

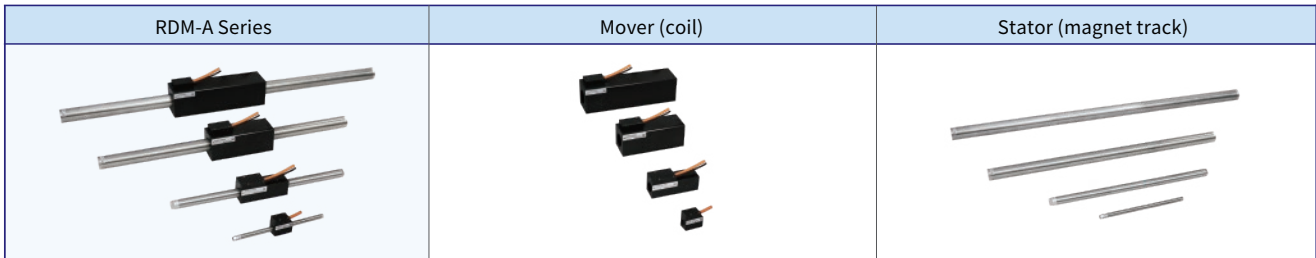
RDM-A SERIES

- ▶ Compact size
- ▶ Full utilization of flux lines
- ▶ Ironless, no cogging force
- ▶ Multi-mover on one track available

EN-23.7.1

Introduction

RDM-A series is a kind of rod motor or shaft motor, since its magnet track is rod-shaped. Similar to other linear motors, RDM-A normally consists of a mover and a stator to realize a linear movement. Usually, the mover refers to motor coil, and the stator refers to magnet track. In some cases, the application of "mover" and "stator" can be reversed.



The magnetic flux is evenly distributed along the circumference of the magnets. The coils are round and arranged closely in the axial direction. For RDM-A series, there is an air gap between the coil and the magnet track to realize a non-contact axial linear movement.

Continuous Force $F_{cn} = 2.1\text{N} \sim 137.8\text{N}$

Peak Force $F_{pk} = 6.2\text{N} \sim 413.4\text{N}$

Features

- ▶ Compact size, similar to ball screw shape, convenient to replace traditional transmission method
- ▶ Full utilization of flux lines
- ▶ Ironless, no attraction force between mover and stator, easy for assembly
- ▶ No cogging force, smooth operation (RDM-A series)
- ▶ Multi-mover on one track available, flexible configuration

Applications

The size of RDM-A varies from 20mm-width coil (8mm-diameter shaft) to 60mm-width coil (30mm-diameter shaft), and each size contains several options of coil lengths and track lengths, together there are over dozens of stroke choices.

The symmetrical and compact structure enables rod motor to become the best alternative to iterate or upgrade ball screw mechanism.

- ▶ High-speed printer
- ▶ Biomedical equipment
- ▶ Semiconductor equipment
- ▶ CNC (Wire cut EDM machine, etc.)
- ▶ Single/multi-axis module platform
- ▶ Counterpoint platform
- ▶ Z-axis pick-and-place module

	Series	Coil Length (mm)	● Continuous Force (F_{cn}) / ■ Peak Force (F_{pk})					Unit: N	
			20	40	60	80	100		120
	RDM020-A-B2	31.0	● 2.1 / ■ 6.2						
	RDM020-A-B3	46.0	● 3.1 / ■ 9.3						
	RDM020-A-B4	61.0	● 4.1 / ■ 12.4						
	RDM030-A-B2	61.0	● 12.4 / ■ 37.2						
	RDM030-A-B3	91.0	● 18.6 / ■ 55.8						
	RDM030-A-B4	121.0	● 24.8 / ■ 74.5						
	RDM050-A-B3	56.8	● 25.8 / ■ 77.4						
	RDM050-A-B5	94.0	● 43.0 / ■ 129.0						
	RDM050-A-B7	131.2	● 60.2 / ■ 180.6						
	RDM060-A-B4	145.0	● 91.9 / ■ 275.6						
	RDM060-A-B5	181.0	● 114.8 / ■ 344.5						
	RDM060-A-B6	217.0	● 137.8 / ■ 413.4						

