



ACD SERIES

- ▶ No cogging torque
- ▶ Direct drive zero cogging coreless motor
- ▶ Low speed ripple, suitable for inspection application
- ▶ Built-in grating position feedback and precision bearings, precise reset through optical zero position

EN-24.5.1

ACD62-60

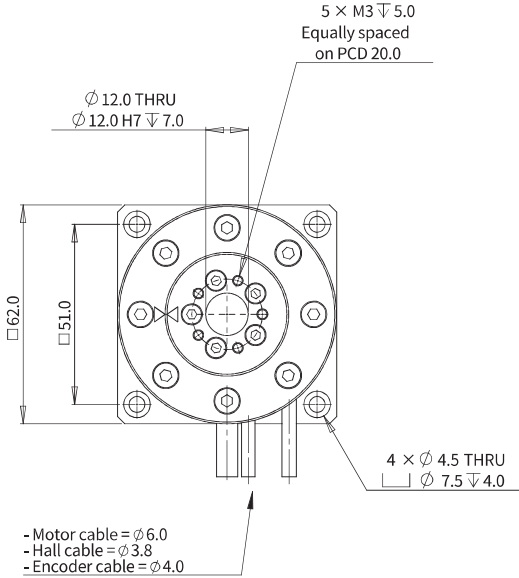
Introduction
Sizing Guide
Frequently Asked Questions
Linear Motors
Voice Coil Motors
Direct Drive Rotary Motors
Motion Control of Gantry Stages

Akribis systems

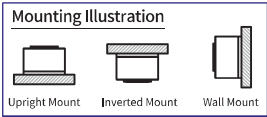
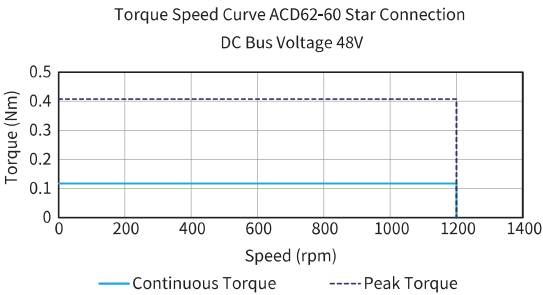
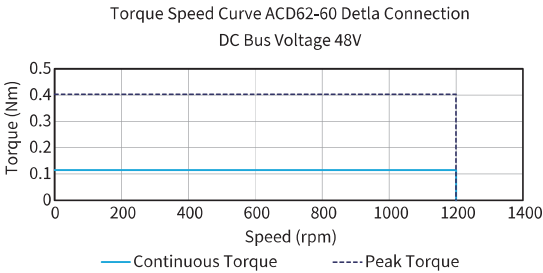
ACD62-60				
Performance Parameters		Symbol	Unit	D Y
Continuous Torque @100°C		T _{cn}	Nm	0.115 0.115
Peak Torque		T _{pk}	Nm	0.40 0.40
Torque Constant ±10%		K _t	Nm/Arms	0.024 0.042
Back EMF Constant ±10%		K _e	Vpeak/rpm	0.002 0.004
Motor Constant @25°C		K _m	Nm/Sqrt(W)	0.023 0.028
Resistance (L-L) @25°C ±10%		R ₂₅	Ω	0.73 1.51
Inductance (L-L) ±20%		L	mH	0.073 0.233
Electrical Time Constant		τ _e	ms	0.10 0.15
Continuous Current @100°C		I _{cn}	Arms	4.8 2.8
Peak Current		I _{pk}	Arms	16.8 9.7
Continuous Power Dissipation @100°C		P _{cn}	W	32.5 22.4
Max. Coil Temperature		t _{max}	°C	100 100
Thermal Dissipation Constant		K _{thn}	W/°C	0.434 0.298
Max. Bus Voltage		U _{bus}	Vdc	48.0 48.0
Pole Number		2P	-	8 8
Rec. Max. Speed @48 VDC (Digital / SINCOS)		Ω _{max}	rpm	1200 1200
Mechanical Parameters				
Overall Mass		m _n	kg	1.00 1.00
Rotor Inertia		J _r	kg·m ²	2.157E-05 2.157E-05
Axial Runout		-	μm	12 12
Radial Runout		-	μm	10 10
Max. Axial Load (Upright Mounting)		-	N	50 50
Max. Axial Load (Inverted / Wall Mounting)		-	N	5 5
Max. Moment Load (Upright Mounting)		-	Nm	0.3 0.3
Max. Moment Load (Inverted / Wall Mounting)		-	Nm	0.05 0.05
Encoder Parameters				
ABI Optical Incremental Encoder (SIN/COS)		-	lines / rev	1620 1620
ABI Optical Incremental Encoder (80x)		-	counts / rev	129600 129600
ABI Optical Incremental Encoder (160x)		-	counts / rev	259200 259200
ABI Optical Incremental Encoder (400x)		-	counts / rev	648000 648000
Accuracy after Error Mapping		-	arc sec	+/-6 +/-6
Repeatability		-	arc sec	+/-3 +/-3
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP40		
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.
 - 2 Resistance is measured by DC current with standard 0.5m cable.
 - 3 Inductance is measured by current frequency of 1 kHz.
 - 4 The value is based on ABI optical SIN/COS encoder (4096x interpolation) under max. bus voltage.
 - 5 Runout specification define in the datasheet is based on constant loading and temperature condition (the value in parenthesis is optional).
 - 6 Please refer to the illustration for different mountings.
 - 7 Based on ABI optical SIN/COS encoder (4096x interpolation) with standard runout.
- The contents of datasheet are subjected to change without prior notice.

