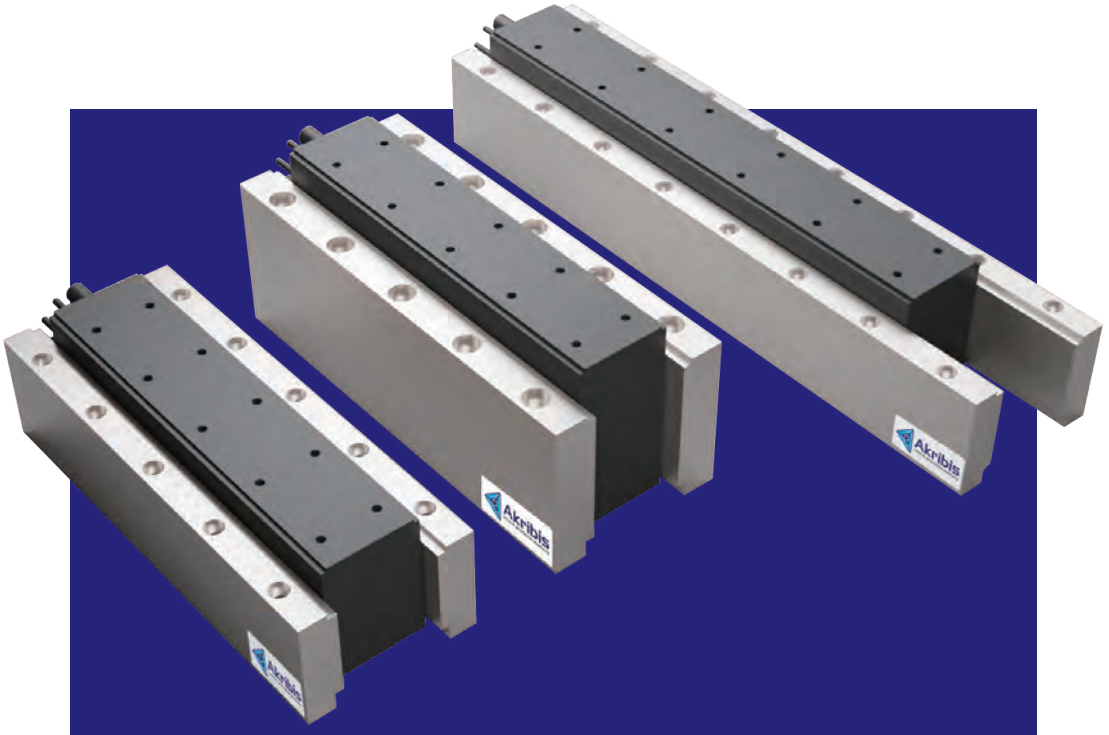


AKD-A SERIES

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

EN-25.11.1

Akribis systems

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 $F_{cn/cw}$ = 550N ~ 2793N

Peak Force F_{pk} = 1770N ~ 5664N

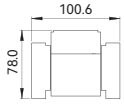
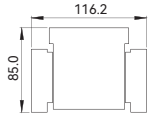
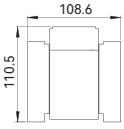
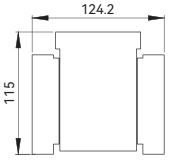
Features

- 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 ($F_{cn/cw}$) / ■ PeakForce (F_{pk}) Unit: N 500 1000 1500 2000 2500 3000 ....
	AKD050-A-B2-N	245	● 550 / ■ 1770
	AKD050-A-B3-N	353	● 825 / ■ 2655
	AKD050-A-B2-W	260	● 896 / ■ 1770
	AKD050-A-B3-W	359	● 1344 / ■ 2655
	AKD080-A-B2-N	245	● 861 / ■ 2832
	AKD080-A-B3-N	353	● 1187 / ■ 4248
	AKD080-A-B2-W	251	● 1433 / ■ 2832
	AKD080-A-B3-W	359	● 2150 / ■ 4248
	AKD080-A-B4-W	467	● 2793 / ■ 5664

