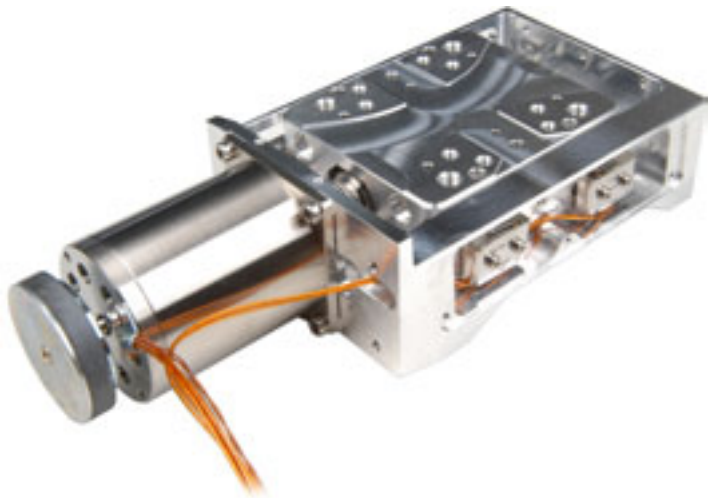


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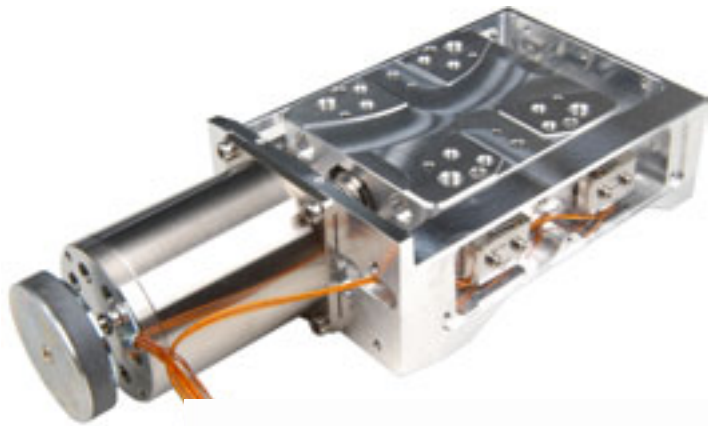
LINEAR STAGES

4.094 Precision Linear Stage PLS-85 Vacuum



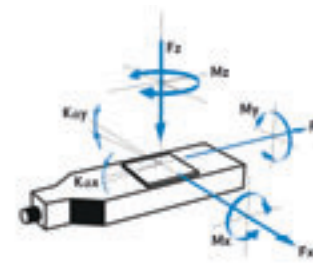
FACTS

| 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 | 60 | 50 | 100 | 25 | 30 | 20 | 70 | 40 |
| HV | 60 | 50 | 100 | 25 | 30 | 20 | 70 | 40 |
| UHV | 60 | 50 | 100 | 25 | 30 | 20 | 70 | 40 |



KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range up to 155 mm (6")
- Uni-directional repeatability down to 0.05 μ m
- Maximum speed 6 mm/sec
- Load capacity up to 8 kg
- Integrated switches
- Option: linear scale



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 mm pitch. The PLS-85 Vacuum can be mounted in any orientation. For demanding positioning tasks, the PLS-85 Vacuum linear stages can be supplied with a side-mounted linear scale. The PLS-85 Vacuum is equipped with a 2-phase steppervacuum motor and has two limit switches.

Please see "GLOSSARY Vacuum Specification" for all vacuum specification.

The PLS-85 Vacuum linear stages are

TECHNICAL DATA

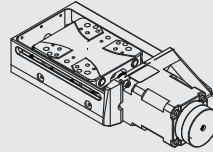
| | | | | |
|------------------------------------|----------|----------|-----------|-----------|
| Travel range (mm) | 26 | 52 | 102 | 155 |
| Straightness / Flatness (μ m) | ± 1 | ± 2 | ± 4 | ± 6 |
| Pitch (μ rad) | ± 60 | ± 90 | ± 120 | ± 150 |
| Yaw (μ rad) | ± 60 | ± 80 | ± 100 | ± 130 |
| Weight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

