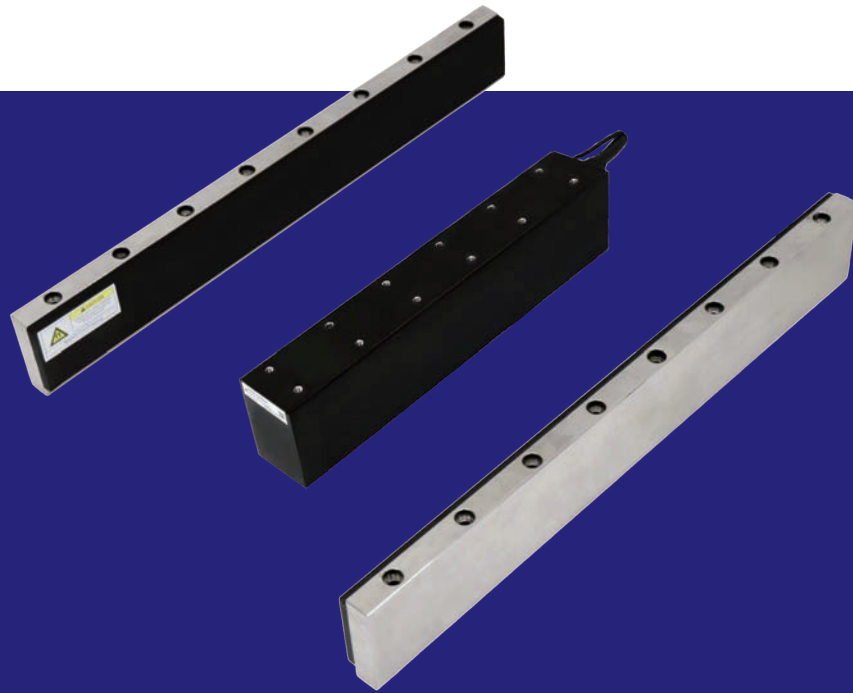




AKD-A SERIES

- ▶ Dual magnet tracks
- ▶ High force density
- ▶ Fast dynamic response
- ▶ Balanced attraction force
- ▶ Low cogging effect

EN-22.10.1

Introduction

The AKD-A series is a linear motor with iron core, with high thrust density, good rigidity, high response speed and compact structure. It is suitable for applications with high thrust density requirements and fast response speed.

Continuous Force $F_{cn} = 550N \sim 1187N$

Peak Force $F_{pk} = 2156N \sim 5174N$

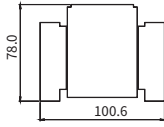
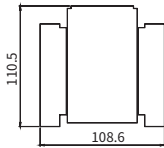
Features

- ▶ Iron core technology and low cogging force
- ▶ High continuous and peak force
- ▶ Dual magnet tracks
- ▶ Balanced attraction force
- ▶ High motor constant
- ▶ Fast dynamic response

Applications

Applicable to point-to-point micron meter level positioning; unlimited travel stroke with top speed of 5m/s or faster (stroke of 100m or longer).

Applications & Industries: high speed positioning systems for product handling in semiconductor, photovoltaic and lithium battery, glass and LCD applications, as well as machining centers, industrial printing machines, laser processing machines with demanding precision, motion control requirements, high-speed dispensing and high-speed placement machine.

	Series	Coil Length (mm)	● Continuous Force (F_{cn}) / ■ PeakForce (F_{pk})						Unit: N
			200	400	600	800	1000	1200	
	AKD050-A-B2	245			● 550 / ■ 2156				
	AKD050-A-B3	353					● 816 / ■ 3234		
	AKD080-A-B2	245					● 861 / ■ 3450		
	AKD080-A-B3	353						● 1187 / ■ 5174	

AKD050-A-B2

AKD050-A-B2				
Performance Parameters	Symbol	Unit	L	H
Continuous Force (NC) @100°C ^①	F _{Cn}	N	550	550
Peak Force	F _{pk}	N	2156	2156
Force Constant ±10%	K _f	N/Arms	67	42.6
Back EMF Constant ±10%	K _e	Vpeak/(m/s)	55	35
Motor Constant @25°C	K _m	N/Sqrt(W)	44.2	44.3
Resistance (L-L) 25°C ±10% ^②	R ₂₅	Ω	1.5	0.6
Inductance (L-L) ±30% ^③	L	mH	6.8	2.7
Electrical Time Constant	T _e	ms	4.4	4.4
Continuous Current (NC) @100°C ^①	I _{cn}	Arms	8.2	13
Peak Current	I _{pk}	Arms	48	76
Continuous Power Dissipation (NC) @100°C ^①	P _{Cn}	W	199	199
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant (NC) ^①	K _{thn}	W/°C	2.7	2.7
Max. Bus Voltage	U _{bus}	Vdc	600	600
Magnetic Period	T _{NN}	mm	27	27
Attraction Force	F _a	kN	0.0	0.0
Mechanical Parameters				
Coil Mass (NC)	m _{cn}	kg	6	6
Coil Length (NC)	L _{cn}	mm	245	245
Track Mass Per Meter	m _{track}	kg/m	19	19
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP00		
Compliance with Global Standards		RoHS, CE		
Ambient Temperature	Operation	0°C to 40°C (non-freezing)		
	Storage	-15°C to 70°C (non-freezing)		
Ambient Humidity	Operation	10%RH to 80%RH (non-condensing)		
	Storage	10%RH to 90%RH (non-condensing)		
Recommended Ambience		Indoor (no direct sunlight); No corrosive gas, inflammable gas, oil mist or dust.		

