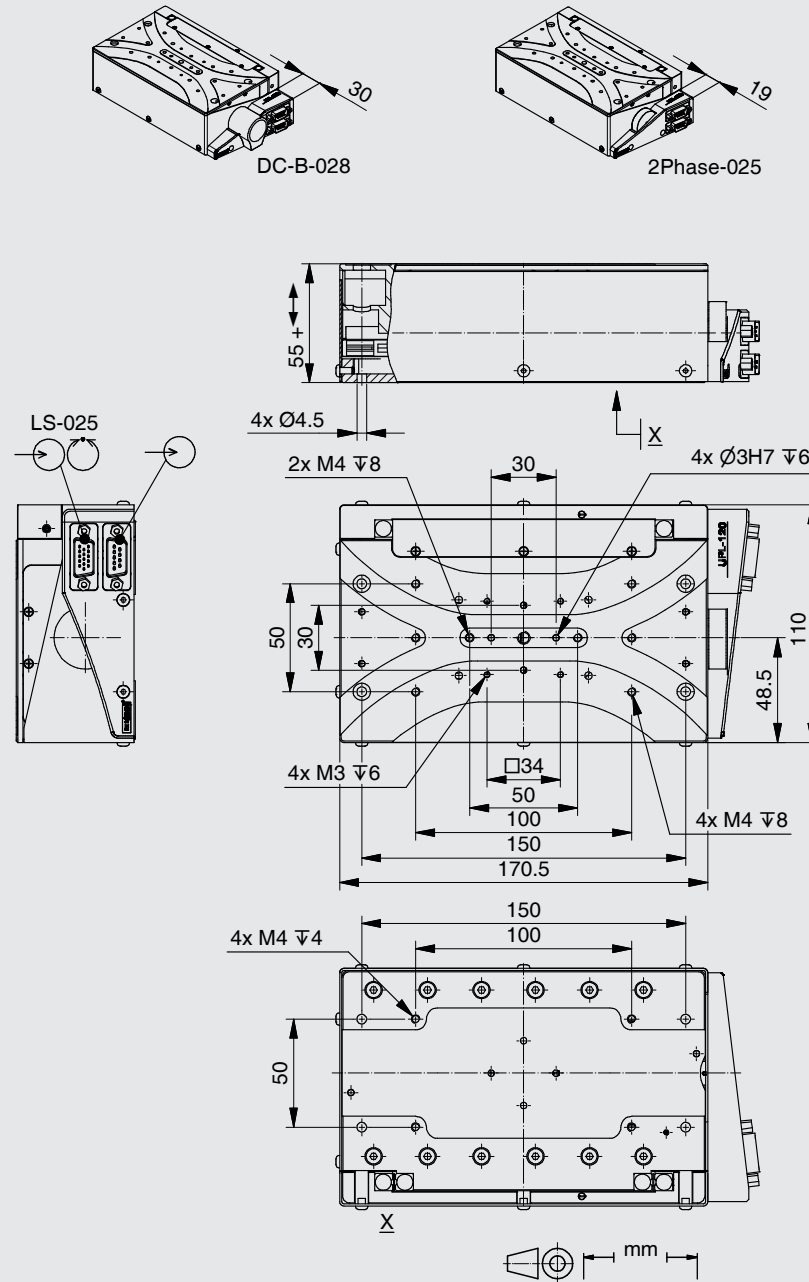
Note: FS = full step, RE = rotary encoder
More info: Detailed information concerning motors and encoders, see appendix.

