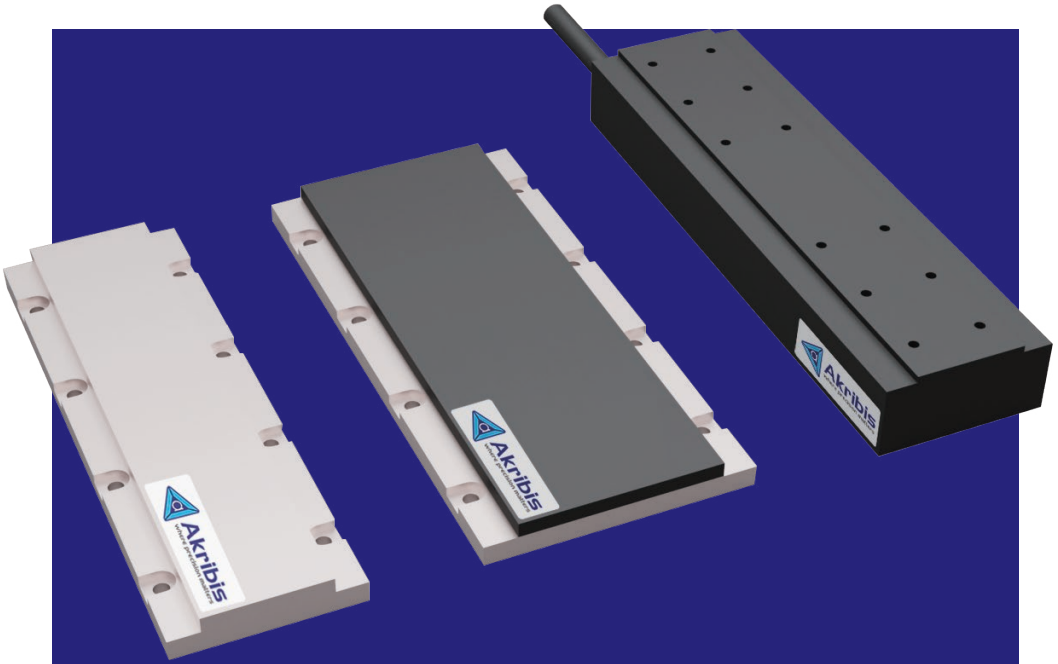


AJM SERIES

- Iron core technology
- Low cogging force
- Integrated with hall sensors
- High force and stiffness

EN-26.3.1

Akribis systems

Introduction

Iron core AJM series linear motors provide compact size, high force density and quick response.

Continuous Force Fcn = 44N ~ 446.8N

Peak Force Fpk = 117N ~ 1409.1N

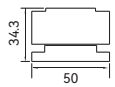
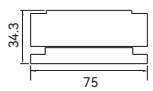
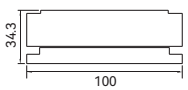
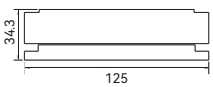
Features

- Iron core technology and low cogging force
- High continuous and peak force
- Optional hall sensors
- High motor constant

Applications

Best suited for point-to-point motion with micron 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 industrial printing machines, laser processing machines with demanding precision and motion control requirements.

	Series	Coil Length (mm) [1]	● Continuous Force (F_{cn}) / ■ PeakForce (F_{pk}) Unit: N							
			100	150	200	250	300	400	500	....
	AJM30-B1	56	● 44 / ■ 117							
	AJM30-B2	96		● 68.1 / ■ 214.7						
	AJM30-B4	176			● 136.2 / ■ 429.4					
	AJM50-B1	56		● 76 / ■ 201						
	AJM50-B2	96			● 117 / ■ 369					
	AJM50-B4	176				● 234 / ■ 738.1				
	AJM80-B1	56			● 113 / ■ 300					
	AJM80-B2	96				● 174.5 / ■ 550.2				
	AJM80-B4	176						● 348.9 / ■ 1100.4		
	AJM100-B1	56			● 145 / ■ 384					
	AJM100-B2	96					● 223.4 / ■ 704.5			
	AJM100-B4	176							● 446.8 / ■ 1409.1	

[1] No hall sensor.

AJM30

			AJM30-B1	AJM30-B2	AJM30-B4
Performance Parameters	Symbol	Unit	Series	Series	Parallel
Continuous Force (NC) @100°C[1]	F_{cn}	N	44	68.1	136.2
Peak Force	F_{pk}	N	117	214.7	429.4
Force Constant ±10%	K_f	N/Arms	14.8	29.6	29.6
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	12.1	24.2	24.2
Motor Constant @25°C	K_m	N/Sqrt(W)	8.5	12.2	17.0
Resistance (L-L) 25°C ±10% [2]	R_{25}	Ω	2.0	3.9	2.0
Inductance (L-L) ±30% [3]	L	mH	8.2	16.5	8.2
Electrical Time Constant	τ_e	ms	4.1	4.2	4.1
Continuous Current (NC) @100°C[1]	I_{cn}	Arms	3.0	2.3	4.6
Peak Current	I_{pk}	Arms	12.0	9.0	18.0
Continuous Power Dissipation (NC) @100°C[1]	P_{cn}	W	34.6	40.1	82.6
Max. Coil Temperature	t_{max}	°C	100	100	100
Thermal Dissipation Constant (NC)[1]	K_{thn}	W/°C	0.5	0.5	1.1
Max. Bus Voltage	U_{bus}	Vdc	600	600	600
Magnetic Period	τ_{NN}	mm	20	20	20
Attraction Force	F_a	N	189	378	756
Mechanical Parameters					
Coil Mass (NC)	m_{cn}	kg	0.4	0.6	1.1
Coil Length (NC)	L_{cn}	mm	56	96	176
Track Mass Per Meter	m_{track}	kg/m	3.3	3.3	3.3
Other Information					
Insulation Class		Class B (130°C)			
Protection Grade		IP00			
Compliance with Global Standards		RoHS, CE, UL(option)			
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.

