



# 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-26.3.1

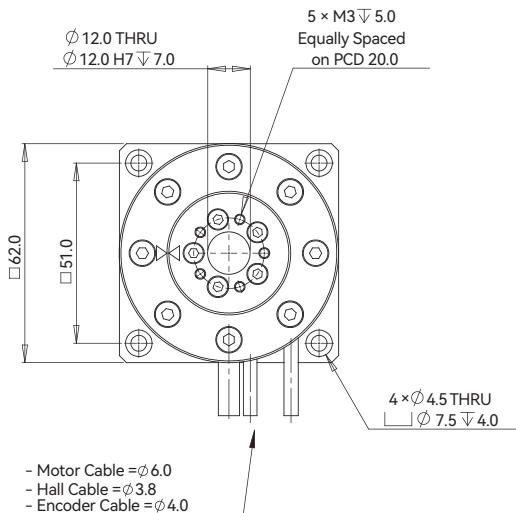
## ACD62-60

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

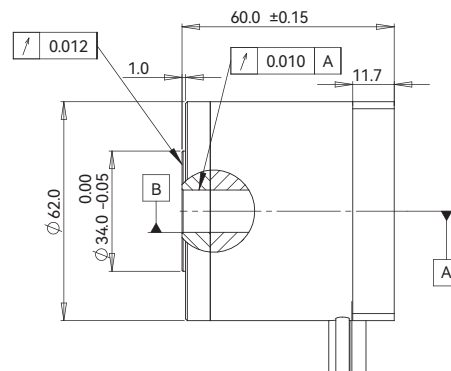
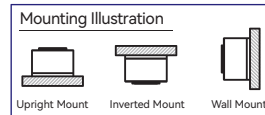
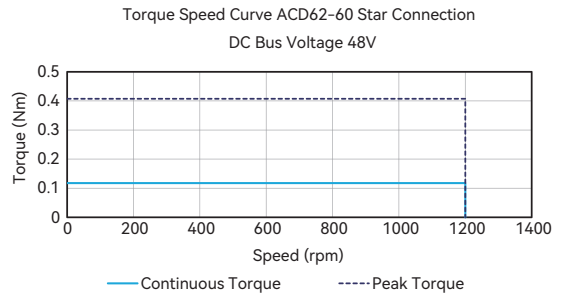
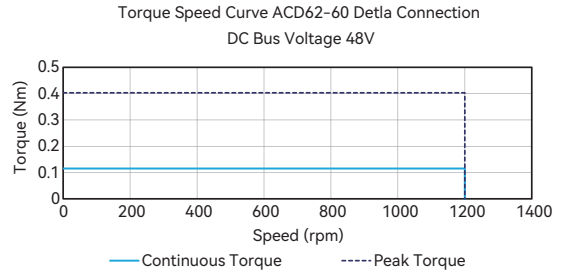
ACD62-60				
<b>Performance Parameters</b>				
Continuous Torque @100°C	T <sub>cn</sub>	Nm	0.115	0.115
Peak Torque	T <sub>pk</sub>	Nm	0.40	0.40
Torque Constant ±10%	K <sub>t</sub>	Nm/Arms	0.024	0.042
Back EMF Constant ±10%	K <sub>e</sub>	Vpeak/rpm	0.002	0.004
Motor Constant @25°C	K <sub>m</sub>	Nm/Sqrt(W)	0.023	0.028
Resistance (L-L) @25°C ±10%	R <sub>25</sub>	Ω	0.73	1.51
Inductance (L-L) ±20%	L	mH	0.073	0.233
Electrical Time Constant	τ <sub>e</sub>	ms	0.10	0.15
Continuous Current @100°C	I <sub>cn</sub>	Arms	4.8	2.8
Peak Current	I <sub>pk</sub>	Arms	16.8	9.7
Continuous Power Dissipation @100°C	P <sub>cn</sub>	W	32.5	22.4
Max. Coil Temperature	t <sub>max</sub>	°C	100	100
Thermal Dissipation Constant	K <sub>thn</sub>	W/°C	0.434	0.298
Max. Bus Voltage	U <sub>bus</sub>	Vdc	48.0	48.0
Pole Number	2P	-	8	8
Rec. Max. Speed @48 VDC (Digital / SIN/COS)	Ω <sub>max</sub>	rpm	1200	1200
<b>Mechanical Parameters</b>				
Overall Mass	m <sub>n</sub>	kg	1.00	1.00
Rotor Inertia	J <sub>r</sub>	kg·m <sup>2</sup>	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
<b>Encoder Parameters</b>				
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
<b>Other Information</b>				
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