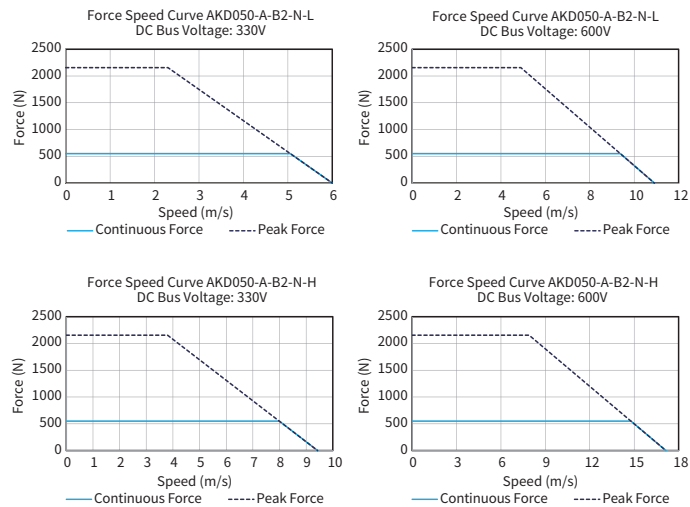
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

② Resistance is measured by DC current with standard 0.5 m cable.

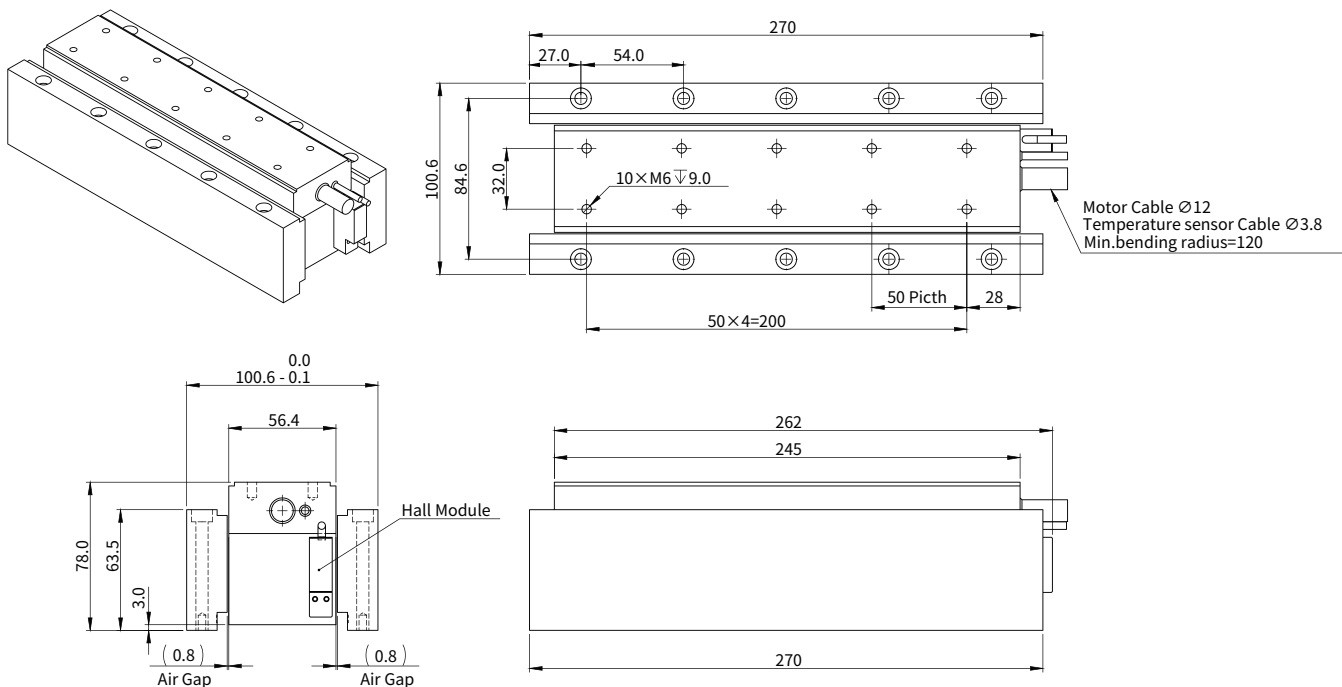
③ Inductance is measured by current frequency of 1 kHz.