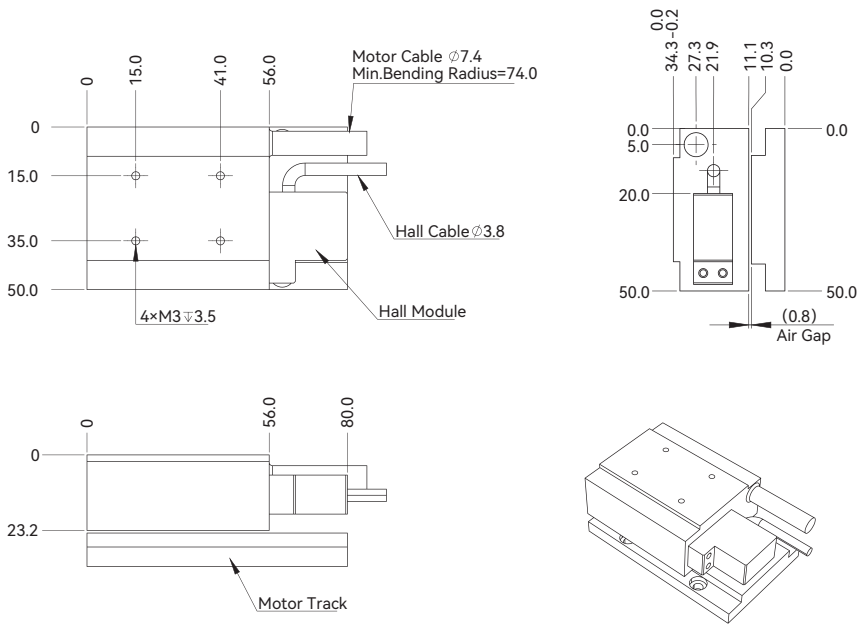
[2] Resistance is measured by DC current with standard 0.5 m cable.

[3] Inductance is measured by current frequency of 1 kHz.

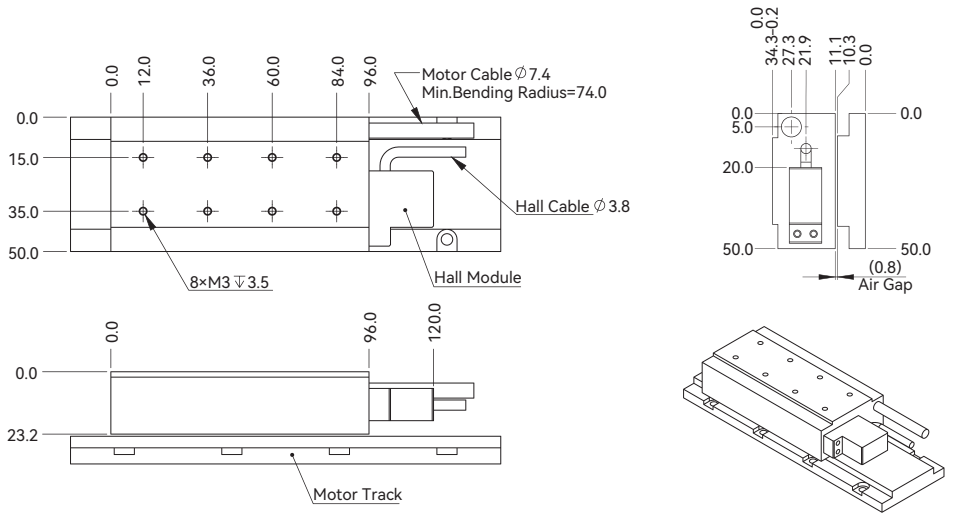
The contents of datasheet are subject to change without prior notice.

Dimensional Drawing

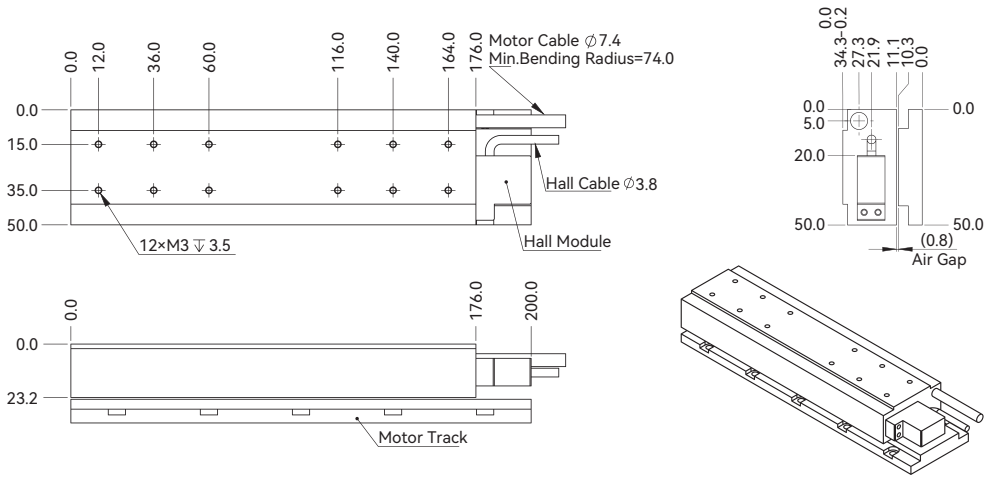
AJM30-B1



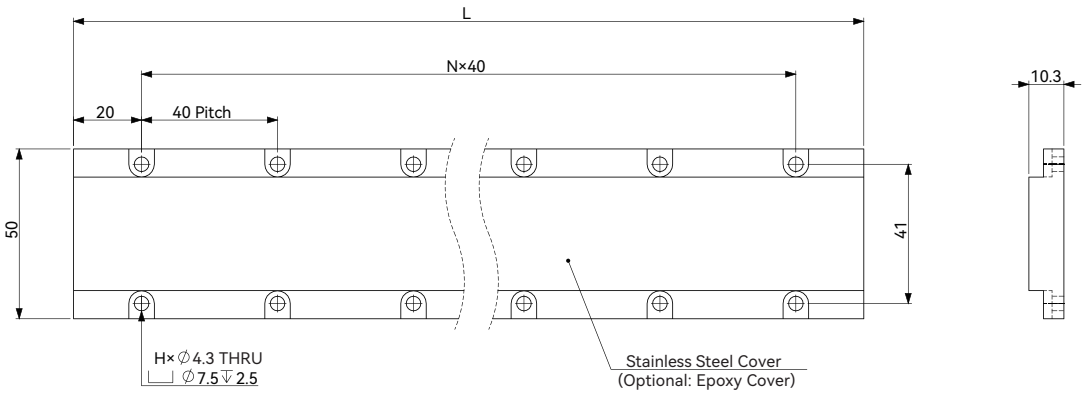
AJM30-B2



AJM30-B4



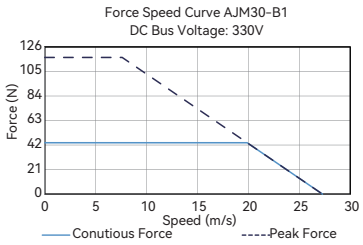
AJM30 Track

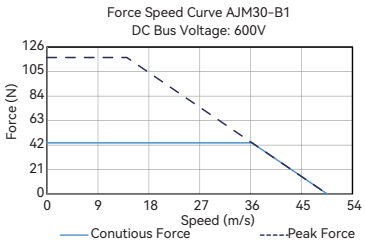


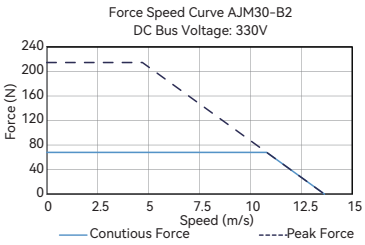
Magnet Track	L	N	H
AJM30-TL80-S	80	1	4
AJM30-TL200-S	200	4	10
AJM30-TL400-S	400	9	20