RDM020-A

Performance Parameters	Symbol	Unit	B2	B3	B4
Continuous Force (NC) @100°C ①	F_{cn}	N	2.1	3.1	4.1
Peak Force	F_{pk}	N	6.2	9.3	12.4
Force Constant $\pm 10\%$	K_f	N/Arms	2.00	3.00	4.00
Back EMF Constant $\pm 10\%$	K_e	Vpeak/(m/s)	1.63	2.45	3.27
Motor Constant @25°C	K_m	N/Sqrt(W)	0.94	1.16	1.35
Resistance (L-L) @25°C $\pm 10\%$ ②	R_{25}	Ω	3.03	4.47	5.88
Inductance (L-L) $\pm 20\%$ ③	L	mH	0.26	0.36	0.49
Electrical Time Constant	τ_e	ms	0.09	0.08	0.08
Continuous Current (NC) @100°C ①	I_{cn}	Arms	1.03	1.03	1.03
Peak Current	I_{pk}	Arms	3.09	3.09	3.09
Continuous Power Dissipation (NC) @100°C ①	P_{cn}	W	6.2	9.2	12.1
Max. Coil Temperature	T_{max}	°C	100	100	100
Thermal Dissipation Constant (NC) ①	K_{thn}	W/°C	0.08	0.12	0.16
Max. Bus Voltage	U_{bus}	Vdc	60	60	60
Magnetic Period	T_{NN}	mm	30.0	30.0	30.0
Attraction Force	F_a	N	0	0	0
Mechanical Parameters					
Coil Mass (NC)	m_{coil}	kg	0.070	0.084	0.100
Coil Length (NC)	L_{coil}	mm	31.0	46.0	61.0
Track Mass per Meter	m_{track}	kg/m	0.37	0.37	0.37
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				

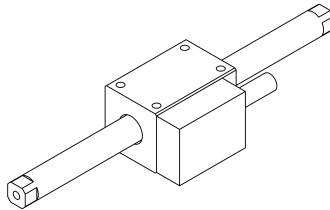
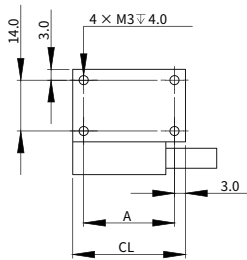
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

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

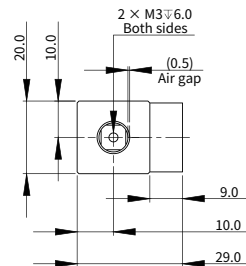
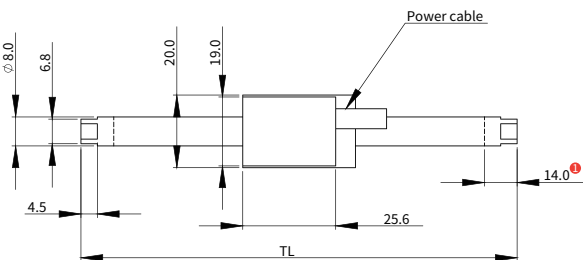
③ Inductance is measured by current frequency of 1 kHz.

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

Dimensional Drawing



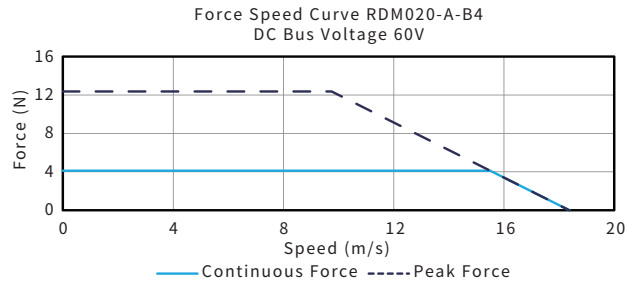
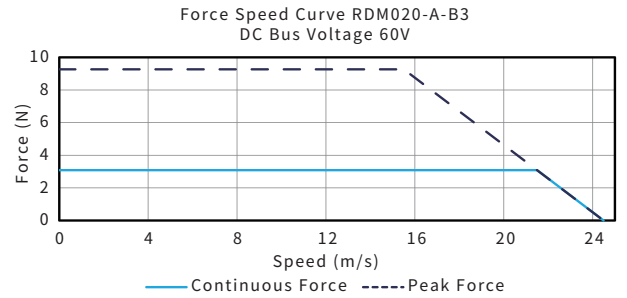
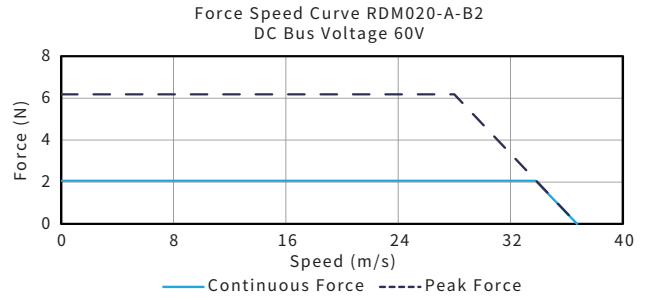
Motor Coil		
Model NO.	Coil Length "CL"	Hole Pitch "A"
RDM020-A-B2	31.0	25.0
RDM020-A-B3	46.0	40.0
RDM020-A-B4	61.0	55.0



Motor Track	
Model NO.	Track Length "TL"
RDM020-A-TL160	160.0
RDM020-A-TL235	235.0
RDM020-A-TL325	325.0

① Non-effective stroke, both sides

Force-Speed Curve



Part Numbering

Motor Coil

RDM020-A-B3-N-KX-M-NF-005-XF-000

Motor Model:

RDM020-A

Coil Length:

B2 / B3 / B4

Cooling Type:

N

Thermal Sensor:

KX / XX

- 1 N = Natural Cooling
- 2 KX = PT100 (RTD)
- 3 XX = No Thermal Sensor
- 4 M = Mid Speed Winding
- 5 NF = Without Built-in Hall Sensor
- 6 005 = 0.5m
- 7 XF = Without Ferrite Bead C/W Flying Leads
- 8 XL = Without Ferrite Bead C/W MATE-N-LOK Plug
- 9 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

Design Control Code:

000

Power Cable:

XF / XL

Cable Length:

005

Sensor Cable:

NF

Winding Code:

M

Motor Track

RDM020-A-TL235-TS-000

Motor Model:

RDM020-A

Track Length:

TL160 / TL235 / TL325

- 1 TLXXX = XXXmm
- 2 TS = Standard track, stainless steel cover
- 3 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

Design Control Code:

000

Track Type and Cover:

TS

RDM030-A

Performance Parameters	Symbol	Unit	B2	B3	B4
Continuous Force (NC) @100°C ①	F_{cn}	N	12.4	18.6	24.8
Peak Force	F_{pk}	N	37.2	55.8	74.5
Force Constant $\pm 10\%$	K_f	N/Arms	7.3	11.0	14.6
Back EMF Constant $\pm 10\%$	K_e	Vpeak/(m/s)	5.96	8.94	11.92
Motor Constant @25°C	K_m	N/Sqrt(W)	3.56	4.37	5.05
Resistance (L-L) @25°C $\pm 10\%$ ②	R_{25}	Ω	2.81	4.19	5.57
Inductance (L-L) $\pm 20\%$ ③	L	mH	0.64	0.93	1.23
Electrical Time Constant	τ_e	ms	0.23	0.22	0.22
Continuous Current (NC) @100°C ①	I_{cn}	Arms	1.70	1.70	1.70
Peak Current	I_{pk}	Arms	5.10	5.10	5.10
Continuous Power Dissipation (NC) @100°C ①	P_{cn}	W	15.7	23.4	31.1
Max. Coil Temperature	T_{max}	°C	100	100	100
Thermal Dissipation Constant (NC) ①	K_{thn}	W/°C	0.21	0.31	0.41
Max. Bus Voltage	U_{bus}	Vdc	60	60	60
Magnetic Period	T_{NN}	mm	60.0	60.0	60.0
Attraction Force	F_a	N	0	0	0
Mechanical Parameters					
Coil Mass (NC)	m_{coil}	kg	0.20	0.27	0.34
Coil Length (NC)	L_{coil}	mm	61.0	91.0	121.0
Track Mass per Meter	m_{track}	kg/m	1.52	1.52	1.52
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				

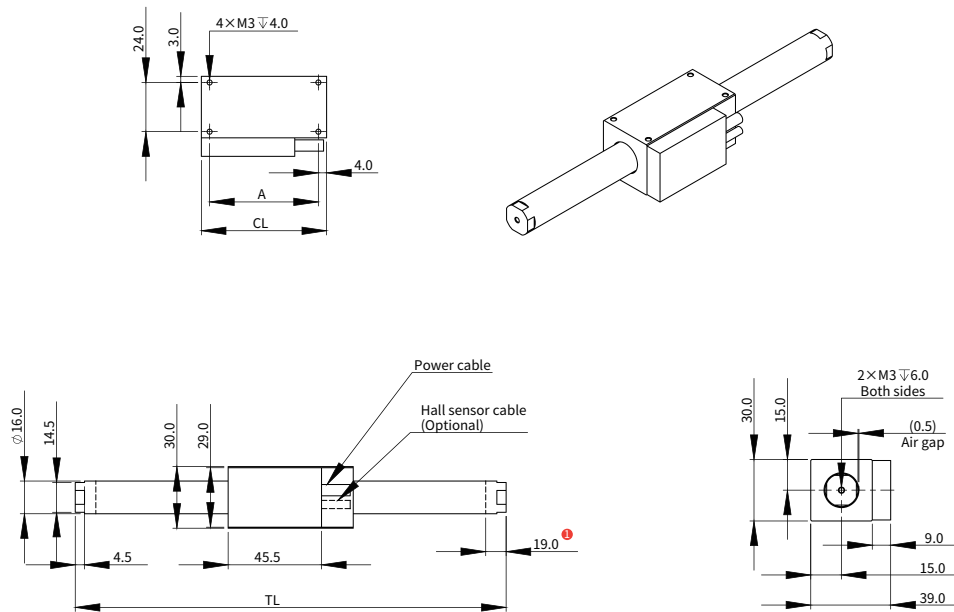
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
Abbreviations: NC-Natural Cooling.

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

③ Inductance is measured by current frequency of 1 kHz.