AKD050-A

			AKD050-A-B2		AKD050-A-B3	
Performance Parameters	Symbol	Unit	L	H	L	H
Continuous Force (NC) @100℃ ❶	F_{cn}	N	550	550	825	825
Continuous Force (WC) @100℃ ❶❹	F_{cw}	N	896	896	1344	1344
Peak Force	F_{pk}	N	1770	1770	2655	2655
Force Constant ±10%	K_f	N/Arms	67	42.6	67	43
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	55	35	55	35
Motor Constant @25℃	K_m	N/Sqrt(W)	44.2	44.3	54.2	54.2
Resistance (L-L) 25℃ ±10% ❷	R_{25}	Ω	1.5	0.6	1.0	0.4
Inductance (L-L) ±30% ❸	L	mH	6.8	2.7	4.5	1.8
Electrical Time Constant	τ_e	ms	4.4	4.4	4.4	4.4
Continuous Current (NC) @100℃ ❶	I_{cn}	Arms	8.2	12.9	12.3	19.4
Continuous Current (WC) @100℃ ❶❹	I_{cw}	Arms	13.3	21.0	20.0	31.5
Peak Current	I_{pk}	Arms	32.9	51.9	49.4	77.9
Continuous Power Dissipation (NC) @100℃ ❶	P_{cn}	W	199	199	299	299
Continuous Power Dissipation (WC) @100℃ ❶❹	P_{cw}	W	528	528	792	792
Max. Coil Temperature	T_{max}	℃	100	100	100	100
Thermal Dissipation Constant (NC) ❶	K_{thn}	W/℃	2.7	2.7	4.0	4.0
Thermal Dissipation Constant (WC) ❶❹	K_{thw}	W/℃	7.0	7.0	10.6	10.6
Max. Bus Voltage	U_{bus}	Vdc	600	600	600	600
Magnetic Period	τ_{NN}	mm	27	27	27	27
Attraction Force	F_a	kN	0.0	0.0	0.0	0.0
Mechanical Parameters						
Coil Mass (NC)	m_{cn}	kg	6	6	8.6	8.6
Coil Length (NC)	L_{cn}	mm	245	245	353	353
Coil Mass (WC)	m_{cw}	kg	6.6	6.6	9.5	9.5
Coil Length (WC)	L_{cw}	mm	260	260	359	359
Track Mass Per Meter	m_{track}	kg/m	19	19	19	19

Other Information		
Insulation Class		Class B (130℃)
Protection Grade		IP00
Compliance with Global Standards		RoHS, CE
Ambient Temperature	Operation	0℃ to 40℃ (non-freezing)
	Storage	-15℃ to 70℃ (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.

❶ Measurement is taken at ambient temperature 25℃. Value depends on the thermal environment.
Abbreviations:NC-Natural Cooling, WC-Water Cooling.

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

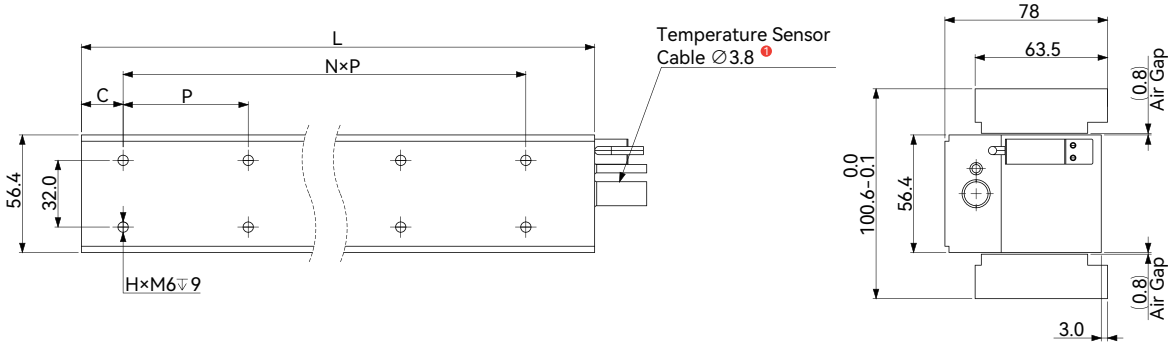
❸ Inductance is measured by current frequency of 1kHz.

❹ Water cooling test conditions: the inlet water temperature of motor is 20℃, and the flow rate is 6L/min.