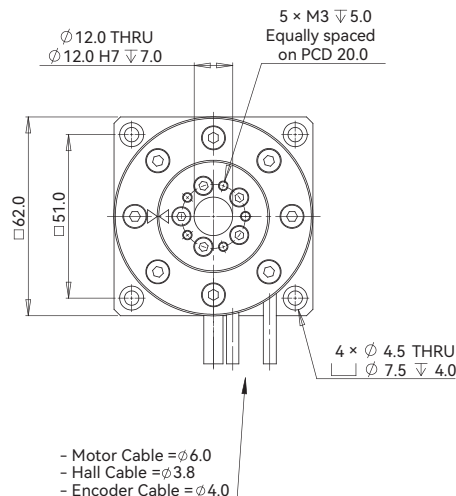


## ACD62-84

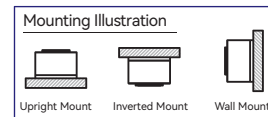
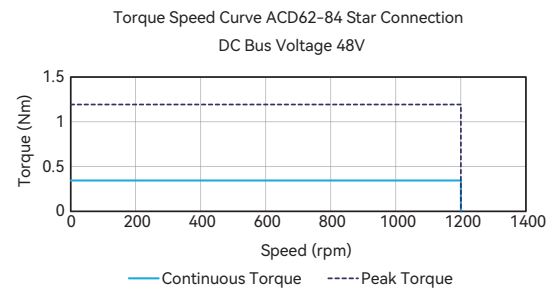
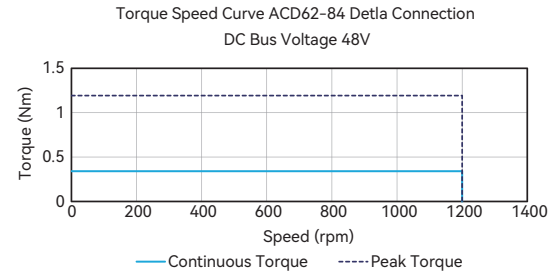
ACD62-84				
Performance Parameters	Symbol	Unit	D	Y
Continuous Torque @100°C	T <sub>cn</sub>	Nm	0.341	0.341
Peak Torque	T <sub>pk</sub>	Nm	1.19	1.19
Torque Constant ±10%	K <sub>t</sub>	Nm/Arms	0.071	0.123
Back EMF Constant ±10%	K <sub>e</sub>	Vpeak/rpm	0.006	0.011
Motor Constant @25°C	K <sub>m</sub>	Nm/Sqrt(W)	0.055	0.068
Resistance (L-L) @25°C ±10%	R <sub>25</sub>	Ω	1.12	2.21
Inductance (L-L) ±20%	L	mH	0.155	0.420
Electrical Time Constant	τ <sub>e</sub>	ms	0.14	0.19
Continuous Current @100°C	I <sub>cn</sub>	Arms	4.8	2.8
Peak Current	I <sub>pk</sub>	Arms	16.8	9.7
Continuous Power Dissipation @100°C	P <sub>cn</sub>	W	49.9	32.7
Max. Coil Temperature	t <sub>max</sub>	°C	100	100
Thermal Dissipation Constant	K <sub>thn</sub>	W/°C	0.665	0.436
Max. Bus Voltage	U <sub>bus</sub>	Vdc	48.0	48.0
Pole Number	2P	-	8	8
Rec. Max. Speed @48 VDC (Digital / SINCOS)	Ω <sub>max</sub>	rpm	1200	1200
Mechanical Parameters				
Overall Mass	m <sub>n</sub>	kg	1.40	1.40
Rotor Inertia	J <sub>r</sub>	kg · m <sup>2</sup>	3.944E-05	3.944E-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.			