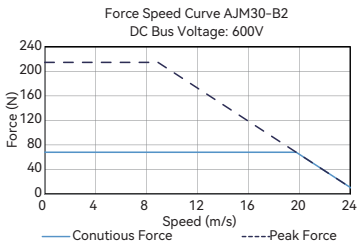
For epoxy cover option, change" -S " to " -E ". (e.g. AJM30-TL80-E)

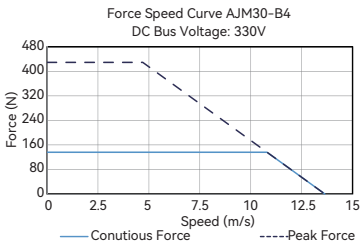
■ Force-Speed Curve

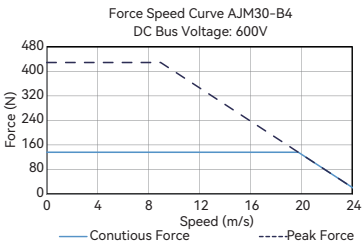












AJM50

			AJM50-B1	AJM50-B2	AJM50-B4
Performance Parameters	Symbol	Unit	Series	Series	Parallel
Continuous Force (NC) @100°C[1]	F_{cn}	N	76	117.0	234.0
Peak Force	F_{pk}	N	201	369.0	738.1
Force Constant ±10%	K_f	N/Arms	25.4	50.9	50.9
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	20.8	41.5	41.5
Motor Constant @25°C	K_m	N/Sqrt(W)	11.9	17.0	23.8
Resistance (L-L) 25°C ±10% [2]	R_{25}	Ω	3.0	6.0	3.1
Inductance (L-L) ±30% [3]	L	mH	13.0	25.9	13.0
Electrical Time Constant	τ_e	ms	4.2	4.3	4.2
Continuous Current (NC) @100°C[1]	I_{cn}	Arms	3.0	2.3	4.6
Peak Current	I_{pk}	Arms	12.0	9.0	18.0
Continuous Power Dissipation (NC) @100°C[1]	P_{cn}	W	52.7	61.2	124.8
Max. Coil Temperature	t_{max}	℃	100	100	100
Thermal Dissipation Constant (NC)[1]	K_{thn}	W/℃	0.7	0.8	1.7
Max. Bus Voltage	U_{bus}	Vdc	600	600	600
Magnetic Period	τ_{NN}	mm	20	20	20
Attraction Force	F_a	N	325	650	1299
Mechanical Parameters					
Coil Mass (NC)	m_{cn}	kg	0.6	0.9	1.7
Coil Length (NC)	L_{cn}	mm	56	96	176
Track Mass Per Meter	m_{track}	kg/m	5.0	5.0	5.0
Other Information					
Insulation Class		Class B (130°C)			
Protection Grade		IP00			
Compliance with Global Standards		RoHS, CE, UL(option)			
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.

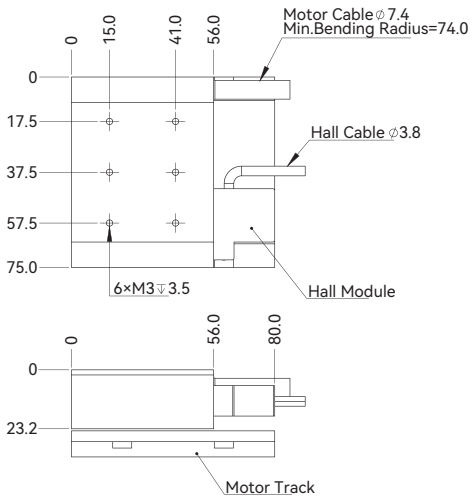
[2] Resistance is measured by DC current with standard 0.5 m cable.

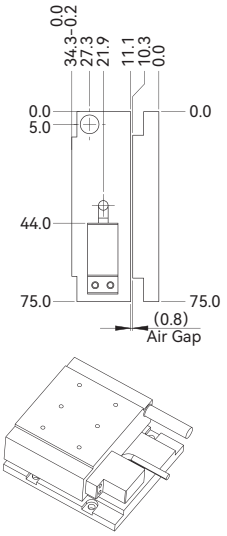
[3] Inductance is measured by current frequency of 1 kHz.