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

Force-Speed Curve



Dimensional Drawing



AKD050-A-B3

AKD050-A-B3				
Performance Parameters	Symbol	Unit	L	H
Continuous Force (NC) @100°C ^①	F _{Cn}	N	816	816
Peak Force	F _{pk}	N	3234	3234
Force Constant ±10%	K _f	N/Arms	67	43
Back EMF Constant ±10%	K _e	Vpeak/(m/s)	55	35
Motor Constant @25°C	K _m	N/Sqrt(W)	54.2	54.2
Resistance (L-L) 25°C ±10% ^②	R ₂₅	Ω	1.0	0.4
Inductance (L-L) ±30% ^③	L	mH	4.5	1.8
Electrical Time Constant	τ _e	ms	4.4	4.4
Continuous Current (NC) @100°C ^①	I _{cn}	Arms	12.1	19.2
Peak Current	I _{pk}	Arms	72	114
Continuous Power Dissipation (NC) @100°C ^①	P _{Cn}	W	292	292
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant (NC) ^①	K _{thn}	W/°C	3.9	3.9
Max. Bus Voltage	U _{bus}	Vdc	600	600
Magnetic Period	τ _{NN}	mm	27	27
Attraction Force	F _a	kN	0.0	0.0
Mechanical Parameters				
Coil Mass (NC)	m _{cn}	kg	8.6	8.6
Coil Length (NC)	L _{cn}	mm	353	353
Track Mass Per Meter	m _{track}	kg/m	19	19
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP00		
Compliance with Global Standards		RoHS, CE		
Ambient Temperature	Operation	0°C to 40°C (non-freezing)		
	Storage	-15°C to 70°C (non-freezing)		
Ambient Humidity	Operation	10%RH to 80%RH (non-condensing)		
	Storage	10%RH to 90%RH (non-condensing)		
Recommended Ambience		Indoor (no direct sunlight); No corrosive gas, inflammable gas, oil mist or dust		

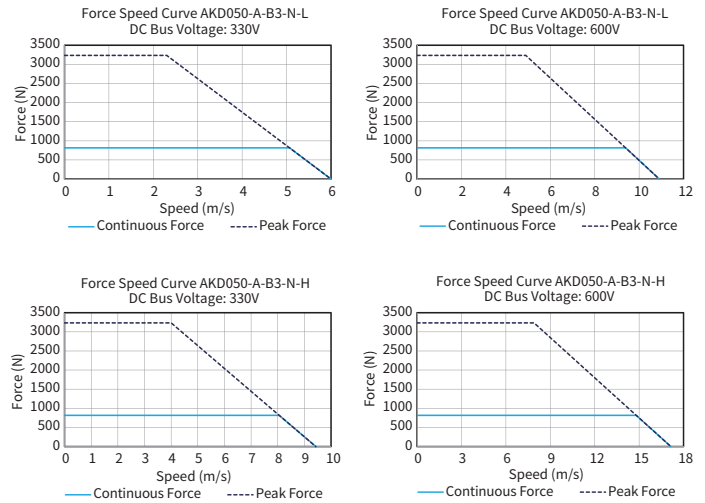
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

② Resistance is measured by DC current with standard 0.5 m cable.

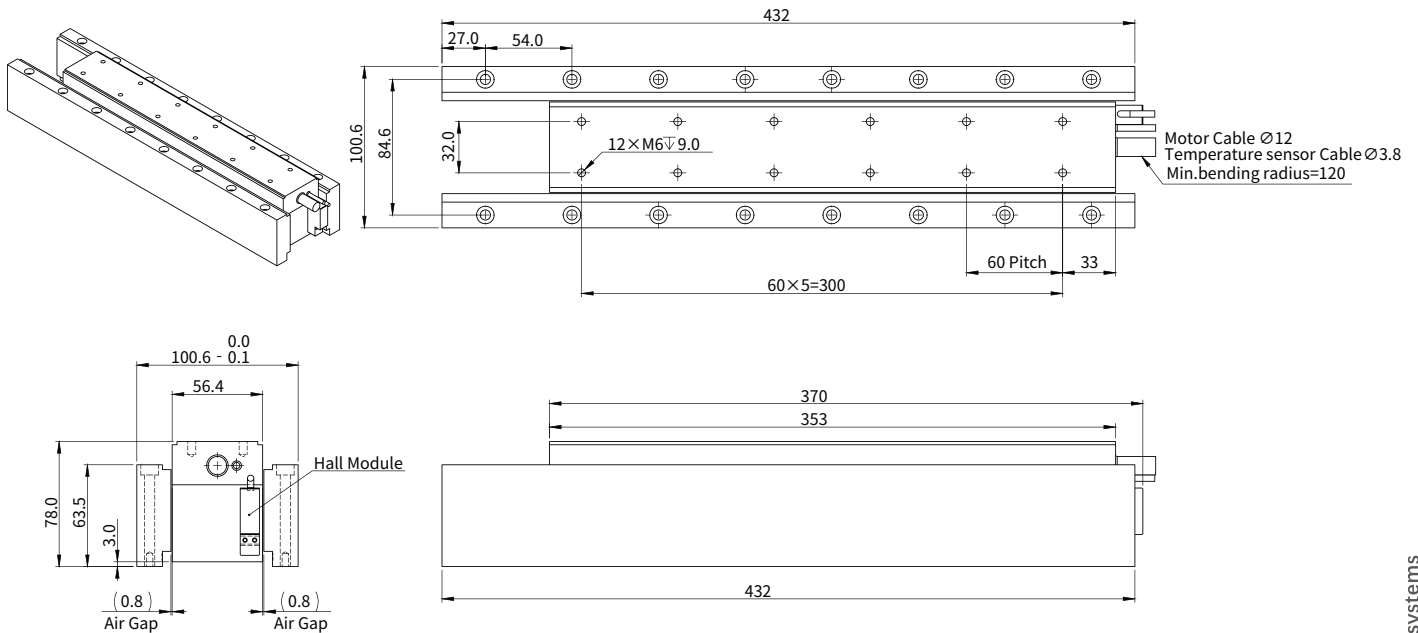
③ Inductance is measured by current frequency of 1 kHz.