Dimension



Torque-Speed Curve

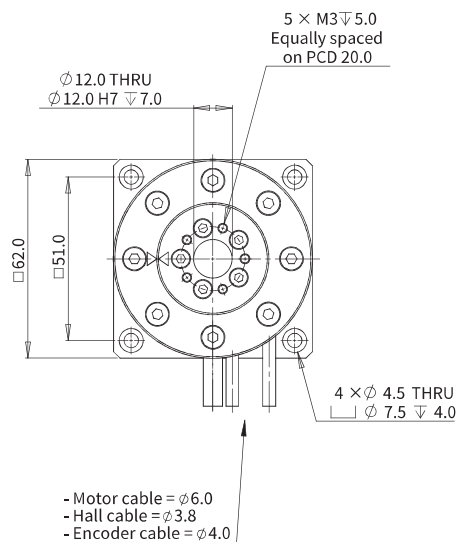


ACD62-84

ACD62-84				
Performance Parameters	Symbol	Unit	D	Y
Continuous Torque @100°C ^①	T _{cn}	Nm	0.341	0.341
Peak Torque	T _{pk}	Nm	1.19	1.19
Torque Constant ±10%	K _t	Nm/Arms	0.071	0.123
Back EMF Constant ±10%	K _e	Vpeak/rpm	0.006	0.011
Motor Constant @25°C	K _m	Nm/Sqrt(W)	0.055	0.068
Resistance (L-L) @25°C ±10% ^②	R ₂₅	Ω	1.12	2.21
Inductance (L-L) ±20% ^③	L	mH	0.155	0.420
Electrical Time Constant	τ _e	ms	0.14	0.19
Continuous Current @100°C ^①	I _{cn}	Arms	4.8	2.8
Peak Current	I _{pk}	Arms	16.8	9.7
Continuous Power Dissipation @100°C ^①	P _{cn}	W	49.9	32.7
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant ^④	K _{thn}	W/°C	0.665	0.436
Max. Bus Voltage	U _{bus}	Vdc	48.0	48.0
Pole Number	2P	-	8	8
Rec. Max. Speed @48 VDC (Digital / SINCOS) ^⑤	Ω _{max}	rpm	1200	1200
Mechanical Parameters				
Overall Mass	m _n	kg	1.40	1.40
Rotor Inertia	J _r	kg·m ²	3.944E-05	3.944E-05
Axial Runout ^⑥	-	μm	12	12
Radial Runout ^⑥	-	μm	10	10
Max. Axial Load (Upright Mounting) ^⑥	-	N	50	50
Max. Axial Load (Inverted / Wall Mounting)	-	N	5	5
Max. Moment Load (Upright Mounting)	-	Nm	0.3	0.3
Max. Moment Load (Inverted / Wall Mounting)	-	Nm	0.05	0.05
Encoder Parameters				
ABI Optical Incremental Encoder (SIN/COS)	-	lines / rev	1620	1620
ABI Optical Incremental Encoder (80x)	-	counts / rev	129600	129600
ABI Optical Incremental Encoder (160x)	-	counts / rev	259200	259200
ABI Optical Incremental Encoder (400x)	-	counts / rev	648000	648000
Accuracy after Error Mapping ^⑦	-	arc sec	+/-6	+/-6
Repeatability ^⑦	-	arc sec	+/-3	+/-3
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP40		
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		