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

Dimensional Drawing

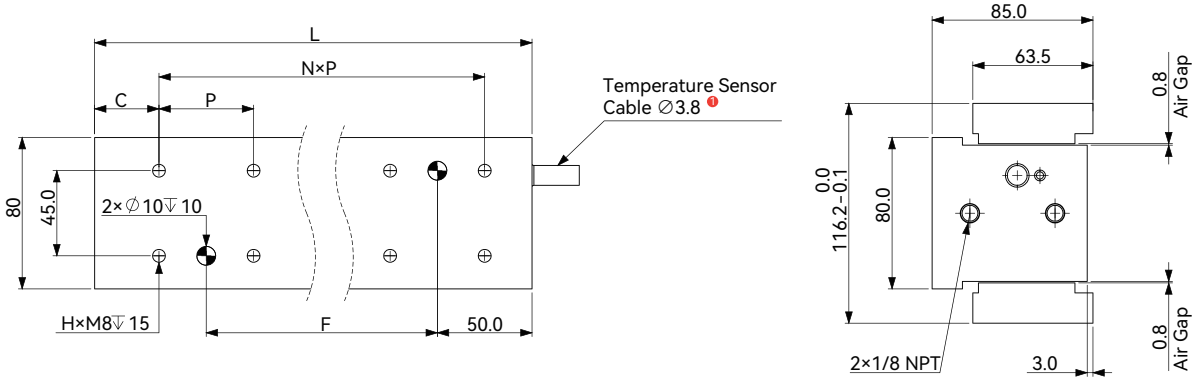
AKD050-A-N-B2



Motor Coil					
Coil Size	L	C	P	N	H
AKD050-A-B2-N-L/H	245	17	50	4	10
AKD050-A-B3-N-L/H	353	20	60	5	12

Motor Cable ❶			
Coil Model	Specification	Outside Diameter of Cable	Min.Bending Radius×10
AKD050-A-B2-N-L/H	4G2.5	10.5	105
AKD050-A-B3-N-L/H			

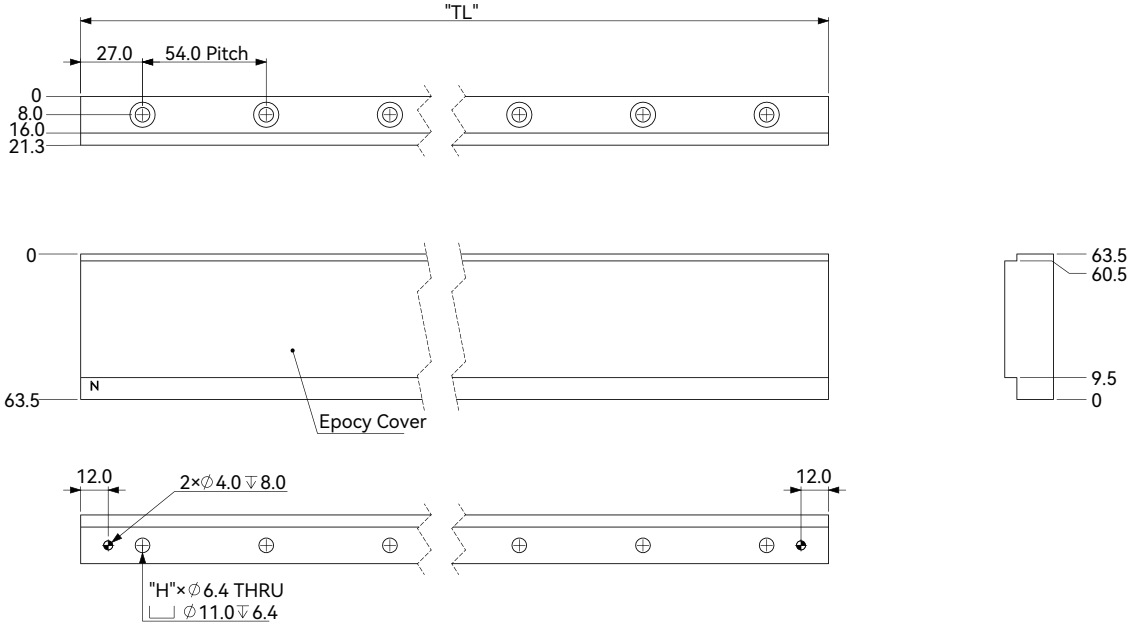
AKD050-A-W-B2



Motor Coil						
Coil Size	L	C	P	N	F	H
AKD050-A-B2-W-L/H	251	26	50	4	150	10
AKD050-A-B3-W-L/H	359	34	50	6	250	14

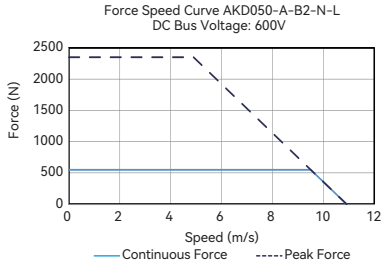
Motor Cable			
Coil Model	Specification	Outside Diameter of Cable	Min.Bending Radius×10
AKD050-A-B2-W-L/H	4G2.5	10.5	105
AKD050-A-B3-W-L/H			