KEY FEATURES

- Travel range 13 mm (1/2")
- Uni-directional repeatability down to 0.05 μm
- Maximum speed 6 mm/sec
- Load capacity up to 15 kg
- Integrated optical limit switches
- Option: linear scale (center mounted)

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- PLS-85
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- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
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- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120**
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- ES-82
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E



Order No.	6635-9-			
DC-B-028		1		
2Phase-025		2		
13 mm (1/2")		1		
open loop		0		
LS-025, Linear steel scale		1		
OLS-010		3		

4.132 Elevation Stage ES-100



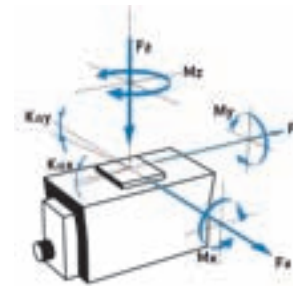
FACTS

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	100	50	30	40	80	80	60	60
2Phase-044	100	50	55	40	80	80	60	60



KEY FEATURES

- Travel range up to 26 mm (1")
- Uni-directional repeatability down to 0.05 μm
- Maximum speed 20 mm/sec
- Load capacity up to 5.5 kg
- Integrated mechanical / hall limit switches
- Option: linear scale (center mounted)



The ES-100 elevation stage matches the LS-110 and PRS-110 stage families. The elevation stage is driven by a precision ground re-circulating ball screw with a 1 mm pitch.

Newly developed cross-roller bearings guarantee a maximum rigidity and guiding quality. The ES-100 can be motorized with a DC or a 2-phase stepper motor and is equipped with two mechanical or hall limit switches. The travel ranges are 13 mm or 26 mm.

For demanding positioning tasks, the ES-100 elevation stages can be supplied with a cost-effective linear scale.

TECHNICAL DATA

Travel range (mm)	13	26
Straightness / Flatness (μm)	± 2	± 3
Pitch (μrad)	± 100	± 150
Yaw (μm)	± 100	± 150
Weight (kg)	2.4	2.5

Motor (Pitch 1 mm)	DC-B-032	2Phase-044	
Linear scale			LS-050
Speed max. (mm/sec)	20	15	
Resolution calculated (μm)	0.5 (RE)	5 (FS)	0.05
Resolution typical (μm)	0.5	0.2	0.05
Bi-directional Repeatability (μm)	± 1.5	± 1.5	± 0.1
Uni-directional Repeatability (μm)	0.5	0.2	0.05
Nominal Current (A)	2.3	1.2	
Voltage Range (V)	24		

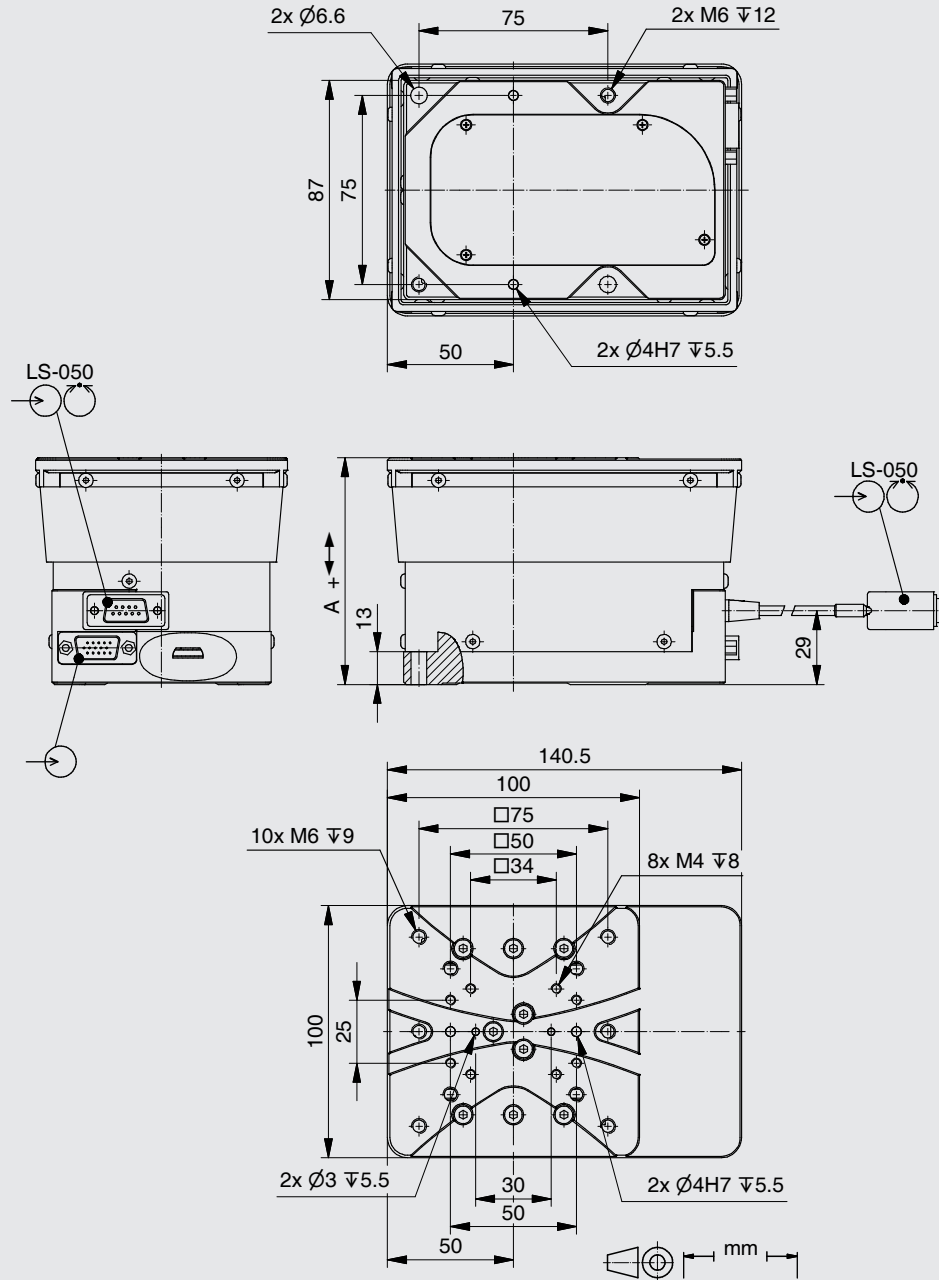
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 20
Material	Aluminum, black anodized