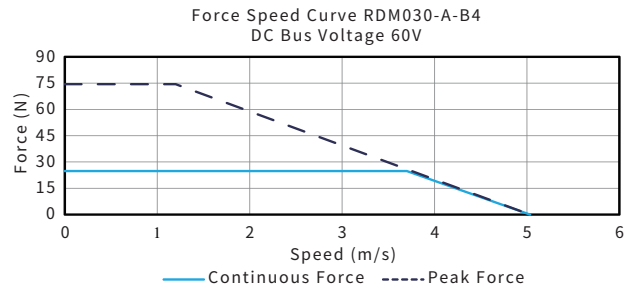
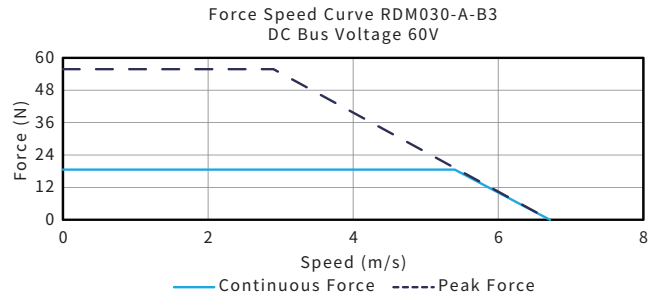
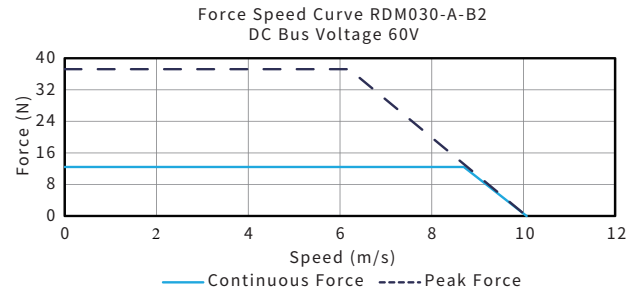
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Dimensional Drawing



① Non-effective stroke, both sides

Force-Speed Curve



Motor Coil		
Model NO.	Coil Length "CL"	Hole Pitch "A"
RDM030-A-B2	61.0	53.0
RDM030-A-B3	91.0	83.0
RDM030-A-B4	121.0	113.0

Motor Track	
Model NO.	Track Length "TL"
RDM030-A-TL332	331.4
RDM030-A-TL422	421.4
RDM030-A-TL512	511.4

Part Numbering

Motor Coil

RDM030-A-B3-N-KX-M-HF-005-XF-000

Motor Model:

RDM030-A

Design Control Code:

000

Coil Length:

B2 / B3 / B4

Power Cable:

XF / XL

Cooling Type:

N

Cable Length:

005

Thermal Sensor:

KX / XX

Sensor Cable:

NF / HF / HL

Winding Code:

M

- 1 N = Natural Cooling
- 2 KX = PT100 (RTD)
- 3 XX = No Thermal Sensor
- 4 M = Mid Speed Winding
- 5 NF = Without Built-in Hall Sensor
- 6 HF = With Built-in Hall Sensor & Hall Cable C/W Flying Leads
- 7 HL = With Built-in Hall Sensor C/W MATE-N-LOK Connector
- 8 005 = 0.5m
- 9 XF = Without Ferrite Bead C/W Flying Leads
- 10 XL = Without Ferrite Bead C/W MATE-N-LOK Plug
- 11 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

Motor Track

RDM030-A-TL422-TS-000

Motor Model:

RDM030-A

Design Control Code:

000

Track Length:

TL332 / TL422 / TL512

Track Type and Cover:

TS

- 1 TLXXX = XXXmm
- 2 TS = Standard track, stainless steel cover
- 3 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

RDM050-A

Performance Parameters	Symbol	Unit	B3	B5	B7
Continuous Force (NC) @100°C ^①	F _{cn}	N	25.8	43.0	60.2
Peak Force	F _{pk}	N	77.4	129.0	180.6
Force Constant ±10%	K _f	N/Arms	17.9	29.9	41.8
Back EMF Constant ±10%	K _e	Vpeak/(m/s)	14.63	24.38	34.13
Motor Constant @25°C	K _m	N/Sqrt(W)	6.43	8.27	9.82
Resistance (L-L)@25°C ±10% ^②	R ₂₅	Ω	5.18	8.68	12.07
Inductance (L-L) ±20% ^③	L	mH	1.34	2.21	3.13
Electrical Time Constant	τ _e	ms	0.26	0.25	0.26
Continuous Current (NC) @100°C ^①	I _{cn}	Arms	1.44	1.44	1.44
Peak Current	I _{pk}	Arms	4.32	4.32	4.32
Continuous Power Dissipation (NC) @100°C ^①	P _{cn}	W	20.8	34.8	48.4
Max. Coil Temperature	T _{max}	°C	100	100	100
Thermal Dissipation Constant (NC) ^①	K _{thn}	W/°C	0.28	0.46	0.65
Max. Bus Voltage	U _{bus}	Vdc	330	330	330
Magnetic Period	T _{NN}	mm	37.2	37.2	37.2
Attraction Force	F _a	N	0	0	0

Mechanical Parameters					
Coil Mass (NC)	m _{coil}	kg	0.40	0.63	0.85
Coil Length (NC)	L _{coil}	mm	56.8	94.0	131.2
Track Mass per Meter	m _{track}	kg/m	3.70	3.70	3.70