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

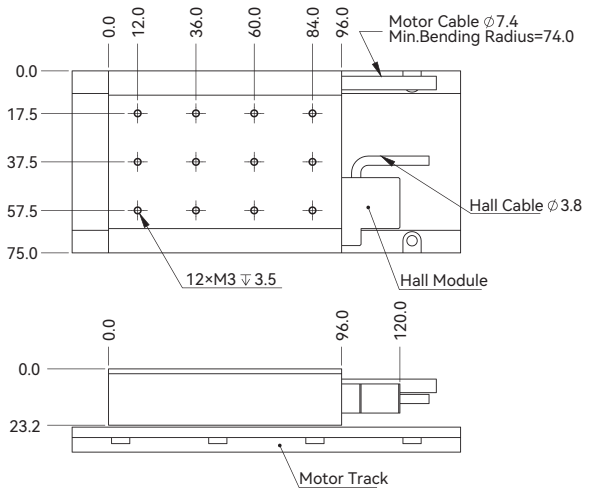
■ Dimensional Drawing

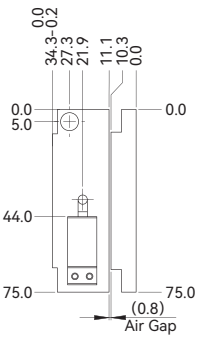
AJM50-B1

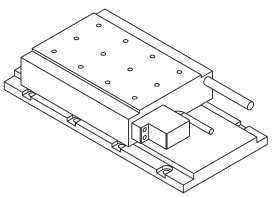




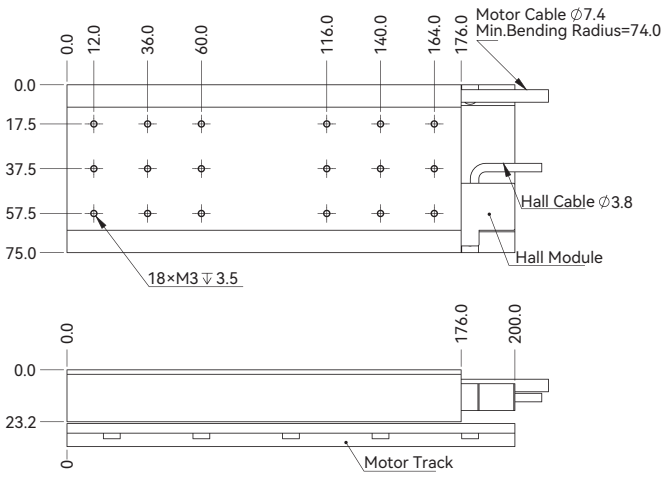
AJM50-B2

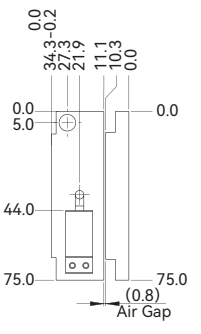


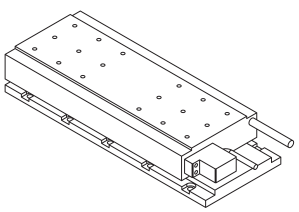




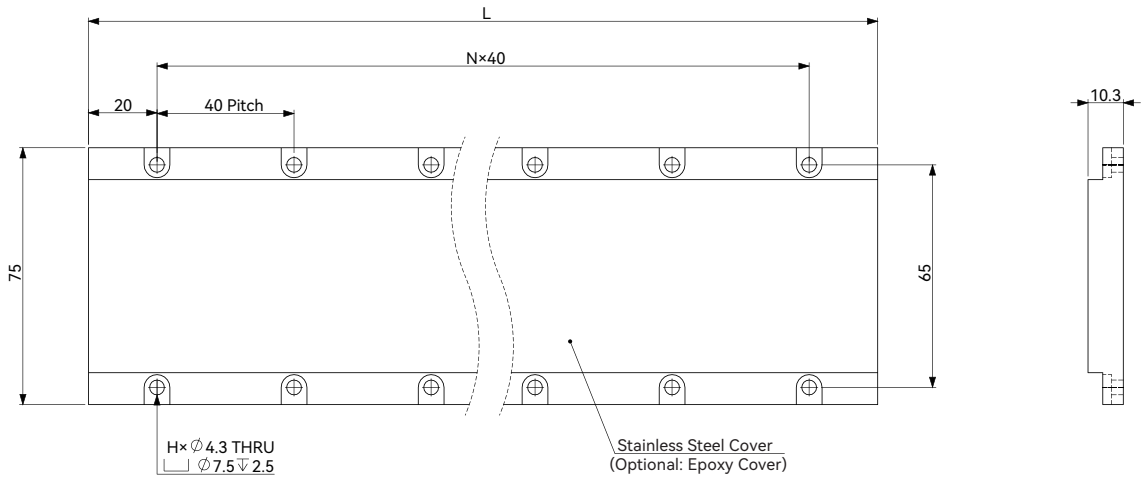
AJM50-B4







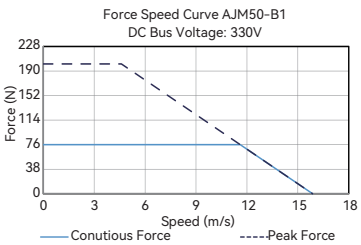
AJ M50 Track

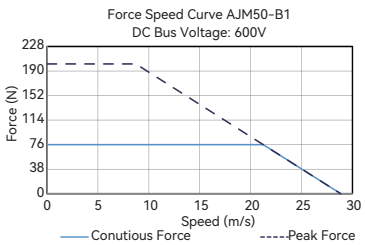


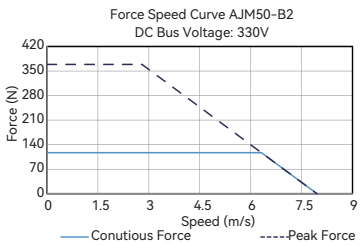
Magnet Track	L	N	H
AJM50-TL80-S	80	1	4
AJM50-TL200-S	200	4	10
AJM50-TL400-S	400	9	20

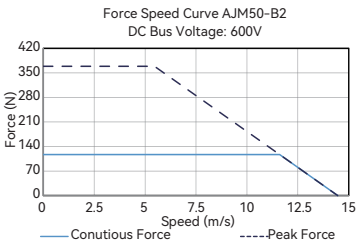
For epoxy cover option, change" -S " to " -E ". (e.g. AJM50-TL80-E)

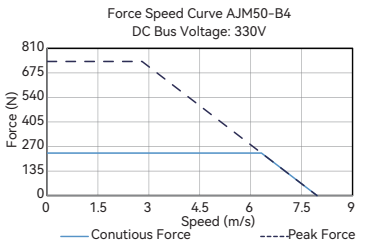
Force-Speed Curve

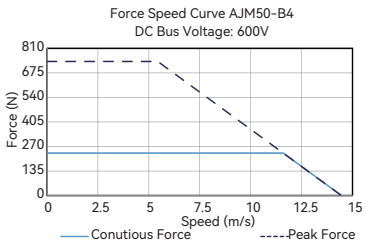












AJM80

			AJM80-B1	AJM80-B2	AJM80-B4
Performance Parameters	Symbol	Unit	Series	Series	Parallel
Continuous Force (NC) @100°C[1]	F_{cn}	N	113	174.5	348.9
Peak Force	F_{pk}	N	300	550.2	1100.4
Force Constant ±10%	K_f	N/Arms	37.9	75.9	75.9
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	31.0	61.9	61.9
Motor Constant @25°C	K_m	N/Sqrt(W)	15.0	21.4	30.1
Resistance (L-L) 25°C ±10% [2]	R_{25}	Ω	4.3	8.4	4.2
Inductance (L-L) ±30% [3]	L	mH	18.6	37.3	18.6
Electrical Time Constant	τ_e	ms	4.4	4.5	4.4
Continuous Current (NC) @100°C[1]	I_{cn}	Arms	3.0	2.3	4.6
Peak Current	I_{pk}	Arms	12.0	9.0	18.0
Continuous Power Dissipation (NC) @100°C[1]	P_{cn}	W	73.7	85.5	173.5
Max. Coil Temperature	t_{max}	℃	100	100	100
Thermal Dissipation Constant (NC)[1]	K_{thn}	W/℃	1.0	1.1	2.3
Max. Bus Voltage	U_{bus}	Vdc	600	600	600
Magnetic Period	τ_{NN}	mm	20	20	20
Attraction Force	F_a	N	484	969	1937
Mechanical Parameters					
Coil Mass (NC)	m_{cn}	kg	0.8	1.2	2.3
Coil Length (NC)	L_{cn}	mm	56	96	176
Track Mass Per Meter	m_{track}	kg/m	7.0	7.0	7.0
Other Information					
Insulation Class		Class B (130°C)			
Protection Grade		IP00			
Compliance with Global Standards		RoHS, CE, UL(option)			
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.