Note: FS = full step, RE = rotary encoder

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

Error and technical modifications are subject to change

Travel (mm)	13	26
A	90	105



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- LS-180
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- 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

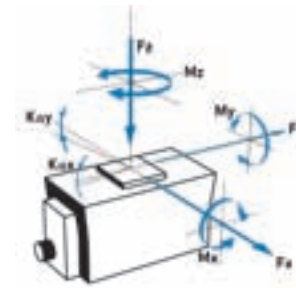
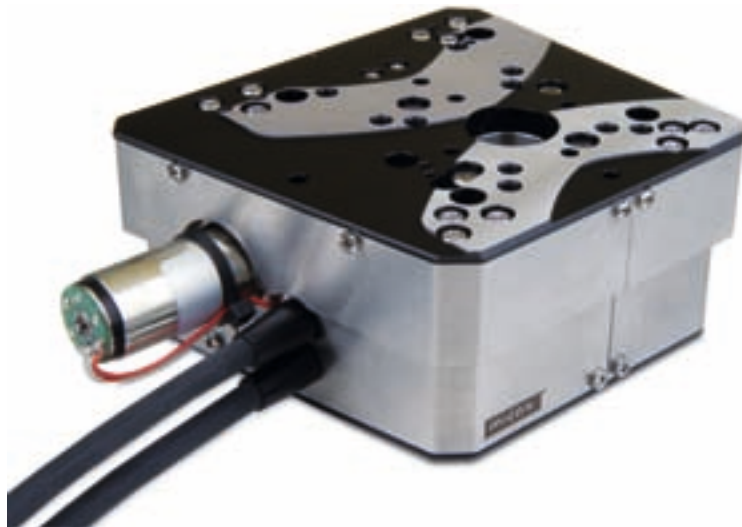
Order No.	6611-9-				
DC-B-032		1			
2Phase-044			2		
13 mm (1/2")		1			
26 mm (1")			2		
without LS-050				0	
LS-050, Linear steel scale					1
HLS-010, Hall limit switches					1
MLS-020, Mechanical limit switches					2

4.134 Elevation Stage ES-82



FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_y\text{Peak}(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
DC-B-009	5	5		20	0.25	0.25	0.25
2Phase-010	5	5	99	20	0.25	0.25	0.25



The ES-82 elevation stage excels due to its minimum height and can be combined with the PLS-85, LS-65 or MTS-65 stages. The ES-82 can be equipped with a DC or a 2-phase geared stepper motor and is equipped with two hall limit switches. The travel range is 13 mm.