| Vacuum type | FV | HV | UHV | FV | UHV |
|--|---------|---------|---------|-----------|---------|
| Linear scale | | | | FV | UHV |
| Speed max. (mm/sec) | 6 | 2.5 | 2.5 | | |
| Resolution calculated (μ m) | 5 (FS) | 5 (FS) | 5 (FS) | 0.05 | 0.05 |
| Resolution typical (μ m) | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| Bi-directional Repeatability (μ m) | ± 1 | ± 1 | ± 1 | ± 0.1 | ± 1 |
| Uni-directional Repeatability (μ m) | 0.1 | 0.1 | 0.1 | 0.05 | 0.05 |
| Nominal Current (A) | 1.2 | 1.2 | 1.2 | | |

| | |
|-------------------------|--|
| Accuracy | on request |
| Velocity range (mm/sec) | 0.001 ... 6 |
| Material | Aluminum or Stainless steel, suitable for vacuum |

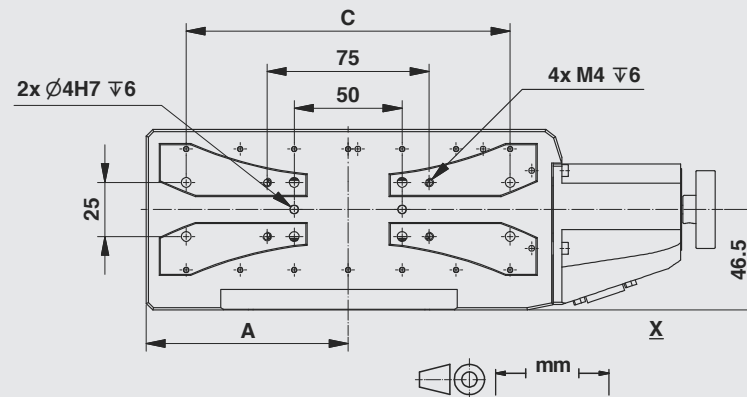
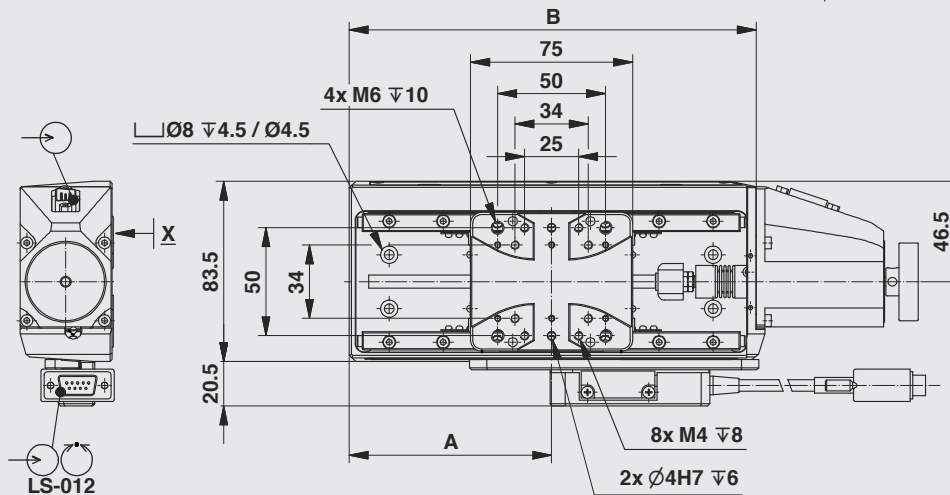
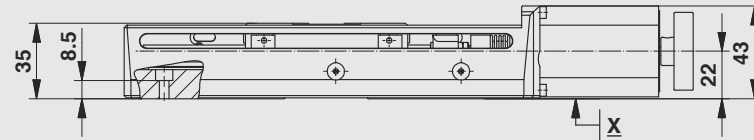
Vacuum Note: FS = full step, RE = rotary encoder
More info: Detailed information concerning motors and encoders, see appendix.

| | | | | |
|-------------|-------|-------|-------|-------|
| Travel (mm) | 26 | 52 | 102 | 155 |
| A | 59 | 68,5 | 93,5 | 128 |
| B | 119,5 | 138,5 | 188,5 | 257,5 |
| C | - | 100 | 150 | 200 |