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	

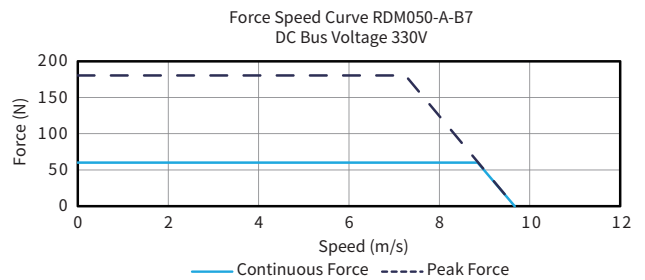
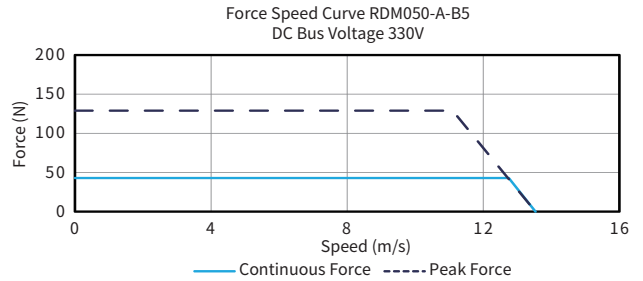
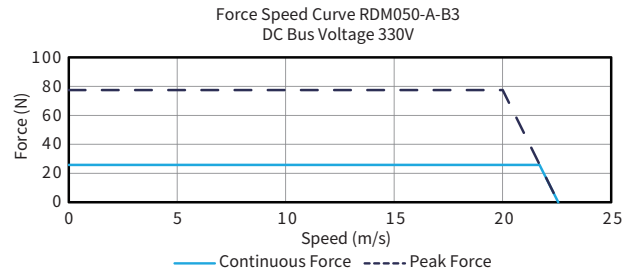
① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment. Abbreviations: NC-Natural Cooling.

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

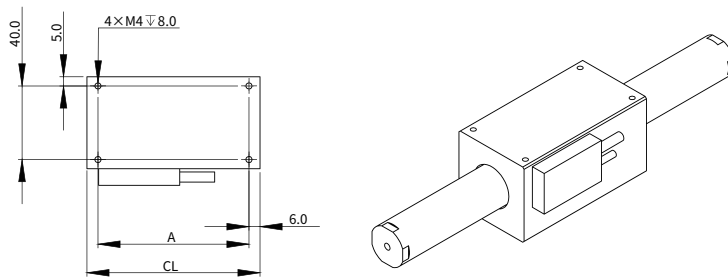
③ Inductance is measured by current frequency of 1 kHz.

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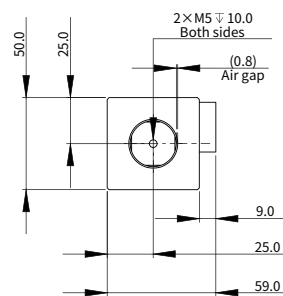
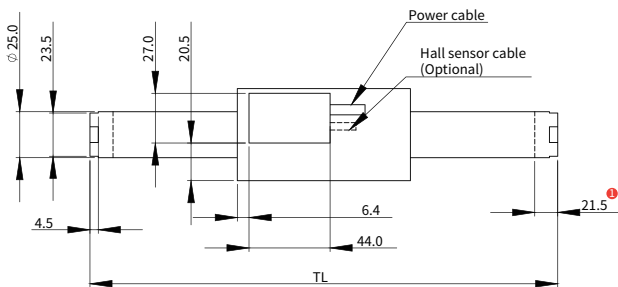
Force-Speed Curve



Dimensional Drawing



Motor Coil		
Model NO.	Coil Length "CL"	Hole Pitch "A"
RDM050-A-B3	56.8	44.8
RDM050-A-B5	94.0	82.0
RDM050-A-B7	131.2	119.2