KEY FEATURES

- Travel range 13 mm (1/2")
- Uni-directional repeatability down to 0.1 μm
- Maximum speed 0.1 mm/sec
- Load capacity up to 2 kg
- Integrated hall limit switches
- Option: linear scale

TECHNICAL DATA

Travel range (mm)	13
Straightness / Flatness (μm)	± 3
Pitch (μrad)	± 75
Yaw (μm)	± 75
Weight (kg)	0.8

Motor (Pitch 7 mm)	DC-B-009	2Phase-010	
Linear scale			LS-025
Speed max. (mm/sec)	0.1	0.08	
Resolution calculated (μm)	0.0005004 (RE)	0.0427009 (FS)	0.05
Resolution typical (μm)	0.3	0.3	0.1
Bi-directional Repeatability (μm)	± 2	± 2	± 0.2
Uni-directional Repeatability (μm)	0.3	0.3	0.1
Nominal Current (A)	0.16	0.25	
Voltage Range (V)	12		

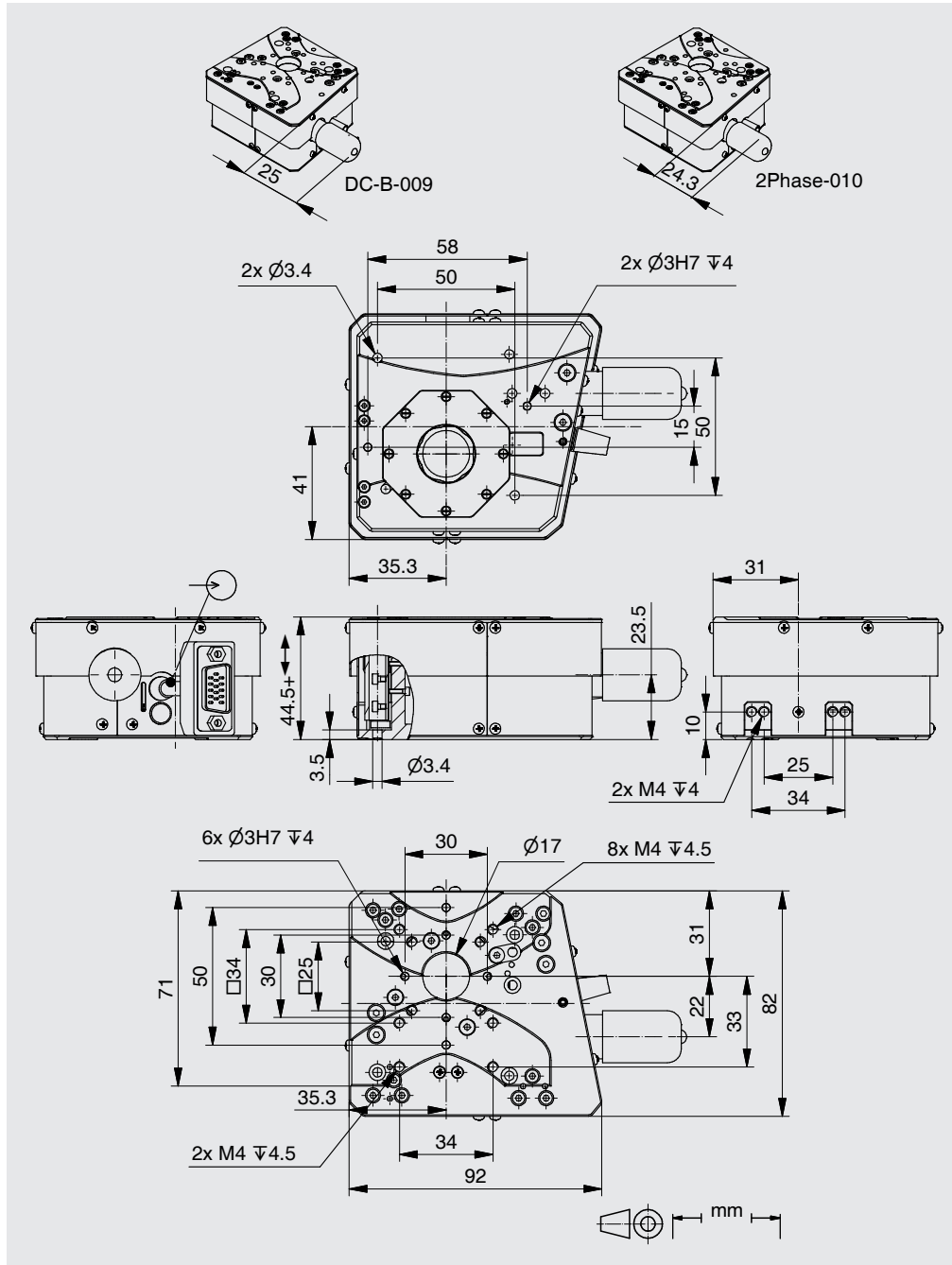
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 0.1
Material	Aluminum, black anodized