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



| | | | | | |
|-------------|---------|---|--|---|---|
| Order No. | 6234-V- | | | 0 | 0 |
| FV | | 1 | | | |
| HV | | 2 | | | |
| UHVG | | 3 | | | |
| 26 mm (1") | | 1 | | | |
| 52 mm (2") | | 2 | | | |
| 102 mm (4") | | 3 | | | |
| 155 mm (6") | | 4 | | | |
| open loop | | 0 | | | |
| closed loop | | 1 | | | |

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LS-65

MT5-65

MT5-70

VT-80

LS-40

MCS

NPE-200

UPL-120

ES-100

ES-82

MA-35

MP-20

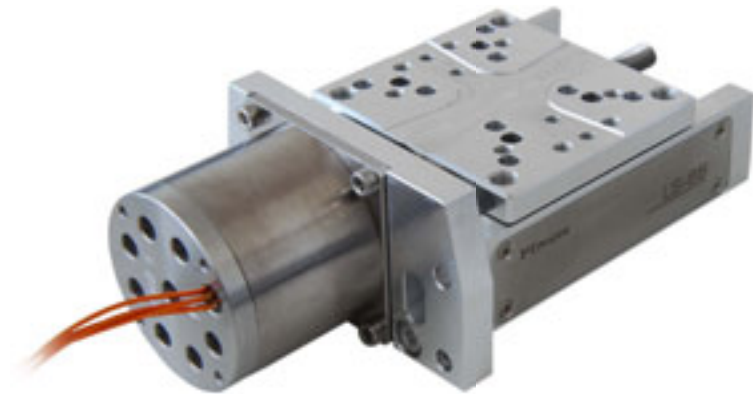
MP-20 B

MP-15



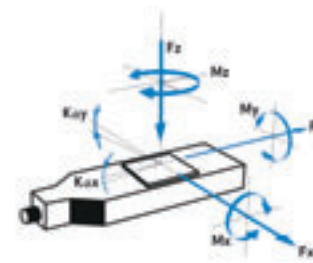
FACTS

| 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 | 25 | 60 | 7.5 | 7.5 | 7.5 | 140 | 80 |
| 10-6 | 50 | 25 | 60 | 7.5 | 7.5 | 7.5 | 140 | 80 |
| HV | 50 | 25 | 60 | 7.5 | 7.5 | 7.5 | 140 | 80 |
| UHV | 50 | 25 | 60 | 7.5 | 7.5 | 7.5 | 140 | 80 |



KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range up to 102 mm (4")
- Uni-directional repeatability down to 0.3 μm
- Maximum speed 4 mm/sec
- Load capacity up to 6 kg
- Integrated limit switches
- Optionally higher resolution / 0.4 mm pitch
- Optionally higher repeatability and speed with ballscrew



The LS-65 Vacuum 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 guarantees smooth and quiet motion. The LS-65 Vacuum linear stages are equipped with a re-circulating ball guiding system and are motorized with a special 2-phase vacuum stepper motor.

TECHNICAL DATA

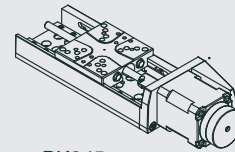
| | | | | |
|------------------------------|------|------|-------|-------|
| Travel range (mm) | 26 | 52 | 77 | 102 |
| Straightness / Flatness (μm) | ± 2 | ± 4 | ± 6 | ± 8 |
| Pitch (μrad) | ± 70 | ± 90 | ± 110 | ± 130 |
| Yaw (μrad) | ± 70 | ± 80 | ± 90 | ± 100 |
| Weight (kg) | 0.6 | 0.7 | 0.8 | 0.9 |

