

AFC90SMZ SERIES VERTICAL Z MODULE

- ▶ Compact design
- ▶ Self-lubricating linear guide
- ▶ Direct drive technology
- ▶ MagSpring Counterbalance Z-Axis
- ▶ High precision optical encoder

EN-24.3.1

AFC90SMZ Series

Introduction

AFC90SMZ series is AFC90 series derived module with magnetic spring balancing module. It is a high-precision positioning motion stage.

Continuous Force $F_{cn} = 20\text{N}-34\text{N}$

Peak Force $F_{pk} = 55\text{N}-91\text{N}$




Features

- ▶ Direct-drive, compact design
- ▶ Self-lubricating linear guide
- ▶ Magnetic spring balancing module
- ▶ Stroke from 25/50mm
- ▶ Repeatability up to $\pm 0.5\mu\text{m}$
- ▶ Resolution of $0.05\mu\text{m}$
- ▶ It can be combined with AFC90 flexibly to form an XZ or XYZ stage

Applications

The AFC90SMZ module is suitable for applications such as sub-micron positioning, optical alignment, and point-to-point high-speed positioning of automation equipment in various industries.

Typical applications include: Imaging systems that perform scanning operations, high-precision placement, semiconductor metrology, and wafer fabrication applications.

Linear Module	Linear Motor	Continuous Force (F_{cn})		Peak Force (F_{pk})		Unit: N		Repeatability (μm)	Page
		20.0	40.0	60.0	80.0	100.0	120.0		
 AFC90SMZ	 CLC0001-025-B3	20.0		55.0				±0.5	03
	 CLC0001-025-B5	34.0		91.0					04

Note:

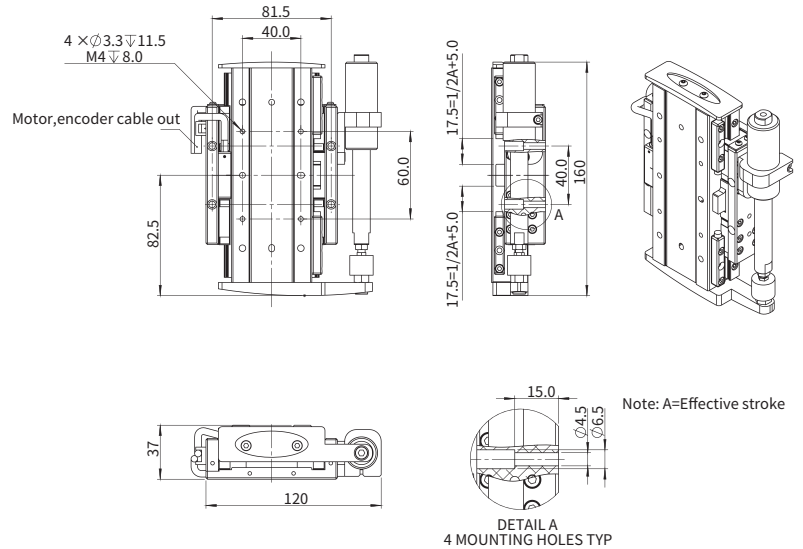
★ Products can be customized to meet specific working environments, please contact cust-service@akribis-sys.com.

AFC90SMZ-25-C13

Motor Specifications	Unit	Value
Motor	-	CLC0001-025-B3
Continuous Force @100°C ^①	N	20.0
Peak Force	N	55.0
Force Constant ±10%	N/Arms	8.1
Back EMF Constant ±10%	Vpeak/(m/s)	6.6
Resistance (L-L) @25°C ±10% ^②	Ω	1.7
Inductance (L-L) ±30% ^③	mH	0.8
Continuous Current (NC) @100°C ^④	Arms	2.5
Peak Current	Arms	7.5
Max. Bus Voltage	Vdc	48.0
Magnetic Period	mm	12.0
Mechanical Specifications	Unit	Value
Stroke	mm	25.0
Resolution	μm	0.05
Repeatability	μm	±0.5
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±3.0
Rated Payload ^⑤	kg	1.5
No-load Moving Mass	kg	0.8
No-load Total Mass	kg	1.4
Max. Allowable Roll Moment	Nm	2.0
Max. Allowable Pitch Moment	Nm	3.0
Max. Allowable Yaw Moment	Nm	2.0

- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment. Abbreviations: NC-Natural Cooling.
 - ② Resistance is measured by DC current with 0.5 m cable.
 - ③ Inductance is measured by current frequency of 1kHz.
 - ④ Load capacity of module without cantilever.
 - ⑤ Affected by the actual output force of the magnetic spring, the maximum deviation of the rated load is ±12%.
- The contents of datasheet are subject to change without prior notice.