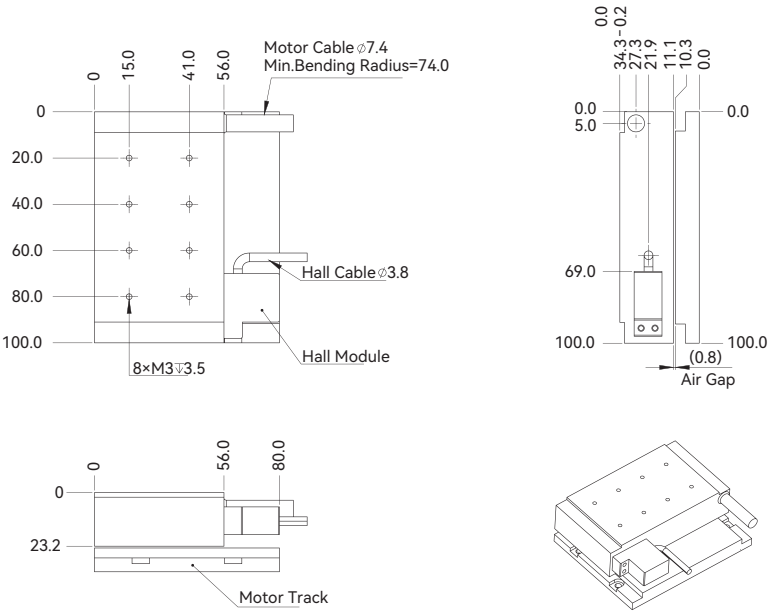
[2] Resistance is measured by DC current with standard 0.5 m cable.

[3] Inductance is measured by current frequency of 1 kHz.

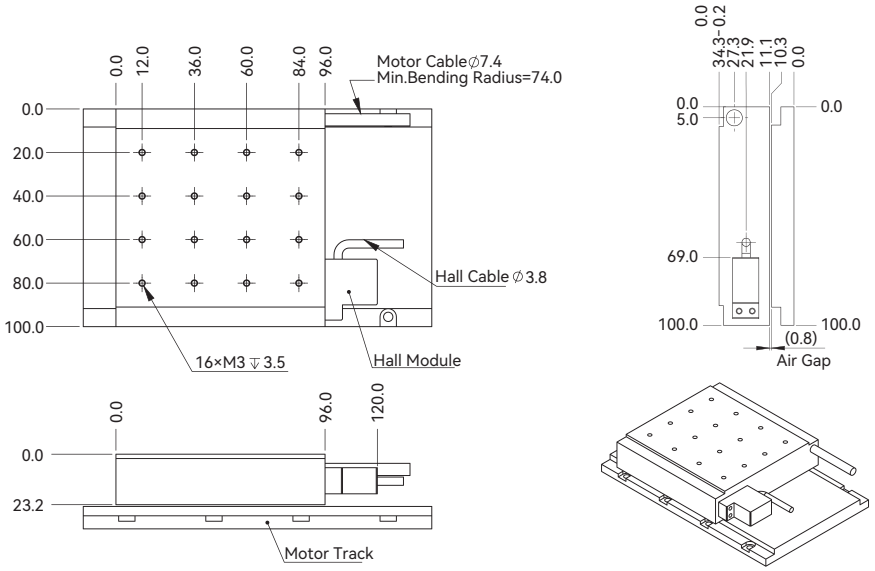
The contents of datasheet are subject to change without prior notice.