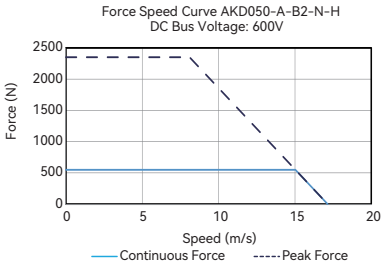
AKD050-A Track

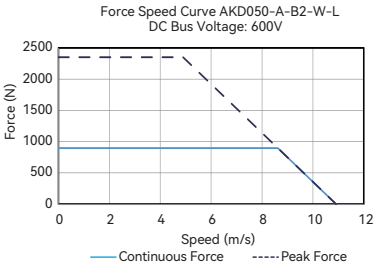


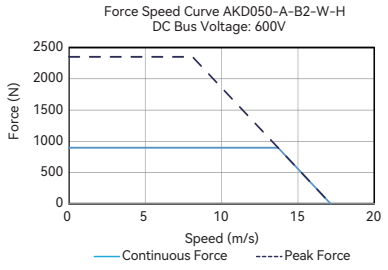
Magnet Track P / N:	Track Length "TL"	No.of Holes
AKD050-A-TL270-TE-000	270	5
AKD050-A-TL432-TE-000	432	8

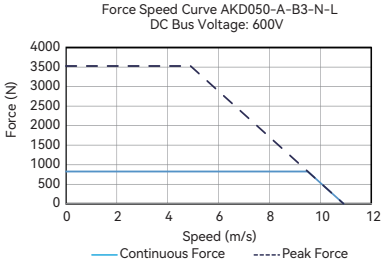
Force-Speed Curve

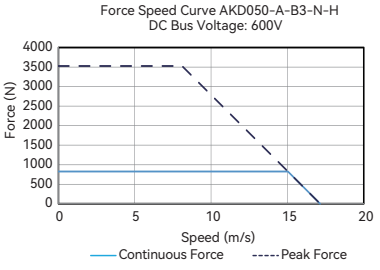


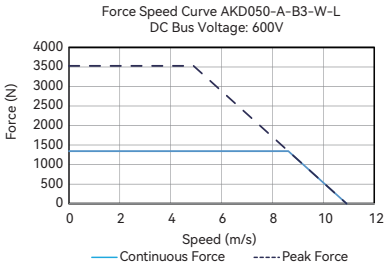


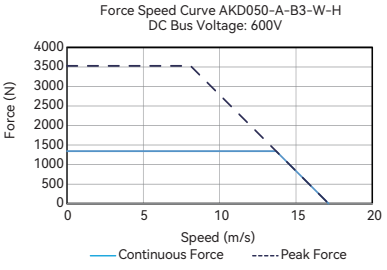












AKD080-A

			AKD080-A-B2		AKD080-A-B3		AKD080-A-B4	
Performance Parameters	Symbol	Unit	L	H	L	H	L	H
Continuous Force (NC) @100℃ ❶	F_{cn}	N	861	861	1187	1187	-	-
Continuous Force (WC) @100℃ ❶❹	F_{cw}	N	1433	1433	2150	2150	2793	2793
Peak Force	F_{pk}	N	2832	2832	4248	4248	5664	5664
Force Constant ±10%	K_f	N/Arms	108	68.2	108	68	108	68
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	88	56	88	56	88	56
Motor Constant @25℃	K_m	N/Sqrt(W)	56	56	68.5	68.6	75.5	75.5
Resistance (L-L) 25℃ ±10% ❷	R_{25}	Ω	2.5	1.0	1.6	0.7	1.4	0.5
Inductance (L-L) ±30% ❸	L	mH	10.8	4.4	7.2	2.9	5.4	2.2
Electrical Time Constant	τ_e	ms	4.4	4.4	4.4	4.4	4.0	4.0
Continuous Current (NC) @100℃ ❶	I_{cn}	Arms	8.0	12.6	11.0	17.4	-	-
Continuous Current (WC) @100℃ ❶❹	I_{cw}	Arms	13.3	21	20.0	31.5	26.0	41.0
Peak Current	I_{pk}	Arms	32.9	51.9	49.4	77.9	65.9	103.9
Continuous Power Dissipation (NC) @100℃ ❶	P_{cn}	W	305	305	386	386	-	-
Continuous Power Dissipation (WC) @100℃ ❶❹	P_{cw}	W	845	845	1268	1267	1765	1765
Max. Coil Temperature	T_{max}	℃	100	100	100	100	100	100
Thermal Dissipation Constant (NC) ❶	K_{thn}	W/℃	4.1	4.1	5.2	5.2	-	-
Thermal Dissipation Constant (WC) ❶❹	K_{thw}	W/℃	11.3	11.3	16.9	16.9	23.5	23.5
Max. Bus Voltage	U_{bus}	Vdc	600	600	600	600	600	600
Magnetic Period	τ_{NN}	mm	27	27	27	27	27	27
Attraction Force	F_a	kN	0.0	0.0	0.0	0.0	0.0	0.0
Mechanical Parameters								
Coil Mass (NC)	m_{cn}	kg	8.7	8.7	12.5	12.5	-	-
Coil Length (NC)	L_{cn}	mm	245	245	353	353	-	-
Coil Mass (WC)	m_{cw}	kg	8.9	8.9	13.4	13.4	17.8	17.8
Coil Length (WC)	L_{cw}	mm	251	251	359	359	467	467
Track Mass Per Meter	m_{track}	kg/m	32	32	32	32	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.