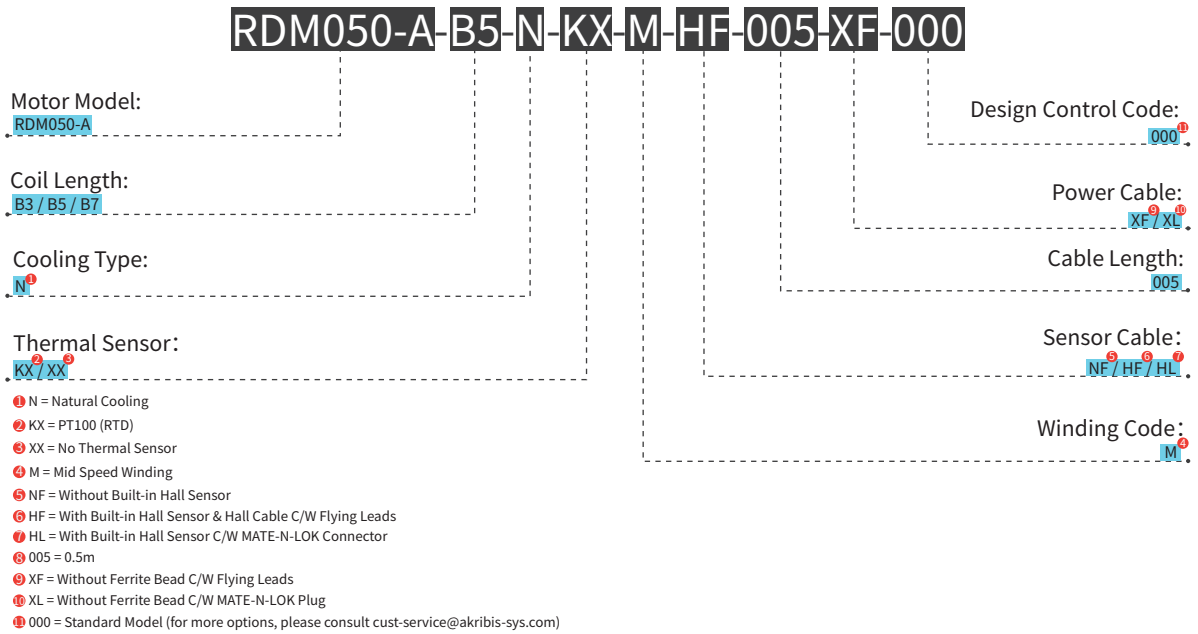


① Non-effective stroke, both sides

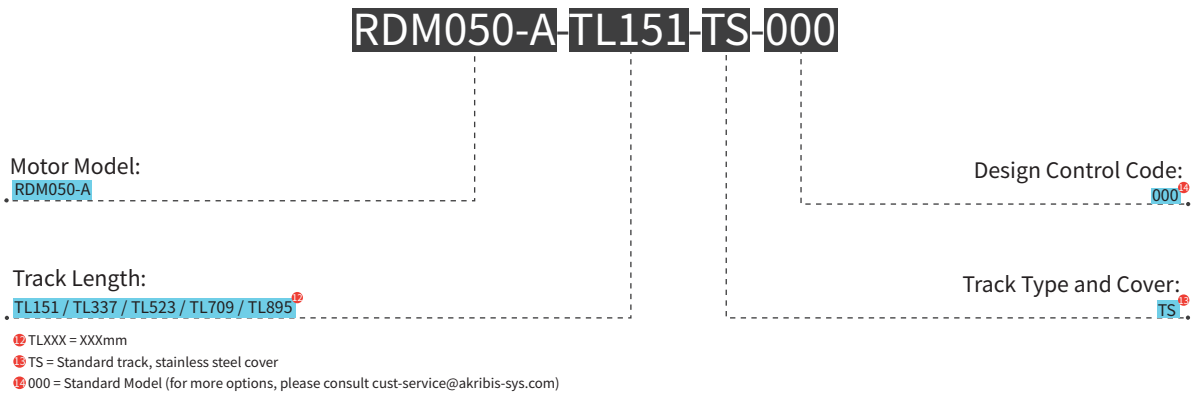
Motor Track	
Model NO.	Track Length "TL"
RDM050-A-TL151	151.0
RDM050-A-TL337	337.0
RDM050-A-TL523	523.0
RDM050-A-TL709	709.0
RDM050-A-TL895	895.0