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

Force-Speed Curve

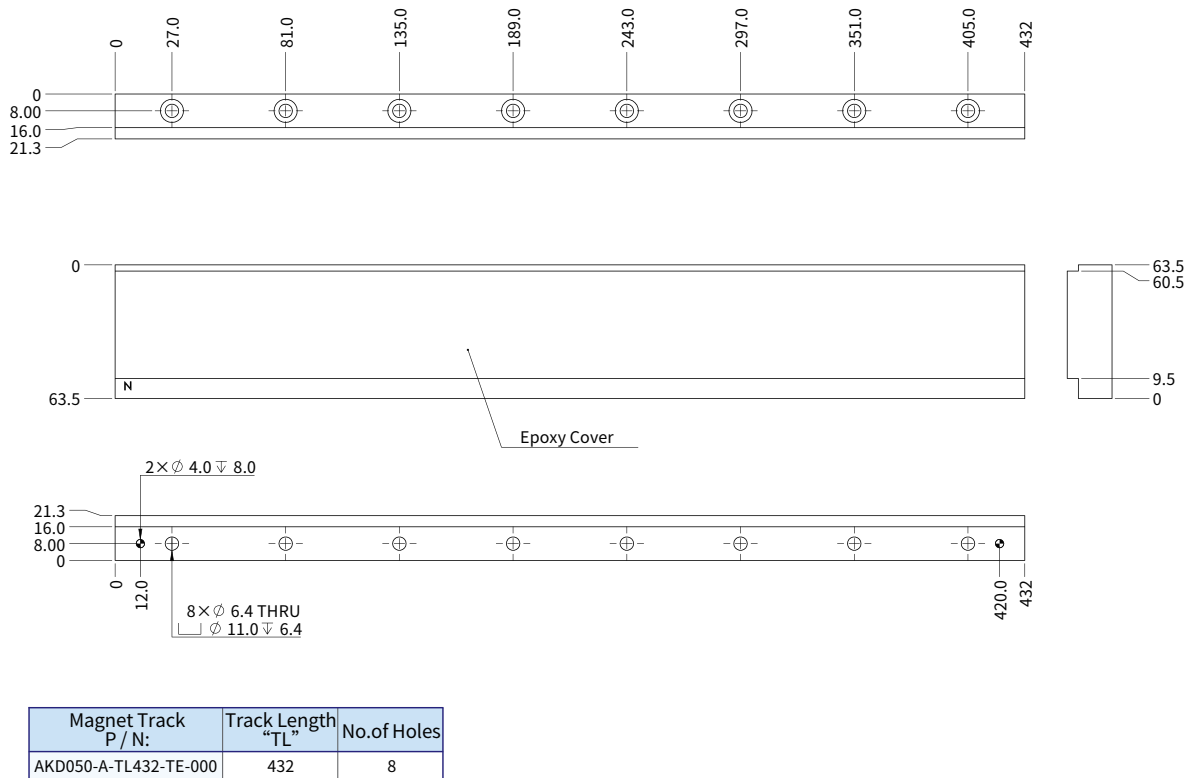
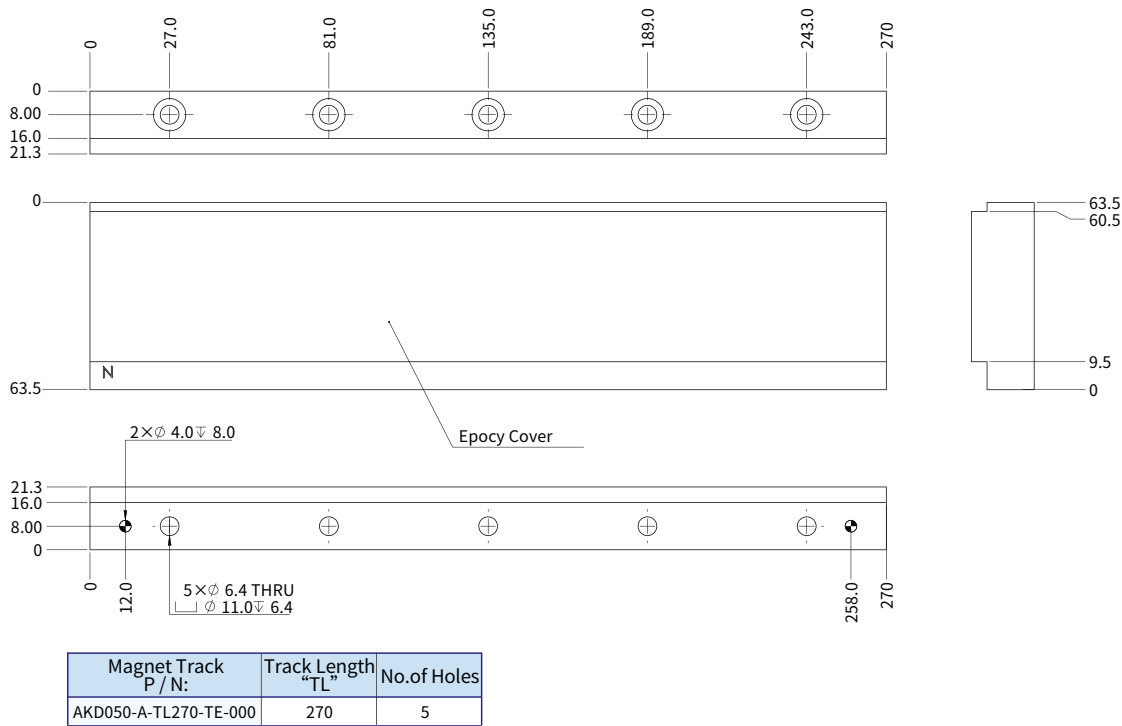