| Vacuum type | FV | 10-6 | HV | UHV | UHV |
|------------------------------------|--------|--------|--------|--------|-------|
| Linear scale | | | | | |
| Speed max. (mm/sec) | 4 | 1.5 | 1.5 | 1.5 | |
| Resolution calculated (μm) | 5 (FS) | 5 (FS) | 5 (FS) | 5 (FS) | 0.05 |
| Resolution typical (μm) | 0.2 | 0.2 | 0.2 | 0.2 | 0.05 |
| Bi-directional Repeatability (μm) | ± 5 | ± 5 | ± 5 | ± 5 | ± 0.1 |
| Uni-directional Repeatability (μm) | 0.3 | 0.3 | 0.3 | 0.3 | 0.05 |
| Nominal Current (A) | 1.2 | 1.2 | 1.2 | 1.2 | |

| | |
|-------------------------|--|
| Accuracy | on request |
| Velocity range (mm/sec) | 0.001 ... 3 |
| Material | Aluminum or Stainless steel, suitable for vacuum |

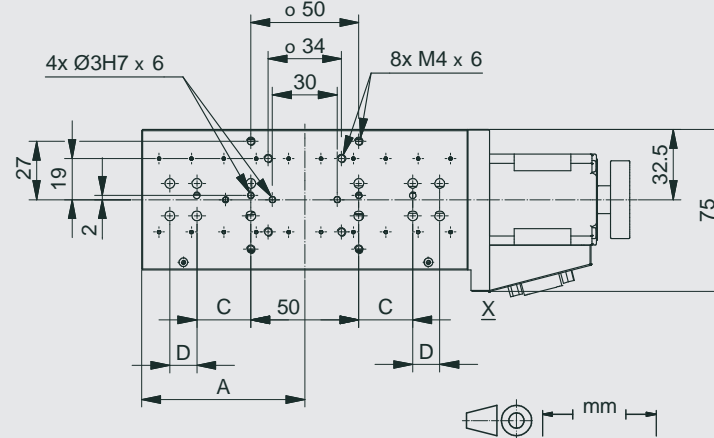
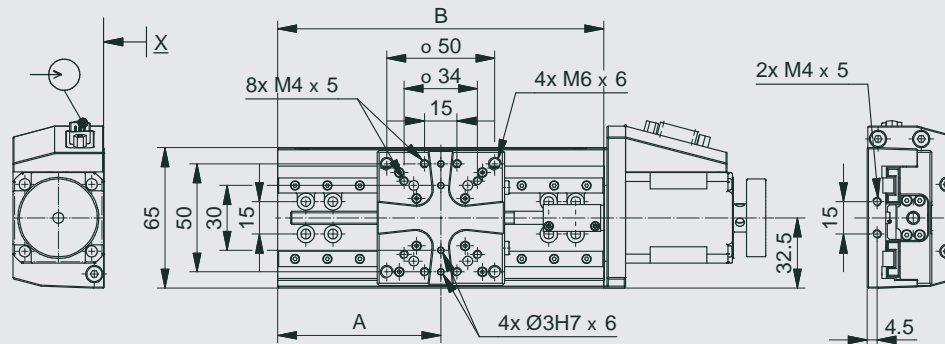
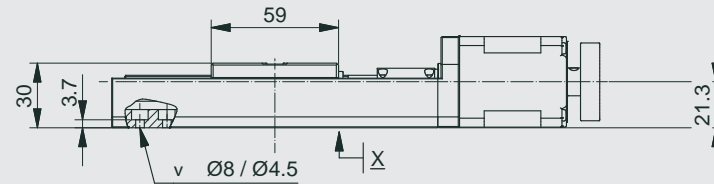
Vacuum Note: FS = full step, RE = rotary encoder
 More info: Detailed information concerning motors and encoders, see appendix.

| Travel (mm) | 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 |



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



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LS-120

LS-110

PLS-85

LS-65

MT5-65

MT5-70

VT-80

LS-40

MCS

NPE-200

UPL-120

ES-100

ES-82

MA-35

MP-20

MP-20 B

MP-15

Order No. 6233-V- 0 0

| | |
|-------------|---|
| FV | 1 |
| HV | 2 |
| UHVG | 3 |
| 10-6 | 6 |
| 26 mm (1") | 1 |
| 52 mm (2") | 2 |
| 77 mm (3") | 3 |
| 102 mm (4") | 4 |
| open loop | 0 |
| closed loop | 1 |

