

AML SERIES LINEAR MODULE

- ▶ Compact design
- ▶ Direct drive technology
- ▶ High precision optical encoder
- ▶ High response
- ▶ Stackable configuration

EN-26.3.1

Introduction

The AML series micro positioning stage consists of micro linear motor, micro guide rail, encoder position feedback and structural base. The internal structure is extremely compact. It is a high-precision positioning motion stage.

There are three standard products: AML40, AML65 and AML80. The micro motor and encoder position feedback built in the three standard modules can be selected according to the actual technical requirements. Customization service is available.

Continuous Force $F_{cn} = 2.3\text{N} \sim 9.6\text{N}$

Peak Force $F_{pk} = 6.9\text{N} \sim 28.8\text{N}$




Features

- ▶ Direct-drive, compact design
- ▶ Stroke from 10mm to 20mm
- ▶ Repeatability up to $\pm 0.3\mu\text{m}$
- ▶ Optional resolution of $0.2\mu\text{m}$, $0.05\mu\text{m}$, SINCOS
- ▶ It can be combined flexibly to form an XY stage or with AMR/AMZ to form an XYT or XYZT stage

Applications

Submicron positioning, optical alignment stage and force control.

They are applied to point-to-point high-speed positioning, optical alignment, Z-axis optical focusing, high speed pick and place, flying probe test and fiber optical alignment for automation equipment of all industries.

Miniature Modules	Continuous Force (F_{cn})						Peak Force (F_{pk})	Unit: N	Stroke ^① (mm)	Repeatability (μm)	Page
	5	10	15	20	25	30					
 AML40	2.3	6.9							10	up to ± 0.3	124
 AML65	5.9	17.7							15		124
 AML80	9.6	28.8							20		125

Note:

① Longer stroke available upon request.

★ Products can be customized to meet specific working environments, please contact cust-service@akribis-sys.com.

AML40

Motor Specifications	Unit	Value	
Motor	-	AML40-10	
Continuous Force (NC) @100°C ^{1 2}	N	2.3	
Peak Force ²	N	6.9	
Force Constant ±10% ²	N/A	0.8	
Back EMF Constant ±10% ²	V/(m/s)	0.8	
Resistance @25°C ±10% ³	Ω	0.89	
Inductance ±20% ⁴	mH	0.15	
Continuous Current (NC) @100°C ¹	A	2.9	
Peak Current	A	8.7	
Max. Voltage	Vdc	48	
Mechanical Specifications	Unit	Value	
Precision Grade ⁵	-	P	N
Effective Stroke	mm	10	
Resolution	μm	SINCOS/0.05	0.2
Repeatability	μm	±0.3	±1.0
Horizontal Straightness	μm	±1.0	±1.5
Vertical Straightness	μm	±1.0	±1.5
Minimum Incremental Motion ⁶	μm	< 0.1	-
Rated Payload ^{7 8}	kg	0.85	
No-Load Moving Mass	kg	0.06	
No-Load Total Mass	kg	0.16	
Max. Static Moment ⁹	Nm	0.1	

¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.

² The values are at mid stroke.

³ Resistance is measured by DC current with standard 0.5m cable.

⁴ Inductance is measured by current frequency of 1kHz.

⁵ Normal grade without anti-creep cross roller, precision grade with anti-creep cross roller.

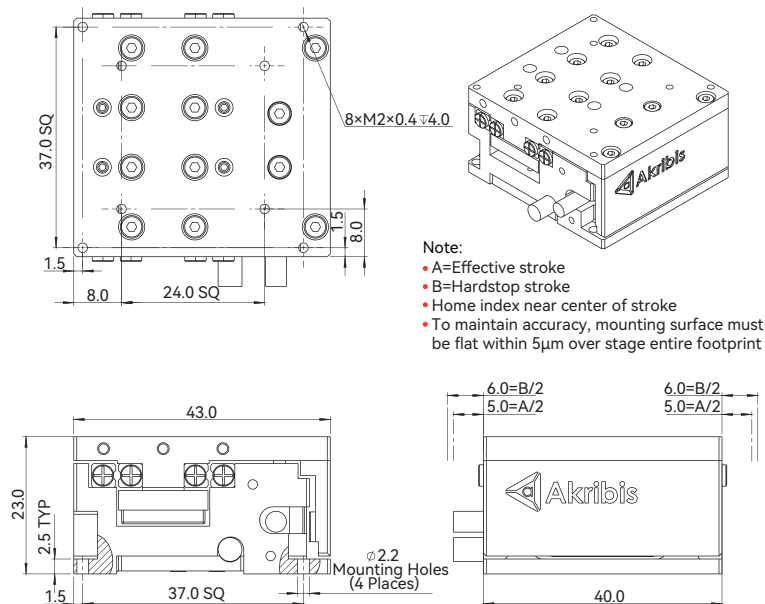
⁶ Encoder interpolated to 5nm resolution, measured by laser interferometer.