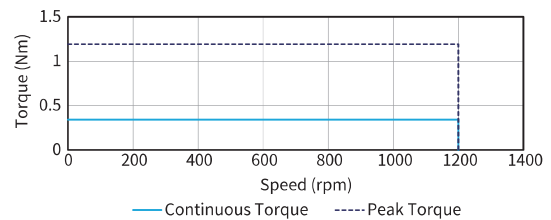
- ① Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
 ② Resistance is measured by DC current with standard 0.5m cable.
 ③ Inductance is measured by current frequency of 1 kHz.
 ④ The value is based on ABI optical SIN/COS encoder (4096x interpolation) under max. bus voltage.
 ⑤ Runout specification define in the datasheet is based on constant loading and temperature condition (the value in parenthesis is optional).
 ⑥ Please refer to the illustration for different mountings.
 ⑦ Based on ABI optical SIN/COS encoder (4096x interpolation) with standard runout.
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Dimension

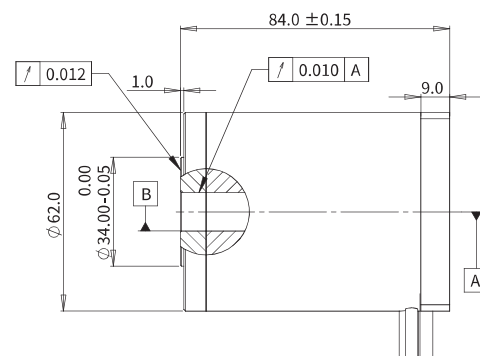
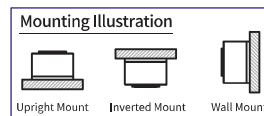
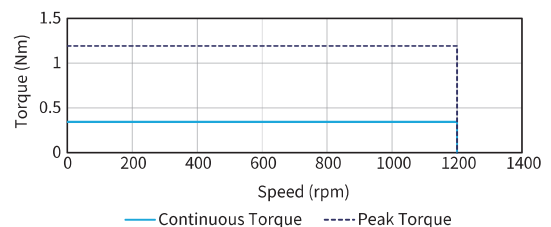