Dimensional Drawing

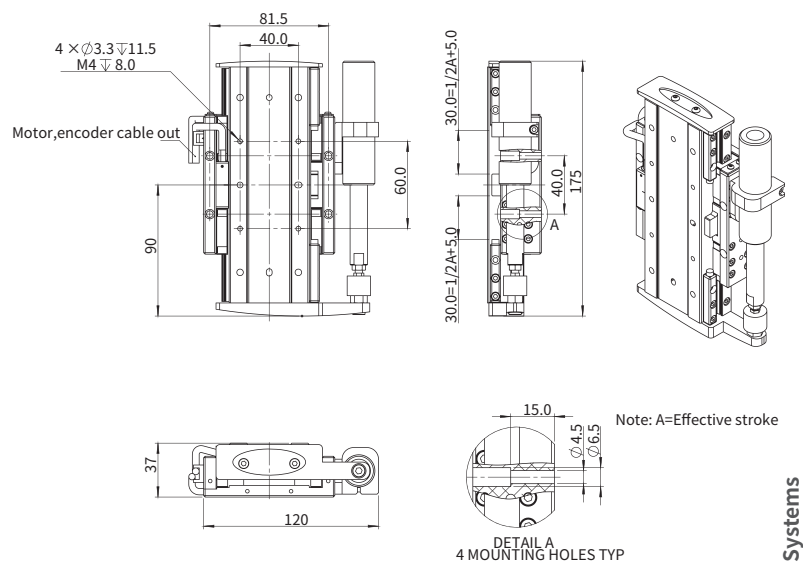


AFC90SMZ-50-C13

Motor Specifications	Unit	Value
Motor	-	CLC0001-025-B3
Continuous Force @100°C ^①	N	20.0
Peak Force	N	55.0
Force Constant ±10%	N/Arms	8.1
Back EMF Constant ±10%	Vpeak/(m/s)	6.6
Resistance (L-L) @25°C ±10% ^②	Ω	1.7
Inductance (L-L) ±30% ^③	mH	0.8
Continuous Current (NC) @100°C ^④	Arms	2.5
Peak Current	Arms	7.5
Max. Bus Voltage	Vdc	48.0
Magnetic Period	mm	12.0
Mechanical Specifications	Unit	Value
Stroke	mm	50.0
Resolution	μm	0.05
Repeatability	μm	±0.5
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±3.0
Rated Payload ^⑤	kg	1.5
No-load Moving Mass	kg	0.8
No-load Total Mass	kg	1.5
Max. Allowable Roll Moment	Nm	2.0
Max. Allowable Pitch Moment	Nm	3.0
Max. Allowable Yaw Moment	Nm	2.0

- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment. Abbreviations: NC-Natural Cooling.
 - ② Resistance is measured by DC current with 0.5 m cable.
 - ③ Inductance is measured by current frequency of 1kHz.
 - ④ Load capacity of module without cantilever.
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Dimensional Drawing