Dimensional Drawing



AKD-A Series

AKD050-A Track



AKD080-A-B2

AKD080-A-B2				
Performance Parameters	Symbol	Unit	L	H
Continuous Force (NC) @100°C ^①	F _{Cn}	N	861	861
Peak Force	F _{Pk}	N	3450	3450
Force Constant ±10%	K _f	N/Arms	108	68.2
Back EMF Constant ±10%	K _e	Vpeak/(m/s)	88	56
Motor Constant @25°C	K _m	N/Sqrt(W)	56	56
Resistance (L-L) 25°C ±10% ^②	R ₂₅	Ω	2.5	1.0
Inductance (L-L) ±30% ^③	L	mH	10.8	4.4
Electrical Time Constant	T _e	ms	4.4	4.4
Continuous Current (NC) @100°C ^①	I _{Cn}	Arms	8.0	13
Peak Current	I _{pk}	Arms	48	76
Continuous Power Dissipation (NC) @100°C ^①	P _{Cn}	W	305	305
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant (NC) ^①	K _{thn}	W/°C	4.1	4.1
Max. Bus Voltage	U _{bus}	Vdc	600	600
Magnetic Period	T _{MN}	mm	27	27
Attraction Force	F _a	kN	0.0	0.0
Mechanical Parameters				
Coil Mass (NC)	m _{cn}	kg	8.7	8.7
Coil Length (NC)	L _{cn}	mm	245	245
Track Mass Per Meter	m _{track}	kg/m	32	32
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP00		
Compliance with Global Standards		RoHS, CE		
Ambient Temperature	Operation	0°C to 40°C (non-freezing)		
	Storage	-15°C to 70°C (non-freezing)		
Ambient Humidity	Operation	10%RH to 80%RH (non-condensing)		
	Storage	10%RH to 90%RH (non-condensing)		
Recommended Ambience		Indoor (no direct sunlight); No corrosive gas, inflammable gas, oil mist or dust.		

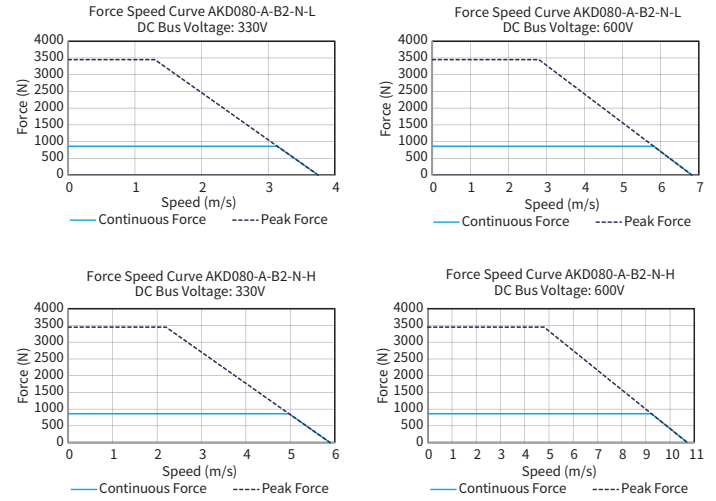
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

② Resistance is measured by DC current with standard 0.5 m cable.