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



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

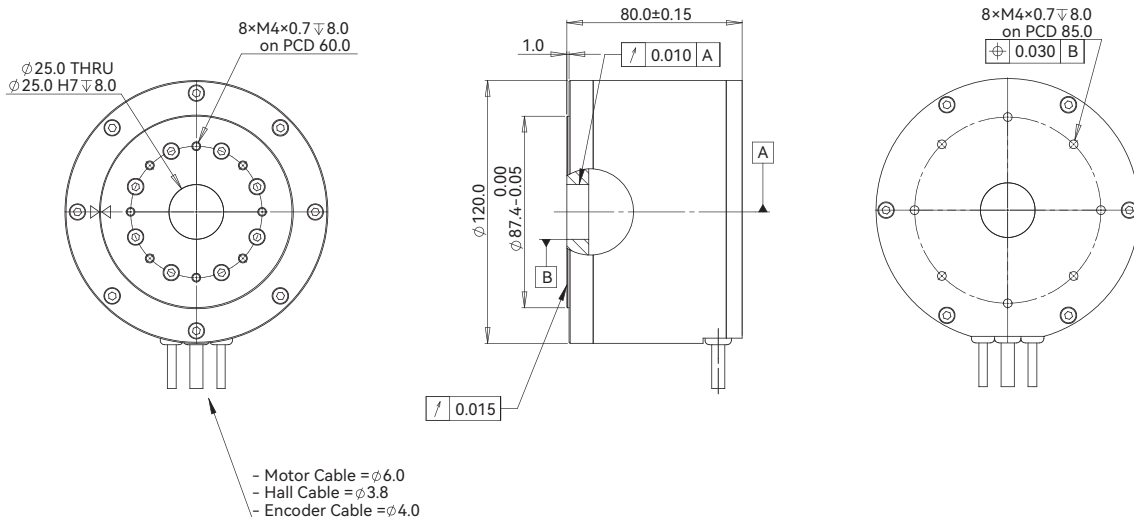
## ACD120-80

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

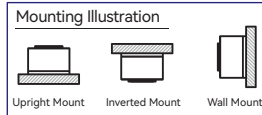
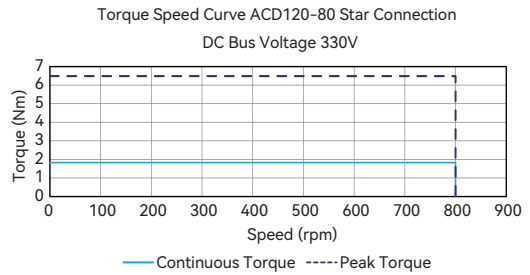
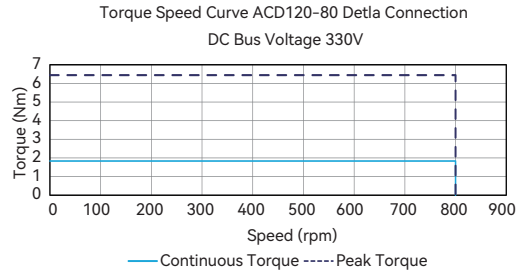
ACD120-80				
Performance Parameters	Symbol	Unit	D	Y
Continuous Torque @100°C	T <sub>cn</sub>	Nm	1.85	1.85
Peak Torque	T <sub>pk</sub>	Nm	6.46	6.46
Torque Constant ±10%	K <sub>t</sub>	Nm/Arms	0.36	0.63
Back EMF Constant ±10%	K <sub>e</sub>	Vpeak/rpm	0.031	0.054
Motor Constant @25°C	K <sub>m</sub>	Nm/Sqrt(W)	0.220	0.238
Resistance (L-L) @25°C ±10%	R <sub>25</sub>	Ω	1.80	4.64
Inductance (L-L) ±20%	L	mH	0.675	1.900
Electrical Time Constant	τ <sub>e</sub>	ms	0.38	0.41
Continuous Current @100°C	I <sub>cn</sub>	Arms	5.1	2.9
Peak Current	I <sub>pk</sub>	Arms	17.9	10.3
Continuous Power Dissipation @100°C	P <sub>cn</sub>	W	90.4	77.7
Max. Coil Temperature	t <sub>max</sub>	°C	100	100
Thermal Dissipation Constant	K <sub>thn</sub>	W/°C	1.205	1.036
Max. Bus Voltage	U <sub>bus</sub>	Vdc	330.0	330.0
Pole Number	2P	-	12	12
Rec. Max. Speed @230 VAC (Digital / SINCOS)	Ω <sub>max</sub>	rpm	800	800
Mechanical Parameters				
Overall Mass	m <sub>n</sub>	kg	3.2	3.2
Rotor Inertia	J <sub>r</sub>	kg·m <sup>2</sup>	1.08E-03	1.08E-03
Axial Runout	-	μm	15	15
Radial Runout	-	μm	10	10
Max. Axial Load (Upright Mounting)	-	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	-	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