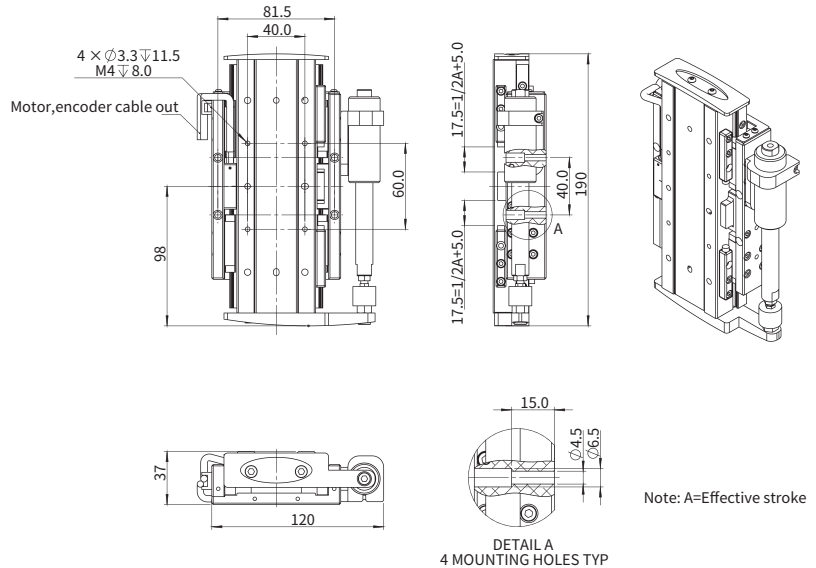


AFC90SMZ Series

AFC90SMZ-25-C15

Motor Specifications	Unit	Value
Motor	-	CLC0001-025-B5
Continuous Force @100°C ^①	N	34.0
Peak Force	N	91.0
Force Constant ±10%	N/Arms	13.5
Back EMF Constant ±10%	Vpeak/(m/s)	11.1
Resistance (L-L) @25°C ±10% ^②	Ω	2.8
Inductance (L-L) ±30% ^③	mH	1.4
Continuous Current (NC) @100°C ^④	Arms	2.5
Peak Current	Arms	7.5
Max. Bus Voltage	Vdc	48.0
Magnetic Period	mm	12.0
Mechanical Specifications	Unit	Value
Stroke	mm	25.0
Resolution	μm	0.05
Repeatability	μm	±0.5
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±3.0
Rated Payload ^⑤	kg	1.5
No-load Moving Mass	kg	0.9
No-load Total Mass	kg	1.8
Max. Allowable Roll Moment	Nm	3.0
Max. Allowable Pitch Moment	Nm	4.0
Max. Allowable Yaw Moment	Nm	3.0

Dimensional Drawing

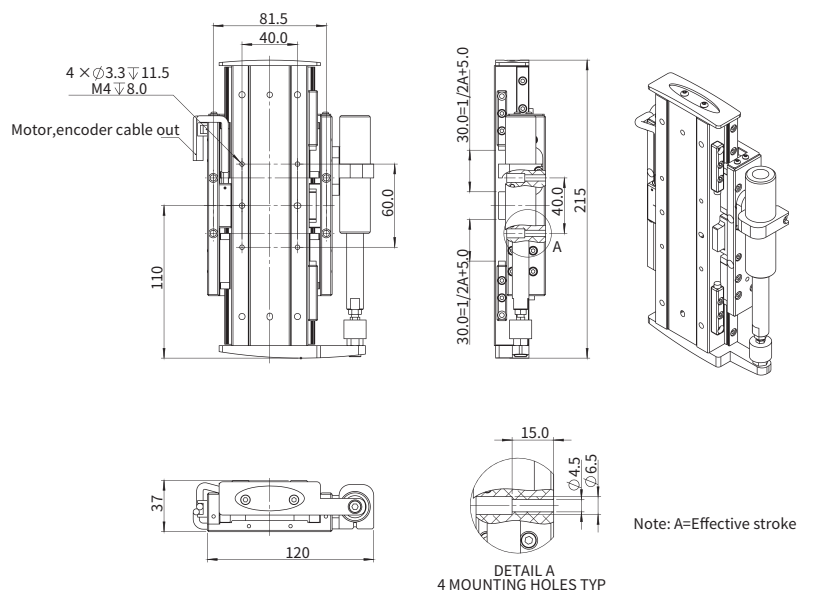


- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment. Abbreviations: NC-Natural Cooling.
 - ② Resistance is measured by DC current with 0.5 m cable.
 - ③ Inductance is measured by current frequency of 1kHz.
 - ④ Load capacity of module without cantilever.
 - ⑤ Affected by the actual output force of the magnetic spring, the maximum deviation of the rated load is ±12%.
- The contents of datasheet are subject to change without prior notice.

AFC90SMZ-50-C15

Motor Specifications	Unit	Value
Motor	-	CLC0001-025-B5
Continuous Force @100°C ^①	N	34.0
Peak Force	N	91.0
Force Constant ±10%	N/Arms	13.5
Back EMF Constant ±10%	Vpeak/(m/s)	11.1
Resistance (L-L) @25°C ±10% ^②	Ω	2.8
Inductance (L-L) ±30% ^③	mH	1.4
Continuous Current (NC) @100°C ^④	Arms	2.5
Peak Current	Arms	7.5
Max. Bus Voltage	Vdc	48.0
Magnetic Period	mm	12.0
Mechanical Specifications	Unit	Value
Stroke	mm	50.0
Resolution	μm	0.05
Repeatability	μm	±0.5
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±3.0
Rated Payload ^⑤	kg	1.5
No-load Moving Mass	kg	1.0
No-load Total Mass	kg	1.9
Max. Allowable Roll Moment	Nm	3.0
Max. Allowable Pitch Moment	Nm	4.0
Max. Allowable Yaw Moment	Nm	3.0

Dimensional Drawing



- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment. Abbreviations: NC-Natural Cooling.
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Ordering Part Number (OPN)

AFC90SMZ-T02-C13AD01-D1

Model:

AFC90SMZ

Cover Type:

T: Standard (Black Anodized)

Effective Stroke:

02: 25mm

05: 50mm

Termination:

1: Motor: Flying Leads/Encoder: DSUB 15
2: Motor: TYCO4/Encoder: DSUB 15

Cable Length:

B: 3.0m
D: 1.0m

Scale Type:

1: Steel Tape, 11ppm/K

Encoder Type:

AD0: ABA-20 (0.05µm)

Motor Type:

C13: CLC0001-025-N-B3(Peak Force: 55N)
C15: CLC0001-025-N-B5(Peak Force: 91N)