Torque-Speed Curve

Torque Speed Curve ACD62-84 Delta Connection
DC Bus Voltage 48V



Torque Speed Curve ACD62-84 Star Connection
DC Bus Voltage 48V



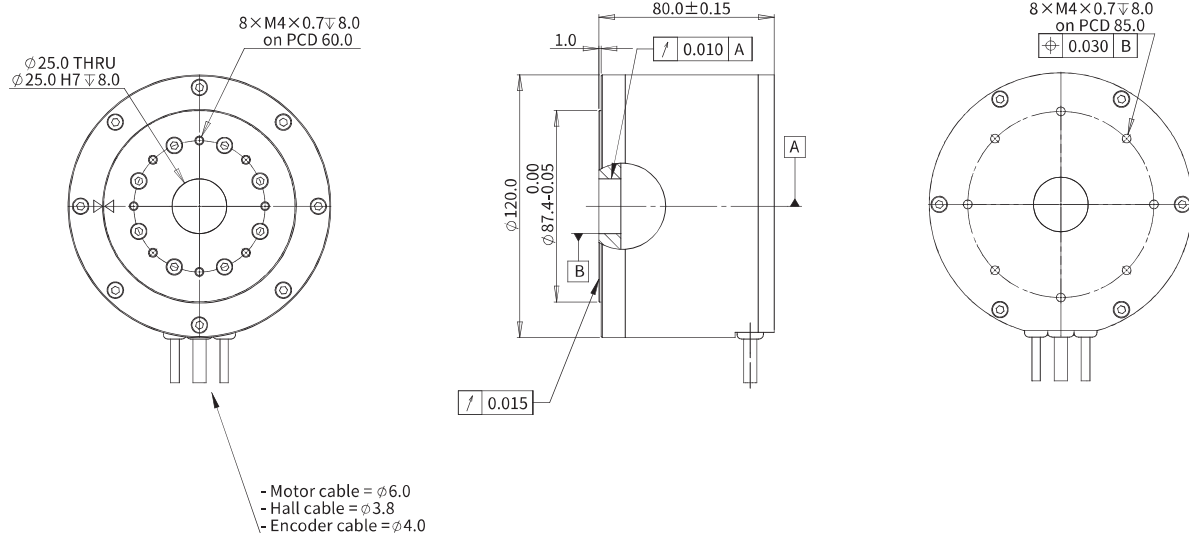
ACD Series

ACD120-80

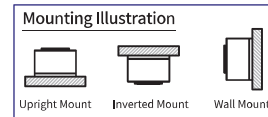
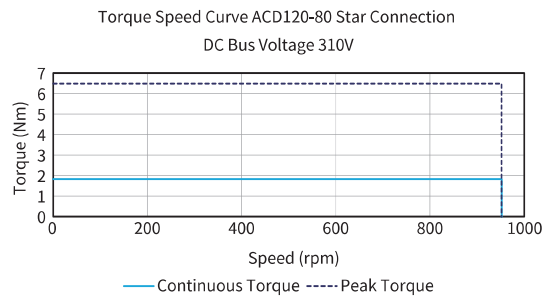
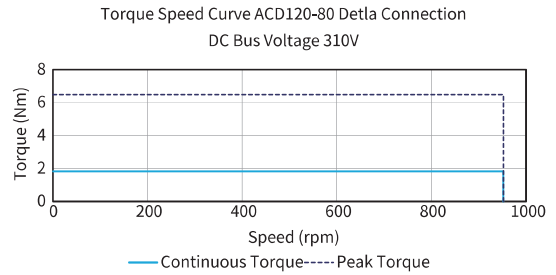
ACD120-80				
Performance Parameters	Symbol	Unit	D	Y
Continuous Torque @100°C ^①	T _{cn}	Nm	1.85	1.85
Peak Torque	T _{pk}	Nm	6.46	6.46
Torque Constant ±10%	K _t	Nm/Arms	0.36	0.63
Back EMF Constant ±10%	K _e	Vpeak/rpm	0.031	0.054
Motor Constant @25°C	K _m	Nm/Sqrt(W)	0.220	0.238
Resistance (L-L) @25°C ±10% ^②	R ₂₅	Ω	1.80	4.64
Inductance (L-L) ±20% ^③	L	mH	0.675	1.900
Electrical Time Constant	τ _e	ms	0.38	0.41
Continuous Current @100°C ^④	I _{cn}	Arms	5.1	2.9
Peak Current	I _{pk}	Arms	17.9	10.3
Continuous Power Dissipation @100°C ^⑤	P _n	W	90.4	77.7
Max. Coil Temperature	t _{max}	°C	100	100
Thermal Dissipation Constant ^⑥	K _{thn}	W/°C	1.205	1.036
Max. Bus Voltage	U _{bus}	Vdc	330.0	330.0
Pole Number	2P	-	12	12
Rec. Max. Speed @230 VAC (Digital / SIN/COS) ^⑦	Ω _{max}	rpm	952	952
Mechanical Parameters				
Overall Mass	m _n	kg	3.2	3.2
Rotor Inertia	J _r	kg·m ²	1.08E-03	1.08E-03
Axial Runout ^⑧	-	μm	15	15
Radial Runout ^⑧	-	μm	10	10
Max. Axial Load (Upright Mounting) ^⑧	-	N	150	150
Max. Axial Load (Inverted / Wall Mounting)	-	N	15	15
Max. Moment Load (Upright Mounting)	-	Nm	10	10
Max. Moment Load (Inverted / Wall Mounting)	-	Nm	1.0	1.0
Encoder Parameters				
ABI Optical Incremental Encoder (SIN/COS)	-	lines / rev	2868	2868
ABI Optical Incremental Encoder (80x)	-	counts / rev	229440	229440
ABI Optical Incremental Encoder (160x)	-	counts / rev	458880	458880
ABI Optical Incremental Encoder (400x)	-	counts / rev	1147200	1147200
Accuracy after Error Mapping ^⑨	-	arc sec	+/-6	+/-6
Repeatability ^⑩	-	arc sec	+/-3	+/-3
Other Information				
Insulation Class		Class B (130°C)		
Protection Grade		IP40		
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.
 ② Resistance is measured by DC current with standard 0.5m cable.
 ③ Inductance is measured by current frequency of 1 kHz.
 ④ The value is based on ABI optical SIN/COS encoder (4096x interpolation) under max. bus voltage.
 ⑤ Runout specification define in the datasheet is based on constant loading and temperature condition (the value in parenthesis is optional).
 ⑥ Please refer to the illustration for different mountings.
 ⑦ Based on ABI optical SIN/COS encoder (4096x interpolation) with standard runout.
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Dimension