■Dimensional Drawing

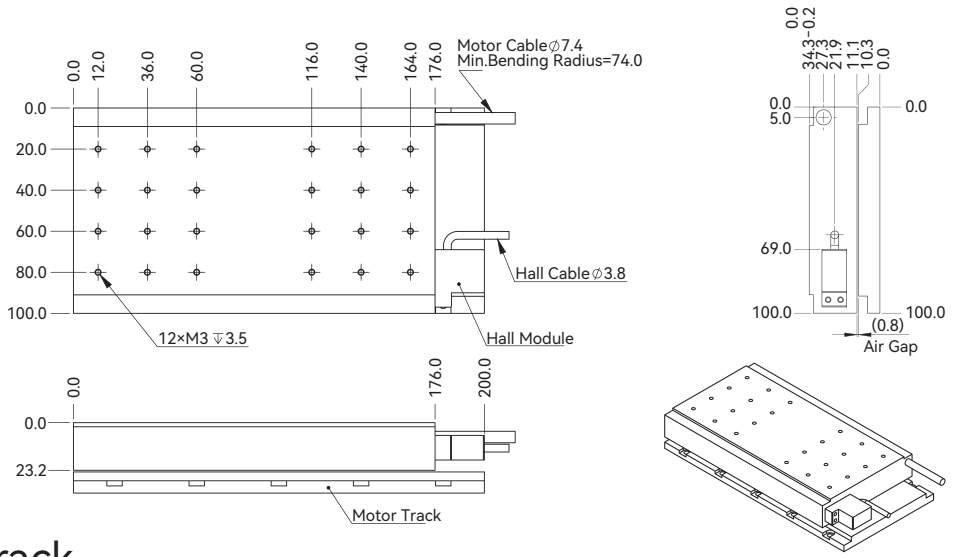
AJM80-B1



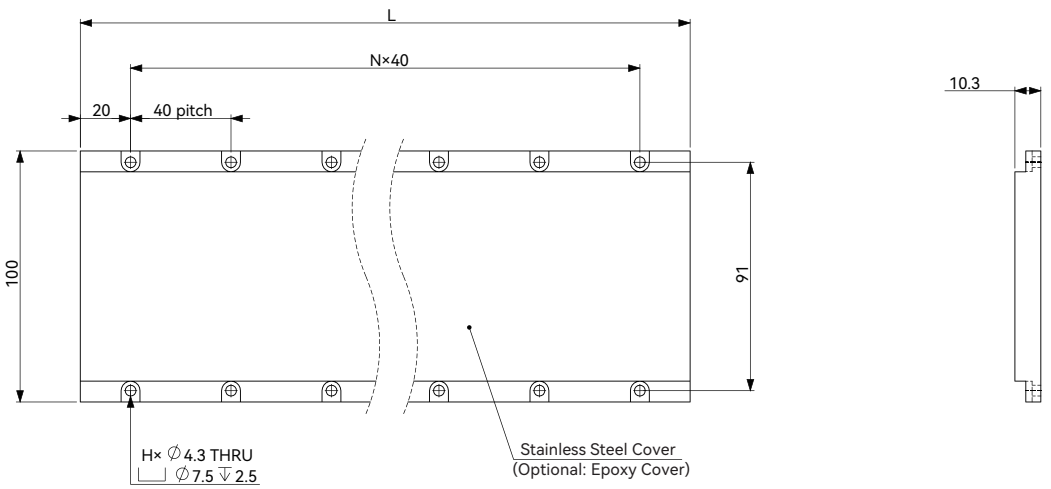
AJM80-B2



AJM80-B4



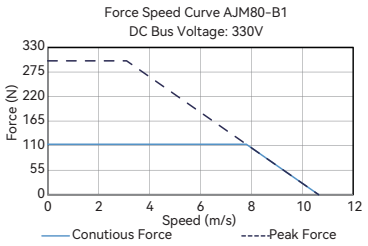
AJM80 Track

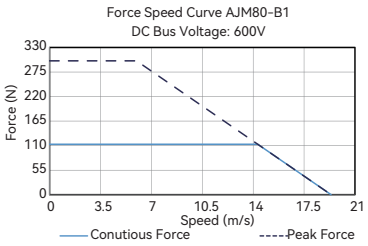


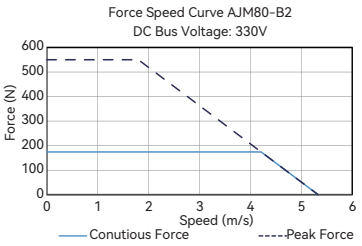
Magnet Track	L	N	H
AJM80-TL80-S	80	1	4
AJM80-TL200-S	200	4	10
AJM80-TL400-S	400	9	20

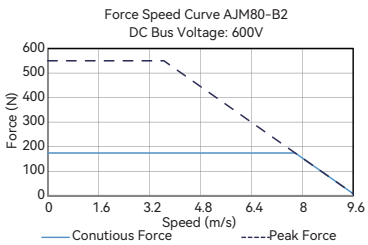
For epoxy cover option, change" -S " to " -E ". (e.g. AJM80-TL80-E)

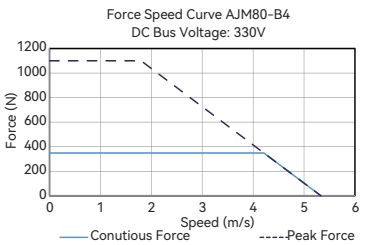
Force-Speed Curve

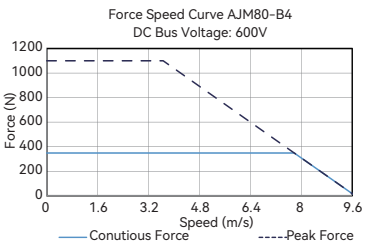












AJM100

			AJM100-B1	AJM100-B2	AJM100-B4
Performance Parameters	Symbol	Unit	Series	Series	Parallel
Continuous Force (NC) @100°C❶	F_{cn}	N	145	223.4	446.8
Peak Force	F_{pk}	N	384	704.5	1409.1
Force Constant ±10%	K_f	N/Arms	48.6	97.1	97.1
Back EMF Constant ±10%	K_e	Vpeak/(m/s)	39.7	79.3	79.3
Motor Constant @25°C	K_m	N/Sqrt(W)	17.3	24.7	34.8
Resistance (L-L) 25°C ±10%❷	R_{25}	Ω	5.3	10.3	5.2
Inductance (L-L) ±30%❸	L	mH	23.6	47.2	23.6
Electrical Time Constant	τ_e	ms	4.5	4.6	4.5
Continuous Current (NC) @100°C❶	I_{cn}	Arms	3.0	2.3	4.6
Peak Current	I_{pk}	Arms	12.0	9.0	18.0
Continuous Power Dissipation (NC) @100°C❶	P_{cn}	W	90.7	105.3	213.0
Max. Coil Temperature	t_{max}	℃	100	100	100
Thermal Dissipation Constant (NC)❶	K_{thn}	W/℃	1.2	1.4	2.8
Max. Bus Voltage	U_{bus}	Vdc	600	600	600
Magnetic Period	τ_{NN}	mm	20	20	20
Attraction Force	F_a	N	620	1240	2481
Mechanical Parameters					
Coil Mass (NC)	m_{cn}	kg	1.0	1.5	2.9
Coil Length (NC)	L_{cn}	mm	56	96	176
Track Mass Per Meter	m_{track}	kg/m	8.8	8.8	8.8
Other Information					
Insulation Class			Class B (130°C)		
Protection Grade			IP00		
Compliance with Global Standards			RoHS, CE, UL(option)		
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.

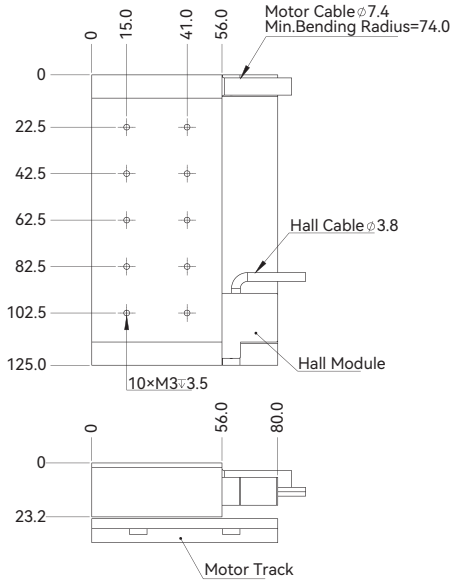
❷ Resistance is measured by DC current with standard 0.5 m cable.

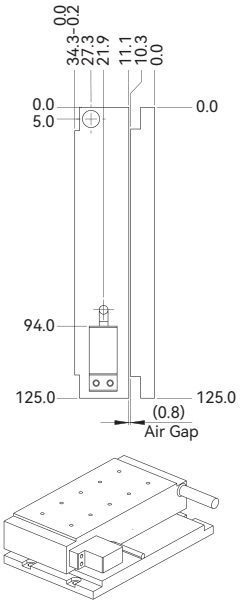
❸ Inductance is measured by current frequency of 1 kHz.