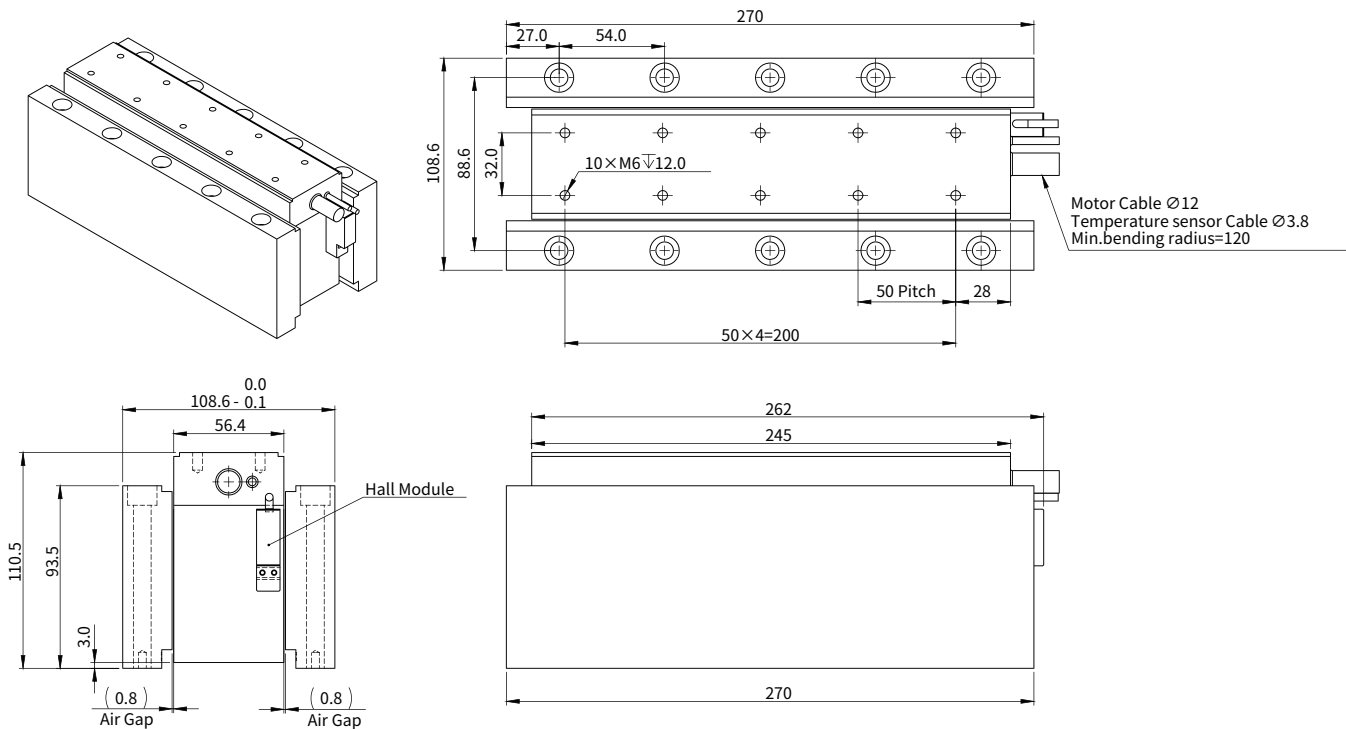
③ Inductance is measured by current frequency of 1 kHz.

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

Force-Speed Curve



Dimensional Drawing



AKD080-A-B3

AKD080-A-B3				
Performance Parameters	Symbol	Unit	L	H
Continuous Force (NC) @100°C ^①	F _{Cn}	N	1187	1187
Peak Force	F _{pk}	N	5174	5174
Force Constant ±10%	K _f	N/Arms	108	68
Back EMF Constant ±10%	K _e	Vpeak/(m/s)	88	56
Motor Constant @25°C	K _m	N/Sqrt(W)	68.5	68.6
Resistance (L-L) 25°C ±10% ^②	R ₂₅	Ω	1.6	0.7
Inductance (L-L) ±30% ^③	L	mH	7.2	2.9
Electrical Time Constant	τ _e	ms	4.4	4.4
Continuous Current (NC) @100°C ^①	I _{cn}	Arms	11	17.4
Peak Current	I _{pk}	Arms	72	114
Continuous Power Dissipation (NC) @100°C ^①	P _{Cn}	W	386	386
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant (NC) ^①	K _{thn}	W/°C	5.2	5.2
Max. Bus Voltage	U _{bus}	Vdc	600	600
Magnetic Period	T _{NN}	mm	27	27
Attraction Force	F _a	kN	0.0	0.0
Mechanical Parameters				
Coil Mass (NC)	m _{cn}	kg	12.5	12.5
Coil Length (NC)	L _{cn}	mm	353	353
Track Mass Per Meter	m _{track}	kg/m	32	32
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP00		
Compliance with Global Standards		RoHS, CE		
Ambient Temperature	Operation	0°C to 40°C (non-freezing)		
	Storage	-15°C to 70°C (non-freezing)		
Ambient Humidity	Operation	10%RH to 80%RH (non-condensing)		
	Storage	10%RH to 90%RH (non-condensing)		
Recommended Ambience		Indoor (no direct sunlight); No corrosive gas, inflammable gas, oil mist or dust.		