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

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

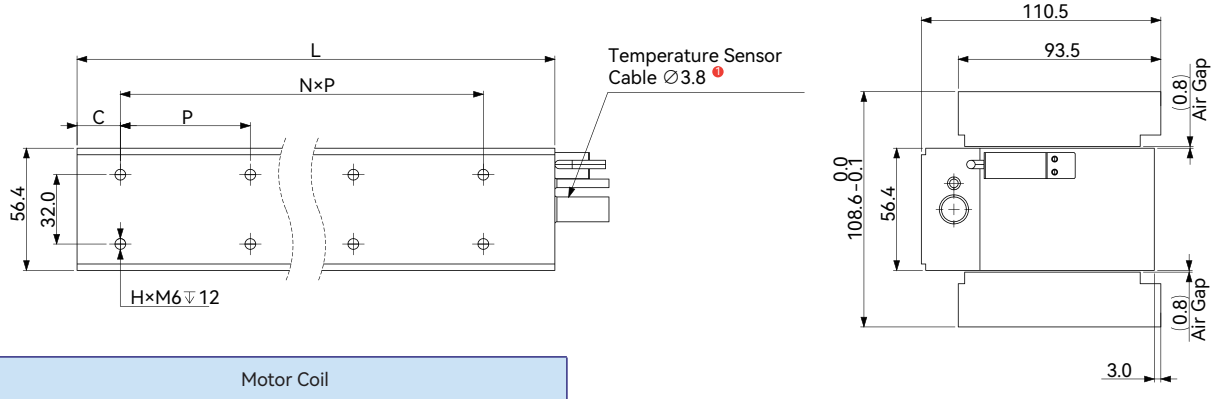
❸ Inductance is measured by current frequency of 1kHz.

❹ Water cooling test conditions: the inlet water temperature of motor is 20℃, and the flow rate is 6L/min.

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

Dimensional Drawing

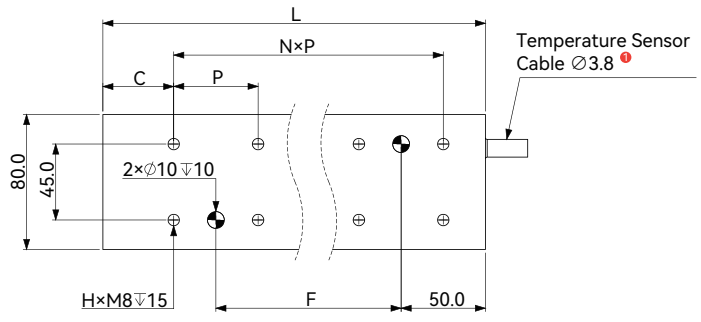
AKD080-A-N-B2

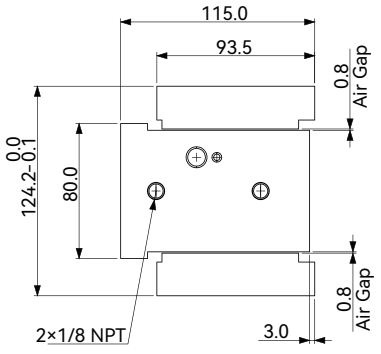


Motor Coil					
Coil Size	L	C	P	N	H
AKD080-A-B2-N-L/H	245	17	50	4	10
AKD080-A-B3-N-L/H	353	20	60	5	12