4.100 Micro Stage MTS-70 Vacuum



FACTS

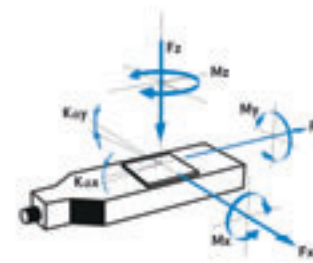
| Load characteristics | $F_x(N)$ | $F_y(N)$ | $F_z(N)$ | $M_x(Nm)$ | $M_y(Nm)$ | $M_z(Nm)$ | $k_{ax}(\mu rad/Nm)$ | $k_{ay}(\mu rad/Nm)$ |
|----------------------|----------|----------|----------|-----------|-----------|-----------|----------------------|----------------------|
| FV | 10 | 3 | 10 | 0.4 | 0.6 | 0.4 | 80 | 30 |
| HV | 10 | 3 | 10 | 0.4 | 0.6 | 0.4 | 80 | 30 |
| UHV | 10 | 3 | 10 | 0.4 | 0.6 | 0.4 | 80 | 30 |



xy axes (setup by PI miCos)

KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range 10 mm
- Uni-directional repeatability down to 0.1 μm
- Maximum speed 3 mm/sec
- Load capacity up to 1 kg
- Integrated limit switches
- Option: linear scale



developed for precision industrial applications with limited space conditions. The stage is driven by a 2-phase gearless vacuum stepper motor. The MTS-70 Vacuum micro stages series is provided with cross-roller bearings and a ground recirculating ball screw guaranteeing maximum stiffness, accuracy and smoothness of motion. The MTS-70 Vacuum 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.

The MTS-70 Vacuum micro stage was

TECHNICAL DATA

| | |
|-------------------------------------|----------|
| Travel range (mm) | 10 |
| Straightness / Flatness (μm) | ± 1 |
| Pitch (μrad) | ± 50 |
| Yaw (μrad) | ± 50 |
| Weight (kg) | 0.4 |

| Vacuum type | FV | HV | UHV | FV | UHV |
|---|---------|---------|---------|-----------|-----------|
| Linear scale | | | | | |
| Speed max. (mm/sec) | 2.5 | 1 | 1 | | |
| Resolution calculated (μm) | 5 (FS) | 5 (FS) | 5 (FS) | 0.05 | 0.05 |
| Resolution typical (μm) | 0.1 | 0.1 | 0.1 | 0.05 | 0.05 |
| Bi-directional Repeatability (μm) | ± 5 | ± 5 | ± 5 | ± 0.2 | ± 0.2 |
| Uni-directional Repeatability (μm) | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| Nominal Current (A) | 1.2 | 1.2 | 1.2 | | |

| | |
|-------------------------|--|
| Accuracy | on request |
| Velocity range (mm/sec) | 0.001 ... 3 |
| 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.