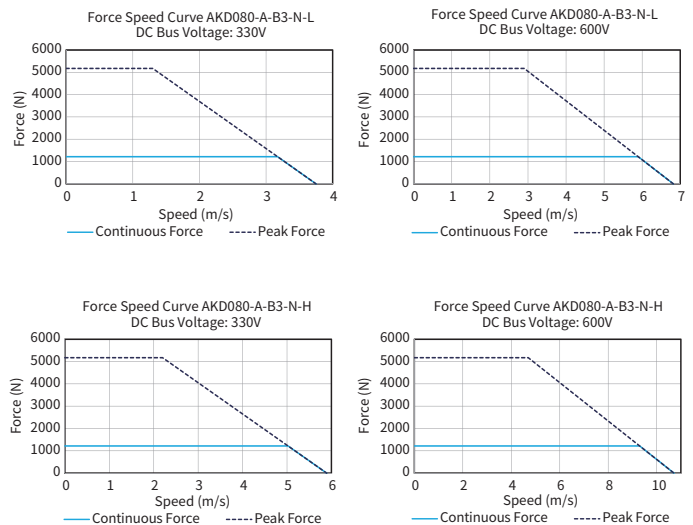
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

② Resistance is measured by DC current with standard 0.5 m cable.

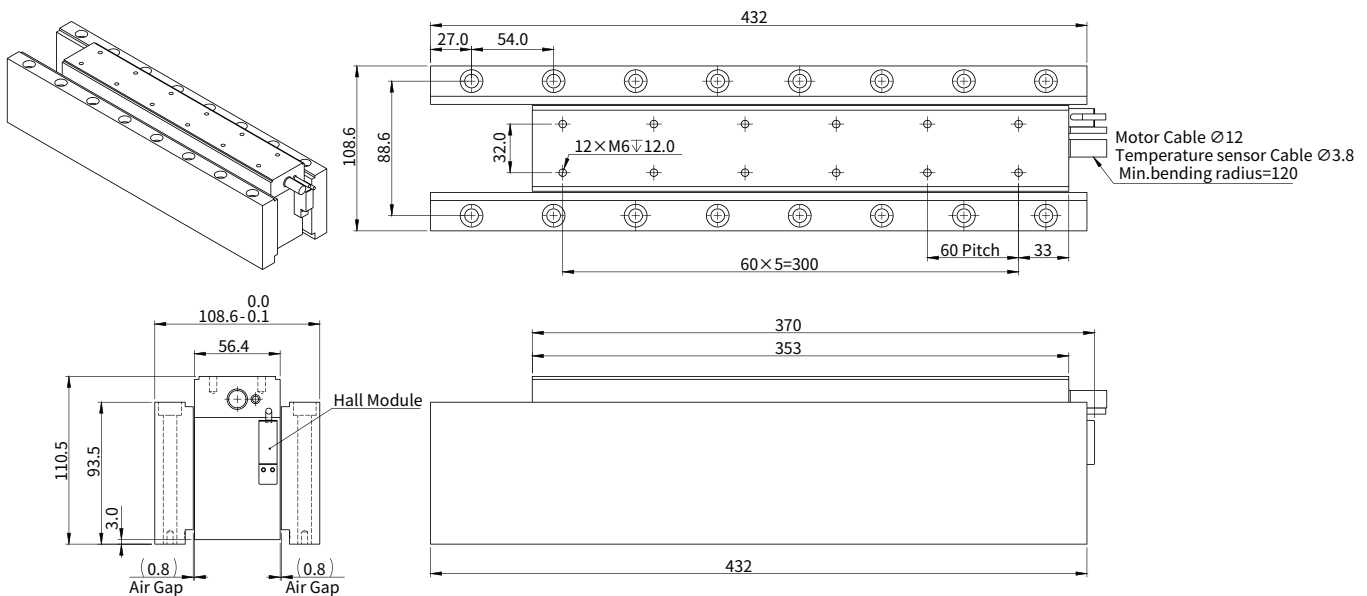
③ Inductance is measured by current frequency of 1 kHz.