Motor Cable ❶			
Coil Model	Specification	Outside Diameter of Cable	Min.Bending Radius×10
AKD080-A-B2-N-L/H	4G2.5	10.5	105
AKD080-A-B3-N-L/H			

AKD050-A-W-B2

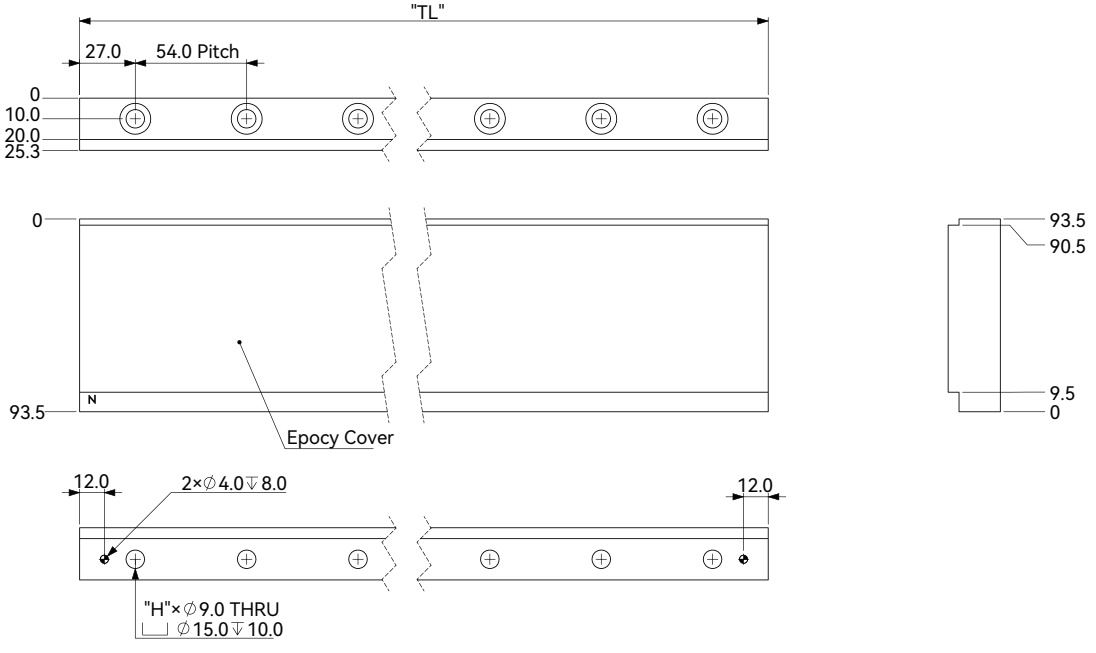




Motor Coil						
Coil Size	L	C	P	N	F	H
AKD080-A-B2-W-L/H	251	26	50	4	150	10
AKD080-A-B3-W-L/H	359	34	50	6	250	14
AKD080-A-B4-W-L/H	467	42	50	8	350	18

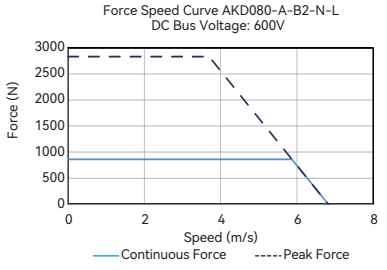
Motor Cable			
Coil Model	Specification	Outside Diameter of Cable	Min.Bending Radius×10
AKD080-A-B2-W-L/H	4G2.5	10.5	105
AKD080-A-B3-W-L/H			
AKD080-A-B4-W-L/H	4G4.0	12	120

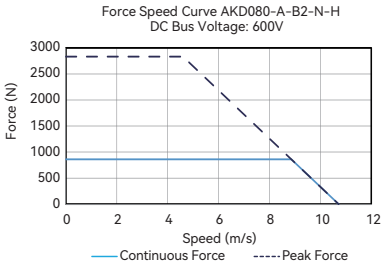
AKD080-A Track

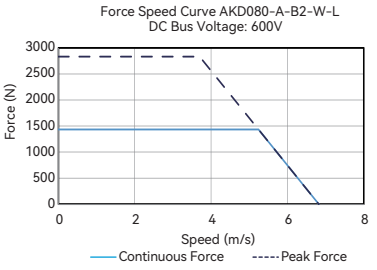


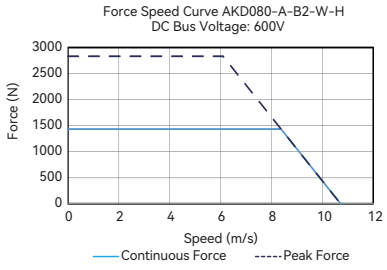
Magnet Track P / N:	Track Length "TL"	No.of Holes
AKD080-A-TL270-TE-000	270	5
AKD080-A-TL432-TE-000	432	8