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MTS-65

MTS-70

VT-80

LS-40

MCS

NPE-200

UPL-120

ES-100

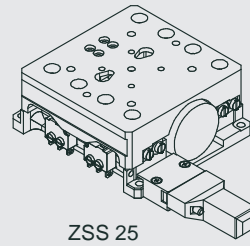
ES-82

MA-35

MP-20

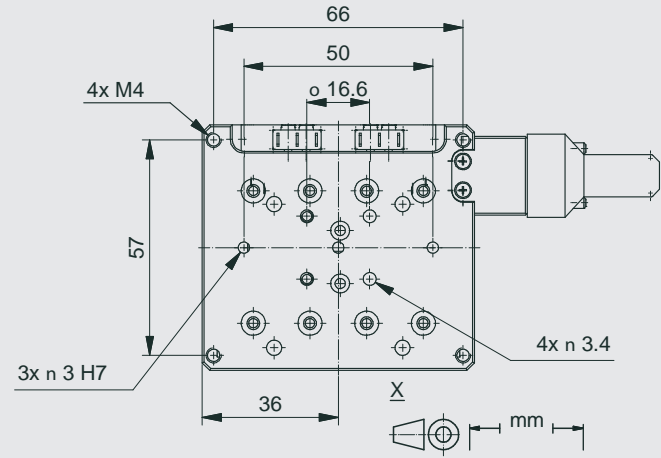
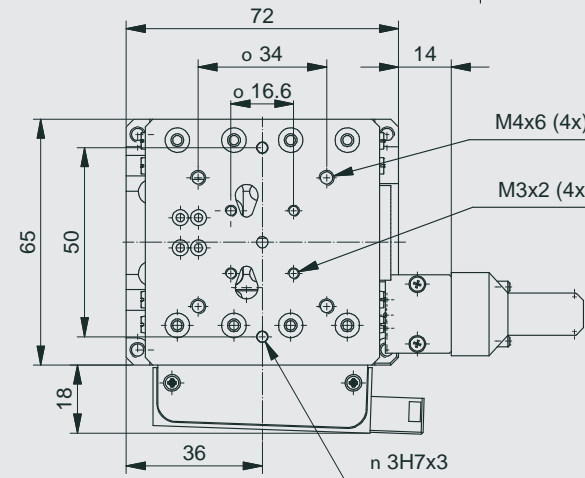
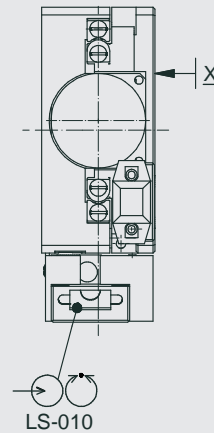
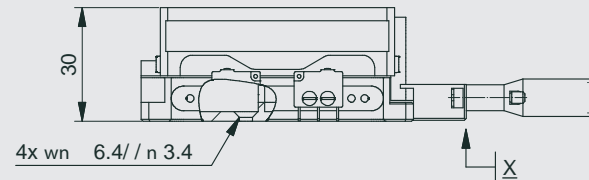
MP-20 B

MP-15



ZSS 25

drawings for the corresponding vacuum class must be requested separately.
The installed motor types are:
ZSS 25.200.1.2-E for FV
VSS 25.200.1.2-E for HV & UHVG

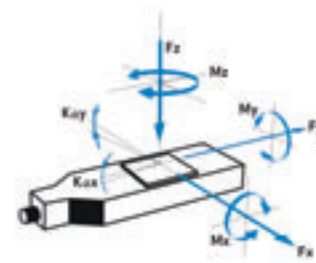


Order No. 6218-V- [] [] [] [] 0 0

| | |
|-------------|---|
| FV | 1 |
| HV | 2 |
| UHVG | 3 |
| 10 mm | 0 |
| open loop | 0 |
| closed loop | 1 |

FACTS

| Load characteristics | $F_x(N)$ | $F_y(N)$ | $F_z(N)$ | $M_x(Nm)$ | $M_y(Nm)$ | $M_z(Nm)$ |
|----------------------|----------|----------|----------|-----------|-----------|-----------|
| FV | 20 | 10 | 30 | 0.4 | 0.6 | 0.4 |
| 10-6 | 20 | 10 | 30 | 0.4 | 0.6 | 0.4 |
| HV | 20 | 10 | 30 | 0.4 | 0.6 | 0.4 |
| UHVG | 20 | 10 | 30 | 0.4 | 0.6 | 0.4 |



space saving modules can be assembled into XYZ-systems. The micro stage LS-40Vacuum is equipped with recirculating 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 or geared vacuum motor. The LS-40 series excels with very smooth, high resolution motion. For restricted space conditions.

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.

Micro stages LS-40 Vacuum are suited for the precise positioning of small parts such as fibers, optical components, laser diodes and inspection equipment. The

TECHNICAL DATA

| | | | |
|-------------------------------------|-----------|-----------|-----------|
| Travel range (mm) | 13 | 26 | 52 |
| Straightness / Flatness (μm) | ± 1.5 | ± 3 | ± 5 |
| Pitch (μrad) | ± 150 | ± 170 | ± 190 |
| Yaw (μrad) | ± 150 | ± 150 | ± 150 |
| Weight (kg) | 0.18 | 0.2 | 0.25 |

| Vacuum type | FV | 10-6 | HV | UHVG |
|---|----------------|----------------|----------|----------|
| Speed max. (mm/sec) | 0.13 | 0.05 | 0.05 | 0.05 |
| Resolution calculated (μm) | 0.2745086 (FS) | 0.2745086 (FS) | 2.5 (FS) | 2.5 (FS) |
| Resolution typical (μm) | 0.1 | 0.1 | 0.1 | 0.1 |
| Bi-directional Repeatability (μm) | ± 3 | ± 3 | ± 3 | ± 3 |
| Uni-directional Repeatability (μm) | 0.1 | 0.1 | 0.1 | 0.1 |
| Nominal Current (A) | 0.25 | 0.25 | 1.2 | 1.2 |