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

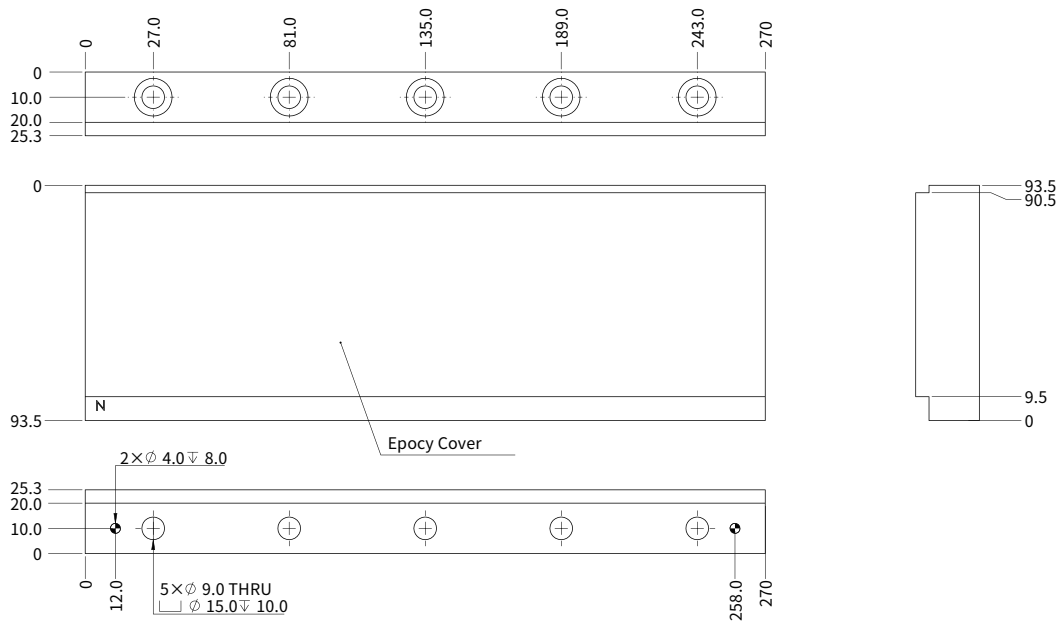
Force-Speed Curve



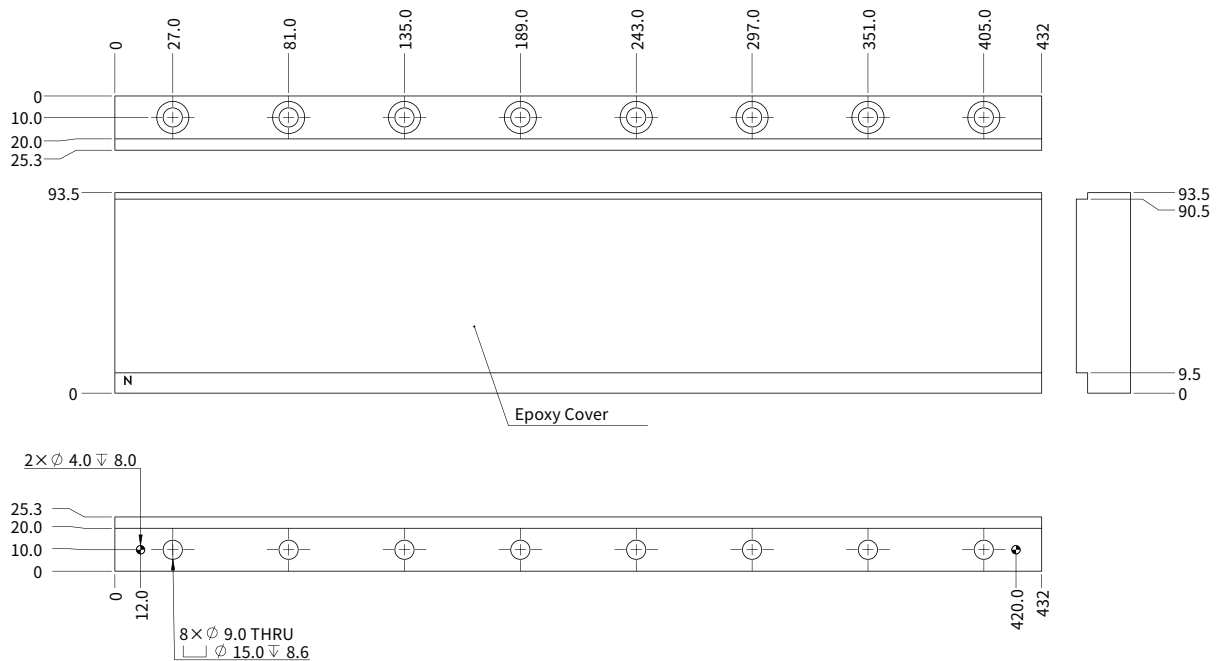
Dimensional Drawing



AKD080-A Track



Magnet Track P / N:	Track Length "TL"	No.of Holes
AKD080-A-TL270-TE-000	270	5



Magnet Track P / N:	Track Length "TL"	No.of Holes
AKD080-A-TL432-TE-000	432	8

Motor Cable Connection

MOTOR CABLE

PIN	DESCRIPTION	COLOR
3	M1	BLACK 1
4	M2	BLACK 2
1	M3	BLACK 3
2	PE	GREEN / YELLOW

TEMPERATURE SENSOR CABLE

PIN	DESCRIPTION	COLOR
A	D1	BLUE
B	D2	RED
C	E1	YELLOW
D	E2	GREY

HALL CABLE

PIN	DESCRIPTION	COLOR
1	HA	GREY
2	HB	YELLOW
3	HC	BLUE
4	5VDC	RED
5	0VDC	BLACK

Part Numbering

Motor Coil

AKD050-A-B2-N-DE-H-NF-005-FF-000

Model: AKD050-A / AKD080-A

Coil Length: B2 / B3

Cooling Type: N

Thermal Sensor: DE

Design Control Code: 000

Power Cable: FF / XM

Cable Length(m): 005

Sensor Cable: HD / NF

Winding Codes: L/H

- N = Natural Cooling
- DE = PT1000+SNM
- HD = With Built-in hall sensor C/W 9-Pins D-Sub Connector
- NF = Without Built-in Hall Sensor C/W flying leads
- 005 = 0.5 Meter
- FF = With Ferrite Bead C/W flying leads
- XM = Without ferrite bead C/W M23 receptacle
- 000 = Original version

Motor Track

AKD050-A-TL270-TE-000

Model: AKD050-A / AKD080-A

Track Length: TL270 / TL432

Design Control Code: 000

Track Type: TE

- TE = Standard track, epoxy cover