Part Numbering

Motor Coil



Motor Track



RDM060-A

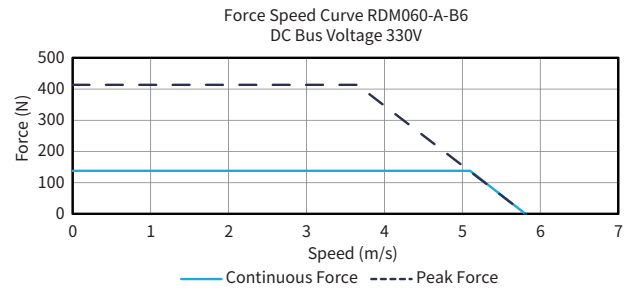
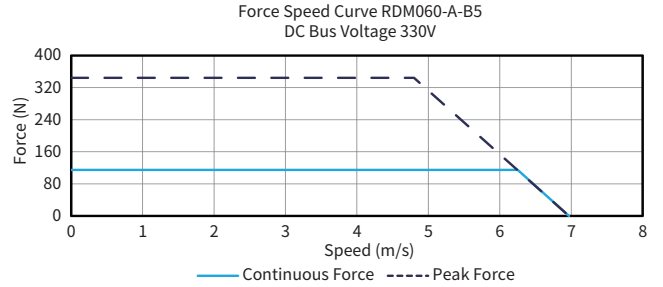
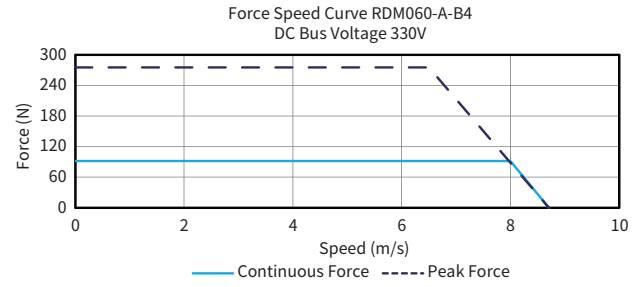
Performance Parameters	Symbol	Unit	B4	B5	B6
Continuous Force (NC) @100°C ①	F_{cn}	N	91.9	114.8	137.8
Peak Force	F_{pk}	N	275.6	344.5	413.4
Force Constant $\pm 10\%$	K_f	N/Arms	46.4	58.0	69.6
Back EMF Constant $\pm 10\%$	K_e	Vpeak/(m/s)	37.89	47.36	56.83
Motor Constant @25°C	K_m	N/Sqrt(W)	14.19	15.87	17.40
Resistance (L-L)@25°C $\pm 10\%$ ②	R_{25}	Ω	7.13	8.91	10.67
Inductance (L-L) $\pm 20\%$ ③	L	mH	3.69	4.57	5.51
Electrical Time Constant	τ_e	ms	0.52	0.51	0.52
Continuous Current (NC) @100°C ①	I_{cn}	Arms	1.98	1.98	1.98
Peak Current	I_{pk}	Arms	5.94	5.94	5.94
Continuous Power Dissipation (NC) @100°C ①	P_{cn}	W	54.0	67.5	80.9
Max. Coil Temperature	T_{max}	°C	100	100	100
Thermal Dissipation Constant (NC) ①	K_{thn}	W/°C	0.72	0.90	1.08
Max. Bus Voltage	U_{bus}	Vdc	330	330	330
Magnetic Period	T_{NN}	mm	72.0	72.0	72.0
Attraction Force	F_a	N	0	0	0

Mechanical Parameters					
Coil Mass (NC)	m_{coil}	kg	1.38	1.71	2.03
Coil Length (NC)	L_{coil}	mm	145.0	181.0	217.0
Track Mass per Meter	m_{track}	kg/m	5.37	5.37	5.37

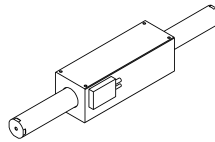
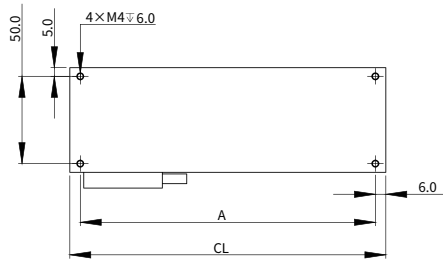
Other Information		
Insulation Class	Class B (130°C)	
Protection Grade	IP00	
Compliance with Global Standards	RoHS,CE	
Ambient Temperature	Operation	0°C to 40°C (non-freezing)
	Storage	-15°C to 70°C (non-freezing)
Ambient Humidity	Operation	10%RH to 80%RH (non-condensing)
	Storage	10%RH to 90%RH (non-condensing)
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 0.5m cable.
- ③ Inductance is measured by current frequency of 1 kHz.
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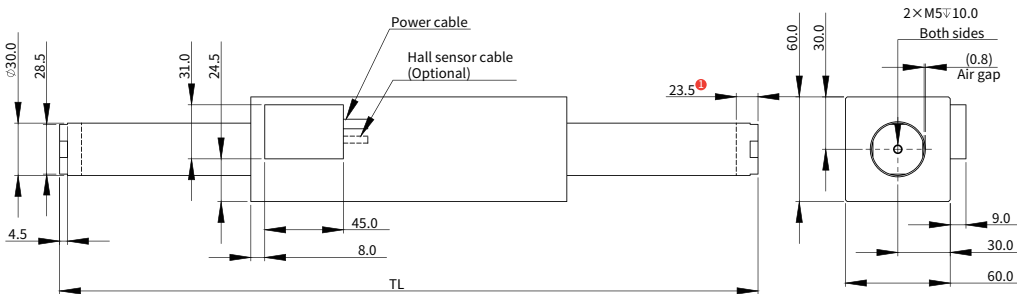
Force-Speed Curve



Dimensional Drawing



Motor Coil		
Model NO.	Coil Length "CL"	Hole Pitch "A"
RDM060-A-B4	145.0	133.0
RDM060-A-B5	181.0	169.0
RDM060-A-B6	217.0	205.0



Motor Track	
Model NO.	Track Length "TL"
RDM060-A-TL328	327.8
RDM060-A-TL544	543.8
RDM060-A-TL760	759.8
RDM060-A-TL976	975.8

- ① Non-effective stroke, both sides

Part Numbering

Motor Coil

RDM060-A-B4-N-KX-M-HF-005-XF-000

Motor Model:

RDM060-A

Coil Length:

B4 / B5 / B6

Cooling Type:

N

Thermal Sensor:

KX / XX

- ① N = Natural Cooling
- ② KX = PT100 (RTD)
- ③ XX = No Thermal Sensor
- ④ M = Mid Speed Winding
- ⑤ NF = Without Built-in Hall Sensor
- ⑥ HF = With Built-in Hall Sensor & Hall Cable C/W Flying Leads
- ⑦ HL = With Built-in Hall Sensor C/W MATE-N-LOK Connector
- ⑧ 005 = 0.5m
- ⑨ XF = Without Ferrite Bead C/W Flying Leads
- ⑩ XL = Without Ferrite Bead C/W MATE-N-LOK Plug
- ⑪ 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

Design Control Code:

000

Power Cable:

XF / XL

Cable Length:

005

Sensor Cable:

NF / HF / HL

Winding Code:

M

Motor Track

RDM060-A-TL328-TS-000

Motor Model:

RDM060-A

Track Length:

TL328 / TL544 / TL760 / TL976

- ① TLXXX = XXXmm
- ② TS = Standard track, stainless steel cover
- ③ 000 = Standard Model (for more options, please consult cust-service@akribis-sys.com)

Design Control Code:

000

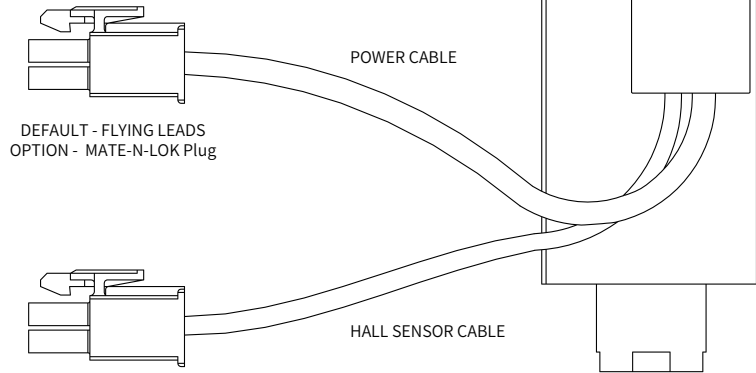
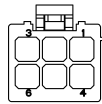
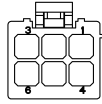
Track Type and Cover:

TS

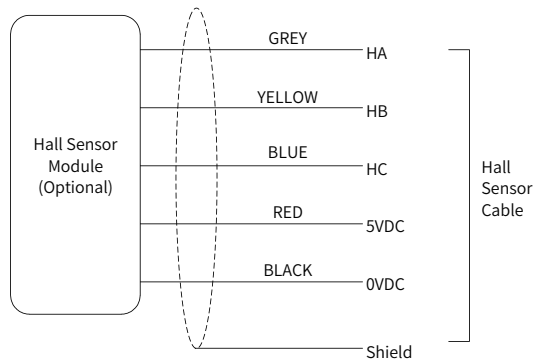
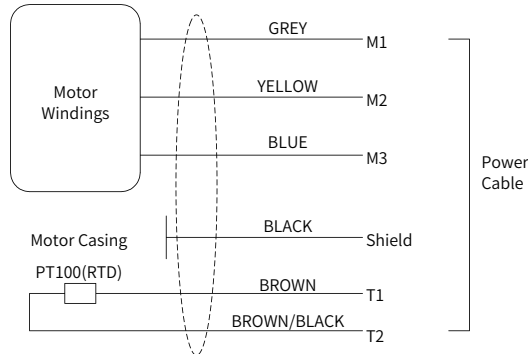
RDM-A Series

Motor Cable Connection

POWER CABLE		
PIN	DESCRIPTION	COLOR
1	M1	GREY
2	M2	YELLOW
3	M3	BLUE
4	PE	BLACK
5	T1	BROWN
6	T2	BROWN/BLACK



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



Power Cable Information

Specification	Unit	
Cable Diameter	mm	5.3 ^①
Cable Length	m	0.5 ^①
Number of Cores	-	$4 \times 0.25\text{mm}^2 + 2 \times 0.14\text{mm}^2$
Cable Colour	-	Orange
Minimum Bending Radius	mm	Moving: Cable diameter $\varnothing \times 10$
		Fixed: Cable diameter $\varnothing \times 6$
CE Compliance	-	Yes

^① Cable diameter within $\pm 0.3\text{mm}$ tolerance, cable length within $\pm 60.0\text{mm}$ tolerance
 Certain specifications in the drawing are subject to change.

Hall Sensor Cable Information

Specification	Unit	
Cable Diameter	mm	3.6 ^①
Cable Length	m	0.5 ^①
Number of Cores	-	$5 \times 0.08\text{mm}^2$
Cable Colour	-	Black
Minimum Bending Radius	mm	Moving: Cable diameter $\varnothing \times 10$
		Fixed: Cable diameter $\varnothing \times 5$
CE Compliance	-	Yes

^① Cable diameter within $\pm 0.3\text{mm}$ tolerance, cable length within $\pm 60.0\text{mm}$ tolerance
 Certain specifications in the drawing are subject to change.