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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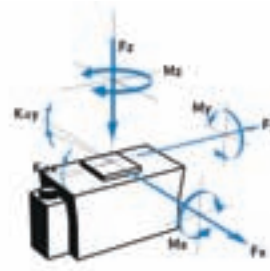
- UPS-150
- UPM-160
- HPS-170
- LS-270
- LMS-230
- LMS-180
- LS-180
- LS-120
- LS-110
- LMS-80
- LMS-60
- PLS-85
- LS-65
- MTS-65
- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
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- ES-82**
- ES-70
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
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Order No.	6613-9-				
DC-B-009		1			
2Phase-010		2			
13 mm (1/2")		1			
without LS-025		0			
LS-025, Linear glass scale		1			
HLS-010, Hall limit switches		1			

FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
DC-B-009	5	5	20	0.25	0.25	0.25
2Phase-010	5	5	20	0.25	0.25	0.25



The ES-70 elevation stage excels due to its minimum height. The ES-70 can be combined with the PLS-85, LS-65 or MTS-65 stages. The ES-70 can be equipped with a DC or a 2-phase geared stepper motor and is equipped with two hall limit switches. The travel range is 6.25 mm.



KEY FEATURES

- Travel range 6.25 mm (1/4")
- Uni-directional repeatability down to 0.3 μ m
- Maximum speed 0.1 mm/sec
- Load capacity up to 2 kg
- Integrated hall limit switches

TECHNICAL DATA

Travel range (mm)	6.25	
Straightness / Flatness (μ m)	± 2	
Pitch (μ rad)	± 50	
Yaw (μ m)	± 50	
Weight (kg)	0.6	

Motor (Pitch 7 mm)	DC-B-009	2Phase-010
Speed max. (mm/sec)	0.1	0.08
Resolution calculated (μ m)	0.0005004 (RE)	0.0427009 (FS)
Resolution typical (μ m)	0.3	0.3
Bi-directional Repeatability (μ m)	± 2	± 2
Uni-directional Repeatability (μ m)	0.3	0.3
Nominal Current (A)	0.16	0.25
Voltage Range (V)	12	