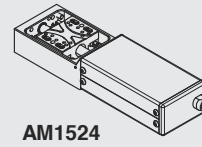
| | |
|-------------------------|--|
| Accuracy | on request |
| Velocity range (mm/sec) | 0.001 ... 1.5 |
| Material | Aluminum or Stainless steel, suitable for vacuum |

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

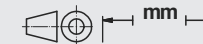
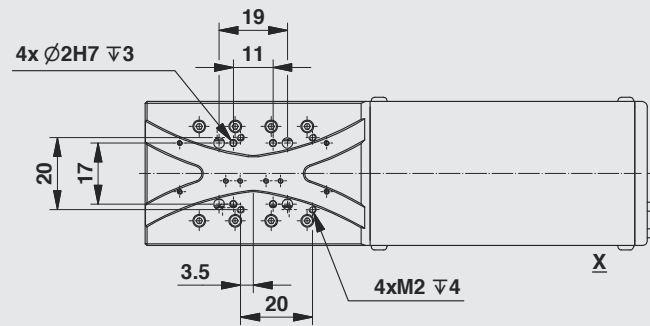
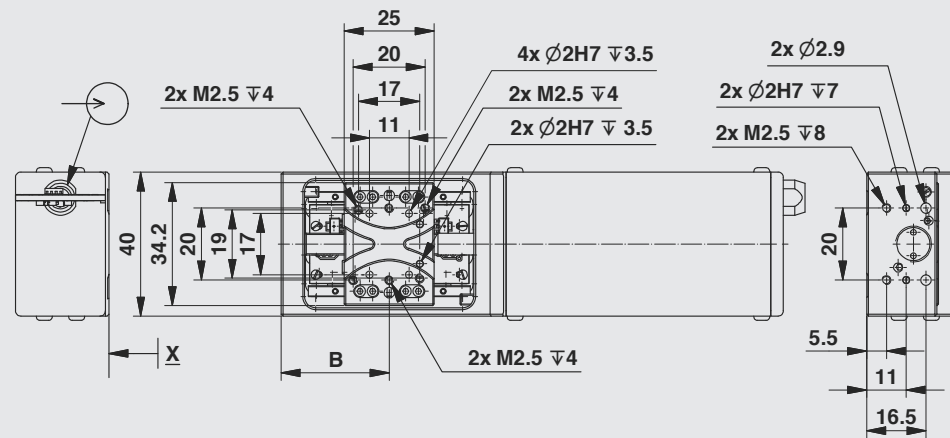
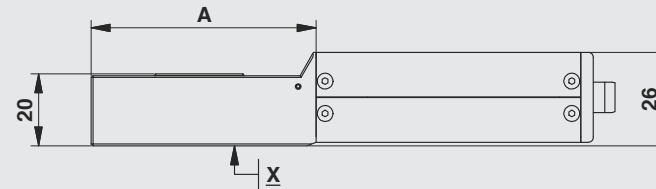
KEY FEATURES

- Vacuum up to 10⁻⁹ hPa
- Travel range up to 52 mm
- Uni-directional repeatability down to 0.1 μm
- Maximum speed 0.13 mm/sec
- Load capacity up to 2 kg
- Integrated 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 |



drawings for the corresponding vacuum class must be requested separately.
 The installed motor types are:
 AM1524 for FV
 VSS 32.200.1.2-E for HV, UHVG



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- 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. | 6213-V- | | | 0 | 0 | 0 |
| FV | | 1 | | | | |
| HV | | 2 | | | | |
| UHVG | | 3 | | | | |
| 10-6 | | 6 | | | | |
| 13 mm | | 1 | | | | |
| 26 mm | | 2 | | | | |
| 52 mm | | 3 | | | | |

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