⁷ Load capacity of module without cantilever.

⁸ This value is based on providing a higher control bandwidth, please contact cust-service@akribis-sys.com for higher load requirements.

The contents of datasheet are subject to change without prior notice.

Dimensional Drawing



AML65

Motor Specifications	Unit	Value	
Motor	-	AML65-15	
Continuous Force (NC) @100°C ^{1 2}	N	5.9	
Peak Force ²	N	17.7	
Force Constant ±10% ²	N/A	2.2	
Back EMF Constant ±10% ²	V/(m/s)	2.2	
Resistance @25°C ±10% ³	Ω	1.76	
Inductance ±20% ⁴	mH	0.72	
Continuous Current (NC) @100°C ¹	A	2.7	
Peak Current	A	8.0	
Max. Voltage	Vdc	48	
Mechanical Specifications	Unit	Value	
Precision Grade ⁵	-	P	N
Effective Stroke	mm	15	
Resolution	μm	SINCOS/0.05	0.2
Repeatability	μm	±0.3	±1.0
Horizontal Straightness	μm	±1.0	±1.5
Vertical Straightness	μm	±1.0	±1.5
Minimum Incremental Motion ⁶	μm	< 0.1	-
Rated Payload ^{7 8}	kg	2.0	
No-Load Moving Mass	kg	0.18	
No-Load Total Mass	kg	0.39	
Max. Static Moment ⁹	Nm	0.5	

¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.

² The values are at mid stroke.

³ Resistance is measured by DC current with standard 0.5m cable.

⁴ Inductance is measured by current frequency of 1kHz.

⁵ Normal grade without anti-creep cross roller, precision grade with anti-creep cross roller.

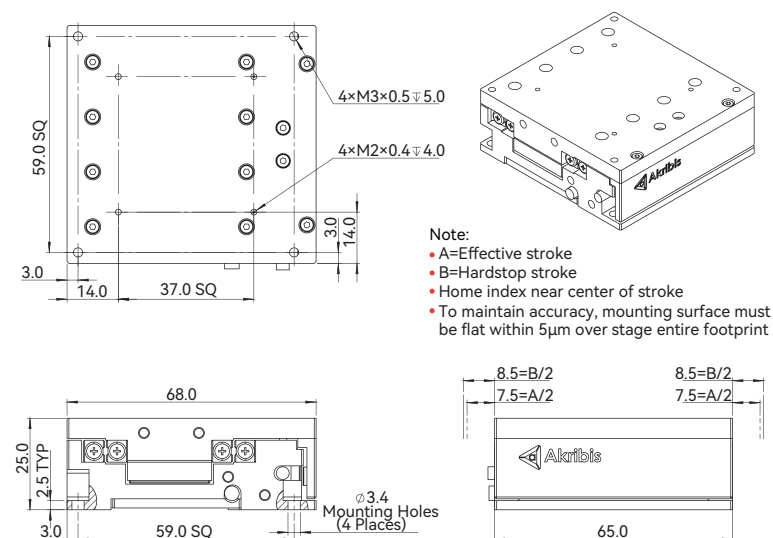
⁶ Encoder interpolated to 5nm resolution, measured by laser interferometer.

⁷ Load capacity of module without cantilever.

⁸ This value is based on providing a higher control bandwidth, please contact cust-service@akribis-sys.com for higher load requirements.