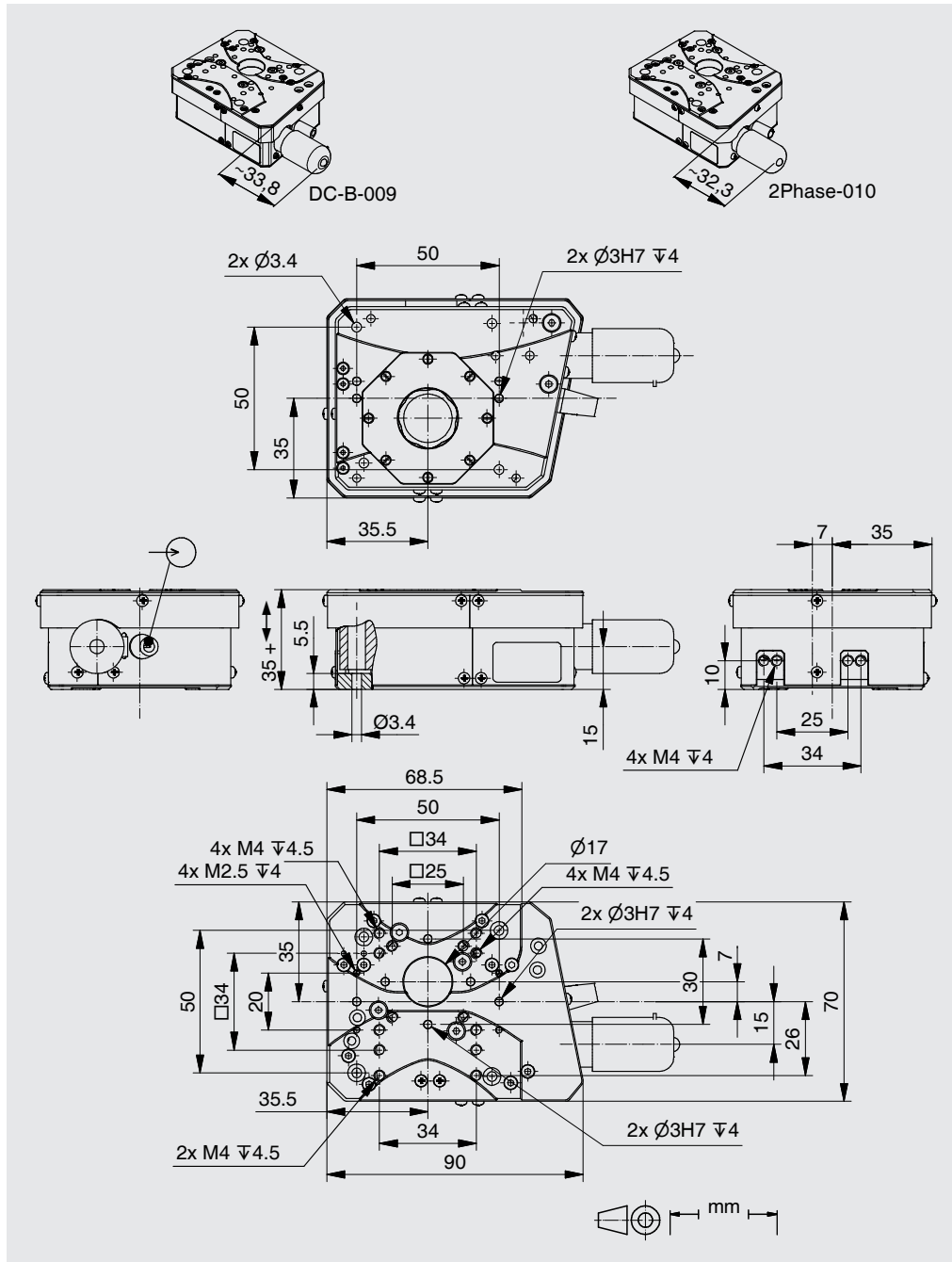
Accuracy	on request
Velocity range (mm/sec)	0.001 ... 0.1
Material	Aluminum, black anodized

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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- PLS-85
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- ES-70**
- ES-50
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS5E



Order No.	6609-9-		0
DC-B-009		1	
2Phase-010		2	
6.25 mm (1/4")		1	
HLS-010, Hall limit switches		1	

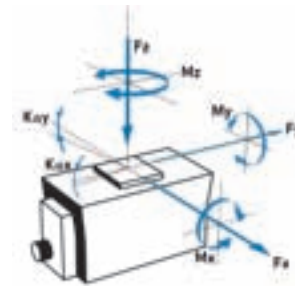
4.138 Elevation Stage ES-50

NEW

V

FACTS

Load characteristics	$F_x(N)$	$F_y(N)$	$F_z(N)$	$M_x(Nm)$	$M_y(Nm)$	$M_z(Nm)$
2Phase-018	5	5	10	1	1	1



The ES-50 elevation stage is designed for applications with limited space conditions. ES-50 linear stage is driven by a 2-phase stepper motor and are equipped with two mechanical limit switches.