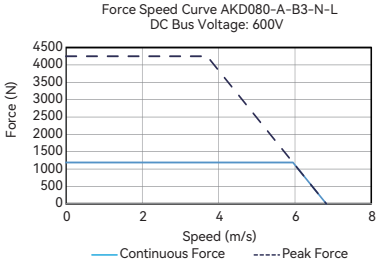
Force-Speed Curve

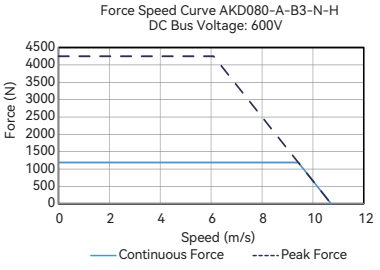


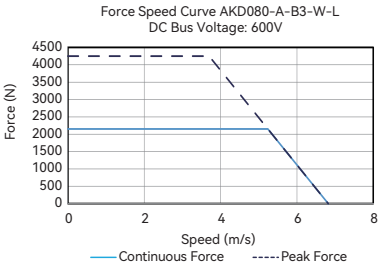


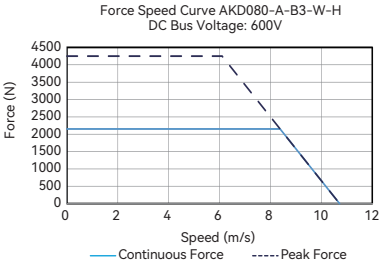


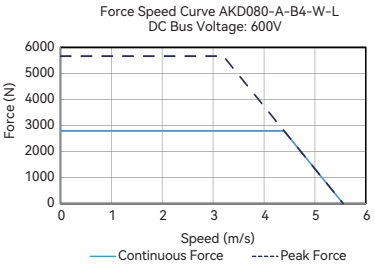


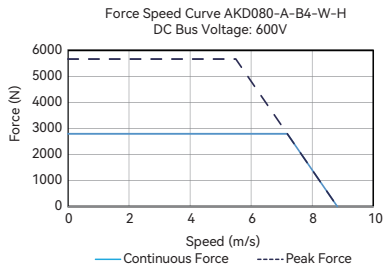








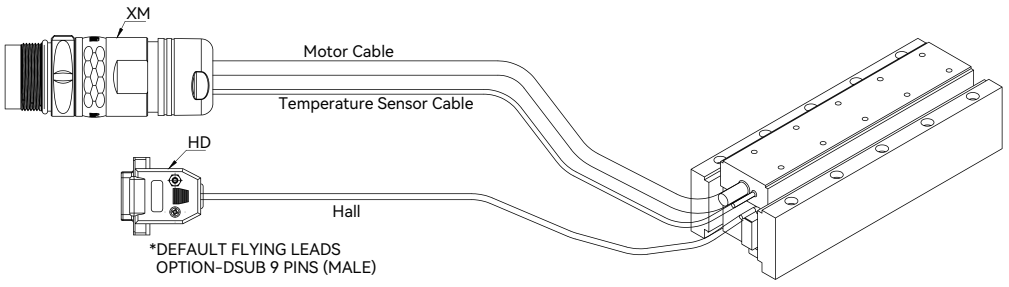




Motor Cable Connection

MOTOR CABLE

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



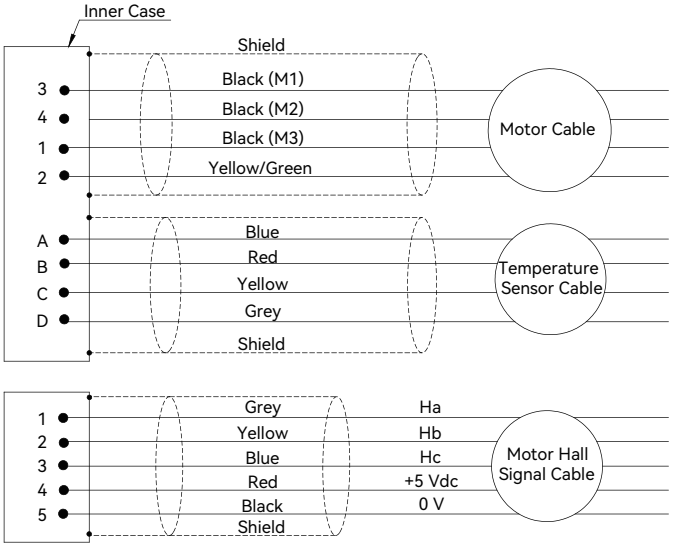
TEMPERATURE SENSOR CABLE

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

HALL CABLE