Torque-Speed Curve

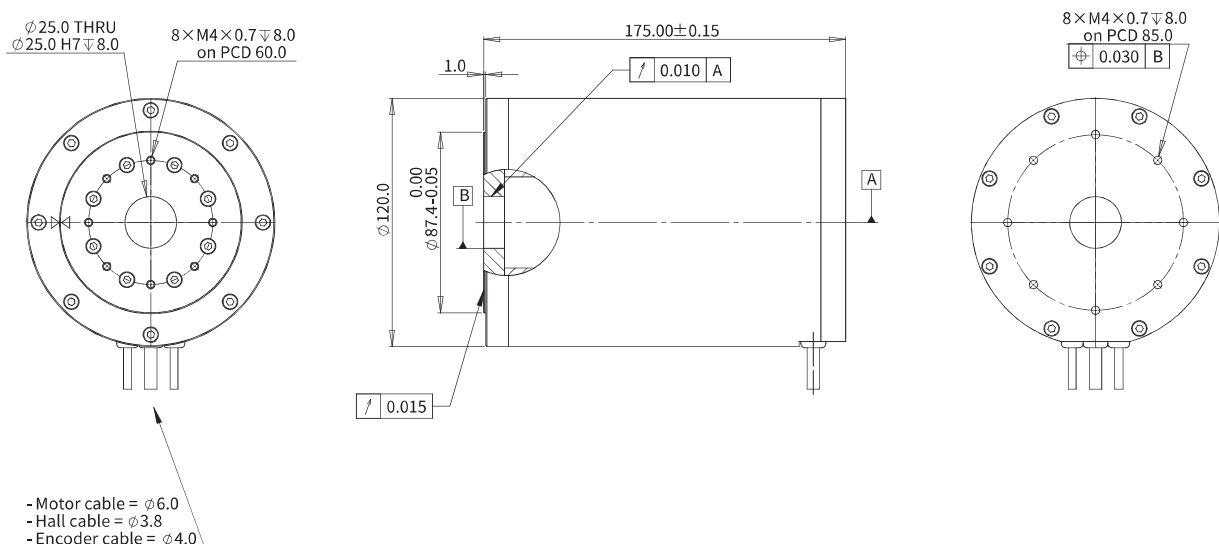


ACD120-175

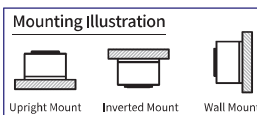
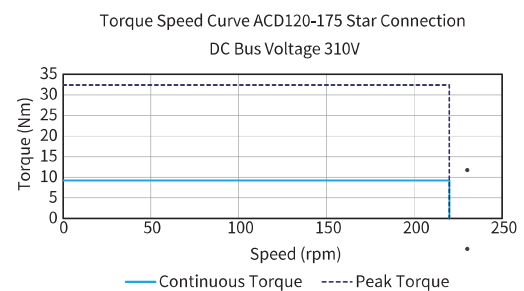
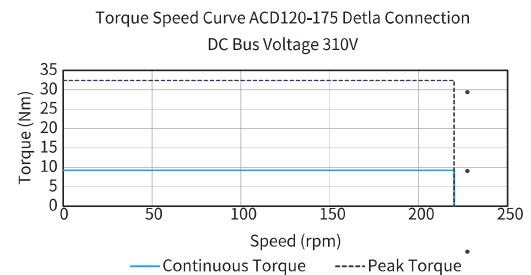
ACD120-175					
Performance Parameters		Symbol	Unit	D	Y
Continuous Torque @100°C ^①		T _{cn}	Nm	9.22	9.22
Peak Torque		T _{pk}	Nm	32.25	32.25
Torque Constant ±10%		K _t	Nm/Arms	1.81	3.13
Back EMF Constant ±10%		K _e	V _{peak} /rpm	0.154	0.268
Motor Constant @25°C		K _m	Nm/Sqrt(W)	0.736	0.736
Resistance (L-L) @25°C ±10% ^②		R ₂₅	Ω	4.02	12.07
Inductance (L-L) ±20% ^③		L	mH	2.000	5.619
Electrical Time Constant		τ _e	ms	0.50	0.47
Continuous Current @100°C ^①		I _{cn}	Arms	5.1	2.9
Peak Current		I _{pk}	Arms	17.9	10.3
Continuous Power Dissipation @100°C ^①		P _{cn}	W	202.4	202.1
Max. Coil Temperature		t _{max}	°C	100	100
Thermal Dissipation Constant ^④		K _{thn}	W/°C	2.698	2.695
Max. Bus Voltage		U _{bus}	V _{dc}	330.0	330.0
Pole Number		2P	-	12	12
Rec. Max. Speed @230 VAC (Digital / SIN/COS) ^⑤		Ω _{max}	rpm	220	220
Mechanical Parameters					
Overall Mass		m _n	kg	7.0	7.0
Rotor Inertia		J _r	kg·m ²	3.21E-03	3.21E-03
Axial Runout ^⑥		-	μm	15	15
Radial Runout ^⑥		-	μm	10	10
Max. Axial Load (Upright Mounting) ^⑦		-	N	150	150
Max. Axial Load (Inverted / Wall Mounting)		-	N	15	15
Max. Moment Load (Upright Mounting)		-	Nm	10	10
Max. Moment Load (Inverted / Wall Mounting)		-	Nm	1.0	1.0
Encoder Parameters					
ABI Optical Incremental Encoder (SIN/COS)		-	lines / rev	2868	2868
ABI Optical Incremental Encoder (80x)		-	counts / rev	229440	229440
ABI Optical Incremental Encoder (160x)		-	counts / rev	458880	458880
ABI Optical Incremental Encoder (400x)		-	counts / rev	1147200	1147200