Two pre-loaded ball bearings assure smooth motion and high stiffness. The ES-50 is optionally available with a linear encoder with 50 nm resolution.



KEY FEATURES

- Travel range 10 mm
- Uni-directional repeatability down to 0.1 μm
- 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 (μm)	± 4	
Pitch (μrad)	± 300	
Yaw (μm)	± 300	
Weight (kg)	1.1	
Motor (Pitch 0.5 mm)	2Phase-018	
Linear scale		LS-012
Speed max. (mm/sec)	5	
Resolution calculated (μm)	2.5 (FS)	0.05
Resolution typical (μm)	0.5	0.1
Bi-directional Repeatability (μm)	± 4	± 0.3
Uni-directional Repeatability (μm)	1	0.2
Nominal Current (A)	0.24	
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 5	
Material		

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

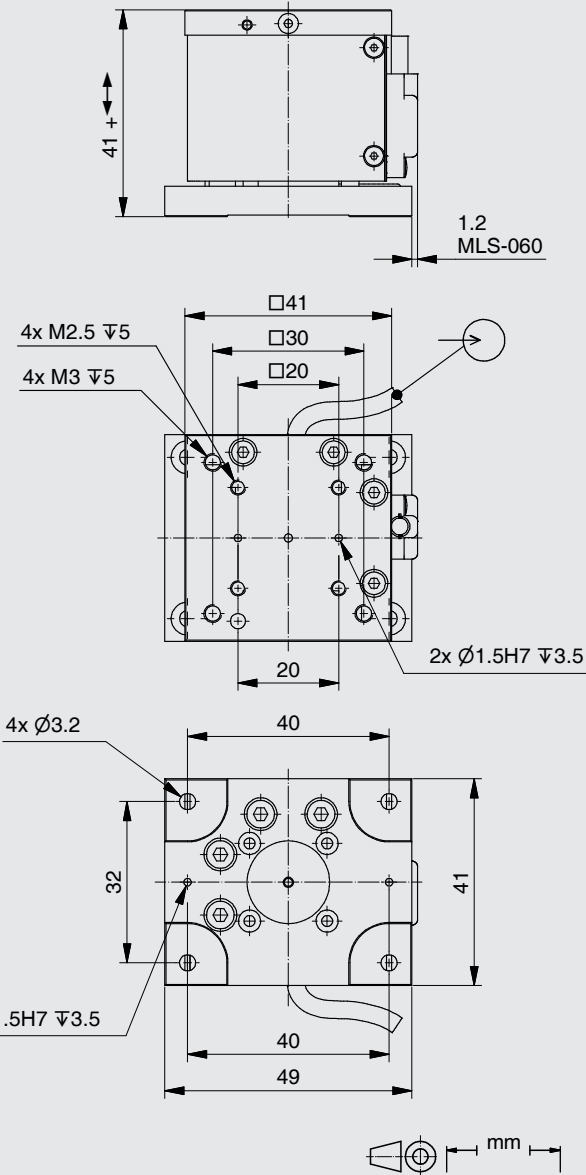
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- MTS-70
- VT-75
- VT-80
- LS-40
- VT-215
- CS-430
- MS-8
- MS-4
- KT-120
- MS-bio
- NPE-200
- UPL-120
- ES-100
- ES-82
- ES-70
- ES-50**
- MA-35
- MP-20
- MP-20 B
- MP-15
- ASS 5E



Order No.	6606-9-					
2Phase-018		2				
10 mm		2				
without LS-012		0				
LS-012, Linear steel scale		1				
MLS-060		2				
Pitch 0.5 mm		1				

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