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

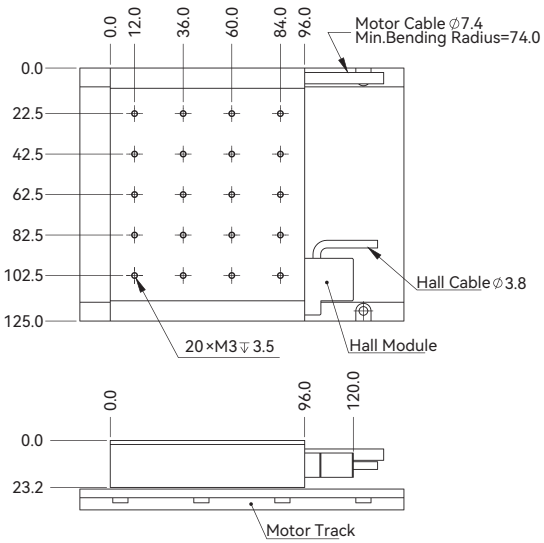
■ Dimensional Drawing

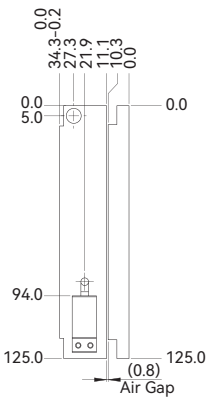
AJM100-B1

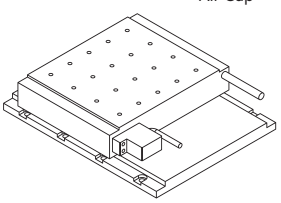




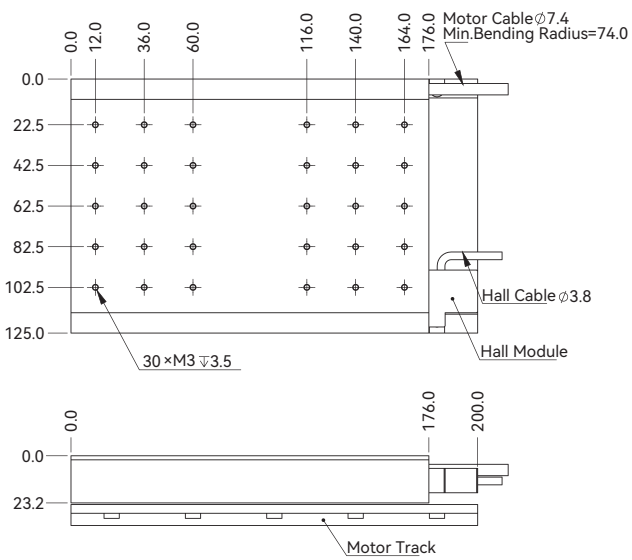
AJM100-B2

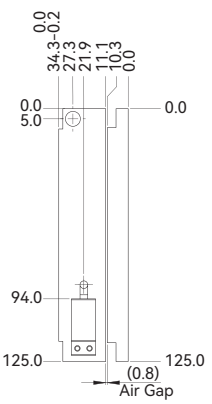


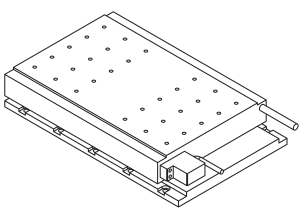




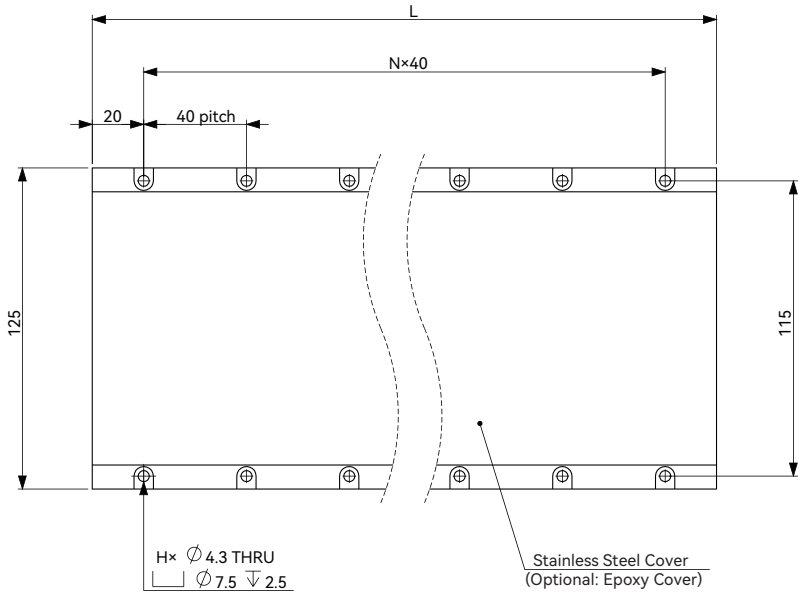
AJM100-B4

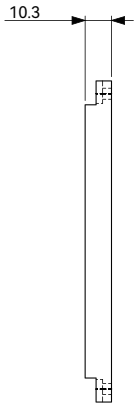






AJM100 Track

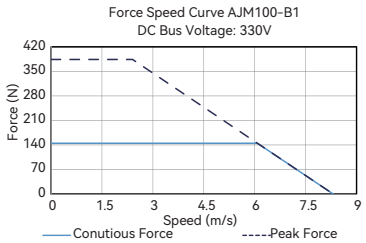


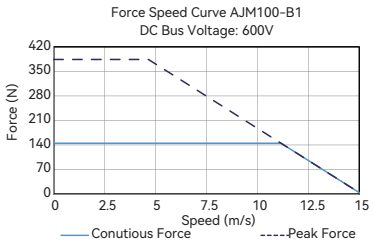


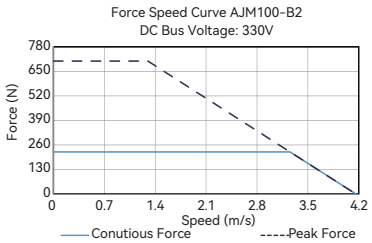
Magnet Track	L	N	H
AJM100-TL80-S	80.0	1	4
AJM100-TL200-S	200.0	4	10
AJM100-TL400-S	400.0	9	20