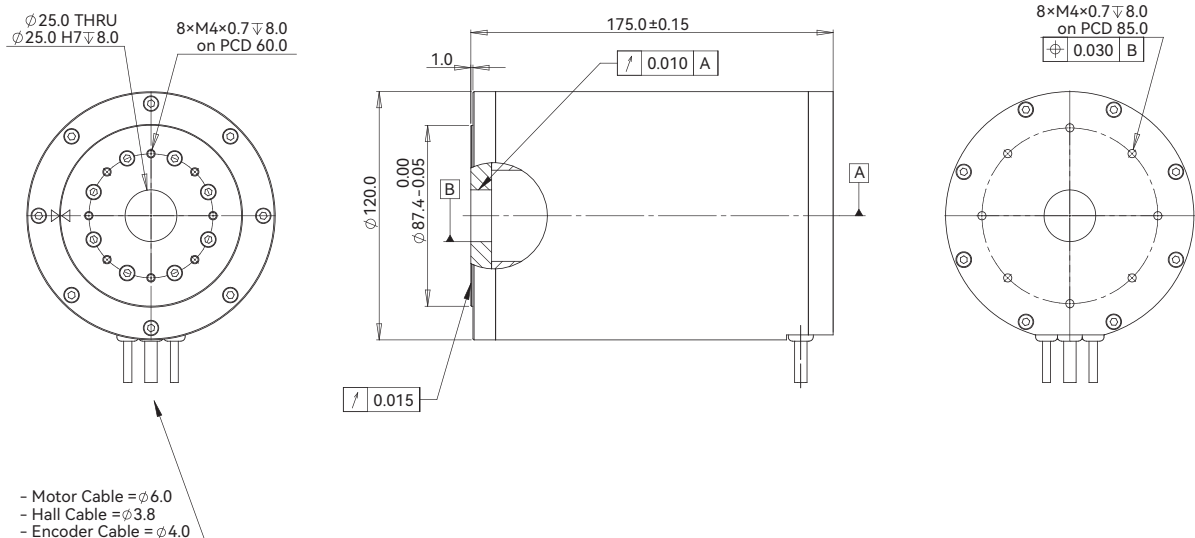


## ACD120-175

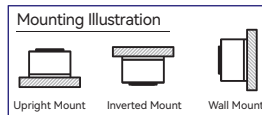
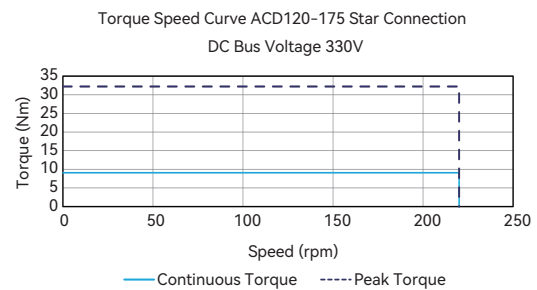
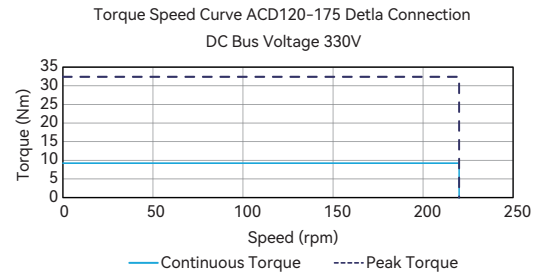
ACD120-175				
Performance Parameters	Symbol	Unit	D	Y
Continuous Torque @100°C ❶	T <sub>cn</sub>	Nm	9.22	9.22
Peak Torque	T <sub>pk</sub>	Nm	32.25	32.25
Torque Constant ±10%	K <sub>t</sub>	Nm/Arms	1.81	3.13
Back EMF Constant ±10%	K <sub>e</sub>	Vpeak/rpm	0.154	0.268
Motor Constant @25°C	K <sub>m</sub>	Nm/Sqrt(W)	0.736	0.736
Resistance (L-L) @25°C ±10% ❷	R <sub>25</sub>	Ω	4.02	12.07
Inductance (L-L) ±20% ❸	L	mH	2.000	5.619
Electrical Time Constant	τ <sub>e</sub>	ms	0.50	0.47
Continuous Current @100°C ❶	I <sub>cn</sub>	Arms	5.1	2.9
Peak Current	I <sub>pk</sub>	Arms	17.9	10.3
Continuous Power Dissipation @100°C ❶	P <sub>cn</sub>	W	202.4	202.1
Max. Coil Temperature	t <sub>max</sub>	°C	100	100
Thermal Dissipation Constant ❶	K <sub>thn</sub>	W/°C	2.698	2.695
Max. Bus Voltage	U <sub>bus</sub>	Vdc	330.0	330.0
Pole Number	2P	-	12	12
Rec. Max. Speed @230 VAC (Digital / SINCOS) ❹	Ω <sub>max</sub>	rpm	220	220
Mechanical Parameters				
Overall Mass	m <sub>n</sub>	kg	7.0	7.0
Rotor Inertia	J <sub>r</sub>	kg·m <sup>2</sup>	3.21E-03	3.21E-03
Axial Runout ❺	-	μm	15	15
Radial Runout ❺	-	μm	10	10
Max. Axial Load (Upright Mounting) ❻	-	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 ❷	-	arc sec	+/-6	+/-6
Repeatability ❷	-	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.			

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



### Torque-Speed Curve



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Akribis systems

## 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