Accuracy after Error Mapping ^⑧		-	arc sec	+/-6	+/-6
Repeatability ^⑧		-	arc sec	+/-3	+/-3
Other Information					
Insulation Class		Class B (130°C)			
Protection Grade		IP40			
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.
 ② Resistance is measured by DC current with standard 0.5m cable.
 ③ Inductance is measured by current frequency of 1 kHz.
 ④ The value is based on ABI optical SIN/COS encoder (4096x interpolation) under max. bus voltage.
 ⑤ Runout specification define in the datasheet is based on constant loading and temperature condition (the value in parenthesis is optional).
 ⑥ Please refer to the illustration for different mountings.
 ⑦ Based on ABI optical SIN/COS encoder (4096x interpolation) with standard runout.
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Dimension



Torque-Speed Curve



ACD Series

Part Numbering

ACD62-84-D-K-NH-0.5-FB-AB-1620-160X

Motor Model: ACD62-60 / 84	Interpolation: SINCOS / 80X / 160X / 400X
Winding Code: D = Delta / Y = Wye	Encoder: AB-1620
Thermal Sensor: K = PT100 (RTD)	Power Cable: FB / 9W4M
Sensor Cable: NH / H9D	Cable Length (m): 0.5

ACD120-80-Y-J-H9D-0.5-FB-AB-2868-SINCOS

Motor Model: ACD120-80 / 175	Interpolation: SINCOS / 80X / 160X / 400X
Winding Code: D = Delta / Y = Wye	Encoder: AB-2868
Thermal Sensor: J = Thermostat / K = PT100 (RTD)	Power Cable: FB / 9W4M
Sensor Cable: NH / H9D	Cable Length (m): 0.5

- ① NH = Without Built-in Hall Sensor C/W Flying Leads
- ② H9D = With Built-in Hall Sensor C/W 9-Pins D-Sub Connector
- ③ FB = With Ferrite Bead C/W Flying Leads
- ④ 9W4M = Without Ferrite Bead C/W D-Sub 9W4 Male Connector

Motor Cable Connection