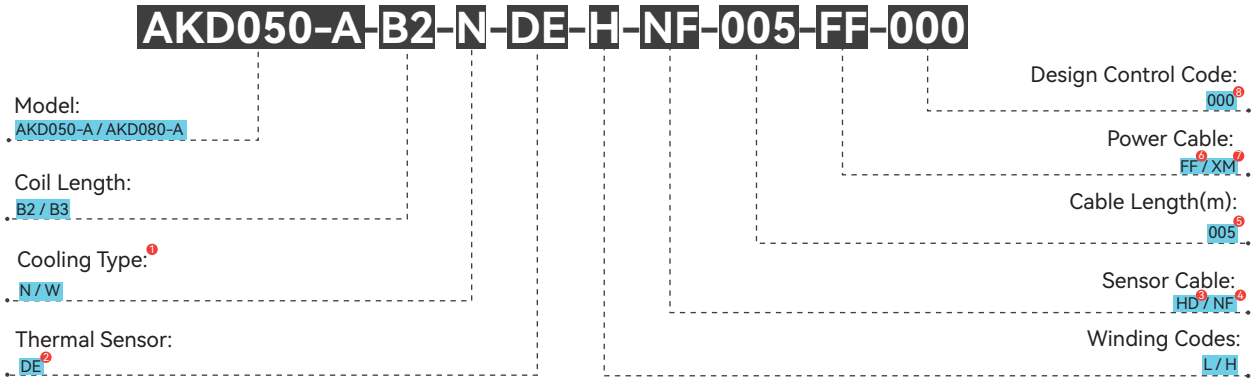
PIN	DESCRIPTION	COLOR
1	HA	GREY
2	HB	YELLOW
3	HC	BLUE
4	5VDC	RED
5	0VDC	BLACK

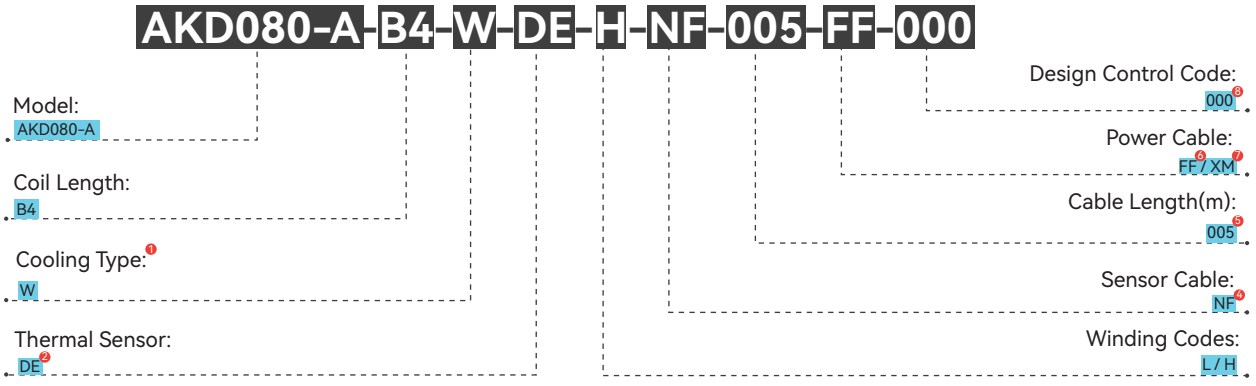
Cable Connection Information



Part Numbering

Motor Coil





1. N = Natural Cooling
2. DE = PT1000+SNM
3. HD = With Built-in hall sensor C/W 9-Pins D-Sub Connector
4. NF = Without Built-in Hall Sensor C/W flying leads
5. 005 = 0.5 Meter
6. FF = With Ferrite Bead C/W flying leads
7. XM = Without ferrite bead C/W M23 receptacle
8. 000 = Original version

Motor Track



9. TE = Standard track, epoxy cover