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Dimensional Drawing

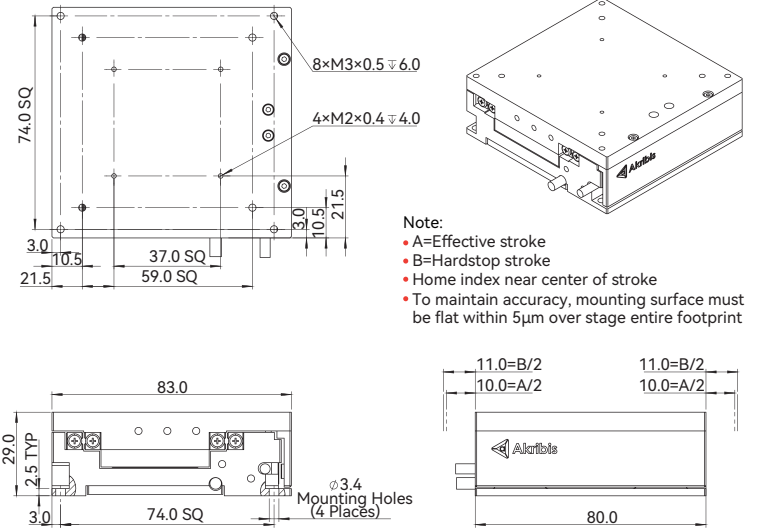


AML80

Motor Specifications	Unit	Value
Motor	-	AML80-20
Continuous Force (NC) @100°C ^{① ②}	N	9.6
Peak Force ^③	N	28.8
Force Constant ±10% ^④	N/A	4.5
Back EMF Constant ±10% ^⑤	V/(m/s)	4.5
Resistance @25°C ±10% ^⑥	Ω	3.26
Inductance ±20% ^⑦	mH	2.53
Continuous Current (NC) @100°C ^⑧	A	2.1
Peak Current	A	6.4
Max. Voltage	Vdc	48
Mechanical Specifications	Unit	Value
Precision Grade ^⑨	-	P N
Effective Stroke	mm	20
Resolution	μm	SINCOS/0.05 0.2
Repeatability	μm	±0.3 ±1.0
Horizontal Straightness	μm	±1.0 ±2.0
Vertical Straightness	μm	±1.0 ±2.0
Minimum Incremental Motion ^⑩	μm	< 0.1 -
Rated Payload ^{⑪ ⑫}	kg	2.5
No-Load Moving Mass	kg	0.34
No-Load Total Mass	kg	0.71
Max. Static Moment ^⑬	Nm	0.82

- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
 ② The values are at mid stroke.
 ③ Resistance is measured by DC current with standard 0.5m cable.
 ④ Inductance is measured by current frequency of 1kHz.
 ⑤ Normal grade without anti-creep cross roller, precision grade with anti-creep cross roller.
 ⑥ Encoder interpolated to 5nm resolution, measured by laser interferometer.
 ⑦ Load capacity of module without cantilever.
 ⑧ This value is based on providing a higher control bandwidth, please contact cust-service@akribis-sys.com for higher load requirements.
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Dimensional Drawing



Ordering Part Number (OPN)

AML40-T10-A0G4-A1

Model:

AML40/AML65/AML80

Precision Grade:

Unmarked: Normal ^①

Cover Type:

T: Standard (Black Anodized)

Effective Stroke (Corresponding Models):

10: 10mm (AML40)
15: 15mm (AML65)
20: 20mm (AML80)

Termination:

1: Motor: Flying Leads/Encoder: DSUB 15
2: Motor: TYCO2/Encoder: DSUB 15

Cable Length:

A: 0.5m
B: 3.0m

Scale Type:

4: Nickel, 14ppm/K

Encoder Type:

A0G: ABI-21, TTL (0.02μm)

AML40P-T10-R0A2-A1

Model:

AML40/AML65/AML80

Precision Grade:

P: Precision ^②

Cover Type:

T: Standard (Black Anodized)

Effective Stroke (Corresponding Models):

10: 10mm (AML40)
15: 15mm (AML65)
20: 20mm (AML80)

Termination:

1: Motor: Flying Leads/Encoder: DSUB 15
2: Motor: TYCO2/Encoder: DSUB 15

Cable Length:

A: 0.5m
B: 3.0m

Scale Type:

2: Glass G8 Soda Lime, 8ppm/K

Encoder Type:

R0A: ATOM2, SINCOS (1Vpp)
R0J: ATOM2, TTL (0.05μm)

Note:

- ① Normal Grade uses non anti-creep roller.
 ② Precision Grade uses anti-creep roller.
 ★ Default mounting orientation for this module is horizontal. For other mounting orientations, please contact cust-service@akribis-sys.com.