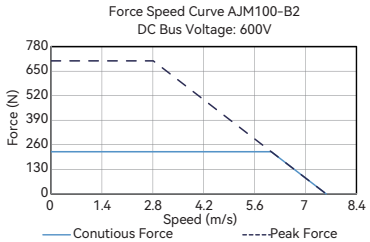
For epoxy cover option, change“ -S ” to “ -E ”. (e.g. AJM100-TL80-E)

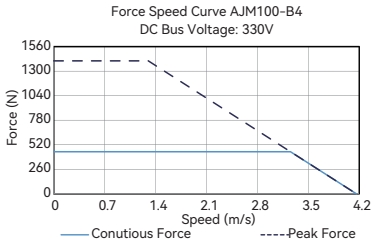
Force-Speed Curve

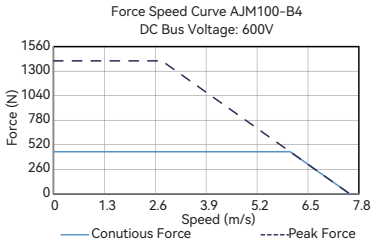








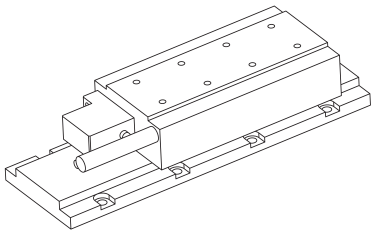


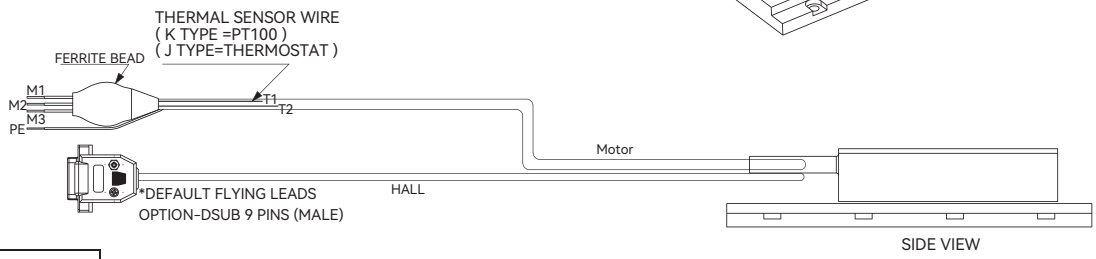


Motor Cable Connection

MOTOR CABLE

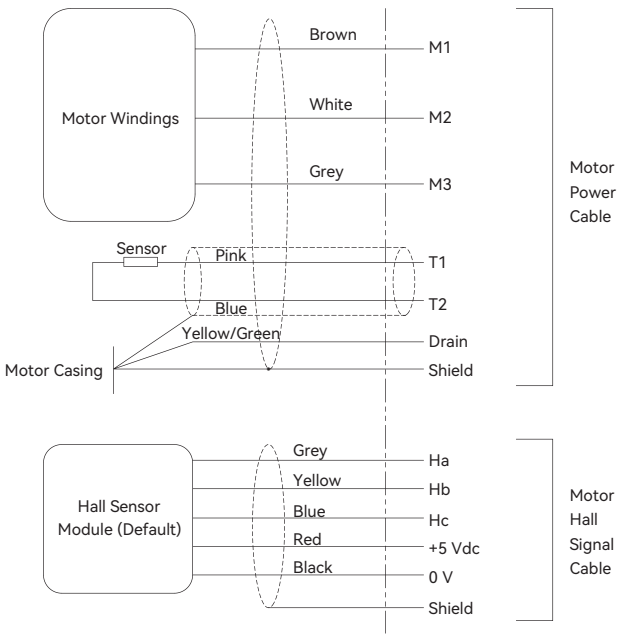
PIN	DESCRIPTION	NO FERRITE BEAD	FERRITE BEAD
-	M1	BROWN	BLACK1
-	M2	WHITE	BLACK2
-	M3	GREY	BLACK3
-	PE	YELLOW/GREEN	YELLOW/GREEN
-	T1	PINK	PINK
-	T2	BLUE	BLUE





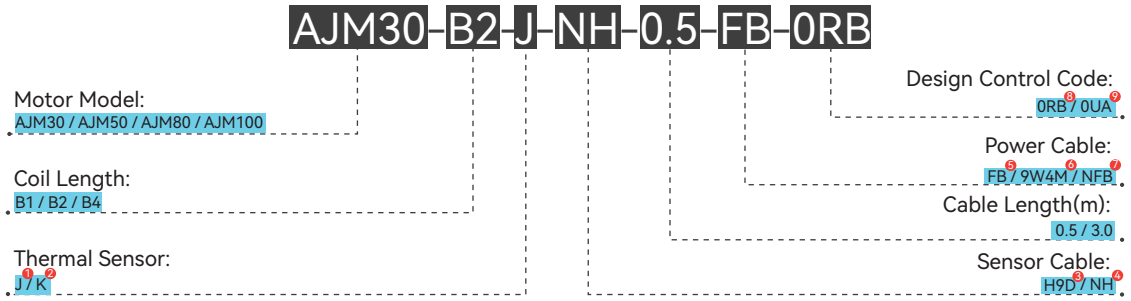
HALL CABLE

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



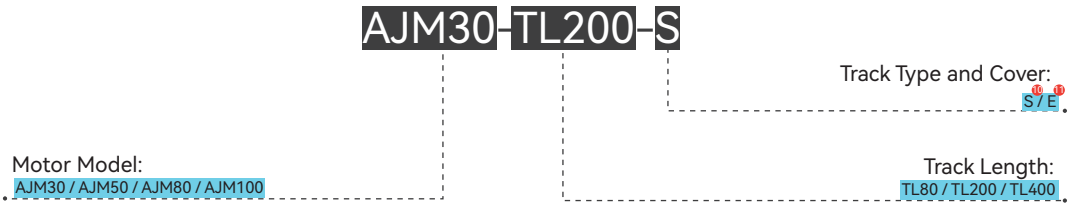
Part Numbering

Motor Coil



1. J = Thermostat
2. K = PT100(RTD)
3. H9D = With Built-in Hall Sensor C/W 9-Pins D-Sub Connector
4. NH = Without Built-in Hall Sensor C/W Flying Leads
5. FB = With Ferrite Bead C/W Flying Leads
6. 9W4M = Without Ferrite Bead C/W D-Sub 9W4 Male Connector
7. NFB = Without Ferrite Bead C/W Flying Leads
8. 0RB = Standard Model (for more options, please consult cust-service@akribis-sys.com)
9. 0UA = UL-certified Model, Only Valid for Power Cable=NFB Options

Motor Track



10. S = Stainless Steel Cover
11. E = Epoxy Cover